Y39W

DIGITAL ELECTRONIC CONTROLLER FOR WINE CELLARS AND SPECIAL SINGLE/DUAL LOOP APPLICATIONS

OPERATING INSTRUCTIONS

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PREFACE

This manual contains the information necessary for the product to be installed correctly and also instructions for its maintenance and use; we therefore recommend that the utmost attention is paid to the following instructions and to save it.

Whenever a failure or a malfunction of the device may cause dangerous situations for persons, thing or animals, please remember that the plant has to be equipped with additional electromechanical devices which will guarantee safety.

1 INSTRUMENT DESCRIPTION

1.1 General Description

Y39W is a digital controller with microprocessor instrument that is typically used for general purpose **Single/dual loop** temperature control applications, but studied in particular to manage: refrigeration units, display cases etc. typically intended for the storage and distribution of wines and/or drinks in domestic or commercial uses.

The instrument is equipped with **ON/OFF temperature control**, **defrost control** at intervals time by stopping compressor and provides up to **3 relay outputs**, up to **3 inputs for NTC** temperature probes and **a digital input** (alternative to a temperature input), in addition can be equipped with an **internal buzzer** that is the sound system for alarms.

The model **Y39SW** has the “S-touch” capacitive sensor keyboard system.

1.2 Front Panel Description

1. [P] **Key:** Used to change the Set Point (press and release) and to program the function parameters (pressed for 5 s). In programming mode is used to enter in parameters edit mode and confirm the values. In programming mode it can be used together with the [▲] key to change the programming level of the parameters. When the keyboard is locked it can be used together with the [▲] (hold pressed for 5 s) key to unlock the keyboard.
2. [▼] **Key:** In programming mode is used for decreasing the values to be set and for selecting the parameters. Hold pressed for 1 s, while in normal mode, it can also be programmed via parameter *t.Fb* to carry out other functions such as activating the **Aux** output, a manual defrost cycle, etc. (see functions of keys [U], [▲] and [▼]).
3. [▲] **Key:** In programming mode is used to increase the value to be set and to select the parameters. In programming mode can be used, togetherwith key [P] to change parameters level. Pressed together with [P] key for 5 s allows the keyboard unlock. Hold pressed for 1 s, while in normal mode, it can also be programmed via parameter *t.FA* to carry out other functions such as activating the **Aux** output, a manual defrost cycle, etc. (see functions of keys [U], [▲] and [▼]).
4. [U]/⏻ **Key:** Press and release the key to display the instrument variables (measured temperatures etc.). In programming mode press the key for 2 s to return in normal mode. Hold pressed for 1 s, while in normal mode, it can also be programmed via parameter *t.uF* to carry out other functions such as turn ON and OFF (stand-by) the device, activate the **Aux** output, a manual defrost cycle, etc. (see functions of keys [U] and [▼]).
5. **LED SET:** During the normal operating mede, signals that a ket is pressed. In programming mode indicates the programming level of the parameters.
6. **LED ☼ - COOL:** Indicates the output(s) status (compressor or temperature control device) when the istrument is programmed for cooling operation: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**). If both loops are programmed to perform a cooling action, this LED signals that at least 1 output is active (OR condition). And more with both loops programmed for cooling action but with parameter *t.Ld* = **2**, this LED shows the **r1** controller status, while the status of controller **r2** is shown by **Aux** LED.
7. **LED ☀ - HEAT:** Indicates the output(s) status (compressor or temperature control device) when the istrument is programmed for heating operation: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**). f both loops are programmed to perform a heating action, this LED signals that at least 1 output is active (OR condition). And more with both loops programmed for heating action but with parameter *t.Ld* = **2**, this LED shows the **r1** controller status, while the status of controller **r2** is shown by **Aux** LED.
8. **LED ❄:** Indicates: Defrost in progress (**ON**) or drainage time in progress (**flashing**).
9. **LED 🌀:** hows the **Fan** output status: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**). If several outputs are programmed for fans operation, this LED signals that at least 1 output is active (OR condition).
10. **LED ⚠:** Shows the Alarm status (**ON**), OFF (**OFF**) and Acknowledged or Lached (**flashing**)
11. **LED Aux:** Shows the Auxiliary output status: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**). If parameter *t.Ld* = **2** and both controllers are programmed to perform the same action, this LED can indicate the status of controller **r2**.
12. **LED Stand-By:** When the instrument is in Stand-by mode is the only lit LED.

2 PROGRAMMING

2.1 Fast Set Point Programming

waypressing t [P] key, however, using the *t.Ed* parameter, it is possible to establish whether and which Set Points can be set with the fast procedure of the [P] key.

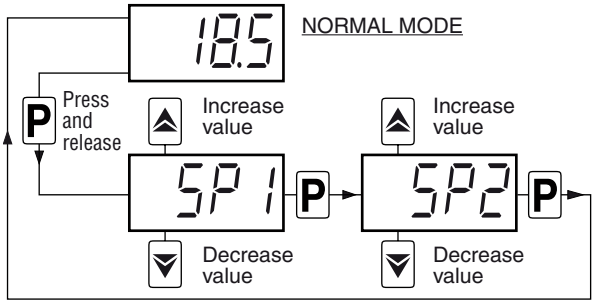
t.Ed parameter can take a value between **0** and **3**:

oF No Set Point can be set with the [P] key fast procedure (the [P] key pressed and released has no effect);

1 Only SP1 can be set;

2 Only SP2 can be set;

3 Both SP1 and SP2 can be set.



For example, if parameter *t.Ed* = **1** or **3**, the procedure is:

Press and release the [P] key, the display will show the label *SP 1* alternated to its value.

To change it press the [▲] key to increase the value or [▼] to decrease it. These keys increase or decrease the value one digit at a time, but if the button is pressed for more than one second the value increases or decreases rapidly and, after two seconds, the speed increases even more in order to quickly reach the desired value.

If only **SP1** (*t.Ed* = **1**) can be modified, once its desired value has been set, pressing the [P] key exits the fast setting mode.

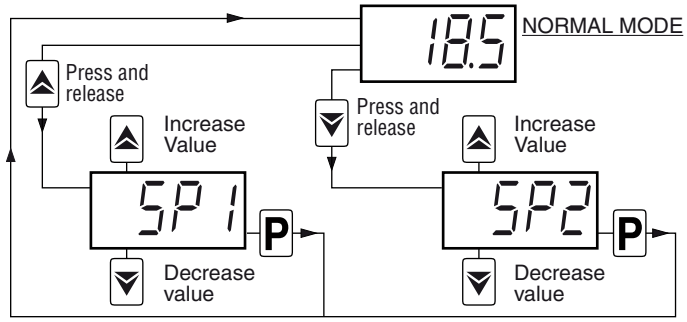
If, instead, also **SP2** (*t.Ed* = **3**) can be set, pressing the [P] key again, the display will show *SP2* alternated to its value.

To change it press the [▲]/[▼] keys as has been done for SP1.

When all the desired values are set, press the key [P] or wait for about 15 s pressing no keys to exit the Fast Set Point Programming mode, after that time the display returns to the normal operating mode.

A different way to access the individual fast Set Points chenge can be achieved by appropriately programming the respective parameters *t.FA* and *t.Fb*. When these parameters are correctly programmed, each Set Point can be recalled for changes pressing and releasing the the by pressing and quickly releasing the [▲] and [▼] keys.

In this case, after changing a Set Point with this modality, the procedure is always exited pressing the [P] key or, automatically, pressing no keys for about 15 s, after which the display returns to the normal operating mode.



Ex. 1: Programming LFA = **4** and LFb = **5**, pressing and releasing the ▲ key the instrument enters the fast **SP1** change mode, while pressing and releasing the ▼ key the instrument enters the fast **SP2** change mode.

Ex. 2: Programming LFA = **4** and LFb = **4**, pressing and releasing the ▲ or the ▼ key the instrument enters the fast **SP1** change mode (the access to the direct Set Point changes is achieved with the same keys that allow changes). In these case the fast Set Point Change mode with the P key can be disabled setting LEd = **0**.

2.2 Standard Mode Parameters Programming

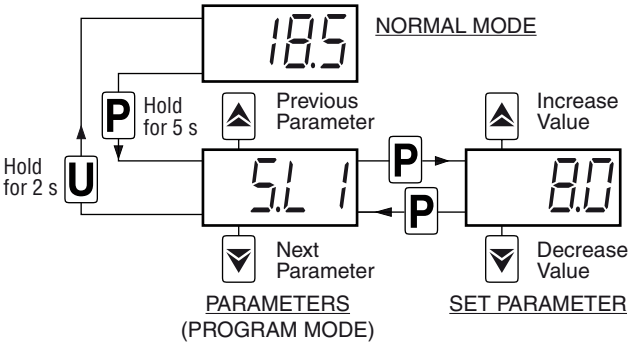
To access the instrument function parameters when password protection is disabled, press the P key and keep it pressed for about 5 s, after which the display shows the code that identifies the first programmable parameter.

