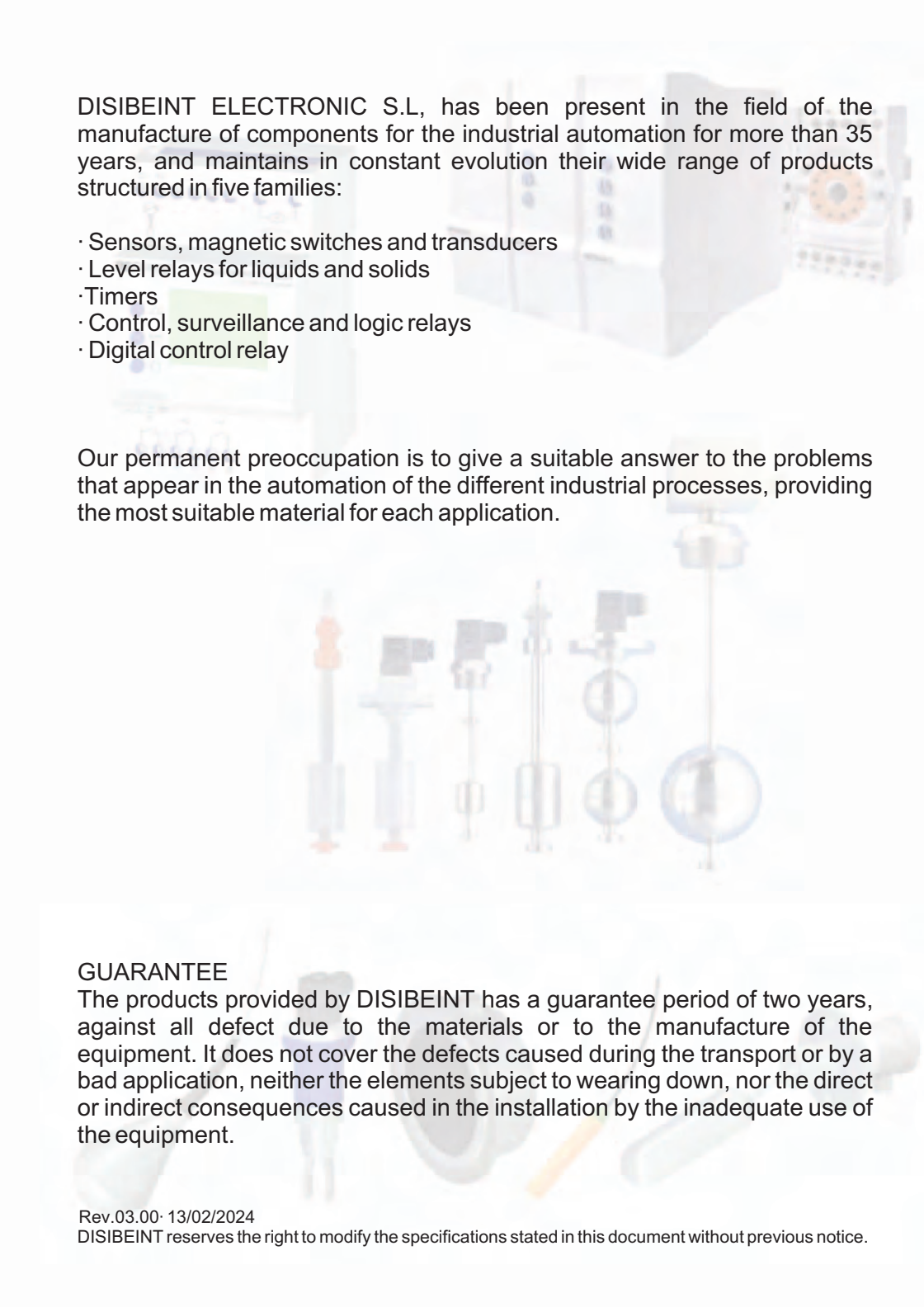


User's manual



**Digital
control relay** **SHA**



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

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.

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MENUS AND SCREENS

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DESCRIPTION OF THE EQUIPMENT

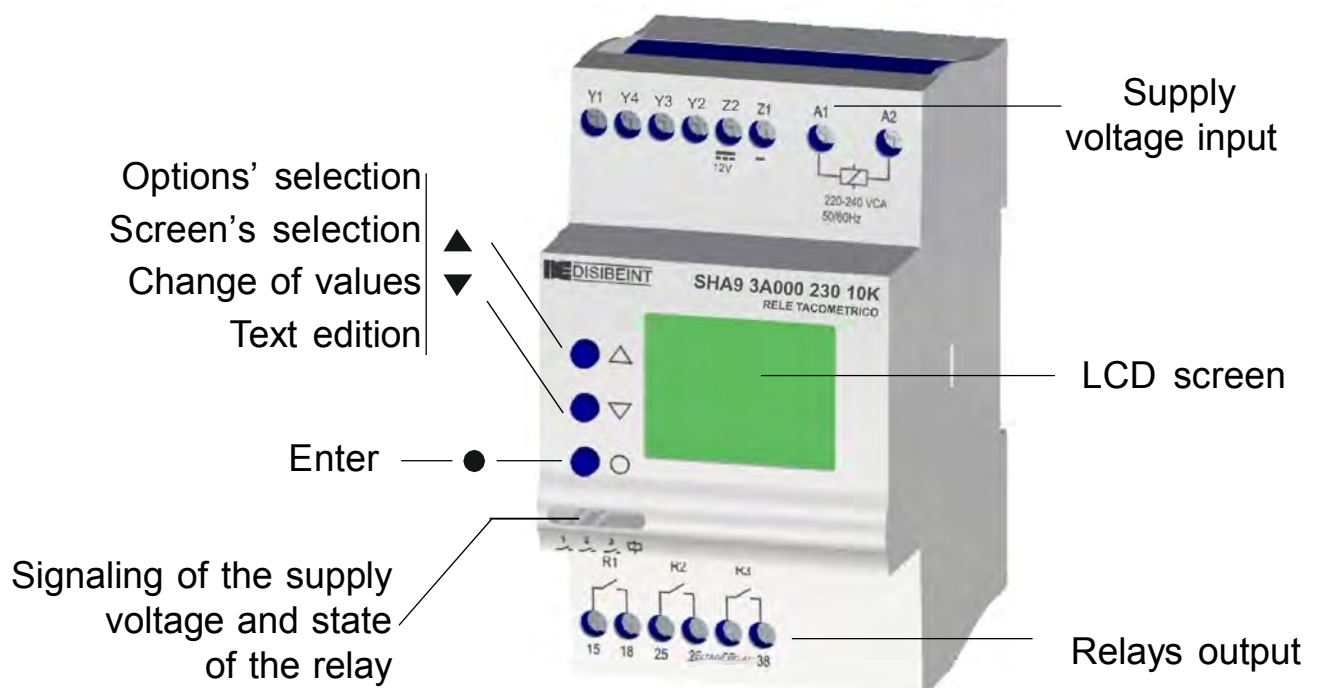
The SHA model is a tachometric digital control relay.

It controls rotation speed maximum and/or minimum.

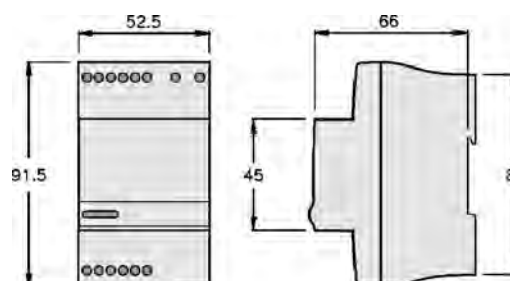
The device, additionally, allows control to starting the engine by activating a push button. (See pages 26..28 for more information).

The actions deriving control the various parameters may be associated with three relays, a 4-20 mA current loop or to a serial RS232 or RS485. To each of the three relays available can be assigned triggering one or more parameters.

PARTS OF THE EQUIPMENT



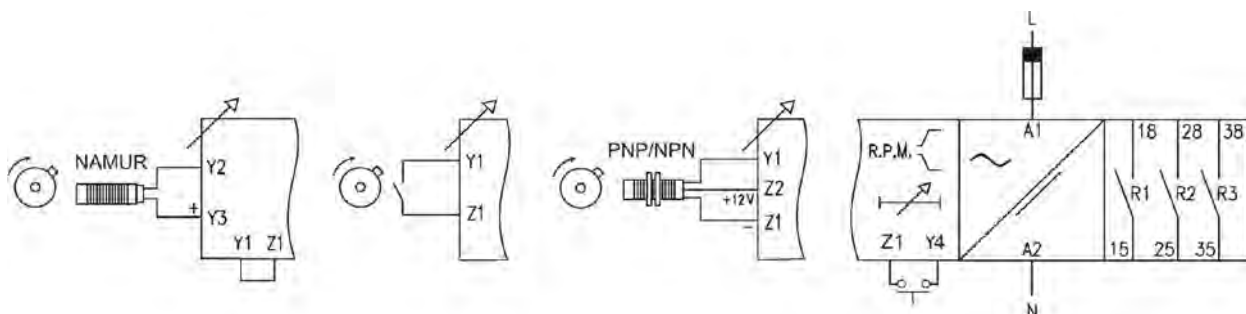
Dimensions



TECHNICAL DATA (1/2)

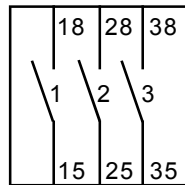
Function	Tachometric relay. Control and visualization of rotation speed to engines shaft, turbines, etc., speed control to conveyor belt, stop control or break transmission chains or transport without end.
Operating mode	User configurable. Each of the relays assigned its own operating mode.
Rotation speed control	<ul style="list-style-type: none"> · Operating margin: 3..9999 rpm · The equipment not processed pulses with a duration of less than 1/8 of the full cycle. · Operability for max. and/or min. rotation speed. In each case, detection is set and the replacement. · Operability by minimum rotational speed and engine starting. Can be controlled engine start by pushbutton between Z1-Y4.
Timing	<ul style="list-style-type: none"> · Associable to the detection and/or replacement of any relay and start the engine. · Adjustable from 0.01 s..999.9 h · Repeatability ± 30 ppm
Resolution	1 rpm
Precision	1%
Detection time	3 flanks of input signal to 5 ms plus of relay reaction.
rpm input signal types	<ul style="list-style-type: none"> · Contact potential free: Y1 / Z1 · Namur sensor: Y2 / Y3(+), link Y1/Z1 · PNP/NPN sensor: Y1 / Z1(-) / Z2(+12VCC). Maximum 10 mA
Starter input types	Contact potential free: Y4 / Z1 Only for the operation by minimum rotational speed at startup.
Visualization of reading value	The value of the read magnitude is displayed by the status display: · ROTATION SPEED: rpm
Relay output	From 1 to 3 independent relays, 1 investor NO. It supplied 3 relays with the standard model.
Output 4-20 mA	The magnitude is assigned to be sent by a 4-20 mA current loop. This feature may coexist with the relays. Precision: 1% additional to read value. This type of output is optional.
PC communication	It can be set different types of communication with a computer (also see the last page): <ul style="list-style-type: none"> - Through a phone connector incorporated at the standard device and the programmable interface CPBZ. - Through an RS232 connection(optional). - Through an RS2485 connection and the SBAZ converter (optional).

Connection



TECHNICAL DATA(2/2)

Output relays

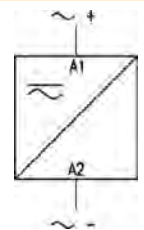
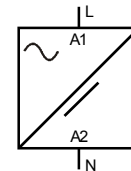


Supply voltage

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 °C)
Volt. between contacts		1000 VAC
Volt. coil/contact		4000 VAC
Isolation resistance		> 100 MW (500 VDC)
Indication		1 red led for relay

Power supply	
Galvanic isolation	
Frequency	
Operative margins	
Consumption	
Power on time	
Reset	
Indication	
*In the worst case	

SHA



[024] .. [400]	[903]	[904]
4000 V	2500 V	
50/60 Hz	-	
+10% -15%	15-70 V	60-240 V
2,5 VA	3,5 W	3,1 W
75 ms	<525 ms*	<135 ms*
>1 net cycle and/or -30% of the nominal voltage	>70 ms* and/or -30% of the nominal voltage	
Green Led		

Constructives and ambientals data

Overvoltage category	III (EN61010)
Rated impulse voltage	4 kV
Pollution degree	2 (EN61010)
Protection	IP 20
Approximate weight	280 g
Storage temperature	-30..+80°C
Operating temperature	-20..+50°C
Humidity	< 95% HR
Housing	Cyclopol - Light grey
Socket	Lexan - Transparent
Leds cover	Technyl - Dark blue
Button, terminal block, clip	Brass
Pins of the 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



**CE CONFORMITY DECLARATION
QUALITY CERTIFICATE**

The company

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

Declares under its sole responsibility 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 Pnnn, Dnnn, Snnn, 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 substances

2011/65/UE from 08/06/2011





- Pb, Hg, Cd, Cr +6, PBB, PBDE

Barcelona, June 2018

L. 

EMILIO JOLIS OLIVA

CONVENTIONS USED IN THIS MANUAL

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	
	<p>In the pages where is explained how to access to the different screens and menus (pages 18..45), it is shown the way to come to the resolution of every option. This way is highlighted by a dark background of the of the screens related in that option.</p> <p>The union of several screens by means of a dashed line, means that the option is valid for all of them.</p>

GENERAL CONCEPTS

Loop 4-20 mA (optional): The value of the rotation speed may be sent by the 4-20mA loop.

See the page 29 to associate a value to the current loop.

Communication with PC (optional): It is possible to communicate the model SHA with a computer via the RS232 serial port for remote programming or to process the data it generates. For a multiple communication (up to 31 equipments) an RS232-RS485 conversor must be used, reference SBAZ.

Display's illumination: The display remains illuminated while its is accessed to the different screens. If a 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.

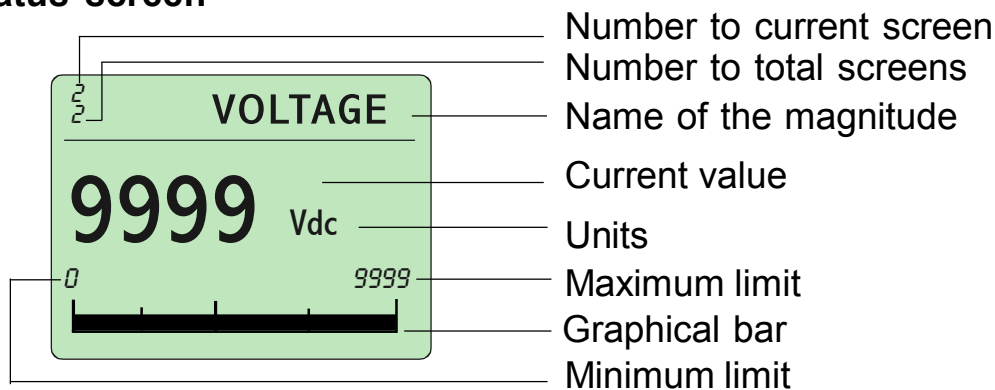
Working mode: After setting up the controller's parameters, it can be back to the normal working mode by executing the option RETURN from the set up menu. The status screens can be also visualized if any key is not pressed for longer than 3 minutes.

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.

TYPES OF SCREENS (1/5)

1.1 Status screen

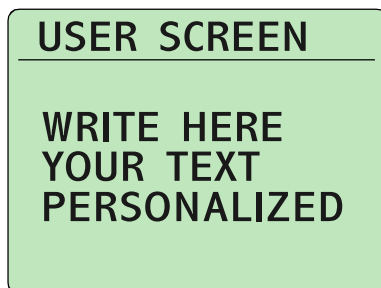


The status screens show the actual values of the magnitudes that the equipment controls. In the normal working mode, the equipment shows the status screen that the user has chosen like preferring magnitude of visualization. In order to move around among the different status screens of status, press ▲ ▼.

