AHM3-SMTP AHM3RC-SMTP
Multifunction Power Meter

User Manual

VER：V18A

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1 Safety Precautions

The manufacturer shall not be held responsible for failure to comply with the instructions in this manual.
The equipment must be installed and serviced only by qualified personnel.
Never work alone.
Prior to any work on or in the equipment,isolate the voltage inputs and auxiliary power supplies，short the secondary of all CT, but never short the secondary of PT.
Always use a properly rated voltage sensing device to conform that all power is off.

Risk of damaging device

- The voltage of the auxiliary power supply is beyond the rated range.
- The frequency of the power distribution system is beyond the rated range.
- The input polarity of the voltage or the current is wired improperly.

2 Description

General

This series multifunction power meters are designed to be used for the measurement and calculation of electrical variables such as voltage, current, frequency, power, power factor, energy, harmonic components,etc. in low-voltage power distribution. It is capable of single-phase,two-phase,or three-phase measurement and can be used in two-wire,three-wire,four-wire, TN,TT,and IT systems.

Module

There are four interfaces on the meter for modules which are used to extend functions. Please pay attention to the following points when installing these modules.

a） Only one of communications modules （DM10-DM13）can be installed onto meter ; Each module of DM11,DM12 and DM13 occupies two interfaces;

b） Only one time memory module can be installed onto the meter;

c） Up to four modules can be installed onto meter. Total width of all modules is 4;

d） Modules of same type of different types can be installed onto meter in compliance with the requirements of a），b）and c）.

E.g. 1 Four DM2;

E.g. 2 Two DM2+one DM7+one DM10

E.g. 3 One DM6+one DM8+one DM11

type	description	type	description
DM1	Memory: 8MB,include RTC	DM8	2 relay outputs
DM2	2 analog inputs：mA	DM9	1 AC digital input
DM3	2 analog inputs：PT100	DM10	Profibus-DP V0
DM4	2 analog inputs： J, K , E or N	DM11	Ethernet :Modbus/TCP, Web Server
DM5	2 analog outputs：mA	DM12	WIFI :Modbus/TCP
DM6	2 digital inputs and 2 digital outputs	DM13	GPRS :Modbus/TCP, SMS
DM7	4 digital inputs		

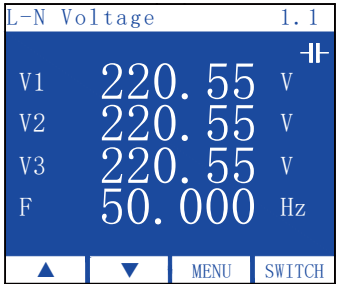
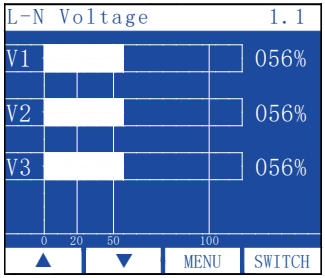
Measurement

- voltage
- current
- Load percent
- Power
- Power factor
- Frequency
- Demand
- Energy
- Total Harmonic Distortion
- Unbalance
- Up to 230/400V can be connected directly.Higher voltages using voltage transforms.
- The ×/1A or ×/5A current transformers can be used

The following list shows variables which can be measured by AHM3 including relative variables calculated from basic electrical parameters.

Measurement variable	Instant	Max	Min	Demand	sum	unit
V1/V2/V3	√	√	√			[V,kV]
V12/V23/V31	√	√	√			[V,kV]
I1/I2/I3	√	√	√	√		[A,kA]
F	√	√	√			[Hz]
P/P1/P2/P3	√	√	√			[kW,MW,GW]
Q/Q1/Q2/Q3	√	√	√			[kvar,Mvar,Gvar]
S/S1/S2/S3	√	√	√			[kVA,MVA,GVA]
PF/PF1/PF2/PF3	√					-
EP+/EP-					√	[kWh,MWh, GWh]
EQ1/EQ2/EQ3/EQ4					√	[kvarh,Mvarh，Gvarh]
Spare Energy					√	
THDV1/THDV2/THDV3	√					[%]
THDI1/THDI2/THDI3	√					[%]
Harmonic RMS-U (1～63th)	√					[%]
Harmonic RMS-I (1～63th)	√					[%]
Unbalance-U	√					[%]
Unbalance-I	√					[%]
Hour meter						h:min

Measurement variable display example

	Left picture shows instantaneous three-phase voltage and frequency. Press ▲ or ▼ button to change to other interfaces. Press MENU button to return to main interface. Press SWITCH button to check corresponding bar graph interface.
	Left picture shows bar graph of three-phase voltage. Press ▲ or ▼ button to change to other interfaces. Press MENU button to return to main interface. Press SWITCH button to check corresponding measured variable interface.

Energy

Meter supports excellent energy metering functions as follows：

·Bi-direction energy metering

·Four-quadrant reactive energy metering

·Tariff energy metering (TOU)

·Spare energy metering

All the values of energy are calculated on the basis of secondary value, minimum resolution of which is 1Wh of 1varh. Provided the external PT or CT is connected, the value of primary energy increases or decreases by 1Wh(1varh) multiple rate.

The maximum value of saved secondary energy is 2147483647 Wh, and the maximum value of displayed primary energy is 99999999999 kWh (99.9 billion kilowatt). Users can manually reset the energy data as per the specific needs.

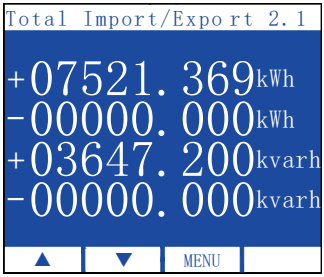
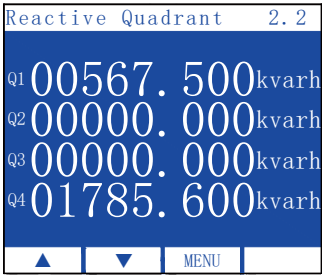
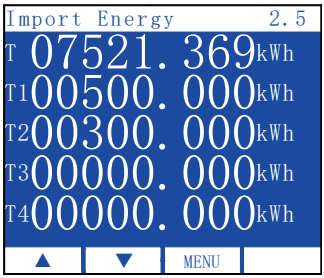
Spare Energy

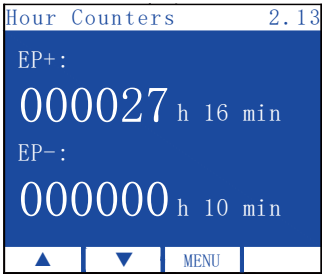
Signal coming from a Generator. when the main line is cut off and a generator gives the power to the installation. The meters must measure and

display the additional 6 Energies and 2 hour meters.

