Revalco®

Made in Italy

equipments for
industrial automation
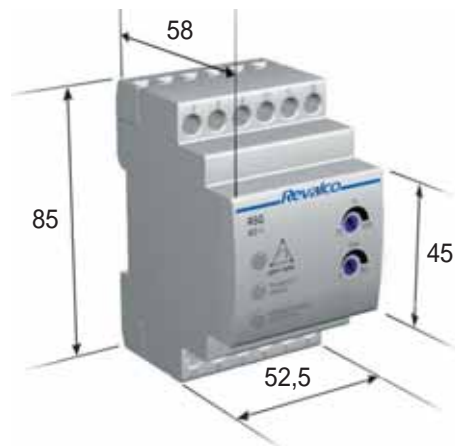
EQUIPMENTS FOR INDUSTRIAL AUTOMATION
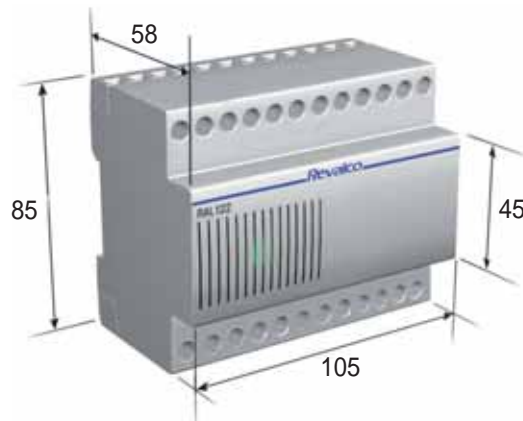
58

85

45

35

2 DIN Modules

58

85

45

52,5

3 DIN Modules

58

85

45

105

6 DIN Modules

68

90

45

159

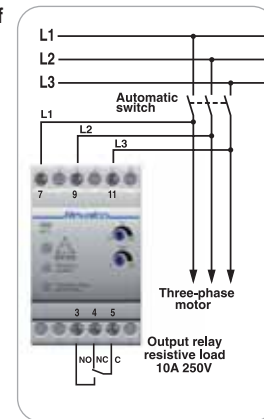**9 DIN Modules**

2

CONTROL AND SEQUENCE PHASE RELAYS

- 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

- 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
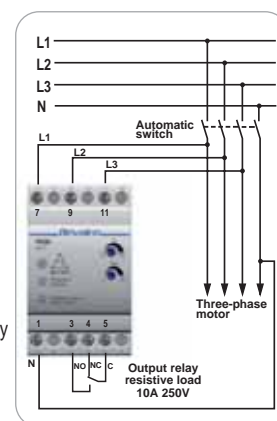
- To control the correct sequence, presence and asimmetry of the three phases
  - **POWER SUPPLY** — 400V (self-supplied between phase L2 and L3) ~50/60Hz
  - **BURDEN** — 1,5 W
  - **PROTECTION CLASS** — IP20
  - **INSULATION CLASS** — II
  - **TEMPERATURE** — operating -10°C ÷ +55°C / storage -25°C ÷ +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
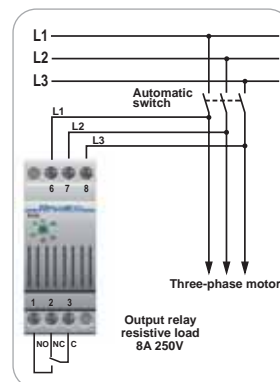
- To control the correct sequence and presence of the three phases
  - **POWER SUPPLY** — 400V (self-supplied between phase L1 and L2) ~50/60Hz
  - **BURDEN** — 1,5 W
  - **PROTECTION CLASS** — IP20
  - **INSULATION CLASS** — II
  - **TEMPERATURE** — operating -10°C ÷ +55°C / storage -25°C ÷ +70°C
  - **APPLYABLE LOAD** — three-phase voltage
  - **OUTPUT RELAY** — 8A 250V~ (NO-NC-C)
  - **DIMENSIONS / WEIGHT Kg** — 2 DIN modules / 0,11
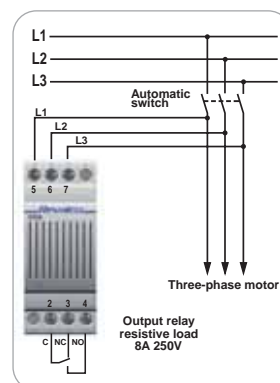
MINIMUM / MAXIMUM RELAYS

