Energy Management Energy Analyzer Type EM271

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- Equivalent to Class 1 (kWh) of EN62053-21 (EM271 Base only)
- Equivalent to Class 2 (kvarh) of EN62053-23 (EM271 Base only)
- Equivalent to Class 1 (TCDxM split-core current sensors accessory only)
- Virtual meter (sum of two 3-phase or six 1-phase loads)
- Energy meter with 6+1 DGT readout
- Current measurement up to 400 A with external TCDxM current transformer accessories
- Single phase variables: V, A, kW
- Total energy measurements: total kWh and kvarh
- Self power supply
- RS485 serial communication port (standard)
- 2 programmable pulsating outputs (optional)
- Fast installation system by:
  - Detachable dual voltage terminal blocks
  - Daisy-chain of max 20 EM271 by dual voltage terminal blocks
  - Detachable serial and pulse outputs terminal blocks
  - RJ11 connection for external TCDxM current transformers
- Overall dimensions: 72x72 mm
- Protection degree (front): IP50

Product description

Dual three-phase energy meter with built-in configuration key-pad and LCD data displaying capable to measure the consumed energy (and other electrical parameters) by up two three-phase loads or by up to six single-phase loads. Housing for both DIN-rail and panel mounting with IP50 (front) protection degree. The voltage connections are carried out by a couple of detachable terminals so to allow a very fast daisy chain installation of multiple meters. Measurement of the current up to 400 A with external spli core current transformer accessories connected by RJ11. Moreover the meter is provided either with two pulsating outputs proportional to the active energy being measured (e.g. one for lighting load and one for power load) and a serial RS485 port or with a dual serial RS485 port based on detachable terminals for a fast installation. A virtual energy meter can be enabled to provide the total consumptions data of the two 3-phase loads (or of the six 1-phase ones).

How to order

EM271-72D MV5 3 X OS X

Model ───────────────
Range code ───────────────
System ───────────────
Power supply ───────────────
Output ───────────────
Option ───────────────

Type Selection

Range code		System		Power supply		Outputs	
MV5:	230VLN/400VLL AC	**3:**	3-phase 3-wire, 3-phase 4-wire, or 1-phase 2-wire	**X:**	Self power supply from 40V to 460VAC, 45 to 65Hz	**OS:**	dual static output (opto-mosfet) and serial port
MV6:	120VLN/230VLL AC both by TCDxMxM split-core current sensors accessory					**2S:**	dual RS485 serial communication port

Option

X: none

N: naked version for panel builders

Note. N option is:

- not including 2 voltage terminal blocks

- not including 2 output terminals blocks (code 2S.N)

- including 2 output terminals blocks (code OS.N)

- including protection cover for voltage terminal

- including mounting brackets and terminal seal covers

Accessories: how to order

EM270-WS V 2T 80

Accessory model ————————————————————
Type ————————————
Terminal/spare part type ————————————
Cable length ————————————————————

Accessories Type Selection

Type		**Terminal type**		**Length**
V:	Voltage cables	**2T:**	EM270 detachable terminal at both sides	Accessory cable length in cm
S:	RS485 cables	**1T:**	EM270 terminal at one side. Available only for voltage cables (V type)	
T:	spare terminals	**V:**	set of 20 voltage terminals	
		C:	set of 20 voltage protection covers	
		S:	set of 20 serial terminals	

Available combinations

EM270 – WS. V.1T.60
EM270 – WS. V.1T.100
EM270 – WS. V.1T.150
EM270 – WS. V.1T.200

EM270 – WS. V.2T.30
EM270 – WS. V.2T.60
EM270 – WS. V.2T.90
EM270 – WS. V.2T.150
EM270 – WS. V.2T.200

EM270 – WS. S.2T.60
EM270 – WS. S.2T.90
EM270 – WS. S.2T.120
EM270 – WS. S.2T.180
EM270 – WS. S.2T.230

EM270 – WS.T.V
EM270 – WS.T.C
EM270 – WS.T.S

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Input specification

Rated Input	
Current type	Galvanic insulation carried out by means of external TCDxM current transformer accessories
Current range	up to 400 A with TCDxM current transformers
Voltage	230VLN / 400VLL (MV5), 120VLN / 230VLL (MV6)

Accuracy	The below data considers the whole measuring chain: EM271 base meter and TCDxM current transformer
(Display, serial communication) (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)	
Current range	In: 10000A (TCDxM primary current)
Current	From 0.02In to 0.05In: ±(1.25% RDG +3DGT) From 0.05In to 0.2In: ±(1% RDG +2DGT) From 0.2In to Imax: ±(0.75% RDG +1DGT)
Voltage range	
MV5 range	Un: 160 to 260VLN (277 to 450VLL)
MV6 range	Un: 40 to 144VLN (70 to 250VLL)
Phase-neutral voltage	In the range Un: ±(0,5% RDG +1DGT)
Phase-phase voltage	In the range Un: ±(1% RDG +1DGT)
Frequency	Range: 45 to 65Hz. Resolution: 1Hz
Active power	From 0.02In to 0.05In, within Un range, PF=1: ±(2% RDG +2DGT) From 0.05In to 0.2In, within Un range, PF=1: ±(1.5% RDG +1DGT) From 0.2In to Imax, within Un range, PF=1: ±(1.25% RDG +1DGT) From 0.05In to 0.1In, within Un range, PF=0.5L to 0.8C: ±(2.5% RDG +2DGT) From 0.1In to 0.2In, within Un range, PF=0.5L to 0.8C: ±(2% RDG +1DGT) From 0.2In to Imax, within Un range, PF=0.5L to 0.8C: ±(1.5% RDG +1DGT)

