Y39H

HUMIDITY AND TEMPERATURE DIGITAL ELECTRONIC CONTROLLER

OPERATING INSTRUCTIONS

20/04 - code: ISTR_M_Y39H-_E_00_--

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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.

Ascon Tecnologic S.r.l. reserves the right to make any formal or functional changes at any moment and without any notice.

Ascon Tecnologic S.r.l. and its legal representatives do not assume any responsibility for any damage to people, things or animals deriving from violation, wrong or improper use or in any case not in compliance with the instrument features.

⚠ 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

Y39H is a digital controller with microprocessor that is typically used to **control temperature** (heating or cooling application) with **ON/OFF control** and **humidity control** (humidification and deumidification) with **ON/OFF control**; the instrument integrates an **asymmetrical oscillator timer** whitch can be used for special applications.

The instrument has up to **3 relay outputs**, **1 input** for the **TRH03 humidity and temperature digital probe**, **a digital input** that, as alternative, can be used fto connect an NT temperature probe and, in addition, can be equipped with an **internal buzzer** that is the sound system for alarms.

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 to confirm 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. ▼**/Aux Key:** In programming mode is used to decrease the parameters value and to select the setting parameter. Hold pressed for 1 s while in normal mode it can also be used, when programmed via parameter *t.Fb*, to carry out other functions such as activating the **Aux** output etc. (see functions of keys U and ▼).
3. ▲**/Tm Key:** Hold pressed for 1 s while in normal mode can be used to start/stop the twin timer when it is programmed in *oFo* = **2** mode. In programming mode is used to increase the parameters value and to select the setting parameter. In programming mode can be used, togetherwith key P to change parameters programming level. Pressed together with P key for 5 s allows the keyboard unlock.
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 used, when programmed via parameter *t.uF*, to carry out other functions such as activating the **Aux** output etc. (see functions of keys U and ▼).
5. **LED SET:** During the normal operating mode, signals that a key is pressed. In programming mode indicates the programming level of the parameters.
6. **LED ☼ - COOL:** Indicates the output status (compressor or temperature control device) when the istrument is programmed for **cooling** operation: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**).
7. **LED ☀ - HEAT:** Indicates the output status (compressor or temperature control device) when the istrument is programmed for **heating** operation: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**).
8. **LED ♒:** Indicates the status of the humidity control output when the operating action is that of dehumidification: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**).
9. **LED ♨:** Indicates the status of the humidity control output when the operating action is that of humidification: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**).
10. **LED ⚠:** Shows the Alarm status (**ON**), OFF (**OFF**) and Acknowledged or Lached (**flashing**)
11. **LED Au:** Shows the Auxiliary output status: ON (**ON**), OFF (**OFF**) or inhibited (**flashing**).
12. **LED Stand-By:** When the instrument is in Stand-by mode is the only lit LED.
13. **LED Tm (Time)**: When flashes points out that the twin timer which operates on the Auxiliay output is enabled.

2 PROGRAMMING

2.1 Fast Set Point Programming

The normal mode to program the setpoint is done by momentarily pressing the P key, the display shows *SPt* (or *SPh*) alternated to the programmed value.

To change the SP, 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.

However, through parameter *t.Ed* is possible to establish if and which Set Points can be set with th ekey P fast procedure. *t.Ed* parameter can be set to a value between **oF** and **3**:

oF No Set Points can be set with the key P fast procedure (pressing and releasing the P key has no effect);
1 Only **SPt** can be set (Temperature Set Point);
2 Only **SPh** can be set (Humidity Set Point);
3 Both **SPt** and **SPh** can be set.

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

– Press and release the P key, the display shows the label *SPt* alternated to the *SPt* value. To change it, press the ▲ key to increase *SPt* value or ▼ to decrease it.
– If *t.Ed* = **1** (only the temperature Set Point can be changed), once set the *SPt* value, pressing the P key, the instrument returns to the *Standard Display*.
– When instead *t.Ed* = **3** (both **SPt** and **SPh** can be set), pressing the P key, the instrument shows *SPh* alternated to the *SPh* value. To change it, use the ▲/▼ keys as for the *SPt* Set Point.

When all the desired values are set, press the key P to exit the Set Point programming mode. The Set Point programming mode can be abandoned by pressing the P key or automatically if no key is pressed for 10 seconds. After that time the display returns to the Normal function mode.

2.2 Standard Mode Parameters Programming

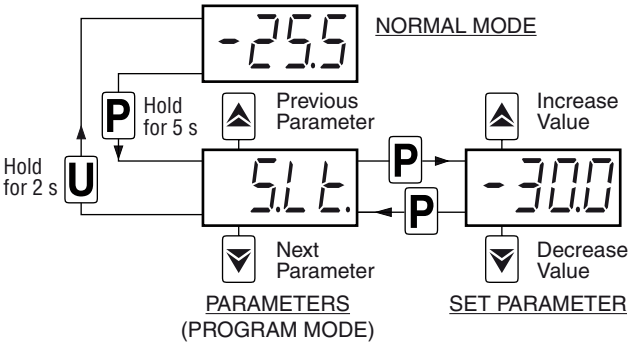
To access the instrument function parameters when password protection is disabled, press the P key and keep it pressed for about 5 seconds, after which the display shows the code that identifies the first programmable parameter.

The desired parameter can be selected using the ▲/▼ keys, then, pressing the P key, the display shows the selected parameter code alternated to its value that can be changed 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 mode.



2.3 Parameter Protection Using a Password

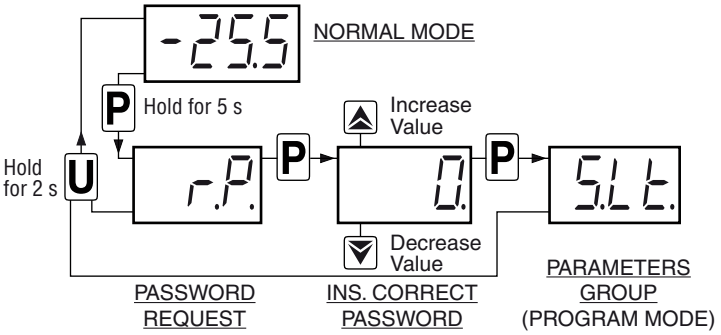
The instrument has a parameter protection function with password that can be customized using the parameter *PPP*.

To protect the parameters, set the desired Password Number at parameter *PP*.

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 *PPP* = **oF**.



