emeter1

Contatore di energia monofase
Single-phase energy meter

emeter3

Contatore di energia trifase
Three-phase energy meter

ITA Manuale d'uso

ENG User manual

LEGGI E CONSERVA QUESTE ISTRUZIONI
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NO POWER & SIGNAL CABLES TOGETHER
READ CAREFULLY IN THE TEXT!

Integrated Control Solutions & Energy Savings

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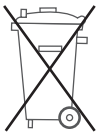
DISPOSAL



INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

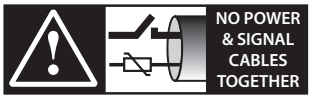
In reference to European Union directive 2002/96/EC issued on 27 January 2003 and related national legislation, please note that:

1. WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
2. the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment;
3. the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
4. the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the instruction sheet indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately;
5. in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

Warranty on materials: 2 years (from production date, excluding consumables).

Approval: the quality and safety of CAREL INDUSTRIES HQ products are guaranteed by the ISO 9001 certified design and manufacturing system.

IMPORTANT: separate as much as possible the probe and digital input cables from cables to inductive loads and power cables, so as to avoid possible electromagnetic disturbance.
Never run power cables (including the electrical panel cables) and signal cables in the same conduits



READ CAREFULLY IN THE TEXT!

Carel emeter 1

Content

Carel emeter 3

Content

1. INTRODUCTION

1.1 Product features

- Class B (kWh) in accordance with EN 50470-3
- Accuracy ±0.5 RDG (current/voltage)
- Energy meter
- Instant variable readings: 3 DGT
- Single-phase variables: A, kW, VLN
- Energy measurements: total kWh (total and partial)
- TRMS since wave distortion measurements (voltage/current)
- Self-powered
- RS485 serial port
- Dimensions: 4 DIN modules
- Protection index (frontal): IP50
- ECM function (easy connection management)

1.2 Product description

Single-phase energy meter with built-in configuration joystick and LCD data displaying; particularly indicated for active energy metering and cost allocation. Housing for DIN-rail mounting with IP50 (front) protection degree. Direct connection up to 65A. Supplied with a RS485 port (Modbus RTU protocol).

2. GENERAL CARACTERISTICS

2.1 Input specifications

Measuring inputs	System: 1
Current type	Galvanic insulation by means of built-in CT's
Current range (direct)	10(65)A
Voltage	230VLN
Accuracy	(Display + RS485) (@25°C ±5°C, RH 60%, 50 Hz)
Current	Ib: 10A, Imax: 65A; Un: 184 to 276VLN, From 0.004Ib to 0.2Ib: ±(0.5% RDG +3DGT), From 0.2Ib to Imax: ±(0.5% RDG +1DGT)
Phase-neutral voltage	In the range Un: ±(0.5% RDG +1DGT)
Start up current:	40mA
Active power	±(1% RDG +2DGT)
Active energy	Class 1 according to EN62053-21 Class B according to EN50470-3 Ib: 10A, Imax: 65A; 0.1Ib = 1,0 A
Additional errors	
Influence quantities	In accordance with EN 50470-3
Temperature drift	≤200 ppm/°C.
Sampling rate	1600 samples/s @ 50 Hz, 1900 samples/s @ 60 Hz
Display	2 lines (1 x 7-DGT + 1 x 3 DGT)
Type	LCD, h 9mm
Instant variable readings	3 DGT
Energies	Total imported: 6+1 DGT
Overload status	EEE displayed when the value being measured exceeds the "continuous input overload" (maximum measurement capacity).
Max. and min. indications	Max. instant variables: 999 (3 DGT); energy: 9 999 999 (7 DGT) Min. instant variables: 0; energy 0.00;
LEDs	Red LED (Energy consumption), 1000 imp./kWh (max frequency: 16Hz) according to EN50470-1
Measurements	
Method	TRMS measurement of distorted waveforms.
Coupling type	Direct
Crest factor	≤4 (91A max. peak)
Current overload	
Continuous	65A, @ 50Hz
For 10 ms	1920A max, @ 50Hz
Voltage overload	
Continuous	1.2 Un
For 500 ms	2 Un
Current input impedance	
Voltage	Refer to "Power Consumption"
Current	< 4VA
Frequency	45 to 65 Hz
Joystick	For display pages selection and programming of the serial address

Tab. 2.a

2.2 Output specifications

RS485	
Type	Multidrop, bidirectional (static and dynamic variables)
Connections	2-wire, max. distance 1000m
Addresses	247, selectable by means of the front joystick
Protocol	MODBUS/JBUS (RTU)
Data (bidirectional) Dynamic (reading only)	System and phase variables: see table "List of variables..."
Static (writing only)	All the configuration parameters.
Data format	1 start bit, 8 data bit, no parity,1 stop bit
Baud-rate	4800, 9600 bit/s
Driver input capability	Maximum 160 transceivers on the same bus.
Insulation	By means of optocouplers, 4000 VRMS output to measuring input

Tab. 2.b

2.3 Software functions

Password	Numeric code of max. 3 digits Password "0", no protection Password from 1 to 999, all data are protected
Display	See «Display pages»
Reset	By means of the front joystick: partial energy only (kWh)

Tab. 2.c

2.4 Power supply specifications

Self-powered	±20% of the rated measuring input voltage, 45 to 65Hz
Power consumption	≤ 11VA/1.9W

