DZ81-MA3UI5C
Intelligence Power Meter
User Manual
(V1.0)

Heyuan Intelligence Technology Co., Ltd

IMPORTANT DECLARATIONS

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Please read this manual carefully before the product is operated. And once you start operating the meter, you'll be considered to have read this manual and accept all our terms. Heyuan shall not be responsible or liable for any damages or injuries caused by improper meter installation and/or operation.

Attention: the following symbols in this manual refer to meanings as follows

 **Electric Shock Symbol: Carries information about procedures which must be followed to reduce the risk of electric shock and danger to personal health**

 Safety Alert Symbol: Carries information about circumstances which if not considered may result in injury or death

The meter must be installed and operated by one who has experience with high-voltage devices or has qualifications. Please connect the meter to correct voltage before operating the meter. Please install and use the meter according to the user manual. Heyuan shall not be responsible or liable for any damages or injuries caused without following the instructions in the user manual.

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Contents

Chapter 1 Meter Overview

DZ81-MA3UI5C is an advanced, smart multifunctional energy meter. It is widely used in power distribution sites, energy management systems and intelligent monitoring systems of different industries. Measuring all parameters: three phase/line voltage, three phase current, zero-sequence voltage, zero-sequence current, voltage unbalance, current unbalance, active power, reactive power, apparent power, power factor, frequency, analysis of harmonic(2~31times), bidirectional active/reactive energy, multi-tariff, four-quadrant electric energy, SOE event records, demand analysis etc. It has 4-channel digital input (DI), and 2 channel digital output(DO), and 1-channel energy pulse output, and supports standard Modbus RTU communication protocol.

Display: LCD display

Chapter 2 Specifications

2.1 Input Voltage

Rated Voltage: 220V/380V AC Voltage Range: 0~1.2Un

2. 2 Input Current

Rated Current: 5A

2.3 Frequency Measurement

Frequency Measuring Range: 45~65Hz

2. 4 Measuring Accuracy

Voltage/Current: 0.2% Energy Accuracy: Class 0.5S Power Factor: 0.1%
Frequency: ±0.01Hz

2. 5 Communication

RS485/Modbus-RTU Communication Protocol
Baud Rate: 2400~19200bps (programmable)
Remark: DZ81-MA3UI5C adopts RS485 interface and Modbus RTU communication protocol to communicate. The terminals are 485A and 485B. Up to 32 pcs of DZ81-MA3UI5C can be connected on 1 communication line and communication address of each DZ81-MA3UI5C is settable.
The RS485 transmission medium is shielded twisted pair, of which diameter is not less than 0.5 mm². In addition, the RS485 interface can also be used for device maintenance and upgrading.

2.6 Power Supply

Power Supply: AC85~265V / DC85~300V DC Power Consumption: <3VA
Power-line Connection Terminals: L/+ and N/-

2. 7 Working Condition

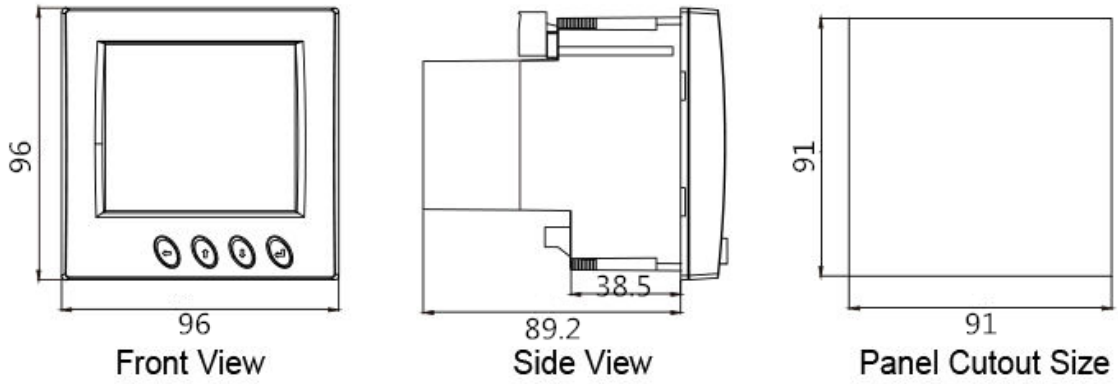
Operating Temperature: -20℃ ~ +70℃ Storage Temperature: -40℃ ~ +85℃
Relative Humidity: 20% ~ 90%(non-condensing)

2.8 Pulse Constant

Pulse constant: 6400imp/kWh

Chapter 3 Dimension and Installation

3.1 Dimension (unit: mm)



Model No.	Cutout Size		External Dimension		
DZ81-MA3UI5C	Width	Length	Length	Width	Height
	91	91	96	96	70.5

3.2 Installation Method

This series of products should be installed in a dry and dust free environment, and avoid exposing to excessive heat, radiation and high electrical noise source. The meters can be installed into a standard panel cutout of switch cabinet.
Step1. Remove the clips from the meter and insert the meter into the cutout from the front side. Make sure that the screen is at the front of the panel.
Step2. Install clips on the back side of the meter and secure tightly to ensure the meter is affixed to the panel.

