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ELECTRICITY CONSUMPTION METER single-phase

LE-01MP

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

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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-01MP is a static (electronic) calibrated electricity meter of single-phase alternating current in a direct system. It is used for reading and recording of consumed electric energy and mains parameters with remote readout via a wired RS-485 network.

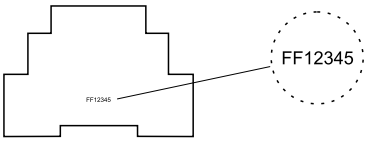
Measured values
Active power - AE+ [kWh]
Phase voltage - U [V]
Phase current - I [A]
Frequency - F [Hz]
Meter system temperature - T [°C]

Functioning
Under the influence of flowing current and applied voltage, the LE meter accurately measures the amount of consumed electricity. Energy consumption is indicated by flashing LED (1000 pulses/kWh). In addition, the device measures the mains parameters and the temperature of its own system. The values are displayed cyclically on LCD display. Parameter changes every 3 seconds. Indicated values: active power (0.1 kWh); voltage (0.1V); current intensity (0.1A). The display is active if the meter power supply is on. If the power supply is off, user can preview the energy usage [kWh] for 30 seconds by pressing the PRESS key.

Communication with the meter working as a SLAVE is performed in accordance with Modbus RTU standard via RS-485 serial port. Converted registers values give results consistent with the indications on the meter display. Each indicator is identified by a unique address assigned by the user.

Meter address
Change of meter address is done via the RS-485 port using the Modbus RTU protocol command to set the desired value in the meter register. The default meter address: 1.

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



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

Technical data

reference voltage	230V AC ±20%
base current	5A
maximum current	100A
minimum current	0,02A
accuracy according to IEC61036	1st class
own power consumption	<8VA; <0,4W
indication range	0÷99999,99kWh
meter constant	(1,0Wh/pulse) 1000pulses/kWh
readout signalling	red LED
port	RS-485
communication protocol	MODBUS RTU
working temperature	-20÷65°C
terminal	screw terminals 25mm²
dimension	1 module (19,5mm)
mounting	on TH-35 rail
protection grade	IP20

MODBUS RTU protocol parameters

Communication parameters	
Protocol	MODBUS RTU
Operation mode	SLAVE
Port settings (factory settings)	bits/s: 1200 / 2400 / 4800 / 9600 data bits: 8 Parity: NONE Start bits: 1 Stop bits: 2
Range of network addresses (factory setting)	1÷247 (1)
Command codes	3: Registers values reading (0×03 - Read holding Register) 6: Single register value setting (0×06) - (Write Single Register)
Maximum frequency of queries	15Hz

Registers parameters				
address	description	command	type	atr
0	voltage [V] (R0×0,1)	03	int	read
1	current strength [A] (R1×0,1)	03	int	read
2	frequency [Hz] (R2×0,1)	03	int	read
7 8	active power [kWh] (R7×256²+R8)/100	03	int	read
37	temperature [°C] (R37×1)	03	int	read
42	modbus transfer rate [bit/s] 1:1200 2:2400 3:4800 4:9600	06	int	write
43	modbus address 1÷247	06	int	write

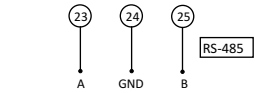
Registers values are stored as integers. To get a reading, the three received registers values should be transform algebraically in accordance with the following formulas:
voltage: R0×0,1 [V]
current: R1×0,1 [A]
frequency: R3×0,1 [Hz]
temperature: R37×1 [°C]
active power [kWh]: R7×256²+R8 [kWh]

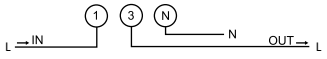
The Modbus transfer rate is a corresponding number in the register, e.g. no. 4 means the rate of 9600.

Available rates and numbers assigned to them:

bps	nr
1200	1
2400	2
4800	3
9600	4

Connection scheme





Installation

1. Disconnect the power supply.
2. Mount the meter on the rail in the distribution box.
3. Connect the input phase to terminal 1.
4. Connect the neutral wire to terminal N.
5. Connect a measured circuit or a single receiver to terminal 3 (output phase) and to N.
6. Connect terminals 23, 24 and 25 to RS-485 network.

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