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 pressed for longer than 3 minutes. To select it, execute the option SEE SCREEN (see page 35).

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



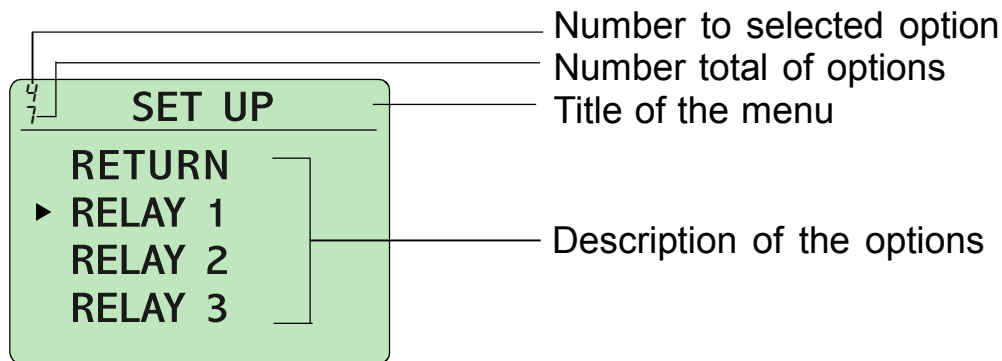
Pressing ▼ and ▲ the desired character is selected and becomes validated by pressing ●, moving up to the following position of the right hand or to the line below. The repeated pulsation of ● provokes the advance of the cursor.



A validated character can not get modified, that means that is not possible to move 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 SCREEN (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 to return the preceding screen, the option RETURN must selected.

1
12
RETURN
RELAY 1
RELAY 2
RELAY 3

2
12
SET UP
RELAY 1
RELAY 2
RELAY 3
OPTIONS

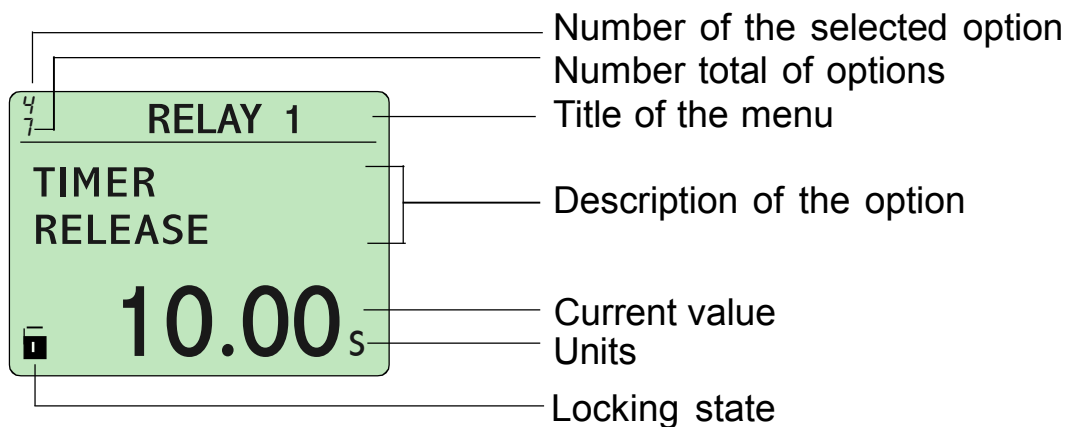
3
12
SET UP
RELAY 1
RELAY 2
RELAY 3
OPTIONS

4
12
SET UP
RELAY 2
RELAY 3
OPTIONS
LOCK

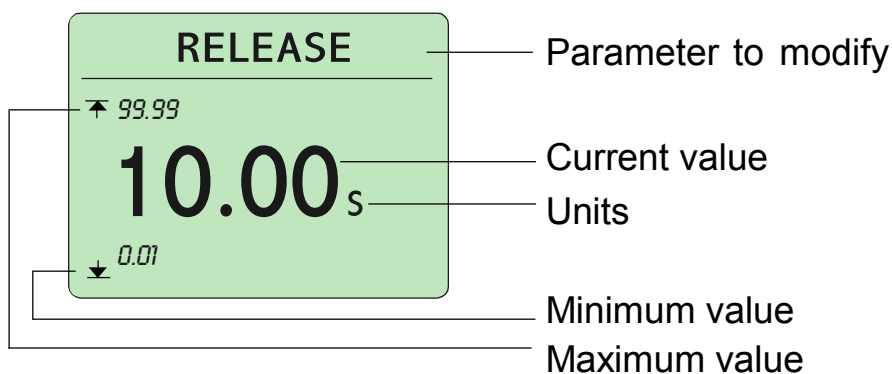
5
12
SET UP
RELAY 3
OPTIONS
LOCK

TYPES OF SCREENS (3/5)

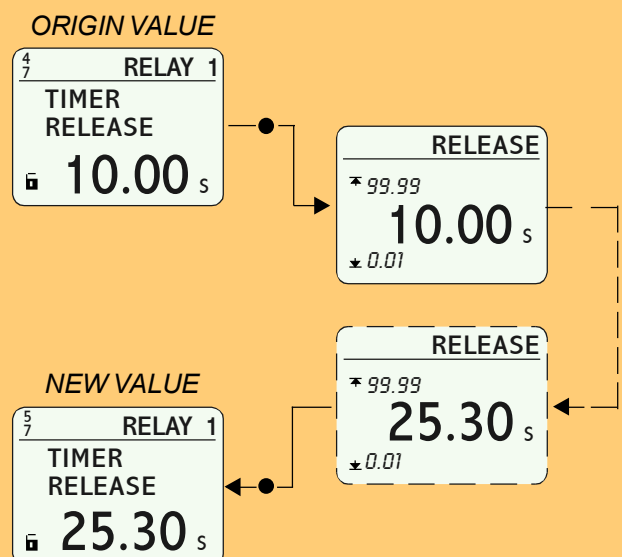
3.1 Informative screen of numerical value



3.2 Screen for changing a numerical value

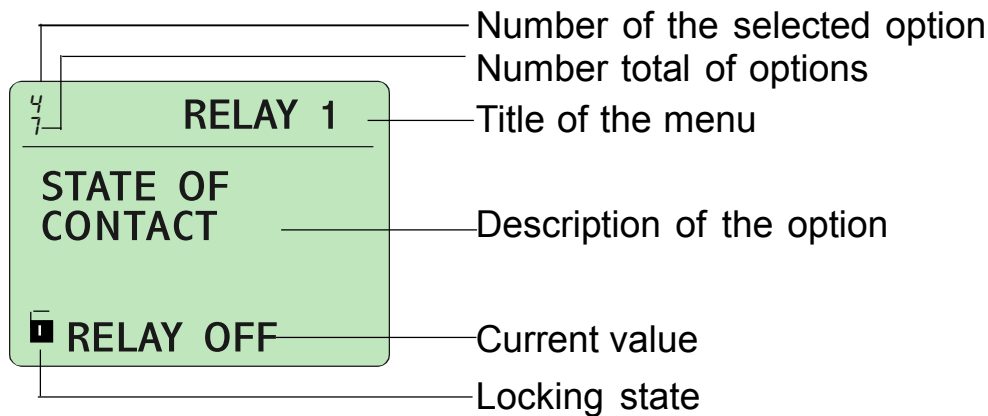


Once placed on the screen that shows the parameter we want to modify its value, press ● in order to access to the screen for changing the value. Since the modification is done digit by digit and not like a complete value, the first digit at left remains blinking. Press ▲▼ to modify the value and ● to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

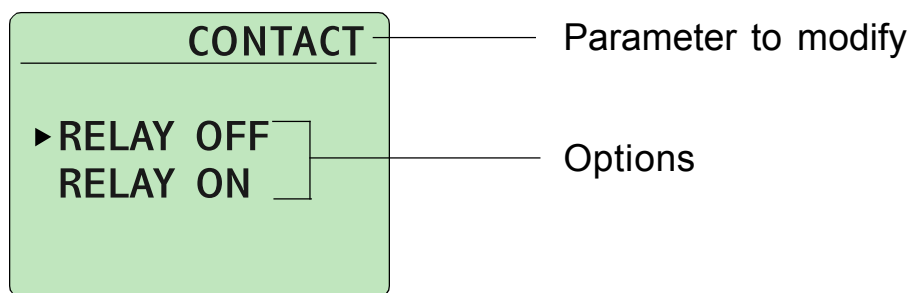


TYPES OF SCREENS (4/5)

4.1 Informative screen of alphanumeric value

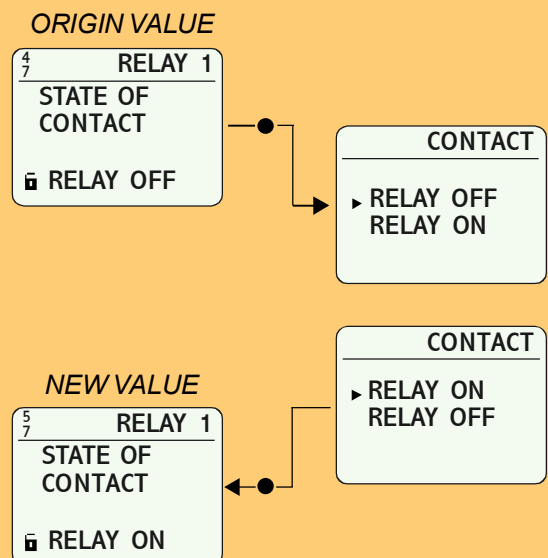


4.2 Screen for changing an alphanumeric value



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 desired value and ● to validate it and return to the preceding screen.



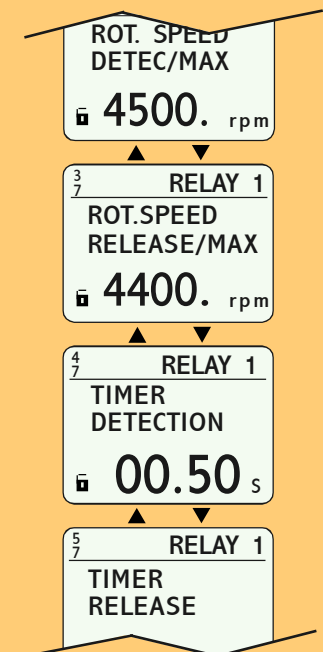
TYPES OF SCREENS (5/5)

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 - Apply supply voltage to terminals A1 and A2. Be sure to match with the value marked on the equipment. The green LED is lit. Now it does not matter if the red LEDs for relays or not illuminated.
- 2 - Set the parameters that your application needs. You can now choose between two solutions: set each parameter individually (see Advanced Programming, pg. 17) or use the "user programs" which, by way of example, contain most of the parameters already configured for some applications "type" and where you only need to modify those that do not fit your application. Please read the description of these programs to see if it suits your needs. (See pp. 14..16).
- 3 - Verify that the relay status is desired, checking the red LEDs on the front.
- 4 - If correct, disconnect the power supply and connect the output relays under the terms of their application. Reapplying voltage, the team will be ready to work.

USER PROGRAMS (1/3)

The user program is ongoing in the SHA model.

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 32).


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 33).

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 (2/3)


PROGRAM 1: Control for maximum, minimum and start-up.

RELAY 1: Control for minimum and star-up

STATE OF CONTACT = ON
 DEFINITION WORKING MODE = 
TURN SPEED DETEC / MIN = 90 rpm
TURN SPEED RELEASE / MIN = 100 rpm
DETECTION TIMER = 0,5 s
RELEASE TIMER = 0,5 s
START-UP TIMER = 5,00 s


ALARM STATE = OFF
TURN SPEED MAXIMUM = NON OPERATIVE
TURN SPEED MINIMUM = OPERATIVE
DETECTION MODE = DELAYED
TIME RANGE DETECTION = SECONDS
RELEASE MODE = DELAYED
TIME RANGE RELEASE = SECONDS
START-UP MODE = DELAYED
TIME RANGE START-UP = SECONDS

RELAY 2: Control for minimum

STATE OF CONTACT = ON
 DEFINITION WORKING MODE = 
TURN SPEED DETEC / MIN = 90 rpm
TURN SPEED RELEASE / MIN = 100 rpm
DETECTION TIMER = 0,5 s
RELEASE TIMER = 0,5 s

ALARM STATE = OFF
TURN SPEED MAXIMUM = OPERATIVE
TURN SPEED MINIMUM = NON OPERATIVE
DETECTION MODE = DELAYED
TIME RANGE DETECTION = SECONDS
RELEASE MODE = DELAYED
TIME RANGE RELEASE = SECONDS
START-UP MODE = INSTANTANEOUS

RELAY 3: Control for maximum and minimum

STATE OF CONTACT = ON
 DEFINITION WORKING MODE = 
TURN SPEED DETEC / MAX = 4500 rpm
TURN SPEED RELEASE / MAX = 4400 rpm
TURN SPEED DETEC / MIN = 90 rpm
TURN SPEED RELEASE / MIN = 100 rpm
DETECTION TIMER = 0,5 s
RELEASE TIMER = 0,5 s

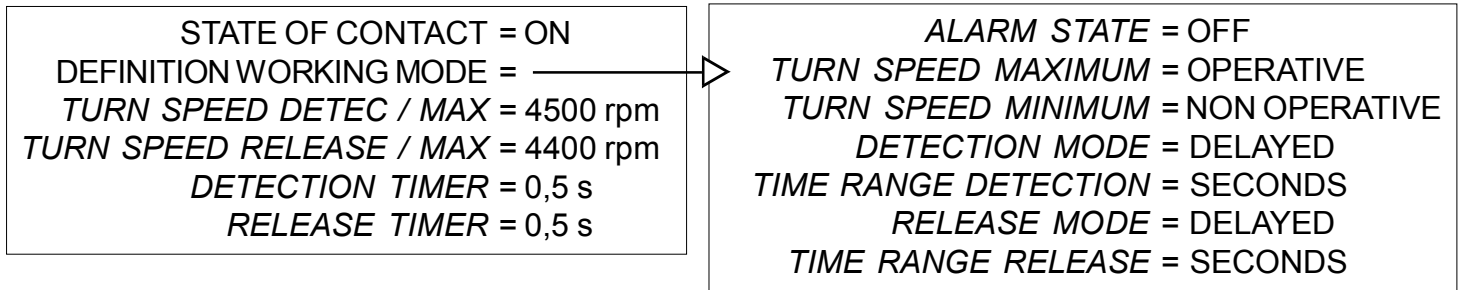
ALARM STATE = OFF
TURN SPEED MAXIMUM = OPERATIVE
TURN SPEED MINIMUM = OPERATIVE
DETECTION MODE = DELAYED
TIME RANGE DETECTION = SECONDS
RELEASE MODE = DELAYED
TIME RANGE RELEASE = SECONDS
START-UP MODE = INSTANTANEOUS

NOTE: Options in italics are only available according to the ones selected in DEFINITION WORKING MODE.