Chapter 4 Terminals

485A	485B	PE+	PE-	DICOM	DI4	DI3	DI2	DI1	PG	N/-	L/+
1	2	3	4	5	6	7	8	9	10	11	12
RS485		Energy Pulse		Digital Input (DI)					Auxiliary Power		

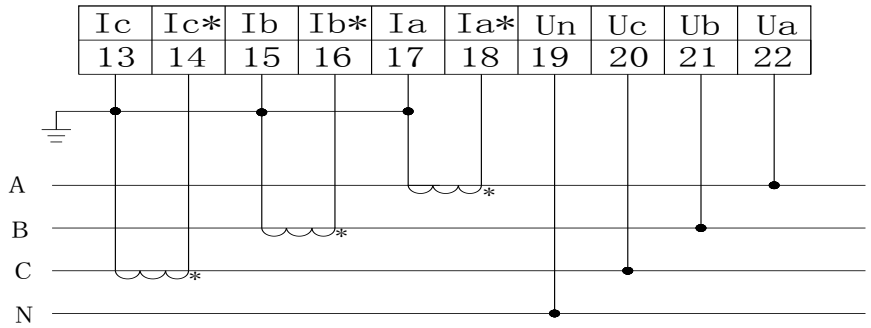
Upper Row of Terminal

Ic	Ic*	Ib	Ib*	Ia	Ia*	Un	Uc	Ub	Ua
13	14	15	16	17	18	19	20	21	22
Current Input						Voltage Input			

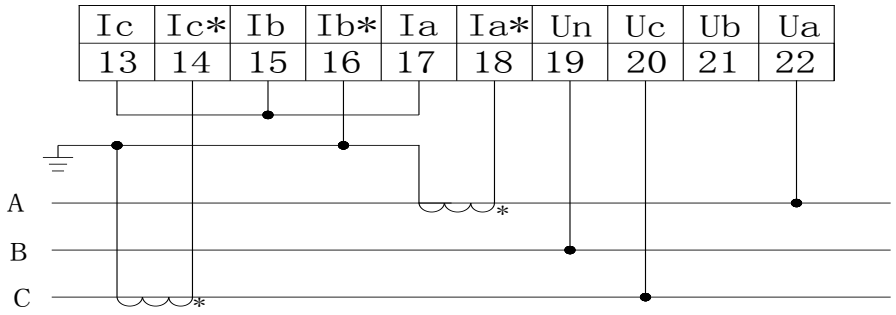
Lower Row of Terminals

Chapter 5 Typical Wiring

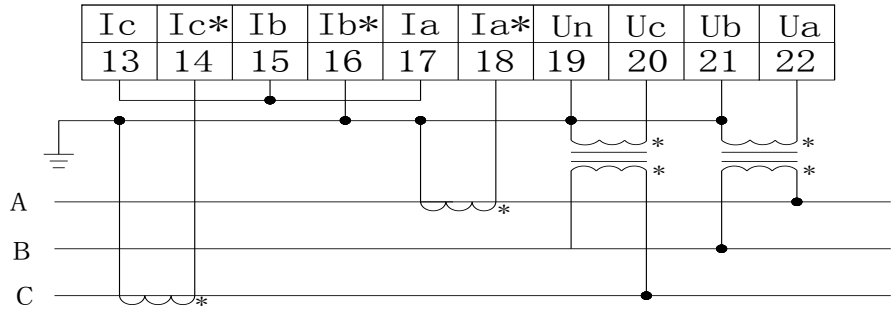
5.1 3-phase 4-wire Wiring Mode in Low Voltage Environment



