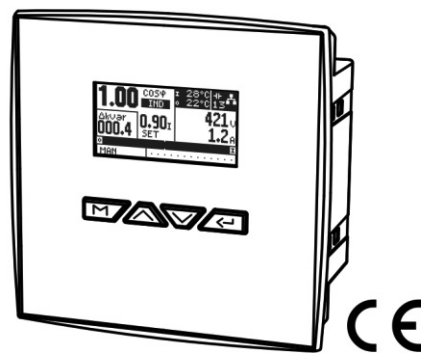




MICROIDEA

# POWER FACTOR CONTROLLER LCD



V0.5-EN\_12-12-2018 - FW 01.09

## EPFCB - INSTALLATION MANUAL

### GB !!! WARNING !!!



- Carefully read the documentation before the installation or use.
- This equipment is to be installed by qualified personnel, complying to current standards, to avoid damages or safety hazards.
- Before any maintenance operation on the device, remove all the voltages from measuring and supply inputs and short-circuit the CT input terminals.
- The manufacturer cannot be held responsible for electrical safety in case of improper use of the equipment.
- Products illustrated herein are subject to alteration and changes without prior notice. Technical data and descriptions in the documentation are accurate, to the best of our knowledge, but no liabilities for errors, omissions or contingencies arising there from are accepted.
- A circuit breaker must be included in the electrical installation of the building. It must be installed close by the equipment and within easy reach of the operator.
- It must be marked as the disconnecting device of the equipment: IEC /EN 61010-1 § 6.11.2.
- Clean the device with a soft dry cloth; do not use abrasives, liquid detergents or solvents.

### FR !!! ATTENTION !!!



- Lire attentivement le documentation avant toute utilisation et installation.
- Ces appareils doivent être installés par un personnel qualifié, conformément aux normes en vigueur en matière d'installations, afin d'éviter de causer des dommages à des personnes ou choses.
- Avant toute intervention sur l'instrument, mettre les entrées de mesure et d'alimentation hors tension et court-circuiter les transformateurs de courant.
- Le constructeur n'assume aucune responsabilité quant à la sécurité électrique en cas d'utilisation impropre du dispositif.
- Les produits décrits dans ce document sont susceptibles d'évoluer ou de subir des modifications à n'importe quel moment. Les descriptions et caractéristiques techniques du catalogue ne peuvent donc avoir aucune valeur contractuelle.
- Un interrupteur ou disjoncteur doit être inclus dans l'installation électrique du bâtiment. Celui-ci doit se trouver tout près de l'appareil et l'opérateur doit pouvoir y accéder facilement. Il doit être marqué comme le dispositif d'interruption de l'appareil : IEC/ EN 61010-1 § 6.11.2.
- Nettoyer l'appareil avec un chiffon doux, ne pas utiliser de produits abrasifs, détergents liquides ou solvants.

### DE !!! ACHTUNG !!!



- Dieses Dokumentation vor Gebrauch und Installation aufmerksam lesen.
- Zur Vermeidung von Personen- und Sachschäden dürfen diese Geräte nur von qualifiziertem Fachpersonal und unter Befolgung der einschlägigen Vorschriften installiert werden.
- Vor jedwem Eingriff am Instrument die Spannungszufuhr zu den Messeingängen trennen und die Stromwandler kurzschließen.
- Bei zweckwidrigem Gebrauch der Vorrichtung übernimmt der Hersteller keine Haftung für die elektrische Sicherheit.
- Die in dieser Broschüre beschriebenen Produkte können jederzeit weiterentwickelt und geändert werden. Die im Katalog enthaltenen Beschreibungen und Daten sind daher unverbindlich und ohne Gewähr.
- In die elektrische Anlage des Gebäudes ist ein Ausschalter oder Trennschalter einzubauen.
- Dieser muss sich in unmittelbarer Nähe des Geräts befinden und vom Bediener leicht zugänglich sein. Er muss als Trennvorrichtung für das Gerät gekennzeichnet sein: IEC/ EN 61010-1 § 6.11.2.
- Das Gerät mit einem weichen Tuch reinigen, keine Scheuermittel, Flüssigreinerer oder Lösungsmittel verwenden.

### ES !!! ADVERTENCIA !!!



- Leer atentamente las documentación antes de instalar y utilizar el regulador.
- Este dispositivo debe ser instalado por personal cualificado conforme a la normativa de instalación vigente a fin de evitar daños personales o materiales.
- Antes de realizar cualquier operación en el dispositivo, desconectar la corriente de las entradas de alimentación y medida, y cortocircuitar los transformadores de corriente.
- El fabricante no se responsabilizará de la seguridad eléctrica en caso de que el dispositivo no se utilice de forma adecuada.
- Los productos descritos en este documento se pueden actualizar o modificar en cualquier momento. Por consiguiente, las descripciones y los datos técnicos aquí contenidos no tienen valor contractual.
- La instalación eléctrica del edificio debe disponer de un interruptor o disyuntor. Éste debe encontrarse cerca del dispositivo, en un lugar al que el usuario pueda acceder con facilidad. Además, debe llevar el mismo marcado que el interruptor del dispositivo (IEC/ EN 61010-1 § 6.11.2).
- Limpiar el dispositivo con un trapo suave; no utilizar productos abrasivos, detergentes líquidos ni disolventes.

### RO !!! AVERTIZARE !!!



- Citiți cu atenție documentația înainte de instalare sau utilizare.
- Acest echipament va fi instalat de personal calificat, în conformitate cu standardele actuale, pentru a evita deteriorări sau pericole.
- Înainte de efectuarea oricărei operațiuni de întreținere asupra dispozitivului, îndepărtați toate tensiunile de la intrările de măsurare și de alimentare și scurtcircuitați bornele de intrare CT.
- Producătorul nu poate fi considerat responsabil pentru siguranța electrică în caz de utilizare incorectă a echipamentului.
- Produsele ilustrate în prezentul sunt supuse modificărilor și schimbărilor fără notificare anterioară. Datele tehnice și descrierile din documentație sunt precise, în măsura cunoștințelor noastre, dar nu se acceptă nicio răspundere pentru erorile, omisiunile sau evenimentele neprevăzute care apar ca urmare a acestora.
- Trebuie inclus un disjuncteur în instalația electrică a clădirii. Acesta trebuie instalat aproape de echipament și într-o zonă ușor accesibilă operatorului. Acesta trebuie marcat ca fiind dispozitivul de deconectare al echipamentului: IEC/EN 61010-1 § 6.11.2.
- Curățați instrumentul cu un material textil moale și uscat; nu utilizați substanțe abrazive, detergenți lichizi sau solvenți.

