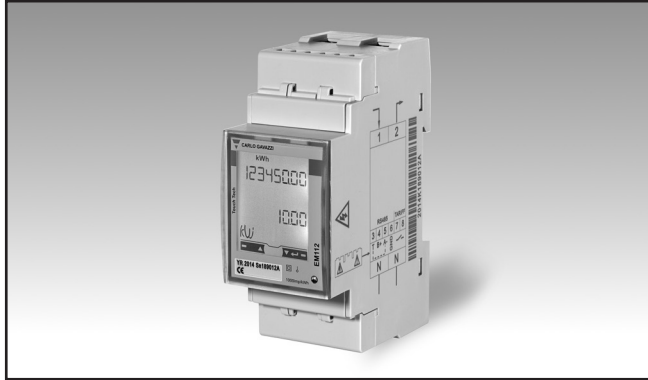


Energy Management Energy Analyzer

Type EM112 (For products produced before 2025, see annex A)

CARLO GAVAZZI



- Single phase energy analyzer
- Accuracy $\pm 0.5\%$ RDG (current/voltage)
- Direct current measurement up to 100 AAC
- Backlit LCD display (3x 8-digit) with integrated touch key-pad
- Energy readout on display: 8 digit
- Variable readout on display: 4 digit
- Energy measurement: kWh and kvarh (imported/exported); kWh+ by 2 tariffs
- System variables, kW, kvar, V, A, PF, Hz, kWdmd, kWdmd peak
- Self power supply
- Dimensions: 2-DIN module
- Protection degree (front): IP51
- Pulse output (optional, by open collector PNP)
- RS485 Modbus port (optional)
- M-bus port (optional)
- Digital input (for tariff management)
- Easy connection or wrong current direction detection

Product description

Single-phase energy analyzer with backlit LCD display with integrated touch keypad. Particularly indicated for active energy metering and for cost

allocation in applications up to 100 A (direct connection), with dual tariff management availability. It can measure imported and exported energy

or be programmed to consider only the imported one. Housing for DIN-rail mounting, with IP51 front degree protection. The analyzer is optionally provided

with pulse output proportional to the active energy being measured, RS485 Modbus port or M-bus port.



STANDARD

Not certified according to MID Directive. Cannot be used for fiscal (legal) metrology.

How to order

EM112-DIN AV0 1 X O1 X

Model _____
Range code _____
System _____
Power supply _____
Output _____
Option _____

Type Selection

Range code	System	Power supply	Output
AV0: 240 VLN AC - 5 (100) A (Direct connection) Starting from serial number 2025150000Z onward (From YR 2025)	1: 1-phase 2-wire	X: Self power supply -30% +20% (AV0) or -30% +30% (AV1) of the rated measuring input voltage, 45 to 65 Hz	O1: pulse output S1: RS485 Modbus port M1: M-bus port
AV1: 120 VLN AC - 5 (100) A (Direct connection). Available on request (MOQ 100 pcs)			
Option			
X: none			

Input specifications

Rated Inputs		Type	Backlit LCD, 3 rows by 8-digit each, h 5 mm
Current type	1-phase loads, direct connection	Read-out	Energy: 8 digit. Variables: 4 digit
Current range	5 (100) A	Touch key	2 (Enter/DOWN and UP).
Nominal voltage	240 VLN AC (AV0 option), 120 VLN (AV1 option)	Max. and Min. indication	
Accuracy (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)		Energies	Max. 99 999 999 Min. 0.01
AV1	$I_{min}=0.25\text{ A}; I_b: 5\text{ A}; I_{max}: 100\text{ A}; U_n: 120\text{ VLN } -30\% +30\%$	Variables	Max. 9999 Min. 0.01
AV0X	$I_{min}=0.25\text{ A}; I_b: 5\text{ A}; I_{max}: 100\text{ A}; U_n: 240\text{ VLN } -30\% +20\%$	Memory energy storage	
Energies		Energy	10 ¹⁰ cycles. Energy value is saved every time the less significant digit increases.
Active energy	Class 1 according to EN 62053-21 (in AV0 version, class 1 accuracy is guaranteed also at 120 VLN)	Programming parameters	10 ¹⁰ cycles. When a parameter is modified, only the relevant memory cell is overwritten
Reactive energy	Class 2 according to EN 62053-23	LEDs	Flashing red light pulses according EN 62052-11, 1000 imp./kWh (max. frequency: 9.2 Hz) Fix orange light: wrong current direction (only with "B" measurement selection)
Start-up current:	40 mA (AV0, AV1), positive or negative Self-consumption is not measured.	Current overloads	
Start-up voltage	84 VLN (AV1), 168 VLN (AV0)	Continuous	100 A, @ 50 Hz
Resolution	Display	For 10ms	3000 A
Current	0.1 A	Voltage Overloads	
Voltage	0.1 V	Continuous	1.2 U_n
Power	0.01 kW or kVar	For 500ms	2 U_n
Frequency	0.1 Hz	Input impedance	
PF	0.01	Voltage input 240 VLN	1.88 MΩ
Energies (positive)	0.01 kWh or kvarh	Voltage input 120 VLN	1.88 MΩ
Energies (negative)	0.01 kWh or kvarh	Current inputs: 5 (100) A	< 2 VA
	Serial communication		
Current	0.001 A		
Voltage	0.1 V		
Power	0.1 kW or kvar		
Frequency	0.1 Hz		
PF	0.001		
Energies (positive)	0.001 kWh or kvarh		
Energies (negative)	0.001 kWh or kvarh		
Energy additional errors			
Influence quantities	According to EN 62053-21		
Temperature drift	≤ 200 ppm/°C		
Sampling rate	4096 samples/s @ 50 Hz 4096 samples/s @ 60 Hz		
Display and touch key-pad			