Scroll the parameters using the ▲/▼ keys, then, press the P key to enter the parameters change mode, at this point the display shows the parameter code alternated to its value; the parameter value can now be modified with the ▲ and ▼ keys.

Once the desired value has been set, press the P key again: the new value is stored and the display shows only the code of the selected parameter.

Pressing the ▲ and ▼ keys, it is possible to select another parameter and change it as described.

To exit the programming mode, press no keys for about 30 s, or keep the U key pressed for 2 s until the controller returns in normal operating mode.



2.3 Parameter Protection Using a Password

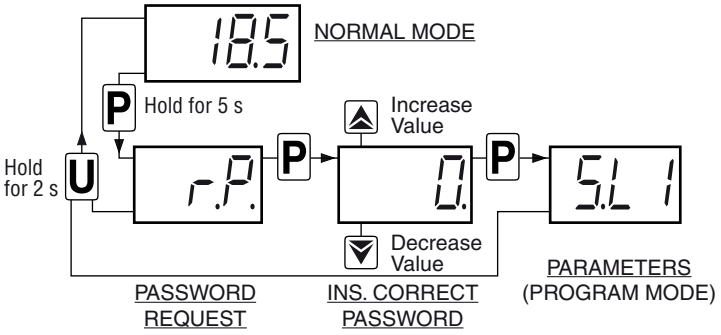
The instrument has a parameter protection function with password that can be customized using the LPP parameter.

To protect the parameters, set the desired Password Number in parameter LPP.

When the protection is active, keep the P key pressed for about 5 s to access the parameters, the display shows rP. Press again the P key, the display changes to 0, now, using the ▲/▼ keys, insert the programmed password number and press the key P again.

If the password is correct the instrument displays the code of the first parameter and it will be possible to program the instrument in the same way described in the previous paragraph.

The password protection can be disabled by setting LPP = **oF**.

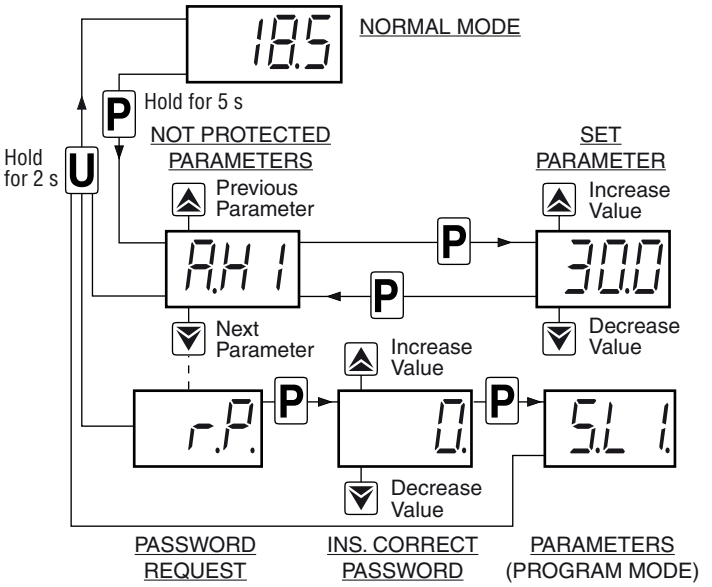


Notes: **1.** All parameters are configured by default as "*protected*" so that by simply setting the LPP parameter they all are password protected.

2. If the Password gets lost, just switch OFF and ON the instrument power supply, push P key during the initial test and keep it pressed for 5 seconds. In this way is possible to have access to ALL the parameters, verify and modify the parameter LPP.

2.4 Customized Mode Parameters Programming (parameters programming level)

By default, when the password protection is activated, it acts on all parameters hiding them to avoid unwanted changes being made to the controller setting.



To make some parameters accessible without having to enter the password while the LPP protection is active, use the procedure that follows:

– Enter the Program mode using the LPP Password and select the parameter that must always be accessible (no password protection).

– Once the parameter has been selected, a blinking **SET** LED means that the parameter can be programmed only entering the password (*protected*), if the LED is steady ON the parameter is programmable without password (*not protected*).

– To change the parameter visibility, press the P key and keeping it pressed also press the ▲ key. The **SET** LED changes its state indicating the new access level of the parameter (**on** = not protected; **blinking** = protected by password).
In case some parameters are "*not protected*", accessing the the programming mode the display first shows the not protected parameters, then the rP parameter (through which will be possible to access the "*protected*" parameters).

2.5 Reset Parameters to Default Value

The instrument allows the reset of the parameters to those values programmed in factory as default.

To restore the default parameters value, set the value **-48** at rP password request.

Therefore, to make the reset to the default parameters, enable the Password using the EPP parameter so that the rP setting is requested, at this point insert **-48** instead of the programmed access password.

Once confirmed the password with the (P) key, the display shows "- - -" for 2 s after which the instrument resets all the parameters to the factory default setting.

2.6 Keyboard Lock Function

On the instrument it is possible to completely lock the keyboard. This function is useful when the controller is installed in an accessible area and changes must be avoided.

To activate the keyboard lock it is enough program the parameter ELo to a value different than **oF**.

The ELo value is the keys inactivity time after which the instrument automatically locks the keyboard. Therefore, pressing no buttons for the time set at ELo, the normal functions of the keys are automatically disabled.

When the keyboard is locked, if any of the key is pressed, the display shows Ln to indicate that the lock is active.

To unlock the keyboard it is enough to contemporarily press (P) + (▲) keys and keep them pressed for 5 s, after which the label LF appears on the display and all the key functions will be available again.

3 USAGE WARNINGS

3.1 Admitted Usage

⚠ The instrument has been projected and manufactured as a measuring and control device to be used according to EN60730-1 at altitudes operation below 2000 m.

The use of the instrument for applications not expressly permitted by the above mentioned rule must adopt all the necessary protective measures.

The instrument **MUST NOT BE USED** in dangerous (flammable or explosive) environments without adequate protections.

The instrument used with NTC 103AT11 probe (identifiable by the printed code "103AT-11" visible on the sensor part) is compliant with standard EN 13485 ("Thermometers for measuring the air and product temperature for the transport,storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream") with the following classification:

[EN13485 air, S, A, 2,- 50°C +90°C]

Remember that the end user must periodically check and verify the thermometers in compliance with standard EN 13486.

The installer must ensure that EMC rules are respected, also after instrument installation, if necessary using proper filters.

4 INSTALLATION WARNINGS

4.1 Mechanical Mounting

The instrument, in case 78 x 35 mm, is designed for flush-in panel mounting. Make a hole 71 x 29 mm and insert the instrument, fixing it with the provided special brackets.

In order to obtain the declared front protection degree, use the screw type bracket (optional).

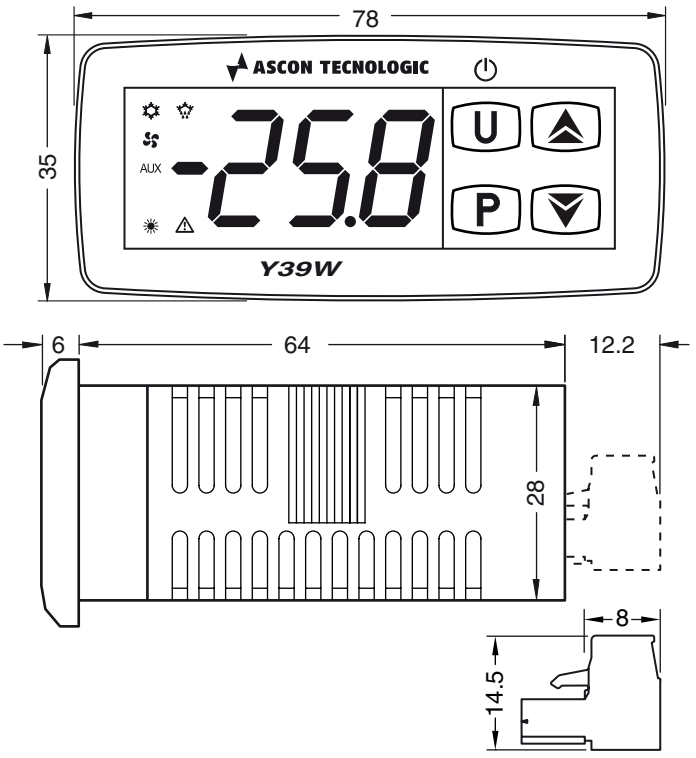
Avoid placing the instrument in environments with very high humidity levels or dirt that may create condensation or introduction of conductive substances into the instrument.

Ensure adequate ventilation to the instrument and avoid installation in containers that house devices which may overheat or which may cause the instrument to function at a higher temperature than the one permitted and declared.