Tariff Energy

Meter supports tariff energy metering of sixteen time zones at most. The starting of a time zone is judged by meter according digital input status.

	Bi-direction energy EP+= 7521.369kWh EP- = 0kWh EQ+ = 3647.2kvarh EQ- = 0kvarh
	Four-quadrant reactive energy 1st quadrant: Q1 = 567.5kvarh 2nd quadrant: Q2 =0kvarh 3rd quadrant: Q3 =0kvarh 4th quadrant: Q4 = 1785.6kvarh
	Tariff import energy Total Energy(T) 7521.7kWh Tariff #1 Energy(T1) 500kWh Tariff #2 Energy(T2) 300kWh Tariff #3 Energy(T3) 0kWh Tariff #4 EnergyT4) 0kWh

	Hour Counters Energy Import (EP+): 27h16m Energy Export (EP-) : 10m

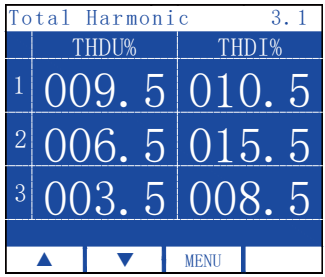
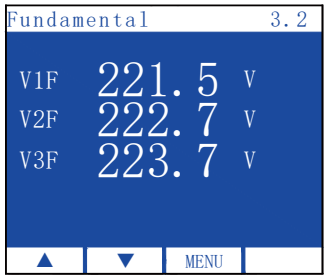
Harmonic

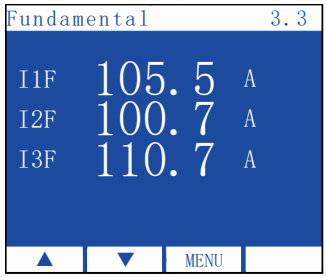
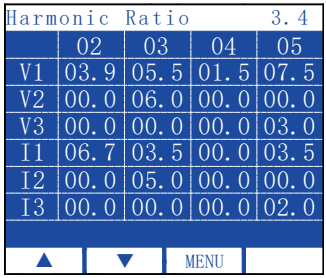
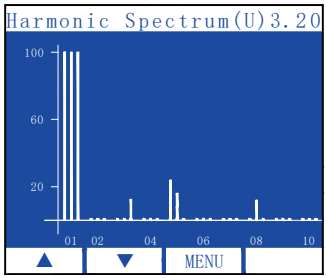
Meter supports harmonic content of grid. Detailed functions are as follows：

· Harmonic RMS (2-63th)

· Fundamental

· Bar graph

	THD_{V1}=9.5% THD_{V2}=6.5% THD_{V3}=3.5% THD_{I1}=10.5% THD_{I2}=15.5% THD_{I3}=8.5%
	Left picture shows voltage fundamental。

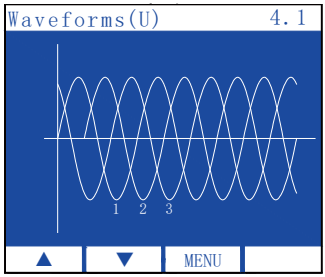
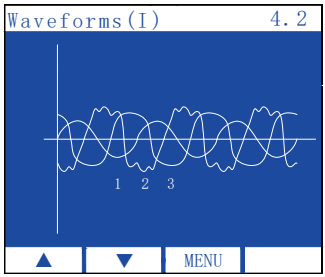
	Left picture shows current fundamental。
	Left picture shows harmonic distortion rate of three-phase voltage and current.
	Bar graph of harmonic content of three-phase voltage. Bar graph of each harmonic shows V1, V2 and V3 from left to right. Left picture shows 3th THD_{V3}: 12% 5th THD_{V1}: 24% 5th THD_{V2}: 16% 8th THD_{V2}: 11%

Power Quality

Meter supports monitoring and analyzing power quality of grid. Measured parameters are as follows:

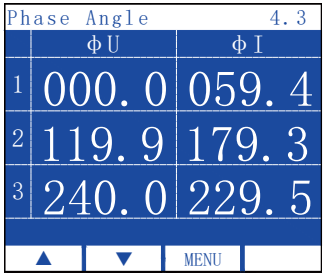
1）Waveform

Real-time display waveform of three-phase voltage and current. Waveform, phase sequence and distortion can be judged directly.

	Left picture shows real-time waveform of three-phase voltage. "1,2,3" correspond to "V1,V2,V3".
	Left picture shows real-time waveform of three-phase current. "1,2,3" correspond to "I1,I2,I3".

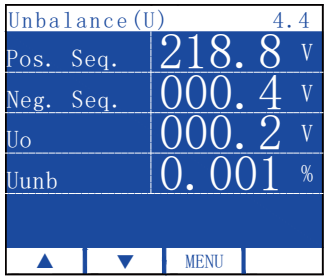
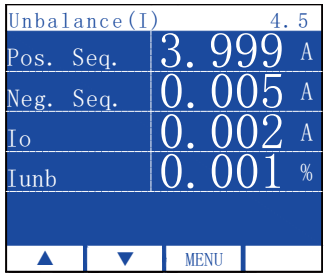
2）Phase angle of voltage and current

Phase angle of voltage and current of each phase is displayed directly. Phase angle of Phase A voltage is defaulted as 0°. Phase angle of other signals are displayed as relative to Phase A voltage (Unit：°).

	Phase angle of three-phase voltage and three-phase current.

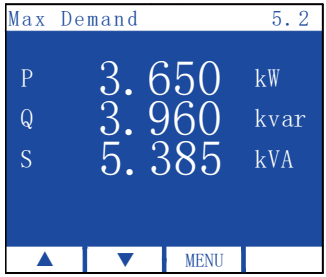
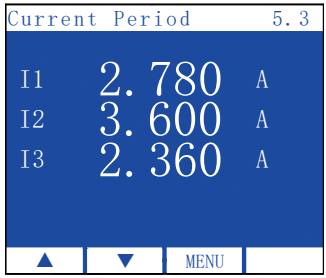
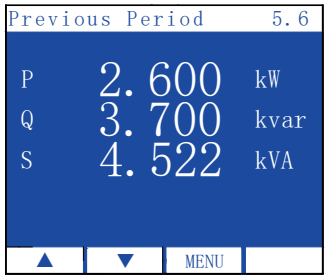
Unbalance

Electrical parameters of three-phase system are divided into three symmetrical components which are positive-sequence component, negative-sequence component and zero-sequence component according to symmetrical component method. The ratio of RMS values of negative-sequence component and positive-sequence component is defined as three-phase unbalance in the condition that power system is in normal operation mode.

