

Iso-4 4 inputs channel residual current monitoring

GENERAL INFORMATION

The Iso-4 allow monitoring the residual current flowing into 4 external toroidal transformer.

The four display is made by three digit red led and show the instantaneous values of currents measured, with automatic scaling.

AVAILABLE TYPES

- **Iso-4** in flush mounted version for panel DIN 96X96mm with minimized depth

MODEL

- ISO-4 4 Current inputs from toroidal current transformer
- ISO-4-485 Same as ISO-4 with EIA-RS485 Modbus interface
- ISO-4-485-A Same as ISO-4 485 with Analog Output 0-20/4-20 mA



ACCESSORIES AND OPTIONS

accessories: transparent cover for protection.

options: external module for more analog or digital outputs (on request)
3rd Harmonic filter

MEASURED PARAMETERS

measured parameters	measuring unit	identification initials				
Residual current	[A]	L1	L2	L3	L4	
Instantaneous maximum residual current	[A]	PEA	L1	L2	L3	L4
Maximum average residual current	[A]	ITH	L1	L2	L3	L4
Average residual current	[A]	AVG	L1	L2	L3	L4

INSTALLATION

INSTRUCTIONS FOR THE USER

Read carefully the instructions/indications contained in this manual before installing and using the instrument.

The instrument described in this manual is intended for use by properly trained staff only.

SAFETY

This instrument has been manufactured and tested in compliance with EN 61010-1 standards. In order to maintain these conditions and to ensure safe operation, the personnel must comply with the indications and markings contained in the manual. When the instrument is received, and before being installed, check that it's ok. And it has not suffered any damage during transport. When starting installation make sure that the operating voltage and mains voltage are compatible with the device instructions. The auxiliary supply shouldn't be earthed. Maintenance and/or repair must be carried out only by qualified and authorized personnel. If there is ever suspicious that there is a lack of safety, during operation, the instrument must be disconnected and cautions taken against accidental use.

Operation is no longer safe when: - The measured values are obviously wrong or unreasonable. / - The instrument doesn't work. / - There is clearly visible damage. / - After serious damages occurred during transport. / - After lengthy storage under unfavourable conditions.

CONNECTIONS

For a correct use of the device, the wiring diagram contained in the present manual, must be respected.
The connections are same for all type:

- auxiliary power supply:

There are 4 screw terminals for the auxiliary supply:

Vac Version	
Terminals	Power Supply
1-2	0-110V = 100-125V 50-60Hz
1-3	0-230V = 220-240V 50-60Hz
1-4	0-400V = 380-415V 50-60Hz

Vac/cc Version	
Terminals	Power Supply
1-3	20-60V

Vac/cc Version	
Terminals	Power Supply
1-3	85-230V

- measurement current inputs:

There are 6+2 terminals for connection with external toroidal transformer (**which use is compulsory**).
Standard model accept inputs until 10A full scale toroidal transformer GBxx/2000 which have ratio 1/2000.

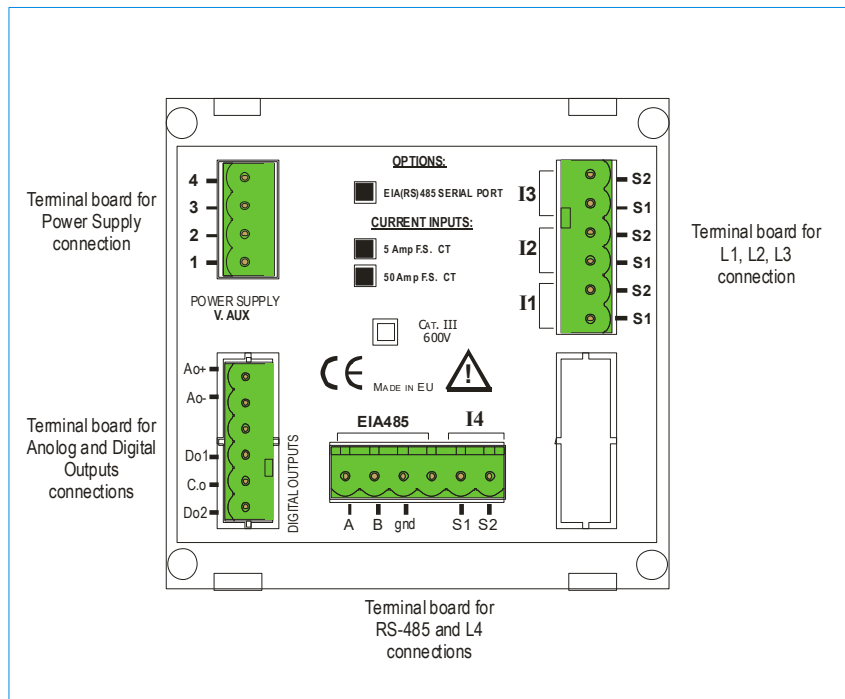
For fixing the flush mount version instrument to the panel, use the fixing devices supplied, by inserting them in the side grooves of the enclosure and tighten the screws.

