

Energy Management Energy Analyzer Type EM24 DIN



- Dimensions: 4-DIN modules
- Protection degree (front): IP50
- RS485 serial output (on request) (MODBUS-RTU), iFIX SCADA compatibility
- Application adaptable display and programming procedure (Easyprog function)
- Easy connections management
- MID "annex MI-003" (Measuring Instruments Directive) compliant

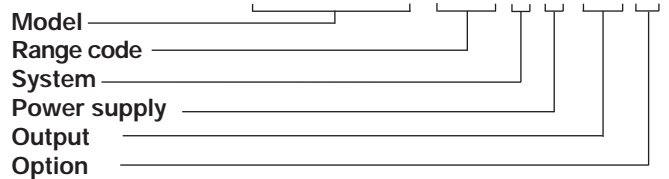
Product Description

Three-phase energy analyzer 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. Direct connection up to 64A and by means of external current and potential trans-

formers. Moreover the meter can be provided with digital outputs that can be either for pulse proportional to the active and reactive energy being measured or for alarm outputs. In alternative the RS485 communication port and 3 digital inputs are available as an option.

- Class 1 (kWh) according to EN62053-21
- Class 2 (kvarh) according to EN62053-23
- Accuracy ± 0.5 RDG (current/voltage)
- Energy analyzer
- Instantaneous variables readout: 4 DGT
- Energies/gas/water readout: 7+1 DGT
- System variables: VLL, VLN, Admd, VA, VAdmd, VAdmd max, W, Wdmd, Wdmd max, var, PF, Hz, Phase-sequence.
- Single phase variables: VLL, VLN, A, VA, W, var, PF
- Energy measurements: total and partial kWh and kvarh or based on 4 different tariffs; single phase measurements
- Gas, cold water, hot water, kWh remote heating measurements
- Hour counter (6+2 DGT)
- TRMS measurements of distorted sine waves (voltages/currents)
- Self power supply (AV0-AV9 inputs)
- Auxiliary power supply (AV5-AV6)
- 3 digital inputs for tariff selection, DMD synch or gas/water (hot-cold) and remote heating metering (on request)
- 2 digital outputs for pulses or for alarms or as a mix of them (on request)

How to order **EM24 DIN AV5 3 X O2 X**



Type Selection

Range codes	System	Output	Power supply
AV5: 400V _{LL} AC - 1/5 (10)A (CT connection) (*)	1: 1-phase., 2-wire; 3-phase, 3-wire, balanced load (**)	XX: none (*) O2: dual open collector type (dual pulse or one pulse + one alarm or dual alarm) (*)	X: Self power supply See "Power supply specifications" (*)
AV6: 120V _{LN} /208V _{LL} AC - 1/5(10)A (VT/PT and CT connections) (*)	3: balanced and unbalanced load: 3-phase, 4-wire; 3-phase, 3-wire; 2-phase, 3-wire;	R2: dual relay type (functions as per "O2") (**)	L: 18 to 60VAC/DC (48 to 62Hz) (**)
AV0: 120V _{LN} /208V _{LL} AC -10(64)A (Direct connection) (**)	1-phase, 2-wire (*)	XS: RS485 port (**) IS: 3 digital inputs for tariff selection or Gas / water / remote heating metering plus RS485 port (*)	D: 115/230 VAC (48 to 62Hz) (*)
AV9: 400V _{LL} AC - 10(64)A (*) (Direct connection)		DP: Dupline port (**)	Note: "L" and "D" power supplies only for AV5 and AV6 inputs; "X" power supply only for AV0 and AV9 inputs.
	Options		
	X: none (*) P: PTB approval (**)		

(*) as standard.
(**) on request.

Input specifications

Rated inputs	System type: 3 Galvanic insulation by means of built-in CT's (AV5 and AV6 models)	Energies	Imported Total/Partial/ Tariff: 7+1DGT or 8DGT; Exported Total/Partial/ Tariff: 6+1DGT or 7DGT (with "-" sign).
Current type	AV5 and AV6: 1/5(10)A	Overload status	EEEE indication when the value being measured is exceeding the "Continuous inputs overload" (maximum measurement capacity)
Current range (by CT)	AV5: 400VLL;	Max. and Min. indication	Max. instantaneous variables: 9999; energies: 9 999 999.9 or 99 999999.
Voltage	AV6: 120/208VLL		Min. instantaneous variables: 0; energies 0.0 or 0
Voltage by VT/PT	AV0: 10(64)A; AV9: 10(64)A		
Current range (direct)	AV0: 208 VLL AC		
Voltage	AV9: 400 VLL AC		
Accuracy (Display + RS485) (@25°C ±5°C, R.H. ≤60%, 48 to 62Hz)	Ib: see below, Un: see below		
AV5 model	In: 5A, Imax: 10A; Un: 160 to 480VLN (277 to 830VLL)	LEDs	Red LED (Energy consumption), 1000 imp./kWh/kvarh Max frequency: 16Hz according to EN62052-11
AV6 model	In: 5A, Imax: 10A; Un: 40 to 144VLN (70 to 250VLL)	Measurements	See "List of the variables that can be connected to:" TRMS measurements of distorted wave forms.
AV0 model	Ib: 10A, Imax: 64A; Un: 96 to 144VLN (166 to 250VLL)	Method	Direct for AV0 and AV9 models. By means of external CT's for AV5 and AV6
AV9 model	Ib: 10A, Imax: 64A; Un: 184 to 276VLN (318 to 480VLL)	Coupling type	
Current		Crest factor	Ib 10A ≤4 (91A max. peak) In 5A ≤3 (15A max. peak)
AV5, AV6 models	From 0.002In to 0.2In: ±(0.5% RDG +3DGT) From 0.2In to Imax: ±(0.5% RDG +1DGT).	Current Overloads	
AV0, AV9 models	From 0.004Ib to 0.2Ib: ±(0.5% RDG +3DGT) From 0.2Ib to Imax: ±(0.5% RDG +1DGT).	Continuous	1/5(10) A: 10A, @ 50Hz 10(64) A: 64A, @ 50Hz
Phase-neutral voltage	In the range Un: ±(0,5% RDG +1DGT)	For 500ms	1/5(10) A: 200A, @ 50Hz
Phase-phase voltage	In the range Un: ±(1% RDG +1DGT)	For 10ms	10(64) A: 1920A max, @ 50Hz
Frequency	±0.1Hz (45 to 65Hz)	Voltage Overloads	
Active and Apparent power	±(1%RDG +2DGT)	Continuous	1.2 Un
Power Factor	±[0.001+1%(1.000 - "PF RDG")]	For 500ms	2 Un
Reactive power	±(2%RDG +2DGT)	Input impedance	
Energies	Class 1 according to EN62053-21 and MID Annex MI-003 Class B Class 2 according to EN62053-23	208VL-L (AV6)	>1600KΩ
		208VL-L (AV0)	Refer to "Power Consumption"
		400VL-L (AV5)	>1600KΩ
		400VL-L (AV9)	Refer to "Power Consumption"
		1/5(10) A (AV5-AV6)	< 0.3VA
		10(64) A (AV0-AV9)	< 4VA
Energy additional errors		Frequency	45 to 65 Hz
Influence quantities	According to EN62053-21, EN62053-23	Joystick	For variable selection and programming of the instrument working parameters
Temperature drift	≤200ppm/°C		
Sampling rate	1600 samples/s @ 50Hz 1900 samples/s @ 60Hz		
Display	3 lines (1 x 8 DGT; 2 x 4 DGT)		
Type	LCD, h 7mm		
Instantaneous variables read-out	4 DGT		