Notes: **1.** All parameters are configured by default as "*protected by password*" so that by simply setting the *PPP* parameter they are all 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 it is possible to have access to ALL the parameters, verify and modify the parameter *PPP*.

2.4 Customized Mode Parameters Programming (parameters programming level)

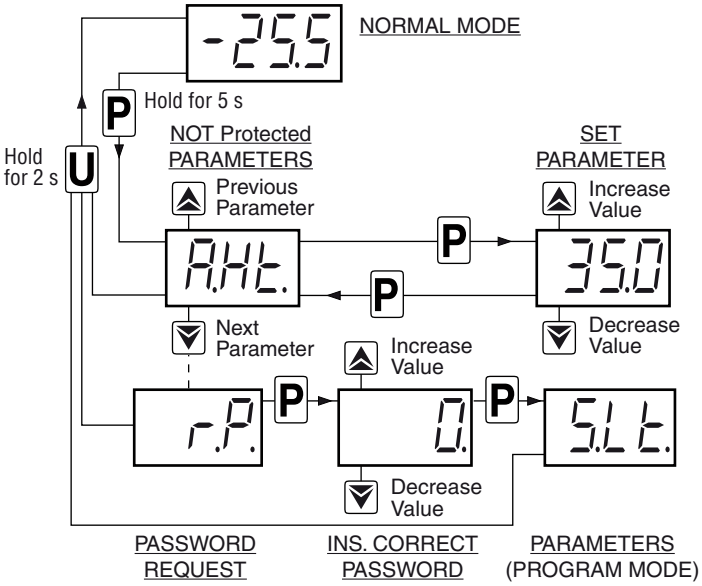
The instrument factory setting provide that the password protection acts on all parameters. To make a parameter accessible without having to enter the password when *PPP* password protection is active, use the procedure that follows:

– Enter the Program mode using the *PPP* 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 (is protected), if the **SET** 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 parameter level (**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 protection using the *PPP* 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

The instrument allows 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, simply set the parameter *tLo* to a value different than **oF**.

The *tLo* value is the keys inactivity time after which the instrument automatically locks the keyboard. Therefore, pressing no buttons for the time set at *tLo*, 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 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 (IP65), use the screw type bracket (optional).

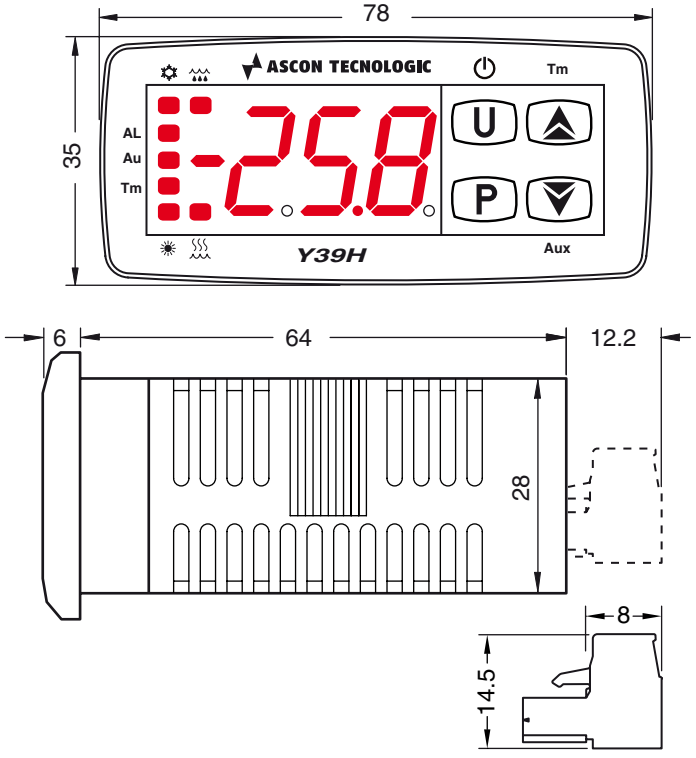
Avoid placing the instrument in environments with very high humidity levels or dirt that may create condensation or introduction of conductive substances into the instrument.

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.

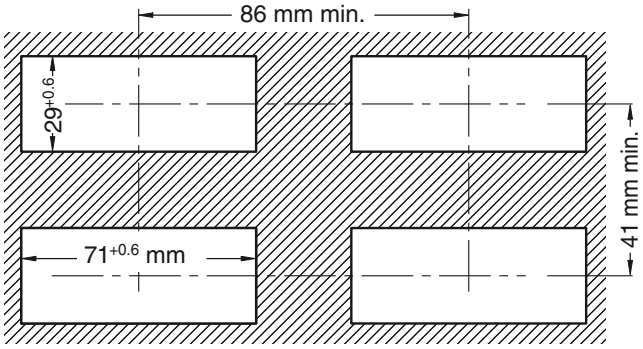
Connect the instrument as far away as possible from sources of electromagnetic disturbances such as motors, power relays, relays, solenoid valves, etc..

4.2 Controller Dimensions [mm]

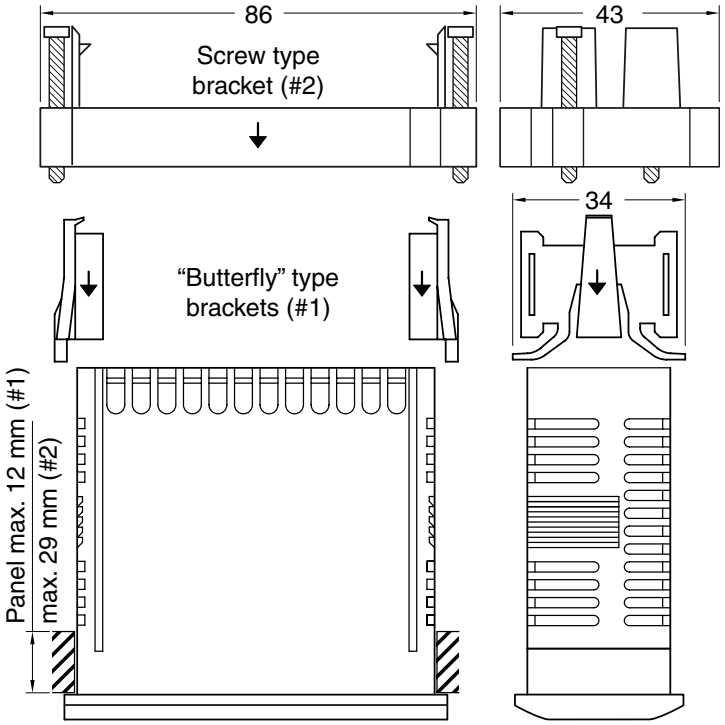
4.2.1 Mechanical Dimensions



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.

