

Qoltec®



OPERATING INSTRUCTIONS

Three-phase DIN rail mounted electricity meter

MODEL : 50989

EN

INTRODUCTION

Thank you for choosing the Qoltec Three-phase Electricity Meter. To ensure your personal and system safety and to obtain the best performance from the unit, please read this manual carefully and thoroughly before installing, using or repairing this unit. Pay particular attention to the warnings and cautions in the manual.

CHARACTERISTICS AND FIELD OF APPLICATION

The DIN rail-mounted three-phase electronic energy meter is a state-of-the-art measuring device of full electronic design, using advanced microprocessor technology and specialised integrated circuits. It uses state-of-the-art digital sampling and surface mount technology (SMT).

The meter fully complies with the requirements of the national GB/T17215.321-2008 and international IEC62053-21 standards.

It is designed to measure active energy in three-phase AC networks at 50 Hz or 60 Hz. The device accurately measures energy consumption in both positive and negative directions.

It is characterised by high reliability, small dimensions, low weight, aesthetic appearance and modern manufacturing technology.

It is designed for indoor installation in environmental conditions:

- ambient temperature from -25°C to +55°C,
- relative humidity $\leq 95\%$,

INSTALLATION AND USE

1. The meter may only be installed and operated after it has been tested and sealed. If the seals are missing or the unit has been stored for a long time, it must be tested again.
2. If the meter's inner packaging or housing is damaged - do not install the meter, but contact the manufacturer's technical department.
3. Installation of the meter must only be carried out by a qualified electrician or technician after reading the operating instructions.
4. The meter must be installed in a well-ventilated and dry place on a stable, non-combustible, vibration-resistant wall.
5. In dusty areas or areas subject to mechanical damage, the meter should be enclosed in a protective cover.

6. Connections should be made in accordance with the diagram on the housing or in the operating instructions. The use of soft copper wires is recommended to avoid overheating and burning out of the meter due to loose contacts.
7. When properly connected to the mains, the power light should illuminate.
8. In areas subject to frequent storms, surge protection should be used.
9. The permissible load on the meter is within the range $0.05 I_b - I_{max}$. Exceeding this range may lead to incorrect readings or overheating of the current coils.
10. Data display: the meter can be fitted with a pulse counter or LCD display.
11. Power indicator: lights up when the unit is operating correctly; goes out in the event of an error or power failure.
12. Pulse indicator: flashes (approx. 80 ms) when recording energy consumption.
13. Reverse direction indicator: lights up when energy is being consumed in the opposite direction (e.g. when returning energy to the grid).

EXTERNAL DRAWING AND WIRING DIAGRAM

Illustration 1 in the appendix

Dimensions:

Height: 100 mm

Width: 123 mm

Depth: 65 mm

DIN rail mounting (mounting width: 35 mm, height: 45 mm)

WIRING DIAGRAM - DIRECT MEASUREMENT (DIRECT ACCESS)

Terminals and their description:

Figure 2 in the appendix

Terminal Description

1 / 2	Phase current input/output I_a
3 / 4	Phase current input/output I_b
5 / 6	Phase current input/output I_c
7	Neutral conductor (N)

17 / 18	Pulse Output
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Description:

The diagram shows a direct three-phase connection where each phase (A, B, C) is connected directly to the meter. The pulse output (17/18) is used for testing or counting energy.

CONNECTION DIAGRAM - MEASUREMENT WITH CURRENT TRANSFORMERS (CT ACCESS)

Terminals and their description:

Illustration 3 in the appendix

Terminal Description

1 / 2	Phase current input/output Ia
3 / 4	Phase current input/output Ib
5 / 6	Phase current input/output Ic
7	Neutral conductor (N)
8 / 10 / 12	Voltage inputs of phases A / B / C
14	14 Neutral conductor (for voltage circuit)
17 / 18	Pulse Output

Description:

In a circuit with current transformers, the meter measures energy indirectly - the current from each phase (Ia, Ib, Ic) flows through the transformers. The voltage inputs (Ua, Ub, Uc) feed the corresponding phase voltages.

Legend:

Pulse Output (17/18) - pulse output for testing and recording energy consumption.

Direct Access - direct connection to the grid.

CT Access - connection to current transformers (indirect measurement).

TEST MODE

The energy pulse output is located on terminals 17 (+) and 18 (-).

For testing, connect the test device with +5VDC (anode to positive terminal, signal lead to negative terminal).

