POLY-PHASE ELECTRONIC ELECTRICITY METER

ZE314

The ZE314 electricity meter series is a poly-phase single- or double-tariff, modern, fully programmable electricity meter for monitoring of electricity consumption in low-demand areas. It is able to meet the monitoring requirements of active energy in accuracy class A or B as per standard EN 50470-1 and EN 50470-3 in both energy import and export directions. Its structure is designed to connect to the network TN-C.

The electricity meter is equipped with LED calibration constant adjustable from 500 to 10.000 imp./kWh. The meter registers separately import and export of electricity. Direction of energy flow is indicated by arrows. Identification of the firmware version, incl. CRC is possible to determine from the register 0.2.0. This register is displayed on the LCD after switching on the electricity meter. The meter calibration is performed in the production based on the findings of accuracy measurement and insert of calculated calibration constants. The electricity meter has no mechanical adjustments.

Against overvoltage the meter is protected by voltage inputs. Any mismatch during wires installation is indicated on the LCD. Size of digit is 8 x 4 mm.

TECHNICAL DATA

Basic Data	
Measurement	Active energy in poly-phase four-wire distribution network, import and export energy measurement. Ability to display the sum of absolute values (A=|+AL1|+|+AL2|+|+AL3|+|-AL1|+|-AL2|+|-AL3|) or display energy import only (A = |+AL1|+|+AL2|+|+AL3| (energy export is not showen) or eventually only energy export (A=|-AL1|+|-AL2|+|-AL3|). Possibility of energy measurement in any 2 random phases or in random 1 phase.
Measurement Method	Electronic meter with shunts in current inputs
Accuracy Class	A or B
Reference Voltage U_n	3 x 230 / 400 V
Range of Operation Voltage	0.75 U_n to 1.15 U_n
Reference Frequency f_n	50 Hz
Maximum Current (I_{max})	60 A, 80 A, 100 A
Reference Current (I_{ref})	5 A, 10 A, 15 A, 20 A
Transitional Current (I_{tr})	0.5 A; 1 A; 1.5 A; 2 A
Minimum Current (I_{min})	0.15 A; 0.2 A; 0.25 A
Starting Current (I_{st})	0.03 · I_{tr}
Consumption in Voltage Circuits	
- active power input at U_n	≤ 1 W
- apparent power input at U_n	≤ 8 VA
Consumption in Current Circuits	≤ 0,1 VA (at I_{ref})
Type of Measured Energy	Active
Method of Connection	Direct
Inputs and Outputs	
Constant of the Electricity Meter	500 imp./kWh, 1.000 imp./kWh, 10.000 imp./kWh, linear
Optical Interface	IR interface and read-out as per ČSN EN 62056-21 300 to 9.600 Bd Communication mode C and A*
Impulse Output S0	Impulse Class A as per ČSN EN 62053-31
Terminal Marking Pulse Output	Terminals 20(+) and 21(-)
Constant of Output S0 - Open Collector	100 - 1.000 imp./kWh
Power Voltage	Nominal 24 VDC, max. 30 VDC
Max. Current	5 - 15 mAss
LCD	
Display Range	Up to 8 positions
Resolution Power in the Operating Mode	1 kWh
Resolution Power in the Test Mode	0.001 kWh Activation of test mode by an order. Deactivation of test mode by an order or after 180 min. or disconnecting the voltage.
Digit Height of Energy Data	8 mm
Direction of Power Transmission and Display of Energy Flow	Yes
Indications Magnetic Interference *	Yes
Indications Opening the Main Cover *	Yes
Indications Opening the Terminal Cover *	Yes
Backlighting *	Yes
Legible Display of Values	– 33 °C to + 70 °C
Impact of Surroundings	
Working Temperature	– 40 °C to + 70 °C
Storage Temperature	– 40 °C to + 75 °C
Insulation Encapsulated Devices	Protection Class II
Ingress Protection	IP54
Resistance to Permanent Magnet	Minimum 0.5 T
Mechanical Environment	M1
Electromagnetic Environment	E2
Weight and Dimensions	
Weight	1.1 kg
External Dimensions Including Terminal Cover (h x w x d)	263 x 176 x 63 mm
Mounting on the Cross	Horizontal: 150 mm Vertical: 210, 220 or 230 mm
Diameter of Current Connecting Terminals	7,6 mm
Connection Screws in the Terminal Board	SL/PZ2 Combined Cross or SL/PZ1
Screws in the Cover of the Terminal Board	SL/PZ2 Combined Cross; Ø bore for seal 2.5 mm
UV stable material box	Yes
Fire resistance terminal	As per UL94 V0

