

ELECTRIC ENERGY METERS

PURPOSE

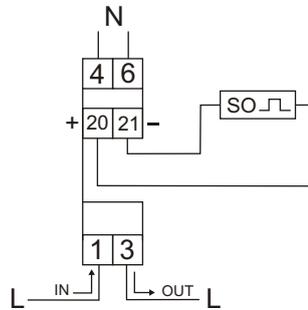
LE are a static (electronic) rated electric energy meters which are to serves as an auxiliary meters to measure the energy consumption in a direct system.

FUNCTIONING

The meter is equipped with a special electronic circuit which generates pulses proportionally to electric energy consumption in a given phase by means of the current flow and voltage applied. The sum of the pulses from *t* is signalled by blinking of an LED, calculated in phase into the electric energy consumed in the system, and finally its total value is indicated by a mechanical drum counter. For LE-01 and LE-03 the last red digit in the counter indicates 0.1 kWh (100 Wh), 1/10 kWh (100Wh).

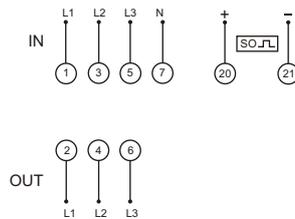
DIRECT MEASUREMENT TYPE

LE-01 / LE-01d SINGLE-PHASE



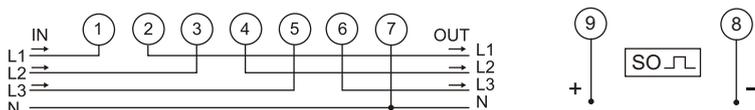
reference voltage	230V AC ±30%
basic current	5A
maximum current	45A
minimum current	0,02A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<8VA; <0,4W
drum counter indication range	
LE-01	0+99999.9 kWh
LE-01d	0+99999.99 kWh
constant of a meter (1Wh/pulse)	1000 pulses/kWh
current consumption signal	1×red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 27V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1Wh/pulse)	1000 pulses/kWh
czas impulsu SO+ SO-	90msek
working temperature LE-01	-20+65°C
LE-01d	-20+50°C
protection level	IP20
connection	6mm ² screw terminals
measurements	1 modules (18 mm)
fixing	on rail TH-35

LE-02d THREE-PHASE



reference voltage	3×230/400V+N
basic current	5 A
maximum current	63A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999.99 kWh
constant of a meter (1,25 Wh/pulse)	800 pulses/kWh
current consumption signal	3×red LEDs
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1,25 Wh/pulse)	800 pulses/kWh
working temperature	-20+50°C
protection level	IP20
connection	16mm ² screw terminals
measurements	4,5 modules (75 mm)
fixing	on rail TH-35

LE-03 / LE-03d THREE-PHASE TYPE



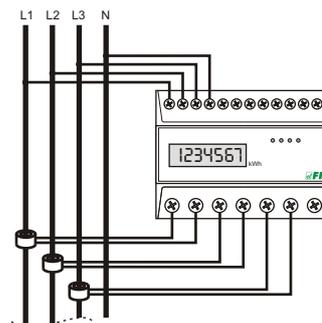
reference voltage	3×230/400V+N
basic current	10 A
maximum current	100A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999.9 kWh
constant of a meter (1,25 Wh/pulse)	800 pulses/kWh
current consumption signal	3×red LEDs
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1,25 Wh/pulse)	800 pulses/kWh
working temperature LE-03	-20+65°C
LE-03d	-20+50°C
protection level	IP20
connection	25mm ² screw terminals
measurements	7 modules (122 mm)

TO CO-OPERATION WITH A CURRENT TRANSFORMERS

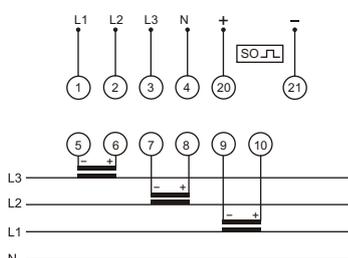
PURPOSE

These meters are intended for current transformers with a secondary current of 5A. Maximum measured current of the system is specified by the value of the primary current while using the current transformer.

Current transformers - see the chapter 28.



