

# Energy Management Energy Meter Type EM110



- Single phase energy meter
- Class 1 (kWh) according to EN62053-21
- Class B (kWh) according to EN50470-3
- Electro-mechanical display
- Energy readout on display: 6+1 digit
- Measurements on display: total kWh
- Direct current measurement up to 45AAC
- Self power supply
- Dimensions: 1-DIN module
- Protection degree (front): IP51
- Pulse output (by opto-mosfet)
- Detects wrong current direction
- Other versions available (not certified, option X: see "how to order" on the next page

## Product description

Single-phase energy meter with electro-mechanical data displaying; particularly indicated for active energy metering and for cost allocation in applications up to 45 A (direct connection), especially when energy reading is necessary during power down. Housing for DIN-rail mounting, with IP51 front degree protection. The meter is provided with pulse output proportional to the active energy being measured. Available for legal metrology (PF option).

### STANDARD

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

## How to order **EM110-DIN AV8 1 X 01 X**



## Type Selection

Range code	System	Power supply	Output
<b>AV8:</b> 230VLN AC - 5(45)A (Direct connection)	<b>1:</b> 1-phase 2-wire	<b>X:</b> Self power supply -30% +20% of the rated measuring input voltage, 45 to 65Hz	<b>O1:</b> pulse output
<b>AV7:</b> 120VLN AC - 5(45)A (Direct connection)			

### Option

**X:** none

## Input specifications

<b>Rated Inputs</b>		<b>Resolution</b>	
Current type	1-phase loads, direct connection	Energy	0.1 kWh
Current range	5(45)A	<b>Energy additional errors</b>	
Nominal voltage	230VLN AC (AV8 option), 120 VLN (AV7 option)	Influence quantities	According to EN62053-21
		<b>Temperature drift</b>	≤200ppm/°C
		<b>Sampling rate</b>	4096 samples/s @ 50Hz 4096 samples/s @ 60Hz
<b>Accuracy</b> (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)		<b>Display</b>	
AV7	I <sub>min</sub> =0.25A; I <sub>b</sub> : 5A, I <sub>max</sub> : 45A; U <sub>n</sub> : 120VLN -30% +30%	Type	Electro-mechanical, h 5 mm
AV8	I <sub>min</sub> =0.25A; I <sub>b</sub> : 5A, I <sub>max</sub> : 45A; U <sub>n</sub> : 230VLN -30% +20%	Energies read-out	Total: 6+1 digit Only positive energy is integrated
Current (AV7, AV8)	From 0.04I <sub>b</sub> to 0.2I <sub>b</sub> : ±(0.5%RDG+1DGT) From 0.2I <sub>b</sub> to I <sub>max</sub> : ±(0.5%RDG)	<b>Max. and Min. indication</b>	Max. 999 999.9 Min. 0.0
Phase-neutral voltage	In the range U <sub>n</sub> : ±(0,5% RDG)	<b>LEDs</b>	Flashing red light pulses according to EN50470-3, EN62052-11, 1000 imp./ kWh (min. period: 90ms) Fix orange light: wrong current direction
Frequency	Range: 45 to 65Hz.	<b>Current overloads</b>	
Active power	From 0.05 I <sub>n</sub> to I <sub>max</sub> , within U <sub>n</sub> range, PF=1: ±(1% RDG) From 0.1 I <sub>n</sub> to I <sub>max</sub> , within U <sub>n</sub> range, PF=0.5L or 0.8C: ±(1% RDG)	Continuous	45A, @ 50Hz
Power factor	±[0.001+1%(1.000 - "PF RDG")]	For 10ms	1350 A
Reactive power	From 0.05 I <sub>n</sub> to I <sub>max</sub> , within U <sub>n</sub> range, sinphi=1: ±(2% RDG) From 0.1 I <sub>n</sub> to I <sub>max</sub> , within U <sub>n</sub> range, sinphi=0.5L or 0.8C: ±(2% RDG)	<b>Voltage Overloads</b>	
Energies	Class 1 according to EN62053-21	Continuous	1.2 U <sub>n</sub>
Start-up current:	20mA (AV7, AV8) Self-consumption is not measured.	For 500ms	2 U <sub>n</sub>
Start-up voltage	84V (AV7), 161V (AV8)	<b>Input impedance</b>	
		Voltage input 230VL-N	> 750 Kohm
		Voltage input 120VL-N	> 750 Kohm
		Current inputs: 5(45) A	< 0.5 VA

## Output specifications

<b>Static output</b>	For pulse output proportional to the active energy (kWh) 1000 kWh per pulse	Pulse ON duration	30ms, according to EN62052-31 PNP transistor $V_{ON}$ 1 VDC; max. 100 mA $V_{OFF}$ 80 VDC max
Purpose		Output type Load	
Pulse rate			

