EM3-DIN INSTRUCTION FOLDER

Introduction

EM3-DIN is an active or reactive energy meter for three-phase systems; it can be either self-supplied or with auxiliary power supply for the 660V L-L models; it is provided with a 6 + 1 dgt electromechanical indicator and two LEDs: the green LED indicates the presence of the power supply, while the red LED indicates the energy consumption (the blinking is proportional to the consumption, 640 pulses/kWh, the faster is the blinking, the higher the consumption). EM3-DIN can be supplied with a dual open collector output to retransmit pulses proportionally to the consumed energy (kWh channel 1, kvarh channel 2).

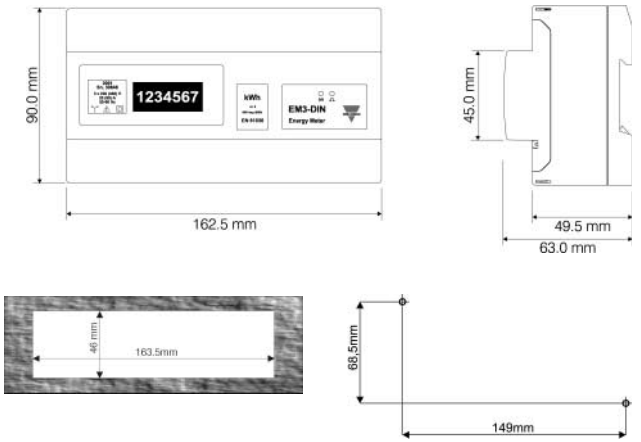
General technical features

Description		Active/reactive energy meter
Selection of displayed energy	By means of dip-switch	Dip-switch 1 ON: active energy
		Dip-switch 1 OFF: reactive energy
Display	Active/Reactive energy	Electromechanical meter 6+1 dgt
	Energy consumption	Red LED, 640 pulses/KWh/kvarh (min. period 0.5s)
	Power supply	Green LED
Pulse output (optional) NOTE: outputs independent from the selected measure	Output 1: kWh	10 pulses/kWh
	Output 2: kvarh	10 pulses/kvarh
Accuracy class	Active energy	2, according to EN61036
	Reactive energy	3, according to EN61268
Frequency		50 to 60 Hz
Additional errors (according to EN61036, EN61268)	Voltage variation	<0.5%
	Frequency variation	<0.5%
	Wave form	<1% (10% 3rd harmonic)
	Voltage disymmetry	<0.5% (referred to the rated input voltage Un)
	Continuos magnetic induction	0
	Magnetic induction	0 (up to 0.5mT)
	HF electromagnetic fields	<1%
	Influence of accessories	0
Temperature drift		250 ppm/° C

Basic current (Ib), according to EN61036/EN61268		20A
Max. current (Imax), acc. to EN61036/EN61268		90A
Overcurrent	Continuous	4.5Ib
	For 10ms	30Imax at 50Hz
Wave form		Sinusoidal and distorted
Crest factor	I 20A	6 (127A peak max)
Rated input voltage (Un)	Range AV3 (AE2002, AE2003)	Un: 660VL-L, 20% Un +15%, 50-60Hz
	Range AV8 (AE2001)	Un: 208VL-L, 20% Un +15%, 50-60Hz
	Range AV9 (AE2000)	Un: 400VL-L, 20% Un +15% ,50-60Hz
Input impedance	AV3	>1.97MOhm
	AV8, AV9	>720kOhm
Power supply	AE2000	Self-supplied 400VL-L, – 20/+15%, 50-60Hz
	AE2001	Self-supplied 208VL-L, – 20/+15%, 50-60Hz
	AE2002	115VAC, -15/+10%, 50-60Hz
	AE2003	230VAC, -15/+10%, 50-60Hz
System type Note: in the self-supplied versions, the neutral must always be connected to the input		3 phases, balanced or unbalanced load, with or without neutral.
Operating temperature		From -20 to +55° C (according to EN61036 and EN61268)
Storage temperature		From -20 to 70° C
Relative humidity (non-condensing)		From 0 to 90% @ 40° C
EMC	Burst	4kV/level 4 (EN61000-4-4)
	Irradiated electromechanical fields immunity	10V/m from 26 to 1000MHz (EN61000-4-3)
	Electrostatic discharges	15kV (EN61000-4-2)
	Radio frequency emissions	According to the limits of CISPR 14 and CISPR 22 std.
Pulse withstand voltage (1.2/50µs)		8kV (EN61000-4-5)
Installation category		CAT. III (IEC 664)
Insulation	Inputs/outputs (opt.)	2kVAC for 1 min.
Dielectric strength		4kVAC for 1 min.
Reference standards	Safety, metrology	IEC -664, EN61036, EN61268
Terminal boards for ammeter inputs	Type	Screw-type
	Max cable section	35 mm^2
	Min. section	6 mm^2
	Min. tightening torque	2 Nm
	Max. tightening torque	6 Nm
Protection degree	Front	IP40
	Terminals	IP20
Mounting		DIN-rail or panel mounted
Material of the housing and transparent front		ABS/NORYL/PC self-extinguishing
Dimensions		162.5x90x63mm (9-DIN modules)
Weight		0.8Kg (packing included)

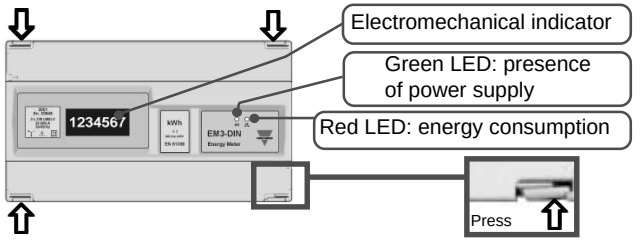
■ *Installation*

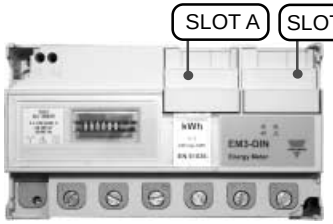
Fix EM3-DIN to the DIN rail or to the panel. The figure below shows the overall dimensions and the panel cutout.



