Single Phase Two Wires RS485 meter

EM118089~EM118091 series User Manual

Warnings

Important Safety Information is contained in the Maintenance section. Familiarize yourself with this information before attempting installation or other procedures.

Risk of Danger: These instructions contain important safety information. Read them before starting installation or servicing of the equipment.

Caution: Risk of Electric Shock

1. Brief Introduction

The EM118089-118091 series is single-phase din-rail energy meter, also is multi-functional energy monitoring energy meter, functions as follow:

- post-paid metering mode
- maximum current can reach 100A
- only 18mm wide
- supports RS485 communication
- complies with MID certificate & DIN EN 50022 standard

It is suitable for domestic & commercial power distribution systems ; new energy metering systems, such as EV charging piles and solar power generation systems.

PN	118089	118090	118091
FW version	V101	V101	V101
CRC	5A8E	B6C9	6B8D
Pulse constant	1000imp/kWh	1000imp/kWh	1000imp/kWh
communication	N/A	RS485 Modbus/DLT645	RS485 Modbus/DLT645
Baud Rate	N/A	9600\19200\38400\115200	9600\19200\38400\115200
SO Output	SO1 for active : can be set up in 100-2500 imp/kWh, can be divisible by 10000	N/A	N/A
	SO2 for reactive : can be set up in 100-2500 imp/kWh,can be divisible by 10000		
Pulse Width	SO:100-1000:100ms SO:1250-2500:30ms	N/A	N/A
Backlight	blue	blue	blue
Lithium battery	N/A	N/A	YES
Multi-tariff	N/A	N/A	YES
metering Mode	1-total =forward 2-total=reverse 3-total =forward +reverse (default) 4-total=forward-reverse	1-total =forward 2-total=reverse 3-total =forward +reverse (default) 4-total=forward-reverse	1-total =forward 2-total=reverse 3-total =forward +reverse (default) 4-total=forward-reverse
Button	YES	YES	YES
Button Function	Page turning, setting, information display	Page turning, setting, information display	Page turning, setting, information display
Default setting	1000imp/kWh,100ms 1000imp/kvarh,100ms	9600/noNE /8/1	9600/noNE /8/1
Measurement Mode setting	button	485/button	485/button

2. Main Functions

- The instantaneous parameters can be measured: voltage, current, active power, reactive power, apparent power, frequency, and power factor
- The electricity parameters can be measured: total active energy, total reactive energy, total forward active energy, total reverse active energy, T1-T4 forward active energy, T1-T4 forward reactive energy, T1-T4 reverse active energy, T1-T4 reverse reactive energy, T1-T4 active energy, T1-T4 reactive energy, T1-T4 four quadrant reactive energy, resettable total active&reactive energy, forward active&reactive demand, forward active&reactive maximum demand, reverse active&reactive demand,reverse active&reactive maximum demand
- The LCD can support backlit display, data can be rolling display, and users can manually turn pages via button.
- It can support RS485 communication and read energy meter’ s parameters
- Single-section size, compact size, standard din-rail installation

3. Technical Parameters

3.1 General Requirements

voltage AC (Un)	230V
current	0,25-5(100)A
Starting current	0.4%Ib
power Consumption	<1W / <10VA
Accuracy	active class 1, reactive class 2
frequency	50Hz/60Hz
Pulse Output	1000imp/kWh
display	LCD5+2=99999.99kWh
Working Temperature	-25～55℃
Relative Humidity	≤75% (non condensing)
Protection Level	IP51 (for indoor use only)
Reference Standard	EN50470-1/3，IEC62052-31，IEC61010-1，IEC62052-11

3.2 Communication

- The meter can support RS485 communication, compatible with MODBUS protocol and DLT645-2007 protocol. And its parameters can be read through RS485 communication.
- Baud rate 9600\19200\38400\115200 can be configurable, default 9600 bps, default set is 9600/noNE /8/1;

3.3 Pulse Constant

1）Default: 1000 imp/kWh

2）EM118089 has SO pulse output

SO1: active, can set 100-2500imp/kWh（it has to be divisible by 10,000）

SO2:reactive, can set 100-2500imp/kWh（it has to be divisible by 10,000）

100-1000: 100ms，1250-2500:30ms

3.4 Accuracy

voltage AC (Un)	1%
current	1%
frequency	1%
active power	1%
reactive power	2%
active energy	1%
reactive energy	2%

