

# AMC100 AC Precision power distribution monitoring device

Installation instruction V1.2

Acrel Co., Ltd

## **Declaration**

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## Contents

|                                                            |    |
|------------------------------------------------------------|----|
| 1 Overview.....                                            | 1  |
| 2 Product Model.....                                       | 1  |
| 3 Technical Parameters.....                                | 1  |
| 4 Appearance and structure.....                            | 5  |
| 5 Terminal.....                                            | 6  |
| 5.1 AMC100-ZA.....                                         | 6  |
| 5.2 AMC100-FA30/FA48.....                                  | 8  |
| 5.3 AMC100-FAK30/FAK48.....                                | 9  |
| 5.4 AMC100-KA30/KA48.....                                  | 11 |
| 5.5 AMC100-KD30/KD48.....                                  | 12 |
| 5.6 AMC100-FT30/FT48.....                                  | 13 |
| 6 Communication protocol .....                             | 15 |
| 6.1 Brief description of the agreement.....                | 15 |
| 6.2 Transmission method.....                               | 15 |
| 6.3 Introduction to Function Code.....                     | 16 |
| 6.4 Communication Adress.....                              | 17 |
| 7 Matters needing attention .....                          | 47 |
| 8 Common fault diagnosis and troubleshooting methods ..... | 47 |

## 1 General

With the rapid development of data centers, the energy consumption of data centers has become more and more prominent. Energy management and power supply and distribution design of data centers have become hot issues. An efficient and reliable data center power distribution system solution is to improve data centers. Electric energy use efficiency, an effective way to reduce equipment energy consumption. To achieve energy saving in the data center, it is first necessary to monitor each electrical load, and there are many load loops in the data center. Traditional measuring instruments cannot meet the requirements of cost, volume, installation, construction and other aspects. Therefore, it is necessary to adopt suitable data Multi-loop monitoring device required by central centralized monitoring

Acrel AMC100 series AC precision power distribution monitoring device is a measuring device designed specifically for power management of data center servers. The device is compact in design and can monitor the full electrical parameters, input and output switches and the status of the lightning arrester of A+B two incoming lines and 192 outgoing lines in real time. The alarm thresholds of all measurement channels can be set individually, and the outgoing line The limited event immediately triggers the system's sound and light alarms, and the high integration of the monitoring loop is realized in the volume of the traditional instrument.

## 2 Product Model

| Model        | Function Description                                                                                                                                                                                                            |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AMC100-ZA    | Monitoring the full power parameters of the A+B dual three-phase AC incoming circuit, 8 switching status inputs, 4 switching status outputs, 2 leakage monitoring, 1 temperature and humidity detection, 3 RS485 communications |
| AMC100-FAK30 | Monitor the full power parameters and switch status of a total of 30 branches of A+B dual AC outlets, and 1 RS485 communication                                                                                                 |
| AMC100-FAK48 | Monitor the full power parameters and switch status of a total of 48 branches of A+B dual AC outlets, and 1 RS485 communication                                                                                                 |
| AMC100-FA30  | Monitor the full power parameters of a total of 30 branches of A+B dual AC outlets, and 1 RS485 communication                                                                                                                   |
| AMC100-FA48  | Monitor the full power parameters of a total of 48 branches of A+B dual AC outlets, and 1 RS485 communication                                                                                                                   |
| AMC100-KA30  | Wet contact, monitor the switching status of 30 branches A+B, 1 RS485 communication                                                                                                                                             |
| AMC100-KA48  | Wet contact, monitor the switching status of 48 branches A+B, 1 RS485 communication                                                                                                                                             |
| AMC100-KD30  | Dry contact, monitor the switching status of 30 branches A+B, 1 RS485 communication                                                                                                                                             |
| AMC100-KD48  | Dry contact, monitor the switching status of 48 branches A+B, 1 RS485 communication                                                                                                                                             |
| AMC100-FT30  | 1 way RS485 communication, 30 way temperature measurement                                                                                                                                                                       |
| AMC100-FT48  | 1 way RS485 communication, 48 way temperature measurement                                                                                                                                                                       |

## 3 Technical Parameters

AC incoming line

| Instrument model         |                   | AMC100-ZA                                                                                                                                                                                                                                                                                 |
|--------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement parameters   |                   | Voltage, current, frequency, active power, reactive power, power factor, active energy, reactive energy, Zero-to-ground voltage, leakage current and zero sequence current, total harmonic content (THD), 2-63 harmonics, current and voltage unbalance, ambient temperature and humidity |
| Bus voltage              | Rated             | 220VAC                                                                                                                                                                                                                                                                                    |
|                          | Measuring range   | ±20%                                                                                                                                                                                                                                                                                      |
|                          | Overload          | Instantaneous voltage 2 times/sec                                                                                                                                                                                                                                                         |
| Current incoming circuit | Rated             | Secondary 5A                                                                                                                                                                                                                                                                              |
|                          | Range             | 0~6A                                                                                                                                                                                                                                                                                      |
|                          | Overload          | Continuous 1.2 times, instantaneous 10 times/sec                                                                                                                                                                                                                                          |
| Temperature and humidity | Temperature Range | -40°C~+99°C                                                                                                                                                                                                                                                                               |
|                          | Humidity Range    | 20%~90%                                                                                                                                                                                                                                                                                   |

|                               |                                                               |                                                                                                                                                                                                                                                                                    |
|-------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input frequency               |                                                               | AC45~65Hz                                                                                                                                                                                                                                                                          |
| Measurement accuracy          | Incoming line                                                 | Voltage/current level 0.2, active power/energy level 0.5, reactive power/energy level 1                                                                                                                                                                                            |
|                               | Temperature                                                   | ±1°C                                                                                                                                                                                                                                                                               |
|                               | Humidity                                                      | ±5%                                                                                                                                                                                                                                                                                |
| Auxiliary power               |                                                               | AMC100-ZA: signal to take power (≤15W)<br>AMC100-ZA-P220: 220V independent power supply<br>AMC100-ZA-P24: DC 12-24V independent power supply                                                                                                                                       |
| Environment                   | Temperature                                                   | Work: -20°C~150°C Storage: -25°C~70°C                                                                                                                                                                                                                                              |
|                               | Humidity                                                      | Relative humidity≤93%                                                                                                                                                                                                                                                              |
|                               | elevation                                                     | ≤2500m                                                                                                                                                                                                                                                                             |
| Switch output                 |                                                               | 4 channels 3A 250VAC/3A 30VDC                                                                                                                                                                                                                                                      |
| Switch input                  |                                                               | 8 dry nodes                                                                                                                                                                                                                                                                        |
| Communication                 |                                                               | 1 isolated RS485/Modbus-RTU to the background system<br>1 RS485/Modbus-RTU to touch screen<br>1 RS485/Modbus-RTU connection downstream module<br>Optional 1-channel Ethernet communication function                                                                                |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                                                                                                                                                          |
| Protection level              |                                                               | IP20                                                                                                                                                                                                                                                                               |
| Pollution level               |                                                               | 2                                                                                                                                                                                                                                                                                  |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                                                                                                                                                       |
|                               | Withstand voltage                                             | A voltage and current signal//B voltage and current signal//switch output//isolated communication port//between other ports meet AC2kV 1min, switch input and other ports should meet AC0.5kV 1min, leakage current Should be less than 2mA, no breakdown or flashover phenomenon. |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                                                                                                                                                            |
|                               | Anti-electric fast transient burst                            | Level 3                                                                                                                                                                                                                                                                            |
|                               | Anti-surge interference                                       | Level 4                                                                                                                                                                                                                                                                            |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                                                                                                                                                            |

#### AC outlet

|                        |                 |                                                                                                                                                    |             |
|------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Instrument model       |                 | AMC100-FA30                                                                                                                                        | AMC100-FA48 |
| Measurement parameters |                 | Voltage, current, frequency, active power, reactive power, power factor, active energy, reactive energy, 2-31 times total current harmonic content |             |
| Bus voltage            | Rated           | 220VAC                                                                                                                                             |             |
|                        | Measuring range | ±20%                                                                                                                                               |             |
|                        | Overload        | Instantaneous voltage 2 times/sec                                                                                                                  |             |
| Current outlet loop    | Rated           | 50mA                                                                                                                                               |             |
|                        | Range           | 0.125~60mA                                                                                                                                         |             |
|                        | Overload        | Continuous 1.2 times, instantaneous 10 times/sec                                                                                                   |             |
| Input frequency        |                 | AC45~65Hz                                                                                                                                          |             |
| Measure                | Outlet          | Voltage/current/active power/active energy level 0.5, reactive power/reactive energy level 1                                                       |             |
| Auxiliary power        |                 | Powered by AMC100-ZA; DC 12-24V power supply when used alone                                                                                       |             |
| Environment            | Temperature     | Work: -15°C~55°C Storage: -25°C~70°C                                                                                                               |             |
|                        | Humidity        | Relative humidity≤93%                                                                                                                              |             |
|                        | elevation       | ≤2500m                                                                                                                                             |             |

|                               |                                                               |                                                                                                                                                                                                                   |
|-------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication                 |                                                               | RS485/Modbus-RTU                                                                                                                                                                                                  |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                                                                                         |
| Protection level              |                                                               | IP20                                                                                                                                                                                                              |
| Pollution level               |                                                               | 2                                                                                                                                                                                                                 |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                                                                                      |
|                               | Withstand voltage                                             | The voltage and current signals of circuit A//the voltage and current signals of circuit B//other ports meet AC2kV for 1min, the leakage current should be less than 2mA, and there is no breakdown or flashover. |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                                                                                           |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                                                                                           |

**Note: The rated input current of the secondary side of the AC outlet module is 50mA, and the default value of the primary side current is 50A. If the current transformer is different, the customer can set the transformation ratio through the touch screen or the host computer according to the actual use.**

|                               |                                                               |                                                                                                                                                                                                                   |              |
|-------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Instrument model              |                                                               | AMC100-FAK30                                                                                                                                                                                                      | AMC100-FAK48 |
| Measurement parameters        |                                                               | Voltage, current, frequency, active power, reactive power, power factor, active energy, reactive energy, 2-31 times total current harmonic content                                                                |              |
| Bus voltage                   | Rated                                                         | 220VAC                                                                                                                                                                                                            |              |
|                               | Measuring range                                               | ±20%                                                                                                                                                                                                              |              |
|                               | Overload                                                      | Instantaneous voltage 2 times/sec                                                                                                                                                                                 |              |
| Current outlet loop           | Rated                                                         | 50mA                                                                                                                                                                                                              |              |
|                               | Range                                                         | 0.125~60mA                                                                                                                                                                                                        |              |
|                               | Overload                                                      | Continuous 1.2 times, instantaneous 10 times/sec                                                                                                                                                                  |              |
| Input frequency               |                                                               | AC45~65Hz                                                                                                                                                                                                         |              |
| Measure                       | Outlet                                                        | Voltage/current/active power/active energy level 0.5, reactive power/reactive energy level 1                                                                                                                      |              |
| Auxiliary power               |                                                               | Powered by AMC100-ZA; DC 12-24V power supply when used alone                                                                                                                                                      |              |
| Environment                   | Temperature                                                   | Work: -15°C~55°C Storage: -25°C~70°C                                                                                                                                                                              |              |
|                               | Humidity                                                      | Relative humidity≤93%                                                                                                                                                                                             |              |
|                               | elevation                                                     | ≤2500m                                                                                                                                                                                                            |              |
| Communication                 |                                                               | RS485/Modbus-RTU                                                                                                                                                                                                  |              |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                                                                                         |              |
| Protection level              |                                                               | IP20                                                                                                                                                                                                              |              |
| Pollution level               |                                                               | 2                                                                                                                                                                                                                 |              |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                                                                                      |              |
|                               | Withstand voltage                                             | The voltage and current signals of circuit A//the voltage and current signals of circuit B//other ports meet AC2kV for 1min, the leakage current should be less than 2mA, and there is no breakdown or flashover. |              |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                                                                                           |              |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                                                                                           |              |

**Note: The rated input current of the secondary side of the AMC100-FAK module is 50mA, and the default value of the primary side current is 50A. If the current transformer is different, the customer can set the transformation ratio through the touch screen or the host computer according to the actual use.**

#### Active switch module

|                               |                                                               |                                                                                                                                                                                       |                        |
|-------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Instrument model              |                                                               | AMC100-KA30                                                                                                                                                                           | AMC100-KA48            |
| Input frequency               |                                                               | 45-65Hz AC45-65Hz                                                                                                                                                                     |                        |
| Auxiliary power               |                                                               | Powered by AMC100-ZA, DC 12-24V power supply when used alone                                                                                                                          |                        |
| Environment                   | Temperature                                                   | Work: -15°C~55°C Storage: -25°C~70°C                                                                                                                                                  |                        |
|                               | Humidity                                                      | Relative humidity≤93%                                                                                                                                                                 |                        |
|                               | elevation                                                     | ≤2500m                                                                                                                                                                                |                        |
| Switch input                  |                                                               | 30 wet nodes (AC 220V)                                                                                                                                                                | 48 wet nodes (AC 220V) |
| Communication                 |                                                               | RS485/Modbus-RTU                                                                                                                                                                      |                        |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                                                             |                        |
| Protection level              |                                                               | IP20                                                                                                                                                                                  |                        |
| Pollution level               |                                                               | 2                                                                                                                                                                                     |                        |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                                                          |                        |
|                               | Withstand voltage                                             | A switch value input signal//B switch value input signal//other ports meet AC2kV 1min between two, the leakage current should be less than 2mA, no breakdown or flashover phenomenon. |                        |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                                                               |                        |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                                                               |                        |

#### Passive switch module

|                               |                                                               |                                                                                                                                                                                       |                   |
|-------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Instrument model              |                                                               | AMC100-KD30                                                                                                                                                                           | AMC100-KD48       |
| Auxiliary power               |                                                               | Powered by AMC100-ZA, DC 12-24V power supply when used alone                                                                                                                          |                   |
| Environment                   | Temperature                                                   | Work: -15°C~55°C Storage: -25°C~70°C                                                                                                                                                  |                   |
|                               | Humidity                                                      | Relative humidity≤93%                                                                                                                                                                 |                   |
|                               | elevation                                                     | ≤2500m                                                                                                                                                                                |                   |
| Switch input                  |                                                               | 30-way trunk node                                                                                                                                                                     | 48-way trunk node |
| Communication                 |                                                               | RS485/Modbus-RTU                                                                                                                                                                      |                   |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                                                             |                   |
| Protection level              |                                                               | IP20                                                                                                                                                                                  |                   |
| Pollution level               |                                                               | 2                                                                                                                                                                                     |                   |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                                                          |                   |
|                               | Withstand voltage                                             | A switch value input signal//B switch value input signal//other ports meet AC2kV 1min between two, the leakage current should be less than 2mA, no breakdown or flashover phenomenon. |                   |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                                                               |                   |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                                                               |                   |

## Temperature measurement module

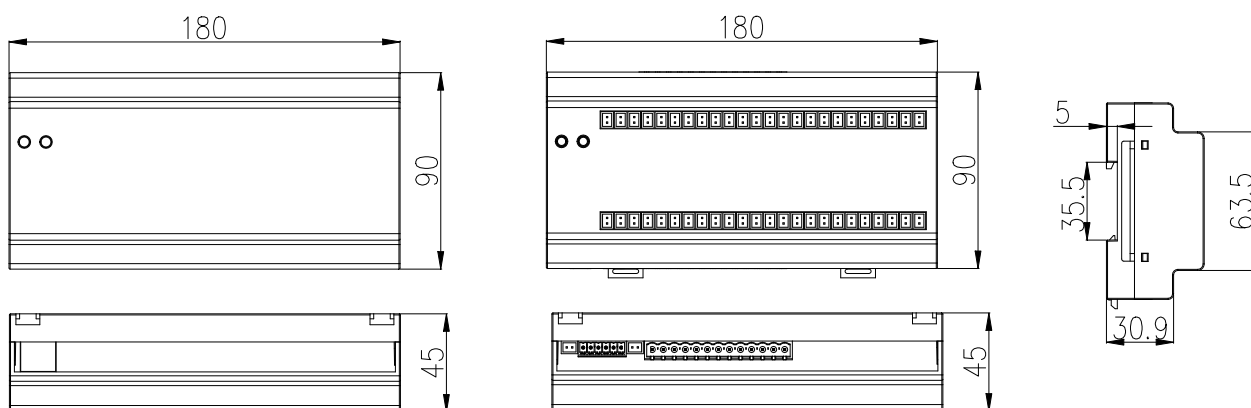
|                               |                                                               |                                                                                                                                                      |             |
|-------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Instrument model              |                                                               | AMC100-FT30                                                                                                                                          | AMC100-FT48 |
| Number of measuring channels  |                                                               | 30 channels                                                                                                                                          | 48 channels |
| Auxiliary power               |                                                               | Powered by AMC100-ZA, DC 12-24V power supply when used alone                                                                                         |             |
| Function                      | Temperature Range                                             | -20°C~150°C                                                                                                                                          |             |
|                               | Communication                                                 | RS485/Modbus-RTU                                                                                                                                     |             |
| Installation Method           |                                                               | DIN35mm rail or bottom plate installation                                                                                                            |             |
| Protection level              |                                                               | IP20                                                                                                                                                 |             |
| Pollution level               |                                                               | 2                                                                                                                                                    |             |
| Environment                   | Temperature/humidity/elevation                                | Working temperature: -20°C~60°C<br>Storage temperature: -25°C~70°C<br>Relative humidity: ≤93%<br>Altitude: ≤2500m                                    |             |
| Security                      | Insulation                                                    | The insulation resistance between all terminals and the conductive parts of the shell is not less than 100MΩ                                         |             |
|                               | Withstand voltage                                             | AC2kV 1min between auxiliary power supply and temperature measurement, leakage current should be less than 2mA, no breakdown or flashover phenomenon |             |
| Electromagnetic compatibility | Anti-static interference                                      | Level 4                                                                                                                                              |             |
|                               | Resistance to radio frequency electromagnetic field radiation | Level 3                                                                                                                                              |             |

## 4 Appearance and structure

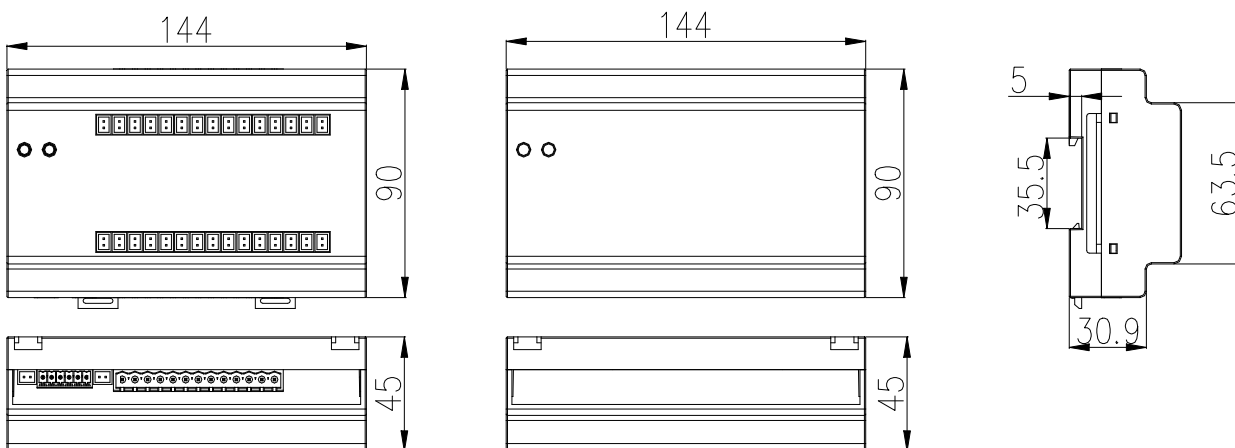
AMC100 series AC precision power distribution monitoring device

Unit: mm

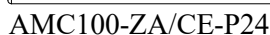
AMC100-ZA, AMC100-FA□48, AMC100-K□48, AMC100-FT48