WITH PROGRAMMABLE CURRENT TRANSDUCER RATIO LE-02d CT THREE-PHASE TYPE



reference voltage	3×230/400V+N
basic current	3×1,5A
max current	3×6A
secondary current	5A
min current	0,04A
measure precision with IEC61036	class 1
meter's own power consumption	<10VA; <2W
number of LCD signs	8
range of display reports	dependent on transmission
constant of the meter	12000imp/kWh
current consumption signal	3×LED red
meter signal	LED red
impulse output SO+ SO-	open collector
connection voltage SO+ SO-	<30V DC
connection current SO+ SO-	<27mA
constant SO+ SO-	dependent on transmission
working temperature	-20+55°C
protection level	IP20
connection	screw terminals 25mm ²
dimensions	4,5 modules (75mm)
fixing	on the rail TH-35

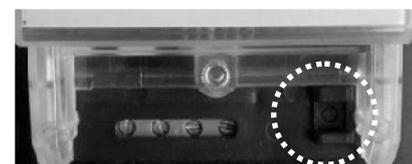
FUNCTIONING

The user has the ability to set the index value used gear ratio, which allows you to indicate the actual value taken by the electricity system.

In the memory of indicator are preserved values of primary currents I_p transformers feasible. Choosing the appropriate value in accordance to the values of the connected transformers automatically sets the appropriate factor, according to which computes the actual value of the electricity taken. The LCD displays the actual value of the energy collected in a format depending on the selected gear.

CT currents I_p inscribed in memory of the indicator:

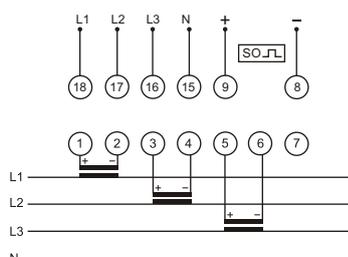
5, 20, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1250, 1500, 2000, 2500, 3000, 4000, 5000, 6000.



przycisk programowania

LE-03d CT200 / LE-03d CT400

TO CO-OPERATION WITH A DEDICATED CURRENT TRANSFORMERS

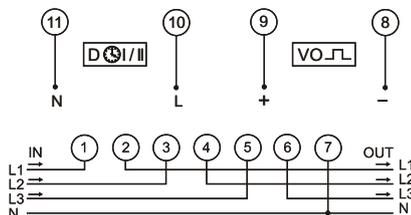


type of transformer	LE-03d CT200	200/5A
	LE-03d CT400	400/5A
reference voltage	3×230/400V+N	
basic current	3×1,5 A	
maximum current	3×5A	
minimum current	0,04A	
measurement accuracy per IEC61036	class 1	
counter's own power consumption	<10VA; <2W	
drum counter indication range	0+999999,9 kWh	
constant of a meter	(0,083Wh/imp)	12000imp/kWh
current consumption signal	3×red LEDs	
read-out status signal	red LED	
pulse output SO+ SO-	open collector	
connection voltage SO+ SO-	< 30V DC	
connection current SO+ SO-	< 27mA	
constant SO+ SO-	(0,083Wh/imp)	12000imp/kWh
working temperature	-20+55°C	
protection level	IP20	
connection	25mm ² screw terminals	
measurements	7 modules (122 mm)	
fixing	on rail TH-35	

In the case of transformers with dedicated operating parameters, the meters display the actual value of the power consumed by the system.