### TR !!! DİKKAT !!!



### IT !!! ATTENZIONE !!!



- Leggere attentamente la documentazione prima dell'utilizzo e l'installazione.
- Questi apparecchi devono essere installati da personale qualificato, nel rispetto delle vigenti normative impiantistiche, allo scopo di evitare danni a persone o cose.
- Prima di qualsiasi intervento sullo strumento, togliere tensione dagli ingressi di misura, di alimentazione e cortocircuare i trasformatori di corrente.
- Il costruttore non si assume responsabilità in merito alla sicurezza elettrica in caso di utilizzo improprio del dispositivo.
- I prodotti descritti in questo documento sono suscettibili in qualsiasi momento di evoluzioni o di modifiche.
- Le descrizioni ed i dati a catalogo non possono pertanto avere alcun valore contrattuale.
- Un interruttore o disgiuntore va compreso nell'impianto elettrico dell'edificio. Esso deve trovarsi in stretta vicinanza dell'apparecchio ed essere facilmente raggiungibile da parte dell'operatore. Deve essere marchiato come il dispositivo di interruzione dell'apparecchio: IEC/ EN 61010-1 § 6.11.2.
- Pulire l'apparecchio con panno morbido, non usare prodotti abrasivi, detergenti liquidi o solventi.

### CZ !!! UPOZORNĚNÍ !!!



- Dokumentace se pozorně přečtete, než začnete instalovat a používat.
- Tato zařízení smí instalovat kvalifikovaní pracovníci v souladu s platnými předpisy a normami pro předcházení úrazů osob či poškození věcí.
- Před jakýmkoli zásahem do přístroje odpojte měřicí a napájecí vstupy od napětí a zkratujte transformátory proudu.
- Výrobce nenese odpovědnost za elektrickou bezpečnost v případě nevhodného používání regulátoru.
- Výrobky popsané v tomto dokumentu mohou kdykoli projít úpravami či dalším vývojem. Popisy a údaje uvedené v katalogu nemají proto žádnou smluvní hodnotu.
- Spínač či odpojovač je nutno zabudovat do elektrického rozvodu v budově. Musejí být nainstalované v těsné blízkosti přístroje a snadno dostupné pracovníku obsluhy. Je nutno ho označit jako vypínač zařízení přístroje: IEC/ EN 61010-1 § 6.11.2.
- Přístroj čistěte měkkou utěrkou, nepoužívejte abrazivní produkty, tekutá čisticí či rozpouštědla.

### PL !!! UWAGA !!!



- Przed użyciem i instalacją urządzenia należy uważnie przeczytać dokumentację.
- W celu uniknięcia obrażeń osób lub uszkodzenia mienia tego typu urządzenia muszą być instalowane przez wykwalifikowany personel, zgodnie z obowiązującymi przepisami.
- Przed rozpoczęciem jakichkolwiek prac na urządzeniu należy odłączyć napięcie od wejść pomiarowych i zasilania oraz zewrzeć zaciski przekładnika prądowego.
- Producent nie przyjmuje na siebie odpowiedzialności za bezpieczeństwo elektryczne w przypadku niewłaściwego użytkowania urządzenia.
- Produkty opisane w niniejszym dokumencie mogą być w każdej chwili udoskonalone lub zmodyfikowane. Opisy oraz dane katalogowe nie mogą mieć w związku z tym żadnej wartości umownej.
- W instalacji elektrycznej budynku należy uwzględnić przełącznik lub wyłącznik automatyczny. Powinien on znajdować się w bliskim sąsiedztwie urządzenia i być łatwo osiągalny przez operatora. Musi być oznaczony jako urządzenie służące do wyłączania urządzenia: IEC/ EN 61010-1 § 6.11.2.
- Urządzenie należy czyścić miękką szmatką, nie stosować środków ściernych, płynnych detergentów lub rozpuszczalników.

