Revalco®

Made in Italy

energy kWh-meters

2011

ENERGY kWh-METERS

INDUCTION ENERGY kWh-METERS

SEALABLE TERMINAL

UTF CERTIFICATIONS / CUSTOMS AGENCY

RECORDERS OF IMPULSES

FISCAL MEASUREMENT OF ENERGY

1 DIN module

2 DIN modules

3 DIN modules

4 DIN modules

96x96 mm
Depth 50,5 mm

6 DIN modules
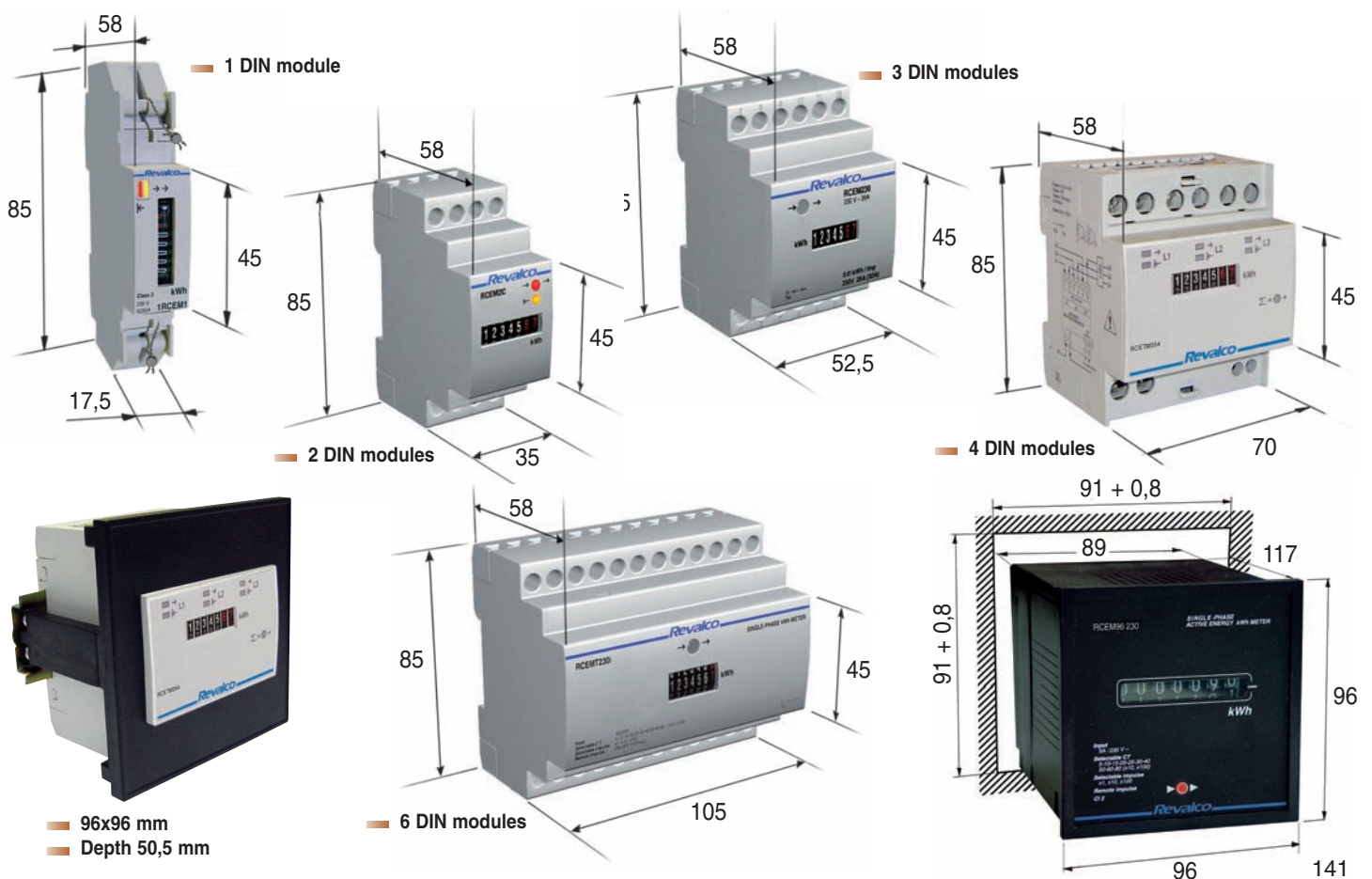
TRANSFORMING FROM A 4 MODULES METER TO A 96x96 METER
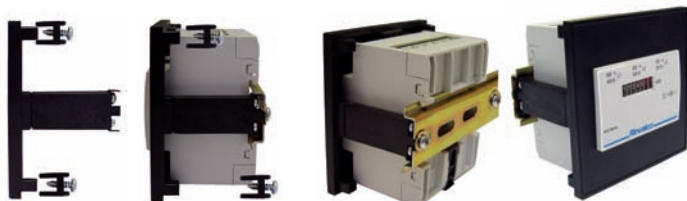
ARAD964   +   "MID" Meter with 4 modules   =   "MID" 96x96 Meter

SEALABLE - 96x96 meters

- Rear view of the minidip sealable selection panel

- Rear view of the sealable terminal cover

SELECTION OF CURRENT TRANSFORMERS AND OUTPUT IMPULSES - 4 modules meters

Minidip view from behind the instrument

C.T. SELECTION

5A   15A   25A   40A   60A   x10

10A   20A   30A   50A   80A   x100   x10   **Max 4000A** ⚠️

OUTPUT PULSE SELECTION

x1   x100

SELECTION OF CURRENT TRANSFORMERS AND OUTPUT IMPULSES - 6 modules meters

Minidip view from behind the instrument

Max 4000A ⚠️

C.T. SELECTION

5A   20A   40A   80A   x1
10A   25A   50A   x10   x10
15A   30A   60A   x100   x100

OUTPUT PULSE SELECTION

1 impulse = 100 Wh
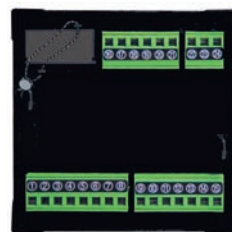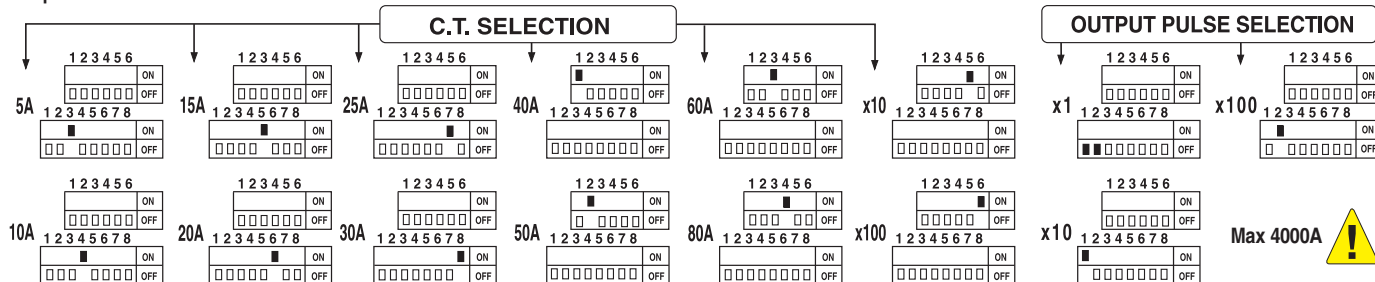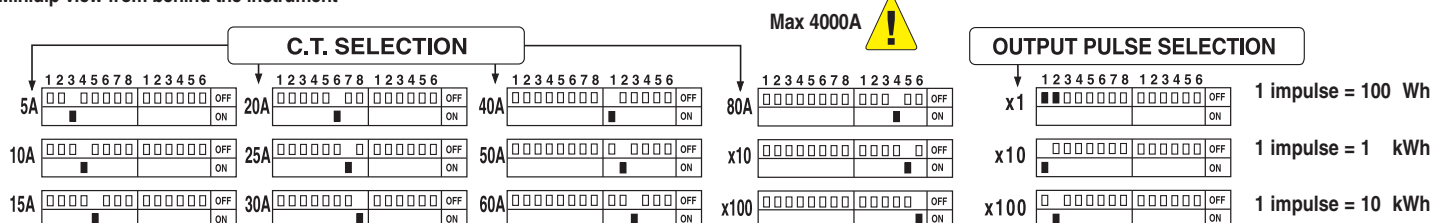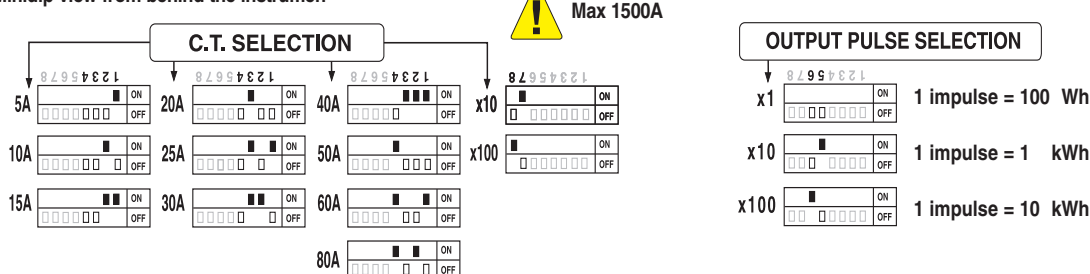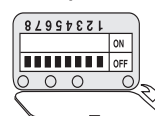1 impulse = 1   kWh
1 impulse = 10   kWh

SELECTION OF CURRENT TRANSFORMERS AND OUTPUT IMPULSES - 96x96 meters

Minidip view from behind the instrumen

⚠️ **Max 1500A**

C.T. SELECTION

5A   20A   40A   x10
10A   25A   50A   x100
15A   30A   60A
          80A

OUTPUT PULSE SELECTION

x1   1 impulse = 100 Wh
x10   1 impulse = 1   kWh
x100 1 impulse = 10   kWh

Rear panel

DETAILS FOR ORDERING

- The three-phase energy meters are calibrated with the following standard values: Input in 5A current and primary selected through minidip
Input in 400V voltage
- Upon request, it is possible to calibrate the meters with the following parameters which are to be indicated when ordering:
Input 1A current
Input under voltage:$100/\sqrt{3}$/V, $110/\sqrt{3}$V, 100V, 110V, 230V, 440V, 500V

"MID" NORMATIVE - STANDARDS EN50470-1, EN50470-3

Taken from the Official Gazette of the European Union. The requisites of attachment I, the specific requisites of this attachment and the assessment and conformity procedures listed in this attachment, are applied to active electric energy meters destined for residential, trade and light commercial uses.

Note: the electric energy meters can be used together with the external transformers, depending on the measuring technique applied. However, this attachment takes into account only electric meters and not the transformers.

DEFINITIONS: An active electric energy meter is a device which measures the active electric energy used in a circuit

I = intensity of electric current which circulates in the meter

I_n = specified reference current for which the transformer in function has been planned

I_{st} = minimum I declared value in correspondence of which the meter starts to count the active electric energy at unit power factor (balanced load polyphase meters), but it is not in class

I_{min} = I value above which the error is kept within the tolerable maximum limits (balanced load polyphase meters). Minimum function current in class within the maximum limits from Ist to Itr

I_{ref} = reference current (ex Ib)

I_{tr} = I value above which the error is kept within the tolerable minimum limits corresponding to the class index of the meter. Transition current from which the KWh is in class within minimum limits

I_{max} = I maximum value for which the error remains within the tolerable maximum limits

U = electric energy voltage supplied to the meter

U_{fn} = specified reference electric energy voltage

f = electric voltage frequency supplied to the meter

f_n = specified reference frequency

PF = power factor = $\cos\varphi$ = phasing $\cos\varphi$ between I and U

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SPECIFIC REQUISITES

1. Accuracy: the manufacturer specifies the class index of the meters. The class indexes are defined as follows: Class A, Class B and Class C.
2. Nominal functioning conditions: the manufacturer specifies the nominal functioning conditions of the meter, in particular the values of:
f_n, U_n, I_n, I_{st}, I_{min}, I_{tr}, I_{max} applicable to the meter. For the chosen values, the meter must satisfy the conditions in the following table:

	Class A	Class B	Class C
For meters with direct connection			
I_{ref}	$10 \times I_{tr}$		
I_{tr}	$I_{max}/50$		
I_{st}	$\leq 0{,}05 \times I_{tr}$	$\leq 0{,}04 \times I_{tr}$	$\leq 0{,}04 \times I_{tr}$
I_{min}	$\leq 0{,}5 \times I_{tr}$	$\leq 0{,}5 \times I_{tr}$	$\leq 0{,}3 \times I_{tr}$
I_{max}	$\geq 50 \times I_{tr}$	$\geq 50 \times I_{tr}$	$\geq 50 \times I_{tr}$
For meters functioning through a transformer			
I_{tr}	$I_n/20$		
I_{st}	$\leq 0{,}06 \times I_{tr}$	$\leq 0{,}04 \times I_{tr}$	$\leq 0{,}02 \times I_{tr}$
I_{min}	$\leq 0{,}4 \times I_{tr}$	$\leq 0{,}2 \times I_{tr}$ (*)	$\leq 0{,}2 \times I_{tr}$
I_n	$= 20 \times I_{tr}$	$= 20 \times I_{tr}$	$= 20 \times I_{tr}$
I_{max}	$\geq 1{,}2 \times I_n$	$\geq 1{,}2 \times I_n$	$\geq 1{,}2 \times I_n$