3.5 Environment

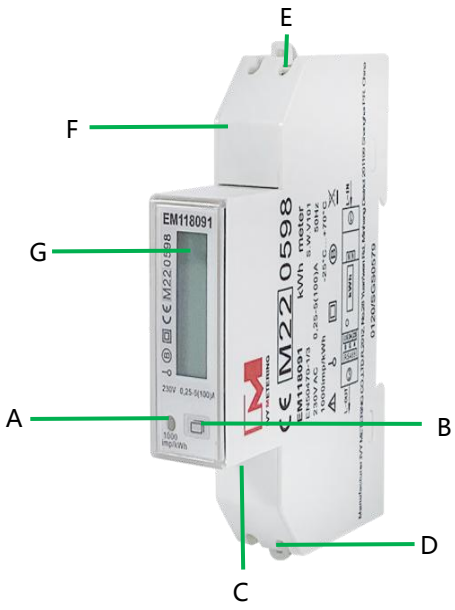
Working Temperature	-25～70℃
Storage/ Transportation Temperature	-30~70℃
Reference Temperature	23 ± 2℃
Relative Humidity	≤75% (non condensing)
Preheating time	10s
Vibration	10Hz to 50Hz,IEC 60068-2-6,2g

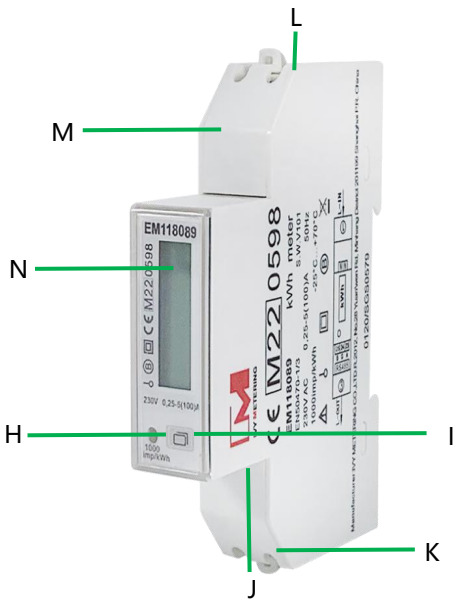
*Maximum working and storage temperatures are in the context of typical daily and seasonal variation.

3.6 Standard Measuring Conditions（reference condition）

Environment Temperature	23 ± 2℃
Frequency	50Hz ± 5%
Current	100A
Voltage	230V ± 5%
Magnetic	resistance to external magnetic field 200MT (stationary magnetic field)

4. Meter’ s Appearance

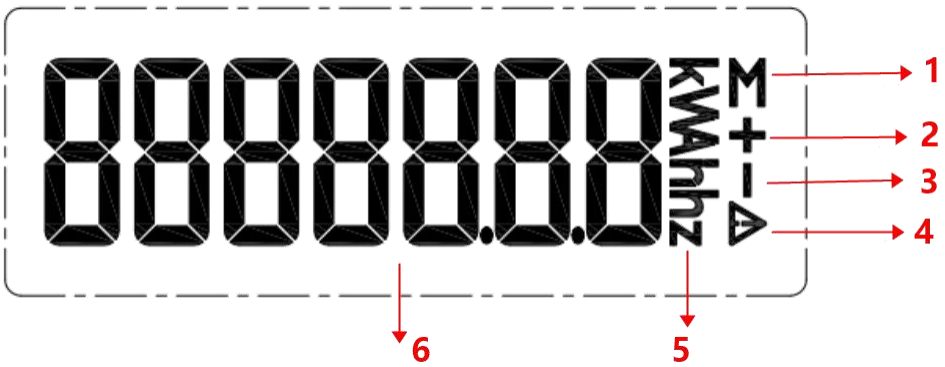




EM118090/118091		EM118089	
A	pulse output	H	pulse output
B	button	I	button
C	RS485 Output	J	SO Output
D	L-Out	K	L-Out
E	L-In	L	L-In
F	neutral wire	M	neutral wire
G	LCD screen	N	LCD screen

5. LCD Display

5.1 Introduction of Full display



1	summation，total energy

2	“+” , forward
3	“-” , reverse
4	display when entering the setting interface, indicating that the energy meter is in the setting state
5	metering unit
6	LCD digits

5.2 Introduction of Starting

LCD display	Meaning
	after power on, the full display page can be displayed for 1 second, and then the rotation display page starts to display.