Digital input specifications

Digital inputs	Voltage free contact	Overload	In case a voltage is erroneously applied to the digital input, the input is not damaged up to 30 V ac/dc.
Function	Tariff management (digital input between 7-8 terminals)		
Number of inputs	1		
Contact measurement voltage	5 V		
Input impedance	$\leq 1 \text{ k}\Omega$		
Contact resistance	$\geq 1 \text{ k}\Omega$, close contact, 100 k Ω , open contact		

Output specifications

RS485 serial port	RS485 by screw connection.	Other	Available functions: wild card, header, initialisation SND_NKE, and req_udr management. Management of primary address modification via M-bus. VIF, VIFE, DIF and DIFE: see protocol
Function	For communication of measured data, programming parameters		
Protocol	Modbus RTU (slave function)		
Baud rate	9.6, 19.2, 38.4, 57.6, 115.2 kbaud, even or no parity,	Static output	
Address	1 to 247 (default: 1)	Purpose	For pulse output proportional to the active energy (kWh)
Driver input capability	1/8 unit load. Maximum 247 transceivers on the same bus.	Pulse rate	Selectable in multiple of 100 Max 500 or 2000 pulses/kWh according to pulse ON duration
Data refresh time	1 s	Pulse ON duration	Selectable: 30 ms or 100 ms according to EN 62052-31
Read command	125 words available in 1 read command	Output type	open collector PNP
Rx/Tx indication	Rx segment on display is shown when a valid Modbus command is sent to that specific meter; Tx segment on display is shown when a valid Modbus reply is sent back to the master	Load	V_{ON} 1 V dc max. 100 mA V_{OFF} 80 V dc max.
M-bus port	M-bus by screw connection.		
Function	For communication of measured data		
Protocol	M-bus according to EN 13757-3		
Baud rate	0.3, 2.4, 9.6 kbaud		
Meters in the M-bus network	250		
Primary address	Selectable		
Secondary address	Univocally defined in each unit		
Secondary address range	from 7000 0000 to 7999 9999		

General specifications

Operating temperature	-25 to +65 °C, indoor, (R.H. from 0 to 90% non- condensing @ 40 °C)	Dimensions (WxHxD)	35 x 63 x 90 mm
Storage temperature	-30 to +80 °C (R.H. < 90% non-condensing @ 40°C)	Material	PTB, self-extinguishing: UL 94 V-0
Overvoltage category	Cat. III	Sealing covers	Included
Insulation (for 1 minute)	4000 VAC RMS between measuring inputs and digital/serial output (see table) 4000 VAC RMS	Mounting	DIN-rail
Dielectric strength	4000 VAC RMS for 1 minute	Protection degree	
EMC	According to EN IEC 61326-1:2021	Front	IP51
Standard compliance		Screw terminals (cable inputs)	IP20
Safety	EN 62052-11; EN 61010- 1:2010/A1:2019/AC:2019- 04; EN IEC 61010-2- 030:2021/A11:2021	Weight	Approx. 170 g (packaging included)
Metrology	EN 62053-21		
Approvals	CE		
Connections			
Cable cross-section area	Measuring inputs: max. 25 mm ² , min. 5 mm ² with/ without metallic cable ferrule; Max. screw tightening torque: 2.8 Nm		
Other terminals	1.5 mm ² , Min./Max. screws tightening torque: 0.5 Nm		
Housing			

Power supply specifications

Self power supply		Power consumption	≤ 1 W, ≤ 8 VA
AV0	240 VAC VLN, -30% +20% 45-65 Hz		
AV1	120 VAC VLN, -30% +30% 45-65 Hz		

Insulation (for 1 minute) between inputs and outputs

	Measuring input	Digital or serial output	Digital input
Measuring input	-	4 kV	4 kV
Digital or serial output	4 kV	-	0 kV
Digital input	4 kV	0 kV	-

Display pages

No	1 st row	2 nd row	3 rd row	"Full" mode	"Easy" mode	Note
0	kWh+ (imported)	-	kW	X	X	With Measurement menu set to "A", this is considering the total energy without considering the current direction.
1	kWh- (exported)	-	kW	X	X	With Measurement menu set to "B"
2	kWh+ (imported)	-	V	X	X	-
3	kWh+ (imported)	-	A	X	X	-
4	kWh+ (imported)	-	PF	X		-
5	kWh+ (imported)	-	Hz	X		-
6	kvarh+ (imported)	-	kvar	X		With Measurement menu set to "A", this is considering the total positive reactive energy without considering the current direction.
7	kvarh- (exported)	-	kvar	X		With Measurement menu set to "B"
8	kWh+ (imported)	kWdmd peak	kWdmd	X		-
9	kWh (t1)	"t1"	kW	X	X	Only relevant to kWh+, with Tariff menu set to ON.
10	kWh (t2)	"t2"	kW	X	X	Only relevant to kWh+, with Tariff menu set to ON.