- **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

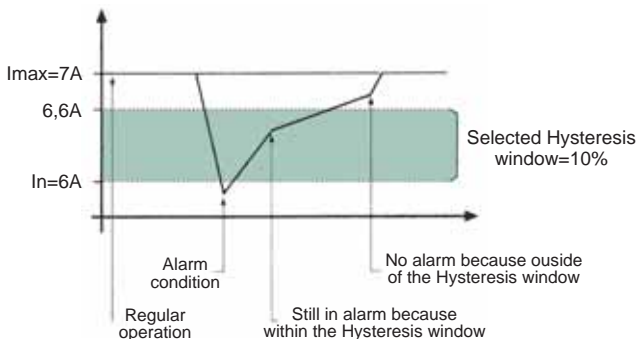**1RSLIC** - **Under single-phase DC current relay**
 Multiple choice inputs: 1mA, 10mA and 20mA (4 ÷ 20 mA)
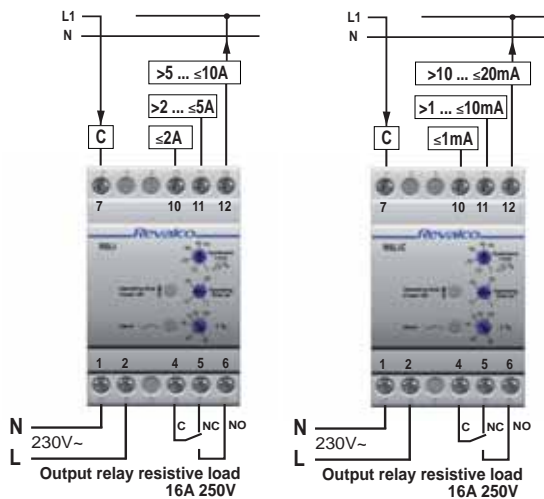
1RSLI   **1RSLIC**

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:

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

- 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.
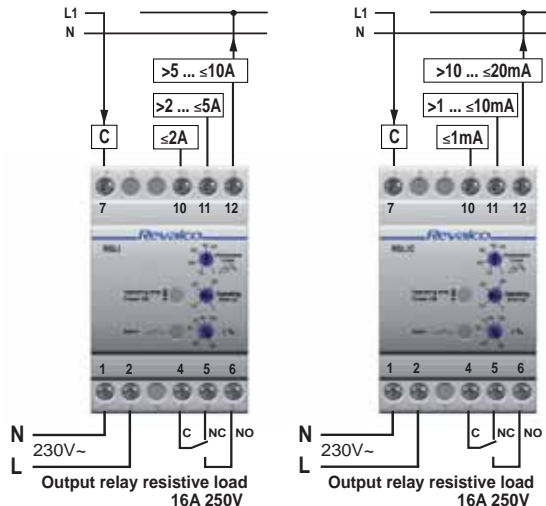
MAXIMUM CURRENT RELAYS

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

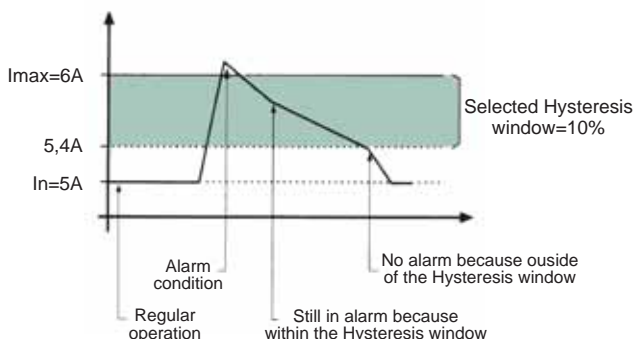**1RSHIC** - **Over single-phase DC current relay**
 Multiple choice inputs: 1mA, 10mA and 20mA (4 ÷ 20 mA)

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:

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

- 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.

