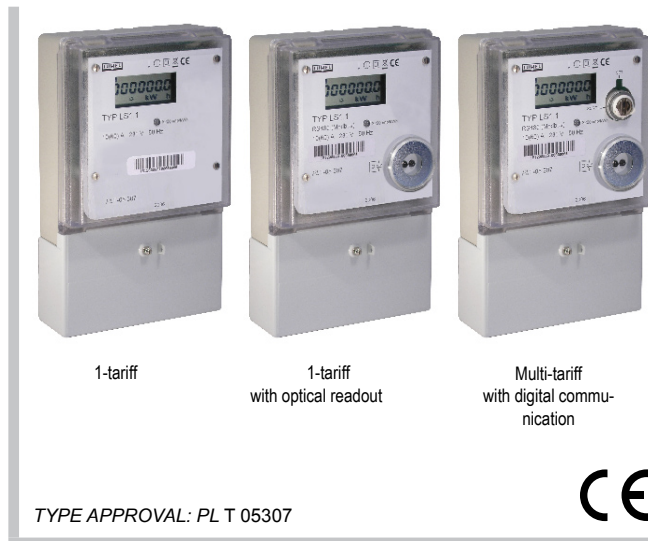


# ELECTRONIC SINGLE-PHASE WATT-HOUR METER WITH DIGITAL COMMUNICATION LS1.1 TYPE



- sequential display of measured quantities on the LCD display:
  - active energy in time zones and summary,
  - energy at the end of the account period in time zones and summary, date and time of the account period closing,
- 15 or 60 minutes' maximal averaged power, with a time index,
- cumulated power.

## APPLICATION

LS1.1 electronic watt-hour meters are destined for the direct measurement of active energy in single-phase power networks with the simultaneous display of measured quantities.

They can be applied for settlement of accounts with electric power plants, inspection of industrial processes, for settlement of accounts with sub-hirers and as an element of energy management systems.

These LS1.1 watt-hour meters are equipped with a dedicated 7-digit LCD display with additional graphic symbols. In standard equipment there is also a pulsing red diode (LED) with a define time constant: imp/kWh and an interface for data transmission in infrared.

The housing enables the placement of verification leaden seals on its shield, and leaden seals of the energy distributors, on the terminal box cover.

These watt-hour meters are destined to be mounted on a wall.

They fulfill following standard requirements: EN 62052-11, EN 62053-21, for active energy and EN 62056-21 for data interface transmission in infrared.

## Extra functions

- display of customer code,
- display of the current date and real time,
- calendar of holidays,
- storage of annual program of the day division into time zones, separately for day-offs with the possibility to introduce changes by means of the photo-electric coupling,
- automatic closing of account periods in the given day of the month at a defined time or on request, on the readout day (photo-electric coupling),
- recording of the external magnetic field presence,

## ANTITHEFT PROTECTION

**LS1.1 electronic watt-hour meters are resistant to strong external magnetic fields of 640 kA/m intensity.**

In watt-hour meters of LS1.1 series, a specially designed antitheft protection is applied in the mechanical design system, electronic system and in the software.

The specially designed LS1.1 watt-hour meter cover makes impossible its deflection in order to interfere in electronics.

The cover is fixed by means of two screws, what gives a fast connection additionally protected by leaden seals. There is a rubber seal under the cover, protecting against water and dust infiltration. The watt-hour meter terminal shield is screwed by two screws to the terminal box which can be additionally sealed with lead.

Moreover, the watt-hour meter has a sensor signaling any interaction by a strong magnetic field (e.g a neodymium magnet). After such an interaction by an external magnetic field, the occurrence date and the interference duration are stored in the watt-hour memory.

Any interference is signaled by a flickering symbol on the display.

LS1.1 watt-hour meters makes energy measurements also when

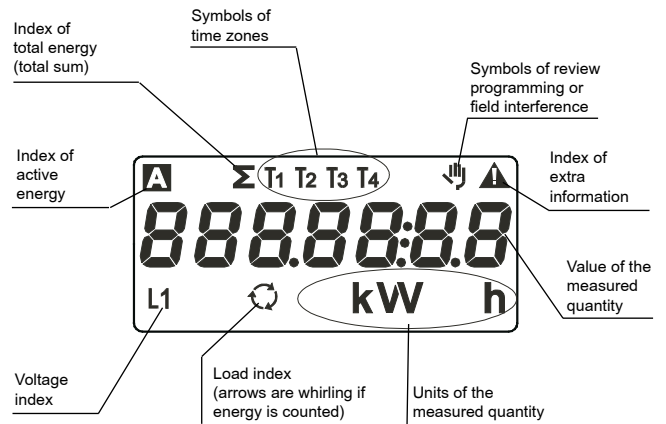
## ADVANTAGES AND FEATURES RESULTING FROM THE APPLICATION OF LS31 WATT-HOUR METERS

- accuracy class 1 or 2 and stability in a large range of loads and temperatures,
- internal and external clock to switch tariffs,
- change of tariff parameters by the button on the frontal cover or through the opto-coupling,
- ca 20 years working life,
- measurements and monitoring of energy consumption in different periods and parameter storage.