Output specifications

Digital outputs		Note	The meters equipped with the relay outputs ("AV0" and "AV9" models with "R2" option) work even if VL1 is missing (VL3, VL2 and neutral have to be available)
Pulse type			
Number of outputs	Up to 2, independent. Programmable from 0.01 to 1000 pulses per kWh/kvarh.		
Type	Outputs connectable to the energy meters (Wh/varh)		
Pulse duration	≥100ms < 120msec (ON), ≥120ms (OFF), according to EN62052-31	RS485	
		Type	Multidrop, bidirectional (static and dynamic variables)
Alarm type		Connections	2-wire Max. distance 1200m Termination directly on the instrument
Number of outputs	Up to 2, independent	Addresses	247, selectable by means of the front joystick
Alarm modes	Up alarm, down alarm (see the table "List of the variables that can be connected to")	Protocol	MODBUS/JBUS (RTU)
Set-point adjustment	From 0 to 100% of the display scale	Data (bidirectional)	
Hysteresis	From 0 to full scale	Dynamic (reading only)	System and phase variables: see table "List of variables..."
On-time delay	0 to 255s	Static (writing only)	All the configuration parameters.
Output status	Selectable; normally de-energized and normally energized	Data format	1 start bit, 8 data bit, no parity, 1 stop bit
Min. response time	≤ 700ms, filters excluded. Set-point on-time delay: "0 s"	Baud-rate	4800, 9600 bits/s
Note	The 2 digital outputs can also work as a dual pulse output, dual alarm output, one pulse output and one alarm output.	Driver input capability	1/5 unit load Maximum 160 transceivers on the same bus.
		Insulation	By means of optocouplers, 4000 VRMS output to measuring input. 4000 VRMS output to supply input
Static output		Note:	The meters equipped with the communication port ("AV0" and "AV9" models with "XS" and "IS" options) work even if VL1 is missing (VL3, VL2 and neutral have to be available)
Purpose	For pulse output or alarm output		
Signal	V _{ON} 1.2 VDC/ max. 100 mA V _{OFF} 30 VDC max.		
Insulation	By means of optocouplers, 4000 VRMS output to measuring inputs, 4000 VRMS output to power supply input.		
Relay output		Dupline	
Purpose	For alarm output or pulse output	Bus	Full Dupline compatibility
Type	Reed Relay, SPST type AC 1-5A @ 250VAC DC 12-5A @ 24VDC AC 15-1.5A @ 250VAC DC 13-1.5A @ 24VDC	Addresses	128, selectable by means of the front joystick
Insulation	4000 VRMS output to measuring input. 4000 VRMS output to supply input.	Variables	Total kWh, total kvarh. W, Wdmd, Wdmd max



Digital input specifications

Number of inputs	3		
Input frequency	20Hz max, duty cycle 50%		
Prescaler adjustment	From 0,1 to 100,0 m ³ /pulse		
Contact measuring voltage	5VDC +/- 5%		
Contact measuring current	10mA max		
Input impedance	680Ω		
Contact resistance	≤100Ω, closed contact ≥500kΩ, open contact		
Working modes	Selectable: <ul style="list-style-type: none"> • total and partial energy meters (kWh and kvarh) without digital inputs; • total and partial energy meters (kWh and kvarh) managed by time periods (t1-t2-t3-t4), W dmd synchronisation (the synchronisation is made every time the tariff changes) and GAS (m³) or WATER (hot-cold m³) or remote heating (kWh) meters; 	Note	<ul style="list-style-type: none"> • total and partial energy meters (kWh and kvarh) managed by time periods (t1-t2), W dmd synchronisation (the synchronisation is made independently from the tariff selection) and GAS (m³) or WATER (hot-cold m³) or remote heating (kWh) meters; • total energy (kWh, kvarh) and GAS, WATER (hot-cold m³) and remote heating meters (3 choices only). The energy metering is only made by means of the analogue inputs.
		Insulation	By means of optocouplers, 4000 VRMS digital inputs to measuring inputs. 4000 VRMS digital inputs to supply input.

Software functions

Password	Numeric code of max. 4 digits; 2 protection levels of the programming data: 1st level: Password "0", no protection; 2nd level: Password from 1 to 9999, all data are protected	Filter	Operating range Filtering coefficient Filter action	0 to 100% of the input display scale 1 to 32 Measurements, serial output (fundamental variables: V, A, W and their derived ones).
System selection	System 3-Ph.n unbalanced load System 3-Ph.1 (only AV5 and AV6) balanced load	Displaying		Up to 3 variables per page See « Display pages » 8 different set of variables available (see « Display pages ») according to the application being selected
	3-phase (4-wire); 3-phase (3-wire). 3-phase (3-wire) one current and 3-phase to phase voltage measurements. 3-phase (4-wire) one current and 3-phase to neutral voltage measurements. 3-phase (2-wire) one current and 1-phase (L1) to neutral voltage measurement.	Reset		By means of the front joystick: - dmd and max. dmd; - total energies and gas/water: kWh, kvarh; - partial energies and tariffs: kWh, kvarh
System 2-Ph System 1-Ph	2-phase (3-wire). 1-phase (2-wire).	Easy connection function	AV9-AV0 models	Automatic phase sequence detection with current and voltage synchronisation.
Transformer ratio			AV5-AV6-AV9-AV0 models	For all the display selections, both energy and power measurements are independent from the current direction. The displayed energy is always "imported" with the only exception of "F" and "H" types (see "display pages" table). For those latter selections the energies can be either "imported" or "exported" depending on the current direction.
VT (PT)	1.0 to 999.9 / 1000 to 9999 / 10.00k to 60.00k (only AV6)			
CT	1.0 to 999.9 / 1000 to 6000 (only AV5 and AV6). The maximum power being measured cannot exceed 210 MW (calculated as maximum input voltage and current, see the "Accuracy" paragraph before. The maximum VT by CT ratio is 48.600). For MID complaint applications the maximum power being measured is 25MW.			