- 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

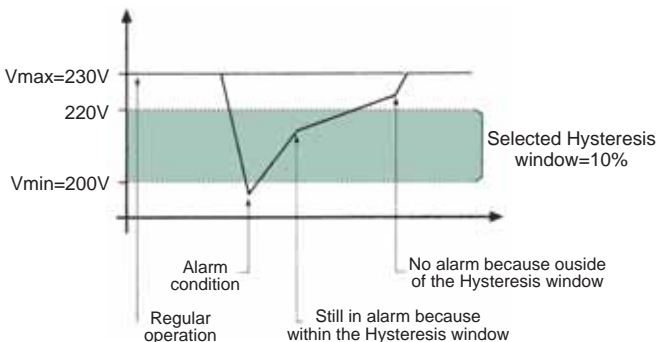**1RSLVC** - **Under single-phase DC voltage relay**
Multiple choice inputs: 1V, 5V and 10V (60mV and other on request)
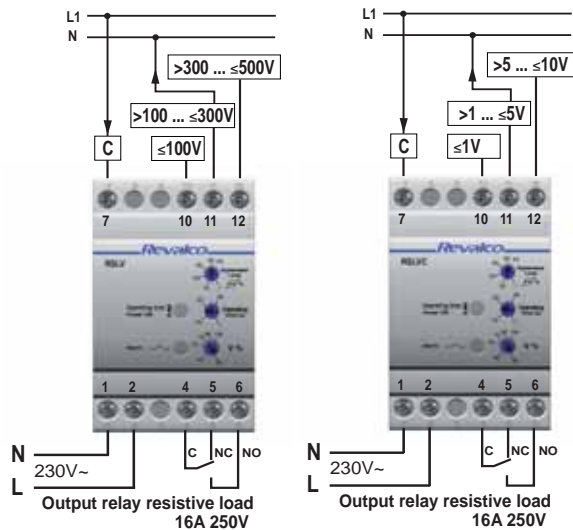
1RSLV   **1RSLVC**

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 (200+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.
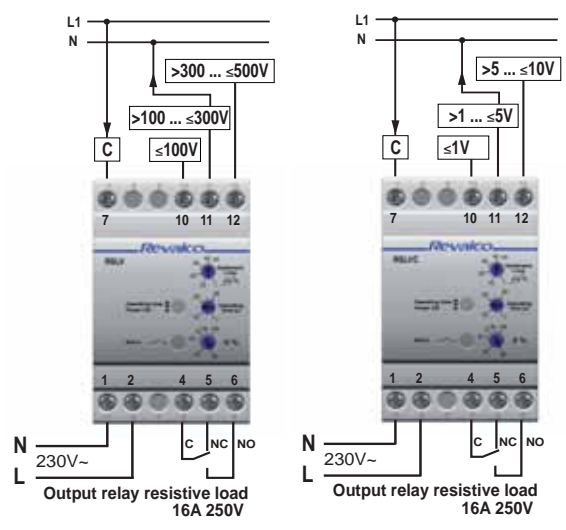
MAXIMUM VOLTAGE RELAYS

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

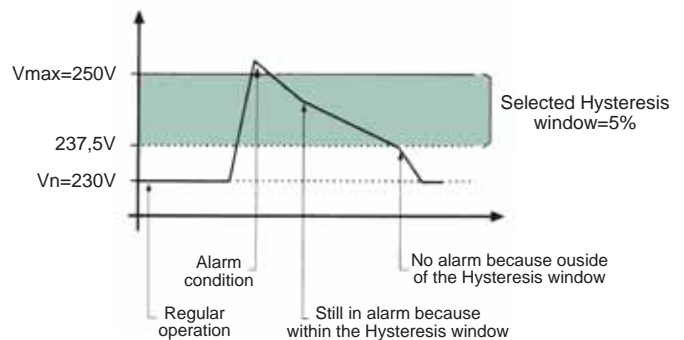**1RSHVC** - **Over single-phase DC voltage relay**
Multiple choice inputs: 1V, 5V and 10V (60mV and other on request)

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.

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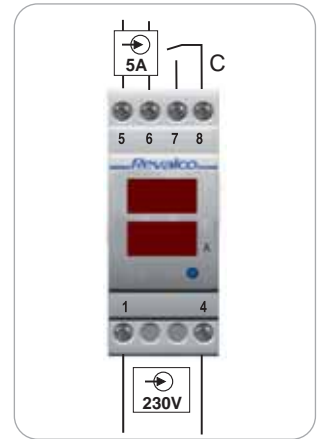
Display visualization: when powered all the segments of display and LED lights on for few seconds. After that, the measure page appears.

