

Energy Management Energy Meter Type EM23 DIN



• Other version available (not certified, option X and P): see "how to order" on the next page

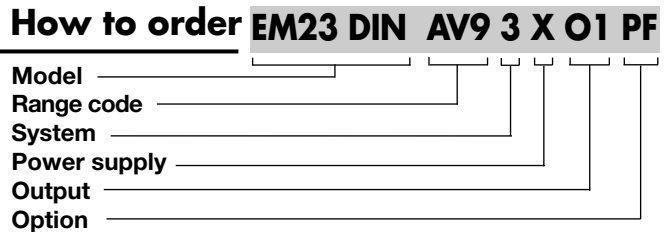
- Class 1 (kWh) according to EN62053-21
- Class B (kWh) according to EN50470-3
- Class 2 (kvarh) according to EN62053-23
- Accuracy ± 0.5 RDG (current/voltage)
- Energy meter
- Instantaneous variables readout: 3 DGT
- Energies readout: 7 DGT
- System variables: W, var, Phase-sequence.
- Single phase variables: A
- Energy measurements: total kWh and kvarh
- TRMS measurements of distorted sine waves (voltages/currents)
- Self power supply
- 1 pulsating output
- Dimensions: 4-DIN modules
- Protection degree (front): IP50
- Easy connections management
- Certified according to MID Directive (option PF only): see "how to order" below

Product Description

Three-phase energy meter with built-in configuration joystick and LCD data displaying; particularly indicated for active and reactive energy metering and for cost allocation. Housing for DIN-rail mounting with IP50

(front) protection degree. output proportional to the active energy being measured. Direct connection up to 65A. Moreover the meter is provided with one pulsating

MID Certified according to MID Directive, Annex "B" + Annex "D" or Annex "B" + Annex "F" for legal metrology relevant to active electrical energy meters (see Annex MI-003 of MID). Can be used for fiscal (legal) metrology.

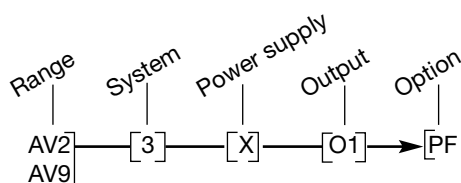


Type Selection

Range codes	System	Output	Power supply
AV2: 400V _{LL} AC 10(65)A (direct connection) V _{LN} : 113V to 265V _{LN} V _{LL} : 196V to 460V _{LL} AV9: 400V _{LL} AC - 10(65)A (direct connection) V _{LN} : 184V to 276V _{LN} V _{LL} : 318V to 480V _{LL}	3: Balanced and unbalanced load: 3-phase, 4-wire; 3-phase, 3-wire;	O1: Open collector type (single pulse output)	X: Self power supply -15% +20% of the rated measuring input voltage, 45 to 65 Hz

Options

PF: Certified according to MID Directive, Annex "B" + Annex "D" or Annex "B" + Annex "F" for legal metrology relevant to active electrical energy meters (see Annex MI-003 of MID). Can be used for fiscal (legal) metrology.



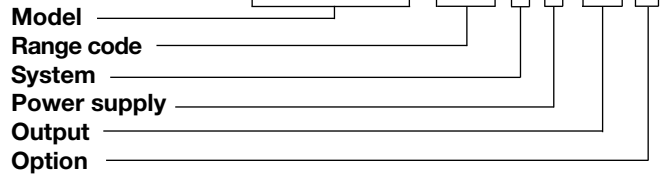
NOTE: please check the availability of the needed code on the verification path diagram on left before order .