AMC100-FA□30, AMC100-K□30, AMC100-FT30



## AMC100-ZA

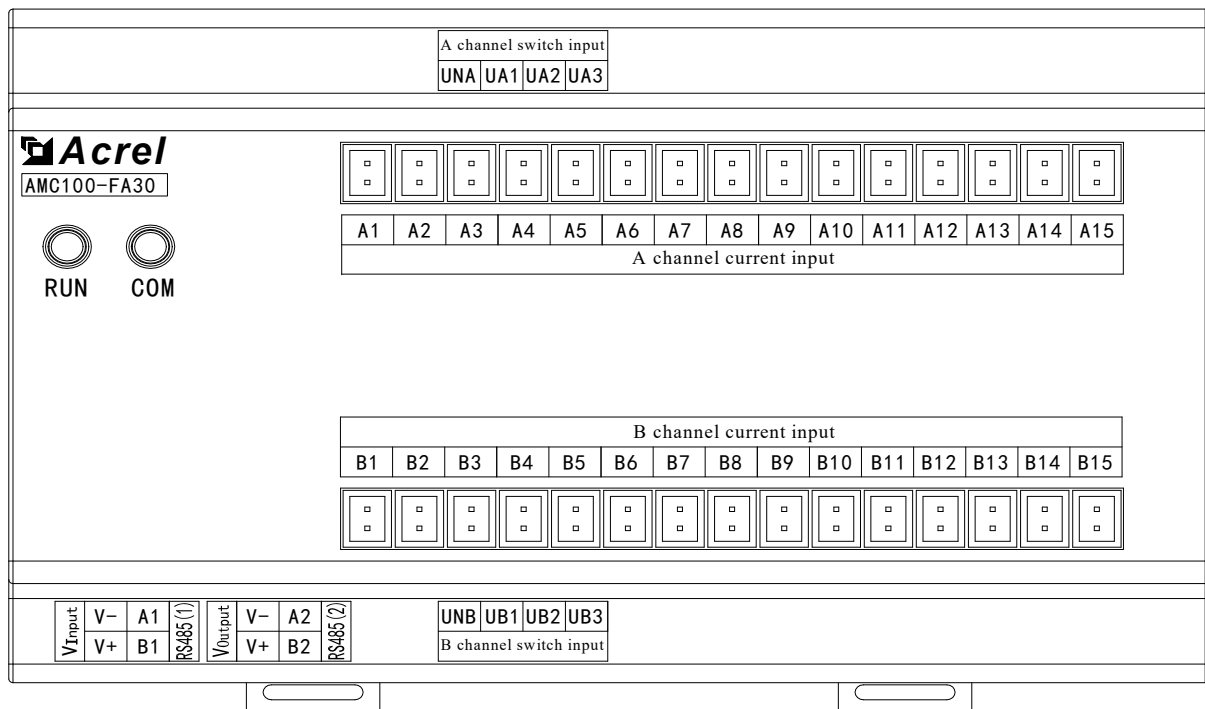


| Terminal number | Definition | Description                                          | Remark                                                                                                                                                                                                     |
|-----------------|------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1               | L(+)       | Auxiliary power                                      | P220 used, not connected by default                                                                                                                                                                        |
| 2               | N(-)       |                                                      |                                                                                                                                                                                                            |
| 5               | UA         | AC voltage Phase A                                   | Three-phase voltage input of circuit A incoming line                                                                                                                                                       |
| 6               | UB         | AC voltage Phase B                                   |                                                                                                                                                                                                            |
| 7               | UC         | AC voltage Phase C                                   |                                                                                                                                                                                                            |
| 8               | UN         | AC voltage neutral line                              |                                                                                                                                                                                                            |
| PG              |            | Ground                                               |                                                                                                                                                                                                            |
| 9               | IA+        | Current input phase A                                | Three-phase current input of circuit A incoming line                                                                                                                                                       |
| 10              | IA-        |                                                      |                                                                                                                                                                                                            |
| 11              | IB+        | Current input phase B                                |                                                                                                                                                                                                            |
| 12              | IB-        |                                                      |                                                                                                                                                                                                            |
| 13              | IC+        | Current input phase C                                |                                                                                                                                                                                                            |
| 14              | IC-        |                                                      |                                                                                                                                                                                                            |
| 15              | I+         | A channel leakage current input                      | Three-phase voltage input of circuit B incoming line                                                                                                                                                       |
| 16              | I-         |                                                      |                                                                                                                                                                                                            |
| 17              | UA         | AC voltage Phase A                                   |                                                                                                                                                                                                            |
| 18              | UB         | AC voltage Phase B                                   |                                                                                                                                                                                                            |
| 19              | UC         | AC voltage Phase C                                   |                                                                                                                                                                                                            |
| 20              | UN         | voltage neutral line                                 |                                                                                                                                                                                                            |
| PG              |            | Ground                                               |                                                                                                                                                                                                            |
| 21              | IA+        | Current input phase A                                | Three-phase current input of circuit B incoming line                                                                                                                                                       |
| 22              | IA-        |                                                      |                                                                                                                                                                                                            |
| 23              | IB+        | Current input phase B                                |                                                                                                                                                                                                            |
| 24              | IB-        |                                                      |                                                                                                                                                                                                            |
| 25              | IC+        | Current input phase C                                |                                                                                                                                                                                                            |
| 26              | IC-        |                                                      |                                                                                                                                                                                                            |
| 27              | I+         | B channel leakage current input                      | The first isolated communication interface, connected to the background system                                                                                                                             |
| 28              | I-         |                                                      |                                                                                                                                                                                                            |
| 30              | A1         | RS485(1)                                             |                                                                                                                                                                                                            |
| 31              | B1         |                                                      |                                                                                                                                                                                                            |
| 32              | A2         | RS485(2)                                             | The second channel is connected to the touch screen or RS485 hub                                                                                                                                           |
| 33              | B2         |                                                      |                                                                                                                                                                                                            |
|                 | A3         | RS485(3)                                             | The third way is connected to the downstream module                                                                                                                                                        |
|                 | B3         |                                                      |                                                                                                                                                                                                            |
|                 | LAN        | Ethernet                                             | CE with Ethernet communication                                                                                                                                                                             |
| 35              | V+         | Power Output<br>(auxiliary power input when use p24) | Power supply to AMC100-FA30/48, AMC100-FAK30/48,AMC100-KA30/48,AMC100-KD30/48,AMC100-FT30/FT48 and touch screen, this power supply prohibits external external devices (such as indicator lights, buzzers) |
| 36              | V-         |                                                      |                                                                                                                                                                                                            |
| 50              | DO1        | Switch output                                        | Connect the buzzer                                                                                                                                                                                         |
| 51              |            |                                                      |                                                                                                                                                                                                            |
| 52              | DO2        |                                                      | Connection indicator                                                                                                                                                                                       |
| 53              |            |                                                      |                                                                                                                                                                                                            |
| 54              | DO3        |                                                      | Reserved 1                                                                                                                                                                                                 |
| 55              |            |                                                      |                                                                                                                                                                                                            |
| 56              | DO4        |                                                      | Reserved 2                                                                                                                                                                                                 |

|    |                        |                          |                                              |
|----|------------------------|--------------------------|----------------------------------------------|
| 57 |                        |                          |                                              |
| 61 | Incoming line A        | Switch input             | OF                                           |
| 62 |                        |                          | SD                                           |
| 63 | Lightning protection A |                          | Determine the SPD status of route A          |
| 64 | Reserve                |                          | Reserved 1                                   |
| 65 | Incoming line B        |                          | OF+SD                                        |
| 66 |                        |                          | SD                                           |
| 67 | Lightning protection B |                          | Determine the SPD status of route B          |
| 68 | Reserve                |                          | Reserved 2                                   |
| 69 | Common port            |                          | Switch common                                |
| 70 |                        |                          |                                              |
| 81 | VSS                    | Temperature and humidity | Connect WH-3 temperature and humidity sensor |
| 82 | DATA                   |                          |                                              |
| 83 | CLK                    |                          |                                              |
| 84 | VDD                    |                          |                                              |

## 5.2 AMC100-FA30/FA48

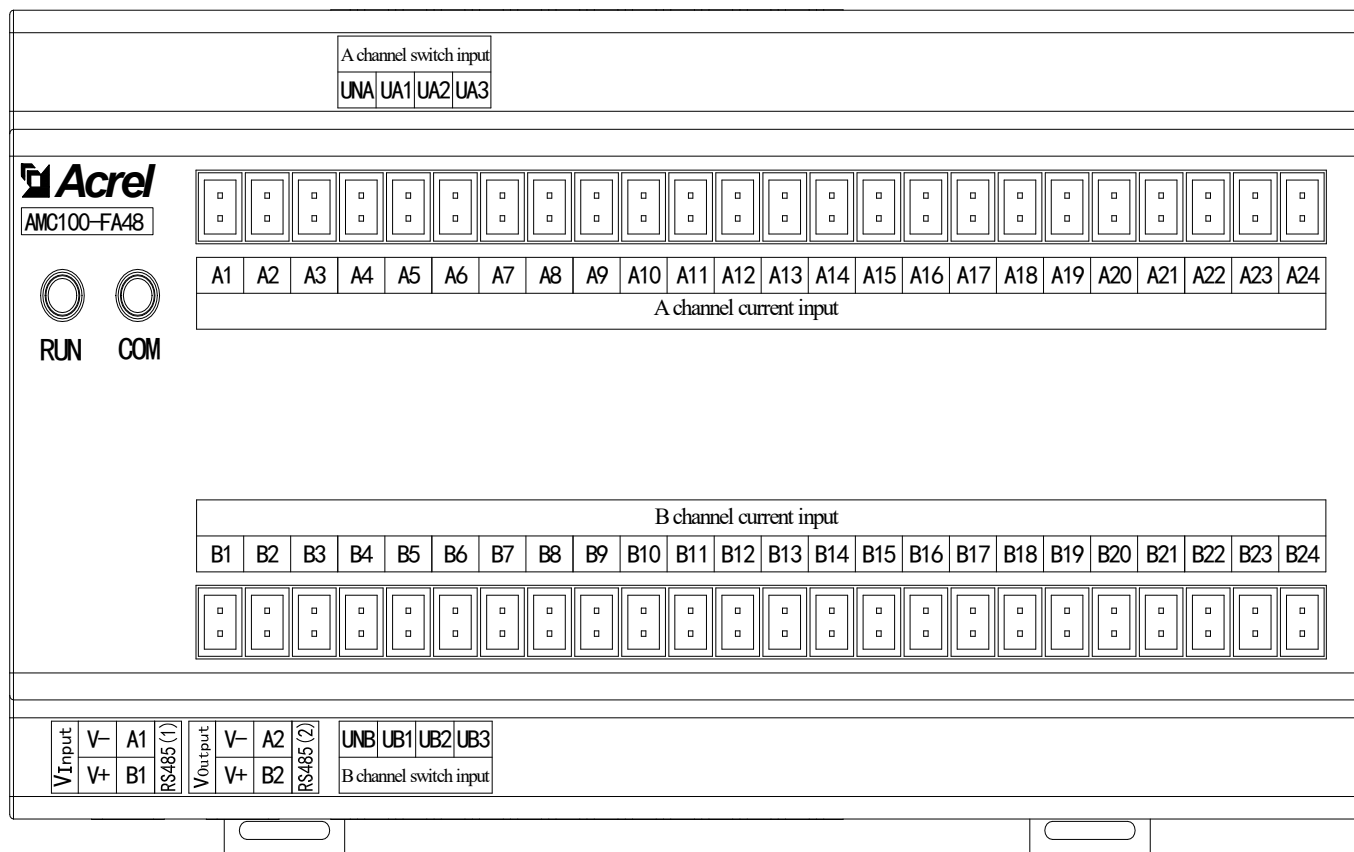
### AMC100-FA30



| Definition | Illustrate            | Remark                                                      |
|------------|-----------------------|-------------------------------------------------------------|
| V+         | Auxiliary power       | Powered by AMC100-ZA<br>Or powered by DC12-24V power supply |
| V-         |                       |                                                             |
| A1         | RS485(1)              | Connect the pre-module                                      |
| B1         |                       |                                                             |
| A2         | RS485(2)              | Connect the subsequent sub-module                           |
| B2         |                       |                                                             |
| UNA        | Route A voltage input | Three-phase voltage input of circuit A outgoing line        |
| UA1        |                       |                                                             |
| UA2        |                       |                                                             |
| UA3        |                       |                                                             |

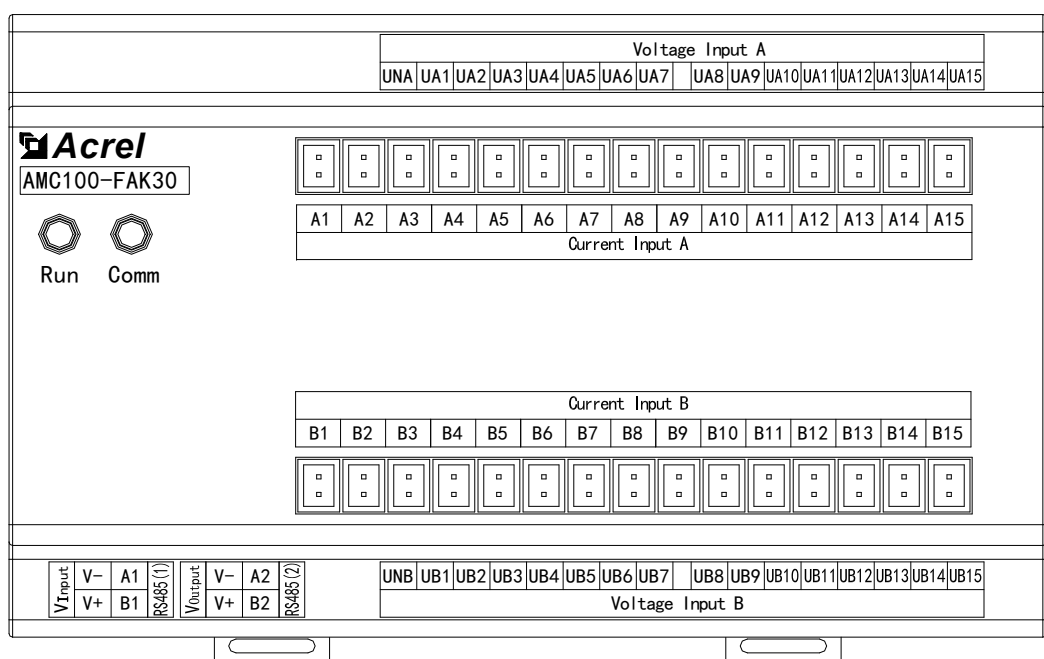
|        |                       |                                                       |
|--------|-----------------------|-------------------------------------------------------|
| UNB    | Route B voltage input | Three-phase voltage input of circuit B outgoing line  |
| UB1    |                       |                                                       |
| UB2    |                       |                                                       |
| UB3    |                       |                                                       |
| A1-A15 | Route A current input | circuit A outgoing line AC current input(15 channels) |
| B1-B15 | Route B current input | circuit A outgoing line AC current input(15 channels) |

#### AMC100-FA48



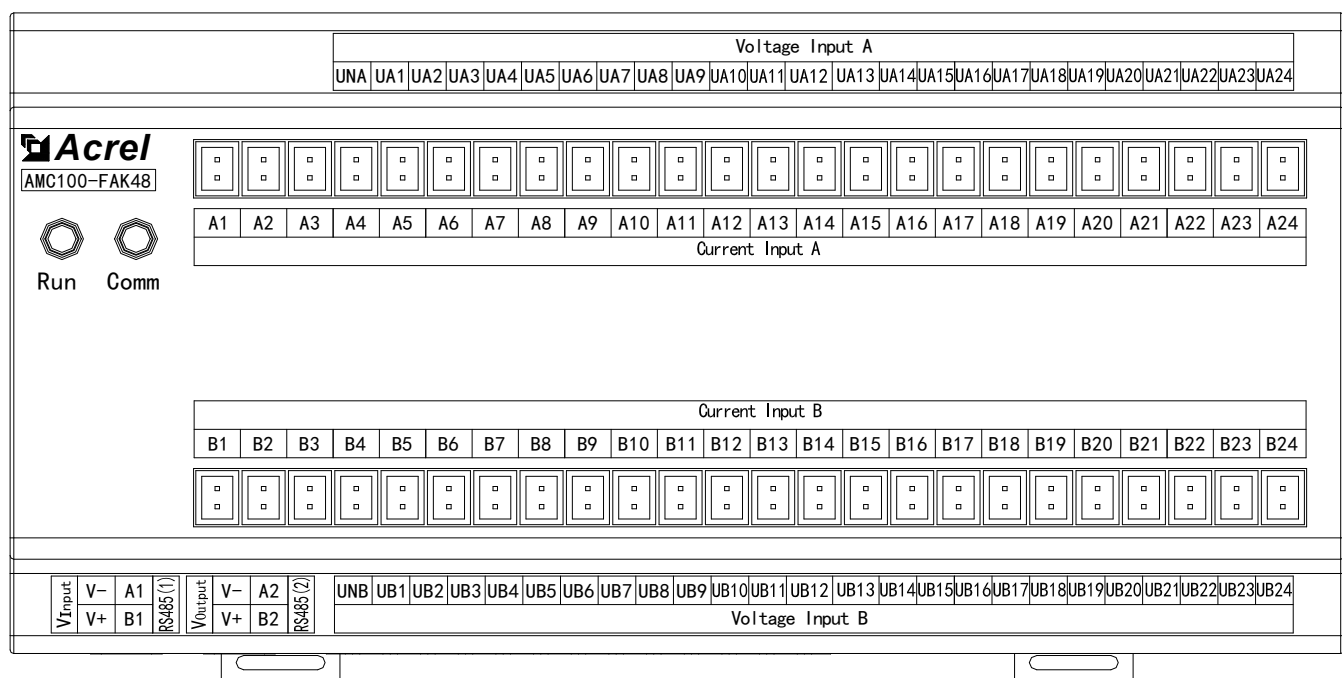
| Definition | Illustrate            | Remark                                                      |
|------------|-----------------------|-------------------------------------------------------------|
| V+         | Auxiliary power       | Powered by AMC100-ZA<br>Or powered by DC12-24V power supply |
| V-         |                       |                                                             |
| A1         | RS485(1)              | Connect the pre-module                                      |
| B1         |                       |                                                             |
| A2         | RS485(2)              | Connect the subsequent sub-module                           |
| B2         |                       |                                                             |
| UA+        | Route A voltage input | Three-phase voltage input of circuit A outgoing line        |
| UA-        |                       |                                                             |
| UB+        | Route B voltage input | Three-phase voltage input of circuit B outgoing line        |
| UB-        |                       |                                                             |
| A1-A24     | Route A current input | circuit A outgoing line AC current input(24 channels)       |
| B1-B24     | Route B current input | circuit A outgoing line AC current input(24 channels)       |

#### 5.3 AMC100-FAK30/FAK48 AMC100-FAK30



| Definition | Illustrate            | Remark                                                      |
|------------|-----------------------|-------------------------------------------------------------|
| V+         | Auxiliary power       | Powered by AMC100-ZA<br>Or powered by DC12-24V power supply |
| V-         |                       |                                                             |
| A1         | RS485(1)              | Connect the pre-module                                      |
| B1         |                       |                                                             |
| A2         | RS485(2)              | Connect the subsequent sub-module                           |
| B2         |                       |                                                             |
| UA1-UA15   | Route A voltage input | Route A switch input (15 channels)                          |
| UNA        |                       |                                                             |
| UB1-UB15   | Route B voltage input | Route B switch input (15 channels)                          |
| UNB        |                       |                                                             |
| A1-A15     | Route A current input | circuit A outgoing line AC current input(15 channels)       |
| B1-B15     | Route B current input | circuit A outgoing line AC current input(15 channels)       |

