THORGEON

ENERGY METERS

ENERGY METER

01015

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M-Bus

MULTI-TARIFF

MID CERTIFICATE BY

3 PHASE | 3x 230/380V | A 3x 0.25-5(100)A | Hz 50–60 | DIN | 4 MODULE | BATTERY | DISPLAY | № SERIAL | IP20

CE EAC UK CA

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INTRODUCTION

This meter is a three phase four wire DIN rail multifunctional high precision electronic guide meter. Meter is equipped the shunt sampling method, with M-BUS communication protocol, magnetic field resistance of 200mT, support of liquid crystal display, standard installation, widely used in a variety of household or commercial electricity systems.

FEATURES AND TECHNICAL PARAMETERS

1 Features

1.1 Measurement function

- measurement of instantaneous parameters: voltage, current, active power, reactive power, apparent power, frequency, power factor (pf), total demand and total demand of reactive power, total active reactive power demand maximum demand, total amount.
- supports a variety of power parameter measurements: the total power, ABC three-phase power, reactive power four quadrant power, can reset the power, power combination code, etc.
- supports active/reactive power direction measurement.

1.2. Communication

- It supports IR (near infrared) and M - BUS communication, able to read and set up the instrument parameters (optional).

1.3. Display

- LCD backlight data scrolling display, you can manually flip the page through the button.

1.4. Button

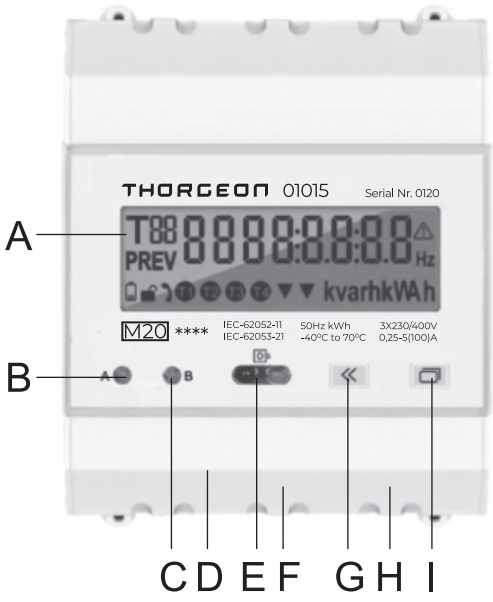
- electric strap touch button, support page flip back and forth and long press to enter.

2. Technical Parameters

Voltage: 3*230(400)V
Current: 0,25-5(80)A
Accuracy class: Active power 1.0, Reactive power 2.0
Standard: IEC 62052-11:2020, IEC 62053-21:2020
Frequency: 50Hz
Impulse constant: 1000imp/kWh,1000imp/kVarh
Display: LCD 6+2
Starting current: 0.4%Ib
Temperature range: -40°~70°C
Average humidity value of year: ≤75% (Non Condensing)
Case Protecti: IP51 (Indoor)

DESCRIPTION

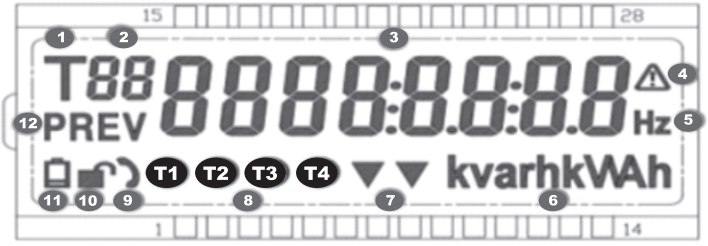
A: LCD screen
B: Impulse indication for active energy
C: Impulse indication for reactive energy
D: SO output
E: Optical port
F: External Signal input
G: Left Button for data checking
H: M-BUS output
I: Right button for data checking
and data setting