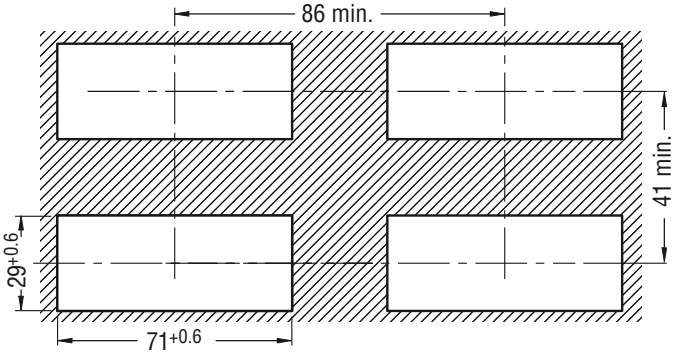
Connect the instrument as far away as possible from sources of electromagnetic disturbances such as motors, power relays, relays, solenoid valves, etc..

4.2 Dimensions [mm]

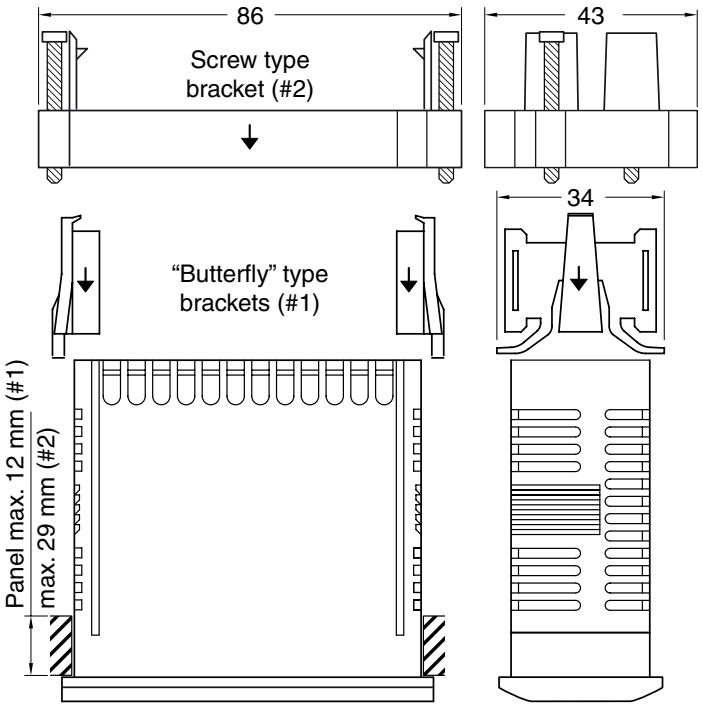
4.2.1 Mechanical Dimensions



4.2.2 Panel Cut-Out



4.2.3 Mounting



4.3 Electrical Connections

Carry out the electrical wiring by connecting only one wire to each terminal, according to the following diagram, checking that the power supply is the same as that indicated ON the instrument and that the load current absorption is no higher than the maximum electricity current permitted.

As the instrument is built-in equipment with permanent connection inside housing, it is not equipped with either switches or internal devices to protect against overload of current: the installation will include an overload protection and a two-phase circuit-breaker, placed as near as possible to the instrument, and located in a position that can easily be reached by the user and **marked as instrument disconnecting device** which interrupts the power supply to the equipment.

It is also recommended that the supply of all the electrical circuits connected to the instrument must be properly protected, using devices (ex. fuses) proportionate to the circulating currents.

It is strongly recommended that cables with proper insulation, according to the working voltages and temperatures are to be used.

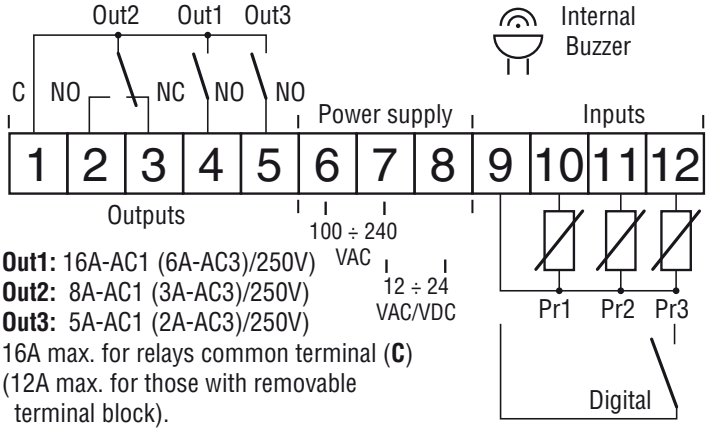
Furthermore, the probe input cable must be kept separate from line voltage wiring.

When a probe shielded cable is used, the protection shield should be connected to ground at only one side.

Whether the instrument is a 12/24 V version (Power supply code F/G) it is recommended to use an external TCTR transformer, or with equivalent features (class II insulation) and to use only one transformer for each instrument because there is no insulation between supply and input.

⚠ We recommend that a check should be made that the parameters are those desired and that the application functions correctly **before connecting the outputs** to the actuators so as to avoid malfunctioning that may cause irregularities in the plant that could cause damage to people, things or animals.

4.3.1 Electrical Wiring Diagram



Out1: 16A-AC1 (6A-AC3)/250V)
Out2: 8A-AC1 (3A-AC3)/250V)
Out3: 5A-AC1 (2A-AC3)/250V)
16A max. for relays common terminal (**C**)
(12A max. for those with removable terminal block).

5 FUNCTIONS

5.1 ON/Stand-by Function

Once powered the instrument can assume 2 different conditions:

ON: The controller uses the control functions.

STAND-BY: The controller uses no control function and the display is turned OFF except for the Stand-by LED.

The transition between Standby and ON status is equivalent to power ON the instrument providing the electrical power.

In case of power failure, the system always sets itself in the condition it was in before the black-out.

The ON/Stand-by function can be selected:

– Pressing the key U/⏻ for at least 1 s if Ł.UF = **3**;

– Pressing the key ▲ for at least 1 s if Ł.FA = **3**;

– Pressing the key ▼ for at least 1 s if Ł.Fb = **3**;

– Using the Digital Input if parameter iF1 = **3**.

5.2 Measure and Display configuration

Through parameter uP it is possible to select the temperature engineering unit and the desired measure resolution (C0 = °C/1°; C1 = °C/0.1°; F0 = °F/1°; F1 = °F/0.1°).

The instrument allows the measure calibration, which can be used to re-calibrate the instrument according to application needs, through the parameters iC1 (for input **Pr1**), iC2 (for input **Pr2**) and iC3 (for input **Pr3**).

While **Pr1** probe measure is always the **r1** controller process value, iP2 and iP3 parameters allow to select the **Pr2** and **Pr3** measures usage according to the following possibilities:

r2 Controller 2 probe: the probe can be used as process value for regulator **r2**;

Au Auxiliary probe: the probe can be used as a display-only probe to which temperature alarms can be linked;

dG Digital input (see Digital input functions);

If probe **Pr2** and/or **Pr3** is/are not used, set the relative parameters iP2 and/or iP3 = **oF**.

It is not possible to program the two parameters for the same function, if so, priority goes to iP2.

Using iFt parameter can be set a software filter for measuring the input values in order to decrease the sensibility to fast temperature changes (increasing the sampling time).

Through the id5 parameter is possible to set the variable normally displayed:

P1 Probe **Pr1** measurement;

P2 Probe **Pr2** measurement;

P3 Probe **Pr3** measurement;

S1 Controller **r1** Set Point;

S2 Controller **r2** Set Point;

t2 Probes **Pr1** and **Pr2** measurements;

t3 Probes **Pr1**, **Pr2** and **Pr3** measurements;

oF Numerical display switched OFF.

If one of the alternated variable display options (**1.2** and **1.3**) is selected, using the itd parameter it is possible manage the display time of the variables.

In these modes the instrument shows for about 1 s the code of the variable (P1, P2, P3), then the value of its measurement for the time established with itd, elapsed which it switches to the code of the next variable and so on.

Regardless of what has been set set for id5 parameter, it is possible to ciclically view all the measurement and operating variables by repeatedly pressing and releasing the U key. The display shows the code that identifies the variable alternated to its value.

The variables that can be displayed are:

Pr1 Probe **Pr1** measurement;

Pr2 Probe **Pr2** measurement (on/oF if set as digital input);

Pr3 Probe **Pr3** measurement (on/oF if set as digital input).

The system automatically exits the variable display mode after 15 s from the last U key pressure.

Note: The uP parameter relative to temperature resolution acts only for display and Set Points, while in the temperature parameters the decimal is always visible.

5.3 Digital Input Configuration

As an alternative to one of the measurement inputs **Pr2** or **Pr3**, the user can set the instrument to use it as a digital input for voltage-free contacts.

The digital input function (available ON terminal **11** as an alternative to **Pr2** input if iP2 = **dg** or ON terminal **12** as an alternative to **Pr3** input if iP3 = **dg**) is defined using the iF1 parameter and the action is delayed for the time programmed with parameter it1. The iF1 parameter can be configured for the following functions:

0 No function;

1 External alarm signal via NO contact: closing the digital input (and after the it1 time) the alarm is activated and the instrument alternately shows ON the display the label AL and the variable set at parameter id5.