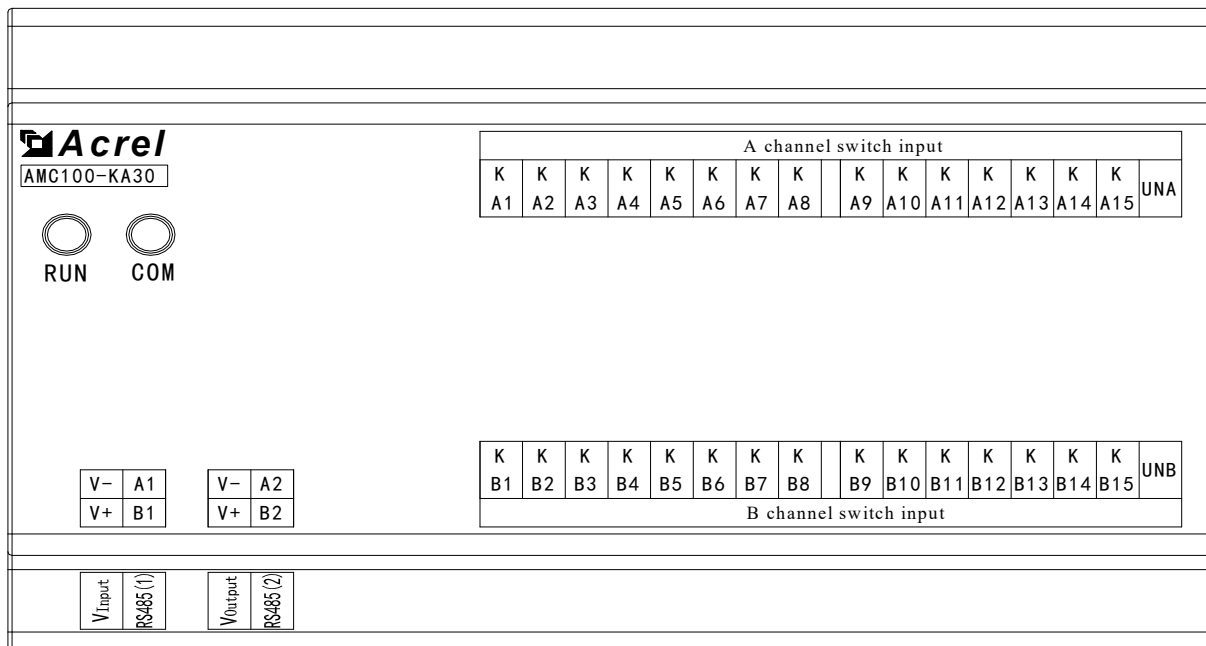
AMC100-FAK48



| Definition | Illustrate            | Remark                                                      |
|------------|-----------------------|-------------------------------------------------------------|
| V+         | Auxiliary power       | Powered by AMC100-ZA<br>Or powered by DC12-24V power supply |
| V-         |                       |                                                             |
| A1         | RS485(1)              | Connect the pre-module                                      |
| B1         |                       |                                                             |
| A2         | RS485(2)              | Connect the subsequent sub-module                           |
| B2         |                       |                                                             |
| UA1-UA24   | Route A voltage input | Route A switch input (24 channels)                          |
| UNA        |                       |                                                             |
| UB1-UB24   | Route B voltage input | Route B switch input (24 channels)                          |
| UNB        |                       |                                                             |
| A1-A24     | Route A current input | circuit A outgoing line AC current input(24channels)        |
| B1-B24     | Route B current input | circuit A outgoing line AC current input(24channels)        |

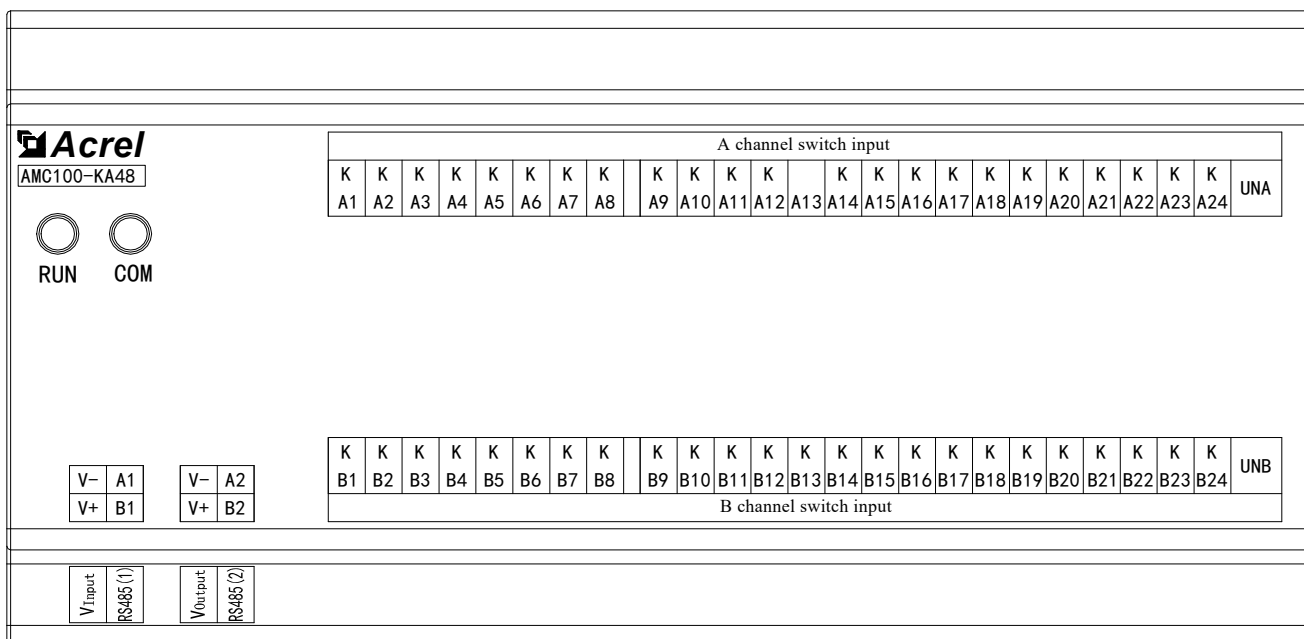
#### 5.4 AMC100-KA30/KA48

##### AMC100-KA30



| Definition | Description            | Remark                                                      |
|------------|------------------------|-------------------------------------------------------------|
| V+         | Auxiliary supply       | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                        |                                                             |
| A1         | RS485(1)               | Connect the pre-module                                      |
| B1         |                        |                                                             |
| A2         | RS485(2)               | Connect the subsequent sub-module                           |
| B2         |                        |                                                             |
| KA1-KA15   | A channel switch input | A channel active switch input (15 channels)                 |
| UNA        |                        |                                                             |
| KB1-KB15   | B channel switch input | B channel active switch input (15 channels)                 |
| UNB        |                        |                                                             |

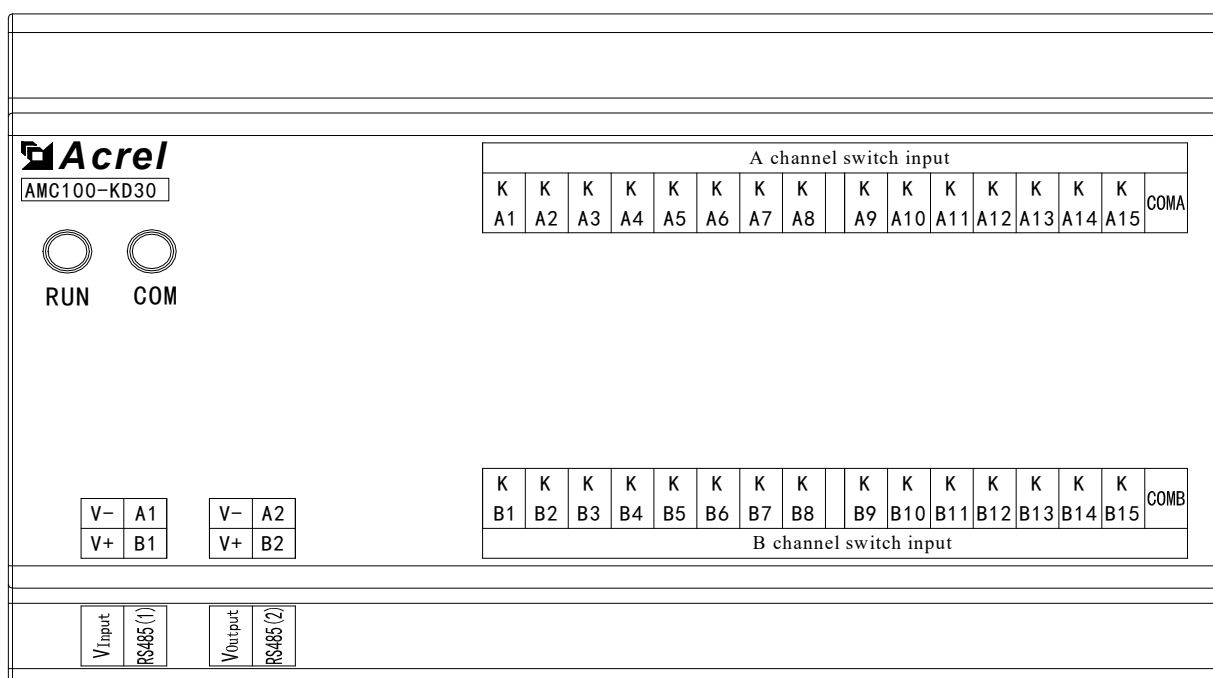
##### AMC100-KA48



| Definition | Description            | Remark                                                      |
|------------|------------------------|-------------------------------------------------------------|
| V+         | Auxiliary supply       | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                        |                                                             |
| A1         | RS485(1)               | Connect the pre-module                                      |
| B1         |                        |                                                             |
| A2         | RS485(2)               | Connect the subsequent sub-module                           |
| B2         |                        |                                                             |
| KA1-KA24   | A channel switch input | A channel active switch input (24 channels)                 |
| UNA        |                        |                                                             |
| KB1-KB24   | B channel switch input | B channel active switch input (24 channels)                 |
| UNB        |                        |                                                             |

## 5.5 AMC100-KD30/KD48

### AMC100-KD30



| Definition | Description            | Remark                                                      |
|------------|------------------------|-------------------------------------------------------------|
| V+         | Auxiliary supply       | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                        |                                                             |
| A1         | RS485(1)               | Connect the pre-module                                      |
| B1         |                        |                                                             |
| A2         | RS485(2)               | Connect the subsequent sub-module                           |
| B2         |                        |                                                             |
| KA1-KA15   | A channel switch input | A passive switch input (15 channels)                        |
| COMA       |                        |                                                             |
| KB1-KB15   | B channel switch input | B passive switch input (15 channels)                        |
| COMB       |                        |                                                             |

## AMC100-KD48

|                                                                                                         |  |                                                                                                  |  |                                            |  |  |  |                                                                                                                |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------|--|--------------------------------------------|--|--|--|----------------------------------------------------------------------------------------------------------------|--|--|--|----------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <br><b>AMC100-KD48</b> |  | A channel switch input                                                                           |  |                                            |  |  |  |                                                                                                                |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| K K K K K K K K<br>A1 A2 A3 A4 A5 A6 A7 A8                                                              |  |                                                                                                  |  |                                            |  |  |  | K K K K K K K K K K K K K K K K K K K K<br>A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 COMA |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <br><b>RUN</b>        |  | <br><b>COM</b> |  |                                            |  |  |  |                                                                                                                |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V- A1<br>V+ B1                                                                                          |  | V- A2<br>V+ B2                                                                                   |  | K K K K K K K K<br>B1 B2 B3 B4 B5 B6 B7 B8 |  |  |  |                                                                                                                |  |  |  | K K K K K K K K K K K K K K K K K K K K<br>B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 COMB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| B channel switch input                                                                                  |  |                                                                                                  |  |                                            |  |  |  |                                                                                                                |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V <sub>Input</sub> RS485 (1)                                                                            |  | V <sub>Output</sub> RS485 (2)                                                                    |  |                                            |  |  |  |                                                                                                                |  |  |  |                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Definition | Description            | Remark                                                      |
|------------|------------------------|-------------------------------------------------------------|
| V+         | Auxiliary supply       | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                        |                                                             |
| A1         | RS485(1)               | Connect the pre-module                                      |
| B1         |                        |                                                             |
| A2         | RS485(2)               | Connect the subsequent sub-module                           |
| B2         |                        |                                                             |
| KA1-KA24   | A channel switch input | A passive switch input (24 channels)                        |
| COMA       |                        |                                                             |
| KB1-KB24   | B channel switch input | B passive switch input (24 channels)                        |
| COMB       |                        |                                                             |

## 5.6 AMC100-FT30/FT48 AMC100-FT30

|                                                                                                                                                                                                                                                                                                                                                                 |          |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-------|-----|-------|---------------------|-------|------|-------|------|-------|------|-------|------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <br><b>AMC100-FT30</b>                                                                                                                                                                                                                                                                                                                                          |          | A temperature input |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                 |          | AT1                 | AT2      | AT3                                                                                                                                         | COMA1 | AT4                                                                                                                                                   | AT5      | AT6 | COMA2 | AT7 | AT8   | AT9                 | COMA3 | AT10 | AT11  | AT12 | COMA4 | AT13 | AT14  | AT15 | COMA5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <br><b>RUN</b>                                                                                                                                                                                                                                                                                                                                                  |          | <br><b>COM</b>      |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V-</td><td>A1</td></tr> <tr><td>V+</td><td>B1</td></tr> </table>                                                                                                                                                                                                           |          | V-                  | A1       | V+                                                                                                                                          | B1    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V-</td><td>A2</td></tr> <tr><td>V+</td><td>B2</td></tr> </table> |          | V-  | A2    | V+  | B2    | B temperature input |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V-                                                                                                                                                                                                                                                                                                                                                              | A1       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V+                                                                                                                                                                                                                                                                                                                                                              | B1       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V-                                                                                                                                                                                                                                                                                                                                                              | A2       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V+                                                                                                                                                                                                                                                                                                                                                              | B2       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>BT1</td><td>BT2</td><td>BT3</td><td>COMB1</td><td>BT4</td><td>BT5</td><td>BT6</td><td>COMB2</td><td>BT7</td><td>BT8</td><td>BT9</td><td>COMB3</td><td>BT10</td><td>BT11</td><td>BT12</td><td>COMB4</td><td>BT13</td><td>BT14</td><td>BT15</td><td>COMB5</td></tr> </table> |          | BT1                 | BT2      | BT3                                                                                                                                         | COMB1 | BT4                                                                                                                                                   | BT5      | BT6 | COMB2 | BT7 | BT8   | BT9                 | COMB3 | BT10 | BT11  | BT12 | COMB4 | BT13 | BT14  | BT15 | COMB5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BT1                                                                                                                                                                                                                                                                                                                                                             | BT2      | BT3                 | COMB1    | BT4                                                                                                                                         | BT5   | BT6                                                                                                                                                   | COMB2    | BT7 | BT8   | BT9 | COMB3 | BT10                | BT11  | BT12 | COMB4 | BT13 | BT14  | BT15 | COMB5 |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V<sub>Input</sub></td><td>RS485(1)</td></tr> </table>                                                                                                                                                                                                                      |          | V <sub>Input</sub>  | RS485(1) | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V<sub>Output</sub></td><td>RS485(2)</td></tr> </table> |       | V <sub>Output</sub>                                                                                                                                   | RS485(2) |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V <sub>Input</sub>                                                                                                                                                                                                                                                                                                                                              | RS485(1) |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V <sub>Output</sub>                                                                                                                                                                                                                                                                                                                                             | RS485(2) |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Definition | Description                 | Remark                                                      |
|------------|-----------------------------|-------------------------------------------------------------|
| V+         | Auxiliary power             | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                             |                                                             |
| A1         | RS485(1)                    | Connect the pre-module                                      |
| B1         |                             |                                                             |
| A2         | RS485(2)                    | Connect the subsequent sub-module                           |
| B2         |                             |                                                             |
| AT1-AT15   | A channel temperature input | A temperature input(15 channels)                            |
| BT1-BT15   | B channel temperature input | A temperature input(15 channels)                            |

## AMC100-FT48

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-------|-----|-------|---------------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <br><b>AMC100-FT48</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          | A temperature input |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | AT1                 | AT2      | AT3                                                                                                                                         | COMA1 | AT4                                                                                                                                                   | AT5      | AT6 | COMA2 | AT7 | AT8   | AT9                 | COMA3 | AT10 | AT11  | AT12 | COMA4 | AT13 | AT14  | AT15 | COMA5 | AT16 | AT17  | AT18 | COMA6 | AT19 | AT20  | AT21 | COMA7 | AT22 | AT23  | AT24 | COMA8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <br><b>RUN</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          | <br><b>COM</b>      |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V-</td><td>A1</td></tr> <tr><td>V+</td><td>B1</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                          |          | V-                  | A1       | V+                                                                                                                                          | B1    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V-</td><td>A2</td></tr> <tr><td>V+</td><td>B2</td></tr> </table> |          | V-  | A2    | V+  | B2    | B temperature input |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A1       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B1       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A2       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B2       |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| BT1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BT2      | BT3                 | COMB1    | BT4                                                                                                                                         | BT5   | BT6                                                                                                                                                   | COMB2    | BT7 | BT8   | BT9 | COMB3 | BT10                | BT11  | BT12 | COMB4 | BT13 | BT14  | BT15 | COMB5 | BT16 | BT17  | BT18 | COMB6 | BT19 | BT20  | BT21 | COMB7 | BT22 | BT23  | BT24 | COMB8 |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V<sub>Input</sub></td><td>RS485(1)</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                     |          | V <sub>Input</sub>  | RS485(1) | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>V<sub>Output</sub></td><td>RS485(2)</td></tr> </table> |       | V <sub>Output</sub>                                                                                                                                   | RS485(2) |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V <sub>Input</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | RS485(1) |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| V <sub>Output</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | RS485(2) |                     |          |                                                                                                                                             |       |                                                                                                                                                       |          |     |       |     |       |                     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Definition | State            | Remark                                                      |
|------------|------------------|-------------------------------------------------------------|
| V+         | Auxiliary supply | Powered by AMC100-ZD<br>Or powered by DC12-24V power supply |
| V-         |                  |                                                             |

|          |                     |                                   |
|----------|---------------------|-----------------------------------|
| A1       | RS485(1)            | Connect the pre-module            |
| B1       |                     |                                   |
| A2       | RS485(2)            | Connect the subsequent sub-module |
| B2       |                     |                                   |
| AT1-AT24 | A temperature input | A temperature input(24channels)   |
| BT1-BT24 | B temperature input | A temperature input(24 channels)  |

## 6 Protocol

This agreement specifies the physical connection and communication protocol for data exchange between the AMC100 series AC precision power distribution monitoring device and the data terminal equipment. The protocol is similar to the Modbus\_RTU communication protocol.

### 6.1 Brief description of the agreement

The communication protocol used by the AMC100 series AC device defines the data sequence definition of address code, function code, and check code in detail, which are all necessary content for specific data exchange. This protocol uses a master-slave response connection (half-duplex) on a communication line, which means that the signal is transmitted in two opposite directions on a single communication line. First, the signal from the host computer is addressed to a unique terminal device (slave), and then the response signal from the terminal device is transmitted to the host in the opposite direction.

This protocol only allows communication between the host (PC, PLC, etc.) and terminal equipment, and does not allow data exchange between independent terminal equipment, so that each terminal equipment will not occupy the communication line when they are initialized, but only in response Inquiry signal to the machine.

### 6.2 Transfer Method

The information transmission is asynchronous, and the unit is byte. The communication information transmitted between the master and the slave is an 11-bit word format, including 1 start bit, 8 data bits (the least effective bit is sent first), Parity check bit (no parity), 2 stop bits.

#### 6.2.1 Data frame format

| Address code | Function code | Data area | CRC verification code |
|--------------|---------------|-----------|-----------------------|
| 1 byte       | 1 byte        | n bytes   | 2 bytes               |

#### 6.2.2 Address domain

The address field is at the beginning of the frame and consists of one byte (8-bit binary code), and the decimal system is 0~255. In our system, only 1~247. Other addresses are reserved. These bits indicate the address of the terminal device designated by the user, which will receive data from the host connected to it. The address of each terminal device must be unique, and only the addressed terminal will respond to the query containing the address. When the terminal sends back a response, the slave address data in the response tells the host which terminal is communicating with it.

