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ELECTRIC ENERGY METER
single-phase

LE-01d

WARRANTY. The F&F products are covered by a warranty of the 24 months from the date of purchase. Effective only with proof of purchase. Contact your dealeror directly with us. More information how to make a compliant can be found on the website: www.fif.com.pl/reklamacje

5 9 0 8 3 1 2 5 9 2 3 5 8

Do not dispose of this device to a garbage bin with other unsorted waste!
In accordance with the Waste Electrical and Electronic Equipment Act any household electro-waste can be turned in free of charge and in any quantity to a collection point established for this purpose, as well as to the store in the event of purchasing new equipment (as per the old for new rule, regardless of brand). Electro-waste thrown in the garbage bin or abandoned in the bosom of nature pose a threat to the environment and human health.

Compliance

MID Directive / Standard EN50470-1/3

Purpose

LE-01d is a static (electronic) calibrated electricity meter of single-phase alternating current in a direct system.

Operation

A special electronic system under the influence of flowing current and applied voltage generates pulses proportional to the drawn energy. Energy consumption is indicated by a flashing LED. The amount of pulses is converted into energy input, and its value is displayed by the segment LCD display. The fractional digits represent the hundredths (.01 kWh = 10Wh)

Pulse output

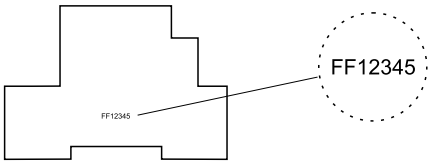
The meter is equipped with pulse output SO+ - SO-. This allows you to connect another pulse device (SO) that reads pulses generated by the meter.
No additional connected equipment is required for proper operation of the meter.

Sealing

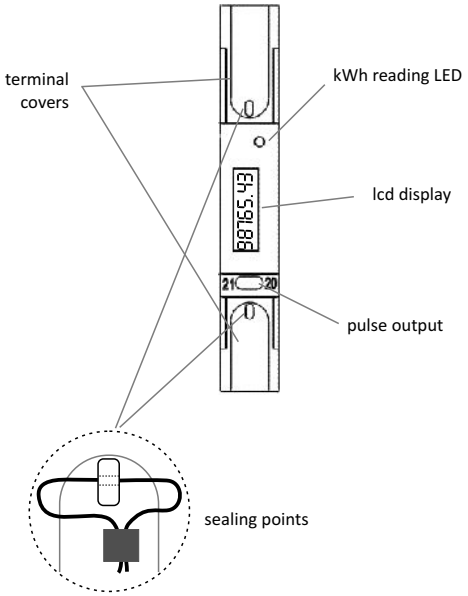
The meter has sealable input and output terminal covers to prevent any attempts to bypass the meter.

Meter number

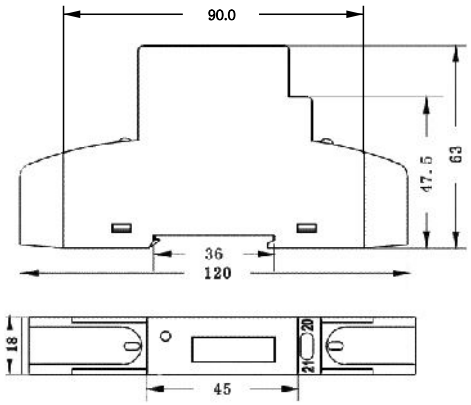
The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed.



Meter front description



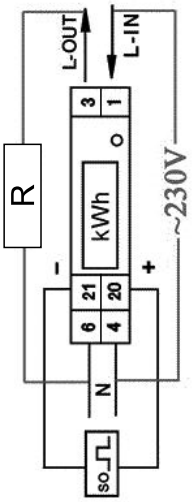
Dimensions



Specification

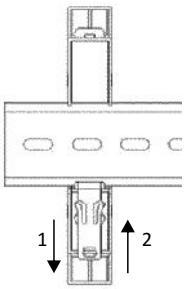
reference voltage		230VAC 50Hz
base current		0,25÷5A
maximum current		50A
minimum current		0,02A
accuracy class		B
compliance		MID / EN50470-1/3
own power consumption		<8VA; <0,4W
indication range		0÷99999,99kWh
meter constant	(1 Wh/pulse)	1000pulses/kWh
kWh read-out signalling		red LED
SO+ SO- pulse output		open collector
SO+ SO- connection voltage		<12÷27V DC
SO+ SO- connection current		<27mA
SO+ SO- constant	(1 Wh/pulse)	1000pulses/kWh
SO+ SO- pulse duration		90ms
SO+ SO- wire lenght		<20m
working temperature		-25÷55°C
protection grade		IP20
terminal		6mm^2 screw terminals
housing		PC+ABS material
dimensions		1 module (18×120×63mm)
weight (Net)		0,71kg
mounting		on TH-35 rail