X= available

List of available menus

Menu name and description		Range	Default setting
PASS	Password request	From 0000 to 9999	0000
nPASS	New password	From 0000 to 9999	0000
Measure	Measurement type (A=easy connection; B=bidirectional, imported and exported energy).	A; b	A
P int	Integration time for Wdmd calculation	1 to 30 min	1
Mode	Selection of complete or simplified set of variables on display	Full or Easy	Full
Tariff	Tariff enabling	Yes/No	No
Home	Home page selection (default page at power-on and after 120 s time-out from other pages).	0 to 10	0
PULSE (O1 option)	Selection of pulse ON duration	30 or 100 ms	30
	Selection of the pulse weight (multiples of 100 pulses/kWh)	100 to 500 (if duration is 100 ms) 100 to 2000 (if 30 ms)	100
Address (S1 option)	Modbus serial address	1 to 247	01
Kbaud (S1)	Modbus baud rate	9.6; 19.2; 38.4; 57.6, 115.2 kbps	9.6
ParlTY (S1)	Modbus parity	No/even	No
	Stopbit (available only if parity is set to "No")	1;2	1
PrI Add (M1 option)	M-bus primary address	1 to 250	0
Kbaud (M1)	M-bus baud rate	0.3; 2.4; 9.6 kbps	2.4
RESET	Allow the reset of tariff meters and W dmd peak (kWh/kvarh meter reset available only via serial communication)	Yes/No	No
End	Exit to measuring mode		

Note: after the confirmation of a new parameter value, the value is stored in the memory without the need to exit the programming mode.

Additional available information on the display (*)

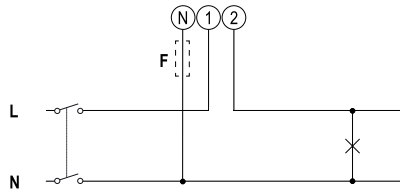
Page	Code	Description
YEAr	InFO 1	Year of manufacture
SErIAL n	InFO 2	Serial number, corresponds to the one indicated on the front print
rEViSIon	InFO 3	Firmware revision – XY.nn:
PuLS Led	InFO 4	Front LED pulse weight
MEASurE	P3	Measurement type
P int	P4	Requested average power calculation interval
ModE	P5	Display mode
tArIFF	P6	Tariff management enabling and current tariff
HoME	P7	Measurement page set as home page
CHEkSuM	InFO 6	Firmware checksum
Pages specific to the S1 version		
AddrESS	P10	Modbus address
bAUd	P11	Baud rate
PArITY	P12–1	Parity
StoP bit	P12–2	Stop bit
Pages specific to the O1 version		
PULSE	P8–1	Duration
PuL rAtE	P8–2	Pulse weight
Pages specific to the M1 version		
Pr I Add	P9	M-Bus primary address
bAUd	P11	Baud rate
SEC Add	InFO 5	M-Bus secondary address, univocal and set during production

(*) can be reached by pressing simultaneously the 2 touch keys

Wiring diagrams

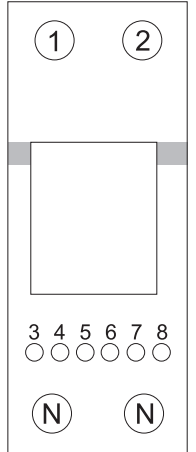
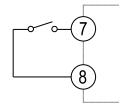
1-ph, 2-wire (F 315mA)

Fig.1



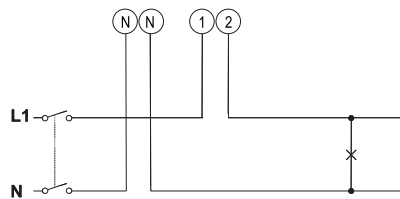
Digital Input

Fig.2



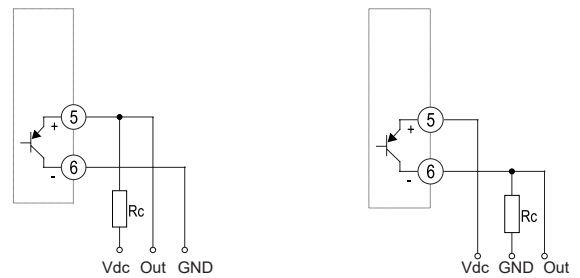
1-ph, 2-wire

Fig.3



Open collector output

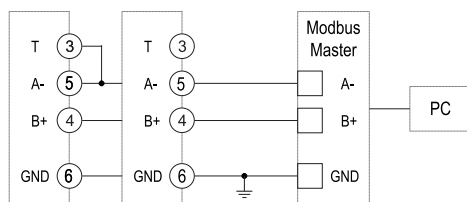
Fig.4



The load resistance (R_c) must be designed so that the closed contact current is under 100 mA (V_{on} is equal to 1 V dc). DC voltage (V_{off}) must be less than or equal to 80 V.

RS485 Modbus communication port

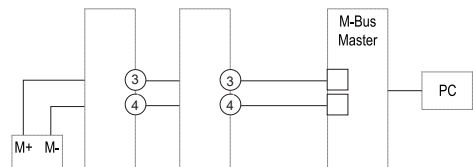
Fig.5



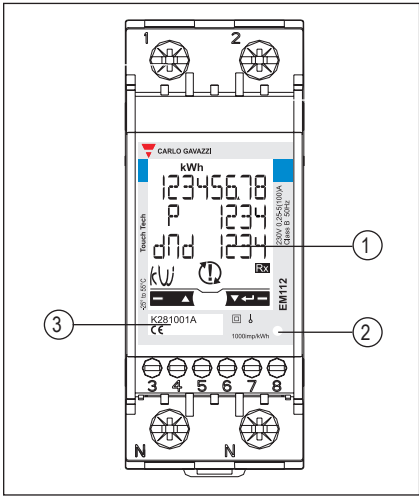
Additional instruments with RS485 are connected in parallel. The serial output must only be terminated on the last network device connecting terminals A- and T. For connections longer than 1000 m use a signal repeater. Maximum 247 transceivers on the same bus.