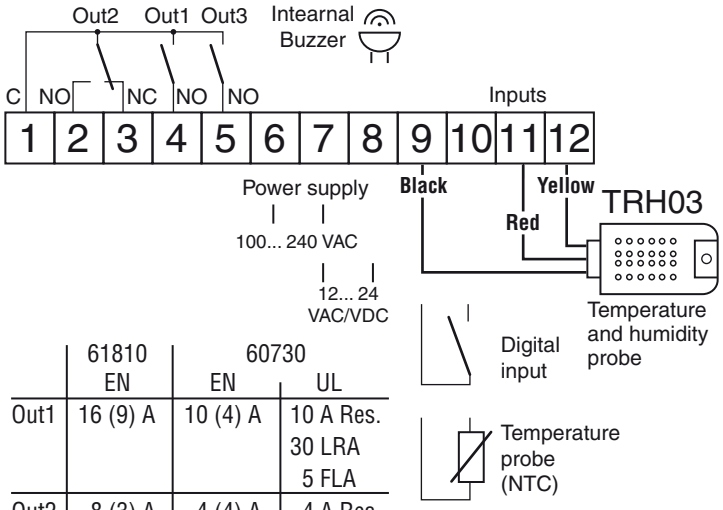
It is strongly recommended that cables with proper insulation, according to the working voltages and temperatures, are to be used. Furthermore, the probe input cable must be kept separate from line voltage wiring.

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



	61810 EN	60730 EN	60730 UL
Out1	16 (9) A	10 (4) A	10 A Res. 30 LRA 5 FLA
Out2	8 (3) A	4 (4) A	4 A Res.
Out3	5 (2) A	2 (2) A	2 A Res.

16A max. on the relays common pole (C = terminal 1);
12A max. on model with removable connectors.

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 ⏻/⏻ for at least 1 s if parameter **uSF** = **2**;
– Pressing the key ▼/**Aux** for at least 1 s if parameter **uFb** = **2**;
– Using the Digital Input if parameter **iF1** = **3**.

5.2 Measure and Display Configuration

The instrument allows to measure temperature and humidity or even just one of the two.

If both are measured, it is possible to use the temperature value measured by the humidity and temperature probe or the one measured by the NTC probe.

To specify to the instrument which temperature value to use, the **iSH** and **iP2** parameters have been provided. **iSH** parameter allows to configure the temperature-humidity probe input according to the following options:

1. Activates TRH03 as humidity and temperature probe;
2. Activates TRH03 as humidity probe only;
3. Reserved;
4. Reserved;
oF Not used (use this option if the only desired temperature measurement is the one of the NTC probe connected to the **Pr2** input).

iP2 parameter allows to configure PR2 input according to the following options:

nt **NTC** temperature probe;
dG Digital input;
oF Not used.

Note: When these parameters are changed, the instrument is initialized.

With 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 **iCt** (temperature), **iCH** (humidity).

Using **iFt** (temperature) and **iFH** (humidity) parameters can be set a software filter for measuring the input values in order to decrease the sensibility to rapid temperature changes (increasing the sampling time).

More precisely, the filter parameters allow to introduce an acquisition delay (both in increase and in decrease and which is also valid for the adjustment) to the measurements, limiting to the time set by the user the measure maximum variation of 0.1 units. In this way, the maximum temperature variation is blocked at 0.1° every **iFt** seconds while that of humidity at 0.1% RH every **iFH** s.

Through the ,dS parameter is possible to set the variable normally displayed:

Pt Measure of the **temperature** Probe;
Ph Measure of the **humidity** Probe;
St Set Point of the temperature control;
Sh Set Point of the humidity control;
th The temperature and humidity measures alternated every 10 s;
tt The temperature and the t.oF timer decreasing counting alternated every 10 s;
3U The temperature, humidity and the t.oF timer decreasing counting alternated every 10 s;
oF Numerical display switched OFF.

The normally displayed value is established by parameter ,dS, but, repeatedly pressing and releasing U key, it is possible to sequentially display all the measurement and operating variables. The display alternately shows the code that identifies the variable and its value. The variables that can be displayed are:

t Temperature probe measurement;
h Humidity probe measurement;
t.oF Countdown to the next activation of the auxiliary output configured as oAo = **2** (only if the timer is enabled);
Lt Minimum stored Pr1 temperature;
Ht Maximum stored Pr1 temperature.

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

5.3 Digital Input Configuration

The digital input function is defined using the ,F, parameter and the action is delayed for the time programmed with parameter ,t,. The ,F, parameter can be configured for the following functions:

0 Digital Input not active;
1 External alarm signalling via NO contact: closing the digital input (and after the ,t, time) the alarm is activated and the instrument alternately shows on the display the label AL and the variable set at parameter ,dS;
2 External alarm signalling with deactivation of all control outputs via NO contact: closing the digital input (and after the ,t, time) all the control outputs are disabled, the alarm is activated and the instrument alternately shows on the display the label AL and the variable set at parameter ,dS;
3 Instrument Switch ON/OFF (ON/Stand-by) of instrument via NO contact: closing the digital input (and after the ,t, time) the instrument is switched **ON** while it is placed in **Stand-by** when the digital input is open;
4 **AUX** auxiliary output remote control with NO contact: when the input is closed (and after the ,t, time), the auxiliary output is activated as described in the operating modes of the auxiliary output;
5 Door opening signalling via NO contact: when the input closes (and after the ,t, time) the instrument alternately displays oP and the variable established with ,dS. With this operating mode, the action of the digital input also activates the time that can be set in parameter AoA after which the alarm is activated to signal that the door has remained open;
-1, **-2**, **-3**, **-4**, **-5**
These functions are like those just described, but work with a reversed logic as the contact is NC.