Connection scheme



Installation

1. Disconnect the power.
2. Mount the indicator on a rail in the distribution box.
3. Connect input phase to terminal 1. Connect wire N to terminal 4.
4. Connect a measured circuit or a single receiver to terminal 3 (output phase L) and to terminal 6 (N).
5. Optionally connect the RS-485 network wires to the 20(A+) - 21(B-) terminals.
6. Put the covers on the terminals and optionally seal them.



General safety conditions

* Please read the manual carefully prior to installing the meter.
* The meter should be installed and operated by qualified personnel familiar with the construction, operation and any hazards involved.
* Do not install the meter if it is damaged or incomplete.
* The user is responsible for proper grounding, selection, installation and functionality of any other devices connected to the meter, including security devices such as overcurrent protection breakers, differential switches and surge protectors.
* Before connecting the power supply make sure that all cables are connected properly.
* Always follow the operational conditions of the meter (voltage, humidity, temperature).
* In order to avoid electric shock or damage to the meter, disconnect the power before each change in connection configuration.
* Do not modify the device on your own, as this may cause damage or improper operation of the meter and consequently expose the users to risk. In these cases the manufacturer is not liable for ensuing events and reserves the right to refuse the warranty claims on the counter.

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ELECTRICITY CONSUMPTION METER three-phase (MID compliant)

LE-03d

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5 9 0 8 3 1 2 5 9 2 3 6 5

Do not dispose of this device to a garbage bin with other unsorted waste!
In accordance with the Waste Electrical and Electronic Equipment Act any household electro-waste can be turned in free of charge and in any quantity to a collection point established for this purpose, as well as to the store in the event of purchasing new equipment (as per the old for new rule, regardless of brand). Electro-waste thrown in the garbage bin or abandoned in the bosom of nature pose a threat to the environment and human health.

Compliance

MID Directive / Standard EN50470-1/3

Purpose

LE-03d is a static (electronic) calibrated electricity meter of three-phase alternating current in a direct system.

Operation

A special electronic system under the influence of flowing current and applied voltage in each phase generates pulses proportional to the energy drawn in the respective phase. Energy consumption in the phase is indicated by a flashing of corresponding LED (A, B, C). The sum of the three phase pulses is indicated by a flashing LED and converted into energy absorbed throughout the three-phase system. Its value is displayed by the segment LCD display. The fractional digit represent the decimal (.1 kWh = 100Wh).

Pulse output

The meter is equipped with pulse output SO+ - SO-. This allows you to connect another pulse device (SO) that reads pulses generated by the meter.
No additional connected equipment is required for proper operation of the meter.

Length of the SO+ SO- pulses depends on the load of the meter:

5÷40A	80 ms	75A	46 ms
45A	75 ms	80A	42 ms
50A	68 ms	85A	40 ms
55A	62 ms	90A	38 ms
60A	57 ms	95A	36 ms
65A	52 ms	100A	34 ms
70A	48 ms		

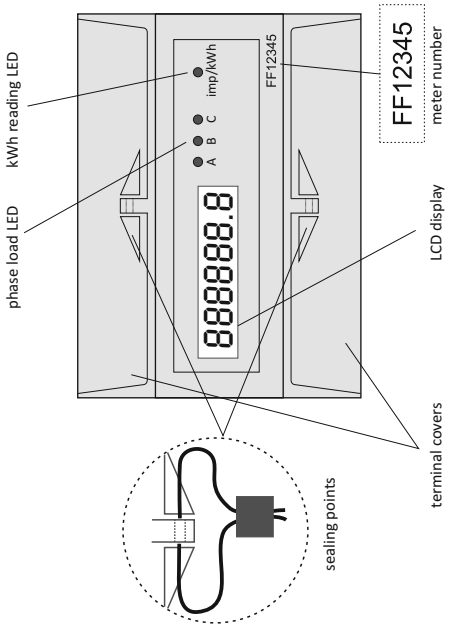
Sealing

The meter has sealable input and output terminal covers to prevent any attempts to bypass the meter.