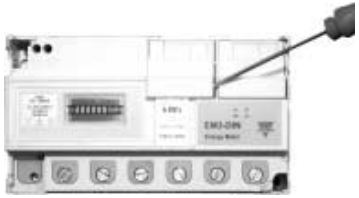
❑ *Front panel description. Access to the slots for the optional output and the energy selection dip-switch.*

Press contemporaneously the four release triggers at the four angles of the instrument, then lift the front cover to access to the slots under it. See figure below.



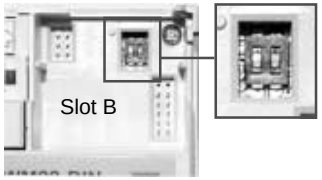


The instrument is provided with special dummy modules to protect the contacts below. In the slot A you can insert the dual pulse output module AO2900 (optional).



To remove the modules, use a screw driver. Insert the screwdriver in the slot on the side of the extractible modules, as shown in the figure on the left, and gently extract the module.
For the second module, follow the same procedure.

Use the dip-switch under slot B to select the type of energy to be displayed: for kWh, set dip-switch 1 in position ON; for kvarh, set dip-switch 1 in position OFF, as shown in the figure below:



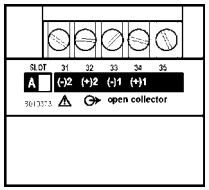
Display of reactive energy

Display of active energy

Warning: shock hazard! The connectors in the optional slots and the screws of the terminals are live if the instrument or the connected three-phase line are ON.

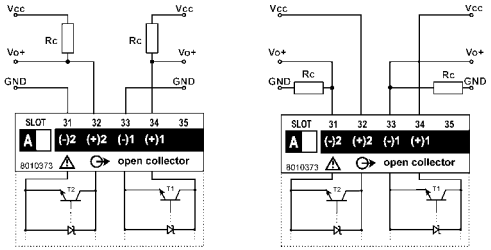
To avoid any damage to the instrument insert and extract the optional modules only when the instrument is OFF.

❑ *Optional module - Pulse output*
Description, connections and technical features



AO 2900 PULSE OUTPUT (optional)

This optional module is useful to retransmit the energy: active energy on channel 1 and reactive energy on channel 2: **install it in slot A only**.



The grounds of the outputs are separated, and therefore it is possible to carry out, for the same module, two different connections. The load resistance (Rc) must be designed so that the closed contact current is lower than 100mA; the VDC voltage must be lower than or equal to 30V.

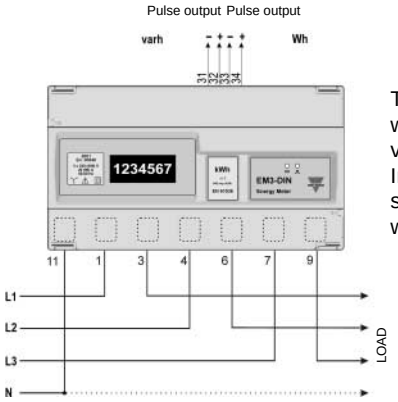
Vdc: power supply voltage output
Vo+: positive contact output (open collector transistor)
GND: ground of contact output (open collector transistor)

■ *Pulse output technical specifications*

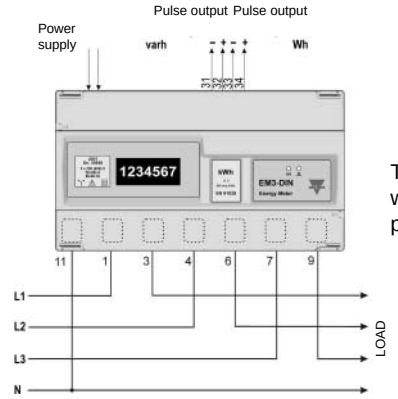
Number of outputs	2: reference (1) and (2)
Type of output	Open collector
V_{ON}	1.2VDC/ max 100mA
V_{OFF}	30VDC max
	Leakage current 10µA,@30V,60° C
Pulse duration	220ms (ON), 200ms (OFF)
Insulation between inputs and outputs	2kVAC between measuring inputs and outputs
Reference standards	EN61036, EN61268, DIN 43864
Insulation between the two outputs	Functional

❑ *Electrical connections*

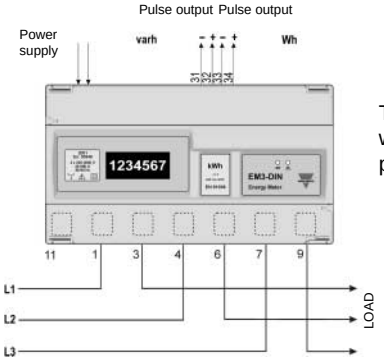
> Warning: to avoid oveheatings of the input terminals (90A), it's necessary to tighten the wires with a torque of at least 2Nm up to 6Nm.



Three-phase connection with neutral: self-supplied version.
In the self-supplied version, the neutral must always be connected.



Three-phase connection with neutral: auxiliary power supply version.



Three-phase connection without neutral: auxiliary power supply version.

■ *Power-on*

After connecting the instrument, power on the line; when the instrument is powered on, the green LED on the front of the instrument will be on. The red LED will start blinking only when the connected loads begin to consume energy.

■ *Notes*