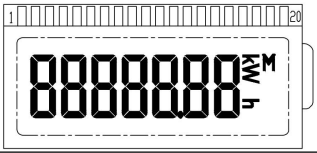
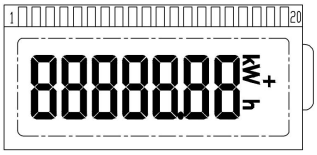
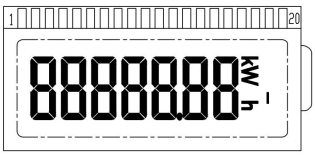
5.2 Function Introduction of Button

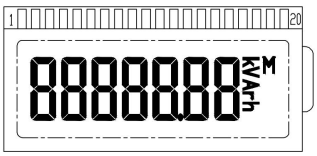
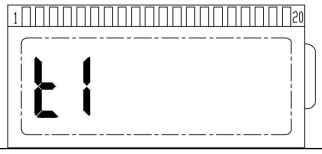
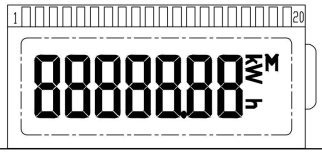
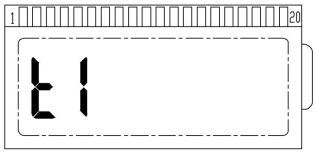
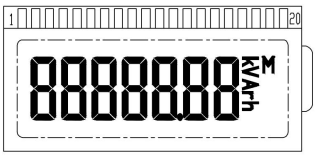
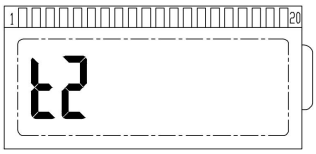
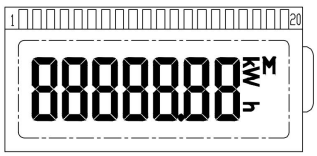
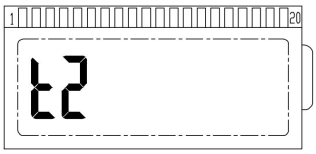
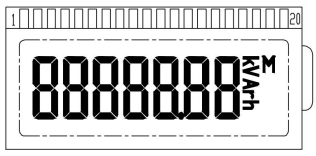
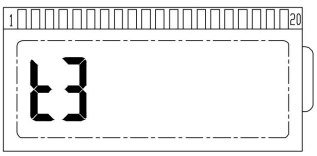
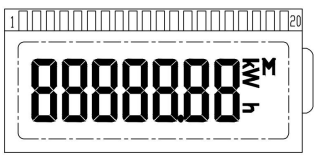
1) Page turning can be done by button (scroll display or manually page turning),

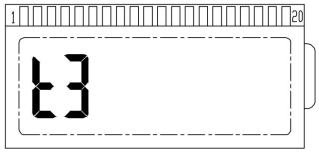
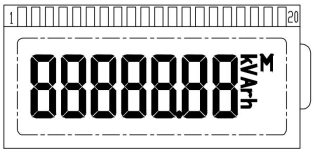
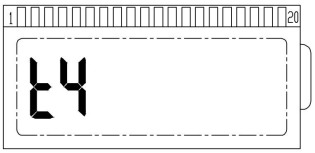
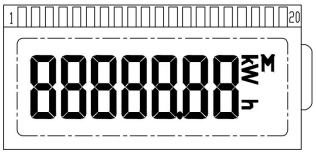
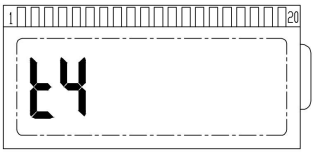
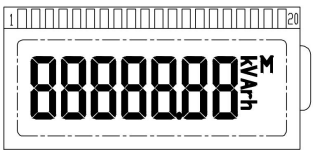
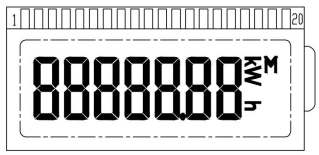
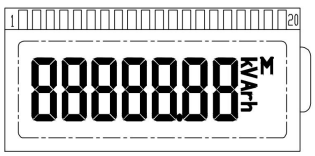
2) On the scroll display interface, press and hold for 3S to enter the information interface. On the information interface SETUP interface, press and hold for 3S (input password, default 0000) to enter the setting page