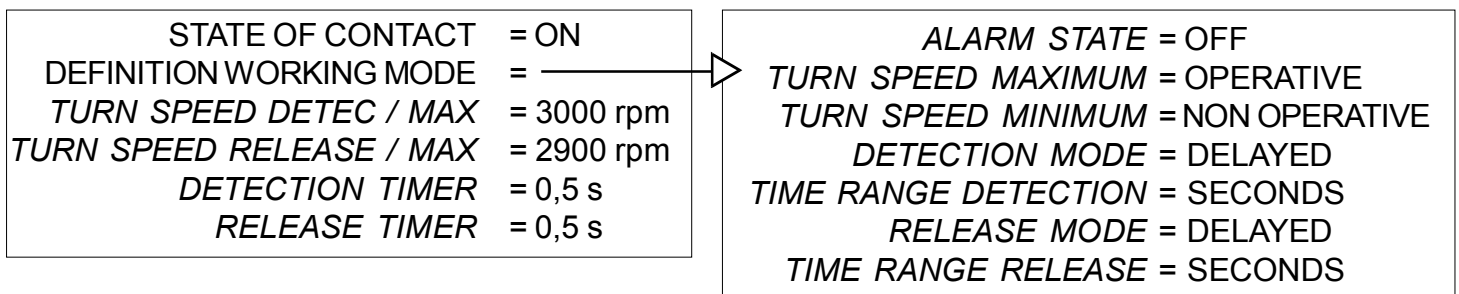
USER PROGRAMS (3/3)

PROGRAM 2: Control of three stepped set points for maximum

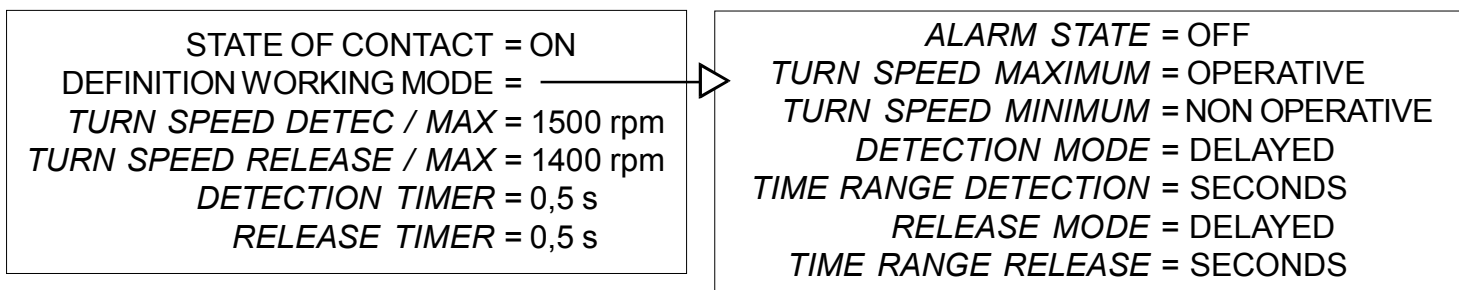
RELAY 1: Control of the upper set point



RELAY 2: Control of the medium set point



RELAY 3: Control of the lower set point



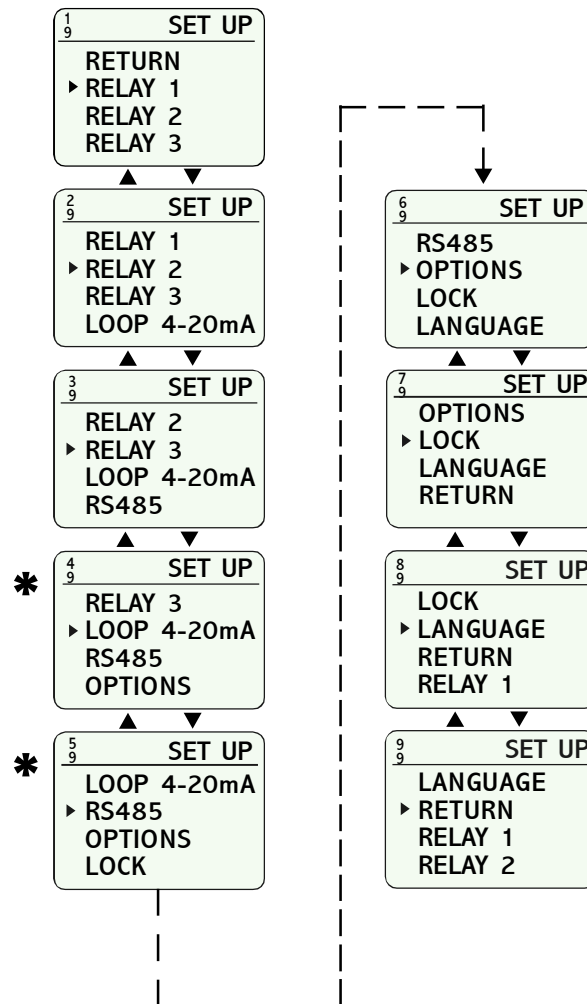
NOTE: Options in italics are only available according to the ones selected in DEFINITION WORKING MODE.

ADVANCED PROGRAMMING

If you want to program by your own the controller SHA, it is not necessary to load any program. Set the parameters showed in the screens that appear when connecting 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 maximum rotation speed, relay 2, ...).
Bear in mind that several relays may control the same magnitude (Ex.: To set two set points to control the minimum rotation speed, active the detection by minimum rotation speed for the relays 1 and 2, and set a different value to each of them).
- 2 - Determine what actions will have timing (Ex.: 3 seconds when detecting maximum rotation speed, 5 seconds when detecting minimum rotation speed...)
- 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 deactivate 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 actived for RELAY 1.
- 4 - Proceed in the same way for the rest of relays, in case that you are going to use them.
- 5 - Consult the following pages to know the rest of programming possibilities offered by the models SHA.

SET UP MENU

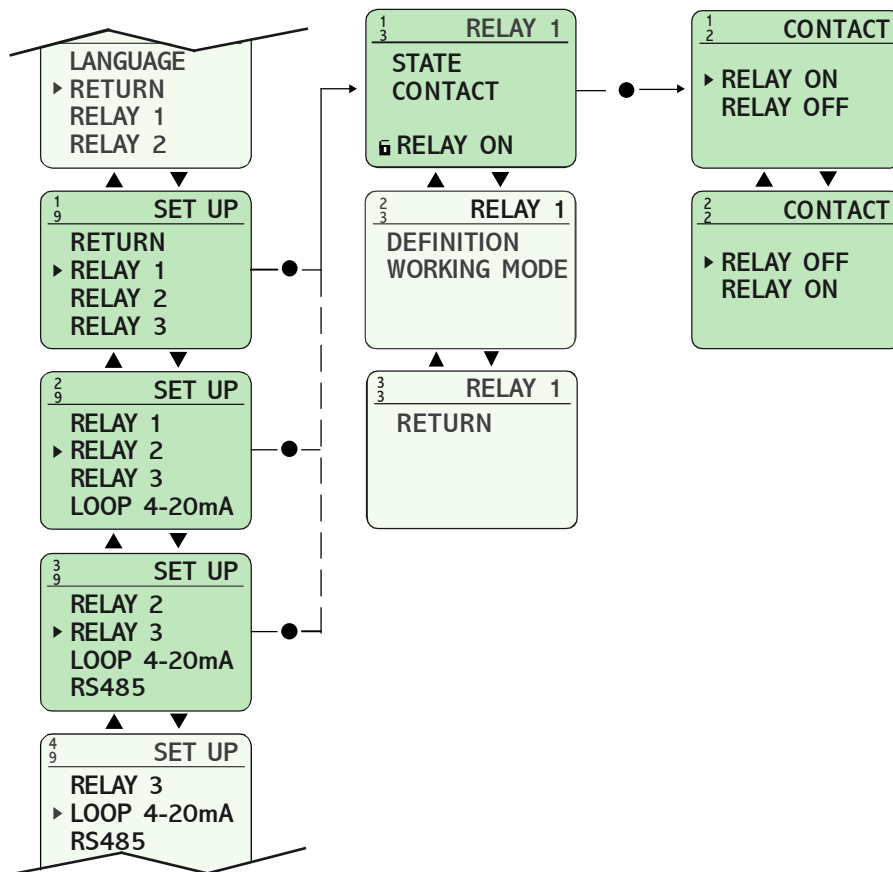


Is the main menu from which is possible to set up all the parameters involved in the equipment. It is accessed from the status screens when pressing the button “Enter”. It is also possible to arrive by choosing the successive options RETURN included in whichever of the rest of menus or screens.



These options depend on the selected equipment, it means that they cannot be available in the one you have.

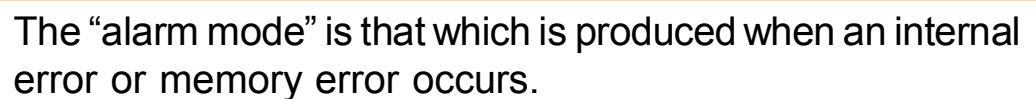
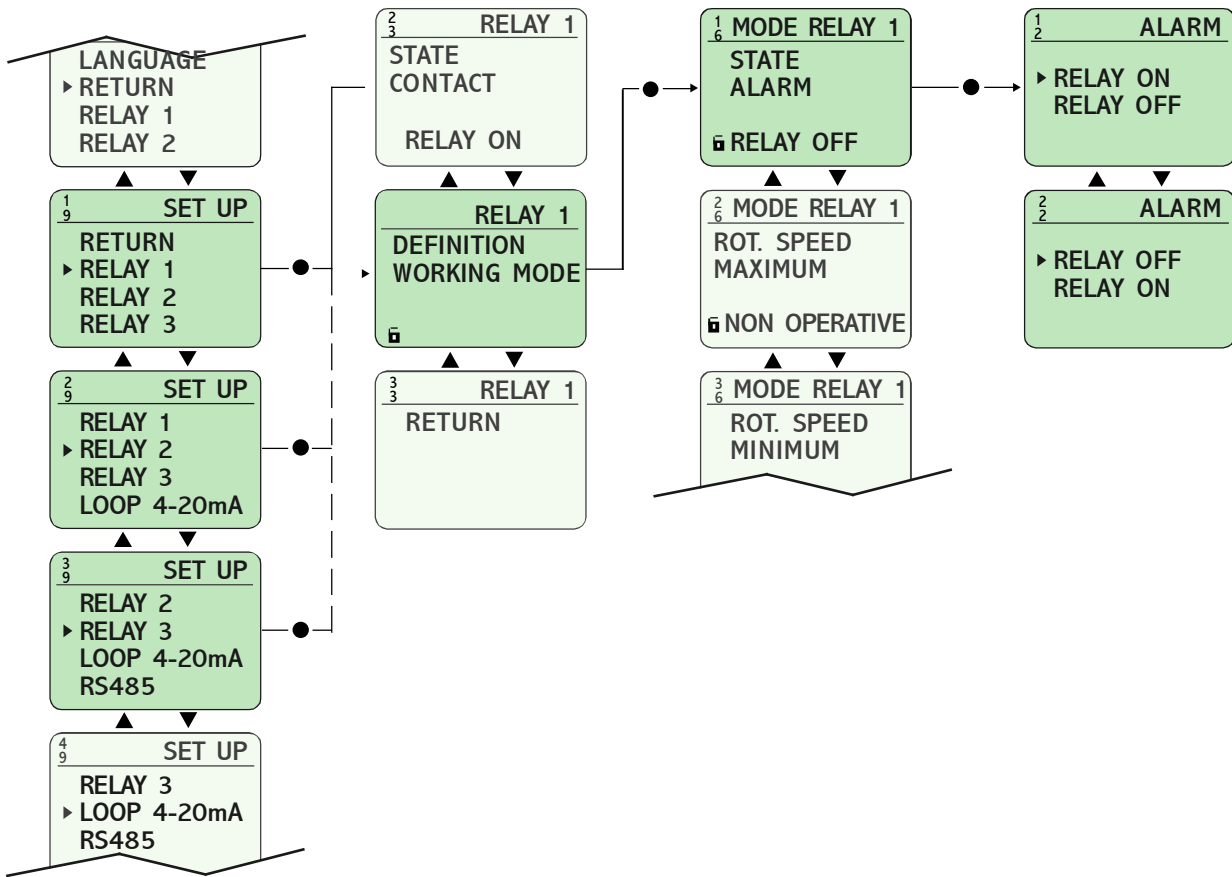
STATE OF THE RELAY CONTACTS



Existing information on this page and in the subsequent configuration referred RELAY 1, RELAY extend to RELAY 2 and 3, being necessary to set the parameters of each relay independently.

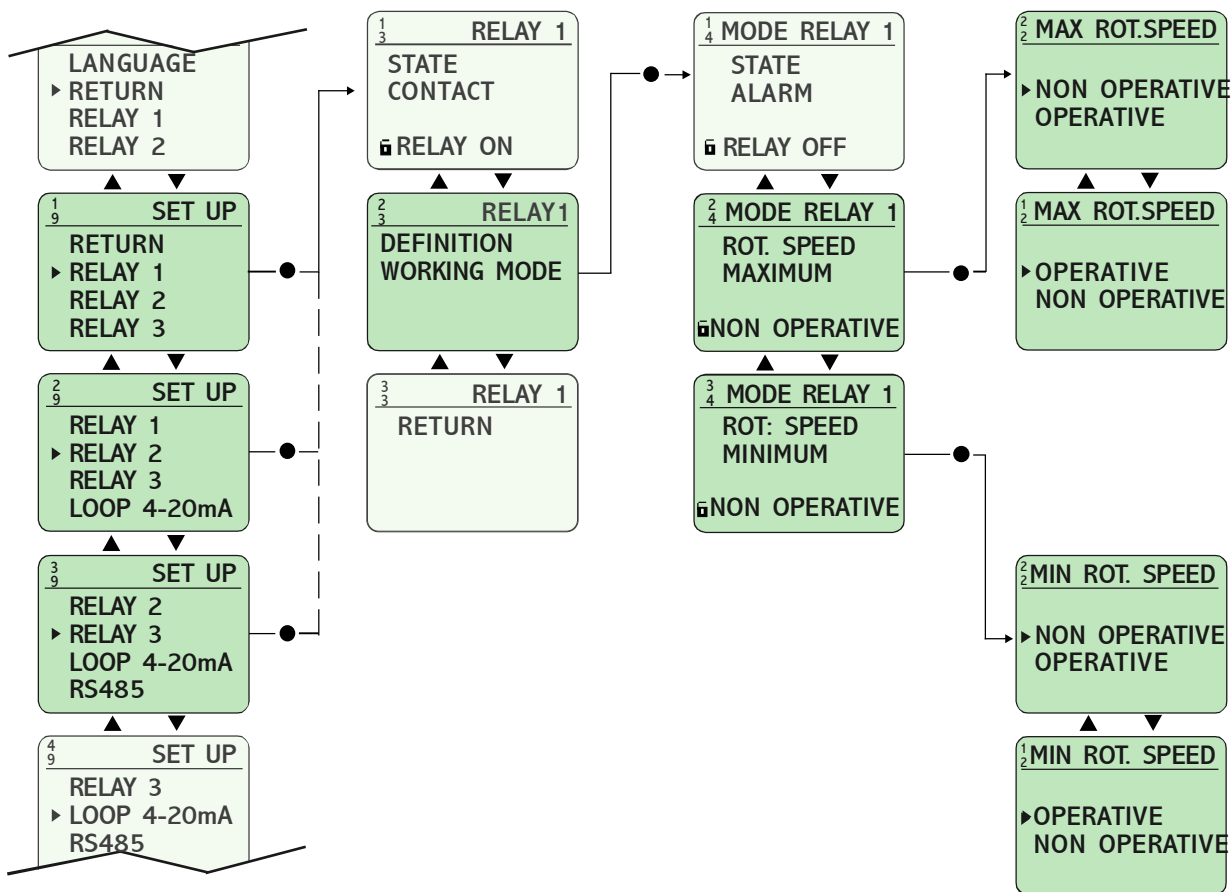


The state of the relay (OFF/ON) indicates the position of the contacts of the relay when the controller is turned on. The state of the contact of the relay must be set up according to the required operation you need to perform.



Because the device would remain with a wrong information, some undesired situation could happen like, for example, the alarm for overvoltage remains unactivated although the voltage be over the adjusted value. By means of this option can be set up the state of the contacts of the relay when this situation is produced.