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:

ot To manage the temperature control device. In the case of neutral zone control (rHC = **nr**) for the control of the cooling control device;
rh To manage the humidity control device. In the case of neutral zone control (rud = **nr**) for the control of the dehumidification control device;
HE To manage the heating control device in case of neutral zone control (rHC = **nr**);
hu To manage the humidification control device in case of neutral zone control (rud = **nr**);
Au To control the auxiliary device;
At To control a silenceable alarm device through a contact that is NA and closed when the alarm sounds;
AL To control an alarm that cannot be silenced through a contact that is NA and closed when the alarm sounds;
-t To control a silenceable alarm device through a contact that is NC and open when the alarm sounds;
-L To control an alarm that cannot be silenced through a contact that is NC and open when the alarm sounds;
on Output ON when the instrument is in ON state. The output is active when the instrument in ON and not active when the instrument is in Stand-by mode. This mode can be used to control shop lights, non-misting resistances or other utilities;
L1 To manage a light device through the keys U/⏻ or D/**Aux** when correctly configured (t.UF or t.Fb = 4). This output can be activated and deactivated even when the instrument is placed in Stand-by;
oF Disabled output.

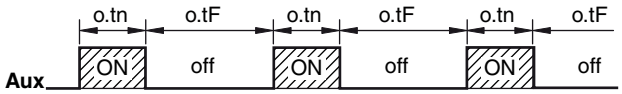
The function carried by for **Aux** output (o01, o02, o03 = **Au**) is defined by the parameter oAo and the function is conditioned by the time set with parameters otn and otF.

Using the otu parameter is possible to establish whether the scale of the otF parameter should be in **hours and minutes** (**H**) or in **minutes and seconds** (**n**).

oAo can be configured for the following functions:

oF No function;
1. Activation by the key U/⏻, D/**Aux** or by Digital Input with contact NO: the output is activated pressing a key U/⏻ or D/**Aux** suitably configured (t.UF or t.Fb = **1**) or via the digital input (,F, = **4**). These commands have a bi-stable function (toggle), which means that when first pressed, the output is activated while the second is disabled. In this mode, the **Aux** output can be turned OFF automatically after a certain time that can be set ON the parameter otn. With otn = **oF** the output is activated and deactivated only manually, using a key U, D, or via the digital input. When otn = **time**, once activated the output is turned OFF automatically after the otn time;
2. Independent twin timer. The **Aux** output is activated when the instrument is turned ON for the time otn then it is deactivated for the time otF and so on. The oAo = **2** mode also provides a timer enabling/disabling function. This function allows the user to manually disable/enable the timer by pressing the D/**Tm** key for 5 s. The flashing **Tm** LED indicates thet the timer is enabled. If oAo = **2**, the first time the timer is switched ON, it is always enabled and can be disabled/re-enabled using the D/**Tm** key. When the instrument is turned OFF and the next time it is

turned ON again, the timer status must therefore be that in which it was when it was turned OFF. If the timer is enabled and the auxiliary output command is configured to be enabled via key (U or ▼) or digital input, the command given by these inputs resets the timer count by activating the **Aux** output (if OFF) or deactivating the **Aux** output (if ON). This mode can be used to activate cyclic actuators such as, for example, fans and shutters for environment air exchange or servomechanisms for the materials rotation devices (e.g.: eggs incubators or test tubes);



oFo = **2**

3. Twin timer dependent on temperature control. The **Aux** output is activated in conjunction with the activation of the **ot** temperature control output. When the **ot** temperature control output is active, the **Aux** output is always active. On the other hand, when the ot output is disabled, the **Aux** output is activated and deactivated cyclically according to the times set at o.tn and o.tF parameters. Therefore, when the output ot is de-activated, the **Aux** output remains active for the time o.tn, then is de-activated for the time o.tF, re-activated for the time o.tn and so on until the output **ot** is activated on temperature control request and consequently the **Aux** output is re-activated, regardless of the times o.tn and o.tF.

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

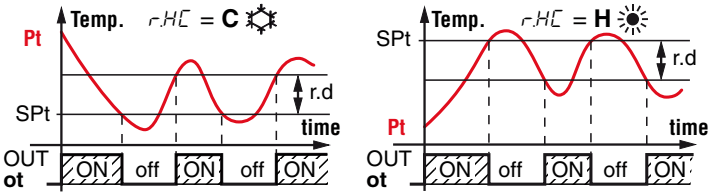
oF Buzzer always disabled;
1 The Buzzer sounds when an alarm is active;
2 The Buzzer sounds when a key pressed (no alarm);
3 The Buzzer sounds when a key pressed and when an alarm is active.

5.5 Temperature Control

The instrument adjustment method can be selected using the r.HC parameter and acts on the outputs configured as **ot** and **HE** according to the temperature measurement, the **SPt** Set Point and the parameters that follow.

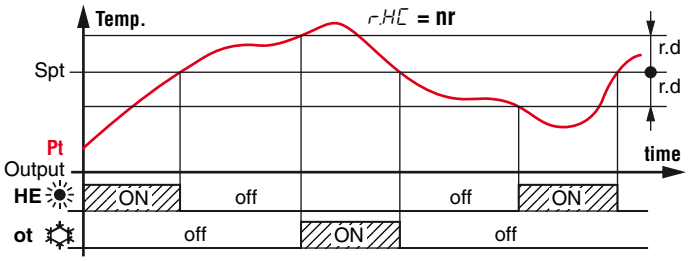
5.5.1 ON/OFF temperature control (r.HC = H or C)

In case of ON/OFF temperature control (r.HC = **H** or **C**) the controller acts depending on the r.d differential (histeresys) which is automatically considered by the controller with **positive** values for **Cooling** actions (r.HC = **C**) or with **negative** values for **Heating** actions (r.HC = **H**).



5.5.2 ON/OFF temperature control with neutral zone (r.HC = nr)

When r.HC = **nr**, the output configured as **ot** operates with a cooling action (like r.HC = **C**) while the output configured as **HE** can be used to operate with a heating action. The r.d differential intervention is automatically assumed by the controller to have positive values for the cooling action and negative values for the heating action.

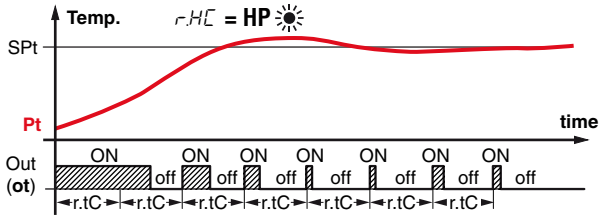


The time protections described below (Pt 1/Pt2) always and only act on the output configured as **ot** and only in ON/OFF control (r.HC = **C**, **H**, **nr**).

5.5.3 Single action PID temperature control (r.HC = HP or CP)

The instrument single action PID control algorithm provides for the setting of the following parameters:

r.d Proportional band;
r.td Derivative time;
r.ti Integral time;
r.tC **ot** output cycle time.



Example of PID control with Heating action.