### RU !!! ПРЕДУПРЕЖДЕНИЕ !!!

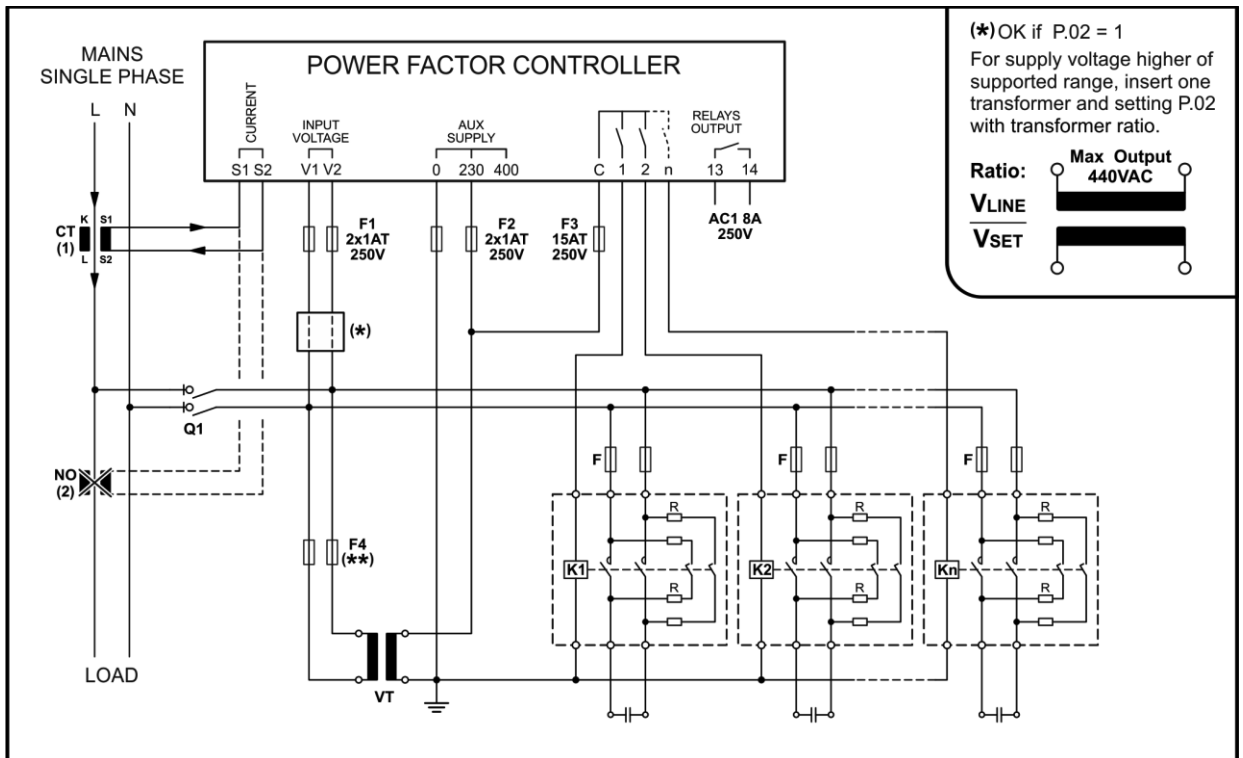


- Прежде чем приступать к монтажу или эксплуатации устройства, внимательно ознакомьтесь содержанием настоящего документация.
- Во избежание травм или материального ущерба монтаж должен осуществляться только квалифицированным персоналом в соответствии с действующими нормативами.
- Перед проведением любых работ по техническому обслуживанию устройства необходимо обесточить все измерительные и питающие входные контакты, а также замкнуть накоротко входные контакты трансформатора тока (ТТ).
- Производитель не несет ответственность за обеспечение электробезопасности в случае ненадлежащего использования устройства.
- Изделия, описанные в настоящем документе, в любой момент могут подвергнуться изменениям или усовершенствованиям. Поэтому каталожные данные и описания не могут рассматриваться как действительные с точки зрения контрактов.
- Электрическая сеть здания должна быть оснащена автоматическим выключателем, который должен быть расположен вблизи оборудования в пределах доступа оператора. Автоматический выключатель должен быть промаркирован как отключающее устройство оборудования: IEC/ EN 61010-1 § 6.11.2.
- Очистку устройства производить с помощью мягкой сухой ткани, без применения абразивных материалов, жидких моющих средств или растворителей.

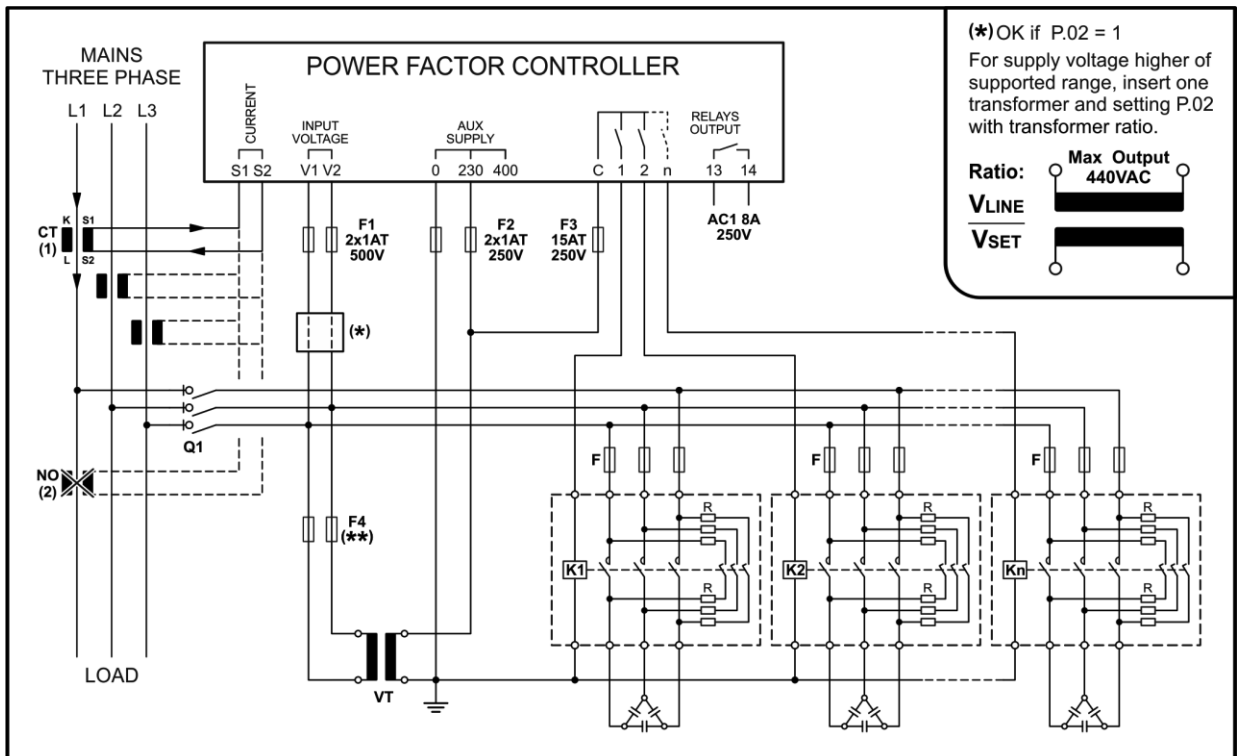


# TYPICAL WIRING DIAGRAM (for reference purposes only)

Standard mono-phase installation



Standard three-phase installation



Q1 - The installer has to provide an external disconnection device; this breaker has to be easily reachable and identified as "disconnection device".

(\*) - See note in the box in the upper right corner of the wiring diagrams.

(\*\*) - The value has to be calculated according to the VT used.

**NOTE:** The transformer VT is used:

- To isolate the controller aux circuit from the main circuit.
- When coil voltage of the contactors are different from the main voltage network.

(1) Setting polarity of CT current in Advanced Menu A.02

(2) On wrong connection, the measured  $\cos\phi$  remain constant when we switch on the banks.

It is necessary to change the connection of CT before to connect it to a phase or a signal.

## FIRST POWER-UP



At the first power up you will be asked for the language to be used.

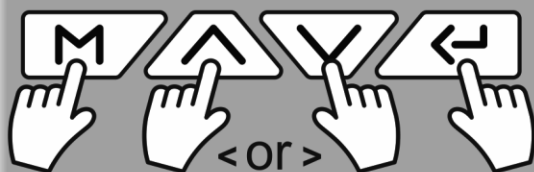
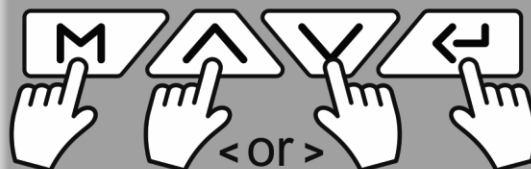
Use to select.