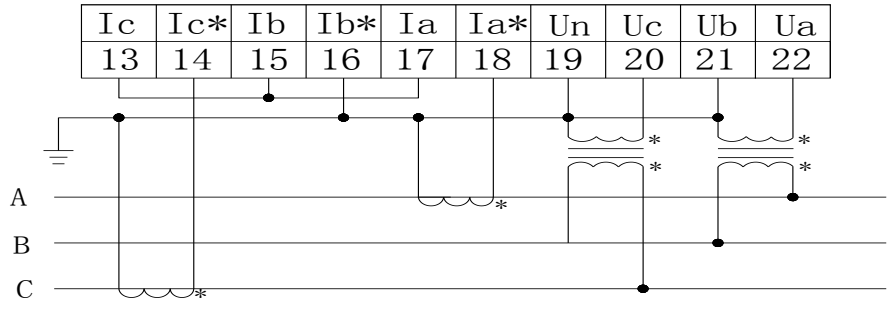
5.2 3-phase 3-wire Wiring Mode in Low Voltage Environment



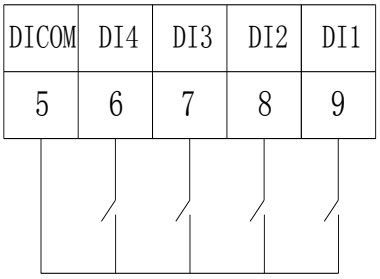
5.3 3-phase 4-wire Wiring Mode in High Voltage Environment



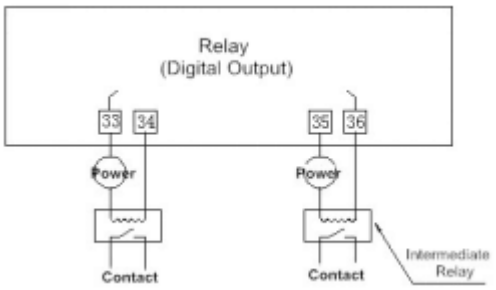
5.4 3-phase 3-wire Wiring Mode in High Voltage Environment



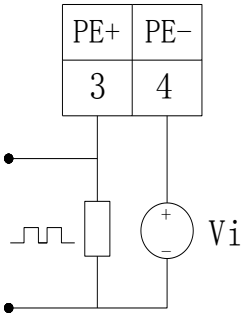
5.5 Digital Input Wiring



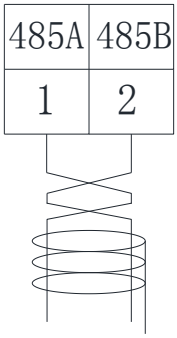
Digital Output Wiring



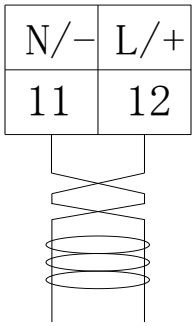
5.6 Energy Pulse Output



5.7 RS485 Communication Interface



5.8 Power Wiring

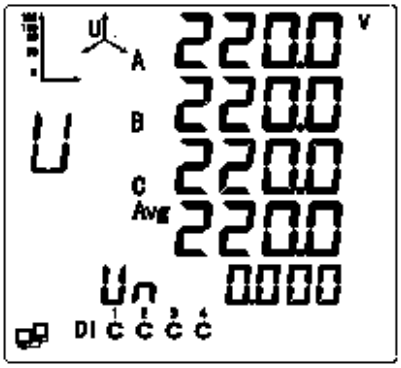


Chapter 6 Meter Display and Operation

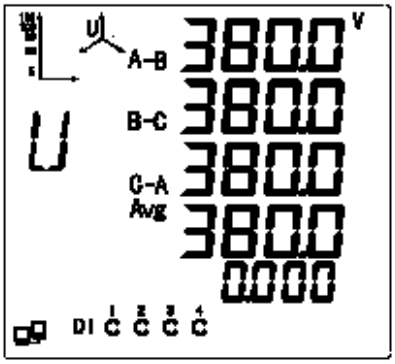
There are four buttons on the front panel, labeled button “H”, button “P”, button “E” and button “V/A” from left to right. It can be used for reading different real-time data and setting parameters though the four buttons.

6.1 Current, Voltage Display Interface

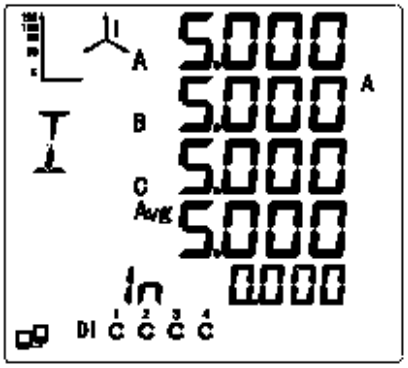
Press button “V/A”, it will cyclically display the values of phase voltage(U), line voltage(UL) and current(I) etc.



