

Energy Management

Energy Meter with plug-in Output Modules

Type EM3-DIN



- Class 2 (active energy)
- Class 3 (reactive energy)
- Active reactive energy meter
- Direct connection up to 90A
- Electromechanical display 6+1DGT
- LED for the indication of the consumed energy
- Selection of the displayed energy by means of dip-switch
- Optional pulse output (as a module)
- Self power supply or auxiliary power supply
115VAC, 230VAC 50-60Hz
- Full compliance with EN61036 (active energy, class 2)
- Full compliance with EN61268 (reactive energy, class 3)
- Dimensions: 9 DIN-modules
- Sealable housing

Product description

EM3-DIN is a three-phase energy meter for the measure of active or reactive energy; the 208V_{L-L}, 220V_{L-L} and 400V_{L-L} meters are self-supplied, while the 660V_{L-L} meters are provided with auxiliary

power supply. EM3-DIN is provided with: 6+1DGT electromechanical indicator for the indication of kWh or kvarh; one green LED for the indication of power ON; one red LED blinking proportional to the consumed energy.

Type selection

Range code	System	Power supply	Slot A (retransmission)
Auxiliary Power Supply (C or D): AV3: 660V _{L-L} / 20(90)AAC	3 : Three-phase, unbalanced load	C: 115VAC - 15+10% 50-60Hz (only range AV3)	X: None
Self Power Supply (X): AV2: 220V _{L-L} / 20(90)AAC		D: 230VAC -15+10% 50-60Hz (only range AV3)	O: Module AO2900 Dual open collector pulse output
AV8: 208V _{L-L} / 20(90)AAC		X: Self power-supply	R: Module AO2910 One relay output + one open collector output.
AV9: 400V _{L-L} / 20(90)AAC			

Input specifications

Accuracy Active energy Reactive energy Start-up current	Class 2, according to EN61036 Class 3, according to EN61268 80mA	Rated input voltage AV2 (AE2004) AV3 (AE2002, AE2003) AV8 (AE2001) AV9 (AE2000)	Un: 220V _{L-L} , -10%≤Un≤+15%, 50-60Hz Un: 660V _{L-L} , -20%≤Un≤+15%, 50-60Hz Un: 208V _{L-L} , -20%≤Un≤+15%, 50-60Hz Un: 400V _{L-L} , -20%≤Un≤+15%, 50-60Hz
Additional errors Voltage variation Frequency variation Wave form Voltage disymmetry External continuous magnetic induction Magnetic induction HF electromagnetic field Accessories influence	Acc. to EN61036, EN61268 < 0.5% < 0.5% <1% (3 rd harmonic: 10%) < 0.5% (referred to the rated input voltage) 0 0 (up to 0.5 mT) < 1% 0	Input impedance AV2 AV3 AV8 AV9	> 720kΩ (220V _{L-L}), ≤ 4VA > 1.97MΩ (660V _{L-L}), ≤ 4VA > 720KΩ (208V _{L-L}), ≤ 4VA > 720KΩ (400V _{L-L}), ≤ 4VA
Temperature drift	≤ 250 ppm/°C	Frequency	50-60 Hz
Measurements Wave form	Active or reactive energy sinusoidal and distorted	Electrical system	3-phase, unbalanced with or without neutral. Note: in the self-supplied version, the neutral must be connected to the measuring inputs.
Crest factor (I ≤ 20A)	≤ 6 (127A peak max)	Display	Electromechanical type 6+1 DGT Green LED, ON if supplied Red LED, 640 imp./kWh/ kvarh (min. period: 0.5s)
Basic current (Ib)	20A (according to EN61036 /EN61268)	Power supply Energy consumption	
Maximum current (Imax)	90A (according to EN61036/EN61268)	Selection of displayed energy Dip-switch 1	By means of DIP-switch ON: active energy OFF: reactive energy
Overload Continuous: current For 10ms: current	4.5 x Ib 30 Imax @ 50Hz		

