Revalco®

Made in Italy

equipments for industrial automation
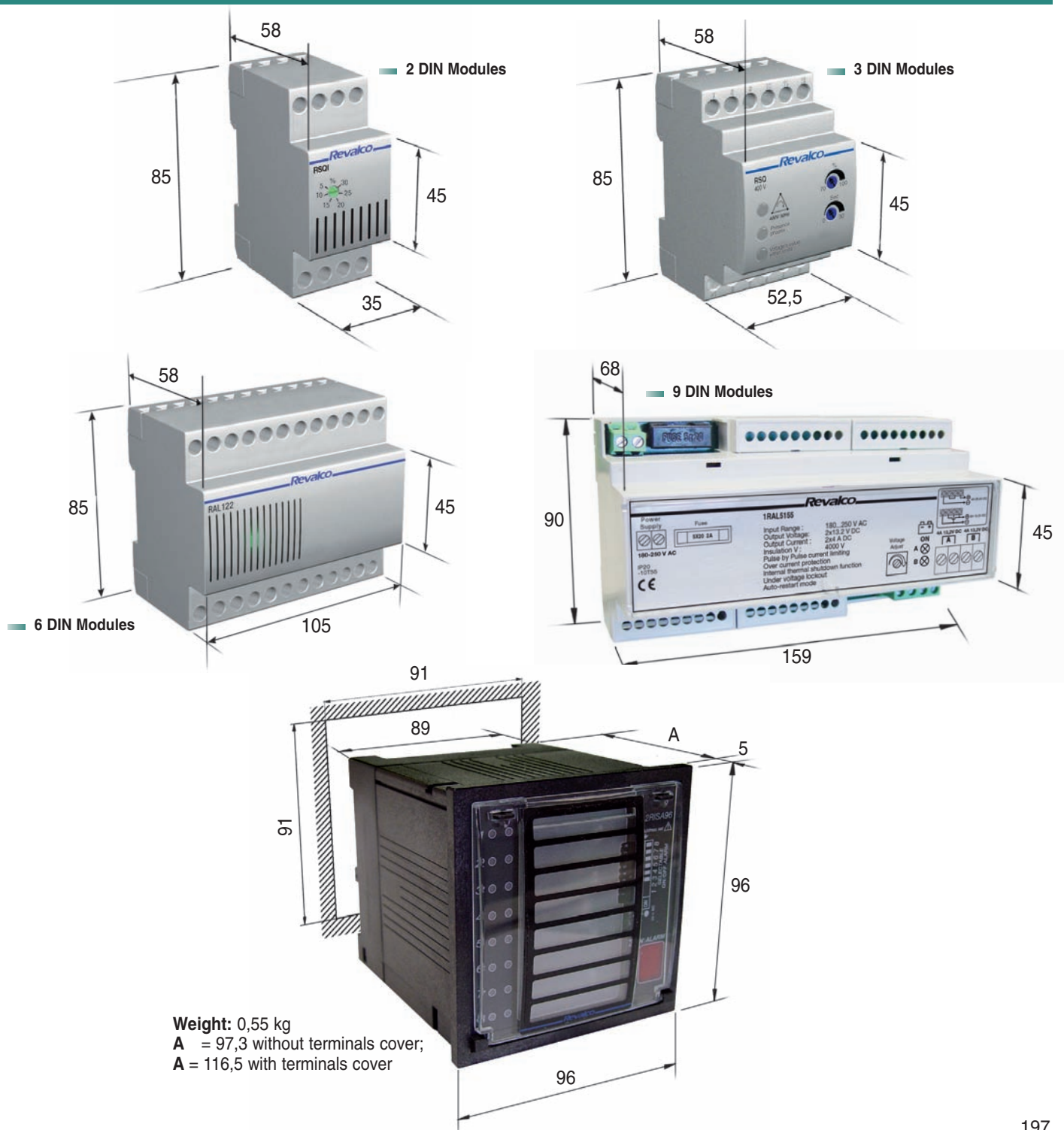
2011

EQUIPMENTS FOR INDUSTRIAL AUTOMATION

DIMENSIONS IN mm

2 DIN Modules

58 · 85 · 45 · 35

3 DIN Modules

58 · 85 · 45 · 52,5

6 DIN Modules

58 · 85 · 45 · 105

9 DIN Modules

68 · 90 · 45 · 159

91 · 89 · A · 5 · 91 · 96 · 96

Weight: 0,55 kg
A = 97,3 without terminals cover;
A = 116,5 with terminals cover

197

8 ALARM CHANNELS SET

2RISA96

Control device and signalling alarms device in accordance to the functional standard "ISA M" (ex ISA 2C) that represent the most diffused device in industrial and marine fields.It is manufactured in a DIN 96x96 flush mounting box and contains eight signalling correspondent to as much alarm conditions, a relay positive safety cumulative alarms), a silenceable electric siren relay and an RS485 interface (10 devices can be connected simultaneously).

Alarms legend (changeable thin cards) permits to the user to describe the typology of alarm.

Front panel permits the access to the thin cards and to the settable input mini switches (easy safety access without opening the electrical board). Power supply, inputs and serial RS485 are galvanically separated in order to grant an high safety standardand better protection against electronic disturbances from the field.

Internal software provides to the normal work of device and in meantime makes self-diagnosis controls verifying the reliability of alarm (as unique result of two different software's routes practically eliminating untimely interventions).

Microprocessor is controlled by a "watch dog" system that in case of anomaly suspends the software execution maintaining in rest position the alarm relay. **This device works as positive security; informs about the presence of incoming alarms and also the eventual faulty condition of the same device.** On front, a red display is present showing the input alarms sum (max 8) that are contemporary present and in alarm condition.

This fact permits to the user to see in real time, independently by the acquisition sequence, without reset, if there are inputs in alarm.

In normal condition of work, the frontal zone correspondent to the thin cards is yellow back illuminated; if an alarm happens, the correspondent two red leds light on and the yellow luminescence light off.

In case of internal anomaly, the relay will be in rest situation, yellow luminescence lights off and no one alarm showed on front.

This device is powered by 230VAC standard auxiliary supply, but on terminals an auxiliary power supply is present to be used if a safety low voltage auxiliary supply is necessary. Inputs can be polarized by a common terminal referred to the positive or negative wire of power supply or connected to other source always polarizing the common in the most convenient way; are galvanically separated from the other circuits and are suitable for an "OPEN COLLECTOR" contact. Power supply circuit is galvanically separated too as well as the RS48 serial.

TECHNICAL CHARACTERISTICS

Auxiliary power supply
Voltage:
- nominal value UAUX   24V, 115V, 230VAC 50/60 Hz (24VDC optional)
- use range   0.9...1.1 UAUX
- Consumption   4 VA max

Input technical characteristics
Voltage
- range   from 12VDC to 48VDC by external aux supply, or by using a supply available on the input circuits (15VDC)

Typology
- alarm/push-button inputs
  8 alarm and 4 push-button inputs (to cancel, to silence, lamps test, identification)
- galvanic insulation
  inputs circuit and external contact alarm > 100VDC/VAC

Output technical characteristics   Galvanic insulation
- alarm relay coil-contact   4 kV
- RS 485   3 kV
Contact characteristics   change over relay
     5A – 1250VA (cos φ=1) max 250VAC

Environment conditions   Ambient temperature:
- nominal temperature   0...+45 °C
- range   -5...+55 °C
- storage temperature   -10...+70 °C
- humidityhumidity   10...95 %
- atmospheric pressure   70...110 kPa

