87045 LIMOGES Cedex
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Single phase meter with direct connection and pulse or Modbus RS485 output

Cat. Nos: 0 046 72 / 77 / 81

Contents **Pages**

1. DESCRIPTION - USE

Single-phase active energy meter.
Measures the electric power consumed by a single-phase circuit downstream of the power distribution metering.
Displays the energy consumption in kWh.

2. RANGE

. Cat. No 0 046 72: 2-modules (35,6 mm), single-phase meter, pulse output, self-powered on the measurement terminals.
. Cat. No 0 046 77: 2-modules (35,6 mm), single-phase meter, Modbus RS485 output, self-powered on the measurement terminals.
. Cat. No 0 046 81: 2-modules (35,6 mm), single-phase meter, pulse output, self-powered on the measurement terminals.

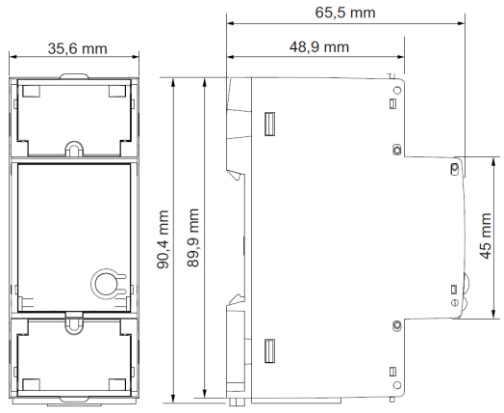
Rated currents:

. Starting current, I_{st}: 20 mA
. Base current, I_b: 10 A
. Maximum current, I_{max}:
36 A [cat. no 0 046 81]
63 A [cat. nos 0 046 72/77]

Rated voltage and frequency:

Cat. No 4 120 74:
. Un: 230V~ ± 15%
. Fn: 50-60 Hz ± 5%

3. OVERALL DIMENSIONS



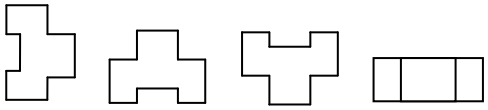
4. PREPARATION - CONNECTION

Fixing:

. On symmetrical EN/IEC 60715 rail or DIN 35 rail.

Operating position:

. Vertical Horizontal Upside down On the side



Terminals:

. Terminals depth: 8 mm.
. Stripping length: 8 mm

Screw head:

. Connection terminals (Lin, Lout, N): Slotted and Philips
. Pulse output (15-29) or RS485 (33-34-35) terminals: Slotted and Philips

Recommended tightening torque:

. Connection terminals (Lin, Lout, N): 1,2 Nm
. Pulse output (15-29) or RS485 (33-34-35) terminals: 0,5 Nm

Max. tightening torque:

. Connection terminals (Lin, Lout, N): 1,4 Nm
. Pulse output (15-29) or RS485 (33-34-35) terminals: 0,8 Nm

Tools required:

. Connection terminals (Lin, Lout, N): flat screwdriver 4 mm or Philips PH2
. Pulse output (15-29) or RS485 (33-34-35) terminals: flat screwdriver 3 mm or Philips PH0
. For fixing the device on the DIN rail: flat screwdriver 5.5 mm (max. 6 mm).

4. PREPARATION - CONNECTION

Connectable section:

. Copper cables.

. Connection terminals (Lin, Lout, N):

	Without ferrule	With ferrule
Rigid cable	**1 x 1 to 16 mm²**	**-**
Flexible cable	**1 x 1 to 10 mm²**	**1 x 1 to 10 mm²**

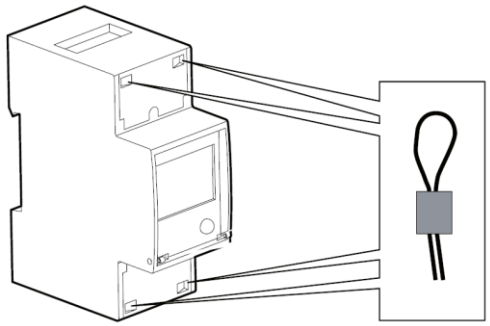
ATTENTION: for safety reasons, it is compulsory not to exceed 4 A/mm² as current density in the input terminals.

. . Pulse output (15-29) or RS485 (33-34-35) terminals:

	Without ferrule	With ferrule
Rigid cable	**1 x 0,05 to 4 mm²**	**-**
Flexible cable	**1 x 0,05 to 2,5 mm²**	**1 x 0,05 to 2,5 mm²**

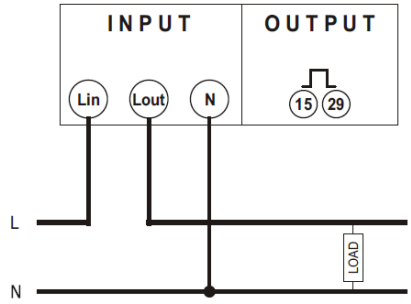
Terminal protection:

. Terminals are protected with integrated sealable screw cover.