Reactive power	From 0.02In to 0.05In, within Un range, sin(ϕ)=1: ±(3% RDG +2DGT) From 0.05In to 0.2In, within Un range, sin(ϕ)=1: ±(2.5% RDG +1DGT) From 0.2In to Imax, within Un range, sin(ϕ)=1: ±(2.25% RDG +1DGT) From 0.05In to 0.1In, within Un range, sin(ϕ)=0.5 (L or C): ±(3.5% RDG +2DGT) From 0.1In to 0.2In, within Un range, sin(ϕ)=0.5 (L or C): ±(3% RDG +1DGT) From 0.2In to Imax, within Un range, sin(ϕ)=0.5 (L or C): ±(2.5% RDG +1DGT)
Energies	kWh: better than the combination of a class 1 of EN62053-21 meter (EM271 base) and class 0.5 of EN60044-1 CTs (TCDxM current transformer) considering the whole measurement chain. kvarh: better than the combination of a class 2 of EN62053-23 meter (EM271 base) and class 0.5 of EN60044-1 CTs (TCDxM current transformer) considering the whole measurement chain 0.002In.
Start-up current	
Temperature drift	≤200ppm/°C
Sampling rate	1600 samples/s @ 50Hz; 1900 samples/s @ 60Hz

Display	2 lines (1 x 7-DGT + 1 x 3-DGT)
Type	LCD, h 7 mm
Instantaneous variables readout	3-DGT (Power: 3-DGT, currents: 3-DGT)
Energies	Imported Total: 6+1DGT
Overload status	EEE indication when the value being measured is exceeding the "Continuous inputs overload" (maximum measurement capacity)

Max. and Min. indication	Max. instantaneous variables: 999; energies: 9 999 999. Min. instantaneous variables: 0; energies 0.0
Refresh time	1 second

Input specification (cont.)

LEDs	Red LED (Energy consumption only, relevant to the sum of the consumption of any load connected to the meter, 1 imp./kWh according to EN50470-1. Green LED for Power-on (steady) and communication status: RX-TX (blinking in case of RS485 option only).	**Crest factor**	1.414 @ Imax (Imax=1.2 In = 0.4V). In any case: Vpeak max = 0.565V
		Voltage Overloads	
		Continuous	1.2 Un
		For 500ms	2 Un (except power supply terminals)
Measurements	See "List of the variables that can be connected to:"	**Voltage input impedance**	
		Self-power supply	Power Consumption: < 4VA / 2W
Method	TRMS measurements of distorted wave forms.	**Frequency**	45 to 65 Hz
		Keypad	2 pushbuttons for variable selection and programming of the digital output parameters
Coupling type	By means of the external current transformer accessories.		

Output specifications

Pulse output		Addresses	247, selectable by means of the front keypad
Number of outputs	2, Programmable from 0.1 to 1000 kWh per pulse.	Protocol	MODBUS/JBUS (RTU)
Type	Output connectable to the energy meters (kWh)	Data (bidirectional)	
Connection type	Detachable screw terminal connectors	Dynamic (reading only)	System and phase variables: see table "List of the variables that can be connected to:".
Pulse duration	Selectable, 40ms or 100ms (ON), according to EN62052-31. Static: opto-mosfet	Static (reading and writing)	All the configuration parameters.
Output	V_{ON} 2.5 $V_{AC/DC}$, max. 70 mA	Data format	1 start bit, 8 data bit, no or even parity,1 stop bit
Load	V_{OFF} 40 $V_{AC/DC}$, max.	Baud-rate	9.6, 19.2, 38.4 kbaud
Insulation	4kVp/2,5kVAC output to measuring inputs.	Driver input capability	1/5 unit load. Maximum 160 transceivers on the same bus.
RS485		Insulation	By means of opto-couplers, 4kVp/2,5kVAC output to measuring input.
Type	Multidrop, bidirectional (static and dynamic variables)		
Connections	2-wire max. distance 1000m		
Connection type	Detachable screw terminal connectors		
Termination	Termination by using a proper jumper in the terminal block.		

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Software functions

Password	Numeric code of max. 3 digits; 2 protection levels of the programming data:
1st level	Password "0", no protection;
2nd level	Password from "1" to "999", all data are protected
Lock knob	Programming (by keypad or serial commands) is not possible with the lock knob located behind the display unit is on lock position
System selection	
System 3P/1.3P	3-phase (3- or 4-wire) supply. Management of one 3-phase load.
System 3P/2.3P	3-phase (3- or 4-wire) supply. Management of two 3-phase loads.
System 3P/3.1P	3-phase (3- or 4-wire) supply. Management of three 1-phase loads.
System 3P/6.1P	3-phase (3- or 4-wire) supply. Management of six 1-phase loads.
System 1P/3.1P	1-phase (2-wire) supply. Management of three 1-phase loads.
System 1P/6.1P	1-phase (2-wire) supply. Management of six 1-phase loads.
Function selection	
Function SUM	ON: each single system and total data (A, W, kWh) available. OFF: each single system data available without total data
Easy connection Function (EC)	ON: measurement independent on current direction. OFF: measurement dependent on current direction (default). When NOT active, energies (kWh and kvarh) and power (kW) measurements are