Press to go to next config step.

Set the CT value using .

Press for next page.

Press to go back.



Set the input measure data:

- Use to select the connection type.

- Press to go to voltage value.

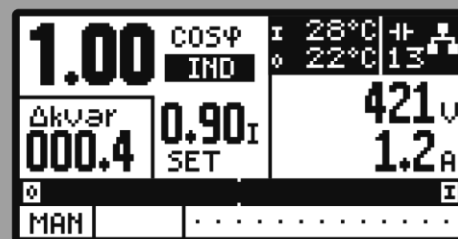
- Use to set the desired value.

Press to save and exit.

Press to discard and go back to the previous page.

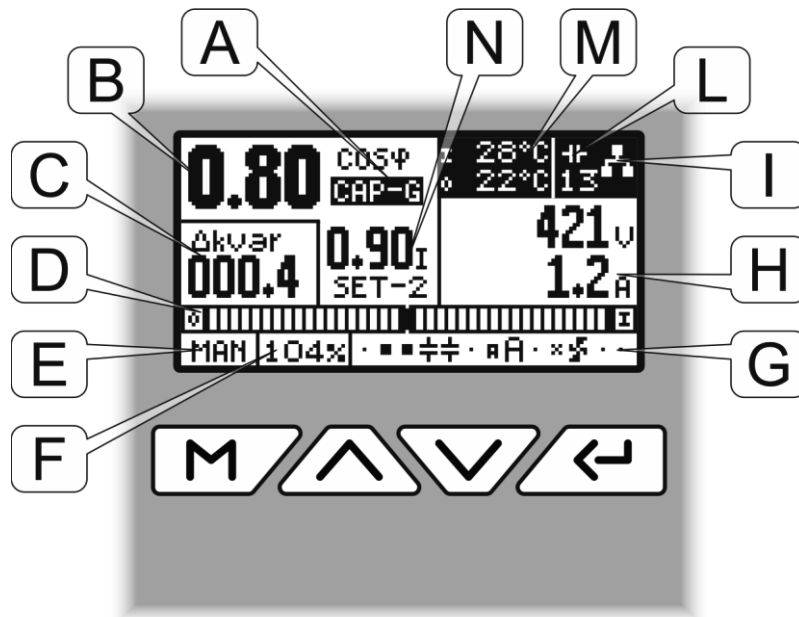
Now the instrument shows the home page with the system info; by the colored backlight keyboard, now is also possible to know the instant status of the installation:

- RED: Alarm (read the display alarm and act consequently).
- YELLOW: actual de-insertion or insertion of a bank.
- GREEN: normal working condition.





To obtain a complete configuration you need to settle all the other sensitive parameters too.

## HOME PAGE



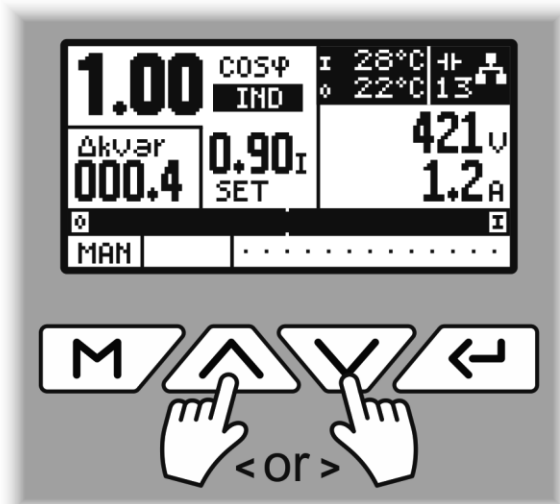
- A** 4 quadrant indication:
- IND: inductive load.
  - CAP: capacitive load.
  - IND-G: inductive generator.
  - CAP-G: capacitive generator.
- B** Instant  $\text{Cos}\phi$  value.
- C** Reactive power needed to get the desired  $\text{Cos}\phi$ .
- D** Graphic bar to indicate the number of banks involved to get the desired  $\text{Cos}\phi$ .  
Disconnected (◻ out) / Connected (◻ in).
- E** MODES:  
MAN: allows to act on the insertions manually.  
Press  $\leftarrow$  for 1s an arrow indicates the selected step.  
Scroll using  $\wedge$   $\vee$ , press  $\leftarrow$  to act on the steps.  
AUTO: Automatic mode (suggested) allow the instrument to follow precisely the settled  $\text{Cos}\phi$ .  
Press  $\boxed{M}$  for 1s to switch between modes.
- IMPORTANT: it's possible to access the settings menu only in MAN mode.
- F** Capacitors overload value (%).
- G** Step config visualization:
- Not configured or not present step.
  - Disconnected step.
  - ⚡ Connected step (blinks during connection).
  - \* Fan configured step.
  - ⚡ Fan step in ON mode.
  - ▣ Configured step for contact NO.
  - ▢ Configured step for contact NC.
- H** Instant current and voltage.
- I** Ethernet module (optional) - Blinks when active.
- L** Max number of steps available.
- M** Temperature indications:
- ◻ Internal (instrument).
  - ◻ External (using an optional probe).  
Config parameter A.13
- N**  $\text{Cos}\phi$  value:
- SET: main  $\text{Cos}\phi$ .
  - SET-G: main  $\text{Cos}\phi$  in generator quadrant.
  - SET-2: secondary  $\text{Cos}\phi$ , config parameter A.13 as remote input from external contact.



## NAVIGATION PAGES

Press   to scroll the pages:



- HOME PAGE
- POWER / ENERGY
- VOLTAGE HARMONICS
- CURRENT HARMONICS
- GRAPHS ( V / I / V+I )
- MAXIMUM VALUES (recording)
- INFO STEPS
- SETTINGS
- ALARMS

If no key is pressed for **30s**, the instrument goes back to the home page unless the instrument is into a config page. In this case a timeout is configurable by using A.11 parameter.



When the  symbol appears as in picture, press  to access to menus or extra pages.




