

Energy Management Energy Meter Type EM10 DIN



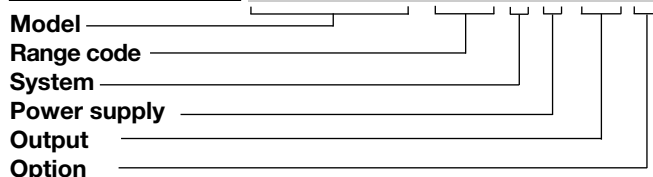
- Class 1 (kWh) according to EN62053-21
- Class B (kWh) according to EN50470-3
- Energy meter
- Energy readout: 5+1 DGT
- Energy measurements: total kWh
- TRMS measurements of distorted sine waves (voltages/currents)
- Self power supply
- Dimensions: 1-DIN module
- Protection degree (front): IP40
- 1 pulse output on request
- Certified according to MID Directive, Annex "B" "Type examination" relevant to active electrical energy meters (see Annex MI-003).

Product Description

One-phase energy meter with LCD data displaying; indicated for active energy metering. Housing for DIN-rail mounting, IP40 (front) protection degree. Direct

connection up to 32A. Moreover the meter can be provided with pulse output proportional to the active energy being measured.

How to order EM10 DIN AV8 1 X 01 P



Type Selection

Range code	System	Power supply	Output
AV7: 120V _{LN} AC - 5(32)A (**) (direct connection)	1: 1-phase	X: Self power supply (from 48 to 62Hz). The instrument works on the range from -20% to +20% of the measuring nominal input voltage.	01: Pulse type (open collector output) (*)
AV8: 230V _{LN} AC - 5(32)A (*) (direct connection)	Option		
(*) as standard. (**) on request, the range is available but not in compliance with the MID	P: Certified according to MID Directive, Annex "B" "Type examination" relevant to active electrical energy meters (see Annex MI-003) (*) X(**): AV7 range is not in compliance with the MID directive		

Input specifications

Rated inputs Current range (by shunt) Voltage range	System: 1 AV7 and AV8: 5(32)A AV7: 120 VLN AC (The option "P" is not available) AV8: 230 VLL AC	Start up current: 0.1 Ib: 0.5A 20mA
Accuracy (Display) (@25°C ±5°C, R.H. ≤60%, 48 to 62Hz) AV7 model AV8 model	Ib: 5A, Imax: 32A; Un: 120VLN (-20% +20%) Ib: 5A, Imax: 32A; Un: 230VLN (-20% +20%)	Energy additional errors Influence quantities According to EN62053-21, ≤200ppm/°C
Active energy	Class 1 according to EN62053-21 and Class B according to EN50470-3. MID (Annex MI-003) Class B. Ib: 5A, Imax: 32A,	Temperature drift ≤200ppm/°C
Reference values		Sampling rate 4096 samples/s @ 50Hz 4096 samples/s @ 60Hz
		Display Type Energie indication 1 line (max: 5+1 DGT) LCD, h 7mm Total: 5+1 DGT
		LEDs Red LED (Energy consumption), 1000 pulses/kWh (Max Frequency 16 Hz) according to EN62053-11
		Measurements Method kWh from 0,0 to 99999,9 TRMS measurements of distorted wave forms



Input specifications (cont.)

Coupling type	Direct	For 500ms	2 Un
Crest factor	lb 5A ≤4 (45A max. peak)	Input impedance	>720KΩ
Current Overload		120VL-N (AV7)	>720KΩ
Continuous	32A, @ 50Hz	230VL-N (AV8)	< 0.5VA
For 10ms	960A, @ 50Hz	5(32) A (AV7-AV8)	
Voltage Overload		Frequency	48 to 62 Hz
Continuous	1.2 Un		

Output specifications

Digital output	(on request)	Insulation	≥120ms (OFF), according to EN62052-31
Number of outputs	1		By means of optocouplers, 4000 VRMS output to measuring inputs
Type	Open collector, 1000 pulses/kWh.		
Signal	V _{ON} 1.2 VDC/ max. 100 mA		
Pulse duration	V _{OFF} 30 VDC max. ≥100ms < 120msec (ON),		