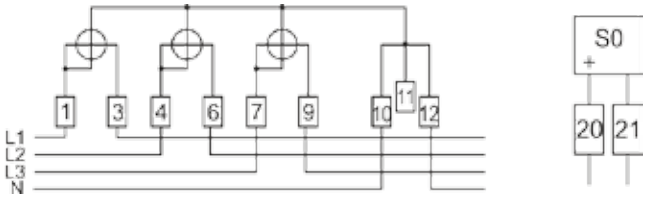
* Optional

MAIN FUNCTIONAL CHARACTERISTICS

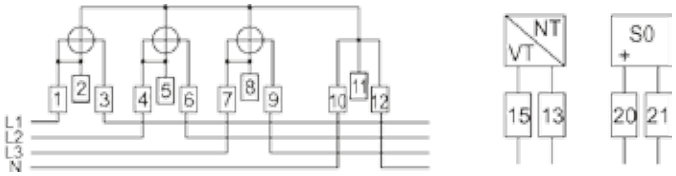
- One-tariff to double-tariff.
- Possibility of setting RTC with push-buttons.
- Universal definition of tariff switch programs or external tariff control.
- Tampering detection and event logging (external magnetic field, optionally meter case/terminal cover tampering).
- Ability to display energy values with up to 3 decimal places.
- Optionally possibility of readout during power outage.
- Optionally possibility of event recorder, historical data and consumption profile.
- Self-diagnostics.

WIRING DIAGRAM

Options (The meter model with shunts does not have to be equipped with voltage terminals 2, 5 and 8. Auxiliary terminals S0 can be marked as 20, 21 or 40, 41):



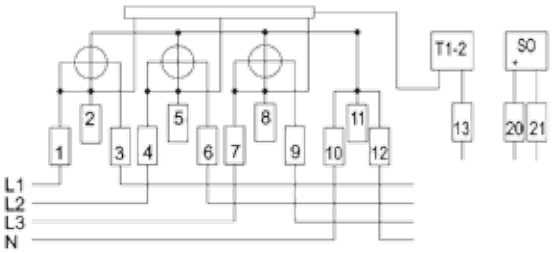
One-tariff with S0



Double-tarift with S0, tariff switching by auxiliary terminals no.13 and 15

Legend:

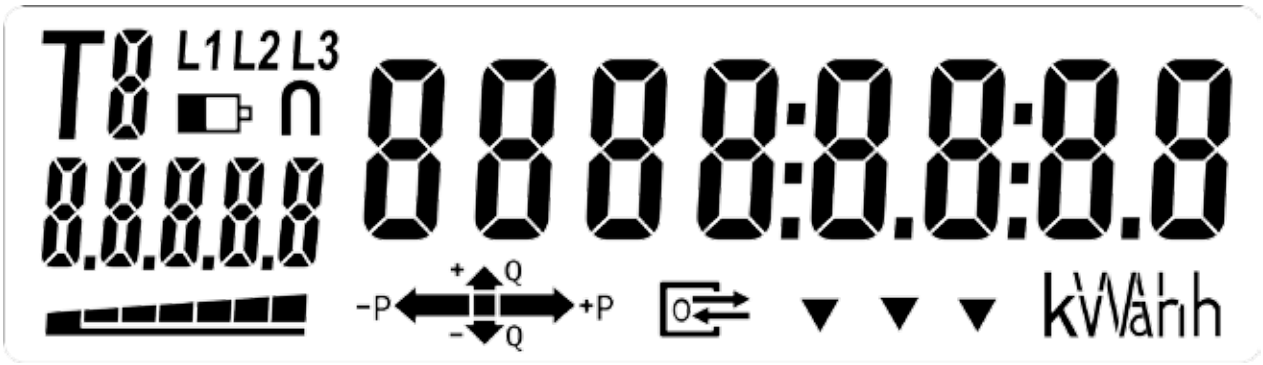
1	Input phase L1
3	Output phase L1
4	Input phase L2
6	Output phase L2
7	Input phase L3
9	Output phase L3
10, 11, 12	Neutral wire N



Double-tarift with S0, tariff switching by auxiliary terminal no.13

DISPLAY DESCRIPTION

The ZE314 electricity meter series is provided with LCD. The operation temperature range for the correct function is from –33 °C. After the connection of the electricity meter to the electrical network the test of all segments of LCD run, after that is shown CRC FW (register 0.2.0) for the short time. Thereafter remains shown standard operation mode of desplayed registers.



The symbol ▼ can indicate the active tariff, where the electricity meter reads consumption or supply. The active tariff is displayed with the applicable symbol T1 or T2 on the device label. The symbol T1 or T2 on the LCD indicates the tariff, to which the currently displayed data apply (e.g. consumption measured in that tariff).

