7. Shunt

ESFL-2 Series

| Primary Input	Rated Voltage Output	Accuracy	Dimension(mm)	Dimension(Casing)(mm)
150 A	75mV	0.2%	22x149x21	83.12X175.52X48.5
200 A	75mV	0.2%	22x149x21	83.12X175.52X48.5
300 A	75mV	0.2%	26x149x21.5	83.12X175.52X48.5
400 A	75mV	0.2%	38x149x21.5	83.12X175.52X48.5
600 A	75mV	0.2%	62x149x21.5	83.12X175.52X48.5

| ESFL-2-150 | ESFL-2-200 | ESFL-2-300 |
| ESFL-2-400 | ESFL-2-600 | Shunt Casing |

Please note: Shunt casing can be optional.

8. Operation

8.1 Display
When it is powered on, the meter will initialize and do self-checking.
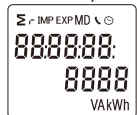
8.2 Buttons function
There are two buttons on the front panel.

	> Scroll the display for data checking. > Changing option at Set-up mode. > Exit the Set-up mode.
	> Set-up mode entry. > Confirmation

8.3 Scroll Display
After the initialization and self-checking programs, the meter displays the measured values. The default page is total kWh.
If the user wants to check other information, please press the scroll button ⟳ on the front panel.

Total kWh → **Re-settable energy** → **Voltage** → **Current** → **Power** → **Pulse constant** → **Primary Current**
→ **Meter address** → **Baud rate** → **Parity** → **Software version**

8.4 Set-up Mode
To get into Set-up Mode, the user needs to press the "Enter" button ⏎ for 3 seconds.

Page	Display	Descriptions	Page	Display	Descriptions
1	0000 PASS	Password Default password: 1000	7	60 dit	DIT(Demand Integration Time). Options: 0, 5, 8, 10, 15, 20, 30, 60minutes Default: 60minutes
2	001 Add	Modbus address Options: 1~247 Default: 001	8	00 SCrL	Scroll display time. Option: 0~60s. Default: 0s, represent do not scroll display
3	19200 bd	Baud rate Options: 1.2k, 2.4k, 4.8k, 9.6k, 19.2k Default: 9.6k	9	60 LP	LP(Backlit time). Options: 0, 5, 10, 20, 30, 60 minutes. Default: 60minutes
4	NONE PrtY	Parity Options: EVEN, ODD, NONE Default: NONE	10	1000 PASS	Password The range is from 0001 to 9999 Default: 1000
5	PLSOut	Type of pulse output Options: Total kWh, Imp kWh, Exp kWh Default: Total kWh	11	n CAnt	Shunt wiring Option: N, P N: Negative type(default) P: Positive type
6	100 tIn	Pulse width Options: 60, 100, 200mS Default: 100mS			