M-Bus communication port

Fig.6

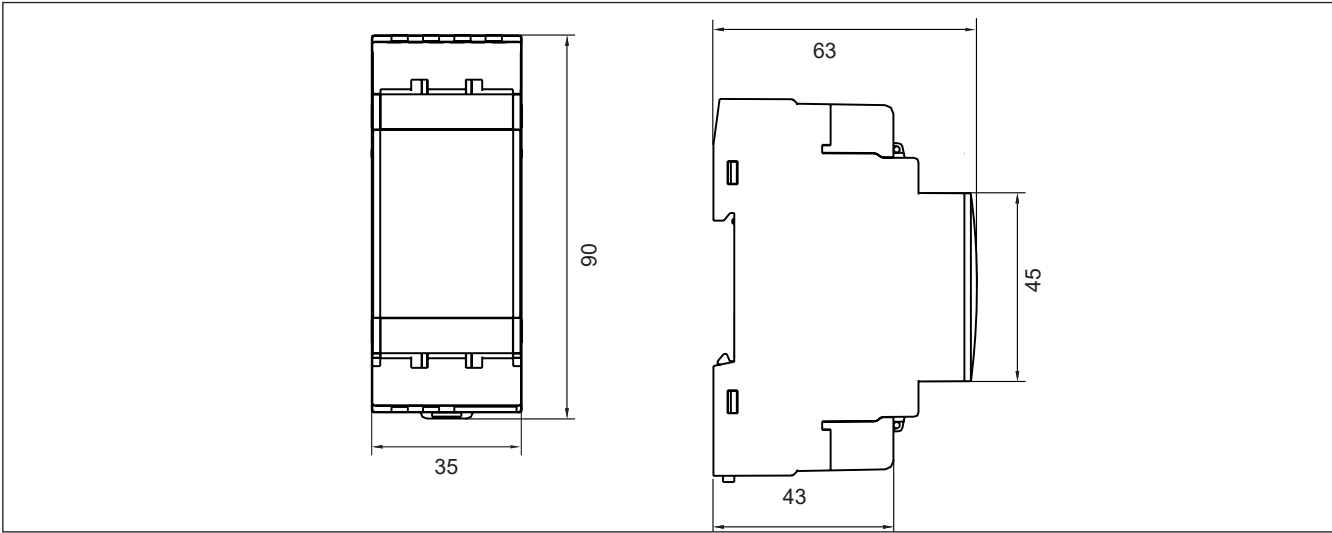


Front panel description



- 1. **Display**
Backlit LCD display with touch key-pad.
Right key: enter, down
Left key: up
- 2. **LED**
LED proportional to kWh reading
- 3. **Serial number and MID data**
Area reserved to serial number

Dimensions (mm)



Introduction

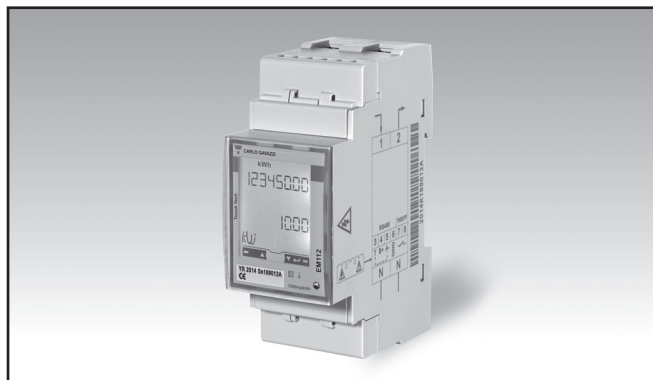
This Annex provides additional information regarding engineering changes introduced in the EM112 energy analyzer starting from the 2025 production series. It has been added to this document to help users identify the correct version of the device and understand the key differences between models. The distinction between the two product versions is based on the serial number:

- Devices with a serial number starting from **2025150000Z** are considered the updated models with the 2025 engineering changes.
- Devices with a lower serial number belong to the pre-2025 generation and follow the specifications outlined in the previous version of the datasheet (see below).

In the following section the old technical specifications will be reported.

Energy Management Energy Analyzer Type EM112

CARLO GAVAZZI



- Single phase energy analyzer
- Class 1 (kWh) according to EN62053-21
- Class B (kWh) according to EN50470-3
- Accuracy $\pm 0.5\%$ RDG (current/voltage)
- Direct current measurement up to 100AAC
- Backlit LCD display (3x 8-digit) with integrated touch key-pad
- Energy readout on display: 8 digit
- Variable readout on display: 4 digit
- Energy measurement: kWh and kvarh (imported/exported); kWh+ by 2 tariffs
- System variables, kW, kvar, V, A, PF, Hz, kWdmd, kWdmd peak
- Self power supply
- Dimensions: 2-DIN module
- Protection degree (front): IP51
- Pulse output (optional, by open collector PNP)
- RS485 Modbus port (optional)
- M-bus port (optional)
- Digital input (for tariff management)
- Easy connection or wrong current direction detection

- Compliant with the international accuracy standard IEC/EN62053-21, and the IEC/EN61557-12 performance requirements (active power and active energy).
- Certified according to MID Directive (option PF only): see "how to order" below

Product description

Single-phase energy analyzer with backlit LCD display with integrated touch keypad. Particularly indicated for active energy metering and for cost allocation in applications up to 100 A (direct connection), with dual tariff management availability. It can measure imported and exported energy or be programmed to consider only

the imported one. Housing for DIN-rail mounting, with IP51 front degree protection. The analyzer is optionally provided with pulse output proportional to the active

energy being measured, RS485 Modbus port or M-bus port.