	Unbalance-U Positive sequence value=218.8V Negative sequence value=0.4V Zero sequence value=0.2V Voltage unbalance value=0.001%
	Unbalance-I Positive sequence value=3.999A Negative sequence value=0.005A Zero sequence value=0.002A Current unbalance value=0.001%

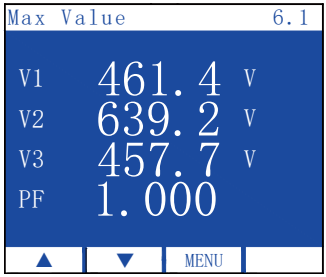
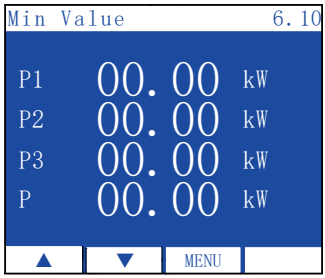
Demand

Meter supports six independent demand recording channels which can measure maximum demand value, present demand value and previous demand value of three-phase current, total active power, total reactive power, total apparent power.

	Left picture shows maximum demand value of three phase total active, reactive and apparent power.
	Left picture shows present demand value of three-phase current.
	Left picture shows previous demand value of three-phase total active, reactive and apparent power.

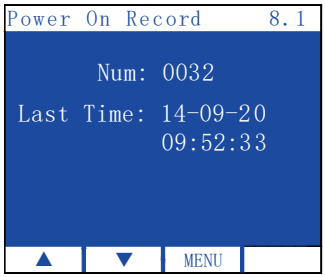
Max/Min

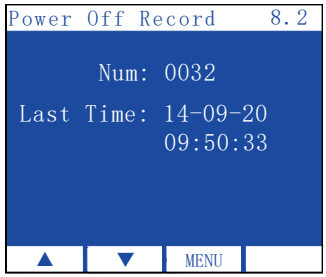
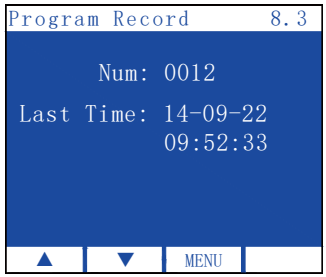
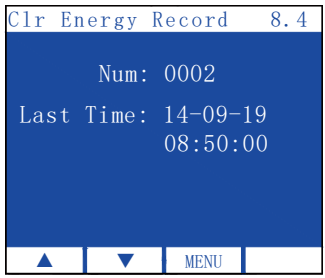
When the measured value is maximum or minimum value at a moment, meter will record this value in non-volatile memory. These maximum or minimum values include three-phase voltage, line voltage, frequency, three-phase current, three-phase and total active power, three-phase and total reactive power, three-phase and total apparent power and total power factor. Following list shows the operation method of checking instantaneous value, maximum value and minimum value of three-phase voltage and frequency.

	Left picture shows maximum value of three-phase voltage and frequency
	Left picture shows minimum value of three-phase and total active power

Event

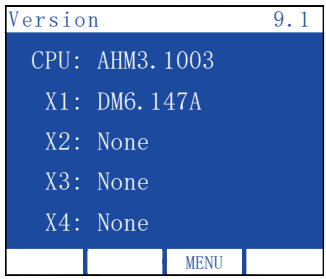
Meter supports recording information of power on, power off, programming and energy clearance when it is equipped with DM1 module. Each type of record includes total pieces and latest occurring time of the event. These information are checked through display interface or read through communication.

	Left picture shows “Power on record” including 32 times of power on and latest power on time.

	Left picture shows “Power off record” including 32 times of power off and latest power off time.
	Left picture shows “Program record” including 12 times of programming and latest programming time.
	Left picture shown “energy clearance record” including 2 times of energy clearance and latest energy clearance time.

Device information

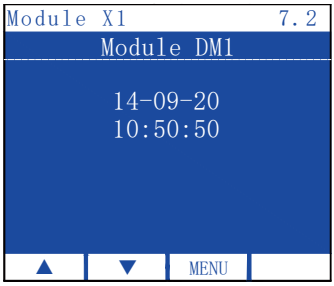
This interface shows the software version of meter and connection of modules.

	Left picture shows software version of meter and module. None indicates that there is no connection or wrong connection to the interface.

Modules

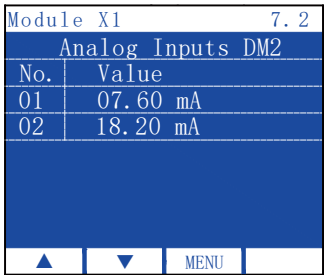
Meter supports four interfaces for connecting extension modules.

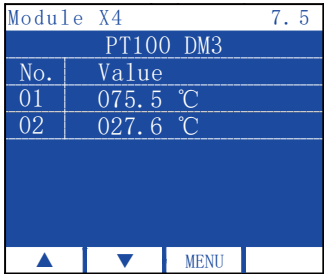
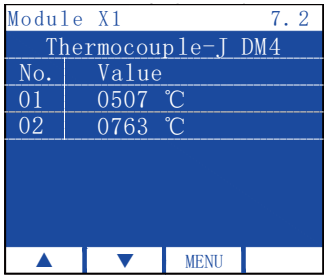
Memory Module（DM1）

	This module provides time information and supports data storage function. Left picture shows time information.

Analogue Input Modules（DM2，DM3，DM4）

DM2 is used to measure 4~20mA signal. DM3 is used to measure PT100 signal. DM3 is used to measure J, K, E thermal couple signal. Display interfaces of measured value are shown as follows:

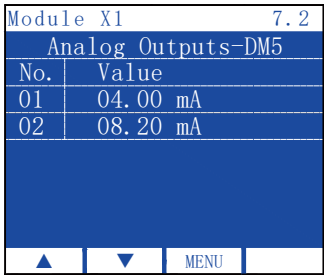
	Left picture shows measured value of analogue input. First analogue input is 7.6mA; Second analogue input is 18.2mA.

	Left picture show measured value of PT100 thermal resistor. First temperature is 75.5℃; Second temperature is 27.6℃.
	Left picture shows measured value of thermal couple with graduation number J. First temperature is 507℃; Second temperature is 763℃.

Analogue Output Module（DM5）

Instantaneous electrical parameters are change into DC current signal output through DM5 module. If this module is installed onto meter, relative interface will be displayed. The current value shown in the interface is theoretical value in present status.

Analogue output items and range are programmed through meter.

	Left picture shows theoretical value of analogue output. First analogue output value is 4mA; second analogue output value is 8.2mA.

