

DRS-205C MODBUS

Single phase two wire DIN Rail energy meter with MODBUS protocol

One module 17.5mm width



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User manual



1.1 Safety instructions

Information for Your Own Safety

This manual does not contain all of the safety measures for operation of the equipment (module, device), because special operating conditions, and local code requirements or regulations may necessitate further measures. However, it does contain information which must be read for your personal safety and to avoid material damages. This information is highlighted by a warning triangle and is represented as follows, depending on the degree of potential danger.



Warning

This means that failure to observe the instruction can result in death, serious injury or considerable material damage.



Caution

This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

Use for the intended purpose

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by Forlong.

Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and proper operation and maintenance. When operating electrical equipment, parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damage.

- ◇ Use only insulating tools.
- ◇ Do not connect while circuit is live (hot).
- ◇ Do not connect the meter to a 3 phase - 400VAC – network.
- ◇ Place the meter only in dry surroundings.
- ◇ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ◇ Make sure the wires are suitable for the maximum current of this meter.
- ◇ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ◇ Do not touch the meter connecting clamps directly with metal, blank wire and your bare hands as you may get electrical shock.
- ◇ Make sure the protection cover is placed after installation.
- ◇ Installation, maintenance and reparation should only be done by qualified personnel.
- ◇ Never break the seals and open the front cover as this might influence the function of the meter, and will cause no warranty.
- ◇ Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.

Disclaimer

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

Subject to technical modifications without notice

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1.2 Foreword

Thank you for purchasing the FORLONG DRS205 series DIN rail single phase two wire energy meter. With the FORLONG product range we have provided a large scale of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other products please contact our sales department at sale01@china-meters.com or fyl@china-meters.com.

Although we produce the Forlong DRS205 series meter according to IEC 62053-21 and our strict quality inspection, there might be possibilities that our product shows a fault or failure for which we do apologize. Under normal conditions your product should give you years of benefit and pleasure. In case there is a problem with the energy meter you should contact your dealer immediately. All energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim for warranty. Therefore NEVER open meter by yourself or break the seal of the energy meter. The warranty time is 6 months after installation, and only valid for construction faults.

1.2 Performance criteria:

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-10°C - +50°C
Storage temperature	-30°C - +70°C
International standard	IEC 62053-21
Accuracy class	1
Protection against penetration of dust and water	IP51
Insulating encased meter of protective class	II

1.3 Specifications:

Meter type	DRS-205C LCD (LCD display)
Nominal voltage (Un)	230V AC or 120V AC

Operational voltage	(-15% ~ +10%)Un
Insulation capabilities:	
- AC voltage withstand	2KV for 1 minute
- Impulse voltage withstand	6KV - 1.2 μ S waveform
Basic current (Ib)	5A
Maximum rated current (Imax)	45A
Operational current range	0.4% Ib- Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50Hz \pm 10%
Internal power consumption	\leq 2W / 10VA
Test output flash rate (RED LED)	1000 or 2000imp/kWh
Pulse output rate (pins 20 & 21)	1000 or 2000imp/kWh
Consumption indicator (RED LED)	Flashing at load running