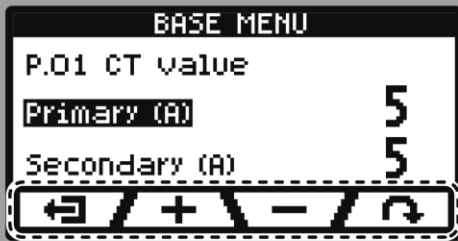
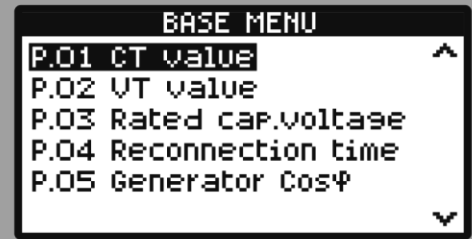
When the scroll arrows appear, using   you can scroll through the menu items or view additional pages.











Example:  
Go to "BASE MENU" and press  to access the settings of the related parameters.











Within each Menu, after selecting the desired item, press  to access the configuration of the related parameters.

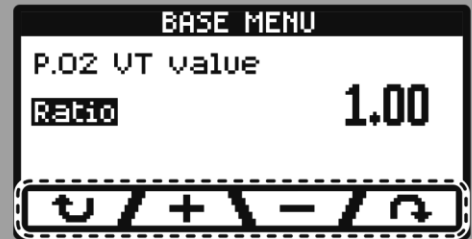


In the initial configuration pages the display show a virtual keyboard that indicates the change of function of the keys:









-  return to menu (  )
-  increase the value or change the data (  )
-  decrease the value or change the data (  )
-  go to the next parameter (  )

In the intermediate pages press:

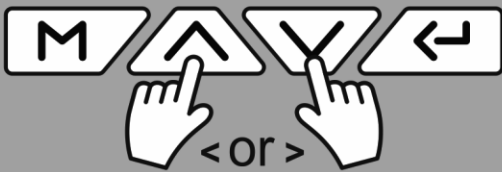
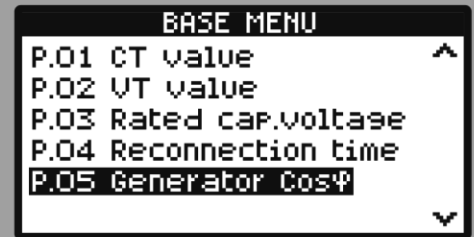
-  go to previous parameter (  ) if pressed for 1s returns to menu.
-  increase the value or change the data (  )
-  increase the value or change the data (  )
-  go to the next parameter (  )



On the final pages press:

-  go to previous parameter (  ) if pressed for 1s returns to menu.
-  increase the value or change the data (  )
-  increase the value or change the data (  )
-  return to menu (  )

Now press **M** to go back to the settings menu.



If you have changed the values or settings, when prompted to save, press **^** to confirm or **v** to cancel.

Press **M** again to return to navigation pages.



The illustrated actions are also valid for the other items in the settings menu.

## POWER / ENERGY

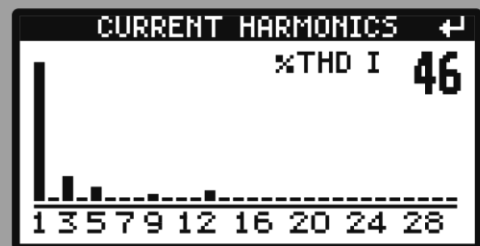
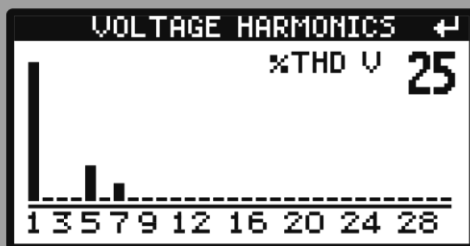
	POWER	ENERGY	
Active power	2.977 kW	0.453 kW/h	Active energy
Reactive power	0.137 kvar	0.040 kvar/h	Reactive energy
Apparent power	2.980 kVA	0.456 kVA/h	Apparent energy



Press for 10s to reset the energy counters.

## VOLTAGE / CURRENT HARMONICS

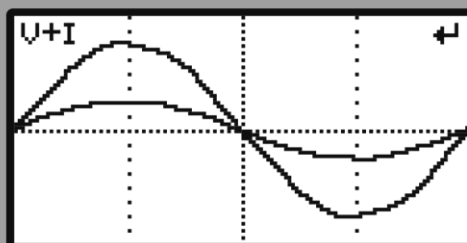
Here is indicated respectively the voltage and current %THD distortion by the use of vertical bars for each harmonic up to the 30th.



Press to show details of the single harmonics, use to scroll page.

## GRAPHS

This is a real time waveform representation.

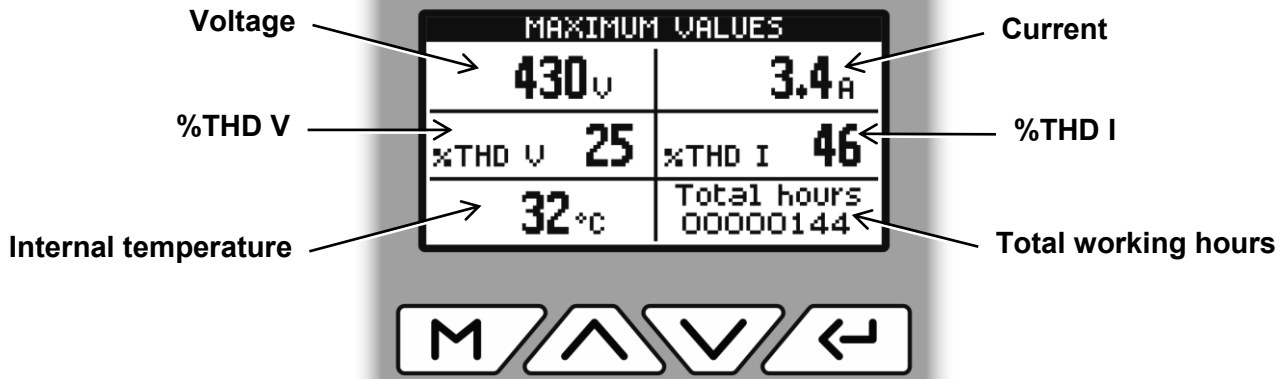


Press repeatedly to scroll voltage, current or both waves simultaneously.



## MAXIMUM VALUES

In this page the maximum values recorded of voltage, current, %THD V and %THD I are indicated.



## INFO STEP

This page shows details of configurations and working cycles of every configured and connected step.