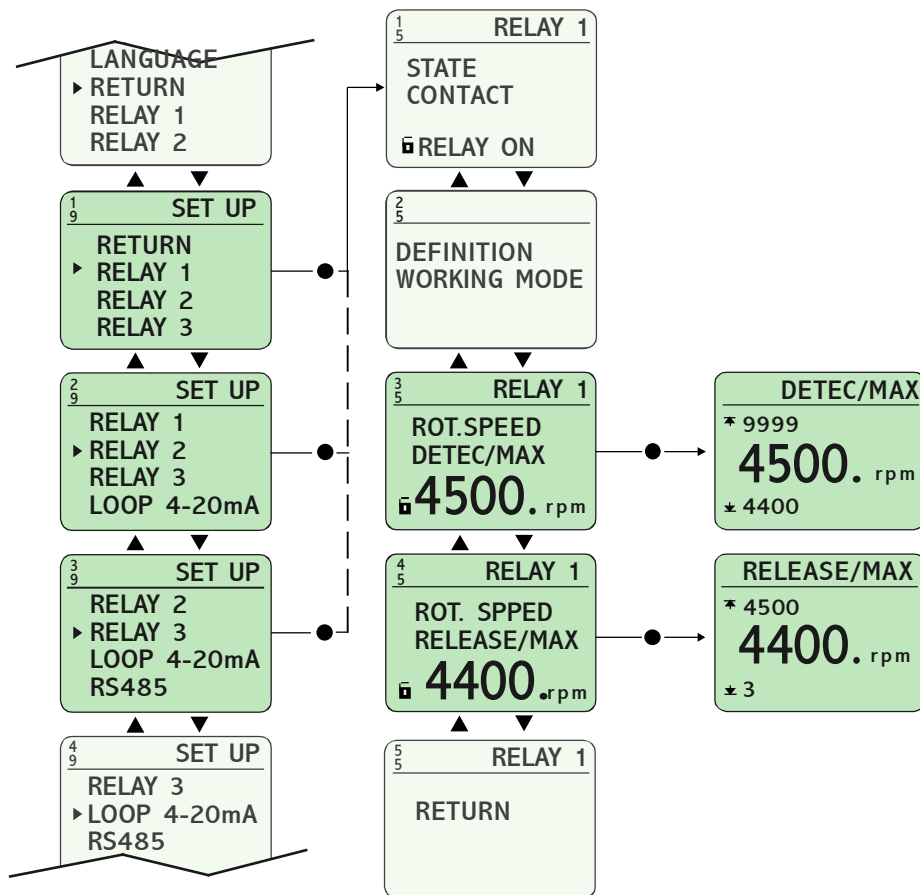
MAX. AND/OR MIN. ROTATION SPEED(1/2)



Activation

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

MAX. AND/OR MIN. ROTATION SPEED (2/2)

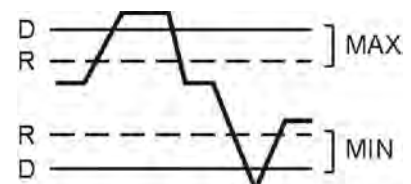


**Previous
condition**

ROTATION SPPED MAXIMUM = [OPERATIVE]
ROTATION SPPED MINIMUM = [OPERATIVE]

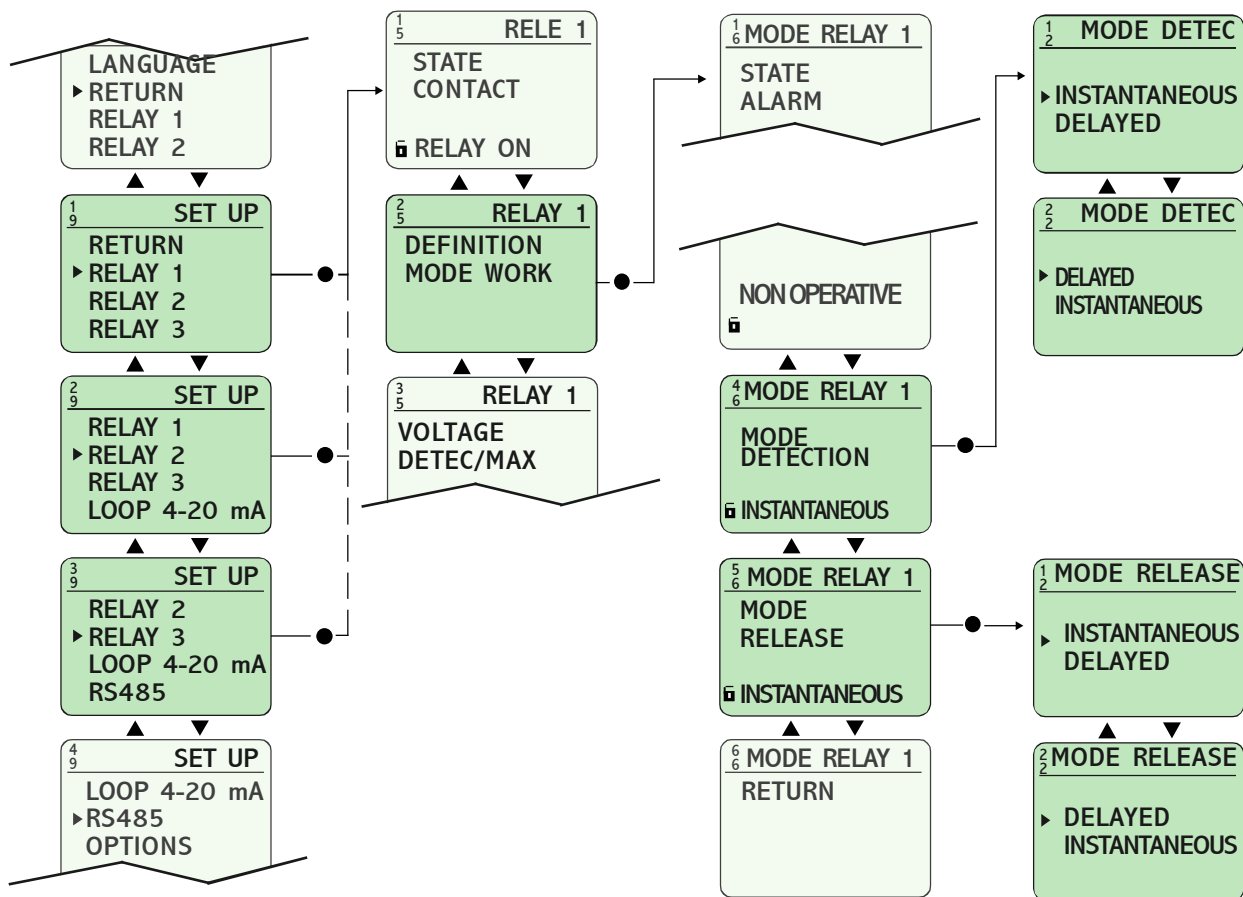


It allows to set the value (rpm) for the detection and/or the release of the max. and/or min. rotation speed. When setting the working values for Maximum, the release value must be lower than the detection value.



Adjustement

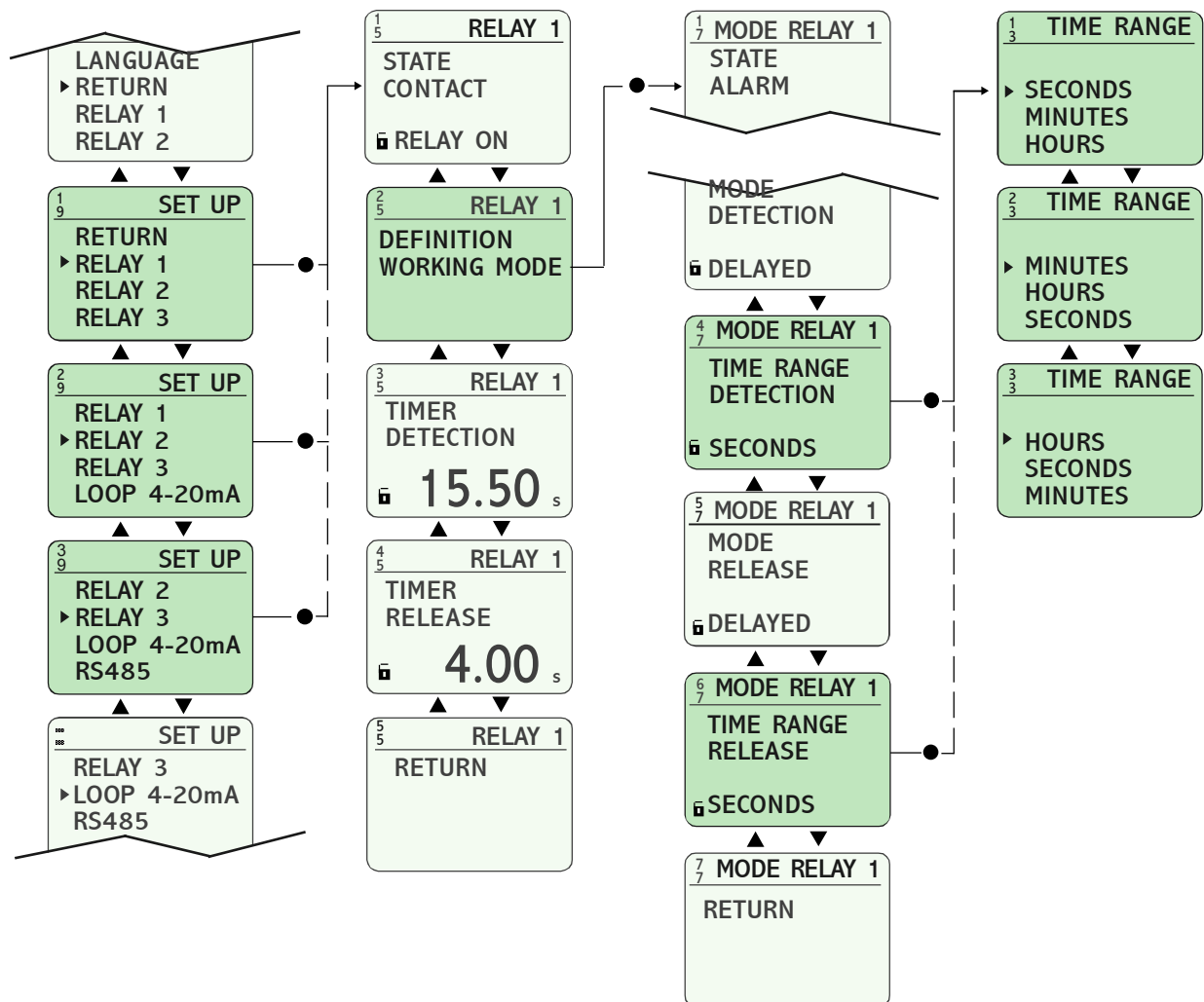
DELAY ON DETECTION AND/OR ON RELEASE (1/3)



To incorporate 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.

Activation

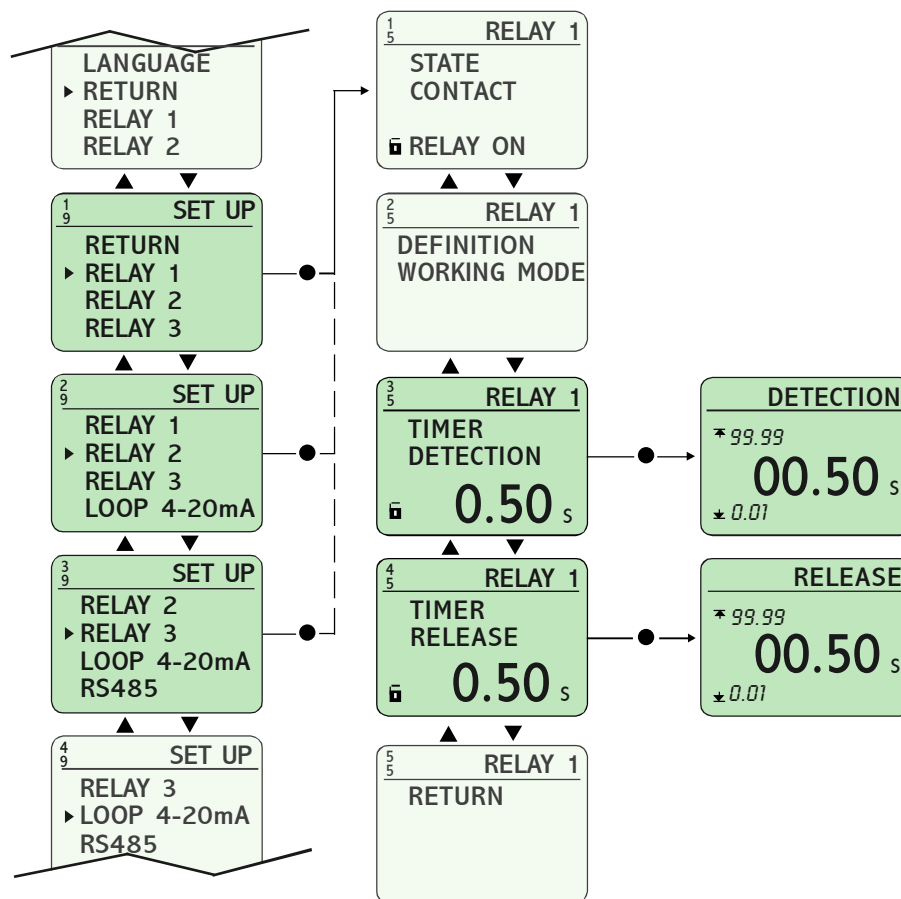
DELAY ON DETECTION AND/OR ON RELEASE (2/3)



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)



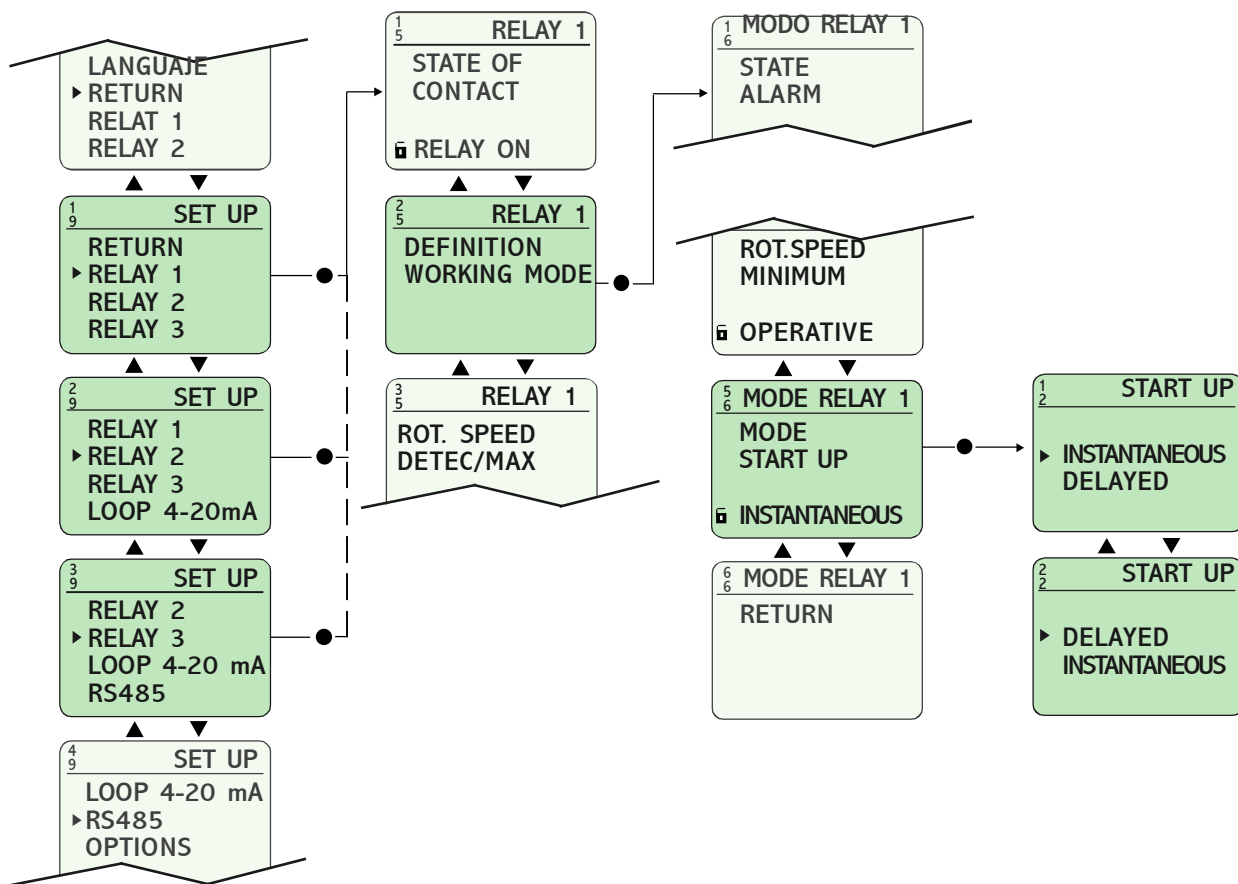
It allows to set the exact time for the detection and/or the release.