#### 6.2.3 Functional domain

The function field code tells which function is performed by the addressed terminal. The following table lists the function codes used in this series of devices, as well as their meanings and functions.

| Code | meaning                   | behavior                                                          |
|------|---------------------------|-------------------------------------------------------------------|
| 03   | Read data                 | register to get the current binary value of one or more registers |
| 16   | Preset multiple registers | Set the binary value to a series of multiple registers            |

#### 6.2.4 Data field

The data field contains the data required by the terminal to perform a specific function or the data collected when the terminal responds to a query. The content of these data may be numerical values, reference addresses or setting values. For example, the function domain code tells the terminal to read a register, and the data domain needs to specify which register to start and how many data to read. The embedded address and data vary according to the type and the content of the slave.

#### 6.2.5 Error check field

This field allows the host and terminal to check for errors during transmission. Sometimes, due to electrical noise and other interference, a set of data may have some changes on the line when it is transmitted from one

device to another. Error checking can ensure that the host or terminal does not respond to the data that has changed during the transmission. This improves the safety and efficiency of the system, and the error check uses a 16-bit cyclic redundancy method (CRC16).

#### 6.2.6 Methods of error detection

The error check field occupies two bytes and contains a 16-bit binary value. The CRC value is calculated by the transmitting device and then appended to the data frame. The receiving device recalculates the CRC value when receiving the data, and then compares it with the value in the received CRC field. If the two values are not equal, it will happen. mistake.

During CRC operation, first preset a 16-bit register to all 1s, and then continuously calculate the 8 bits in each byte in the data frame with the current value of the register, only 8 data per byte Bit participates in generating CRC, start bit, stop bit and possible parity bit do not affect CRC. When generating the CRC, the 8 bits of each byte are XORed with the contents of the register, and then the result is shifted to the low bit, and the high bit is supplemented with "0", and the least significant bit (LSB) is shifted out and checked. If it is 1, This register will perform an exclusive OR operation with a preset fixed value (0A001H). If the lowest bit is 0, no processing will be performed.

The above processing is repeated until 8 shift operations are performed. After the last bit (the 8th bit) is shifted, the next 8-bit byte is XORed with the current value of the register, and the other 8 above is also performed. When all the bytes in the data frame are processed, the final value generated is the CRC value.

The process of generating a CRC is:

(1)Preset a 16-bit register as 0FFFFH (all 1s), which is called CRC register. . XOR the 8 bits of the first byte in the data frame with the low byte in the CRC register, and store the result back to the CRC register. Shift the CRC register one bit to the right, fill the highest bit with 0, and shift the lowest bit out and check. If the lowest bit is 0: repeat the third step (the next shift); if the lowest bit is 1: change the CRC register to a preset fixed value (0A001H) Perform exclusive OR operation.

Repeat the third and fourth steps until 8 shifts. A complete eight bits have been processed in this way.

(2)Repeat steps 2 to 5 to process the next eight bits until all bytes are processed. The final CRC register value is the CRC value.

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

### 6.3 Introduction to Function Code

#### 6.3.1 Function code 03H: read register

This function allows users to obtain the data and system parameters collected and recorded by the device. The number of data requested by the host at one time is not limited, but it cannot exceed the defined address range.

The following example is reading 3 basic data collected from slave 01 (each address in the data frame occupies 2 bytes) Uab, Ubc, Uca, where the address of Uab is 03H, the address of Ubc is 04H, Uca The address is 05H.

| Host send         |           | Send message |
|-------------------|-----------|--------------|
| address code      |           | 01H          |
| function code     |           | 03H          |
| Starting Address  | high byte | 00H          |
|                   | Low byte  | 03H          |
| register Quantity | high byte | 00H          |
|                   | Low byte  | 03H          |
| CRC check code    | Low byte  | F5H          |
|                   | High byte | CBH          |

| Return from the machine |           | Return information |
|-------------------------|-----------|--------------------|
| address code            |           | 01H                |
| function code           |           | 03H                |
| Number of bytes         |           | 06H                |
| Register data           | high byte | 0EH                |
|                         | Low byte  | EEH                |
| Register data           | high byte | 0EH                |
|                         | Low byte  | E8H                |
| Register data           | high byte | 0EH                |
|                         | Low byte  | E9H                |
| CRC check code          | Low byte  | 8FH                |
|                         | High byte | 7EH                |

### 6.3.2 Function code 10H: write multiple registers

Function code 10H allows users to change the contents of multiple registers. The system parameters and switch output status of the instrument can be written with this function number. The host can write up to 16 (32 bytes) data at a time.

The following example is that the instrument with the preset address 01 outputs the switch value DO at the same time. The switch output status indication register address is 0045H, and the first bit corresponds to DO.

| Host send                |           | Send message | Return from the machine |           | Return information |
|--------------------------|-----------|--------------|-------------------------|-----------|--------------------|
| address code             |           | 01H          | address code            |           | 01H                |
| function code            |           | 10H          | function code           |           | 10H                |
| Starting Address         | high byte | 00H          | Starting Address        | high byte | 00H                |
|                          | Low byte  | 45H          |                         | Low byte  | 45H                |
| register Quantity        | high byte | 00H          | register Quantity       | high byte | 00H                |
|                          | Low byte  | 01H          |                         | Low byte  | 01H                |
| Number of bytes          |           | 02H          | CRC check code          | Low byte  | 10H                |
| 0045H Data to be written | high byte | 00H          |                         | High byte | 1CH                |
|                          | Low byte  | 01H          |                         |           |                    |
| CRC Check code           | Low byte  | 69H          |                         |           |                    |
|                          | High byte | 05H          |                         |           |                    |

## 6.4 Communication Address

### 6.4.1 AMC100-ZA

Telemetry, remote control

Parameter setting area (0x0000~0x006A)

| Number | variable        | Address | R/W | Length (bytes) | Unit                                                                                       | Data Type |
|--------|-----------------|---------|-----|----------------|--------------------------------------------------------------------------------------------|-----------|
| 1      | 1 relay output  | 0x0000  | R/W | 2              |                                                                                            | u16       |
| 2      | 2 relay outputs | 0x0001  | R/W | 2              |                                                                                            | u16       |
| 3      | 3 relay outputs | 0x0002  | R/W | 2              |                                                                                            | u16       |
| 4      | 4 relay outputs | 0x0003  | R/W | 2              |                                                                                            | u16       |
| 5      | Power zero      | 0x0004  | R/W | 2              |                                                                                            | u16       |
| 6      | Address 1       | 0x0005  | R/W | 2              | 1-247                                                                                      | u16       |
| 7      | Baud rate 1     | 0x0006  | R/W | 2              | Factory default 57600<br>0-115200 1-2400 2-4800 3-9600<br>4-19200 5-38400 6-57600 7-115200 | u16       |
| 8      | Check method 1  | 0x0007  | R/W | 2              | 0-none 1-odd 2-even                                                                        | u16       |
| 9      | Address 2       | 0x0008  | R/W | 2              | 1-247                                                                                      | u16       |
| 10     | Baud rate 2     | 0x0009  | R/W | 2              | Factory default 57600<br>0-115200 1-2400 2-4800 3-9600<br>4-19200 5-38400 6-57600 7-115200 | u16       |
| 11     | Check method 2  | 0x000A  | R/W | 2              | 0-none 1-odd 2-even                                                                        | u16       |
| 12     | Wiring          | 0x000B  | R/W | 2              | 0-3P4L、1-3P3L                                                                              | u16       |
| 13     | Rated Voltage   | 0x000C  | R/W | 2              | V                                                                                          | u16       |

|    |                                    |           |     |    |                                              |       |
|----|------------------------------------|-----------|-----|----|----------------------------------------------|-------|
| 14 | Rated current 1                    | 0x000D    | R/W | 2  | A                                            | u16   |
| 15 | Rated current 2                    | 0x000E    | R/W | 2  | A                                            | u16   |
| 16 | Voltage transformation ratio       | 0x000F    | R/W | 2  |                                              | u16   |
| 17 | Incoming wire ratio 1 <sup>①</sup> | 0x0010    | R/W | 2  |                                              | u16   |
| 18 | Incoming wire ratio 2              | 0x0011    | R/W | 2  |                                              | u16   |
| 19 | Outgoing mode (single and double)  | 0x0012    | R/W | 2  | 0-single 1-double                            | u16   |
| 20 | spare                              | 0x0013    | R/W | 2  |                                              | u16   |
| 21 | Humidity alarm threshold           | 0x14-0x15 | R/W | 4  | %                                            | float |
| 22 | Temperature alarm threshold        | 0x16-0x17 | R/W | 4  | °C                                           | float |
| 23 | Slave address 1-20                 | 0x18-0x2B | R/W | 40 | Set the address of the slave connected later | u16   |
| 24 | spare                              | 0x002C    | R/W | 2  |                                              | u16   |
| 25 | spare                              | 0x002D    | R/W | 2  |                                              | u16   |
| 26 | spare                              | 0x002E    | R/W | 2  |                                              | u16   |
| 27 | spare                              | 0x002F    | R/W | 2  |                                              | u16   |
| A  | High leakage current               | 0x0030    | R/W | 4  | A                                            | float |
|    | Zero sequence current H            | 0x0032    | R/W | 4  | A                                            | float |
|    | Zero ground voltage H              | 0x0034    | R/W | 4  | V                                            | float |
|    | Over frequency                     | 0x0036    | R/W | 4  | Hz                                           | float |
|    | Underfrequency                     | 0x0038    | R/W | 4  | Hz                                           | float |
|    | Current imbalance                  | 0x003A    | R/W | 4  | %                                            | float |
|    | 电压不平衡<br>Voltage unbalance         | 0x003C    | R/W | 4  | %                                            | float |
|    | Power overload                     | 0x003E    | R/W | 4  | kW                                           | float |
|    | Current H2                         | 0x0040    | R/W | 4  | A                                            | float |
|    | Current H1                         | 0x0042    | R/W | 4  | A                                            | float |
|    | Current L1                         | 0x0044    | R/W | 4  | A                                            | float |
|    | Current L2                         | 0x0046    | R/W | 4  | A                                            | float |
|    | Overpressure                       | 0x0048    | R/W | 4  | V                                            | float |
|    | Undervoltage                       | 0x004A    | R/W | 4  | V                                            | float |
|    | Lack of phase                      | 0x004C    | R/W | 4  | V                                            | float |
| B  | High leakage                       | 0x004E    | R/W | 4  | A                                            | float |
|    | current Zero sequence              | 0x0050    | R/W | 4  | A                                            | float |
|    | current H Zero ground voltage H    | 0x0052    | R/W | 4  | V                                            | float |
|    | Over frequency                     | 0x0054    | R/W | 4  | Hz                                           | float |
|    | Underfrequency                     | 0x0056    | R/W | 4  | Hz                                           | float |
|    | Current imbalance                  | 0x0058    | R/W | 4  | %                                            | float |
|    | Voltage unbalance                  | 0x005A    | R/W | 4  | %                                            | float |
|    | Power overload                     | 0x005C    | R/W | 4  | kW                                           | float |
|    | Current H2                         | 0x005E    | R/W | 4  | A                                            | float |
|    | Current H1                         | 0x0060    | R/W | 4  | A                                            | float |
|    | Current L1                         | 0x0062    | R/W | 4  | A                                            | float |
|    | Current L2                         | 0x0064    | R/W | 4  | A                                            | float |
|    | Overpressure                       | 0x0066    | R/W | 4  | V                                            | float |
|    | Undervoltage                       | 0x0068    | R/W | 4  | V                                            | float |
|    | Lack of phase                      | 0x006A    | R/W | 4  | V                                            | float |

①Note: AMC100-ZA CT setting is different according to transformer model such as 100A/5V CT set to 20、200A/5V set to 40.

## Electric parameter data area (0x0100~0x01AA)

| Number | variable                       | Address | R/W | Length (bytes) | Unit  | Data Type |
|--------|--------------------------------|---------|-----|----------------|-------|-----------|
| A      | Phase A voltage                | 0x0100  | R   | 4              | V     | float     |
|        | Phase B voltage                | 0x0102  | R   | 4              | V     | float     |
|        | Phase C voltage                | 0x0104  | R   | 4              | V     | float     |
|        | AB line voltage                | 0x0106  | R   | 4              | V     | float     |
|        | BC line voltage                | 0x0108  | R   | 4              | V     | float     |
|        | CA line voltage                | 0x010A  | R   | 4              | V     | float     |
|        | frequency                      | 0x010C  | R   | 4              | Hz    | float     |
|        | phase A current                | 0x010E  | R   | 4              | A     | float     |
|        | Phase B current                | 0x0110  | R   | 4              | A     | float     |
|        | Phase C current                | 0x0112  | R   | 4              | A     | float     |
|        | phase A active                 | 0x0114  | R   | 4              | kW    | float     |
|        | phase B active                 | 0x0116  | R   | 4              | kW    | float     |
|        | Phase C active                 | 0x0118  | R   | 4              | kW    | float     |
|        | Total Phase active             | 0x011A  | R   | 4              | kW    | float     |
|        | Phase A reactive power         | 0x011C  | R   | 4              | kvar  | float     |
|        | Phase B reactive               | 0x011E  | R   | 4              | kvar  | float     |
|        | Phase C reactive               | 0x0120  | R   | 4              | kvar  | float     |
|        | Total reactive                 | 0x0122  | R   | 4              | kvar  | float     |
|        | Phase A inspecting power       | 0x0124  | R   | 4              | kVA   | float     |
|        | Phase B inspecting power       | 0x0126  | R   | 4              | kVA   | float     |
|        | Phase C inspecting power       | 0x0128  | R   | 4              | kVA   | float     |
|        | Total inspecting power         | 0x012A  | R   | 4              | kVA   | float     |
|        | A phase power factor           | 0x012C  | R   | 4              |       | float     |
|        | B-phase power factor           | 0x011E  | R   | 4              |       | float     |
|        | C-phase power factor           | 0x0120  | R   | 4              |       | float     |
|        | Total power factor             | 0x0122  | R   | 4              |       | float     |
|        | EPA                            | 0x0124  | R   | 4              | kWh   | u32       |
|        | EPB                            | 0x0126  | R   | 4              | kWh   | u32       |
|        | EPC                            | 0x0128  | R   | 4              | kWh   | u32       |
|        | EP                             | 0x013A  | R   | 4              | kWh   | u32       |
|        | EQA                            | 0x013C  | R   | 4              | kvarh | u32       |
|        | EQB                            | 0x013E  | R   | 4              | kvarh | u32       |
|        | EQC                            | 0x0140  | R   | 4              | kvarh | u32       |
|        | EQ                             | 0x0142  | R   | 4              | kvarh | u32       |
|        | Zero-ground voltage            | 0x0144  | R   | 4              | V     | float     |
|        | Leakage                        | 0x0146  | R   | 4              | A     | float     |
|        | Neutral current                | 0x0148  | R   | 4              | A     | float     |
|        | Voltage unbalance              | 0x014A  | R   | 4              | %     | float     |
|        | Current imbalance              | 0x014C  | R   | 4              | %     | float     |
|        | Load percentage 1              | 0x014E  | R   | 4              | %     | float     |
|        | Load percentage 2              | 0x0150  | R   | 4              | %     | float     |
|        | Load percentage 3              | 0x0152  | R   | 4              | %     | float     |
| B      | Phase A voltage reactive power | 0x0154  | R   | 4              | V     | float     |
|        | Phase B voltage                | 0x0156  | R   | 4              | V     | float     |
|        | Phase C voltage                | 0x0158  | R   | 4              | V     | float     |

|  |                          |        |   |   |       |       |
|--|--------------------------|--------|---|---|-------|-------|
|  | AB line voltage          | 0x015A | R | 4 | V     | float |
|  | BC line voltage          | 0x015C | R | 4 | V     | float |
|  | CA line voltage          | 0x015E | R | 4 | V     | float |
|  | frequency                | 0x0160 | R | 4 | Hz    | float |
|  | A phase current          | 0x0162 | R | 4 | A     | float |
|  | Phase B current          | 0x0164 | R | 4 | A     | float |
|  | C phase current          | 0x0166 | R | 4 | A     | float |
|  | A phase active           | 0x0168 | R | 4 | kW    | float |
|  | B phase active           | 0x016A | R | 4 | kW    | float |
|  | C-phase active           | 0x016C | R | 4 | kW    | float |
|  | Total Phase active       | 0x016E | R | 4 | kW    | float |
|  | Phase A reactive power   | 0x0170 | R | 4 | kvar  | float |
|  | Phase B reactive         | 0x0172 | R | 4 | kvar  | float |
|  | Phase C reactive         | 0x0174 | R | 4 | kvar  | float |
|  | Total reactive power     | 0x0176 | R | 4 | kvar  | float |
|  | Phase A inspecting power | 0x0178 | R | 4 | kVA   | float |
|  | Phase B inspecting power | 0x017A | R | 4 | kVA   | float |
|  | Phase C inspecting power | 0x017C | R | 4 | kVA   | float |
|  | Total inspecting power   | 0x017E | R | 4 | kVA   | float |
|  | A phase power factor     | 0x0180 | R | 4 |       | float |
|  | B-phase power factor     | 0x0182 | R | 4 |       | float |
|  | C-phase power factor     | 0x0184 | R | 4 |       | float |
|  | Total power factor       | 0x0186 | R | 4 |       | float |
|  | EPA                      | 0x0188 | R | 4 | kWh   | u32   |
|  | EPB                      | 0x018A | R | 4 | kWh   | u32   |
|  | EPC                      | 0x018C | R | 4 | kWh   | u32   |
|  | EP                       | 0x018E | R | 4 | kWh   | u32   |
|  | EQA                      | 0x0190 | R | 4 | kvarh | u32   |
|  | EQB                      | 0x0192 | R | 4 | kvarh | u32   |
|  | EQC                      | 0x0194 | R | 4 | kvarh | u32   |
|  | EQ                       | 0x0196 | R | 4 | kvarh | u32   |
|  | Zero-ground voltage      | 0x0198 | R | 4 | V     | float |
|  | Leakage                  | 0x019A | R | 4 | A     | float |
|  | Neutral current          | 0x019C | R | 4 | A     | float |
|  | Voltage unbalance        | 0x019E | R | 4 | %     | float |
|  | Current imbalance        | 0x01A0 | R | 4 | %     | float |
|  | Load percentage 1        | 0x01A2 | R | 4 | %     | float |
|  | Load percentage 2        | 0x01A4 | R | 4 | %     | float |
|  | Load percentage 3        | 0x01A6 | R | 4 | %     | float |
|  | Temperature              | 0x01A8 | R | 4 | %     | float |
|  | Humidity                 | 0x01AA | R | 4 | %     | float |