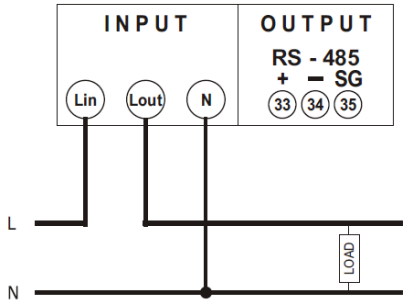


Electrical wiring diagrams:

. 0 046 72 and 0 046 81 :



. 0 046 77:

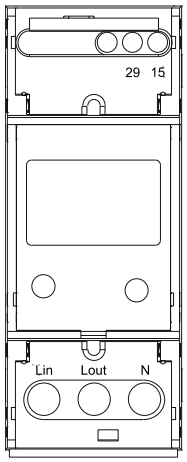


5. GENERAL CHARACTERISTICS

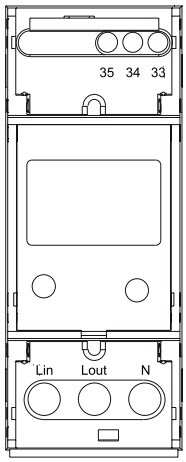
Case marking:

. By permanent ink pad printing.

. 0 046 72 and 0 046 81

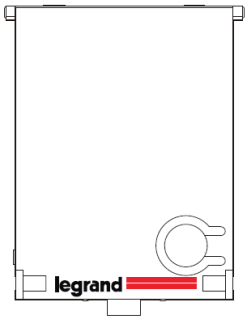


0 046 77



Transparent front cover marking:

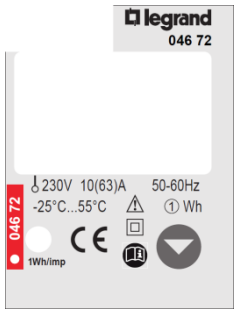
. By permanent ink pad printing.



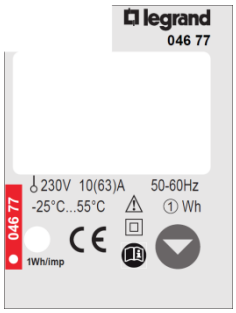
Front face marking:

. By adhesive foil.

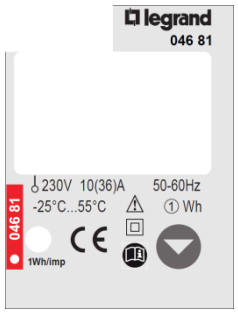
. 0 046 72



0 046 77



. 0 046 81



5. GENERAL CHARACTERISTICS *(continued)*

Display:
Type: 6 digit LCD
Resolution: 0,1 kWh/kvarh
Maximum indication: 99999,9 kWh/kvarh

Metrological LED:
. Pulse weight: 1 Wh/imp

Programming:
. Through front key.
. Access secured by identification code (**default code 1000**); the code can be modified during the programming procedure.

Values display:
. Manual scrolling by pressing on the front key.

Display:
. Total active energy
. Partial active energy (reset possible)
. Current
. Voltage
. Active power
. Frequency
. Power factor
. Hour meter (reset possible)
. Software version

Accuracy class:
. Active energy, total and partial: 1 (IEC/EN 62053-21);

RS485 communication port's characteristics (cat. no 0 046 77):
. Programmable addresses: from 1 to 247
. Baud rate: 2,4 - 4,8 - 9,6 - 19,2 kbps
. Parity bit: none, even, odd
. Galvanically isolated respect to measuring inputs and auxiliary supply
. Standard RS485 3 wires, half-duplex
. Protocol Modbus® RTU
. Response time (time out question/answer): ≤200 ms

. Default configuration:
. Addresses: 255
. Baud rate:9600 bps
. Parity bit: even

Pulse output's characteristics (cat. nos 0 046 72 / 81):
. Optorelays with potential-free SPST-NO contact
. Type S0 (IEC/EN62053-31)
. Voltage U_{imp}: max. 27 VAC/DC
. Current I_{imp}: max. 50 mA
. Programmable pulse weight, possible values: 1 - 10 ***(Default configuration)*** - 100 - 1k Wh/imp or varh/imp
. Programmable pulse duration, possible values: 50 - 100 - 200 - 300 - 400 - 500 ms.