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

Time

START UP TIMER (1/3)



Previous conditions

ROT. SPEED MINIMUM = [OPERATIVE]



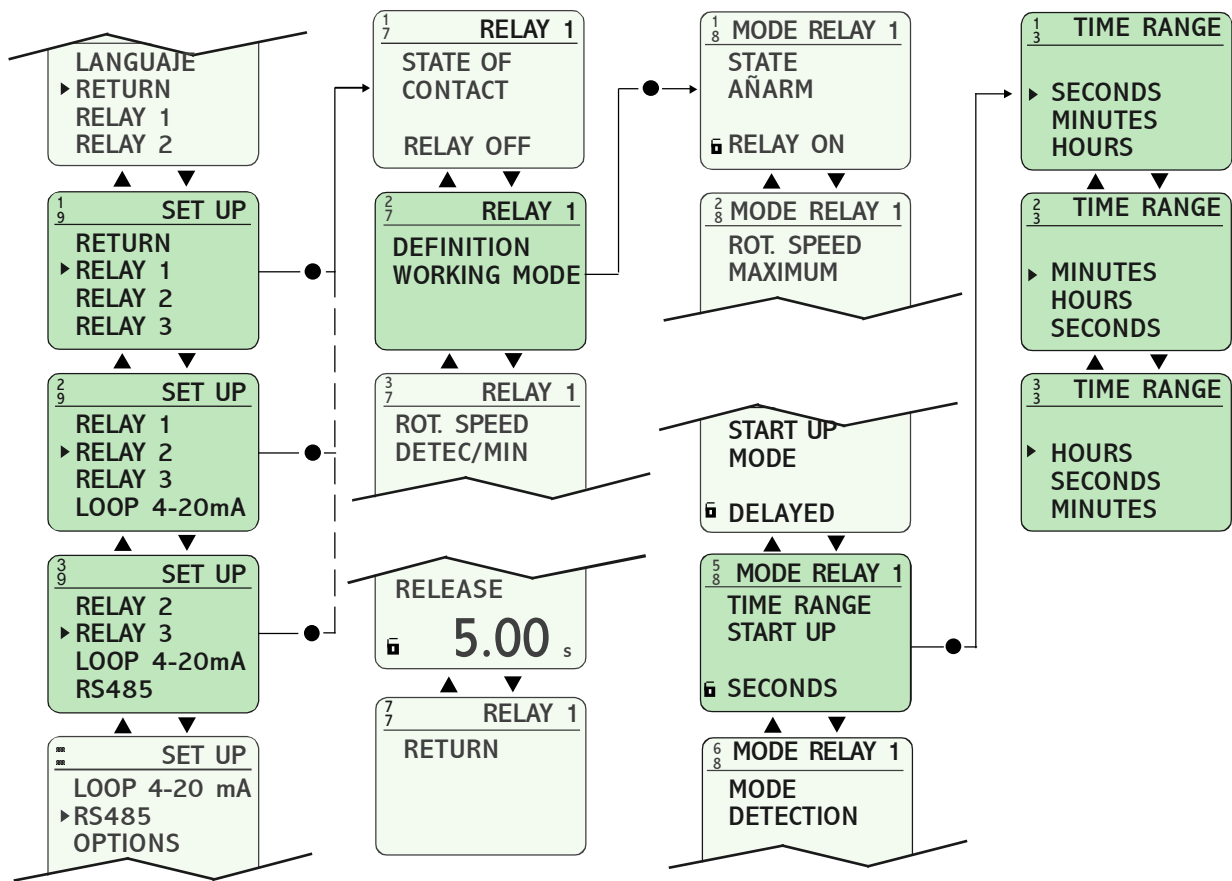
Activation

To set a set up timer, the START UP MODE must be set as DELAYED. When the set up button (Y4-Z1) is pressed, the contact of the relay is located as the value indicated in the STATE of the CONTACT mode during the adjusted time (pages. 27 and 28).



Once the preset time is elapsed, the equipment uses the parameters defined in its different control functions.

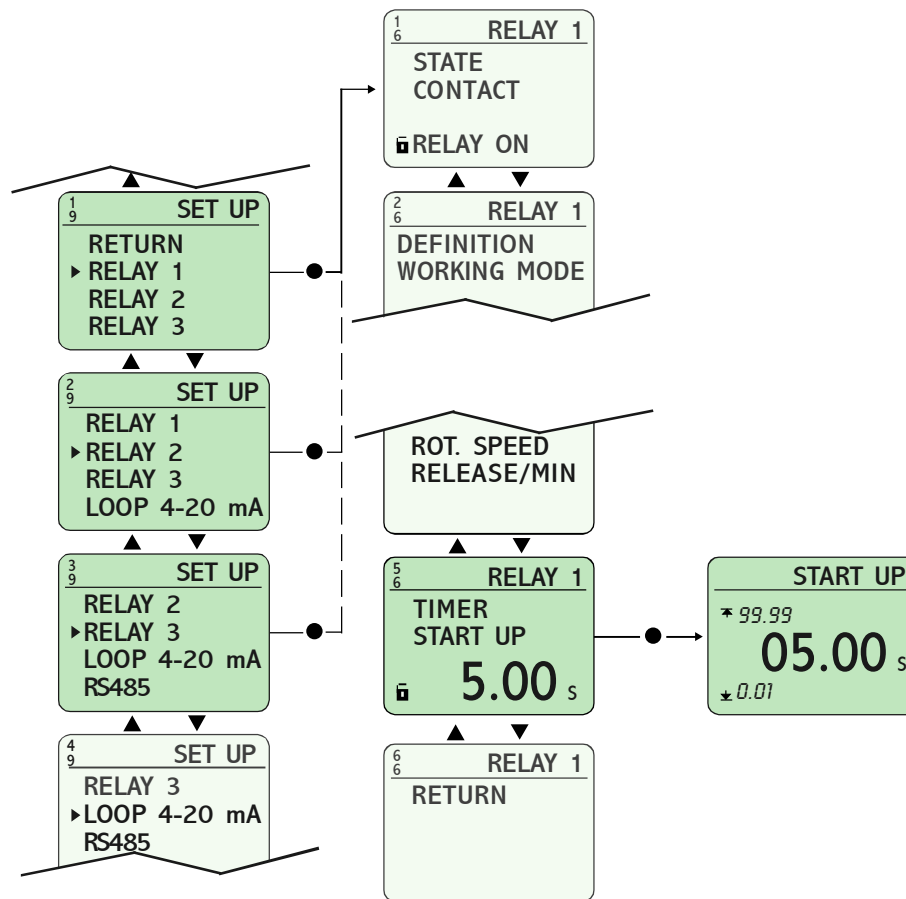
START UP TIMER (2/3)



Ranges

The start up timer ranges could be set as SECONDS, MINUTES or HOURS

START UP TIMER (3/3)



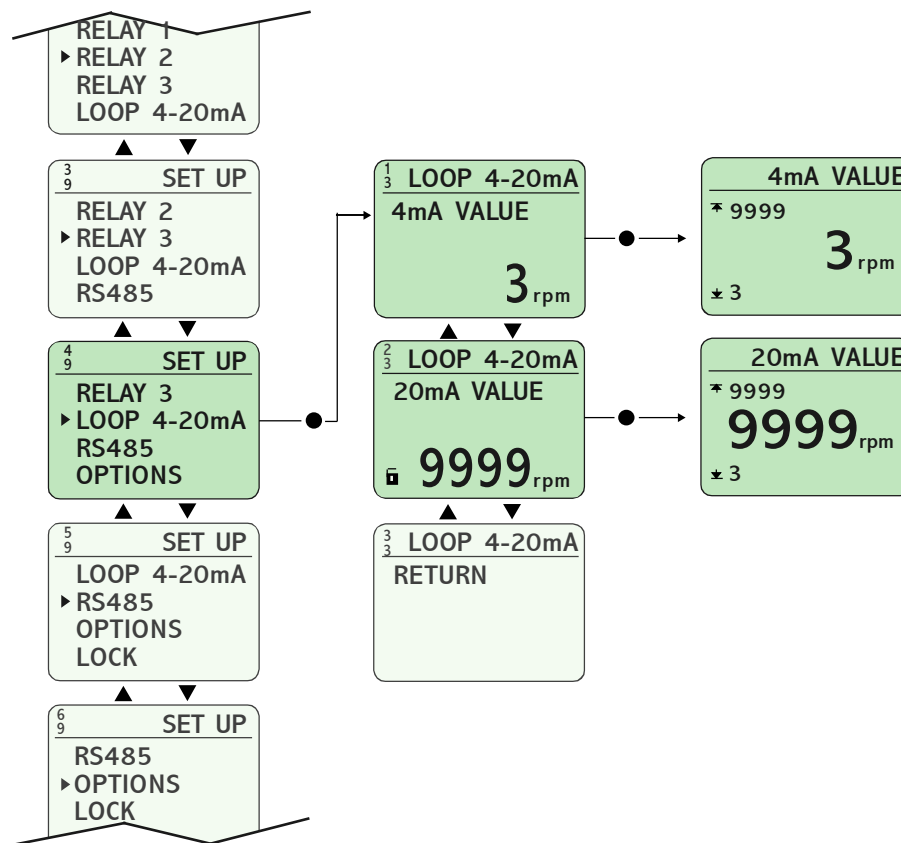
It allows to set the exact time for the start up timer.

The time range varies between the following margins, in function of the previously selected range:

- 0,01..99,99 SECONDS
- 0,01..99,99 MINUTES
- 0,1..999,9 HOURS

Time

LOOP 4-20 mA



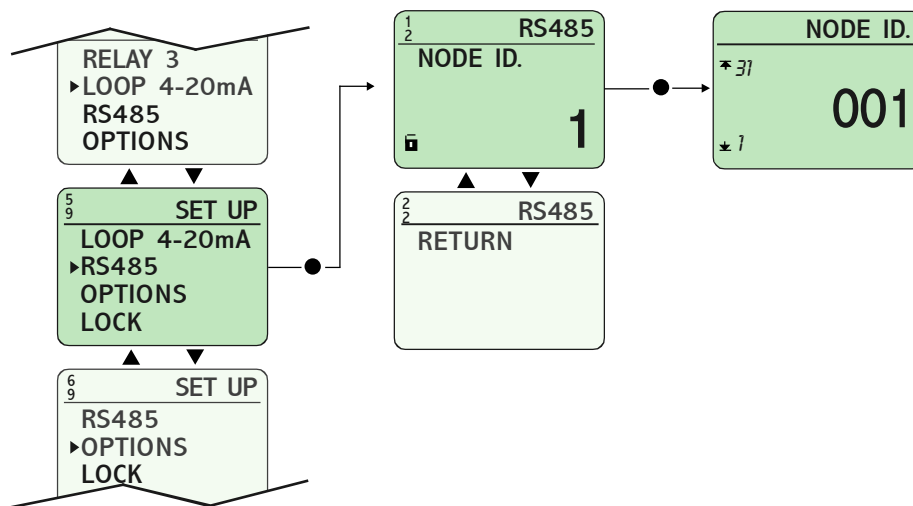
Adjustment

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 unique to models with this method of communication.
Consult the connection at page 47.

RS485



Is possible to communicate the controller SHA 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.

Is essential to employ the converter RS232-RS485 (reference SBAZ).

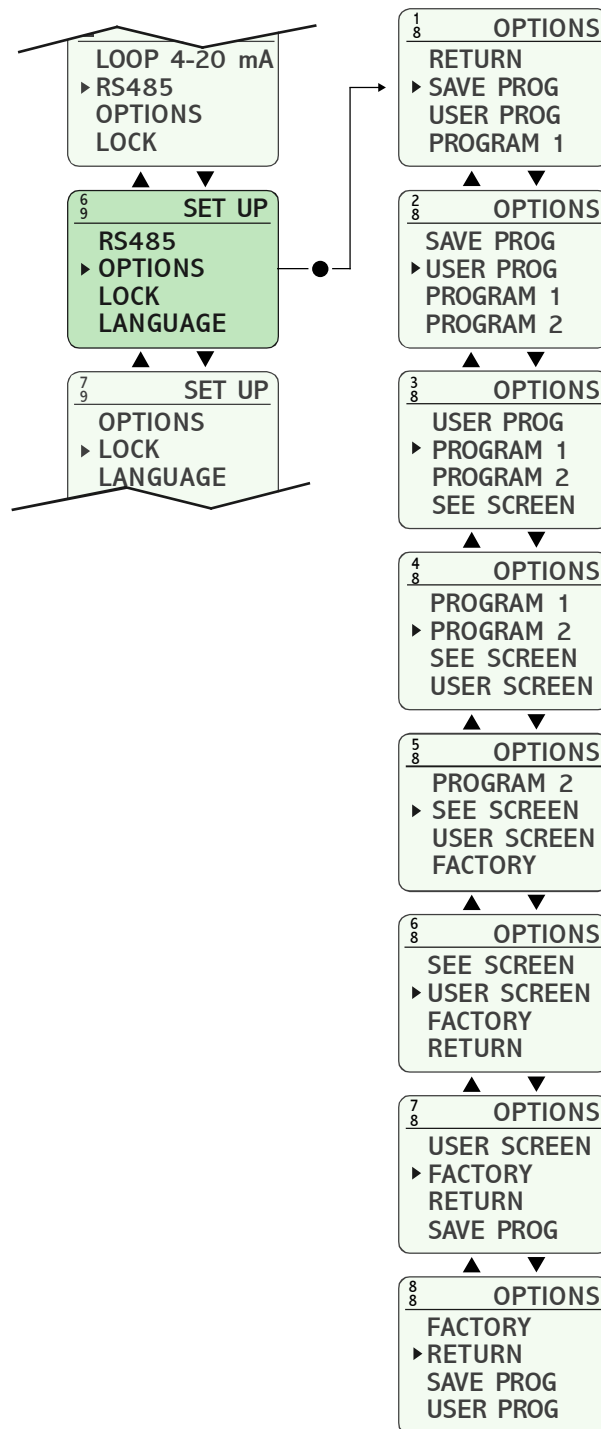
For extended information relative to programming with a computer, consult the manual deCom.



This feature is unique to models with this method of communication.