Phase Voltage



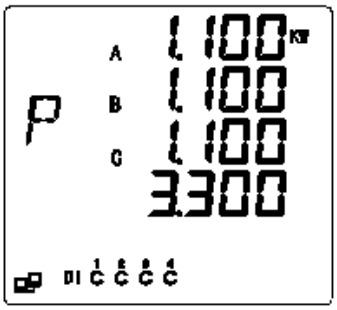
Line Voltage



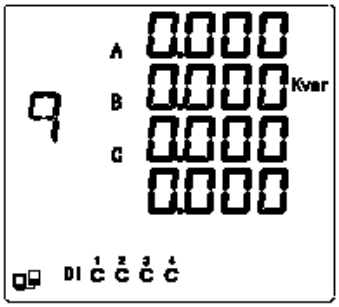
Current

6.2 Power Display Interface

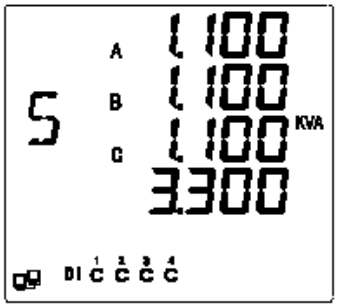
Press button “P”, it will cyclically display the values of three phase active power, reactive power, apparent power, power factor, frequency etc.



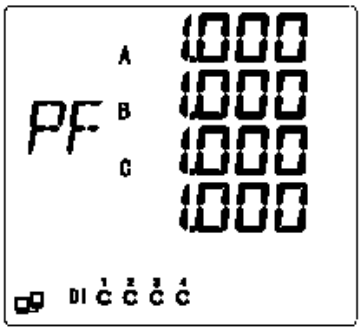
Active Power



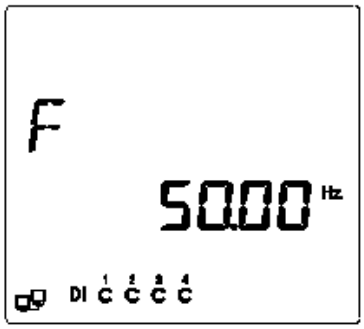
Reactive Power



Apparent Power



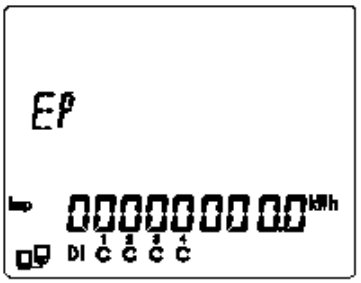
Power Factor



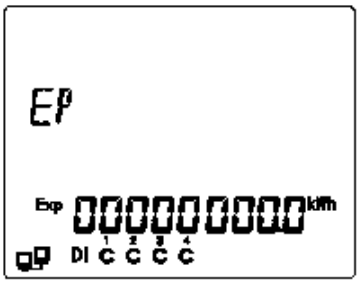
Frequency

6.3 Energy Display Interface

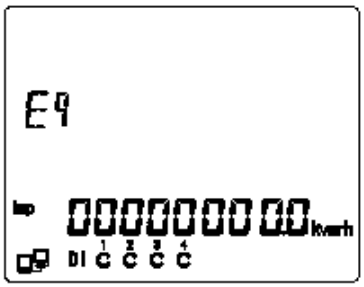
Press button “E”, it will cyclically display the values of energies including import active energy, export active energy, import reactive energy, export reactive energy, total active energy, total reactive energy, net active energy, apparent energy etc..