Tab. 2.d

2.5 General specifications

Operating temperature	from -25°C to +55°C (from -13°F to 131°F) (U.R. from 0 to 90% non-condensing @ 40°C) in accordance with EN50470-1
Storage temperature	from -30°C to +70°C (from -22°F to 158°F) (U.R. < 90% non-condensing @ 40°C) in accordance EN50470-1
Installation category	Cat. III (IEC60664, EN60664)
Insulation (for 1 minute)	4000 VRMS between measuring inputs and output
Dielectric strength	4kVAC RMS for 1 minute
Noise rejection (CMRR)	100 dB, from 48 to 62 Hz
EMC	in accordance with EN60470-1
Electrostatic discharges	15kV air discharge
Immunity to radiated fields	Test with current applied: 10V/m from 80 to 2000MHz
Immunity to electromagnetic fields	Test without current applied: at 30V/m from 80 to 2000MHz
Burst	On current and voltage measuring input circuits: 4kV
Disturbance immunity	10V/m da 150KHz a 80MHz
Pulse immunity	On current and voltage measuring input circuits: 4kV;
Radiofrequency emissions	in accordance with CISPR 22
Standards compliance	
Safety	IEC60664, IEC61010-1 EN60664, EN61010-1 EN50470-1
Metering	EN50470-3
Pulse output	DIN43864, IEC62053-31
Approval	CE
Connections	screw terminals
Wire size	Max. 16 mm^2 (measuring inputs); Min. 2.5 mm2 (measuring inputs) by cable lug Min./Max. screws tightening torque: 1.7 Nm / 3 Nm Other outputs: 1.5 mm^2 Min./Max. screws tightening torque: 0.4 Nm / 0.8 Nm
Housing	
Dimensions	71 x 90 x 64.5 mm
Material	ABS, self-extinguishing: UL 94 V-0
Mounting	DIN-rail
Protection index	
Frontal	IP50
Connections	IP20
Weight	Approx. 400 g (packing included)

Tab. 2.e

2.6 Insulation between inputs and output

	Measuring inputs	Serial output	Self power supply
Measuring inputs	-	4kV	0kV
Serial output	4kV	-	4kV
Self power supply	0kV	4kV	-

Tab. 2.f

2.7 Display pages

	Joystick position	1st line	2nd line	Note
1a	UP ⇧	kWh total	kW	
1b	UP ⇧	kWh partial	kW	moving joystick in ⇧ direction
2	Left ⇦	VLN (value)	kW	
3	Down ⇩	A (value)	"A" indication	

Tab. 2.g

	Variable	Description
1	kWh total	Total energy
2	kWh partial	Total partial energy
3	VLN (value)	Voltage phase/neutral
4	A (value)	Phase current
5	kW	Active power

2.8 List of available menus

		Default
PASS ?	Password	0
nPA	New Password	
Adr	Instrument serial address	1
bdr	Baud Rate	9.6
SYS	1P	
rES	Partial energy meter reset (No/Yes)	

Tab. 2.h

3. OTHER INFORMATIONS

3.1 Precision

kWh, accuracy (RDG) according to current

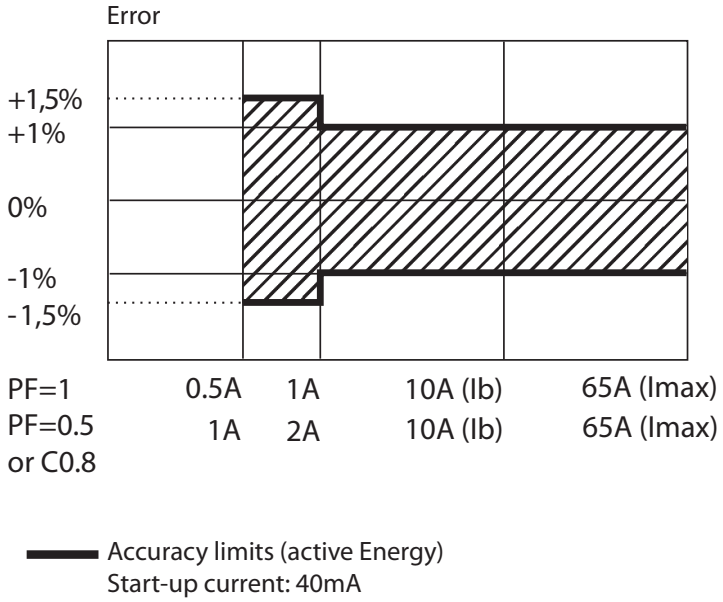


Fig. 3.a

3.1 Terminal block layout

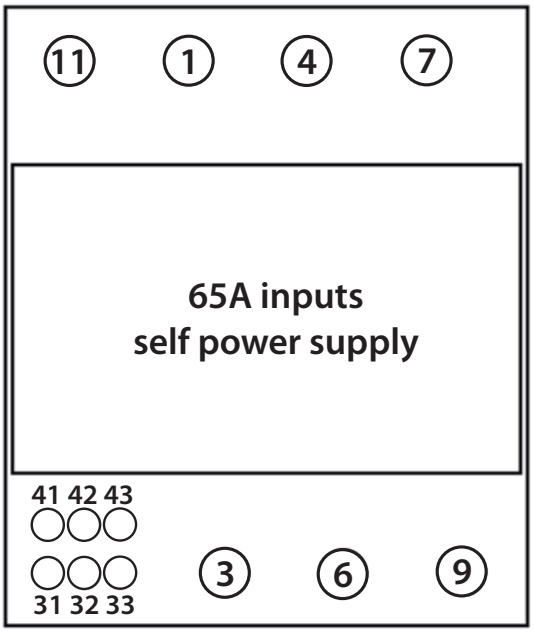


Fig. 3.b

4. WIRING DIAGRAM

4.1 Wiring diagrams "65A" Self-power supply

(Sys 1P – Single-phase load)