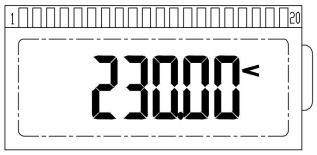
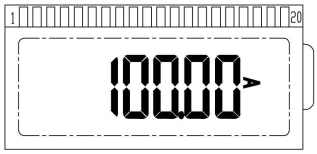
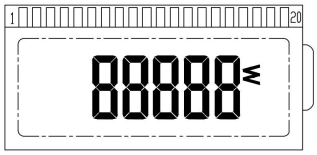
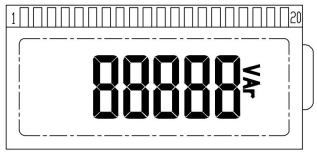
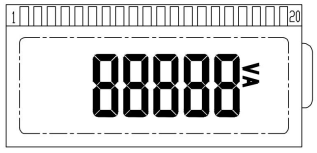
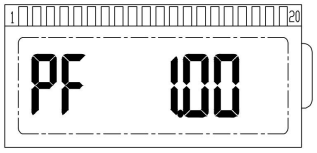
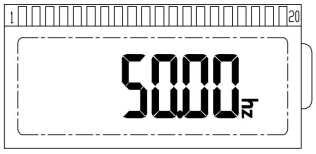
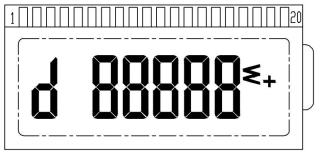
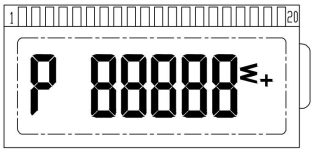
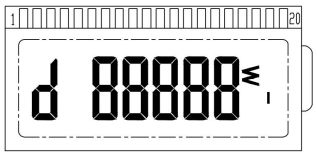
3)Quit(long press to return to the scroll display page)

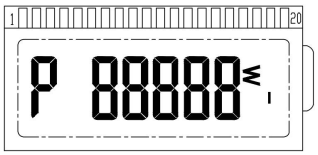
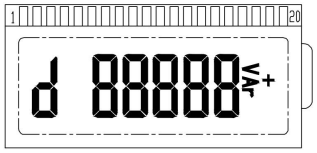
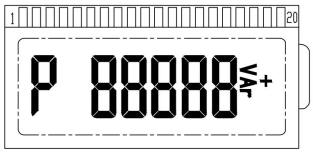
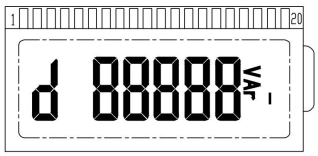
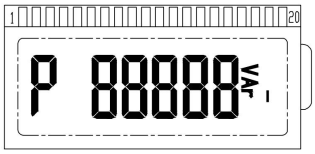
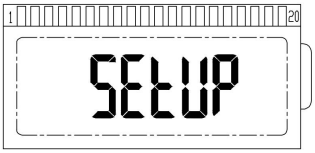
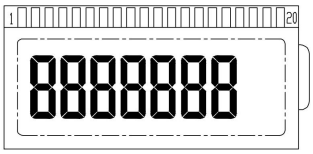
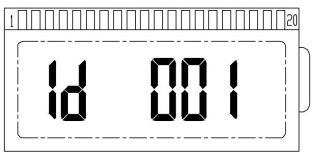
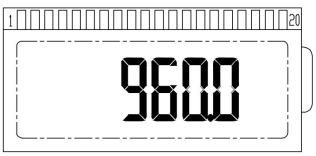
5.3 Introduction of Pages