General specifications

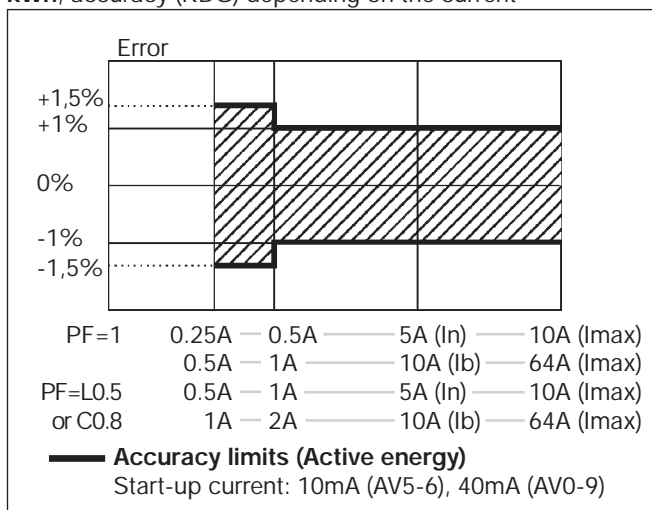
Operating temperature	-25°C to +55°C (13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62053-21 and EN62053-23	Radio frequency suppression	According to CISPR 22
Storage temperature	-30°C to +70°C (22°F to 140°F) (R.H. < 90% non-condensing @ 40°C) according to EN62053-21 and EN62053-23	Standard compliance	IEC60664, IEC61010-1 EN60664, EN61010-1 EN62052-11 EN62053-21, EN62053-23. MID "annex MI-003" DIN43864, IEC62053-31 CE, PTB (Revenue Approvals)
Installation category	Cat. III (IEC60664, EN60664)	Safety	
Insulation (for 1 minute)	4000 VRMS between measuring inputs and power supply. 4000 VRMS between power supply and RS485/digital output	Metrology	
Dielectric strength	4000 VRMS for 1 minute	Pulse output Approvals	
Noise rejection CMRR	100 dB, 48 to 62 Hz	Connections	Screw-type
EMC	According to EN62052-11	Cable cross-section area AV0-AV9 models	Max. 16 mm ² (measuring inputs); Min. 2.5 mm ² (measuring inputs) Other inputs: 1.5 mm ² Min./Max. screws tightening torque: 1.7 Nm / 3 Nm
Electrostatic discharges	15kV air discharge;	Cable cross-section area AV5-AV6 models	Max. 1.5 mm ²
Immunity to irradiated	Test with current: 10V/m from 80 to 2000MHz;	Housing DIN	
Electromagnetic fields	Test without any current: 30V/m from 80 to 2000MHz;	Dimensions (WxHxD)	71 x 90 x 64.5 mm
Burst	On current and voltage measuring inputs circuit: 4kV	Material	Nylon PA66, self-extinguishing: UL 94 V-0 DIN-rail
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz	Mounting	
Surge	On current and voltage measuring inputs circuit: 4kV; on "L" auxiliary power supply input: 1kV;	Protection degree	
		Front	IP50
		Screw terminals	IP20
		Weight	Approx. 400 g (packing included)

Power supply specifications

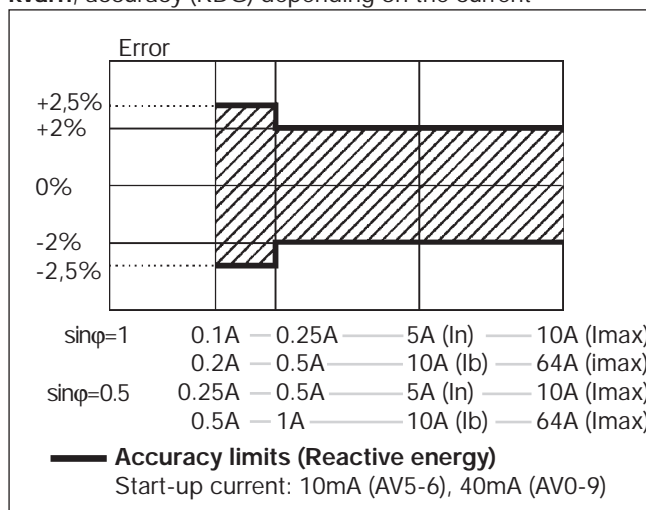
Self supplied version	AV9-AV0 models "O2" and "DP" options only: -20% +15%, 48-62Hz "R2", "XS" and "IS" options only: -15% +10%, 48-62Hz	neutral may work also if one or two phases are missing.
Note	The instruments provided with "IS" and "R2" options work only if all the voltage inputs are connected (3-phase and neutral). If a 1-phase connection has to be performed, the L1, L2 and L3 voltage inputs have to be short circuited. The instrument provided with "O2" option, working in a 3-phase system with	
		Auxiliary power supply
		AV5-AV6 modules: L: 18 to 60VAC/DC; D: 115VAC/230VAC (48 to 62Hz)
		Power consumption
		AV9-AV0 models AV9-AV0 models (IS option only) AV5-AV6 models
		≤ 20VA/1W ≤ 12VA/2W ≤ 2VA/2W

Accuracy

kWh, accuracy (RDG) depending on the current



kvarh, accuracy (RDG) depending on the current



MID "Annex MI-003" compliance

Accuracy

AV0-AV9 models

$0.9 U_n \leq U \leq 1.1 U_n$;
 $0.98 f_n \leq f \leq 1.02 f_n$;
 f_n : 50 or 60Hz;
 $\cos\phi$: 0.5 inductive to 0.8
 capacitive.
 Class B
 I_{st} : 0.04A;
 I_{min} : 0.5A;
 I_{tr} : 1A;
 I_{max} : 64A.