	dependent from the current direction (if negative, A, P, Q are shown with the "-" sign). The displayed energy values are only relevant to the "imported" energies.
Transformer ratio	
VT (PT) ratio	1.0 to 99.9 / 100 to 999 (999 is internally considered 1000)
CT primary current	Auto-detection of the primary current of the TCDxM current transformer. The 2 TCDxM' can have a different primary current. The maximum value of the VT is limited to grant the measurement of the Max possible power (210MW). The below table "Max VT(PT) ratio" list the max VT values. In case of programming a VT or a current primary value which exceed this limit, an error message appears for 2s, then the previous value is displayed again. An exception is sent via Modbus in case of wrong CT or VT value set via serial communication.
Max VT (PT) ratio	
MV5 and MV6 models	See relevant table
Integration time	
For dmd power calculation	Selectable, from 1 to 60 min
Displaying	Up to 3 variables per page. See «Display pages»
Reset	By means of the front keypad: - total energies (function SUM on): kWh and kvarh - partial energies: single load energy (kWh and kvarh) and demanded power (Wdmd) - Max demand (Md) of active and apparent power.

Max VT (PT) ratio according to the current sensors range

TCDA1	60		100		200		400		NO TCD	
TCDA2	MV5	MV6	MV5	MV6	MV5	MV6	MV5	MV6	MV5	MV6
60	999.0	999.0	999.0	999.0	764.6	999.0	432.1	744.3	231.1	398.1
100	999.0	999.0	994.0	999.0	662.6	999.0	397.6	684.7	220.8	380.4
200	764.6	999.0	662.6	999.0	497.0	855.9	331.3	570.6	198.8	342.3
400	432.1	744.3	397.6	684.7	331.3	570.6	248.5	427.9	165.6	285.3
NO TCD	231.1	398.1	220.8	380.4	198.8	342.3	165.6	285.3	---	---

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General specifications

Operating temperature	Operating temperature -25 to +55°C (-13°F to +131°F) (R.H. from 0 to 90% non-condensing @ 40°C) according to EN62052-11	**Standard compliance**	
		Safety	IEC60664, EN60664, IEC61010-1, EN61010-1 EN62052-11, EN50470-1
		Pulse output	DIN43864, IEC62053-31
Storage temperature	-30 to +70°C (-22°F to +158°F) (R.H. < 90% non-condensing @ 40°C) according to EN62052-11	**Approvals**	CE, cULus
		Connections	
		Voltage	Detachable dual screw terminals. Max wire cross section 1.5 mm² (14 AWG). Min./max. screws tightening torque: 0.2/0.25 Nm
Overvoltage category	Cat. III (IEC 60664, EN60664)	Current inputs	2x RJ11 (female) for current connections
Dielectric strength	4000VAC RMS for 1 minute (all terminals to front panel)	Outputs (pulse and RS485 port)	Detachable screw terminals. Max wire cross section 1.5 mm² (14 AWG). Min./max. screws tightening torque: 0.2/0.25 Nm.
Noise rejection			
CMRR	100 dB, 48 to 62 Hz	**Housing**	
EMC	According to EN62052-11 and EN50470-1 (E2)	Dimensions (WxHxD)	72 x 72 x 65 mm
		Material	Noryl, self-extinguishing: UL 94 V-0
Electrostatic discharges	15kV air discharge, 8kV contact discharge;	Mounting	DIN-rail or Panel mounting
Immunity to irradiated electromagnetic fields	Test with current: 10V/m from 80 to 2000MHz	**Protection degree**	
		Front	IP50
	Test without any current: 30V/m from 80 to 2000MHz;	Screw terminals	IP20
Burst	On current (TCDxM primary) and voltage measuring inputs circuit: 4kV	**Weight**	Approx. 400g (packing included)
Immunity to conducted disturbances	10V/m from 150kHz to 80Mhz		
Surge	On current (TCDxM primary) and voltage measuring inputs circuit: 4kV;		
Radio frequency suppression	According to CISPR 22		

Accessories specifications

Voltage cables	4 x 1 mm², 450/750 V max	Terminals	Two EM271 detachable terminals
Terminals	One (1T) or two (2T) EM271 detachable terminals 4 spare ferrules included in the bag.	Pairs and section	2x2xAWG22
		Single conductor type	ST 11x0.20
		Dielectric	PVCR2, 1.40 mm
Serial cables	Total double shielding multipair cable with bootlace ferrules	Max. resistivity	56 ohm/km
		Capacity	C1 100 pF/m; C2 165 pF/m
		Approvals	CE