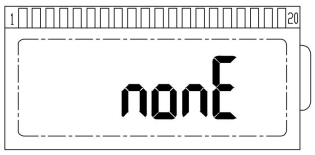
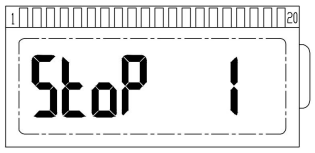
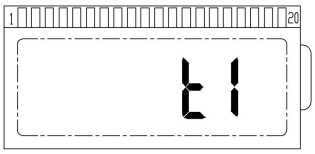
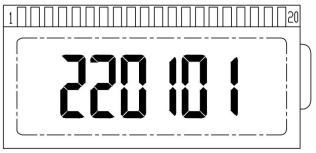
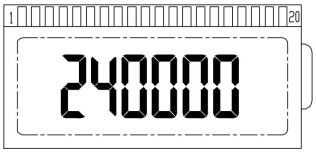
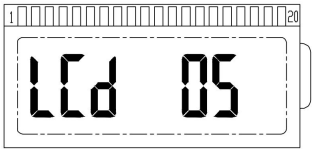
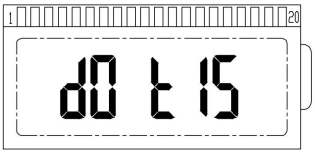
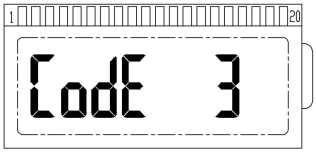
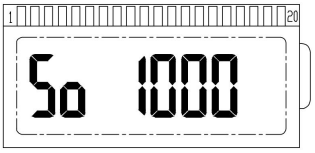
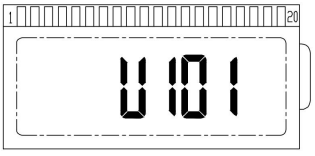
Scroll display page			
Index	**LCD Page**	**Max. display**	**Meaning**
1		5+2 00000.00kWh	active total energy
2		5+2 00000.00kWh	forward active energy
3		5+2 00000.00kWh	reverse active energy

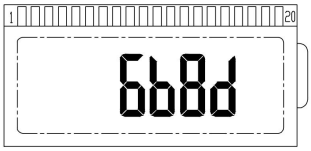
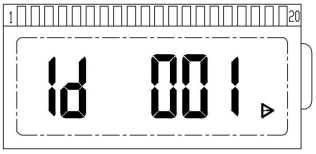
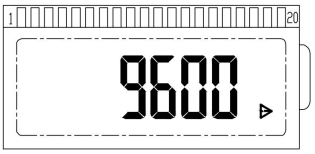
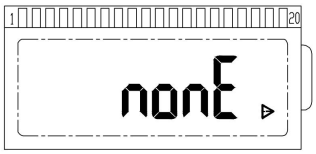
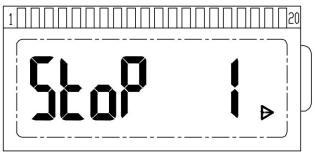
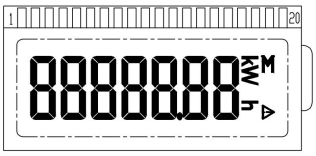
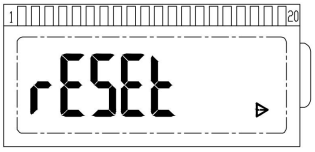
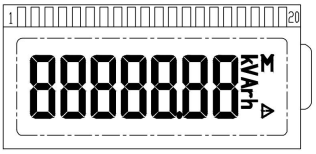
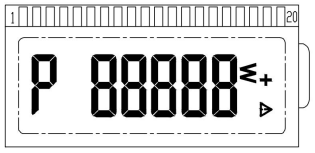
4		5+2 00000.00kVAr	reactive total energy
5		tariff indicate	T1 active total energy
		5+2 00000.00kWh	
6		tariff indicate	T1 reactive total energy
		5+2 00000.00kWh	
7		tariff indicate	T2 active total energy
		5+2 00000.00kWh	
8		tariff indicate	T2 reactive total energy
		5+2 00000.00kVAr	
9		tariff indicate	T3 active total energy
		5+2 00000.00kWh	

