

# 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

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

## Output Specifications

### Digital Output

Number of outputs	1
Type	Open collector, 1000 pulses/kWh
Signal	V <sub>on</sub> 1.2 VDC/max 100 mA V <sub>off</sub> 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

<b>Operating temperature</b>	-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;
<b>Storage temperature</b>	-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
<b>Installation category</b>	Cat. III (IEC60664, EN60664).	<b>Standard compliance</b>	
<b>Insulation (for 1 minute)</b>	4000 VRMS between measuring inputs and digital output (O1).	Safety	IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11
<b>Dielectric strength</b>	4000 VRMS for 1 minute	Metrology	EN62053-21, EN62053-23. MID "annex MI-003"
<b>Noise rejection CMRR</b>	100 dB, 48 to 62 Hz.	Pulse output Approvals	DIN43864, IEC62053-31 CE, PTB (Revenue Approvals)
<b>EMC</b>	According to EN62052-11	<b>Connections</b>	Screw-type
Electrostatic discharges	8kV air discharge;	Cable cross-section area	Min 2.5 mm <sup>2</sup> , Max 10 mm <sup>2</sup> (measuring inputs); Other terminals: 1.5 mm <sup>2</sup>
Immunity to irradiated electromagnetic fields	Test with applied current: 10V/m from 80 to 2000MHz;		Min./Max. screws tightening torque: 1 Nm / 4 Nm
Burst	On current and voltage measuring input circuits: 4kV	<b>DIN Housing</b>	
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	Dimensions (WxHxD)	17.5 x 90 x 67.5 mm
		Materials	Nylon PA66, self-extinguishing: UL 94 V-0
		Mounting	DIN-rail
		<b>Protection Degree</b>	
		Front	IP40
		Screw terminals	IP20
		<b>Weight</b>	Approx 100g (packing included)

## Power Supply Specification

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

<b>Accuracy</b>	0.9 $U_n \leq U \leq 1.1 U_n$ ; 0.98 $f_n \leq f \leq 1.02 f_n$ ; fn: 50 or 60Hz; cosj: 0.5 inductive to 0.8 capacitive. Class B I st: 0.025A; I min: 0.32A; I tr: 0.64A; I max: 32A	<b>Operating temperature</b> -25°C to +55°C (13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)

## Used calculation formula

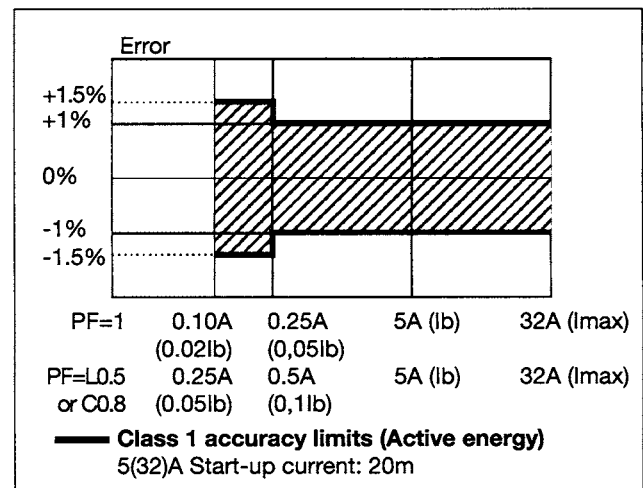
### Energy metering

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

Where:  
i= considered phase (L1)  
P= active power;  
t1, t2 =starting and ending time points of consumption recording;  
n= time unit;  
 $\Delta t$ = time interval between two successive power consumptions;  
n1, n2 = starting and ending discrete time points of consumption recording

## Accuracy

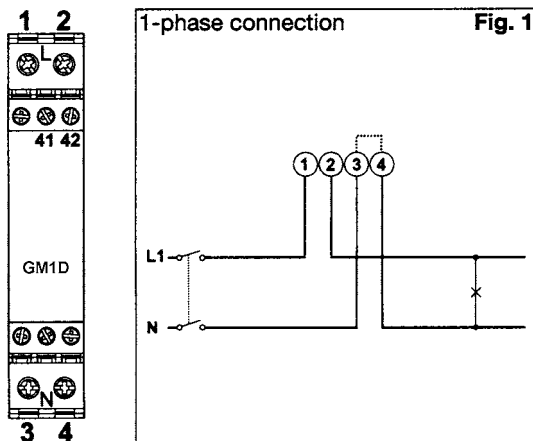
kWh, accuracy (RDG) depending on the current



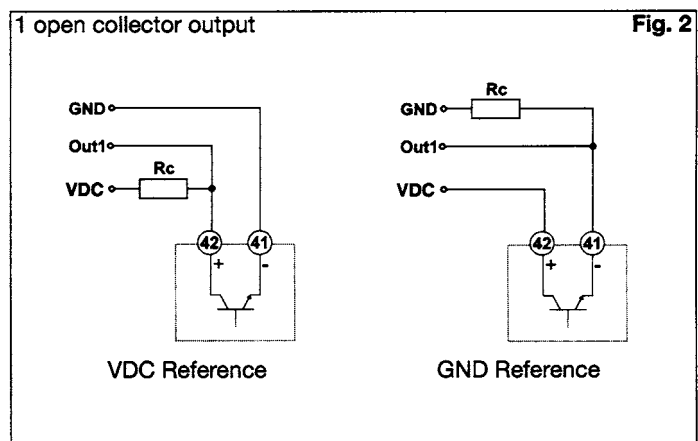
## Insulation between inputs and outputs

	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)

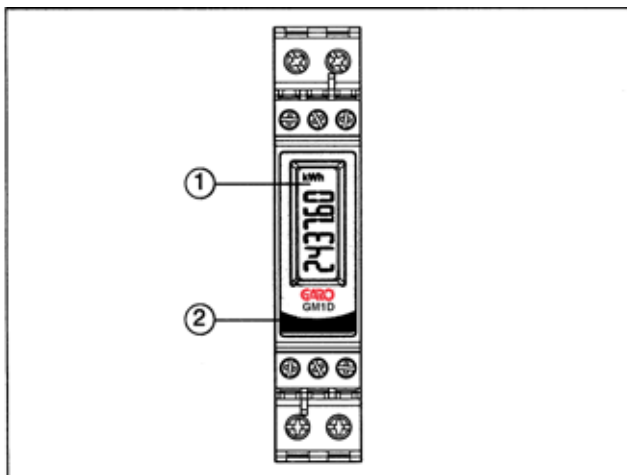


NOTE: The 3 and 4 terminals, in the instrument, are wired together



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