For safety reasons, place an external fuse protection at the auxiliary voltage supply, and use adequate cables for the working voltages and currents, with a cross sections from 0,5 to 2,5 mm².

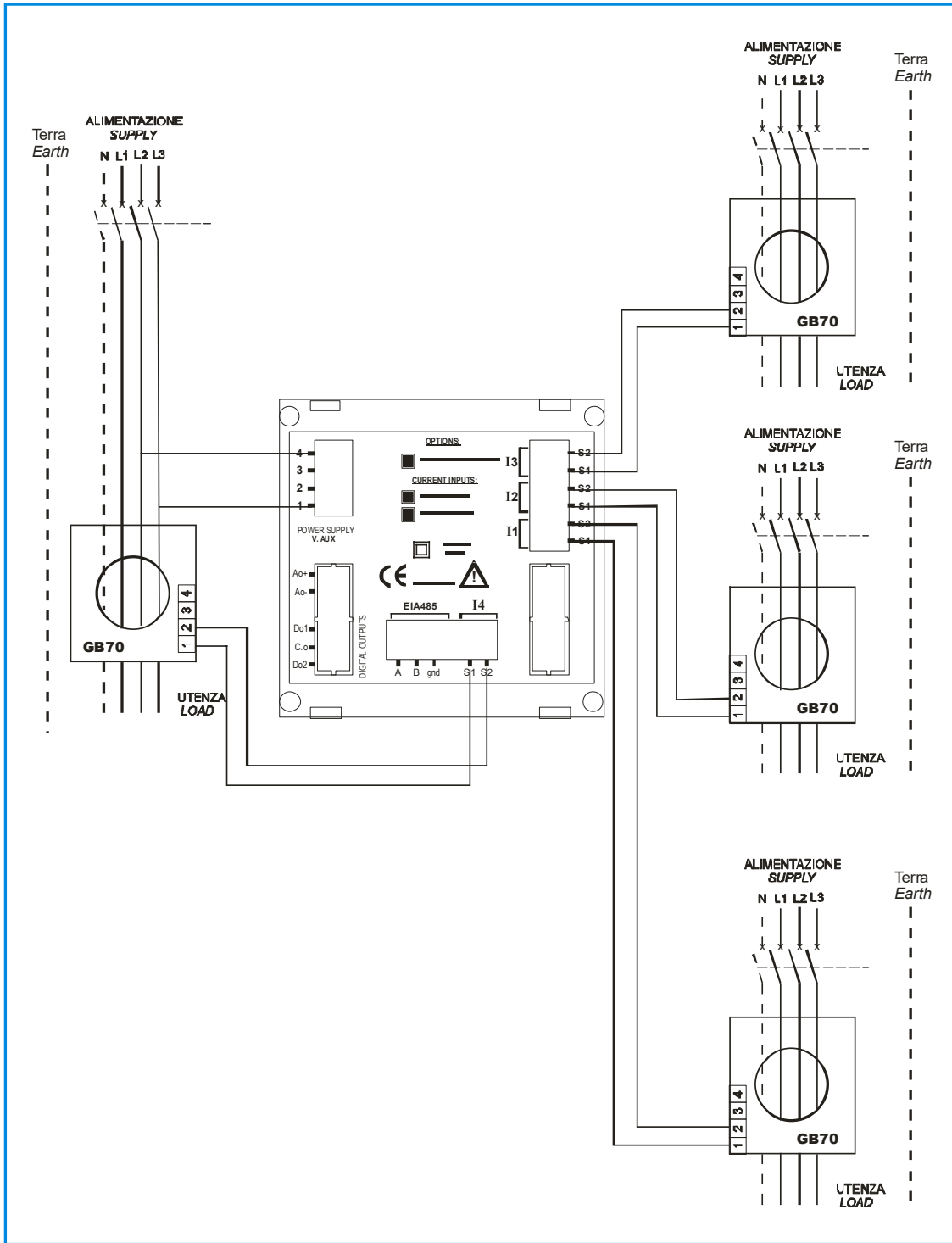
Remarks on the measures

The refresh time of the display is less than one second and it corresponds anyhow to the calculation time of the measures, according to the measuring methodology used, thus providing an easy reading of the values also in presence of sudden variations of the measuring parameters. Should you have any problem, please contact the Technical Assistance.

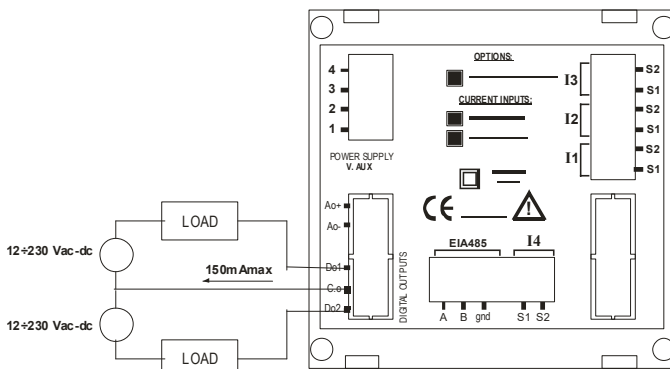
REAR PANEL



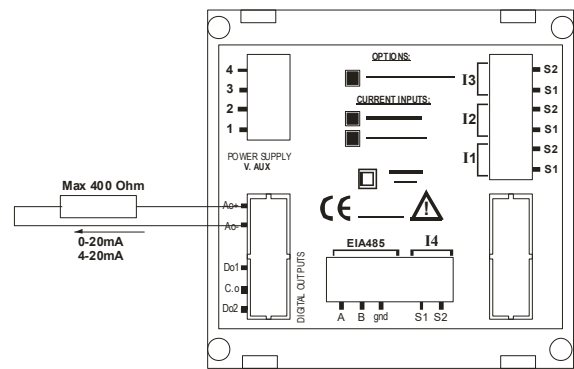
WIRING CONNECTION



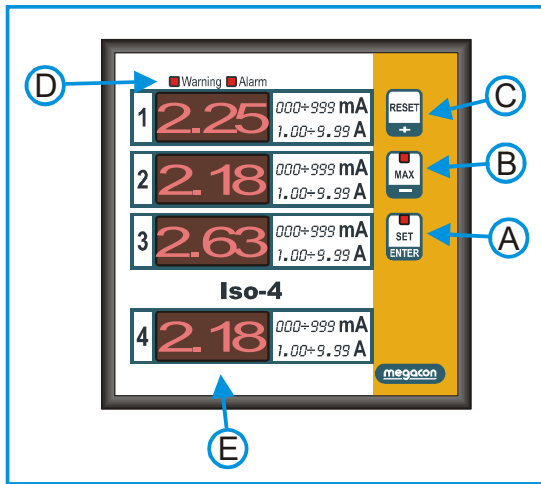
Digital Output connection



Analog Output connection



FRONT PANEL DESCRIPTION



LEGEND:

A: push-button to enter in the SETUP. In the SETUP mode is used to change the voice of settings and to confirm the new value set.

B: push-button to visualize the maximum value on **E** display and in setup it's used to decrease the value set.

C: push-button to acknowledge and rearm ALARM digital output 2 (momentary push); longer push to reset the store values; in SETUP it's used to increase the value set.

D: led bar for the alarm indication: indicating the status of WARNING digital output DO1 and the status of ALARM digital output DO2.

E: 4 display for the residual current visualization of each single channel. The first three are the main display in the SETUP.

VISUALIZATION

On the 4 display the ISO-4 show the instantaneous values of currents measured of the residual current flowing into 4 external toroidal transformer.