Standards CEI
- Safety
  CEI EN 61010-1   300V   CAT III
- Electromagnetic compatibility (immunity)
  CEI EN 61000-6-2 (ex EN 50082-2)
- Electromagnetic compatibility (emission)
  CEI EN 61000-6-4 (ex EN 50081-2)
- Protection IP   CEI EN 60529
- Sequence   CEI EN 61810–1   EN61810-2 (ex CEI 41.1)

Mechanical characteristics
- mounting   flush mounting DIN 43700
- Protection degree   IP20 / IP30 on front

Visualization
- display   total number(sum) of alarm in action
- Leds   8 doubled, independent   red colour

Operation safety
- signalling   double signalling circuit
- control   self-test microprocessor and software

FRONTAL ELEMENTS DESCRIPTION

DOUBLE LED ALARM
SIGNALLING MICROPROCESSOR OPERATIONS

NUMBER OF INPUT
ALARMS DISPLAY

CHANGEABLE ALARM
DESCRIPTION
THIN CARD POCKET
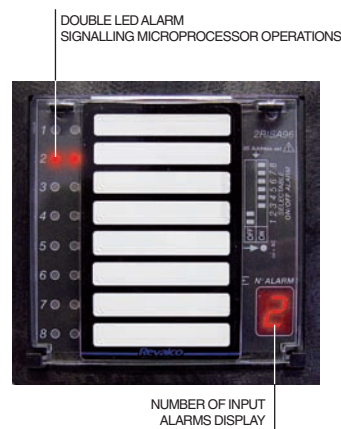
EQUIPMENT
- Mini CD containing the MODBUS protocol and instructions how to fill-in the labels to insert into the proper pocket situated on front of instrument

SEQUENCE DESCRIPTION

ALARM INPUT	LED	ALARM RELAY	ELECTRIC SIREN RELAY
- Rest alarm (no alarms)	LIGHT OFF	ON	OFF
- A) Alarm present	PULSE	OFF	ON
- B) Rest alarm	PULSE	OFF	ON
- By pressing "TO SILENCE"	PULSE	OFF	OFF
- By pressing "IDENTIFICATION"	LIGHT ON	OFF	OFF
- No alarm (return to rest condition)	LIGHT ON	OFF	OFF
- By pressing "TO CANCEL" If alarm is always present starts again from A) position	LIGHT OFF	ON	OFF
- Pulse alarm (temporary "ON") PULSE	PULSE	OFF	ON

Further the sequence starts again from B) position

REST CONDITION INPUT ALARMS SETTING

Push-button inputs (to cancel, identification, to silence) are forecasted by the standards in rest condition (normally closed). Test lamp push-button is not forecasted by the standards, and it works by the pressure and by the time duration of it. Opening the front panel it is possible to see the setting micro switches of relays (from 1 to 8).
Using a screwdriver it is possible to move them to ON or OFF considering the rest condition related to the alarm n° in use.

Examples:
ALARM 1 = ON rest (input lack = Alarm)   ALARM 2 = ON rest (input lack = Alarm)
ALARM 3 = OFF rest (input presence = Alarm)   ALARM 4 = ON rest (input lack = Alarm)
ALARM 5 = OFF rest (input presence = Alarm)   ALARM 6 = ON rest (input lack = Alarm)
ALARM 7 = ON rest (input lack = Alarm)   ALARM 8 = ON rest (input lack = Alarm)

RS485 COMMUNICATION PROTOCOL ASCII communication protocol

Pigeon-holes condition question:
Rxx send ASCII R character (82) followed by the address value xx of instrument from 0 to 9(from decimal 48 to decimal 57).
Example of instrument   with address 4: SEND   "R4"   82,52
Pigeon-holes condition= Alarms present and/or identified:
ALL 1 OFF; ALL 2 ON; ALL 3 ON; ALL 4 OFF; ALL 5 OFF; ALL 6 OFF; ALL 7 OFF; ALL 8 OFF
ANSWER: "0 1 1 0 0 0 0 0"

RS485 address setting: Turn off the instrument
Maintain pressure on test lamp push-button
Move the micro switches as per the following table (MI= micro switch , N° instrument address), then power the instrument:

ADDRESS N°	MI 1	MI 2	MI 3	MI 4	MI 5	MI 6	MI 7	MI 8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
6	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
9	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON

Example "ADDRESS 1" like the table:

Release the test lamp push-button
Turn off the instrument
Move the micro switches as mentioned in the "REST CONDITION INPUT ALARMS SETTING" chapter
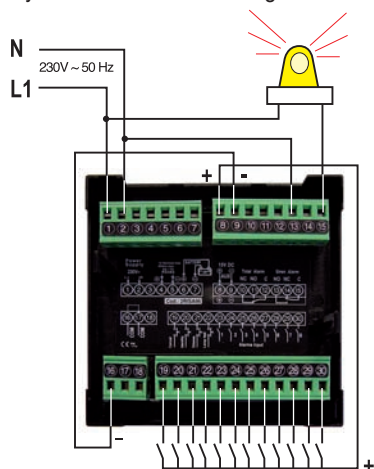Give power to the instrument that now is working
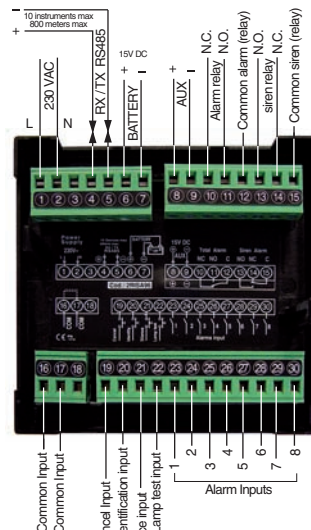
- Power supply 230VAC
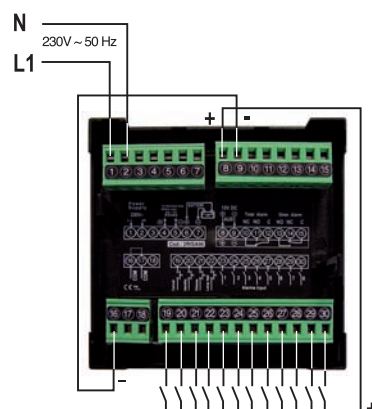- Output contact relays in condition of turn off device

EXAMPLE N. 1
- Inputs normally open powered by auxiliary from the apparatus
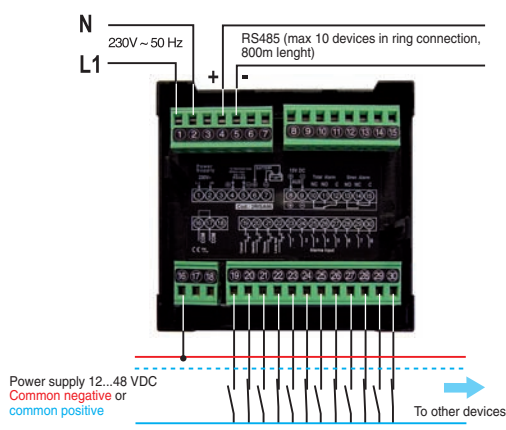- Electric siren relay that drive an AC winking

EXAMPLE N. 2
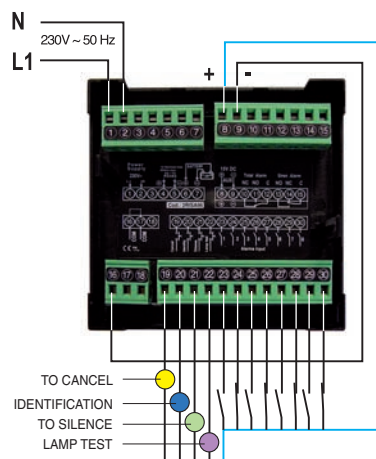- Inputs normally open and closed powered by auxiliary from the apparatus

EXAMPLE N. 3
- Inputs normally open and closed powered by external auxiliary supply
- RS485 (documented property protocol)

EXAMPLE N. 4
- Inputs normally open and closed powered by auxiliary from the apparatus
- Push-buttons connection: to cancel, identification, to silence, lamp test


EXAMPLE N. 5
- Inputs normally open and closed powered by external auxiliary supply
- RS485 (documented property protocol)

Presence of back-up battery grants the operation also in absence of voltage supply (normal condition of work) on the device and on the all control electronic circuits.

