

# Energy Management Energy Meter Type EM110



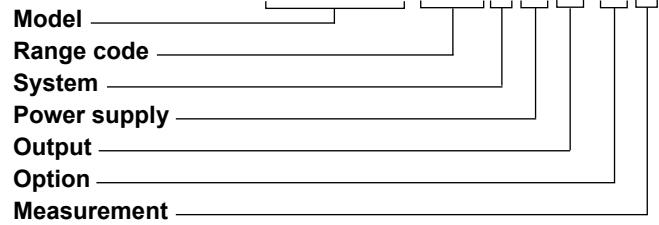
- Single phase energy meter
- Class 1 (kWh) according to EN62053-21
- Class B (kWh) according to EN50470-3
- Electro-mechanical display
- Energy readout on display: 6+1 digit
- Measurements on display: total kWh
- Direct current measurement up to 32 AAC
- Self power supply
- Dimensions: 1-DIN module
- Protection degree (front): IP51
- Pulse output (by open collector PNP)
- Detects wrong current direction
- Certified according to MID Directive (option PF only): see "how to order" below

## 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 32 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.

**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 EM110-DIN AV8 1 X O1 PF B



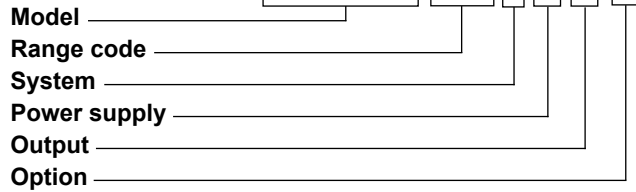
## Type Selection

Range code	System	Power supply	Output
<b>AV8:</b> 230VLN AC - 5(45)A (Direct connection up to 32 A)	<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 up to 32 A)			
Option	Measurement		
<b>PF:</b> Certified according to MID Directive. Can be used for fiscal(legal) metrology.	<b>B:</b> Only the total positive energy meter is certified according to MID. Negative energy is not measured.		

**STANDARD**

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

**How to order EM110-DIN AV8 1 X O1 X**



**Type Selection**

Range code	System	Power supply	Output
<b>AV8:</b> 230VLN AC - 5(45)A (Direct connection up to 32 A)	<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 up to 32 A)			

**Option**

**X:** none

## Input specifications

<b>Rated Inputs</b>		<b>Sampling rate</b>	4096 samples/s @ 50Hz 4096 samples/s @ 60Hz
Current type	1-phase loads, direct connection up to 32 A	<b>Display</b>	
Nominal current range	5(45)A Ib 5 A	Type	Electro-mechanical, h 5 mm
Nominal voltage	I <sub>max</sub> 45 A 230VLN AC (AV8 option), 120 VLN (AV7 option)	Energies read-out	Total: 6+1 digit Only positive energy is integrated
<b>Accuracy</b> (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)		<b>Max. and Min. indication</b>	Max. 999 999.9 Min. 0.0
AV7	I <sub>min</sub> =0.25A; I <sub>b</sub> : 5A, I <sub>max</sub> : 45A; Un: 120VLN -30% +30%	<b>LEDs</b>	Flashing red light pulses according to EN50470-3, EN62052-11, 1000 imp./ kWh (min. period: 90ms, max. frequency: 11 Hz)
AV8	I <sub>min</sub> =0.25A; I <sub>b</sub> : 5A, I <sub>max</sub> : 45A; Un: 230VLN -30% +20%		Fix orange light: wrong current direction
Energies	Class 1 according to EN62053-21 Class B (Class B (kWh) according to EN50470-3)	<b>Current overloads</b>	
Start-up current:	20mA (AV7, AV8) Self-consumption is not measured.	Continuous	45A, @ 50Hz
Start-up voltage	84V (AV7), 161V (AV8)	For 10ms	1350 A
<b>Resolution</b>		<b>Voltage Overloads</b>	
Energy	0.1 kWh	Continuous	1.2 Un
<b>Energy additional errors</b>		For 500ms	2 Un
Influence quantities	According to EN62053-21	<b>Input impedance</b>	
<b>Temperature drift</b>	≤200ppm/°C	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>			
Purpose	For pulse output proportional to the active energy (kWh)	Pulse OFF duration	EN62052-31 ≥120ms, according to EN62052-31
Pulse rate	1000 pulses per kWh	Output type	open collector PNP
Pulse ON duration	30ms, according to	Load	V <sub>ON</sub> 1 VDC; max. 100 mA V <sub>OFF</sub> 80 VDC max

