

Energy Management Energy Meter GM1D E09 814 97



Certified according to MID Directive



Product Description

One-phase energy meter with LCD data displaying; indicated for active energy metering. Housing for DINrail mounting, IP40 (front) protection degree. Direct connection up to 32A. Moreover the meter is provided with pulse output proportional to the active energy being measured.

- Class 1 (kWh) according to EN62053-21
- Energy meter
- Energy: 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
- MID "annex MI-003" (Measuring Instruments Directive)-compliant

Input Specifications

Rated inputs		Measurements	
Current range	32A	Method	kWh from 0,0 to 99999,9
Voltage range	230V		TRMS measurements of distorted wave forms
Accuracy (Display) (@25°C ±5°C, R.H. ≤ 60%, 48 to 62 Hz)		Coupling type	Direct
	Ib: 52A, I _{max} : 32A; Un: 120 VLN (-20% +20%)	Crest Factor	Ib 5A ≤ 4 (45A max. peak)
Active energy	Class 1 according to EN62053-21 and MID Annex MI-003 Class B	Current Overload	
Reference values	Ib: 5A, I _{max} : 32A, 0.1 Ib: 0.5A	Continuous	32A, @ 50Hz
Start up current	20 mA	For 10ms	960A, @ 50Hz
Energy additional errors		Voltage Overload	
Influence quantities	According to EN62053-21, EN62053-23	Continuous	1.2 Un
Temperature drift		For 500ms	2 Un
≤ 200ppm/°C.		Input impedance	
Sampling rate		230V-L-N	> 720K Ω
1600 samples/s @ 50Hz, 1900 samples/s @ 60Hz		Frequency	
Display		48 to 62 Hz	
Type	1 line (max: 5+1 DGT)		
Energy indication	LCD, h 7mm Total: 5+1 DGT		
LEDs			
Red LED (Energy consumption), 1000 pulses/kWh (Max Frequency 16 Hz) according to EN62053-11			

Specifications are subject to change without notice GM1D E09 814 97

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Output Specifications

Digital Output

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

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 and EN62053-23.	Surge	On current and voltage measuring input circuits: 4kV;
Storage temperature	-30°C to +70°C (-22°F to 158°F) (R.H. < 90% noncondensing @ 40°C) according to EN62053-21 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
Dielectric strength	4000 VRMS for 1 minute	Metrology	EN62053-21, EN62053-23. MID "annex MI-003"
Noise rejection CMRR	100 dB, 48 to 62 Hz.	Pulse output Approvals	DIN43864, IEC62053-31 CE, PTB (Revenue Approvals)
EMC	According to EN62052-11	Connections	Screw-type
Electrostatic discharges	8kV air discharge;	Cable cross-section area	Min 2.5 mm ² , Max 10 mm ² (measuring inputs); Other terminals: 1.5 mm ²
Immunity to irradiated electromagnetic fields	Test with applied current: 10V/m from 80 to 2000MHz;	DIN Housing	Min./Max. screws tightening torque: 1 Nm / 4 Nm
Burst	On current and voltage measuring input circuits: 4kV	Dimensions (WxHxD)	17.5 x 90 x 67.5 mm
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	Materials	Nylon PA66, self-extinguishing: UL 94 V-0
		Mounting	DIN-rail
		Protection Degree	
		Front	IP40
		Screw terminals	IP20
		Weight	Approx 100g (packing included)

Power Supply Specification

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

Accuracy

$0.9 U_n \leq U \leq 1.1 U_n$;
 $0.98 f_n \leq f \leq 1.02 f_n$;
 f_n : 50 or 60Hz;
 $\cos \phi$: 0.5 inductive to 0.8 capacitive.
 Class B
 I_{st} : 0.025A;
 I_{min} : 0.32A;
 I_{tr} : 0.64A;
 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