(*) For electromechanical meters I_{min} of class B apply $\leq 0{,}4 \times I_{tr}$

EXAMPLE: for class A monophase direct meters (Gazette EU-L135/51-30.04.2004-Table 1) = (EN50470-1:2006-Table 3)
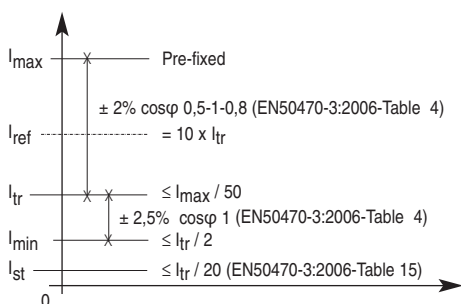
- Standard values V = 230/400V (EN50470-1:2006-Table 1)
- Standard values I_{tr} = 0.5-1-1.5-2A (EN50470-1:2006-Table 2)
- Standard values F = 50Hz (EN50470-1:2006-4.3)
- Max current measure circuit consumption at I_{ref} = 2.5VA (EN50470-3:2006-Table 2)
- Measuring points to evaluate the % error (at least 3 measures per point = I_{min}, I_{tr}, I_{ref}, I_{max} (EN50470-3:2006-Table 13)
- Monophase absolute errors (EN50470-3:2006-Table 4):
  between I_{min} and I_{tr} only cosφ 1 = ± 2.5%; between I_{tr} and I_{max} cosφ 0.5-1-0.8 = ± 2%
- Polyphase absolute errors with balanced voltage and load on single phase only between I_{tr} and I_{max} cosφ 0.5-1 (no C)= ± 3% (EN50470-3:2006-Table 5)
- Additional errors due to the temperature (EN50470-3:2006-Table 6):
  between I_{min} and I_{max} cosφ 1 = ± 1.8%; between I_{tr} and I_{max} cosφ 0.5-1-0.8 = ± 2.7%
- Additional errors due to the voltage variation ± 10% (EN50470-3:2006-Table 6):
  between I_{min} and I_{max} cosφ 1 = ± 1%; between I_{tr} and I_{max} cosφ 0.5-1-0.8 = ± 1.5%
- Additional errors due to the frequency variation ± 2% (EN50470-3:2006-Table 6):
  between I_{min} and I_{max} cosφ 1 = ± 0.8%; between I_{tr} and I_{max} cosφ 0.5-1-0.8 = ± 1%
- In 5°C... 30°C range, the total sum of errors cannot exceed ± 3.5% (EN50470-3:2006-Table 8)

DC kWh-METERS

FOR DIRECT CURRENT

1RCEM2C

BURDEN	< 4W
POWER SUPPLY	48V DC (40 ÷ 54 V DC) selfsupplied
ACCURACY CLASS	2
TEMPERATURE	functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
READING RESOLUTION	0,01 kWh
DISPLAY	99999,99 kWh (5 entires + 2 decimals)
SIGNALLING LED	**yellow** OFF = correct connection
	yellow ON = wrong connection

it is necessary to check the measuring circuit connections, if the connection is inverted, the numberer will block and stop counting until the anomaly is resolved

	red flashing = active consumption
NOMINAL CURRENT	DC from external shunt (....A/60mV)

The value of primary current must be indicated during the order between:
30A - 40A - 50A - 60A - 80A - 100A - 120A - 150A

MAXIMUM ADMITTED CURRENT	1,2 In
OUTPUT IMPULSES	Open-Collector System (SO, DIN43864), max 36V/20mA DC - Impulse duration 100 ms
DIMENSIONS / WEIGHT kg.	2 DIN modules / 0,13

open-collector - max 36V / 20mA DC

Connection sequence:
1- Connect the shunt.....A/60mV
2- Make the other connections
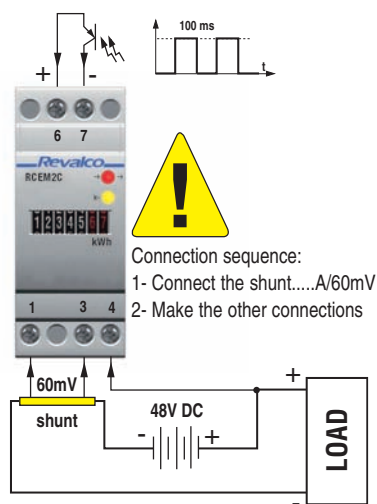
MONOPHASE ACTIVE ENERGY kWh-METERS

4 DIN MODULES · INSERTION ON CT 5A

- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication
- the standard meter is calibrated at 5A-230V with the use of the coefficient multiplier to calculate depending on the primary value of the CT used. In this case, every flash of the front led corresponds to 1Wh.
- the input voltmetric and amperometric values are to be communicated when ordering
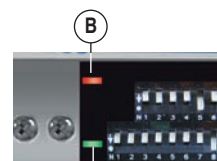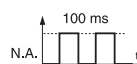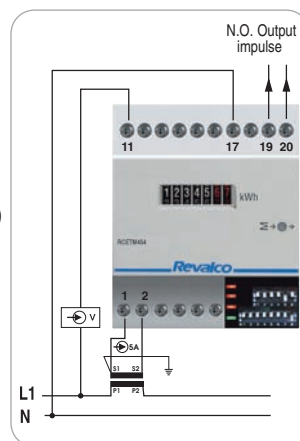
- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **PRECISION** Class A
- **TEMPERATURE** functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY** 999999,9 kWh (6 entires + 1 decimal)
- **SIGNALLING LIGHT** flashing **red** led = active consumption (the flashing is proportional to the consumption)
  pulse **red** led = connection error, verify the connections of the measuring circuit
- **ENERGY READING** For all values of cosφ from 0.5 to 1
- **PRIMARY CURRENT TRANSFORMERS** 5-10-15-20-25-30-40-50-60-80 (x10 and x100) selectable (max 4000A)
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_n 5A
- **MAXIMUM CURRENT** I_{max} 6A
- **MINIMUM START CURRENT** I_{st} 10mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 15mA
- **TRANSITION CURRENT** I_{tr} 0,25A
- **PROGRAMMABLE OUTPUT IMPULSES**
  - **x1** = 1 impulse every 0,1 kWh - resolution 0,1 kWh
  - **x10** = 1 impulse every 1 kWh - resolution 1 kWh
  - **x100** = 1impulse every 10 kWh - resolution 10 kWh
  relay normally open, 0,5A / 100V - impulse duration 100 ms
- **DIMENSIONS / WEIGHT kg.** 4 DIN modules / 0,40

1RCEM41

M.I.D. · IN FASE DI CERTIFICAZIONE · NORMATIVE · IN FASE DI CERTIFICAZIONE ·

1RCEM41D
digital display

CONNECTIONS AND AUTOMATIC TEST: firstly, choose the relationship of the CT and the output impulse by selecting the appropriate minidip (see above); subsequently connect current and voltage circuits as shown in the layout. Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit. At this point, verify that the front red led flashes to confirm the correct connection, in this case, by opening the upper panel, it can be noted that the green led (A) positioned near the minidip is switched on and that the red led (B corresponding to L1 phase) is switched off.
Whereas, if the front red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connection.
In this case, by opening the small panel placed near the upper part of the instrument, it will be noted that the green led (A) is switched off and the red led (B) is switched on. In this case, verify the correct connection of the current transformer (the current must enter from the P1 side and exit from the P2 side).

In case of no L1 or neutral (N) phase, the meter will not function as it is no longer powered.

1 DIN MODULE · 30A DIRECT INSERTION WITH SEALABLE TERMINAL COVERS

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** < 4W
- **PRECISION** Class A
- **TEMPERATURE** functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **READING RESOLUTION** 0,01 kWh
- **DISPLAY**: 99999,99 kWh (5 entires + 2 decimals) with memory preservation even in the presence of a fault
- **SIGNALLING LIGHT** led **yellow** led OFF = correct connection
  yellow led ON = incorrect connection
  red flashing led = indicates active consumption
  The flashing is proportional to the consumption.
- **ENERGY READING** For all values of cosφ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_{max} 30A
- **MINIMUM START CURRENT** I_{st} 0,30mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 30mA
- **TRANSITION CURRENT** I_{tr} 0,60A
- **OUTPUT IMPULSES** Open-Collector System (SO, DIN43864), max 36V/20mA CC
  Impulse duration >80 ms - 1 impulse every 0.01 kWh
- **PROTECTION AGAINST POLARITY INVERSION**
- **DIMENSIONS / WEIGHT kg.** 1 DIN module / 0,08

1RCEM1

M.I.D. · IN FASE DI CERTIFICAZIONE · NORMATIVE · IN FASE DI CERTIFICAZIONE ·

U 6kW max
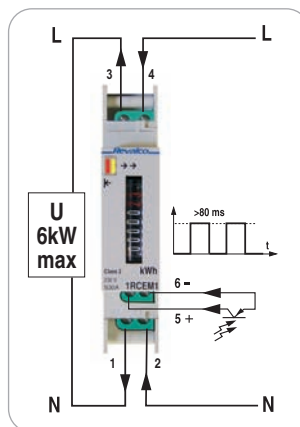
2 DIN MODULES · 30A DIRECT INSERTION

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1W / 3W
- **PRECISION** Class A
- **TEMPERATURE** functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **READING RESOLUTION** 0,01 kWh
- **DISPLAY** 99999,99 kWh (5 entires + 2 decimals)
- **SIGNALLING LIGHT** led **yellow** led OFF = correct connection
  (the indication is obtained after 1 flash of the red led; this is the automatic connection test, equivalent to a consumption of 10Wh)
  yellow led ON = incorrect connection
  (the indication is obtained after 1 flash of the red led); it is necessary to check the measuring circuit connections, if the connection is inverted, the numberer will block and stop counting until the anomaly is resolved
  red flashing led = active consumption (the flashing is proportional to the consumption.
- **ENERGY READING** For all values of cosφ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_{max} 30A
- **MINIMUM START CURRENT** I_{st} 0,30mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 30mA
- **TRANSITION CURRENT** I_{tr} 0,60A
- **OUTPUT IMPULSES** Open-Collector System (SO, DIN43864), max 36V/20mA CC
  Impulse duration 100 ms - 1 impulse every 0.01 kWh
- **DIMENSIONS / WEIGHT kg.** 2 DIN modules / 0,13

1RCEM2

M.I.D. · IN FASE DI CERTIFICAZIONE · NORMATIVE · IN FASE DI CERTIFICAZIONE ·

1RCEM2D
digital display

L-N standard connection
(L) - (N) alternative connection

230V 50Hz
U 6kW max

1RCEM3U

NORMATIVE M.I.D. • IN FASE DI CERTIFICAZIONE • IN FASE DI CERTIFICAZIONE •

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1W / 3W
- **PRECISION**   Class A
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **READING RESOLUTION**   0,01 kWh
- **DISPLAY**   99999,99 kWh (5 entires + 2 decimals)
- **SIGNALLING LIGHT** led **yellow** led OFF = correct connection
  (the indication is obtained after 1 flash of the red led; this is the automatic connection test, equivalent to a consumption of 10Wh)
  yellow led ON = incorrect connection
  (the indication is obtained after 1 flash of the red led); it is necessary to check the measuring circuit connections, if the connection is inverted, the numberer will block and stop counting until the anomaly is resolved
  red flashing led = indicates active consumption. The flashing is proportional to the consumption
- **ENERGY READING**   For all values of $\cos\varphi$ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_{max} 30A
- **MINIMUM START CURRENT** I_{st} 0,30mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 30mA
- **TRANSITION CURRENT** I_{tr} 0,60A
- **OUTPUT IMPULSES**   Open-Collector System (SO, DIN43864), max 36V/20mA CC - Impulse duration 100 ms
- **DIMENSIONS / WEIGHT kg.**   3 DIN modules / 0,17

1RCEM263

1RCEM263D
digital display

NORMATIVE M.I.D. • IN FASE DI CERTIFICAZIONE • IN FASE DI CERTIFICAZIONE •

- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication
- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA
- **PRECISION**   Class A
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimal)
  memory preservation even in the presence of a fault
- **SIGNALLING LIGHT** led **yellow** led OFF = correct connection
  (the indication is obtained after 1 flash of the red led; this is the automatic connection test, equivalent to a consumption of 10Wh)
  yellow led ON = incorrect connection
  (the indication is obtained after 1 flash of the red led); it is necessary to check the measuring circuit connections, if the connection is inverted, the numberer will block and stop counting until the anomaly is resolved
  red flashing led = indicates active consumption. The flashing is proportional to the consumption
- **ENERGY READING**   For all values of $\cos\varphi$ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **MAXIMUM CURRENT** I_{max} 63A
- **MINIMUM START CURRENT** I_{st} 0,63mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 63mA
- **TRANSITION CURRENT** I_{tr} 1,26A
- **OUTPUT IMPULSES**   Open-Collector System (SO, DIN43864), max 36V/20mA CC
  Impulse duration >80 ms; 1 impulse = 100W
- **DIMENSIONS / WEIGHT kg.**   2 DIN modules / 0,30

