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LE-03M-4Q

Electric energy meter,
3-phase, 4-quadrant



Do not dispose of this device in the trash along with other waste!

According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.



Compliance

MID Directive	2014/32/EU Issue I
Certificate number	0598/MID/B/25/135
Notification body	0598 - SGS Fimko OY

Purpose

The LE-03M-4Q meter is a static (electronic) calibrated 3-phase alternating current electricity meter in a direct circuit, enabling 4-quadrant measurement of electricity. It is used for indication and registration of consumed electricity and mains parameters with the possibility of remote reading of indications via the RS-485 communication interface that supports the Modbus RTU protocol.

The meter has 2 pulse outputs.

Touch buttons on the meter's facade allow the selection of the displayed parameter and the modification of the meter's settings. The backlit LCD display makes it easy to read the measured values. Changing the displayed parameter is carried out

by default every 5 seconds or at a frequency set by the user, as well as manually by means of the touch field on the front of the meter.

Operation and programming manual

Detailed PDF instructions can be downloaded from the website: www.fif.com.pl from the product subpage.

Functions

- » 3-phase, 2-way, 4-quadrant measurement of electricity consumption;
- » Direct measurement up to 100 A;
- » Registration of total consumption:
 - active and reactive energy (import and export);
 - reactive energy divided into 4 quadrants;
- » Display of network parameters (voltages, currents, active power, reactive power, apparent power, power factor, frequency);
- » Calculation of active and reactive power demand;
- » Additional, cashable energy consumption meter accessible both from the display and remotely;
- » MID-certificated;
- » RS-485 communication port;
- » Modbus RTU protocol;
- » 2× SO pulse output with programmable number of pulses per kWh/kVArh;
- » Backlit, multifunctional LCD display;
- » Configuration security by PIN number.

Measured values

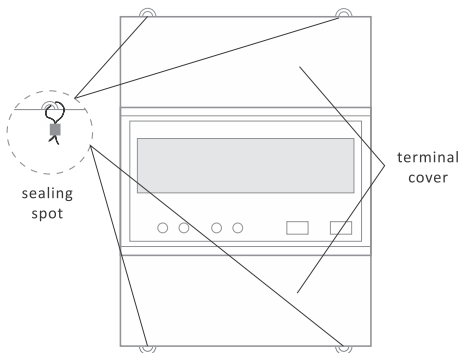
Active energy consumed/supplied	AE+/AE-	[kWh]
Reactive energy consumed/supplied	RE+/RE-	[kVArh]
Reactive energy with division into 4 quadrants	Q1÷Q4	[kVArh]
Phase voltages	U1, U2, U3	[V]
Phase-to-phase voltages	U12, U23, U31	[V]
Phase currents	I1, I2, I3	[A]
Frequency	f	[Hz]
Active power	P	[W]
Reactive power	Q	[var]
Apparent power	S	[VA]
Power factor	$\cos\varphi$	

Pulse output

The indicator has a 2 SO+/SO- pulse outputs. This allows you to connect a pulse meter-reading pulses generated by the counter. For proper operation of the indicator is not required to connect additional devices.

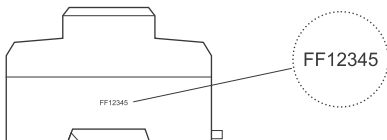
Sealing

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

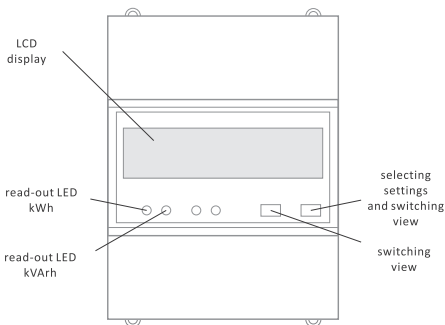


Meter number

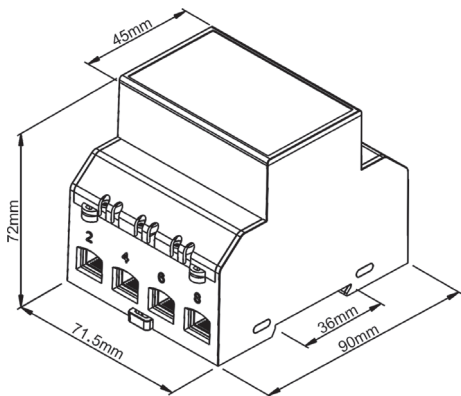
The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed).



Front description



Dimensions



Mounting

1. Disconnect the power supply to the switchboard.
2. Mount the meter on a rail in the distribution box.
3. Connect the power supply as marked to terminals 1 (L1), 3 (L2), 5 (L3), 7 (N).
4. Connect the measured circuit or the single consumer to the terminals as indicated: 2 (L1), 4 (L2), 6 (L3), 8 (N).
5. Connect the RS-485 network cables to terminals 19 (A) and 20 (B).

6. Connect the additional pulse receiver to terminals 16 and 18 (–) and 15 and 17 (+). The terminals are located under the lower terminal cover of the meter. **The additional pulse receiver is not required.**
7. Attach the meter terminal covers.



