DISIBEINT ELECTRONIC SL

User's manual

Digital Control Relay

SAA · SAB · SAC · SAD· SAJ

DISIBEINT ELECTRONIC S.L, has been present in the field of the manufacture of components for the industrial automation for more than 35 years, and maintains in constant evolution their wide range of products structured in five families:

· Sensors, magnetic switches and transducers
· Level relays for liquids and solids
·Timers
· Control, surveillance and logic relays
· Digital control relay
· Data transmission

Our permanent preoccupation is to give a suitable answer to the problems that appear in the automation of the different industrial processes, providing the most suitable material for each application.

GUARANTEE

The products provided by DISIBEINT has a guarantee period of two years, against all defect due to the materials or to the manufacture of the equipment. It does not cover the defects caused during the transport or by a bad application, neither the elements subject to wearing down, nor the direct or indirect consequences caused in the installation by the inadequate use of the equipment.

Rev.09.01 - 02/05/2019
DISIBEINT reserves the right to modify the specifications stated in this document without previous notice.

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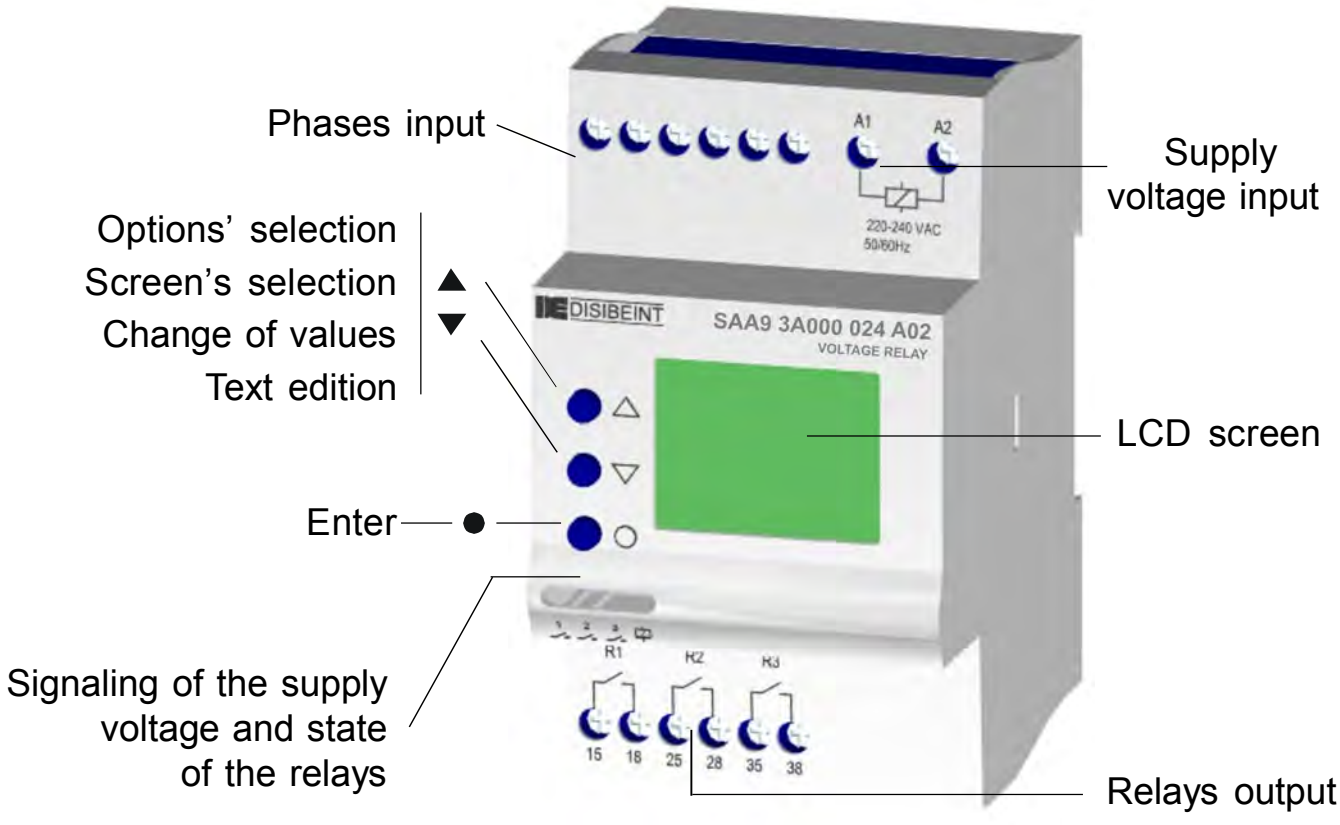
DESCRIPTION OF THE EQUIPMENT

The models SAA and SAC are current controllers for single phase lines in AC.
The models SAB and SAD are current controllers for lines in DC.
The model SAJ is a relay for the supply and control of a 4-20mA current loop.

They can control the following parameters:
- Maximum and/or minimum current. RMS value in SAA and SAC. Average value in SAB, SAD and SAJ.
- Network frequency (SAA / SAC)
- DC component (SAA / SAC)
- Maximum and/or minimum frequency (SAA / SAC)
- Maximum DC component (SAA / SAC)
- Maximum ripple (SAB / SAD)

The actions derived of the control of the different parameters can be associated to three relays, to 4-20mA loop or to a serial communication RS232 or RS485. One or more parameters can be associated to each one of the available relays (see the Technical Data in page 3 to know the possible incompatibilities).

PARTS OF THE EQUIPMENT



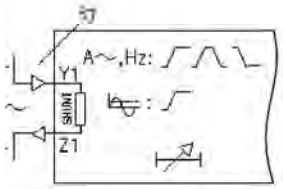
TECHNICAL DATA (1/2)

Function	Current relay for single phase in AC lines(SAA and SAC) or in DC lines (SAB, SAD and SAJ).
Working mode	Through user's set up. Each one of the available relays can be assigned with the operation by one or more magnitudes, operating by the first one that occurs.
Display of the reading values	By means of the following status screens: CURRENT: Value of the current. VOLTAGE: Value of the voltage in mV (SAC, SAD). READING UNIT: (options described on page 39): Value converted to the selected reading unit (SAC, SAD, SAJ). FREQUENCY: Value of the network frequency (SAA, SAC). DC COMPONENT: Value of the maximum DC component (SAA, SAC). RIPPLE: Value of the DC ripple (SAB, SAD).
Output	- From 1 to 3 independent relays - Analogical 4-20 mA - Communication RS232 - RS485
Detection / Release	In all the magnitudes, it is possible to set the detection value and/or the release value.
Timer	Associated to an action of any relay. Adjustment to detection and/or release. Several functions.
Repetibility	± 30 ppm
Time ranges	0,01..99,99 s 0,01..99,99 m 0,1..999,9 h
Reading precision	Taken on the current measured value: 1%
Frequency	0,3 %
4-20mA	1% additional to the measured value.
Caution ⚠	Apply simultaneously the supply voltage and the line to be controlled. In the case that both lines cannot be connected simultaneously, connect always the supply voltage first than the line to be controlled.

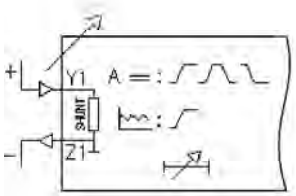
TECHNICAL DATA (2/3)

Connection diagrams

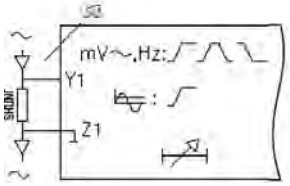
SAA

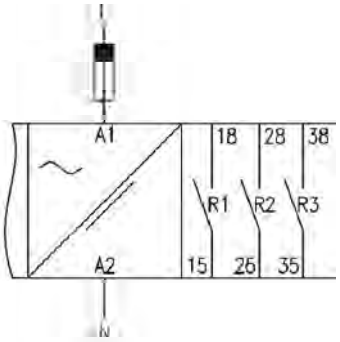


SAB

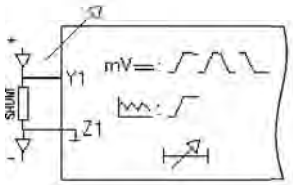


SAC

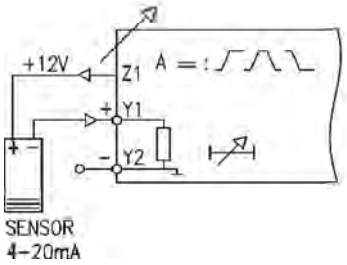




SAD



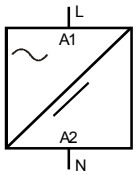
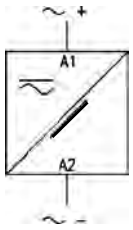
SAJ



DISIBEINT

TECHNICAL DATA (3/3)

Supply voltage

	AC		AC - DC	
				
Supply voltage code	[024] .. [440]		[903]	[904]
Galvanic isolation	4000 V		2500 V	
Frequency	50 Hz	60 Hz	-	
Operating margins	+10% -15%		15-70 V	60-240 V
Consumption	2,5 VA		3,5 W	3,1 W
Start-up time	100 ms	96,6 ms	<525 ms	<135 ms
Detection time	25 ms	21,6 ms	115 ms	110 ms
Reset	> 1 net cycle and/or -30% of the nominalvoltage		>70 ms* and/or-30% of the nominal voltage	
Indication	Green Led			

* In the worth of the cases

Constructive and enviromental data

Voltage phase-neutral	300 V
Overvoltage category	III
Rated impulse voltage	4 kV
Pollution degree	2 (EN61010)
Protection	IP 20
Approximate weight	280 g
Storage temperature	-30..+80ºC
Operating temperature	-20..+50ºC
Humidity	< 95% HR
Housing	Cycoloy - Light grey
Socket	Lexan - Transparent
Leds cover	Technyl - Dark blue
Button, term. block, clip	Brass
Pins of terminal block	0,8 Nm

Designed and manufactured under EEC normative.

Directives referred:

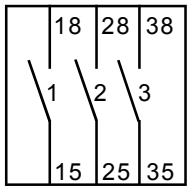
Electromagnetic compatibility: EMC 2004/108/EEC.

Low voltage: LVD 2006/95/EEC.

Hazardous substances: 2011/65/EEC.

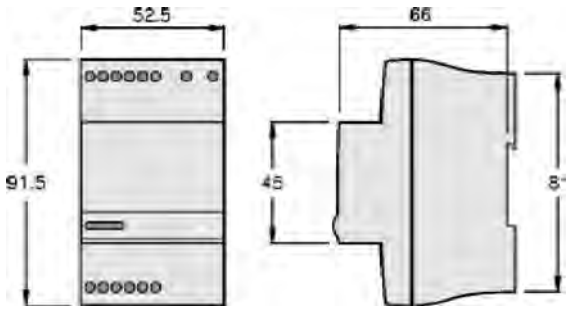
Plastics: UL 91 V0.

Output relays



Resistive load	AC	6 A / 240 V
	DC	6 A / 24 V
Inductive load	AC	3 A / 240 V
	DC	3 A / 24 V
Mechanical life		> 10^6 oper.
Mech. switching rate		18.000 oper. / hour
Elect. life at full load		360 oper. / hour
Contact material		AgSnO Alloy
Operating voltage		240 VAC (85 ºC)
Volt. between contacts		1000 VAC
Volt. coil/contact		4000 VAC
Isolation resistance		> 100 MΩ (500 VDC)
Indication		1 red led per relay

Dimensions



CE

CE CONFORMITY DECLARATION
QUALITY CERTIFICATE

The company

DISIBEINT ELECTRONIC S.L.
Segle XX 91
E08032 Barcelona - Spain
CIF. B - 60893849

Declares under its sole responsability that the following products:

- Float Switches with generic references INCR, INMR, INME, INMF
- Level sensors and your accessories, with generic references NS, NR, NCP, NCV, NP, SC, CNM, CNP, CNPR, CNV, SVR, IBT, BPCB, BPCBA, CBBP
- Level Magnetic Switches with generic reference IMN
- Level Magnetic Transducers with generic references TMN, TMR
- Electronic relays embraced under the generic denomination of the series P*nnn*, D*nnn*, S*nnn, being 'nnn'* any combination of letters and/or numbers that make up a specific reference

identified with the brand DISIBEINT, have been manufactured according to the instructions of our procedure manual and are in conformity with:

Directive of Electromagnetic Compatibility
EMC 2014/30/UE from 26/02/2014
- Emission (UNE-EN 61000 6-4/2007/A1:2011)
- Immunity (UNE-EN 61000 6-2/2006)

Low Voltage Directive
LVD 2014/35/UE from 26/02/2014
- Machinery (UNE-EN 60204 -1/2007/A1:2009)
- Measuring Electronic Devices (UNE-EN 61010-1/2011)

Directive about certain hazardous sustances
2011/65/UE from 08/06/2011
- Pb, Hg, Cd, Cr +6, PBB, PBDE

Barcelona, June 2018

EMILIO JOLIS OLIVA

CONVENTIONS USED IN THIS MANUAL

References

This manual is valid for the models SAA, SAB, SAC, SAD and SAJ. Since certain informations are not valid for all the models, in the top row of each page are stated the references of the models explained in that page.

Symbols

	It refers to the information own of the theme that is treated.
	Indicate important warnings to take into account.
	It refers to how the keys must be pressed to perform the actions indicated in the examples.
	General information about the controller or about this manual, too.

Screens

In the pages where is explained how to access to the different screens and menus (page 9), it is shown the way to come up to the resolution of every option. This way is highlighted by a dark background of the screens related in that option.

The union of several screens by means of a dashed line, means that the option is valid for all of them.

GENERAL CONCEPTS

Loop 4-20 mA (optional): The value sent by the 4-20mA loop can be whichever of the following ones:
- Indirect current or the selected reading unit (SAA, SAB)
- Indirect voltage or the selected reading unit (SAC, SAD, SAJ)
- Frequency (SAA, SAC)

See the page 45 to associate a value to the current loop.

Communication with PC (optional): It is possible to communicate the controllers SAA, SAB, SAC, SAD and SAJ with a computer via the serial port RS232 for its remote programming or to process the data that it generates. For a standing-alone communication, the programming interface CBPZ is required. For a multiple communication (up to 31 equipments) a RS232-RS485 conversor must be used, reference SBAZ.

Display's illumination: The display remains illuminated while its is accessed to the different screens. If any key is not pressed for longer than 30 seconds, the light turns off. In order to turn the light on, it is enough to press any key once only.

Working mode: After setting up the controller's parameters, it can be back to the normal working mode by executing the option RETURN from the set up menu. The status screens can be also visualized if any key is not pressed for longer than 3 minutes.

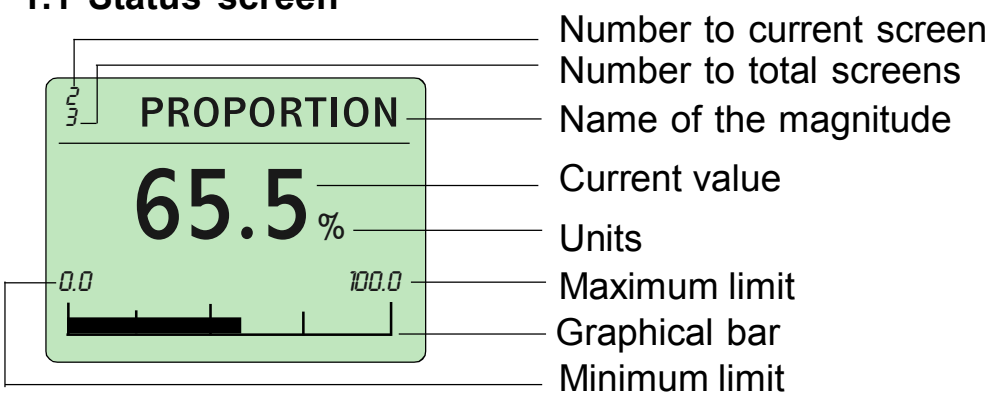
Interactive menus: Only those options that can be configured are accessible in menus, being the rest of the they no visible. This characteristic is interactive, this is, that it's produced automatically in function of the active options at each moment.

Change of values: The screens used to change a numerical value contain the margins between that value can be adjusted. These margins can depend on another options, so that they can visualize different values in function of another previous relations.

Assignation of magnitudes: Each relay can be activated by the control of one or various magnitudes. For exemple, it can be assigned to RELAY 1 the action by maximum voltage and minimum frequency, although when the relay is activated, it is not possible to know which magnitude has provoked it.

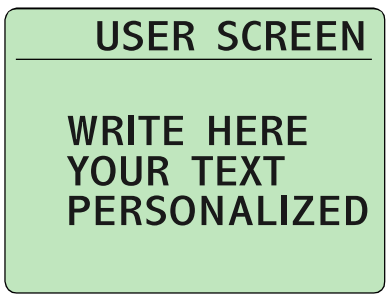
TYPES OF SCREENS (1/5)

1.1 Status screen



The status screens show the actual values of the magnitudes that the equipment controls. In the normal working mode, the equipment shows the status screen that the user has chosen like preferring magnitude of visualization.
In order to move around among the different status screens of status, press ▲▼. By pressing ● from anyone, it is entered to the set up menu.
The default status screen is the one shown when the equipment is powered or when any key is not pressed for longer than 3 minutes. To select it, execute the option SEE SCREEN (see page 44).

1.2 User screen



The text edited in the user screen is the one that will be shown next to the status screens when the equipment is in the normal working mode. The characters that can be used are the following:

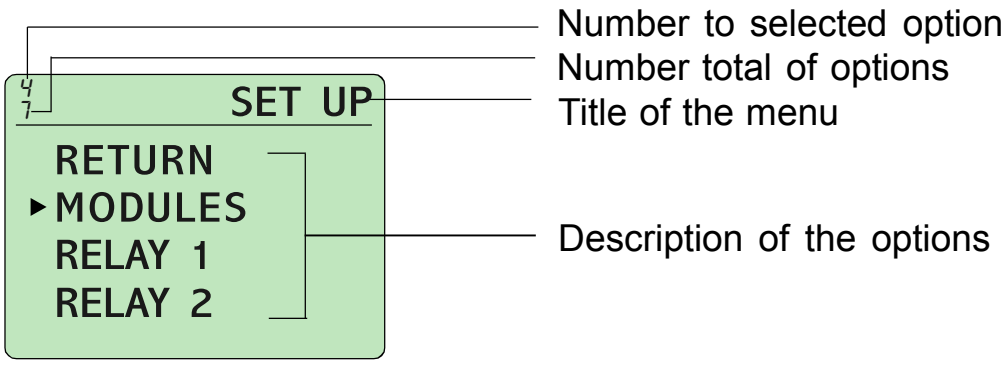
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Å Æ ß Ç Ñ Ø - / # % < = > 0 1 2 3 4 5 6 7 8 9

Pressing ▼ and ▲ the desired character is selected and becomes validated by pressing ●, moving up to the following position of the right hand or to the line below. The repeated pulsation ● of this key provokes the advance of the cursor.

A validated character can not be modified, it means that is not possible to move the cursor back. In order to modify a text, is necessary to enter again into the edition screen.
In order to abandon this screen is essential to advance until the last position of the last row.

TYPES OF SCREENS (2/5)

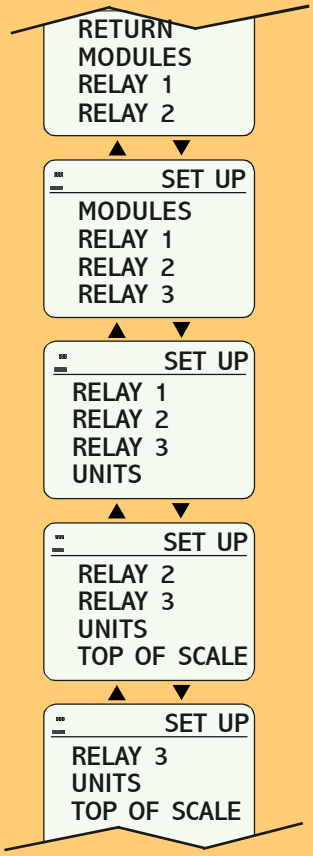
2.1 Screen of options menu



2.2 Selection of options menu

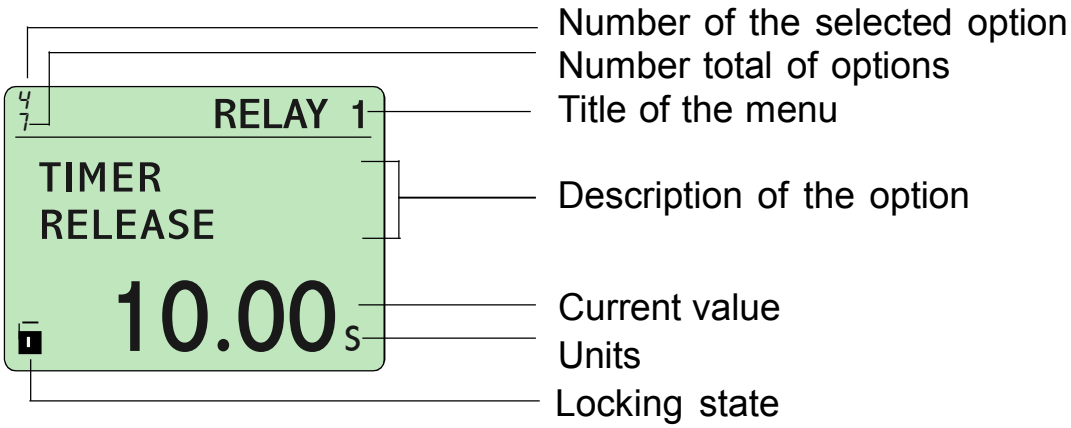
Are those in which a series of options is visualized, line by line. The selection of one option carries to a new menu. The digits placed at the top of the screen indicate, from top to down, the number of the selected option and the total number of options. The options are disposed in an endless loop, in such a way than after the last option it comes to the first one of the series. In the same way, moving back from the first option it comes to the last one of the series.

Press the keys ▲▼ until the cursor indicate the desired value and ● to validate it and jump to a new menu. In order to abandon a menu of options and return to the preceding screen, the option RETURN must selected.

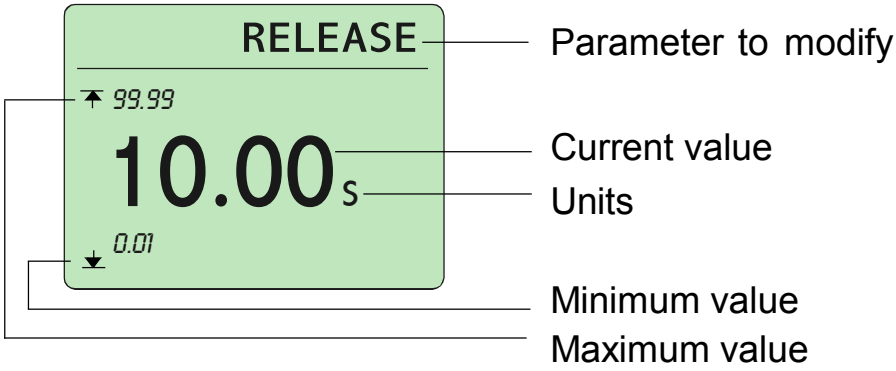


TYPES OF SCREENS (3/5)

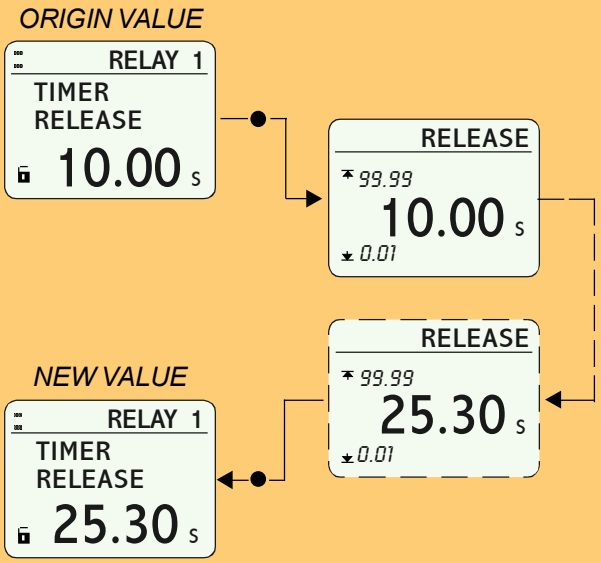
3.1 Informative screen of numerical value



3.2 Screen for changing a numerical value

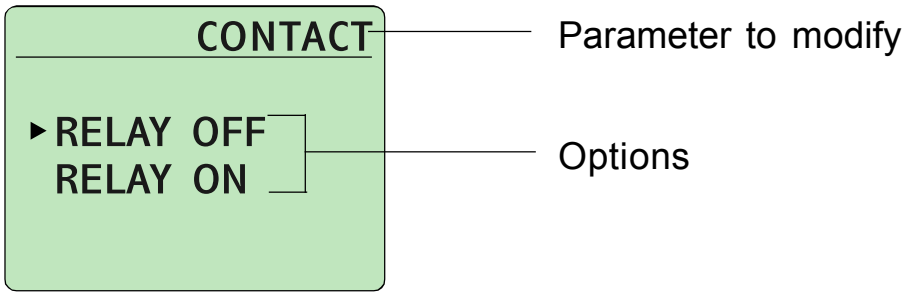


Once placed on the screen that shows the parameter we want to modify its value, press ● in order to access to the screen for changing the value. Since the modification is done digit by digit and not like a complete value, the first digit at left remains blinking. Press ▲ ▼ to modify the value and ● to validate it and to advance to the following digit. When the last digit becomes validated the preceding screen is visualizated again.