It is suitable in alarm, surveillance, security nets or other different with presence of back-up power supply.
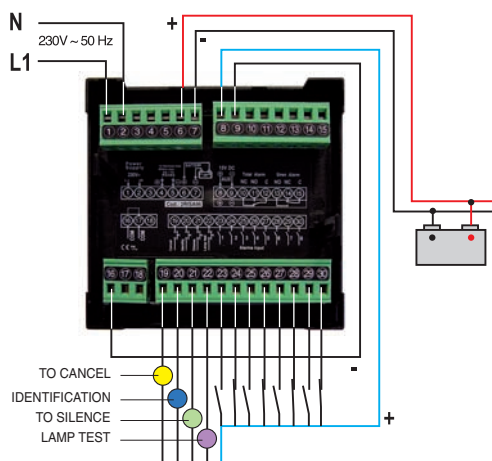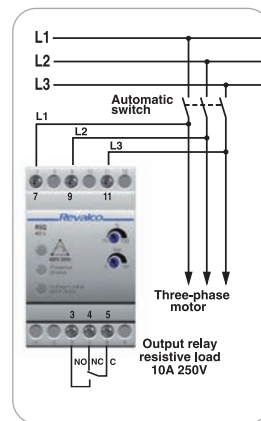
CONTROL AND SEQUENCE PHASE RELAYS

1RSQ

- To control the correct sequence and presence of the phases in a three phase system and the control of the voltage values within the limits (70-100%)
  - **POWER SUPPLY**   400V (self-supplied between phase L1 and L2) ~50/60Hz
  - **BURDEN**   1,5 W
  - **PROTECTION CLASS**   IP20
  - **INSULATION CLASS**   II
  - **TEMPERATURE**   operating -10°C ÷ +55°C
         storage -25°C ÷ +70°C
  - **APPLYABLE LOAD**   three-phase voltage
  - **ADJUSTMENT OF THE MIN. VOLTAGE VALUE**   from 70% to 100%
  - **SIGNALLING**
    - **green** led   if light ON, the sequence of the phases is correct; if light OFF, there is an anomaly
    - **green** led "presence phases"   if light ON, all the three phases are present; if light OFF, there is an anomaly
    - **green** led "Min voltage"   if light ON, the minimum voltage is within the limits; if light OFF, there is an anomaly
  - **CLOSING TIME OF THE CONTACT**   adjustable from 0 to 20 sec
  - **OUTPUT RELAY**   10A 250V~ (NO-C-NC)
  - **DIMENSIONS / WEIGHT Kg.**   3 DIN modules / 0,25

1RSQN

- To control the correct sequence and presence of the phases in a three phase system, presence of the neutral and the control of the voltage values within the limits (70-100%)
  - **POWER SUPPLY**   400V (self-supplied between phase L1 and L2) ~50/60Hz
  - **BURDEN**   1,5 W
  - **PROTECTION CLASS**   IP20
  - **INSULATION CLASS**   II
  - **TEMPERATURE**   operating -10°C ÷ +55°C
         storage -25°C ÷ +70°C
  - **APPLYABLE LOAD**   three-phase voltage
  - **ADJUSTMENT OF THE MIN. VOLTAGE VALUE**   from 70% to 100%
  - **SIGNALLING**
    - **green** led   if light ON, the sequence of the phases is correct; if light OFF, there is an anomaly
    - **green** led "presence phases"   if light ON, all the three phases and the neutral are present; if light OFF, there is an anomaly
    - **green** led "Min voltage"   if light ON, the minimum voltage is within the limits; if light OFF, there is an anomaly
  - **CLOSING TIME OF THE CONTACT**   adjustable from 0 to 20 sec
  - **OUTPUT RELAY**   10A 250V~ (NO-C-NC)
 - **DIMENSIONS / WEIGHT Kg.**   3 DIN modules / 0,25
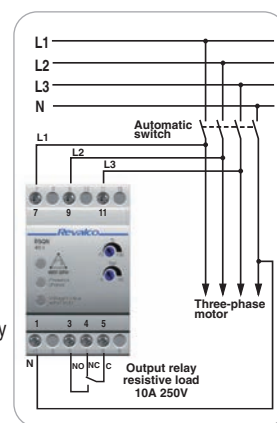
1RSQI

- To control the correct sequence, presence and asimmetry of the three phases
  - **POWER SUPPLY**   400V (self-supplied between phase L2 and L3) ~50/60Hz
  - **BURDEN**   1,5 W
  - **PROTECTION CLASS**   IP20
  - **INSULATION CLASS**   II
  - **TEMPERATURE**   operating -10°C ÷ +55°C / storage -25°C ÷ +70°C
  - **APPLYABLE LOAD**   three-phase voltage
  - **ADJUSTMENT OF THE ASIMMETRIC PHASE**   from 5% to 30%
  - **SIGNALLING**
    - **green** led (situated in the internal side of the adjustement trimmer)
      if light ON, the device works correctly;
      if light OFF, there is an anomaly
  - **OUTPUT RELAY**   8A 250V~ (NO-NC-C)
  - **DIMENSIONS / WEIGHT Kg**   2 DIN modules / 0,19
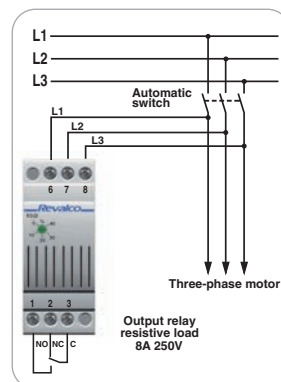
1RSQE

- To control the correct sequence and presence of the three phases
  - **POWER SUPPLY**   400V (self-supplied between phase L1 and L2) ~50/60Hz
  - **BURDEN**   1,5 W
  - **PROTECTION CLASS**   IP20
  - **INSULATION CLASS**   II
  - **TEMPERATURE**   operating -10°C ÷ +55°C / storage -25°C ÷ +70°C
  - **APPLYABLE LOAD**   three-phase voltage
  - **OUTPUT RELAY**   8A 250V~ (NO-NC-C)
  - **DIMENSIONS / WEIGHT Kg**   2 DIN modules / 0,11
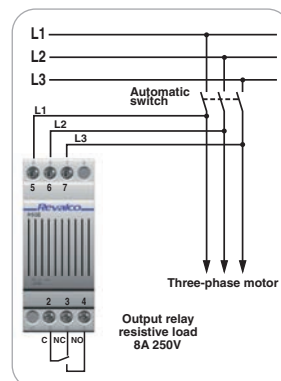
MINIMUM / MAXIMUM RELAYS
AMMETERS - DOUBLE THRESHOLD (MIN / MAX)

-	**BURDEN**	2VA
-	**AUXILIARY POWER SUPPLY**	230VAC ±10% standard 50/60 Hz
-	**CLASS**	0,5% ±2 digit referred to the end scale value
-	**DISPLAY**	2 display 3 digits each red colour. Digit height 8 mm
-	**RANGE**	Input from 0,1 to 999A with 5A steps, selectable by a frontal button
•	Input **5A** - it is necessary to connect the CT .../5A correspondent to the end scale value setted	
-	**CT RANGE**	from 5 to 999A with 5A steps, selectable by a frontal button
-	**MAXIMUM CURRENT**	6A
-	**PERMANENT OVERLOAD**	110% I_{nom}
-	**THERMIC OVERLOAD (1s)**	200% I_{max}
-	**RELAY**	1 NO contact - 250V/10A resistive load
-	**GALVANIC INSULATION**	4kV from coil and contact
-	**DIMENSIONS**	2 DIN modules
-	**FUNCTIONS**	measure of current in true RMS by CT.../5A
		2 settable current thresholds with only one NO output relay
		settable disconnection optical prealarm.