MID Certified according to MID Directive, Module B and Module D of Annex II, for legal metrology relevant to active electrical energy meters (see Annex V, MI003, of MID). Can be used for fiscal (legal) metrology.

How to order

EM112-DIN AV0 1 X O1 PF B

Model _____
 Range code _____
 System _____
 Power supply _____
 Output _____
 Option _____
 Measurement _____

Type Selection

Range code	System	Power supply	Output
AV0: 230VLN AC - 5(100)A (Direct connection)	1: 1-phase 2-wire	X: Self power supply -30% +20% of the rated measuring input voltage, 50Hz	O1: pulse output S1: RS485 Modbus port M1: M-bus port
Option	Measurement		
PF: Certified according to MID Directive. Can be used for fiscal (legal) metrology.	A: The power is always integrated (both in case of positive imported and negative exported power) and the total energy meter is certified according to MID. B: Only the total positive energy meter is certified according to MID.		



STANDARD

Not certified according to MID Directive. Cannot be used for fiscal (legal) metrology.

How to order

EM112-DIN AV0 1 X O1 X

Model

Range code

System

Power supply

Output

Option

Type Selection

Range code	System	Power supply	Output
AV0: 230VLN AC - 5(100)A (Direct connection)	1: 1-phase 2-wire	X: Self power supply -30% +20% of the rated measuring input voltage, 45 to 65Hz	O1: pulse output S1: RS485 Modbus port M1: M-bus port
AV1: 120VLN AC - 5(100)A (Direct connection). Available on request (MOQ 100 pcs)			
Option			
X: none			

Input specifications

Rated Inputs		Display and touch key-pad	
Current type	1-phase loads, direct connection	Type	Backlit LCD, 3 rows by 8-digit each, h 5 mm
Current range	5(100)A	Read-out	Energy: 8 digit. Variables: 4 digit
Nominal voltage	230VLN AC (AV0 option), 120 VLN (AV1 option)	Touch key	2 (Enter/DOWN and UP).
Accuracy (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)		Max. and Min. indication	
AV1	Imin=0.25A; Ib: 5A, Imax: 100A; Un: 120VLN -30% +30%	Energies	Max. 99 999 999 Min. 0.01
AV0	Imin=0.25A; Ib: 5A, Imax: 100A; Un: 230VLN -30% +20%	Variables	Max. 9999 Min. 0.01
Energies	Class 1 according to EN62053-21 (in AV0 version, class 1 accuracy is guaranteed also at 120 VLN) Class B (kWh) according to EN50470-3 Class 2 according to EN62053-23 40mA (AV0, AV1), positive or negative Self-consumption is not measured.	Memory energy storage	
Active energy		Energy	10^10 cycles. Energy value is saved every time the less significant digit increases. 10^10 cycles. When a parameter is modified, only the relevant memory cell is overwritten
Reactive energy		Programming parameters	
Start-up current:		LEDs	
Start-up voltage	84VLN (AV1), 161VLN (AV0)	Flashing red light pulses according to EN50470-3, EN62052-11, 1000 imp./kWh (min. period: 90ms, max. frequency: 11 Hz) Fix orange light: wrong current direction (only with PFB option or with “B” measurement selection in case of X option)	
Resolution		Current overloads	
Current	Display 0.1 A	Continuous	100A, @ 50Hz
Voltage	0.1 V	For 10ms	3000 A
Power	0.01 kW or kVar	Voltage Overloads	
Frequency	0.1 Hz	Continuous	1.2 Un
PF	0.01	For 500ms	2 Un
Energies (positive)	0.01 kWh or kvarh	Input impedance	
Energies (negative)	0.01 kWh or kvarh	Voltage input 230VL-N	1.2Mohm
Serial communication		Voltage input 120VL-N	1.2Mohm
		Current inputs: 5(100) A	< 2VA
Current	0.001 A		
Voltage	0.1 V		
Power	0.1 kW or kvar		
Frequency	0.1Hz		
PF	0.001		
Energies (positive)	0.001 kWh or kvarh		
Energies (negative)	0.001 kWh or kvarh		
Energy additional errors			
Influence quantities	According to EN62053-21		
Temperature drift			
≤200ppm/°C			
Sampling rate			
4096 samples/s @ 50Hz			
4096 samples/s @ 60Hz			

Digital input specifications

Digital inputs

Function

Number of inputs

Contact measurement voltage

Input impedance

Contact resistance

Free of voltage contact
 Tariff management (switch between 7-8)
 1
 5 V
 $\leq 1\text{kohm}$
 $\geq 1\text{kohm}$, close contact
 100kohm, open contact

Overload

In case a voltage is erroneously applied to the digital input, the input is not damaged up to 30 V ac/dc.

Output specifications

RS485 serial port

Function

Protocol

Baud rate

Address

Driver input capability

Data refresh time

Read command

Rx/Tx indication

RS485 by screw connection.
 For communication of measured data, programming parameters
 Modbus RTU (slave function)
 9.6, 19.2, 38.4, 57.6, 115.2 kbaud, even or no parity,
 1 to 247 (default: 1)
 1/8 unit load. Maximum 247 transceivers on the same bus.
 1s
 50 words available in 1 read command
 Rx segment on display is shown when a valid Modbus command is sent to that specific meter;
 Tx segment on display is shown when a valid Modbus reply is sent back to the master

Other

Static output

Purpose

Pulse rate

Pulse ON duration

 Output type
 Load

Available functions: wild card, header, initialisation
 SND_NKE, and req_uds management. Management of primary address modification via M-bus.
 VIF, VIFE, DIF and DIFE: see protocol

For pulse output proportional to the active energy (kWh)
 Selectable in multiple of 100
 Max 500 or 2000 pulses/kWh according to pulse ON duration
 Selectable: 30ms or 100 ms according to EN62052-31
 open collector PNP
 V_{ON} 1 V dc max. 100mA
 V_{OFF} 80 V dc max.

