

SINGLE-PHASE, 1 TARIFF ELECTRICITY METER DDS 353H-3



DDS353H-1/2/3 is a single phase DIN Rail meter, 100 A, which is a multi-functional meter for energy monitoring. It is only 18 mm width, but can support RS485 communication and comply with DIN EN 50022 standard, which is fit for the power distribution system for household and commercial.

Features and Technical Parameters

- Measure the active and reactive energy accurately.
- It can read grid parameters, analyze the energy quality and load condition in the certain time period.
- DIN RAIL (Comply to German Industry Standard) mounted.
- Only 18 mm width, but can achieve 100 A.
- Support RS485 communication, Protocol: Modbus-RTU mode.
- The meter has Li-battery for RTC. The RTC accuracy is 0.5 s every day.
- Blue backlight, which is for easy reading in dark place.
- Do scrolling display for current (A) , voltage (V) , etc.
- 2 Modes for data display:
 - a. Auto scrolling mode: the time interval is 5 s.
 - b. Button mode by external button for data checking.
- The material of the meter case: PBT resistance.
- Protection class: IP51 (For indoor usage)



Technical data

Basic data	
Accuracy class	B complies with EN 50470-1, 50470-3
Constant of electricity meter (test LED output)	1000 imp./ kWh
Connection	Direct two-wire
Nominal voltage U_n	230 V
Range of operating voltage	0.85 U_n až 1.15 U_n
Own consumption (voltage circuits incl. power supply)	Max. 1 W , max. 10 VA cap.
Own consumption of current circuit	Max. 0,05 VA
Nominal frequency f_n	50 Hz
Operating frequency	50 to 60 Hz
Start-up current I_{st}	Below 20 mA
Minimum current I_{min}	250 mA
Reference current I_{ref}	5 A
Maximum current I_{max} permanently	100 A
Maximum range of measurement	250 mA to 100 A
Outputs	
Test LED output	1000 imp./ kWh
Impact of surroundings	
Temperature range	
• Operating	-25 °C to +55 °C
• Storage	-25 °C to +55 °C
Humidity	Max. 95 % without condensation
Ingress protection IP	IP 51
Mechanical environment	M1
Electromagnetic environment	E2
Resistance to voltage impulses	
Impulse voltage	6 kV
Impulse shape	1.2 μ s/ 50 μ s
Electromagnetic compatibility	
Electrostatic discharges	complies with EN 61000-4-2
• Test voltage	8 kV
• Number of discharges	10
High frequency electromagnetic field	complies with ČSN EN 61000-4-3
• Severity grade 3, vertical and horizontal polarization	
Fast transient phenomena (impulse groups)	complies with ČSN EN 61000-4-4
• Length of impulse group	15 ms
• Period of impulse group	300 ms
• Test Length	60 s
• Test voltage	4 kV
Suppression of radio interference	complies with ČSN EN 55022
• Peak phase of interfering voltage within zone	0.15 to 30 MHz
• Peak phase of intensity of electromagnetic field within zone	30 to 2000 MHz
• Resistance to interference spread in wiring pursuant to ČSN EN 61000-4-6	0.15 to 80 MHz
Weight and dimensions	
Weight	Approx. 0.1 kg
Width	18.2 mm
Height	90 mm
Depth	72 mm
Installation	On bar DIN
Operation position	Discretionary
Wire connection	
Diameter of terminal	9 mm
Maximum cross-section of wire	
• Rope	25 mm ²
• Strand	7*2.12 mm ²
Minimum cross-section of wire	1 mm ²
• Diameter of head	7 mm
• Cross slot	Type Z, size 2
• Torque	2.0 Nm
Other technical parameters correspond to ČSN EN 50470-1.50470-3	

Description



- A Impulse indication
- B Button for data checking
- C Output RS485
- D L-Out
- E L-In
- F Neutral Wire
- G LCD screen

Outputs and communication

The electricity meter is equipped with a test LED output. The frequency of transmitted light impulses is directly proportional to the energy consumed by the meter constant, which is typically 1000 imp./kWh.

This meter supports RS485, Protocol is Modbus-RTU mode;
The default parameters: meter ID:1, baudrate: 9600 bps, data bit: 8, Parity: Even, Stop bit: 1.