1RSDI

Display visualization: when powered all the segments of display and LED lights on for few seconds. After that, the measure page appears.

DESCRIPTION

current (A)   TRMS (AC+DC) value. Decimal point is present only if the setted CT value is lower than 100.
Dot situated in the upper right side (when lights on) shows that the output relay is active.
When display flashes shows that threshold is "ON".

PROGRAMMING: To enter in programming page, make a long pressure (4 seconds about) on the front button. When the programming request is recognised the first settable parameter appears. Releasing the button all words will flash quickly, this situation will remain until the end of procedure.
After 4 seconds the pages with configuration parameters start to be displayed ; one every 4 seconds showing the actual selected value.
If it is necessary to see the values without any modification press shortly once the button when the proper page is displayed.
To change the values of parameters, it is enough to press the frontal button while this parameter is displayed. To fast forward maintain pressure on the frontal button.
The value is automatically saved in permanent way when the automatic display of the pages starts again.

⚠ **IMPORTANT NOTE:**
during the programming the output relay condition IS NOT MODIFIED. The normal work restart automatically at the end of programming

| DEFAULT PARAMETER		DESCRIPTION
start value	**Hi.t**	"Hi" threshold level (High trigger) (Value from 0 to 255). It is the threshold value over which, normally, output is actived. When this value is setted in lower value than the "Lot" the functionning will change (see threshold description). Default value 0
start value	**Lot**	"Lo" threshold level (Low trigger) (Value from 0 to 255). It is the threshold value under which, normally, output is actived. When this value is setted in higher value than the "Hit" the functionning will change (see threshold description). Default value 0
start value	**ton**	Timer ON (Value from 0 to 255). It is the intervention delay value (display is flashing) expressed in Seconds. Default value 1
start value	**toF**	Timer OFF (Value from 0 to 255). It is the intervention delay value (display stop to flash) expressed in Seconds. Default value 0
CT	**ct**	Select the ratio .../5A of the current transformer (Value from 5 to 999 every 5 steps). Default value = 100
average	**AVE**	It is the number (n) of single measures effected on the electrical parameter before it's visualization on the display (Value from 1 to 255). Practically it is the filter of the measure stabilization. The numbering rise up from 1 to 255; more higher is the selected number, more slow are the eventual variations of reading. This is valid for all the measured parameters. Default value 60

After powering the relay is not active for the first 10 seconds to permits the measure stabilization. This device measures and controls the instantaneous value of current on terminals, verifying continuously if and when the conditions to activate the relay happen according to the needed conditions. It is possible to set 2 threshold levels called "Hit" (high trigger) and "Lot" (low trigger) both from 0 to 999 (except the decimal point). It is possible to obtain the following six different possibilities:
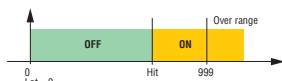
- **Hit and Lot values = 0 (Default)**

Output is constantly on rest for every current values setted (over range included)

- **Hit and Lot values equal, but different from 0.**
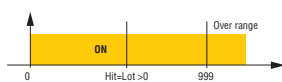
Output is constantly on rest for every current values setted (over range included). This option is useful for test or maintenance.

- **Lot = 0 and Hit > 0: MAXIMUM THRESHOLD**

This is the classic configuration. Relay is active when the measure is HIGHER than the Hit value and return to rest when the measure become LOWER or EQUAL to Hit value.

- **Hit = 0 and Lot > 0 : MINIMUM THRESHOLD**
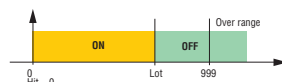
Relay is active when the measure is LOWER than the Lot value and return to rest when the measure become HIGHER or EQUAL to Lot value.
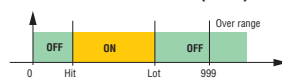
- **Lot value < Hit value, both higher than 0 DOUBLE THRESHOLD (OR)**

Relay is light off only if the measure is within Lot (higher or equal) and Hit (lower or equal) limits.

Relay is light on when measure is HIGHER than Hit and LOWER than Lot values.

- **Hit < Lot, both higher than 0 DOUBLE THRESHOLD (AND)**

Relay is light off only if the measure is within Lot (lower) and Hit (higher) limits. Relay is light off when measure is LOWER or EQUAL than Hit and HIGHER or EQUAL than Lot values.
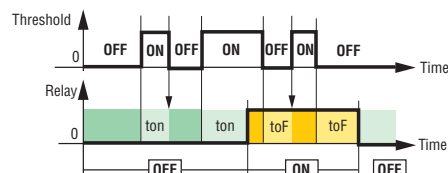
Two delay times functions are possible on the output relay (ton = Timer On, toF = Timer Off) both settable from 0 to 999 Seconds.

This times can be used also a filter for temporary conditions wich must not cause the intervention of relay.

1   Delay times as normal use
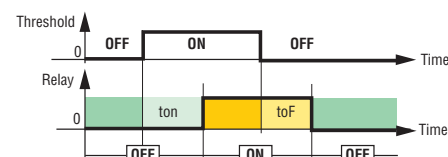
2   Delay times as "filter"

CURRENT RELAYS

- **BURDEN**	2 W
- **POWER SUPPLY STANDARD**	230V ±10%, 50/60 Hz
- **DC power supplies, galvanically insulated, on request**	
- **ACCURACY**	5%
- **TEMPERATURE**	operating -10°C ÷ +55°C / storage -25°C ÷ +70°C
- **SIGNALLING** operating relay	**red** led light
power supply (ON)	**green** led light
operating time	flashing **green** led

- **GALVANIC SEPARATION BETWEEN INPUTS AND OUTPUTS**
  - insulation between inputs, outputs, power supply 2kV for 1min at 50Hz
  - insulation between the all circuits and earth 4kV for 1min at 50Hz

|		
- **OUTPUT RELAY**	16A 250V ~	resistive load
- **HYSTERESIS**	1 ÷ 45%	adjustable potentiometer on front
- **DELAY TIME**	1 ÷ 30 sec	adjustable potentiometer on front
- **CALIBRATION**	30 ÷ 100%	adjustable potentiometer on front
- **OVERLOADING**	2 **In** for 10 sec	
- **DIMENSIONS / WEIGHT kg.**	3 DIN modules / 0,25	

MINIMUM CURRENT RELAYS

1RSLI - **Under single-phase AC current relay**
Multiple choice inputs: 2A, 5A and 10A

1RSLIC - **Under single-phase DC current relay**
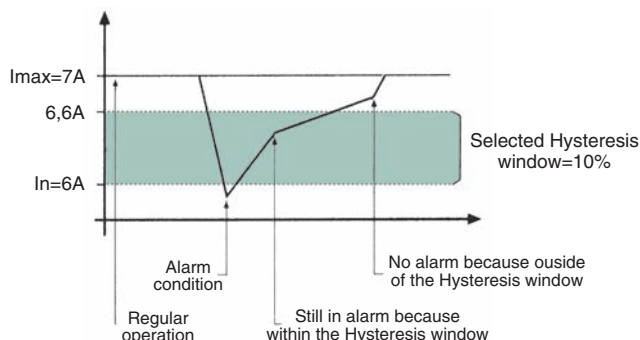Multiple choice inputs: 1mA, 10mA and 20mA (4 ÷ 20 mA)
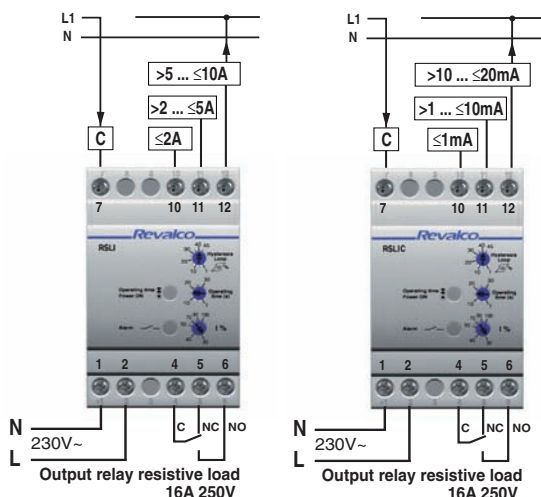
1RSLI   **1RSLIC**

