

# THREE-PHASE ELECTRONIC ELECTRICITY METER

## ENERLUX T

- meters of the latest generation, multitariff, multifunctional
- active and reactive energy metering in 4 dials, class 0.2S; 0.5S; 1 (EN 62053-21; EN 62053-22; EN 62053-23)
- demand registering
- communication possibilities (EN 62056-21)
- DLMS/COSEM compliant

ENERLUX T meters belong to the category of the work measuring means and are meant for active and reactive electric energy metering for residential consumers and commercial and industrial agents that use multi-tariff systems for electric energy billing on low, medium and high voltage networks. The instrument enables electric energy metering in both directions of energy circulation.

### TECHNICAL CHARACTERISTICS

#### Rated values:

- Rated voltage  $U_n$  (V): 3x58/100 V...3x240/416 V; 3x100 V...3x416 V
  - Rated current  $I_n$  (A): 1 A, 5 A for the meter with transformer connection
  - Base current  $I_b$  (A): 5 A, 10 A for the meter with direct connection
  - Maximum current  $I_{max}$  (A): - 6 A, 10 A, 20 A for the meter with transformer connection  
- 40 A, 60 A, 80 A, 100 A for the meter with direct connection
  - Rated frequency  $f_n$  (Hz): 50 Hz or 60 Hz
  - Frequency range (Hz): 45...65
  - Meter constant (imp/kWh): 1000/5000/10000
- \* Other variants available on request.

#### Accuracy characteristics and influences:

- class 0.2S, 0.5 S, for active energy, according to EN 62053-22;
  - class 1, 2, for active energy, according to EN 62053-21;
  - class 2, 3, for reactive energy, according to EN 62053-23;
- Time base accuracy:  $\max. \pm 0.5s/24h$  according to EN 62053-21

#### Climatic characteristics:

- Operating temperature range:  $-40...+60^\circ C$
- Transport and storage temperature:  $-40...+80^\circ C$

#### Mechanical and constructive characteristics:

- Overall dimensions: according to figure 2
- Display: LCD custom design  
80x30 mm according to fig. 1
- Wiring diagram: L1L1L2L2L3L3NN
- Optical port and current loop: according to EN 62056-21
- Protection degree: IP 51
- Meter testing device: LED for imp/kWh + LED for imp/kvarh



#### Equipment options:

- A - Auxiliary supply voltage;
  - D - Sealable maximum demand reset button;
  - M\* - RS232 port for remote reading;
  - N\* - RS485 port for remote reading;
  - S - Sealable button for blocking the parameters changing
  - C - Load profile memory;
  - G - Pulse generator;
  - R - Signalling relays;
- \* options M and N can not be chosen together for the same meter

The 3 auxiliary outputs (G and R equipment options) can be configured as:

- pulse generators;
- signalling relays;

The electrical characteristics of the auxiliary outputs:

- voltage max. 40 V;
- current max. 100 mA;
- pulse length for the pulse generator: min. 30 ms

#### Operational characteristics:

- **Energy metering**, as presented below:
  - 2 registers of active imported, exported active energy (W+, W-);
  - 4 registers of active energy in quadrants I, II, III, IV).

The energy types, as per clauses a) and b) (programmable) can be metered in up to 4 time zones.

- **Maximum demand registering**

The meter is provided with:

- 8 registers for 8 demands
- 8 cumulative registers corresponding to the 8 demands

Each of the 8 demands can be programmed to be calculated from each of energy types, according to clauses a) and b).

The programmable time interval with 5, 10, 15, 20, 30, 60 min. using block or sliding window method.

The demand registering functions can be suspended for some time after the supply breakdown and its resuming. The time interval will be programmable from 0 to 60 minutes with one minute resolution.

• **Clock-calendar**

The meter is provided with the clock-calendar function and the observance of leap years.

The meter clock-calendar function enables the automatic change of the summer/winter hour according to "last Sunday in March/October" rule, with programmable changing hour and direction, and with the possibility of disabling this function.

• **Tariff programs**

The meter enables tariffing the energy in up to 4 time zones. The measured energy types, as per clauses a), b) can be configured to be tariffed in time zones. There can be defined two tariffing sequences in the tariffing program for time zones; one is currently active, the other is resident (the start data is programmable).

The time zones metering program is annual. There can be defined up to 12 seasons in a year. Within each season, the weekly program will be defined, it being made up of 7 types of days chosen from the 24 types of days which can be defined. Every day there can be defined up to 12 switchings for each of the two sequences of the daily program. The programming resolution is of 30 minutes.

There can also be defined 64 more holidays groups within the tariffing program. The time length of a holidays group can be programmed for an interval of 1 to 4 days. Each holidays group of days can be defined with or without annual repetition.

• **Meter self-reading** (for billing purposes)

The meter self-reading enables the following:

- energy indexes memorizing (30 registers);
- registered demands memorizing;
- demands summing up in cumulative registers;
- demand registers with automatic reset;
- billing time interval.