Digital Input

Digital input adopts dry contact mode. There is internal power supply for digital input so that there is no need for external power supply.

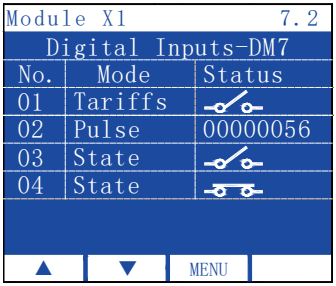
There are four working modes for digital input as follows：

1)State monitoring mode：It is used to monitor the state of breaker, the position of handcart, etc. The state of digital inputs can be indicated locally or read remotely through communication.

2)Pulse counter mode：Meter counts pulse numbers from input terminal. Pulse counting adds one when meter receives one pulse.

3) Spare energy synchronization：Terminal status is used as synchronization signal. Spare energy metering starts after meter received the signal. This function is effective in DM9 module.

4)Tariff energy setting mode： This function is valid in DM7 module. Digital input is used for setting tariffs. There are sixteen kinds of tariffs. Meter accumulates energy of present period to corresponding tariff period. The function is effective in DM7 module.



Left picture shows working modes of four digital input.

Digital input 1 is in tariff energy status;

Digital input 2 is in pulse counting status with pulse number 56;

Digital input 3 is for Spare energy;

Digital input 4 is for check status, and there is input signal.

Relay Output

Meter supports two relay outputs. More relay outputs are realized by connecting DM8 module to meter.

The relay output has three working modes: Energy pulse、remote control and alarm mode.

The relay output module (DM8) has two working modes: remote control and

alarm mode.

Parameters like working mode, alarm item, limit value,time delay and hysteresis should be set. The data format of limit value is the secondary integer data.

1) Energy pulse output mode

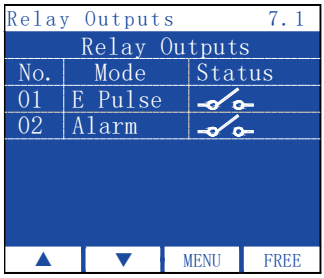
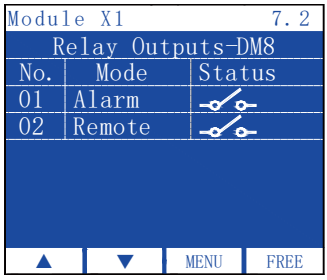
Meter supports bi-directional active and reactive energy pulse output function through relay output. Pulse frequency is smaller than 1Hz.

2) Remote control output mode

Receiving command PC or PLC through communication, the relay which supports electric level manner or pulse manner can be in motion or be released.

3) Alarm mode

High alarm indicates the relay acts in case of the measuring value more than the alarm value, while low alarm indicates the relay acts in case of the measuring value less than that alarm value. Only when all the terms spurring the relay alarm do not work, the meter has been turned off power or any software shields the alarm function, does the relay be released.

	Left picture shows working mode of relay outputs of meter. Relay output 1 is energy pulse mode; Relay output 2 is alarm mode.
	Left picture shows working mode of relay outputs of module. Relay output 1 is alarm mode; Relay output 2 is remote control mode.

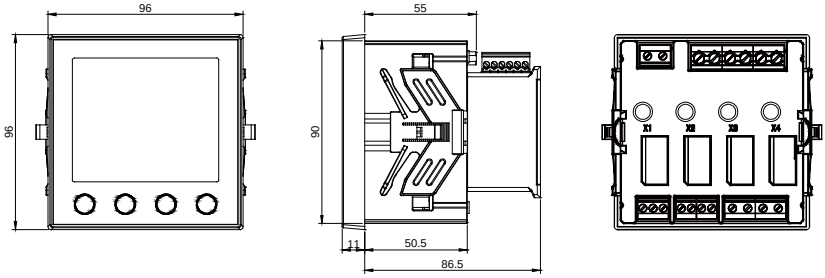
Communication

This series power meter provides an RS-485 slave port and adopts Modbus-RTU protocol. All devices are connected in a bus line by twisted-conductor and shielded cable. Up to 32 stations can be connected together in a segment.The cable at the start and end of a segment is terminated with resistors.

One more communication is realized by connecting extension module to meter. As for detailed information, please refer to user manual of DM10, DM11, DM12 and DM13.

3 Installation

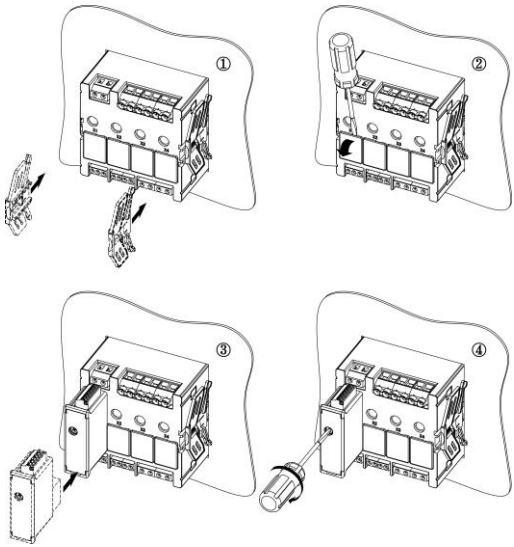
Dimensions



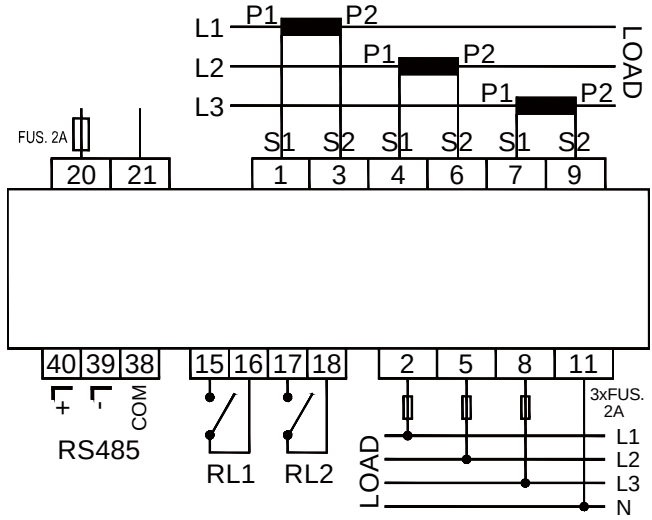
Mounting

1) Cut a hole in the panel measuring 91×91 mm^2.
2) Take out the power meter and loosen the clips.
3) Insert the meter into the cutout from outside.
4) Insert the clips and fix the meter.