STANDARD

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

How to order **EM23 DIN AV9 3 X O1 P**

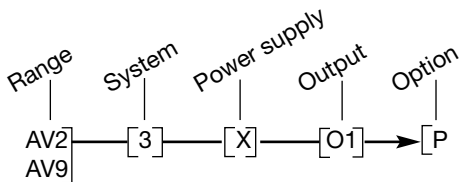


Type Selection

Range codes	System	Output	Power supply
AV2: 400 _{LL} AC 10(65)A (direct connection) V _{LN} : 113V to 265V _{LN} V _{LL} : 196V to 460V _{LL}	3: Balanced and unbalanced load: 3-phase, 4-wire; 3-phase, 3-wire;	O1: Open collector type (single pulse output)	X: Self power supply -15% +20% of the rated measuring input voltage, 45 to 65 Hz
AV9: 400 _{LL} AC - 10(65)A (direct connection) V _{LN} : 184V to 276V _{LN} V _{LL} : 318V to 480V _{LL}			

Options

P: Bearing EC "Type examination" (annex B of MID) relevant to active electrical energy meters (see Annex MI-003).



NOTE: please check the availability of the needed code on the verification path diagram on left before order .

Input specifications

Rated inputs	System type: 3	Energies (imported)	Autorange
Current type	By direct connection		6+1DGT or 7DGT (X and P options);
Voltage	AV2: 133/230 V _{LN} AC 230/400 V _{LL} AC		5+2, 6+1 or 7 DGT (PF option)
Current range (direct)	AV9: 230 V _{LN} /400 V _{LL} AC AV2 and AV9: 10 (65)AAC	Overload status	EEE indication when the value being measured is exceeding the "Continuous inputs overload" (maximum measurement capacity)
Accuracy (Display) (@25°C ±5°C, R.H. ≤60%, 48 to 62Hz)	lb: see below, Un: see below	Max. and Min. indication	Max. instantaneous variables: 999; energies: 9 999 999. Min. instantaneous variables: 0; energies 0.0 (X and P options), 0.00 (PF option)
AV2 model	lb: 10A, I _{max} : 65A; Un: 113 to 265V _{LN} (196 to 460V _{LL})		
AV9 model	lb: 10A, I _{max} : 65A; Un: 184 to 276V _{LN} (318 to 480V _{LL})		
Current (AV2, AV9)	From 0.004lb to 0.2lb: ±(0.5% RDG +3DGT). From 0.2lb to I _{max} : ±(0.5% RDG +1DGT).		
Phase-neutral voltage	In the range Un: ±(0,5% RDG +1DGT)	LEDs	Red LED (Energy consumption), 0.001 kWh by pulse Max frequency: 16Hz according to EN50470-1
Phase-phase voltage	In the range Un: ±(1% RDG +1DGT)	Measurements	See "List of the variables that can be connected to:"
Active power	±(1% RDG +2DGT)	Method	TRMS measurements of distorted wave forms.
Reactive power	±(2% RDG +2DGT)	Coupling type	Direct
Active energy	Class 1 according to EN62053-21 and Class B according to EN50470-3	Crest factor	lb 10A ≤4 (91A max. peak)
Reactive energy	Class 2 according to EN62053-23	Current Overloads	
AV2, AV9 models	lb: 10A, I _{max} : 65A; 0.1 lb: 1A, Start up current: 40mA	Continuous	65A, @ 50Hz
		For 10ms	1920A max, @ 50Hz
Energy additional errors		Voltage Overloads	
Influence quantities	According to EN62053-21, EN62053-23 and EN50470-1-2	Continuous	1.2 Un
		For 500ms	2 Un
Temperature drift	≤200ppm/°C	Input impedance	
Sampling rate	1600 samples/s @ 50Hz 1900 samples/s @ 60Hz	Voltage (AV2, AV9)	Refer to "Power Consumption"
Display refresh time	750 msec.	Current (AV2, AV9)	< 4VA
Display		Frequency	45 to 65 Hz
Type	2 lines (1 x 7 DGT; 1 x 3DGT)	Joystick	For variable selection.
Instantaneous variables read-out	LCD, h 9mm 3 DGT		