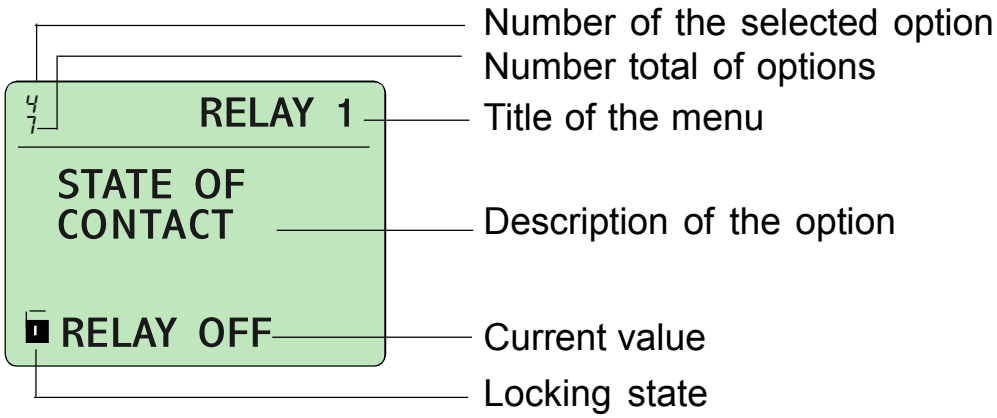


TYPES OF SCREENS (4/5)

4.1 Informative screen of alphanumeric value

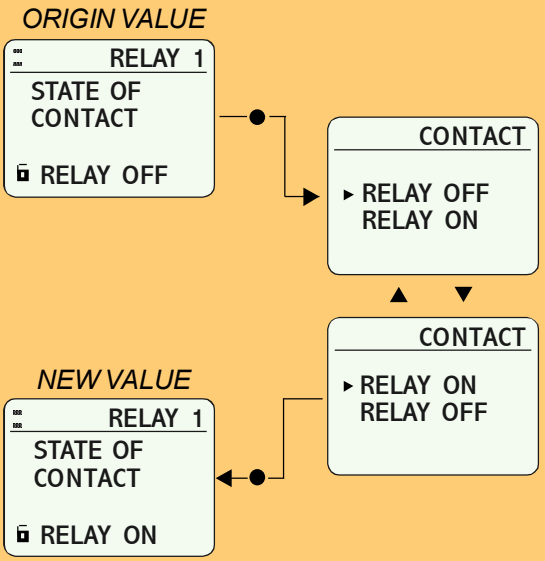


4.2 Screen for changing an alphanumerical value



Once placed on the screen that shows the parameter we want to modify its value, press ● in order to access to the screen for changing the value.

Press ▲ ▼ until the cursor indicates the desuired value and ● to validate it and return to the preceding screen.

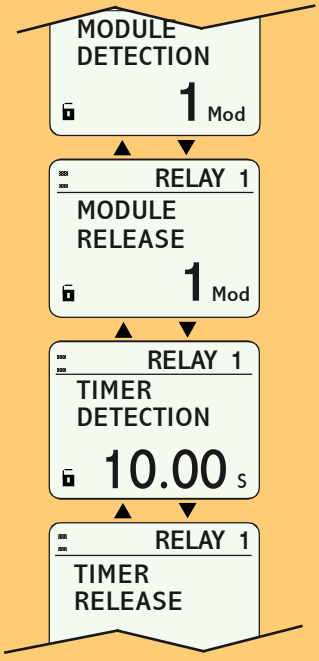


TYPES OF SCREENS (5/5)

5.1 Screens menus

Are those in which is visualized a series of screens, all them related under the same concept. The digits placed at the top of the screen indicate, from top to down, the number of the selected screen and the total number of screens. The screens are disposed in an endless loop, in such a way than after the last screen it comes to the first one of the series. In the same way, moving back from the first screen it comes to the last one of the series.

Each one of the screens usually displays the definition of a parameter and its actual value. Press the keys ▲▼ to move to a new screen and ● to modify the value visualized in it. If no-one value is visualized on the screen, pressing ● it is accessed to a new menu. In order to abandon a screens menu and return to the preceding one, the RETURN screen must be selected.



QUICK START

1 - Keep without voltage the input signal (terminals Y1 and Z1) and the output relay disconnected.

2 - Apply supply voltage to the terminals A1 and A2. Be sure that it be coincident with the value marked in the housing. The green led must be turned on. Now there is not important whether the red leds related with the relays are turned on or off. Because there is not input signal, the status screens display nonreal values, fluctuating constantly.

3 - Set up the parameters that your application needs. Now you can choose two solutions: configure each parameter individually (see Advanced Programming, page 18) or use the «user programs» that, as an example, contains several parameters already configured for some *typical* applications. You will only need to modify those parameters belonging to your particular application. Read carefully the description of these programs and see if they becomes adapted to your needs. (see pages 15..18).
Don't mind if the relays switch on/off while your are setting up the controller: remember that the input signal is not applied.

4 - Switch off the supply voltage.

5 - Be sure that the current to be controlled is within the measurement margins of the controller.
Take into account the polarity in the models SAB, SAD and SAJ.

6 - Apply simultaneously the supply voltage and the current to be controlled. In the case that both lines can not be connected simultaneously, connect always the supply voltage first than the current to be controlled. Confirm that the state of the relay is the required one by checking the red leds in the front of the housing.

7 - If everything is right, turn the supply voltage off and connect the output relays according to the conditions of your installation. When the supply voltage is applied again, the controller is ready for normal operation.

USER PROGRAMS (1/7)

User programs are permanent in the controllers SAA, SAB, SAC, SAD and SAJ.

In order to modify them, load the program you desire (for example, number 1) into memory by means of the sequence SET UP-OPTIONS-PROGRAM 1. Modify the parameters, values, timers, etc. and do the opportune checkings until everything work correctly.

Bear in mind that the disconnection of the supply voltage does not provoke the loss of data. For your safety, save your changes by means of the sequence SET UP-OPTIONS-SAVE PROG. (see page 45).

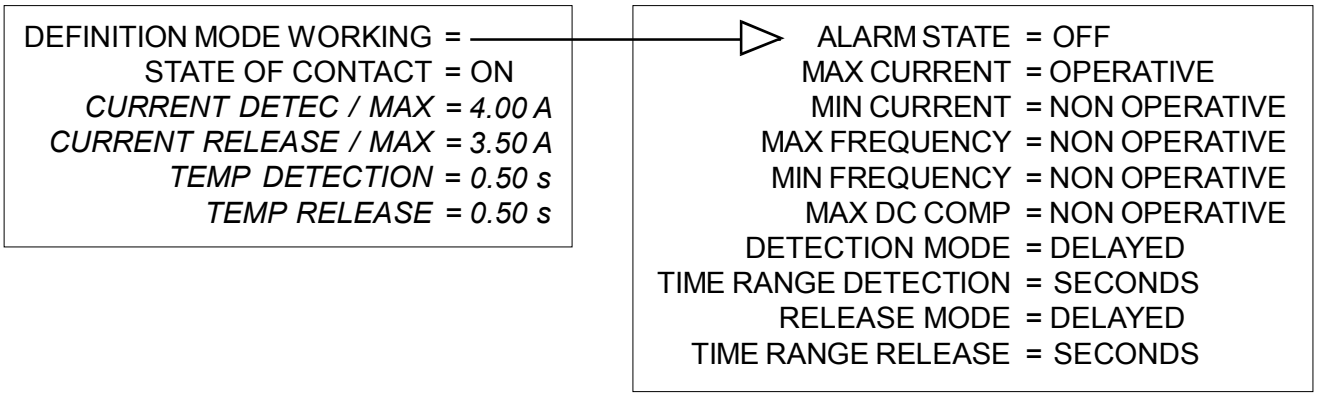
Remember than every time that Program 1 is loaded into memory, the default factory parameters will be restored. If the User Program is loaded (SET UP-OPTIONS-PROG USER), you will obtain the parameters that you modified (see page 46).

It is not required to load any user program when the equipment turns on: it is kept the same configuration that was operative the last time that the equipment was turned off.

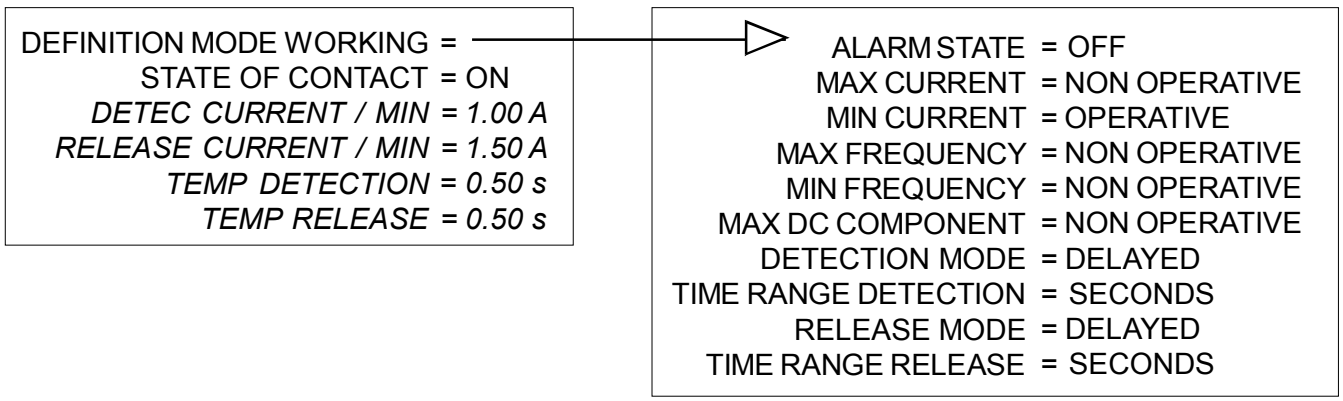
USER PROGRAMS (2/7)

PROGRAM 1: Maximum and minimum current control.
It's suposed a current to be controlled of 5 A.

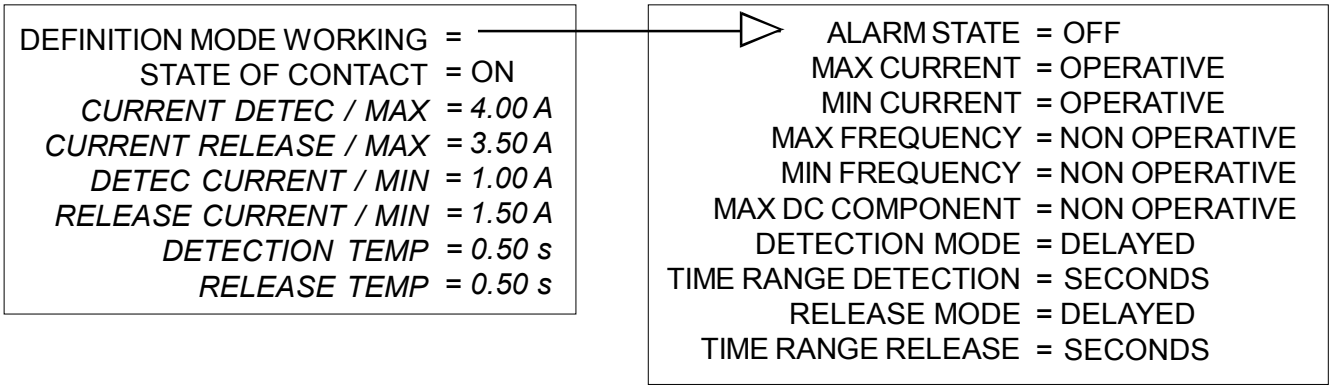
RELAY 1: Maximum current detection



RELAY 2: Minimum current detection



RELAY 3: Maximum and minimum current detection

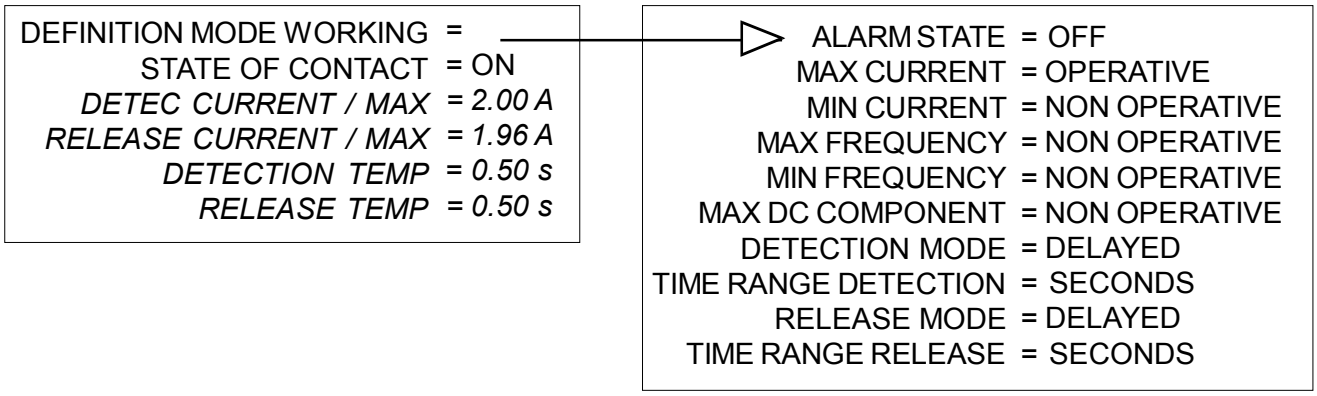


NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

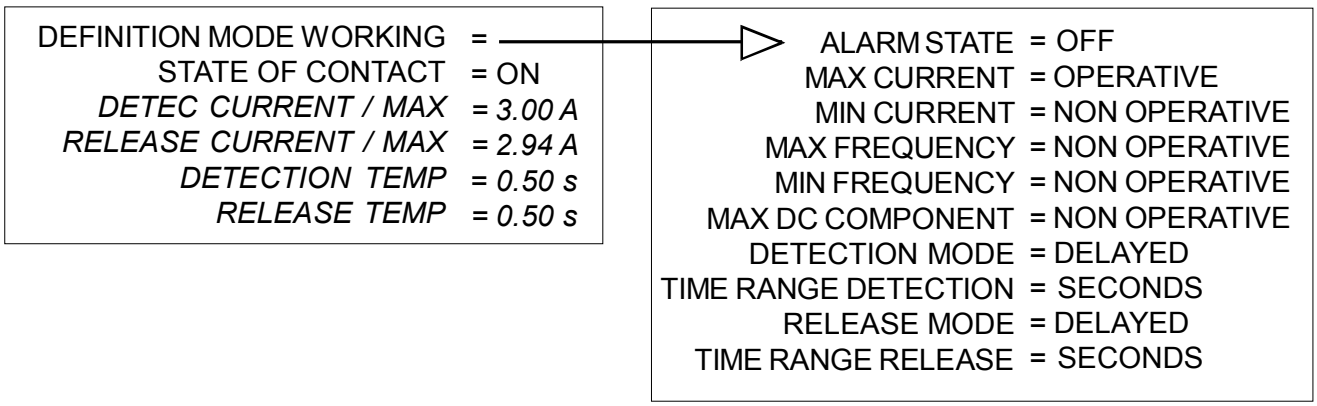
USER PROGRAMS (3/7)

PROGRAM 2: Maximum current control with 3 stepped set-points.
It's suposed a current to be controlled of 5 A.

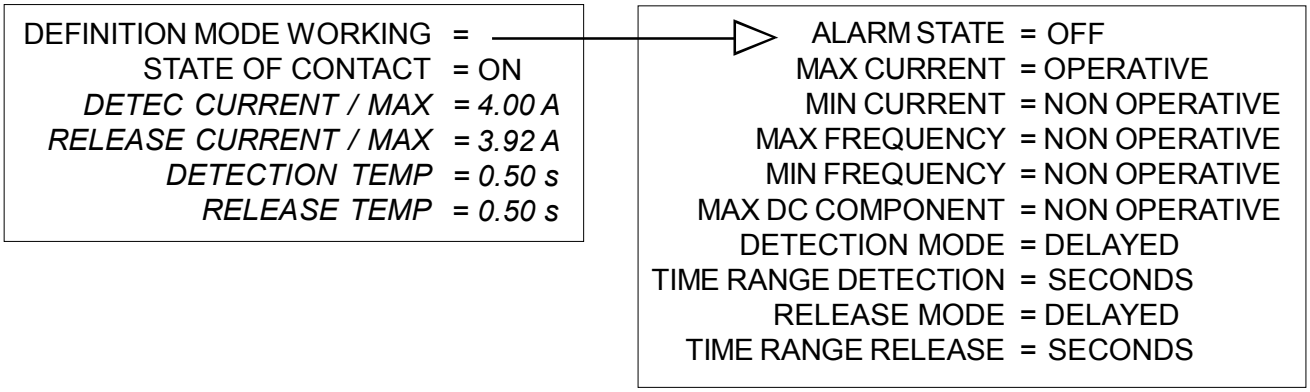
RELAY 1: Maximum current detection (2 A)



RELAY 2: Maximum current detection (3 A)



RELAY 3: Maximum current detection (4 A)

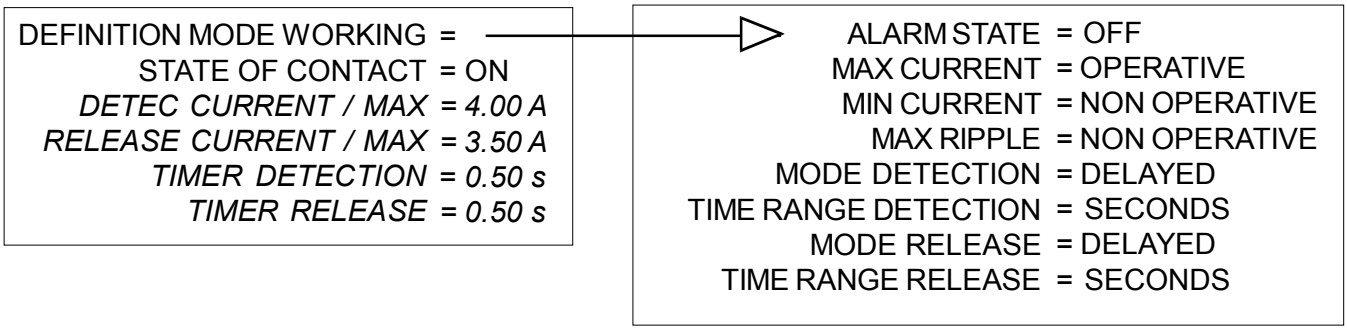


NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

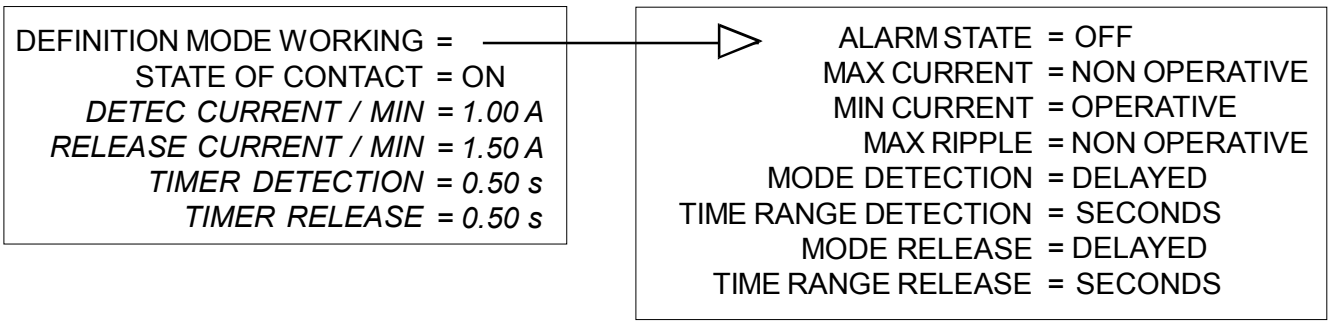
USER PROGRAMS (4/7)

PROGRAM 1: Control maximum and minimum current.
It is supposed to control an current of 5 A.

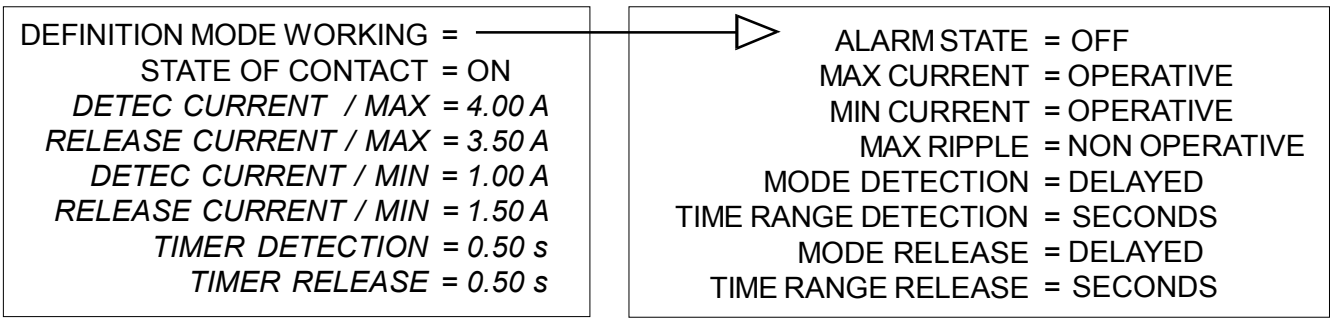
RELAY 1: Detection of the maximum current



RELAY 2: Detection of the minimum current



RELAY 3: Detection of maximum and minimum current

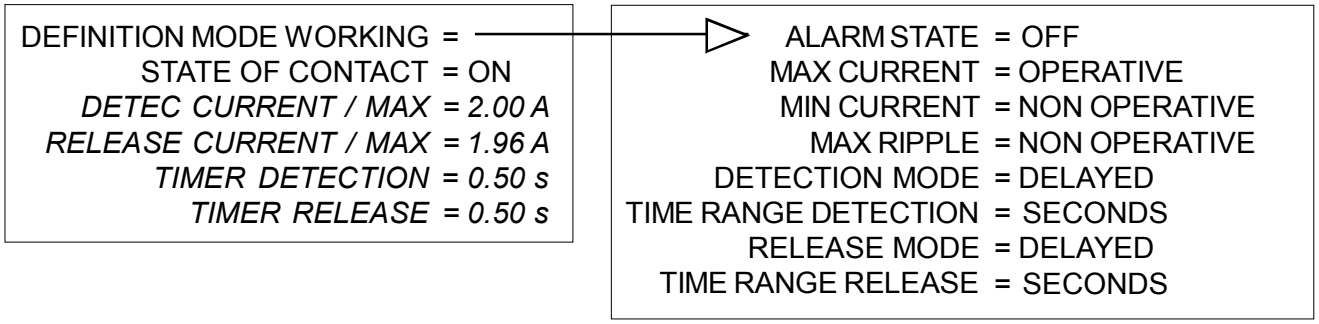


NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

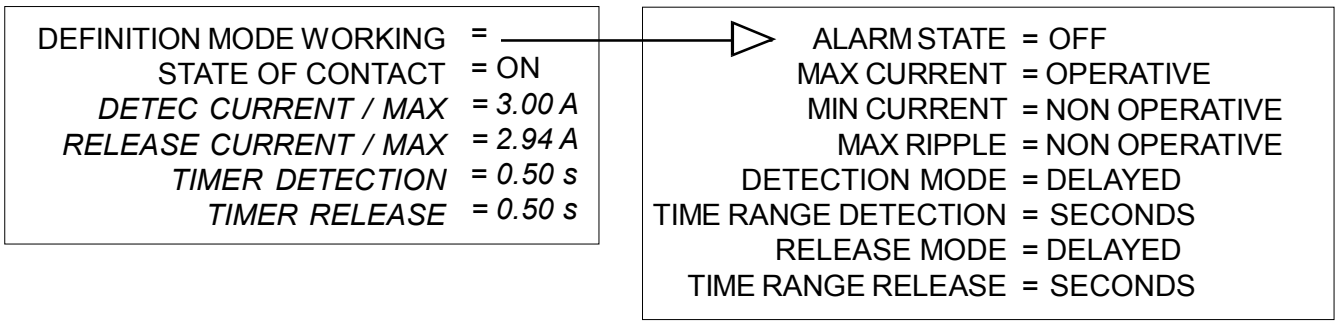
USER PROGRAMS (5/7)

PROGRAM 2: Current and ripple control.
It's suposed a controlling current of 5 A.