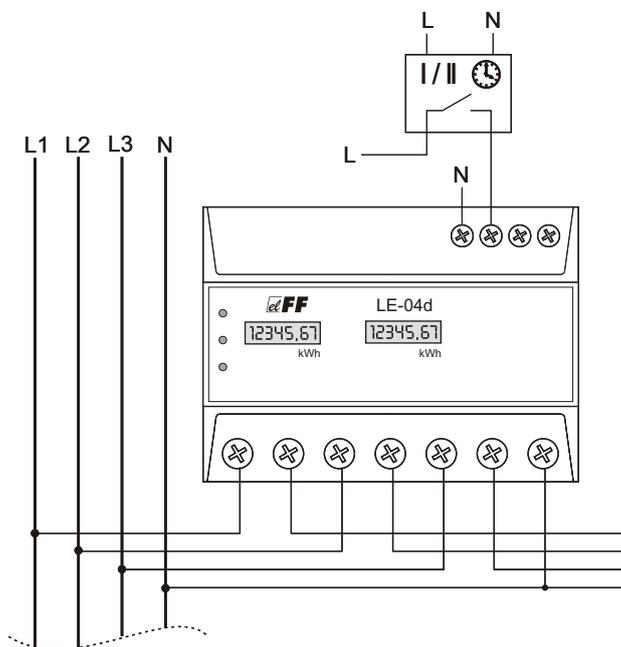
TWO-TARIFFS TYPE

LE-04d



reference voltage	3×230/400V+N
basic current	10A
max current	100A
min current	0,04A
measure precision with IEC61036	class 1
meter's own power consumption	<10VA; <2W
range of display reports T0 i T1	0+99999,99kWh
constant of the meter	(1,25Wh/imp) 800imp/kWh
current consumption signal	4×LED red
meter signal T0 i T1	2×LED red
impulse output VO	open collector
connection voltage VO	<24V DC
connection current SO+ SO-	<30mA
constant VO	(1,25Wh/imp) 800imp/kWh
working temperature	-20+55°C
protection level	IP20
connection	screw terminals 25mm ²
dimensions	7 modules (122mm)
fixing	on the rail TH-35

The counter is equipped to measure the electricity in two tariff system. The values indicated in the power tariffs are separate displays T0 and T1. Switching between the tariffs is fed to the input control voltage meter D (joints 10-11). This can be used for controlling the external clock. Counter T0 read energy input in the absence of voltage control at the entry to the T1 D. Meter read energy input from the control voltage appears at the entrance to the D decay. Operation of the meter is indicated by shine the corresponding LED.



Pulse output supply system with connected external counting machine

FUNCTIONING

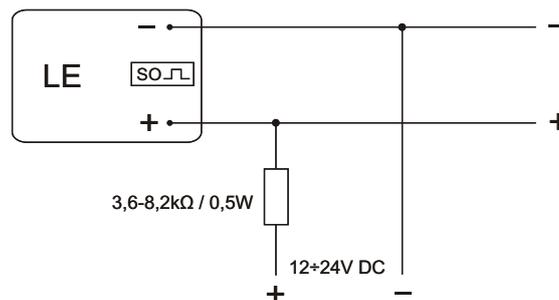
In order to connect to electricity energy meter counting device has to be connected in parallel to the system power supply 12±24V DC through resistor 3.6 ÷ 8.2 kOhm / 0,5 W current limiting. Maximum load counting circuit is 27mA.

ATTENTION!

Changing the polarization of power can damage the meter pulse output.

ATTENTION!

In the absence of connecting an external counting device is not allowed to connected to the output pulse power system.



WITH RS-485 PORT AND MODBUS RTU COMMUNICATION PROTOCOL

PURPOSE

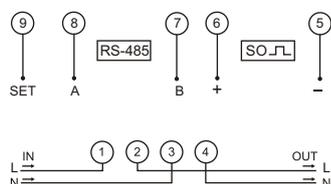
Energy meters *M. series* are used for reading and recording taken of electricity with possibility of remote readings of energy meters registers group via wired network in RS-485 standard.



FUNCTIONING

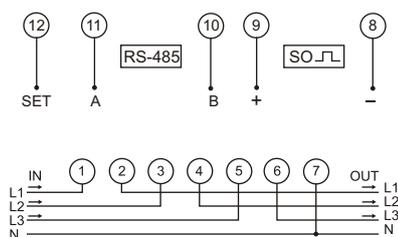
Communication with energy meters as a slave device is in compliance with the standard Modbus RTU via RS-485. The indication is written in the form of consecutive bytes of hex. When converted to decimal form we obtain the result in kWh consistent with the indications on the display counter.