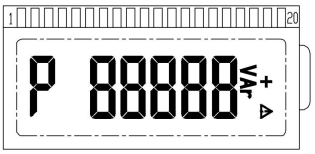
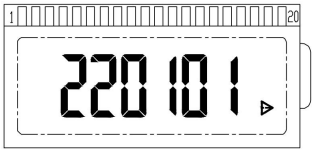
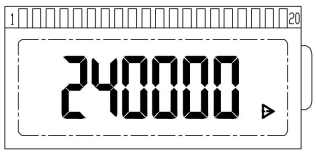
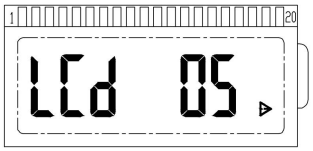
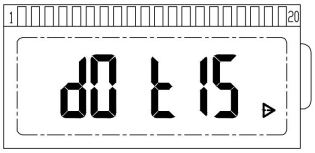
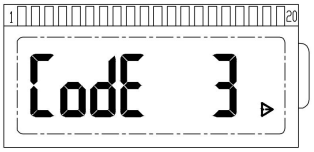
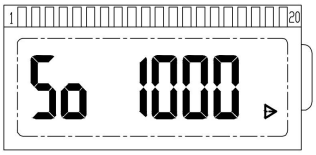
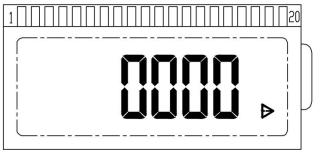
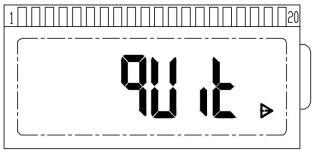
10		tariff indicate	T3 reactive total energy
		5+2 00000.00kVAr	
11		tariff indicate	T4 active total energy
		5+2 00000.00kWh	
12		tariff indicate	T4 reactive total energy
		5+2 00000.00kVAr	
13		reset indicate	active clear energy
		5+2 00000.00kWh	
14		reset indicate	reactive clear energy
		5+2 00000.00kVAr	

15		3+2 000.00V	voltage(3+2)V
16		3+2 000.00A	current(with the direction) (3+2) A
17		5+0 00000W	active power(with the direction)(5+0)W
18		5+0 00000var	reactive power(with the direction)(5+0)var
19		5+0 00000VA	apparent power(5+0)VA
20		1+2 0.00PF	power factor(with the direction with CL)(1+2)PF
21		2+2 00.00Hz	frequency(2+2)Hz
22		5+0 00000W	forward active demand(5+0)W
23		5+0 00000W	forward active max. demand(5+0)W
24		5+0 00000W	reverse active demand(5+0)W

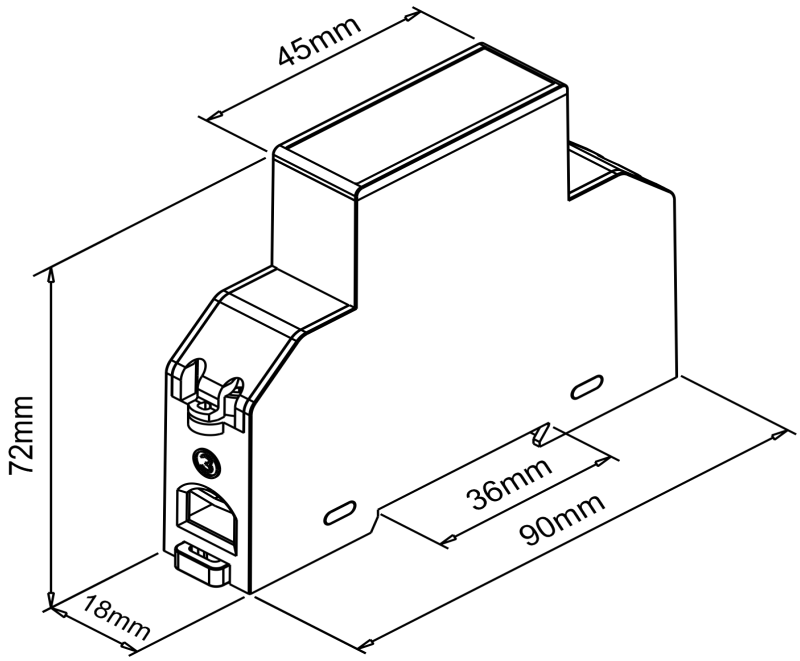
25		5+0 00000W	reverse active max.demand(5+0)W
26		5+0 00000var	forward reactive demand(5+0)var
27		5+0 00000var	forward reactive max. demand(5+0)var
28		5+0 00000var	reverse reactive demand(5+0)var
29		5+0 00000var	reverse reactive max.demand(5+0)var
Long press the button for 3S to enter the information page			
Index	**LCD Page**	**Max. display**	**Meaning**
1		0000	setup(Long press and enter the password to enter the settings page) Default: 0000
2		000000000000	meter Serial number 12 digits (Mbus 2nd address/64 5address)
3		1-247	communication address(Modbus/Mbus version) (SO version no)
4		6=9600 7=19200 8=38400 9=57600 10=76800 11=115200	baud rate(Modbus/Mbus version) (SO version no)