Power supply specifications
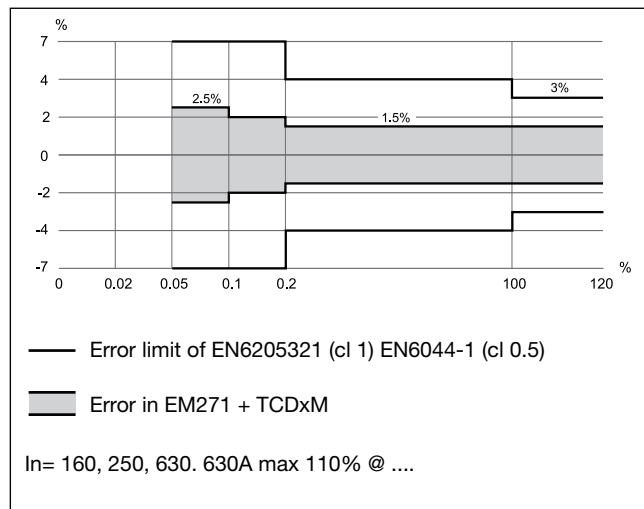
Self supplied version	From 40V to 460VAC, 45 to 65Hz, between L2 and L3 (in case of 1-phase supply N is connected to L2, L to L3)	**Power consumption**	≤4VA/2W

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Accuracy

kWh, **PF**=1, compared with a cl 1 meter EN62053-2 plus a cl 0.5 CT EN60044-1

—— Error limit of EN6205321 (cl 1) EN6044-1 (cl 0.5)

� Error in EM271 + TCDxM

In= 160, 250, 630. 630A max 110% @ ....
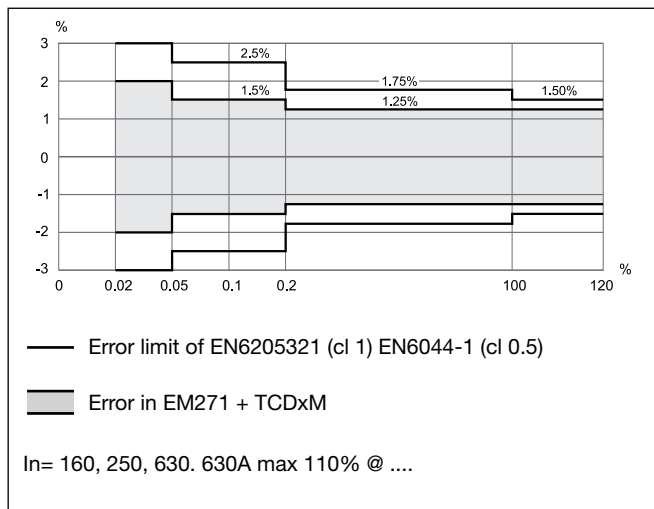
kvarh,PF=1, compared with a cl 1 meter EN62053-23 plus a cl 0.5 CT EN60044-1

—— Error limit of EN6205321 (cl 1) EN6044-1 (cl 0.5)

▰ Error in EM271 + TCDxM

In= 160, 250, 630. 630A max 110% @ ....

Used calculation formulas

Phase variables

Instantaneous effective current

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

Instantaneous apparent power

$$VA_1 = V_{1N} \cdot A_1$$

Instantaneous reactive power

$$var_1 = \sqrt{(VA_1)^2 - (W_1)^2}$$

System variables

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

$$\cos\varphi_\Sigma = \frac{W_\Sigma}{VA_\Sigma}$$

Energy metering

$$k\,var\,hi = \int_{t1}^{t2} Qi(t)dt \cong \Delta t \sum_{n1}^{n2} Qnj$$

Where:
i= considered phase (L1, L2 or L3)
P= active power; **Q**= reactive power;
t1, t2 =starting and ending time points of consumption recording; **n**= time unit; Δ **t**= time interval between two successive power consumptions;
n1, n2 = starting and ending discrete time points of consumption recording

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List of the variables that can be connected to:

| RS485 communication port | All the variables listed in the "Display pages" table, when available (according to the selected system), can be read via serial communication | Pulse outputs
Pulse out 1

Pulse out 2 | | kWh load 1 (3-phase load 1 or sum of 1-phase loads 1, 2, 3) kWh load 2 (3-phase load 2 or sum of 1-phase loads 4, 5, 6) |

Display pages

No	A (1st line)	B (1st line)	(2nd line)	SYS 1.3P	SYS 2.3P	SYS 3.1P	SYS 6.1P	Note
1	kWh		kW ($\sum$)		S	S	S	$\sum$ = Total
2	dMd		kW ($\sum$)		S	S	S	$\sum$ = Total, dMd = dmd
3	Pd		kW ($\sum$)		S	S	S	$\sum$ = Total, Pd = maximum (peak) demand
4	A L1 ($\sum$)	A L2 ($\sum$)	A L3 ($\sum$)		S1	S1	S1	$\sum$ (Total) single phase currents
5	kvarh		kvar ($\sum$)		S	S	S	$\sum$ = Total
6	dMd		kVA ($\sum$)		S	S	S	$\sum$ = Total, demand = dmd
7	Pd		kVA ($\sum$)		S	S	S	$\sum$ = Total, Pd = maximum (peak) demand
8a	kWh (Load A1)		kW (Load A1)	X	X			
8b	kWh (Load A1)		L1			X	X	Relevant to 1-ph load 1
8c	kWh (Load A1)		L2			X	X	Relevant to 1-ph load 2
8d	kWh (Load A1)		L3			X	X	Relevant to 1-ph load 3
8e	kW L1(Load A1)	kW L2	kW L3			X	X	Relevant to 1-ph load 1, 2, 3
9a	dMd (Load A1)		kW (Load A1)	X	X			
9b	dMd L1 (Load A1)		kW (Load A1 L1)			X	X	Relevant to 1-ph load 1
9c	dMd L2 (Load A1)		kW (Load A1 L2)			X	X	Relevant to 1-ph load 2
9d	dMd L3 (Load A1)		kW (Load A1 L3)			X	X	Relevant to 1-ph load 3
10a	Pd (Load A1)		kW (Load A1)	X	X			Md = maximum demand
10b	Pd L1 (Load A1)		kW (Load A1 L1)			X	X	Relevant to 1-ph load 1
10c	Pd L2 (Load A1)		kW (Load A1 L2)			X	X	Relevant to 1-ph load 2
10d	Pd L3 (Load A1)		kW (Load A1 L3)			X	X	Relevant to 1-ph load 3
11	A L1 (Load A1)	A L2 (Load A1)	A L3 (Load A1)	X	X	X	X	In case of system 3P: load 1 single phase currents. In case of system 1P AL1 is the current of 1-ph load 1, Al2 of load 2, AL3 of load 3.
12	kvarh (Load A1)		kvar (Load A1)	X	X			
13	dMd (Load A1)		kVA (Load A1)	X	X			
14	Pd (Load A1)		kVA (Load A1)	X	X			Pd = maximum (peak) demand
15a	kWh (Load A2)		kW (Load A2)		X			