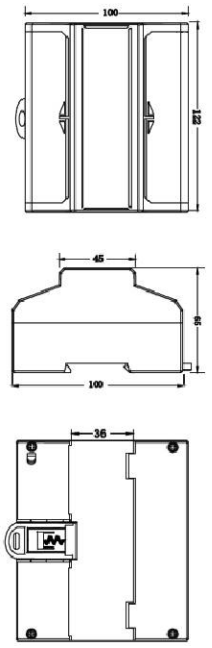
Meter number

The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed.

Meter front description



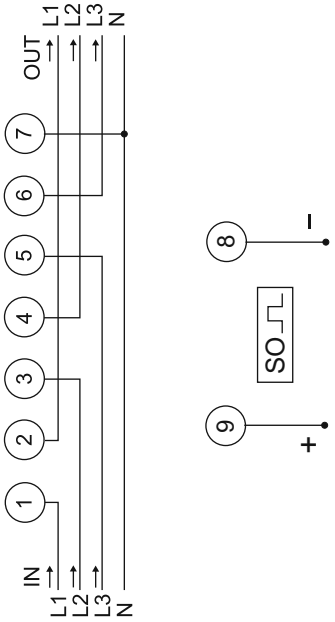
Dimensions



Technical data

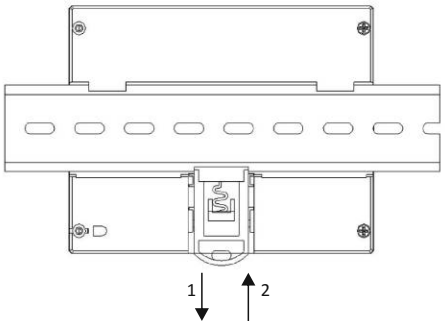
reference voltage	3×230/400V+N
base current	0,25÷10A
maximum current	100A
minimum current	0,04A
accuracy class	B
compliance	MID / EN50470-1/3
own power consumption	<10VA; <2W
indication range	0÷999999,9kWh
meter constant	(1 Wh/pulse) 1000pulses/kWh
phases A, B, C current consumption signalling	3× red LED
kWh read-out signalling	red LED
SO+ SO- pulse output	open collector
SO+ SO- connection voltage	<12÷27V DC
SO+ SO- connection current	<27mA
SO+ SO- constant	(1 Wh/pulse) 1000pulses/kWh
SO+ SO- pulse duration (load-dependent)	34÷80msec
SO+ SO- wire length	<20m
working temperature	-20÷55°C
terminal	screw terminals 25mm^2
housing	ABS material
dimensions	7 modules (122×100×65 mm)
mounting	on TH-35 rail
protection grade	IP20

Connection diagram



Installation

1. Disconnect the switching station power.
2. Mount the meter on the TH rail in the distribution box.
3. Open the covers on the terminals.
4. Connect the power to terminal 1 (L1 IN), terminal 3 (L2 IN), terminal 5 (L3 IN).
5. Connect a measured circuit or a single receiver to terminal 2 (L1 OUT), terminal 4 (L2 OUT), terminal 6 (L3 OUT).
6. Connect wire N to terminal 7.
7. Optionally connect the RS-485 network wires to the 9(A+) - 8(B-) terminals.
8. Close the covers on the terminals and optionally seal them.



General safety conditions

* Please read the manual carefully prior to installing the meter.
* The meter should be installed and operated by qualified personnel familiar with the construction, operation and any hazards involved.
* Do not install the meter if it is damaged or incomplete.
* The user is responsible for proper grounding, selection, installation and functionality of any other devices connected to the meter, including security devices such as overcurrent protection breakers, differential switches and surge protectors.
* Before connecting the power supply make sure that all cables are connected properly.
* Always follow the operational conditions of the meter (voltage, humidity, temperature).
* In order to avoid electric shock or damage to the meter, disconnect the power before each change in connection configuration.
* Do not modify the device on your own, as this may cause damage or improper operation of the meter and consequently expose the users to risk. In these cases the manufacturer is not liable for ensuing events and reserves the right to refuse the warranty claims on the counter.