8.5 Error code

1	Er EE1	Memory error
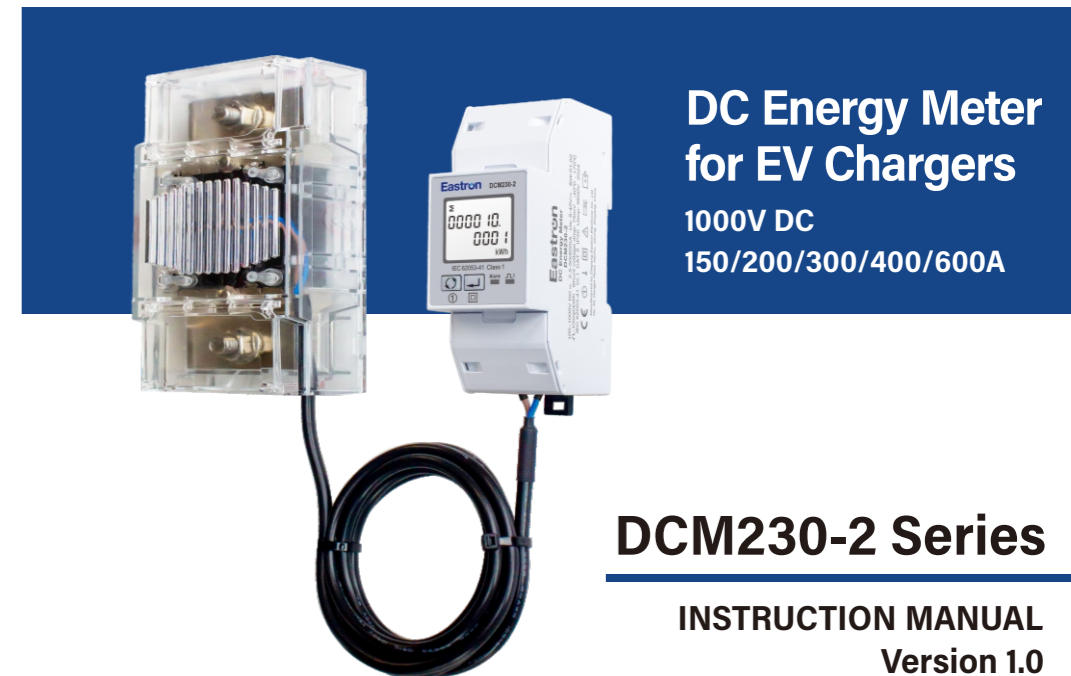
DC Energy Meter for EV Chargers
1000V DC
150/200/300/400/600A

DCM230-2 Series
INSTRUCTION MANUAL
Version 1.0

CE RoHS

ZHEJIANG EASTRON ELECTRONIC CO., LTD.

1. Product introduction

Eastron DCM230-2 series DC energy meters are designed for measuring and monitoring in DC systems. The DIN rail DC energy meters can measure of important DC parameters: Voltage, current, power and energy etc. It also supports bi-directional measurement with pulse output. All data in the meter are accessible via RS485 using Modbus RTU.
The meter works with DC power supply. Input voltage range is up to 1000V DC, and current inputs are flexible with an external DC shunt.

2. Safety

⚠️ **Warning**
The General warning symbol calls attention to possible risks of injury. Observe all the instructions listed under the symbol to prevent injuries or even death.

⚡ **Caution**
Hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

- The unit does not have internal fuses, therefore external fuses must be used for protection and safety under fault conditions.
- Use only insulating tools.
- Do not connect the meter while circuit is live (hot).
- Place the meter only in dry surroundings.
- Do not mount the meter in an explosive area or expose the meter in the dust, mildew and insects.
- Make sure the used wires or bus-bar are suitable for the maximum current of this meter.
- Make sure wiring correctly before activating the current/voltage to the meter.
- Do not touch the meter's connection terminal directly with your bare hands, with metal, blank wire or other material as you may get an 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 functionality of the meter, and will avoid any warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break.
- An external switch or circuit-breaker should be installed on the power supply wires, which will be used to disconnect the meter and the device supplying energy. It is recommended that this switch or circuit-breaker is placed near the meter because that is more convenient for the operator. The switch or circuit breaker must comply with the specifications of the building's electrical design and all local regulations.
- Although the auxiliary power supply is a low-voltage terminal, it still needs to disconnects the power supply and then wire it.
- To connect the external shunt, it is necessary to disconnect the power supply and wear insulated gloves.

3. Type code

DCM230-2-600

- DC Energy Meter
- Product Series Code
- DC Power Supply
- Max. Current 600A
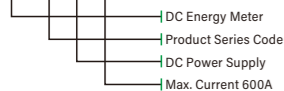
Model	Shunt	Voltage Range	Current Range	Pulse Constant(Default)
DCM230-2-150	150A/75mV		1.5-30(150)A	100 imp/kWh
DCM230-2-200	200A/75mV		2.0-40(200)A	100 imp/kWh
DCM230-2-300	300A/75mV	100V-1000V	2.5-50(300)A	10 imp/kWh
DCM230-2-400	400A/75mV		2.5-50(400)A	10 imp/kWh
DCM230-2-600	600A/75mV		2.5-50(600)A	10 imp/kWh