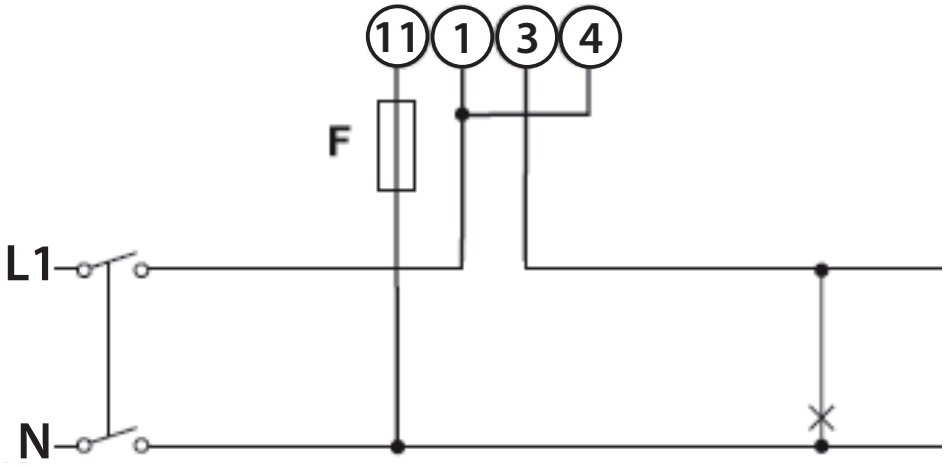


Fig. 4.a

4.2 RS485 serial port

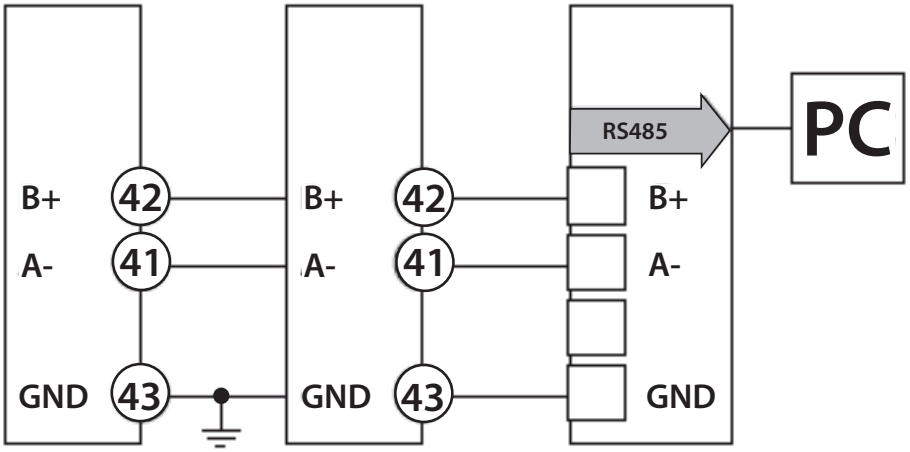


Fig. 4.b

5. DISPLAY AND DIMENSIONS

5.1 Front panel layout

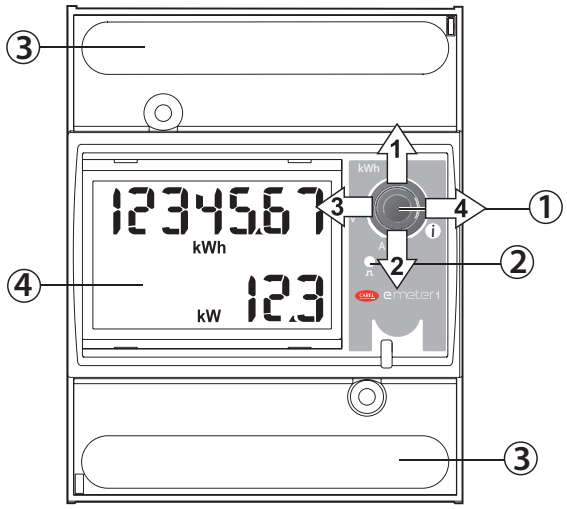


Fig. 5.a

① Joystick
To program the configuration parameters and scroll the variables on the display.

② Red LED
Red LED blinking proportional to the energy being measured.

③ Connections
Screw terminal blocks for instrument wiring.

④ Display
LCD-type with alphanumeric indications to:
- display configuration parameters;
- display all the measured variables.

NOTE: In the working mode, the joystick can be moved UP ⇧, DOWN ⇩ and LEFT ⇦ to scroll the measurement pages. In the programming mode, the joystick can be moved in all the direction (⇧, ⇩, ⇦, ⇨) to scroll the programming menus and to increase/decrease the setting values.

5.2 Dimensions and drilling template (DIN rail mounting)

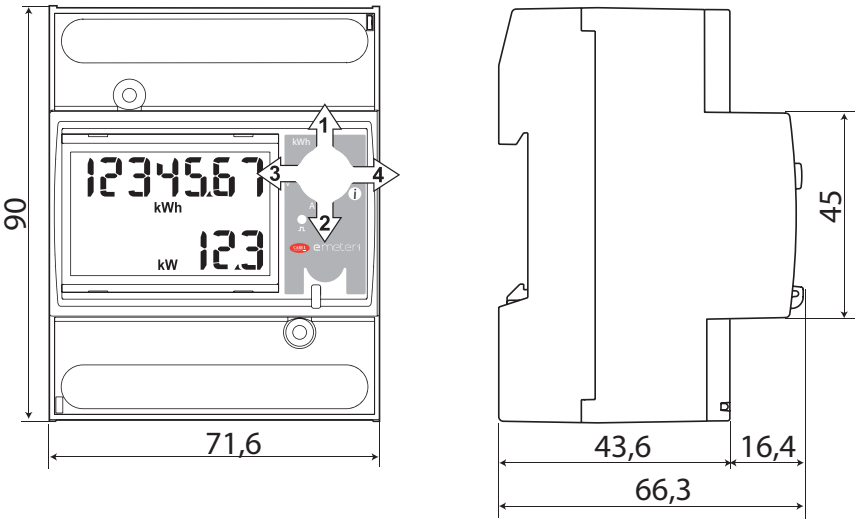


Fig. 5.b

1. INTRODUCTION

1.1 Product features

- Class B (kWh) in accordance with EN 50470-3
- Class 1 (kWh) in accordance with EN 62053-21
- Class 2 (kVarh) in accordance with EN 62053-23
- Accuracy ±0.5 RDG (current/voltage)
- Energy meter
- Instant variable readings: 3 DGT
- Energy reading: 6+1 DGT
- System variables: W, var, cosφ, Hz, phase sequence
- Single-phase variables: VLL, VLN, A, cosφ
- Energy measurements: total kWh and kVarh
- TRMS since wave distortion measurements (voltage/current)
- Self-powered
- Dimensions: 4 DIN modules and 72x72mm
- Protection index (front): IP50
- Display and programming adaptable to the application
- Optional detachable display for programming adaptable to the application (cod. Carel MTOPZD0000)
- Multi-purpose housing: for both DIN rail and panel mounting

1.2 Product description

Three-phase energy meter with detachable front display unit. The same unit can be used either as a DIN-rail mounting or a panel mounting energy meter. This energy meter is especially suitable for both active and reactive energy metering for cost allocation, but also for measuring and relaying the main electrical parameters; with IP50 (front) ingress protection. Current measurements carried out by external current transformers, and voltage measurements carried out either by direct connection or by voltage transformers. Carel emeter3 is supplied as standard with a pulse output for active energy retransmission.