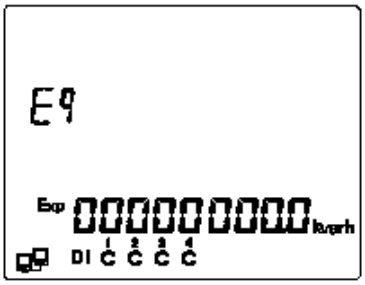
Import Active Energy



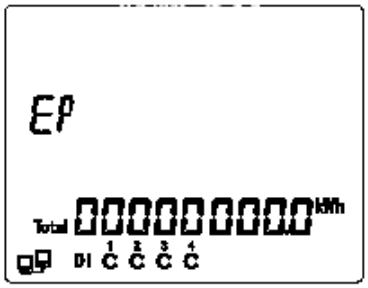
Export Active Energy



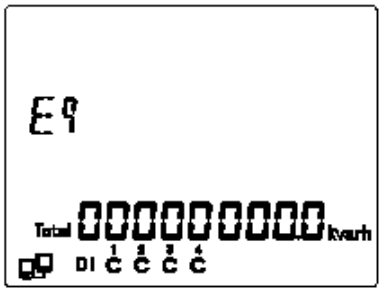
Import Reactive Energy



Export Reactive Energy

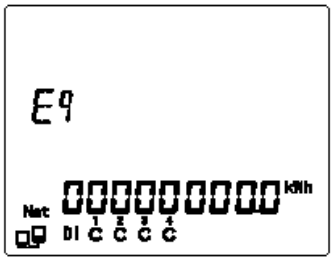


Total Active Energy

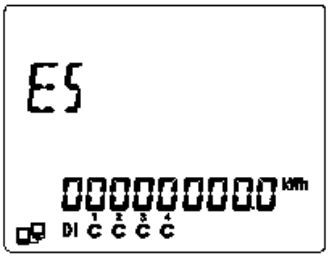


Total Reactive Energy

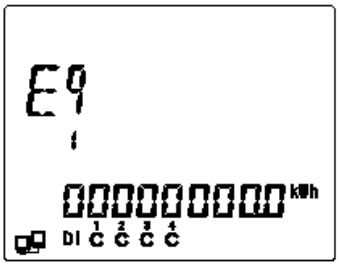
Net Active Energy



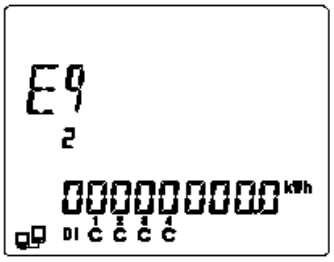
Net Reactive Energy



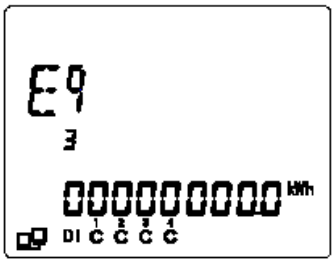
Apparent Energy



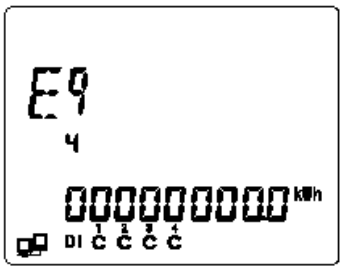
Reactive Energy in 1st Quadrant



Reactive Energy in 2nd Quadrant



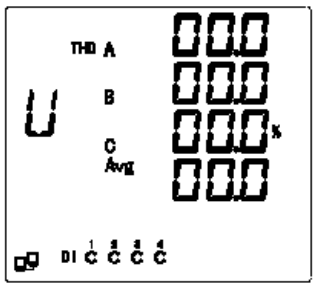
Reactive Energy in 3th Quadrant



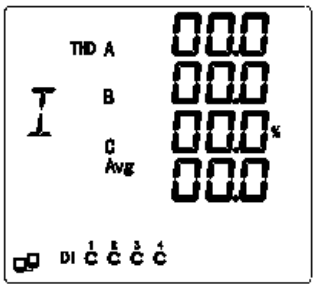
Reactive Energy in 4th Quadrant

6.4 Harmonic Display Interface

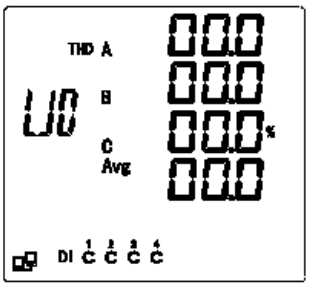
Press button “H”, it will cyclically display values of total harmonic distortion (THD) of voltage or current.