AV5-AV6 models

Operating temperature

EMC compliance

Class B

I_{st} : 0.01A;
 I_{min} : 0.05A;
 I_{tr} : 0.25A;
 I_n : 5A;
 I_{max} : 10A

-25°C to +55°C (13°F to 131°F) (R.H. from 0 to 90% non-condensing @ 40°C)

E2

Used calculation formulas

Phase variables

Instantaneous effective voltage

$$V_{IN} = \sqrt{\frac{1}{n} \cdot \sum_1^n (V_{INi})^2}$$

Instantaneous active power

$$W_1 = \frac{1}{n} \cdot \sum_1^n (V_{INi}) \cdot (A_1)_i$$

Instantaneous power factor

$$\cos\phi_1 = \frac{W_1}{VA_1}$$

Instantaneous effective current

$$A_1 = \sqrt{\frac{1}{n} \cdot \sum_1^n (A_1)_i^2}$$

Instantaneous apparent power

$$VA_1 = V_{IN} \cdot A_1$$

Instantaneous reactive power

$$VAR_1 = \sqrt{(VA_1)^2 - (W_1)^2}$$

System variables

Equivalent three-phase voltage

$$V_{\Sigma} = \frac{V_{12} + V_{23} + V_{31}}{3}$$

Voltage asymmetry

$$ASY_{LL} = \frac{(V_{LLmax} - V_{LLmin})}{V_{LL\Sigma}}$$

$$ASY_{LN} = \frac{(V_{LNmax} - V_{LNmin})}{V_{LN\Sigma}}$$

Three-phase reactive power

$$VAR_{\Sigma} = (VAR_1 + VAR_2 + VAR_3)$$

Three-phase active power

$$W_{\Sigma} = W_1 + W_2 + W_3$$

Three-phase apparent power

$$VA_{\Sigma} = \sqrt{W_{\Sigma}^2 + VAR_{\Sigma}^2}$$

Three-phase power factor

$$\cos\phi_{\Sigma} = \frac{W_{\Sigma}}{VA_{\Sigma}} \quad (\text{TPF})$$

Energy metering

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

$$kVarh_i = \int_{t_1}^{t_2} Q_i(t) dt \approx \Delta t \sum_{n_1}^{n_2} Q_{i,j}$$

Where:

i = considered phase (L1, L2 or L3)
 P = active power; Q = reactive power;
 t_1, t_2 = starting and ending time points
 of consumption recording; n = time
 unit; Δt = time interval between two
 successive power consumptions;
 n_1, n_2 = starting and ending discrete
 time points of consumption recording

List of the variables that can be connected to:

- RS485 communication port
- Alarm outputs ("max" variable", "energies" and "hour counter" excluded)
- Pulse outputs (only "energies")
- Dupline bus (only "kWh, kvarh, W, Wdmd, Wdmd max")

No	Variable	1-phase system	2-phase system	3-ph. 4-wire balanced sys.	3-ph. 4-wire unbal. sys.	3 ph. 3-wire bal. sys.	3 ph. 3-wire unbal. sys.	Notes
1	V L-N sys	o	x	x	x	x	x	sys=system
2	V L1	x	x	x	x	x	x	
3	V L2	o	x	x	x	x	x	
4	V L3	o	o	x	x	x	x	
5	V L-L sys	o	x	x	x	x	x	sys=system
6	V L1-2	o	x	x	x	x	x	
7	V L2-3	o	o	x	x	x	x	
8	V L3-1	o	o	x	x	x	x	
9	A dmd max	o	x	x	x	x	x	Highest "dmd" current among the phases (1)
10	A L1	x	x	x	x	x	x	
11	A L2	o	x	x	x	x	x	
12	A L3	o	o	x	x	x	x	
13	VA sys	x	x	x	x	x	x	sys=system
14	VA sys dmd	x	x	x	x	x	x	sys=system (1)
15	VA L1	x	x	x	x	x	x	
16	VA L2	o	x	x	x	x	x	
17	VA L3	o	o	x	x	x	x	
18	var sys	x	x	x	x	x	x	sys=system
19	var L1	x	x	x	x	x	x	
20	var L2	o	x	x	x	x	x	
21	var L3	o	o	x	x	x	x	
22	W sys	x	x	x	x	x	x	sys=system
23	W sys dmd	x	x	x	x	x	x	sys=system (1)
24	W L1	x	x	x	x	x	x	
25	W L2	o	x	x	x	x	x	
26	W L3	o	o	x	x	x	x	
27	PF sys	x	x	x	x	x	x	
28	PF L1	x	x	x	x	x	x	
29	PF L2	o	x	x	x	x	x	
30	PF L3	o	o	x	x	x	x	
31	Hz	x	x	x	x	x	x	
32	Phase seq.	o	x	x	x	x	x	
33	Hours	x	x	x	x	x	x	
34	kWh (+)	x	x	x	x	x	x	Total or by user
35	kvarh (+)	x	x	x	x	x	x	Total or by user
36	kWh (+)	x	x	x	x	x	x	Partial or by tariff
37	kvarh (+)	x	x	x	x	x	x	Partial or by tariff
38	kWh (-)	x	x	x	x	x	x	Total
39	kvarh (-)	x	x	x	x	x	x	Total
40	m ³ Gas	x	x	x	x	x	x	Total
41	m ³ Cold H ₂ O	x	x	x	x	x	x	Total
42	m ³ Hot H ₂ O	x	x	x	x	x	x	Total
43	kWh H ₂ O	x	x	x	x	x	x	Total

(x) = available

(o) = not available (zero indication on the display)