When PID control is choosen, the *Autotuning* function is available which allows the automatic tuning of the above parameters. To activate the *Autotuning* function:

– Set and activate the desired Set Point SPt;
– Set the r.H parameter. r.HC = **HP** (if the control is heating) or r.HC = **CP** (if the control is cooling);
– Set the r.At parameter as:

1 The Autotuning is started automatically every time the instrument is turned on;
2 The Autotuning is started automatically the next time the instrument is turned ON and, once the tuning is finished, the r.At parameter is automatically set to **oF**;
3 The Autuning is manually started using the U or ▼ key (when appropriately configured as t.UF or t.Fb = **3**).

If the Autotune process is not completed within 12 hours, the instrument will showthe error message **E.At** on the display.

In case of probe error, the instrument automatically stops the cycle in progress.

The values calculated by Autotune are automatically stored in the instrument memory at the end of the correct PID parameters tuning.

Autotune in progress is indicated by the At label, alternated every 10 s with the normal display value

In the event of a probe error (in all control modes), it is possible to make the output configured as **ot** continues to operate cyclically according to the times programmed with parameters r.t1 (activation time) and r.t2 (deactivation time).

When an error occurs to the **Pt** temperature probe, the instrument activates the **ot** output for the time set at r.t1, then deactivates it for the time set at r.t2 and so on until the error persists.

By programming r.t1 = **oF** the **ot** output in probe error con-

ditions will always remain OFF.

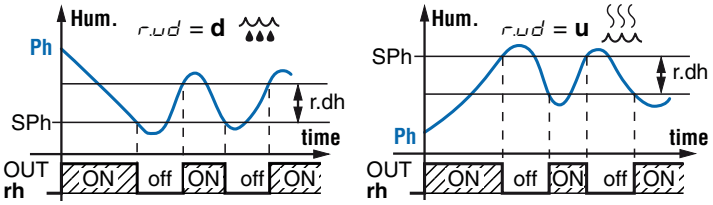
On the other hand, by programming r.t 1 to any value and r.t2 = **oF**, the **ot** output in probe error conditions will always remain ON.

5.6 Humidity controller

5.6.1 ON/OFF humidity control (r.ud = **u** or **d**)

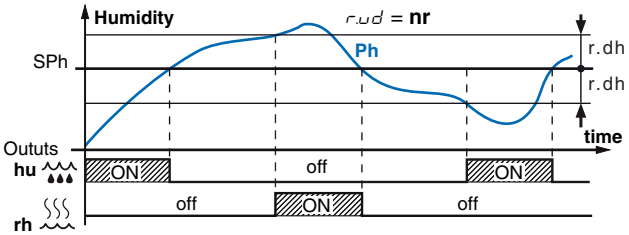
The instrument humidity control mode is of the ON/OFF type and acts on the outputs configured as **rh** and **hu** as a function of the humidity measurement, the **SPh** Set Point, the intervention differential r.dh and the r.ud operation mode.

With regard to the operating mode programmed with parameter r.ud, the differential is automatically considered by the controller with positive values for a *Dehumidification* control (r.ud = **d**) or with negative values for *Humidification* control (r.ud = **u**).



5.6.2 ON Humidity controller with neutral zone (r.ud = **nr**)

If the r.ud = **nr** parameter is programmed, the output configured as **rh** operates with a *Dehumidification* action (such as r.ud = **d**) and it is possible to use the output configured as **hu** which operates with a *Humidification* action. Also in this case, the differential is automatically considered by the controller with positive values for a *Dehumidification* control or with negative values for *Humidification* control.



When the controller requests the activation of the **rh** output, it is possible to arrange that the output is switched ON and OFF cyclically according to the times programmed in parameter r.h 1 (activation time) and r.h2 (deactivation time).

Upon the occurrence of an activation request by the humidity controller, the instrument activates the **rh** output for the time r.h 1, then deactivates it for the time r.h2 and so on until the Set Point is reached.

By programming r.h 1 = **oF** the **rh** output in the event of a request from the humidity controller will always remain OFF.

By programming, instead, r.h 1 = **any value** and r.h2 = **oF**, the **rh** output in the event of a request from the humidity controller will always remain ON.

This function can be especially useful in the case of humidification action to modulate the actuator (motor or water injection solenoid valve).

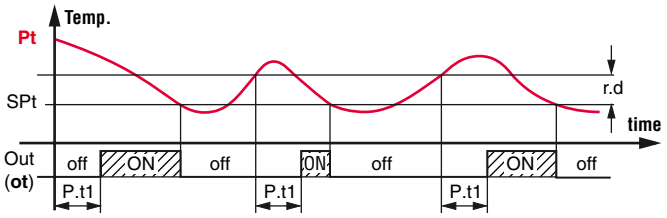
5.7 Compressor Protection Function and Delay at Power-ON

The compressor protection functions performed by the instrument are studied to avoid frequent and close compressor starts driven by the instrument in refrigeration applications and in any case can be used to add a time control on the output intended for controlling the temperature actuator.

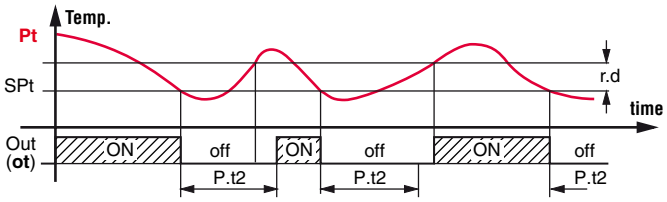
This function provides **2** time controls. These control functions manage the switching ON of the output configured as **ot** associated with the temperature control request (not operating in PID control).

The protection consists of preventing the output being switched ON during the protection times and therefore that any activation occurs only after all the times have elapsed.

First control (parameter P.t 1) foresees a delay to the **ot** output activation (switching ON delay).



Second control (parameter P.t2) inhibits the activation of **ot** output by a time delay (P.t2) that starts when the output is turned OFF (delay after switching-OFF).



During the output inhibition phases caused by the protections, the OUT LED blinks.

It is also possible to prevent activation of all the outputs after the instrument is turned ON for the time set with parameter P.od. During the power ON delay phase, the display shows the indication od alternated with the normal visualization.

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

5.8 Alarm Functions

The alarm conditions of the instrument are:

– Probe errors: E 1, -E 1, E2, -E2, E3, -E3;
– Temperature alarms: H it and Lot;
– Humidity alarms: H ih and Loh;
– 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 o.bu) and on the desired output, if configured with parameters o.o 1, o.o2 or o.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 the flashing ⚠ LED.