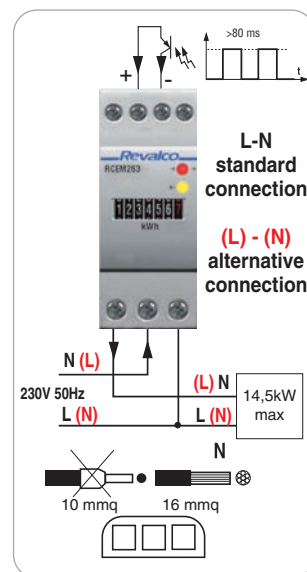**2RCEM96230**

- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication
- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA
- **FREQUENCY**   40 ÷ 60 Hz
- **PRECISION**   Class 2
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   9999999 kWh (7 entires and segment decimals)
- **SIGNALLING LIGHT**   flashing **red** led = active consumption (the flashing is proportional to the consumption)
  Each flashing equals to 1 Wh for CT up to 80A; at 10 Wh between 100 and 800A; at 100 Wh > at 800A
  pulse **red** led = connection error, verify the connections of the measuring circuit
- **ENERGY READING**   For all values of $\cos\varphi$ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 230V ± 10% self powered - 50 ÷ 60 Hz
- **PRIMARY OF CURRENT TRANSFORMERS** 5-10-15-20-25-30-40-50-60-80 (x10 e x100) selectable (max 1500A)
- **NOMINAL CURRENT** I_n 5A
- **MAXIMUM CURRENT** I_{max} 6A
- **MINIMUM START CURRENT** I_{st} 0,10mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 15mA
- **TRANSITION CURRENT** I_{tr} 0,25A
- **OUTPUT IMPULSES**
  - **x1** = 1 impulse every 0,1 kWh - resolution 0,1 kWh
  - **x10** = 1 impulse every 1 kWh - resolution 1 kWh
  - **x100** = 1 impulse every 10 kWh - resolution 10 kWh
  relay normally open, 0.5A / 100V - impulse duration 100 ms
- **PROTECTION DEGREE**   IP20 on terminals - IP54 on front
- **WEIGHT kg.**   0,55
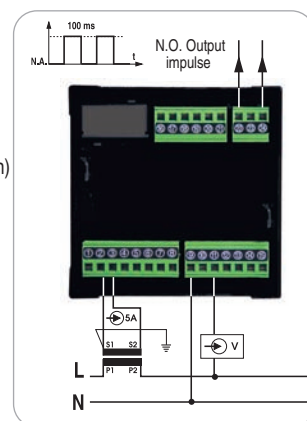
CONNECTIONS AND AUTOMATIC TEST: firstly, choose the relationship of the CT and the output impulse by selecting the appropriate mini-dip (see above); subsequently, connect current and voltage circuits as shown in the layout. Power and wait at least 3 seconds, so that a current correspondent to the nominal one, passes through the circuit. At this point, verify that the front red led flashes to confirm the correct connection, in this case, by opening the small upper panel, it can be noted that the green led (A) positioned near the minidip is switched on and that the red led (B corresponding to L1 phase) is switched off. Whereas, if the frontal red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connection. In this case, by opening the small panel placed near the upper part of the instrument, it will be noted that the green led (A) is switched off and the red led (B) is switched on.
In this case, verify the correct connection of the current transformer (the current must enter from the P1 side and exit from the P2 side).

In case of no L1 or neutral (N) phase, the meter will not function as it is no longer powered.

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THREE-PHASE ACTIVE ENERGY kWh-METERS

4 DIN MODULES **1RCETM354 / 1RCETM354D** (digital display)

6 DIN MODULES **1RCETM35**

SWITCHBOARD VERSION 96X96 **2RCET9635**

- direct reading of energy consumption; it is not necessary to calculate any multiplication coefficient

4 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION **1RCETM354U**

6 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION **1RCETM35U**

SWITCHBOARD VERSION 96X96 WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION **2RCET9635U**

- the standard meter is calibrated at 5A-400V with the use of the coefficient multiplier to be calculated depending on the primary value of the CT used. In this case, every flash of the front led corresponds to 1Wh.
- upon request, it can be supplied with the direct reading of energy consumption in which it is not necessary to calculate any coefficient multiplication
- **the voltmetric and amperometric input values have to be communicated when being ordered as these models are without the minidip**
- AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION 1VA / 3VA for each phase
- PRECISION   Class A (for model 1RCETM354 and 1RCETM354U) - Class 2 for all other models
- TEMPERATURE   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- DISPLAY   999999,9 kWh (6 entires + 1 decimals)
- SIGNALLING LIGHT   flashing **red** led = active consumption (the flashing is proportional to the consumption)
  Each flashing is equal to 1 Wh for CT up to 80A; at 10 Wh between 100 and 800A; at 100 Wh > at 800A (only for 6 modules and 96x96)
  pulse **red** led = connection error, it is necessary to verify the connections of the measuring circuit
- ENERGY READING   For all values of cosφ from 0.5 to 1
- PRIMARY OF CURRENT TRANSFORMERS 5-10-15-20-25-30-40-50-60-80 (x10 e x100) selectable
  max 4000A for modular version, max 1500A for 96x96 version
- NOMINAL VOLTAGE U_n 400V ± 10% self powered - 50 ÷ 60 Hz
- NOMINAL CURRENT I_n 5A
- MAXIMUM CURRENT I_{max} 6A
- MINIMUM START CURRENT I_{st} 0,10mA
- MINIMUM FUNCTIONING CURRENT I_{min} 15mA
- TRANSITION CURRENT I_{tr} 0,25A
- PROGRAMMABLE OUTPUT IMPULSES **x1** = 1 impulse every 0,1 kWh - resolution 0,1 kWh
                                x10 = 1 impulse every 1 kWh - resolution 1 kWh
                                x100 = 1 impulse every 10 kWh - resolution 10 kWh
  relay normally open, 0.5A / 100V - impulse duration 100 ms
- DIMENSIONS / WEIGHT kg.   4 or 6 modules DIN / 0.40 (modular) - 96x96mm / 0.55 (switchboard version)

digital display

1RCETM354 - 1RCETM354U   **1RCETM35 - 1RCETM35U**   **2RCET9635 - 2RCET9635U**

CONNECTIONS AND AUTOMATIC TEST: firstly, choose the relationship of the CT and the output impulse by selecting the appropriate minidip (apart from model 2RCET9635U); subsequently, connect current and voltage circuits as shown in the layout. Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit.

At this point, verify that the red frontal led flashes to confirm the correct connection. In this case, by opening the upper small panel it can be noted that the green led (A) is switched on and the red led (B corresponding to phase L1 and D corresponding to phase L3) are switched off.

Whereas, if the frontal red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connection.

In this case, by opening the small panel placed near the upper part of the instrument, it will be noted that the green led (A) is switched off and both red led (B and D) corresponding to the phase incorrectly connected, are switched on. In this case verify that the connections are correct.

The following anomalies may have verified:
- the current in an amperometric measuring circuit circulates in reverse mode due to errors in the CT connection (the current must enter from the P1 side and exit from the P2 side)
- the connection between the two CT and the respective phases have been inverted (Example: CT on L1 instead of on L3 and vice-versa).
- a connection in the voltmetric measuring circuit of the phase corresponding to the red led switched on is missing
- the connection of the voltmetric circuit has been inverted (Example: L1 in place of L3 and vice-versa).

- In case of no L1 or L3 phase, the meter will not function as it is no longer powered.
- **NOTE**: in case the UTF certifier is required, the reading can be carried out by calculating the coefficient multiplier (k) in function of the CT used

4 DIN MODULES   **1RCETM454 / 1RCETM454D** (digital display)
6 DIN MODULES   **1RCETM45**
SWITCHBOARD VERSION 96X96   **2RCET9645**
- direct reading of energy consumption; it is not necessary to calculate any multiplication coefficient
4 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION   **1RCETM454U**
6 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION   **1RCETM45U**
SWITCHBOARD VERSION 96X96 WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION **2RCET9645U**

- the standard meter is calibrated at 5A-400V with the use of the coefficient multiplier to be calculated depending on the primary value of the CT used. In this case, every flash of the front led corresponds to 1Wh.
- upon request, it can be supplied with the direct reading of energy consumption in which it is not necessary to calculate any coefficient multiplication
- **the voltmetric and amperometric input values have to be communicated when being ordered as these models are without the minidip**

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **PRECISION**   Class A (for model 1RCETM454 and 1RCETM454U) - Class 2 for all other models
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimals)
- **SIGNALLING LIGHT**   flashing **red** led = active consumption (the flashing is proportional to the consumption)
  Each flashing is equal to 1 Wh for CT up to 80A; at 10 Wh between 100 and 800A; at 100 Wh > at 800A (only for 6 modules and 96x96)
                             pulse **red** led = connection error, it is necessary to verify the connections of the measuring circuit
- **ENERGY READING**   For all values of cosφ from 0.5 to 1
- **PRIMARY OF CURRENT TRANSFORMERS** 5-10-15-20-25-30-40-50-60-80 (x10 e x100) selectable
                             max 4000A for modular version, max 1500A for 96x96 version
- **NOMINAL VOLTAGE** U_n 3x230V/400V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_n 5A
- **MAXIMUM CURRENT** I_{max} 6A
- **MINIMUM START CURRENT** I_{st} 0,10mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 15mA
- **TRANSITION CURRENT** I_{tr} 0,25A
- **PROGRAMMABLE OUTPUT IMPULSES** $x1$ = 1 impulse every 0,1 kWh   - resolution   0,1 kWh
                             $x10$ = 1 impulse every 1   kWh   - resolution   1   kWh
                             $x100$ = 1 impulse every 10 kWh   - resolution   10   kWh
                             relay normally open, 0.5A / 100V - impulse duration 100 ms
- **DIMENSIONS / WEIGHT kg.** 4 or 6 modules DIN / 0.40 (modular) - 96x96mm / 0.55 (switchboard version)

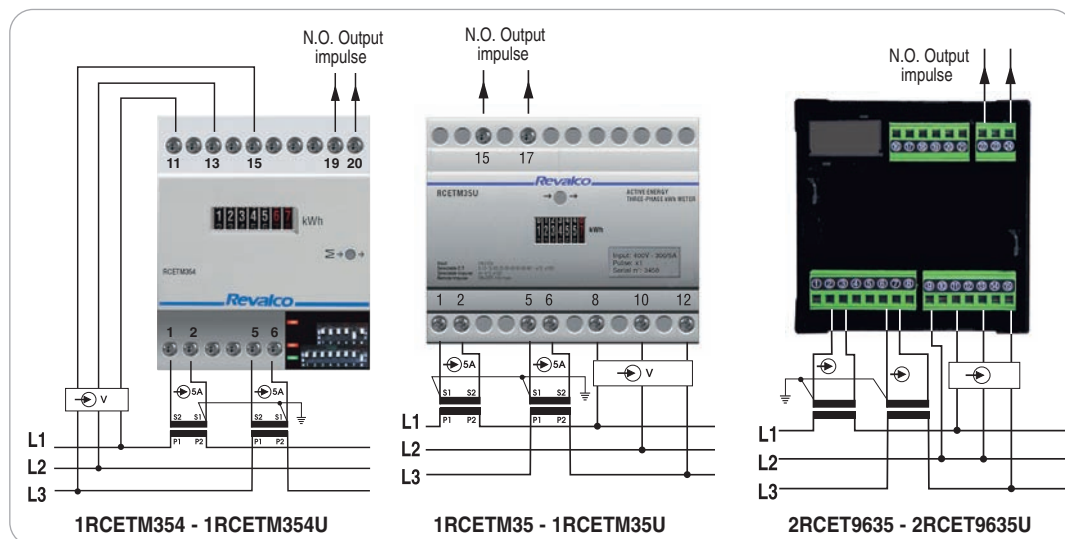digital display

1RCETM454 - 1RCETM454U   **1RCETM45 - 1RCETM45U**   **2RCET9645 - 2RCET9645U**

CONNECTIONS AND AUTOMATIC TEST: firstly, choose the relationship of the CT and the output impulse by selecting the appropriate minidip (apart from model 2RCET9645U); subsequently, connect current and voltage circuits as shown in the layout. Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit.
At this point, verify that the red frontal led flashes to confirm the correct connection. In this case, by opening the upper small panel it can be noted that the green led (A) is switched on and the red led (B corresponding to phase L1, C corresponding to phase L2 and D corresponding to phase L3) are switched off.
Whereas, if the frontal red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connection.
In this case, by opening the small panel placed near the upper part of the instrument, it will be noted that the green led (A) is switched off and one, two or all three red led (B, C and D) corresponding to the phase incorrectly connected, are switched on. In this case verify that the connections are correct. The following anomalies may have verified:
- the current in an amperometric measuring circuit circulates in reverse mode due to errors in the CT connection (the current must enter from the P1 side and exit from the P2 side)
- the connection between the three CT and the respective phases has been inverted (Example: CT on L1 instead of on L3 etc.)
- a connection in the voltmetric measuring circuit of the phase corresponding to the red led switched on is missing
- the connection of the voltmetric circuit has been inverted (Example: L1 in place of L3 etc.)