2. GENERAL CARACTERISTICS

2.1 Input specifications

Measuring inputs	System: 3-phase
Current type	Not isolated (shunt inputs). **Note:** the external current transformers can be earthed individually.
Current range (using CT)	5 A from CT
Voltage	3x230 (400) V, three-phase plus neutral

Accuracy (Display + RS485) (@25°C ±5°C, RH 60%, 50 Hz)	In: 5 A, Imax: 6 A; Un: from 160 to 260 VLN (277 to 450 VLL).
Current	From 0.002 In to 0.2 In: ±(0.5% RDG +3DGT)From 0.2 In to Imax: ±(0.5% RDG +1DGT)
Phase-neutral voltage	In the range Un: ±(0.5% RDG +1DGT)
Phase-phase voltage	In the range Un: ±(1% RDG +1DGT)
Frequency	Range: 50 Hz; resolution: ±1Hz
Active power	±(1% RDG +2DGT)
Power factor	±[0.001+1%(1.000 - "cos RDG")].
Reactive power	±(2% RDG +2 DGT).
Active energy	class B in accordance with EN 50470-1-3; class 1 in accordance with EN 62053-21.
Reactive energy	class 2 in accordance with EN 62053-23. In: 5 A, Imax: 6 A; 0.1 In: 0.5 A. Start-up current: 10 mA.

Additional errors	
Influence quantities	In accordance with EN 62053-21, EN 50470-1-3, EN 62053-23
Temperature drift	≤200 ppm/°C.
Sampling rate	1600 samples/s @ 50 Hz, 1900 samples/s @ 60 Hz
Display refresh time	1 second
Display	2 lines line 1: 7 DGT, ine 2: 3 DGT or line 1: 3 DGT + 3 DGT, line 2: 3 DGT
Type	LCD, 7 mm H
Instant variable readings	3 DGT
Energy	Total imported: 5+2 DGT (5 whole numbers + 2 decimals), 6+1 DGT (6 whole numbers + 1 decimal) or 7 DGT (7 whole numbers)
Overload for instant values	EEE displayed when the value being measured exceeds the "continuous input overload" (maximum measurement capacity).
Max. and min. indications	Max. instant variables: 999 (3 DGT); energy: 9 999 999 (7 DGT) Min. instant variables: 0; energy 0.00;

LEDs	Red LED (energy consumption), 0.001 kWh per pulse if CT ratio x VT ratio is < 7; 0.01 kWh per pulse if CT ratio x VT ratio is ≥ 7.0 < 70.0; 0.1 kWh per pulse if CT ratio x VT ratio is ≥ 70.0 < 700.0; 1 kWh per pulse if CT ratio x VT ratio is ≥ 700.0. 1000 pulse/kWh (max frequency: 16Hz) in accordance with EN 62052-11.
Maximum frequency	16 Hz, in accordance with EN 50470-3 Green LED (positioned near the terminal block) for "instrument on", when on steady; flashing when RS485 communication is available and operational.
Measurements	See "list of the variables that can be associated:"
Method	TRMS measurement of distorted waveforms.
Coupling type	By external CTs.
Crest factor	In 5 A: ≤ 3 (15 A max. peak).
Current overload	
Continuous	6 A @ 50 Hz.
For 500 ms	120 A @ 50 Hz.
Voltage overload	
Continuous	1.2 A
For 500 ms	2 A
Current input impedance	< 0.3 VA
5 A	
Voltage input impedance	<2 VA
Power supply	
Frequency	50 ± 5Hz/60 ± 5Hz.
Front keypad	Two buttons for selecting the variables and programming the instrument operating parameters.

Tab. 2.a

2.2 Output specifications

Digital outputs	
Number of outputs	1
Type	Programmable from 0.01 to 9.99 kWh per pulse. Output can be associated with the energy meter (kWh)
Pulse duration	≥100ms < 120ms (ON), ≥120ms (OFF), in accordance with EN 62052-31.
Output	Static: OPTO-MOSFET
Load	VON 2.5 Vac/dc / max. 70 mA, VOFF 260 Vac/dc max.
Insulation	By opto-isolators, 4000 VRMS between output and measuring inputs.
RS485	
Type	Multidrop, bidirectional (static and dynamic variables).
Connection	2 wires. Maximum distance 1000 m, termination directly on the instrument.
Addresses	247, can be selected on front keypad.
Protocol	MODBUS/JBUS (RTU)
Data (bidirectional) Dynamic (read-only)	System and phase variables: see "list of variables..."
Static (read/write)	All configuration parameters.
Data format	1 start bit, 8 data bits, no parity, 1 stop bit.
Baud rate	9600 bit/s
Network devices	Maximum 160 devices in the same network.
Insulation	By opto-isolators, 4000 VRMS between outputs and measuring inputs.

Tab. 2.b

2.3 Software functions

Password	Numerical code, max 3 digits;
Programming lock:	A trimmer located at the rear of the display module can be used to prevent block access to the instrument configuration data.
System selection	
3-Ph.n system, unbalanced load	Three-phase (4 wires); three-phase (3 wires)
	Three-phase (3 wires), 1 current and 3 line-to-line voltage measurements. Note: line-to-line voltage is calculated by multiplying the virtual line-to-neutral voltage by 1.73.
3-Ph.1 system, balanced load	Three-phase (4 wires), 1 current and 3 line-to-neutral voltage measurements. Note: line-to-line voltage is calculated by multiplying the virtual line-to-neutral voltage by 1.73.
	Three-phase (2 wires), 1 current and 1 line-to-neutral voltage measurement (L1).
2-Ph system	Two-phase (3 wires).
1-Ph system	Single-phase (2 wires).
Transformer ratio	
CT	from 1.0 to 99.9 / from 100 to 999 . The maximum output measured cannot exceed 210 MW (calculated as maximum input current and voltage, see "Accuracy" in the previous paragraph. The maximum VT by CT ratio is 48.600)
Display	Up to 3 variables per page. See "Display pages", 3 different sets of variables (see "Display pages") according to the selected application
Reset	Using the front keypad: total energy (kWh, kVarh)