When measured current overcome the full scale display show ∞A .

MAX

Pressing the **B** key the led **MAX** is on and the instrument shows the following values:

PEA: the instantaneous maximum values

ITH: the maximum values in average time (A_{CT} ').

A_{CT} : the last average values calculated in the average time (A_{CT} ')

SETUP

SET

Pressing the **A** key the SETUP mode is active, the led **SETUP** is on and on the **E** displays appear the writing **ΣETYP**. For all settings, the message **SET** is always displayed on the fourth display.

Set display 1-4 on or off. (for example, only one input is used)

One or more displays in which the inputs are not used can be extinguished.

Press SET once. Press the "Reset" button twice and then shows SET L1 in the display. If the input L2 to timeout, press "Reset" again, and then seen SET L2. Press further on the "Reset" button to select the input L3 and L4.

Press the SET and then seen DISAbI. If "OFF" appears as the display is on. To extinguish the display, press "Reset" and then SET. Then appears "on" in the display.

To light the display, press the "MAX" and then SET. Then appears "OFF" in the display.

(If it says "on" as is extinguishing function switched on and the display is off)

Set the average time (AVG T')

The front panel show:

1	A_{CT}
2	T□
3	001
4	ΣET

Pressing another time the **A** key, the message A_{CT} □ with the value set appears on the main display and the message **SET**, to indicate the SETUP mode active, on the fourth display. To increase the value press the **C** key. To decrease it, press the **B** key. The range is from 1 to 30 minutes. To confirm it press the **A** key.

The average time is the time used to calculate the average parameters (A_{CT} e ITH).

Set the address for the communication network (ID ADR) (only for ISO-4-485 and ISO-4-485-A)

The front panel show:

1	IA
2	ADP
3	001
4	ΣET

After the confirm with the **A** key of the previous value, the message **IA** $\alpha\Delta P$ will appear on the main display; to set the value that will identify the instrument when it will be connected in a EIA485 communication network, proceed with the modality, already described. The settable values are from 1 to 247. To confirm, press the **A** key.

Set the baud rate (ΣEP BΔP) (only for ISO-4-485 and ISO-4-485-A)

The following setting is the baud rate. The message **ΣET BΔP** on the main display to indicate the programming of the baud rate. To modify the value set, proceed with the modality, already described The values settable are:

- 19.2 => 19200 baud - 9.60 => 9600 baud - 4.80 => 4800 baud - 2.40 => 2400 baud

Press **A** to confirm the value displayed.

Set of the serial parameters (only for ISO-4-485 and ISO-4-485-A)

The front panel show:

1	8 1
2	ΠAP
3	NO
4	ΣET

The following message will appear on the main display using the **B** and **C** keys. To confirm press the **A** key.

81 8 data bit / 1 stop bit ΠAP No parity No	82 8 data bit / 2 stop bit ΠAP No parity No	81 8 data bit / 1 stop bit ΠAP Even parity EçE	81 8 data bit / 1 stop bit ΠAP Odd parity oΔΔ
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Set the state of digital output 1 and 2 in warning and alarm condition

The front panel show:

1	Δo1 (or Δo2)
2	μΔE
3	NoΠ (or NXΛ)
4	ΣET

This setting allow to define the state of DO1 (Warning) and DO2 (ALARM) as the following tables.

Note: the WARNING and ALARM LED in front panel show the logical status of the event (light: presence, off: absence);
the INFO page show the PHISICAL status of digital output (ON or OFF).

DIGITAL OUTPUT DO1 (WARNING)

CONDITION STATE	LED WARNING	SETTING	DIGITAL OUTPUT IS
absence of 'WARNING' condition	LED OFF	NoΠ	OPEN
presence of 'WARNING' condition	LED ON	NoΠ	CLOSED
absence of 'WARNING' condition	LED OFF	NXΛ	CLOSED
presence of 'WARNING' condition	LED ON	NXΛ	OPEN

DIGITAL OUTPUT DO2 (ALARM)

CONDITION STATE	LED ALARM	SETTING	DIGITAL OUTPUT IS
absence of 'ALARM' condition	LED OFF	NoΠ	OPEN
presence of 'ALARM' condition	LED ON	NoΠ	CLOSED
absence of 'ALARM' condition	LED OFF	NXΛ	CLOSED
presence of 'ALARM' condition	LED ON	NXΛ	OPEN

Use the **B** and **C** keys to modify setting on display L3; use **A** key to confirm.