M-bus port

Function

Protocol

Baud rate

Meters in the M-bus network

Primary address

Secondary address

Secondary address range

M-bus by screw connection.
 For communication of measured data
 M-bus according to EN13757-3
 0.3, 2.4, 9.6 kbaud
 250
 Selectable
 Univocally defined in each unit
 from 7000 0000 to 7999 9999

General specifications

Operating temperature	-25 to +65 °C, indoor, (R.H. from 0 to 90% non-condensing @ 40°C)	Housing	
Storage temperature	-30°C to +80°C (R.H. < 90% non-condensing @ 40°C)	Dimensions (WxHxD)	35 x 63 x 90 mm
Overvoltage category	Cat. III	Material	PTB, self-extinguishing: UL 94 V-0
Insulation (for 1 minute)	4000 VAC RMS between measuring inputs and digital/serial output (see table) 4000 VAC RMS	Sealing covers	Included
Dielectric strength	4000 VAC RMS for 1 minute	Mounting	DIN-rail
EMC	According to EN62052-11	Protection degree	
Standard compliance		Front	IP51
Safety	EN62052-11	Screw terminals (cable inputs)	IP20
Metrology	EN62053-21, EN50470-3 IEC/EN61557-12 (active power and active energy, MID models only)	Weight	Approx. 160 g (packing included)
Approvals	CE, UKCA, MID (PF option only), UL (AV1 model only)		
Connections			
Cable cross-section area	Measuring inputs: max. 25 mm ² , min. 5 mm ² with/without metallic cable ferrule; Max. screw tightening torque: 2.8 Nm		
Other terminals	1.5 mm ² , Min./Max. screws tightening torque: 0.5 Nm		

Power supply specifications

Self power supply		Power consumption	
AV0	230VAC VL-N, -30% +20% 45-65Hz		≤ 1W, ≤ 8VA
AV1	120VAC VL-N, -30% +30% 45-65Hz		

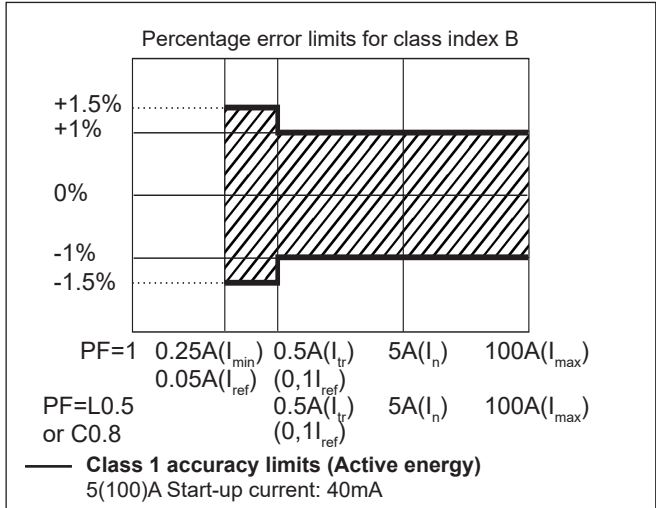
Insulation (for 1 minute) between inputs and outputs

	Measuring input	Digital or serial output	Digital input
Measuring input	-	4 kV	4 kV
Digital or serial output	4 kV	-	0 kV
Digital input	4 kV	0 kV	-

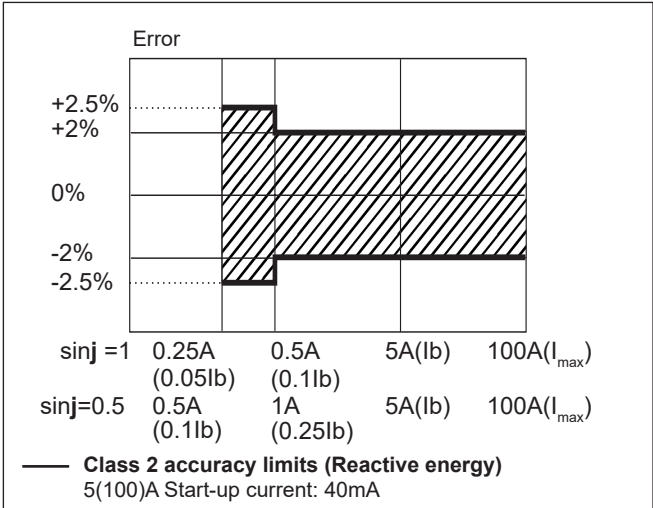


Accuracy (according to EN50470-3 and EN62053-23)

kWh, accuracy (RDG) depending on the current



kvarh, accuracy (RDG) depending on the current



Measurement accuracy according to IEC/EN61557-12 (MID versions)

Active power

Performance class 1

Active energy

Performance class 2

MID compliance (PF option only)

Accuracy	0.9 Un ≤ U ≤ 1.1 Un; 0.98 fn ≤ f ≤ 1.02 fn; fn: 50 Hz; cosj: 0.5 inductive to 0.8 capacitive. Class B Considering listed Ib or In values
Operating temperature	-25 to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)
EMC compliance	E2
Mechanical compliance	M2