DESCRIPTION

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".

current (A)

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		POSSIBLE VALUES	DESCRIPTION
start value	Hi t 0.0	VALUE from 0 to 255	"Hi" threshold level (High trigger) 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 0.0	VALUE from 0 to 255	"Lo" threshold level (Low trigger) 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 1	VALUE from 0 to 255	Timer ON It is the intervention delay value (display is flashing) expressed in Seconds. Default value 1
start value	toF 0	VALUE from 0 to 255	Timer OFF It is the intervention delay value (display stop to flash) expressed in Seconds. Default value 0
CT	ct 100	VALUE from 5 to 999 every 5 steps	Select the ratio .../5A of the current transformer. Default value = 100
average	AVE 88	VALUE from 1 to 255	It is the number (n) of single measures effected on the electrical parameter before it's visualization on the display. 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:
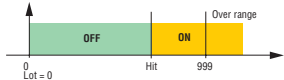
- **Hit and Lot values = 0 (Default)**

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**
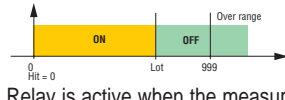
Relay is active when the measure is LOWER than the Lot value and return to rest when the measure become HIGHER or EQUAL to Lot value.
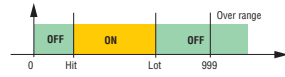
- **Lot value < Hit value, both higher than 0 DOUBLE THRESHOLD (OR)**
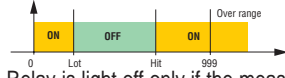
Relay is light off only if the measure is within Lot (higher or equal) and Hit (lower or equal) limits.

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.

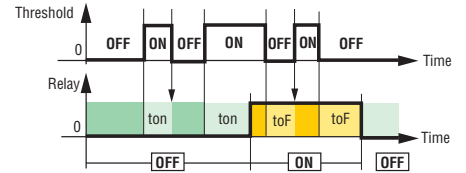Two delay times functions are possible on the output relay (ton = Timer On, toF = Timer Off) both settable from 0 to 999 Seconds.

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
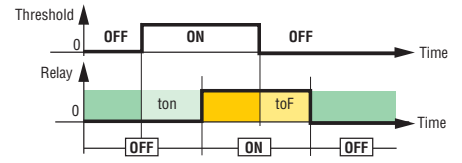
2 Delay times as "filter"

STABILIZED SUPPLIES BATTERY CHARGERS
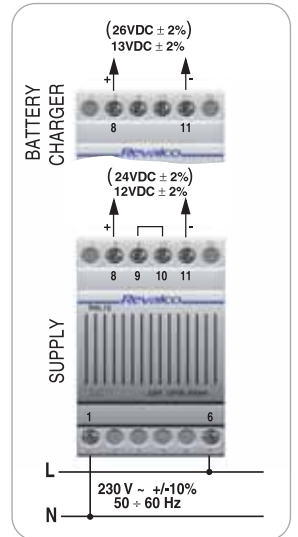
1RAL12 - 1RAL24

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**

example: with two suppliers in **parallel**

	1RAL12	1RAL24
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**

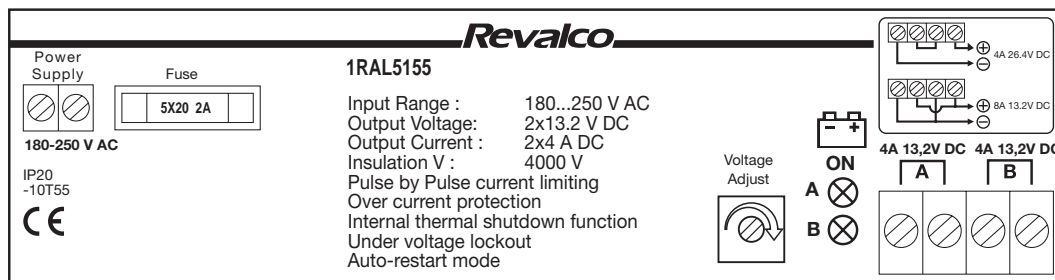| - DIMENSIONS	8 DIN modules
- WEIGHT kg.	0,50
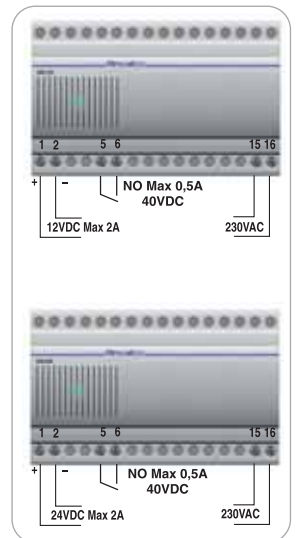
1RAL5155

Stabilized supplies and Battery chargers with SWITCHING and MOFSET technology. Fixed commutation frequency; low current ignition; instantaneous overload limiting device; over-current, over-voltage and over-temperature protection; working stop with lower voltage than 180V; automatic restart when stop conditions are cancelled.