DISPLAY

LCD display content:
1. Total indication of the total amount of electricity, total power, etc.
2. Page number indication
3. LCD 8-bit value display
5. Frequency unit
6. Measuring unit
7. ABC phase page indicator
8. Indicated Rates
9. Communication indication
10. Enter the Settings page flag
11. Battery indicator

Note: power-on, the 3s full display page is displayed, and then the wheel display page starts



Key Function	Short Press	Hold down for more than 3 sec.
Left button	Page turning	Switch display page: wheel display page -> A-phase battery page -> B-phase battery page -> C-phase battery page -> Information page -> Wheel display page Set page or enter password page: Press and hold to return to the wheel display page
Right button		Enter the Settings page/confirm settings

PAGING INFORMATION

LCD phase energy display page of phase A B and C			
Page	**Content**	**Unit**	**Declaration (remark)**
1	Total active energy	kWh	6+2 000000.00
2	Forward active energy	kWh	6+2 000000.00
3	Reverse active energy	kWh	5+2 00000.00 (With "-" indicator)
4	T1 Total active energy	kWh	6+2 000000.00
5	T1 Forward active energy	kWh	6+2 000000.00
6	T1 Reverse active energy	kWh	5+2 00000.00 (With "-" indicator)
7	T2 Total active energy	kWh	6+2 000000.00
8	T2 Forward active energy	kWh	6+2 000000.00
9	T2 Reverse active energy	kWh	5+2 00000.00 (With "-" indicator)
10	T3 Total active energy	kWh	6+2 000000.00
11	T3 Forward active energy	kWh	6+2 000000.00
12	T3 Reverse active energy	kWh	5+2 00000.00 (With "-" indicator)
13	T4 Total active energy	kWh	6+2 000000.00
14	T4 Forward active energy	kWh	6+2 000000.00
15	T4 Reverse active energy	kWh	5+2 00000.00 (With "-" indicator)
16	Total reactive energy	kvarh	6+2 000000.00
17	Forward reactive energy	kvarh	6+2 000000.00
18	Reverse reactive energy	kvarh	5+2 00000.00 (With "-" indicator)
19	The first quadrant reactive power	kvarh	6+2 000000.00
20	The second quadrant reactive power	kvarh	6+2 000000.00
21	The third quadrant reactive power	kvarh	6+2 000000.00
22	The forth quadrant reactive power	kvarh	6+2 000000.00
23	T1 Total reactive energy	kvarh	6+2 000000.00
24	T1 Forward reactive energy	kvarh	6+2 000000.00
25	T1 Reverse reactive energy	kvarh	5+2 00000.00 (With "-" indicator)
26	T2 Total reactive energy	kvarh	6+2 000000.00
27	T2 Forward reactive energy	kvarh	6+2 000000.00
28	T2 Reverse reactive energy	kvarh	5+2 00000.00 (With "-" indicator)
29	T3 Total reactive energy	kvarh	6+2 000000.00
30	T3 Forward reactive energy	kvarh	6+2 000000.00
31	T3 Reverse reactive energy	kvarh	5+2 00000.00 (With "-" indicator)
32	T4 Total reactive energy	kvarh	6+2 000000.00
33	T4 Forward reactive energy	kvarh	6+2 000000.00
34	T4 Reverse reactive energy	kvarh	5+2 00000.00 (With "-" indicator)
35	**Re-settable Active energy**	kWh	6+2 000000.00
36	Forward active energy can be cleared	kWh	6+2 000000.00
37	Reverse active energy can be cleared	kWh	5+2 00000.00 (With "-" indicator)
38	**Re-settable Reactive energy**	kvarh	6+2 000000.00
39	Forward reactive energy can be cleared	kvarh	6+2 000000.00
40	Reverse reactive energy can be cleared	kvarh	5+2 00000.00 (With "-" indicator)