4. Specifications

Electrical Characteristics

Voltage DC input	Min. 100V DC, Max. 1000V DC
Auxiliary supply	Min. 9V DC, Max. 40V DC
DC shunt input	75mV (default)
Current range	DCM230-2-150: 1.5-30(150)A
	DCM230-2-200: 2.0-40(200)A
	DCM230-2-300: 2.5-50(300)A
	DCM230-2-400: 2.5-50(400)A
	DCM230-2-600: 2.5-50(600)A
Voltage loop power consumption	≤ 0.5W
Current loop power consumption	DCM230-2-150: ≤18W / DCM230-2-200: ≤24W
	DCM230-2-300: ≤36W / DCM230-2-400: ≤48W
	DCM230-2-600: ≤72W
Auxiliary loop power consumption	≤ 2W
DC voltage withstand	6.2kV DC
Impulse voltage withstand	9.6kV - 1.2 / 50μS waveform
Pulse duration	60mS, 100mS(default), 200mS
Pulse output indicate	Total kWh/ Import kWh / Export kWh
Display	LCD with backlit
Max. reading	999999.9999kWh
Accuracy	IEC62053-41 Class 1.0

Environment Characteristics

Operating temperature	-40°C to + 70°C
Storage and transportation temperature	-40°C to + 80°C
Reference temperature	23°C± 2°C
Relative humidity	0 to 95%, non-condensing
Altitude	up to 2000m
Measuring category	CAT II
Mechanical environment	M1
Electromagnetic environment	E2
Degree of pollution	2
Protective class	II
Warm up time	3S

Mechanical Characteristics

DIN rail dimensions	36x100x63 (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Ingress Protection rating	IP20 (Installed in an electrical cabinet with IP51 rating)
Material	Self-extinguishing UL94V-0
Installation environment	Dry environment

Communication

Communication type	RS485
Protocol	Modbus RTU
Baudrate	1200, 2400, 4800, 9600(default), 19200 bps
Parity	EVEN / ODD / NONE
Stop bits	1 or 2

Technical Standards

[1] EN IEC 61326-1:2021 Electromagnetic Compatibility Directive - Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements.
[2] EN IEC 61326-2-3:2021 Electromagnetic Compatibility Directive.
[3] EN 61010-1:2010+A1:2019 Low Voltage Directive 2014/35/EU - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements.
[4] EN 61010-2-030:2010 Low Voltage Directive 2014/35/EU - Particular requirements for testing and measuring circuits.
[5] IEC 62052-11:2020 Electricity metering equipment (d.c.) - General requirements, tests and test conditions - Part 11: Metering equipment.
[6] EN IEC 62052-11/A11:2022 Electricity metering equipment (d.c.) – Part 11: General requirements, tests and test conditions – Metering equipment.
[7] IEC 62053-41:2021 Electricity metering equipment (d.c.) - Particular requirements - Part 41: Static meters for DC energy (classes 0,5 and 1).
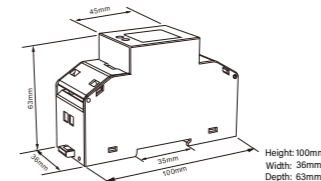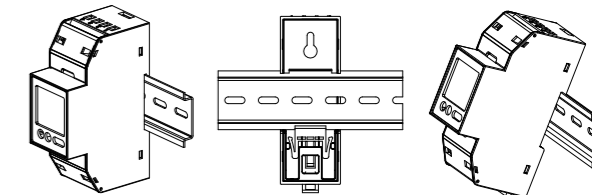
5. Marking

6. Installation

6.1 Dimensions and Installation

• Dimensions

• Installation

Height: 100mm
Width: 36mm
Depth: 63mm

6.2 Wiring

• Terminal Connection

• Shunt Connection

Shunt Connection: Positive Type

Shunt Connection: Negative Type