The buzzer (when present) can e set to point out the alarm conditions (o.bu = **1** or **3**) and operates as a silenceable aòarm. is activated in alarm condition and can be manually disabled pressing any instrument key (alarm silencing). This means that, when the buzzer is acivated by an alarm status,

it can be disabled (silenced) pressing one of the keys.

Also the outputs can operate as alarm outputs. The possible selections for the alarm signalling function are:

At The output must be enabled in alarm condition and can be manually disabled (alarm silencing) by pressing any key of the instrument (typical application for an acoustic signal);

AL The output must be enabled 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).

5.8.1 Temperature Alarms

The temperature alarm funtion works according to the programmed probe measurement, the type of alarm set at parameter *AyE*, the alarm thresholds at parameters *AHE* (maximum alarm) and *ALE* (minimum alarm) and the relative differential *AdE*.

Through parameter *AyE* it is possible to set if alarm thresholds *AHA*/*ALA* are to be considered as Absolute or Relative to the Set Point and if the message *H iE* (maximum temperature alarm)/*LoE* (minimum temperature alarm) is to be displayed at alarm intervention.

The possible selections of the parameter *AyE* are:

1 Temperature Absolute Alarms with *H iE*/*LoE* label;

2 Temperature Relative Alarms with *H iE*/*LoE* label;

3 Temperature Absolute Alarms with no label;

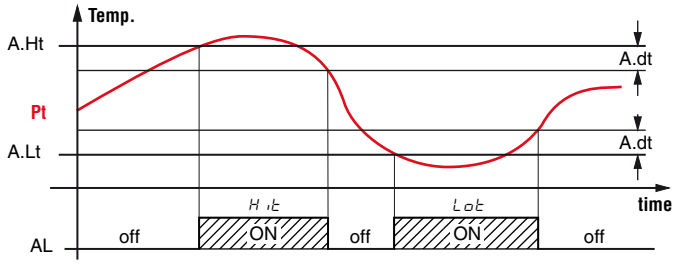
4 Temperature Relative Alarms with no label.

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

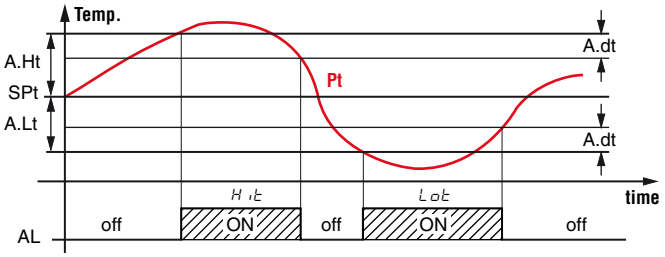
These parameters are:

A.PA Temperature and Humidity alarm 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.

A.tt Temperature alarms delay activation time. Temperature alarms are enabled at the end of the exclusion times and are activated after the *AtE* time when the temperature measured by the probe exceeds or goes below the respective maximum and minimum alarm thresholds. The alarm thresholds are those set at parameters *AHE* and *ALE* when the alarms are set as absolute (*AyE* = **1**);



or assume the values [**SP** + *AHE*] and [**SP** + *ALE*] if the alarms are relative (*AyE* = **2**).



The maximum and minimum temperature alarms can be disabled setting *AHE* and *ALE* = **oF**.

Through the *rtA* parameter it is also possible to establish the actions of the temperature alarms on the outputs as follows:

0 No action;

1 The temperature alarms enable only the Alarm output;

2 The temperature alarms disable the control outputs (ot anf HE) and do not enable the Alarm output;

3 The temperature alarms disable the control outputs (ot anf HE) and enable the Alarm output.

The intervention of the temperature alarms therefore provides for the lighting of the alarm **AL** LED, the activation of the outputs configured with an alarm function, the activation of the internal buzzer if configured and, if provided, the display of the messages:

H iE In the event of a high Temperature alarm;

LoE In case of a low Temperature alarm.

5.8.2 Humidity alarm

The temperature alarm funtion works according to the programmed probe measurement, the type of alarm set at parameter *AyH*, the alarm thresholds at parameters *AHH* (maximum alarm) and *ALH* (minimum alarm) and the relative differential *AdH*.

Through parameter *AyH* it is possible to set if alarm thresholds *AHH*/*ALH* are to be considered as Absolute or Relative to the Set Point and if the message *H iH* (maximum temperature alarm)/*LoH* (minimum temperature alarm) is to be displayed at alarm intervention.

The possible selections of the parameter *AyH* are:

1 Humidity Absolute Alarms with *H iH*/*LoH* label;

2 Humidity Relative Alarms with *H iH*/*LoH* label;

3 Humidity Absolute Alarms with no label;

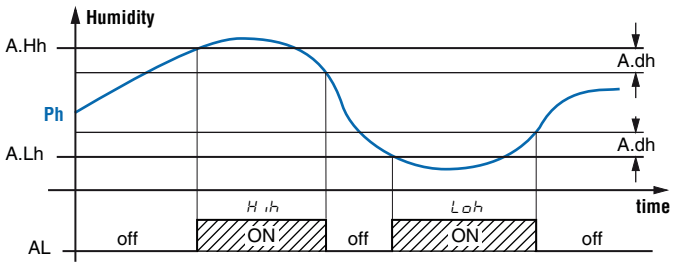
4 Humidity Relative Alarms with no label.

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

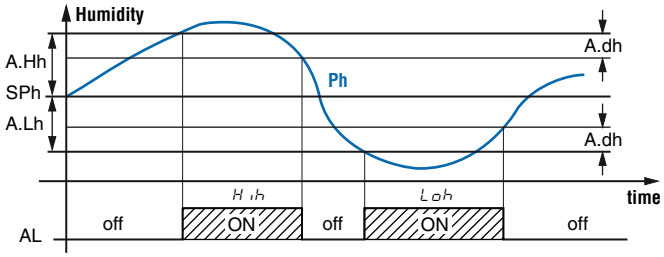
These parameters are:

A.PA Temperature and Humidity alarm 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.

A.th Humidity alarms delay activation time. Humidity alarms are enabled at the end of the exclusion times and are activated after the *AtH* time when the Humidity measured by the probe exceeds or goes below the respective maximum and minimum alarm thresholds. The alarm thresholds are those set at parameters *AHH* and *ALH* when the alarms are set as absolute (*AyH* = **1**);



or assume the values [**SPh** + *RHh*] and [**SPh** + *RLh*] if the alarms are relative (*RYh* = **2**).