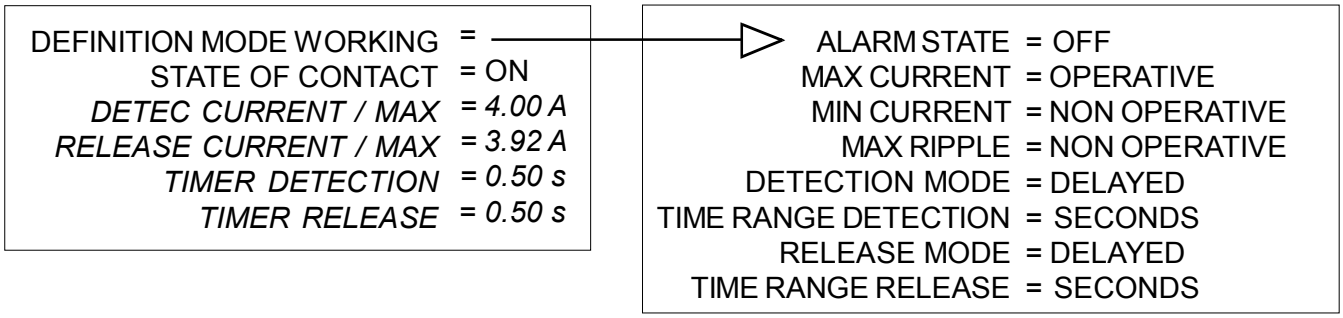
RELAY 1: Maximum current detection



RELAY 2: Maximum current detection



RELAY 3: Maximum current and ripple detection



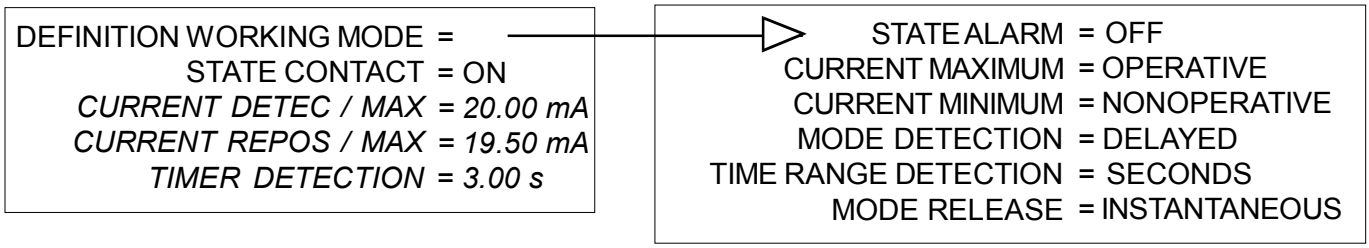
NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

* Not available for the model SAJ

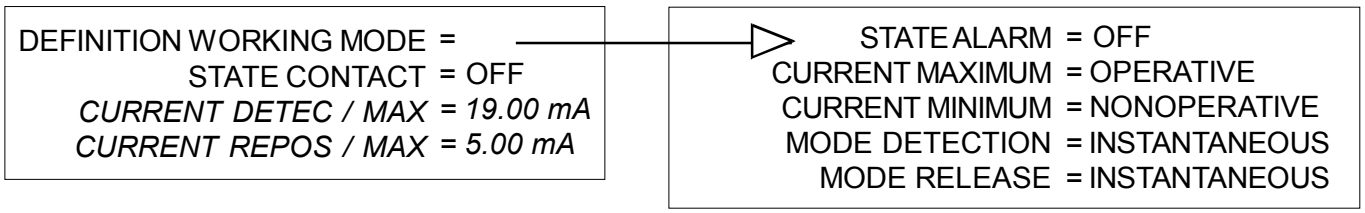
USER PROGRAMS (6/7)

PROGRAM 1: Control of maximum and minimum current.

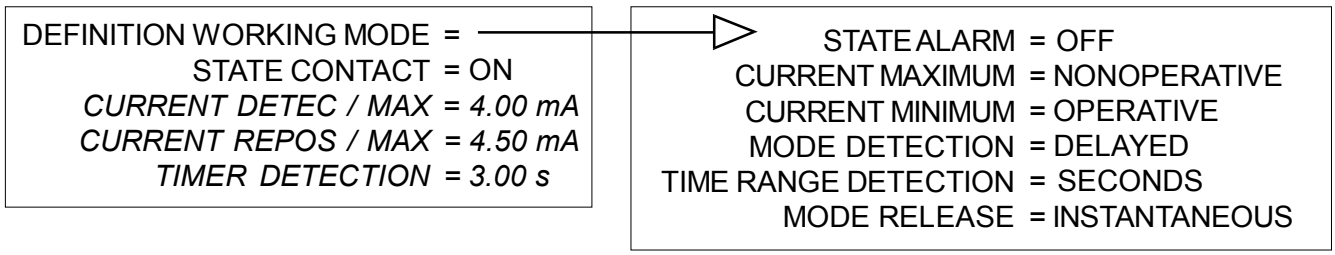
RELAY 1: Detection of the maximum current



RELAY 2: Detection of the maximum current



RELAY 3: Detection of the minimum current



NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

USER PROGRAMS (7/7)

PROGRAMA 2: Control of maximum and minimum current with 3 stepped set-points.

RELAY 1: Detection of the maximum current

DEFINITION WORKING MODE	=
STATE CONTACT	= OFF
CURRENT DETEC / MAX	*= 6.00 mA*
CURRENT REPOS / MAX	*= 5.00 mA*
TIMER DETECTION	*= 3.00 s*
TIMER RELEASE	*= 3.00 s*

STATE ALARM	= OFF
CURRENT MAXIMUM	= OPERATIVE
CURRENT MINIMUM	= NONOPERATIVE
MODE DETECTION	= DELAYED
TIME RANGE DETECTION	= SECONDS
MODE RELEASE	= DELAYED
TIME RANGE RELEASE	= SECONDS

RELAY 2: Detection of the maximum current

DEFINITION WORKING MODE	=
STATE CONTACT	= OFF
CURRENT DETEC / MAX	*= 12.00 mA*
CURRENT REPOS / MAX	*= 11.00 mA*
TIMER DETECTION	*= 3.00 s*
TIMER RELEASE	*= 3.00 s*

STATE ALARM	= OFF
CURRENT MAXIMUM	= OPERATIVE
CURRENT MINIMUM	= NONOPERATIVE
MODE DETECTION	= DELAYED
TIME RANGE DETECTION	= SECONDS
MODE RELEASE	= DELAYED
TIME RANGE RELEASE	= SECONDS

RELAY 3: Detection of the maximum current

DEFINITION WORKING MODE	=
STATE CONTACT	= OFF
CURRENT DETEC / MAX	*= 20.00 mA*
CURRENT REPOS / MAX	*= 19.00 mA*
TIMER DETECTION	*= 3.00 s*
TIMER RELEASE	*= 3.00 s*

STATE ALARM	= OFF
CURRENT MAXIMUM	= OPERATIVE
CURRENT MINIMUM	= NONOPERATIVE
MODE DETECTION	= DELAYED
TIME RANGE DETECTION	= SECONDS
MODE RELEASE	= DELAYED
TIME RANGE RELEASE	= SECONDS

NOTE: The options in italics are only available according to the options selected in DEFINITION WORKING MODE

ADVANCED PROGRAMMING

If you want to program by your own the controllers SAA, SAB, SAC, SAD and SAJ it is not necessary to load any program. Set the parameters showed in the screens that appear when turning the equipment on for the first time. Follow the steps below before beginning to program:

1 - Determine what action will make each relay (Ex.: relay 1 to control the overcurrent, relay 2 to control the frequency,…). Bear in mind the following characteristics:

    1.1 - Different relays can control the same magnitude (Ex.: To set up two set points for a minimum voltage, active the detection by minimum voltage for the relays 1 and 2, and set a different value to each one of them).

    1.2 - Diferent magnitudes can be associated to the same relay.

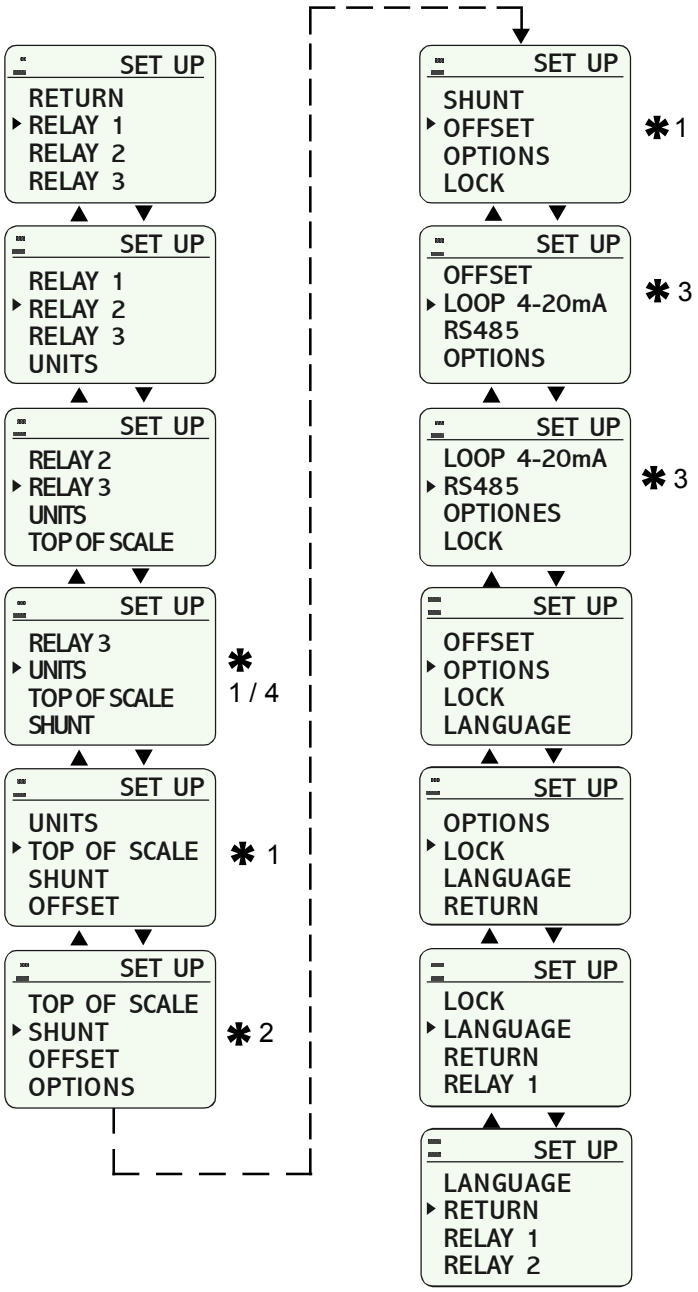
2 - Determine what actions will be timed (Ex.: 3 seconds when detecting overcurrent, 5 seconds if the frequency is low,…).

3 - Begin to program. Remember that certain options will be available according to which are settled in other previous options. Enter to the menu SET UP and select RELAY 1. Look for the screen DEFINITION WORKING MODE and select it. Active and deactive the options of the screens of this menu according to your previous planning. If you want to add timing to the detection or to the release, set the screens MODE DETECTION or MODE RELEASE like DELAYED, respectively. In the following screen you will be able to set the time units. Select the screen RETURN to return to the previous menu and program the rest of the options that you have activated for RELAY 1.

4 - Proceed in the same way for the rest of relays, in case that you are going to use them.

5 - Read the following pages to know the different options and configurations of the digital control relays SAA, SAB, SAC, SAD and SAJ.

SET UP MENU

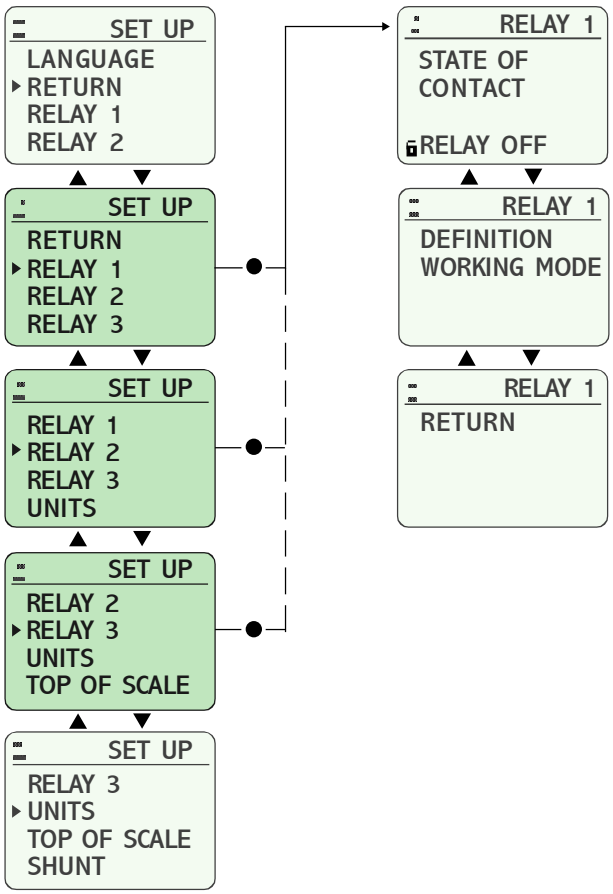


Is the main menu from which is possible to set up all the parameters involved in the controller. It is accessed from the status screens when pressing the button ●. It is also possible to arrive here by chosing the succesives options RETURN included in whichever of the rest of menus or screens.

✱

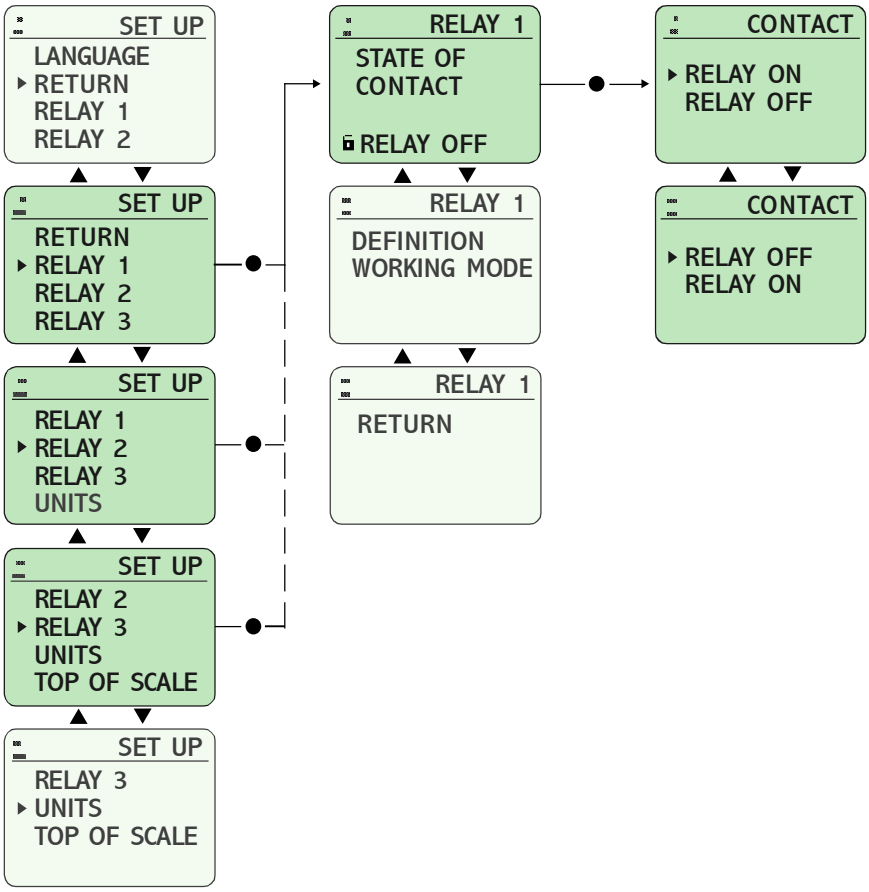
*1 - Available for the ranges 1A, 5A, and 100mV.
*2 - available in the range 100mV.
*3 - Available according the selected communication option.
*4 - In the model SAJ third option is MAGNITUDE.

RELAY MENU



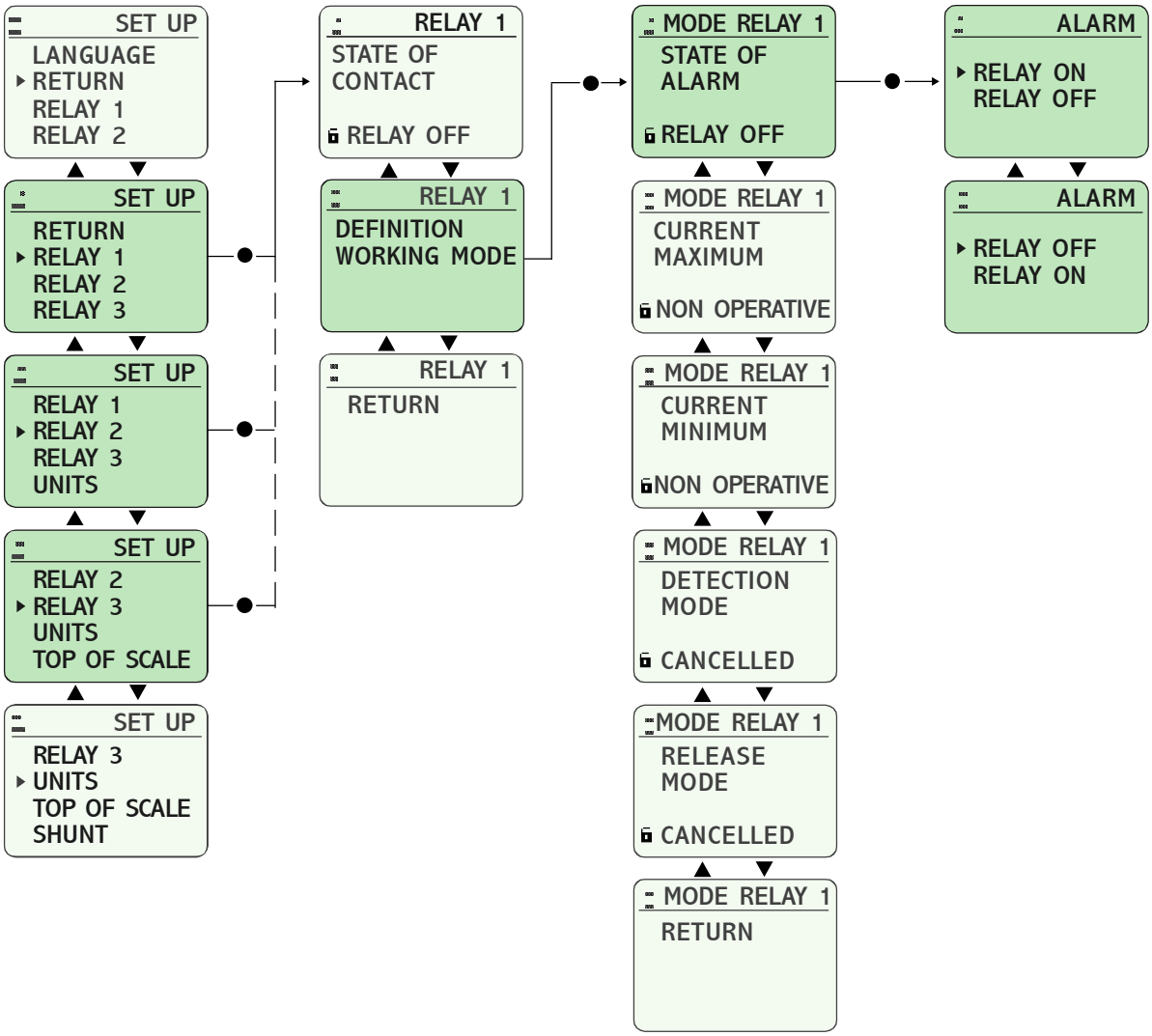
The informations existing in this page and in the following ones are refered to the set up of RELAY 1 and are also extensive to RELAY 2 and RELAY 3, being necessary to set up the parameters of each relay independently.

STATE OF THE RELAY CONTACTS



The state of the relay (OFF/ON) indicates the position of the contacts of the relay when the controller is turned on. The state of the contact of the relay must be set up according to the required operation you need to perform.

STATE OF THE RELAY IN ALARM MODE

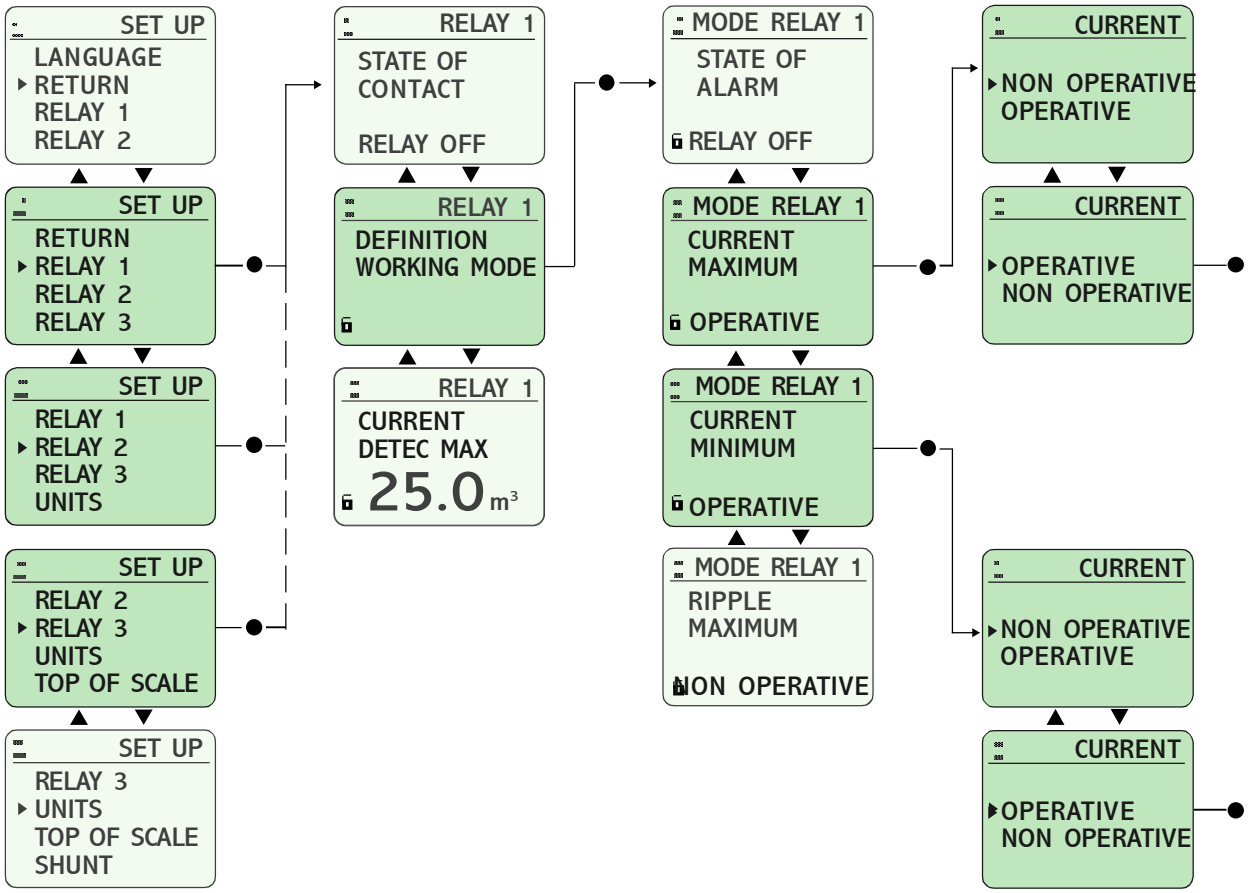


The “alarm mode” is that which is produced in the following circunstance:

- It has produced an error in the internal memory of the controller or in another component which does not allow its right operation.

Because the controller would remain with a wrong information, by means of this option can be set up the state of the contacts of the relay when the above situation is produced.