- In case of no L1 or L3 phase, the meter will not function as it is no longer powered.
⚠ - **NOTE:** in case the UTF certifier is required, the reading can be carried out by calculating the coefficient multiplier (k) in function of the CT used

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4 DIN MODULES   **1RCETM304 / 1RCETM304D** (digital display)
6 DIN MODULES   **1RCETM430**

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **PRECISION**   Class A (for model 1RCETM304) - Class 2 (for model 1RCETM430)
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimals)
- **SIGNALLING LIGHT** flashing **red** led = active consumption (the flashing is proportional to the consumption)
           Each flashing is equal to 1 Wh
     pulse **red** led = connection error, it is necessary to verify the connections of the measuring circuit
- **ENERGY READING**   For all values of cosφ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 3x230V/400V ± 10% self powered - 50 ÷ 60 Hz
- **MAXIMUM CURRENT** I_{max} 32A
- **MINIMUM START CURRENT** I_{st} 0,32mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 32mA
- **TRANSITION CURRENT** I_{tr} 0,64A
- **REFERENCE CURRENT** I_{ref} 6,4A
- **PROGRAMMABLE OUTPUT IMPULSES**   **x1** = 1 impulse every 0,1 kWh - resolution 0,1 kWh
           x10 = 1 impulse every 1 kWh - resolution 1 kWh
           x100 = 1 impulse every 10 kWh - resolution 10 kWh
           relay normally open, 0.5A / 100V - impulse duration 100 ms

100 ms   N.A.

- **DIMENSIONS / WEIGHT kg**   6 DIN modules / 0,40

digital display

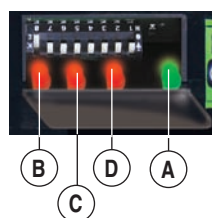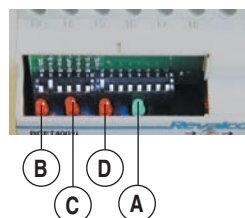**CONNECTIONS AND AUTOMATIC TEST:** firstly, choose the relationship of the CT and the output impulse by selecting the appropriate minidip; subsequently, connect current and voltage circuits as shown in the layout.
Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit.
At this point, verify that the red frontal led flashes to confirm the correct connection. In this case, by opening the upper small panel it can be noted that the green led (A) is switched on and the red led (B corresponding to phase L1, C corresponding to phase L2 and D corresponding to phase L3) are switched off. Whereas, if the frontal red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connection. In this case, by opening the small panel placed near the upper part of the instrument, it will be noted that the green led (A) is switched off and one, two or all three red led (B, C and D) corresponding to the phase incorrectly connected, are switched on. In this case verify that the connections are correct.
The following anomalies may have verified:
- the current in an amperometric measuring circuit circulates in reverse mode
- a connection in one or more phases has been inverted (Example: L1 instead of L3 etc.)
- a connection in the voltmetric measuring circuit of the phase corresponding to the red led switched on is missing
- the connection of the voltmetric circuit has been inverted (Example: L1 in place of L3 etc.)

B   D
C   A
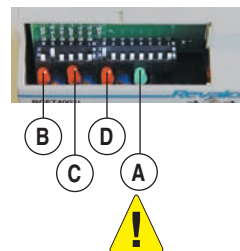
To be powered, the meter requires the presence of neutral and at least one of the three phases.

1RCETM304

N.O. Output impulse

1RCETM430
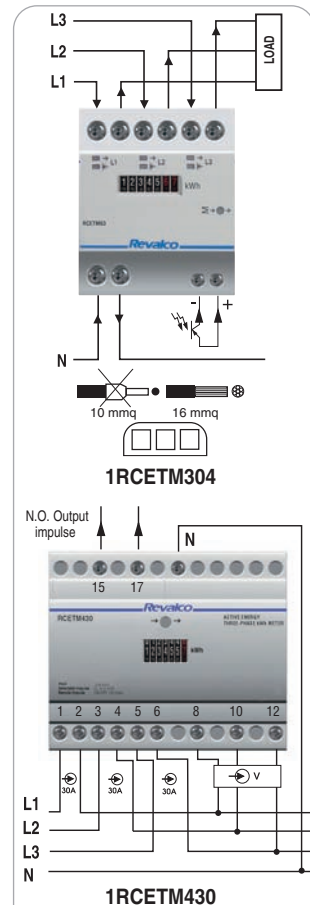
For well function of the meter DO NOT move the minidip from the position established by the factory (dip n°8 in ON position). Eventually the only dip to be moved are n°1 and n°2 for selecting the output impulse.

4 DIN MODULES   **1RCETM63 / 1RCETM63D** (digital display)
4 DIN MODULES FOR UTF CERTIFICATION   **1RCETM63U**
- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication

- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **PRECISION**   Class A
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimals)
           memory preservation even in the presence of a fault
- **SIGNALLING LIGHT**   flashing **red** led = active consumption
           (the flashing is proportional to the consumption)
   Each impulse is equal to 100W to which a trigger of the numberer corresponds (+0.1kWh)
           yellow led OFF = correct connection
           yellow led ON = incorrect connection
- **ENERGY READING**   For all values of cosφ from 0.5 to 1
- **NOMINAL VOLTAGE** U_n 3x230V/400V ± 10% self powered - 50 ÷ 60 Hz
- **MAXIMUM CURRENT** I_{max} 63A
- **MINIMUM START CURRENT** I_{st} 0,63mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 63mA
- **TRANSITION CURRENT** I_{tr} 1,26A
- **REFERENCE CURRENT** I_{ref} 12,6A
- **ELECTRIC CABLE**   20-6 AWG 16 mm²
- **OUTPUT IMPULSES**   10 impulses every kWh
           Open-Collector System (SO according to DIN43864),
           max 60VCC/30mA CC - Impulse duration >80 ms

100 ms   N.A.

- **DIMENSIONS / WEIGHT kg**   4 DIN modules / 0,70

digital display
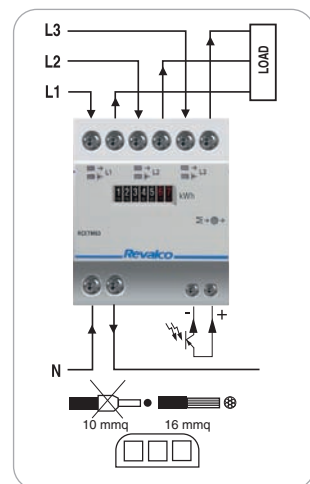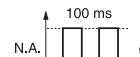
THREE-PHASE REACTIVE ENERGY kWh-METERS

INSERTION ON CT 5A

6 DIN MODULES - 3 WIRES WITHOUT NEUTRAL (ARON)	**1RCETRM35**
SWITCHBOARD VERSION 96X96 - 3 WIRES WITHOUT NEUTRAL (ARON)	**2RCETR9635**
6 DIN MODULES - 4 WIRES WITH NEUTRAL	**1RCETRM45**
SWITCHBOARD VERSION 96X96 - 4 WIRES WITH NEUTRAL	**2RCETR9645**

- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication
- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **NOMINAL VOLTAGE**   400V(±10%) self powered - 50 ÷ 60 Hz
- **PRECISION**   Class 3
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimals)
- **SIGNALLING LIGHT**   flashing **red** led   = active consumption (the flashing is proportional to the consumption)
      Each flashing is equal to: 1 varh for CT up to 80A, 10 varh for CT including between 100 and 800A, 100 varh for CT > at 800A
                          pulse **red** led   = connection error, it is necessary to verify the connections of the measuring circuit
- **ENERGY READING**   For all values of cosφ from 0.5 to 1
- **NOMINAL CURRENT**   5A
- **PRIMARY OF CURRENT TRANSFORMERS**   5-10-15-20-25-30-40-50-60-80 (x10 e x100) selectable
                                         max 4000A for modular version, max 1500A for 96x96 version
- **MAXIMUM CURRENT**   allowed: 6A   acceleration 5 times the **In** for 0.5 seconds
- **MINIMUM START CURRENT**   15mA
- **PROGRAMMABLE OUTPUT IMPULSES**   **x1** = 1 impulse every 0,1 kvarh - resolution 0,1 kWh
                                         x10 = 1 impulse every 1   kWh - resolution 1   kWh
                                         x100 = 1 impulse every 10 kWh - resolution 10 kWh
                                         relay normally open, 0.5A / 100V - impulse duration 100 ms
- **DIMENSIONS / WEIGHT kg**   6 DIN modules / 0,40 (modular version) - 96x96mm / 0,55 (switchboard version)

1RCETRM35   **1RCETRM45**   **2RCETR9635**   **2RCETR9645**
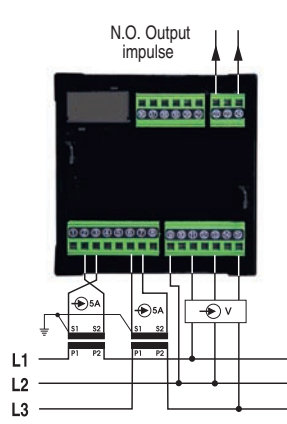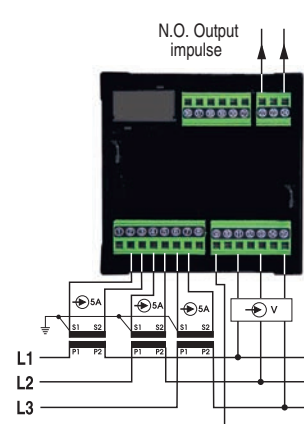
CONNECTIONS AND AUTOMATIC TEST

Firstly, choose the relationship of the CT and the output impulse by selecting the appropriate minidip; subsequently connect current and voltage circuits as shown in the layout.
Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit.
Eventually, to check the correct connection, open the small panel placed in the upper part of the instrument and verify that:
- the green led (A) is switched on (it indicates that the meter is powered)
- that one, two or three red led (B, C or D) are switched off (indicates that the meter is measuring an **inductive** energy)
- that one, two or three red led (B, C or D) are switched on (indicates that the meter is measuring an **capacitive** energy)
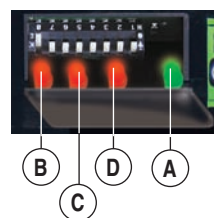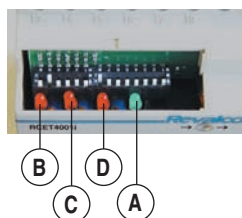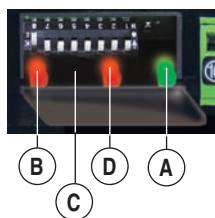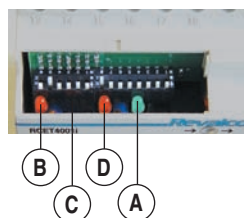
⚠ In case of no L1 or L3 phase, the meter will not function as it is no longer powered.

⚠ To be powered, the meter requires that the neutral and at least one of the three phases, be present.

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kWh-METERS WITH MINIMUM LOAD THRESHOLD AND ENABLING FOR HOUR-METER CERTIFIABLE (FISCAL USE)

1RCETM45C

1RCETM454C

1RCETM454CD

2RCET9645UC

4 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION
6 DIN MODULES WITH SEALABLE TERMINAL COVERS FOR UTF CERTIFICATION

- the standard meter is calibrated at 5A-400V with the use of the coefficient multiplier to be calculated depending on the primary value of the CT used. In this case, every flash of the front led corresponds to 1Wh.
- upon request, it can be supplied with the direct reading of energy consumption in which it is not necessary to calculate any coefficient multiplication
- **the voltmetric and amperometric input values have to be communicated when being ordered as these models are without the minidip.**
- **AMPEROMETRIC / VOLTMETRIC SELFCONSUMPTION** 1VA / 3VA for each phase
- **PRECISION**   Class A (for 1RCETM454C) - Class 2 for other models
- **TEMPERATURE**   functioning -5°C ÷ +50°C / storage -25°C ÷ +70°C
- **DISPLAY**   999999,9 kWh (6 entires + 1 decimals)
- **SIGNALLING LIGHT**   flashing **red** led = active consumption (the flashing is proportional to the consumption)
                          Each flashing is equal to: 1 Wh for CT up to 80A
                          10 Wh for CT including between 100 and 800A
                          100 Wh for CT > at 800A
                pulse **red** led = connection error, it is necessary to verify
                          the connections of the measuring circuit
- **ENERGY READING**   For all values of cosφ from 0.5 to 1
- **PRIMARY OF CURRENT TRANSFORMERS**
                          5-10-15-20-25-30-40-50-60-80 (x10 and x100) selectable
                          max 4000A for modular version, max 1500A for 96x96 version
- **NOMINAL VOLTAGE** U_n 3x230V/400V ± 10% self powered - 50 ÷ 60 Hz
- **NOMINAL CURRENT** I_n 5A
- **MAXIMUM CURRENT** I_{max} 6A
- **MINIMUM START CURRENT** I_{st} 0,10mA
- **MINIMUM FUNCTIONING CURRENT** I_{min} 15mA
- **TRANSITION CURRENT** I_{tr} 0,25A
- **RELAY**   Normally open 0,5A/100V
- **DIMENSIONS / WEIGHT kg**   4/6 DIN modules / 0,40

SWITCHBOARD VERSION 96X96 WITH SEALABLE TERMINAL COVERS (UTF CERTIFICATION)
- direct reading of energy consumption; it is not necessary to calculate any coefficient multiplication
- **NOTE**: in case the UTF certifier is required, the reading can be carried out by calculating the coefficient multiplier (k) in function of the CT used. In this case, every flashing of the frontal led corresponds to 1Wh.
- **the voltmetric and amperometric input values have to be communicated when being ordered as these models are without the minidip.**

⚠ - In case of no L1 or L3 phase, the meter will not function as it is no longer powered.
- To be powered, the meter requires that the neutral and at least one of the three phases, be present.