The maximum and minimum Humidity alarms can be disabled setting *RHh* and *RLh* = **oF**.

The intervention of the Humidity alarms therefore provides for the lighting of the alarm **AL** LED, the activation of the outputs configured with an alarm function, the activation of the internal buzzer if configured and, if provided, the display of the messages:

H ih In the event of a high Humidity alarm;

Loh In case of a low Humidity alarm.

5.8.3 External Alarm from Digital Input

The instrument can notify an alarm external to the instrument activated by the digital input having a programmed action *iF1* = **1** or **2**.

Simultaneously to the configured alarm signal (buzzer and/or output), the instrument points out the alarm lighting up the **AL** 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.

5.8.4 Open Door Alarm

The instrument can notify an **Open door alarm** activated by the digital input with the function programmed as *iF1* = **5**.

When the digital input is activated, the instrument shows the label *oP* (door open) on the display, 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 **AI** LED while continues displaying the label *oP*.

5.9 Function of Keys U/⏻ and ▼/Aux

Two 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 the parameter *t.UF* while the ▼/Aux key function can be defined by the parameter *t.Fb*.

Both the 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 as explained in the Aux output configuration parameter;

2 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;

3 Pressing the key for at least 1 s it is possible to enable/disable an Autotuning cycle (in the case of PID control and *r.At* = **3**);

4 Pressing the key for at least 1 s it is possible toenable/disable th output configured as **L1**.

6 ACCESSORIES

The instrument is equipped with a TTL communication port with a 5-pole connector that allows the connection of some accessories described below.

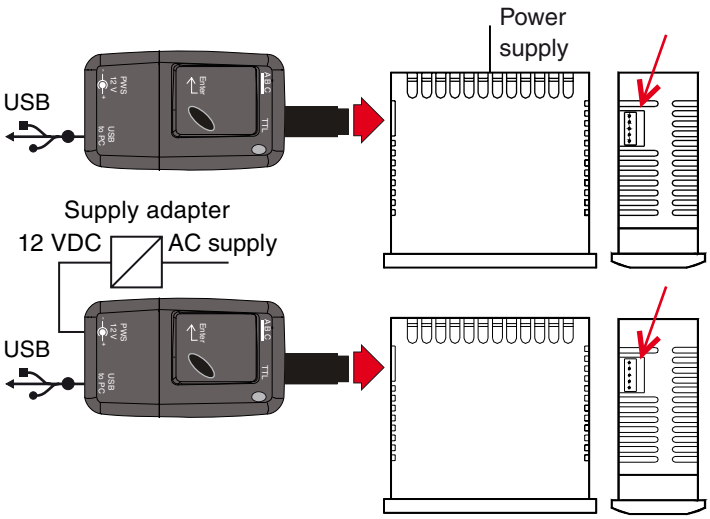
6.1 Parameters Configuration by A01

Through the TTL port and the **A01** device equipped with a 5-pole connector it is possible to transfer the operating parameters to and from the instrument.

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.

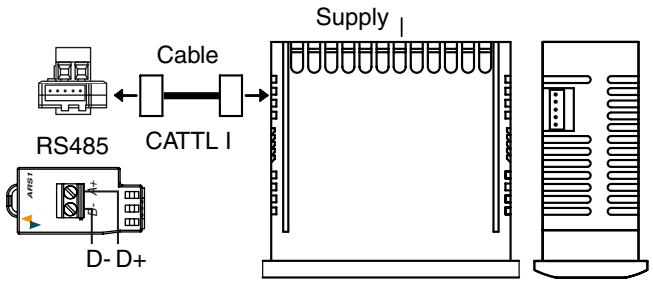
To use the **A01** device it is necessary that the device or instrument are being correctly supplied.



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

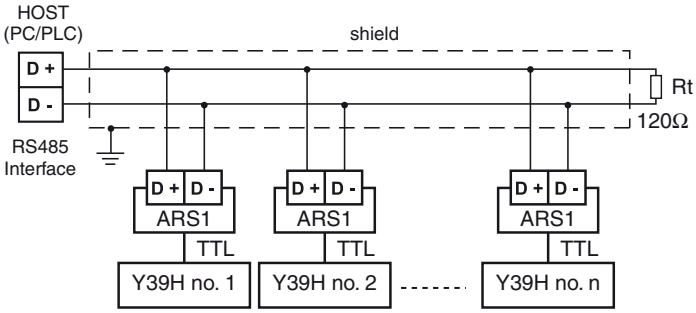
6.2 RS 485 Serial Interface by ARS1

Through the ARS1 device (TTL/RS485 interface) and the appropriate TTL cable, it is possible to connect the instrument to a serial communication network (RS485 type) to which other instruments (controllers or PLC) are connected, all depending typically on a Personal Computer used as plant supervisor.



Using a Personal Computer it is possible to acquire all the functionning data and program all the instrument configuration parameters.

The software protocol adopted for the instrument is a **MODBUS-RTU** type, widely used in several PLC and supervision programs available on the market (Y and Z series protocol manual is available on request).



If the instrument is used in a MODBUS network, program, with parameter *LRd*, the station Address.

Note: The baud-rate is fixed at 9600 baud.

ARS1 converter is directly supplied by the instrument.