Output specifications

Digital outputs		Static output	
Pulse type		Purpose	For pulse output
Number of outputs	100 pulses per kWh (0.01kWh/pulse).	Signal	V _{ON} 1.2 VDC/ max. 100 mA V _{OFF} 30 VDC max.
Type	Output connected to the active energy (kWh)	Insulation	By means of optocouplers, 4000 VRMS between output to measuring inputs.
Pulse duration	≥100ms < 120msec (ON), ≥120ms (OFF), according to EN62052-31		



Software functions

System selection System 3-Phase unbalanced load	3-phase (4-wire); 3-phase (3-wire).	Both energy and power measurements are independent from the current direction. The displayed energy is always "imported"
Displaying	Up to 3 variables per page	
Easy connection function	Automatic phase sequence detection with current and voltage synchronisation.	

General specifications

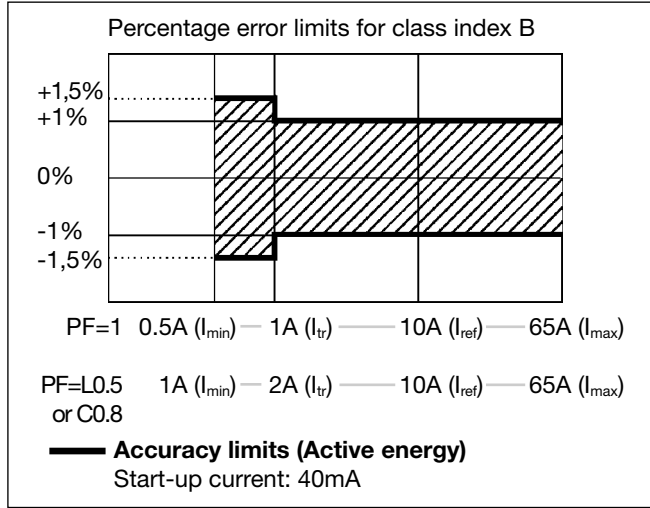
Operating temperature	-25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62053-21, EN62053-23 and EN50470-1	Standard compliance Safety	IEC60664, IEC61010-1 EN60664, EN61010-1
Storage temperature	-30°C to +70°C (-22°F to 158°F) (R.H. < 90% non-condensing @ 40°C) according to EN62053-21, EN62053-23 and EN50470-1	Metrology	EN62052-11, EN50470-1 EN62053-21, EN62053-23, EN50470-3. MID "Annex MI-003"
Installation category	Cat. III (IEC60664, EN60664)	Pulse output Approvals	DIN43864, IEC62053-31 CE, MID (PF option only)
Insulation (for 1 minute)	4000 VRMS between measuring inputs and digital output	Connections Cable cross-section area	Screw-type measuring inputs max. 16 mm ² ; min. 2.5 mm ² (by cable lug) Min./Max. screws tightening torque: 1.7 Nm / 3 Nm Output terminals: 1.5 mm ² Screws tightening torque: 0.5 Nm
Dielectric strength	4000 VRMS for 1 minute	Housing DIN Dimensions (WxHxD)	71 x 90 x 64.5 mm
Noise rejection CMRR	100 dB, 48 to 62 Hz	Material	Nylon PA66, self-extinguishing: UL 94 V-0 DIN-rail
EMC Electrostatic discharges Immunity to irradiated	According to EN62052-11 15kV air discharge; Test with current: 10V/m from 80 to 2000MHz;	Mounting	
Electromagnetic fields	Test without any current: 30V/m from 80 to 2000MHz;	Protection degree Front	IP50
Burst	On current and voltage measuring inputs circuit: 4kV	Screw terminals	IP20
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	Weight	Approx. 400 g (packing included)
Surge	On current and voltage measuring inputs circuit: 4kV.		
Radio frequency suppression	According to CISPR 22		