2 External alarm signal with all control outputs disable via NO contact: closing the digital input (and after the it1 time), all the control output are disabled, the alarm is activated and the instrument alternately shows ON the display the label AL and the variable set at parameter id5.

3 Instrument Switch ON/OFF (ON/Stand-by) of instrument via NO contact: closing the digital input (and after the it1 time) the instrument is switched **ON** while it is placed in **Stand-by** when the digital input is open.

4 Auxiliary (**Aux**) output remote control via NO contact: closing the digital input (and after the it1 time) the auxiliary output is activated as described at auxiliary output oF0 = **3** function mode.

5 Cell door opening with fan stop via NO contact: closing the digital input (and after the it1 time) the fans are stopped and the instrument alternately shows ON the display the label oP and the variable set at parameter id5. With this function mode, the action of the digital input also activates the time that can be set with parameter AoA after which the alarm is activated to point out that the door has been left open and the fan restarts.

6 Cell door opening without fan stop via NO contact: closing the digital input (and after the it1 time) the instrument alternately shows ON the display the label oP and the variable set at parameter id5. With this function mode, the action of the digital input also activates the time that can be set with parameter AoA after which the alarm is activated to point out that the door has been left open.

-1, **-2**, **-3**, **-4**, **-5**, **-6**

These functions are like those just described, but work with a reversed logic as the contact is NC.

When an input is configured as digital, it is possible to check its status using the variable display mode through the U key or by configuring the normal display via id5 for the input configured as digital. The display shows oF if the digital input is open and on if closed.

5.4 Outputs and Buzzer Configuration

The instrument outputs can be configured by the relative parameters o01, o02 and o03. The outputs can be configured for the following functions:

- r1 To control the temperature control device of **loop 1**;
- r2 To control the temperature control device of **loop 2**;
- dF To control the defrost device;
- Fn To manage the recirculation fans;
- Au To control the auxiliary device (see the Auxiliary output functioning);
- At To control a silenceable alarm device through a contact that is normally open and closed when in alarm;
- AL To control an alarm that cannot be silenced through a contact that is normally open and closed when in alarm;
- -t To control a silenceable alarm device through a contact that is normally closed, and then open when in alarm;
- -L To control an alarm that cannot be silenced through a contact that is normally closed and open when in alarm;
- on Output ON when the instrument is in ON state. This mode can be used to control lights, non-misting resistance ON room door or other utilities;
- oF No function (output disabled).

If an outoput is configured as **Aux** (o01, o02, o03 = **Au**), its function is defined by the parameter oFo and conditioned by the time set with parameter otu.

oFo can be configured for the following functions:

oF No function (Auxiliary output not active);

1. Delayed from **r1** control output. The auxiliary output is activated with the otu delay after the activation of the output configured as **r1**. The output is then turned OFF at the same time of the **r1** output. This mode can be used as a command for a second compressor or for all those working utilities operating as the **r1** output, but which must be delayed after the compressor start up to avoid excess electricity absorption.
2. Delayed from **r2** control output. Similar to mode 1 functioning mode but referred to **r2**.
3. Activation by the key (U), (▲) or (▼) or by digital input with contact NO: the output is activated pressing a key (U), (▲), (▼) suitably configured with tUF, tFA or tFb = **1** or via the digital input (iF = **4**). These commands have a toggle (bi-stable) function (the 1st key pressure activates the output while the 2nd disables the output). In this functioning mode, the **Aux** output can be turned OFF automatically after a certain time that can be set with the parameter otu. With otu = **oF** the output is activated and deactivated only manually, using a key ((U), (▲), (▼)) or the digital input. Differently, the output, once activated, is turned OFF automatically after the otu time. This mode of operation can be used to control the shop window lighting, anti-fogging resistors or other utilities.
4. Internal Light output managed by digital input. The output will be ON when door is opened (iF = **5**, **6**).

The internal buzzer (when present) can be configured by parameter obu to carry out the following functions:

oF Buzzer always disabled;

1 The Buzzer sounds when an alarm is active;

2 The Buzzer sounds when a key pressed (does not signal alarms);

3 The Buzzer sounds when a key pressed and when an alarm is active.

5.5 Temperature Controllers

The type of control of both the loops is ON/OFF and acts on the outputs configured as **r1** and **r2** depending on: the probes measure (**Pr1, r2**), the Set Points (**SP**, **SP2**), the differentials (hysteresis) r.d1, r.d2 and the action rFc.

By appropriately configuring the instrument, it is possible to obtain a neutral zone controller, 2 independent controllers in cooling mode, 2 independent controllers in heating mode or two independent controllers: one in cooling mode and the other in heating mode.

Depending on the function mode programmed with parameter rFC the relative differentials r.d1 and r.d2 are automatically considered by the controller with **positive** values for **Cooling** actions (rFC = **C**) or with **negative** values for **Heating** actions (rFC = **H**).

The **r1** controller always has **Pr1** measurement as process value while the **r2** controller can use, as process value, the measurement of **Pr1**, **Pr2** or **Pr3** probes depending on the value programmed at parameters iP2 and iP3.

If one of iP2/ iP3 parameters is configured with a value different than **r2**, the process value of **r2** controller is always the **Pr1** probe measure. If instead iP2 or iP3 is configured = **r2** the probe to which the parameter refers will be considered as process value for the **r2** controller.

When the neutral zone operating mode is selected, the process value considered by the controller is only the **Pr1** probe measurement (even if a probe is configured for **r2** operation).

Similarly, the Set Point value for the neutral zone operating mode is always **SP1** while in all other cases, the **r1** controller always have **SP1** as the Set Point value while the **r2** controller always have **SP2** (remember that **SP2** can still be programmed as relative to **SP1** through the parameter SSc = **2r**).

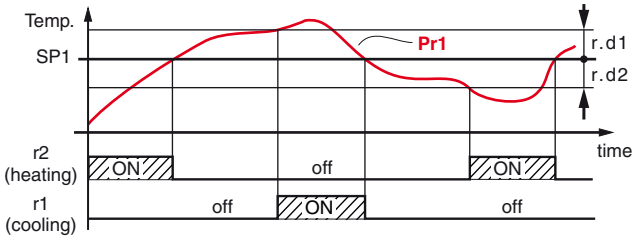
Through parameter rFc it is possible to select the operating mode of the two controllers in the following ways:

rFc value	r1 Controller			r2 Controller		
	Action	SP	Process value	Action	SP	Process value
nr	Cool	SP1	Pr1	Heat	SP1	Pr1
CC	Cool	SP1	Pr1	Cool	SP2 or (SP1 + SP2)	Pr1 or r2 probe
HH	Heat	SP1	Pr1	Heat		
HC	Heat	SP1	Pr1	Cool		
CH	Cool	SP1	Pr1	Heat		

Neutral zone controller (Single Loop) - rFc = nr

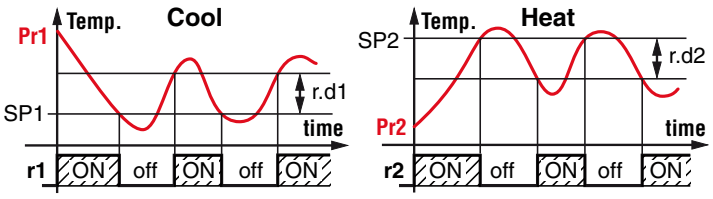
In neutral zone operation (double action ON/OFF control) it is possible to control the temperature of a system equipped with both a cooling element (to be connected to the output configured as **r1**) and a heating element (to be connected to the output configured as **r2**), based on a single Set Point (**SP1**).

The controller behaves as follows: it switches OFF the active output when **Pr1** process value reaches the **SP1** Set Point and activates the **r1** output when the **Pr1** temperature is greater than [**SP1** + r.d1], or it switches on the **r2** output when the process value is less than [**SP1** - r.d2].



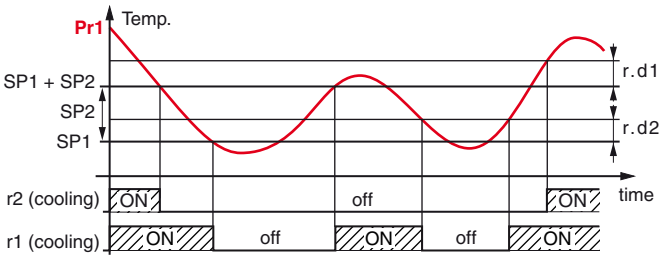
Double controller (Double Loop) - r.Fc = CC, HH, HC, CH

By configuring r.Fc = **CC**, **HH**, **HC**, **CH** and equipping the instrument with 2 temperature probes (**Pr1** probe plus a probe configured as **r2**) is possible to control the temperature in two different environments/zones (dependent or independent between them) in any desired way.