LE-01M SINGLE-PHASE TYPE



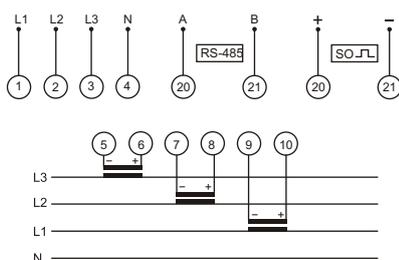
reference voltage	230V AC ±30%
basic current	10 A
maximum current	100A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+99999,99 kWh
constant of a meter(0,625Wh/pulse)	1600 pulses/kWh
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO-(0,625 Wh/pulse)	1600 pulses/kWh
port	RS-485communication
ation protokol	MODBUS RTU
working temperature	-20+50°C
protection level	IP20
connection	25mm ² screw terminals
measurements	4,5 modules (75 mm)
fixing	on rail TH-35

LE-03M THREE-PHASE TYPE



reference voltage	3×230/400V+N
basic current	3×10A
maximum current	3×100A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999,9 kWh
constant of a meter (1,25Wh/pulse)	800 pulses/kWh
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1,25Wh/pulse)	800 pulses/kWh
port	RS-485communication
ation protokol	MODBUS RTU
working temperature	-20+50°C
protection level	IP20
connection	25mm ² screw terminals
measurements	7 modules (122mm)
fixing	on rail TH-35

LE-03M CT WITH PROGRAMMABLE CURRENT TRANSDUCER RATIO



reference voltage	3×230/400V+N
basic current	3×1,5A
max current	3×5A
second current	5A
min current	0,04A
measure precision with IEC61036	class 1
meter's own power consumption	<10VA; <2W
range of display reports	dependent on transform
constant of the meter (for 5/5A)	1200pulses/kWh
current consumption signaling	3×red LED
reading signaling	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	<30V DC
connection current SO+ SO-	<27mA
constant SO+ SO-	dependent on transform
port	RS-485
communication protokol	MODBUS RTU
working temperature	-20+55°C
protection level	IP20
connection	screw terminals 25mm ²
dimensions	7 modules (122mm)
fixing	on the rail TH-35

In the memory index values are preserved primary currents I_p transformers feasible. Choosing the appropriate value in accordance with the values of the connected transformers automatically sets the appropriate factor, according to which computes the actual value of the electricity taken. This value is projected on the LCD display format depending on the selected gear.

PULSE METER

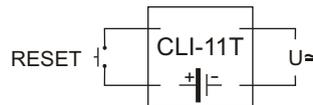
PURPOSE

Pulse meters are intended for counting AC/DC voltage signals, generated by additional peripheral devices in order to determine the number of carried out working cycles in automatics systems, e.g. in order to control the number of press strokes, the number of revolutions of a rotating device, the number of components leaving the production line, etc.

CLI-11T

FUNCTIONING

CLI-11T meter is a one-way meter, enabling the counting of pulses from 0 to 999999 range (six digits). It is equipped with RESET input for the connection of an external button, enabling the resetting of the meter state for any value.



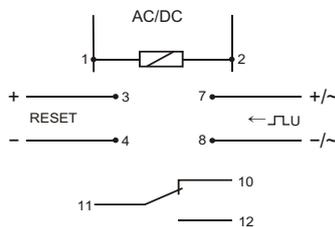
Supply	(non-voltage type) internal battery
Battery life	10 years
T input voltage	
CLI-11T 230V	110+240V AC/DC
CLI-11T 24V	4+30V DC
maximum counting frequency	200Hz
RESET input	non-voltage type
display	8 characters / h 6.7mm
precision	1%±1digit
connection	screw terminals 1,5mm ²
working temperature	-5+50°C
dimensions	96×96×92mm
fixing hole	92×92mm

CLI-01 PROGRAMMABLE

CLI-02

FUNCTIONING

CLI-01 is a programmable, one-way type electronic meter enabling the counting of external pulses in 0 to 99 999 999 range. Pulses are counted from 0 to value set by the user. After reaching the limiting value, the meter will stop to count. Meter will count from 0 again after reset.



supply	24+264V AC/DC
T input voltage low state	0+4V
T input voltage high state	5+264V
RESET input voltage	24+264V
maximum frequency for DC signal	5kHz
maximum frequency for AC signal	50Hz
maximum relay load current	8A
power input	1,5W
operating temperature	-20+50°C
terminal	screw terminal 2,5mm ²
dimensions	3 modules (52,5mm)
assembly	TH-35 bus