	A	B	C	D
STEP   kvar   h   IN*ins.				
+ 1	11.02	23	122	^
+ 2	5.514	34	297	
+ 3	11.02	10	75	
+ 4	1.102	2	13	
+ 5	0.000	0	0	v

M
^
v
←

< or >

- A - Step number.
- B - Nominal reactive power.
- C - Working hours.
- D - Insertion number.

Press ← to enter the page, use ^ v to scroll all the steps data.

Once accessed the page, press ← for **10s** to reset the step data.

## SETTINGS

### QUICK MENU:

DESCRIPTION	RANGE	DEFAULT	UM
Desired Cosφ	0.90 CAP...0.85 IND	0.90 IND	Cosφ
Sensitivity	5...600	30	s
Language	ENGLISH / ITALIAN / SPANISH	ENGLISH	-

### BASE MENU:

CODE	DESCRIPTION	RANGE	DEFAULT	UM	
<b>P.01</b>	CT value	Primary	0 / 5...10000	5	A
		Secondary	1 / 5	5	A
<b>P.02</b>	VT value ( $V_{LINE}/V_{SET}=500/400=1.25$ )	Ratio	0.40...100.00	1.00	-
<b>P.03</b>	Rated cap.voltage	Volt	80...65000	400	V
<b>P.04</b>	Reconnection time (capacitors discharge)	Seconds	1...600	180	s
<b>P.05</b>	Generator Cosφ	Cosφ	DISABLED / 0.80 IND...0.80 CAP	DISABLED	Cosφ

### ADVANCED MENU:

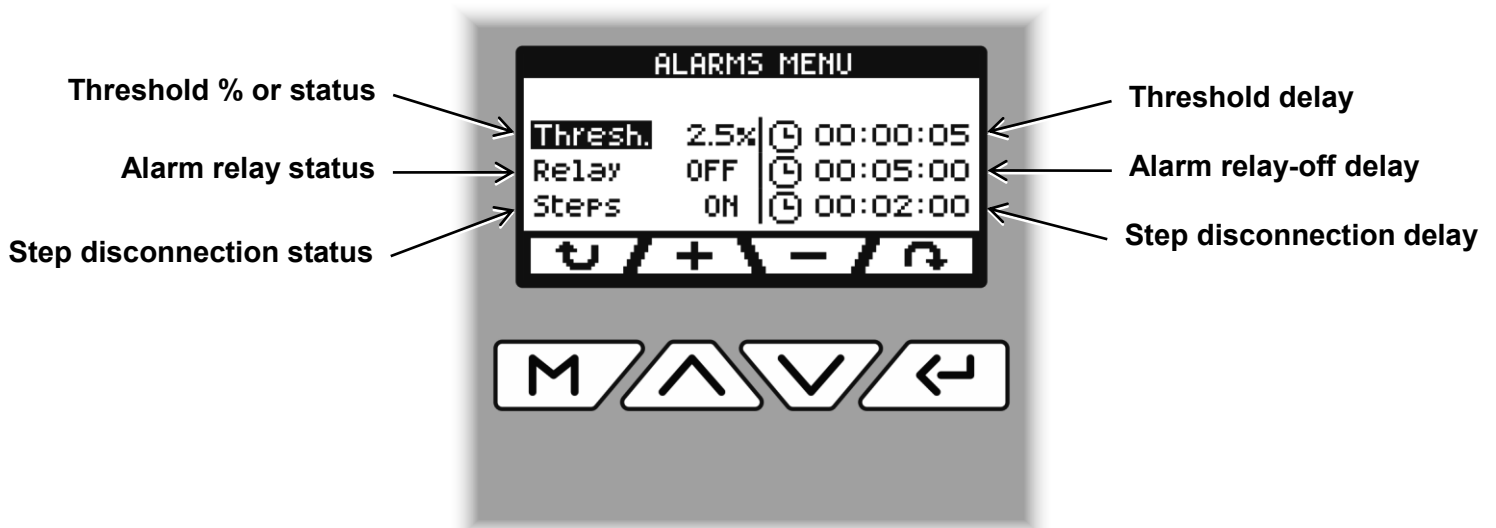
CODE	DESCRIPTION	RANGE	DEFAULT	UM	
<b>A.01</b>	Connection	Type	SINGLE-PHASE    THREE-PHASE	THREE-PHASE	-
		Phase	L-N    L1-L2 / L2-L3 / L3-L1	L2-L3	-
		Volt	220...440	400	V
<b>A.02</b>	CT configuration	Phase	L1 - DIRECT / REVERSE L2 - DIRECT / REVERSE L3 - DIRECT / REVERSE	L1 - DIRECT	-
<b>A.03</b>	Frequency	Hz	50 / 60	50	Hz
<b>A.04</b>	Data communication	Type	RS485 / ETHERNET	RS485	-
<b>A.05</b>	RS485	Address	DISABLED / 1...199	1	n°
		Protocol	MODBUS / PROPRIETARY	PROPRIETARY	-
		Bauds	1200 / 2400 / 4800 / 9600 / 19200	9600	Bd
		Parity	EVEN / ODD / NONE	EVEN	-
		Delay (TX<->RX)	0...9999	100	ms
<b>A.06</b>	Ethernet	IP address	000...255	192.168.000.100	-
		Gateway	000...255	192.168.000.001	-
		Port	0...65535	502	-
<b>A.07</b>	Temperature	Measure unit	°C / °F	°C	-
		Min threshold	1...240	30	°C
		Max threshold	1...240	50	°C
<b>A.08</b>	Fixed step	Step number	DISABLED / 1...13	DISABLED	n°
		Mode	NORMAL / WITH CALCULATIONS	NORMAL	-
<b>A.09</b>	Antihunting	Cosφ threshold	DISABLED / 0.90 IND...0.95 CAP	DISABLED	Cosφ
<b>A.10</b>	Steps insertion	Delay (s)	1.0...5.0	1.0	s
<b>A.11</b>	Home return time	Delay (s)	DISABLED / 5...180	30	s
<b>A.12</b>	Backlight	Display	Timed / Always ON	Timed	-
		Keyboard	ON / OFF	ON	-
<b>A.13</b>	Extern. probe input	Mode	DISABLED / TEMPERATURE PROBE / ENABLE 2nd Cosφ	DISABLED	-
		Desired Cosφ	0.85 IND...0.90 CAP	0.90 IND	Cosφ
<b>A.14</b>	Contrast	Value	0...8	7	-