Orientation Values of Current in Each Phase (total output in all phases) Indicated by the Bar Chart Segments

segment 1	Starting power	segment 5	2,23 A (1 536 W)
segment 2	0,035 A (24 W)	segment 6	8,90 A (6 144 W)
segment 3	0,14 A (96 W)	segment 7	35,60 A (24 576 W)
segment 4	0,56 A (384 W)		

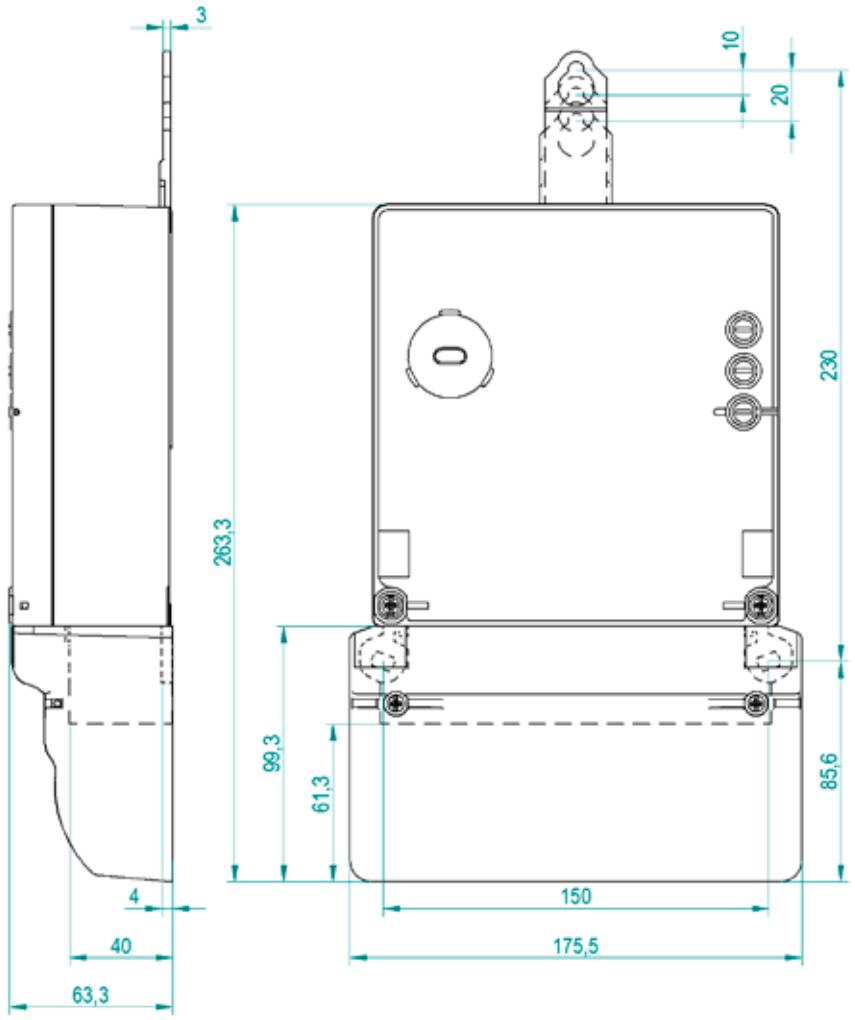
The bar chart on the LCD always indicates an orientation size of the instantaneous total output in all phases. If current is (in all phases simultaneously) below the start-up value, the bar chart is not indicated. The bar chart is flashing if supply exceeds consumption. Supply in individual phases is indicated by the symbols of occurrence of voltage (L1, L2, L3).

The phase symbols (L1, L2, L3) indicate the status of connection of the electricity meter as follows:

- L1, L2, L3 permanently displayed — the electricity meter is connected correctly, all phases present,
- Any of them not displayed — the applicable phase is missing,
- The display rotates L1 →L2→L3 — all phases present, incorrect order of phases,
- The bar chart is flashing and L1 or L2 or L3 — in the applicable phase, there is reverse direction of current (supply).

DIMENSIONAL SKETCH

Electircity meter complies as per DIN 43857.



MAINTENANCE AND STORAGE

Care And Maintenance

The device is a maintenance-free product with determined minimum operation service life of 15 years. For possible cleaning of the outside surface from dust and other impurities, the manufacturer does not recommend using organic solvents, aggressive chemicals and abrasive cleaning agents. Prescribed storage temperatures shall be complied with: failure to do so can result in shortening of electronic components service life. The product shall be protected against wet and humid conditions. It is designed for internal use, i.e. it may be used only in places providing additional protection against the effects of external environment (e.g. in a building or cabinet). Precipitation, humidity and liquids containing minerals can cause corrosion of electric circuits if the device becomes wet. The product shall not be placed on and dried by a source of heat or inserted into a source of heat (e.g. microwave oven, classic oven or radiator / heater) as it can overheat and some of its parts explode. It shall not be exposed to excessive heat as it can lead to deformation of case / cover. The device shall not be stored in cold premises, especially with subsequent warming-up (to nominal operation temperature). Humidity can condensate inside and damage electronic components or isolation properties of the product can deteriorate.