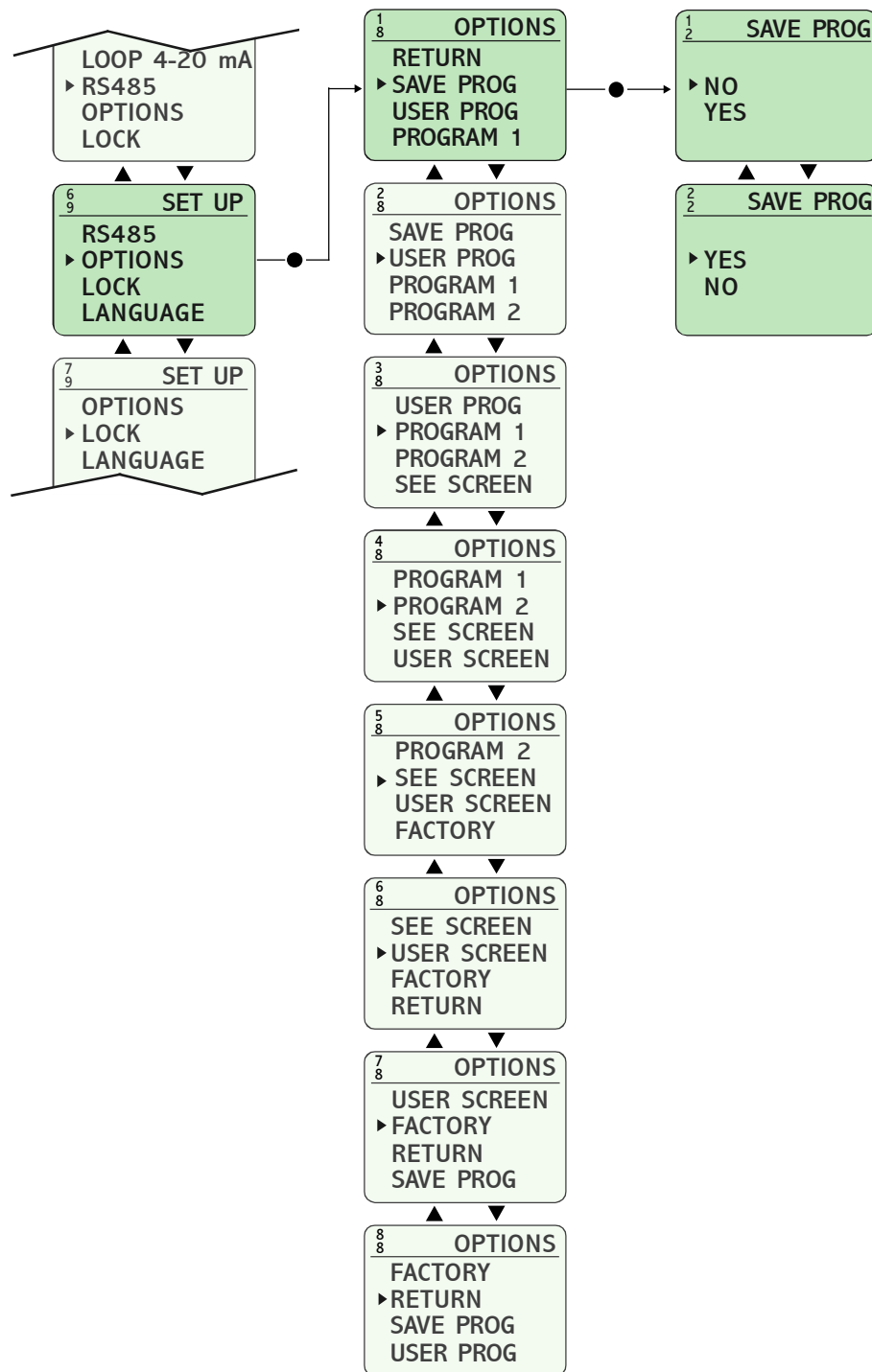
Consult the connection at page 48.

OPTIONS MENU



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

SAVE PROGRAM

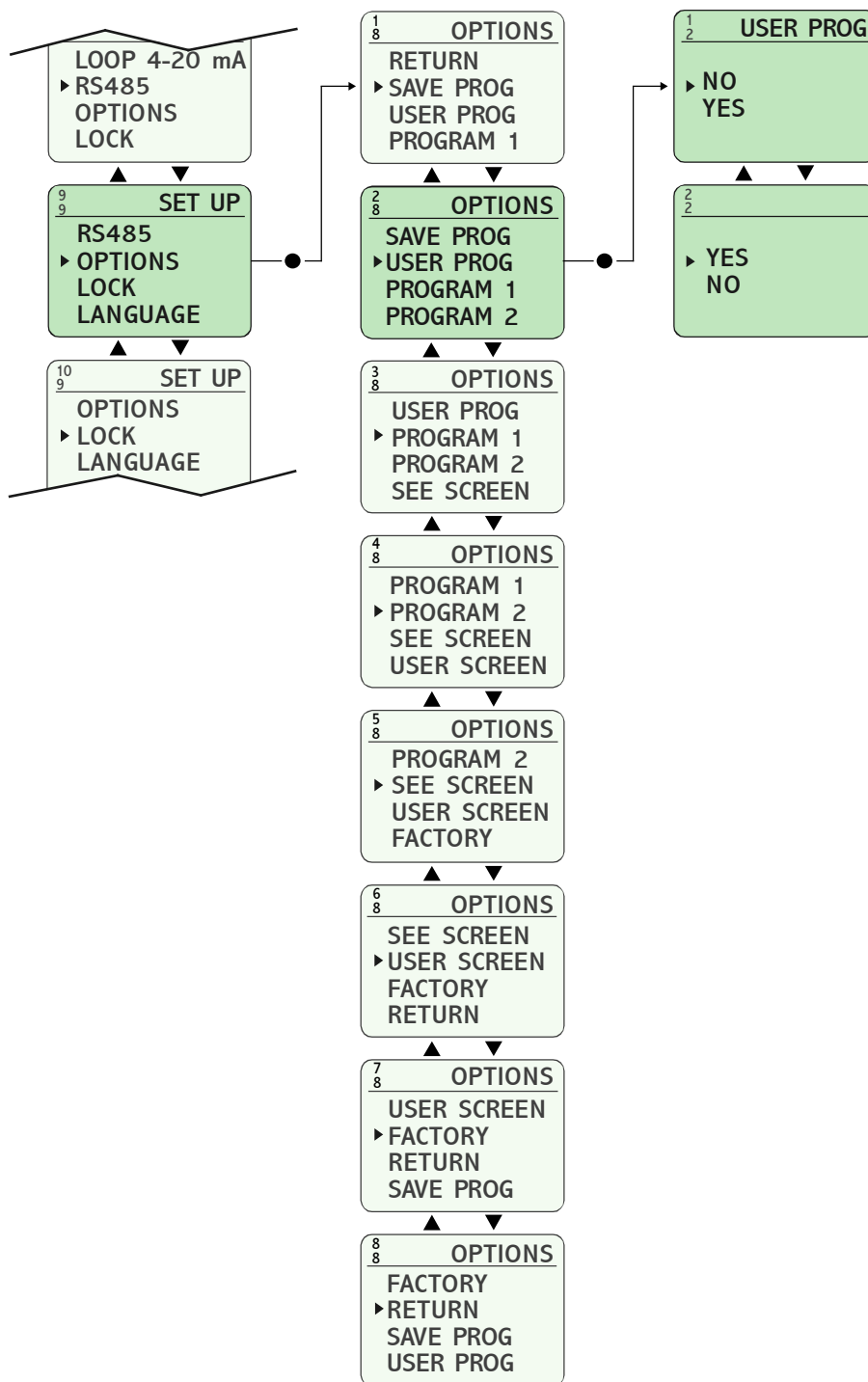


It stores the changes done in the different parameters and options. Each time that SAVE PROGRAM is executed, the values stored in the user program are overwritten.



You will find more information related to the user program in the pages 14..16.

USER PROGRAMS

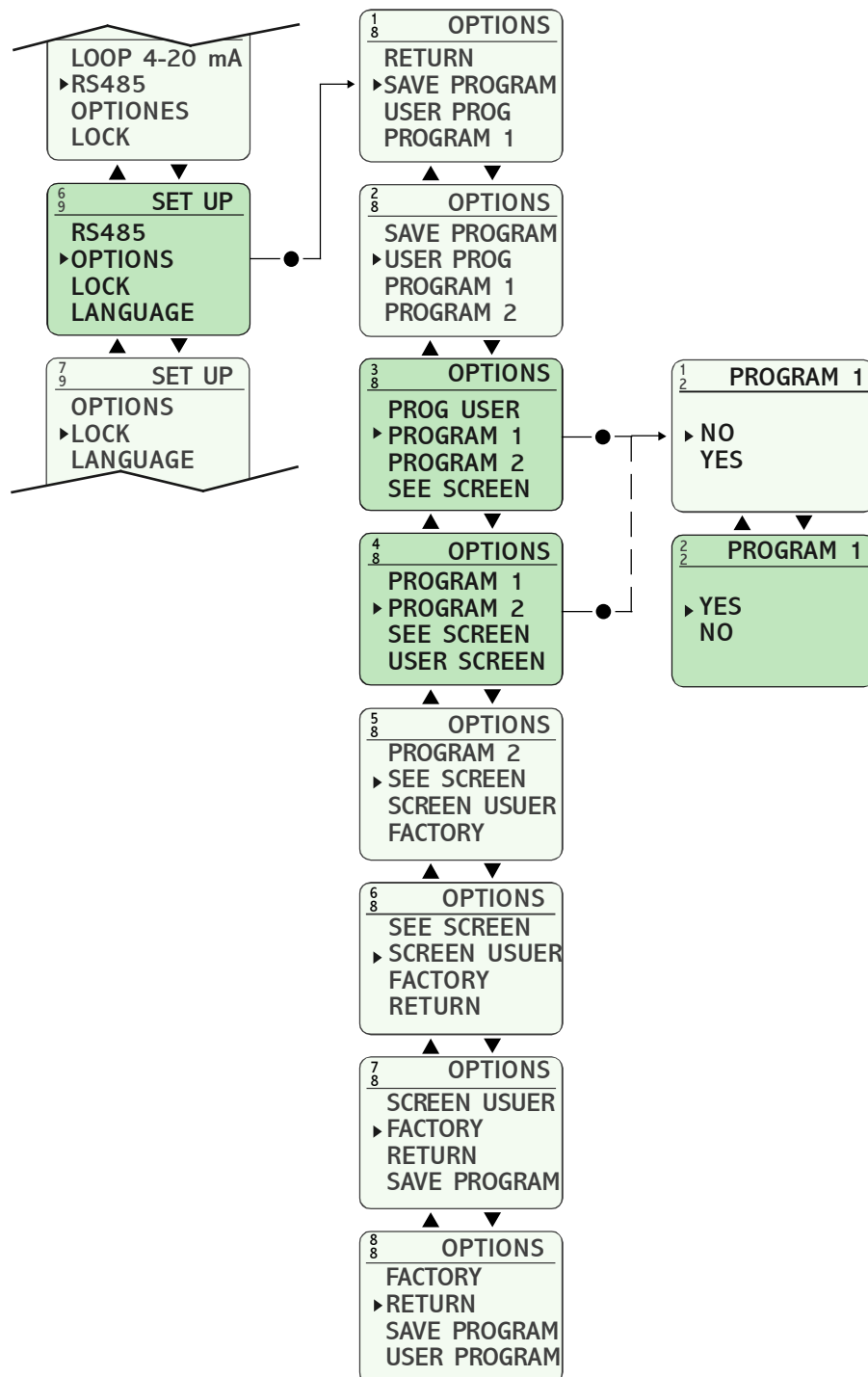


It loads into memory the program that was stored with the option SAVE PROGRAM, becoming the working program. Each time that this option is executed, the values stored in the memory are overwritten.



You will find more information related to the user program in the pages 14..16.

PROGRAM 1 AND 2

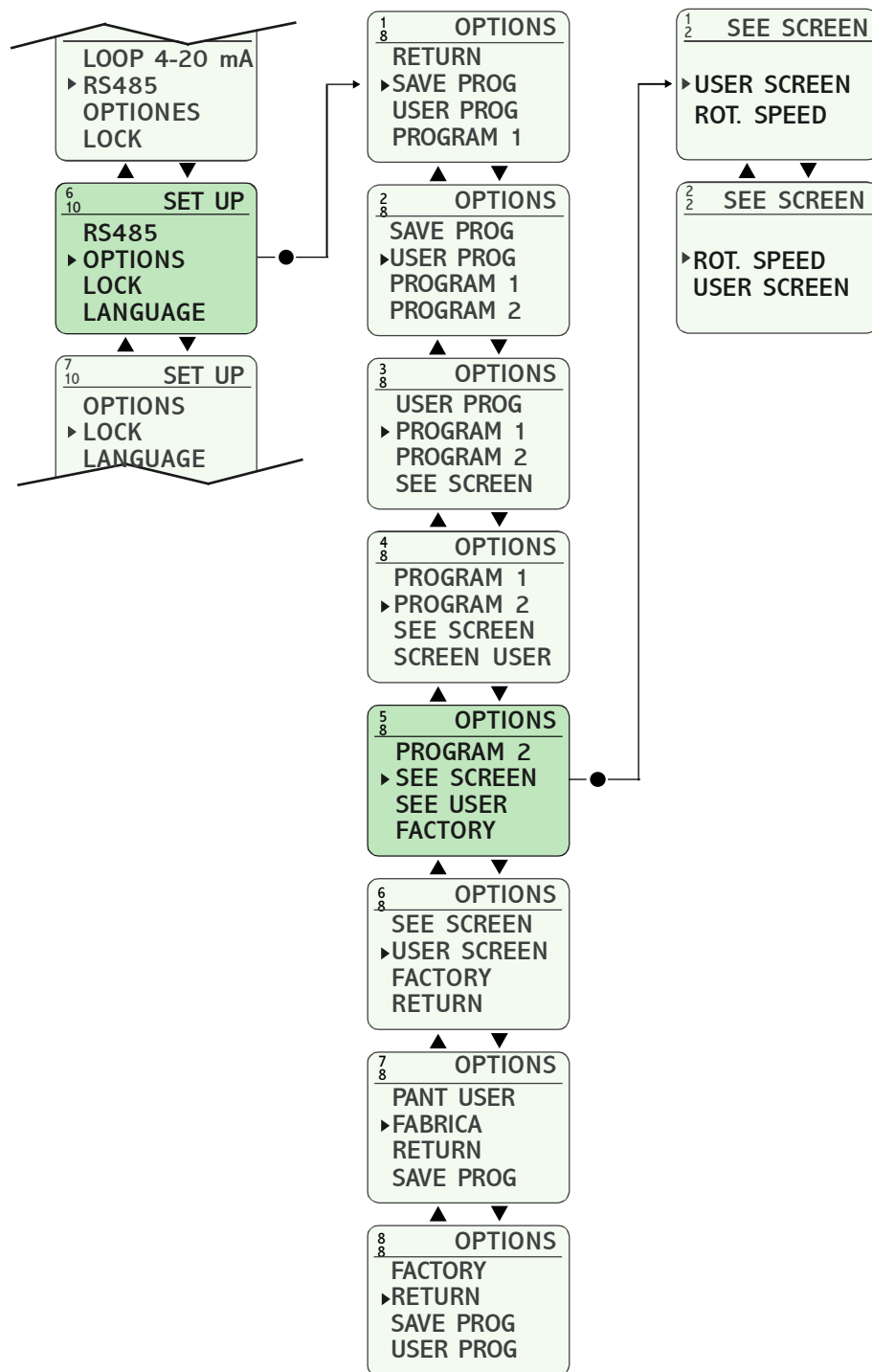


It loads into memory the selected program, becoming the working program. Each time that this option is executed, the values stored in the memory are overwritten.