The minimum load threshold is calibrated in factory at 1/200 of the nominal current.
Therefore: 0.025A in case of nominal current 5A
             0.005A in case of nominal current 1A

CONNECTIONS AND AUTOMATIC TEST: connect the current and voltage circuits as shown in the layout. Power and wait for at least 3 seconds, so that a current corresponding to the nominal one, passes through the circuit.
At this point, verify that the red frontal led flashes to indicate the correct connection.
If the frontal red led throbs (the brightness gradually increases and decreases), it means there is an anomaly in the connections which therefore need to be verified.
The following anomalies may have verified:
- the current in an amperometric measuring circuit circulates in reverse mode due to errors in the CT connection (the current must enter from the P1 side and exit from the P2 side)
- the connection between the two CT and the respective phases has been inverted (CT on L1 instead of on L3 and vice-versa)
- a connection in the voltmetric measuring circuit of the phase corresponding to the red led switched on is missing
- the connection of the voltmetric circuit has been inverted (L1 in place of L3 and vice-versa)
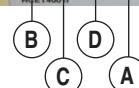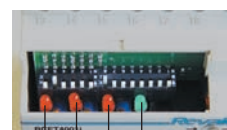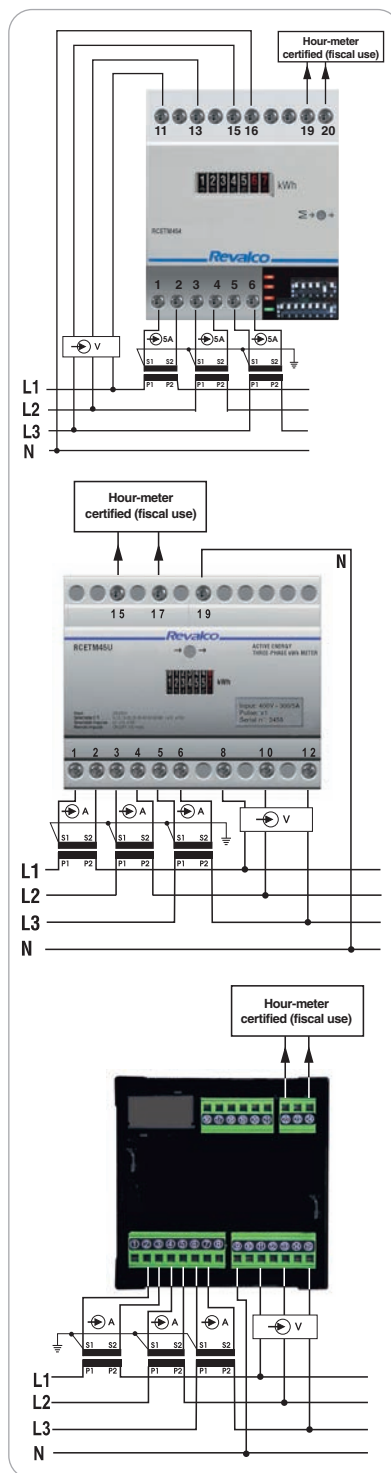
INDUCTION kWh-METERS

TECHNICAL CHARACTERISTICS

RULES
The meters listed in this catalogue have been realised according to rules:IEC 13-13 / IEC 521, 145, and 529 / VDE 0418 / DIN 40040 / SEN 0601 / BS5685.

TESTING VOLTAGE
The instruments are tested according to the rules with sinusoidal alternate voltage of 2000 V eff. to frequency between 40 and 60Hz, applied for one minute between the circuits and the mass. This testing voltage corresponds to a reference maximum nominal voltage for the isolation of 0.6kV.

PRECISION CLASS
The precision class of the meters for active energy is 2, for reactive energy is 3.

OVERLOADING
The amperometric winding support 400% of permanent overloads, whereas the voltmetric ones, support 120% of continuous overloads.

FUNCTIONING TEMPERATURE
The instruments satisfy the rules requisites, for which the functioning temperature is of 20°C +/- 10°C.
They can however function in continuous service, without deterioration and with an acceptable class error, with temperatures between 0 and +40°C.
In any case, the meter must not present an over-temperature of the windings above 50°C.

STORAGE TEMPERATURE
The storage temperature must be between -40°C and +65°C. Temperature exceeding the two limits can alter the functioning conditions.

HUMIDITY
The standard meters function with ambient relative humidity of 95% without condensation, with temperature at 35°C for a maximum of 65 days/year.
The average yearly value of relative humidity must not exceed 65%.

CASINGS
The casings are in bakelite with a IP52 protection degree, whereas on the terminals, the protection degree is IP30.

EMPTY RUNNING
If only the voltmetric circuits are powered with nominal voltage +/- 20% at nominal frequency +/- 5%, the mobile equipment must perform less then one turn. This rule cautions the user in that it tends to detect if without load, meaning with the amperometric circuit disconnected, the disk still rotates. However, as the presence of an empty residual torque cannot be excluded initially, even if very small, to avoid the continuous rotation of the disk, a stop wind vane of the reverse start has been applied.

START
The meter mobile equipment must start and turn continuously with 0.5% of the nominal current and cos =1 to the nominal voltage and frequency.
This rule tends to protect the distributing company in that it assures the meter functioning above a minimum load.
To verify the said rule, apply a load corresponding to the abovesaid value, in this way assuring that the disk accomplishes at least three complete turns

CALCULATION OF THE COEFFICIENT MULTIPLIER
When it is necessary to calculate the coefficient multiplier (constant k) for the meter reading which uses:
- only the CT (example 400/5A) it is necessary to divide the primary and secondary value **400: 5 = 80 (k)**
- the CT and the TV (example CT of 400/5A and TV of 380/100V) do as above and multiply the two obtained values **400:5= 80 (k_1) 380:100 = 3,8 (k_2) 80x3,8 = 304 (k)**

⚠️ **Remember that the CT to match with the meters must be in class 0.5 and have a minimum power of 6VA.**

MOUNTING POSITION
⚠️ **The only possible position is the vertical one. It is suggested to place the meters in this position, even if only to try them.**
If laid down, the same disk weight stops any movement simulating a non functioning.

DIMENSIONS in mm
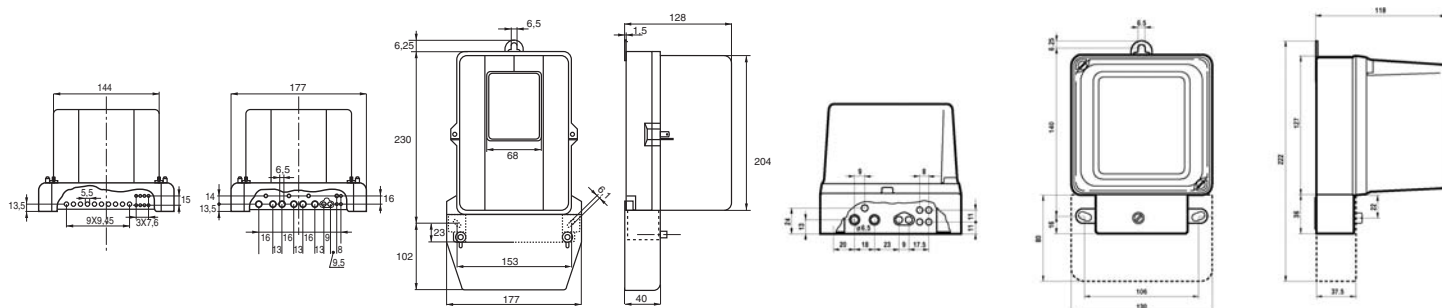
MONOPHASE ACTIVE ENERGY - 2 WIRES

	3RCEMI5100	3RCEMI5230	3RCEMI5400	3RCEMI10230		3RCEMI20230
- **FUNCTIONING VOLTAGE**	100V	230V	400V		230V	
- **CURRENT (Ib / Imax)**		5 / 20A		10 / 40A		20 / 80A
- **SELF-CONSUMPTION**						
voltmetric circuit		0,11W		0,18W		0,26W
amperometric circuit		0,23VA		0,35VA		0,38VA
- **ACCELERATION CURRENT**		0,5% Ib				
- **FREQUENCY**			50Hz			
- **DISPLAY**			5 entires + 1 decimal			
- **WEIGHT Kg.**			1,57			

Direct insertion

Insertion through CT
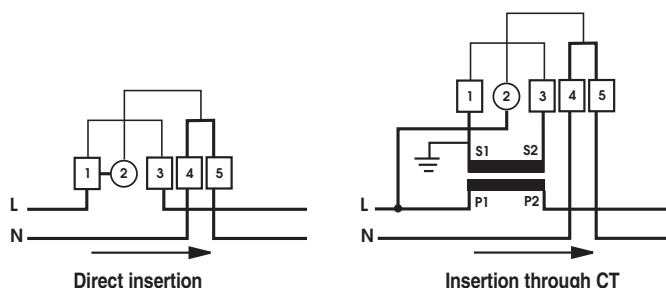
3 WIRES WITHOUT NEUTRAL (ARON) THREE-PHASE ACTIVE ENERGY

	3RCETI351	3RCETI354	3RCETI3104	3RCETI3204
- FUNCTIONING VOLTAGE	2X100V	2x400V	2x400V	2x400V
- CURRENT (Ib / Imax)		5 / 20A	10 / 40A	20 / 80A
- SELF-CONSUMPTION				
voltmetric circuit		2x0,10W	2x0,15W	
amperometric circuit		2x0,12VA	2x0,16VA	
- ACCELERATION CURRENT		0,5% Ib		
- FREQUENCY		50Hz		
- DISPLAY		5 entires + 1 decimal		
- WEIGHT Kg.		3,5		

Direct insertion **Insertion through CT** **Insertion through CT and VT**
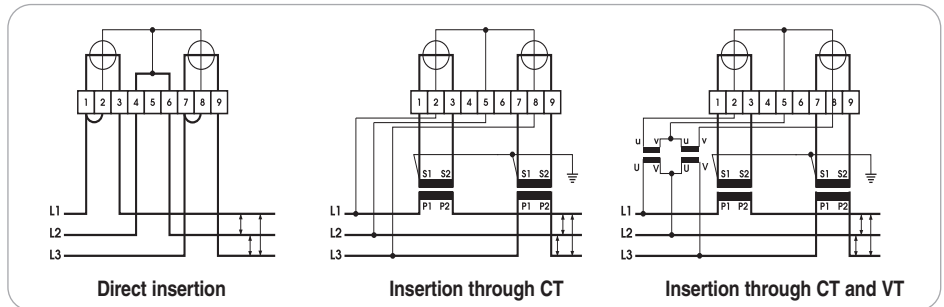
4 WIRES WITH NEUTRAL THREE-PHASE ACTIVE ENERGY

	3RCETI451	3RCETI454	3RCETI4104	3RCETI4204
- FUNCTIONING VOLTAGE	3x100 $\sqrt{3}$ /100V	3x230/400V	3x230/400V	3x230/400V
- CURRENT (Ib / Imax)		5 / 20A	10 / 40A	20 / 80A
- SELF-CONSUMPTION				
voltmetric circuit		3x0,10W	3x0,15W	
amperometric circuit		3x0,12VA	3x0,16VA	
- ACCELERATION CURRENT		0,5% Ib		
- FREQUENCY		50Hz		
- DISPLAY		5 entires + 1 decimal		
- WEIGHT Kg.		3,5		

Direct insertion **Insertion through CT** **Insertion through CT and VT**

THREE-PHASE REACTIVE ENERGY

	3 WIRES		4 WIRES	
	3RCETRI351	3RCETRI354	3RCETRI451	3RCETRI454
- FUNCTIONING VOLTAGE	2x100V	2x400V	3x100 $\sqrt{3}$ /100V	3x230/400V
- CURRENT (Ib / Imax)		5 / 20A		5 / 20A
- SELF-CONSUMPTION				
voltmetric circuit		2x0,10W		3x0,10W
amperometric circuit		2x0,12VA		3x0,12VA
- ACCELERATION CURRENT		0,5% Ib		
- FREQUENCY		50Hz		
- DISPLAY		5 entires + 1 decimal		
- WEIGHT Kg.		3,5		

Insertion through CT

Insertion through CT and VT

Insertion through CT **Insertion through CT and VT**

SEALABLE TERMINAL

With the sealable terminal boards it is possible to realise: The upstream and downstream sectioning of the measuring instruments; the insertion of a sample equipment, before or after a measuring instrument; the derivation through commune sockets from the four connecting terminals and the voltage passage from the amperometric input to the knife, through a jumper to be arranged.

- In normal service, the voltmetric powers are inserted on the R-S-T terminals, whereas the amperometric ones on terminals countersigned R1-R2, S1-S2, T1-T2
- The instruments are to be connected to terminals 1 and 2.
- The vertical cursor bridges are closed, those at horizontal cursor are open.
- In case of control apparatus insertion, operate as follows: Using normal plugs, derive the voltmetrics of the same apparatus on the voltage sockets of the separating knives or the connection blocks of the fuse holders. Insert the amperometrics of the control apparatus, through plugs on sockets 1 and R1 or 2 and R2 and analogously on the other phases. Select the corresponding vertical cursor.