D140221/D170828

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ENERGY METER
three phase type

LE-03d
CT200

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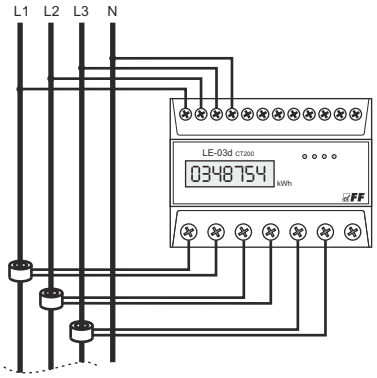
Purpose

LE-03d CT200 is a static (electronic) rated energy which is to serve as an auxiliary meters to measure energy consumption in a three phase direct system. These meters is 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. In the case of transformers with dedicated operating parameters, the meters display the actual value of the power consumed by the 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. Consumption of energy in the phase is indicated by shining the corresponding LED (L1, L2, L3). The sum of the three phases of pulses indicated by shining LED is converted to energy, taken in the entire three-phase system and its value is determined by the segment LCD display.



Pulse output

The counter has a pulse output SO+ - SO. This allows you to connect another read device pulse generated by the pulse by meter. For the correct operation of the meter isn't required to connect additional devices.

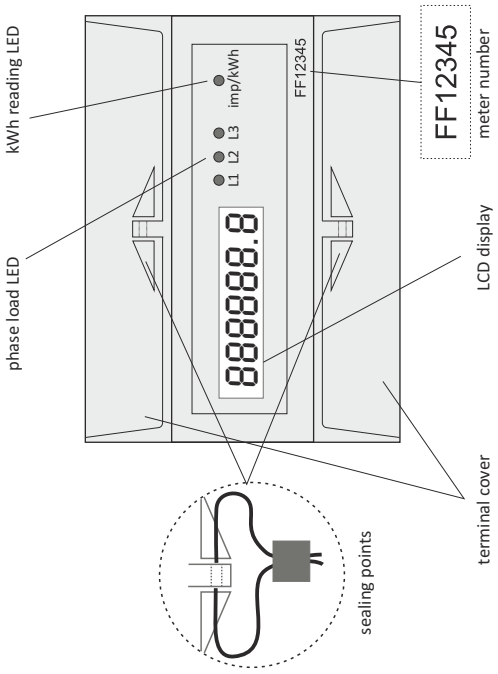
Sealing

The meter has the possibility of sealing guards input and output terminals to prevent the circumvention of making counter.

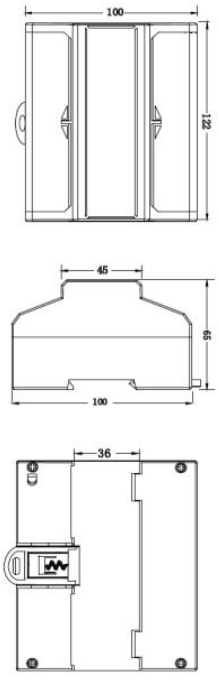
Meter number

The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed.

Meter front description



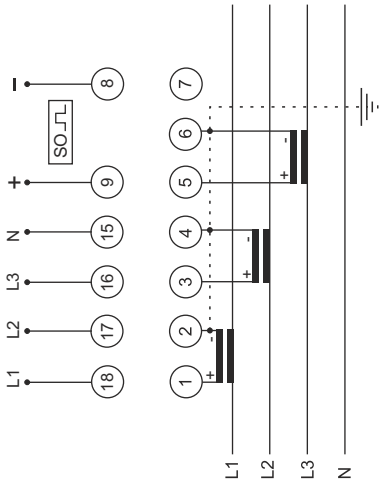
Dimensions



Technical data

type of transformer		200/5A
reference voltage		3× 230/400V+N
basic current		3× 1.5A
maximum current		3× 5A
minimum current		0.04A
measure precision (with IEC61036)		1st class
meter's own power consumption		<10VA; <2W
load current inputs		0.4VA
indication range		9999999kWh
constant of the meter	(3.33Wh/pulse)	300pulses/kWh
current consumption signal		3× red LED
read signal		red LED
impulse output SO+ SO-		open collector
connection voltage SO+ SO-		<30V DC
connection current SO+ SO-		<27mA
constant SO+ SO-	(3.33Wh/pulse)	300pulses/kWh
pulse time SO+ SO-		35msec
working temperature		-20÷50°C
terminal		25mm² screw terminals
dimensions		7 modules (122mm)
mounting		on the rail TH-35
protection level		IP20