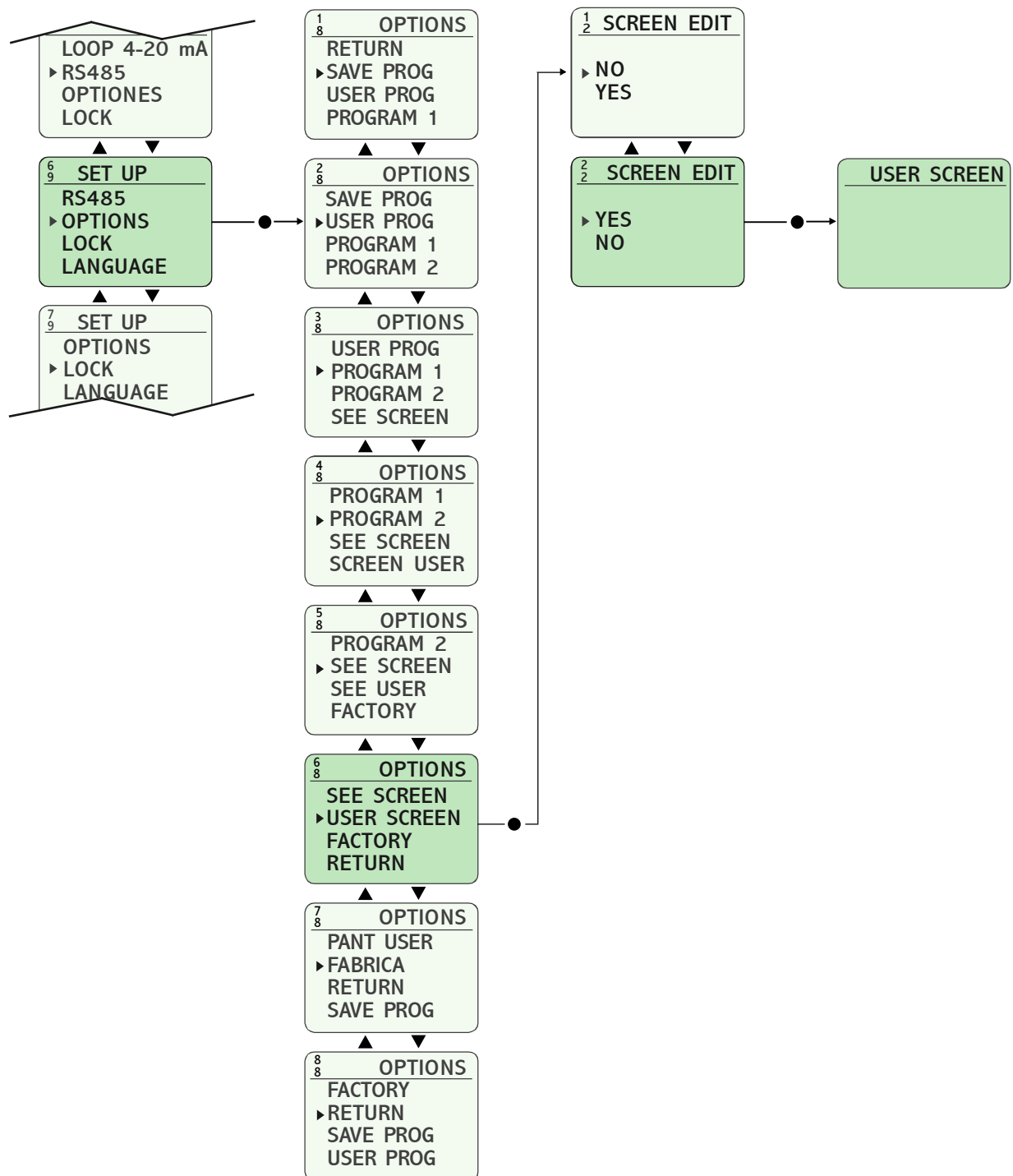
You will find more information related to the user program in the pages 14..16.

SEE SCREEN



This option allows to set which will be the default screen in the status screens menus (normal working mode).

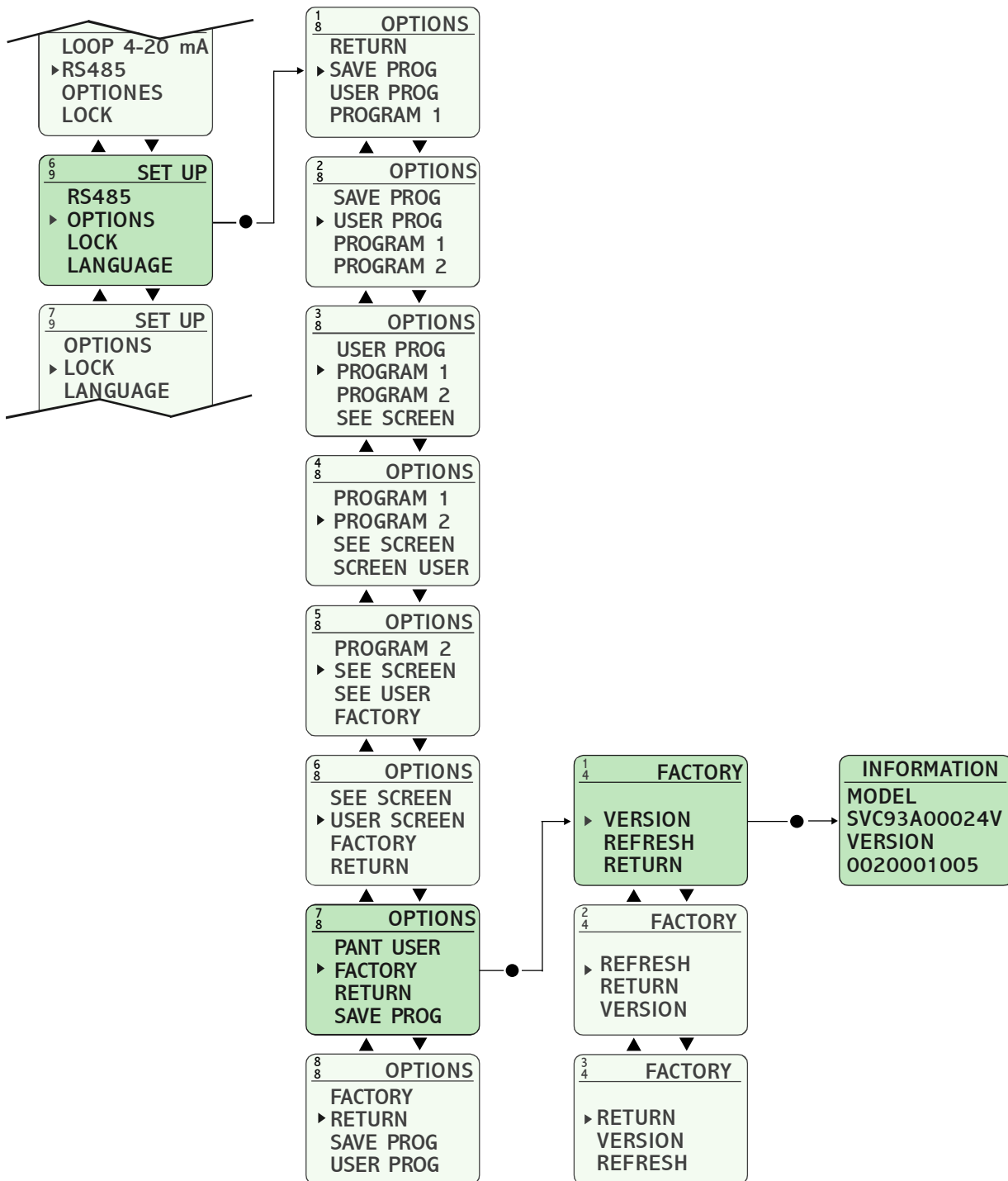
EDIT USER SCREEN



On this screen you can edit any text identifying the device.

You can use 4 lines of 13 characters each. For characters that can be used and how to edit them, see the section "1.2 DISPLAY USER".
(See page 8).

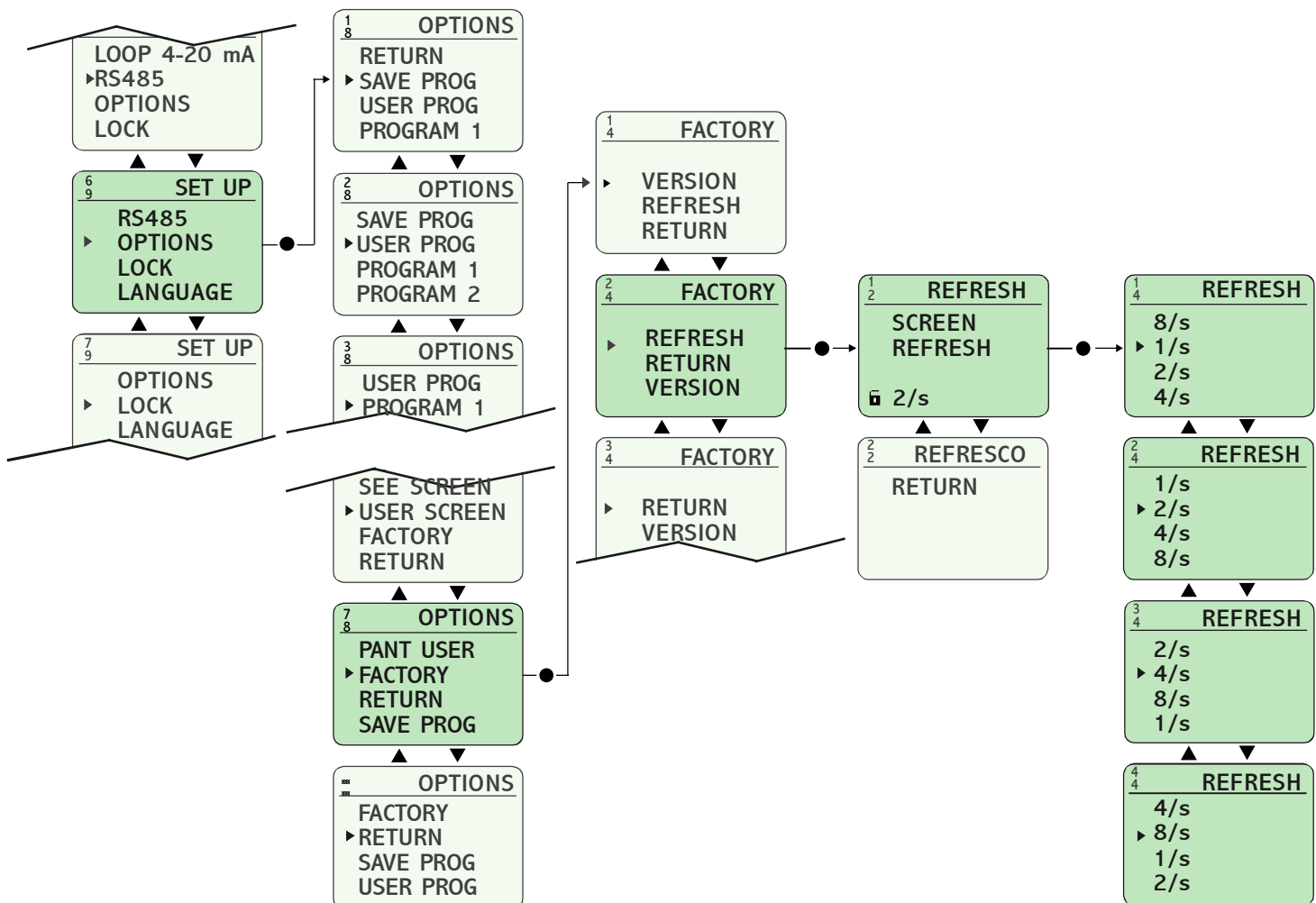
INFORMATION OF MODEL AND VERSION



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.

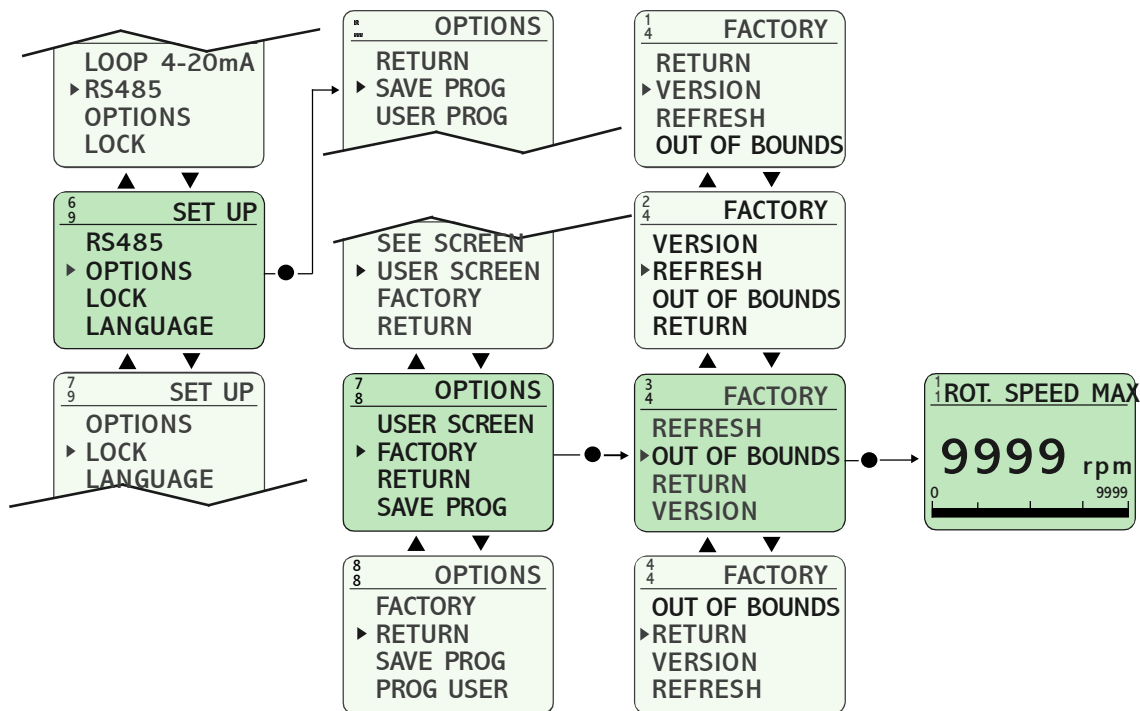
SCREEN REFRESH



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



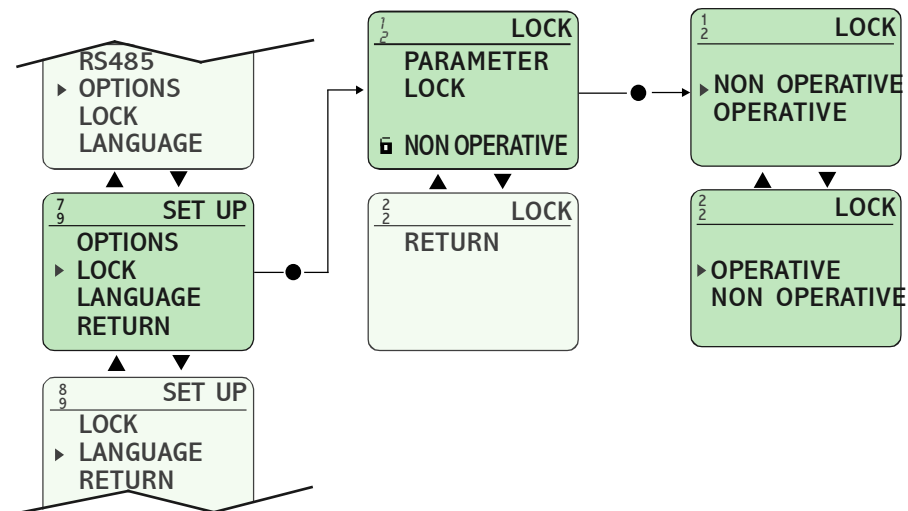
By means of this option is possible to read the highest values registered since the first time that the device was turned on. A value higher than the stored one overwrites it. The controlled magnitude is the rotation speed.