BASIC FAULTS

With a balanced three-phase load, the meter should operate continuously at the rated voltage and frequency ($\cos \varphi = 1.0$), as specified in the manufacturer's test table.

Balanced three-phase load

Current value	Connection via CT	Power factor (COS φ)	Percentage error limits (%)	
Direct connection	Via CT		Class 1	Class 2
0.05I _b	0.02I _b	1.0	±1.5	±2.5
0.1I _b	0.05I _b	0.5L	±1.5	±2.5
0.1I _b -I _{max}	0.05I _b -I _{max}	0.8C	±1.5	-
0.1I _b -I _{max}	0.05I _b -I _{max}	1.0	±1.0	±2.0
0.2I _b -I _{max}	0.1I _b -I _{max}	0.5L	±1.0	±2.0
0.2I _b -I _{max}	0.1I _b -I _{max}	0.8C	±1.0	-

Single phase load

Current value		Power factor (COS φ)	Percentage error limits (%)	
Direct connection	Via CT		Class 1	Class 2
0.1I _b -I _{max}	0.05I _b -I _{max}	1.0	±2.0	±3.0
0.2I _b -I _{max}	0.1I _b -I _{max}	0.5L	±2.0	±3.0

Legend:

I_b - base (rated) current

I_{max} - maximum current

CT (Current Transformer) - current transformer

L - inductive load (delayed)

C - capacitive load (forward)

The tables show the permissible measurement error limits for energy meters in different accuracy classes (1 and 2) depending on the current and power factor values.

STARTING

The dial (or pulse counter) starts to rotate continuously when the meter is operating at rated voltage, rated frequency and $\cos\varphi = 1.0$ and the load current corresponds to the values in the table below:

Connection mode	Class 1	Class 2
Direct	$0.004I_b$	$0.005I_b$
With transformer	$0.002I_b$	$0.003I_b$

Explanations:

I_b - rated (base) current

$\cos\varphi$ - power factor

The meter should start recording energy (movement of the dial or flashing of the pulse diode) at a current not less than the values given in the table, which confirms its sensitivity according to the accuracy class.

DISPOSAL

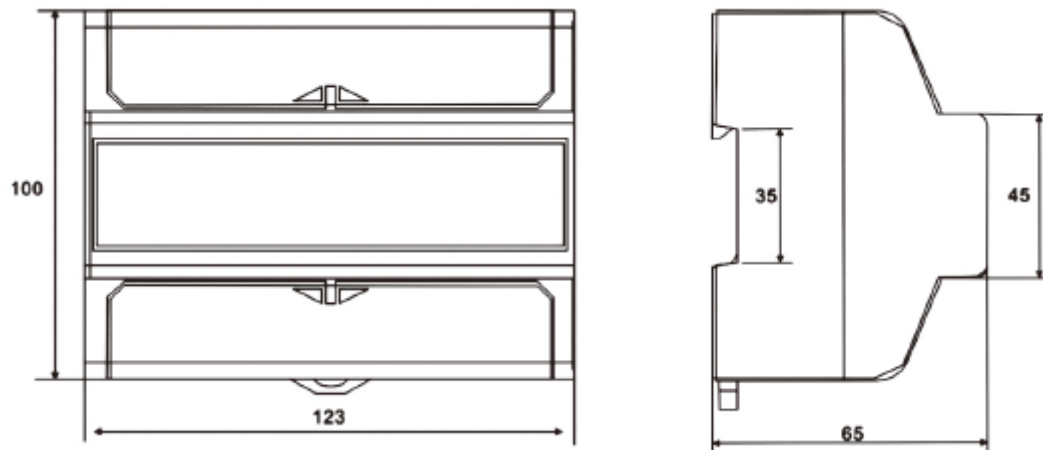
Dispose of in accordance with local electronic waste regulations. Do not throw into fire or incinerate.

WARRANTY

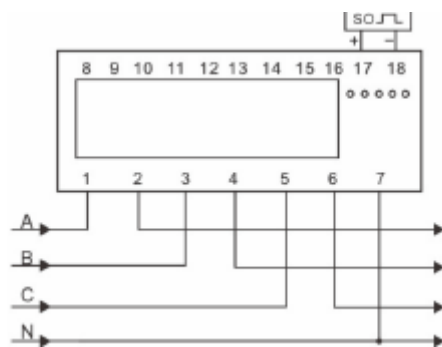
The product is covered by a 24-month manufacturer's warranty from the date of purchase. In case of problems, please contact customer service.

Attachement 1

1



2



3