Tab. 2.c

2.4 General specifications

Operating temperature	-25°C to +55°C (-13°F to 131°F) (RH from 0 to 90% non-condensing @ 40°C) in accordance with EN 62053-21 and EN 62053-23.
Storage temperature	-30°C to +70°C (from -22°F to 158°F) (RH < 90% without condensate @ 40°C) in accordance with EN 62053-21 and EN 62053-23.
Installation category	Cat. III (IEC 60664, EN 60664).
Insulation (for 1 minute)	4000 VRMS between measuring inputs and output.
Dielectric strength	4000 VRMS for 1 minute.
Noise rejection (CMRR)	100 dB, from 48 to 62 Hz.
EMC	in accordance with EN 62052-11
Electrostatic discharges	15 kV air discharge;
Immunity to radiated electromagnetic fields	Test with current applied: 10 V/m from 80 to 2000 MHz. Test without current applied: 30 V/m from 80 to 2000 MHz;
Immunity to fast transient bursts	On current and voltage measuring input circuits: 4 kV;
Pulse immunity	On current and voltage measuring input circuits: 4 kV
Radiofrequency emissions	In accordance with CISPR 22
Standards compliance	
Safety	IEC 60664, IEC 61010-1 EN 60664, EN 61010-1 EN 62052-11
Metering	EN 62053-21, EN 62053-23. EN 50470-3
Pulse output	DIN 43864, IEC 62053-31
Approval	CE, cULus listed
Connections	screw terminals
Wire size	2.4 x 3.5 mm, min./max. screw tightening torque: 0.4 Nm / 0.8 Nm
Housing	
Dimensions	72 x 72 x 65 mm
Material	Noryl PA66, flame retardant: UL 94 V-0
Mounting	Panel and DIN rail
Protection index (Frontal)	IP50
Connections	IP20
Weight	Around 400 g (including packaging)

Tab. 2.d

2.5 Power supply specifications

Self-powered	18 to 260 Vac (48-62 Hz) (VL1-N)
Power consumption	≤ 2.6VA

Tab. 2.e

2.6 Insulation between inputs and output

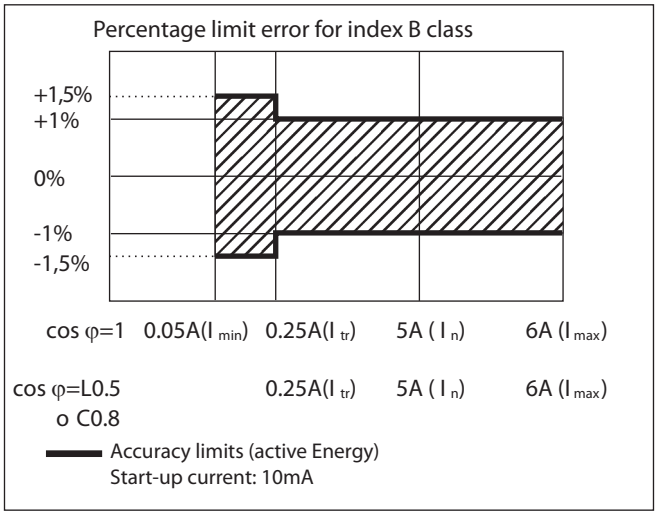
	Measuring inputs	OPTO-MOSFET output	Communication port	Power supply
Measuring inputs	-	4 kV	4 kV	0 kV
OPTO-MOSFET output	4 kV	-	-	4 kV
Communication port	4 kV	-	-	4 kV
Power supply	0 kV	4 kV	4 kV	-

Tab. 2.f

3. OTHER INFORMATIONS

3.1 Accuracy (in accordance with EN 50470-3 and EN 62053-23)

kWh, accuracy (RDG) according to current



kVarh, accuracy (RDG) according to current

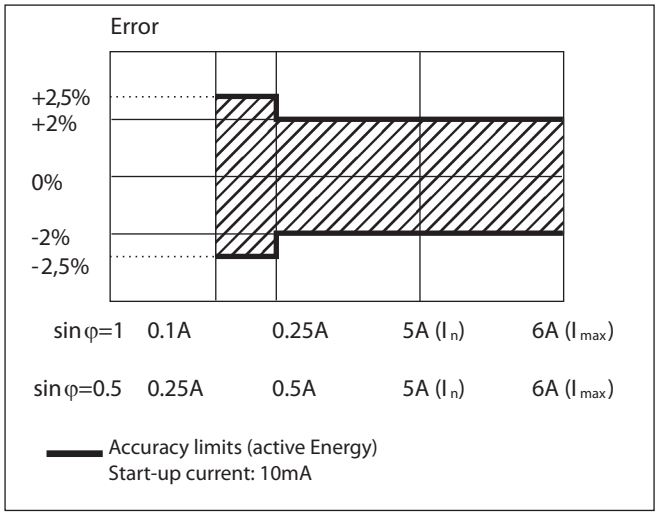


Fig. 3.a

3.2 Calculation formulae applied

Single-phase variables

Instantaneous effective voltage

$$V_{1N} = \sqrt{\frac{1}{n} \cdot \sum_{1}^{n} (V_{1N})_i^2}$$

Instantaneous active power

$$W_1 = \frac{1}{n} \cdot \sum_{1}^{n} (V_{1N})_i \cdot (A_1)_i$$

Instantaneous power factor

$$\cos\varphi_1 = \frac{W_1}{VA_1}$$

Instantaneous effective current

$$V_{1N} = \sqrt{\frac{1}{n} \cdot \sum_{1}^{n} (V_{1N})_i^2}$$

Instantaneous apparent power

$$VA_1 = V_{1N} \cdot A_1$$

Instantaneous reactive power

$$\text{var}_1 = \sqrt{(VA_1)^2 - (W_1)^2}$$

System variables

Equivalent three-phase voltage

$$V_{\Sigma} = \frac{V_1 + V_2 + V_3}{3} \cdot \sqrt{3}$$

Three-phase active power

$$W_{\Sigma} = W_1 + W_2 + W_3$$

Three-phase apparent power

$$VA_{\Sigma} = \sqrt{W_{\Sigma}^2 + \text{var}_{\Sigma}^2}$$

Three-phase power factor (TPF)

$$\cos\varphi_1 = \frac{W_1}{VA_1}$$

Energy metering

$$k\,\text{var}\,hi = \int_{t1}^{t2} Qi(t)dt \cong \Delta t \sum_{n1}^{n2} Qnj$$

$$kWhi = \int_{t1}^{t2} Pi(t)dt \cong \Delta t \sum_{n1}^{n2} Pnj$$

Where:
i= phase considered (L1, L2 or L3);
P= active power;
Q= reactive power;
t1, t2 =start and end of metering period;
n= unit of time;
t= time interval;
n1, n2 = first and last unit of time in metering period.