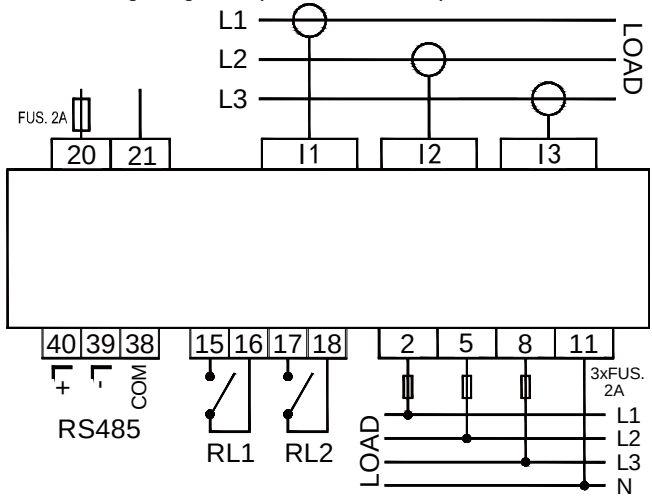
Wiring



Typical Wiring Diagrams



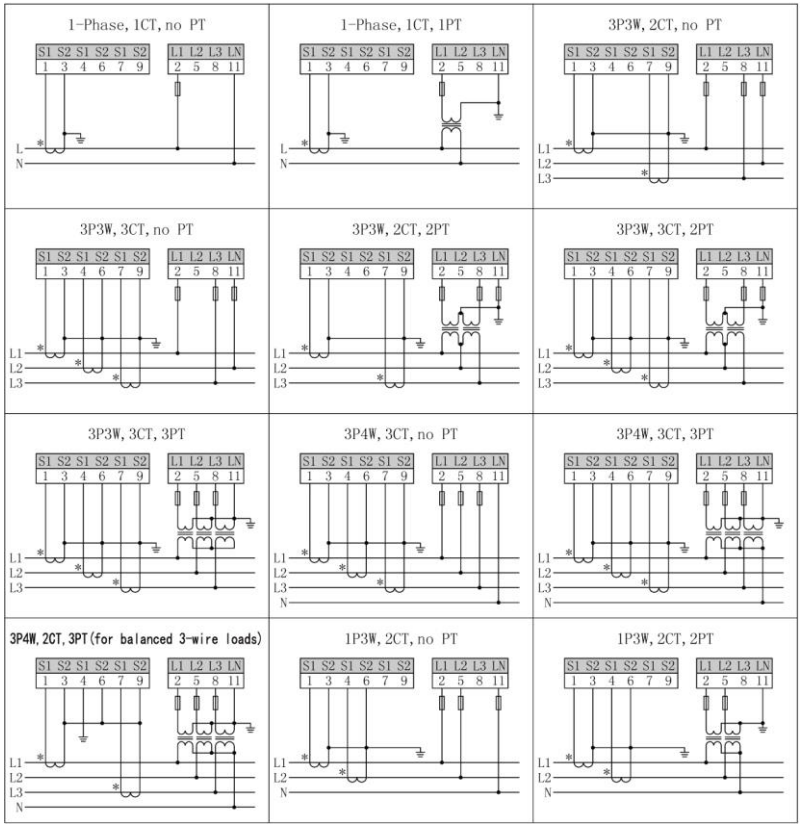
Rogowski coil Wiring Diagrams (AHM3RC-SMTP)



Note:

1. Auxiliary power supply: AC/DC (80～270)V
2. Rated current of fuse: 0.5A

Signal Wiring Diagrams



Note：

(a) External wiring mode should be the same as internal wiring mode of meter. Otherwise, measured information of meter will be not correct (Please refer to 5.5 for detailed setting method).

(b) Meter measures AC voltage and current signals. Please do not connect DC signals to input terminals of meter.

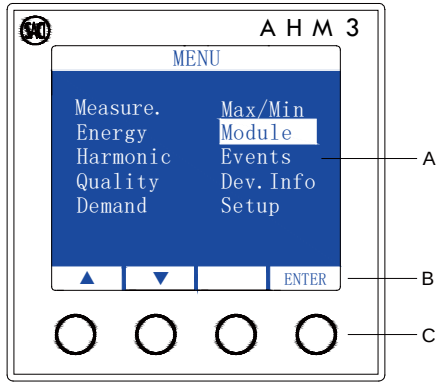
(c) Voltage input: The external PT should be applied when the input voltage exceeds the rated value. Accuracy of external PT should be equal to or better than measurement accuracy of meter. For easy maintenance, it is suggested to use the terminal blocks.

(d) Current input: The external CT should be applied when the input current exceeds the rated value. Accuracy of external CT should be equal to or better than measurement accuracy of meter. If other meters are also connected to a same CT, please connect them in serial. Before removing the current input wires, the primary circuit loop of CT should be cut off, or the secondary circuit loop should be shorted. For easy maintenance, it is suggested to use the terminal blocks;

(e) Make sure phase sequence and direction of three-phase voltage and current are consistent with each other. Otherwise, the values and signs will be incorrect.

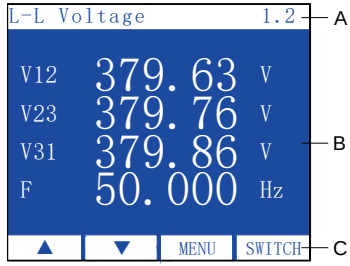
4 Operation

Panel



A：Display window　B：Key Function indication　C：Touch-key

Display



A: measured information indication;

B: display different data and graph information;

C: function button

- Up-left part of each display interface indicates measured information;
- Up-right part of each display interface indicates page number;
- Data window shows value of measured information;
- Lower part of each display interface shows the functions of buttons.

Setup button

Parameters of meter are set through buttons by user.

Sign	Function instruction
▲	Move upward; switch to previous page; change parameters; increase number at selected bit
▼	Move downward; switch to the following page; change parameters
◄	Move leftward to modify or display data in cyclic order
SWITCH	Switch between data and bar graph
MENU	Return to Main menu directly
ESC	Return to upper level of menu; cancel modification
ENTER	Enter selected item
EDIT	Modify selected item
ENTER	Confirm modification
	Not effective

Method of changing numbers

Press ◄ button to select a bit, and then press ▲ button to increase the number at selected bit in cyclic order.