Dual output controller - r.Fc = CC, HH, HC, CH

By configuring r.Fc = **CC**, **HH**, **HC**, **CH** and installing only 1 temperature probe (**Pr1**) is possilble to control the temperature in a single environment through 2 outputs in all the desired modes.



Example: Controller with double output and r.Fc = **CC** operation:

- **r1** output operates in cooling with Process Value **Pr1** and Set Point **SP1**.
- **r2** output operates in cooling with Process Value **Pr1** and Set Point **SP2** relative to **SP1**.

In the event of probe(s) error, it is possible to set the instrument so that the outputs configured as r1 and r12 continue working in cycles according to the ativation times set at parameters r. In (output **r1**), r.2n (output **r2**) and deactivation times r. IF (output **r1**) and r.2F (output **r2**).

When an error to the probe that measures the Process Value for the respective controller occurs, the instrument activates the control output **r1** for the time r. In and keeps the output **r2** OFF for the time r.2F then, after the time r. In has elapesd, deactivates the output **r1** for the time r. IF and after the time r.2F activates the output **r2** for the time r.2n.

Note: The outputs phase-shifted operation in probe(s) error condition allows, programming r. In = r.2F and r. IF = r.2n, to avoid the simultaneous operation of the actions of the two outputs.

Programming r. In and r.2n = **oF** the outputs, in probe(s) error condition, remain switched OFF. Programming instead r. In and r.2n to any value and r. IF r.2F = **oF** the outputs, in probe(s) error condition, remain switched ON.

The controller outputs status is pointed out by the LEDs and, when suitable programmed, also by the **Aux** LED. Even if no outputs are configured for **r1** and **r2** operation, the LEDs still indicate the controllers status.

If both controllers are configured for the same action (r.Fc = **CC**, **HH**) the ☀ or ☼ LEDs indicate the activation of at least one of the two controllers and the deactivation of both.

To view the status of the two controllers separately, is possible program the parameter t.Ld = **2**. In this mode, the ☀/☼ LEDs show the status of the **r1** controller while the **Aux** LED shows the status of controller **r2**.

Remember that the temperature control outputs function can be conditioned by the "*Controllers Outputa delay and delay at power-on*", "*Defrost*", "*Door open*" and "*External alarm with outputs disable*" from digital input functions.

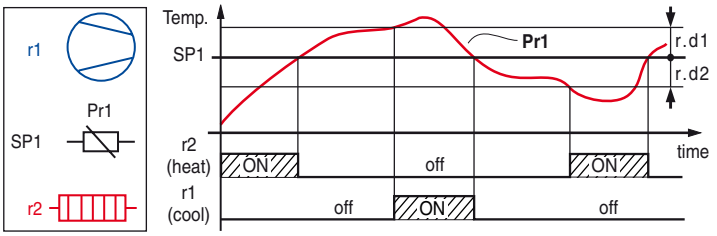
5.6 General description of some instrument typical applications

Mono-temperature cell with neutral zone control (Cooling or Heating)

The system is equipped with a cooling and a heating device which act on a single environment.

According to the temperature to be maintained, the instrument then cools or heats.

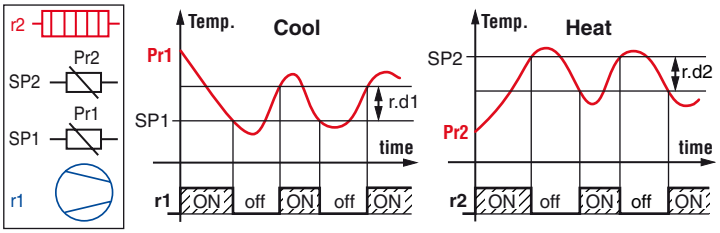
For better heat circulation and to avoid stratification at different temperatures, it is normally recommended to place the cooling element at the top and the heating element at the bottom.



Multi-temperature cell with control of two distinct zones (Cooling and Heating)

The system is equipped with a cooling device and a heating one which operate in two different areas. According to the temperatures to be maintained in the two zones, the instrument cools and/or heats.

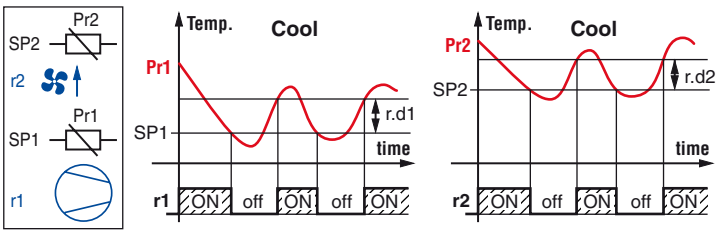
If the two zones are in a single environment, halfway between the them there will be areas with intermediate temperatures. In this specific case, the cooling element is placed at the bottom and the heating one at the top of the room.



Multi-temperature cell with control of two distinct but dependent zones (Cooling and Cooling)

The system is equipped with two cooling devices that operate in two distinct areas.

In the case in example, there is a lower temperature zone on which the cooling actuator acts directly and a higher temperature zone cooled by a fan that draws air from the colder zone.



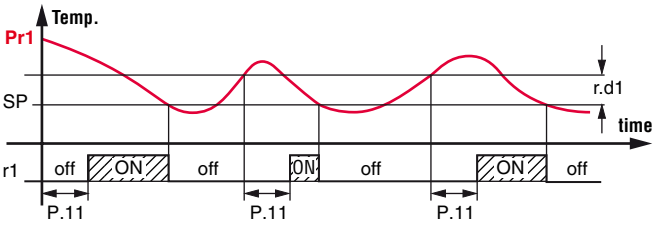
5.7 Compressor Protection Function and Delay at Power-ON

The instrument allows 2 time controls to manage the switching ON of the two control outputs **r1** and **r2** connected to the request of the temperature controller.

The protection consists of preventing the outputs being enabled (switched ON) during the delay times and therefore that any activation occurs only after both the protection times have elapsed.

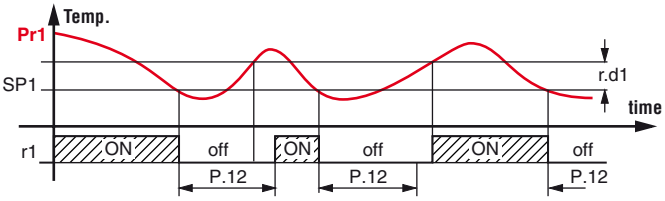
These functions are set to avoid frequent and close starts of the compressor(s) controlled by the instrument in refrigeration applications or in any case they can be used to add a time control on the outputs witch control the actuators.

First control (parameter P.11) foresees a delay to the **r1** output activation while P2.1 delays tha **r2** activation(switch ON delay).



*Example of **r1** output with cooling action.*

The second control provides the **ot** output inhibition if, since the output was deactivated, the times set at parameters P.12 (for **r1** output) and P22 (for **r2** output) have not elapsed (delay after switching-OFF).



During the output inhibition phases the LED **OUT** (Cool ❄, Heat ☀ or **Aux** if foreseen) blinks.

It is also possible to prevent activation of all the outputs after the instrument is turned ON, for the time set at parameter Pod.

During the power ON delay, the display shows the label od alternated with the normal visualization.

All these functions are disabled if the relative parameters are set to **OFF** (oF).

5.8 Defrost Control

The defrost control acts on the outputs configured as **r1** and **r2**, if configured for cooling actions, on the output configured as df and on the outputs configured for Fans if connected to a controller set for cooling action.

The type of defrost that the instrument must carry out is set with parameter ddt that can be programmed as:

- EL **Not ventilated**, with **electrical heating** or by **stopping compressor**: During defrost outputs **r1** and **r2** - configured for cooling operation - are deactivated, **df** output and **Fn** output are activated. Not using the **dF** output results in a compressor stop defrost with fans not active;
- Fn **Ventilated**, with **electrical heating** or by **stopping compressor**: During defrost outputs **r1** and **r2** - configured for cooling operation - are deactivated, **df** output is activated while **Fn** output is deactivated. Not using the **dF** output results in a compressor stop defrost with fans active;
- no **Without compressor or fans output conditioning**: during defrost, the control outputs **ot** and the Fanscontinue operating while **df** output is enabled.

5.8.1 Automatic Defrosts Start

The automatic control of defrost occours by:

– Interval times;

– For continuous compressor operating time.

Interval time automatic defrosts

The automatic defrost is therefore obtained by setting, with dd1 parameter, the time that must elapse between the end of a defrost and the beginning of the next one.

Setting dd1 = **oF** the automatoc defrosts are disabled.

Automatic defrosts by continuous compressor operating tme

The instrument starts a defrost cycle when the compressor is activated continuously for the dCd time.

This function is used because the continuous operation of the compressor for a long period is normally a symptom of a low heat exchange typically caused by ice on the evaporator.

By setting dCd = **oF** the function is disabled.