1.4 Basic errors:

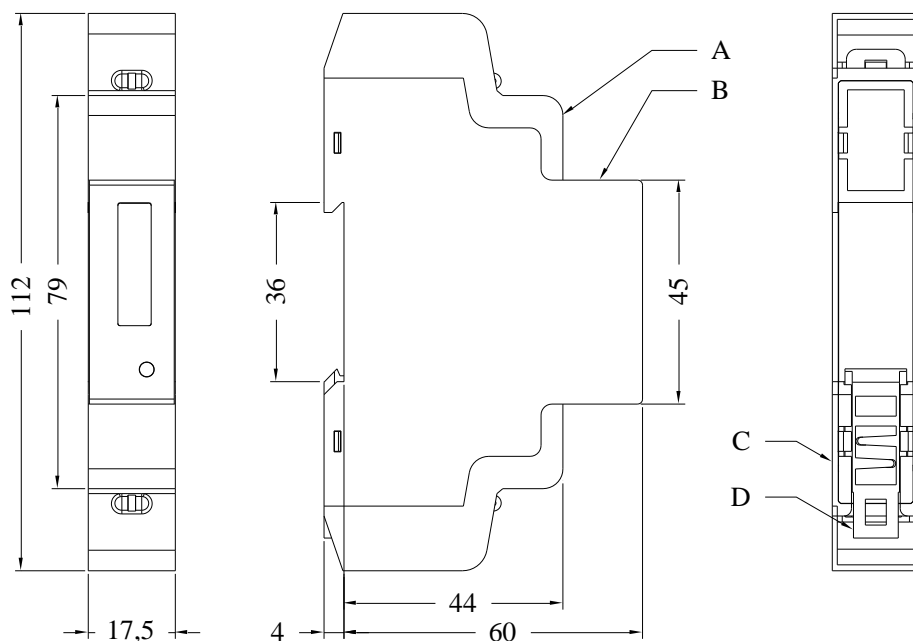
0.05Ib	Cos ϕ = 1	\pm 1.5%
0.1Ib	Cos ϕ = 0.5L	\pm 1.5%
	Cos ϕ = 0.8C	\pm 1.5%
0.1Ib - Imax	Cos ϕ = 1	\pm 1.0%
0.2Ib - Imax	Cos ϕ = 0.5L	\pm 1.0%
	Cos ϕ = 0.8C	\pm 1.0%

1.5 Description

A	LCD
B	Terminal block
C	Case
D	Protection cover
E	Security hasp

Material

Register	PC inflammable retarding
Case	ABS inflammable retarding
Terminal block	ABS inflammable retarding
Protection cover	ABS inflammable retarding

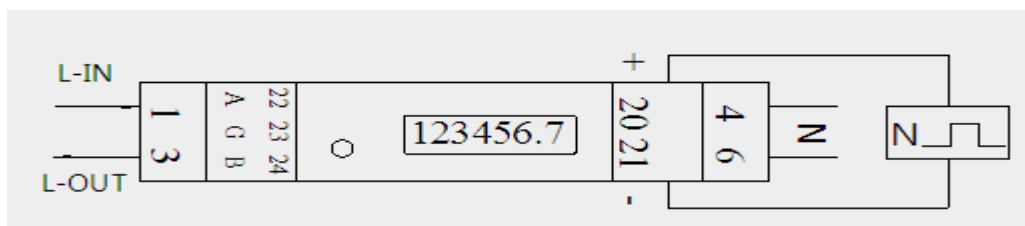


1.6 Dimensions

Height	112 mm
Width	17.5 mm
Depth	60 mm
Weight	0.12 Kg (net)

1.7 Installation

Connection of the wires should be done in accordance with the underneath connection diagram.



- 1 Inlet phase line
- 4 Inlet neutral line
- 3 Outgoing phase line
- 6 Outgoing neutral line
- 20 and 21 Pulse output contact
- 22 RS485 A
- 23 RS485 GND
- 24 RS485 B

1.8 Operating

Consumption indication

There is a LED which has two colors (green and red) while flashing in the front panel of DRS-205 series. When consumption happens, the LED will flash and display red. The more quickly LED flash, the more consumption there is.

Reading the meter

The DRS-205C MODBUS energy meter is equipped with 6+1 LCD display (5+2 LCD display available) which is used as recording consumption and can't be reset to zero. The reading accuracy is 1/10 kWh (1/100 kWh) .

Pulse output

The DRS-205 Series DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy for accuracy testing. The pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (U_i) should be 5-27V DC, and the maximum input current (I_{max}) is 27mA DC. To connect the impulse output, connect 5-27V DC to connector 20 (anode), and the signal wire (S) to connector 21 (cathode).