Enter and exit programming status

- Enter programming status

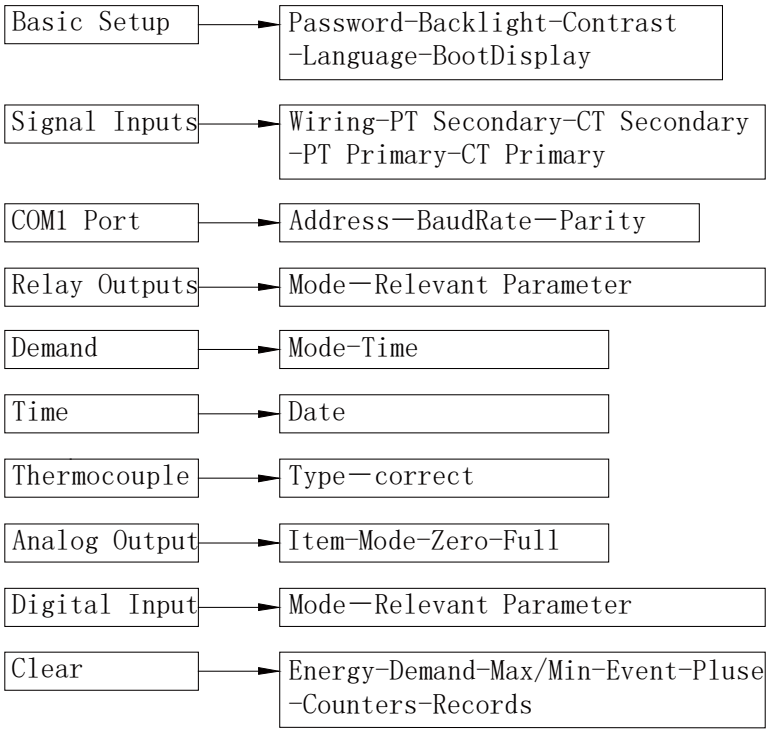
First, press ▲ or ▼ button to select Setup item; second press ENTER to enter programming interface; third, select User setting and input correct password to start programming and parameter setting. (Password is defaulted as 0001. It can be changed by user.)

- Exit programming status

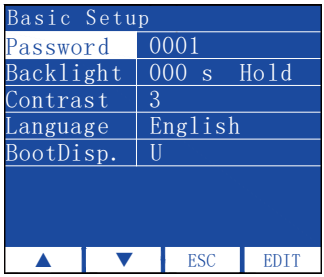
First, return to first level of programming menu; second, press ESC button to see Yes or No; third, select Yes to save modified data and return to main menu, or select No to cancel modification and return to main menu.

Setup Menu Overview

Programming menu of meter adopts hierarchical structure as follows.

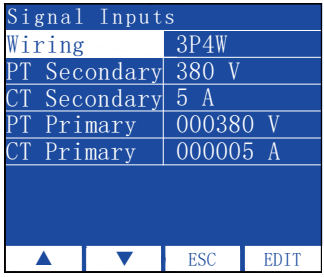


Basic Setup



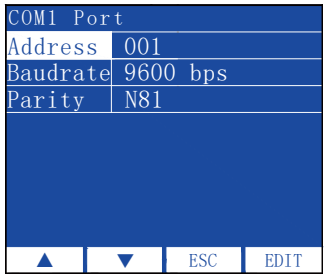
Password	0001-9999
Backlight	000s-999s 000s-backlight constant on
Contrast	0-7
Language	English
BootDisp	Set first display interface after power on. This interface can be set as U, I, P, E, THD, Waveform, Demand and Max/Min

Signal Input Setup



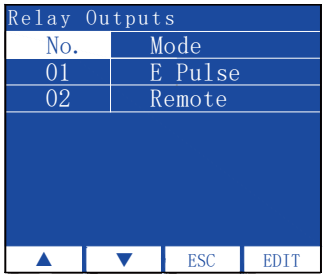
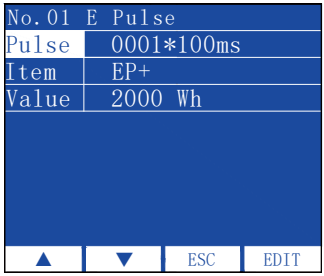
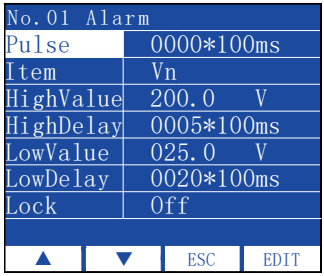
Wring	1P2W,1P3W, 3P3W,3P4W
PT Secondary	0-690V
CT Secondary	0-6A
PT Primary	0-999999V
CT Primary	0-999999A

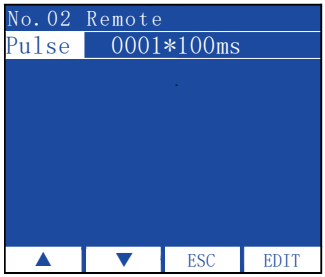
Communication Setup



Address	1~247
Baud rate	1200~38400bps
Parity	E81,O81,N81,N82

Relay Output Setup

<table>
<tr><td> 
</td><td>There are four working modes of relay output which are energy pulse, remote communication and alarm. Energy pulse working mode is only effective for meter.</td></tr>
<tr><td rowspan="4"> 
</td><td colspan="2">Energy pulse output mode</td></tr>
<tr><td>Pulse</td><td>(Energy pulse width)
(0~9999)×100ms</td></tr>
<tr><td>Item</td><td>EP+: kwh+
EP-: kwh-
EQ+: kvarh+
EQ-: kvarh-</td></tr>
<tr><td>Value</td><td>Secondary energy value corresponding to one energy pulse</td></tr>
<tr><td rowspan="8"> 
</td><td colspan="2">Alarm output mode</td></tr>
<tr><td>Pulse</td><td>Pulse width:
(0~9999)×100ms</td></tr>
<tr><td>Item</td><td>Vn</td></tr>
<tr><td>HighValue</td><td>High Limit value（Primary）</td></tr>
<tr><td>HighDelay</td><td>Delay time:
(0~9999)×100ms</td></tr>
<tr><td>LowValue</td><td>Low Limit value（Primary）</td></tr>
<tr><td>LowDelay</td><td>Delay time:
(0~9999)×100ms</td></tr>
<tr><td>Lock</td><td>Interlock: ON/OFF</td></tr>
</table>

<table>
<tr><td rowspan="2"> 
</td><td colspan="2">Remote control output mode</td></tr>
<tr><td>Pulse</td><td>Pulse width:0~ ms</td></tr>
</table>

Demand Setup

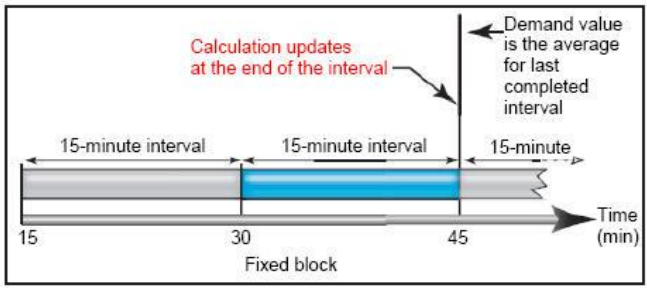
A demand is the average value of a quantity, such as power, over a specified period of time.