3.3 List of variables that can be associated

- RS485 communication port
- Pulse output ("energy" only)

	Variable	Description	1-phase system	2-phase system	3-phase, 4-wire balanced system / 3-phase, 3-wire balanced system / 3-phase, 4-wire balanced system / 3-phase, 3-wire balanced system	Note
1	kWh	Total energy	x	x	x	Total
2	kvarh	Total reactive energy	x	x	x	Total
3	V L-N sys (1)	Total voltage phase/neutral	o	x	x	sys=system (∑)
4	V L1	Voltage phase L1-N	x	x	x	
5	V L2	Voltage phase L2-N	o	x	x	
6	V L3	Voltage phase L3-N	o	o	x	
7	V L-L sys (1)	Voltage phase/phase	o	x	x	sys=system (∑)
8	V L1-2	Phase to phase voltage L1-L2	o	x	x	
9	V L2-3	Phase to phase voltage L2-L3	o	o	x	
10	V L3-1	Phase to phase voltage L3-L1	o	o	x	
11	A L1	Current phase L1	x	x	x	
12	A L2	Current phase L2	o	x	x	
13	A L3	Current phase L3	o	o	x	
14	VA sys (1)	Apparent power	x	x	x	sys=system (∑)
15	VA L1 (1)	Apparent power phase L1	x	x	x	
16	VA L2 (1)	Apparent power phase L2	o	x	x	
17	VA L3 (1)	Apparent power phase L3	o	o	x	
18	var sys	Total reactive power	x	x	x	sys=system (∑)
19	var L1 (1)	Total reactive phase L1	x	x	x	
20	var L2 (1)	Total reactive phase L2	o	x	x	
21	var L3 (1)	Total reactive phase L3	o	o	x	
22	W sys	Total active power	x	x	x	sys=system (∑)
23	W L1 (1)	Active power phase L1	x	x	x	
24	W L2 (1)	Active power phase L2	o	x	x	
25	W L3 (1)	Active power phase L3	o	o	x	
26	PF sys	cosφ total	x	x	x	sys=system (∑)
27	PF L1	cosφ phase L1	x	x	x	
28	PF L2	cosφ phase L2	o	x	x	
29	PF L3	cosφ phase L3	o	o	x	
30	Hz	Frequency	x	x	x	
31	Sequenza fasi	Frequency sequence (-1=L1-L3-L2; 0=L1-L2-L3)	o	o	x	

Tab. 3.g

(x) = available
(or) = not available (zero shown on the display)
(1) = variable only available via RS485 serial communication port

3.4 Display pages

	1st variable (1st part of line 1)	2nd variable (2nd part of line 1)	3rd variable (2nd line)	Remarks
	Phase sequence			For reverse phase sequence, the alarm triangle will be shown on every page
1	Total kWh		sys W	
2	Total kVarh		sys kvar	
3		cosφ sys	Hz	C, -C, L, -L shown, depending on the quadrant
4	cosφ L1	cosφ L2	cosφ L3	C, -C, L, -L shown, depending on the quadrant
5	A L1	A L2	A L3	
6	V L1-2	V L2-3	V L3-1	
7	V L1	V L2	V L3	

Tab. 3.h

3.5 Other information available on the display

Type	Line 1	Line 2	Remarks
Meter information 1	Y. 2007	r.A0	Year of manufacture and firmware revision
Meter information 2	PuL_ LEd (kWh)	value	kWh per LED pulse
Meter information 3	SYS [3P.n]	value	System and connection type
Meter information 4	Ct rAt.	value	Current transformer ratio
Meter information 5	Ut rAt.	value	Voltage transformer ratio
Meter information 6	PuLSE (kWh)	value	Pulse output: kWh per pulse
Meter information 7	Add	value	Serial communication address

Tab. 3.i

3.6 One instrument with two installation possibilities

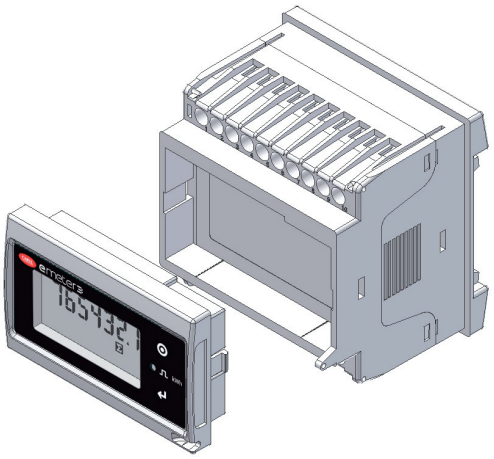


Fig. 3.b

Thanks to the patented detachable display, the instrument can be used either as a panel-mounted energy meter or...

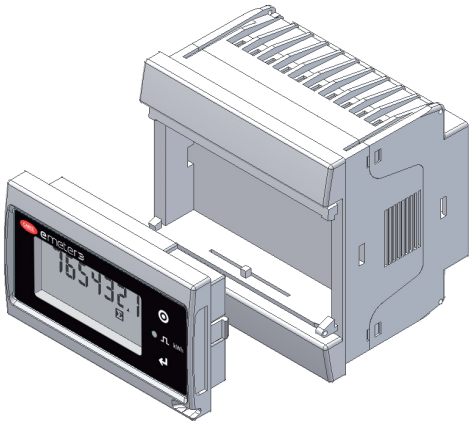


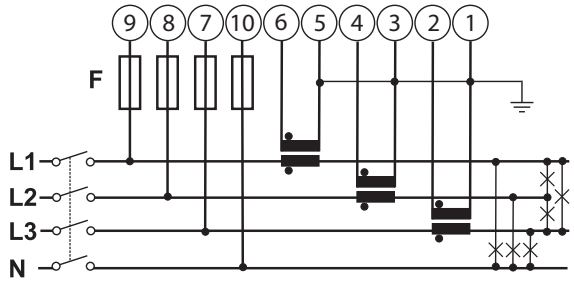
Fig. 3.c

... a DIN-rail mounted energy meter.