Display pages

No	1 st row	2 nd row	3 rd row	"Full" mode	"Easy" mode	Note
0	kWh+ (imported)		kW	X	X	In PF version (MID) this is the only certified energy meter. In PFA version and in X version with Measurement menu set to "A", this is considering the total energy without considering the current direction.
1	kWh- (exported)		kW	X	X	In PFB version and in X version with Measurement menu set to "B"
2	kWh+ (imported)		V	X	X	
3	kWh+ (imported)		A	X	X	
4	kWh+ (imported)		PF	X		
5	kWh+ (imported)		Hz	X		
6	kvarh+ (imported)		kvar	X		In PFA version and in X version with Measurement menu set to "A", this is considering the total positive reactive energy without considering the current direction.
7	kvarh- (exported)		kvar	X		In PFB version and in X version with Measurement menu set to "B"
8	kWh+ (imported)	kWdmd peak	kWdmd	X		
9	kWh (t1)	"t1"	kW	X		Only relevant to kWh+, with Tariff menu set to ON.
10	kWh (t2)	"t2"	kW	X		Only relevant to kWh+, with Tariff menu set to ON.

X= available

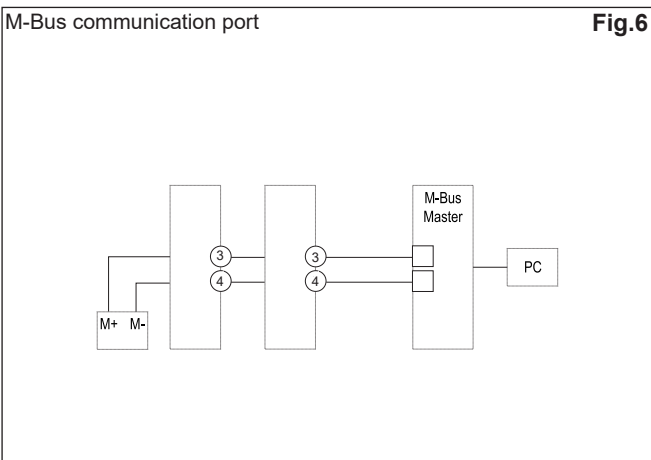
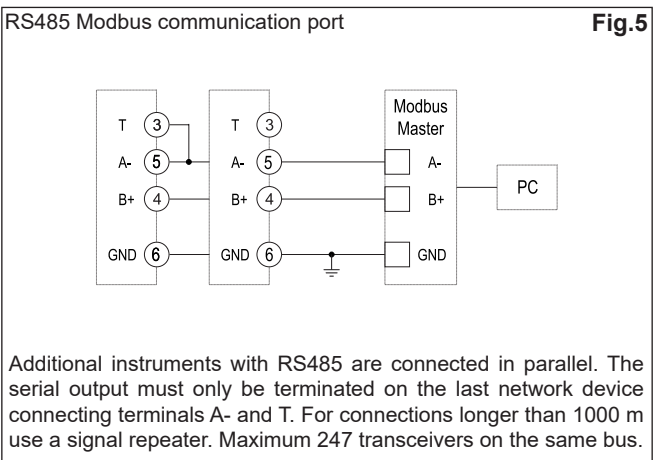
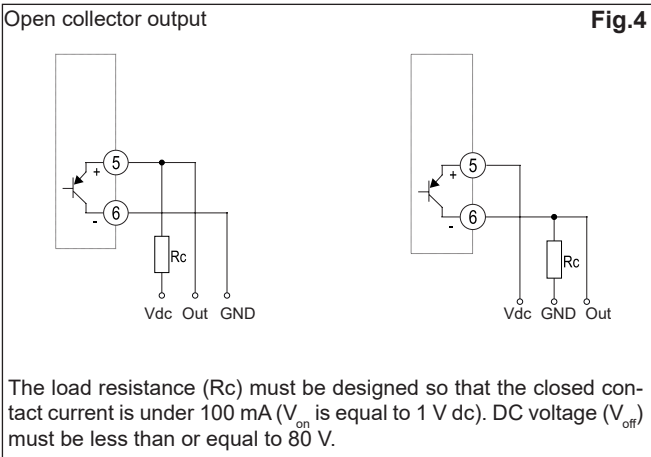
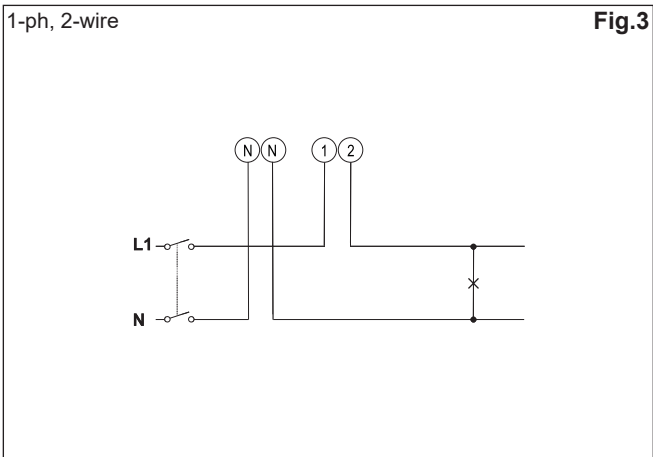
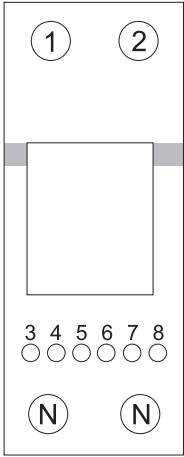
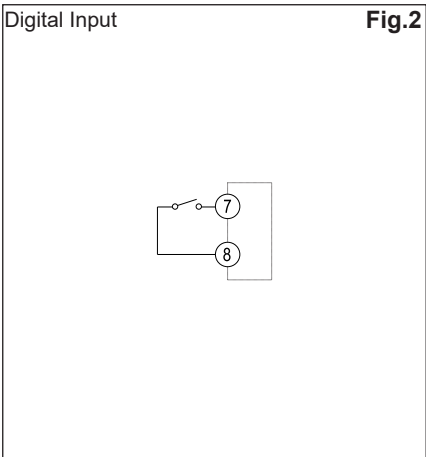
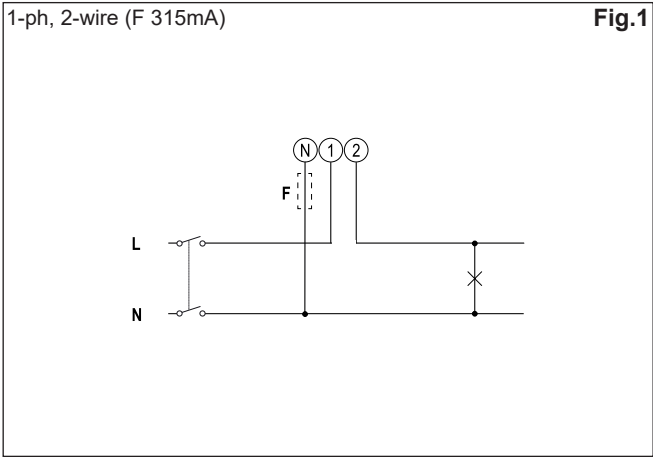
List of available menus