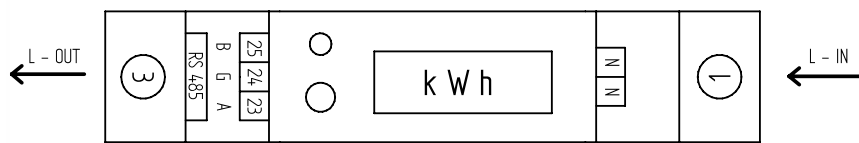
The measured data is stored in registers which can be read via the IR interface.

Installation Instructions

The design allows for a simple DIN-rail installation.

- 1) Choose 35 mm standard DIN-rail (the length is confirmed by yourself), fixed them in the location which are waiting for installation;
- 2) Push down the clip under the bottom of the meter for a gear;
- 3) Put the meter into the DIN-rail, then push up the clip for a gear, install meter to the DIN-rail;
- 4) Connect according to wiring diagram;
- 5) After connection, use lead sealing to seal terminal cover.

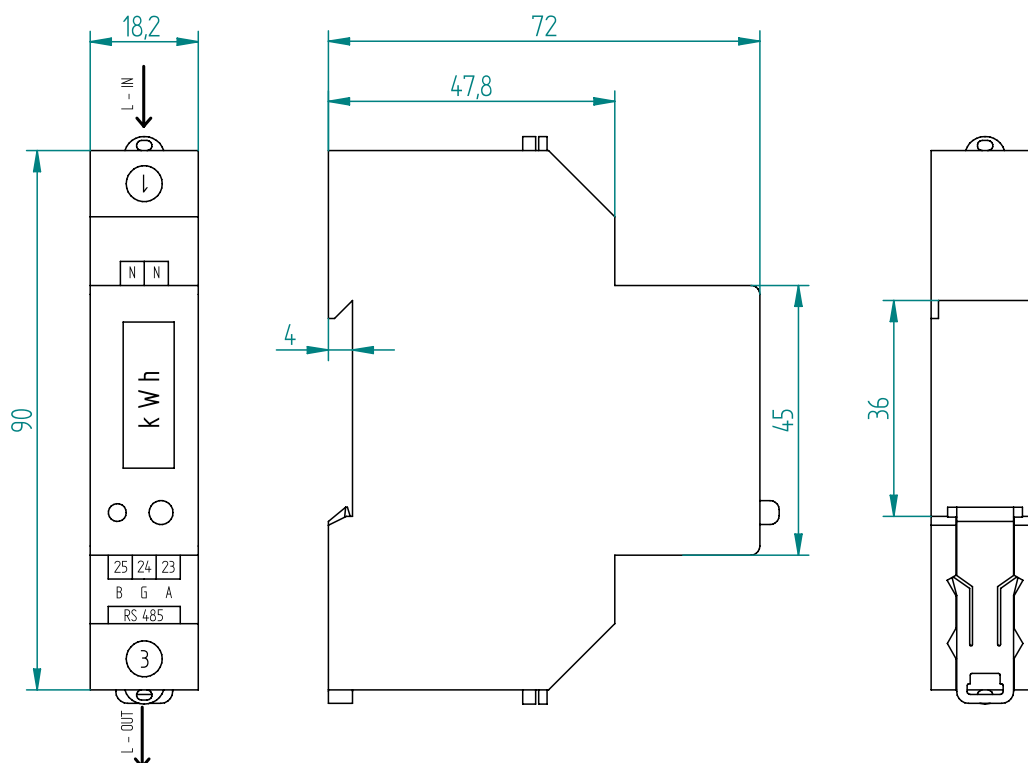
Wiring Connection



Note: 23, 24, 25 is for A+, G, B-.

If the RS485 communication converter doesn't have ground clamp, no need to connect. For Neutral wire, you can connect one clamp or connect both.

Dimensional drawing





Maintenance And Storage

Care And Maintenance

The device is a maintenance-free product with determined minimum operation service life of 15 years. For possible cleaning of the outside surface from dust and other impurities, the manufacturer does not recommend using organic solvents, aggressive chemicals and abrasive cleaning agents. Prescribed storage temperatures shall be complied with: failure to do so can result in shortening of electronic components service life. The product shall be protected against wet and humid conditions. It is designed for internal use, i.e. it may be used only in places providing additional protection against the effects of external environment (e.g. in a building or cabinet). Precipitation, humidity and liquids containing minerals can cause corrosion of electric circuits if the device becomes wet. The product shall not be placed on and dried by a source of heat or inserted into a source of heat (e.g. microwave oven, classic oven or radiator / heater) as it can overheat and some of its parts explode. It shall not be exposed to excessive heat as it can lead to deformation of case / cover. The device shall not be stored in cold premises, especially with subsequent warming-up (to nominal operation temperature). Humidity can condensate inside and damage electronic components or isolation properties of the product can deteriorate.