4. WIRING DIAGRAM

4.1 Wiring diagrams

[1]



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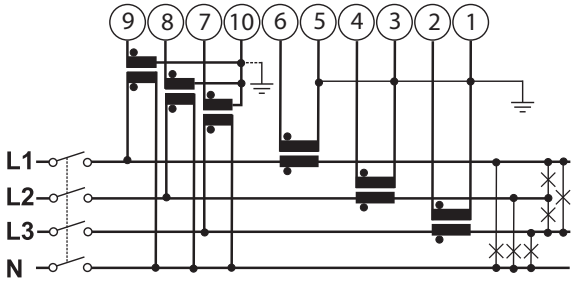
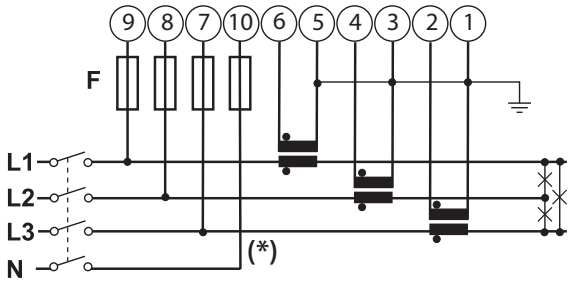
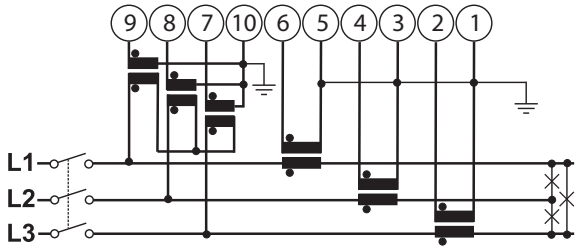


[3]



[4]



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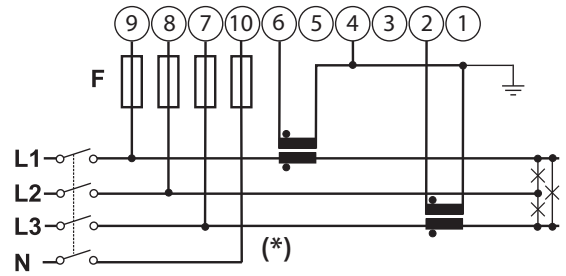

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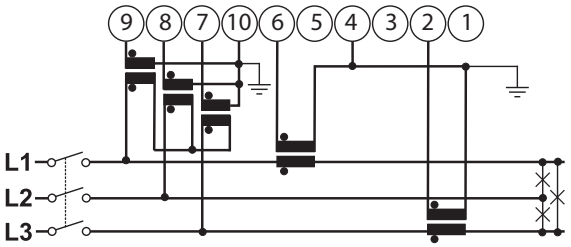

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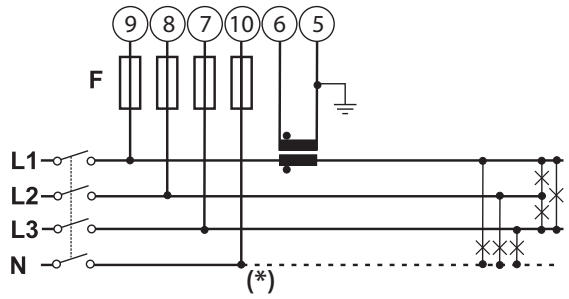

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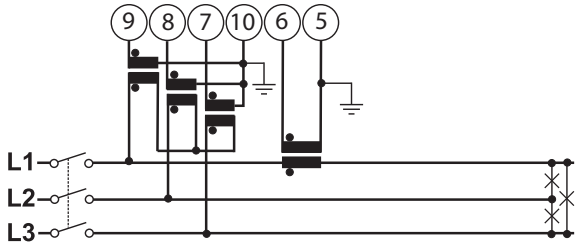

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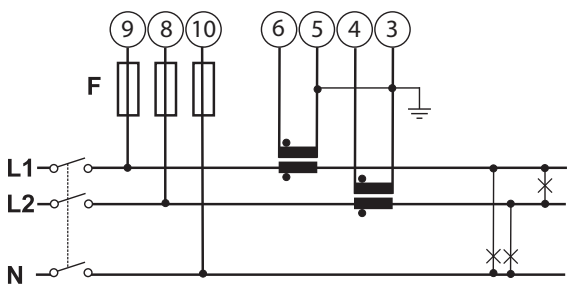
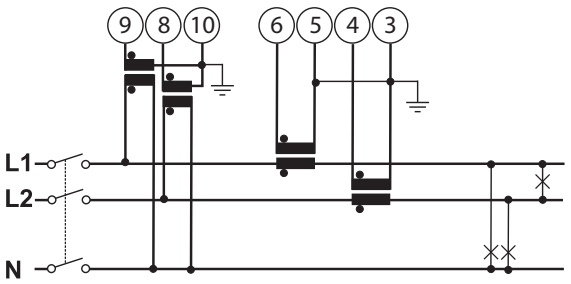
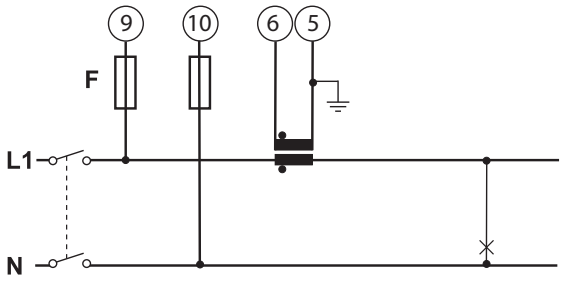


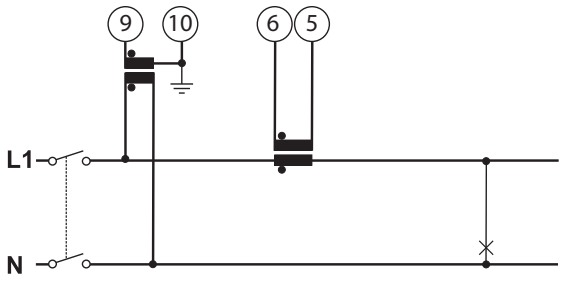
[10]



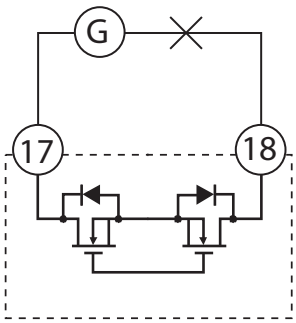
[11]



