Qoltec®

User Manual

3-phase 4-wire 100A energy meter for DIN rail

Model: 50992

Introduction

Thank you for your trust and for choosing our product. We are confident that the product will meet your expectations. This manual contains instructions on the installation and use of the product, including important safety instructions regarding correct operation and installation. If you have any questions after reading this manual, please contact our Customer Service Department

About the product

A three-phase, four-wire electronic energy meter for measuring positive and negative energy in a 50 Hz AC network. It utilises microcontroller technology, digital sampling and SMT assembly. Complies with GB/T17215.321-2008 and IEC 62053-21 (Class 1). Equipped with a large LCD display, it features low power consumption, high accuracy, operational stability and resistance to interference, moisture, fire and other environmental factors.

Specifications and technical parameters

Name:	Three-phase energy meter
Model:	DTS
Accuracy:	1.0
Rated voltage:	3x230/380V
Specification:	3x30(100)A
Display:	LCD 6+1
Power consumption:	≤2W/5VA
Inrush current:	0.4% Ib
Insulation performance:	AC voltage 4 kV for 1 minute, 1.2/50 μs 6 kV impulse voltage waveform
Dimensions:	76 x 101 x 65 mm

Note: at the rated input current, the value before the brackets is the rated current 1b, and the value in brackets is the maximum input current 1max.

Technical specifications

a) Measurement error: Basic error of the energy meter under balanced load:

Current value		Power factor COSφ	Permissible percentage error	
Current value	Connection via current transformer		Level 1	Level 2
0.05 Ib	0.02 Ib	1.0	±1.5	±2.5
0.1 Ib	0.05 Ib	0.5 L	±1.5	±2.5
		0.8C	±1.5	-
0.1 Ib – 1 max	0.05 Ib – 1 max	1.0	±1.0	±2.0
0.1 Ib – 1 max	0.1 Ib – 1 max	0.5 L	±1.0	±2.0
		0.8 C	±1.0	-

Basic error of the energy meter under a single-phase load:

Current value		Power factor COSφ	Permissible percentage error	
Current value	Connection via a current transformer		Level 1	Level 2
0.1 Ib – 1 max	0.05 Ib – 1 max	1.0	±2.0	±3.0
0.2 Ib – 1 max	0.1 Ib – 1 max	0.5 L	±2.0	±3.0

Start

Under conditions of rated voltage, rated frequency and COSφ=1, when the energy meter's input current reaches the value shown in the table below, the meter will commence continuous energy measurement:

Device type	**Accuracy class 1**	**Accuracy class 2**
Directly connected	0.004 Ib	0.005 Ib
Connected via a transducer	0.002 Ib	0.003 Ib

Pulse waveform

When the input current exceeds 115% of the rated value, the pulse output should not exceed one pulse.

Insulation strength

All circuits of the meter can withstand a 6 kV impulse voltage with a 1.2/50 μs waveform. Between different polarities, the test is carried out 10 times without arcing. Between the casing and the circuits – 2 kV AC voltage at 50 Hz for 1 minute.

Operating voltage range: 70–115% Ub

Power consumption: <2 W and 10 VA

Data storage: data retained for 12 months; after a power failure – for 10 years

Installation and use

Precautions

1. The meter has been tested and sealed – do not open it.
2. For meters that have not been used for a long time, the test must be repeated before installation.
3. If the casing is damaged, do not install – contact the service department.
4. Installation must only be carried out by trained personnel.
5. Mount on a 35mm DIN rail in a dry, well-ventilated indoor location.
6. Do not install in damp, dusty or high-vibration areas.
7. Energy meter: 45748.91 kWh
8. In dirty environments or where the device may be damaged, the energy meter should be installed in a protective housing.
9. During installation and wiring, follow the connection diagram on the meter cover or in this manual. The use of copper cables is recommended.

Connection method

Designations: *Figures 1 and 2 in the appendix*

A out, B out, C out – phases

zero out – neutral wire

Current inputs (from the mains): A phase current (S1), B phase current (S1), C phase current (S1)

Voltage inputs: C voltage, B voltage, A voltage

Pulse and communication terminals (optional):

pulse+, pulse− – pulse output

485+, 485− – RS485 connector (e.g. for remote reading)

Connection method

Connect in accordance with the diagram on the meter (Figure 3 in the appendix)

Terminals	Description
1/2	Input/output line (the arrow indicates the direction)
3/4	Input/output line (first phase, reverse)
5/6	Input/output line (third phase)
7/8	Neutral
9/11/13	Ua/Ub/Uc (voltage measurement via CT)
23/24	Test pulse

Precautions for use

1. When the energy meter is used in areas at risk of lightning strikes, surge protection must be fitted.
2. The meter's current load should not exceed 0.5Ib1max (direct connection) or 0.2Ib1max (via a current transformer).
3. When the meter is used with a current transformer, the energy consumption must be multiplied by the transformer's turns ratio.
4. Reverse power indicator: when the 'Rev' indicator is lit, this means that the phase wires have been swapped.
5. Pulse indicator: flashing indicates that the meter is operating; the faster it flashes, the higher the consumption.
6. Reverse consumption and communication: when the Rev indicator is lit, this indicates reverse power flow.

Measurement method

This energy meter is equipped with a photoelectric pulse test port. The port is located on the lower terminal block: +5V to terminal no. 8 (positive), signal to terminal no. 7 (negative).

Communication interface

The energy meter is equipped with an RS485 communication function. The interface is located on the lower terminal strip; communication takes place in

accordance with Modbus or DLT645. The communication terminals are No. 16 (A) and No. 15 (B).

Table 1: Communication identification (DLT645-2007 protocol)

No.	Data name	Data format	Data length	Access type	Communication identifier
1	Total energy	XXXXXX.XX	4	Read-only	00010000
2	Meter number	NN NN NN NN	4	Read-only	00004001
3	Time	XXXX XXXX	4	Read-only	00000000
4	Password permissions	XXXX XXXX	4	Record	04000001

Table 2: Communication (MODBUS-RTU protocol)

No	Address (HEX)	Data name	Data format	Access	Data length	Notes
1	0000H–0001H	Total energy	XXXXX.X kWh	Read-only	4	
2	0002H	Active energy	XXXX	Read-only	2	
3	0006H	Clear counter	—	—	—	Sending C119
4	0007H	Station address	001–247	Read/write	1	
5	0008H	Transmission speed	01:9600, etc.	Read/write	1	default: 01
6	0009H	Data format	01:N,8,1 etc.	Read/write	1	default: 01

Maintenance and cleaning

1) Switch off the power supply before cleaning.

2) Wipe the device with a dry cloth. Do not use chemicals or water.

Disposal

Avoid disposing of the device in ordinary rubbish bins to prevent environmental pollution. Take the device to appropriate electronic waste collection points or to shops that recycle electronic equipment.

Service and repairs

Please note that incorrect repairs may cause serious damage to the device and may even pose a risk to the user. If you experience problems with the device and do not have the experience or knowledge to repair it yourself, it is advisable to seek assistance from a specialist or a technical support service.

Attachment

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