Power supply specifications

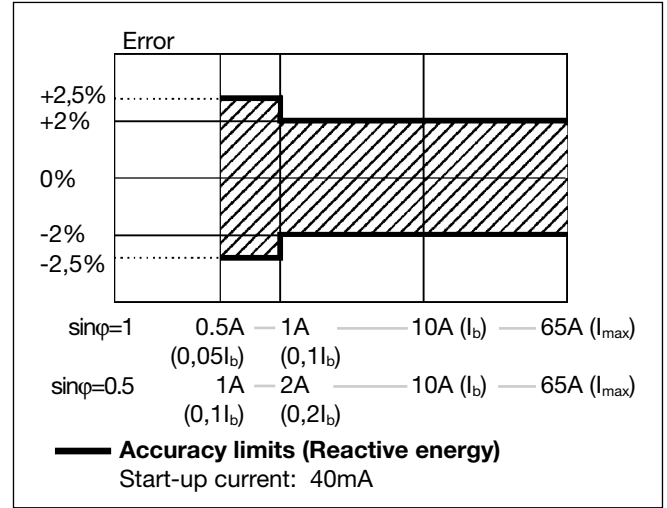
Self supplied version AV2 model	-15% +15% of Un, 48-62Hz.	in a 3-phase system with neutral may work also if one or two phases are missing.	
AV9 model	-15% +20% of Un, 48-62Hz.		
Note	The instrument provided with "O1" option, working	Power consumption	≤20VA/1W

Accuracy (according to EN50470-3 and EN62053-23)

kWh, accuracy (RDG) depending on the current



kvarh, accuracy (RDG) depending on the current



MID "Annex MI-003" compliance (PF option only)

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: 0.04A; I min: 0.5A; I tr: 1A; I max: 65A.	EMC compliance	E2
Operating temperature	-25°C to +55°C (-13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)	Mechanical compliance	M2
		Protection degree	in order to achieve the protection against dust and water required by the norms harmonized to MID, the meter must be used only installed in IP51 (or better) cabinets.

List of the available variables

No	Variable	3-ph. 4-wire bal. system	3-ph. 4-wire unbal. system	3 ph. 3-wire bal. system	3 ph. 3-wire unbal. system	Notes
1	A L1	x	x	x	x	
2	A L2	x	x	x	x	
3	A L3	x	x	x	x	
4	var sys	x	x	x	x	sys=system
5	W sys	x	x	x	x	sys=system
6	Phase seq.	x	x	x	x	
7	kWh	x	x	x	x	Total
8	kvarh	x	x	x	x	Total

(x) = available

Display pages

Display variables in 3-phase systems with or without neutral

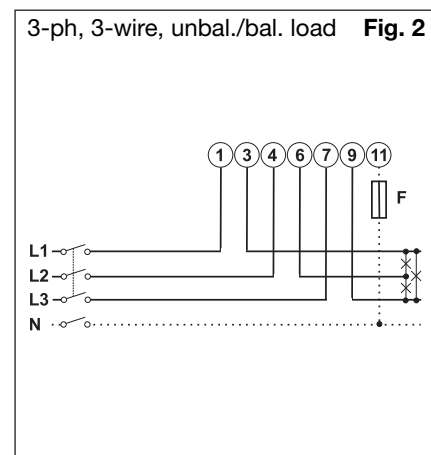
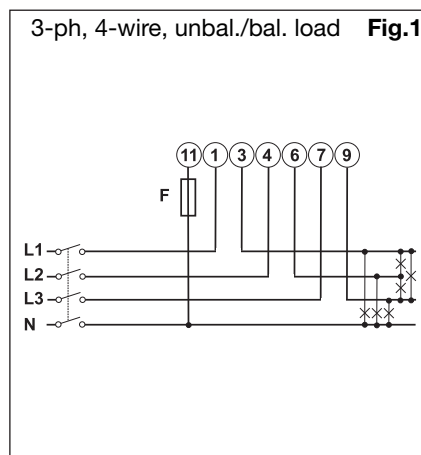
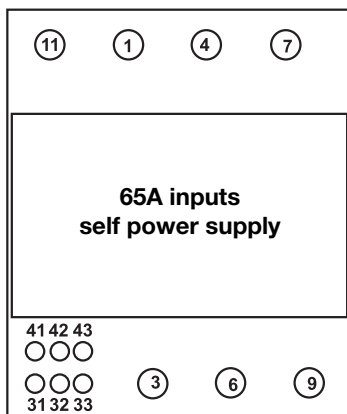
No	1 st line	2 nd line	Phase Sequence	Notes
1	Total kWh	kW sys	Warning triangle if reverse sequence	
2	Total kvarh	kvar sys	Warning triangle if reverse sequence	
3	AL1 - AL2	AL3	Warning triangle if reverse sequence	