5.8.2 Manual Defrost

To start up a manual defrosting cycle, press the key U/▲ or ▼ when configured with parameters t.UF, t.FA and t.Fb = **2**. When in normal mode, press the key programmed for the manual defrost start and keep it pressed for about 5 s after which, if the conditions are correct, the LED ❄ lights up and the instrument carries out a defrosting cycle.

To stop a defrosting cycle, press the key ▲ during a defrost cycle and keep it pressed for about 5 s.

5.8.3 Defrosts End

The duration of the defrost cycle is established by parameter ddE. By setting ddE = **oF** both automatic and manual defrosts are disabled.

The defrost cycle in progress is signaled by the lighted ❄ LED.

5.9 Fans Control

The output configured as **Fn** can be used to control recirculation fans inside the environment in which the temperature is controlled.

Through the rFF parameter it is possible to obtain the following output operations:

- **0** Fans not connected to controllers. The output is always activated regardless of the state of the controllers. During defrosts the output behaves as established by parameter ddt (if = **EL** the output is deactivated; if = **Fn**/**no** the output remains activate).
- **1** Fans connected to **r1** controller. The output is activated when the controller output **r1** is activated, while it is deactivated when the output **r1** is not. During defrosts the output behaves as established by parameter ddt (if = **EL** the output is deactivated; if = **Fn**/**no** the output is activated).
- **2** Fans connected to **r2** controller. The output is activated when the controller output **r2** is activated, while it is deactivated when the output **r2** is not. During defrosts the output behaves as established by parameter ddt (if = **EL** the output is deactivated; if = **Fn**/**no** the output is activated).
- **3** Fans connected to both controllers. The output is activated when at least one of the control outputs is active while it is deactivated when both outputs are disabled. During

defrosts the output behaves as established by parameter *ddt* (if = **EL** the output is deactivated; if = **Fn**/**no** the output is activated).

The status of the fan output is signalled by LED. If no output is configured for **Fn** operation, the LED is always off. The fan output can be inhibited via the digital input configured as a door sensor (*iF1* = **5**).

5.10 Alarm Functions

The alarm conditions of the instrument are:

– Probe errors: *E1*, *-E1*, *E2*, *-E2*, *E3*, *-E3*;

– Temperature alarms: *H1*, *Lo1*, *H2* and *Lo2*;

– External alarm: *AL* ;

– Open door alarm: *oP*.

The instrument alarm functions act on the alarm LED ⚠, on internal buzzer (if present and programmed by parameter *oBu*) and on the desired output, if configured with parameters *o1*, *o2* or *o3* according to the parameters set.

All alarm conditions are pointed out lighting up the ⚠ LED, while the silenced or stored alarms are shown with ⚠ LED flashing.

The buzzer when present, can be configured to point out the alarms with parameter *oBu* = **1** or **3**, is activated in alarm condition and can be manually disabled pressing any instrument key (alarm silencing).

The possible selections of output parameters for the alarm signalling function are:

At The output is activated in alarm condition and can be manually deactivated by pressing any key of the instrument (typical application for an acoustic signal);

AL The output is activated in alarm condition but cannot be manually disabled; the alarm status ends when the alarm condition ceases (typical application for a light signal);

-t Function similar to *At* but with inverse logic function (output active in normal conditions, disabled in alarm).

-L Function similar to *AL* but with inverse logic function (output active in normal conditions, disabled in alarm).

5.10.1 Temperature Alarms

The instrument has two temperature alarms, each with a maximum and minimum threshold, fully configurable.

The temperature alarms work according to **pr1**, **pr2** or **Aux** probes measurements, the type of alarm set at parameters *AY1* and *AY2* the alarm thresholds at parameters *AH1* and *AH2*(maximum alarms), *ALH1* and *ALL2* (minimum alarms) and the relative differentials *HA1* and *HA2*.

Through parameters *AY1*/*AY2* it is possible to set if alarm thresholds *AH1*/*AH2*/*AL1*/*AL2* are to be considered as Absolute or Relative to which Set Point and if the reference temperatures must be related the pobe set as **Pr1** or to the probe set as *r2* or **Au** probe.

The possible selections of parameters *AY2* and *AY2* are:

1 Absolute Alarms referred to **Pr1** probe;

2 Alarms Relative to **SP1** referred to **pr1** probe;

3 Absolute Alarms referred to **r2** probe;

4 Alarms Relative to **SP2** referred to **r2** probe;

5 Absolute Alarms referred to **Au** probe.

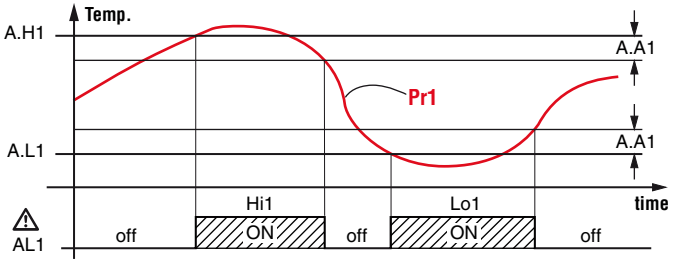
Using some parameters it is also possible to delay the enabling and the intervention of these alarms.

These parameters are:

APA Temperature alarms intervention delay **at instrument power ON** when the instrument is in alarm status at power ON. If the instrument is not in alarm status at power ON, *APA* is not considered.

AdA Temperature alarms exclusion time at the end of defrost cycle (and, if programmed, after the draining) or after a continuous cycle.

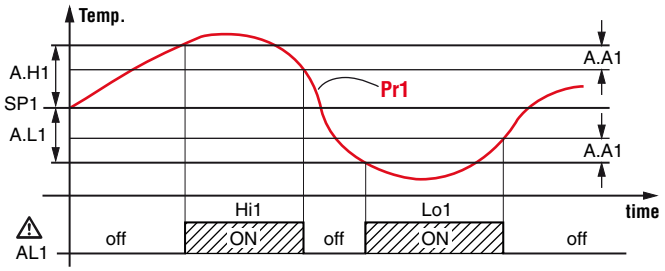
At❑ Temperature alarms 1 and 2 delay activation time. Temperature alarms are enabled at the end of the exclusion times and are activated after *At1*, *At2* times when the temperature measured by the probe(s) exceeds or goes below the respective maximum and minimum alarm thresholds. The alarm thresholds are those set at parameters *AH1*/*AH2*/*AL1*/*AL2* when the alarms are set as absolute (*AY1* and *AY2* = **1**, **3**, **5**);



*Example of absolute alarms H1 and **L1** referred to **Pr1**.*

Or they will be the values given by the sum of the reference Set Point and the alarm thresholds if the alarms are relative (*AY1*, *AY2* = **2**, 4).

For example if *AY1* = **2** the intervention thresholds will be [**SP1** + *AH1*] and [**SP1** + *AL1*] and if *AY2* = **4** the intervention thresholds will be [**SP2** + *AH2*] and [**SP2** + *AL2*].



*Example of relative alarms H1 and **L1** referred to **Pr1**.*

Note: In the case **Sp2** Set Point is set as relative to **SP1** (*SSc* = **2r**) and an alarm is set relative to **SP2** (eg. *AY2* = **4**) the effective intervention thresholds will be [**SP1** + **SP2** + *AH2*] and [**SP1** + **SP2** + *AL2*].

The maximum and minimum temperature alarms can be disabled setting *AH1*/*AH2*/*AL1*/*AL2* = **oF**.

The intervention of temperature alarms causes: the lighting up of the ⚠ LED to signal the alarm, the activation of the outputs configured with an alarm function and if configured, the internal buzzer activation.

5.10.2 External Alarm from Digital Input

The instrument can notify an alarm external to the instrument when the digital input configured *iF1* = **1** or **2** is activated.

Simultaneously to the configured alarm signal (buzzer and/or output), the instrument points out the external alarm lighting up the ⚠ LED and displaying the label *AL* alternated to the variable set at parameter *id5*.

iF1= **1** mode produces no action on the control outputs while with *iF1* = **2** the control outputs are disabled at digital input intervention.

5.10.3 Open Door Alarm

The instrument can notify an **Open door alarm** activated by the digital input with the function programmed as i1F = **5** or **6**.

When the digital input is activated, the instrument shows on the display the label dP alternated to the variable set at parameter idS then, after the delay programmed at parameter AoA, the instrument signals the alarm via the activation of the configured alarm output (buzzer/ouput), lighting up the ⚠ LED while continues displaying the label dP.

If i1F = **5** at open door alarm intervention the fans are reactivated.

5.11 Function of Keys (U), (▲) and (▼)

Three of the instrument keys, in addition to their normal functions, can be configured to operate other commands.