Menu name and description		Range	Default setting
PASS	Password request	From 0000 to 9999	0000
nPASS	New password	From 0000 to 9999	0000
Measure	Measurement type (A=easy connection; B=bidirectional, imported and exported energy). Not available in PFA and PFB versions (MID)	A; b	A
P int	Integration time for Wdmd calculation	1 to 30 min	1
Mode	Selection of complete or simplified set of variables on display	Full or Easy	Full
Tariff	Tariff enabling	Yes/No	No
Home	Home page selection (default page at power-on and after 120 s time-out from other pages). Not available in PFA and PFB versions (MID).	0 to 9	0
PULSE (O1 option)	Selection of pulse ON duration	30 or 100 ms	30
	Selection of the pulse weight (multiples of 100 pulses/kWh)	100 to 500 (if duration is 100ms) 100 to 2000 (if 30 ms)	100
Address (S1 option)	Modbus serial address	1 to 247	01
Kbaud (S1)	Modbus baud rate	9.6; 19.2; 38.4; 57.6, 115.2 kbps	9.6
ParltY (S1)	Modbus parity	No/even	No
PrI Add (M1 option)	M-bus primary address	1 to 250	0
Kbaud (M1)	M-bus baud rate	0.3; 2.4; 9.6 kbps	2.4
RESET	Allow the reset of tariff meters and W dmd peak (kWh/kvarh meter reset available only via serial communication)	Yes/No	No
End	Exit to measuring mode		

Note: after the confirmation of a new parameter value, the value is stored in the memory without the need to exit the programming mode.



Wiring diagrams



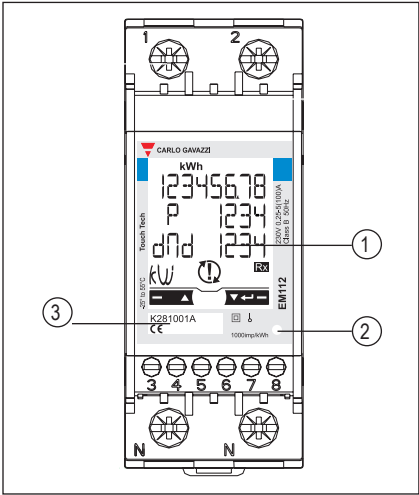
Additional available information on the display (*)

Page	Code	Description
YEA r	InFO 1	Year of manufacture
SEr IAL n	InFO 2	Serial number, corresponds to the one indicated on the front print
rEVI SIon	InFO 3	Firmware revision – XY.nn:
PuLS Led	InFO 4	Front LED pulse weight
MEASurE	P3	Measurement type (only X option)
P int	P4	Requested average power calculation interval
ModE	P5	Display mode
tArIFF	P6	Enabling tariff management and any current tariff
HoME	P7	Measurement page set as home page (only X option)
Pages specific to the S1 version		
AddrESS	P10	Modbus address
bAUd	P11	Baud rate
PArITY	P12	Parity
StoP bit	P12–2	Stop bit
Pages specific to the O1 version		
PULSE	P8	Duration
PuL rAtE	P8–2	Pulse weight
Pages specific to the M1 version		
Pr I Add	P9	M-Bus primary address
bAUd	P11	Baud rate
SEC Add	InFO 5	M-Bus secondary address, univocal and set during production

(*) can be reached by pressing simultaneously the 2 touch keys



Front panel description



- 1. **Display**
Backlit LCD display with touch key-pad.
Right key: enter, down
Left key: up
- 2. **LED**
LED proportional to kWh reading
- 3. **Serial number and MID data**
Area reserved to serial number and MID-relevant data in PF versions

Dimensions (mm)