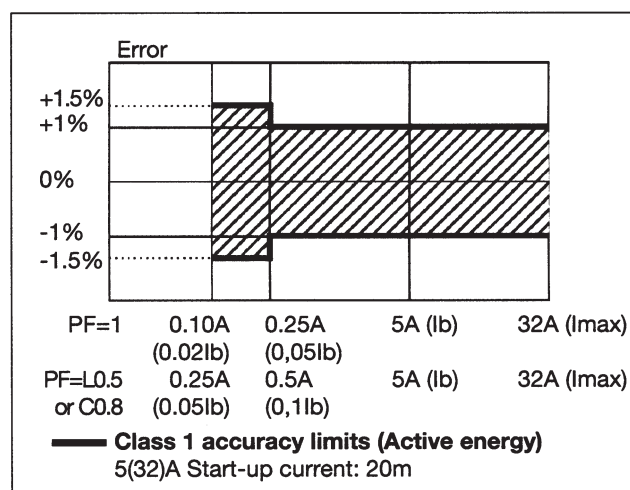
Energy metering

$$kWh_i = \int_{t1}^{t2} P_i(t) dt \cong \Delta t \sum_{n1}^{n2} P_{nj}$$

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

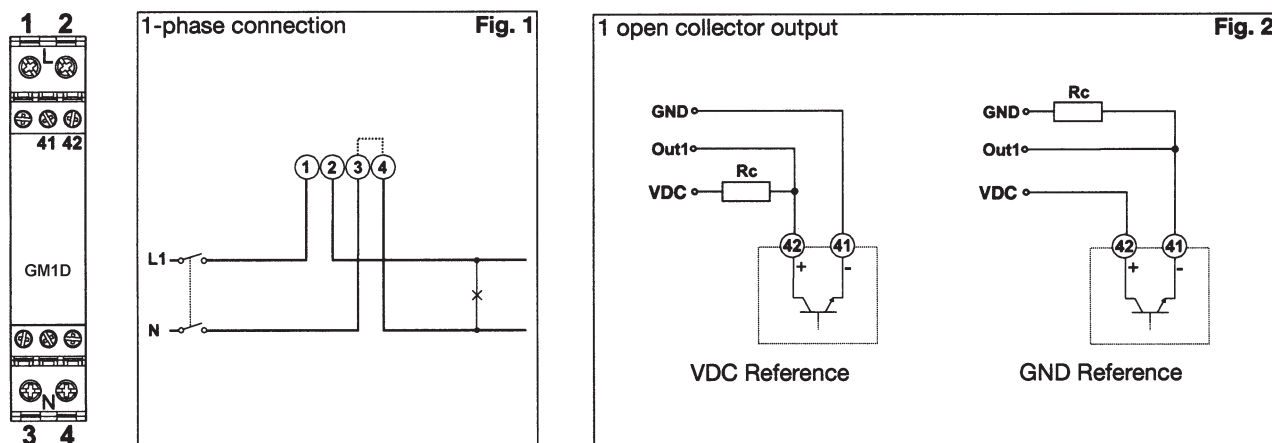
kWh, accuracy (RDG) depending on the current



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	–

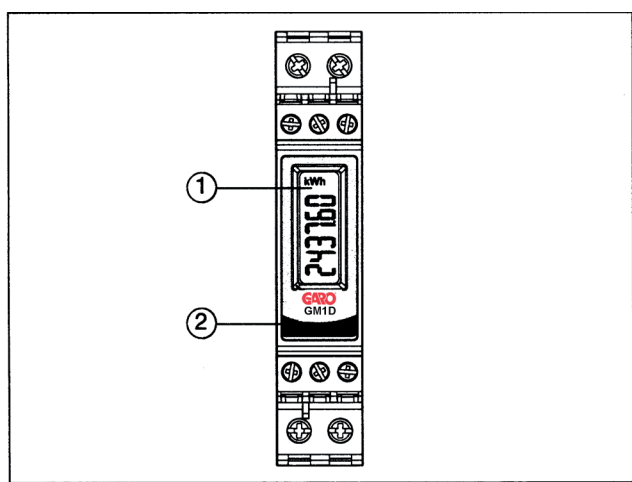
Wiring diagram and open collector output (O1)



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



1. **Display**
LCD-type with energy indication
2. **LED**
Red LED to show the consumed energy

Dimensions and panel cut-out