Output specifications

Pulse outputs (on request)	AO2900, slot A		
Number of outputs	2	AO2910 module	Insulation between the two outputs: functional
Channel 1	Pulse outputs to be used as retransmission of the energies:	Pulse output	Relay + open collector output. Working mode like AO2900.
Channel 2	active energy		One static output+one relay output, other characteristics like AO2900.
Number of pulses	reactive energy	Output type	Static type like module AO2900; Relay type: SPDT, AC1, AC15: 1AAC @250VAC
Type	10 / kWh, 10 / kvarh		2000 V _{RMS} outputs to measuring inputs, 2000 V _{RMS} output to supply input.
	Open collector (NPN transistor)	Insulation	Insulation between the two outputs: 2000 V _{RMS}
	V _{ON} 1.2VDC / max 100mA		
Pulse duration	V _{OFF} 30VDC max		
	220ms (ON), ≥200ms (OFF) according to DIN43864		
Leakage current	≤10μA, @ 30V, 60°C		
Insulation	By means of optocouplers, 2000Vrms for 1 minute between measuring inputs and pulse outputs.		

Power supply specifications

Self power supply	400VAC V _{L-L} -20% +15% 50-60Hz 208VAC V _{L-L} -20% +15% 50-60Hz 220VAC V _{L-L} -10+15%, 50-60Hz	Auxiliary power supply	230VAC -15+10% 50-60Hz 115VAC -15+10% 50-60Hz
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General specifications

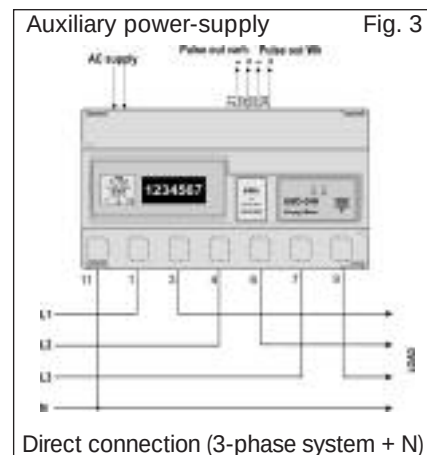
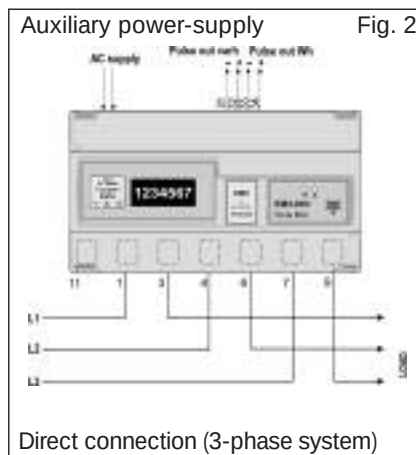
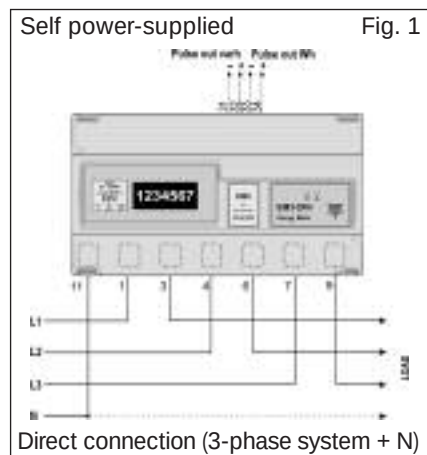
Operating temperature	-20 to +55°C (14°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN61036 and EN61268	Standards	Metrology Safety Pulse output	EN61036, EN61268 IEC-664 DIN 43864
Storage temperature	-20 to +70°C (14°F to 140°F)	Connections	Cable cross-section area	Screw-type, Max. 35 mm ² (measuring inputs) Min. 6 mm ² (measuring inputs) Other inputs: 4 mm ²
Dielectric strength	4000Vrms for 1 minute		Min./Max. screws tightening torque	2 Nm / 6 Nm (90A inputs)
Installation category	Cat. III (IEC 664)	Housing	Dimensions Material	162.5 x 90 x 63 mm ABS, NORLYL, PC self-extinguishing
EMC		Mounting		DIN-rail or wall
Burst	4kV / level 4 (EN61000-4-4)	Degree of protection		Front: IP40 Screw terminals: IP20
Immunity to irradiated electromagnetic fields	10V/m from 26 to 1000MHz (EN61000-4-3)	Weight		Approx. 800 g (packing included)
Electrostatic discharges	15kV (EN61000-4-2)			
Radio frequency emissions	according to CISPR 14 and CISPR 22			
Pulse voltage (1.2/50μs)	8kV (EN61000-4-5)			