⚠️ **In case of replacing the measuring instruments, it is necessary to pre-emptively close the horizontal cursors, section the vertical cursors and open the knives.**

FOR MONOPHASE METERS

ARMS1
Encumbering dimensions:
95x85x48 mm
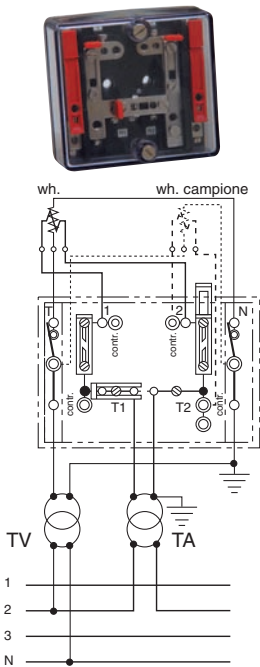
FOR THREE-PHASE METERS TWO SYSTEMS

ARMS2
Encumbering dimensions:
170x85x48 mm
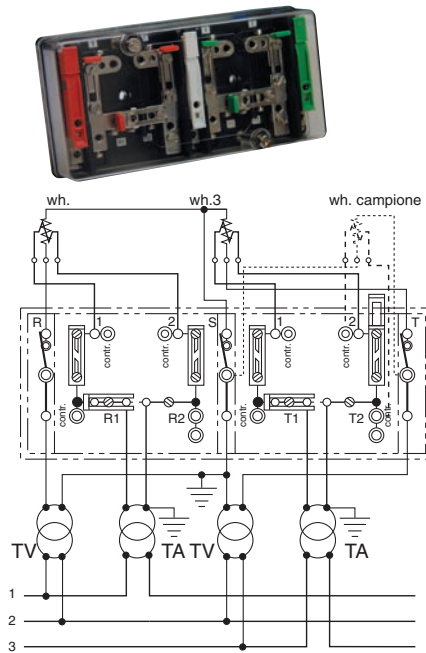
FOR THREE-PHASE METERS THREE SYSTEMS

ARMS3
Encumbering dimensions:
245x85x48 mm
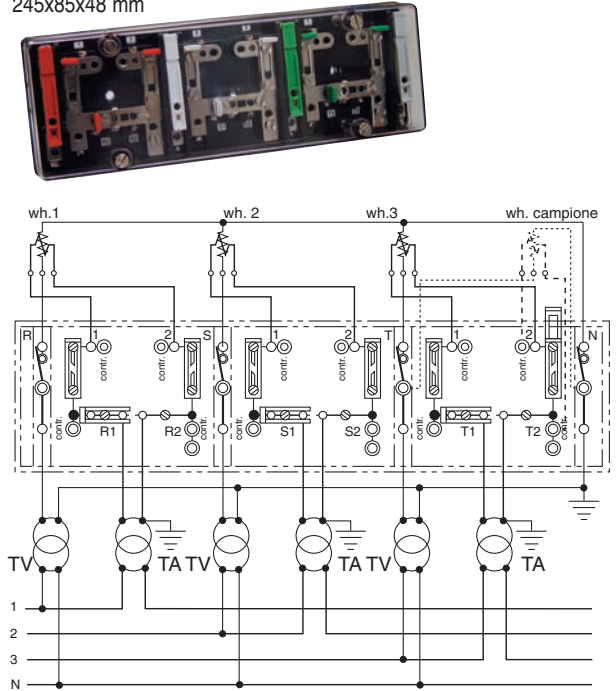
Sealable terminals board with removable bridges at perpendicular deconnection. Standards EN60947-7-1
Nominal voltage: unitary block 600V; terminals board 800V; bridges 600V Cat. IV
Wire dimensions: unitary block with terminals cover from 1,5 to 6 mm^2; max values 16 mm^2 - 2x6 mm^2
Current values: 32A at T=-5°C...30°C; 14A at T=-5°C...60°C; 76A
Class II, double insulation
Impulse voltage: 8kV

FOR THREE-PHASE METERS TWO SYSTEMS

ARMS2S
Dimensions:
without terminals cover 126x67x62 mm
with terminals cover 134x138x65 mm
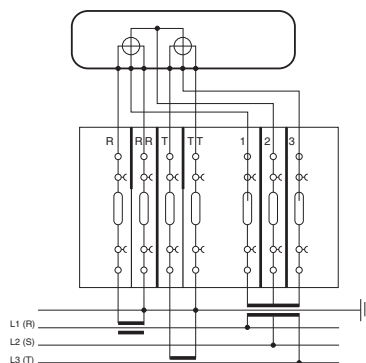
FOR THREE-PHASE METERS THREE SYSTEMS

ARMS3S
Dimesions:
without terminals cover 126x67x62 mm
with terminals cover 134x138x65 mm
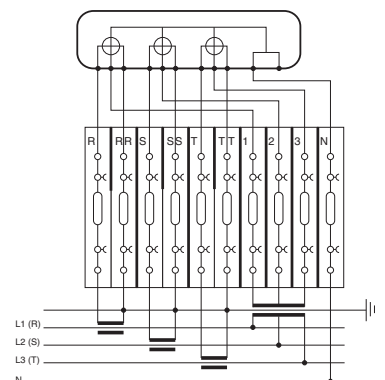
GENERAL DESCRIPTIONS

Revalco is able to supply the certification of the measuring groups in case the Customs Technical Department requests it.

The certification of the whole plant is to be requested at the competent **UTF** offices of the area. In case of a measuring group with three systems composed of 3 current transformers and one meter, 5 inspection certificates are necessary. When the measuring group to be inspected is a 2 system, 4 certificates are requested as the interested CT are only two. One for each current transformer (in this example TAR8V 800/5A)

▬ One for each current transformer (in this example TAR8V 800/5A)
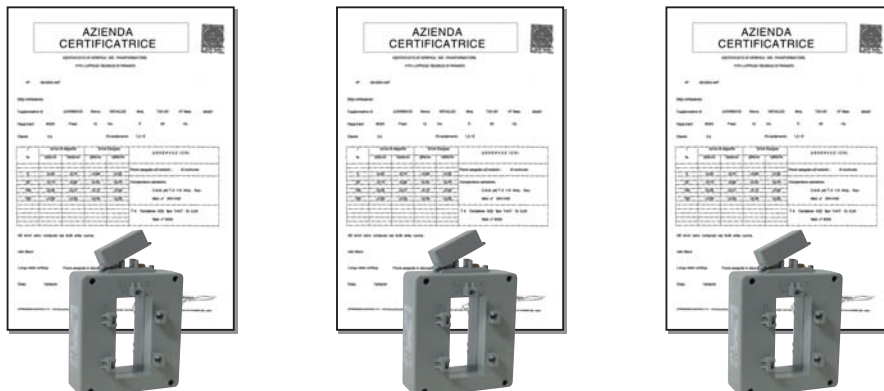
▬ One for the meter

▬ One for the transformers complex + meter

RECORDERS OF IMPULSES

5 INPUTS WITH OUTPUT RS485

1RCD5485

- **POWER**	230V +/- 10%, 50/60Hz
- **SELF-CONSUMPTION**	2 VA
- **GALVANIC ISOLATION**	inputs/power/output
- **TESTING VOLTAGE**	3kV
- **NUMBER OF INPUTS**	5
- **TYPE OF INPUTS**	Free contact (NPN)
- **POLARITY**	NO or NC (programmable from Software)
- **MAX. RESISTANCE OF CONTACT**	600 Ω
- **MAX. RESIDUAL VOLTAGE UPON CONTACT**	1,5 V
- **SERIAL INTERFACE**	RS485 (isol. 3kV)
- **SERIAL COMMUNICATION PROTOCOL**	ModBus RTU
- **SERIAL COMMUNICATION SPEED**	9600-19200-38400-57600-115200 (programmable)
- **SERIAL COMMUNICATION PARAMETERS**	8,N,1 No flow control
- **ADDRESSING**	1 - 255 through minidip
- **NUMBER OF TOTALIZATORS**	5
- **CAPACITY OF TOTALIZATORS**	999999999 (9 digits)
- **MINIMUM DURATION TOT IMPULSES**	55 microSec (1)
- **MAX. FREQUENCY TOT IMPULSES**	9000 / sec. (1)
- **NUMBER OF ACCUMULATORS**	5
- **CAPACITY OF ACCUMULATORS**	999999999,9999 (9 entires + 4 decimals)
- **MINIMUM DURATION CONT IMPULSES**	500 microSec (2)
- **MAX. FREQUENCY CONT IMPULSES**	1000 / sec. (2)
- **PROGRAMMABLE FILTERS**	5, field of 0 to 25.5 milliseconds resolut. 100 microSec
- **DIMENSIONS / WEIGHT**	3 DIN modules / 0,30 kg

(1) Duty cycle 50%, ACCUMULATORS=OFF, Filters=0=OFF

(2) Duty cycle 50%, Filters=0=OFF. When the ACCUMULATORS are ON, this limit is also applied to the TOTALIZATORS
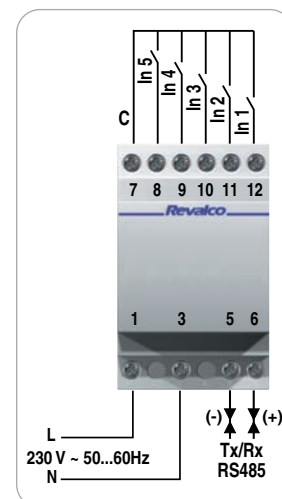
MECHANICAL CHARACTERISTICS

- type of mounting: guide DIN50022   - protection degree: complete apparatus IP20/ frontal IP30

ENVIRONMENTAL CONDITIONS ambient temperature:

- nominal field: 0...+45 °C   - external field: -5...+55 °C   - warehousing temperature: -10...+70 °C
- relative humidity: 10...95 %   - atmospheric pressure: 70...110 kPa

REFERENCE STANDARDS IEC Rules :

- Safety: IEC EN 61010-1 CAT II   - Protection degrees of the wrapping (IP Code): IEC EN 60529
- Electromagnetic compatibility (immunity): IEC EN 61000-6-2 (ex EN 50082-2)   - Electromagnetic compatibility (emission): IEC EN 61000-6-4 (ex EN 50081-2)

- Diagnostic: two led for the control of the insertion and the functioning
- Interface RS485 optoisolated at 3kV, protocol MODBUS RTU (Full Compliance) with 5 programmable speeds, up to 115200 bps.
- Inputs compatible with relay contact or static output (Open Collector) at very high speed
- Possibility to program counting with closed or open contact.
- Access password for the programming of the parameters/pre-set, totalizators and accumulators zeroing
- Input filters programmable with 100 microSec resolution.
- Possibility to permanently memorise the totalizators and accumulators (in EEPROM mode).
- Possibility to activate accumulators with programmable impulse weight from 0 to 9999.9999 (at fourth decimal).
- Possibility to block the totalizators and accumulators at maximum counting value (999.999.999 without subsequent zeroing)
- Free software that can be unloaded from site with demo

Device for the collection of impulses coming from: energy meters, water meters, gas meters, heat recorders, step count, people count, access count, piece count or any other count application equipped with a free relay count from potential or from an "Open Collector" (example: photocell or proximity sensor).
The impulses received on the 5 independent channels can be counted inside the device so that the totals are available to a "Master" Modbus requesting it.

The counting of every channel is deposited in appropriate dedicated registers, one for the totalisation and the others to supply "Weighed" measures.

During programming, through a provided software (updates available on the site), a "Weight" can be associated to every impulse, that is, the register increasing numerical quantity to every received impulse.
Example: if the water weight of 10m³ is associated to channel 1, at every received impulse the internal meter will increase by 10 meaning 0....10....20....30...
In this way the "Master" Modbus which questions the device obtains an already coherent (real) number without having to numerically elaborate the measure.
This function can be activated or deactivated and influences the performances of the instrument (see specifics).
The device is equipped with a permanent memory (EEPROM).

For every channel it can be chosen whether to save the data permanently or to loose them when switching off (saving in the permanent memory occurs when switching the instrument off). When switching on again, the accumulators saved will be found intact. By removing the small upper panel, access is gained to the settings of the MODBUS addresses (from 1 to 255) of the device through 8 microswitches, two led make a simple diagnostic available.
- The red led flashes when it receives impulses on any one of the 5 channels. The duration of every flash and every pause is 100mSec. In case of simultaneous impulses from more channels or fast impulses, the flashing looses meaning, that is, it no longer follows the inputs flow but indicates in general that there is activity. This led is mainly used to verify the connections and instrument functioning.
- The yellow led flashes when the device, after having received a valid question in Modbus through the RS485 interface to the address programmed with the microswitches, answers with the requested data.

ADDRESS SELECTION

Switch in "ON" position	address n°
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

Addresses above number 8 are obtained by summing up the single switches. Examples:

Address n° 1

1 2 3 4 5 6 7 8 — OFF / ON

Address n° 9

1 2 3 4 5 6 7 8 — OFF / ON

Address n° 128

1 2 3 4 5 6 7 8 — OFF / ON

Address n° 255

1 2 3 4 5 6 7 8 — OFF / ON

After a few seconds from switching on, during which both Led are switched on, the instrument is able to acquire impulses simultaneously from 5 counting channels, which can be programmed singularly to accept contact NO or NC and each can be filtered from disturbances with a digital filter programmable from 0.0 to 25.5mSec (resolution 100uSec). The valid impulses are always sent to the respective TOTALIZATORS, which count, increasingly, each single impulse (1:1).
The capacity of each totalizator is of one billion impulses (999.999.999) and it can be decided if once this limit is reached, the counting should block or if the totalizator should restart from zero. It can also be decided whether the counting value of each totalizator should be permanently saved or whether it should be zeroed after switching off and switching on again. The same impulses can be sent to the respective ACCUMULATORS, which can be personalised so that they can count the weighed units in a different way from the single impulse. These accumulators represent the size, also chosen one decimal part with resolution 1/10000. The counting capacity is one billion comma 9999 (999,999,999.9999).
As for the totalizators, it can be decided whether to permanently save or not (singularly) the counting values.
The physical acquisition limit of the impulses is of 9000 imp/Sec (9 KHz) for each channel.
This limit can be reached only on the TOTALIZATORS when:
1. The input filters are switched off (0.0mSec)
2. The ACCUMULATORS are switched off
3. The arriving impulses have a duty cycle 50% (impulse time = pause time)
4. The serial communication is at maximum speed (115.200bps)
The requested calculation operations to elaborate the impulse and record it in weighed mode on the accumulators, drastically effect the acquisition performances.
The serial communication speed also influences the performances, and in optimal conditions at 9600bps the maximum acquisition frequency is just above 2 KHz.
To be able to interact by sending configuration controls to the instrument or zeroing/pre-selection controls, it is COMPULSORY to supply the PASSWORD, which 'opens a time window of 10 seconds during which the configuration can be amended (password included).
If the password is not supplied, any writing access attempted is refused.
In case an attempt to supply a wrong password is made, the instrument blocks any further access attempt for an hour.
Even if switching the instrument off, this time is not zeroed.
If the password is lost, there is no way to recover it or to bring the instrument back to the factory values.
The instrument must be sent to the assistance for repair.
The factory PASSWORD is 0 (zero). The values accepted are numerical and go from 0 to 65535.