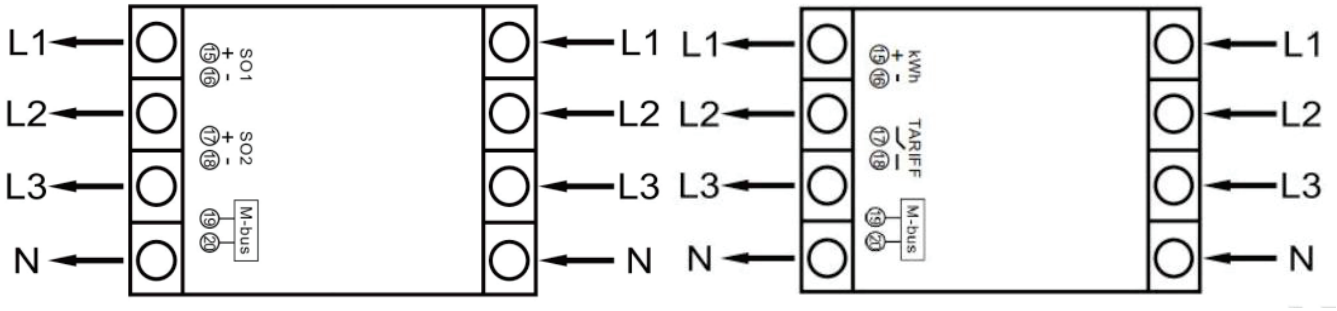
41	Maximum active power demand	kW	2+3 00.000
42	Forward maximum active power demand	kW	2+3 00.000
43	Reverse maximum active power demand	kW	2+3 00.000 (With "-" indicator)
44	Maximum reactive power demand	kvarh	2+3 00.000
45	Forward maximum reactive power demand	kvarh	2+3 00.000
46	Reverse maximum reactive power demand	kvarh	2+3 00.000 (With "-" indicator)
47	A-N voltage	V	2+2 000.00
48	B-N voltage	V	2+2 000.00
49	C-N voltage	V	2+2 000.00
50	A-B voltage	V	2+2 000.00
51	B-C voltage	V	2+2 000.00
52	C-A voltage	V	2+2 000.00
53	Phase A current	A	3+3 000.000 (With "-" indicator when reverse)
54	Phase B current	A	3+3 000.000 (With "-" indicator when reverse)
55	Phase C current	A	3+3 000.000 (With "-" indicator when reverse)
56	Total active power	kw	2+3 00.000 (With "-" indicator when reverse)
57	Phase A active power	kw	2+3 00.000 (With "-" indicator when reverse)
58	Phase B active power	kw	2+3 00.000 (With "-" indicator when reverse)
59	Phase C active power	kw	2+3 00.000 (With "-" indicator when reverse)
60	Total reactive power	kvar	2+3 00.000 (With "-" indicator when reverse)
61	Phase A reactive power	kvar	2+3 00.000 (With "-" indicator when reverse)
62	Phase B reactive power	kvar	2+3 00.000 (With "-" indicator when reverse)
63	Phase C reactive power	kvar	2+3 00.000 (With "-" indicator when reverse)
64	Total apparent power	kva	2+3 00.000
65	Phase A apparent power	kva	2+3 00.000
66	Phase B apparent power	kva	2+3 00.000
67	Phase C apparent power	kva	2+3 00.000
68	Total frequency	Hz	2+1 00.0
69	Phase A frequency	Hz	2+1 00.0
70	Phase B frequency	Hz	2+1 00.0
71	Phase C frequency	Hz	2+1 00.0
72	Total power factor		1+3 0.000 With capacitive 'C' and inductive 'L', with '-' (based onactive power)
73	Phase A power factor PF1		1+3 0.000 With capacitive 'C' and inductive 'L', with '-' (based onactive power)
74	Phase B power factor PF2		1+3 0.000 With capacitive 'C' and inductive 'L', with '-' (based onactive power)
75	Phase C power factor PF3		1+3 0.000 With capacitive 'C' and inductive 'L', with '-' (based onactive power)
Long press the 3 seconds of Left button switch the display page: Scroll display page->A-phase engergy page->B-phase engergy page->C-phase energy page->Information page->Scroll page			