## General specifications

<b>Operating temperature</b>	-25 to +65 °C, indoor, (R.H. from 0 to 90% non-condensing @ 40°C)	<b>Standard compliance</b>	EN62052-11 EN62053-21, EN50470-3
<b>Storage temperature</b>	-30°C to +80°C (R.H. < 90% noncondensing @ 40°C)	<b>Approvals</b>	CE, MID (PF option only), cULus (AV7 option only)
<b>Overvoltage category</b>	Cat. III	<b>Connections</b>	
<b>Insulation (for 1 minute)</b>	4000 VAC RMS between measuring inputs and digital/serial output (see table) 4000 VAC RMS	Cable cross-section area	Measuring inputs: 6 mm <sup>2</sup> , with/without metallic cable ferrule; Max. screw tightening torque: 1.1 Nm
<b>Dielectric strength</b>	4000 VAC RMS for 1 minute	Other terminals	1.5 mm <sup>2</sup> , Min./Max. screws tightening torque: 0.4 Nm
<b>EMC</b>		<b>Housing</b>	
Electrostatic discharges	According to EN62052-11 15kV air discharge;	Dimensions (WxHxD)	17.5 x 63 x 90 mm
Immunity to irradiated electromagnetic fields	Test with current: 10V/m from 80 to 2000MHz; Test without any current: 30V/m from 80 to 2000MHz;	Material	Noryl, self-extinguishing: UL 94 V-0
Burst	On current and voltage measuring inputs circuit: 4kV	Sealing covers	Included
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	<b>Mounting</b>	DIN-rail
Surge	On current and voltage measuring inputs circuit: 4kV;	<b>Protection degree</b>	
Radio frequency	According to CISPR 22	Front	IP51
		Screw terminals (cable inputs)	IP20
		<b>Weight</b>	Approx. 75 g (packing included)

## Power supply specifications

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

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

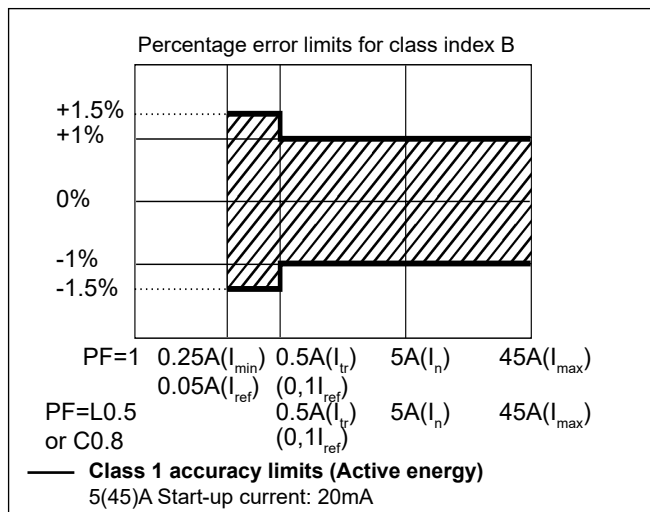
	Measuring input	Digital output
Measuring input	-	4 kV
Digital output	4 kV	-

## MID compliance (PF option only)

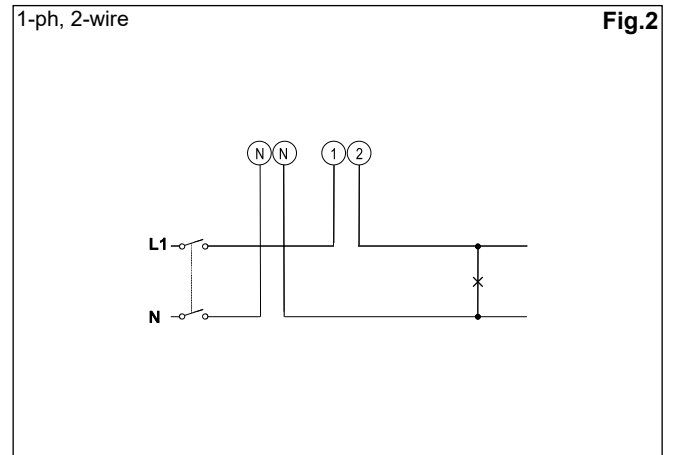
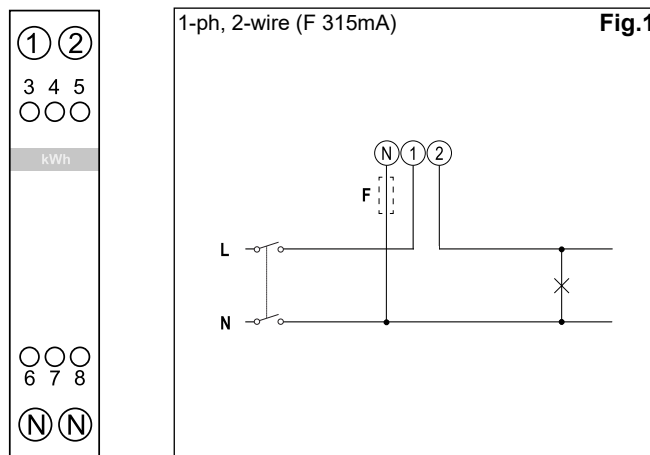
<b>Accuracy</b>	0.9 Un ≤ U ≤ 1.1 Un; 0.98 fn ≤ f ≤ 1.02 fn; fn: 50 Hz; cosφ: 0.5 inductive to 0.8 capacitive. Class B Considering listed Ib or In values
<b>Operating temperature</b>	-25 to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)
<b>EMC compliance</b>	E2
<b>Mechanical compliance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