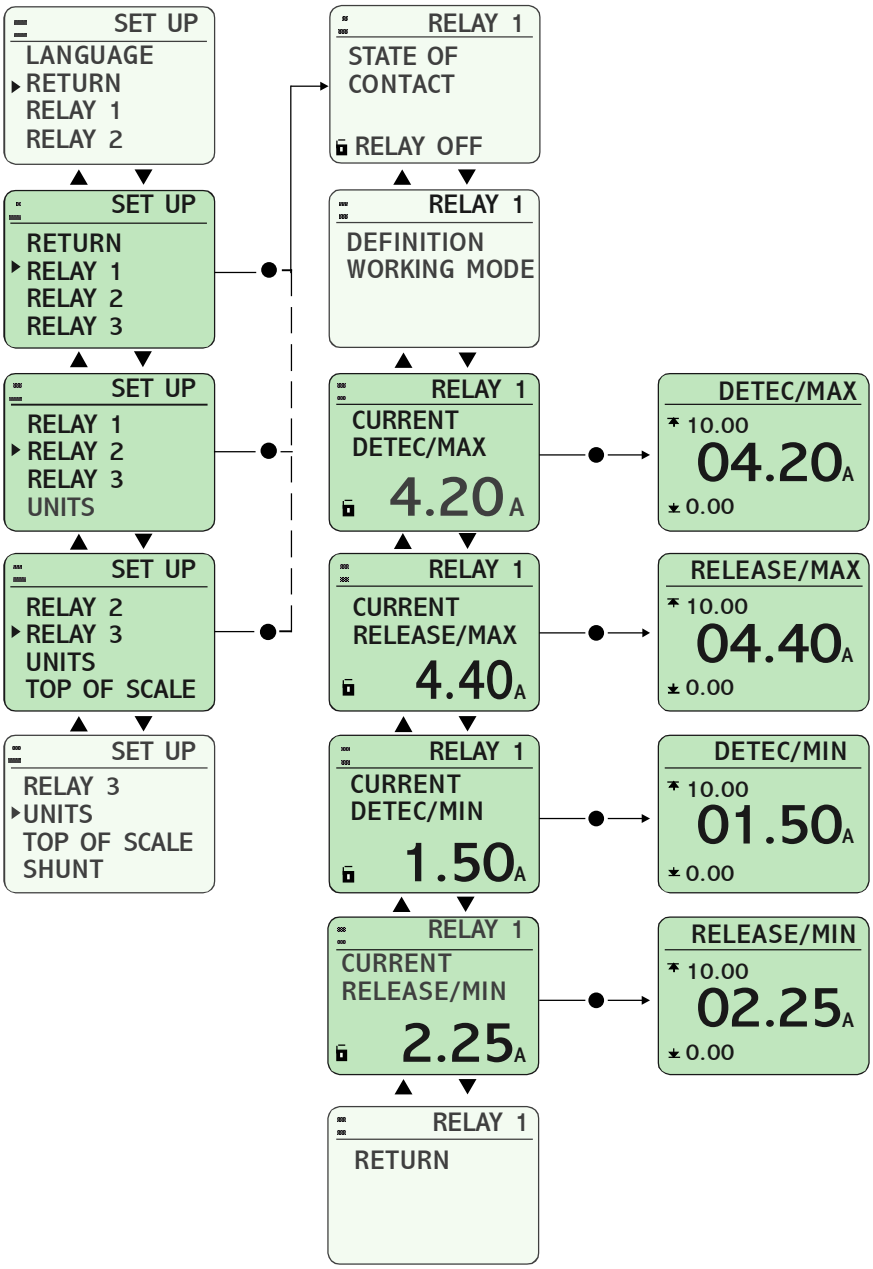
MAXIMUM AND/OR MINIMUM CURRENT (1/2)



Activation

To make the relay operates when the controller detects a determinate maximum and/or minimum current, set this option as OPERATIVE.

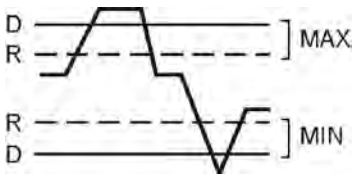
MAXIMUM AND/OR MINIMUM CURRENT (2/2)



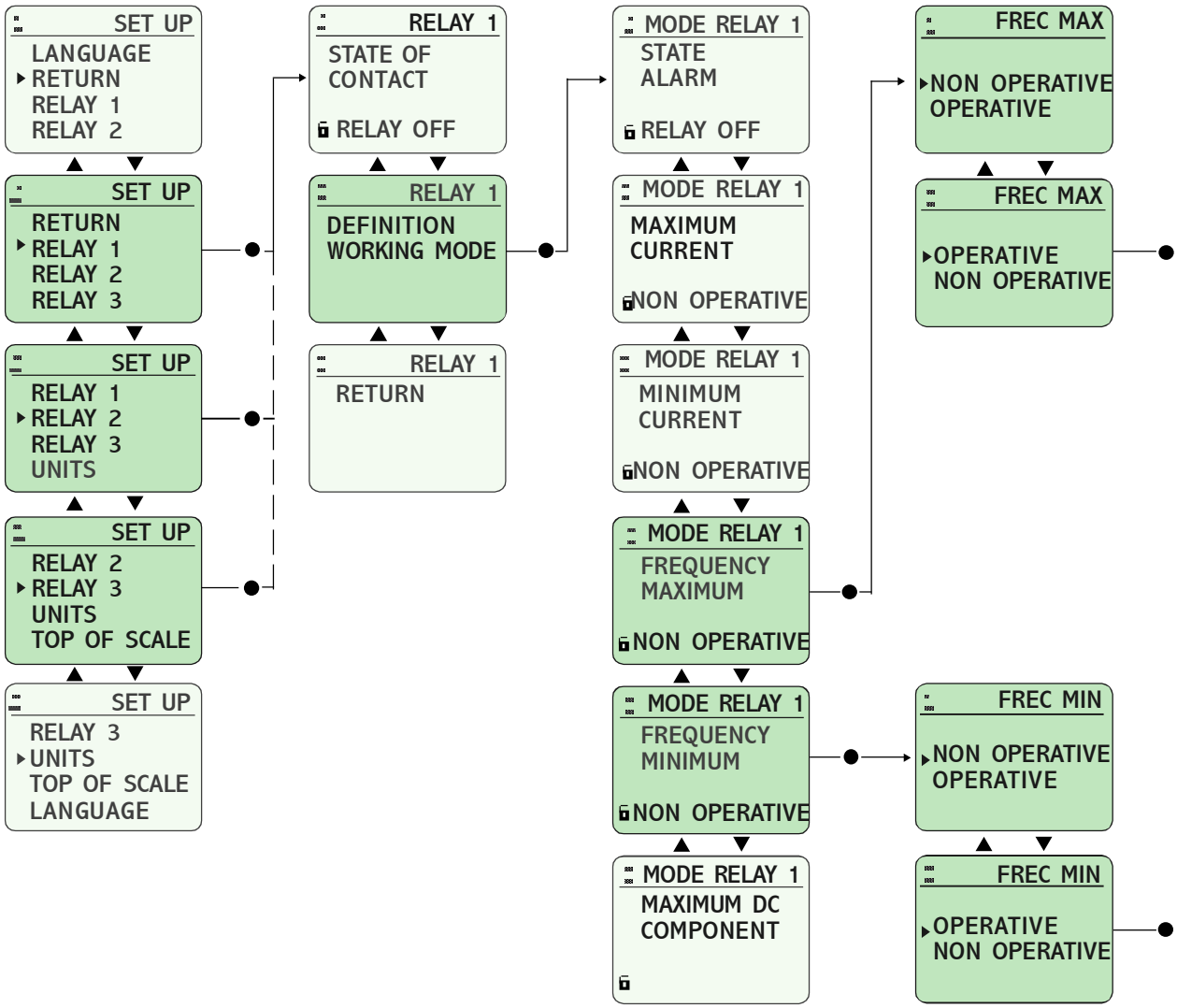
Previous conditions	CURRENT MAXIMUM = **[** OPERATIVE **]** CURRENT MINIMUM = **[** OPERATIVE **]**

Adjustment

It allows to set the values for detection and release. In the model SAJ it is displayed the selected unit (see page 36).
Setting the values for MAX, release must be lower than detection.
Setting the values for MIN, release value must be higher than detection.



MAXIMUM AND/OR MINIMUM FREQUENCY (1/2)



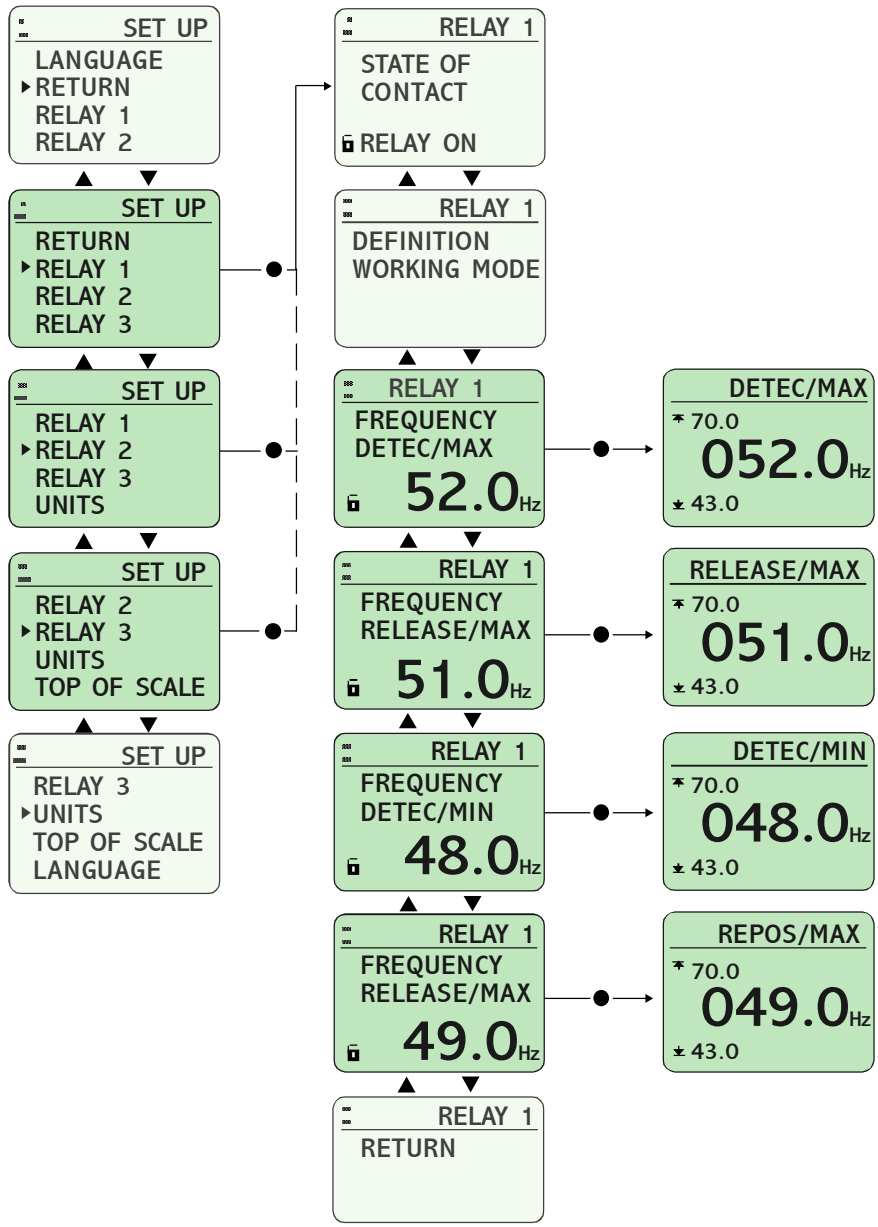
Activation

To make the relay operates when the controller detects a determinate maximum and/or minimum frequency, set this option as OPERATIVE.

With independence of the state of this option, if the frequency varies in a magnitude such as the controller loose the precision for the normal operation, it will switch to the alarm state.

See page 24 for further details.

MAXIMUM AND/OR MINIMUM FREQUENCY (2/2)



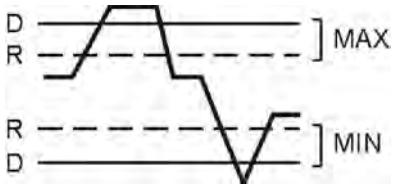
Previous conditions	FREQUENCY MAXIMUM = **[** OPERATIVE **]** FREQUENCY MINIMUM = **[** OPERATIVE**]**

Adjustment

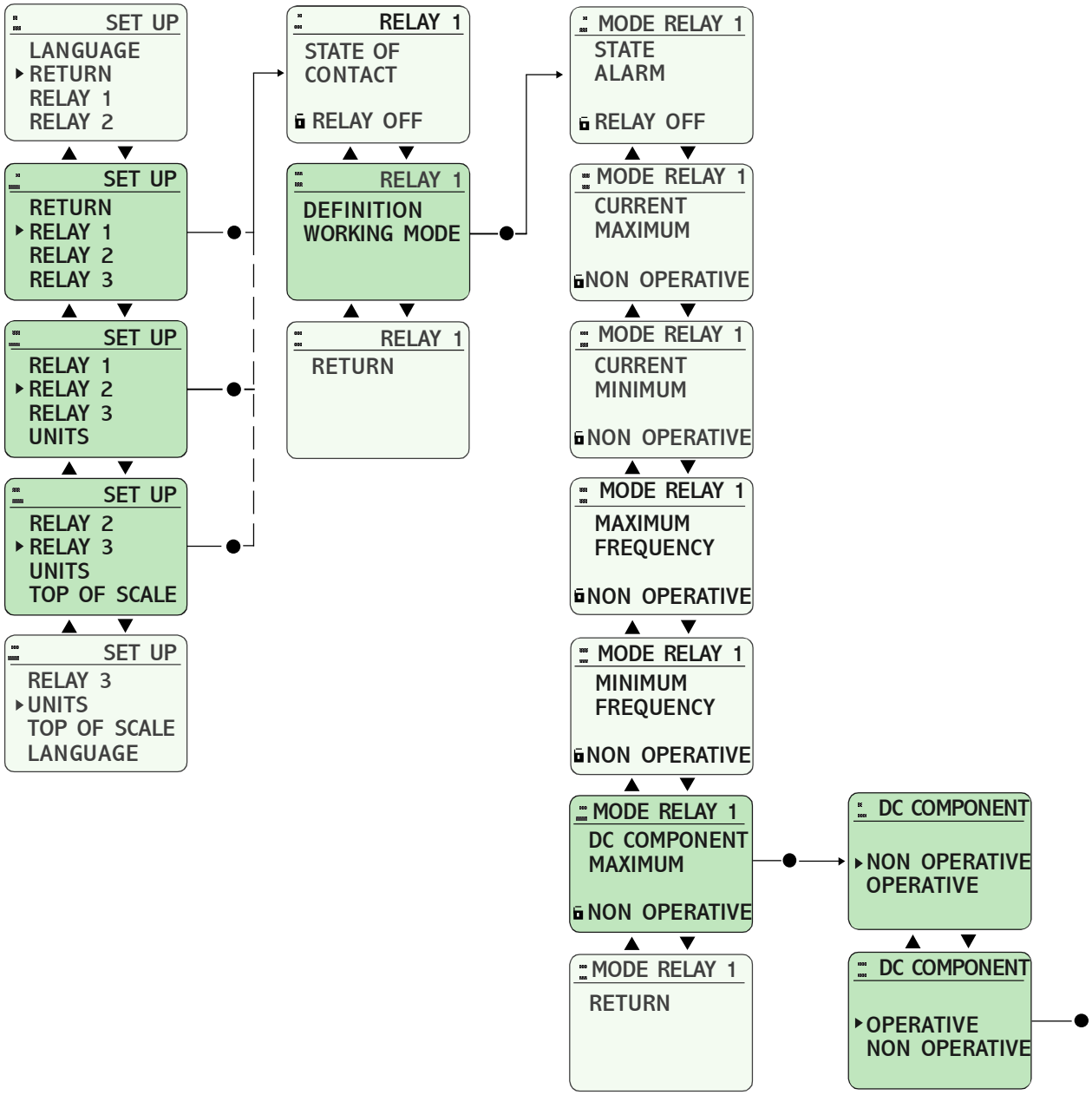
It allows to set the value (Hz) for the detection and/or the release of the maximum and/or minimum frequency.

When setting the working values for Maximum, the release value must be lower than the detection value.

When setting the working values for Minimum, the release value must be higher than the detection value.

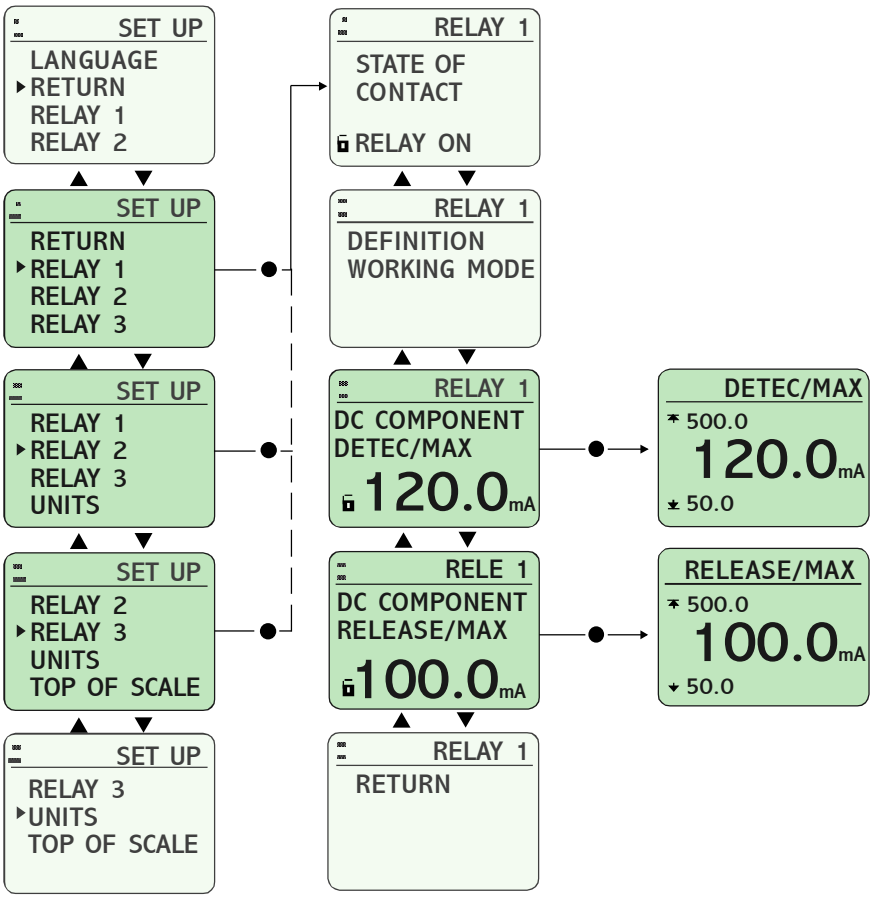


MAXIMUM DC COMPONENT (1/2)



To make the relay operate when the controller detects a maximum DC voltage on the AC line, set this option as OPERATIVE.

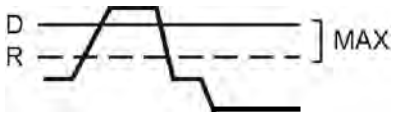
MAXIMUM DC COMPONENT (2/2)



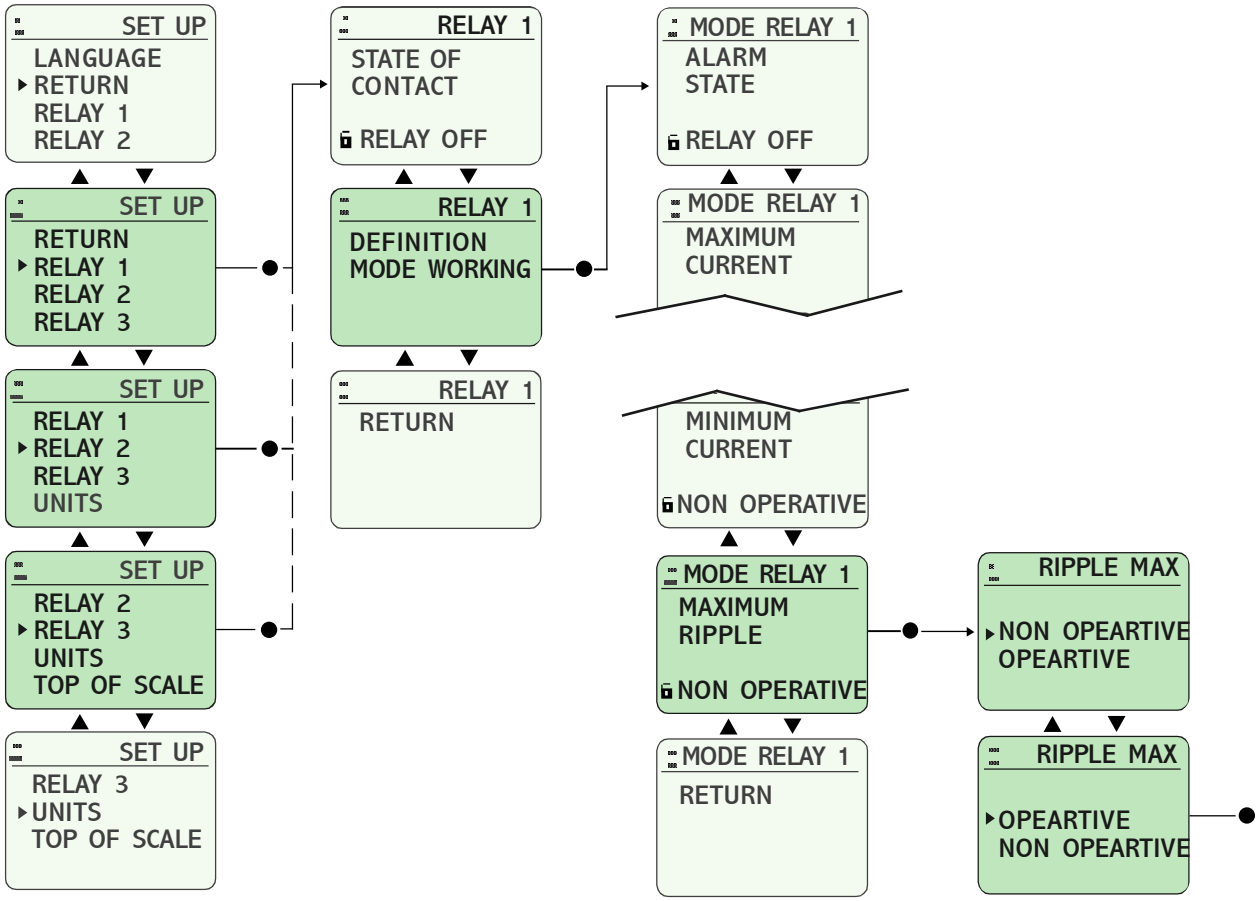
Previous conditions	DC COMPONENT MAXIMUM = **[** OPERATIVE **]**

Adjustment

It allows to set the value (mA) for the detection of the maximum DC voltage on the AC line.
When setting the working value, the release value must be lower than the detection value.

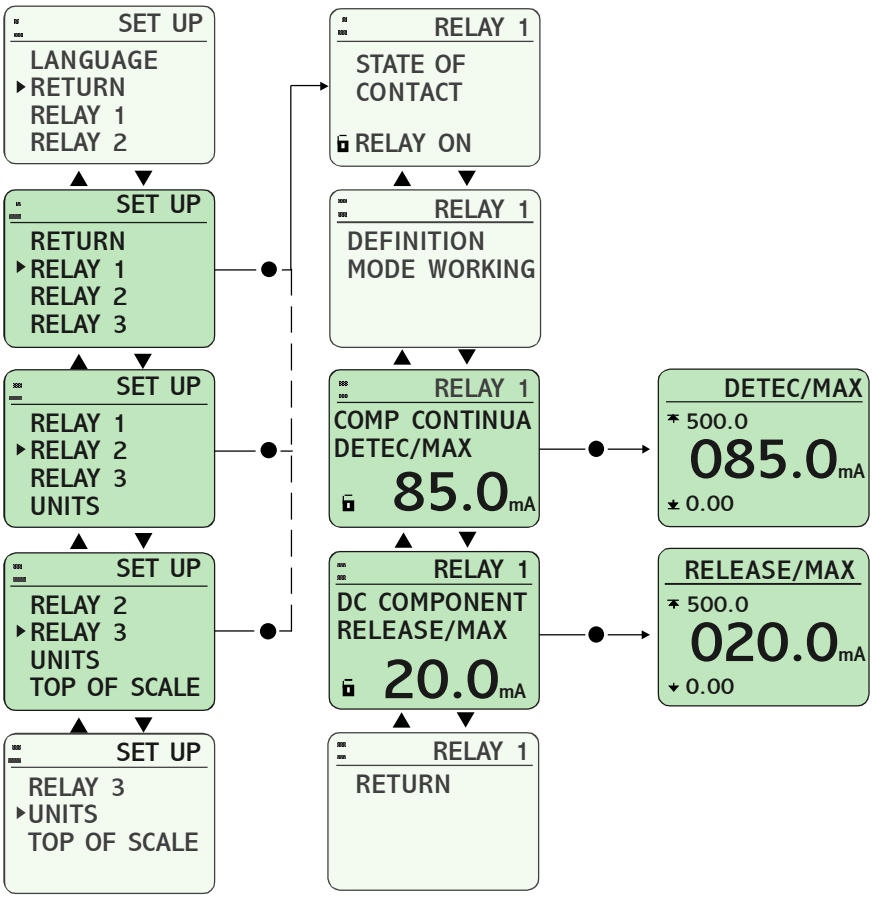


RIPPLE (1/2)



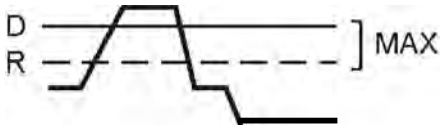
To make the relay operate when the controller detects a wrong ripple in the control line, set this option as OPERATIVE.