5		0=none (default) 1=Odd 2=Even	check bit (Modbus/Mbus version) (SO version no)
6		1=1 bit (default) 2=2 bit	stop bit (Modbus/Mbus version) (SO version no)
7		tariff indicate	current metering tariff (no tariff version, without this function)
8		DD/MM/YY	date(no battery version, no)
9		HH/MM/SS	time(no battery version, no)
10		0-99 s	scroll displaying time
11		default 15minutes	demand metering Way &period
12		1-total =forward 2-total=reverse 3-total =forward +reverse (default) 4-total=forward-reverse	combined code
13		default 1000imp/kWh,100ms 1000imp/kvarh,100ms	SO constant (Only SO version can have)
14			software version number

15			code check
Press and hold the button for 3S to enter the setting page			
1		1-247	communication address (Modbus/Mbus version) (SO version, no)
2		6=9600 7=19200 8=38400 9=57600 10=76800 11=115200	baud rate(Modbus/Mbus version) (SO version, no)
3		0=none (default) 1=Odd 2=Even	check bit(Modbus/Mbus version) (SO version, no)
4		1=1 bit (default) 2=2 bit	stop bit(Modbus/Mbus version) (SO version, no)
5		Reset indicate	rest clear active energy
		5+2 00000.00kWh	
6		Reset indicate	rest clear reactive energy
		5+2 00000.00kvarh	
7		5+0 00000W	clear max.active demand

8		5+0 00000VA	clear max. reactive demand
9		DD/MM/YY	date (without tariff version, without this function)
10		HH/MM/SS	time (without tariff version, without this function)
11		0-99 S	scroll displaying time (without tariff version, without this function)
12		15m,30m,60m	demand calculation method & period default 15 minutes
13		1-total =forward 2-total=reverse 3-total =forward +reverse (default) 4-total=forward-	combined code
14		100-2500 can be set, it has to be divisible by 10,000. default 1000imp/kWh,100ms 1000imp/kvarh,100ms	so constant(only so version supports)
15			password setting default 0000
16			quit(long press to return to the scroll displaying page)

6. Overall Dimension



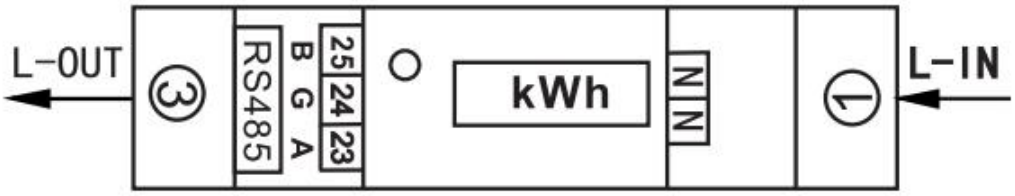
7. Wiring Diagram

EM118089

note:

- 23:So output indicates,
- total active energy or active/reactive forwarder energy(optional)
- 24:So output indicates,
- total reactive energy or active/reactive reverse energy(optional)
- 25:G is for GND
- For neutral wire, user can connect one N port . or user can connect both N ports.