5. GENERAL CHARACTERISTICS *(continued)*

Plastic material:
. Self-extinguishing polycarbonate.

Ambient operating temperature:
. Min. = - 5 °C Max. = + 55 °C.

Ambient storage temperature:
. Min. = - 25 °C Max. = + 70 °C.

Device protection:
. By 40 A circuit breaker (cat. no 0 046 81)
. By 63 A circuit breaker (cat. nos 0 046 72 / 77)

Protection Index:
. Protection index of terminals against solid and liquid bodies (wired device): IP 20 (IEC/EN 60529).
. Protection index of the front face against solid and liquid bodies: IP 51 (IEC/EN 60529).
. Class II, front with faceplate

Impulse withstand voltage:
. Measuring inputs / RS485 port:
wave 1,2 / 50 µs 0,5 J: 6kV
alternate current 50 Hz / 1 min.: 4 kV
. Measuring inputs / Pulse output:
wave 1,2 / 50 µs 0,5 J: 6kV
alternate current 50 Hz / 1 min.: 4 kV
. All circuits / earth:
alternate current 50 Hz / 1 min.: 4 kV

Insulation voltage, Ui:
. 300V Phase-Earth

Pollution degree:
. 2

Installation category:
. III

Short-time overcurrent (EN62053-21, EN62053-23):
. 30 Imax for 10 ms

Power consumption in voltage circuit:
. 4 VA (1,90 W) at 264 VAC

Power consumption in current circuit:
. 1,5 W

Thermal power dissipated:
. ≤ 4 W.

Average weight per device:
.0,235 kg.

Volume when packed:
. 0,46 dm^3.

6. COMPLIANCE AND APPROVALS

Compliance to standards:

. Compliance with Directive on electromagnetic compatibility (EMC) n° 2014/30/EU
. Compliance with low voltage directive n° 2014/35/EU.
. Electromagnetic Compatibility: Test according to EN/IEC 62052-11
. Accuracy class:
Active energy accuracy class: 1 (IEC/EN 62053-21).

Environment respect – Compliance with EU directives:

. Compliance with Directive 2011/65/EU amended by Directive 2015/863 (RoHS 2) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
. Compliance with REACH regulation: at the date of the publication of this document no substance from the candidate list is present in these products.

Plastic materials :

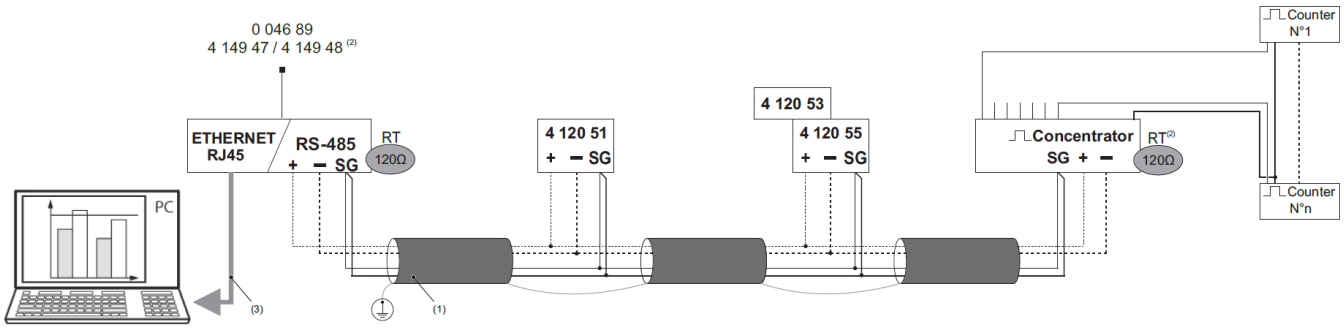
. Halogens-free plastic materials.
. Marking of parts according to ISO 11469 and ISO 1043.

Packaging :

. Design and manufacture of packaging compliant to decree 98-638 of the 20/07/98 and also to directive 94/62/CE.

7.COMMUNICATION

Modbus RS485 wiring diagram:



(1) RS485: Prescribed use of Cable Belden 9842, Belden 3106A (or equivalent) for a maximum length of 1000 m, or Category 6 cable (FTP or UTP) for a maximum length of 50 m;
(2)Resistance not furnished
(3) Ethernet: Cat. 6 (FTP/UTP)

To be integrated in a monitoring / energy counting system, energy counters with pulse output must be connected to a pulse concentrator (cat. nos 0 046 87, 4 120 65, 4 149 26)

Modbus communication tables

. Modbus communication tables are available at http://ecatalogue-export.legrand.com