Set the Password (ΠΑΣ)

The instrument is supplied without password. When a password (from 0002 to 9999) is set, using the **C** (to increase), **B** (to decrease) and **A** (to confirm) keys, only who know this value can to enter in the setup or to make the reset. The password, in fact, is required all the time that someone try to enter in the setup (pressing the **A** key) or to make the reset (pressing the **C** key). If the password is wrong, the message ΠΑΣΣ EPP will appear on the display and the instrument go back to the measures visualization. To input the password, when required by the instrument, use the **A**, **B** and **C** keys as the same way done previously.

The menu is cyclic. After the last setting, the instrument go back to the first page of Setup (ΣEToΠ). The instrument comes back to the visualization measures after 20 seconds without to touch any key.

Set of the set points

It's possible to define two set point (WARNING and ALARM) of each line. If the current exceeds the value set of the WARNING set point, the digital output DO1 (see info page) and the WARNING LED will be activated, if the current exceed the ALARM set point, the digital output DO2 and the ALARM LED will be activated. The activation of the digital output happens after a delay setting. The display of the channel in alarm will blink.

In SETUP mode, pressing the **C** key, on the main display appears the message ΣET Λ1; this indicates the set point of the first channel.

1	Λ1
2	ΣET
3	
4	

1	çAP
2	NiN
3	oΦΦ
4	Λ1

1	ΔΛΨ
2	çAP
3	0.01
4	ΣET

1	AΛP
2	APN
3	oΦΦ
4	Λ1

1	ΔΛΨ
2	AΛP
3	0.01
4	ΣET

Pressing the **A** key on the **E** display will appear the message çAP NiN with the value to set as set point. This value could be modified using the **B** and **C** keys from 0 to full scale or oΦΦ. Setting to oΦΦ mean no activation of this set point. Confirm with **A** key. On the display appears the message ΔΛΨ çAP to define the delay in the activation of the digital output DO1. To set the value (from 0.1 to 25.0 seconds) it's necessary to use the **B** and **C** key; **A** key to confirm.

Next on the **E** display will appear the message AΛP αpv with the value to set as set point. This value could be modified using the **B** and **C** keys from 0 to full scale or oΦΦ. Setting to oΦΦ mean no activation of this set point. Confirm with **A** key. On the display appears the message ΔΛΨ YAP to define the delay in the activation of the digital output DO2.

The same procedure can be performed for the other channels (ΣET Λ2, ΣET Λ3, ΣET Λ4) to setting the relatives parameters.

RESET

In measures visualization mode, pressing the **C** key the digital output rearm for ALARM setpoint DO2; only if the measured current is below the ALARM setpoint.

Pressing the **C** key for more than 5 seconds it's possible to reset:

- ΡΕΣΕΤ ΠΕΑ: the maximum values
- ΡΕΣΕΤ ΑϚΓ: the average values
- ΡΕΣΕΤ ΑΛΛ: the average and the maximum values

Using the **A** key it's possible to choose one of the types of the reset that appears on the main display.

To enable the deleting press the **B** or **C** key and the indication on the fourth display change from **No** to ψεσ. Confirm the cancellation, by pressing the **A** key. The indication change from ψεσ to — when the reset is done.

DIGITAL OUTPUTS

The digital outputs DO1 and DO2 are linked to the WARNING and ALARM condition respectively.

The WARNING condition is activated when the current go over the lower of the WARNING setpoint in L1 L2 L3 and L4 setting; the led WARNING light-up when the WARNING conditions is verified. The channel which has caused the WARNING condition blinking until this status is true.

The WARNING condition is automatically reset when the current drops below the lower of the WARNING setpoint in L1 L2 L3 and L4 setting; the led WARNING light- up when the WARNING conditions is verified.

The led WARNING show the LOGICAL condition of the WARNING setpoint, not the physical status of DO1. The physical status of DO1 and DO2 can be verified in the INFO PAGE.