Supposing to control a load with the following ratings:
In=7A   rated regular operating current
Imin=6A   current at which 1RSLI relay is requested to trip
- Connect as shown in diagram (terminals 7 and 12 as Imin=6A)

- NOTE: contact position shown is related to a powered device NOT in alarm
- Set "Current %" trimmer (Ex. to 60%) since:

$$I\% = \frac{6 \ (I \ min)}{10 \ (I \ limit)} \times 100 = 60\%$$

- Set "Hysteresis %" trimmer to 10%. Obtain a tripping window of 6 to 6,6 A
  (6A+10% = 6,6A).
  The relay will trip at 6A and regular operation will start again at 6,6A.
- Set "Operating time" trimmer. This makes it possible to delay the relay tripping time from 1 to 30 seconds; during the delay the "Power ON" led will flash, at the end of the delay the "Alarm" led will turn on and the relay will trip.
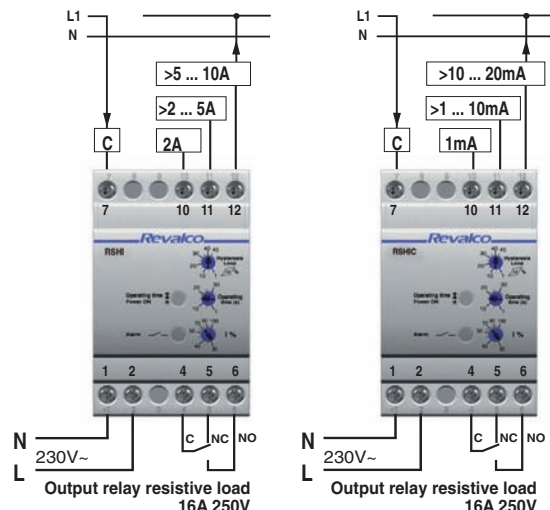
MAXIMUM CURRENT RELAYS

1RSHI - **Over single-phase AC current relay**
Multiple choice inputs: 2A, 5A and 10A

1RSHIC - **Over single-phase DC current relay**
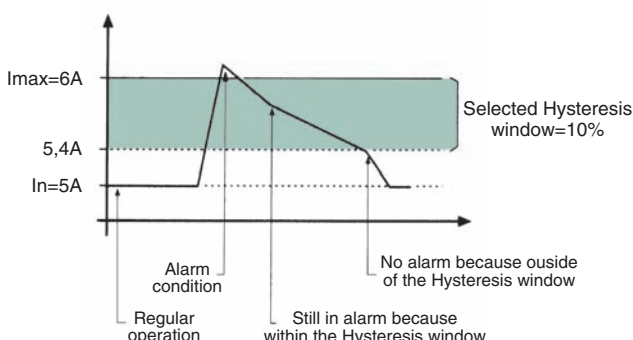Multiple choice inputs: 1mA, 10mA and 20mA (4 ÷ 20 mA)

1RSHI   **1RSHIC**

Supposing to control a load with the following ratings:
In=5A   rated regular operating current
Imax=6A   current at which 1RSHI relay is requested to trip
- Connect as shown in diagram (terminals 7 and 12 as Imax=6A)

- NOTE: contact position shown is related to a powered device NOT in alarm
- Set "Current %" trimmer (Ex. to 60%) since:

$$I\% = \frac{6 \ (I \ max)}{10 \ (I \ limit)} \times 100 = 60\%$$

- Set "Hysteresis %" trimmer to 10%. Obtain a tripping window of 5,4 to 6 A (6A-10% = 5,4A).
  The relay will trip at 6A and regular operation will start again at 5,4A.
- Set "Operating time" trimmer. This makes it possible to delay the relay tripping time from 1 to 30 seconds; during the delay the "Power ON" led will flash, at the end of the delay the "Alarm" led will turn on and the relay will trip.

VOLTAGE RELAYS

|		
- **BURDEN**		2 W
- **POWER SUPPLY STANDARD**		230V ±10%, 50/60 Hz
- **DC power supplies, galvanically insulated, on request**		
- **ACCURACY**		5%
- **TEMPERATURE**		operating -10°C ÷ +55°C / storage -25°C ÷ +70°C
- **SIGNALLING**	operating relay	**red** led light
	power supply (ON)	**green** led light
	operating time	flashing **green** led
- **GALVANIC SEPARATION BETWEEN INPUTS AND OUTPUTS**		
	• insulation between inputs, outputs, power supply 2kV for 1min at 50Hz	
	• insulation between the all circuits and earth 4kV for 1min at 50Hz	
- **OUTPUT RELAY**		16A 250V ~ resistive load
- **HYSTERESIS**		1 ÷ 45% adjustable potentiometer on front
- **DELAY TIME**		1 ÷ 30 sec adjustable potentiometer on front
- **CALIBRATION**		30 ÷ 100% adjustable potentiometer on front
- **OVERLOADING**		2 **In** for 10 sec
- **DIMENSIONS / WEIGHT kg.**		3 DIN modules / 0,25

MINIMUM VOLTAGE RELAYS

1RSLV - **Under single-phase AC voltage relay**
Multiple choice inputs: 100V, 300V and 500V

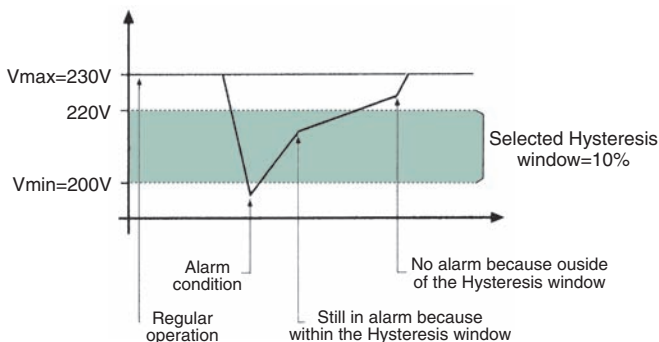**1RSLVC** - **Under single-phase DC voltage relay**
Multiple choice inputs: 1V, 5V and 10V (60mV and other on request)
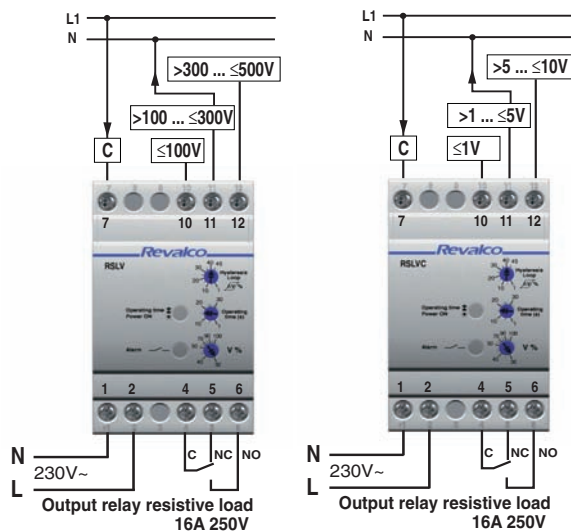
1RSLV   **1RSLVC**

Supposing to control a load with the following ratings:
Vn=230 VCA   rated regular operating voltage
Vmin=200 VCA voltage at which 1RSLV relay is requested to trip
- Connect as shown in diagram (terminals 7 and 11 as Vmin=200V)

- NOTE: contact position shown is related to a powered device NOT in alarm
- Set "Voltage %" trimmer (Ex. to 66,7%) since:

$$V\% = \frac{200 \ (V \ min)}{300 \ (V \ limit)} \times 100 = 66,7 \ \%$$

- Set "Hysteresis %" trimmer to 10%. Obtain a tripping window of 200 to 220V (200V+10% = 220V).
The relay will trip at 200V and regular operation will start again at 220V.