Available models and modules

Type	Inputs	Power Supply	Number of channels	Ordering code
EM3-DIN AV9.3.X	400V _{L-L} / 20(90)AAC	Self power supply		AE2000
EM3-DIN AV8.3.X	208V _{L-L} / 20(90)AAC	Self power supply		AE2001
EM3-DIN AV2.3.X	220V _{L-L} / 20(90)AAC	Self power supply		AE2004
EM3-DIN AV3.3.C	660V _{L-L} / 20(90)AAC	115VAC - 15+10%		AE2002
EM3-DIN AV3.3.D	660V _{L-L} / 20(90)AAC	230VAC - 15+10%		AE2003
Open collector output			2	AO2900
Relay + open coll. output			2	AO2910

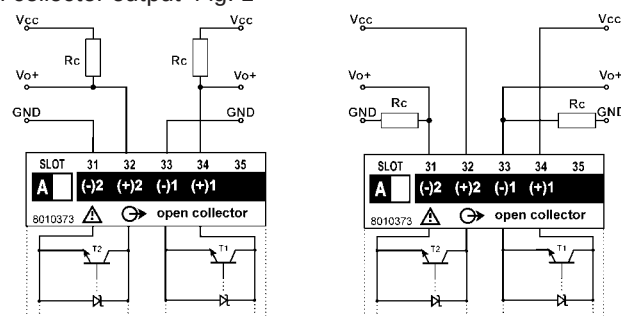
Wiring diagrams

EM3-DIN 20(90)A

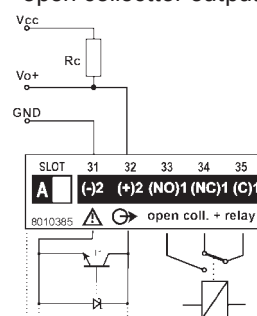


Wiring diagrams (optional module)