Harmonic data area (0x0200~0x05D8)

| Number | variable | Adress | R/W | Length (bytes) | Unit  | Data Type |
|--------|----------|--------|-----|----------------|-------|-----------|
| A      | THDUA    | 0x0200 | R   | 2              | 0.01% | u16       |
|        | THDUB    | 0x0201 | R   | 2              | 0.01% | u16       |
|        | THDUC    | 0x0202 | R   | 2              | 0.01% | u16       |
|        | THDIA    | 0x0203 | R   | 2              | 0.01% | u16       |

|               |            |        |   |   |       |       |
|---------------|------------|--------|---|---|-------|-------|
|               | THDIB      | 0x0204 | R | 2 | 0.01% | u16   |
|               | THDIC      | 0x0205 | R | 2 | 0.01% | u16   |
|               | THDUA 2-63 | 0x0206 | R | 2 | 0.01% | u16   |
|               | THDUB 2-63 | 0x0244 | R | 2 | 0.01% | u16   |
|               | THDUC 2-63 | 0x0282 | R | 2 | 0.01% | u16   |
|               | THDIA 2-63 | 0x02C0 | R | 2 | 0.01% | u16   |
|               | THDIB 2-63 | 0x02FE | R | 2 | 0.01% | u16   |
|               | THDIC 2-63 | 0x033C | R | 2 | 0.01% | u16   |
| B             | THDUA      | 0x037A | R | 2 | 0.01% | u16   |
|               | THDUB      | 0x037B | R | 2 | 0.01% | u16   |
|               | THDUC      | 0x037C | R | 2 | 0.01% | u16   |
|               | THDIA      | 0x037D | R | 2 | 0.01% | u16   |
|               | THDIB      | 0x037E | R | 2 | 0.01% | u16   |
|               | THDIC      | 0x037F | R | 2 | 0.01% | u16   |
|               | THDUA 2-63 | 0x0380 | R | 2 | 0.01% | u16   |
|               | THDUB 2-63 | 0x03BE | R | 2 | 0.01% | u16   |
|               | THDUC 2-63 | 0x03FC | R | 2 | 0.01% | u16   |
|               | THDIA 2-63 | 0x043A | R | 2 | 0.01% | u16   |
|               | THDIB 2-63 | 0x0478 | R | 2 | 0.01% | u16   |
|               | THDIC 2-63 | 0x04B6 | R | 2 | 0.01% | u16   |
| A fundamental | THDPA      | 0x04F4 | R | 4 | kW    | float |
|               | THDPB      | 0x04F6 | R | 4 | kW    | float |
|               | THDPC      | 0x04F8 | R | 4 | kW    | float |
|               | THDPT      | 0x04FA | R | 4 | kW    | float |
|               | THDQA      | 0x04FC | R | 4 | kW    | float |
|               | THDQB      | 0x04FE | R | 4 | kW    | float |
|               | THDQC      | 0x0500 | R | 4 | kW    | float |
|               | THDQT      | 0x0502 | R | 4 | kW    | float |
|               | THDSA      | 0x0504 | R | 4 | kW    | float |
|               | THDSB      | 0x0506 | R | 4 | kW    | float |
|               | THDSC      | 0x0508 | R | 4 | kW    | float |
|               | THDST      | 0x050A | R | 4 | kW    | float |
| A harmonic    | THDPA      | 0x050C | R | 4 | kW    | float |
|               | THDPB      | 0x050E | R | 4 | kW    | float |
|               | THDPC      | 0x0510 | R | 4 | kW    | float |
|               | THDPT      | 0x0512 | R | 4 | kW    | float |
|               | THDQA      | 0x0514 | R | 4 | kW    | float |
|               | THDQB      | 0x0516 | R | 4 | kW    | float |
|               | THDQC      | 0x0518 | R | 4 | kW    | float |
|               | THDQT      | 0x051A | R | 4 | kW    | float |
|               | THDSA      | 0x051C | R | 4 | kW    | float |
|               | THDSB      | 0x051E | R | 4 | kW    | float |
|               | THDSC      | 0x0520 | R | 4 | kW    | float |
|               | THDST      | 0x0522 | R | 4 | kW    | float |
| B fundamental | THDPA      | 0x0524 | R | 4 | kW    | float |
|               | THDPB      | 0x0526 | R | 4 | kW    | float |
|               | THDPC      | 0x0528 | R | 4 | kW    | float |

|            |       |        |   |   |    |       |
|------------|-------|--------|---|---|----|-------|
|            | THDPT | 0x052A | R | 4 | kW | float |
|            | THDQA | 0x052C | R | 4 | kW | float |
|            | THDQB | 0x052E | R | 4 | kW | float |
|            | THDQC | 0x0530 | R | 4 | kW | float |
|            | THDQT | 0x0532 | R | 4 | kW | float |
|            | THDSA | 0x0534 | R | 4 | kW | float |
|            | THDSB | 0x0536 | R | 4 | kW | float |
|            | THDSC | 0x0538 | R | 4 | kW | float |
|            | THDST | 0x053A | R | 4 | kW | float |
| B harmonic | THDPA | 0x053C | R | 4 | kW | float |
|            | THDPB | 0x053E | R | 4 | kW | float |
|            | THDPC | 0x0540 | R | 4 | kW | float |
|            | THDPT | 0x0542 | R | 4 | kW | float |
|            | THDQA | 0x0544 | R | 4 | kW | float |
|            | THDQB | 0x0546 | R | 4 | kW | float |
|            | THDQC | 0x0548 | R | 4 | kW | float |
|            | THDQT | 0x054A | R | 4 | kW | float |
|            | THDSA | 0x054C | R | 4 | kW | float |
|            | THDSB | 0x054E | R | 4 | kW | float |
|            | THDSC | 0x0550 | R | 4 | kW | float |
|            | THDST | 0x0552 | R | 4 | kW | float |

#### Alarm status data read

| variable                   | Address | R/W | Word length | Data Type | Status bit             |                        |                         |                       |                    |                    |                    |                      |
|----------------------------|---------|-----|-------------|-----------|------------------------|------------------------|-------------------------|-----------------------|--------------------|--------------------|--------------------|----------------------|
| Main module                | 0x01B0  | R   | 4           | u32       | Bit31                  | Bit30                  | Bit29                   | Bit28                 | Bit27              | Bit26              | Bit25              | Bit24                |
|                            |         |     |             |           |                        |                        |                         |                       |                    |                    |                    |                      |
|                            |         |     |             |           | Bit23                  | Bit22                  | Bit21                   | Bit20                 | Bit19              | Bit18              | Bit17              | Bit16                |
|                            |         |     |             |           |                        |                        |                         |                       |                    |                    | <b>Humidity</b>    | <b>Temperature</b>   |
|                            |         |     |             |           | Bit15                  | Bit14                  | Bit13                   | Bit12                 | Bit11              | Bit10              | Bit9               | Bit8                 |
|                            |         |     |             |           |                        |                        |                         |                       | DO4                | DO3                | DO2                | DO1                  |
|                            |         |     |             |           | Bit7                   | Bit6                   | Bit5                    | Bit4                  | Bit3               | Bit2               | Bit1               | Bit0                 |
|                            |         |     |             |           | DI8                    | DI7                    | DI6                     | DI5                   | DI4                | DI3                | DI2                | DI1                  |
| A side incoming line alarm | 0x01B2  | R   | 4           | u32       | Bit31                  | Bit30                  | Bit29                   | Bit28                 | Bit27              | Bit26              | Bit25              | Bit24                |
|                            |         |     |             |           |                        | High leakage current   | Zero sequence current H | Zero ground voltage H | Over frequency     | Under-frequency    | Current imbalance  | Voltage unbalance    |
|                            |         |     |             |           | Bit23                  | Bit22                  | Bit21                   | Bit20                 | Bit19              | Bit18              | Bit17              | Bit16                |
|                            |         |     |             |           | A-phase power overload | B-phase power overload | C-phase power overload  | A phase current H2    | Phase B current H2 | C phase current H2 | A phase current H1 | Phase B current H1   |
|                            |         |     |             |           | Bit15                  | Bit14                  | Bit13                   | Bit12                 | Bit11              | Bit10              | Bit9               | Bit8                 |
|                            |         |     |             |           | C phase current H1     | A phase current L1     | Phase B current L1      | C phase current L1    | A phase current L2 | Phase B current L2 | C phase current L2 | Phase A over-voltage |
|                            |         |     |             |           | Bit7                   | Bit6                   | Bit5                    | Bit4                  | Bit3               | Bit2               | Bit1               | Bit0                 |
|                            |         |     |             |           | Phase B over-          | Phase C over-          | Phase A under-          | Phase B under-        | Phase C under-     | Phase A missing    | Phase B missing    | phase C missing      |

|                            |        |   |   |     |                        |                        |                        |                       |                       |                       |                       |                       |
|----------------------------|--------|---|---|-----|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                            |        |   |   |     | voltage                | voltage                | voltage                | voltage               | voltage               | phase                 | phase                 | phase                 |
| B side incoming line alarm | 0x01B4 | R | 4 | u32 | Bit31                  | Bit30                  | Bit29                  | Bit28                 | Bit27                 | Bit26                 | Bit25                 | Bit24                 |
|                            |        |   |   |     |                        | High leakage current   | Zero ground voltage L  | Zero ground voltage H | Over frequency        | Under-frequency       | Current imbalance     | Voltage unbalance     |
|                            |        |   |   |     | Bit23                  | Bit22                  | Bit21                  | Bit20                 | Bit19                 | Bit18                 | Bit17                 | Bit16                 |
|                            |        |   |   |     | A-phase power overload | B-phase power overload | C-phase power overload | A phase current H2    | Phase B current H2    | C phase current H2    | A phase current H1    | Phase B current H1    |
|                            |        |   |   |     | Bit15                  | Bit14                  | Bit13                  | Bit12                 | Bit11                 | Bit10                 | Bit9                  | Bit8                  |
|                            |        |   |   |     | C C phase current H1   | A phase current L1     | Phase B current L1     | C phase current L1    | A phase current L2    | Phase B current L2    | C phase current L2    | Phase A over-voltage  |
|                            |        |   |   |     | Bit7                   | Bit6                   | Bit5                   | Bit4                  | Bit3                  | Bit2                  | Bit1                  | Bit0                  |
|                            |        |   |   |     | Phase B over-voltage   | Phase C over-voltage   | Phase A under-voltage  | Phase B under-voltage | Phase C under-voltage | Phase A missing phase | Phase B missing phase | C phase missing phase |
| Slave communication alarm  | 0x01B6 | R | 2 | u16 | Bit15                  | Bit14                  | Bit13                  | Bit12                 | Bit11                 | Bit10                 | Bit9                  | Bit8                  |
|                            |        |   |   |     |                        |                        |                        |                       |                       |                       |                       |                       |
|                            |        |   |   |     | Bit7                   | Bit6                   | Bit5                   | Bit4                  | Bit3                  | Bit2                  | Bit1                  | Bit0                  |
|                            |        |   |   |     |                        |                        |                        |                       | Slave 20              | Slave 19              | Slave 18              | Slave 17              |
|                            | 0x01B7 |   | 2 | u16 | Bit15                  | Bit14                  | Bit13                  | Bit12                 | Bit11                 | Bit10                 | Bit9                  | Bit8                  |
|                            |        |   |   |     | Slave 16               | Slave 15               | Slave 14               | Slave 13              | Slave 12              | Slave 11              | Slave 10              | Slave 9               |
|                            |        |   |   |     | Bit7                   | Bit6                   | Bit5                   | Bit4                  | Bit3                  | Bit2                  | Bit1                  | Bit0                  |
|                            |        |   |   |     | Slave 8                | Slave 7                | Slave 6                | Slave 5               | Slave 4               | Slave 3               | Slave 2               | Slave 1               |

#### 6.4.2 AMC100-FAK48 (30) /FA48(30)

telemetry,remote control

Parameter Setting Area (0x0000~0x007F) When the module is FAK30/FA30,CT and load values can be set as 1-15 and 25-39 channel parameters.

| Address | variable                     | Remark | Length (Bite) | Unit                                                                                                                                                | Data Type |
|---------|------------------------------|--------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 0x0000  | address                      | R/W    | 2             | 1-254, 0 is the universal address                                                                                                                   | u16       |
| 0x0001  | Baud rate                    | R/W    | 2             | 0 115200 1-2400 2-4800 3-9600 4-19200 5-38400 6-57600 7-115200                                                                                      | u16       |
| 0x0002  | Check method                 | R/W    | 2             | 0-None 1-odd 2-even                                                                                                                                 | u16       |
| 0x0003  | spare                        | R/W    | 2             |                                                                                                                                                     | u16       |
| 0x0004  | Power zero                   | R/W    | 2             | 0x6601--0x6630 Clear the power of the 1st--48th channel 0x66F1 Clear the 1-24 channel 0x66F2 Clear the 25--48 channel 0x66FF Clear the 1-48 channel | u16       |
| 0x0005  | spare                        | R/W    | 2             |                                                                                                                                                     | u16       |
| 0x0006  | spare                        | R/W    | 2             |                                                                                                                                                     | u16       |
| 0x0007  | spare                        | R/W    | 2             |                                                                                                                                                     | u16       |
| 0x0008  | Switch A                     | R/W    | 2             | V                                                                                                                                                   | u16       |
| 0x0009  | Over-current ratio two       | R/W    | 2             | Load percentage>over-current ratio level 2 %%%will alarm                                                                                            | u16       |
| 0x000A  | Over-current ratio level one | R/W    | 2             | %                                                                                                                                                   | u16       |

|        |                               |     |   |                                                                                                                                                                                                                                                                    |     |
|--------|-------------------------------|-----|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 0x000B | Undercurrent ratio one level  | R/W | 2 | %                                                                                                                                                                                                                                                                  | u16 |
| 0x000C | Undercurrent ratio two        | R/W | 2 | %                                                                                                                                                                                                                                                                  | u16 |
| 0x000D | PT1                           | R/W | 2 | Voltage transformation ratio                                                                                                                                                                                                                                       | u16 |
| 0x000E | CT1 <sup>①</sup>              | R/W | 2 | Current transformation ratio of 1 circuit                                                                                                                                                                                                                          | u16 |
| 0x000F | CT2                           | R/W | 2 | Current transformation ratio of 2 circuit                                                                                                                                                                                                                          | u16 |
| 0x0010 | CT3                           | R/W | 2 | Current transformation ratio of 3 circuit                                                                                                                                                                                                                          | u16 |
| 0x0011 | CT4                           | R/W | 2 | Current transformation ratio of 4 circuit                                                                                                                                                                                                                          | u16 |
| 0x0012 | CT5                           | R/W | 2 | Current transformation ratio of 5 circuit                                                                                                                                                                                                                          | u16 |
| 0x0013 | CT6                           | R/W | 2 | Current transformation ratio of 6 circuit                                                                                                                                                                                                                          | u16 |
| 0x0014 | CT7                           | R/W | 2 | Current transformation ratio of 7 circuit                                                                                                                                                                                                                          | u16 |
| 0x0015 | CT8                           | R/W | 2 | Current transformation ratio of 8 circuit                                                                                                                                                                                                                          | u16 |
| 0x0016 | CT9                           | R/W | 2 | Current transformation ratio of 9 circuit                                                                                                                                                                                                                          | u16 |
| 0x0017 | CT10                          | R/W | 2 | Current transformation ratio of 10 circuit                                                                                                                                                                                                                         | u16 |
| 0x0018 | CT11                          | R/W | 2 | Current transformation ratio of 11 circuit                                                                                                                                                                                                                         | u16 |
| 0x0019 | CT12                          | R/W | 2 | Current transformation ratio of 12 circuit                                                                                                                                                                                                                         | u16 |
| 0x001A | CT13                          | R/W | 2 | Current transformation ratio of 13 circuit                                                                                                                                                                                                                         | u16 |
| 0x001B | CT14                          | R/W | 2 | Current transformation ratio of 14 circuit                                                                                                                                                                                                                         | u16 |
| 0x001C | CT15                          | R/W | 2 | Current transformation ratio of 15 circuit                                                                                                                                                                                                                         | u16 |
| 0x001D | CT16                          | R/W | 2 | Current transformation ratio of 16 circuit                                                                                                                                                                                                                         | u16 |
| 0x001E | CT17                          | R/W | 2 | Current transformation ratio of 17 circuit                                                                                                                                                                                                                         | u16 |
| 0x001F | CT18                          | R/W | 2 | Current transformation ratio of 18 circuit                                                                                                                                                                                                                         | u16 |
| 0x0020 | CT19                          | R/W | 2 | Current transformation ratio of 19 circuit                                                                                                                                                                                                                         | u16 |
| 0x0021 | CT20                          | R/W | 2 | Current transformation ratio of 20 circuit                                                                                                                                                                                                                         | u16 |
| 0x0022 | CT21                          | R/W | 2 | Current transformation ratio of 21 circuit                                                                                                                                                                                                                         | u16 |
| 0x0023 | CT22                          | R/W | 2 | Current transformation ratio of 22 circuit                                                                                                                                                                                                                         | u16 |
| 0x0024 | CT23                          | R/W | 2 | Current transformation ratio of 23 circuit                                                                                                                                                                                                                         | u16 |
| 0x0025 | CT24                          | R/W | 2 | Current transformation ratio of 24 circuit                                                                                                                                                                                                                         | u16 |
| 0x0026 | ALLCT1                        | R/W | 2 | The default value is 1, when it is greater than 1, all CT values become ALLCT values, when it is 0, all CT values become 1, and ALLCT becomes 1 again after updating, without affecting other CT values(1-24 CT all set)                                           | u16 |
| 0x0027 | LoadV1                        | R/W | 2 | This parameter is used to calculate the load percentage/current I/rated load value<br>If the Load parameter is set to 0, the alarm of this road will be turned off, and the load percentage of this road will be 0 the load percentage=current I /rated load value | u16 |
| 0x0028 | Rated load value of 1 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x0029 | Rated load value of 2 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x002A | Rated load value of 3 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x002B | Rated load value of 4 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x002C | Rated load value of 5 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x002D | Rated load value of 6 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |
| 0x002E | Rated load value of 7 circuit | R/W | 2 | A                                                                                                                                                                                                                                                                  | u16 |

|        |                                |     |   |                                            |     |
|--------|--------------------------------|-----|---|--------------------------------------------|-----|
| 0x002F | Rated load value of 8 circuit  | R/W | 2 | A                                          | u16 |
| 0x0030 | Rated load value of 9 circuit  | R/W | 2 | A                                          | u16 |
| 0x0031 | Rated load value of 10 circuit | R/W | 2 | A                                          | u16 |
| 0x0032 | Rated load value of 11 circuit | R/W | 2 | A                                          | u16 |
| 0x0033 | Rated load value of 12 circuit | R/W | 2 | A                                          | u16 |
| 0x0034 | Rated load value of 13 circuit | R/W | 2 | A                                          | u16 |
| 0x0035 | Rated load value of 14 circuit | R/W | 2 | A                                          | u16 |
| 0x0036 | Rated load value of 15 circuit | R/W | 2 | A                                          | u16 |
| 0x0037 | Rated load value of 16 circuit | R/W | 2 | A                                          | u16 |
| 0x0038 | Rated load value of 17 circuit | R/W | 2 | A                                          | u16 |
| 0x0039 | Rated load value of 18 circuit | R/W | 2 | A                                          | u16 |
| 0x003A | Rated load value of 19 circuit | R/W | 2 | A                                          | u16 |
| 0x003B | Rated load value of 20 circuit | R/W | 2 | A                                          | u16 |
| 0x003C | Rated load value of 21 circuit | R/W | 2 | A                                          | u16 |
| 0x003D | Rated load value of 22 circuit | R/W | 2 | A                                          | u16 |
| 0x003E | Rated load value of 23 circuit | R/W | 2 | A                                          | u16 |
| 0x003F | Rated load value of 24 circuit | R/W | 2 | A                                          | u16 |
| 0x0040 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0041 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0042 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0043 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0044 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0045 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0046 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0047 | Spare                          | R/W | 2 |                                            | u16 |
| 0x0048 | Switch B                       | R/W | 2 | V                                          | u16 |
| 0x0049 | Undercurrent ratio B1          | R/W | 2 | %                                          | u16 |
| 0x004A | Undercurrent ratio B2          | R/W | 2 | %                                          | u16 |
| 0x004B | Undercurrent ratio B1          | R/W | 2 | %                                          | u16 |
| 0x004C | Undercurrent ratio B2          | R/W | 2 | %                                          | u16 |
| 0x004D | PT2                            | R/W | 2 | Voltage transformation ratio               | u16 |
| 0x004E | CT25                           | R/W | 2 | Current transformation ratio of 25 circuit | u16 |
| 0x004F | CT26                           | R/W | 2 | Current transformation ratio of 26 circuit | u16 |
| 0x0050 | CT27                           | R/W | 2 | Current transformation ratio of 27 circuit | u16 |
| 0x0051 | CT28                           | R/W | 2 | Current transformation ratio of 28 circuit | u16 |
| 0x0052 | CT29                           | R/W | 2 | Current transformation ratio of 29 circuit | u16 |
| 0x0053 | CT30                           | R/W | 2 | Current transformation ratio of 30 circuit | u16 |