The (U) key function can be defined by parameter tuF, the (▲) key function through parameter tFA and the (▼) key function through parameter tFb. All parameters can be configured to perform the following functions:

oF The key carries out no function;

1 Pressing the key for at least 1 s it is possible to enable/ disable the auxiliary output if configured as oAo = **3**;

2 Pressing the key for at least 5 s it is possible to enable/ disable a defrost cycle;

3 Pressing the key for at least 1 s it is possible to switch the instrument from the ON status to Stand-by status and vice versa;

4 Pressing the key for at least 1 s it is possible access the **SP1** fast Set Point set up;

5 Pressing the key for at least 1 s it is possible access the **SP2** fast Set Point set up.

6 ACCESSORIES

The instrument is equipped with a TTL port with a 5 poles connector that allows to connect some accessories.

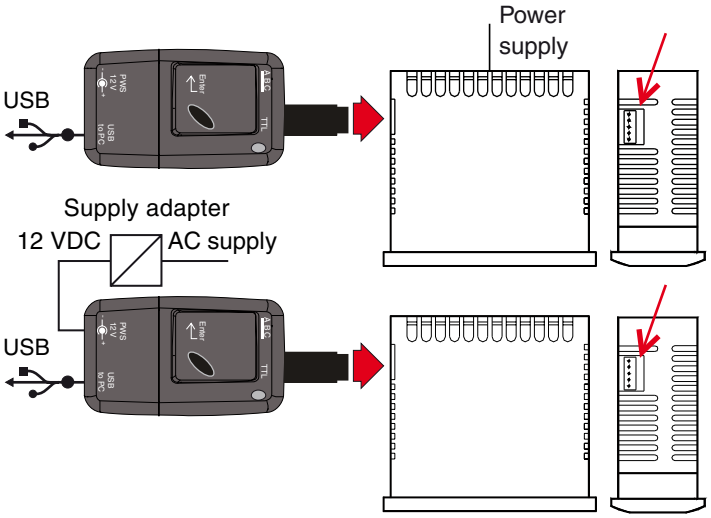
6.1 Parameters Configuration by A01

Through the TTL port the instrument allows the transfer of the functioning parameters to/from the device **A01**.

This device it is mainly usable for serial programming those instruments that need the same parameters configuration or to keep a copy of the parameters setting of an instrument and allow its fast duplication.

The same device allows to connect a PC via USB with which, through the appropriate configuration software for "*AT UniversalConf tools*", the operating parameters can be configured.

To use the **A01** device it is necessary that the device or instrument are being correctly supplied.



For additional info, please look at the A01 instruction manual.

7 PROGRAMMABLE PARAMETERS TABLE

Here below is a description of all the parameters available on the instrument. Some of them may not be present because depend on the model/type of instrument.

Parameter		Description	Range	Default	Note
1	SL 1	Min. value for Set Point 1 (**SP1**)	-99.9 ÷ S.H1	-50.0	
2	SH 1	Max. value for Set Point 1 (**SP1**)	S.L1 ÷ 999	99.9	
3	SL2	Min. value for Set Point 2 (**SP2**)	-99.9 ÷ S.H2	-50.0	
4	SH2	Max. value for Set Point 2 (**SP2**)	S.L2 ÷ 999	99.9	
5	SSc	Set Point connection	in SP1 and SP2 independent; 2r SP2 relative to SP1; d1 SP1 never less than SP2 and SP2 never higher than SP1; d2 SP2 never less than SP1 and SP1 never higher than SP2.	in	
6	SP 1	Set Point 1 (**SP1**)	S.L1 ÷ S.H1	0.0	
7	SP2	Set Point 2 (**SP2**)	S.L2 ÷ S.H2	0.0	
8	uP	Unit and resolution of the measurement (decimal point)	C0 °C resolution 1°; F0 °F resolution 1°; C1 °C resolution 0.1°; F1 °F resolution 0.1°.	C1	
9	iFt	Measurement filter	oF/0.1 ÷ 20.0 s	2.0	
10	iC 1	Pr1 Probe Calibration	-30.0 ÷ 30.0°C/°F	0.0	
11	iC2	Pr2 Probe Calibration	-30.0 ÷ 30.0°C/°F	0.0	
12	iC3	Pr3 Probe Calibration	-30.0 ÷ 30.0°C/°F	0.0	
13	iP2	Pr2 Input usage	oF Not used; r2 Process value for r2 controller (loop); Au Auxilary, enabled for the alarms display only; dG Digital input.	oF	
14	iP3	Pr3 Input usage		oF	
15	iF i	Digital input function and logic	0 No function; 1 External alarm; 2 External alarm and control outputs disable; 3 Switch on/off (Stand-by); 4 Auxiliary output command; 5 Door open with fan stop; 6 Door open without fan stop;.	0	
16	it i	Delay in acquiring digital input	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s.x10)	oF	
17	idS	Variable normally shown on display	oF Display off; P1 **Pr1** measurement; P2 **Pr2** measurement; P3 **Pr3** measurement; S1 Set Point 1; S2 Set Point 2; 1.2 Alternated **Pr1** and **Pr2** probes measurement; 1.3 Alternated **Pr1**, **Pr2** and **Pr3** probes measurement.	P1	
18	itd	Time each variable remains displayed	1 ÷ 30 s	5	
19	rFc	Controller functioning mode	**nr** Neutral zone: **r1** Cools with **SP1** and **Pr1**, **r2** Heats with **SP1** and **Pr1**; **CC** Cool - Cool: **r1** Cools with **SP1**, **r2** Cools with **SP2**; **HH** Heat - Heat: **r1** Heats with **SP1**, **r2** Heats with **SP2**; **HC** Heat - Cool: **r1** Heats with **SP1**, **r2** Cools with **SP2**; **CH** Cool - Heat: **r1** Cools with **SP1**, **r2** Heats with **SP2**.	nr	
20	rd 1	Differential (histeresys) controller **r1**	0.0 ÷ 30.0 °C/°F	1.0	
21	rd2	Differential (histeresys) controller **r2**	0.0 ÷ 30.0 °C/°F	1.0	
22	r. In	Time **r1** activation for probe failure	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
23	r. IF	Time **r1** deactivation for probe failure	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
24	r.2n	Time **r2** activation for probe failure	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
25	r.2F	Time **r2** deactivation for probe failure	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
26	rFF	Fans output operating mode	0 Fans not connected to the controllers; 1 Fans connected to controller **r1**; 2 Fans connected to controller **r2**; 3 Fans connected to both controller.	0	
27	P. 1 1	Output **r1** activation delay	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
28	P. 12	Delay after output **r1** switch OFF	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	

Parameter		Description	Range	Default	Note
29	P2 1	Output **r2** activation delay	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
30	P22	Delay after output **r2** switch OFF	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
31	Pod	Outputs activation delay at power ON	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
32	ddt	Defrost Type	EL Not ventilated with Electrical heating/Stop Compressor; Fn Ventilated with Electrical heating/Stop Compressor; no Without compressor output conditioning.	EL	
33	dd 1	Defrosts interval	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
34	ddE	Length (max.) of defrost cycle	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
35	dcd	Defrost start for continuous compressor functioning	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
36	AY 1	Temperature 1 alarms type	1 Absolute (**Pr1**); 2 Relative to **SP1** (**Pr1**); 3 Absolute (**r2**); 4 Relative to **SP2** (**r2**); 5 Absolute (**Au**).	1	
37	AH 1	High temperature 1 Alarm threshold	oF/-99.9 ÷ 999°C/°F	oF	
38	AL 1	Low temperature 1 Alarm threshold	oF/-99.9 ÷ 999°C/°F	oF	
39	Ad 1	Differential alarms AH 1 and AL 1	0.0 ÷ 30.0°C/°F	1.0	
40	At 1	Delay alarms AH 1 and AL 1	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
41	AY2	Temperature 1 alarms type	1 Absolute (**Pr1**); 2 Relative to **SP1** (**Pr1**); 3 Absolute (**r2**); 4 Relative to **SP2** (**r2**); 5 Absolute (**Au**).	3	
42	AH2	**Pr2**/**Pr3** High temp. Alarm threshold	oF/-99.9 ÷ 999°C/°F	oF	
43	AL2	**Pr2**/**Pr3** Low temp. Alarm threshold	oF/-99.9 ÷ 999°C/°F	oF	
44	Ad2	Differential alarms AH2 e AL2	0.0 ÷ 30.0°C/°F	1.0	
45	At2	Delay alarms AH2 e AL2	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
46	APA	Temperature Alarms delay at power ON	oF/.01 ÷ 9.59 (h.min) ÷ 99.5 (h.min x 10)	2.00	
47	AdA	Temperature Alarms delay after defrost	oF/ 0.01 ÷ 9.59 (h.min) ÷ 99.5 (h.min x 10)	1.00	
48	AoA	Open door Alarm delay	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	3.00	
49	o1	Out1 function	r1 Controller 1; r2 Controller 2; dF Defroster; Fn Fans; Au Auxiliary; At/-t Silenceable alarm; AL/-L Not silenceable Alarm; on Output ON when instrument switched on; oF No function.	r1	
50	o2	Out2 function		r2	
51	o3	Out3 function		oF	
52	obu	Buzzer function mode	oF Disable;d 1 Active for alarms only; 2 Active for Key pressed only; 3 Active for alarms and Key pressed.	3	
53	oFo	Aux output operating mode	oF No function; 1 Delayed **r1** output; 2 Delayed **r2** output; 3 Manual activation by key or digital input; 4 Internal light (OFF = door closed and ON = door open).	oF	
54	otu	Time relative to auxiliary output	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF	
55	tUF	Function mode key (U)	oF No function; 1 Auxiliary output command; 2 Defrost command; 3 Switch ON/OFF command (Stand-by); 4 Access the fast SP1 change procedure; 5 Access the fast SP2 change procedure.	oF	
56	tFA	Function mode key (▲)		oF	
57	tFb	Function mode key (▼)		oF	
58	tLo	Keyboard lock function delay	oF/0.01 ÷ 9.59 (min.s) ÷ 30.0 (min.s x 10)	oF	
59	tLd	**Aux** LED functioning mode	1 Output configured as Auxiliary; 2 Output controller **r2** when both controllers are configured for the same operation mode (**H-H** or **C-C**).	1	
60	tEd	Set Point visibility with the Fast SP change procedure (key (P))	oF None; 1 SP1; 2 SP2; 3 SP1 and SP2.	1	
61	tPP	Parameters protection password	oF/1 ÷ 999	oF	
62	tAd	Serial communications instrument address	0 ÷ 255	1	