USE OF DIGITAL FILTERS
They can be applied to avoid that disturbance or mechanical contacts rebounds alter the counting. The filters have a resolution of 100uSec per unit.
To correctly measure them, the following must be taken into account:
- The MINIMUM duration of the NOMINAL impulse to be recorded is that in the chosen state for the counting, meaning Normally Open or Normally Closed [Ton].
- The duration of the 'pause between one impulse and another must be at least equal or greater than the duration of the impulse [Toff]. If not, the following argument no longer stands and the application of the filters be 'experimental'.
- The maximum applicable filter to an input without loss of impulses is equal to [Ton] – 100uSec.
  It is however better, if the environment and the conditions allow it, not to equalise this value but to set one as low as possible respect to the 'disturbance' to be filtered.
  In fact, on the filter limits, if the arriving impulse did not have a regular duration, it would risk loosing it.
Against an erroneous setting of the filters and consequent under-counting, the instrument does not supply any error indication.

USE OF ACCUMULATORS
They are normally kept switched off to maximise the instrument performances, which it can better and more quickly manage its main function, meaning that, to concentrate the counting of the single impulses from 5 lines at the same time and quickly communicate on the serial line. In fact, the 'weighing' of that totalised, can very easily be followed from the remote control unit, which surely has a higher calculating power. However, in particular cases and when the acquisition of the impulses must not happen with elevated frequency (less than 1000imp/sec for each line), it is possible to singularly enable the accumulators and establish the impulse value for each of them.
The value ("weight") of the impulse has a whole part which can be chosen between 0 and 9999 and a decimal part between 0.0000 and 0.9999.
When a meter is enabled, the decimal and whole part of the impulse weight is added to the counting value, which is also expressed with a whole part up to 999999999 and a decimal part between 0.0000 and 0.9999. Seeing as the 'load' of the calculation which the instrument has to carry out is not constant but it depends on the numbers and on how many accumulators it must manage, OVERLOAD flags for each measuring line have been introduced, which indicate the exceeded calculation capacity and also that part of the arriving impulses have been lost. In the presence of this indication, it must be known that both the totalizator and the counter of that channel contain an incorrect number of impulses (lower

FISCAL MEASUREMENT OF ENERGY
kWh-METER DAB13000
ABB

UTF certification is available for italian market. Under request is possible to obtain certifications for other markets
The three-phase kWh-meter with neutral, 4 wires, DELTA PLUS is an electronic device for DIN rail mounting, suitable for distribution boards and small panels. It was built according to the guidelines of ABB ProM and measures the Active Energy connected via current transformers. Easy to read it by its LCD display with 7mm high characters and various symbols.
 It has an independent polarity, a solid state relay (semiconductor) that generates pulses proportional to the measured energy displayed by a red LED; can be equipped with inputs and outputs for control and alarm management, as well as for pulse counting.

COMMUNICATION: this counter, integrated with the communication EIB, M-bus or LON-bus, is easy to read remotely;. is also equipped with an IR output with which you can connect serial ABB communication adapters.

PROGRAMMING: the selection of information and programming is accomplished through two buttons that can be sealed

INSTALLATION CONTROL: this application is effected during all the working time

FUNCTION OF PRIMARY MEASUREMENT: the kWh-meter has the function of primary measure when it is connected with external VT and / or CT. The range of CT and VT is easily selected with two programmable buttons. This function enables to display the real vision on energy consumption.

MEASURES: the kWh-meter contains measurement functions that let you read the essential parameters, such as:
- Powers in kW   - Current in A   - Voltage in V   - Frequency in Hz   - Power Factor

DIMENSIONS in mm
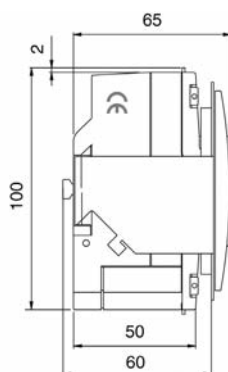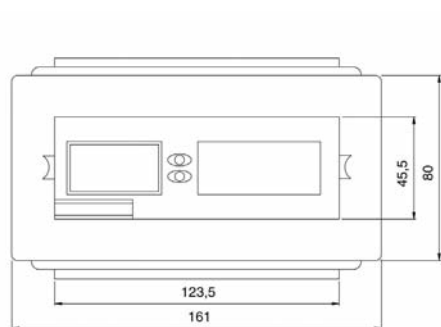
CONNECTION DIAGRAM

TECHNICAL FEATURES

Voltage	3 x 57-288 V / 100-500 V (4 wires)	Temperatures: operation -40 to +55°C; Storage -40 to +70°C	
Voltage range	from -20% to +15% of nominal voltage	**PULSE OUTPUT**	
Self consumption of voltage circuit	< 3 VA, 2 W/phase	Connection cables	0 - 2.5 mm² (for combined instruments 0-0.5 mm²)
Current	- base 1A		
	- max 6A	External voltage pulse	0 - 247 V CA/CC (independent polarity)
Starting current	< 2 mA		
Self consumption of current circuit	< 0.08 VA/phase	Maximum current	0 - 100 mA
GENERAL		Pulse duration	100 ms
Frequency	50/60 ±5% Hz	Pulse frequency	Programmable
Standards	IEC 61036 for active energy kWh meters (class 1 and 2)	**PULSE INDICATOR**	
	IEC 61268 for reactive energy kvarh meters (class 2)	Red LED	5000 imp/kWh
	Output impulses as per standards	Pulse duration	40 ms
	DIN 43864 (SO) IEC 62053-31	**ELECTROMAGNETIC COMPATIBILITY (EMC)**	
Display	LCD 7 digits, height 7 mm	Test voltage	6 kV 1.2/50μs (IEC 600-60)
Class	as per standards IEC 61036 Cl. 1	Transient	4 kV (IEC 61000-4-4)
Voltage transformers range	1 - 9 999	Immunity from radio frequency	80 MHz - 1 GHz to 10 V/m (IEC 61000-4-3)
Current transformers range	1 - 9 999		
Max range of transformers	CT x VT max = 999 999	Immunity from induced noise	150 kHz - 80 MHz (IEC 61000-4-6)
Connection cables	current and voltage 0.5 - 10 mm²	Radio frequency emission	Standard CISPR 22 class B
		Electrostatic discharge (ESD)	15 kV (IEC 61000-4-2)
DIMENSIONS		**MATERIAL**	
width	122.5 mm	Transparent front, case and terminals cover in polycarbonate material	
height	97 mm	Terminals	In polycarbonate added with glass fiber
weight	303.5 g		
DIN modules	7	Protection class	II
ENVIRONMENT		**TARIFF INPUTS (OPTIONAL)**	
Resistance to heat and fire	As per standards IEC 60695-2-1 terminals 960°C terminals cover 650°C	Max voltage	276 VAC
		Max dimension cables	2.5 mm²
		Input voltages range	0 - 20 VCA (voltage OFF) 57 - 276 VCA (voltage ON)
Humidity	75% annual average, 95% for 30 days/year	Wires section on terminals	Lon and M-bus 0-2.5 mm² EIB 0.5 mm²
Protection against durst and water as per standards IEC 60529	IP20 on terminals without terminals cover		

kWh-METER 3MT830 / 3MT831
ISKRA

WITH REMOTE SIGNAL, "MID" STD **UTF CERTIFICATION**

UTF certification is available for Italian market. Under request is possible to obtain certifications for other markets Three-phase kWh-meters, high precision in class 0,5s available in "closed" or "modular" versions for direct or indirect connection. Used for measuring and registration of Acitve, reactive, Apparent Energies and Power. Devices developed for industrial use as well as big or medium dimensions commercial centers; manufactured following the IEC 62053-21, IEC 62053-22, IEC 62053-23, EN50470-1, EN50470-3, ISO 9001 standards and represent the best on accuracy and reliability of the products present on the market.

- **3MT830** "close" version with 6 terminals without expanded modules
- **3MT831** "modular" version with possibility of expansion of services through additional modules of input / output and communication
- Measure of Active Energy, Reactive Energy, Apparent Energy and Power
- Measure of Voltage, Current and Frequency
- Over voltage, under voltage and power supply break
- Analysis of the harmonic components
- Power Factor and phase angle
- Anti-fraud provisions
- Multi range measurement: 57-240V
- Internal or external power supply
- Optical probe with reading data even without Voltage

Class 0,5s	Maximum power	Two registers of events
Direct , semi-direct or indirect connection	Two independent communication interface	Real time clock
Qualitative parameters of network	Two independent load profiles	Multi-tariff registration

THREE-PHASE MULTIFUNCTION KWH METERS FOR4 INDUSTRY
- high precision and long-term stability
- measurement of Active Energy in two directions: IEC 62053-22 Class 0.5s or IEC 62053-21 in class 1
- measurement of Reactive Energy (4 quadrants and combined quadrants in IEC62053-23 in class 2 or 3 (calibrated up to 1%)
- measurement of Apparent Energy (calibrated up to 1%)
- direct or indirect connection (CT, CT / VT) in three-phase, 3 or 4 wire networks
- different methods of recording
- compensation of CT / VT error
- measuring of the current on Neutral phase
- average current , measuring of maximum and Total Power
- recording of the highest absolute Power for tariff band

NETWORK QUALITY
Values monitored and displayed:
- Instantaneous values of Voltage, Current and Frequency of phases
- RMS values of voltage and Current of phases
- Power Factor and Phase Angle of each phase
- Analysis of harmonics up to the eighth component in Voltage and Current of the phases
- Voltage drop for each phase and total

TERMINALS
The instrument is equipped with 6 terminals that can be used as inputs (maximum 2), as outputs (maximum 4), as communication ports (RS232/RS485 or CS) and as connection to external power. Optional modules (available only on model 3MT831) expand theses capacities

MODULARITY (3MT831 MODEL ONLY)
The presence of optional modules may greatly expand the possibilities of input / output and communication of the device. Interchangeable modules are recognized automatically (plug & play). They may also be inserted without disconnecting the power or remove the safety seals. In case of failure in a module, the security functions of the counter is in any case 100% warranted.

INPUT / OUTPUT MODULES
The maximum combination provides 4 inputs and 8 outputs. The input / output are freely programmable.

FORMS OF COMMUNICATION
The modules cover a wide range of communication possibilities. In addition to communications toward the center, the modules also offer the ability to connections in series.

MULTI HOURS TARIFF
The counter allows the recording of different tax rates for Energy and Power. The considerable number of registers allows the creation of complex tariff schemes.

REGISTER OF EVENTS
The counter is equipped with two registers: configuration and operational events. To prevent potential fraud, the covers of meter and terminal, are equipped with sensors that emit the registration even in absence of power.

LOAD PROFILE
Two independent load profiles (e.g. 15 minutes, 4 channels, 190 days) record the Power, the Energy (absolute and cumulative values), the parameters of network quality, etc.. Each load profile has 16 channels.

DISPLAY
LCD 8 digits, 7 segments 8x4 mm in height. Displayed data are identified by 5 characters EDIS-code (DIN43863-3), the numbers are 7 segments high 6x3mm

MECHANICAL CHARACTERISTICS
A compact plastic housing made with flame retardant materials, protects the meter from dust and water. A sliding support allows the fixing distances between 165 and 230 mm. The entire meter is built with recyclable materials.

POWER SUPPLY
The meter can be powered either from the same measured Energy or external (57-240VAC / VDC) power.

OPTICAL-MAGNETIC PROBE
The magnetic-optical sensor (SONDA6) allows the reading and programming of counter even without power.

SOFTWARE
Several types of software for remote reading and programming of counter are available.

