

DRS-201A & D

Single phase two wire DIN rail energy meter

(One module)



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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 operating the equipment (module, device) for different conditions and requirements. However, it does contain information which you must know for your own safety and to avoid damages. These information are highlighted by a warning triangle indicating the degree of potential danger.



Warning

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



Caution

It 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.

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1.2 Foreword

Thank you for purchasing the FORLONG DRS201 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 sale04@china-meters.com or fyl@china-meters.com

Although we produce the Forlong DRS201 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.

1.3 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

1.4 Specifications:

Meter type	DRS-201A (Mechanical register display) DRS-201D LCD (LCD display)
Nominal voltage (Un)	230V AC
Operational voltage	(-15% ~ +10%)Un
Insulation capabilities:	
- AC voltage withstand	2KV for 1 minute
- Impulse voltage withstand	4KV – 1.2μS 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 ±10%
Internal power consumption	≤2W / 10VA
Test output flash rate (RED LED)	1000/2000imp/kWh
Pulse output rate (pins 20 & 21)	1000/2000imp/kWh
Consumption indicator (RED LED)	Flashing at load running

1.5 Basic errors:

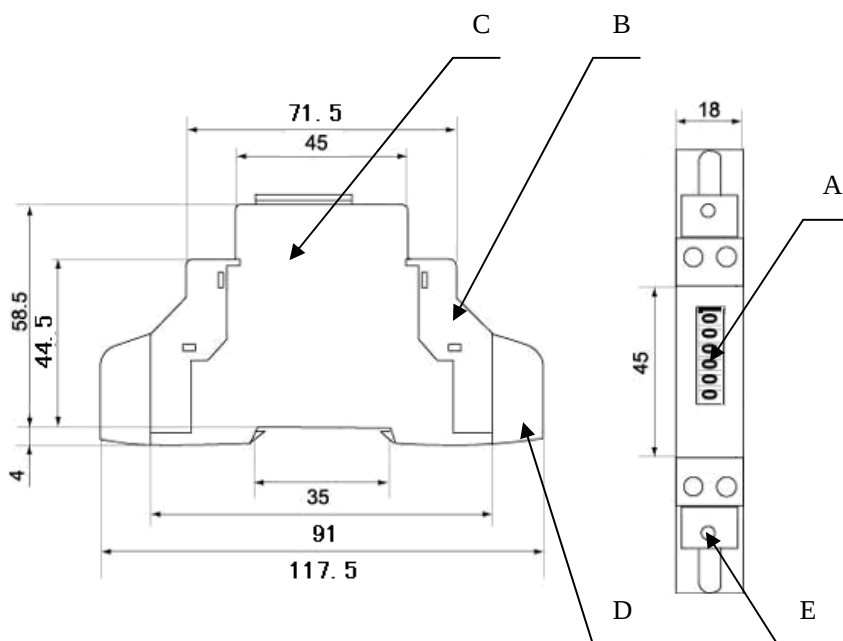
0.05Ib	Cosφ = 1	±1.5%
0.1Ib	Cosφ = 0.5L	±1.5%
	Cosφ = 0.8C	±1.5%
0.1Ib - Imax	Cosφ = 1	±1.0%
0.2Ib - Imax	Cosφ = 0.5L	±1.0%
	Cosφ = 0.8C	±1.0%

1.6 Description

A	Register or 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



1.7 Dimensions

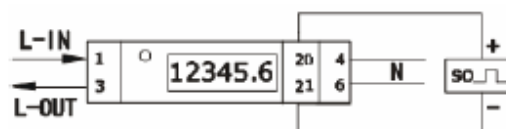
Height	117.5 mm
Width	18 mm
Depth	58.5 mm
Weight	0.1 Kg (net)

1.8 Installation

⚠ CAUTION	
♦	Turn off all the power before working on it.
♦	Always use a properly rated voltage sensing device to confirm that power is off.

 WARNING	
◆ Installation should be performed by qualified personnel familiar with related procedures and regulations. ◆ Use insulating tools to install the meter. ◆ Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line. ◆ The case is sealed, do not broken it	

- ✧ We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the capacity of the circuit breaker or over current device used in the circuit.
- ✧ An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or circuit-breaker should comply with the specifications of the building electrical design and all local regulations.
- ✧ An external fuse or thermal cut-off which will be used as a over-current protection device for the meter must be installed on the supply side wire, and it is recommended that the over-current protection device is near the meter so that it is more convenience for the operator. The over-current protection device should comply with the specifications of the buildings electrical design and all local regulations.
- ✧ This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
- ✧ To prevent tampering, secure the meter with a padlock or a similar device.
- ✧ The meter has to be installed against a wall which is fire resistant.
- ✧ The meter has to be installed in a good ventilated and dry place.
- ✧ The meter has to be installed in a protection box when placed in dangerous or dusty environment.
- ✧ The meter can be installed and used after being tested and sealed with a letter press printing.
- ✧ The meter can be installed on a 35mm DIN rail.
- ✧ The meter should be installed in an available height so that it is easy to read.
- ✧ When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge Protection Devices.
- ✧ After finishing installation, the meter must be sealed to prevent tampering.
- ✧ 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 |

1.9 Operating

Consumption indication

There is a LED which has two colors (green and red) while flashing in the front panel of DRS-201 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-201A series energy meter is equipped with a 5+1 register. five integers are marked with black color and one decimal is marked with red. The DRS-201D LCD series energy meter is equipped with 5+2 LCD display which is used as recording consumption and can't be reset to zero. The reading accuracy is 1/100 kWh.

Pulse output

The DRS-201 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_{imax}) 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).

1.10 Troubleshooting**CAUTION**

- ◆ During reparation and maintenance, do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you may get electricity shock
- ◆ Turn off all powers supplying the energy meter and the equipment on which the meter installed before opening the protection cover to avoid getting electric shock.

**WARNING**

- ◆ Maintenance or reparation should be performed by qualified personnel familiar with applicable codes and regulations.
- ◆ Use insulated tools to maintain or repair the meter.
- ◆ Make sure the protection cover is in place after maintenance or reparation.
- ◆ Case is sealed, failure to observe this instruction can result in damage for meter.

Problem	Check	Solution
No light for the Power supply indicator.	Is AC power supply connected to the meter ?	Check switch or circuit-breaker and fuse or thermal cut-off.
	Is the 1 and 4 connecting correct ?	Reinstall terminal screws on the 1 and 4. Make sure all screws are fixed. Then there should be a 230V 50Hz AC voltage between the terminal screws on the 1 and 4 when power supply is input.
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
No light for the consumption indicator.	Is the load running ?	Only when load is running, this LED will flash.
	Is the operating power too low ?	If the operating power is too low, the spacing interval of flashing will take some more time, this is why it seems like LED isn't burning.
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
The register can't run.	Is there a power supply inside the meter ?	Check that the power supply indicator is burning.
	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 meter won't count.
	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 20 (anode), and the signal wire (S) to connector 21 (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 contact your technical supporter to replace this meter.

1.11 Technical support

Any questions, please contact:

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