

DEM3K302

Three Phase CT High Refresh MID Din Rail meter



Product highlights

- **High refresh communication rate: 75ms**

75ms sampling rate and communication rate, to meet the real-time communication needs of photovoltaic systems, energy storage systems, factory energy monitoring systems, and platforms

- **High compatibility of communication mode**

Support MODBUS Protocol and DLT645 Protocol

- **Accurate measuring**

Comply with EN IEC international standards

- **Certification**

MID certification

- **Compact Design**

Optimized PCB layout and compact case design

Application

- **Photovoltaic systems**
- **Energy storage systems**
- **Factory energy monitoring systems**

1.introduction

1.1. Product Overview

DEM3K302 is a three-phase CT din rail meter that employs a high-speed processing chip solution, specifically designed for high-speed metering scenarios such as photovoltaic systems, energy storage, systems, and factory energy monitoring. Simultaneously, its wide operating temperature range of -40°C to 70°C meets the requirements for application in outdoor charging piles exposed directly to sunlight. Moreover, this series of energy meters adopts a rail-mount installation method, featuring compact size and easy installation. The entire series supports RS485 communication, compatible with various protocols; it boasts excellent metering accuracy and a rich set of functions, meeting MID certification requirements, making it an ideal choice for high-precision, high-speed AC metering applications.

1.2. functional characteristics

- rich in metering functions: forward and reverse electric energy metering;
- Accuracy Class: 0.5 s
- 75ms high refresh communication rate
- Multi-tariff, multi-period: the product has 4 tariffs and 8 periods by default
- Flexible Communication methods: Support RS485 Communication, compatible with Modbus, DL/T645-2007 protocol
- LCD backlight display: Shows voltage, current, power, power and other information; features automatic sequential display with a default interval of 5 seconds.
- Self-diagnosis, alarm and security protection functions
- MID certification
- Provide a optional version DEM3K302-1: support 350:1 VT

2. Product specifications

2.1. Voltage input



Voltage connection	Direct connection/VT
Rated voltage	57.7~240VLN/100~415VLL
Voltage tolerance	From 0.8 to 1.15 Un
Voltage ratio	Maximum support: 100:1VT
Frequency	50/60Hz

2.2. Current input

Current connection	CT
Maximum ratio	2000
Basic current	5A
Minimum current	0.05A
Maximum current	6A

2.3. Measurement accuracy

Type	Precision
Voltage	±0.5%
Current	±0.5%
Power	±0.5%
Electrical Energy	0.5s

2.4. Communication parameters

Mode of communication	RS485
Protocol	RS485 is compatible with Modbus RTU, DLT/645-2007
Type of communication	Two-way
RS485 connection type	
RS485 configuration parameters	Modbus address (1 to 247) Baudrate (9.6/19.2/38.4/57.6/76.8/115.2 KBPS)) Parity (none/odd/even)
Refresh time	≤75ms

2.5. Functional parameters

Measurement function	Monitor electrical energy consumption, major electrical variables (including active and reactive power, power factor) and calculate current/voltage harmonics including Depending on the amount of electricity
Measurement method	Forward and reverse measurement, net two-way, first remember single-phase and then calculate, and then respectively into kwh +-, absolute value measurement
Tariff	Default 4 tariffs, 8 time periods
Self-diagnosis	Store self-diagnosis
Event alarm	Over-current, high temperature, magnetic field detection, low battery power, etc.
Firmware upgrade	Local update
Clock	Automatic network time calibration, temperature compensation
Other functions	Wiring CHECK Screen Saver function Page filters runtime hour counter

2.6. Generic parameters

LCD display	6+2
LCD refresh time	1S
LED	Red Pulse Light
Keys	Paging, setting
IP level	IP20
Level of protection	Class II protection
Rated pulse voltage	6kV
Installation method	Guide Rail Type (3P)

***Note:** This series of products should be installed in cabinets with IP54 protection level (outdoor) , or cabinets with IP51 protection level (indoor)

2.7. Environmental specifications

Operating temperature	-40℃~70℃
Storage temperature	-40℃~70℃
Maximum humidity	≤95%
Altitude	<2000 m