Page	Content	Description (remark)
1	Serial number	000000000000,12 digit
2	M-bus	0-250
3	Baud rate	300/600/1200/2400/4800/9600
4	Parity	Odd/Even/None
5	Stop bit	1/2bit
6	Scroll display time	5-99 seconds, 0 disables scroll display
7	Combined code	1=Total=Forward 2=Total=Reverse 3=Total=Forward+Reverse 4=Total=Forward-Reverse
8	Demand Type and Period	0= interval 1= slip (period 1-30 minutes)
9	SO output	Undetermined
10	Date	DDMMYY
11	Time	HHMMSS
12	Version number	U101
13	Checksum	XXXX

LCD setting page		
1	M-bus First address	0-250
2	Baud rate	300/600/1200/2400/4800/9600
3	Parity	Odd/Even/None
4	Stop bit	1/2bit
5	Scrolling time	5-99 seconds, 0 disables scroll display
6	Combined code	1=Total=Forward 2=Total=Reverse 3=Total=Forward+Reverse 4=Total=Forward-Reverse
7	Demand Type and Period	0= interval 1= slip (period 1-30 minutes)
8	SO constant	Undetermined
9	Date	DDMMYY
10	Time	HHMMSS
11	Reset the active re-settable energy	After long press, the total (total, forward and reverse) and split-phase (total, forward and reverse) can be reset, and the corresponding data can be selected to reset
12	Reset the reactive re-settable energy	
13	Reset the active maximum demand	
14	Reset the reactive maximum demand	
15	Password	4 digit
16	Quit	Exit settings
Note: Press the right button for more than 3 seconds to input the correct password		

Pulse output terminal Setting					
Measurement mode	**SO Output number**	**SO Output mode**	**SO Output description**	**SO Output LED**	**Total electric quantity specification**
Forward only	SO-1	Active forward	Only output active forward pulse	Only output positive active puls	Total energy = forward energy, no sign for energy in communication and display
	SO-2	Forward reactive	Only output reactive forward pulse		
Reverse only	SO-1	Reverse active	Only output active reverse pulse	Output only reverse active pulse	Total energy = reverse energy, with sign for energy in communication and display
	SO-2	Reverse reactive	Only output reactive reverse pulse		
Absolute (forward energy + reverse energy)	SO-1	Absolute active (Default)	Output absolute value (forward + reverse) active puls	Output absolute value (forward + reverse)	Total energy = forward + reverse energy, without sign for energy in communication and display
		Active forward	Only output active forward pulse		
		Reactive forward	Only output reactive forward pulse		
	SO-2	Absolute reactive (Default)	Output absolute value (forward + reverse) reactive pulse		
		Active reverse	Only output active reverse pulse		
		Reactive reverse	Only output reactive reverse pulse		
Algebraic SUM (forward energy - reverse energy)	SO-1	Absolute active (Default)	Output absolute value (forward - reverse) active puls	Output absolute value (forward - reverse) active pulse	Total energy = forward - reverse energy, with sign for energy in communication and display if reverse>forward
		Active forward	Only output active forward pulse		
		Reactive forward	Only output reactive forward pulse		
	SO-2	Absolute reactive (Default)	Output absolute value (forward - reverse) reactive pulse		
		Active reverse	Only output active reverse pulse		
		Reactive reverse	Only output reactive reverse pulse		

WIRING CONNECTION



15 16:SO1 is SO output for kWh or Active/reactive forward kWh optional 17 18:SO2 is SO output for kvarh or Active/reactive reverse kWh optional 19 20 : M-bus output	15 16:SO is SO output for kWh 17 18:for external signal input ***Important notice: no high voltage input!*** 19 20:M-bus output

INSTALLATION INSTRUCTION

● Installation staff should be experienced electrician or specialized person, and should ensure that they have read this user guide.