## ALARM MENU (DEFAULT):

Description	Threshold	Time hh:mm:ss	Alarm Relay	Steps
Too high voltage	10%	00:15:00	ON	ON
Too low voltage	15%	00:00:05	ON	OFF
Too high current	110%	00:02:00	ON	OFF
Too low current	2.5%	00:00:05	ON	ON (00:02:00)
Overcompensation	ON	00:02:00	ON	OFF
Undercompensation	ON	00:15:00	ON	OFF
Overtemperature	45°C	00:00:10	ON	OFF
THD V	OFF	00:00:00	ON	OFF
THD I	OFF	00:00:00	ON	OFF
Too low Cosφ	OFF	00:01:00	ON	OFF
External overtemperature	OFF	00:00:10	ON	OFF
Capacitors overload <sup>(1)</sup>	Thresh.1 = 125%	00:03:00	ON (00:05:00)	-
	Thresh.2 = 150%	-		
No-Voltage release <sup>(2)</sup>	ON	-	OFF	ON

Alarm page sample with the maximum configurable options:



(1) The delay time of Capacitor overload alarm operates inversely proportional to the overload entity, compared to the programmed thresholds of Thresh.1 and Thresh.2.

When the overload is lower than Thresh.1 the alarm will not be generated.

When the overload is equal to Thresh.1, the delay time is equal to the one set.

When the overload increases, the delay time decreases proportionally until it reaches zero once the value set at Thresh.2 is reached.

With Thresh.1 at off, there is no tripping until the Thresh.2 value is exceeded and the immediate disconnection of the steps occurs.

With Thresh.2 at off, the delay time is constant.

Protection is performed through the Steps disconnection and Alarm relay enabling ( if ON ).

The alarm is deactivated only after the value has dropped and stay constantly below the settled threshold for all the Alarm relay-off delay time set. Now the steps are reconnected and the system will work as usual.







**Note:**

This protection can only be used if the capacitors are not equipped with filtering devices such as inductors or similar.

(2) A no-voltage release has occurred on the line voltage inputs for more than 9ms.

## SETTING PASSWORD:

The password is used to block access to settings, in new devices is disabled to allow free access.

- In the Settings Menu select "SET PASSWORD" and press  to access.
- Use   to set the numeric value of the password.
- Press , when prompted to save, press  to confirm or  to cancel.

With the password activated you can only access the Quick Menu, to access all the settings you need to enter the numeric code, access to all menu items will remain active for 5m.

To deactivate the password enter the value 00000 and save.

## SETTING STEPS:

You can set the steps manually or perform automatic acquisition.

- In the Settings Menu select "SET STEPS" and press  to access.

### - Manual adjustment

By accessing this item it is possible to set for each single step the plate value (in kVAr) of the capacity connected to it.

### - Automatic acquisition

This function allows the automatic recognition of the capacities connected to the steps.

Once the automatic acquisition is confirmed, the instrument inserts one step at a time, detects its value and sets it automatically.

Once the acquisition is complete, check that the measured values are correct.

## RS485 / ETHERNET COMMUNICATION (optional)

### DETAIL SETTING RS485:

- 1) In the Advanced Menu select "A.04 Data communication" and press to access.
- 2) Press (↶) to select the voice "Type", now use (+) or (-) to set to RS485 (default), press (↶) again to go to the next parameter A.05.
- 3) Use (↶) or (M) to select the parameter, use (+) or (-) to set the selected value.
- 4) Within the "A.05 RS485" there are the following settings for communication:
  - **Address:** set the device address.
  - **Protocol:** \* Proprietary: to be used for communication with our EPFController software (default).  
\*Modbus: standard Modbus RTU communication protocol.
  - **Bauds:** set the desired serial communication speed (default 9600).
  - **Parity:** set the type of control desired (default EVEN).
  - **Delay:** time between the end of the Master's call and the Slave's response (default 100ms).
- 5) Press (M) for about 1s to return to the parameter list of the Advanced Menu.
- 6) Press and release (M), when prompted to save, press to confirm or to cancel.
- 7) The device will restart, and will be possible to communicate in RS485 with the set parameters.

### DETAIL SETTING ETHERNET (optional):

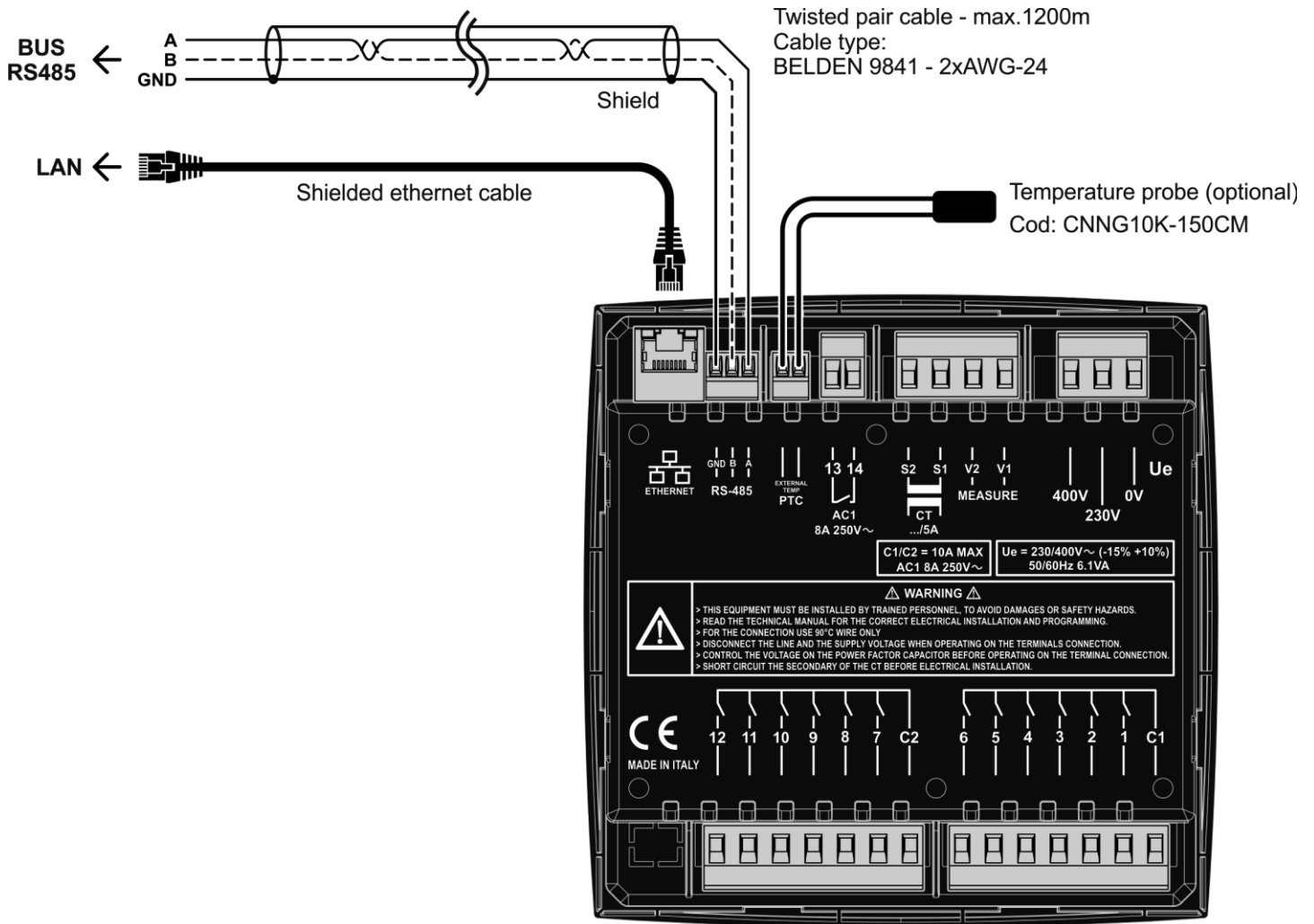
- 1) In the Advanced Menu select "A.04 Data Communication" and press to access.
- 2) Press (↶) to select the voice "Type", now use (+) or (-) to set to ETHERNET (Modbus TCP protocol).
- 3) Press (M) for about 1s to return to the parameter list of the Advanced Menu.
- 4) Select "A.06 Ethernet" and press to access.
- 5) Use (↶) or (M) to select the parameter, use (+) or (-) to set the selected value.
- 6) Within the "A.06 Ethernet" there are the following settings for communication:
  - **IP address:** set an IP address of the network (default 192.168.000.100).
  - **Gateway:** set the IP address of the network gateway (default 192.168.000.001).
  - **Port:** set up TCP for Modbus TCP (default 502).
- 7) Press (M) for about 1s to return to the parameter list of the Advanced Menu.
- 8) Press and release (M), when prompted to save, press to confirm or to cancel.
- 9) The device will restart, and will be possible to communicate in ETHERNET with the set parameters.