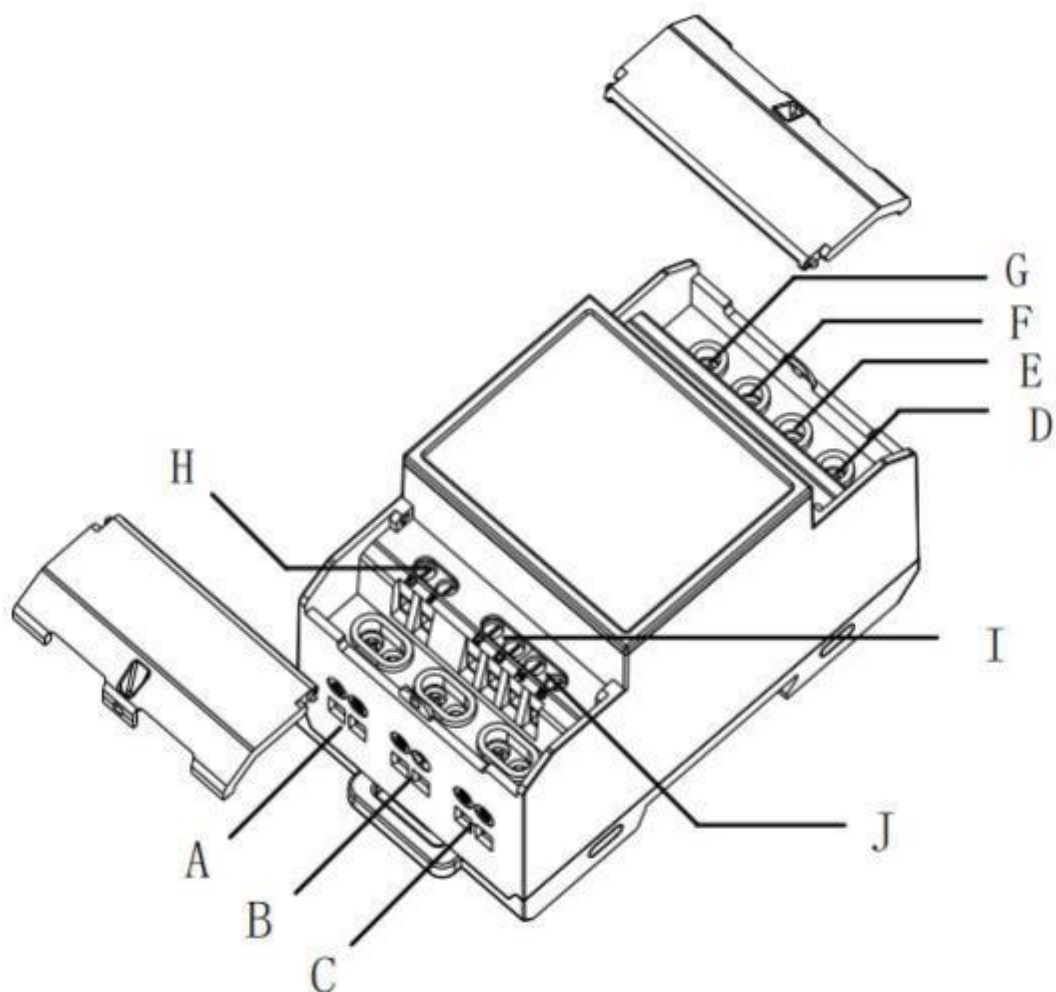
2.8. Standards and regulations certification

Compliance with standards	IEC 62052-11:2020 IEC 62053-21:2020 IEC 62053-23:2020 EN 50470-3:2022
Product certification	MID(application after completion of R & D)