● During installation, if it comes across severe strike or falling, which causes obvious damage trace, don't install it or turn it on. Please contact us in time.

● Before leaving our factory, all the meters have been checked out and lead sealed, they can be installed directly.

● Meters should be installed indoors or outdoors cabinet. The wall which is installed should be firm and fireproof, besides, no corrosive gas in the air.

● Meters should be installed according to the wiring diagram on terminal box. When inserting, using copper wire or copper connector will be better.

Installation instruction details

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

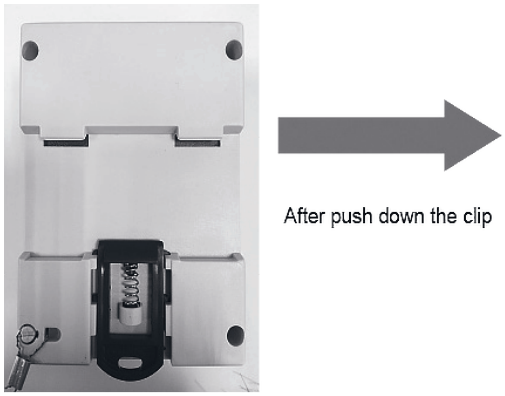


Fig.1

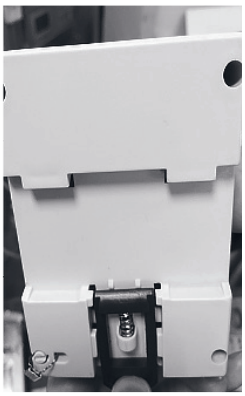


Fig.2

Fig. 3

Fig. 4

Recommended wire (For your reference):

Safe carrying capacity of rubber or plastic insulated wire(1)					
specification (mm)	nominal cross section (mm^2)	Safe carrying capacity (A)			
		BX	BLX	BV	BLV
1*1.13	1	20		18	
1*1.37	1.5	25		22	
1*1.76	2.5	33	25	30	23
1*2.24	4	42	33	40	30
1*2.73	6	55	42	50	40
7*1.33	10	80	55	75	55
7*1.76	16	105	80	100	75
7*2.12	25	140	105	130	100
7*2.50	35	170	140	160	125
19*1.83	50	225	170	205	150
19*2.14	75	280	225	255	185
19*2.50	95	340	280	320	240

Note: BX(BLX) copper (aluminum) core rubber insulated wire or BV(BLV) copper (aluminum) core PVC plastic insulated wire widely used in 500V or less than 500V AC and DC power distribution system. The temperature for the data listed in the above table is 35°C the safe carrying capacity value for the wire on single coved.

SAFETY INSTRUCTIONS

- Case is sealed, do not open the meter. No warranty if case is opened.
- The meter should be installed indoors or in the outdoor electric meter box.
- The meter is intended to be installed in a Mechanical Environment 'M1', with Shock and Vibrations of low significance, as per 2014/32/EU Directive.
- The meter is intended to be installed in Electromagnetic Environment 'E2', as per 2014/32/EU Directive.

Information for Your Own Safety

This manual does not contain all the safety measures for the operation of this equipment (module, device) because special operating conditions, local code requirements or local regulations may necessitate further measures. However, it does contain information which must be adhered to for your own personal safety and to avoid damage to the equipment. This information is highlighted by a warning triangle with an exclamation mark or a lightning bolt depending on the severity of the warning.

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

Caution 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 Installation and operation of this equipment described in this manual may only be performed by qualified personal. Only people that are authorized to install, connect, and use this equipment and have the proper knowledge about labeling and grounding electrical equipment and circuits and can do so according to safety and regulatory standards are considered qualified personnel in the manual.

Use for the intend purpose

The equipment (device, module) may only be used for the application cases specified in the catalog and the user manual and only in connection with devices and components recommended and approved by THORGEON