Service

Service shall be ensured by: ZPA Smart Energy a.s., Komenského 821, 541 01 Trutnov, Czech Republic, Trademark Smart Energy, Tel. + 420 499 907 111, E-mail zpa@zpa.cz, www.zpa.cz.

Transport

The device shall be packed for transport either in the original package, in which it was delivered by the manufacturer, or in a package causing/ensuring no damage due to handling or transport.

Safety

Manufacturer Warnings

The product is capable of safe operation. The manufacturer has issued the EU Declaration of Conformity as per Act 90/2016 Coll.

Despite this fact, the manufacturer warns of the risk of possible danger resulting from incorrect handling or incorrect use of the product as follows:

- Installation and maintenance must be performed by a personnel with the corresponding electro-technical qualification and adequately trained, that shall inform the operator on conditions of safe operation;
- The product shall not be used for purposes other than those it was manufactured for;
- The product shall not be willfully modified contrary to the type design;
- The product shall not be operated with voltage, current or frequency other than those it was produced or professionally modified for;
- The product shall be located and secured so as to complicate or disable handling by persons with no electro-technical qualification, especially children;
- Before every new putting to operation, e.g. after repair, maintenance etc., Ingress Protection shall be restored in full, all safety measures taken and inspection done by a designated electrical inspector;
- During operation, premises where the device is installed, shall be free of danger of fire or explosion in case of development of gases, vapors of inflammable liquids and occurrence of inflammable dust,
- The product shall be handled by a qualified and adequately trained person only, and handling shall be performed without voltage with the exception of measurement by measuring meter with insulated tips;
- The product shall not be operated under conditions or in an environment not ensuring safe operation (e.g. location on flammable base, cover from inflammable material, insufficient protection from penetration of foreign elements, water or other liquids);
- The product shall be located and operated in an indoor environment, i.e. in places providing additional protection against effects of external environment (e.g. inside a building or cabinet).
- The product shall not be operated in an environment with major vibrations and oscillations or under such conditions.
- Failure of the user to observe any of the aforesaid warnings renders the manufacturer not being liable for a defect occurring as an incidental consequence of this failure. Non-observance of storage and operation conditions recommended in article Care And Maintenance can have an adverse effect on the device service life.

Responsibility

The owner of the device is responsible for ensuring that all persons engaged in working and handling the product:

- Are knowledgeable and qualified as per national regulations;
- Have read and understood corresponding parts of this document;
- Strictly observe safety regulations and operation data stipulated in its individual articles.

The owner of the device is further responsible for:

- Protection of persons;
- Prevention of damage to material;
- Personnel training.

Safety Instructions

The following safety instructions shall be observed under all circumstances:

- Wires the device is connected to shall be powered neither during installation nor replacement. Powered contacts pose a life threat. For this reason, until the work is finished, the corresponding power supply fuses shall be removed and stored in a place, safeguarding against unnoticed reinstallation by a person holding no responsibility;
- Local safety regulations shall be observed. The device installation shall be executed solely by qualified and trained personnel;
- During installation, the product shall be firmly held or secured against falling and causing injury;

- Dropped device shall not be installed even if showing no visible signs of damage. It shall be returned for inspection either to designated repair office or directly to manufacturer. Internal damage can cause functional failures or a short circuit;
- The product shall by no means be cleaned under running water or by high-pressure equipment. Water penetration can cause a short circuit. It is necessary to respect ingress protection of the device.

Disposal

As per certificate ISO 14001 data, the components used in the device are mostly separable and so can be disposed of or recycled accordingly. At the end of its service life, the device shall be handed over to specialized companies dealing in used material separation and consequent recycling. An unused device shall be disposed of ecologically as per the Waste Act.

The device contains no radioactive, carcinogenic or other materials having an adverse effect either on human health or the environment. All plastic materials can be recycled.

Packing is recyclable and at the end of its service life shall be handed over to specialized companies as a source of secondary raw materials or energy.

Liquidation and Legal Regulations Concerning the Environment Protection

The product disposal shall strictly observe local regulations for environment protection.

Components	Disposal
PCB, LCD, LED	Electronic waste. Dispose of as per local regulations.
Battery	Dangerous waste. Dispose of as per local regulations.
Metal parts	Separate and hand over to the waste collection center for disposal as per local regulations.
Plastic components	Separate and hand over for disposal or re-granulation as per local regulations.