3. Connection diagram

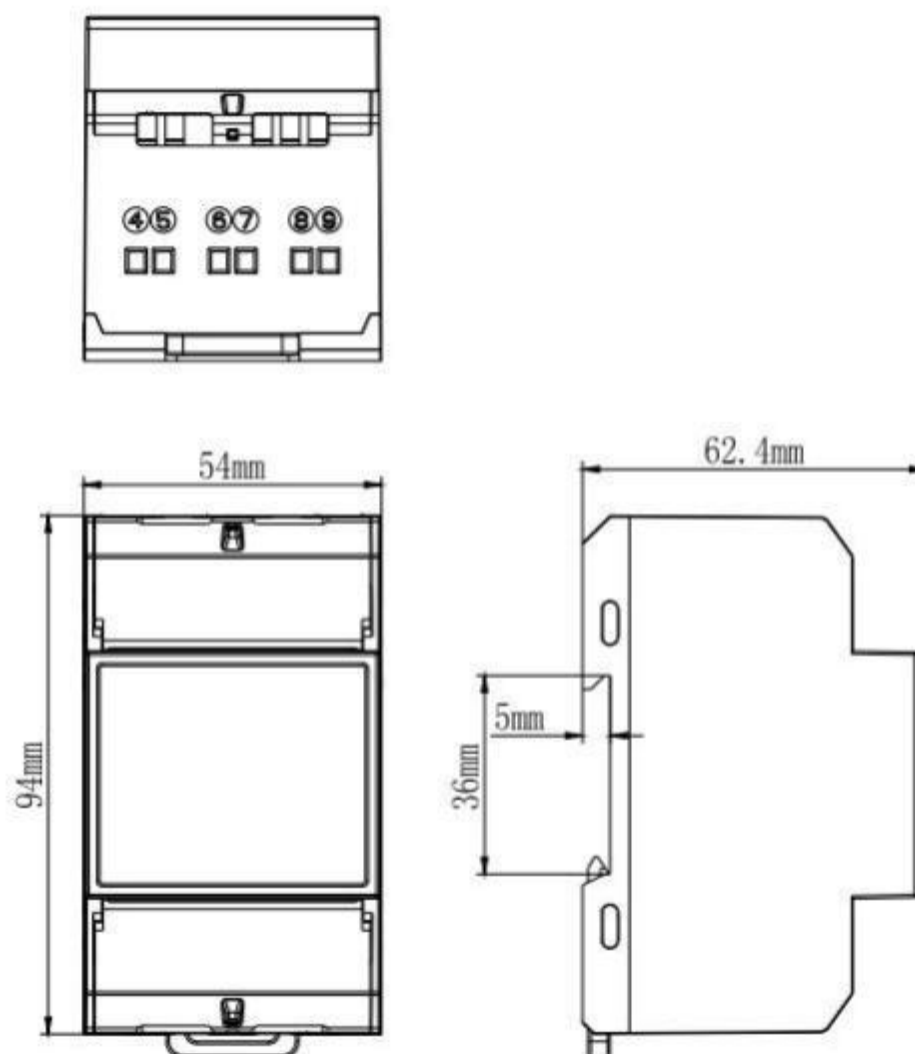
3.1. Structure diagram

3.1.1. Host structure diagram



Area code	Host architecture description
A、B、C	IA, IB, IC current sampling interface
D、E、F	UA, UB, UC voltage sampling interface
G	Zero-line interface
H	On-off output
I	Rate switches
J	RS485 interface

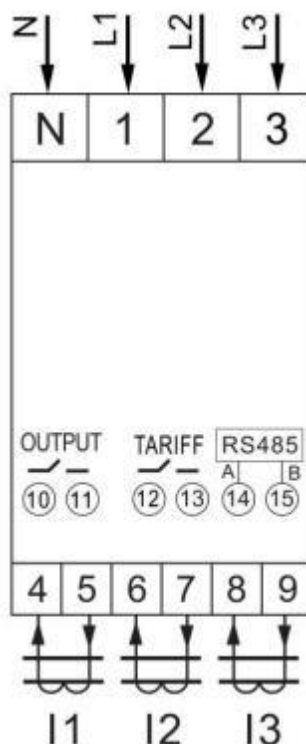
3.2. Dimension drawings



Case
dimensions

54mm×94mm×62.4mm

3.3. wiring diagram



- Ports 1,2,3 are voltage samples
- Ports 4,5,6,7,8, and 9 are a set of current samples respectively
- Port 10 and Port 11 are switch outputs
- Port 12 and Port 13 are for tariff switch
- Port 14 and Port 15 are a group of RS485 communication ports

4. LCD page display and switching

4.1. page display

4.1.1.1 Page 1

Main page	
Page	Display contents
1	total active energy
	total reactive energy
	Total apparent energy
2	total active energy
	Positive total active energy
	Reserve total active energy
3	total reactive energy
	Positive total reactive energy
	Reverse total reactive energy
4	Positive total active energy
	Running time(KW+)
5	Reverse total active energy
	Running time(KW-)
6	Total active energy(clearable)
	Total reactive energy(clearable)
7	Positive total active energy(clearable)
	Running time(KW+)(clearable)
8	Reverse total active energy(clearable)
	Running time(KW-)(clearable)
9	L1 phase voltage
	L2 phase voltage
	L3 phase voltage
10	L1-2 line voltage
	L2-3 line voltage
	L3-1 line voltage
11	L1 current
	L2 current
	L3 current
12	Total active power
	Total reactive power
	Total apparent power
13	L1 active power
	L2 active power
	L3 active power
14	L1 reactive power
	L2 reactive power
	L3 reactive power
15	L1 active power
	L2 active power
	L3 active power
16	L1 reactive power
	L2 reactive power
	L3 reactive power
17	L1 active power
18	L1 Frequency
	L2 Frequency
	L3 Frequency
19	L1 Voltage harmonic content
	L2 Voltage harmonic content
	L3 Voltage harmonic content
20	L1 Current harmonic content
	L2 Voltage harmonic content
	L3 Voltage harmonic content
21	Date
	Time
	Running time