(1) Max. value with data storage

Display pages

Sel. pos.	No	1st variable (1st line)	2nd variable (2nd line)	3rd variable (3rd line)	Note	Applications							
						A	B	C	D	E	F	G	H
	1	Phase seq.	VLN sys	Hz		x	x	x		x	x	x	x
	2	Phase seq.	VLL sys	Hz							x	x	x
	3	Total kWh (+)	W sys dmd	W sys dmd max		x	x	x		x	x	x	x
	4	kWh (+)	A dmd max	"PArT"	"PArT" = Partial kWh (+)						x	x	x
	5	Total kvarh (+)	VA sys dmd	VA sys dmd max			x	x			x	x	x
	6	kvarh (+)	VA sys	"PArT"	"PArT" = Partial kvarh (+)						x	x	x
	7	Totalizer 1 (2)	W sys	(3)	(1)			x			x	x	x
	8	Totalizer 2 (2)	W sys	(3)	(1)			x			x	x	x
	9	Totalizer 3 (2)	W sys	(3)	(1)			x			x	x	x
	10	kWh (+)	t1 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	11	kWh (+)	t2 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	12	kWh (+)	t3 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	13	kWh (+)	t4 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	14	kvarh (+)	t1 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	15	kvarh (+)	t2 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	16	kvarh (+)	t3 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	17	kvarh (+)	t4 tariff	W sys dmd	(1) digital input enabled			x			x	x	x
	18	kWh (+) X	W X	User X	(1) specific function enabled				x				
	19	kWh (+) Y	W Y	User Y	(1) specific function enabled				x				
	20	kWh (+) Z	W Z	User Z	(1) specific function enabled				x				
	21	Total kvarh (-)	VA sys dmd	VA sys dmd max							x		x
	22	Total kWh (-)	W sys dmd	W sys dmd max						x	x		x
	23	Hours	W sys	PF sys						x	x	x	x
	24	Hours	var sys	PF sys						x	x	x	x
	25	var L1	var L2	var L3								x	x
	26	VA L1	VA L2	VA L3								x	x
	27	PF L1	PF L2	PF L3								x	x
	28	W L1	W L2	W L3						x		x	x
	29	A L1	A L2	A L3						x		x	x
	30	V L1-2	V L2-3	V L3-1								x	x
	31	V L1	V L2	V L3								x	x
0	Selector position which can be linked to any of the variable combinations listed above (No. from 1 to 31)												
1	Selector position which can be linked to any of the variable combinations listed above (No. from 1 to 31)												
2	Selector position which can be linked to any of the variable combinations listed above (No. from 1 to 31)												
3	Selector position which can be linked to any of the variable combinations listed above (No. from 1 to 31). In this position the front LED blinks proportionally to the reactive energy (kvarh) being measured												

(1) The page is available according to the enabled measurement.

(2) m³ Gas, m³ Water, kWh remote heating.

(3) Hot or Cold (water).

Note: in case of alarm the down arrow on the display blinks. There is a time-out of 60s that brings the scrolled page to the default one (selectable according to the table given above).

Additional available information on the display

Type	1st line	2nd line	3rd line
Meter information 1	Serial number	Year of production	Display page index
Meter information 2 (AV0-9)	System (1-2-3-phase)	Connection (2-3-4-wire)	dmd (time)
Meter information 3 (AV5-6)	CT ratio	System (1-2-3-phase)	Connection (2-3-4-wire)
Meter information 4 (AV5-6)	VT/PT ratio		dmd (time)
In case of alarm output	Alarm output 1 or 2 status	Set-point value	Variable type
In case of pulse output	Pulse output 1 or 2 variable link (kWh/kvarh)	Output pulse weight (pulse/kWh/kvarh)	
In case of communication port	Serial port	Address	RS485 status (RX-TX)

List of selectable applications

	Description	Notes
A	Basic domestic	Mainly energy metering
B	Shopping centres	Mainly energy metering
C	Advanced domestic	Mainly energy metering (total and based on tariff), gas and water metering
D	Multi domestic (also camping and marinas)	Mainly energy metering (3 by single phase)
E	Solar	Energy meter with some basic power analyzer functions
F	Industrial	Mainly energy metering
G	Advanced industrial	Energy metering and power analysis
H	Advanced industrial for power generation	Complete energy metering and power analysis

Insulation between inputs and outputs

	Measuring Inputs	Relay outputs	Open collector outputs	Comm. port and digital inputs	Self power supply	Auxiliary power supply
Measuring Inputs	-	4kV	4kV	4kV	0kV	4kV
Relay outputs	4kV	-	-	-	4kV	4kV
Open collector outputs	4kV	-	-	-	4kV	4kV
Comm. port and digital inputs	4kV	-	-	-	4kV	4kV
Self power supply	0kV	4kV	4kV	4kV	-	-
Aux. power supply	4kV	4kV	4kV	4kV	-	-

NOTE: all the models with auxiliary power supply have, mandatory, to be connected to external current transformers because the isolation among the current inputs is just functional (100VAC).

Tamper proof accessory kit



The "tamper proof" kit is available with the "P" option (two screw protection covers).

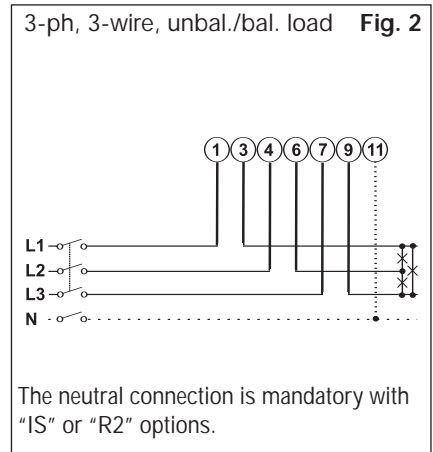
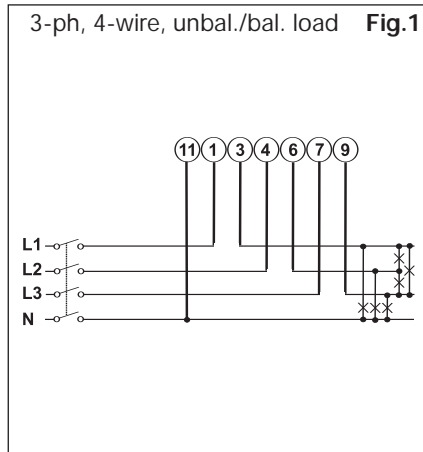
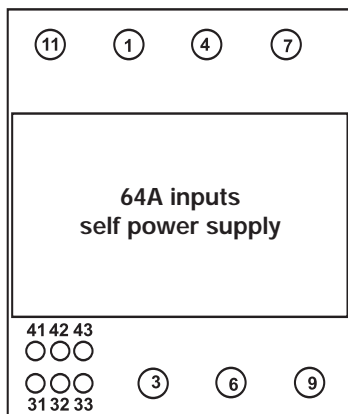
The instrument can be sealed in three points:

- Upper cover;
- Lower cover;
- Front selector (to lock the instrument programming);

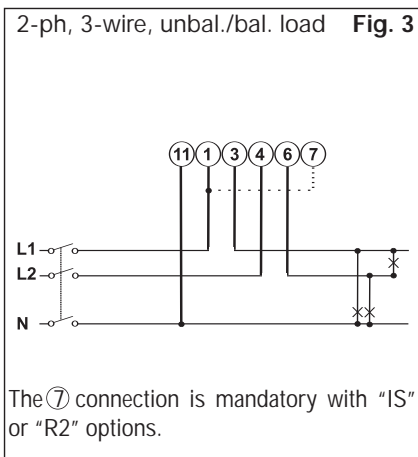


Wiring diagrams

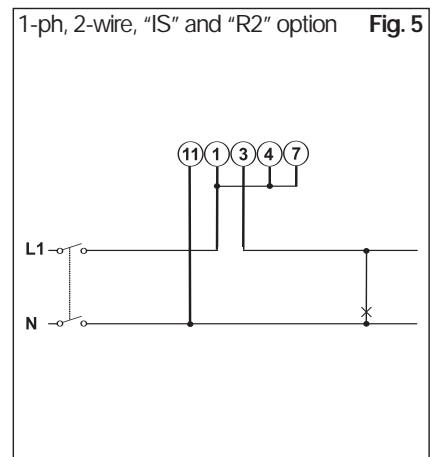
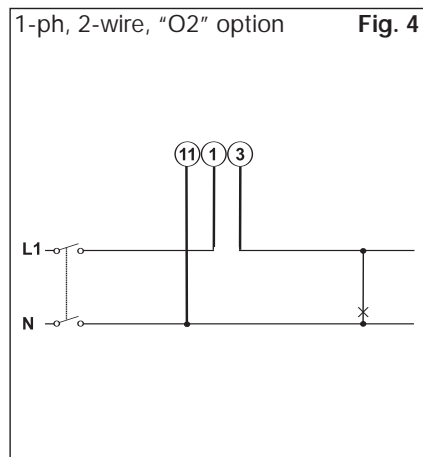
(64A) System type selection: 3P.n



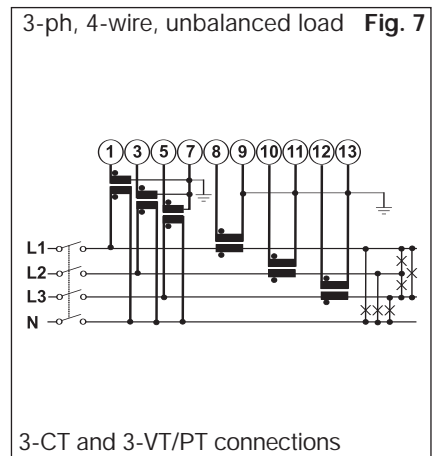
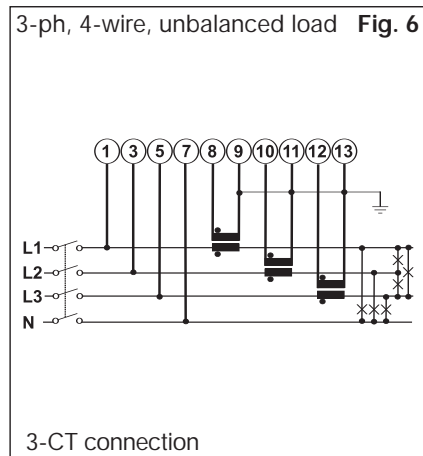
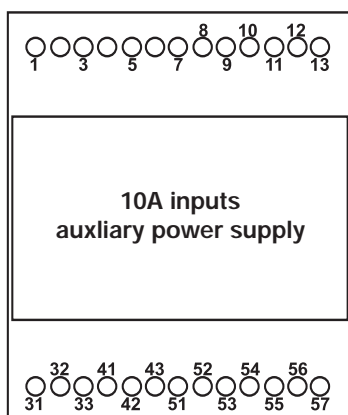
(64A) System type selection: 2P



(64A) System type selection: 1P

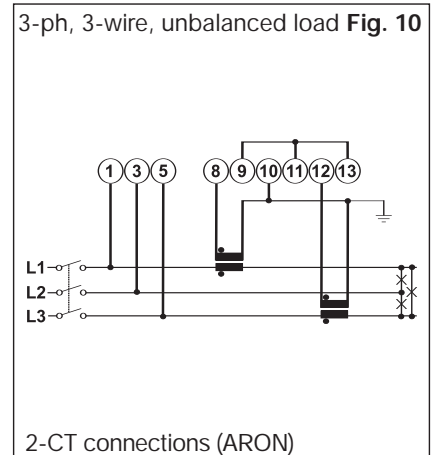
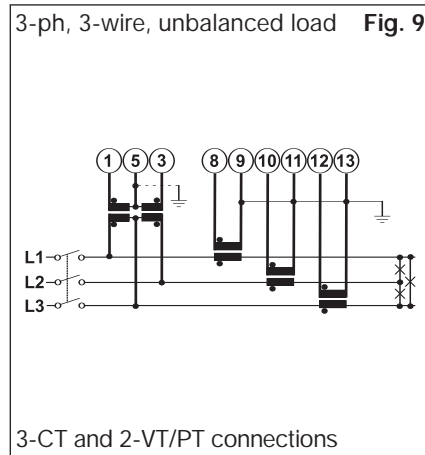
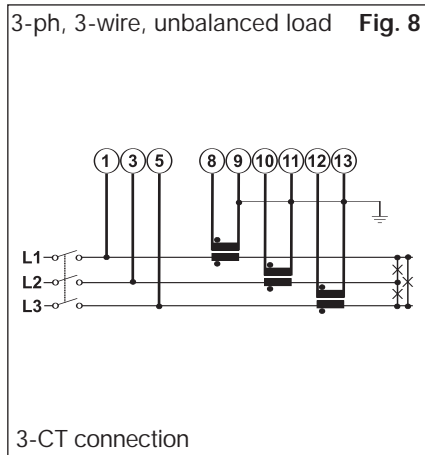