RIPPLE (2/2)

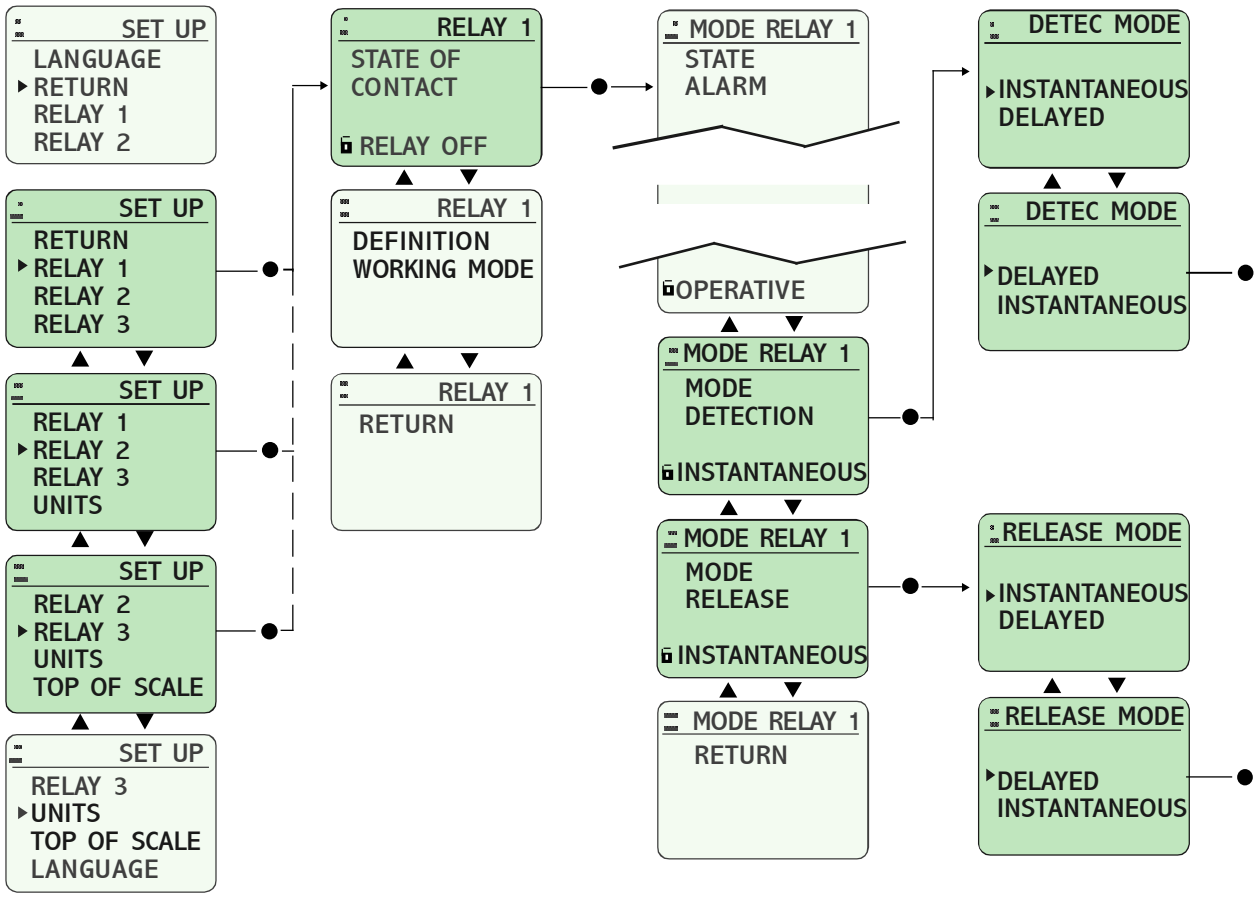


MAXIMUM RIPPLE = **[** OPERATIVE **]**

It allows to set the value for the detection of the maximum ripple in the line to be controlled.
When setting the working value, the release value must be lower than the detection value.



DELAY ON DETECTION AND/OR ON RELEASE (1/3)

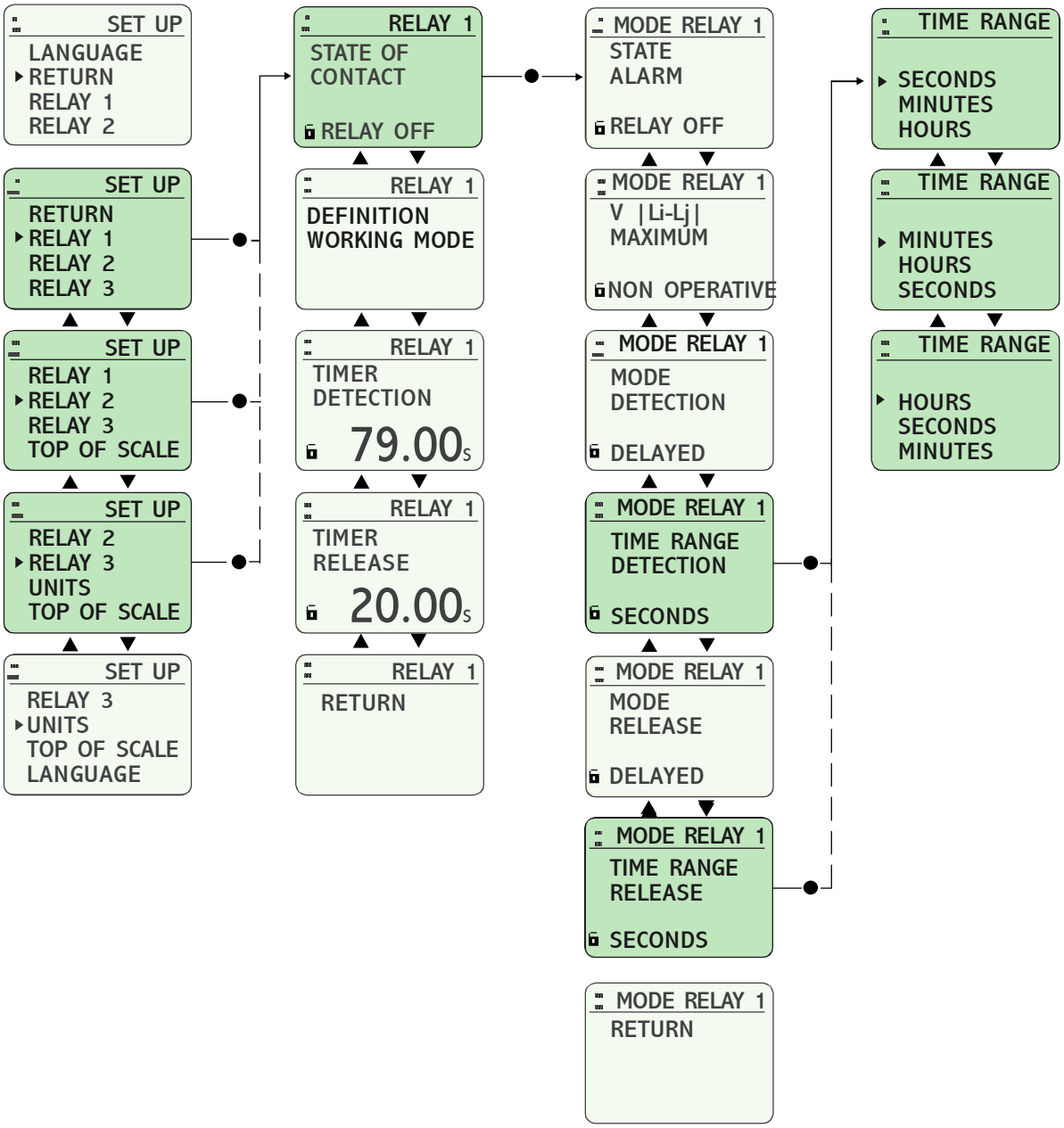


Activation

To add a time delay to the detection and/or to the release, the options MODE DETEC and/or MODE RELEASE must be set as DELAYED. The relay will not operate until the signal will be kept (at the detection) and/or lost (at the release) for a time longer than the adjusted one.

The time delay is related to the relay and not to the magnitude associated to the relay. It means that a timed relay with two magnitudes associated (for example, overcurrent and frequency) will start the timer for whichever of them, the first who occurs. It means, too, that in the case that both magnitudes occurs at the same time, the delay will be unique.

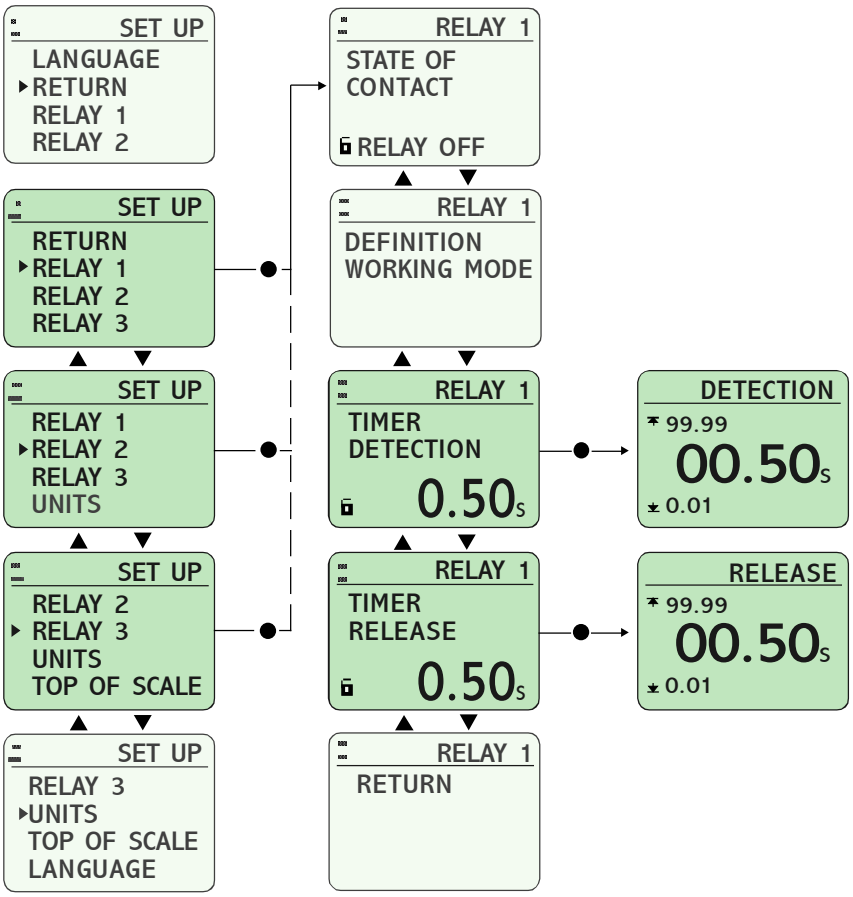
DELAY ON DETECTION AND/OR ON RELEASE (2/3)



Ranges

The time ranges for the detection and/or for the release can be set as SECONDS, MINUTES or HOURS.

DELAY ON DETECTION AND/OR ON RELEASE (3/3)

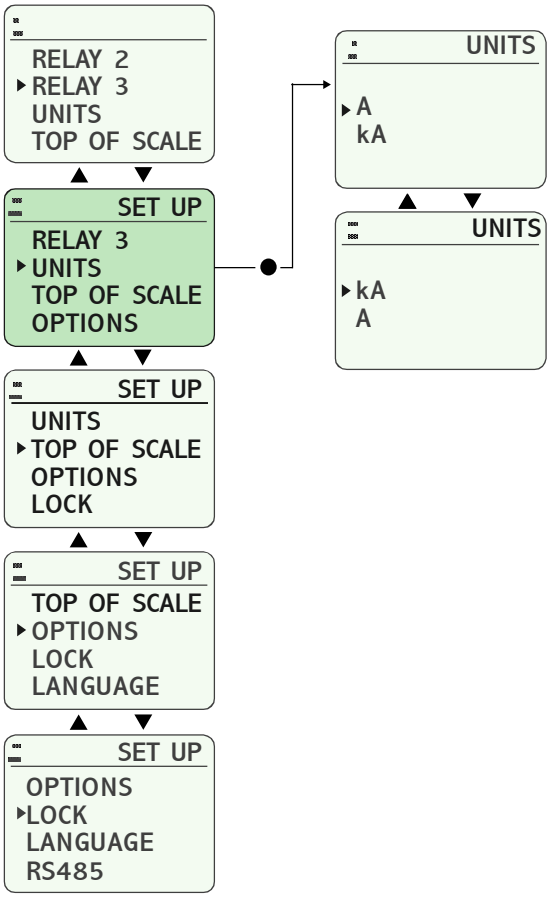


Time

It allows to set the exact time for the detection and/or the release.

The time margins depend on the previously selected range, and can be adjusted between the following values:
· 0,01..99.99 SECONDS
· 0,01..99.99 MINUTES
· 0,1..999.9 HOURS

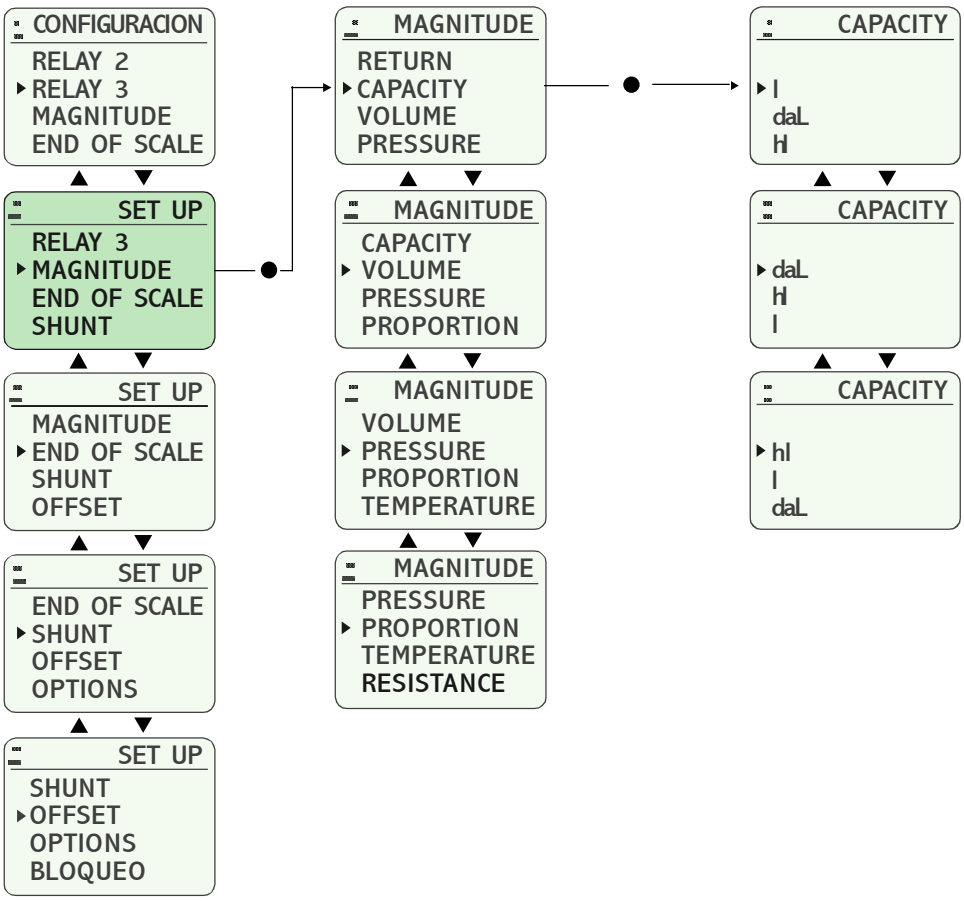
READING UNITS (1/2)



⚠	In order to facilitate the reading of the measured value, it is possible to define in what units the reading will be performed. In the following table the possible units based on each range are specified.

Ranges	1 A 5 A	
Units	A kA	

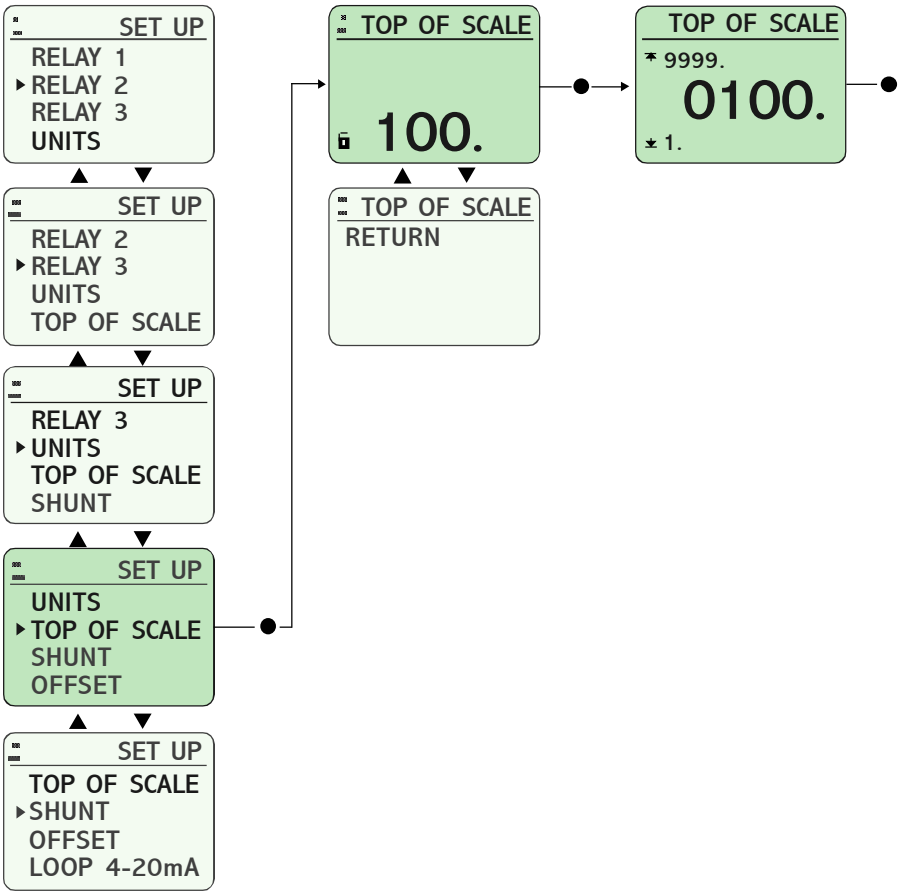
READING UNITS (2/2)



⚠	In order to facilitate the reading of the measured value, it is possible to define in what magnitude and unit the reading will be performed. In the following table the possible units based on each magnitude are specified.

	Magnitudes	Units
SAJ	TEMPERATURE	ºC · ºK · ºF
	RESISTANCE	Ω · KΩ
SAC·SAD·SAJ	VOLTAGE	V · mV
	CURRENT	A · mA
SAJ	FREQUENCY	Hz · kHz
	CAPACITY	L · daL · hL
	VOLUME	m^3 · cm^3
	PRESSURE	k/cm^2 · bar · mbar · psi · m.c.a.
	PROPORTION	%
	WIND SPEED	m/s - kmh

TOP OF SCALE



Assignation

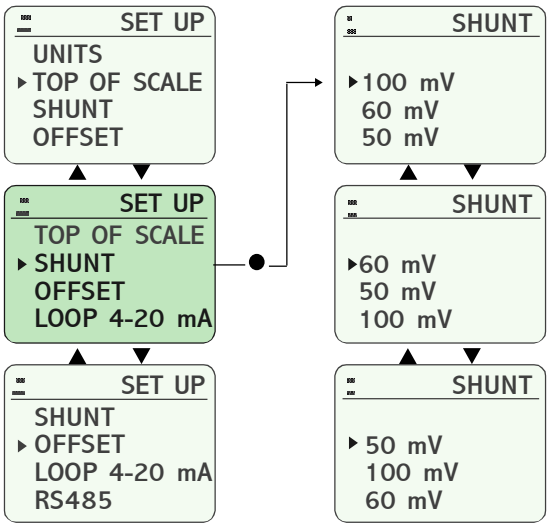
With this option is settled the maximum value possible to be read, according to the selected reading unit (see page 34).

*****

In the model SAJ, the minimum allowed value is related with the value of “MINIMUM VALUE” (see page 42).

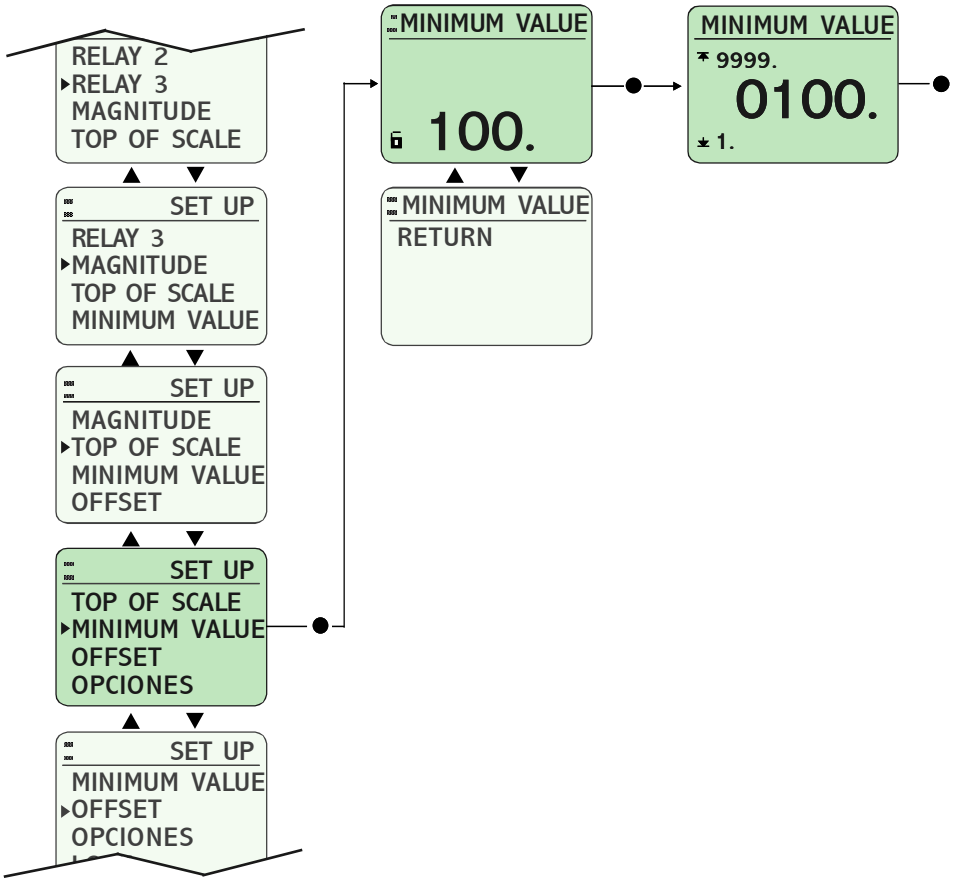
When this value is modified, the values for detection and release are re-calculated themselves for keeping the proportionality.

SHUNT



This options allows to sellect the value of the shunt connected to the terminals Y1 and Z1.

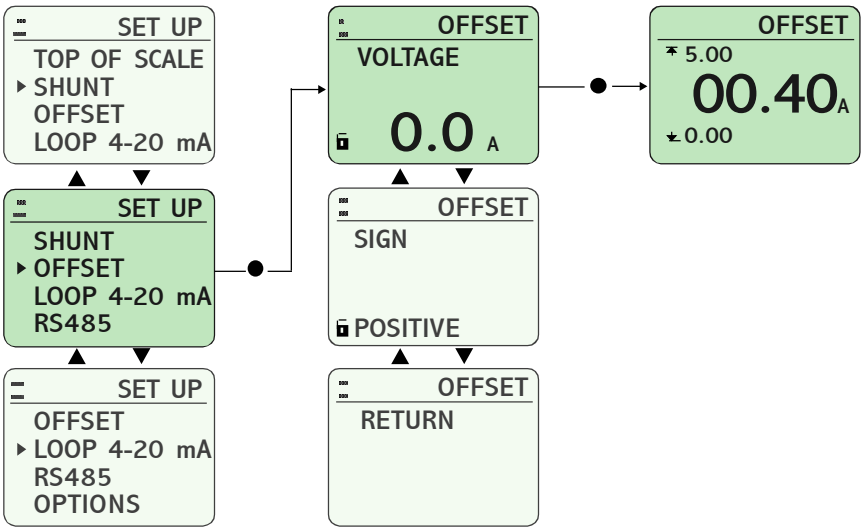
MINIMUM VALUE



With this option is settled the minimum value of the selected reading magnitude and unit (see page 37), that will be associated to the measuring value of 4 mA.
The maximum allowed value corresponds to the value "TOP OF SCALE" (see page 40).