4.1.1.2 Page 2

Tariff energy		
Page	Display contents	Tariff mode
1	T1 total active energy	RTC tariff
	T1 total reactive energy	
2	T2 total active energy	
	T2 total reactive energy	
3	T3 total active energy	
	T3 total reactive energy	
4	T4 total active energy	
	T4 total reactive energy	
5	T1 Positive total active energy	
	T1 Reverse total active energy	
6	T2 Positive total active energy	
	T2 Reverse total active energy	
7	T3 Positive total active energy	
	T3 Reverse total active energy	
8	T4 Positive total active energy	
	T4 Reverse total active energy	
9	T1 Positive total reactive energy	
	T1 Reverse total reactive energy	
10	T2 Positive total reactive energy	
	T2 Reverse total reactive energy	
11	T3 Positive total reactive energy	
	T3 Reverse total reactive energy	
12	T4 Positive total reactive energy	
	T4 Reverse total reactive energy	
1	DS1 total active energy	DS tariff
	DS1 total reactive energy	
2	DS2 total active energy	
	DS2 total reactive energy	
3	DS1 Positive total active energy	
	DS1 Reverse total active energy	
4	DS2 Positive total active energy	
	DS2 Reverse total active energy	
5	DS1 Positive total reactive energy	
	DS1 Reverse total reactive energy	
6	DS2 Positive total reactive energy	
	DS2 Reverse total reactive energy	

4.1.1.3 Page 3

Demand	
Page	Display contents
1	Total active maximum demand
	Total reactive maximum demand
	Total apparent maximum demand
2	Maximum positive total active power demand
	Maximum reverse total active power demand
3	Maximum positive total reactive power demand
	Maximum reverse total reactive power demand
4	L1 Maximum active demand
	L2 Maximum active demand
	L3 Maximum active demand
5	L1 Maximum reactive demand
	L2 Maximum reactive demand
	L3 Maximum reactive demand
6	L1 Maximum apparent demand
	L2 Maximum apparent demand
	L3 Maximum apparent demand
7	L1 Maximum positive active power demand
	L2 Maximum positive active power demand
	L3 Maximum positive active power demand
8	L1 Maximum reverse active power demand
	L2 Maximum reverse active power demand
	L3 Maximum reverse active power demand
9	L1 Maximum positive reactive power demand
	L2 Maximum positive reactive power demand
	L3 Maximum positive reactive power demand
10	L1 Maximum reverse reactive power demand
	L2 Maximum reverse reactive power demand
	L3 Maximum reverse reactive power demand
11	L1 Maximum current demand
	L2 Maximum current demand
	L3 Maximum current demand

4.1.1.4 Page 4

information	
Page	Display contents
1	Serial number
2	Version No. and firmware checksum
3	Wiring mode
4	Measurement mode
5	Tariff mode
6	CT/VT
7	Communication ID
8	Communication baud rate
	Communication check bit
	Communication stop bit
9	Demand type
	Demand time
10	Backlight time
11	Display mode
12	The home page mode display page
13	Alarm information
14	Wiring error switch
15	Phase voltage threshold switch
	Phase voltage threshold setH
	Phase voltage threshold setL
16	Line voltage threshold switch
	Line voltage threshold setH
	Line voltage threshold setL
17	Current threshold switch
	Current threshold setH
	Current threshold setL
18	Power factor threshold switch
	Power factor threshold setH
	Power factor threshold setL
19	Active power threshold switch
	Active power threshold setH
	Active power threshold setL
20	Reactive power threshold switch
	Reactive power threshold setH
	Reactive power threshold setL
21	Apparent power threshold switch
	Apparent power threshold setH
	Apparent power threshold setL
22	Alarm delay time