## Accuracy according to EN50470-3

kWh, accuracy (RDG) depending on the current



## Wiring diagrams

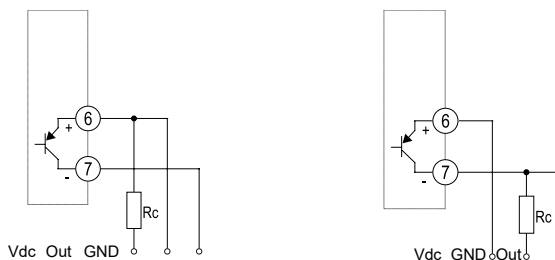


## Wiring diagrams (cont.)



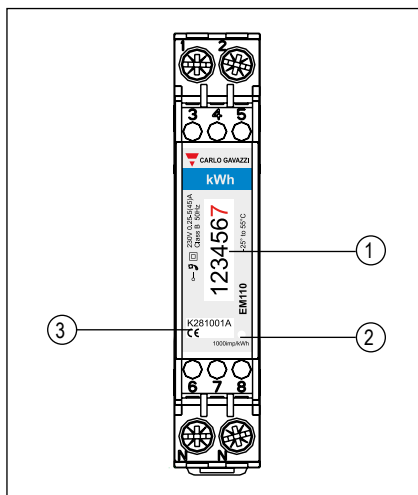
Pulse output

Fig.3



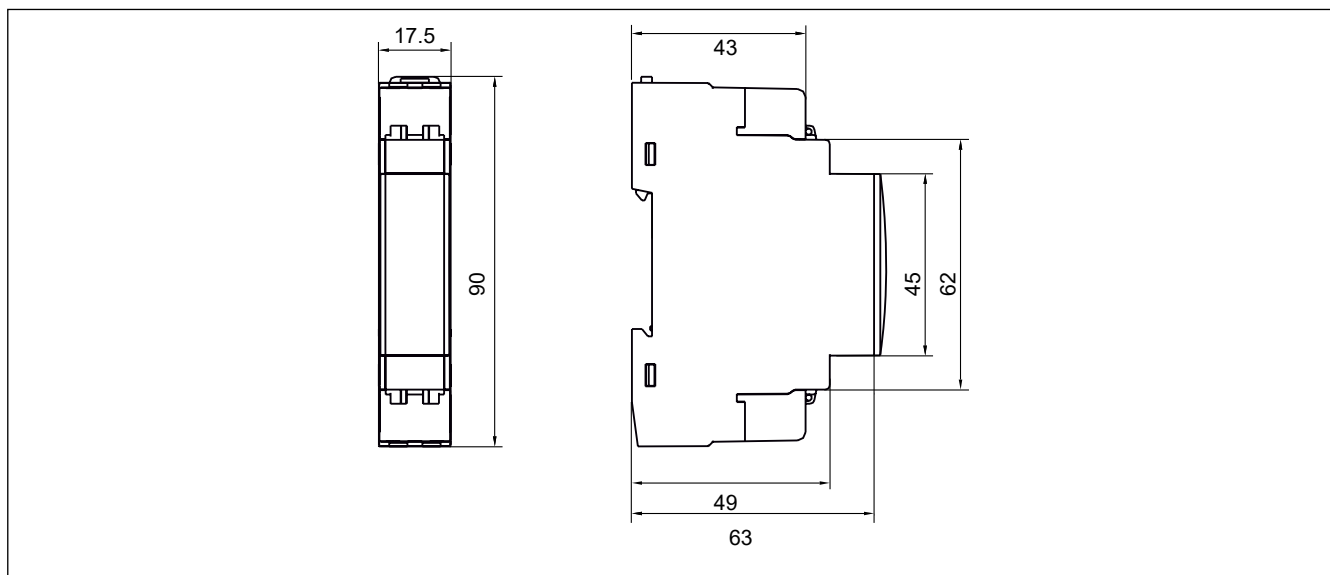
Open collector outputs: the load resistance ( $R_c$ ) must be designed so that the closed contact current is under 100 mA ( $V_{on}$  is equal to 1 V dc). DC voltage ( $V_{off}$ ) must be less than or equal to 80 V.

## Front panel description



1. **Display**  
Electro-mechanical type with total kWh indication
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



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