Display function

Cycle display status, Display cycle can be set within 5~20 seconds, the default is 5 seconds. The display items as following:

The display parameters to choose as followed:

Display item
Total active forward kWh and total active reverse kWh
Active forward kWh
active reverse kWh
voltage
current
Active power factor
Reactive power factor
apparent power
Power factor
Frequency
ID number
Baud rate
CT ratio(to choose)
Version no. Of software

S0 output

0.001kWh/imp (default), 0.001kWh/imp, 0.01kWh/imp, 0.1kWh/imp, 1kWh/imp, 5kWh/imp, 10kWh/imp (to choose)

The communication function: MODBUS Protocol

MODBUS protocol with RS485 interface Baud rate: 2400(default) 1200 4800 9600(to choose)

We also have this type with Metering BUS Protocol

1.9 Troubleshooting

Problem	Check	Solution
No light for the Power supply indicator (Phase A, B & C LED).	Is AC power supply connected to the meter ?	Check switch or circuit-breaker and fuse or thermal cut-off.
	Is the A, B, C and N connecting correct ?	Re-install terminal screws on the A, B, C and N. Make sure all screws are fixed. Then there should be a 230V 50Hz AC voltage between the terminal screws on the N and A or B or C, when power supply is input.
	Is the terminals 1, 2, 3, 4, 5,6 and 7 connecting correct ?	Reinstall terminal screws on the 1, 2, 3, 4, 5,6 and 7. Make sure all screws are fixed. Then there should be a 230V 50Hz AC voltage between the terminal screws on the 7 and 1 or 3 or 5, when power supply is input.
No light for the communication indicator(COM.LED)	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
	Is there a power supply inside the meter?	Check that the power supply
	Does any equipment outside communicate with the meter	Only when the communication between the meter's infrared port Or the RS485 port and the equipment outside, The LED will blink
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.

Problem	Check	Solution
No communication Of RS485 wire data with the meter	Is the meter ID correct? Is the communication distance too long? Is there too many meters connected to RS485 main wire Is the RS485 port connection correct? Is the connection Maybe there is a fault in the inside circuit.	Check and use the correct the Meter ID. After the meter finish the production, the Meter ID defaults to 0~67H ,69H~FFH . Shorten the communication distance between the reading equipment outside and the meter. Keep sure it is not more than 1200m The equipment to connection with RS485 main wire is not more than 256pcs The correct connection is: the A signal wire of RS485 main wire to the meter terminal 11,the B signal wire of RS485 main wire to the meter terminal 10 Please connect with technical supporter to replace this meter.
No communication of the infrared wireless data with the meter	Is the meter ID correct? Is the communication distance too long? Is the communication protocol correct? Maybe there is a fault in the inside circuit.	Check and use the correct the Meter ID. After the meter finish the production, the Meter ID defaults to 0~67H ,69H~FFH Shorten the communication distance between the reading equipment outside and the meter. suggest not more than 5m Please contact the technical support to get the meter communication protocol Please contact the technical supporter to replace this meter.

Problem	Check	Solution
The LCD energy register can't run.	Is the load running ?	Only when load is running, RED LED is burning continue, the LCD energy register will run.
	Is the operating power too low ?	If the operating power is too low, the spacing interval of the pulses will take some more time. This is why it seems like the LCD energy register can't run
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
No pulse output.	Is DC power supply connected to the meter ?	Check the external voltage source (Ui) is 5-27V DC.
	Is the connecting correct ?	Check correct connecting: Connect 5-27V DC to connector 3 (anode), and the signal wire (S) to connector 2 (cathode).
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
Pulse output rate wrong.	Maybe there is a fault in the inside circuit.	Please connect with technical supporter to replace this meter.

1.10 Technical support

Please contact

TEL: 021-60975591

FAX: 021-60975593

Email: Sale01@china-meters.com

www.china-metes.com