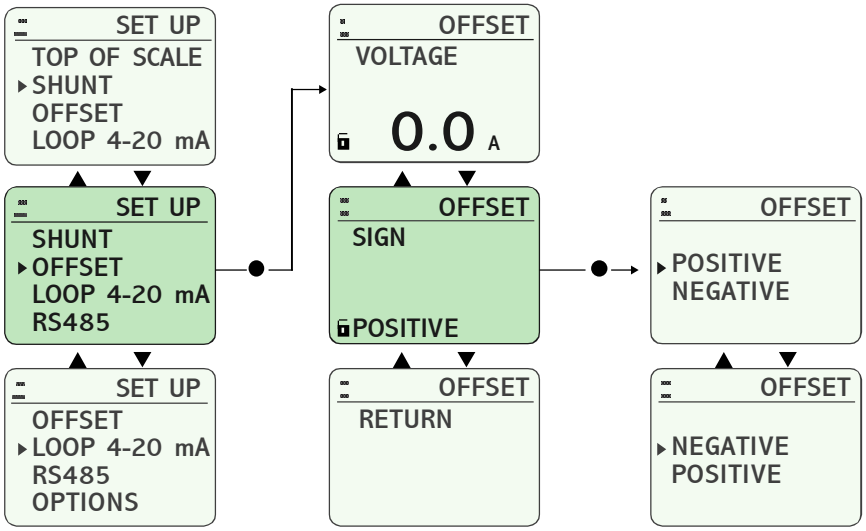
When this value is modified, the maximum and minimum values for detection and release become overwritten to adapt to the new situation.

OFFSET (1/2)



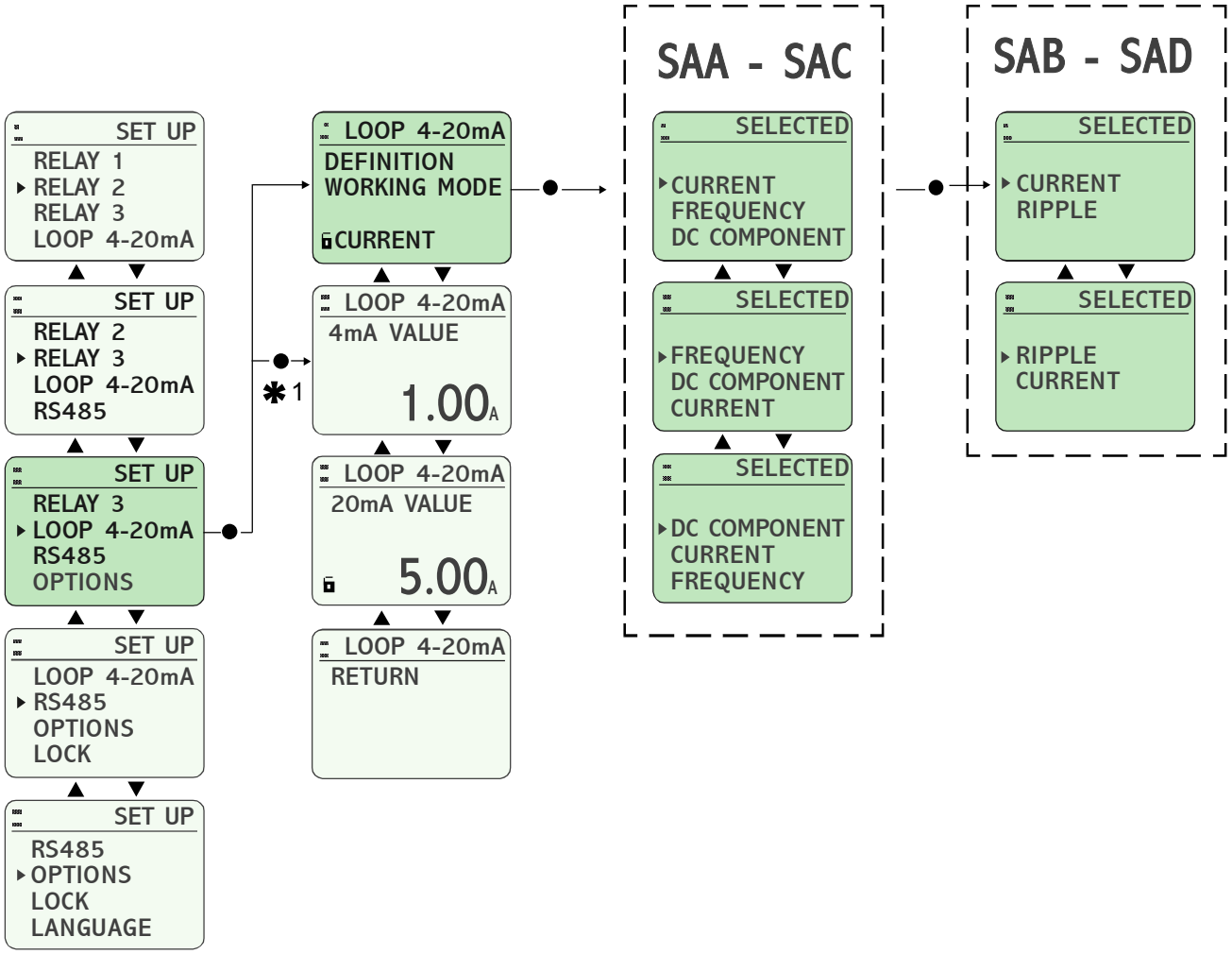
With this option can be equalized the value shown in the screen with the one read in other standard instrument, by applying a correction factor that will be added or substracted to the value read by the controller.
The correction factor is expressed in the reading unit selected with the option READING UNITS (see page 34).

OFFSET (2/2)



It allows to add or to reduce the offset or correction value, setting the option SIGN like POSITIVE or negative, respectively.

LOOP 4-20 mA (1/2)



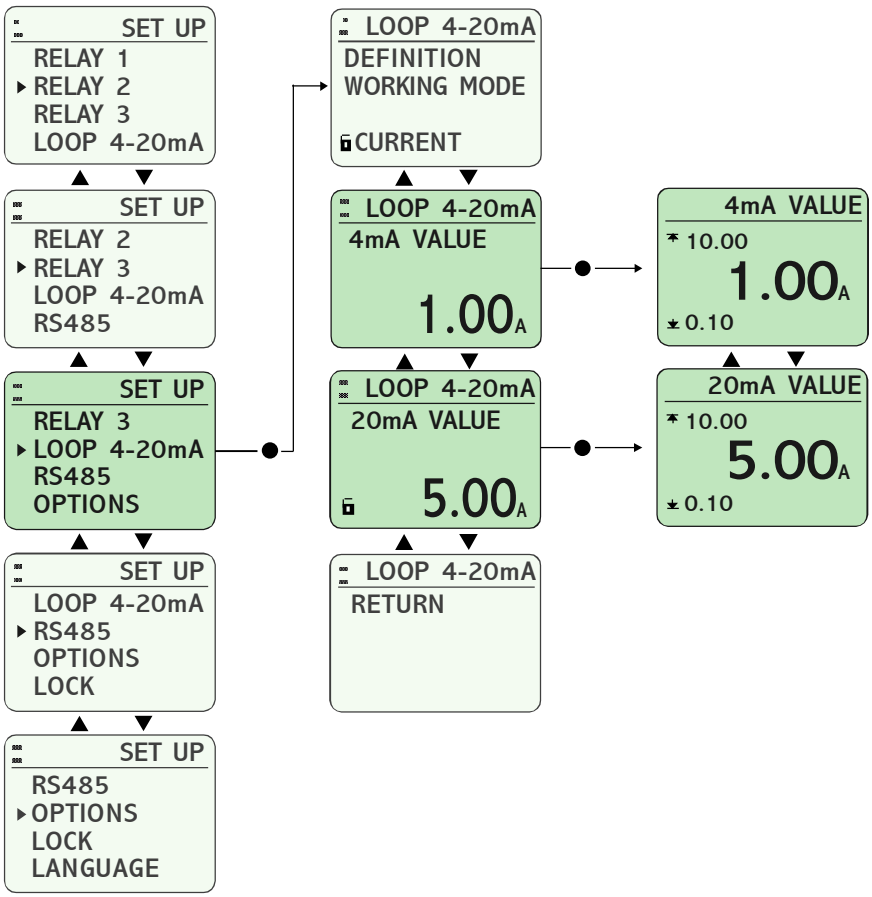
***1**	In the models SAJ it is only possible to set the value associated to the values 4 mA y 20 mA of the reading magnitude.

Throught this option is set the magnitude related with the 4-20 mA current loop, and it can be whichever of the following ones:

· Current
· Frequency **(SAA - SAC)**
· DC Component **(SAA - SAC)**
· Ripple **(SAB - SAD)**

This feature is optional.

LOOP 4-20 mA (2/2)

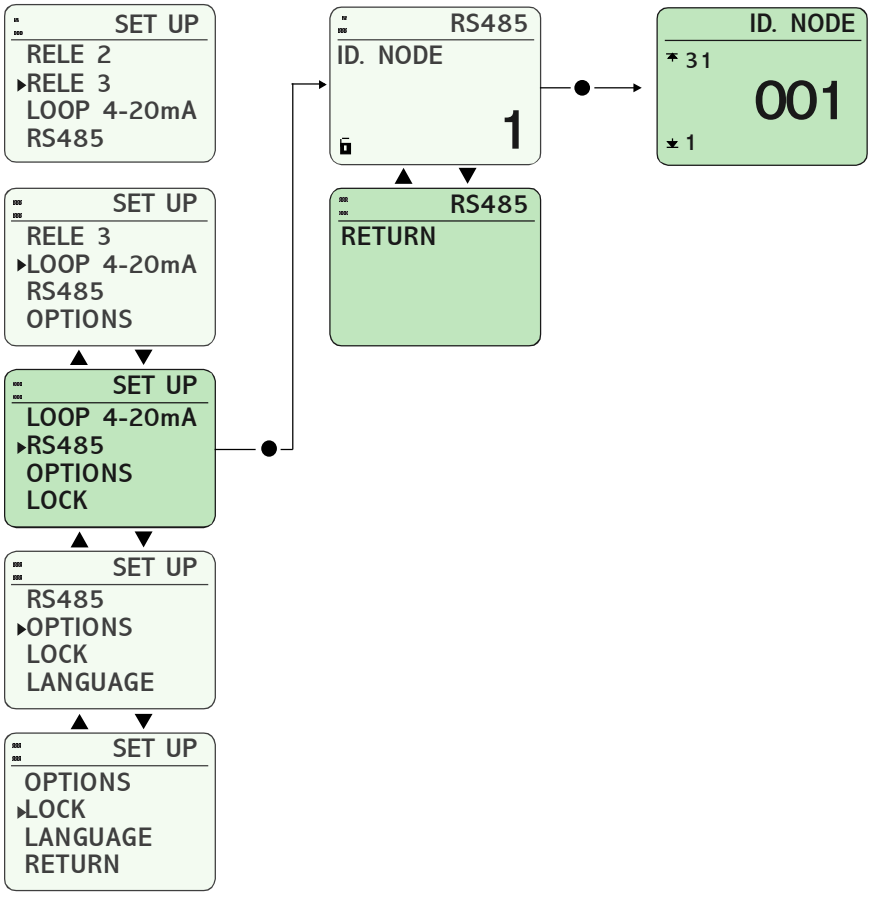


Adjustment

This option allows to define the operating margins for the 4-20 mA loop current. It is required to set by separate a countervalue for 4 mA and for 20 mA. It is possible to invert the loop sense by setting to 4 mA a countervalue higher than to 20 mA.

This feature is optional.

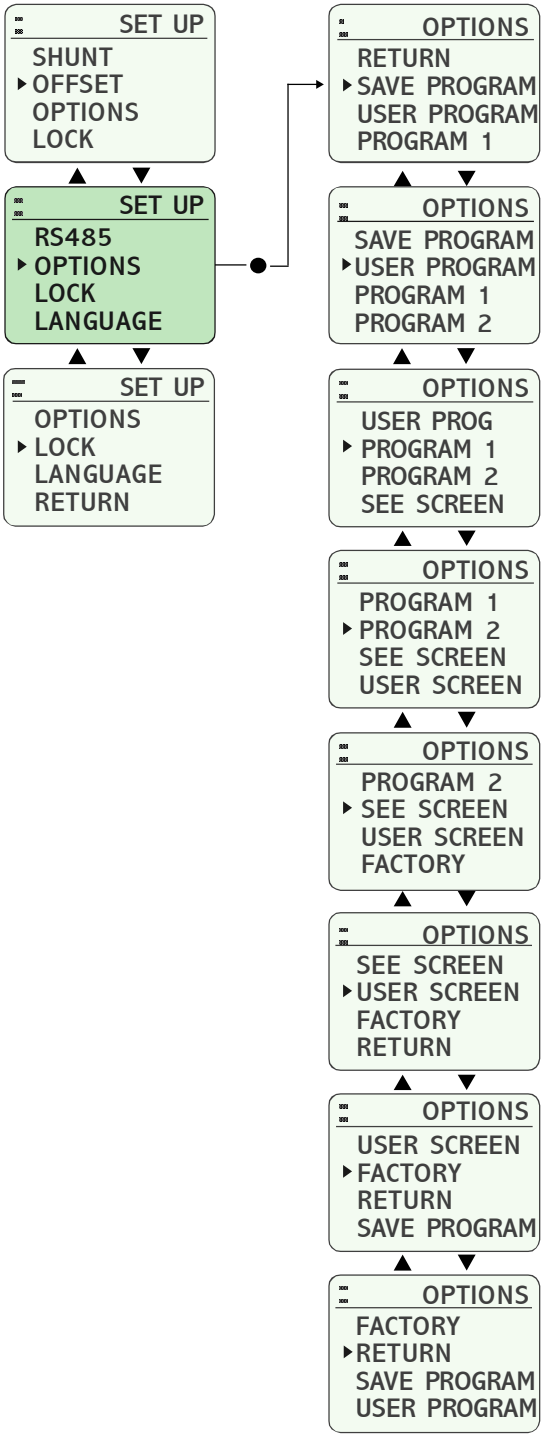
RS485



Is possible to communicate the controllers SAA, SAB, SAC ,SAD and SAJ with a computer via the serial port RS232 for the remote programming or to process the generated data.
With the option RS485 can be connected up to 31 equipments in the same net, being equal or different among them. A node number, exclusive identification number, must be assigned to each equipment. It is essential to employ the converter RS232-RS485 (reference SBAZ).
For extended information relative to programming with a computer, consult the manual *deCom*.

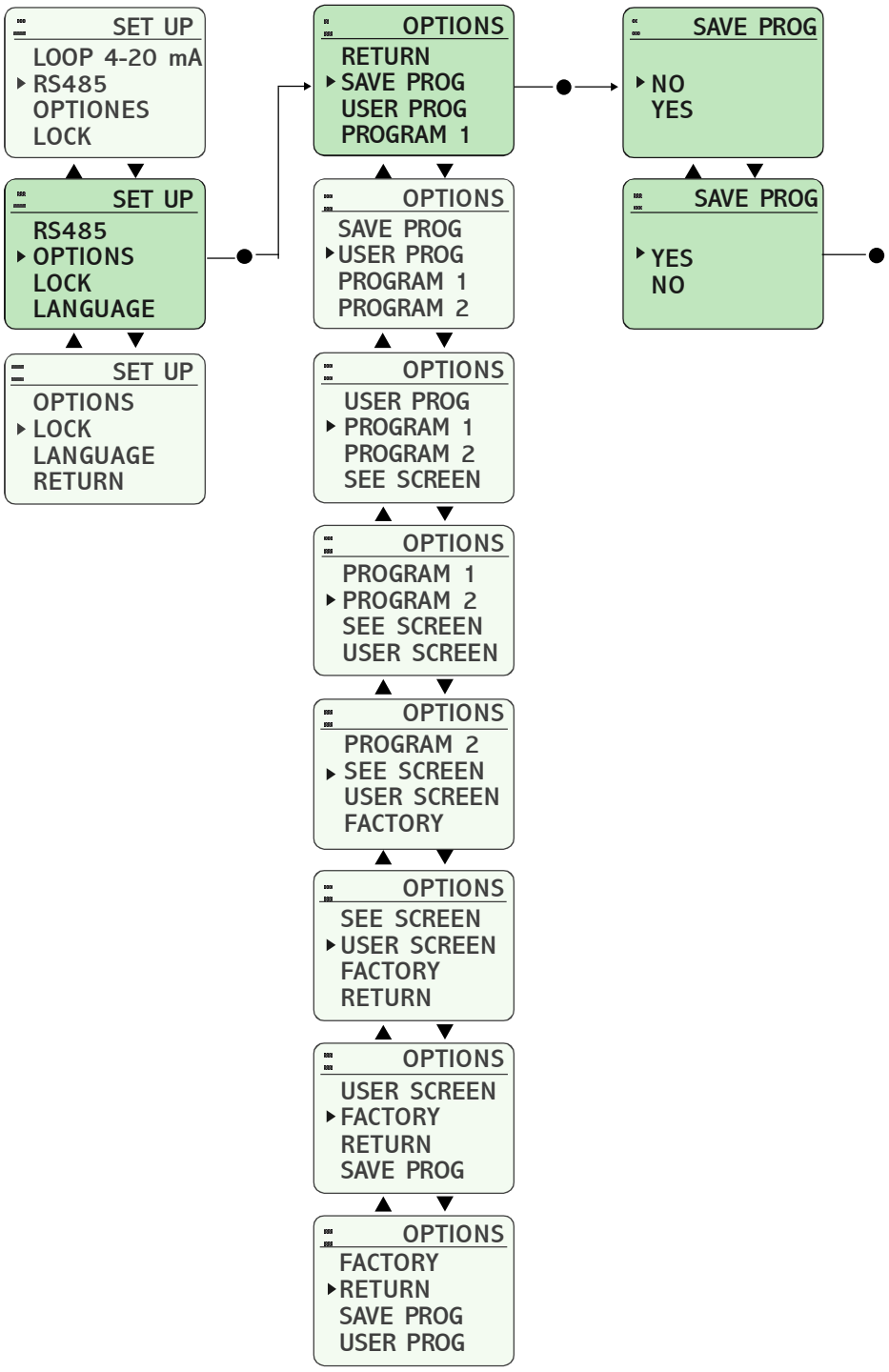
This feature is optional.

OPTIONS MENU



With the options menu are set those parameters which are not basic for the operative of the device.

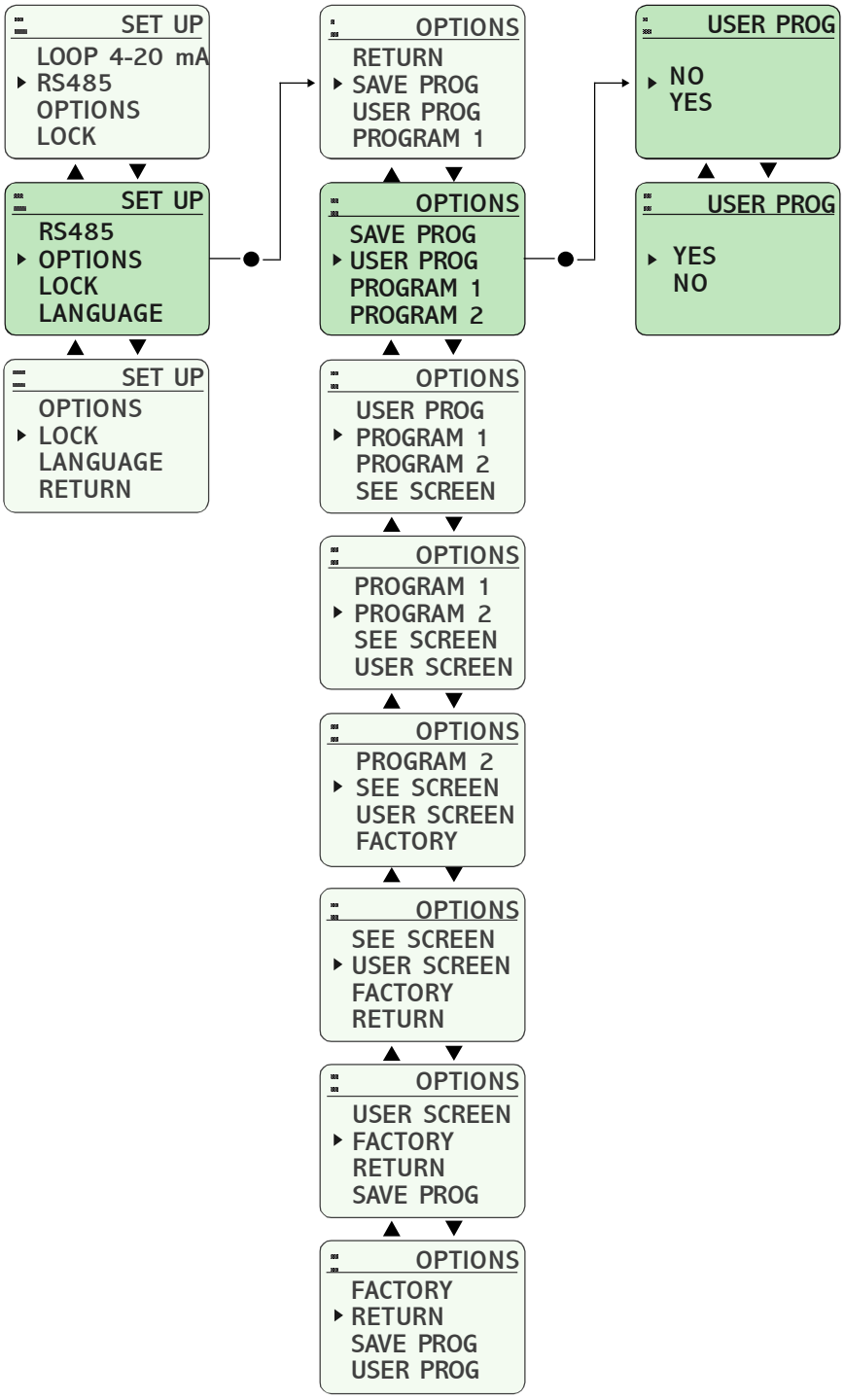
SAVE PROGRAM



It stores the changes done in the different parameters and options. Each time that SAVE PROGRAM is executed, the values stored in the user program are overwritten.

You will find more information related to the user program in the pages 15..21.

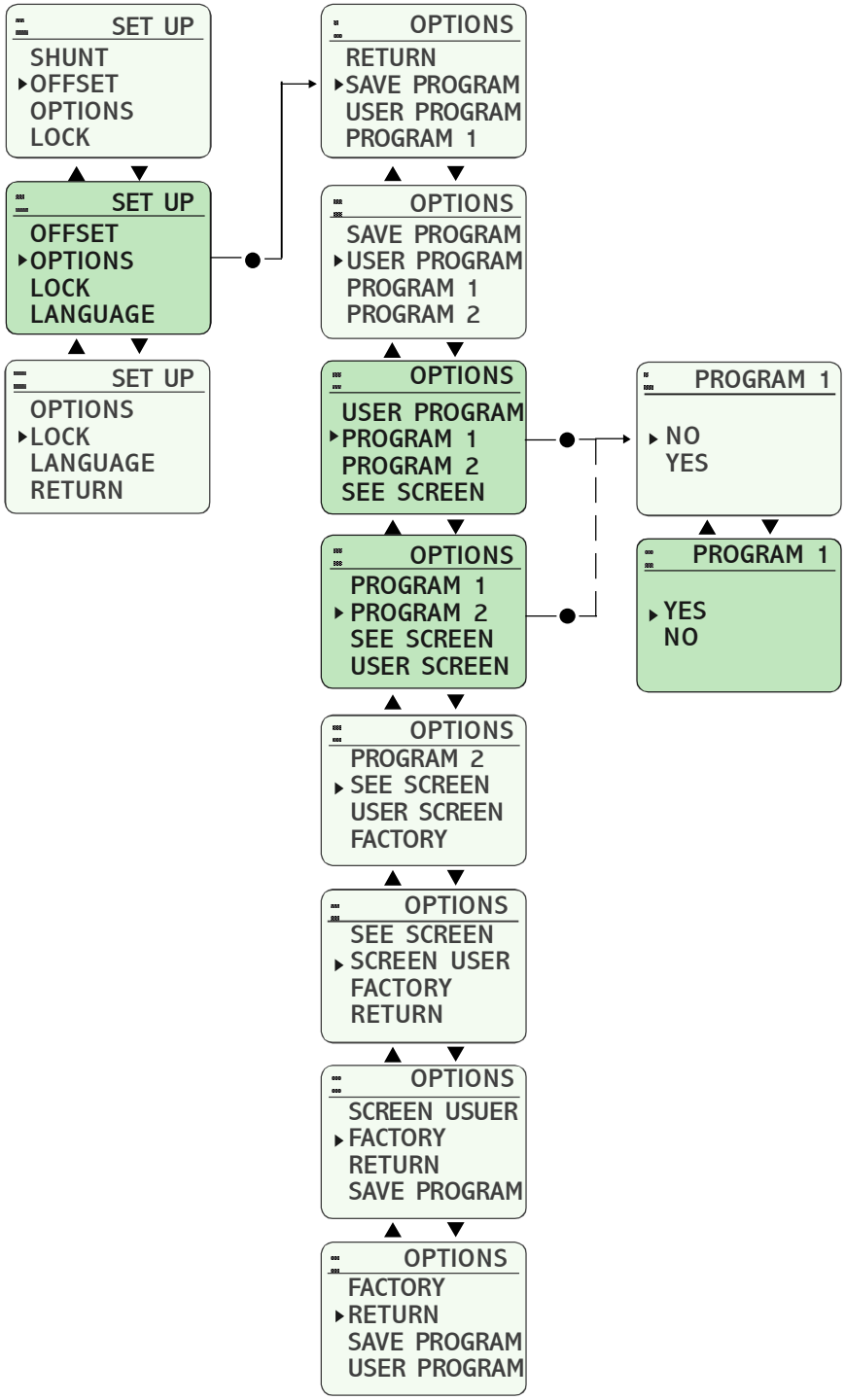
USER PROGRAMS



It loads into memory the program that was stored with the option SAVE PROGRAM, becoming the working program. Each time that this option is executed, the values stored in the memory are overwritten.