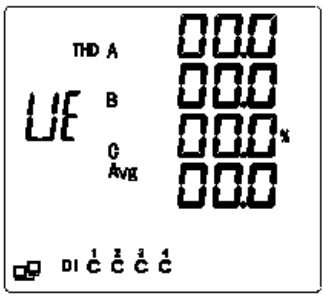
THD of Voltage



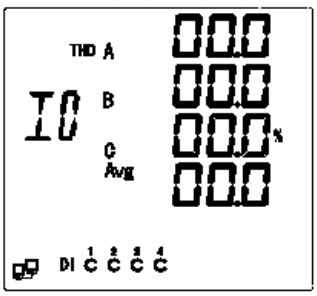
THD of Current



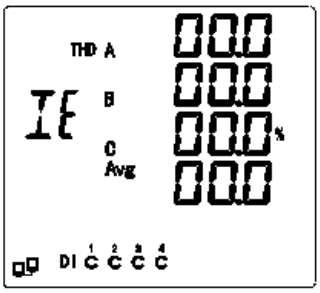
Odd THD of Voltage



Even-order THD of Voltage

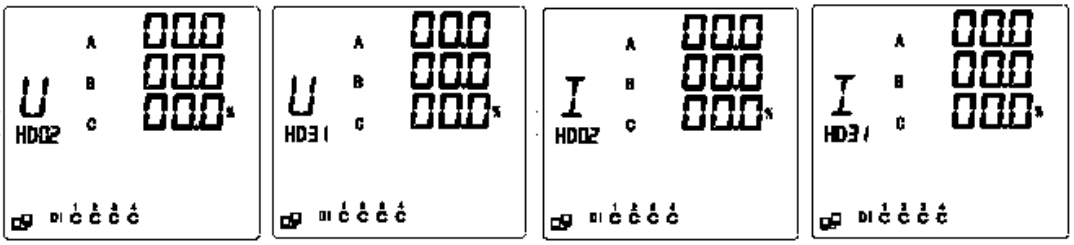


Odd THD of Current



Even-order THD of Current

Press “H” and “E” simultaneously, the meter will display the 2nd~31st HC (harmonic content). The harmonic order will increase from 2nd to 31st by one each time pressing button “P”. And the harmonic order will decrease by one each time pressing button “E”. And press buttons “H” and “E” again, it will switch back to display interface of voltage & current.



2nd HC of Voltage　31th HC of Voltage　2nd HC of Current　31th HC of Current

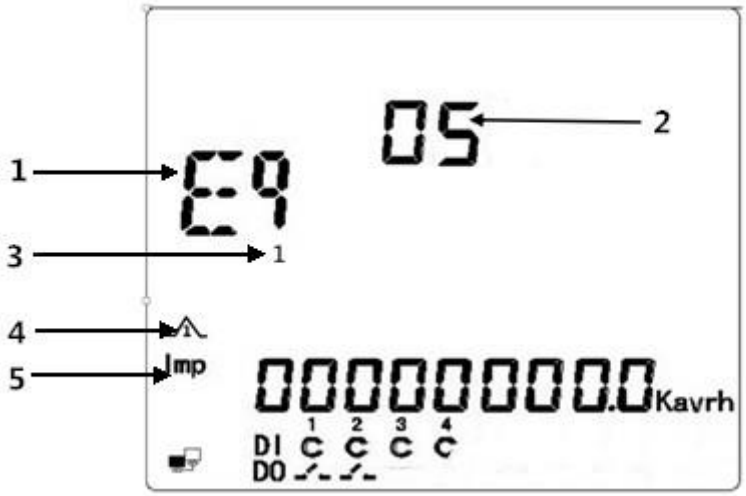
6.5 Multi-tariff Display Interface

Press buttons “E” and “V/A” simultaneously, it will enter the interface of historical multi-tariff.

Press button “V/A” to switch the last Nth-month energy (N represents 00~11).

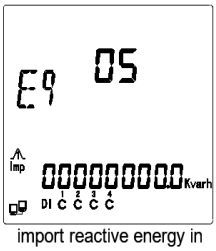
Press button "H" to switch the interfaces of energy in sharp, peak, shoulder or off-peak period.

Press button “E” to switch the interfaces of active energy, reactive energy and apparent energy etc.

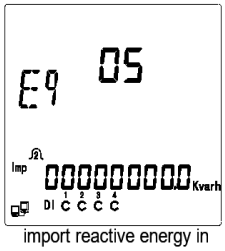


No.	Item	Description
1	Active; Reactive	Ep: Active Energy; Eq: Reactive Energy;
2	Historical Period Time	The number 00~11 represent the current month to the last 11th month.
3	Reactive Energy in Quadrants	Number 1~4 represent the 1st to the 4th quadrant

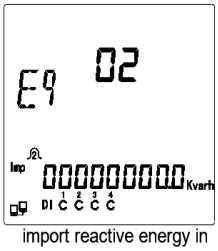
4	Multi-tariff	: Sharp Period : Peak Period : Shoulder Period :Off-peak Period
5	Energy Type	Imp: Import energy Exp: Export energy Total: Absolute value and electrical energy Net: Net energy



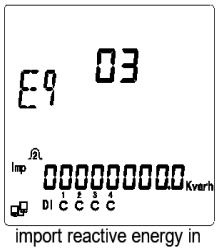
import reactive energy in sharp period of last 5th month



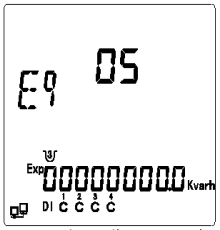
import reactive energy in peak period of last 5th month



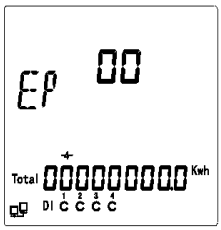
import reactive energy in peak period of last 2nd month