## TECHNICAL DATA

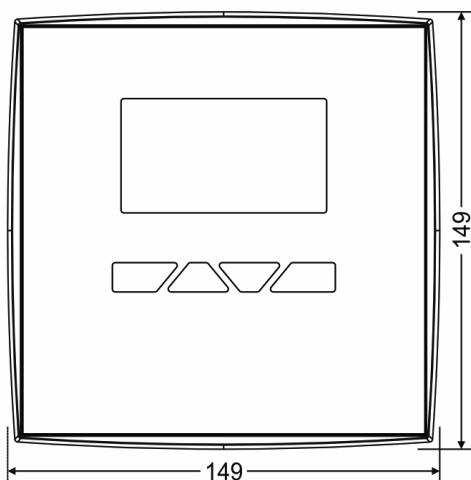
<b>Supply</b>	
Rated voltage	230 / 400 V~
Operating limits	-15%...+10% Ue
Frequency	50 or 60Hz
Power Consumption L/N - 230V~	5.5VA
Immunity time for microbreakings	< 30ms
Measurement/Overtoltage category	Class II
<b>Inputs</b>	
Measuring voltage range	10...460 V~
Measure current range	0.020...5.5A
Measuring method	TRMS
Overload capacity	1.1Ie
Measurement/Overtoltage category	Class II
FFT - Harmonic Spectrum	THD% - 64st
<b>Relay Output</b>	
Number of contact	7 / 13
Contact type	1 NO
Rated current	8A 250V~ AC1
Maximum rated voltage	250V~
Maximum current at contact common	10A (C1/C2) - 8A (13/14)
Insulating category/Rated voltage - VDE0110	C/250 - B/400
Electrical contact Life	20 x 10 <sup>6</sup> ops
Mechanical contact Life	100 x 10 <sup>3</sup> ops
<b>Ambient conditions</b>	
Operating temperature	-20 / +60 °C
Storage temperature	-30 / +70 °C
Operating altitude	up to 2000m
Maximum pollution degree	2
Electrical insulation - mains/contact	4 kV
Relative humidity w/o condensation	95 RH%
<b>Connections and Housing</b>	
Type of terminal	Pluggable
Conductor cable type	only 105°C - 1.5/2.5mm <sup>2</sup> - 16/14 AWG
Enclosure version	Flush mount
Protection degree	IP41 Front - IP20 Terminals
Dimensions	149 x 149 x 68mm
Weight	650...730g
<b>Communication Interface (not opto-isolated)</b>	
RS485 protocol	PROPRIETARY / MODBUS RTU
Ethernet	Optional on request

**EC Directives:** - 2014/30/UE - EMC  
 - 2014/35/UE - LVD

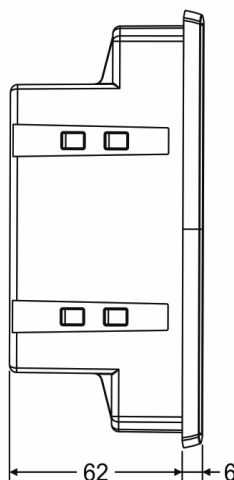
## BACK PANEL CONNECTIONS



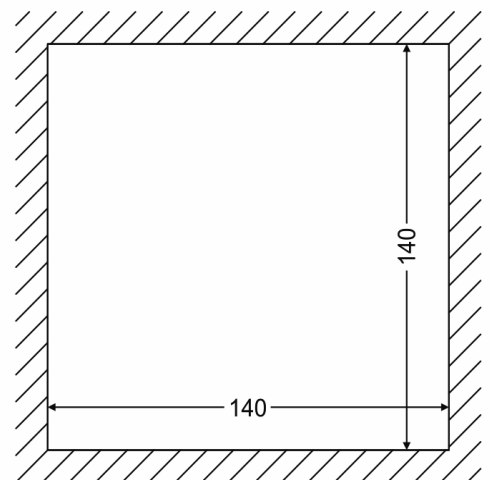
## DIMENSIONS



FRONT VIEW



SIDE VIEW



MOUNTING HOLE