- Set "Operating time" trimmer. This makes it possible to delay the relay tripping time from 1 to 30 seconds; during the delay the "Power ON" led will flash, at the end of the delay the "Alarm" led will turn on and the relay will trip.
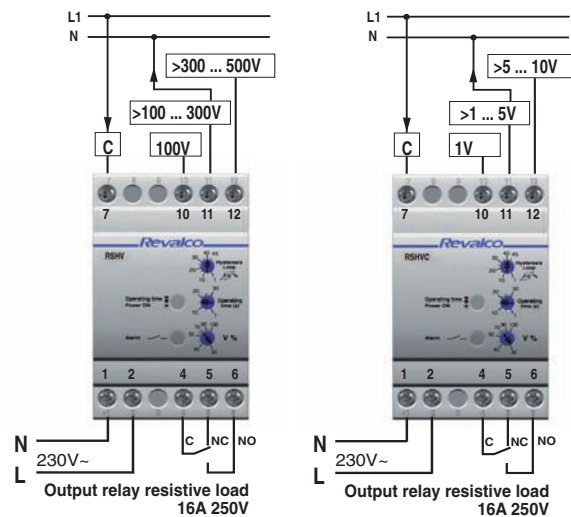

MAXIMUM VOLTAGE RELAYS

1RSHV - **Over single-phase AC voltage relay**
Multiple choice inputs: 100V, 300V and 500V

1RSHVC - **Over single-phase DC voltage relay**
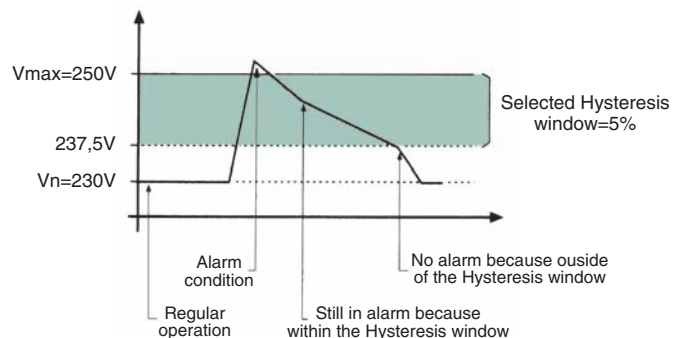Multiple choice inputs: 1V, 5V and 10V (60mV and other on request)

1RSHV   **1RSHVC**

Supposing to control a load with the following ratings:
Vn=230 VCA rated regular operating voltage
Vmax=250 VCA voltage at which 1RSHV relay is requested to trip
- Connect as shown in diagram (terminals 7 and 11 as Vmax=250V)

- NOTE: contact position shown is related to a powered device NOT in alarm
- Set "Voltage %" trimmer (Ex. to 83,33%) since:

$$V\% = \frac{250 \ (V \ max)}{300 \ (V \ impostata)} \times 100 = 83,33 \ \%$$

- Set "Hysteresis %" trimmer to 5%. Obtain a tripping window of 237,5 to 250V (250V-5% = 237,5V).
The relay will trip at 250V and regular operation will start again at 237,5V

- Set "Operating time" trimmer. This makes it possible to delay the relay tripping time from 1 to 30 seconds; during the delay the "Power ON" led will flash, at the end of the delay the "Alarm" led will turn on and the relay will trip.

STABILIZED SUPPLIES BATTERY CHARGERS

1RAL12 - 1RAL24

The 1RAL12 and 1RAL24 delivers 1A continuously to batteries that are completely discharged. Once batteries are fully charged, the 1RAL12 and 1RAL24 will maintain the charged state by intermittent recharges as required.

The specification of the 1RAL12 and 1RAL24 includes internal protection against short circuits, inversion of polarity and protection against overheading while limiting the supply of current until normal operating temperatures are restored.

		1RAL12	1RAL24
- POWER SUPPLY		230V ± 10%, 50/60 Hz	
- STABILISED OUTPUT	as supplier	12 VDC ± 2% - 0,5 A	24 VDC ± 2% - 0,25 A
- OUTPUT	as battery charger	13 VDC - 1 A	26 VDC - 0,5 A
- GALVANIC SEPARATION		between input and output	

- **Protected against short-circuits, the polarity inversions and overtemperature**
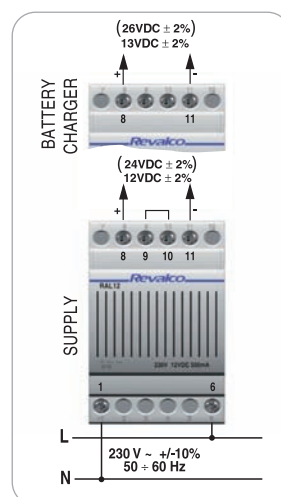- **THESE DEVICES CAN BE CONNECTED IN PARALLEL**

		1RAL12	1RAL24
example: with two suppliers in **parallel** there is a stabilised output at		12 V - 1 A	24 V - 0,5 A

- Stabilised supply: bridge between terminals 9 and 10
- Battery charger: NO bridge between terminals 9 and 10

- DIMENSIONS	3 DIN modules
- WEIGHT kg.	0,40

1RAL122 - 1RAL242

These supplies are made by an integrated transformer and an electronic accessory switching technology, high efficiency, low losses, low thermic dispersions and low emmission of noises through the net.

The 1RAL122 and 1RAL242 delivers 2A continuously to batteries that are completely discharged. Once batteries are fully charged, the 1RAL122 and 1RAL242 will maintain the charged state by intermittent recharges as required.

The specification of the 1RAL122 and 1RAL242 includes internal protection against short circuits, inversion of polarity and protection against overheading while limiting the supply of current until normal operating temperatures are restored.
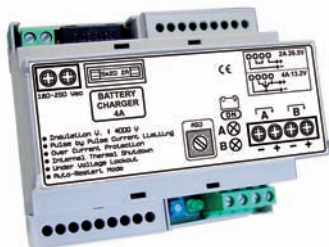
	1RAL122	1RAL242
- POWER SUPPLY	230V ±10%	
- POWER	55VA	
- OUTPUT VOLTAGE	13 VDC - 2 A	26 VDC - 2 A
- GALVANIC SEPARATION	between input and output	

- **Protected against short-circuits, polarity inversions and overtemperature**
- **SIGNALLING LED** light-on green led = ON
- Output pulse NO (0,5 A / 40 VDC) for remote signal

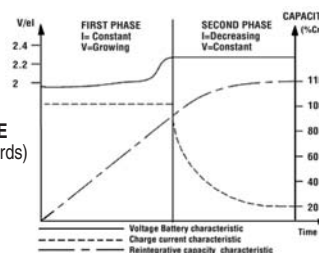| - DIMENSIONS	8 DIN modules
- WEIGHT kg.	0,50
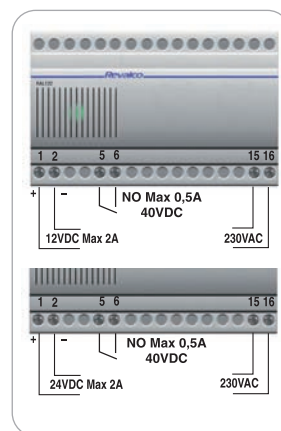
1RAL800

Stabilized supplies and Battery chargers with SWITCHING technology, energy power saving. Fixed commutation frequency; low start-up current; over-current, over-voltage and over-temperature protection; working stop with lower voltage than 180V; automatic restart when stop conditions are cancelled; pulse by pulse current limiting; internal high voltage sense FET.