Display pages (cont.)

No	A (1st line)	B (1st line)	(2nd line)	SYS 1.3P	SYS 2.3P	SYS 3.1P	SYS 6.1P	Note
15b	kWh (Load A2)		L1			X	Relevant to 1-ph load 4	
15c	kWh (Load A2)		L2			X	Relevant to 1-ph load 5	
15d	kWh (Load A2)		L3			X	Relevant to 1-ph load 6	
15e	kW L1(Load A2)	kW L2	kW L3				X	Relevant to 1-ph load 4, 5, 6
16a	dMd (Load A2)		kW (Load A2)	X				
16b	dMd L1 (Load A2)		kW (Load A2 L1)		X	Relevant to 1-ph load 4		
16c	dMd L2 (Load A2)		kW (Load A2 L2)		X	Relevant to 1-ph load 5		
16d	dMd L3 (Load A2)		kW (Load A2 L3)		X	Relevant to 1-ph load 6		
17a	Pd (Load A2)		kW (Load A2)	X			Md = maximum demand	
17b	Pd L1 (Load A2)		kW (Load A2 L1)		X	Relevant to 1-ph load 4		
17c	Pd L2 (Load A2)		kW (Load A2 L2)		X	Relevant to 1-ph load 5		
17d	Pd L3 (Load A2)		kW (Load A2 L3)		X	Relevant to 1-ph load 6		
18	A L1 (Load A2)	A L2 (Load A2)	A L3 (Load A2)		X		X	In case of system 2.3P: Load 2 single phase currents. In case of system 6.1P AL1 is the current of 1-ph load 4, Al2 of load 5, AL3 of load 6.
19	kvarh (Load A2)		kvar (Load A2)		X			
20	dMd (Load A2)		kVA (Load A2)		X			
21	Md (Load A2)		kVA (Load A2)		X			Md = max. demand
22	V L1N (L1)	V L2N (L2)	V L3N (L3)	X	X	X	X	
23	V12 (L1)	V23 (L2)	V31 (L3+triangle)	X	X			
24	kW (LoadA1)	kW (Load A2)	kW (∑)		S		S	In case of system 6.1P load 1 is the sum of 1-ph loads 1, 2, 3 and load 2 is the sum of 1-ph loads 4, 5, 6.

Note: whatever page the user has selected, after 120s it goes back to page 1 (if available, otherwise page 8).
X: available;
S: available only if SUM function is ON;
S1: available only if SUM function is ON but TCDxM phase orders are the same (both 123 or both 321, see available menu table);
Empty: not available.

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Additional available information on the display

Type	1st line	2nd line	Note
Meter information 1	Y. 2014	r.A0	Year of production and firmware release
Meter information 2	PuL_LEd (kWh)	[value]	kWh per pulses of the LED
Meter information 3	SYS [2.3P]		1.3P, 2.3P, 3.1P, 6.1P
Meter information 4	[value 1][value 2]**	TCDxM	Phase order (123 or 321) of TCDxM A1 and A2
Meter information 5	Ut rat.	[value]	Voltage transformer ratio
Meter information 6	Ct Prin	[value]	Current transformer primary value
Meter information 7*	PuL 1 (kWh)	[value]	Pulse output: kWh per pulse Load A1
Meter information 8*	PuL 2 (kWh)	[value]	Pulse output: kWh per pulse Load A2
Meter information 9	AddrESS	[value]	Serial communication address
Md reset	rESEtuP	no/YES	Reset of maximum demand

(*) = in case of digital pulse output model
(**) = [value 2] is "---" in case of system 1.3P or 3.1P. "Ct Prin" is "---" in case of TCDA not connected.