The meter memorizes the self-read values of the last 12 self-readings.

• **Load profile (optional)**

The load profile memorizing capacity ensures for 6 channel and 15 min. acquisition period, 45 days time length.

Profile channels is programmable. The load profile acquisition period is programmable with 1...60 min. The load profile registers absolute energy values (not differences), and time markers for any acquisition.

• **Events**

The list of events contains 500 events.

Types of events:

- 1). Supply voltage drop
- 2). Restored supply voltage
- 3). Voltage drop on phase R
- 4). Restored voltage on phase R
- 5). Voltage drop on phase S
- 6). Restored voltage on phase S
- 7). Voltage drop on phase T
- 8). Restored voltage on phase T
- 9). Frequency exceeds -6%...+4% fn range, limits according to EN 50160
- 10). Energy direction reversing
- 11). Positive energy direction
- 12). RTS phases succession (fault)
- 13). RST phases succession (normal)
- 14). Meter programming (without clock)
- 15). Meter clock programming
- 16). Low battery
- 17). Measuring circuit error
- 18). Different energy directions per phase
- 19). Normal energy direction per phase restored

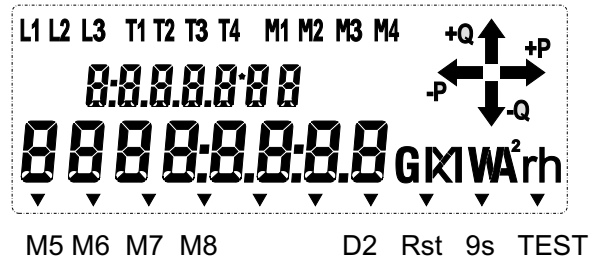


Fig. 1

• **Display**

According to figure 1, the LCD displays the following:

- voltage on each phase L1, L2, L3;
- active tariff (T1, T2, T3, T4);
- the programmed demand which is calculated as per programming (M1, M2, M3, M4, M5, M6, M7, M8);
- code of displayed quantity according to IEC 62056-61 Electricity metering - Data exchange for meter reading, tariff and load control - Part 61 - OBIS Object Identification System;
- the measured value, displayed on up to 8 digits;
- measuring units for active, reactive, apparent energies and powers, voltages, currents, with k, M, G multiples;
- quantities measured by the meter (active power in one or two directions +P and -P and/or reactive power in one or two directions +Q and -Q);
- momentary directions of active and reactive measured energy: active imported energy  $\rightarrow$ , active exported energy  $\leftarrow$ , reactive imported energy  $\uparrow$ , reactive exported energy  $\downarrow$
- annunciators which indicate the following:
  - meter operation with the second display sequence, "D2 annunciator";
  - demands reset and the meter self-reading, "RST annunciator";
  - the last 9 seconds for the demand calculation time interval, "9S annunciator";
  - test mode meter operation, "TEST annunciator".

Meter display modes: two programmable sequences, that can be scrolled manually or automatically.

• **Errors and warnings diagnosis**

The meter is provided with self-diagnosis facilities. If an error is detected, on the screen appears and remain the message: Err: x x x x x x

- x can be 1 for measuring circuit error
- 2 for energy registers error
- 3 for firmware memory error
- 4 for calibration zone error
- 5 for tariffing program error

• **Communication**

Through the optical port and current loop, according to EN 62056-21.

For modem communication or other possibilities, according to IEC dedicated (optional), the meter is provided with RS232 port or RS485 port.

The meter is provided with GSM GPRS modem.

The billing and load profile data could be sent by the meter under DLMS protocol.

• **Supplementary functions**

- Three configurable auxiliary outputs:
  - 2 pulse generators outputs that can be configured for active and reactive energy (optional);
  - 3 relay outputs (optional) that can be configured for: signalling out the power threshold exceeding; signalling out the interval end; load control.
- facilities concerning the energy quality, according to EN 50160:
  - time metering with  $f_n$  outside  $f_n \pm 1\%$  range;
  - time metering with  $U_n$  outside  $U_n \pm 10\%$  range;
  - event generation at  $f_n$  outside  $f_n -6\% \dots +4\%$  range.

**SYMBOLS**

ENERLUX T - A, C, D, G, M, Mg, N, R, S (option)  
 3x230/400 V, 1(6) A, 50 Hz, cl. 0.5S

**OVERALL AND FIXING DIMENSIONS, SEALS:**

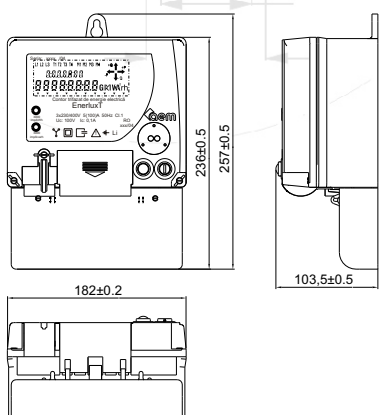


Fig. 2

**WIRING DIAGRAM:**