Standards: safety CEI EN 61010-1 CAT II - accuracy class CEI EN 60688 - EMC (immunity) CEI EN 61000-6-2 (ex EN 50082-2) - EMC (emissions) CEI EN 61000-6-4 (ex EN 50081-2)

- POWER SUPPLY	180...280 VAC
- OUTPUT RANGE	13,2VDC x 2 - 2ADCx2
- CONFIGURATION	26.5VDC - 2ADC / 13.2VDC - 4ADC
- INSULATION VOLTAGE	4kV between inputs and outputs
- BURDEN	<1W (EuP)
- RIPPLE	<3%
- TRICKLE CHARGE	2,2V for max endurance
- NORMALIZED CHARGE	DIN41773 (IU)
- DIMENSIONS / WEIGHT	6 DIN modules / 0,25 kg

CHARGE PROFILE
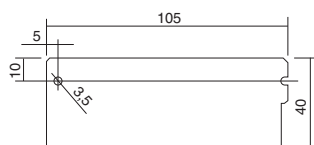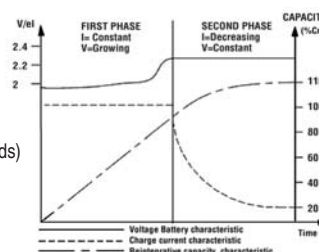IU (DIN 41773 standards)

RAL800V

Stabilized supplies and Battery chargers with SWITCHING technology, energy power saving. Fixed commutation frequency; low start-up current; over-current, over-voltage and over-temperature protection; working stop with lower voltage than 180V; automatic restart when stop conditions are cancelled; pulse by pulse current limiting; internal high voltage sense FET.

Standards: safety CEI EN 61010-1 CAT II - accuracy class CEI EN 60688 - EMC (immunity) CEI EN 61000-6-2 (ex EN 50082-2) - EMC (emissions) CEI EN 61000-6-4 (ex EN 50081-2)

- POWER SUPPLY	180...280 VAC
- OUTPUT RANGE	13,2VDC x 2 - 2ADCx2
- CONFIGURATION	26.5VDC - 2ADC / 13.2VDC - 4ADC
- INSULATION VOLTAGE	4kV between inputs and outputs
- BURDEN	<1W (EuP)
- RIPPLE	<3%
- TRICKLE CHARGE	2,2V for max endurance
- NORMALIZED CHARGE	DIN41773 (IU)
- DIMENSIONS / WEIGHT	6 DIN modules / 0,25 kg

CHARGE PROFILE
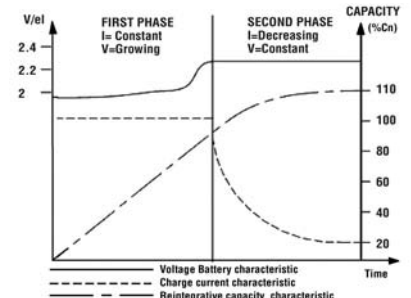IU (DIN 41773 standards)

NEW

BATTERY CHARGERS

RAL2E12 (2A - 12VDC)

This automatic battery charger is composed by a power transformer and an electronic control module. The transformer is provided by a safety mark, so it grants an high level of insulation and confidence as well as a galvanic separation from supply also in presence of electrical discharge or high energy disturbances. The technology with which it is manufactured permits to minimize the thermic dissipation and to absorb few energy working without load. The electronic module controls the battery voltage and, considering it's status, actives the charge threshold. On rest, the maintenance threshold permits to the battery to deliver the necessary current to recharge it with the same quantity consumed by the load. The battery charger limits its current to the maximum possible (2A) and start to recharge the battery.
This equipment is an industrial article for general applications use.

- **POWER SUPPLY**   230VAC ± 10%
- **BURDEN**   20VA (magnetic core with low heat production)
- **SAFETY**   safety transformer, galvanic separation
- **PROTECTIONS**   safety transformer
- **CHARGE CURRENT**   2A max
- **VOLTAGE CHARGE**   15VDC max
- **MAINTENANCE VOLTAGE**   13,2VDC (automatic charge)
- **STANDARDS**   safety CEI EN 61010-1 CAT II; Class CEI EN 60688; Emc immunity CEI EN 61000-6-2 (ex EN 50082-2), Emissions CEI EN 61000-6-4 (ex EN 50081-2) Equipments suitable to charge the batteries conform to the EN50342-1
- **DIMENSIONS / WEIGHT kg**   90x75 h65 mm /
- **MOUNTING POSITION:** Revalco suggests to fix the equipment to the wall (metallic) in <u>vertical position</u> (like the photograph) with the scope to increase the heat dissipation capacity. On the contrary the thermic protection will limits the device performance (automatic reduction of charge current)
- **CONTROL PANEL**   on front: - green LED shows when the battery charge is powered (negative connected with the battery)
                                - red LED shows when the battery is in charge (led lights-on for few periods informs about the maintenance status of charge)
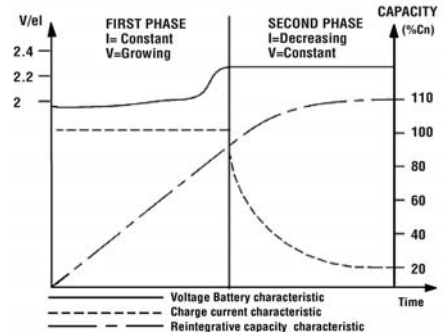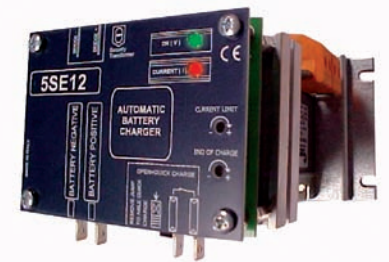   on side: - trimmer for adjustment of end charge voltage

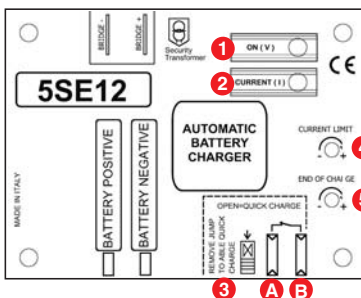**CHARGE PROFILE**
IU (DIN 41773 standards)

RAL5SE12 (5A - 12VDC) - RAL5SE24 (5A - 24VDC)

This automatic battery charger is composed by a power transformer and an electronic control module. The transformer is provided by a safety mark, so it grants an high level of insulation and confidence as well as a galvanic separation from supply also in presence of electrical discharge or high energy disturbances. The technology with which it is manufactured permits to minimize the thermic dissipation and to absorb few energy working without load. The electronic module controls the battery voltage and, considering it's status, actives the charge threshold. On rest, the maintenance threshold permits to the battery to deliver the necessary current to recharge it with the same quantity consumed by the load. The battery charger limits its current to the maximum possible (5A) and start to recharge the battery. The deep load limit can be activated from external acting on the proper input after the removal of little bridge (open contact = deep charge). These equipments are industrial articles for general applications.