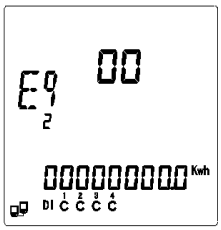
import reactive energy in peak period of last 3rd month



export reactive energy in off-peak period of last 5th month



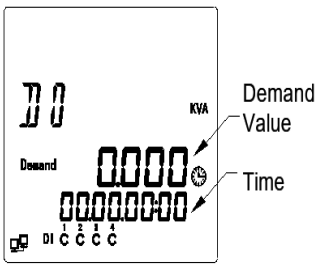
import reactive energy in sharp period of last 5th month



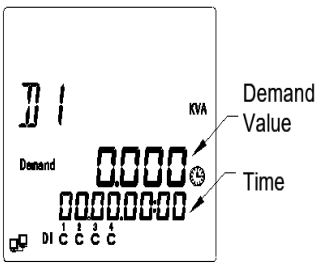
two-quadrant reactive energy in present month

6.6 Demand Display Interface

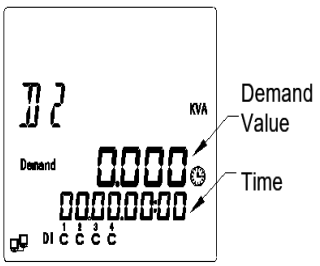
Press buttons “E” and “V/A” simultaneously, it will enter the interface of demand. Press button “P” or “E” to switch last-day demand, present demand, last-month demand, present-month demand. Press buttons “P” and “V/A” simultaneously again, it will exit demand interface.



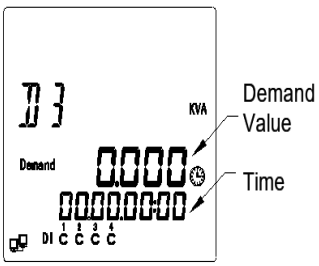
last day demand



present demand



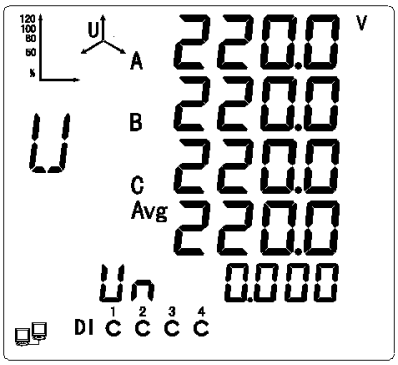
last monthly demand



present monthly demand

Chapter 7 Parameter Setting Interface

7.1 System Parameter Setting



Press buttons “H” and “V/A” simultaneously at any display interface of metering data, it will enter the system setting interface.

At the setting mode:

The button “H” is used for digital shift. Press button “H” each time to shift one digit, which will flash at the same time.

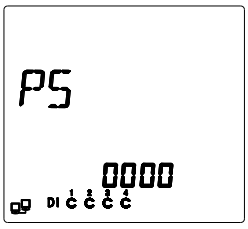
The button “P” is used to plus 1. Press button “P” each time and the flashing digit plus 1. If the flashing digit is 9, press button "P" and the digit will become 0.

The button "E" is used to minus 1. Press button “P” each time and the flashing digit minus 1. If the flashing digit is 0, press button "E" and the digit will become 9.

The button “V/A” is used to confirm the setting and switch to the next setting interface. Press button “H” and “V/A” simultaneously at any setting interface, it will exit the setting interface and switch to the display interface of metering data.

Press buttons “H” and “V/A” simultaneously at any setting interface, it will exit the setting interface and turn to the metering data display interface.

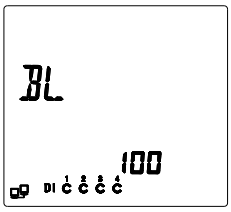
7.2 Password Inquiry Interface



On password inquiry interface,
Step 1. Press button “P” to change the first bit data, the range of which is from 0 to 9.
Step 2. Press button “H” to confirm the data and be ready to change next bit data.
Step 3. Repeat step 1 and 2 until change the last bit data and confirm it.

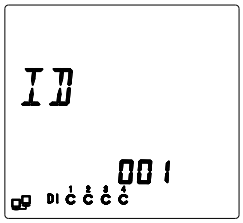
After setting is completed, press button “V/A” to confirm and enter back-light time setting interface. The default password is 0000.

7.3 Back-light Time Setting Interface



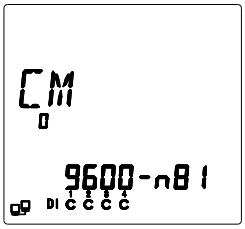
On back-light time setting interface,
Step 1. Press button “P” to change the first bit data, the range of which is from 0 to 9.
Step 2. Press button “H” to confirm the data and be ready to change next bit data.
Step 3. Repeat step 1 and 2 until change the last bit data and confirm it.
After setting is completed, press button “V/A” to confirm and enter communication address setting interface.