Power demand is calculated using arithmetical integration of power values during a period of time divided by the length of the period. The result is equivalent to the energy accumulated during the period of time divided by the length of the period.

Current demand is calculated using arithmetical integration of the current r.m.s. values during a period of time,divided by the length of period.

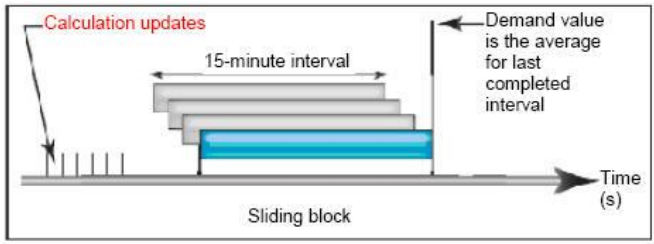
The power meter handles the intervals duration to calculate the demand. It can implement several methods:

Fixed block interval: the intervals are consecutive, the power meter calculates and updates the demand at the end of each interval.



Note: 15min is only an example.

Sliding block interval: the intervals are sliding. The power meter calculates and updates the demand at the sliding speed.



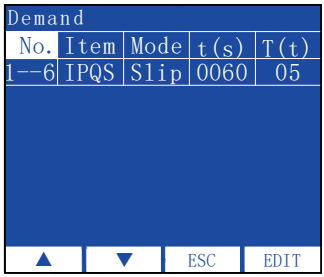
Note: 15min is only an example.

Relative time parameters are set as t (sliding time, unit: minute) and T (sliding block interval, unit: minute)

Fixed interval mode means that demand average value of T minutes is calculated for every T block, and then the value is judged and record. Demand of one month is record automatically at a fixed time.

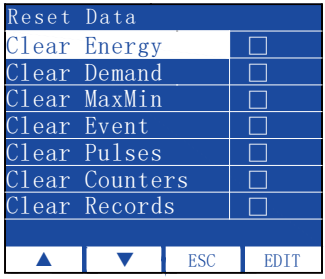
Sliding interval mode means than demand average value of latest T minutes is calculated, and then the value is judged and record. Demand of one month is record automatically at a fixed time.

Synchronous mode means that the demand measurement is controlled by external signals which come from digital inputs of DM6 and DM7. When digital input module is in synchronous status and one of its digital inputs acts, the demand measurement starts; when all digital inputs stop, the demand measurement also stops.

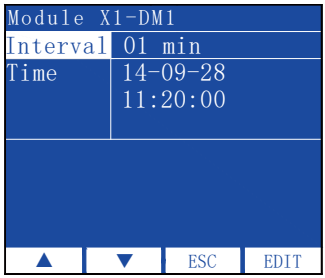


No.	1-6
Item	I1,I2,I3,P,Q,S
Mode	Slip/Fixed/Syn
t	
T	T=n*t, n:

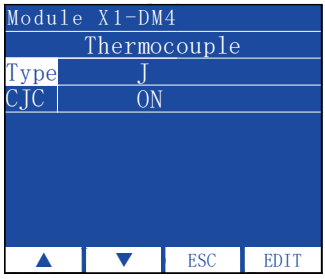
Reset Data

	Parameters of energy, demand, Max./Min. value and Event are cleared in this interface. If the parameters are cleared, the relative value will be zero and not be reset; If energy is cleared, a piece of energy clearance SOE is made.

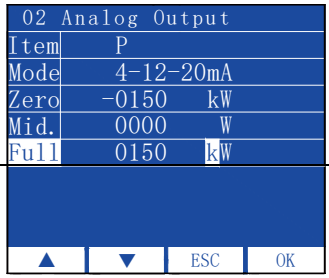
Memory Module Setup

	Interval	Data record Interval0~99min
	Time	Setup real-time-clock

Thermocouple Module Setup

	Type	J,K,E,N
	CJC	Cold junction Compensation: ON/OFF

Analogue Output Setup

	Item	See following list
	Mode	4-12-20mA
	Zero	Zero scale（Primary）
	Mid.	Middle scale（Primary）

	Full	Full scale（Primary）

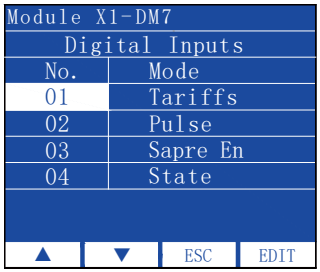
Analogue output items are shown in following list:

Lower limit value and upper limit value of analog output are primary values. Upper limit value should not be larger than two times of rated value. 4-12-20mA analog output mode is only valid for active power, reactive power, apparent power and power factor.

Item	Format	Instruction
OFF		Off
V1	xxx.x __V	Voltage
V2		
V3		
V12		
V23		
V31		
I1	x.xxx __A	Current
I2		
I3		
In		
P1	x.xxx __W	Active Power
P2		
P3		
P		
Q1	x.xxx __var	Reactive Power
Q2		
Q3		
Q		
S1	x.xxx __VA	Apprent Power
S2		
S3		
S		

PF1	x.xxx	Power Factor
PF2		
PF3		
PF		
F	xx.xx Hz	Frequency

Digital Input Setup



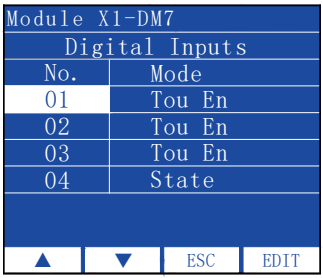
There are four working modes of digital input.

1）Tariff energy (effective in DM7 module)

2）Pulse counting

3）Spare energy (effective in DM9 module)

4）Status monitoring



DM7 module is used for setting tariffs from its first digital input. There are four digital inputs available. Tariff is judged by meter according to digital input status. Status 0000 corresponds to T1, and Status 1111 corresponds to T16. See following list for detailed information.

Detailed corresponding relation is shown in following list. "0" indicates the digital input is open, and "1" indicates the digital input is closed.

DI4	DI3	DI2	DI1	Tariff
0	0	0	0	T1
0	0	0	1	T2
0	0	1	0	T3
0	0	1	1	T4
0	1	0	0	T5
0	1	0	1	T6
0	1	1	0	T7
0	1	1	1	T8
1	0	0	0	T9
1	0	0	1	T10

1	0	1	0	T11
1	0	1	1	T12
1	1	0	0	T13
1	1	0	1	T14
1	1	1	0	T15
1	1	1	1	T16

Program Example

E.g. select wiring mode as three phase three wire, set primary value of PT as 6kV, and set secondary value of PT as 100V.