General specifications

Operating temperature	-25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23	Surge	On current and voltage measuring input circuits: 4kV; According to CISPR 22
Storage temperature	-30°C to +70°C (-22°F to 158°F) (R.H. < 90% non-condensing @ 40°C) according to EN62053-21, EN50470-1 and EN62053-23	Radio frequency suppression	According to CISPR 22
Installation category	Cat. III (IEC60664, EN60664)	Standard compliance	
Insulation (for 1 minute)	4000 VRMS between measuring inputs and digital output (O1).	Safety	IEC60664, IEC61010-1 EN60664, EN61010-1 (EN62052-11) EN50470-1 EN62053-21, EN62053-23, EN50470-3
Dielectric strength	4000 VRMS for 1 minute	Metrology	MID "annex MI-003"
CMRR Noise rejection	100 dB, 48 to 62 Hz	Pulse output Approvals	DIN43864, IEC62053-31 CE, MID according to "ANNEX B" (EC type certificate)
EMC	According to EN62052-11 8kV air discharge;	Connections	Screw-type
Electrostatic discharges	Test with applied current: 10V/m from 80 to 2000MHz;	Cable cross-section area	Min. 2.5 mm ² , Max. 10 mm ² (measuring inputs);
Immunity to irradiated electromagnetic fields	Test without any applied current: 30V/m from 80 to 2000MHz;		Min./Max. screws tightening torque: 0.5 Nm / 1.1 Nm
Burst	On current and voltage measuring input circuits: 4kV	DIN Housing	Other terminals: 1.5 mm ²
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	Dimensions (WxHxD)	Min./Max. screws tightening torque: 0.4 Nm/0.8 Nm
		Material	17.5 x 90 x 67.5 mm
		Mounting	Nylon PA66, self-extinguishing: UL 94 V-0 DIN-rail
		Protection degree	
		Front	IP40
		Screw terminals	IP20
		Weight	Approx. 100 g (packing included)

Power supply specifications

Self supplied version	120VLN, 230 VLN (-20% +20%) 48-62Hz	Power consumption	≤ 3VA
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MID "Annex MI-003" compliance

Accuracy	0.9 Un ≤ U ≤ 1.1 Un; 0.98 fn ≤ f ≤ 1.02 fn; fn: 50 or 60Hz; cosφ: 0.5 inductive to 0.8 capacitive. Class B I st: 0.02A; I min: 0.25A; I tr: 0.64A; I ref: 5A; I max: 32A.	Operating temperature	-25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)
		EMC compliance	E2

Used calculation formula

Energy metering

$$kWh_i = \int_{t_1}^{t_2} P_i(t) dt \cong \Delta t \sum_{n_1}^{n_2} P_{nj}$$

Where:

i= considered phase (L1)

P= active power;

t₁, t₂ =starting and ending time points of consumption recording;

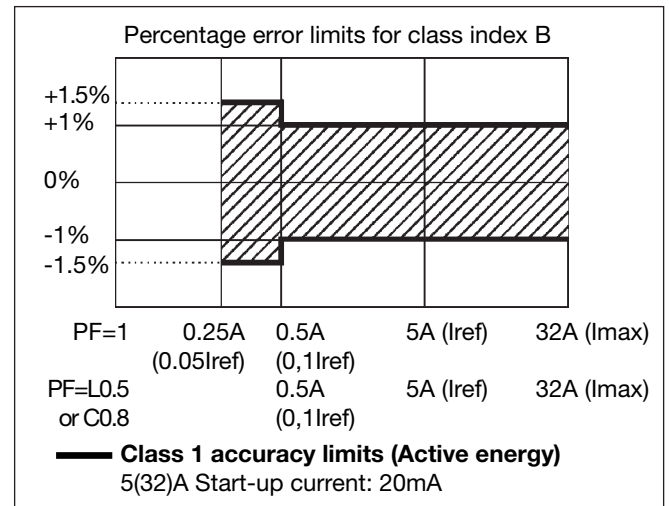
n= time unit;