|        |                                |     |   |                                            |     |
|--------|--------------------------------|-----|---|--------------------------------------------|-----|
| 0x0054 | CT31                           | R/W | 2 | Current transformation ratio of 31 circuit | u16 |
| 0x0055 | CT32                           | R/W | 2 | Current transformation ratio of 32 circuit | u16 |
| 0x0056 | CT33                           | R/W | 2 | Current transformation ratio of 33 circuit | u16 |
| 0x0057 | CT34                           | R/W | 2 | Current transformation ratio of 34 circuit | u16 |
| 0x0058 | CT35                           | R/W | 2 | Current transformation ratio of 35 circuit | u16 |
| 0x0059 | CT36                           | R/W | 2 | Current transformation ratio of 36 circuit | u16 |
| 0x005A | CT37                           | R/W | 2 | Current transformation ratio of 37 circuit | u16 |
| 0x005B | CT38                           | R/W | 2 | Current transformation ratio of 38 circuit | u16 |
| 0x005C | CT39                           | R/W | 2 | Current transformation ratio of 39 circuit | u16 |
| 0x005D | CT40                           | R/W | 2 | Current transformation ratio of 40 circuit | u16 |
| 0x005E | CT41                           | R/W | 2 | Current transformation ratio of 41 circuit | u16 |
| 0x005F | CT42                           | R/W | 2 | Current transformation ratio of 42 circuit | u16 |
| 0x0060 | CT43                           | R/W | 2 | Current transformation ratio of 43 circuit | u16 |
| 0x0061 | CT44                           | R/W | 2 | Current transformation ratio of 44 circuit | u16 |
| 0x0062 | CT45                           | R/W | 2 | Current transformation ratio of 45 circuit | u16 |
| 0x0063 | CT46                           | R/W | 2 | Current transformation ratio of 46 circuit | u16 |
| 0x0064 | CT47                           | R/W | 2 | Current transformation ratio of 47 circuit | u16 |
| 0x0065 | CT48                           | R/W | 2 | Current transformation ratio of 48 circuit | u16 |
| 0x0066 | ALLCT2                         | R/W | 2 | 25-48 CT all sets                          | u16 |
| 0x0067 | Rated load value of 25 circuit | R/W | 2 | A                                          | u16 |
| 0x0068 | Rated load value of 26 circuit | R/W | 2 | A                                          | u16 |
| 0x0069 | Rated load value of 27 circuit | R/W | 2 | A                                          | u16 |
| 0x006A | Rated load value of 28 circuit | R/W | 2 | A                                          | u16 |
| 0x006B | Rated load value of 29 circuit | R/W | 2 | A                                          | u16 |
| 0x006C | Rated load value of 30 circuit | R/W | 2 | A                                          | u16 |
| 0x006D | Rated load value of 31 circuit | R/W | 2 | A                                          | u16 |
| 0x006E | Rated load value of 32 circuit | R/W | 2 | A                                          | u16 |
| 0x006F | Rated load value of 33 circuit | R/W | 2 | A                                          | u16 |
| 0x0070 | Rated load value of 34 circuit | R/W | 2 | A                                          | u16 |
| 0x0071 | Rated load value of 35 circuit | R/W | 2 | A                                          | u16 |
| 0x0072 | Rated load value of 36 circuit | R/W | 2 | A                                          | u16 |
| 0x0073 | Rated load value of 37 circuit | R/W | 2 | A                                          | u16 |
| 0x0074 | Rated load value of 38 circuit | R/W | 2 | A                                          | u16 |
| 0x0075 | Rated load value of 39 circuit | R/W | 2 | A                                          | u16 |
| 0x0076 | Rated load value of 40 circuit | R/W | 2 | A                                          | u16 |
| 0x0077 | Rated load value of 41 circuit | R/W | 2 | A                                          | u16 |
| 0x0078 | Rated load value of 42 circuit | R/W | 2 | A                                          | u16 |

|        |                                |     |   |   |     |
|--------|--------------------------------|-----|---|---|-----|
|        | circuit                        |     |   |   |     |
| 0x0079 | Rated load value of 43 circuit | R/W | 2 | A | u16 |
| 0x007A | Rated load value of 44 circuit | R/W | 2 | A | u16 |
| 0x007B | Rated load value of 45 circuit | R/W | 2 | A | u16 |
| 0x007C | Rated load value of 46 circuit | R/W | 2 | A | u16 |
| 0x007D | Rated load value of 47 circuit | R/W | 2 | A | u16 |
| 0x007E | Rated load value of 48 circuit | R/W | 2 | A | u16 |
| 0x007F | ALLLoadV2                      | R/W | 2 | A | u16 |

①Note: CT setting is different according to transformer model such as 50A/50mA CT set to 10、100A/50mA set to 20、200A/50mA set to 40.

Electrical parameter data area (0x0090 ~ 0x03EF) When the module is FAK30/FA30,the valid data are 1-25 and 25-39 channels.When the module address is set to 20-29,the valid data is 1-30 channels.

| Number | Address | variable                              | Remark                                          | Length(Bite) | Unit      | Type  |
|--------|---------|---------------------------------------|-------------------------------------------------|--------------|-----------|-------|
| 1      | 0x0090  | U (voltage)                           | R                                               | 4            | V         | float |
|        | 0x0091  |                                       |                                                 |              |           |       |
|        | 0x0092  | I (current)                           | R                                               | 4            | A         |       |
|        | 0x0093  |                                       |                                                 |              |           |       |
|        | 0x0094  | P (active power)                      | R                                               | 4            | kW        |       |
|        | 0x0095  |                                       |                                                 |              |           |       |
|        | 0x0096  | Q (reactive power)                    | R                                               | 4            | kvar      |       |
|        | 0x0097  |                                       |                                                 |              |           |       |
|        | 0x0098  | S (apparent power)                    | R                                               | 4            | kVA       |       |
|        | 0x0099  |                                       |                                                 |              |           |       |
|        | 0x009A  | PF (power factor)                     | R                                               | 4            |           |       |
|        | 0x009B  |                                       |                                                 |              |           |       |
|        | 0x009C  | EP (active energy)                    | R                                               | 4            | 0.01kWh   | u32   |
|        | 0x009D  |                                       |                                                 |              |           |       |
|        | 0x009E  | EQ (reactive energy)                  | R                                               | 4            | 0.01kvarh | u32   |
|        | 0x009F  |                                       |                                                 |              |           |       |
|        | 0x00A0  | THDI (total current harmonic content) | R                                               | 2            | 0.01%     | u16   |
|        | 0x00A1  | Load (load percentage)                | R load ratio=I/load value without decimal point | 2            | %         | u16   |
| 2      | 0x00A2  | U (voltage)                           | R                                               | 4            | V         | float |
|        | 0x00A3  |                                       |                                                 |              |           |       |
|        | 0x00A4  | I (current)                           | R                                               | 4            | A         |       |
|        | 0x00A5  |                                       |                                                 |              |           |       |
|        | 0x00A6  | P (active power)                      | R                                               | 4            | kW        |       |
|        | 0x00A7  |                                       |                                                 |              |           |       |
|        | 0x00A8  | Q (reactive power)                    | R                                               | 4            | kvar      |       |
|        | 0x00A9  |                                       |                                                 |              |           |       |
|        | 0x00AA  | S (apparent power)                    | R                                               | 4            | kVA       |       |
|        | 0x00AB  |                                       |                                                 |              |           |       |
|        | 0x00AC  | PF (power factor)                     | R                                               | 4            |           |       |
|        | 0x00AD  |                                       |                                                 |              |           |       |
|        | 0x00AE  | EP (active energy)                    | R                                               | 4            | 0.01kWh   | u32   |

|   |        |                                       |                                                 |   |           |       |
|---|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|   | 0x00AF |                                       |                                                 |   |           |       |
|   | 0x00B0 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|   | 0x00B1 |                                       |                                                 |   |           |       |
|   | 0x00B2 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|   | 0x00B3 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 3 | 0x00B4 | U (voltage)                           | R                                               | 4 | V         | float |
|   | 0x00B5 |                                       |                                                 |   |           |       |
|   | 0x00B6 | I (current)                           | R                                               | 4 | A         |       |
|   | 0x00B7 |                                       |                                                 |   |           |       |
|   | 0x00B8 | P (active power)                      | R                                               | 4 | kW        |       |
|   | 0x00B9 |                                       |                                                 |   |           |       |
|   | 0x00BA | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|   | 0x00BB |                                       |                                                 |   |           |       |
|   | 0x00BC | S (apparent power)                    | R                                               | 4 | kVA       |       |
|   | 0x00BD |                                       |                                                 |   |           |       |
|   | 0x00BE | PF (power factor)                     | R                                               | 4 |           |       |
|   | 0x00BF |                                       |                                                 |   |           |       |
|   | 0x00C0 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|   | 0x00C1 |                                       |                                                 |   |           |       |
|   | 0x00C2 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|   | 0x00C3 |                                       |                                                 |   |           |       |
|   | 0x00C4 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|   | 0x00C5 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 4 | 0x00C6 | U (voltage)                           | R                                               | 4 | V         | float |
|   | 0x00C7 |                                       |                                                 |   |           |       |
|   | 0x00C8 | I (current)                           | R                                               | 4 | A         |       |
|   | 0x00C9 |                                       |                                                 |   |           |       |
|   | 0x00CA | P (active power)                      | R                                               | 4 | kW        |       |
|   | 0x00CB |                                       |                                                 |   |           |       |
|   | 0x00CC | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|   | 0x00CD |                                       |                                                 |   |           |       |
|   | 0x00CE | S (apparent power)                    | R                                               | 4 | kVA       |       |
|   | 0x00CF |                                       |                                                 |   |           |       |
|   | 0x00D0 | PF (power factor)                     | R                                               | 4 |           |       |
|   | 0x00D1 |                                       |                                                 |   |           |       |
|   | 0x00D2 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|   | 0x00D3 |                                       |                                                 |   |           |       |
|   | 0x00D4 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|   | 0x00D5 |                                       |                                                 |   |           |       |
|   | 0x00D6 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|   | 0x00D7 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 5 | 0x00D8 | U (voltage)                           | R                                               | 4 | V         | float |
|   | 0x00D9 |                                       |                                                 |   |           |       |
|   | 0x00DA | I (current)                           | R                                               | 4 | A         |       |
|   | 0x00DB |                                       |                                                 |   |           |       |
|   | 0x00DC | P (active power)                      | R                                               | 4 | kW        |       |

|   |        |                                       |                                                 |   |           |       |     |
|---|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|-----|
|   | 0x00DD |                                       |                                                 |   |           |       |     |
|   | 0x00DE | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|   | 0x00DF |                                       |                                                 |   |           |       |     |
|   | 0x00E0 | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|   | 0x00E1 |                                       |                                                 |   |           |       |     |
|   | 0x00E2 | PF (power factor)                     | R                                               | 4 |           |       |     |
|   | 0x00E3 |                                       |                                                 |   |           |       |     |
|   | 0x00E4 | EP (active energy)                    | R                                               | 4 | 0.01kWh   |       | u32 |
|   | 0x00E5 |                                       |                                                 |   |           |       |     |
|   | 0x00E6 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh |       | u32 |
|   | 0x00E7 |                                       |                                                 |   |           |       |     |
|   | 0x00E8 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     |       | u16 |
|   | 0x00E9 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         |       | u16 |
| 6 | 0x00EA | U (voltage)                           | R                                               | 4 | V         | float |     |
|   | 0x00EB |                                       |                                                 |   |           |       |     |
|   | 0x00EC | I (current)                           | R                                               | 4 | A         |       |     |
|   | 0x00ED |                                       |                                                 |   |           |       |     |
|   | 0x00EE | P (active power)                      | R                                               | 4 | kW        |       |     |
|   | 0x00EF |                                       |                                                 |   |           |       |     |
|   | 0x00F0 | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|   | 0x00F1 |                                       |                                                 |   |           |       |     |
|   | 0x00F2 | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|   | 0x00F3 |                                       |                                                 |   |           |       |     |
|   | 0x00F4 | PF (power factor)                     | R                                               | 4 |           |       |     |
|   | 0x00F5 |                                       |                                                 |   |           |       |     |
|   | 0x00F6 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |     |
|   | 0x00F7 |                                       |                                                 |   |           |       |     |
|   | 0x00F8 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |     |
|   | 0x00F9 |                                       |                                                 |   |           |       |     |
|   | 0x00FA | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |     |
|   | 0x00FB | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |     |
| 7 | 0x00FC | U (voltage)                           | R                                               | 4 | V         | float |     |
|   | 0x00FD |                                       |                                                 |   |           |       |     |
|   | 0x00FE | I (current)                           | R                                               | 4 | A         |       |     |
|   | 0x00FF |                                       |                                                 |   |           |       |     |
|   | 0x0100 | P (active power)                      | R                                               | 4 | kW        |       |     |
|   | 0x0101 |                                       |                                                 |   |           |       |     |
|   | 0x0102 | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|   | 0x0103 |                                       |                                                 |   |           |       |     |
|   | 0x0104 | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|   | 0x0105 |                                       |                                                 |   |           |       |     |
|   | 0x0106 | PF (power factor)                     | R                                               | 4 |           |       |     |
|   | 0x0107 |                                       |                                                 |   |           |       |     |
|   | 0x0108 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |     |
|   | 0x0109 |                                       |                                                 |   |           |       |     |
|   | 0x010A | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |     |
|   | 0x010B |                                       |                                                 |   |           |       |     |

|    |        |                                       |                                                 |                                                 |           |           |     |
|----|--------|---------------------------------------|-------------------------------------------------|-------------------------------------------------|-----------|-----------|-----|
|    | 0x010C | THDI (total current harmonic content) | R                                               | 2                                               | 0.01%     | u16       |     |
|    | 0x010D | Load (load percentage)                | R load ratio=I/load value without decimal point | 2                                               | %         | u16       |     |
| 8  | 0x010E | U (voltage)                           | R                                               | 4                                               | V         | float     |     |
|    | 0x010F |                                       |                                                 |                                                 |           |           |     |
|    | 0x0110 | I (current)                           | R                                               | 4                                               | A         |           |     |
|    | 0x0111 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0112 | P (active power)                      | R                                               | 4                                               | kW        |           |     |
|    | 0x0113 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0114 | Q (reactive power)                    | R                                               | 4                                               | kvar      |           |     |
|    | 0x0115 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0116 | S (apparent power)                    | R                                               | 4                                               | kVA       |           |     |
|    | 0x0117 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0118 | PF (power factor)                     | R                                               | 4                                               |           |           |     |
|    | 0x0119 |                                       |                                                 |                                                 |           |           |     |
|    | 0x011A | EP (active energy)                    | R                                               | 4                                               | 0.01kWh   | u32       |     |
|    | 0x011B |                                       |                                                 |                                                 |           |           |     |
|    | 0x011C | EQ (reactive energy)                  | R                                               | 4                                               | 0.01kvarh | u32       |     |
|    | 0x011D |                                       |                                                 |                                                 |           |           |     |
|    |        | 0x011E                                | THDI (total current harmonic content)           | R                                               | 2         | 0.01%     | u16 |
|    |        | 0x011F                                | Load (load percentage)                          | R load ratio=I/load value without decimal point | 2         | %         | u16 |
| 9  | 0x0120 | U (voltage)                           | R                                               | 4                                               | V         | float     |     |
|    | 0x0121 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0122 | I (current)                           | R                                               | 4                                               | A         |           |     |
|    | 0x0123 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0124 | P (active power)                      | R                                               | 4                                               | kW        |           |     |
|    | 0x0125 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0126 | Q (reactive power)                    | R                                               | 4                                               | kvar      |           |     |
|    | 0x0127 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0128 | S (apparent power)                    | R                                               | 4                                               | kVA       |           |     |
|    | 0x0129 |                                       |                                                 |                                                 |           |           |     |
|    | 0x012A | PF (power factor)                     | R                                               | 4                                               |           |           |     |
|    | 0x012B |                                       |                                                 |                                                 |           |           |     |
|    | 0x012C | EP (active energy)                    | R                                               | 4                                               | 0.01kWh   | u32       |     |
|    | 0x012D |                                       |                                                 |                                                 |           |           |     |
|    |        | 0x012E                                | EQ (reactive energy)                            | R                                               | 4         | 0.01kvarh | u32 |
|    |        | 0x012F                                |                                                 |                                                 |           |           |     |
|    |        | 0x0130                                | THDI (total current harmonic content)           | R                                               | 2         | 0.01%     | u16 |
|    |        | 0x0131                                | Load (load percentage)                          | R load ratio=I/load value without decimal point | 2         | %         | u16 |
| 10 | 0x0132 | U (voltage)                           | R                                               | 4                                               | V         | float     |     |
|    | 0x0133 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0134 | I (current)                           | R                                               | 4                                               | A         |           |     |
|    | 0x0135 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0136 | P (active power)                      | R                                               | 4                                               | kW        |           |     |
|    | 0x0137 |                                       |                                                 |                                                 |           |           |     |
|    | 0x0138 | Q (reactive power)                    | R                                               | 4                                               | kvar      |           |     |
|    | 0x0139 |                                       |                                                 |                                                 |           |           |     |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x013A | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x013B |                                       |                                                 |   |           |       |
|    | 0x013C | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x013D |                                       |                                                 |   |           |       |
|    | 0x013E | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x013F |                                       |                                                 |   |           |       |
|    | 0x0140 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0141 |                                       |                                                 |   |           |       |
|    | 0x0142 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0143 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 11 | 0x0144 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0145 |                                       |                                                 |   |           |       |
|    | 0x0146 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0147 |                                       |                                                 |   |           |       |
|    | 0x0148 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0149 |                                       |                                                 |   |           |       |
|    | 0x014A | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x014B |                                       |                                                 |   |           |       |
|    | 0x014C | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x014D |                                       |                                                 |   |           |       |
|    | 0x014E | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x014F |                                       |                                                 |   |           |       |
|    | 0x0150 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0151 |                                       |                                                 |   |           |       |
|    | 0x0152 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0153 |                                       |                                                 |   |           |       |
|    | 0x0154 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0155 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 12 | 0x0156 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0157 |                                       |                                                 |   |           |       |
|    | 0x0158 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0159 |                                       |                                                 |   |           |       |
|    | 0x015A | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x015B |                                       |                                                 |   |           |       |
|    | 0x015C | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x015D |                                       |                                                 |   |           |       |
|    | 0x015E | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x015F |                                       |                                                 |   |           |       |
|    | 0x0160 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0161 |                                       |                                                 |   |           |       |
|    | 0x0162 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0163 |                                       |                                                 |   |           |       |
|    | 0x0164 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0165 |                                       |                                                 |   |           |       |
|    | 0x0166 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0167 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
| 13 | 0x0168 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0169 |                                       |                                                 |   |           |       |
|    | 0x016A | I (current)                           | R                                               | 4 | A         |       |
|    | 0x016B |                                       |                                                 |   |           |       |
|    | 0x016C | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x016D |                                       |                                                 |   |           |       |
|    | 0x016E | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x016F |                                       |                                                 |   |           |       |
|    | 0x0170 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0171 |                                       |                                                 |   |           |       |
|    | 0x0172 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0173 |                                       |                                                 |   |           |       |
|    | 0x0174 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0175 |                                       |                                                 |   |           |       |
|    | 0x0176 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0177 |                                       |                                                 |   |           |       |
|    | 0x0178 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0179 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 14 | 0x017A | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x017B |                                       |                                                 |   |           |       |
|    | 0x017C | I (current)                           | R                                               | 4 | A         |       |
|    | 0x017D |                                       |                                                 |   |           |       |
|    | 0x017E | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x017F |                                       |                                                 |   |           |       |
|    | 0x0180 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0181 |                                       |                                                 |   |           |       |
|    | 0x0182 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0183 |                                       |                                                 |   |           |       |
|    | 0x0184 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0185 |                                       |                                                 |   |           |       |
|    | 0x0186 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0187 |                                       |                                                 |   |           |       |
|    | 0x0188 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0189 |                                       |                                                 |   |           |       |
|    | 0x018A | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x018B | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 15 | 0x018C | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x018D |                                       |                                                 |   |           |       |
|    | 0x018E | I (current)                           | R                                               | 4 | A         |       |
|    | 0x018F |                                       |                                                 |   |           |       |
|    | 0x0190 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0191 |                                       |                                                 |   |           |       |
|    | 0x0192 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0193 |                                       |                                                 |   |           |       |
|    | 0x0194 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0195 |                                       |                                                 |   |           |       |
|    | 0x0196 | PF (power factor)                     | R                                               | 4 |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x0197 |                                       |                                                 |   |           |       |
|    | 0x0198 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0199 |                                       |                                                 |   |           |       |
|    | 0x019A | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x019B |                                       |                                                 |   |           |       |
|    | 0x019C | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x019D | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 16 | 0x019E | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x019F |                                       |                                                 |   |           |       |
|    | 0x01A0 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x01A1 |                                       |                                                 |   |           |       |
|    | 0x01A2 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x01A3 |                                       |                                                 |   |           |       |
|    | 0x01A4 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x01A5 |                                       |                                                 |   |           |       |
|    | 0x01A6 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x01A7 |                                       |                                                 |   |           |       |
|    | 0x01A8 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x01A9 |                                       |                                                 |   |           |       |
|    | 0x01AA | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x01AB |                                       |                                                 |   |           |       |
|    | 0x01AC | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x01AD |                                       |                                                 |   |           |       |
|    | 0x01AE | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x01AF | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 17 | 0x01B0 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x01B1 |                                       |                                                 |   |           |       |
|    | 0x01B2 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x01B3 |                                       |                                                 |   |           |       |
|    | 0x01B4 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x01B5 |                                       |                                                 |   |           |       |
|    | 0x01B6 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x01B7 |                                       |                                                 |   |           |       |
|    | 0x01B8 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x01B9 |                                       |                                                 |   |           |       |
|    | 0x01BA | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x01BB |                                       |                                                 |   |           |       |
|    | 0x01BC | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x01BD |                                       |                                                 |   |           |       |
|    | 0x01BE | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x01BF |                                       |                                                 |   |           |       |
|    | 0x01C0 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x01C1 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 18 | 0x01C2 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x01C3 |                                       |                                                 |   |           |       |
|    | 0x01C4 | I (current)                           | R                                               | 4 | A         |       |