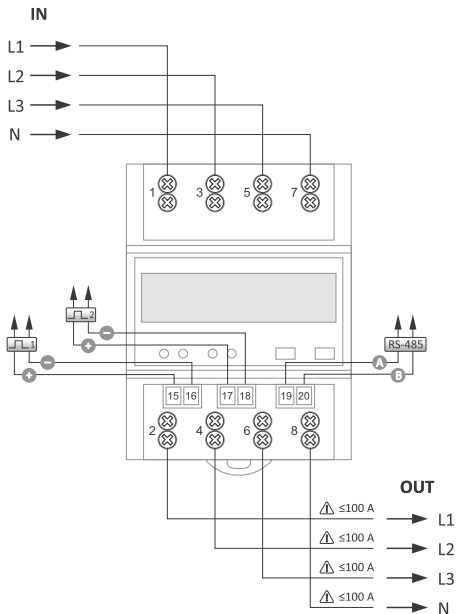
Particular attention must be paid to the maximum currents flowing in the current circuits, especially the neutral conductor. In the case of large phase currents, there is a risk that the neutral current will exceed the limit value of 100 A. **In this case, the output of the neutral conductor must not be connected to terminal 8!**

Wiring diagram

- | | |
|--------|------------------------------|
| 1 | L1 phase - input |
| 2 | L1 phase - output |
| 3 | L2 phase - input |
| 4 | L2 phase - output |
| 5 | L3 phase - input |
| 6 | L3 phase - output |
| 7 | neutral wire - input |
| 8 | neutral wire - output |
| 15, 16 | pulse output 1 |
| 17, 18 | pulse output 2 |
| 19, 20 | output: RS-485 communication |

3-phase 4-wire system

Direct measurement



Technical data

MID declaration	0598/MID/B/25/135
installation	3-phase (4-wire)
pomiar	direct
rated voltage	3×230/400 V AC
current	
minimum detection current	0.02 A
minimum	0.25 A
base	5 A
maximum	100 A
overload	30× I _{max} /10 ms
insulation	4 kV/1 min.; 6 kV/1.2 μs
insulation protection class	II class
installation category	CAT III
environmental condition class	
mechanical	M1
electromagnetical	E2
voltage measurement range (L-N)	176÷276 V AC
measurement accuracy	
voltage	0.5%
current	0.5%
frequency	0.2%
active power	1%
reactive power	1%
apparent power	1%
active energy (EN50470-1/3)	B class
reactive energy (IEC62053-23)	2nd class
rated frequency	50 Hz

power consumption	
own power consumption	<12 VA; 1 W
indication range	0÷999999.99 kWh/kVArh
display	backlit LCD (blue)
meter constant	1000 pulses/kWh (kVArh)
pulse outputs	
quantity	2
type	open collector (OC)
voltage maximum	27 V DC
current maximum	27 mA
pulse output 1	
pulse constant	100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000* , 1200, 1500, 1600, 2000, 2400, 3000, 3200/kWh (kVArh)
pulse time	50÷80 ms
pulse output 2	
pulse constant	100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000* , 1200, 1500, 1600, 2000, 2400, 3000, 3200/kWh (kVArh)
pulse time	50÷80 ms
communication	
interface	Modbus RTU
port	RS-485
address	1* ÷247
baud rate	9600* , 19200, 38400, 115200 bps
parity	NONE* , ODD, EVEN
stop bits	1* , 2

read-out indication	2× red LED
working temperature	-40÷70°C
storage temperature	-40÷70°C
humidity (non-condensing)	≤95%
vibration resistance (IEC60068-2-6)	2g (10÷50 Hz)
mounting altitude	up to 2500 m a.s.l.
terminal	
power circuits	
screw terminals	2.5÷25 mm ²
tightening torque (max)	2.5 Nm
communication, pulse outputs	
screw terminals	0.5÷1.5 mm ²
tightening torque (max)	0.4 Nm
housing	PC+ABS plastic (self-extinguishing)
dimensions	4 modules (71.5 mm)
mounting	for TH-35 rail
internal (enclosure recommended)	IP51
external (enclosure required)	IP54
ingress protection	
front	IP51
whole	IP20

** factory settings*

Warranty

F&F products are covered by a 24-month warranty from the date of purchase.

The warranty is only valid with proof of purchase.

Contact your dealer or contact us directly.

CE declaration

F&F Filipowski L.P. declares that the device is in conformity with the essential requirements of the Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.

The CE and MID Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found www.fif.com.pl on the product subpage.

General work safety conditions

- » Please read the instructions carefully before installation.
- » The device should be installed and operated by qualified personnel who are familiar with its design, operation, and associated risks.
- » Do not install a meter that is damaged or incomplete.
- » The user is responsible for proper grounding of the system, proper selection, installation, and efficiency of other devices connected to the meter, including safety devices such as over-current, residual current and overvoltage circuit breakers.
- » Before connecting the power supply, make sure that all cables are connected correctly.
- » It is essential to observe the operating conditions of the meter (supply voltage, humidity, temperature).
- » To avoid electric shock or damage to the meter, turn off the power supply whenever the connection is changed.
- » Do not make any changes to the unit yourself. Doing so can result in damage to or improper operation of the device, which in turn can pose a threat to people operating it. In such cases, the manufacturer is not responsible for the resulting events and may refuse the provided warranty in the event of a complaint.