The stored values do not depend of the device's operation margins and they can be higher than them. If a value overtakes the displaying capacity of the controller, it will show the text 99.99.



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

PARAMETERS LOCK



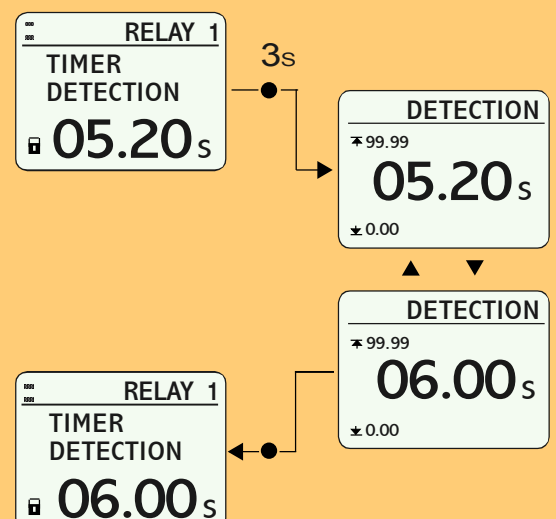
All device parameters can be locked so that it can not be changed accidentally.

The LCD status parameters indicated by the following symbols:

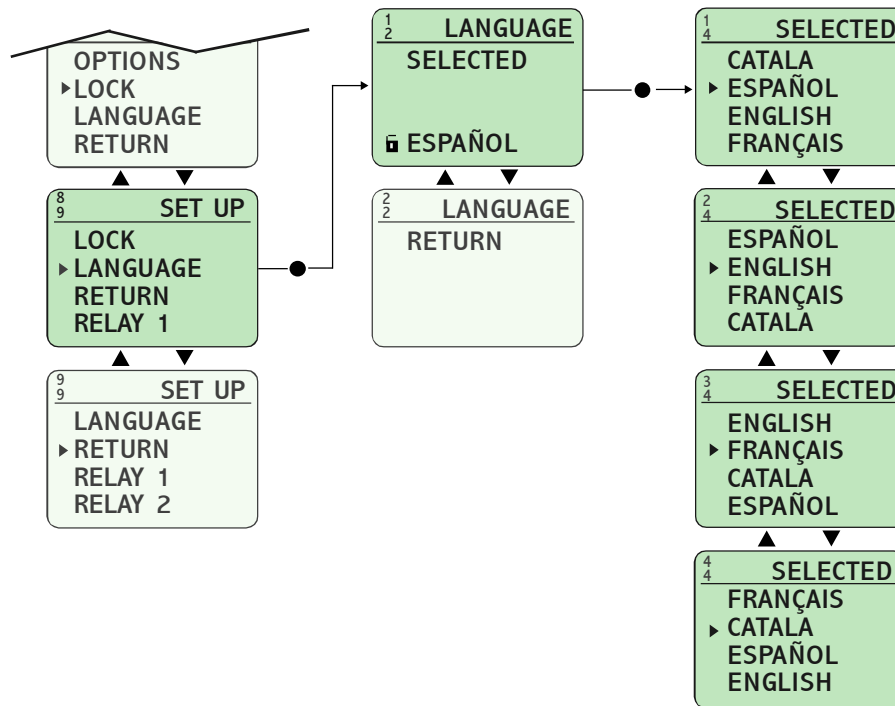
- Parameters locked:
- Parameters unlocked:



You can change the value of a parameter that is blocked without having to access the above sequence. To do this, once located on the screen that shows the parameter whose value has to change, hold the button for 3 seconds to access the screen for changing the value. Once validated the change back to the screen from becoming blocked again parameter.



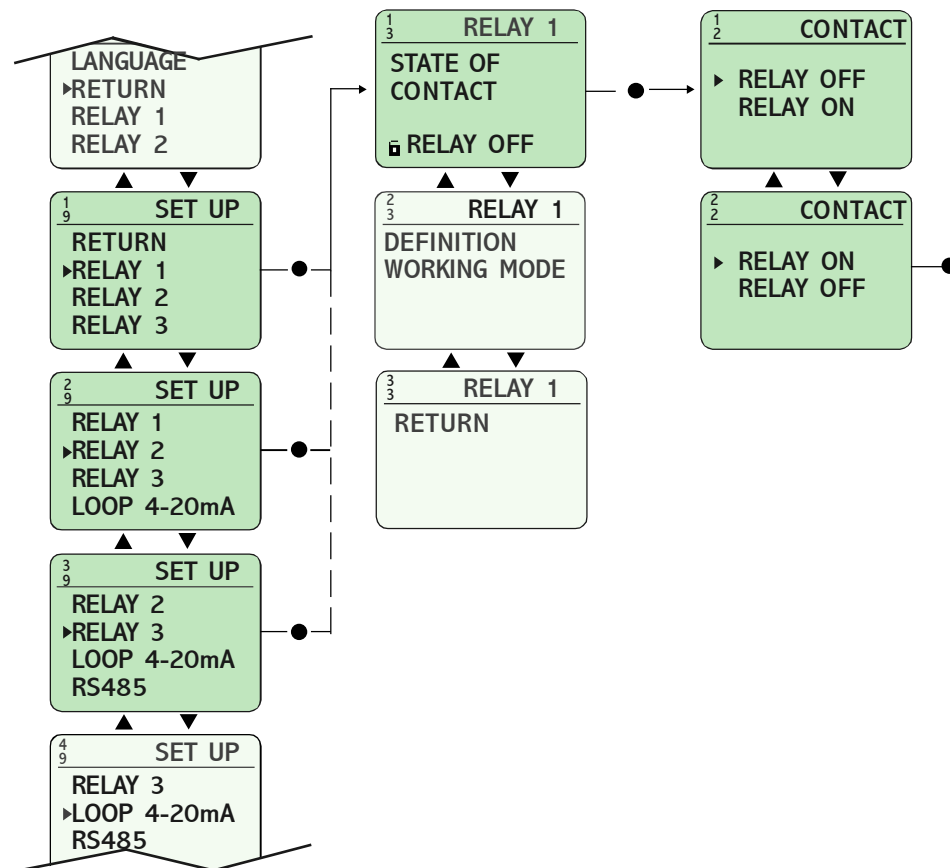
LANGUAGE



The SHA model incorporates four different languages with which to display the text on the screen. Three of them are always present in every team: English, Spanish and French, the fourth option on request.



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



Previous conditions

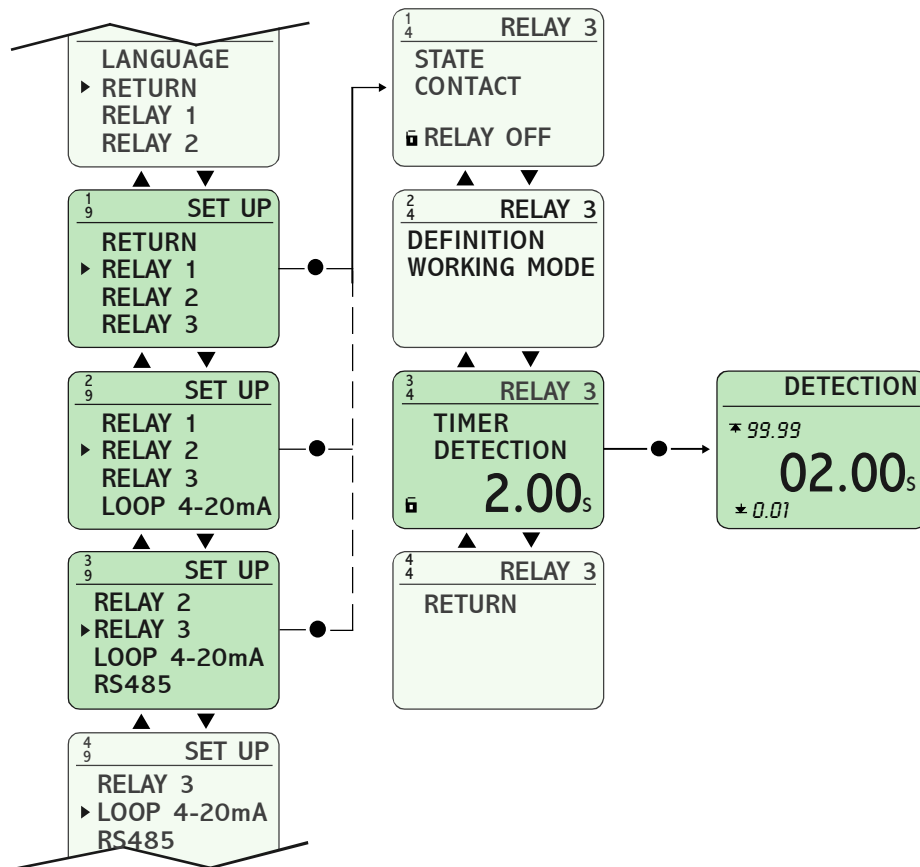
STATE OF CONTACT = [RELAY ON]
 ROT. SPEED MAXIMUM = [NON OPERATIVE]
 ROT. SPEED MINIMUM = [NON OPERATIVE]
 MODE DETECTION = [CANCELED]
 MODE RELEASE = [CANCELED]



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)

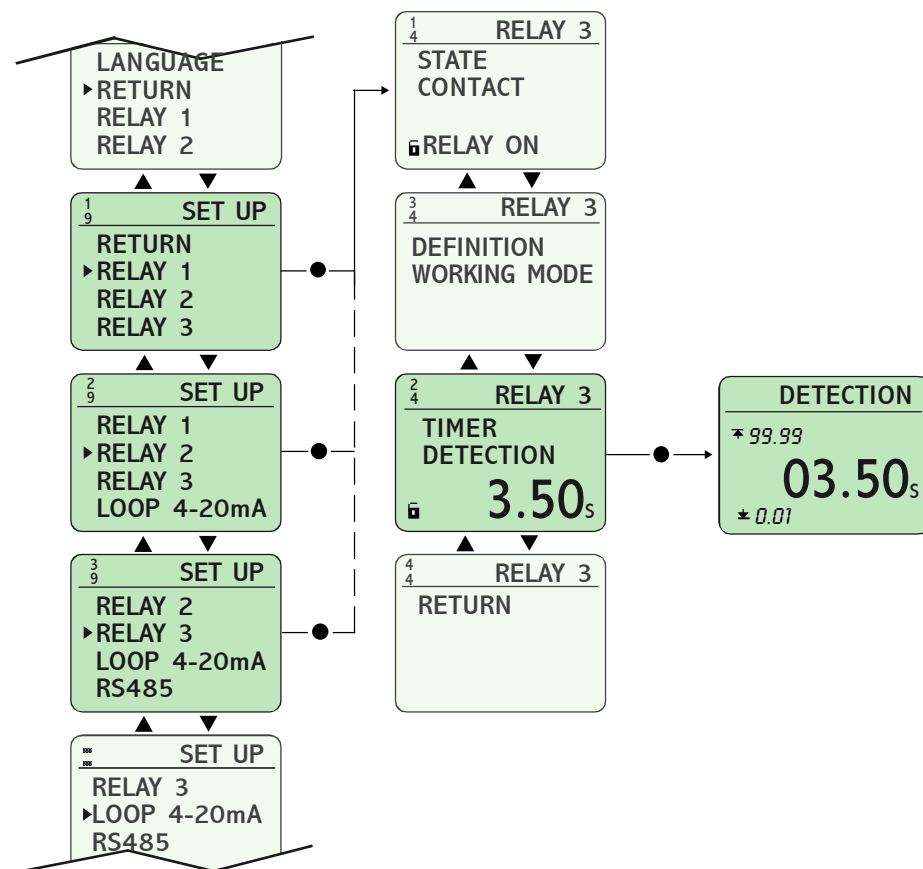
DELAY ON CONNECTION

**Previous condition**

STATE CONTACT = [RELAY OFF]
 ROT. SPEED MAXIMUM = [NON OPERATIVE]
 ROT. SPEED MINIMUM = [NON OPERATIVE]
 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.



Previous conditions

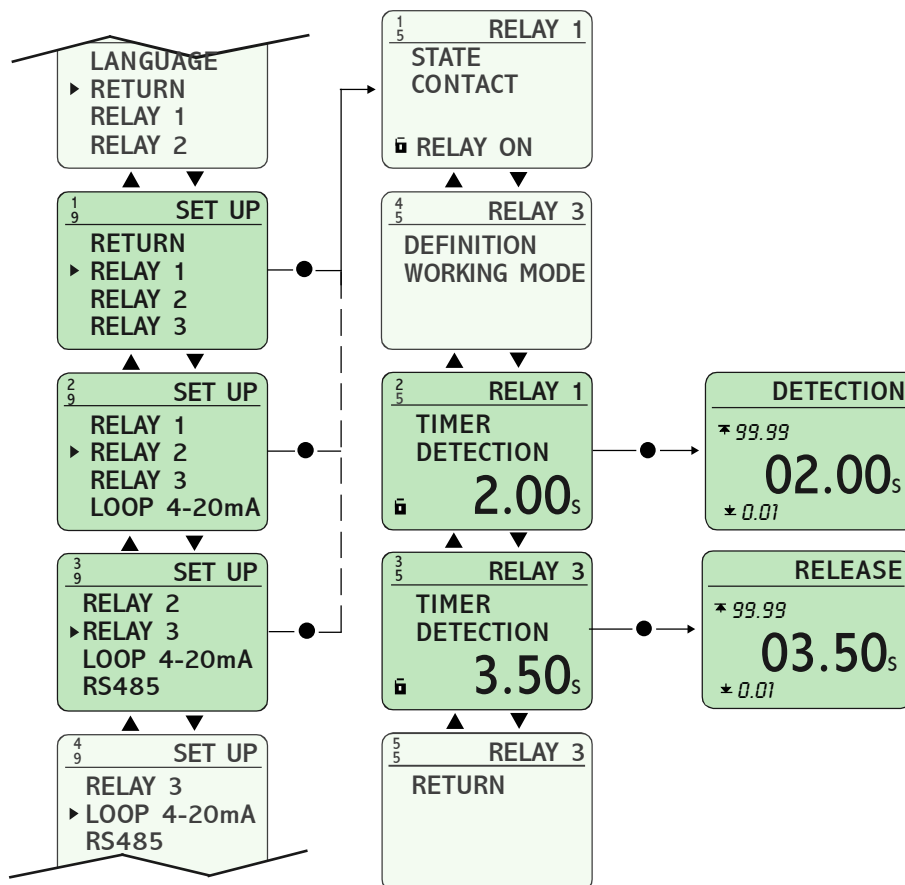
STATE CONTACT = [RELAY ON]
 VOLTAGE MAXIMUM = [NON OPERATIVE]
 VOLTAGE MINIMUM = [NON OPERATIVE]
 MODE DETECTION = [DELAYED]
 MODE RELEASE = [CANCELED]



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 previous pages, 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 repeats non-stop itself.

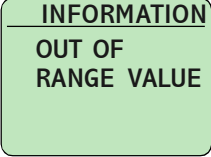
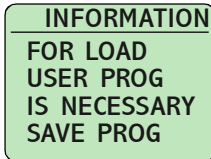
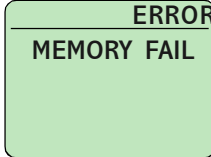
Cycle ON-OFF

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 repeats non-stop itself.

ERROR SCREENS AND INFORMATION

Under certain situations, the instrument displays informative screens, usually related to mistakes or inappropriate 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 has 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.

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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