Δt= time interval between two successive power consumptions;

n₁, n₂ = starting and ending discrete time points of consumption recording

Accuracy according to EN50470-3

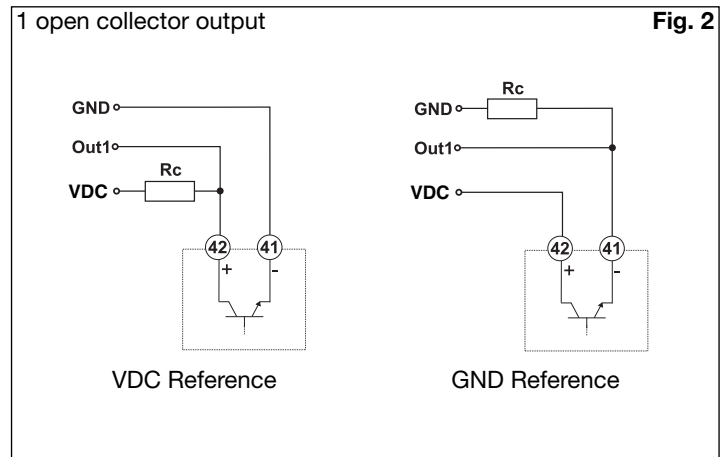
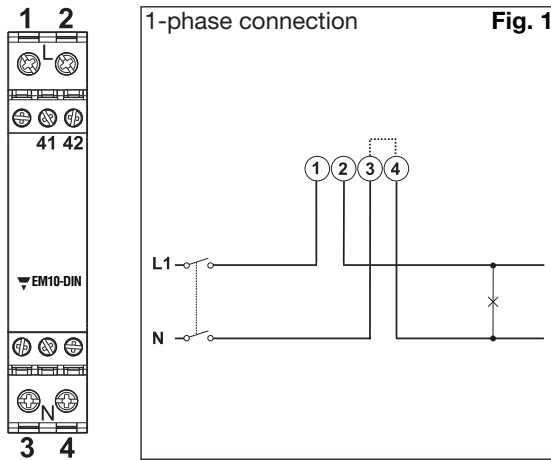
kWh, accuracy (RDG) depending on the current



Insulation between inputs and outputs

	Measuring inputs	Open collector output	AC self-power supply
Measuring inputs	-	4kV	0kV
Open collector output	4kV	-	4kV
AC self-power supply	0kV	4kV	-

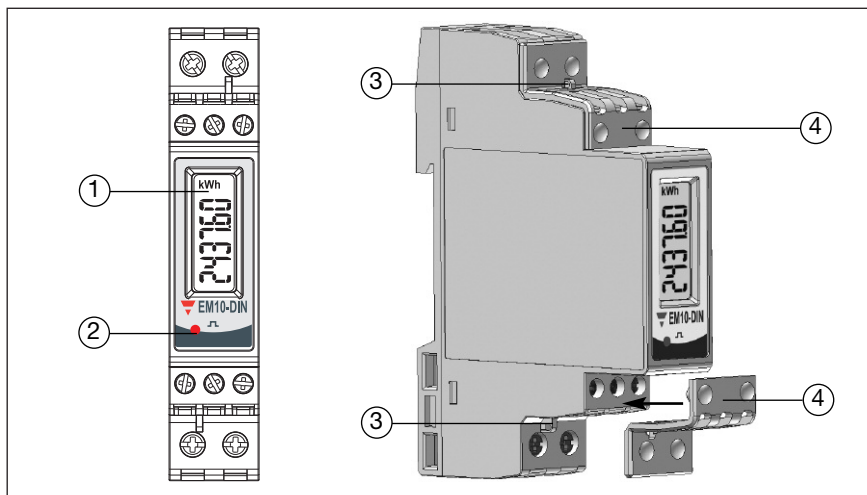
Wiring diagram and open collector output (O1)



NOTE: The 3 and 4 terminals, in the instrument, are wired together

The load resistances (RC) must be designed so that the close contact current is lower than 100mA; the VDC voltage must be lower than or equal to 30VDC.

Frontal panel description and tamper proof



- 1. Display**
LCD-type with energy indication.
- 2. LED**
Red LED to show the consumed energy.
- 3. Tamper proof**
The instrument can be sealed in two points: upper cover and lower cover.
- 4. Protection covers for tamper proof**
The "tamper proof" kit is available with the "P" option.

Dimensions and panel cut-out