7.4 Communication Address Setting Interface



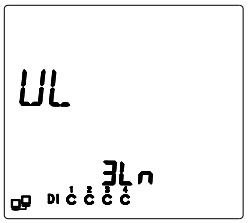
On communication address setting interface, the present communication address is 1.
Step 1. Press button “P” to change the first bit data, the range of which is 0~9.
Step 2. Press button “H” to confirm the data and be ready to change next bit data.
Step 3. Repeat step 1 and 2 until change the last bit data and confirm it.
The value range is from 1~247. After setting is completed, press button “V/A” to confirm and enter communication parameter setting interface.

7.5 Communication Parameter Setting Interface



On communication parameter setting interface, the present baud rate is 9600. The RS485 communication parameter is n81.
Step 1. Press button “P” or “E” to cyclically display baud rate 2400, 4800, 9600 or 19200.
Step 2. Press button “H” to shift digit right to change RS485 communication parameters. Press buttons “P” or “E” to cyclically display n81, E81 or o81.
Step 3. Repeat step 1 and 2 until completing the communication parameter setting and enter voltage wiring mode setting interface.

7.6 Voltage Wiring Mode Setting Interface

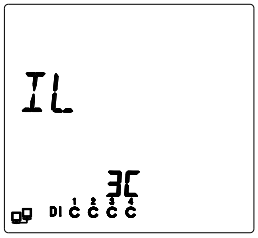


There are 3 options for the voltage wiring modes, i.e. “3Ln” referring to 3-phase 4-wire wiring mode; “2LL” referring to 3-phase 3-wire wiring mode, “2Ln” referring to 2-phase 3-wire wiring mode. The setting methods are as follows.

Step 1. Press button “P” or “E” to change and choose the wiring method.

Step 2. After setting is completed, press button “V/A” to confirm and enter current wiring mode setting interface.

7.7 Current Wiring Mode Setting Interface

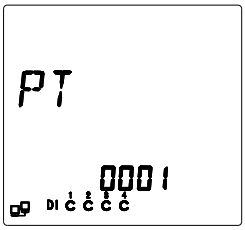


There are 3 options for the current wiring modes, i.e. “3C” referring to 3 CTs used for current wiring; “2C” referring to 2 CTs used for current wiring to calculate phase B current in three-phase balanced environment and “1C” referring to 1 CT used for current wiring to meter phase A current only, which equals to phase B current and phase C current separately in three-phase balanced environment.

Step 1. Press button “P” or “E” to change and choose the wiring method.

Step 2. After setting is completed, press button “V/A” to confirm and enter PT ratio setting interface.

7.8 PT Ratio Setting Interface



On PT ratio setting interface, the value range is 1~9999.

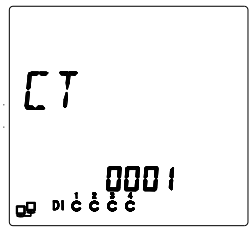
Step 1. Press button “P” or “E” to change the first bit data, the range of which is 0~9.

Step 2. Press button “H” to confirm the data and be ready to change next bit data.

Step 3. Repeat step 1 and 2 until change the last bit data and confirm it.

After setting is completed, press button “V/A” to confirm and enter CT ratio setting interface.

7.9 CT Ratio Setting Interface



On CT ratio setting interface, the value range is 1~9999.

Step 1. Press button “P” or “E” to change the first bit data, the range of which is 0~9.

Step 2. Press button “H” to confirm the data and be ready to change next bit data.

Step 3. Repeat step 1 and 2 until change the last bit data and confirm it.

After setting is completed, press button “V/A” to confirm and enter CT ratio setting interface.

For example, if the PT ratio is 10KV/100V, the PT ratio will be 100, that is to divide 10,000 by 100. The CT ratio setting is the same as PT ratio setting.

Remark: the product of PT ratio and CT ratio is not more than 300,000.

Chapter 8 After-sales Service

Product Warranty

1. The product warranty period is one year.
2. The company is responsible for free maintenance or exchange within one-year warranty period.
3. The cost of the components and freight shall be charged for improper meter installation and/or operation.
4. Over the warranty period, part of the maintenance cost according to actual situation will be charged.

Service Guarantee

1. Product technical consulting and quality complaints will be replied within 12 hours.
2. Solutions for quality complaints will be provided within 24 hours.
3. Except statutory holidays and force majeure.

Chapter 9 Contact Us

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