Standards: safety CEI EN 61010-1 CAT II - 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...250 VAC
- CONFIGURATION	26.4VDC - 4ADC / 13.2VDC - 8ADC
- INSULATION VOLTAGE	4kV between inputs and outputs
- BURDEN	<1W (EuP)
- STABILIZED OUTPUT	<3% ondulation
- MAINTENANCE CHARGE	2,23V for each element
- STANDARDIZED CHARGE	DIN41773 (IU)
- DIMENSIONS / WEIGHT	9 DIN modules / 0,4 kg

1RAL5155

Input Range :	180...250 V AC
Output Voltage:	2x13.2 V DC
Output Current :	2x4 A DC
Insulation V :	4000 V

Pulse by Pulse current limiting
Over current protection
Internal thermal shutdown function
Under voltage lockout
Auto-restart mode

Power Supply 180-250 V AC
Fuse 5X20 2A
IP20 -10T55

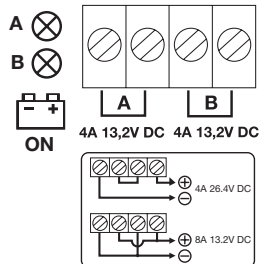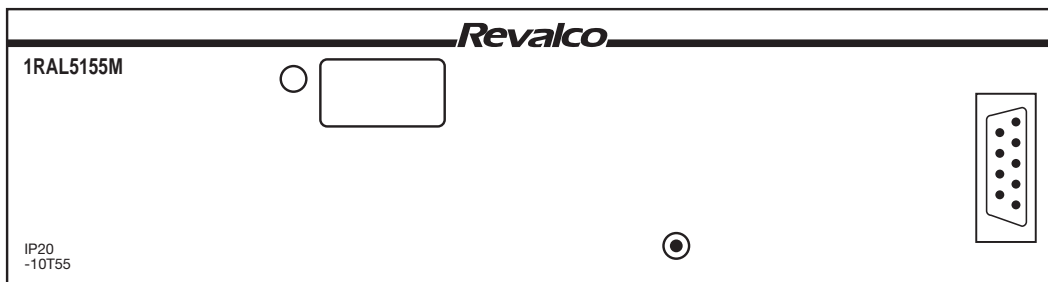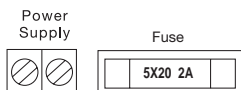Series connection
Parallel connection

1RAL5155M

Stabilized supplies and Battery chargers with SWITCHING / MOFSET technology and functional status from remote (MODBUS RTU). Fixed commutation frequency; low current ignition; instantaneous overload limiting device; over-current, over-voltage and over-temperature protection; working stop with lower voltage than 180V; automatic restart when stop conditions are cancelled. Standards: safety CEI EN 61010-1 CAT II - 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...250 VAC
- CONFIGURATION	26.4VDC - 4ADC / 13.2VDC - 8ADC
- INSULATION VOLTAGE	4kV between inputs and outputs
- BURDEN	<1W (EuP)
- STABILIZED OUTPUT	<3% ondulation
- MAINTENANCE CHARGE	2,23V for each element
- STANDARDIZED CHARGE	DIN41773 (IU)
- MODBUS RTU OUTPUT	on front
- DISPLAY	3 digits for current and voltage reading
- PUSH BUTTON	on front for reading commutation (current/voltage)
- DIMENSIONS / WEIGHT	9 DIN modules / 0,4 kg

Power Supply

Fuse
5X20 2A

Revalco

1RAL5155M

IP20
-10T55

A ⊗
B ⊗

ON

A	B
4A 13,2V DC	4A 13,2V DC

4A 26.4V DC — Series connection

8A 13,2V DC — Parallel connection

Revalco®