Service

Service shall be ensured by: ZPA Smart Energy a.s., Komenského 821, 541 01 Trutnov, Czech Republic, Trademark Smart Energy, Tel. + 420 499 907 111, E-mail zpa@zpa.cz, www.zpa.cz .

Transport

The device shall be packed for transport either in the original package, in which it was delivered by the manufacturer, or in a package causing / ensuring no damage due to handling or transport.

SAFETY

Manufacturer Warnings

The product is capable of safe operation. The manufacturer has issued the EU Declaration of Conformity as per Act 90/2016 Coll.
Despite this fact, the manufacturer warns of the risk of possible danger resulting from incorrect handling or incorrect use of the product as follows:

- Installation and maintenance must be performed by a personnel with the corresponding electro-technical qualification and adequately trained, that shall inform the operator on conditions of safe operation;
- The product shall not be used for purposes other than those it was manufactured for;
- The product shall not be willfully modified contrary to the type design;
- The product shall not be operated with voltage, current or frequency other than those it was produced or professionally modified for;
- The product shall be located and secured so as to complicate or disable handling by persons with no electro-technical qualification, especially children;
- Before every new putting to operation, e.g. after repair, maintenance etc., Ingress Protection shall be restored in full, all safety measures taken and inspection done by a designated electrical inspector;
- During operation, premises where the device is installed, shall be free of danger of fire or explosion in case of development of gases, vapors of inflammable liquids and occurrence of inflammable dust,
- The product shall be handled by a qualified and adequately trained person only, and handling shall be performed without voltage with the exception of measurement by measuring meter with insulated tips;
- The product shall not be operated under conditions or in an environment not ensuring safe operation (e.g. location on flammable base, cover from inflammable material, insufficient protection from penetration of foreign elements, water or other liquids);
- The product shall be located and operated in an indoor environment, i.e. in places providing additional protection against effects of external environment (e.g. inside a building or cabinet).
- The product shall not be operated in an environment with major vibrations and oscillations or under such conditions.

Failure of the user to observe any of the aforesaid warnings renders the manufacturer not being liable for a defect occurring as an incidental consequence of this failure. Non-observance of storage and operation conditions recommended in article Care And Maintenance can have an adverse effect on the device service life.

Responsibility

The owner of the device is responsible for ensuring that all persons engaged in working and handling the product:

- Are knowledgeable and qualified as per national regulations;
- Have read and understood corresponding parts of this document;
- Strictly observe safety regulations and operation data stipulated in its individual articles.

The owner of the device is further responsible for:

- Protection of persons;
- Prevention of damage to material;
- Personnel training.

Safety Instructions

The following safety instructions shall be observed under all circumstances:

- Wires the device is connected to shall be powered neither during installation nor replacement. Powered contacts pose a life thread. For this reason, until the work is finished, the corresponding power supply fuses shall be removed and stored in a place, safeguarding against unnoticed reinstallation by a person holding no responsibility;
- Local safety regulations shall be observed. The device installation shall be executed solely by qualified and trained personnel;
- With no exception, prior to terminal cover opening, current transformer secondary circuits shall be short circuited. High voltage generated during current transformer circuit interruption poses a life threat and damages the transformer;
- Transformers in medium or high voltage systems shall be grounded on one side or in a neutral point on the secondary side. Non-observance can result in their being charged to a voltage exceeding product isolation strength and also posing a life threat;
- During installation, the product shall be firmly held or secured against falling and causing injury;
- Dropped device shall not be installed even if showing no visible signs of damage. It shall be returned for inspection either to designated repair office or directly to manufacturer. Internal damage can cause functional failures or a short circuit;
- The product shall by no means be cleaned under running water or by high-pressure equipment. Water penetration can cause a short circuit. It is necessary to respect ingress protection of the device.

DISPOSAL

As per certificate ISO 14001 data, the components used in the device are mostly separable and so can be disposed of or recycled accordingly. At the end of its service life, the device shall be handed over to specialized companies dealing in used material separation and consequent recycling. An unused device shall be disposed of ecologically as per the Waste Act.

The device contains no radioactive, carcinogenic or other materials having an adverse effect either on human health or the environment. All plastic materials can be recycled.

Packing is recyclable and at the end of its service life shall be handed over to specialized companies as a source of secondary raw materials or energy.

Liquidation and Legal Regulations Concerning the Environment Protection

The product disposal shall strictly observe local regulations for environment protection.

Components	Disposal
Printed circuit boards, LCD, LED	Electronic waste. Dispose of as per local regulations.
Battery	Dangerous waste. Dispose of as per local regulations.
Metal parts	Separate and hand over to the waste collection center for disposal as per local regulations.
Plastic components	Separate and hand over for disposal or re-granulation as per local regulations.

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