4.1.1.1.5 Page 5

Setting	
Page	Display content
1	Wiring mode
2	Measurement mode
3	CT/VT
4	Tariff mode
5	Communication ID
6	Communication baud rate
	Communication check bit
	Communication stop bit
7	Demand type
	Demand time
8	Backlight time
9	Display mode
10	The home page mode display page
11	Wiring error switch
12	Phase voltage threshold switch
	Phase voltage threshold setH
	Phase voltage threshold setL
13	Line voltage threshold switch
	Line voltage threshold setH
	Line voltage threshold setL
14	Current threshold switch
	Current threshold setH
	Current threshold setL
15	Power factor threshold switch
	Power factor threshold setH
	Power factor threshold setL
16	Active power threshold switch
	Active power threshold setH
	Active power threshold setL
17	Reactive power threshold switch
	Reactive power threshold setH
	Reactive power threshold setL
18	Apparent power threshold switch
	Apparent power threshold setH
	Apparent power threshold setL
19	Alarm delay time
20	Set password

4.2. Page switch

- LCD page operation (short and long press)
 - Measurement pages are divided into home pages and sub pages. Each home page contains several sub pages, DEM3C302 series meters have a total of 5 home pages.
 - On any page, press the button once for a short time to switch to the next sub page within the current home page.
 - ◆ If it is currently on the last sub page in a home page, switch to the first sub page in the current home page.
 - On any page, press and hold the button once to go to the first sub page within the next home page of the current home page.
 - ◆ If it is currently on the last home page, switch to the first sub page within the first home page.

5. Product installation

5.1. Installation instructions

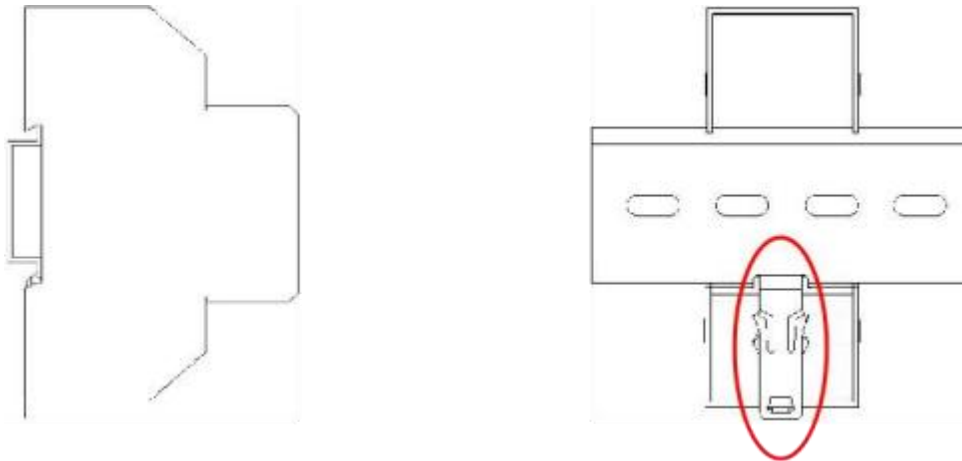
- Electric energy meter installation requires experienced electricians or professionals, and be sure to have read this user guide
- During the installation process, if there is obvious damage to the shell due to severe impact or fall, please do not install or power on, and contact our company in time.
- The energy meter has passed the inspection before leaving the factory and can be directly installed and used.
- The energy meter should be installed in an indoor or outdoor electric meter box. The installation base should be fixed on a solid fire-resistant wall, and there is no corrosive gas in the air.
- The energy meter should be connected in accordance with the wiring diagram on the terminal button box, preferably with copper wire or copper terminal.

5.2. installation instructions

- 1) Take a standard guide rail (length self-defined) , fixed in the location of the meter to be installed;
- 2) Push the buckle at the bottom of the meter down one gear, as shown below:



3) Hang the meter on the guide rail, then push the buckle up a gear, the meter is stuck on the guide rail. As shown in the following figure:



4) the installation of the guide rail has been completed.

5.3. Notes

- Access voltage must be strictly in accordance with the voltage level indicated on the label.
- installation must be the terminal screw tight, and the metering device will be firmly in the strong fire-resistant, not easy to vibration screen. The measuring device should be installed vertically with a height of 1.8 meters.
- after wiring will cover the lead seal.

6. Transport and storage

- watt-hour meter in transportation and storage should not be subjected to severe impact, should be based on GB13384-2008 "Instrument packaging general technical conditions," the provisions of transportation and storage;
- electric energy meter should be stored in the original package, the preservation of the local environment temperature range of $-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$, relative humidity does not exceed 85% , air, no corrosive gas;
- electric energy meter stored in the warehouse, should be placed on the bench, stack height not more than 10 boxes, unpacking, single packing of electric energy meter stack height, not more than 5 layers.