## General specifications

<b>Operating temperature</b>	-20 to +65 °C, indoor, (R.H. from 0 to 90% non-condensing @ 40°C)	<b>Standard compliance</b>	IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11 EN62053-21, EN50470-3
<b>Storage temperature</b>	-30°C to +80°C (R.H. < 90% noncondensing @ 40°C)	Safety	
<b>Installation category</b>	Cat. III (IEC 60664, EN60664)	Metrology	CE (cULus pending)
<b>Insulation (for 1 minute)</b>	4000 VAC RMS between measuring inputs and digital/serial output (see table) 4000 VAC RMS	<b>Approvals</b>	
<b>Dielectric strength</b>	4000 VAC RMS for 1 minute	<b>Connections</b>	Cable cross-section area Measuring inputs: 6 mm <sup>2</sup> , with/without metallic cable ferrule; Max. screw tightening torque: 1.1 Nm 1.5 mm <sup>2</sup> , Min./Max. screws tightening torque: 0.4 Nm
<b>EMC</b>	According to EN62052-11 15kV air discharge; Test with current: 10V/m from 80 to 2000MHz; Test without any current: 30V/m from 80 to 2000MHz; On current and voltage measuring inputs circuit: 4kV 10V/m from 150KHz to 80MHz On current and voltage measuring inputs circuit: 4kV; According to CISPR 22	Other terminals	
Electrostatic discharges		<b>Housing</b>	Dimensions (WxHxD) 17.5 x 63 x 90 mm Material Noryl, self-extinguishing: UL 94 V-0
Immunity to irradiated		Material	
Electromagnetic fields		Sealing covers	Included
Burst		<b>Mounting</b>	DIN-rail
Immunity to conducted disturbances		<b>Protection degree</b>	Front IP51 Screw terminals IP20
Surge		<b>Weight</b>	
Radio frequency			

## Power supply specifications

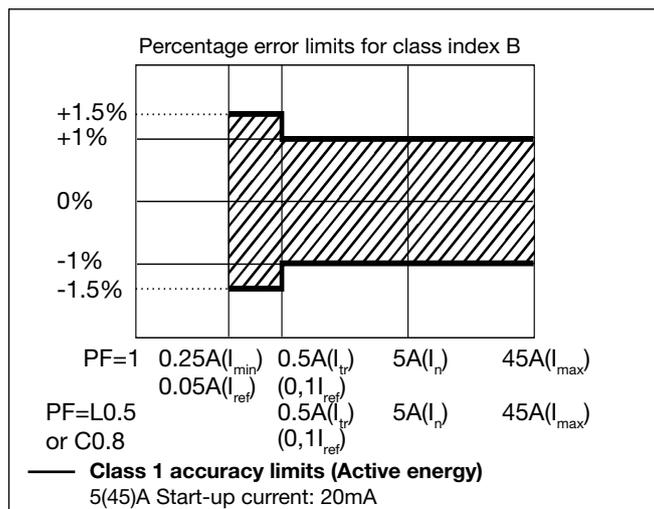
<b>Self power supply</b>	230VAC VL-N, -30% +20% 50/60Hz 120VAC VL-N, -30% +30% 50/60Hz	<b>Power consumption</b>	≤1.0W, ≤ 8VA
AV8			
AV7			

## Insulation (for 1 minute) between inputs and outputs

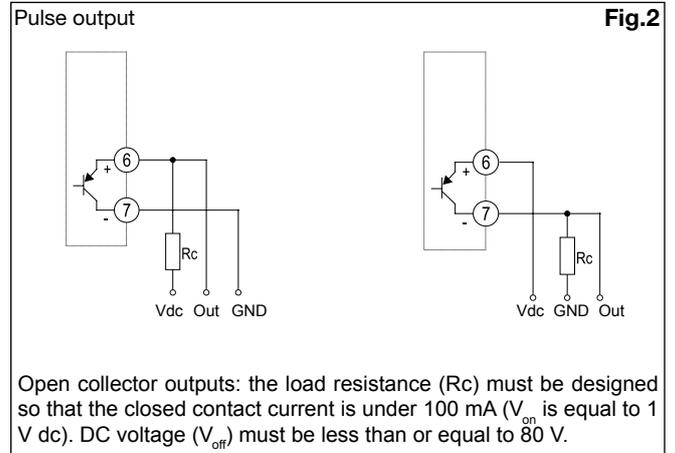
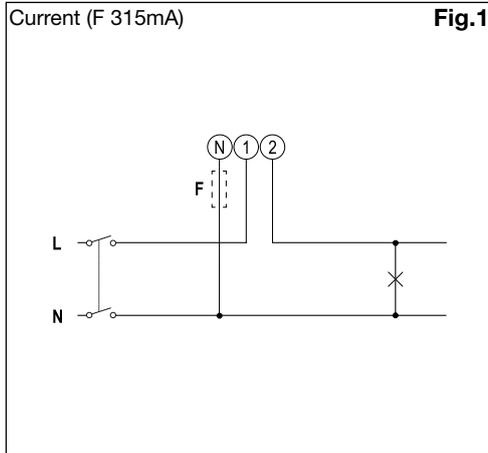
	Measuring input	Auxiliary power supply	Digital output
Measuring input	-	0 kV	4 kV
Auxiliary power supply	0 kV	-	4 kV
Digital output	4 kV	4 kV	-

## Accuracy according to EN50470-3

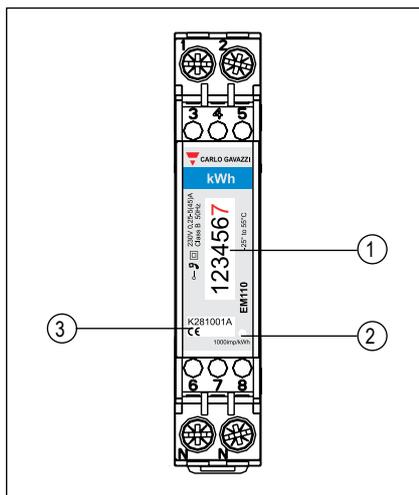
kWh, PF=accuracy (RDG) depending on the current



## Wiring diagrams



## Front panel description



1. **Display**  
Electro-mechanical type with total kWh indication
2. **LED**  
LED proportional to kWh reading
3. **Serial number**  
Area reserved to serial number

## Dimensions