|        |        |                                       |                                                 |   |           |       |       |
|--------|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|-------|
|        | 0x01C5 |                                       |                                                 |   |           |       |       |
|        | 0x01C6 | P (active power)                      | R                                               | 4 | kW        |       |       |
|        | 0x01C7 |                                       |                                                 |   |           |       |       |
|        | 0x01C8 | Q (reactive power)                    | R                                               | 4 | kvar      |       |       |
|        | 0x01C9 |                                       |                                                 |   |           |       |       |
|        | 0x01CA | S (apparent power)                    | R                                               | 4 | kVA       |       |       |
|        | 0x01CB |                                       |                                                 |   |           |       |       |
|        | 0x01CC | PF (power factor)                     | R                                               | 4 |           |       |       |
|        | 0x01CD |                                       |                                                 |   |           |       |       |
|        | 0x01CE | EP (active energy)                    | R                                               | 4 | 0.01kWh   |       | u32   |
|        | 0x01CF |                                       |                                                 |   |           |       |       |
|        | 0x01D0 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh |       | u32   |
|        | 0x01D1 |                                       |                                                 |   |           |       |       |
|        | 0x01D2 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     |       | u16   |
|        | 0x01D3 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         |       | u16   |
| 19     | 0x01D4 | U (voltage)                           | R                                               | 4 | V         | float |       |
|        | 0x01D5 |                                       |                                                 |   |           |       |       |
|        | 0x01D6 | I (current)                           | R                                               | 4 | A         |       |       |
|        | 0x01D7 |                                       |                                                 |   |           |       |       |
|        | 0x01D8 | P (active power)                      | R                                               | 4 | kW        |       |       |
|        | 0x01D9 |                                       |                                                 |   |           |       |       |
|        | 0x01DA | Q (reactive power)                    | R                                               | 4 | kvar      |       |       |
|        | 0x01DB |                                       |                                                 |   |           |       |       |
|        | 0x01DC | S (apparent power)                    | R                                               | 4 | kVA       |       |       |
|        | 0x01DD |                                       |                                                 |   |           |       |       |
|        | 0x01DE | PF (power factor)                     | R                                               | 4 |           |       |       |
|        | 0x01DF |                                       |                                                 |   |           |       |       |
|        | 0x01E0 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |       |
|        | 0x01E1 |                                       |                                                 |   |           |       |       |
|        | 0x01E2 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |       |
|        | 0x01E3 |                                       |                                                 |   |           |       |       |
|        | 0x01E4 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |       |
|        | 0x01E5 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |       |
|        | 20     | 0x01E6                                | U (voltage)                                     | R | 4         | V     | float |
| 0x01E7 |        |                                       |                                                 |   |           |       |       |
| 0x01E8 |        | I (current)                           | R                                               | 4 | A         |       |       |
| 0x01E9 |        |                                       |                                                 |   |           |       |       |
| 0x01EA |        | P (active power)                      | R                                               | 4 | kW        |       |       |
| 0x01EB |        |                                       |                                                 |   |           |       |       |
| 0x01EC |        | Q (reactive power)                    | R                                               | 4 | kvar      |       |       |
| 0x01ED |        |                                       |                                                 |   |           |       |       |
| 0x01EE |        | S (apparent power)                    | R                                               | 4 | kVA       |       |       |
| 0x01EF |        |                                       |                                                 |   |           |       |       |
| 0x01F0 |        | PF (power factor)                     | R                                               | 4 |           |       |       |
| 0x01F1 |        |                                       |                                                 |   |           |       |       |
| 0x01F2 |        | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |       |
| 0x01F3 |        |                                       |                                                 |   |           |       |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x01F4 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x01F5 |                                       |                                                 |   |           |       |
|    | 0x01F6 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x01F7 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 21 | 0x01F8 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x01F9 |                                       |                                                 |   |           |       |
|    | 0x01FA | I (current)                           | R                                               | 4 | A         |       |
|    | 0x01FB |                                       |                                                 |   |           |       |
|    | 0x01FC | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x01FD |                                       |                                                 |   |           |       |
|    | 0x01FE | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x01FF |                                       |                                                 |   |           |       |
|    | 0x0200 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0201 |                                       |                                                 |   |           |       |
|    | 0x0202 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0203 |                                       |                                                 |   |           |       |
|    | 0x0204 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0205 |                                       |                                                 |   |           |       |
|    | 0x0206 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0207 |                                       |                                                 |   |           |       |
|    | 0x0208 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0209 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 22 | 0x020A | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x020B |                                       |                                                 |   |           |       |
|    | 0x020C | I (current)                           | R                                               | 4 | A         |       |
|    | 0x020D |                                       |                                                 |   |           |       |
|    | 0x020E | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x020F |                                       |                                                 |   |           |       |
|    | 0x0210 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0211 |                                       |                                                 |   |           |       |
|    | 0x0212 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0213 |                                       |                                                 |   |           |       |
|    | 0x0214 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0215 |                                       |                                                 |   |           |       |
|    | 0x0216 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0217 |                                       |                                                 |   |           |       |
|    | 0x0218 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0219 |                                       |                                                 |   |           |       |
|    | 0x021A | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x021B | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 23 | 0x021C | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x021D |                                       |                                                 |   |           |       |
|    | 0x021E | I (current)                           | R                                               | 4 | A         |       |
|    | 0x021F |                                       |                                                 |   |           |       |
|    | 0x0220 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0221 |                                       |                                                 |   |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x0222 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0223 |                                       |                                                 |   |           |       |
|    | 0x0224 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0225 |                                       |                                                 |   |           |       |
|    | 0x0226 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0227 |                                       |                                                 |   |           |       |
|    | 0x0228 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0229 |                                       |                                                 |   |           |       |
|    | 0x022A | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x022B |                                       |                                                 |   |           |       |
|    | 0x022C | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x022D | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 24 | 0x022E | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x022F |                                       |                                                 |   |           |       |
|    | 0x0230 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0231 |                                       |                                                 |   |           |       |
|    | 0x0232 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0233 |                                       |                                                 |   |           |       |
|    | 0x0234 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0235 |                                       |                                                 |   |           |       |
|    | 0x0236 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0237 |                                       |                                                 |   |           |       |
|    | 0x0238 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0239 |                                       |                                                 |   |           |       |
|    | 0x023A | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x023B |                                       |                                                 |   |           |       |
|    | 0x023C | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x023D |                                       |                                                 |   |           |       |
|    | 0x023E | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x023F | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 25 | 0x0240 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0241 |                                       |                                                 |   |           |       |
|    | 0x0242 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0243 |                                       |                                                 |   |           |       |
|    | 0x0244 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0245 |                                       |                                                 |   |           |       |
|    | 0x0246 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0247 |                                       |                                                 |   |           |       |
|    | 0x0248 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0249 |                                       |                                                 |   |           |       |
|    | 0x024A | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x024B |                                       |                                                 |   |           |       |
|    | 0x024C | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x024D |                                       |                                                 |   |           |       |
|    | 0x024E | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x024F |                                       |                                                 |   |           |       |
|    | 0x0250 | THDI (total current                   | R                                               | 2 | 0.01%     | u16   |

|    |        |                                          |                                                    |                                                    |           |       |
|----|--------|------------------------------------------|----------------------------------------------------|----------------------------------------------------|-----------|-------|
|    |        | harmonic content)                        |                                                    |                                                    |           |       |
|    | 0x0251 | Load (load percentage)                   | R load ratio=I/load value<br>without decimal point | 2                                                  | %         | u16   |
| 26 | 0x0252 | U (voltage)                              | R                                                  | 4                                                  | V         | float |
|    | 0x0253 |                                          |                                                    |                                                    |           |       |
|    | 0x0254 | I (current)                              | R                                                  | 4                                                  | A         |       |
|    | 0x0255 |                                          |                                                    |                                                    |           |       |
|    | 0x0256 | P (active power)                         | R                                                  | 4                                                  | kW        |       |
|    | 0x0257 |                                          |                                                    |                                                    |           |       |
|    | 0x0258 | Q (reactive power)                       | R                                                  | 4                                                  | kvar      |       |
|    | 0x0259 |                                          |                                                    |                                                    |           |       |
|    | 0x025A | S (apparent power)                       | R                                                  | 4                                                  | kVA       |       |
|    | 0x025B |                                          |                                                    |                                                    |           |       |
|    | 0x025C | PF (power factor)                        | R                                                  | 4                                                  |           |       |
|    | 0x025D |                                          |                                                    |                                                    |           |       |
|    | 0x025E | EP (active energy)                       | R                                                  | 4                                                  | 0.01kWh   | u32   |
|    | 0x025F |                                          |                                                    |                                                    |           |       |
|    | 0x0260 | EQ (reactive energy)                     | R                                                  | 4                                                  | 0.01kvarh | u32   |
|    | 0x0261 |                                          |                                                    |                                                    |           |       |
|    | 0x0262 | THDI (total current<br>harmonic content) | R                                                  | 2                                                  | 0.01%     | u16   |
|    |        | 0x0263                                   | Load (load percentage)                             | R load ratio=I/load value<br>without decimal point | 2         | %     |
| 27 | 0x0264 | U (voltage)                              | R                                                  | 4                                                  | V         | float |
|    | 0x0265 |                                          |                                                    |                                                    |           |       |
|    | 0x0266 | I (current)                              | R                                                  | 4                                                  | A         |       |
|    | 0x0267 |                                          |                                                    |                                                    |           |       |
|    | 0x0268 | P (active power)                         | R                                                  | 4                                                  | kW        |       |
|    | 0x0269 |                                          |                                                    |                                                    |           |       |
|    | 0x026A | Q (reactive power)                       | R                                                  | 4                                                  | kvar      |       |
|    | 0x026B |                                          |                                                    |                                                    |           |       |
|    | 0x026C | S (apparent power)                       | R                                                  | 4                                                  | kVA       |       |
|    | 0x026D |                                          |                                                    |                                                    |           |       |
|    | 0x026E | PF (power factor)                        | R                                                  | 4                                                  |           |       |
|    | 0x026F |                                          |                                                    |                                                    |           |       |
|    | 0x0270 | EP (active energy)                       | R                                                  | 4                                                  | 0.01kWh   | u32   |
|    | 0x0271 |                                          |                                                    |                                                    |           |       |
|    | 0x0272 | EQ (reactive energy)                     | R                                                  | 4                                                  | 0.01kvarh | u32   |
|    | 0x0273 |                                          |                                                    |                                                    |           |       |
|    | 0x0274 | THDI (total current<br>harmonic content) | R                                                  | 2                                                  | 0.01%     | u16   |
|    |        | 0x0275                                   | Load (load percentage)                             | R load ratio=I/load value<br>without decimal point | 2         | %     |
| 28 | 0x0276 | U (voltage)                              | R                                                  | 4                                                  | V         | float |
|    | 0x0277 |                                          |                                                    |                                                    |           |       |
|    | 0x0278 | I (current)                              | R                                                  | 4                                                  | A         |       |
|    | 0x0279 |                                          |                                                    |                                                    |           |       |
|    | 0x027A | P (active power)                         | R                                                  | 4                                                  | kW        |       |
|    | 0x027B |                                          |                                                    |                                                    |           |       |
|    | 0x027C | Q (reactive power)                       | R                                                  | 4                                                  | kvar      |       |
|    | 0x027D |                                          |                                                    |                                                    |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x027E | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x027F |                                       |                                                 |   |           |       |
|    | 0x0280 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0281 |                                       |                                                 |   |           |       |
|    | 0x0282 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0283 |                                       |                                                 |   |           |       |
|    | 0x0284 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0285 |                                       |                                                 |   |           |       |
|    | 0x0286 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0287 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 29 | 0x0288 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0289 |                                       |                                                 |   |           |       |
|    | 0x028A | I (current)                           | R                                               | 4 | A         |       |
|    | 0x028B |                                       |                                                 |   |           |       |
|    | 0x028C | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x028D |                                       |                                                 |   |           |       |
|    | 0x028E | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x028F |                                       |                                                 |   |           |       |
|    | 0x0290 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0291 |                                       |                                                 |   |           |       |
|    | 0x0292 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0293 |                                       |                                                 |   |           |       |
|    | 0x0294 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0295 |                                       |                                                 |   |           |       |
|    | 0x0296 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0297 |                                       |                                                 |   |           |       |
|    | 0x0298 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0299 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 30 | 0x029A | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x029B |                                       |                                                 |   |           |       |
|    | 0x029C | I (current)                           | R                                               | 4 | A         |       |
|    | 0x029D |                                       |                                                 |   |           |       |
|    | 0x029E | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x029F |                                       |                                                 |   |           |       |
|    | 0x02A0 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02A1 |                                       |                                                 |   |           |       |
|    | 0x02A2 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02A3 |                                       |                                                 |   |           |       |
|    | 0x02A4 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x02A5 |                                       |                                                 |   |           |       |
|    | 0x02A6 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x02A7 |                                       |                                                 |   |           |       |
|    | 0x02A8 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x02A9 |                                       |                                                 |   |           |       |
|    | 0x02AA | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x02AB | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
| 31 | 0x02AC | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x02AD |                                       |                                                 |   |           |       |
|    | 0x02AE | I (current)                           | R                                               | 4 | A         |       |
|    | 0x02AF |                                       |                                                 |   |           |       |
|    | 0x02B0 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x02B1 |                                       |                                                 |   |           |       |
|    | 0x02B2 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02B3 |                                       |                                                 |   |           |       |
|    | 0x02B4 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02B5 |                                       |                                                 |   |           |       |
|    | 0x02B6 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x02B7 |                                       |                                                 |   |           |       |
|    | 0x02B8 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x02B9 |                                       |                                                 |   |           |       |
|    | 0x02BA | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x02BB |                                       |                                                 |   |           |       |
|    | 0x02BC | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x02BD | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 32 | 0x02BE | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x02BF |                                       |                                                 |   |           |       |
|    | 0x02C0 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x02C1 |                                       |                                                 |   |           |       |
|    | 0x02C2 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x02C3 |                                       |                                                 |   |           |       |
|    | 0x02C4 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02C5 |                                       |                                                 |   |           |       |
|    | 0x02C6 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02C7 |                                       |                                                 |   |           |       |
|    | 0x02C8 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x02C9 |                                       |                                                 |   |           |       |
|    | 0x02CA | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x02CB |                                       |                                                 |   |           |       |
|    | 0x02CC | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x02CD |                                       |                                                 |   |           |       |
|    | 0x02CE | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x02CF | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 33 | 0x02D0 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x02D1 |                                       |                                                 |   |           |       |
|    | 0x02D2 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x02D3 |                                       |                                                 |   |           |       |
|    | 0x02D4 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x02D5 |                                       |                                                 |   |           |       |
|    | 0x02D6 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02D7 |                                       |                                                 |   |           |       |
|    | 0x02D8 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02D9 |                                       |                                                 |   |           |       |
|    | 0x02DA | PF (power factor)                     | R                                               | 4 |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x02DB |                                       |                                                 |   |           |       |
|    | 0x02DC | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x02DD |                                       |                                                 |   |           |       |
|    | 0x02DE | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x02DF |                                       |                                                 |   |           |       |
|    | 0x02E0 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x02E1 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 34 | 0x02E2 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x02E3 |                                       |                                                 |   |           |       |
|    | 0x02E4 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x02E5 |                                       |                                                 |   |           |       |
|    | 0x02E6 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x02E7 |                                       |                                                 |   |           |       |
|    | 0x02E8 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02E9 |                                       |                                                 |   |           |       |
|    | 0x02EA | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02EB |                                       |                                                 |   |           |       |
|    | 0x02EC | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x02ED |                                       |                                                 |   |           |       |
|    | 0x02EE | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x02EF |                                       |                                                 |   |           |       |
|    | 0x02F0 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x02F1 |                                       |                                                 |   |           |       |
|    | 0x02F2 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x02F3 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 35 | 0x02F4 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x02F5 |                                       |                                                 |   |           |       |
|    | 0x02F6 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x02F7 |                                       |                                                 |   |           |       |
|    | 0x02F8 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x02F9 |                                       |                                                 |   |           |       |
|    | 0x02FA | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x02FB |                                       |                                                 |   |           |       |
|    | 0x02FC | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x02FD |                                       |                                                 |   |           |       |
|    | 0x02FE | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x02FF |                                       |                                                 |   |           |       |
|    | 0x0300 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0301 |                                       |                                                 |   |           |       |
|    | 0x0302 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0303 |                                       |                                                 |   |           |       |
|    | 0x0304 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0305 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 36 | 0x0306 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0307 |                                       |                                                 |   |           |       |
|    | 0x0308 | I (current)                           | R                                               | 4 | A         |       |