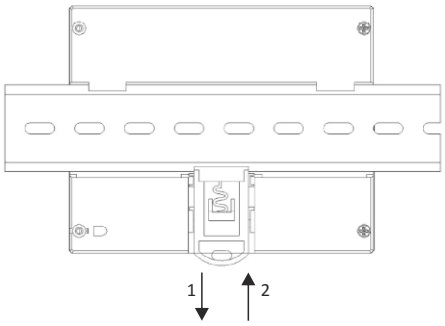
Wiring diagram



Assembly

1. Take OFF the power.
2. Energy meter put on the rail, in the switchgearbox.
3. Voltages of controlled phase connect with marks to contacts 18 (L1), 17 (L2), 16 (L3).
4. Transformers fasten to the operating phase, a secondary output connect in accordance with indications to the contacts 1-2 (L1), 3-4 (L2), 5-6 (L3).
5. Cable N connect to contact 15.
6. In order to increase the security of the system and the accuracy of the measurement it is recommended to ground the "-" terminals of the current transformers secondary side.
7. Additional pulse receiver connect to contact 9(+) - 8(-).

ATTENTION! It is not required for the correct operation of the meter.



General safety conditions

* Please read the manual carefully prior to installing the meter.
* The meter should be installed and operated by qualified personnel familiar with the construction, operation and any hazards involved.
* Do not install the meter if it is damaged or incomplete.
* The user is responsible for proper grounding, selection, installation and functionality of any other devices connected to the meter, including security devices such as overcurrent protection breakers, differential switches and surge protectors.
* Before connecting the power supply make sure that all cables are connected properly.
* Always follow the operational conditions of the meter (voltage, humidity, temperature).
* In order to avoid electric shock or damage to the meter, disconnect the power before each change in connection configuration.
* Do not modify the device on your own, as this may cause damage or improper operation of the meter and consequently expose the users to risk. In these cases the manufacturer is not liable for ensuing events and reserves the right to refuse the warranty claims on the counter.

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ENERGY METER
three phase type

LE-03d
CT400

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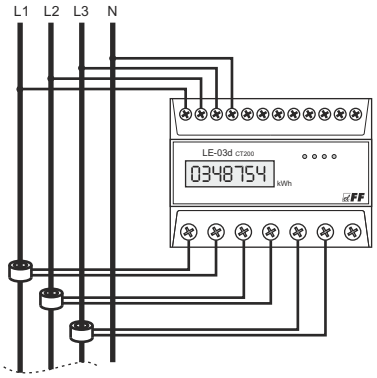
Purpose

LE-03d CT400 is a static (electronic) rated energy which is to serve as an auxiliary meters to measure energy consumption in a three phase direct system. These meters is 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. In the case of transformers with dedicated operating parameters, the meters display the actual value of the power consumed by the 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. Consumption of energy in the phase is indicated by shining the corresponding LED (L1, L2, L3). The sum of the three phases of pulses indicated by shining LED is converted to energy, taken in the entire three-phase system and its value is determined by the segment LCD display.



Pulse output

The counter has a pulse output SO+ - SO. This allows you to connect another read device pulse generated by the pulse by meter. For the correct operation of the meter isn't required to connect additional devices.

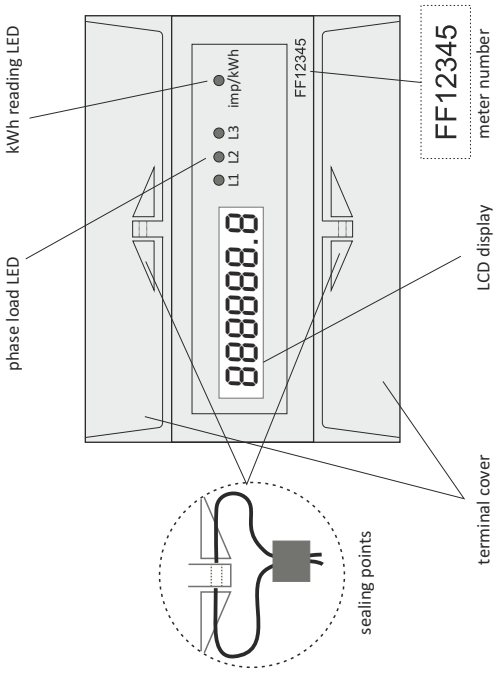
Sealing

The meter has the possibility of sealing guards input and output terminals to prevent the circumvention of making counter.