Display resolution

Variable	Resolution	Range	
		From	**To**
Active and Apparent Power	0.1 W 1 W 0.01 kW 0.1 kW 1 kW	0.1 W 1 W 1.00 kW 10.0 kW 100 kW	99.9 W 999 W 9.99 kW 99.9 kW 999 kW
Energy (kWh and kvarh)	0.1 kWh / kvarh 1 kWh / kvarh	0.1 kWh 1 000 000 kWh	999 999.9 kWh 9 999 999 kWh
Voltage	1 V	1 V	999 V
Current	0.01 A 0.1 A 1 A	0.01 A 10.0 A 1A	9.99 A 99.9 A 999 A

Error message management

Description	Display message
1st load TCDxM not connected	[load 1] MISSInG TCDxM
2nd load TCDxM enabled (systems 2.3P or 6.1P) but not connected	[load 2] MISSInG TCDxM
1st and 2nd loads TCDxM not connected	[load 1] [load 2] MISSInG TCDxM
Over-range condition of the measuring inputs (voltage and current)	E E E

List of available menus

Always available		Selection	Default setting
PASS ?	Password	From 0 to 999	0
PASS ? (100)	"rESEt UP" Reset of the max value of Wdmd and VAdmd (only for Total)	no / YES	No
CnG¬_PASS	New Password	From 0 to 999	0
SYS	3-phase (3- or 4-wire). Management of one 3-phase load.	1.3P	1.3P
	3-phase (3- or 4-wire). Management of two 3-phase loads.	2.3P	
	1-phase (4-wire). Management of three 1-phase load.	3.1P	
	1-phase (4-wire). Management of six 1-phase loads.	6.1P	
SuM (**)	SUM function	On/OFF	On
EC (***)	Easy connection function	On/OFF	OFF
P.int ti	Integration time for "dmd" power calculation	From 1 to 60 min	15
Ut	VT ratio	1.0 to 99.9 / 100 to 999	1.0
PuL 1 (*)	Number of kWh per pulse Load A1	From 0.01 to 9.99	0.1
PuL 2 (*) (**)	Number of kWh per pulse Load A2	From 0.01 to 9.99	0.1
t.on (*)	TON time (milliseconds) (digital output)	40 or 100ms	100
AddrESS	Modbus address of the instrument	From 1 to 247	1
bAud	Modbus baud rate	9.6, 19.2, 38.4 kbps	9.6
PArItY	Modbus parity	No, EvEn	No
EnE PA.rE	Reset of the Load A1 and Load A2 energies (6 load in 1-phase system)	no / YES	No
EnE to.rE	Reset of the total energy	no / YES	No

(*) = in case of digital pulse output, only 3-phase systems. In 1-phase system the pulse is relevant to the sum of the first three and second three 1-phase loads.
(**) = not present in case of 1.3P
(***) = in case of Easy connection disabled and imported power: A, kW are to be shown with negative sign; only kWh is not integrated; the negative instantaneous contribution to Wdmd calculation is not considered. In all the cases kvar is displayed with the actual sign.

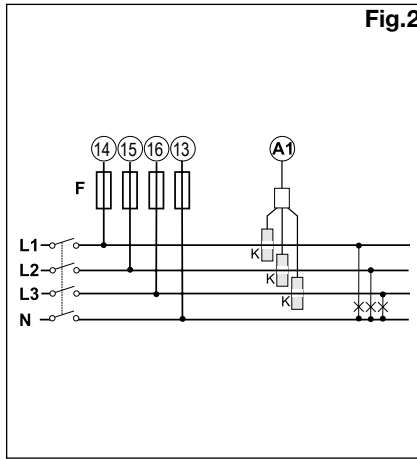# Tamper proof capability
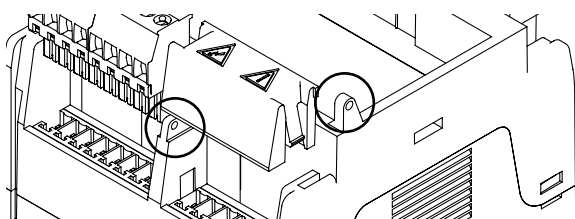
Position of the seals
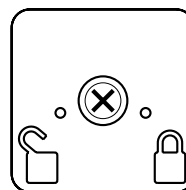
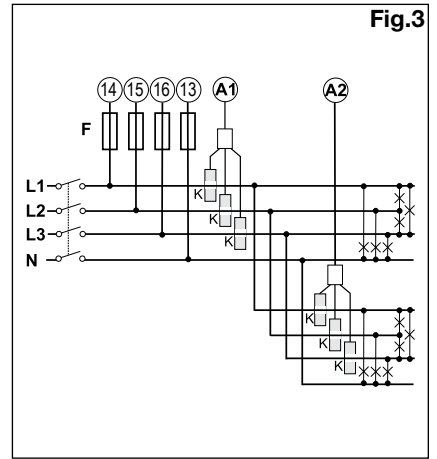Rear view of the detached display unit with highlight of the programming lock.

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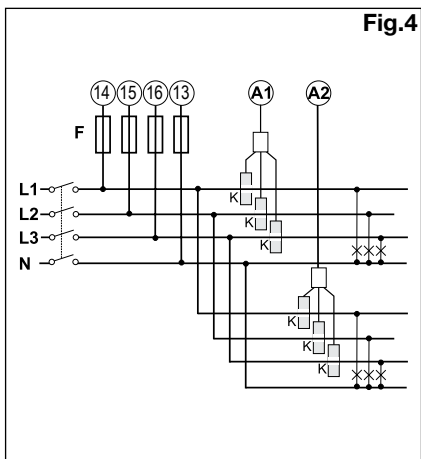# Wiring diagrams