FUNCTIONS

- * control panel, enabling programming and the monitoring of device operation
- * T input, adapted for operation with AC/DC signal, 5 to 264V amplitude and 50 Hz frequency for AC and 5kHz for DC signals
- * possibility to set THRESHOLD parameter (1÷99 999 999 range), specifying the limiting number of pulses counted in a single operation cycle
- * external RESET input
- * relay output signaling the preset meter state (contact 1C/O 8A)
- * local counter, reset using the external reset input or using RESET button
- * total counter for all impulses (loop mode 0 → 99 999 999 → 0 → ... or reset using the meter configuration menu)
- * digital filter, enabling the limiting of maximum frequency of the counted pulses (in order to reduce interferences on meter input)
- * local and total meter state memory after supply failure
- * program menu in three languages: Polish, English or Russian

ADDITIONAL FUNCTIONS OF CLI-02:

- * 'downward' counting mode to the selected value with zero value signaling (e.g. 9999 → 0)
- * selection of input pulse edge (leading or trailing) the counter will react to
- * possibility of automatic local counter reset (loop mode) with possibility to set selected relay action
- * relay action selection: pulse with set time length; ON OFF or OFF ON state change
- * scaling pulse values according to set multiplier or divider
- * limiting access to program menu using PIN code

WORKING TIME METERS

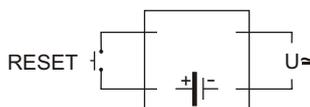
PURPOSE

Working time meters are intended for counting the number of working hours in automatic production processes or the number of device working hours, which, due to safety requirements and operation efficiency have limited overhaul life, i.e. operational capacity that may not be exceeded (e.g. advanced power units, special radioactive lamps, etc.).

CLG-13T with button RESET CLG-14T without button RESET

FUNCTIONING

CLG-13T meter is an electronic, one-way meter, enabling the counting of working hours in 0 to 99999,9 range (five digits + one decimal). It is equipped with RESET input for the connection of external button and RESET button in front (with locking), enabling counter state reset for any value.

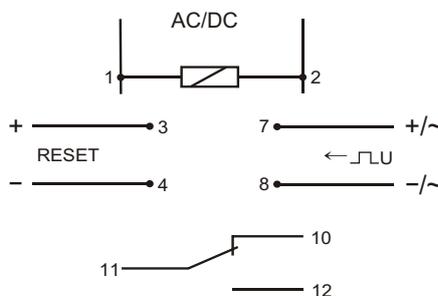
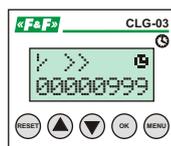


Supply	(non-voltage type) internal battery	
Battery life	10 years	
T input voltage		
CLG-11T 230V	110+240V AC/DC	
CLG-11T 24V	4+30V DC	
CLG-14T 230V	110+240V AC/DC	
maximum counting frequency	200Hz	
RESET input	non-voltage type	
display	6 characters / h 6.7mm	
precision	1%±1 digit	
connection	screw terminals 1,5mm ²	
working temperature	-5+50°C	
dimensions	96×96×92mm	
fixing hole	92×92mm	

CLG-03

FUNCTIONING

CLG-03 is a programmable, multi-function electronic meter, enabling the counting of working hours of the connected devices or systems in 1 to 999 999 range, corresponding to 114 years of operation. Working time is counted according to an individual program, set by the user. After reaching the limiting value, the meter will configure itself according to individual user's needs.



zasilanie	24+264V AC/DC
napięcie wejścia zliczającego	4+264V
prąd obciążenia przekaźnika	8A
pobór mocy	1,5W
temperatura pracy	-20+50°C
przyłącze	zaciski śrubowe 2,5mm ²
wymiary	3 moduły (52,5mm)
montaż	na szynie TH-35

FUNCTIONS

- * control panel, enabling programming and the monitoring of device operation
- * T input for DC signal and AC signal 50 Hz
- * counting time upwards without threshold value
- * 'downward' counting mode to the selected value with zero value signaling (e.g. 9999 → 0)
- * counting working time with high state (constant voltage) at the T input
- * counting working time between two pulses given at the T input
- * counting time upwards to the selected threshold value
- * external RESET input
- * relay output signaling the preset meter state (contact 1C/O 8A)
- * relay action selection: pulse with set time length; ON → OFF or OFF → ON state change
- * local and total meter state memory after supply failure
- * limiting access to program menu using PIN code
- * setting display illumination mode
- * program menu in three languages: Polish, English or Russian