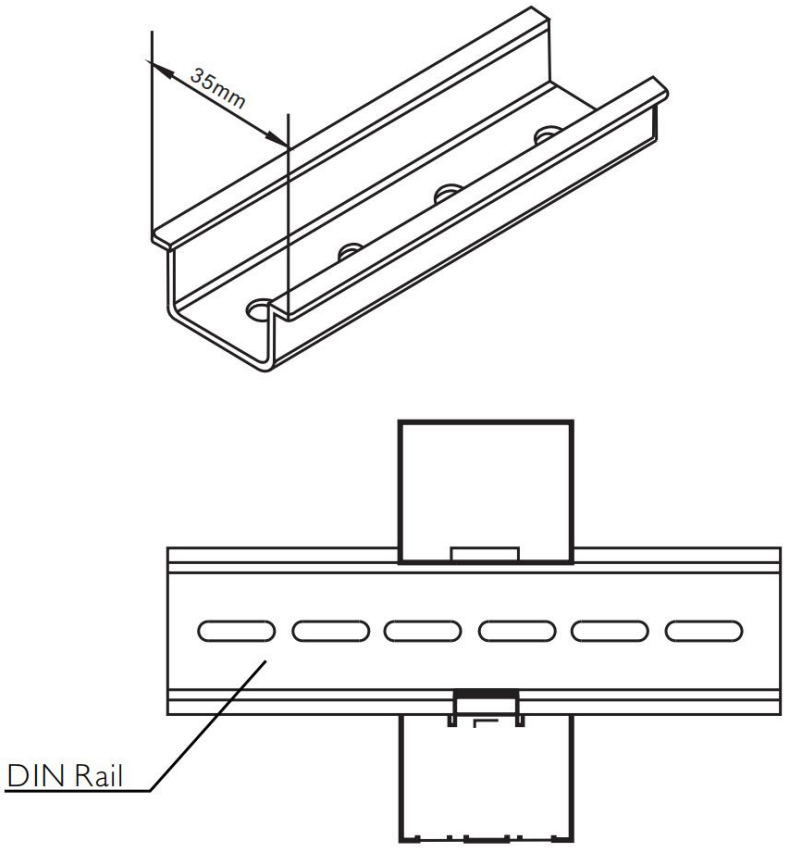
EM118090/118091



- 23,24,25: they are A,G,B port of RS485 interface.
- G port does not need to connect usually.
- For neutral wire, user can connect one N port . or user can connect both N ports.

8. Installation Instruction

35mm standard din-rail installation



9. Transportation & Storage

The electric energy meter should not be subjected to severe shock during transportation and storage, and should be transported and stored according to the provisions of GB13384-2008 "General technical conditions for instrument packaging";
The electric energy meter should be kept in the original package, and temperature range of the place where it is kept is -30- 70℃, the relative humidity is no more than 95% and no corrosive gas in the air;
The electric energy meter should be stored in the warehouse and put on the shelves. The stack height should not exceed 10 boxes. After unpacking, the stack height of single packed electric energy meters should not exceed 5 layers.

10. Quality Assurance

10.1 Calculation method of warranty period:

Warranty is handled according to the commercial invoice issued by our company, and the time is 18 months from the date when the meter is shipped from the warehouse, minus the maintenance time and delivery time for no spare parts.

10.2 Warranty coverage

10.2.1 When the user fully follows up the transportation, storage, installation and application of the electric energy meter, and the company's conditions of sealing integrity (in the case of no printing and dis-assembly), the electric energy meter that does not meet the quality requirements and valid evidence (For example, desks, certificate photos, feedback documents from customers' local users, relevant government departments, documents, etc.) should be provided by the customer.

10.2.2 We will repair, replace or return the meter in the following cases:
no demonstration and no prior explanation;
Does not meet the implementation standards indicated on the product or its packaging;
(If the standard on the product/package is required by the customer, but does not meet the company's product implementation standard, the customer should make a corresponding responsibility commitment)
Does not meet the quality status indicated by product instructions, physical samples, etc.

Unqualified meters should be determined in consultation with the user. Generally, we will repair or replenish in the next order. Special circumstances shall be determined through consultation between the two parties.
note: The quality guarantee is not applicable. If there is no valid invoice, the evidence corresponding to the quality problem of the order cannot be provided, and the damage caused by force majeure or the warranty beyond the validity period, but can be recovered for repair (transportation and other related costs need to be borne by the customer)

11. Technical Support

Users' manual is mainly used to guide users to better utilize this series of meter. If unclear please contact with us at any time, we will give you a satisfactory answer.

Sales Center & Technical Support:
Ivy metering Co.,Ltd
Add: Room 1206, AFC Grand Hongqiao International, no.999/1009 Li'an Rd, Minhang District, Shanghai, China
Tel: +86 21 62209608
Contact: Ms Angel
Email: info@ivy-metering.com