3-ph. system type selection: 3P/1.3P

Fig.1

Note: in case of 3W connection,
do not consider N in this diagram
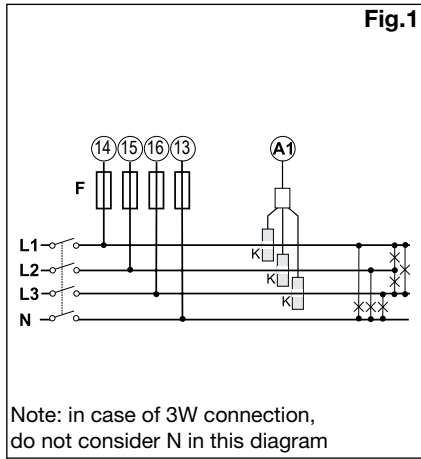
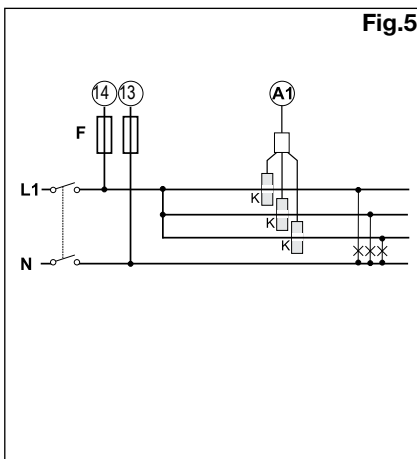**3-phase system type selection: 3P/3.1P**

Fig.2

3-phase system type selection: 3P/2.3P
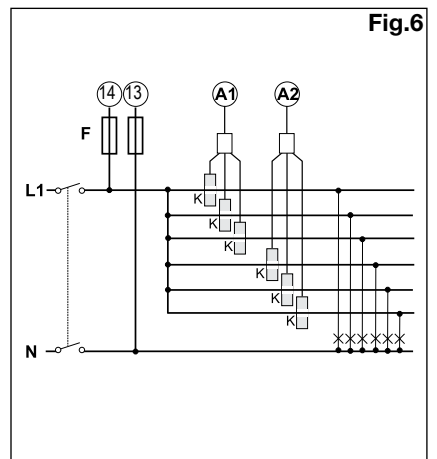

Fig.3

1-phase system type selection: 3P/6.1P
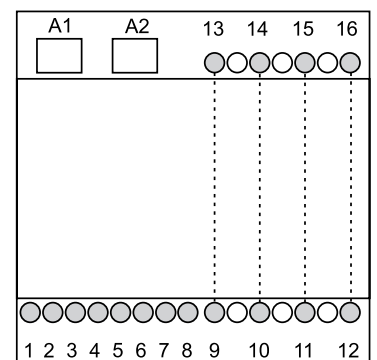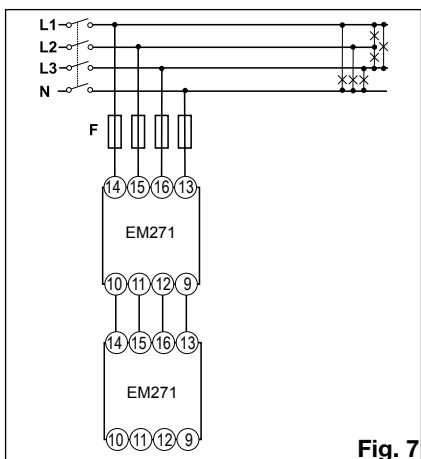

Fig.4
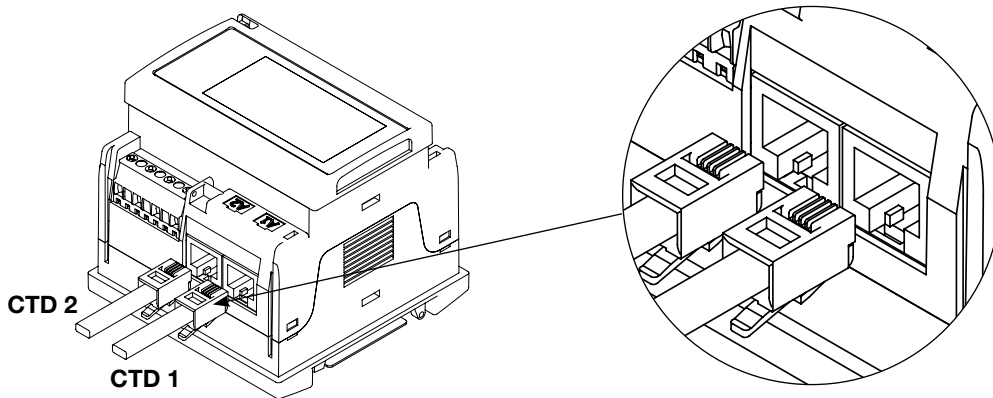
1-phase system type selection: 1P/3.1P
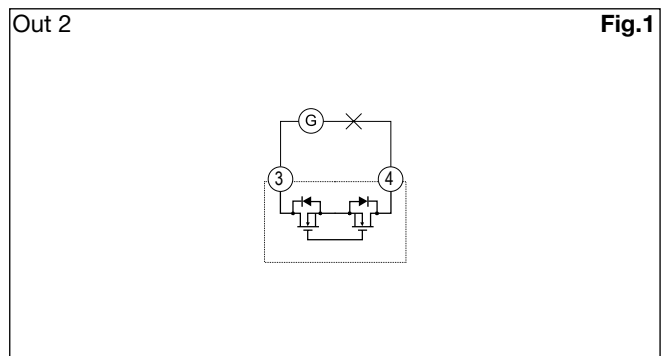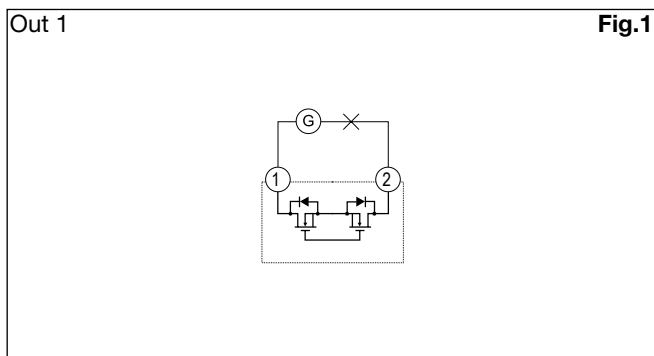