You will find more information related to the user program in the pages 15..21.

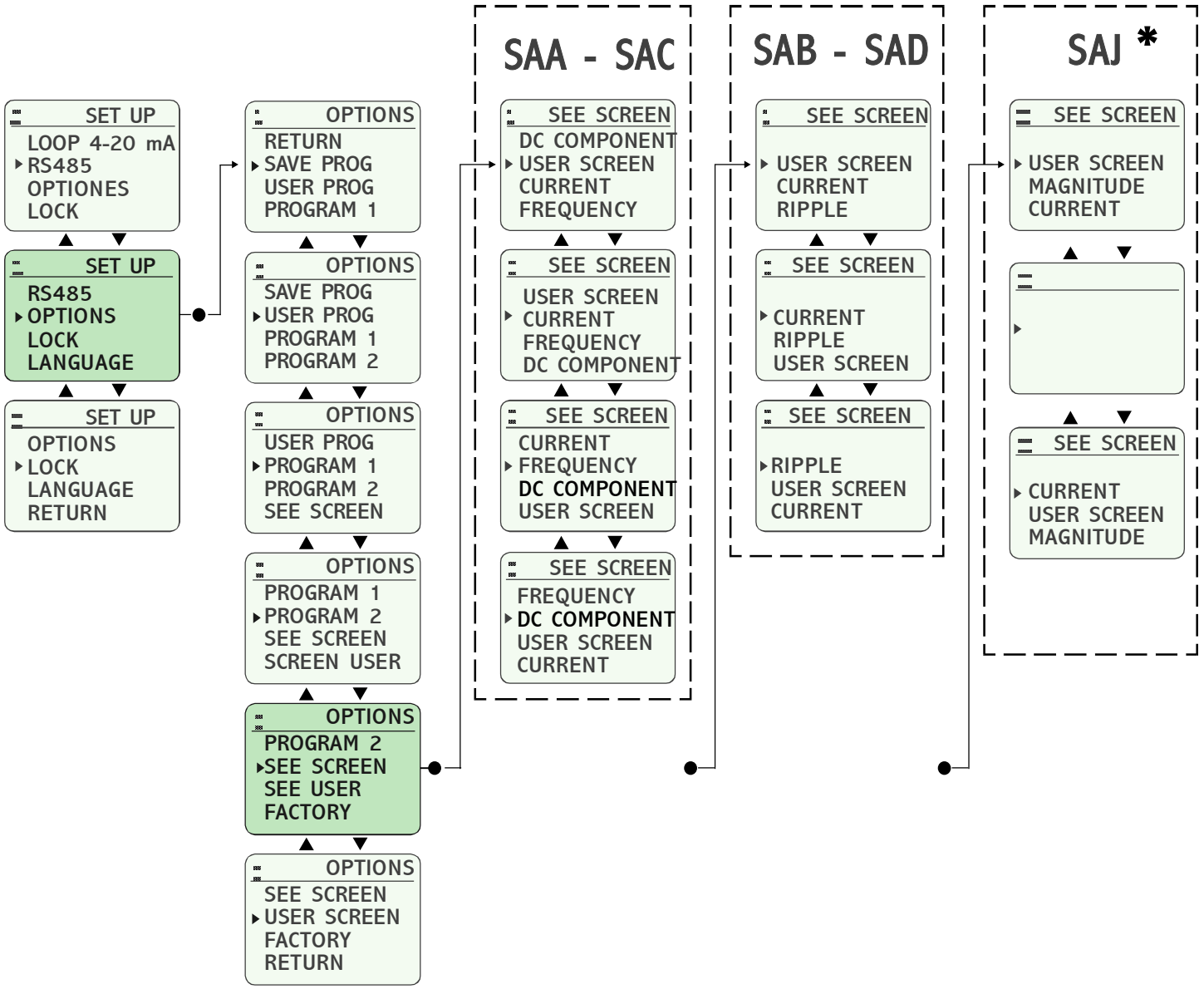
PROGRAM 1 AND 2



It loads into memory the selected program, becoming the working program. Each time that this option is executed, the values stored in the memory are overwritten.

You will find more information related to the user program in the pages 15..21.

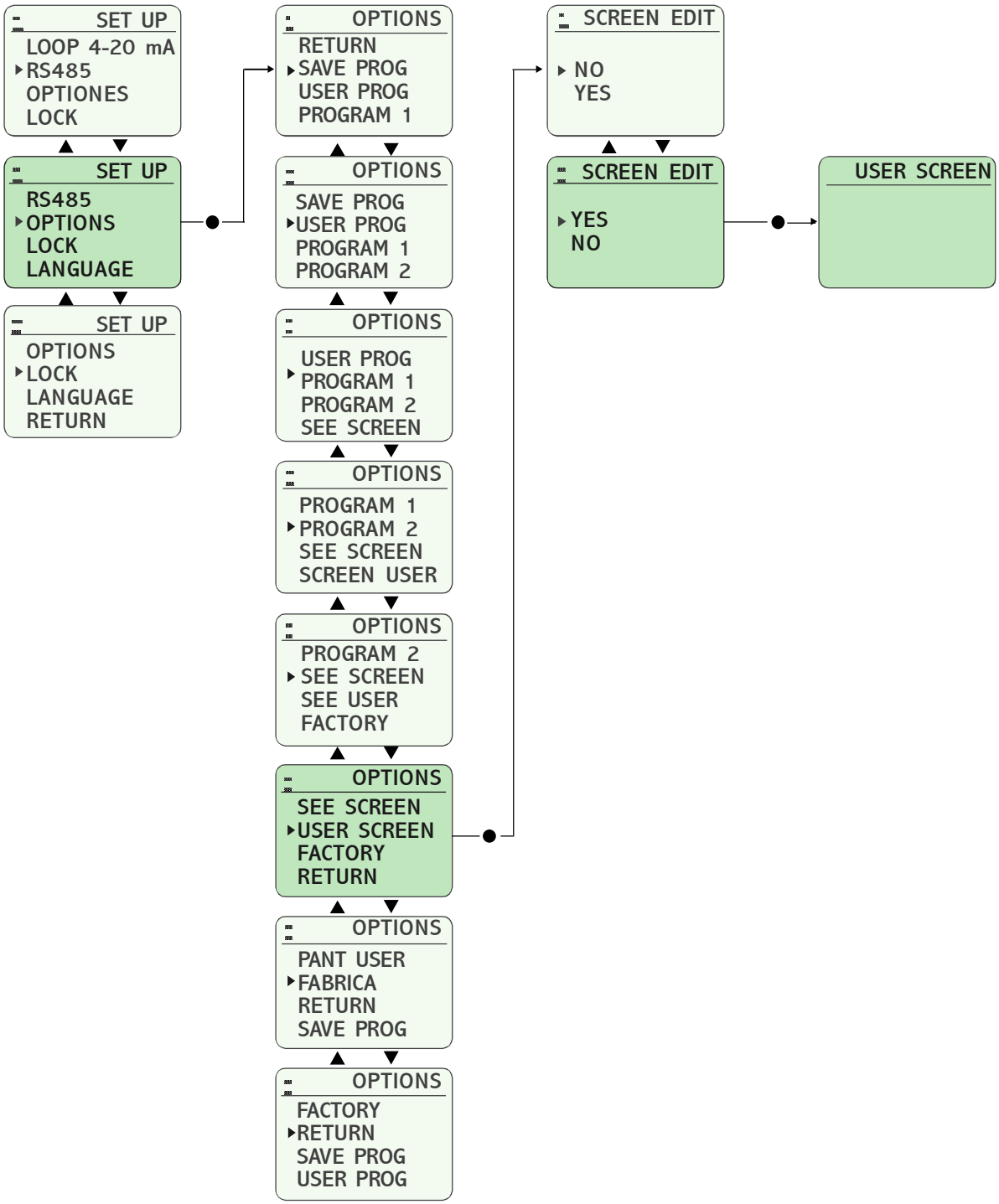
SEE SCREEN



This option allows to establish which will be the screen by defect in the menu of state screens (normal way of work).

* In the model SAJ, additionally to the CURRENT screen, it can be selected the reading magnitude, previously selected (see page 39).

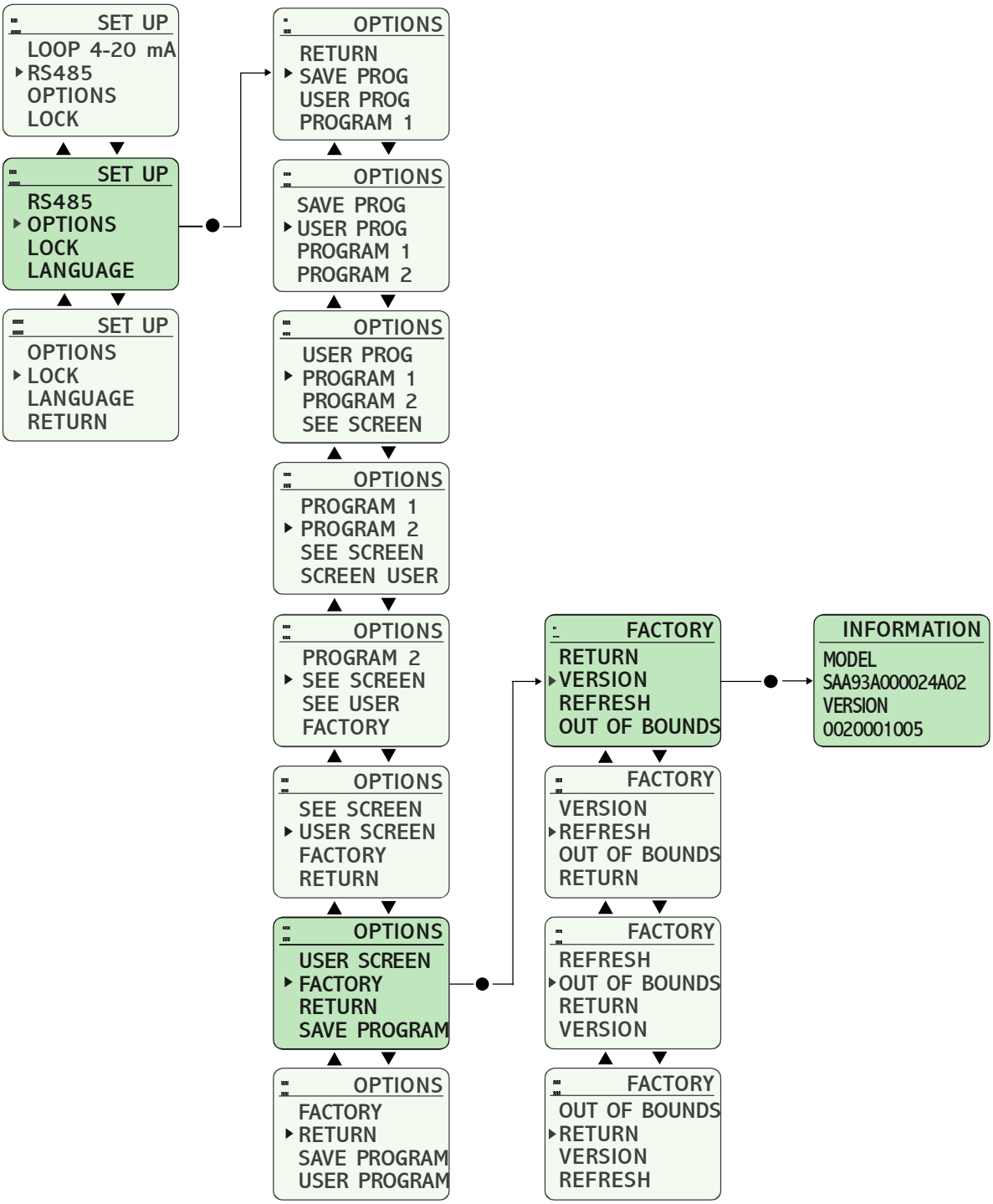
USER SCREEN EDITION



In this screen it can be edited any text to identificate the equipment. It can be used 4 lines and 13 characters each.

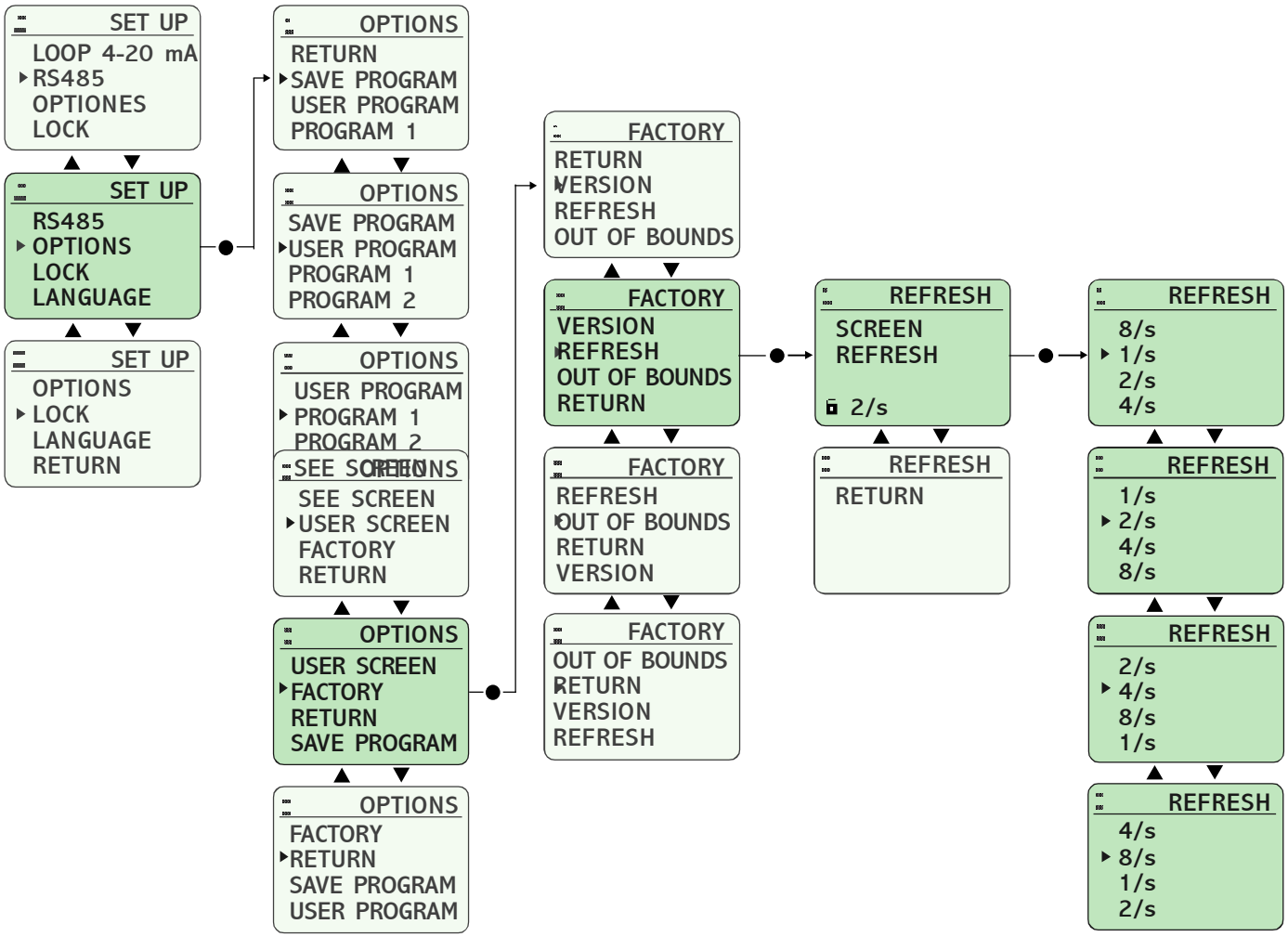
To learn which are the available characters and the way to edit them see “1.2 USER SCREEN” at page 9.

INFORMATION OF THE MODEL AND VERSION



Access to this option if you want to know the exact reference of the model and the version of the built-in software. This is an informative screen. It is active for 3 seconds and returns automatically to the previous screen once the time has elapsed.

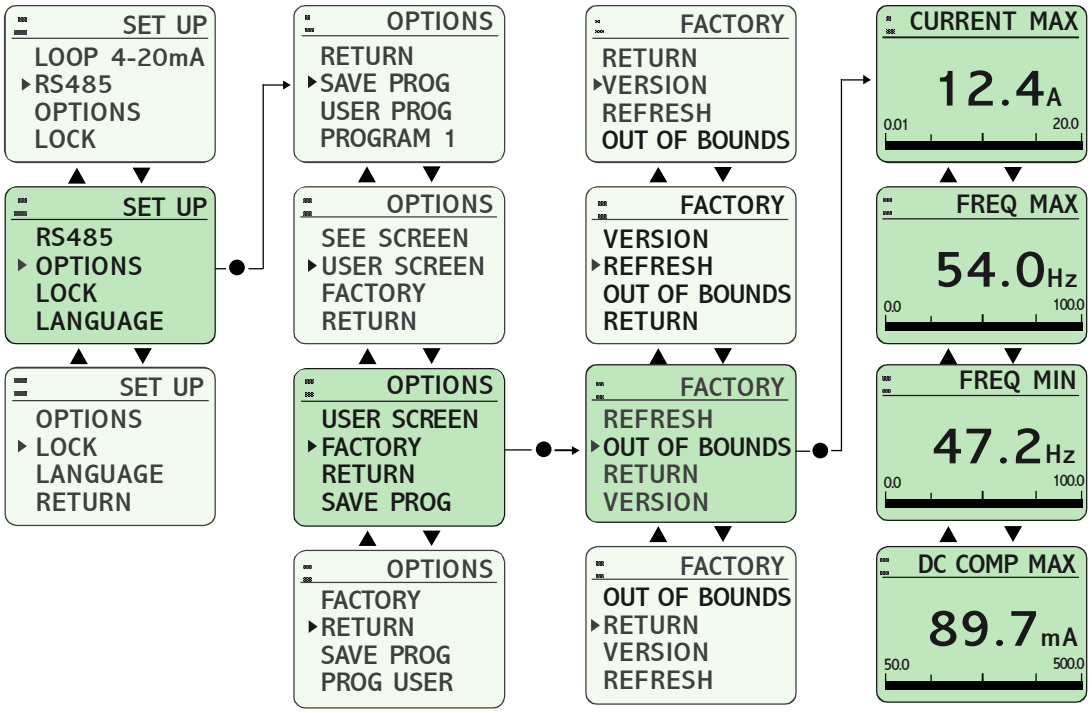
SCREEN REFRESH



It is defined as the time of regeneration of the information showed in the LCD. Only the status screens are affected for this option.

The value indicates the times that the screen is regenerated each second. So, with the value 1/s the screen is regenerated 1 time per second, and with the value 8/s it is done 8 times per second.

OUT OF BOUNDS VALUES



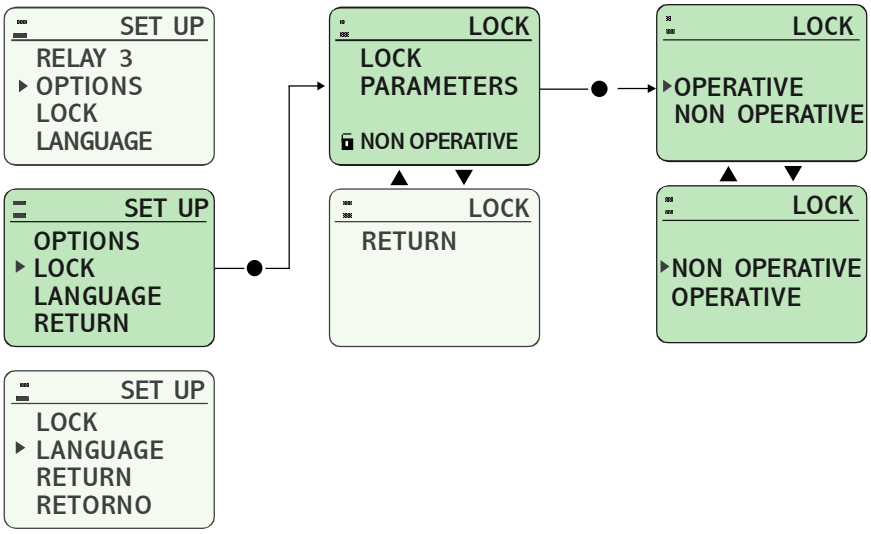
By means of this option is possible to read the highest values registered since the first time that the controller was turned on. A value higher than the stored one overwrites it. The magnitudes to be controlled are:

- Current (or selected magnitude)
- Frequency **(SAA - SAC)**
- DC Component **(SAA - SAC)**
- Ripple **(SAB - SAD)**

The stored values do not depend of the controller's operation margins and they can be higher than them.

This screen is just informative and the values can't be modified using neither the buttons nor the programing software.

LOCKING PARAMETERS

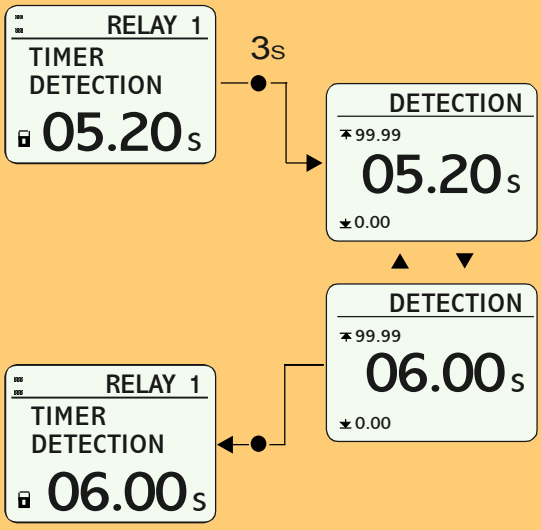


All the parameters of the equipment can be locked in order to avoid any undesired modification.

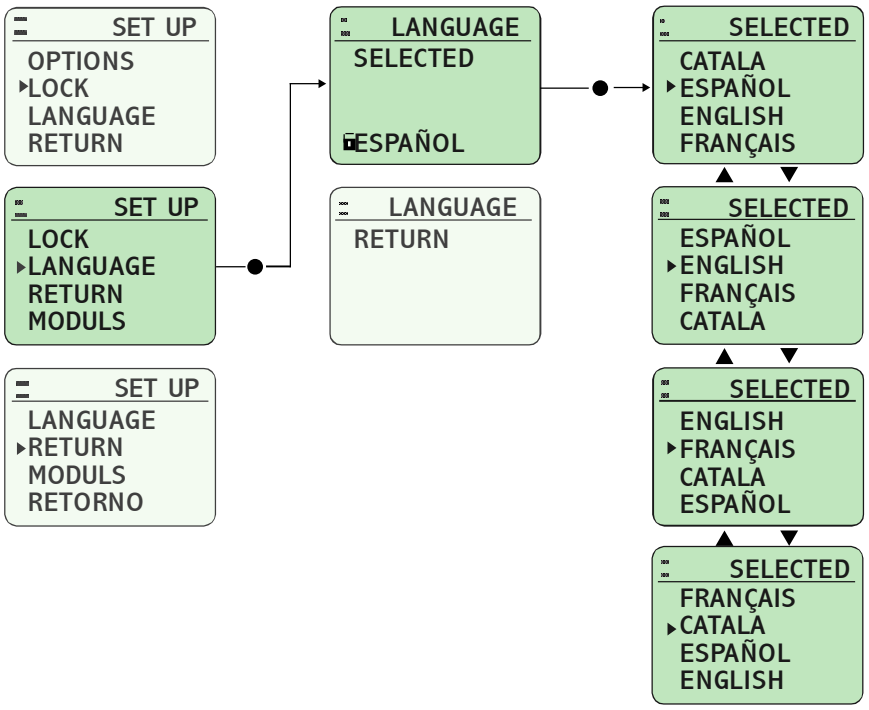
In the LCD the state of parameters is indicated as follows:

- Locked parameters:
- Unlocked parameters:

It is possible to modify the value of a locked parameter without access to the above mentioned options. To do that, once placed in the screen showing the parameter and the value to be modified, hold the button ● for 3 seconds and will reach to the screen of change of value.
Once the change has been validated, it returns to the previous screen and the parameter become locked again.