(10A) System type selection: 3P.n

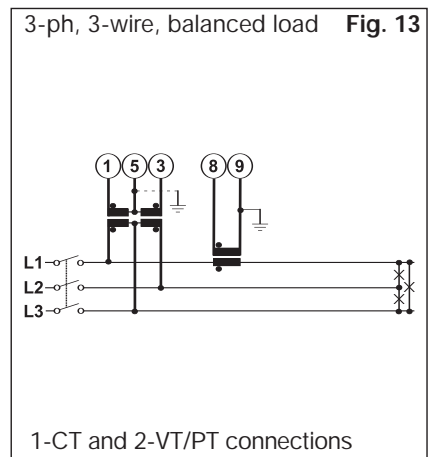
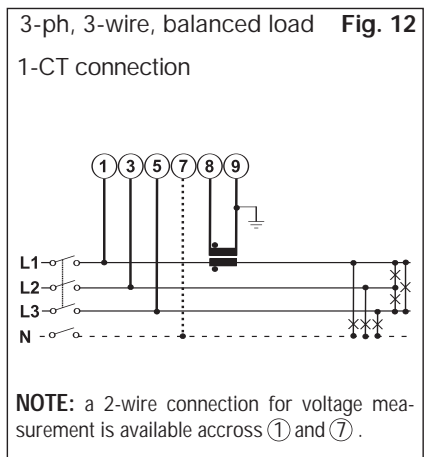
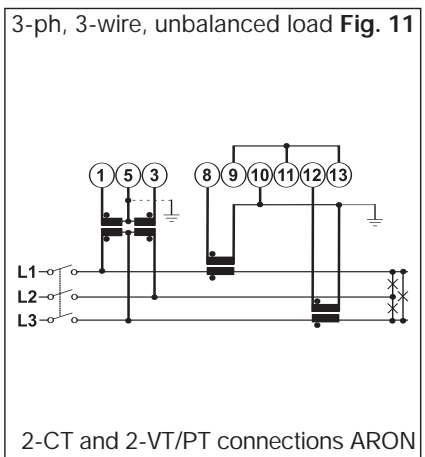


Wiring diagrams

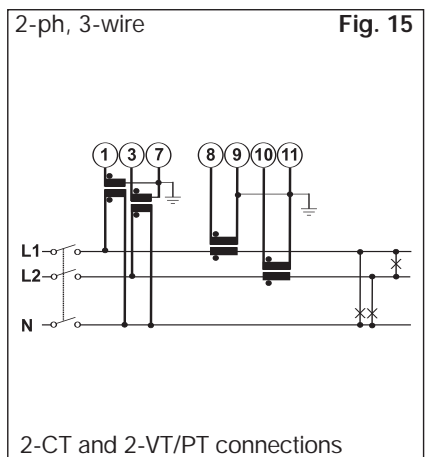
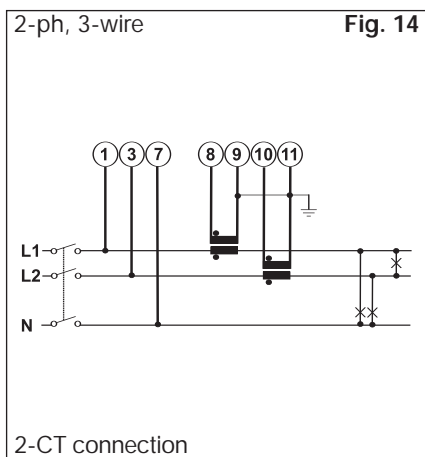
(10A) System type selection: 3P.n



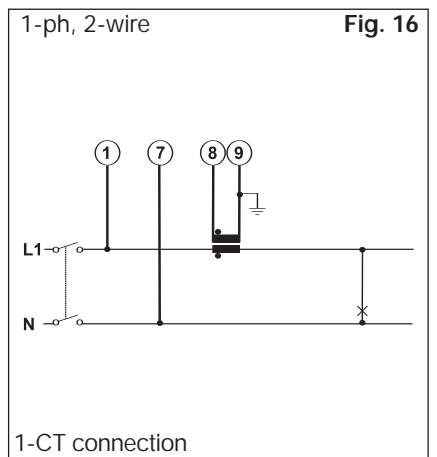
System type selection: 3P.1



(10A) System type selection: 2P

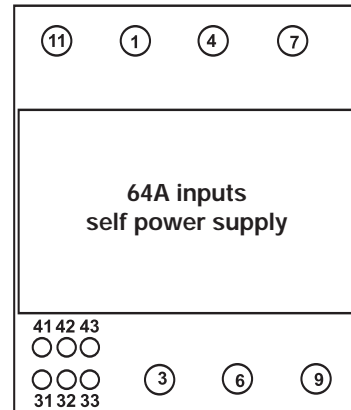
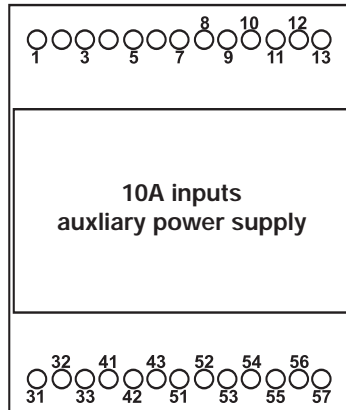
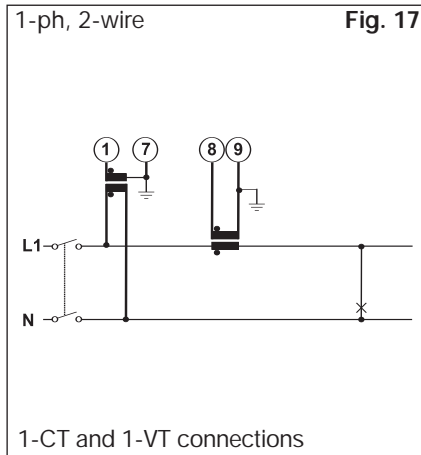