Fig.5

1-phase system type selection: 1P/6.1P

Fig.6

Loom example

Fig. 7

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TCDxM current transformer connections

CTD 2
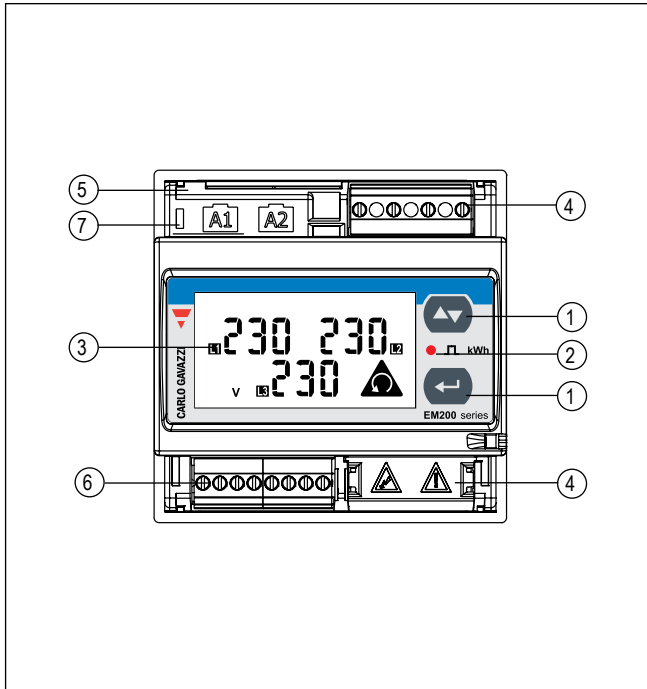
CTD 1

Static output connections

Out 1   **Fig.1**

Out 2   **Fig.1**

RS485 Serial Port

Single Port   **Fig.1**

Dual (In/out) Port   **Fig.2**

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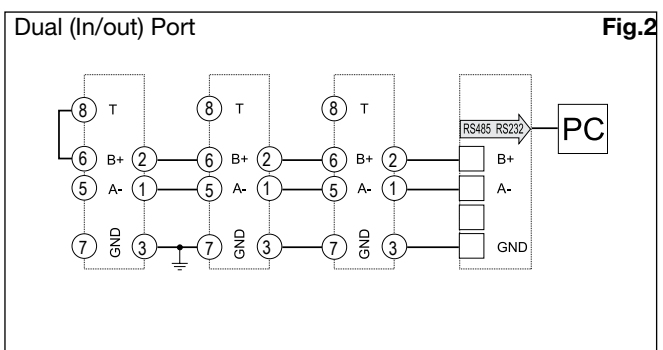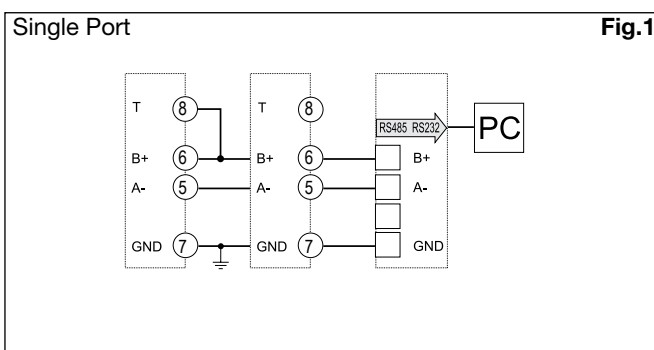
Front panel description

1. **Keypad**
   2 push-buttons to program the configuration parameters and scroll the variables on the display
2. **LED**
   Red LED blinking proportional to the total active energy being measured (Total= Load A1 + Load A2).
3. **Display**
   LCD-type with alphanumeric indications to:
   - display configuration parameters;
   - display all the measured variables.
4. **Detachable voltage screw terminals**
   Detachable screw terminal blocks for voltage wiring.
   NOTE: max 20 EM271 connected in cascade. No other loads can be connected to voltage terminals.
5. **Current RJ11 connectors**
   RJ11 connectors (female) for quick connection to up to two CT accessories.
6. **RS485 or pulse screw terminals**
   Detachable screw terminal blocks for quick connection in daisy chain of the serial RS485 line or for connection if the 2 independent pulse output.
7. **Power-On LED**
   Green LED lit when power supply is available.

Dimensions and panel cut-out (mm)

DIN

72x72

□ 68x68
-0 +0.7