LANGUAGE

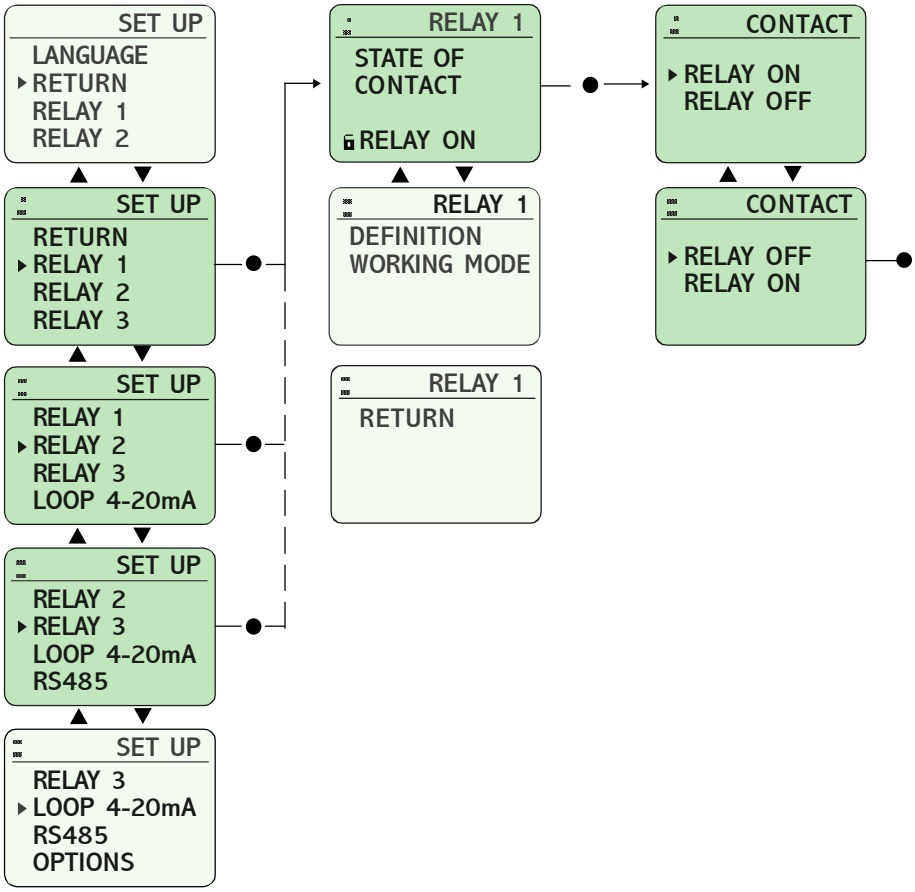


These devices incorporate four different languages for showing the texts in the screen. Three of them are the same in all the models: Spanish, English and French, being optional the fourth one.

See the composition of the reference in the technical data sheet to know the available languages.

Complementary Functions (1/4) AUXILIARY CONTACT

The relays that are not related with any magnitude can be used to perform complementary functions.

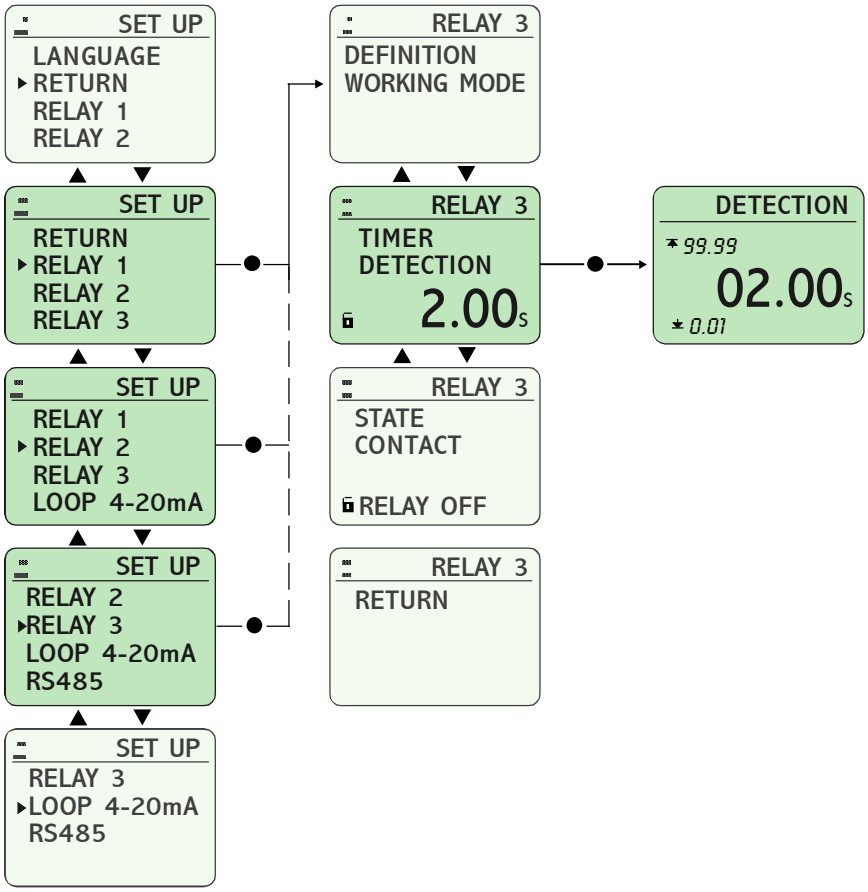


Previous conditions

CURRENT MAXIMUM = **[** NON OPERATIVE **]**
CURRENT MINIMUM = **[** NON OPERATIVE **]**
MAX. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)**
MIN. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)**
MAX DC COMP = **[** NON OPERATIVE **] (SAA, SAC)**
RIPPLE MAXIMUM = **[** NON OPERATIVE **] (SAB, SAD)**
STATE CONTACT = **[** ON **]**
MODE DETECTION = **[** CANCELED **]**
MODE RELEASE = **[** CANCELED **]**

When the supply voltage is connect the contact of the relay operates instantaneously and will remain in this state until the supply voltage disconnected.

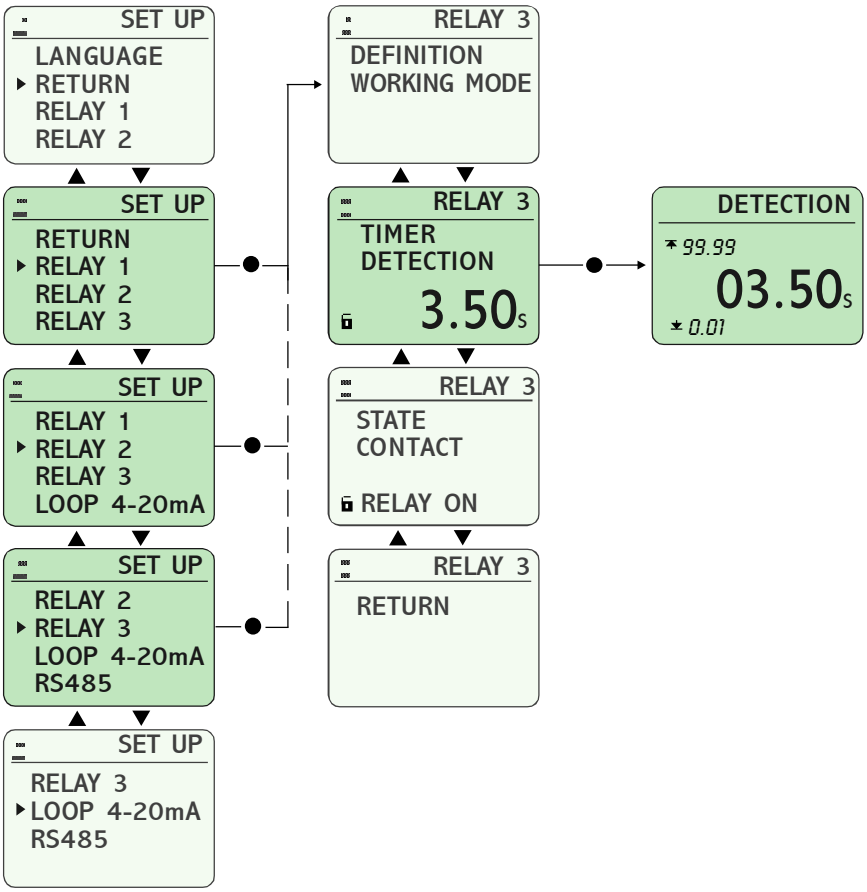
Complementary Functions (2/4) — DELAY ON CONNECTION



Previous condition	CURRENT MAXIMUM = **[** NON OPERATIVE **]** CURRENT MINIMUM = **[** NON OPERATIVE **]** MAX. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)** MIN. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)** MAX DC COMP = **[** NON OPERATIVE **] (SAA - SAC)** RIPPLE MAXIMUM = **[** NON OPERATIVE **] (SAB, SAD)** STATE CONTACT = **[** OFF **]** MODE DETECTION = **[** DELAYED **]** MODE RELEASE = **[** CANCELED **]**

When the supply voltage is connected the relay remains released and the time circuit starts up. Once the time has elapsed the relay operates. It can remain in this state for an undefined time.

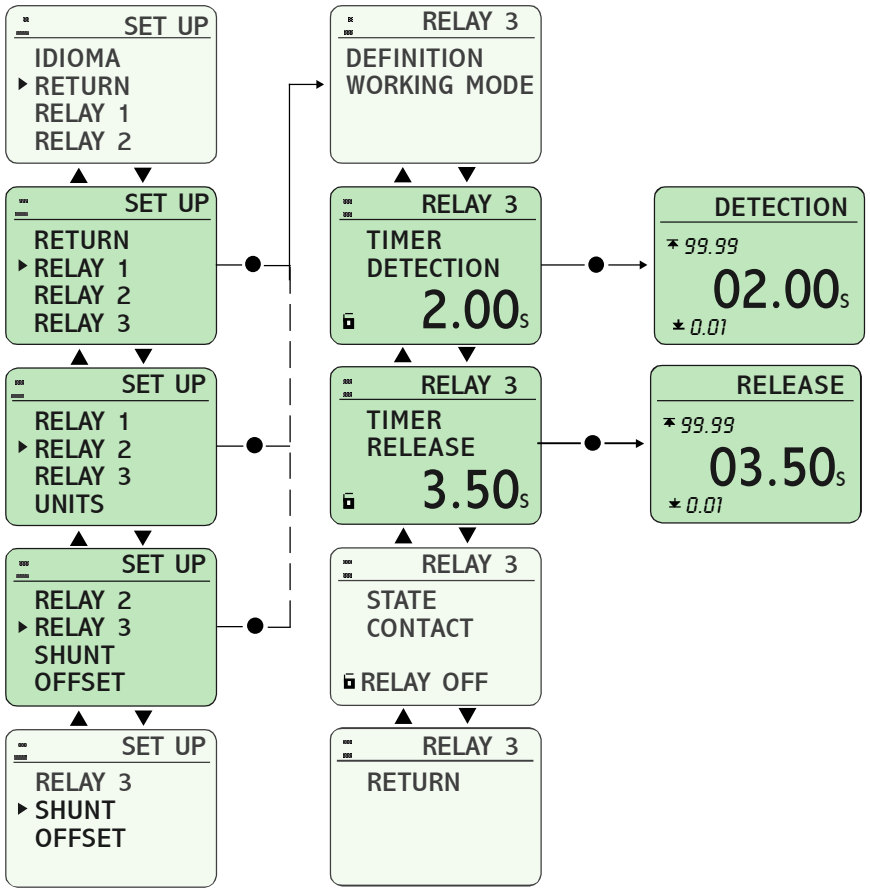
Complementary Functions (3/4) — DELAY ON INTERVAL



Previous conditions	CURRENT MAXIMUM = **[** NON OPERATIVE **]** CURRENT MINIMUM = **[** NON OPERATIVE **]** MAX. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)** MIN. FREQUENCY = **[** NON OPERATIVE **] (SAA, SAC)** MAX DC COMP = **[** NON OPERATIVE **] (SAA - SAC)** RIPPLE MAXIMUM = **[** NON OPERATIVE **] (SAB, SAD)** STATE CONTACT = **[** OFF **]** MODE DETECTION = **[** DELAYED **]** MODE RELEASE = **[** CANCELED **]**

When the supply voltage is connected the relay operates instantaneously and the time circuits starts up. Once the time has elapsed the relay releases. It can remain in this state for an undefined time.

Complementary Functions (4/4) — RECYCLER TIMER



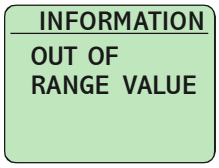
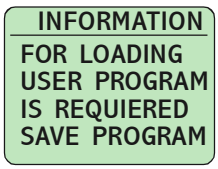
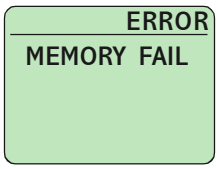
Previous conditions	Same as to page 57 except: MODE DETECTION = **[** DELAYED **]** MODE RELEASE = **[** DELAYED **]**

Cycle OFF-ON	STATE OF CONTACT = **[** RELAY OFF **]** When the supply voltage is connected the time adjusted in TIMER DETECTION starts up. Once the time has elapsed the relay operates until the time adjusted in TIME RELEASE elapses. The cycle repeates non-stop itself.

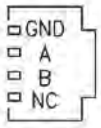
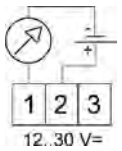
Cycle ON-OFF	STATE OF CONTACT = **[** RELAY ON **]** When the supply voltage is connected the relay operates instantaneously and the time circuit adjusted in TIMER DETECTION starts up. Once the time has elapsed the relay releases and remains in this state until the time adjusted in TIME RELEASE elapses. The cycle repeates non-stop itself.

ERROR SCREENS AND INFORMATION

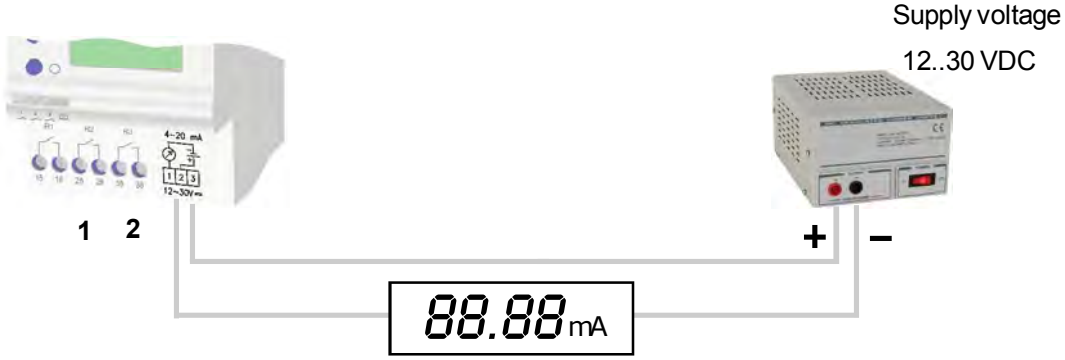
If front of certain situations the devices display informative screens, usually related with errors or unapropiated actions.

	Cause	Solution
	It has been introduced a value out of the allowed limits in the magnitude which is being adjusted.	Introduce whichever value between the allowed limits.
	It was attempted to load into memory the user program, but this was not loaded previously.	Save an user program.
	An error in the internal memory of the controller has been produced.	Contact with the manufacturer.

OUTPUTS COMMUNICATION (1/2)

Communication (According options)			
Standard Code 0	**RS232** Code 3	**RS485** Code 8	**4-20 mA** Code 4
			

4-20 mA CURRENT LOOP



ACCESSORIES

CBPZ

Interface for remote programming from a PC.
It allows the connection between whichever digital relay not provided with bus and a PC.
Not required for devices provided with bus RS232, RS485 or with 4-20mA output.

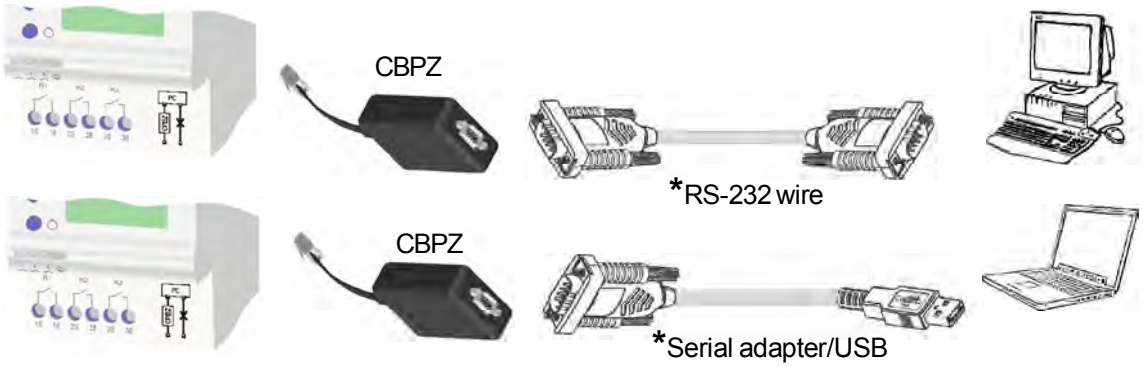
SBAZ

RS485 to RS232 signal converter for the remote programming or for the data capture and visualization from a PC.
It allows the connection of up to 31 digital control relays provided with RS485 communication bus, to get an unique codified RS232 output.

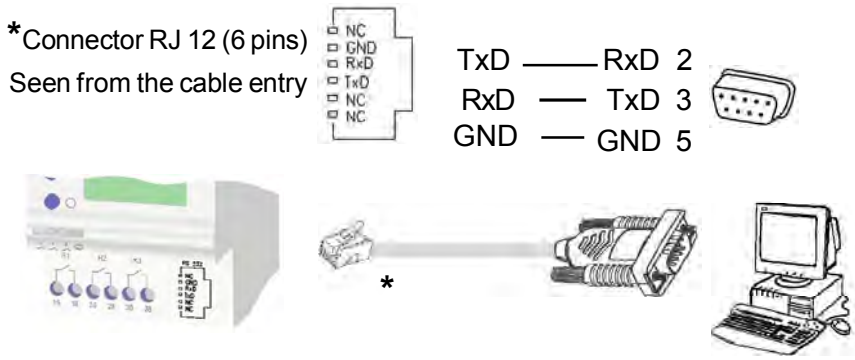
OUTPUTS COMMUNICATION (2/2)

REMOTE PROGRAMMING FROM PC

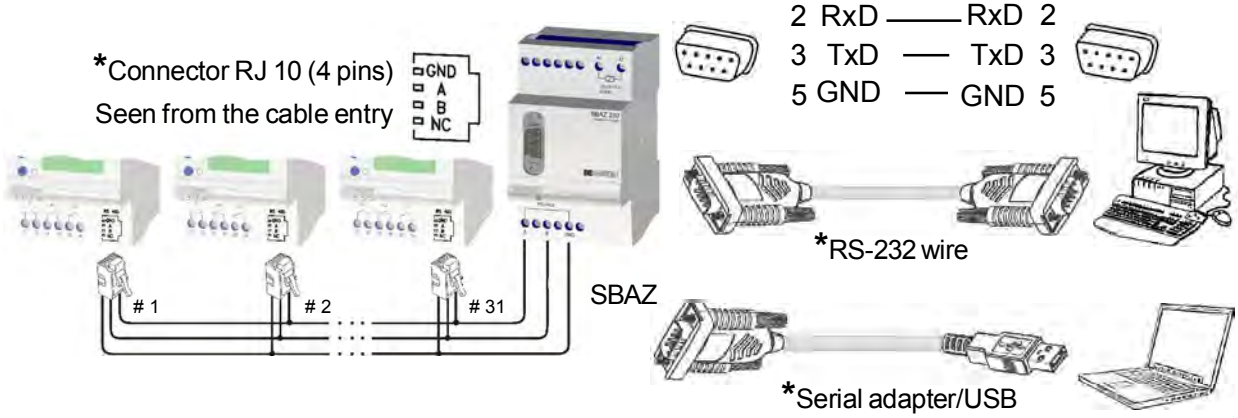
STANDARD MODE



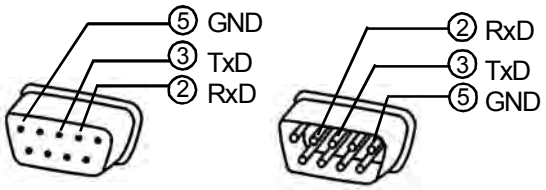
RS232 COMMUNICATION



RS485 COMMUNICATION



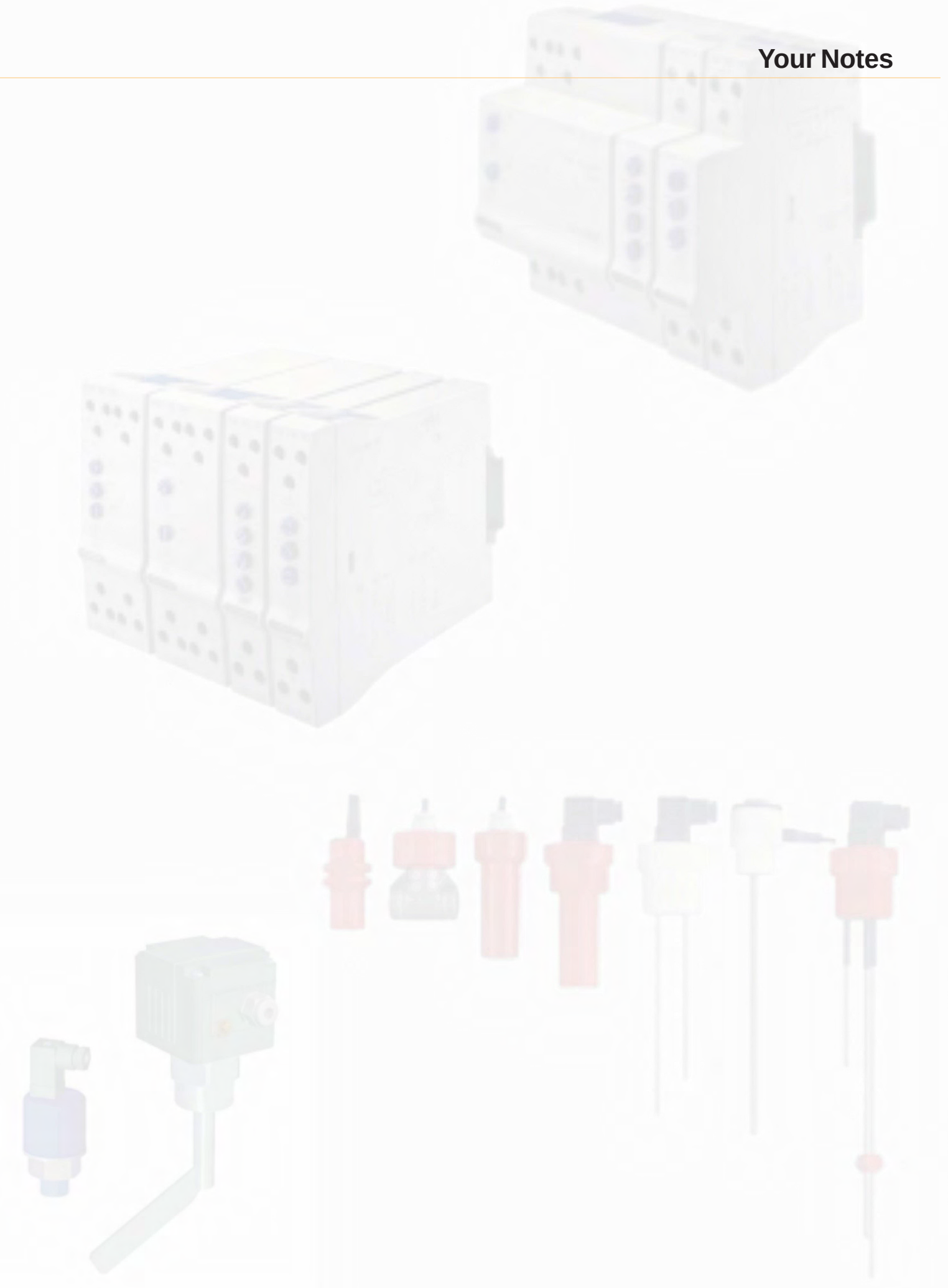
* Disibeint not supply cables or connectors. You can find these products in stores specializing in computer equipment.



Your Notes

Z1
Y1
A1
A2
220-240 VCA
50/60Hz
DISIBEINT
SNI9 3A000 230 80N
LEVEL MODULAR SYSTEM
R1
K2
K3
15
18
25
28
35
38

Your Notes



Your Notes

Z1
Y1
A1
A2
220-240 VCA
50/60Hz
DISIBEINT
SNI9 3A000 230 80N
LEVEL MODULAR SYSTEM
R1
K2
K3
15
18
25
28
35
38

Manufacturing program

Sensors

A wide variety of types of sensors allows an easy way to find out the efficient solution for the control of the level in a large number of products.

Level relays

Its combination with the level sensors is the suitable complement for the control of the level in wells, tanks and reservoirs.

Timers

From the common functions of timing and passing through the multifunction models, it is arrived to elements with specific functions

Control relays

This wide family who contributes to confidence and yield in complex installations where the security is the essential element.

Digital control relays

This family of controllers combines the own characteristics of the classic relays and improve them by adding new benefits.

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