## TECHNICAL DATA

<b>Kind of network</b>	2 - wire
<b>Connection way of the watt-hour meter</b>	direct
<b>Reference voltage <math>U_n</math></b>	230 V
<b>Basic current <math>I_b</math></b>	5 or 10 A
<b>Maximal current <math>I_{max}</math></b>	40 or 60 A
<b>Accuracy class</b>	1 or 2
<b>Working temperature range</b>	- 25... 55°C
<b>Storage ambient temperature</b>	- 30... 85°C
<b>Power consumption:</b>	
- in voltage circuit	≤ 8 VA/0.3 W
- in voltage circuit	≤ 7 VA/1.3 W (for watt-hour meter with RS-485, RS-232 interfacesor radio module)
- in current circuit	≤ 0.015 VA
<b>Starting current</b>	0.004 $I_b$
<b>Detection level of the voltage presence</b>	0.90 $U_n$
<b>Pulse constant of the LED diode</b>	3200 imp./kWh or another (to agree)
<b>Readout field</b>	special LCD display
<b>Communication interfaces</b>	acc. to the version code
<b>Output of energy pulses</b>	output of O.C. type, passive
<b>Stała impulsowania wyjścia</b>	3200 imp./kWh or another (to agree)
<b>Tariff input</b>	1 input (2 tariffs), switched by voltage $U_n$
<b>Available tariffs</b>	G11, G12, G12w, G13, C12a, C12b, C12w, C22a, C22b, 1 tariff programmed by the user
<b>Number of tariff zones</b>	from 1 to 4
<b>Resistance against external permanent magnetic field</b>	640 kA/m
<b>Resistance against surge voltages</b>	4 kV
<b>Reaction of the watt-hour meter to voltage decays</b>	Storage of data and the - watt-hour meter state after the decay in the FRAM non-volatile memory, storage durability: min. 15 years
<b>Battery life</b>	min. 10 years
<b>Clock accuracy</b>	± 2 s/day
<b>Protection degree ensured by the housing</b>	IP 54
<b>External dimensions (H × W × D)</b>	203 × 122 × 65 mm
<b>Weight</b>	ca. 0.75 kg

## Appearance of the LCD display



## ORDER CODES

Electronic 1-phase watt-hour meter	LS1.1 -	X	X	XX	X	X	X
<b>Basic and maximal current:</b>							
5 (40) A.....	1						
5 (60) A.....	2						
10 (40) A.....	4						
10 (60) A.....	5						
on order <sup>1)</sup> .....	X						
<b>Input voltage:</b>							
230 V.....	1						
on order <sup>1)</sup> .....	X						
<b>Communication interface:</b>							
optical port.....	00						
optical port + impulse output (OC type).....	01						
optical port + RS-485 (Modbus) output.....	02						
optical port + RS-232 (Modbus) output.....	04						
without optical port and interfaces <sup>3)</sup> .....	05						
optical port + radio module <sup>1)</sup> .....	20						
on order <sup>1)</sup> .....	XX						
<b>Accuracy class:</b>							
1.....	1						
2.....	2						
<b>Tariffs:</b>							
one-tariff without internal clock.....	1						
one-tariff or multi-tariff with internal clock.....	2						
two-tariff with external clock <sup>1)2)</sup> .....	3						
<b>Acceptance tests:</b>							
without legalization.....	8						
with legalization.....	7						
acc. to user's agreements <sup>1)</sup> .....	X						

<sup>1)</sup> - Custom-made version, one must agree with the manufacturer

<sup>2)</sup> - Concerns only version LS1.1 - X X 00 X X X (optical port)

<sup>3)</sup> - Concerns only the LS1.1 - X X XX X 1 X version, one tariff watt-hour meter without internal clock.

## ORDERING EXAMPLE:

The code: **LS1.1 - 2 1 01 1 1 8** means:

- LS1.1** - electronic single-phase watt-hour meter
- 2** - basic and maximal current: 5 (60) A
- 1** - input voltage: 230 V
- 01** - with optical port + impulse output of OC type
- 1** - accuracy class: 1
- 1** - one-tariff watt-hour meter without internal clock
- 8** - without legalization