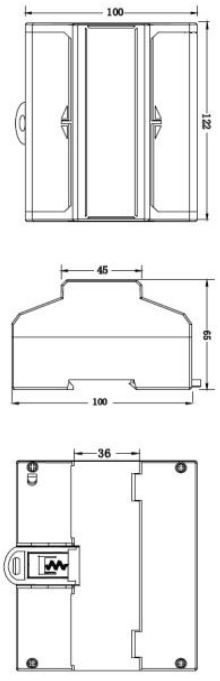
Meter number

The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed.

Meter front description



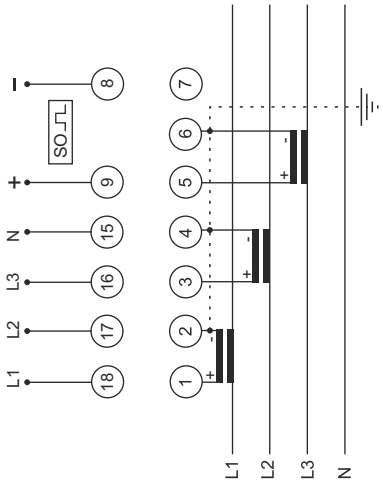
Dimensions



Technical data

type of transformer		400/5A
reference voltage		3× 230/400V+N
basic current		3× 1.5A
maximum current		3× 5A
minimum current		0.04A
measure precision (with IEC61036)		1st class
meter's own power consumption		<10VA; <2W
load current inputs		0.4VA
indication range		9999999kWh
constant of the meter	(3.33Wh/pulse)	300pulses/kWh
current consumption signal		3× red LED
read signal		red LED
impulse output SO+ SO-		open collector
connection voltage SO+ SO-		<30V DC
connection current SO+ SO-		<27mA
constant SO+ SO-	(3.33Wh/pulse)	300pulses/kWh
pulse time SO+ SO-		35msec
working temperature		-20÷50°C
terminal		25mm² screw terminals
dimensions		7 modules (122mm)
mounting		on the rail TH-35
protection level		IP20

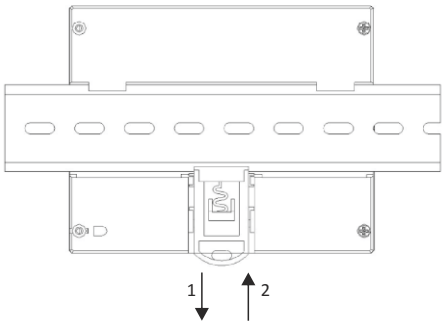
Wiring diagram



Assembly

1. Take OFF the power.
2. Energy meter put on the rail, in the switchgearbox.
3. Voltages of controlled phase connect with marks to contacts 18 (L1), 17 (L2), 16 (L3).
4. Transformers fasten to the operating phase, a secondary output connect in accordance with indications to the contacts 1-2 (L1), 3-4 (L2), 5-6 (L3).
5. Cable N connect to contact 15.
6. In order to increase the security of the system and the accuracy of the measurement it is recommended to ground the "-" terminals of the current transformers secondary side.
7. Additional pulse receiver connect to contact 9(+) - 8(-).

ATTENTION! It is not required for the correct operation of the meter.



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* Before connecting the power supply make sure that all cables are connected properly.
* Always follow the operational conditions of the meter (voltage, humidity, temperature).
* In order to avoid electric shock or damage to the meter, disconnect the power before each change in connection configuration.
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ELECTRICITY CONSUMPTION INDICATOR
three-phase, two-tariff

LE-04d

5 190831 259337 9

Do not dispose of this device to a garbage bin with other unsorted waste!
In accordance with the Waste Electrical and Electronic Equipment Act any household electro-waste can be turned in free of charge and in any quantity to a collection point established for this purpose, as well as to the store in the event of purchasing new equipment (as per the old for new rule, regardless of brand). Electro-waste thrown in the garbage bin or abandoned in the bosom of nature pose a threat to the environment and human health.