TECHNICAL CHARACTERISTICS

ACCURACY CLASS: Active Energy: Class 0.5s (IEC 62053-22 or IEC62053-21), Reactive energy: Class 2 or 3 (IEC 62053-23 calibrated up to 1%); Apparent Energy 1%
MEASURED VOLTAGE (V): Multi-range 57-240V + / -20% (phase / neutral)
MEASURED CURRENT (A): Direct Connect 5 (60), 5 (120) - connection with CT: 1 (1.2) A, 1 (2) A, 1 (6) A, 5 (6) A, 5 (10) A, 5 (20) A
OUTPUT: up to 8 outputs including the I/O Module - Type: photo-MOS relays floating up to 1 km
      Admitted load: 25VA (100mA, 250VAC) - pulse duration from 10 ms to 2500 ms
INPUT: max 6 inputs included the input on the module I / O (80-240VAC)
COMMUNICATIONS: IR ,9600 baud max – RS232 max 19200 baud- RS485 max 19200 baud (protocols IEC62056-21, IEC60870-102-5, DLMS /COSEM)
LED: pulse frequency less than or equal to 40Hz – Pulse duration 14ms or 30ms about
REAL TIME CLOCK: - IEC61038 accuracy, 6 ppm = less than or equal to + / - 3 minutes per year - Super Cap 1F for a minute of 250h backup
      - Lithium battery with 10 years of operational reserve and duration of about 20 years
EMC VALUES: - Electrostatic discharge 15kV(IEC50801-2) - Electromagnetic field 10V / m (IEC50801-3) – HF Interference (Burst tests) 4kV (IEC50801-4)
      - Dielectric strength 4kVrms 50 Hz for one minute - 6kV voltage shock, 1.2 / 50 microseconds
TEMPERATURE (IEC62053-22): operating -20 ° C. ....+ 60 ° C / storage -30 ° C ... +70 ° C
INSTALLATION: DIN43857 - 327x177x90mm - 1.4 kg - UL94 (94V0) - IP53

kWh-METER ZMD405-CT / ZMD410-CT
LANDIS+GYR

WITH REMOTE SIGNAL, "MID" STD   **UTF CERTIFICATION**

UTF certification is available for Italian market. Under request is possible to obtain certifications for other markets. Based on the industrial tradition, Landis + Gyr is now in production with the latest generation of kWh-meters. Counters that have a new hardware platform, combining modern technology with the features now demanded by the market. These counters record the consumption of Active and Reactive Energy in three phase systems with three and four-wire, and are the answer to a wide range of specific requirements; from a simple counter to the more complex, with full functionality and the possibility of data acquisition with sophisticated control of flexible tariffs in big industrial plants. They are equipped with communication unit modular "plug and play" which provide the right choice at any time.

VOLTAGE:
Rated voltage Vn ZMD400xT : from 3 x 58/100 V to 69/120 V; from 3 x 110/190 V from 133/230 V, from 3 x 220/380 V to 240/415 V
Voltage Range: from 80% to 115%

FREQUENCY
Rated frequency Fn: 50 or 60 Hz
Tolerance: ± 2%

SPECIFIC DATA STANDARDS IEC
Nominal Current In: 1 A, 2 A, 5 A, 5 I I 1 A
Maximum current Imax: Metrological 2 A, 5 A 200% In ; metrological 1 A 2 A, 10 A; metrological 5 I I 1 A 6 A: Thermic 1 A, 2 A, 5 A, 5 I I 1 A 12 A
Short circuit current: 0.5 sec with 20 x Imax

PRECISION MEASUREMENT
ZxD405CT: Active Energy according to IEC 62053-22 Class 0.5S; Reactive Energy according to IEC 62053-23 Class 1
ZxD410CT: Active Energy Class 1 according to IEC 62053-21, Reactive Energy Class 1 according to IEC 62053-23

STARTING CURRENT
ZxD405CT: In accordance with IEC 0.1%, typical 0.07% In, 5 I I 1 A 1 A as a counter
ZxD410CT: In accordance with IEC 0.1%, typical 0.14% In, 5 I I 1 A 1 A as a counter

SPECIFIC DTA STANDARD "MID"
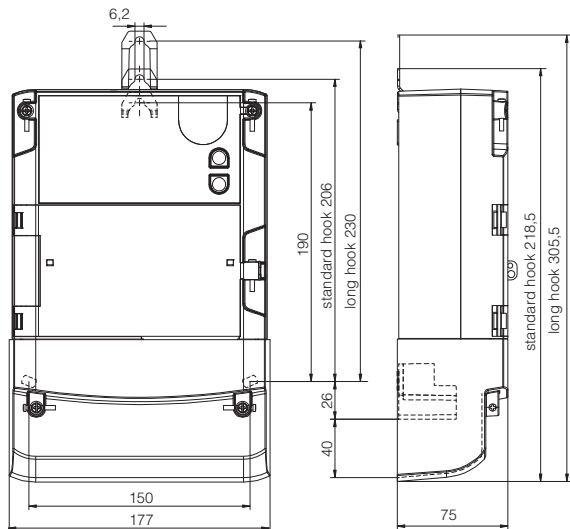Current (for Class B and C): Nominal: 1.0 In, 5.0 A; Minimum: Imin 0.01, 0.05 A, Transient: Itr 0.05, 0.25 A; Maximum Imax 2.0, 10.0 A
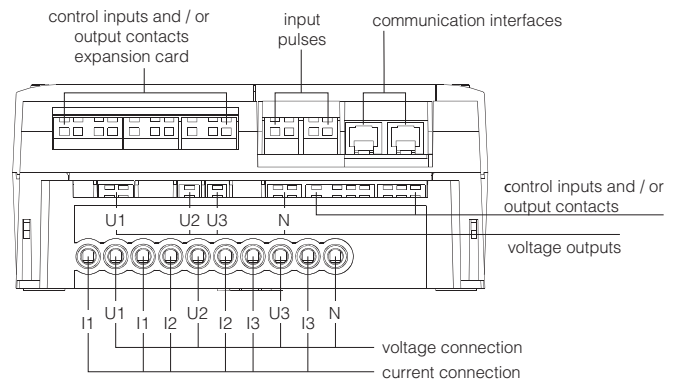Measurement accuracy: in accordance with EN 50470-3
ZxD400CT Class B and C:
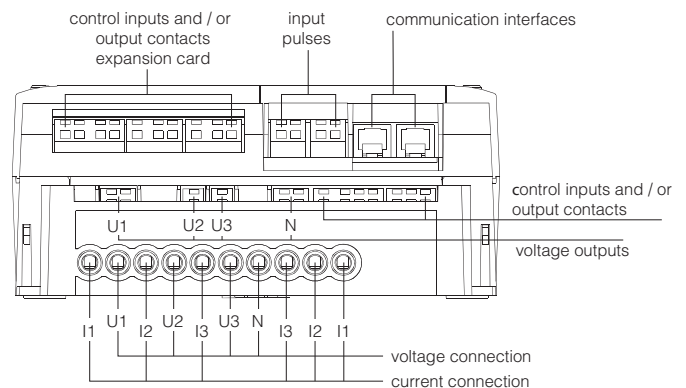Starting current Ist: Class B from 0,002 to 0,01 A; Class C from 0,001 to 0,005 A

DIMENSIONS in mm (standard terminal cover)
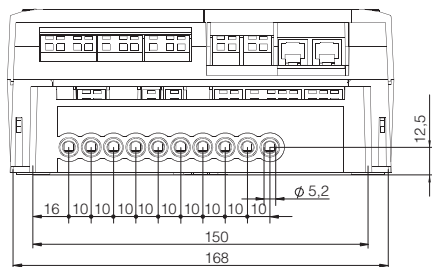
TERMINALS

Terminals diagram DIN standards

Symmetrical terminals diagram(option for ZND400 only)

EXAMPLES OF INSTALLATION AND CERTIFICATION

In the following pages are some examples of installation and certification.

NOTE: If the installation were provided for medium voltage transformers, contact the technical department of Revalco for quotations and explanations, considering that also for these type of devices the certifications are necessary

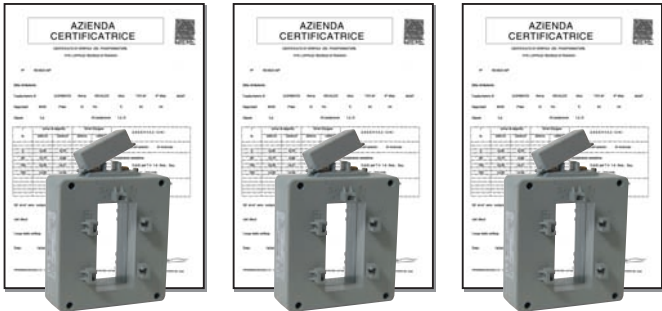## "MID" CERTIFICATION   UTF CERTIFICATION

ELECTRONIC kWh METERS DAB13000   **3**   SYSTEMS

Revalco is able to provide the certification of groups of measure in case the Technical Department of Finance request them. The certification of the whole plant must be requested to the **UTF** competent local offices. In the case of a group of three measurement systems consist of a modular meter (DAB13000) and **three current transformers**, 5 certificates are necessary

■ **One for each current transformer used (in this case 3)**   **One for the complex transformers+ kWh-meter**

■ **One for the kWh-meter**
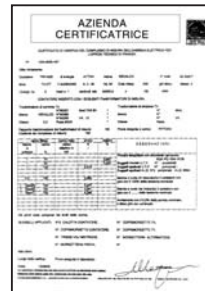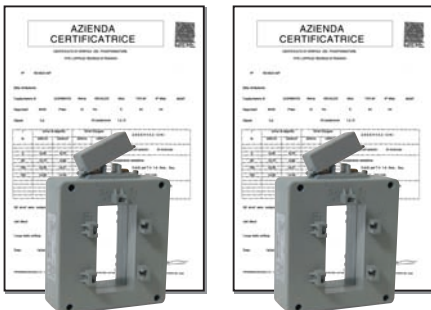
DAB13000

DAB13000

ELECTRONIC kWh METERS DAB13000   **2**   SYSTEMS

When the measurement group to be certified is in **two systems**, 4 certificates are required as the CT are only two, using a modular counter DAB13000

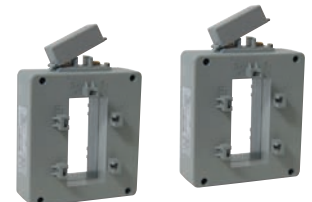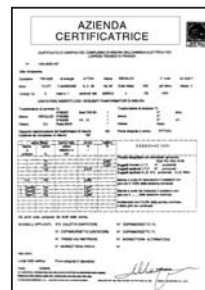■ **One for each current transformer used (in this case 2)**   **One for the complex transformers+ kWh-meter**

■ **One for the kWh-meter**

DAB13000

DAB13000

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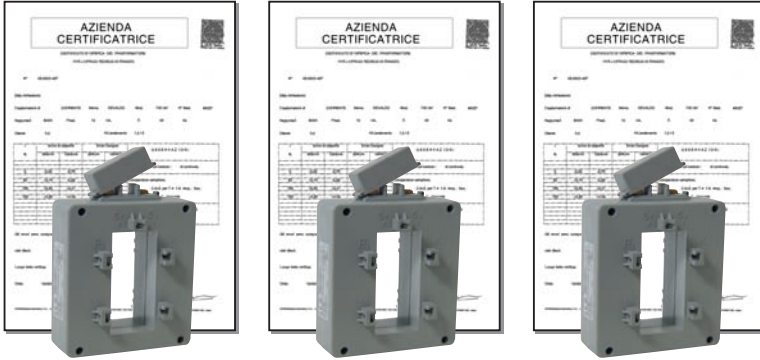# "MID" CERTFICATION + REMOTE SIGNAL

UTF CERTIFICATION

ELECTRONIC kWh METERS ③ SYSTEMS

Revalco is able to provide the certification of groups of measure in case the Technical Department of Finance request them. The certification of the whole plant must be requested to the **UTF** competent local offices. In the case of a group of **three measurement systems** consist of a modular meter (3MT830 or 3MT831 or ZMD405CT or ZMD410CT) and three current transformers; 5 certificates are necessary

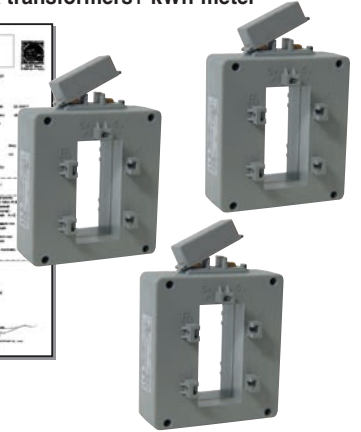▬ **One for each current transformer used (in this case 3)**

▬ **One for the complex transformers+ kWh-meter**

▬ **One for the kWh-meter**

3MT830 **3MT831**	**ZMD405CT** **ZMD410CT**

or

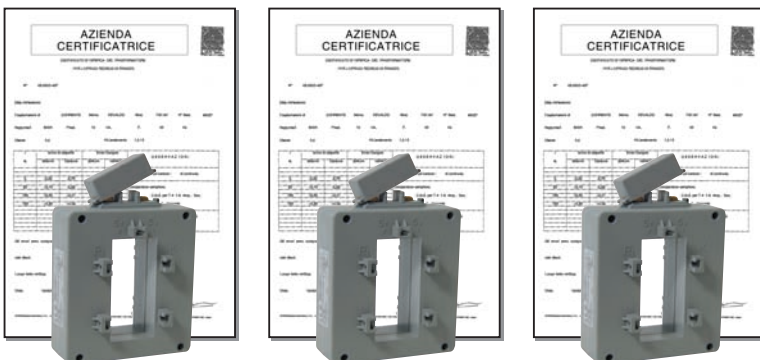|	
3MT830 **3MT831**	**ZMD405CT** **ZMD410CT**

or

ELECTRONIC kWh METERS ② SYSTEMS

When the measurement group to be certified is in **two systems**, 4 certificates are required as the CT are only two, using a modular counter DAB13000

▬ **One for each current transformer used (in this case 2)**

▬ **One for the complex transformers+ kWh-meter**

▬ **One for the kWh-meter**

3MT830 **3MT831**	**ZMD405CT** **ZMD410CT**

or

3MT830 **3MT831**	**ZMD405CT** **ZMD410CT**

or

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