Note: whatever page the user has selected, after 60s it goes back to page 1.

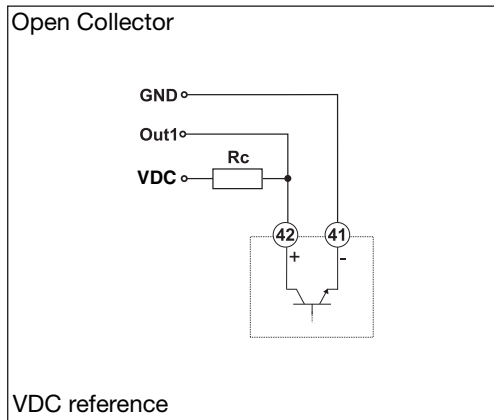
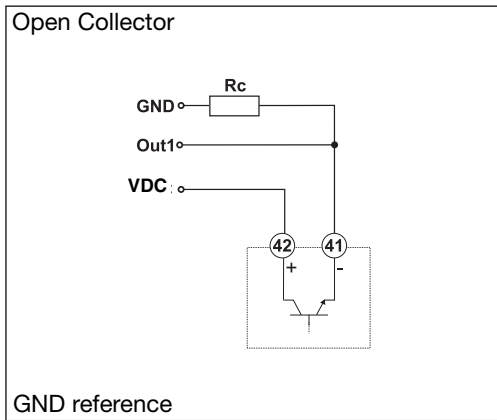
Insulation between inputs and outputs

	Measuring Inputs	Open collector outputs	Self power supply
Measuring Inputs	-	4kV	0kV
Open collector outputs	4kV	-	4kV
Self power supply	0kV	4kV	-

Wiring diagrams

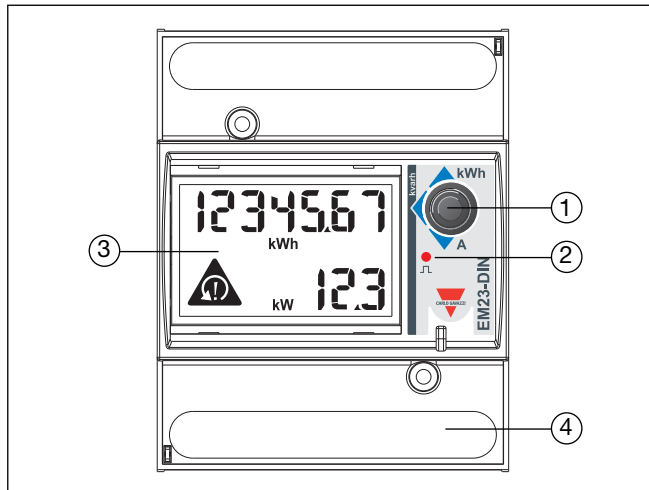


Open collector output wiring diagrams



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

Front panel description



1. **Joystick**
To scroll the variables on the display.
2. **LED**
Red LED blinking proportional to the energy being measured.
3. **Display**
LCD-type with alphanumeric indications to display all the measured variables.
4. **Connections**
Screw terminal blocks for instrument wiring.

Dimensions