5 Communication

Meter is defaulted to be equipped with one RS-485 communication adopting Modbus-RTU protocol. Other communication modes such as Profibus-DP, GPRS, Ethernet and WIFI can be realized by connecting module to meter. As for detailed information, please refer to user manual of communication modules DM10, DM11, DM12 and DM13.

6 Maintenance And Troubleshooting

Communication

First ensure the communication settings of meter, such as, slave address, baud rate, check mode, etc. are in compliance with that of host equipment. In case more than one meters does not send back the data, please check if the connection of communication bus on site is correct, and if the RS485 converter is running regularly.

The data being display is not what you expert

Verify appropriate voltage and current are offered to the meter, and you can use a multimeter to measure the voltage signal. What's more, when necessary, the clamp ammeter can be used to measure the current signal.

Verify the connection of signal wiring is appropriate, for example, the homonymous ends of current signal and phase sequence of each phase should be correct. The meter can display the value of active power, signal of which is negative only in case of generating electricity, while in regular situation, positive. However, the wrong connection of input or output wires, or wrong connection of phase sequence may lead to irregular display of power value. This series of meters permit modifying the directions of homonymous ends of current, and you can set up reverse current in setting menu.

The electric quantity displayed by the meter is primary grid value, and it will be incorrect if the multiple rate of PT or CT set in the meter is different from that of PT or CT used practically. Besides, the measuring range of voltage and current inside the meter and wiring grid should be adjusted according to practical wiring mode on site, to keep right display of parameters.

Energy is inaccurate

The energy is accumulated based on the measurement of power. First observe whether the power value of meter is in compliance with practical load. The meter supports bi-direction energy metering. In case the wiring mode is

incorrect, and the total active power is negative, the reverse active energy, not the forward active energy, will be accumulated.

The problem happening most frequently on site is that the input or output wires are connected reversely, which will cause the phase active power to be negative. Besides, the wrong phase sequence will also lead to incorrect display of electric energy.

The display is blank

Make sure appropriate auxiliary power supply is provided for the meter, for the auxiliary power supply with voltage beyond the stipulated range may damage the meter absolutely. The voltage of auxiliary power supply can be measured by multimeter. If it turns out to be correct, and the meter displays nothing, please try electrifying the meter once again.

7 Technical specifications

7.1 AHM3-SMTP

Electric Characteristics			
Accuracy	Voltage and current		0.2%
	Power,Power Factor		0.5%
	Frequency		±0.01Hz
	Active power		IEC62053-22, class 0.5S
	Reactive power		IEC62053-23, class 2
Data update rate			1s
Input	Wiring mode		1P2W、1P3W、3P3W、3P4W
	Voltage	Rated value	400 VAC L-N (690 VAC L-L)
		Overload	1.2Vln
		Impedance	>1MΩ
	Current	Rated value	1A or 5A
		Overload	Continuous: 1.2In
			Instantaneous: 10In/5s
		burden	<0.1VA
		Impedance	<20mΩ
	Grid frequency		(45～65)Hz
Auxiliary supply	Working range		AC/DC（80～270）V
	consumption		≤ 10VA
Energy pulse output			2 photocouple outputs, pulse width (80±20%) ms

Digital input		Dry contact input, isolation：2000VAC
Relay output		Contact rated at AC 250V/5A or DC 30V/5A
		Isolation： 2500VAC
Communications		
RS485 port		Modbus-RTU , 2-wire,up to 38400bps
Mechanical Characteristics		
IP index	IP65（front panel）and IP20（meter body）	
Dimensions	96×96×55mm	
Environmental Characteristics		
Operating temperature		(-10～60)℃
Storage temperature		(-25～70)℃
Relative humidity		(5～95)% (no gel)
Insulation		IEC 61010-1
Electromagnetic Compatibility		
Immunity to electrostatic discharge		IEC 61000-4-2-Level III
Immunity to radio-frequency field		IEC 61000-4-3- Level III
Immunity to electrical fast transients/bursts		IEC 61000-4-4- Level Ⅳ
Immunity to impulse waves		IEC 61000-4-5- Level Ⅳ
Immunity to conducted disturbances		IEC 61000-4-6- Level III
Immunity to power frequency magnetic fields		IEC 61000-4-8- Level III
Immunity to voltage dips and short interruptions		IEC 61000-4-11- Level III

7.2 AHM3RC-SMTP

Electric Characteristics			
Accuracy	Voltage		0.2%
	current		0.5%
	Power,Power Factor		1%
	Frequency		±0.01Hz
	Active power		IEC62053-21, class 1
	Reactive power		IEC62053-23, class 2
Data update rate			1s
Input	Wiring mode		1P2W、1P3W、3P3W、3P4W
	Voltage	Rated value	400 VAC L-N (690 VAC L-L)

		Overload	1.2Vln
		Impedance	>1MΩ
	Current	Rated value	Rogowski coil In
		Overload	Continuous: 1.2In
			Instantaneous: 10In/5s
		burden	<0.1VA
		Impedance	<20mΩ
	Grid frequency		(45～65)Hz
Auxiliary supply	Working range		AC/DC（80～270）V
	consumption		≤ 10VA
Energy pulse output			2 photocouple outputs, pulse width (80±20%) ms
Digital input			Dry contact input, isolation：2000VAC
Relay output			Contact rated at AC 250V/5A or DC 30V/5A
			Isolation： 2500VAC
Communications			
RS485 port			Modbus-RTU , 2-wire,up to 38400bps
Mechanical Characteristics			
IP index	IP65（front panel）and IP20（meter body）		
Dimensions	96×96×55mm		
Environmental Characteristics			
Operating temperature			(-10～60)℃
Storage temperature			(-25～70)℃
Relative humidity			(5～95)% (no gel)
Insulation			IEC 61010-1
Electromagnetic Compatibility			
Immunity to electrostatic discharge			IEC 61000-4-2-Level III
Immunity to radio-frequency field			IEC 61000-4-3- Level III
Immunity to electrical fast transients/bursts			IEC 61000-4-4- Level Ⅳ
Immunity to impulse waves			IEC 61000-4-5- Level Ⅳ
Immunity to conducted disturbances			IEC 61000-4-6- Level III
Immunity to power frequency magnetic fields			IEC 61000-4-8- Level III
Immunity to voltage dips and short interruptions			IEC 61000-4-11- Level III