8 PROBLEMS AND MAINTENANCE

8.1 Error messages

Error	Reason	Action
E1-E1	The probe may be interrupted (E) or in short circuit (-E), or may measure a value outside the range allowed	Check the correct connection of the probe with the instrument and check the probe works correctly
E2-E2		
E3-E3		
EPr	Internal EEPROM memory error	Press the P key
Err	Fatal memory error	Replace the instrument or ship to factory for repair

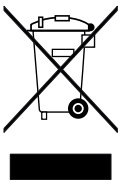
8.2 Other messages

Message	Reason
od	Delay at power-on in progress
Ln	Keyboard lock
Hi1	Temperature 1 max. alarm in progress
Lo1	Temperature 1 min. alarm in progress
Hi2	Temperature 2 max. alarm in progress
Lo2	Temperature 2 min. alarm in progress
oP	Door opened

8.3 Cleaning

We recommend cleaning of the instrument only with a slightly wet cloth using water and not abrasive cleaners or solvents.

8.4 Disposal



The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

9 WARRANTY AND REPAIRS

The instrument is under warranty against manufacturing flaws or faulty material, that are found within 18 months from delivery date.

The guarantee is limited to repairs or to the replacement of the instrument.

The eventual opening of the housing, the violation of the instrument or the improper use and installation of the product will bring about the immediate withdrawal of the warranty effects.

In the event of a faulty instrument, either within the period of warranty, or further to its expiry, please contact our sales department to obtain authorisation for sending the instrument to our company.

The faulty product must be shipped to Ascon Tecnologic with a detailed description of the faults found, without any fees or charge for Ascon Tecnologic, except in the event of alternative agreements.

10 TECHNICAL DATA

10.1 Electrical Data

Power supply: 12 VAC/DC, 12 ÷ 24 VAC/DC, 100 ÷ 240 VAC ±10%;

AC Frequency: 50/60 Hz;

Power consumption: 3.5 VA approx.

Input(s): 3 inputs for temperature probes: NTC (103AT-2, 10kΩ @ 25°C); 1 digital input for free of voltage contacts (as alternative to Pr2/Pr3 input);

Output(s): Up to 3 relay outputs:

	EN 61810	EN 60730	UL 60730
Out1 - SPST-NO - 16A - 1HP 250V, 1/2HP 125 VAC	16 (9) A	10 (4) A	12 A Res., 30 LRA, 5 FLA
Out2 - SPDT - 8A - 1/2HP 250V, 1/3HP 125 VAC	8 (3) A	4 (4) A	4 A Res.
Out3 - SPST-NO - 5A - 1/8HP 250V, 1/10HP 125 VAC	5 (2) A	2 (2) A	2 A Res.

16 A max. for outputs common (pin. 1), 12 A max. for extractable terminal block model.

Electrical life for relay outputs: 100000 op. (EN60730);

Action type: type 1.B (EN 60730-1);

Overvoltage category: II;

Protection class: Class II;

Insulation: Reinforced insulation between the low voltage part (supply H type and relay output) and front panel; Reinforced insulation between the low voltage section (supply H type and relay output) and the extra low voltage section (inputs); Reinforced between supply and relay output; No insulation between supply F or G type and inputs.

10.2 Mechanical Data

Housing: Self-extinguishing plastic, UL 94 V0;

Heat and fire resistance category: D;

Ball Pressure Test secondo EN60730: accessible parts 75°C, support live parts 125°C;

Dimensions: 78 x 35 mm, depth 64 mm

Weight: 130 g approx.;

Mounting: Incorporated Flush in panel (thickness 12 mm max.) in 71 x 29 mm hole;

Connections: 2.5 mm^2 screw terminals block or 2.5 mm^2 extractable screw terminals block for 0.2 ÷ 2.5 mm^2/ AWG 24 ÷ 14 cables;

Front panel protection degree: IIP65 (NEMA 3S) mounted with opotional screw type bracket;

Pollution situation: 2;

Operating temperature: 0 ÷ 50°C;

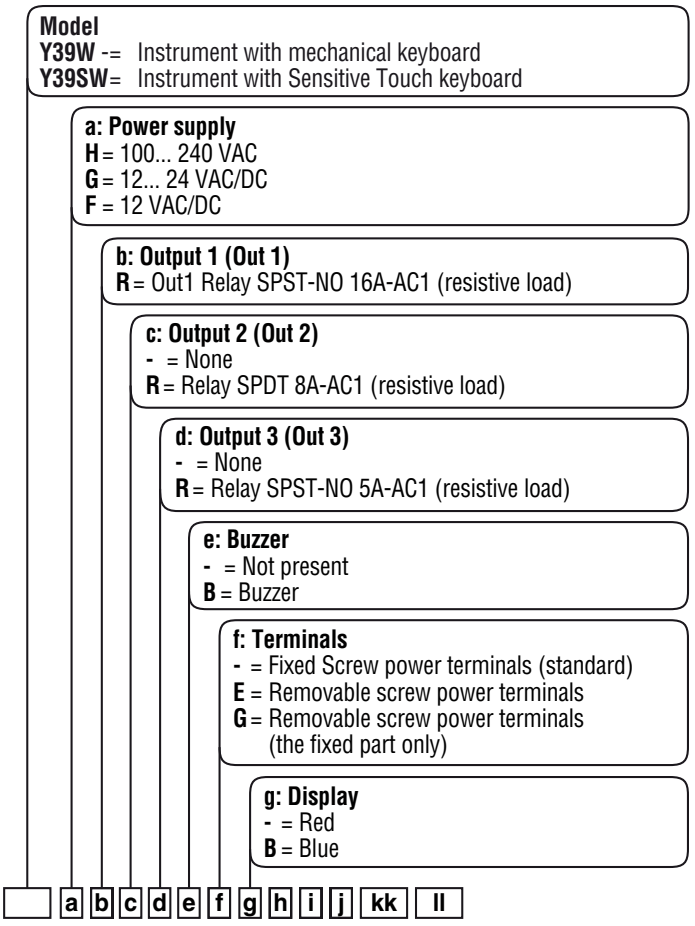
Operating humidity: < 95 RH% with no condensation;

Storage temperature: -25 ÷ +60°C.

10.3 Functional Features

Temperature Control: ON/OFF mode;
Defrost control: Interval cycles or temperature by Electric Heating/Compressor stops or hot-gas/reverse cycle;
Measurement range: NTC: -50 ÷ 109°C/-58 ÷ 228°F;
Display resolution: 1° or 0.1° (in the range -99.9 ÷ 99.9°);
Overall accuracy: ±(0.5% fs + 1 digit);
Sampling rate: 130 ms;
Display: 3 Digit Red (Blue optional) h 15.5 mm;
Software class and structure: Class A;
Compliance: Directive 2004/108/CE (EN55022: class B; EN61000-4-2: 8kV air, 4kV cont.; EN61000-4-3: 10V/m; EN61000-4-4: 2kV supply and relay outputs, 1kV inputs; EN61000-4-5: supply 2kV com. mode, 1kV\ diff. mode; EN61000-4-6: 3V),
Directive 2006/95/CE (EN 60730-1, EN 60730-2-9),
Regulation 37/2005/CE (EN13485 air, S, A, 2,- 50°C +90°C with probe NTC 103AT11).

11 HOW TO ORDER



h, i, j: RESERVED CODES;
kk, ll: SPECIAL CODES.

Note: To order the Optional Screw type Bracket necesary to obtain the IP65 Front protection degree, please, contact your Ascon Tecnologic supplier.