|    |        |                                       |                                                 |   |           |       |     |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|-----|
|    | 0x0309 |                                       |                                                 |   |           |       |     |
|    | 0x030A | P (active power)                      | R                                               | 4 | kW        |       |     |
|    | 0x030B |                                       |                                                 |   |           |       |     |
|    | 0x030C | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|    | 0x030D |                                       |                                                 |   |           |       |     |
|    | 0x030E | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|    | 0x030F |                                       |                                                 |   |           |       |     |
|    | 0x0310 | PF (power factor)                     | R                                               | 4 |           |       |     |
|    | 0x0311 |                                       |                                                 |   |           |       |     |
|    | 0x0312 | EP (active energy)                    | R                                               | 4 | 0.01kWh   |       | u32 |
|    | 0x0313 |                                       |                                                 |   |           |       |     |
|    | 0x0314 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh |       | u32 |
|    | 0x0315 |                                       |                                                 |   |           |       |     |
|    | 0x0316 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     |       | u16 |
|    | 0x0317 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         |       | u16 |
| 37 | 0x0318 | U (voltage)                           | R                                               | 4 | V         | float |     |
|    | 0x0319 |                                       |                                                 |   |           |       |     |
|    | 0x031A | I (current)                           | R                                               | 4 | A         |       |     |
|    | 0x031B |                                       |                                                 |   |           |       |     |
|    | 0x031C | P (active power)                      | R                                               | 4 | kW        |       |     |
|    | 0x031D |                                       |                                                 |   |           |       |     |
|    | 0x031E | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|    | 0x031F |                                       |                                                 |   |           |       |     |
|    | 0x0320 | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|    | 0x0321 |                                       |                                                 |   |           |       |     |
|    | 0x0322 | PF (power factor)                     | R                                               | 4 |           |       |     |
|    | 0x0323 |                                       |                                                 |   |           |       |     |
|    | 0x0324 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |     |
|    | 0x0325 |                                       |                                                 |   |           |       |     |
|    | 0x0326 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |     |
|    | 0x0327 |                                       |                                                 |   |           |       |     |
|    | 0x0328 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |     |
|    | 0x0329 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |     |
| 38 | 0x032A | U (voltage)                           | R                                               | 4 | V         | float |     |
|    | 0x032B |                                       |                                                 |   |           |       |     |
|    | 0x032C | I (current)                           | R                                               | 4 | A         |       |     |
|    | 0x032D |                                       |                                                 |   |           |       |     |
|    | 0x032E | P (active power)                      | R                                               | 4 | kW        |       |     |
|    | 0x032F |                                       |                                                 |   |           |       |     |
|    | 0x0330 | Q (reactive power)                    | R                                               | 4 | kvar      |       |     |
|    | 0x0331 |                                       |                                                 |   |           |       |     |
|    | 0x0332 | S (apparent power)                    | R                                               | 4 | kVA       |       |     |
|    | 0x0333 |                                       |                                                 |   |           |       |     |
|    | 0x0334 | PF (power factor)                     | R                                               | 4 |           |       |     |
|    | 0x0335 |                                       |                                                 |   |           |       |     |
|    | 0x0336 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |     |
|    | 0x0337 |                                       |                                                 |   |           |       |     |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x0338 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0339 |                                       |                                                 |   |           |       |
|    | 0x033A | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x033B | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 39 | 0x033C | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x033D |                                       |                                                 |   |           |       |
|    | 0x033E | I (current)                           | R                                               | 4 | A         |       |
|    | 0x033F |                                       |                                                 |   |           |       |
|    | 0x0340 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0341 |                                       |                                                 |   |           |       |
|    | 0x0342 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0343 |                                       |                                                 |   |           |       |
|    | 0x0344 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0345 |                                       |                                                 |   |           |       |
|    | 0x0346 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0347 |                                       |                                                 |   |           |       |
|    | 0x0348 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0349 |                                       |                                                 |   |           |       |
|    | 0x034A | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x034B |                                       |                                                 |   |           |       |
|    | 0x034C | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x034D | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 40 | 0x034E | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x034F |                                       |                                                 |   |           |       |
|    | 0x0350 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0351 |                                       |                                                 |   |           |       |
|    | 0x0352 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0353 |                                       |                                                 |   |           |       |
|    | 0x0354 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0355 |                                       |                                                 |   |           |       |
|    | 0x0356 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0357 |                                       |                                                 |   |           |       |
|    | 0x0358 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x0359 |                                       |                                                 |   |           |       |
|    | 0x035A | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x035B |                                       |                                                 |   |           |       |
|    | 0x035C | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x035D |                                       |                                                 |   |           |       |
|    | 0x035E | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x035F | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 41 | 0x0360 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0361 |                                       |                                                 |   |           |       |
|    | 0x0362 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0363 |                                       |                                                 |   |           |       |
|    | 0x0364 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0365 |                                       |                                                 |   |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x0366 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0367 |                                       |                                                 |   |           |       |
|    | 0x0368 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x0369 |                                       |                                                 |   |           |       |
|    | 0x036A | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x036B |                                       |                                                 |   |           |       |
|    | 0x036C | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x036D |                                       |                                                 |   |           |       |
|    | 0x036E | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x036F |                                       |                                                 |   |           |       |
|    | 0x0370 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0371 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 42 | 0x0372 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0373 |                                       |                                                 |   |           |       |
|    | 0x0374 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0375 |                                       |                                                 |   |           |       |
|    | 0x0376 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0377 |                                       |                                                 |   |           |       |
|    | 0x0378 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x0379 |                                       |                                                 |   |           |       |
|    | 0x037A | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x037B |                                       |                                                 |   |           |       |
|    | 0x037C | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x037D |                                       |                                                 |   |           |       |
|    | 0x037E | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x037F |                                       |                                                 |   |           |       |
|    | 0x0380 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0381 |                                       |                                                 |   |           |       |
|    | 0x0382 | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x0383 | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 43 | 0x0384 | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x0385 |                                       |                                                 |   |           |       |
|    | 0x0386 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x0387 |                                       |                                                 |   |           |       |
|    | 0x0388 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x0389 |                                       |                                                 |   |           |       |
|    | 0x038A | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x038B |                                       |                                                 |   |           |       |
|    | 0x038C | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x038D |                                       |                                                 |   |           |       |
|    | 0x038E | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x038F |                                       |                                                 |   |           |       |
|    | 0x0390 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x0391 |                                       |                                                 |   |           |       |
|    | 0x0392 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x0393 |                                       |                                                 |   |           |       |
|    | 0x0394 | THDI (total current                   | R                                               | 2 | 0.01%     | u16   |

|    |        |                                          |                                                    |   |           |       |
|----|--------|------------------------------------------|----------------------------------------------------|---|-----------|-------|
|    |        | harmonic content)                        |                                                    |   |           |       |
|    | 0x0395 | Load (load percentage)                   | R load ratio=I/load value<br>without decimal point | 2 | %         | u16   |
| 44 | 0x0396 | U (voltage)                              | R                                                  | 4 | V         | float |
|    | 0x0397 |                                          |                                                    |   |           |       |
|    | 0x0398 | I (current)                              | R                                                  | 4 | A         |       |
|    | 0x0399 |                                          |                                                    |   |           |       |
|    | 0x039A | P (active power)                         | R                                                  | 4 | kW        |       |
|    | 0x039B |                                          |                                                    |   |           |       |
|    | 0x039C | Q (reactive power)                       | R                                                  | 4 | kvar      |       |
|    | 0x039D |                                          |                                                    |   |           |       |
|    | 0x039E | S (apparent power)                       | R                                                  | 4 | kVA       |       |
|    | 0x039F |                                          |                                                    |   |           |       |
|    | 0x03A0 | PF (power factor)                        | R                                                  | 4 |           |       |
|    | 0x03A1 |                                          |                                                    |   |           |       |
|    | 0x03A2 | EP (active energy)                       | R                                                  | 4 | 0.01kWh   | u32   |
|    | 0x03A3 |                                          |                                                    |   |           |       |
|    | 0x03A4 | EQ (reactive energy)                     | R                                                  | 4 | 0.01kvarh | u32   |
|    | 0x03A5 |                                          |                                                    |   |           |       |
|    | 0x03A6 | THDI (total current<br>harmonic content) | R                                                  | 2 | 0.01%     | u16   |
|    | 0x03A7 | Load (load percentage)                   | R load ratio=I/load value<br>without decimal point | 2 | %         | u16   |
| 45 | 0x03A8 | U (voltage)                              | R                                                  | 4 | V         | float |
|    | 0x03A9 |                                          |                                                    |   |           |       |
|    | 0x03AA | I (current)                              | R                                                  | 4 | A         |       |
|    | 0x03AB |                                          |                                                    |   |           |       |
|    | 0x03AC | P (active power)                         | R                                                  | 4 | kW        |       |
|    | 0x03AD |                                          |                                                    |   |           |       |
|    | 0x03AE | Q (reactive power)                       | R                                                  | 4 | kvar      |       |
|    | 0x03AF |                                          |                                                    |   |           |       |
|    | 0x03B0 | S (apparent power)                       | R                                                  | 4 | kVA       |       |
|    | 0x03B1 |                                          |                                                    |   |           |       |
|    | 0x03B2 | PF (power factor)                        | R                                                  | 4 |           |       |
|    | 0x03B3 |                                          |                                                    |   |           |       |
|    | 0x03B4 | EP (active energy)                       | R                                                  | 4 | 0.01kWh   | u32   |
|    | 0x03B5 |                                          |                                                    |   |           |       |
|    | 0x03B6 | EQ (reactive energy)                     | R                                                  | 4 | 0.01kvarh | u32   |
|    | 0x03B7 |                                          |                                                    |   |           |       |
|    | 0x03B8 | THDI (total current<br>harmonic content) | R                                                  | 2 | 0.01%     | u16   |
|    | 0x03B9 | Load (load percentage)                   | R load ratio=I/load value<br>without decimal point | 2 | %         | u16   |
| 46 | 0x03BA | U (voltage)                              | R                                                  | 4 | V         | float |
|    | 0x03BB |                                          |                                                    |   |           |       |
|    | 0x03BC | I (current)                              | R                                                  | 4 | A         |       |
|    | 0x03BD |                                          |                                                    |   |           |       |
|    | 0x03BE | P (active power)                         | R                                                  | 4 | kW        |       |
|    | 0x03BF |                                          |                                                    |   |           |       |
|    | 0x03C0 | Q (reactive power)                       | R                                                  | 4 | kvar      |       |
|    | 0x03C1 |                                          |                                                    |   |           |       |

|    |        |                                       |                                                 |   |           |       |
|----|--------|---------------------------------------|-------------------------------------------------|---|-----------|-------|
|    | 0x03C2 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x03C3 |                                       |                                                 |   |           |       |
|    | 0x03C4 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x03C5 |                                       |                                                 |   |           |       |
|    | 0x03C6 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x03C7 |                                       |                                                 |   |           |       |
|    | 0x03C8 | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x03C9 |                                       |                                                 |   |           |       |
|    | 0x03CA | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x03CB | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 47 | 0x03CC | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x03CD |                                       |                                                 |   |           |       |
|    | 0x03CE | I (current)                           | R                                               | 4 | A         |       |
|    | 0x03CF |                                       |                                                 |   |           |       |
|    | 0x03D0 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x03D1 |                                       |                                                 |   |           |       |
|    | 0x03D2 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x03D3 |                                       |                                                 |   |           |       |
|    | 0x03D4 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x03D5 |                                       |                                                 |   |           |       |
|    | 0x03D6 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x03D7 |                                       |                                                 |   |           |       |
|    | 0x03D8 | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x03D9 |                                       |                                                 |   |           |       |
|    | 0x03DA | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x03DB |                                       |                                                 |   |           |       |
|    | 0x03DC | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x03DD | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |
| 48 | 0x03DE | U (voltage)                           | R                                               | 4 | V         | float |
|    | 0x03DF |                                       |                                                 |   |           |       |
|    | 0x03E0 | I (current)                           | R                                               | 4 | A         |       |
|    | 0x03E1 |                                       |                                                 |   |           |       |
|    | 0x03E2 | P (active power)                      | R                                               | 4 | kW        |       |
|    | 0x03E3 |                                       |                                                 |   |           |       |
|    | 0x03E4 | Q (reactive power)                    | R                                               | 4 | kvar      |       |
|    | 0x03E5 |                                       |                                                 |   |           |       |
|    | 0x03E6 | S (apparent power)                    | R                                               | 4 | kVA       |       |
|    | 0x03E7 |                                       |                                                 |   |           |       |
|    | 0x03E8 | PF (power factor)                     | R                                               | 4 |           |       |
|    | 0x03E9 |                                       |                                                 |   |           |       |
|    | 0x03EA | EP (active energy)                    | R                                               | 4 | 0.01kWh   | u32   |
|    | 0x03EB |                                       |                                                 |   |           |       |
|    | 0x03EC | EQ (reactive energy)                  | R                                               | 4 | 0.01kvarh | u32   |
|    | 0x03ED |                                       |                                                 |   |           |       |
|    | 0x03EE | THDI (total current harmonic content) | R                                               | 2 | 0.01%     | u16   |
|    | 0x03EF | Load (load percentage)                | R load ratio=I/load value without decimal point | 2 | %         | u16   |

Alarm status data read (0x03F0~0x0420) When the module is FAK30/FA30,the effective alarm data are 1-15 and 25-39 channels of data,When the address is set to 20-29, the effective alarm data is 1-30 channels.When the module is FA48(30),the status bit of switching value is always 0 and no acquisition is required.

Alarm status assignment

|       |       |       |        |                              |                            |                           |                               |
|-------|-------|-------|--------|------------------------------|----------------------------|---------------------------|-------------------------------|
| Bit15 | Bit14 | Bit13 | Bit12  | Bit11                        | Bit10                      | Bit9                      | Bit8                          |
|       |       |       |        |                              |                            |                           |                               |
| Bit7  | Bit6  | Bit5  | Bit4   | Bit3                         | Bit2                       | Bit1                      | Bit0                          |
|       |       |       | Switch | Over-current secondary alarm | Over-current level 1 alarm | Low current level 1 alarm | Under current secondary alarm |

| Number | Address | variable                            | Remark | Length(Bite) | Unit |
|--------|---------|-------------------------------------|--------|--------------|------|
| 1      | 0x03F0  | ALMData1 (channel 1 alarm status)   | R      | 2            | u16  |
| 2      | 0x03F1  | ALMData2 (channel 2 alarm status)   | R      | 2            | u16  |
| 3      | 0x03F2  | ALMData3 (channel 3 alarm status)   | R      | 2            | u16  |
| 4      | 0x03F3  | ALMData4 (channel 4 alarm status)   | R      | 2            | u16  |
| 5      | 0x03F4  | ALMData5 (channel 5 alarm status)   | R      | 2            | u16  |
| 6      | 0x03F5  | ALMData6 (channel 6 alarm status)   | R      | 2            | u16  |
| 7      | 0x03F6  | ALMData7 (channel 7 alarm status)   | R      | 2            | u16  |
| 8      | 0x03F7  | ALMData8 (channel 8 alarm status)   | R      | 2            | u16  |
| 9      | 0x03F8  | ALMData9 (channel 9 alarm status)   | R      | 2            | u16  |
| 10     | 0x03F9  | ALMData10 (channel 10 alarm status) | R      | 2            | u16  |
| 11     | 0x03FA  | ALMData11 (channel 11 alarm status) | R      | 2            | u16  |
| 12     | 0x03FB  | ALMData12 (channel 12 alarm status) | R      | 2            | u16  |
| 13     | 0x03FC  | ALMData13 (channel 13alarm status)  | R      | 2            | u16  |
| 14     | 0x03FD  | ALMData14 (channel 14 alarm status) | R      | 2            | u16  |
| 15     | 0x03FE  | ALMData15 (channel 15 alarm status) | R      | 2            | u16  |
| 16     | 0x03FF  | ALMData16 (channel 16 alarm status) | R      | 2            | u16  |
| 17     | 0x0400  | ALMData17 (channel 17 alarm status) | R      | 2            | u16  |
| 18     | 0x0401  | ALMData18 (channel 18 alarm status) | R      | 2            | u16  |
| 19     | 0x0402  | ALMData19 (channel 19 alarm status) | R      | 2            | u16  |
| 20     | 0x0403  | ALMData20 (channel 20 alarm status) | R      | 2            | u16  |
| 21     | 0x0404  | ALMData21 (channel 21 alarm status) | R      | 2            | u16  |
| 22     | 0x0405  | ALMData22 (channel 22 alarm status) | R      | 2            | u16  |
| 23     | 0x0406  | ALMData23 (channel 23 alarm status) | R      | 2            | u16  |
| 24     | 0x0407  | ALMData24 (channel 24 alarm status) | R      | 2            | u16  |
| 25     | 0x0408  | ALMData25 (channel 25 alarm status) | R      | 2            | u16  |
| 26     | 0x0409  | ALMData26 (channel 26 alarm status) | R      | 2            | u16  |
| 27     | 0x040A  | ALMData27 (channel 27 alarm status) | R      | 2            | u16  |
| 28     | 0x040B  | ALMData28 (channel 28 alarm status) | R      | 2            | u16  |
| 29     | 0x040C  | ALMData29 (channel 29 alarm status) | R      | 2            | u16  |
| 30     | 0x040D  | ALMData30 (channel 30 alarm status) | R      | 2            | u16  |
| 31     | 0x040E  | ALMData31 (channel 31 alarm status) | R      | 2            | u16  |
| 32     | 0x040F  | ALMData32 (channel 32 alarm status) | R      | 2            | u16  |
| 33     | 0x0410  | ALMData33 (channel 33 alarm status) | R      | 2            | u16  |
| 34     | 0x0411  | ALMData34 (channel 34 alarm status) | R      | 2            | u16  |
| 35     | 0x0412  | ALMData35 (channel 35 alarm status) | R      | 2            | u16  |
| 36     | 0x0413  | ALMData36 (channel 36 alarm status) | R      | 2            | u16  |
| 37     | 0x0414  | ALMData37 (channel 37 alarm status) | R      | 2            | u16  |
| 38     | 0x0415  | ALMData38 (channel 38 alarm status) | R      | 2            | u16  |

|    |        |                                     |   |   |     |
|----|--------|-------------------------------------|---|---|-----|
| 39 | 0x0416 | ALMData39 (channel 39 alarm status) | R | 2 | u16 |
| 40 | 0x0417 | ALMData40 (channel 40 alarm status) | R | 2 | u16 |
| 41 | 0x0418 | ALMData41 (channel 41 alarm status) | R | 2 | u16 |
| 42 | 0x0419 | ALMData42 (channel 42 alarm status) | R | 2 | u16 |
| 43 | 0x041A | ALMData43 (channel 43 alarm status) | R | 2 | u16 |
| 44 | 0x041B | ALMData44 (channel 44 alarm status) | R | 2 | u16 |
| 45 | 0x041C | ALMData45 (channel 45 alarm status) | R | 2 | u16 |
| 46 | 0x041D | ALMData46 (channel 46 alarm status) | R | 2 | u16 |
| 47 | 0x041E | ALMData47 (channel 47 alarm status) | R | 2 | u16 |
| 48 | 0x041F | ALMData48 (channel 48 alarm status) | R | 2 | u16 |
| 49 | 0x0420 |                                     |   |   |     |

## 7 Precautions

- 7.1 The device should be installed in a dry, clean place away from heat sources and strong electromagnetic fields.
- 7.2 Pay attention to the phase sequence and polarity of AC voltage and current when wiring the device, otherwise the measurement will be inaccurate.
- 7.3 CT must be used for current input, and the transformation ratio parameter of incoming line CT must be set through communication.
- 7.4 The accuracy of CT affects the measurement accuracy of this device. The angle difference of CT will affect the measurement accuracy of the power and electric energy of the device.
- 7.5 When applied to direct access system without PT, a 2A fuse should be installed.
- 7.6 The CT grounding terminal of the current input on the device should be led to the grounding terminal separately. It is not allowed to connect the current input grounding terminal in parallel on the device and then lead to the grounding terminal.
- 7.7 The communication cable should use shielded twisted pair.

## 8 Common fault diagnosis and troubleshooting methods

### 8.1 The measurement of the device is inaccurate

- \*Check whether the wiring of voltage and current is correct, and whether the incoming and outgoing wires of current input are correct;
- \*Check whether the CT setting of the device corresponds to the actual external CT;

### 8.2 The voltage and current measurement is correct but the power measurement is inaccurate

- \*Check whether the current input direction is correct;
- \*Check whether the phase corresponding to each current loop is correct; the outgoing loop needs to be adjusted according to the actual connection;

### 8.3 Abnormal communication

- \*Check whether the communication cable is connected properly;
- \*Check whether the A and B terminals of communication are staggered;
- \*Check whether the address of the device is set correctly, and whether the communication baud rate is set correctly;
- \*When the communication of multiple devices is abnormal, first try to see if the communication of the single device is normal;

### 8.4 The incoming line voltage, current, and power are all, but the electric energy has no value

- \*Check the CT ratio setting of the incoming line.

Change record:

| Before change | After change | Change content                                                                                                                                      |
|---------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.0          | V1.1         | 1、Fixed some errors in the text;<br>2、Delete the measurement accuracy in FT30/48 technical parameters;<br>3、Modify the address of AC harmonic part; |
| V1.1          | V1.2         | 1、Modify the FDK laser printing diagram and change the switch input to voltage input                                                                |

Headquarters: Acrel Co., LTD.

Address: No.253 Yulv Road Jiading District, Shanghai , China

Postcode: 201801

Manufacturer: Jiangsu Acrel Electrical Manufacturing Co., LTD.

Address: No.5 Dongmeng Road,Dongmeng industrial Park, Nanzha Street,Jiangyin City,Jiangsu Province,China

TEL/WeChat/WhatsApp : 0086 188 6162 8731

Web-site: [www.acrel-electric.uk](http://www.acrel-electric.uk)

Postcode: 214405

E-mail: [elsie.ren@email.acrel.cn](mailto:elsie.ren@email.acrel.cn)