Open collector output Fig. 1



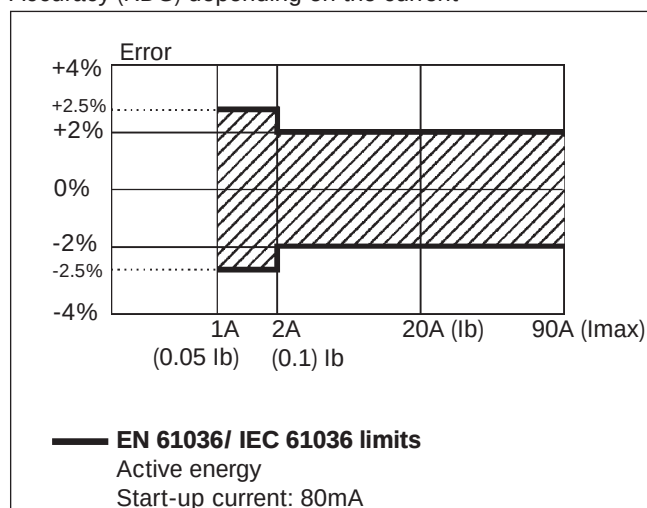
Relay + open collector output Fig. 2



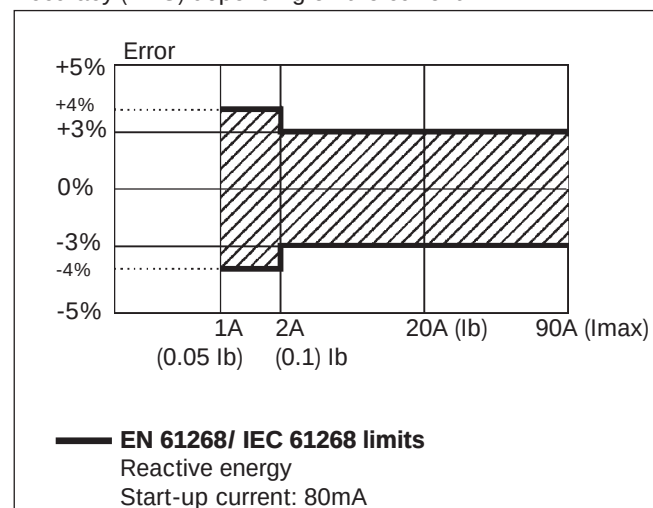
Only open collector outputs: the grounds of the outputs are separated, and therefore it's possible to carry out, for the same module, two different connections. The load resistance (R_c) must be designed so that the closed contact current is lower than 100mA; the VDC voltage must be lower than or equal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

Accuracy

Accuracy (RDG) depending on the current

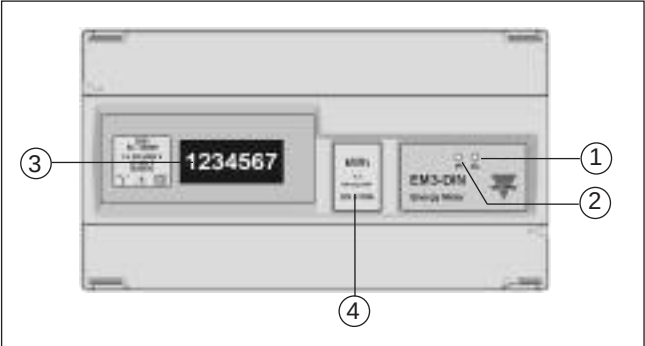


Accuracy (RDG) depending on the current



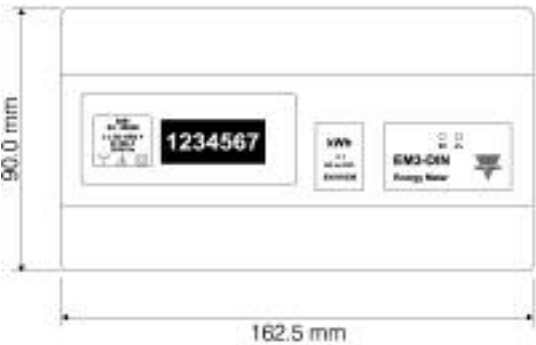


Front panel description



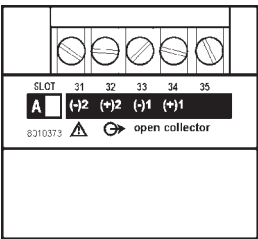
- 1. **Red LED**
Indicates the consumed energy (640 pulses / kWh, minimum period 0.5ms) blinking proportionally.
- 2. **Green LED**
Indicates power ON.
- 3. **Display**
Electromechanical type, 6+1 DGT, displays kWh or kvarh according to the selection made by means of an internal dip-switch.
- 4. **Engineering unit**
Removable double sided [front (kWh) / back (kvarh)] label

Dimensions



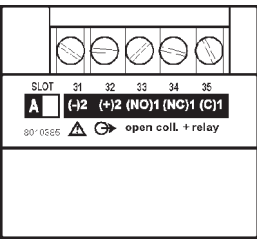
Terminal board

Dual open collector output module



AO 2900

Realy + open collector output



AO 2910