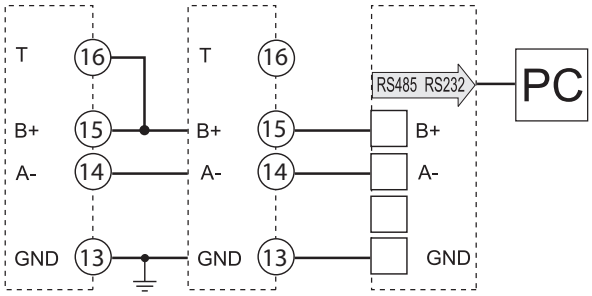
[12]



[13] VDC/AC



[14]



Key:

System type selection 3P.n
[1] - 3-ph, 4-wire, unbalanced load, 3-CT connection
[2] - 3-ph, 4-wire, unbalanced load, 3-CT and 3-VT/PT connections

System type selection 3P
[3] - 3-ph, 3-wire, unbalanced load, 3-CT connection
[4] - 3-ph, 3-wire, unbalanced load, 3-CT and 3-VT/PT connections
[5] - 3-ph, 3-wire, unbalanced load, 2-CT connnections (ARON)
[6] - 3-ph, 3-wire, unbalanced load, 3-VT/PT and 2-CT connections (ARON)

System type selection 3P.1
[7] - 3-ph, 3/4-wire, balanced load, 1-CT connection (if the neutral is available the voltage connection can be realized to only 2-wire VL1 and N)
[8] - 3-ph, 3-wire, balanced load, 1-CT and 3-VT/PT connection

System type selection 2P
[9] - 2-ph, 3-wire, 2-CT connection
[10] - 2-ph, 3-wire, 2-CT and 2-VT/PT connections

System type selection 1P
[11] - 1-ph, 2-wire, 1-CT connection.
[12] - 1-ph, 2-wire, 1-CT and 1-VT/PT connection

Static output and serial port
[13] - Opto-mosfet static output
[14] - RS485 connection 2 wires
[a] - last instrument
[b] - instrument 1...n,
[c]- RS485/RS232 transducer

(*) NOTE: For a correct power supply of the instrument, the neutral must always be connected

5. DISPLAY AND DIMENSIONS

5.1 Front panel layout

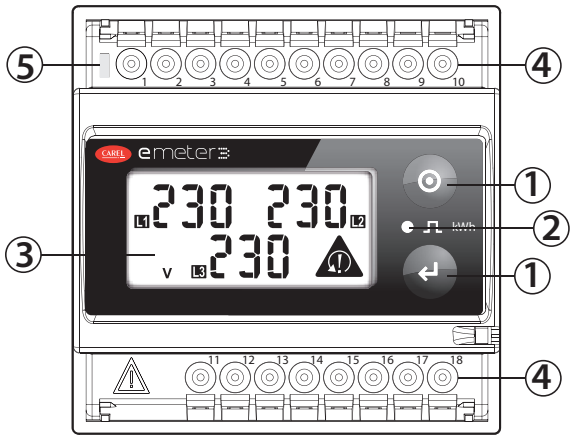


Fig. 5.a

① TKeypad
To program the configuration parameters and scroll the variables on the display.

② Red LED
The red LED flashes in proportion to energy consumption.

③ Display
LCD with alphanumeric display of configuration parameters and measured variables.

④ Connections
Screw terminals for instrument wiring.

⑤ Green LED
The green LED comes on when the instrument is powered.

5.2 Dimensions (DIN rail configuration)

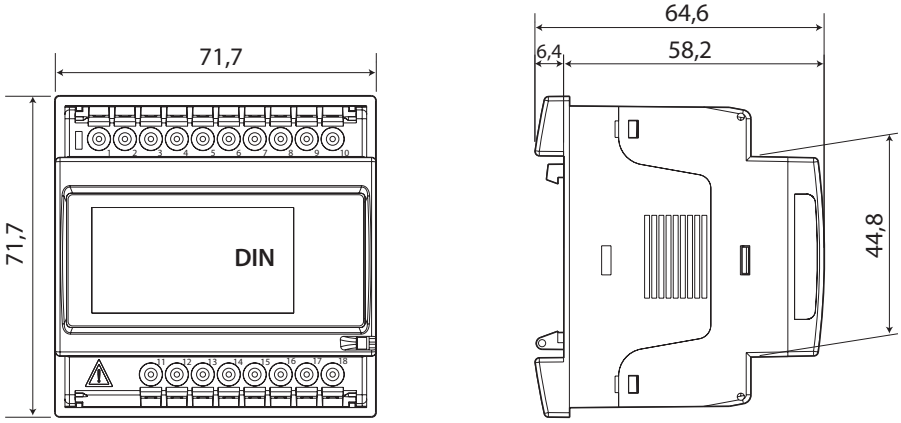


Fig. 5.b

5.3 Dimensions and drilling template (72x72 panel-mounting configuration)

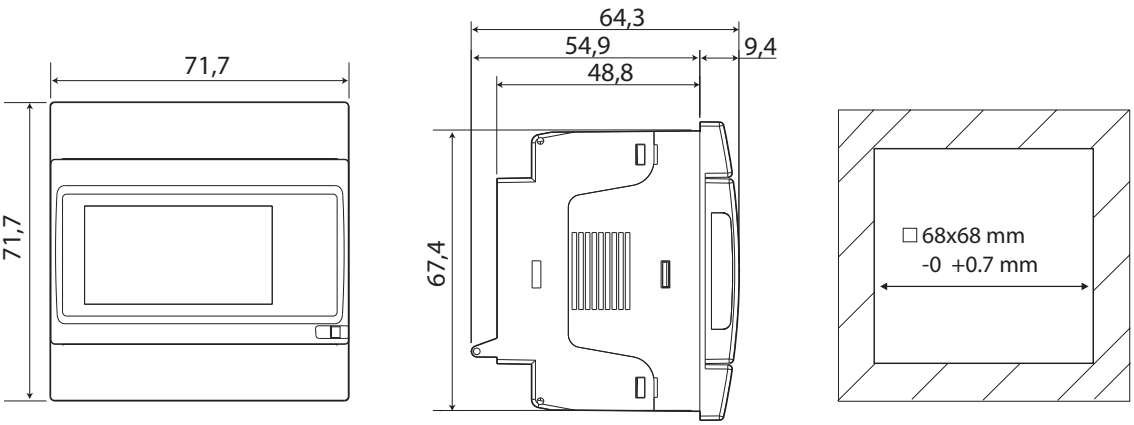


Fig. 5.c

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