(10A) System type selection: 1P

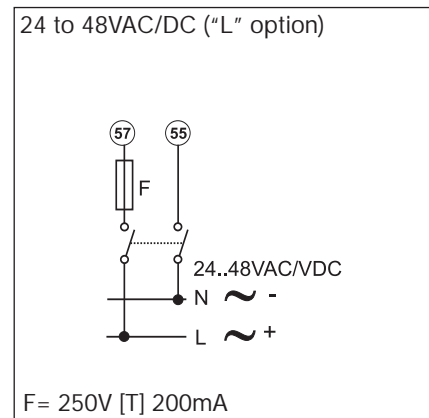
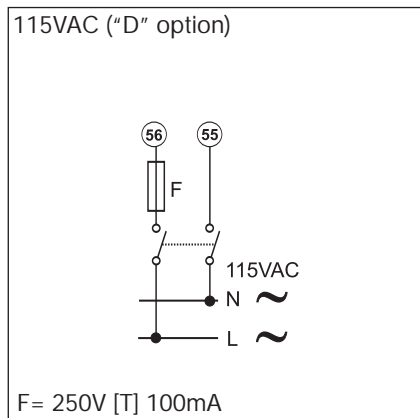
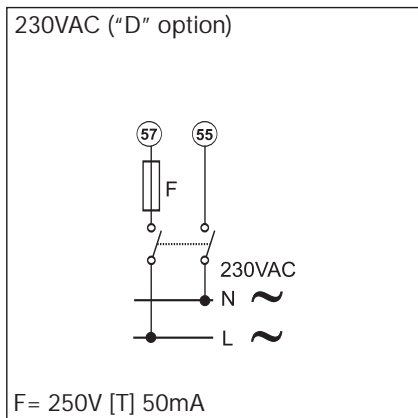


Wiring diagrams

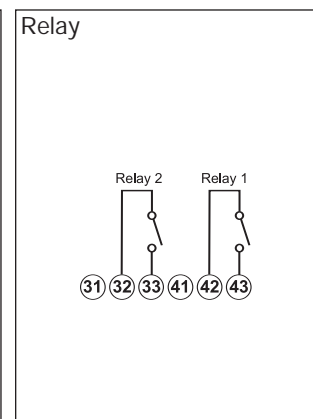
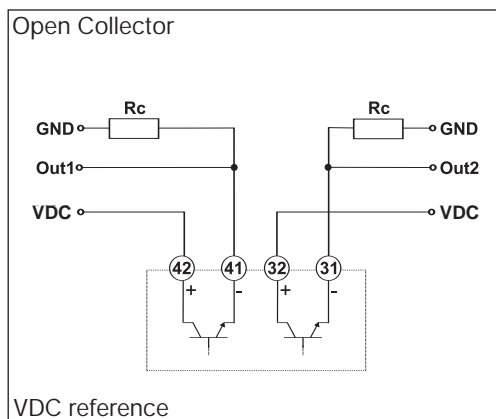
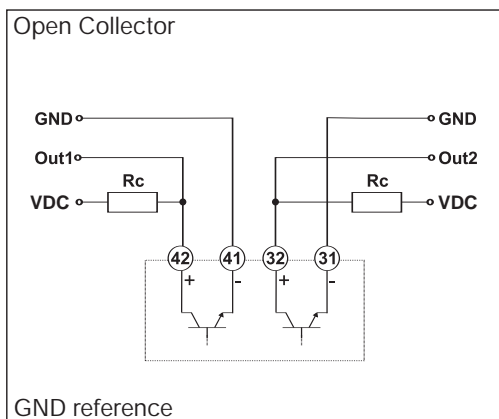
(10A) System type selection: 1P



Power supply wiring diagrams (auxiliary power supply)

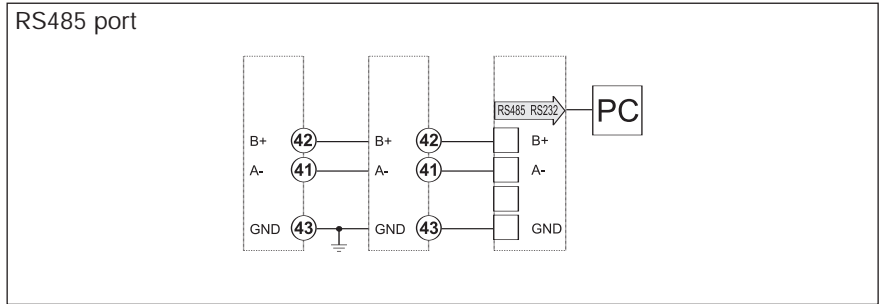
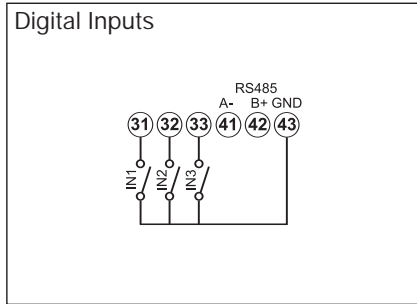


Open collector and relay outputs wiring diagrams

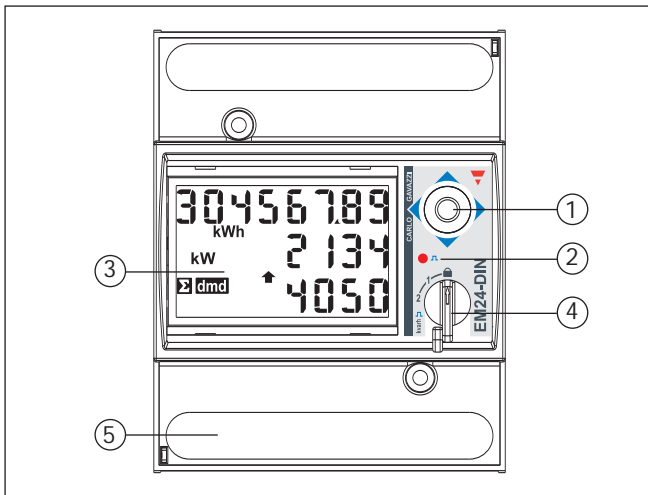


The load resistances (RC) must be designed so that the close contact current is lower than 100mA; the VDC voltage must be lower than or equal to 30VDC.

Digitala inputs and RS485 port wiring diagrams



Front panel description



1. **Joystick**
To program the configuration parameters and 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 configuration parameters;
- display all the measured variables.
4. **Selector**
To select the desired display pages and to lock the programming.
5. **Connections**
Screw terminal blocks for instrument wiring.

Dimensions