- **POWER SUPPLY**   230 - 400VAC +/- 10%
- **BURDEN**   80VA (magnetic core with low heat production)
- **SAFETY**   safety transformer, galvanic separation
- **PROTECTIONS**   safety transformer, high temperature, short circuit (+/- battery)
- **CHARGE CURRENT**   5A continuously
- **VOLTAGE CHARGE RANGE**   32VDC max
- **MAINTENANCE VOLTAGE**   26,4VDC/13,2VDC (automatic charge)
- **RAPID VOLTAGE CHARGE**   27VDC/13,5VDC (deep charge)
- **STANDARDS**   safety CEI EN 61010-1 CAT II; Class CEI EN 60688; Emc immunity CEI EN 61000-6-2 (ex EN 50082-2), Emissions CEI EN 61000-6-4 (ex EN 50081-2) Equipments suitable to charge the batteries conform to the EN50342-1
- **BATTERY:** Before to use the battery for the first time, make a cycle of complete charge. Battery (if correctly installed) can be reach the maximum declared capacity also after 15 charge/discharge cycles (during the normal use) being in any case conforms to the "**BCI Specifications**". For other informations on the behaviour of system battery charger / battery see: SAE J240, SAE J537, SAE J541, SAE J930, SAE J539, SAE J1495, SAE J2185, BCI recommended procedure.
- **DIMENSIONS / WEIGHT kg**   135x85 h160 mm /

CHARGE PROFILE
IU (DIN 41773 standards)

**1** = battery charger auxiliary supply on <–> battery connected.

2 = battery charging in progress (led on for short time in stand by status/ end of charge).

3 = enabled on remove jump (quick charge operation able).
       Contact closed between **A** e **B** change status from stationary (trickle) chargeto high voltage charge.

4 = current limit setting (from 0,5A to 5A)

**5** = end of charge voltage setting

RAL12PRO24 (12A - 24VDC)

This automatic battery charger is composed by a power transformer and an electronic control module. The transformer is provided by a safety mark, so it grants an high level of insulation and confidence as well as a galvanic separation from supply also in presence of electrical discharge or high energy disturbances. The technology with which it is manufactured permits to minimize the thermic dissipation and to absorb few energy working without load. The electronic module controls the battery voltage and, considering it's status, actives 2 charge thresholds. On rest, the maintenance threshold permits to the battery to deliver the necessary current to recharge it with the same quantity consumed by the load. In case of high delivery from battery (motor start) the battery charger actives the deep charge. The battery charger limits its current to the maximum possible (12A) and start to recharge the battery. The limit to which the recharge will end is higher than the maintenance charge ; at the end the battery charge stops its self waiting for the passage to the maintenance limit (lowering of battery voltage). Deep charge limit can be activated from external also acting on the proper input. An additional control starts automatically in presence of rapid discharge. Deep charge is inserted and maintained also in presence of its attainment and for a period selected by the operator in order to grant the optimal recharge status. A remote signal of empty battery is available which intervene when the battery charge supply voltage failed or after a selectable period of low voltage battery condition. This is a professional equipment for applications on which safety and confidence are necessary. Useful for not garrisoned installations where the preservation status of batteries is fundamental

- **POWER SUPPLY**   230 - 400VAC +/- 10%
- **BURDEN**   750VA
                                    (M6 magnetic core with low heat production and no load absorption)
- **SAFETY**   safety transformer, galvanic separation
- **PROTECTIONS**   safety transformer, high temperature, short circuit (+/- battery)
- **CHARGING CURRENT**   12A normal and short circuit condition
- **CHARGING VOLTAGE**   max 32VDC (internal setting)
- **STAND BY VOLTAGE**   26.4 vdc (internal setting)
- **HIGH SPEED CHARGE**   27 vdc (internal setting)
- **BATTERY VOLTAGE LEVEL DOWN**   22 vdc (internal setting)
- **BATTERY LOW**   battery voltage decrease under alarm level
- **FAULT**   relay 8A safety configuration (normally working)
- **CHARGE COMPLETE**   time setting for completely charge at second voltage level
- **PROTECTION**   security transformer, thermal, short circuit
- **STANDARDS**   safety CEI EN 61010-1 CAT II; Class CEI EN 60688; Emc
                                    immunity CEI EN 61000-6-2 (ex EN 50082-2)
                                    Emissions CEI EN 61000-6-4 (ex EN 50081-2).
                                    Equipments suitable to charge the batteries conform to the EN50342-1 standard

- **BATTERY**: Before to use the battery for the first time, make a cycle of complete charge. Battery (if correctly installed) can be reach the maximum declared capacity also after 15 charge/discharge cycles (during the normal use) being in any case conforms to the "**BCI Specifications**". For other informations on the behaviour of system battery charger / battery see: SAE J240, SAE J537, SAE J541, SAE J930, SAE J539, SAE J1495, SAE J2185, BCI recommended procedure.
- **DIMENSIONS / WEIGHT kg**   250x192 h150 mm /
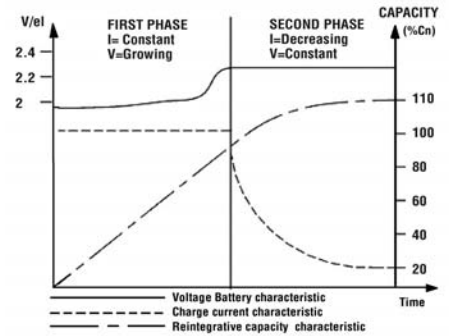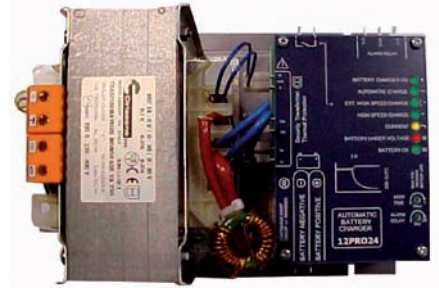
CHARGE PROFILE
IU or IUoU (keep time use)
(DIN 41773 standards)
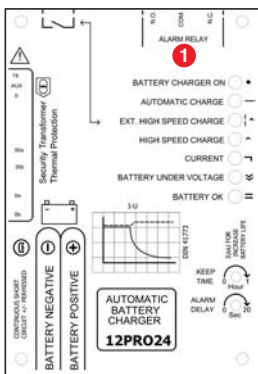
1 = relay "battery charger failure and battery low voltage" (safety configuration, normally working)

2 = battery charger live

3 = automatic charge (1° voltage level)

4 = external high speed charge (2° voltage level)

5 = internal high speed charge

6 = current limit in progress

7 = low battery voltage (battery failure)

8 = battery ok

9 = time for completely charging procedure (iuou standard)

10 = delay time for alarm battery state

EMERGENCY SUPPLY

RAL12E

- Automatic battery charging, DIN rail mounting.
- Small size of battery, dimensions 100x45x120 mm
- Output supply during black out **(L)** with automatic shut down for preserve the battery integrity
- Galvanic isolation from auxiliary supply (230vac) tipical for electrical safety device
  (insulation 4 kv between 230VAC and 12VDC)
- Charge 24 hour before that be used (auxiliary supply 230VAC live)

TYPICAL APPLICATIONS:
- **Lift (LS)**
  Device to feed horn alarm, emergence light and lift to floor indicator
- **Safety horn (S)**
  Safety horn or other acustic device what it work also during blackout time (230VAC)
- **Emergency light (L)**
  Light on during blackout time (12vdc from battery sourse in absence of auxiliary supply)
- **Bright direction pointer or warning (LI)**
  All times on (consumption current below Ic nominal)
  On for all supply condittion (normally or black out)