Purpose

LE-04d is a static (electronic), calibrated indicator of electric power of three-phase alternating current in direct system. The indicator is suitable for use with an external control timer and is designed for measuring and billing in two-tariff system.

Functioning

Special electronic system, under the influence of current flow and applied voltage, generates pulses in each phase in proportion to the electricity consumed in this phase. Energy consumption in phases is indicated by flashing LED A and C. The sum of the pulses of the three phases is indicated by flashing LED (800 pulses/kWh) and is converted to energy consumed in the entire three-phase system, and its value is displayed by segment LCD display.
The number after the decimal is tenths (0.11 kWh = 110 Wh).
Indicator is suitable for registering the value of electricity in two-tariff system. Two separate displays T0 and T1 indicate the value of electricity consumption in a given tariff. Switching between the tariffs takes place when the control voltage is applied on the D input of the meter (terminals 10-11). This can done

with external control clock. The T0 meter reads the value of energy consumption in the absence of control voltage at the input D. The T1 meter reads the value of energy from the appearance of the control voltage at the input D, until its disappearance. Operation of the given meter is indicated by appropriate LED.

Pulse output

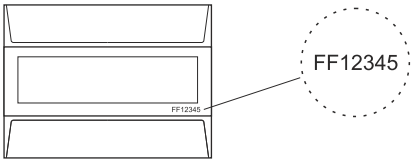
Indicator has a pulse output VO. This allows you to connect another pulse device that reads pulses generated by the meter. Connection of an additional device is not required for proper operation of the meter

Sealing

The meter has sealable input and output terminal cover to prevent any attempts to bypass the meter.

Meter number

The meter is marked with individual serial number allowing its explicit identification. The marking is laser engraved and cannot be removed.



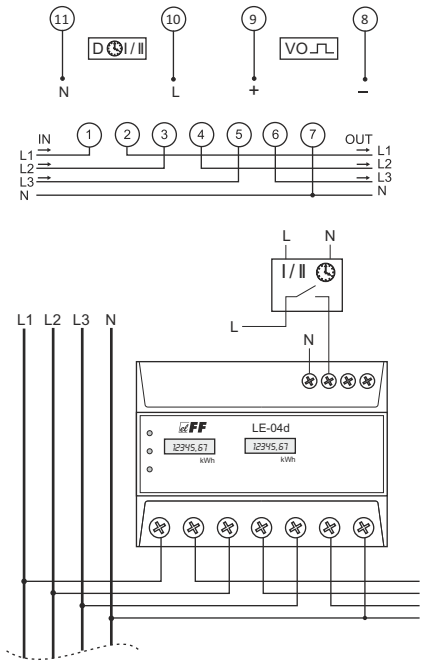
Technical data

reference voltage	3× 230/400V+N
basic current	10A
maximum current	100A
minimum current	0,04A
measure precision (with IEC61036)	1 class
own power consumption	<10VA; <2W
T0 and T1 display indication range	0÷99999.99kWh
meter constant	(1,25Wh/pulse) 800pulses/kWh
current consumption indication	3× red LED
T0 and T1 meter indication	2× red LED
pulse output VO	open collector
connection voltage VO	<24V DC
connection current VO	<30mA
constant VO	(1,25Wh/pulse) 800pulses/kWh
pulse time VO	30ms
working temperature	-20÷55°C
terminal	25mm² screw terminals
dimensions	7 modules (122mm)
mounting	on TH-35 rail
ingress protection	IP20

Assembly

1. Disconnect the power supply.
2. Mount the meter on the rail in the distribution box.
3. Connect power supply to terminals 1 (L1), 3 (L2), 5 (L3).
4. Connect measuring circuit or a single receiver to terminals 2 (L1), 4 (L2), 6 (L3).
5. Connect wire N to terminal 7.
6. Connect the contact of switching timer to terminal 10. Connect terminal 11 to N.
7. Connect additional pulse receiver (not required) to terminals 9 (+)/8 (-).

Wiring diagram



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