The ALARM condition is activated when the current go over the lower of the ALARM setpoint in L1 L2 L3 and L4 setting; the led ALARM light-up when the ALARM conditions is verified. The channel which has caused the ALARM condition blinking until this status is true.

The ALARM condition it is not automatically reset when the current drops below the lower of the ALARM setpoint in L1 L2 L3 and L4 setting; it can be reset, rearming DO2, pushing the **C** key **ONLY IN MEASURE VISUALIZATION**.

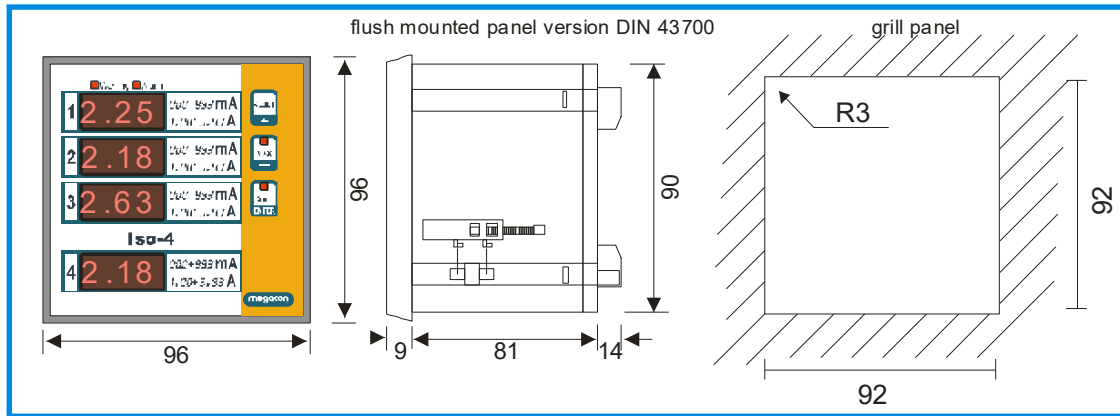
I/O INFO PAGE

The I/O info page appears in **F** displays: on the second part (L2) the status of the first digital output (DO1), on the third part (L3) the status of the second digital output (DO2).

The status of the two digital outputs is **ON** if the digital output is activated or **OFF** if deactivated.

The status of the serial port appear on the **G** display when the instrument has this option. If the instrument receives data, it displays the letter **P** and the number of the instrument that is in communication while if the instrument transmits data, it displays the letter **T**.

DIMENSIONS



TECHNICAL FEATURES

MEASURES, PRECISIONS

currents	true RMS of measured currents ONLY by external residual current transformer measurement range: from GBxx toroidal transformers: 10÷10000mA trms measure precision: $\pm 0,5\%$ ± 1 digit 40 to 65 Hz
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AUXILIARY POWER SUPPLY, INPUTS

auxiliary power supply	100-125 / 220-240V / 380-415V $\pm 10\%$ 20-60 Vac/dc 85-230 Vac/dc (others voltage on request) frequency 50-60Hz - consumption 3VA
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current inputs	permanent overload 30%
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INPUTS / OUTPUTS

digital outputs	Two outputs with common, optomos 12÷230Vac/dc, max 150mA, insulation: 3kV for 60 seconds
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GENERAL INFORMATION

display, operators	4 red LED displays (10mm each one) composed by 3 digits / 7 segments
mechanical	protection degree: IP52 frontal side - IP20 enclosure and terminal board - weight: about 0,5 kg - connections with terminal boards for cable 2,5 mm ² thermoplastic self-extinguishing enclosure - built-in mounting DIN 96x96mm, depth 95mm
environmental	operating temperature: -10÷60°C; humidity <90% storage temperature: -25÷80°C insulation test: 3 kV for 1 minute
standards	EN 61000-4-2/3/4/5/11; EN 61000-6-2



Remark: In consideration of the evolution of the products and standards, the company reserves the right to modify at any time the features of the product described in this literature, therefore we recommend to always verify them beforehand. The manufacturer's liability for damages resulting from product defects "may be reduced or deleted (...) when the damage is attributable jointly to a product defect and to the negligence of the injured party or of a third party for whom the injured party is responsible" (Article 8, 85/374/CEE).