For additional info, please consult the ARS1 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
1	SLt	Temperature Minimum Set Point	-99.9 ÷ S.Ht	-50.0
2	SHt	Temperature Maximum Set Point	S.Lt ÷ 999	99.9
3	SLh	Humidity Minimum Set Point	0.0 ÷ S.Hh	0.0
4	SHh	Humidity Maximum Set Point	S.Lh ÷ 100	100
5	SPt	Humidity Set point	S.Lt ÷ S.Ht	20.0
6	SPh	Humidity Set point	S.Lh ÷ S.Hh	50.0
7	iSh	Humidity-Humidity Probe	oF Not used; 1 Enable TRH03 as Humidity and Temperature probe; 2 Enable TRH03 as Humidity probe; 3 Reserved; 4 Reserved.	1
8	iP2	Pr2 Input configuration	oF Not used; nt NTC Temperature probe; dG Digital Input.	dG
9	uP	Temperature unit and resolution (decimal point)	C0 °C resolution 1°; F0 °F resolution 1°; C1 °C resolution 0.1°; F1 °F resolution 0.1°.	C1
10	iFt	Temperature measurement filter (variation time x 0.1°)	oF ÷ 20.0 s	oF
11	idh	Humidity resolution (decimal point)	on/oF	oF
12	iFh	Humidity measurement filter (variation time x 0.1% RH)	oF ÷ 20.0 s	oF
13	iCt	Temperature Probe Calibration	-30.0 ÷ 30.0°C/°F	0.0
14	iCh	Humidity Probe Calibration	-30.0 ÷ 30.0 RH%	0.0
15	idS	Variable normally shown on the display	t Tempearture measurement; h Humidity measurement; St Tempearture Set Point; Sh Humidity Set Point; th Humidity and Tempearture measurements alternated every 10 s; tt Tempearture and countdown t.oF measurements alternated every 10 s; 3U Humidity, Tempearture and countdown t.oF measurements alternated every 10 s; oF Display OFF	th
16	iF1	Digital Input function	0 No function; 1 External alarm; 2 External alarm with control outputs disabling; 3 Switch on/off (Stand-by); 4 Auxiliary (Aux) output enable/disable; 5 Open Door.	0
17	it1	Delay in acquiring digital input	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s. x 10)	oF
18	rd	Intervention differential (Hysteresis) for ON/OFF temperature control or Proportional band for PID temperature control	0.1 ÷ 99.0°C/°F	2.0
19	rtd	Derivative time (PID temperature control)	oF ÷ 200 s	25
20	rt1	Integral time (PID temperature control)	oF ÷ 500 s	100
21	rtC	Cycle time (PID temperature control)	1 ÷ 120 s	30
22	rAt	Autotuning (PID temperature control)	oF No; 1 At all power ON; 2 At first power ON only; 3 Manual start with one key pressure.	3
23	rtA	Temperature alarms action on the temperature control outputs	0 None; 1 Activate the Alarm output only; 2 Disable the control outputs (**ot** and **HE**) and do not enable the alarm output; 3 Disable the control outputs (**ot** and **HE**) and enable the alarm output.	1
24	rt1	Temperature Output (**ot**) enable time for T. probe error	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
25	rt2	Temperature Output (**ot**) disable time for T. probe error	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
26	rMC	Output (**ot**) operating mode	H Heating ON/OFF control; C Cooling ON/OFF control; nr Neutral zone ON/OFF Control (**ot** = Cooling; **HE** = Heating); HP PID Heating control; CP PID Cooling control.	H

Parameter		Description	Range	Default
27	r.dh	Humidity intervention differential (Hysteresis)	0.0 ÷ 30.0°C/°F	5.0
28	r.h1	Humidity Output (**ot**) enable time for H. probe error	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	1.00
29	r.h2	Humidity Output (**ot**) disable time for H. probe error	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
30	r.ud	Humidity Output (**rh**) operating mode	u Humidifies; d Dehumidifies; nr Neutral zone (**rh** = Dehumidifies, **hu** = Humidifies)	u
31	Pt1	**ot** temperature control output activation delay	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s. x 10)	oF
32	Pt2	**ot** temperature control output activation delay after **ot** switch OFF	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
33	Pod	Outputs activation delay at power ON	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
34	AYt	Temperature alarms type	1 Absolute with label (Hit - Lot) display; 2 Relative with label (Hit - Lot) display; 3 Absolute with no label display; 4 Relative with no label display.	1
35	AHt	High temperature Alarm threshold	oF/-99.9 ÷ 999 °C/°F	oF
36	ALt	Low temperature Alarm threshold	oF/-99.9 ÷ 999 °C/°F	oF
37	Adt	Temperature alarm differential AHt and ALt	0.0 ÷ 30.0°C/°F	1.0
38	Att	Temperature alarm delay AHt and ALt	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
39	AYh	Humidity alarms type	1 Absolute with label (Hih - Loh) display; 2 Relative with label (Hih - Loh) display; 3 Absolute with no label display; 4 Relative with no label display.	1
40	AHh	High humidity Alarm threshold	oF/-99.9 ÷ 100 RH%	oF
41	ALh	Low humidity Alarm threshold	oF/-99.9 ÷ 100 RH%	oF
42	Adh	Humidity alarm differential AHh and ALh	0.0 ÷ 30.0 RH%	1.0
43	Ath	Humidity alarm delay AHh and ALh	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
44	APA	Temperature and Hunidity Alarms delay at power ON	oF/0.01 ÷ 9.59 (h.min) ÷ 99.5 (h.min x 10)	2.00
45	AoA	Alarm delay with door open	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	3.00

46	o.o1	OUT1 function	oF No Function;
			ot Temperature control (Cooling if r.HC = **C**, **CP**, **nr**; Heating if r.HC = **H** o **HP**);
			rh Humidity control (Dehumidification if r.ud = **d**, **nr**; Humidification if r.ud = **u**);
			HE Heating (with r.HC = **nr**);
			hu Humidification (with r.ud = **nr**);
			Au Auxiliary;
			At/-t Acknowledgeable alarm;
			AL/-L Not Acknowledgeable alarm;
			on Output active when the instrument is ON;
			L1 Light
				ot

47	o.o2	OUT2 function		rh
48	o.o3	OUT3 function		Au
49	o.bu	Buzzer function mode	oF Disabled; 1 Active alarms only; 2 Key pressed only; 3 Active alarms and key pressed.	3
50	oFo	Auxiliary output operating mode	oF No function; 1 Manual activation by key or digital input; 2 Independent twin timer; 3 Twin timer enabled only when the temperature control is disabled (when Temp. contr. enabled the output is always ON).	2
51	o.tn	ON time relating to the auxiliary output	oF/0.01 ÷ 9.59 (min.s) ÷ 99.5 (min.s x 10)	oF
52	o.tF	OFF time relating to the auxiliary output	oF/0.01 ÷ 9.59 (min.s o h.min) ÷ 99.5 (min.s o h.min x 10)	oF
53	o.tu	Unità di misura parametro o.tF	H h.min; n min.s.	n
54	t.UF	(U) key operating mode	oF No function; 1 Auxiliary output command; 2 Switch on/off (Stand-by) 3 Start Autotuning; 4 Light ON/OFF (**L1** Output).	oF
55	t.Fb	(▼) key operating mode		oF
56	t.Lo	Keyboard lock function delay	oF/0.01 ÷ 9.59 (min.s) ÷ 30.0 (min.s x 10)	oF
57	t.Ed	(P) key Fast Set Point change procedure; Setp Point visibility	oF None; 1 **SPt**; 2 **SPh**; 3 **SPt** and **SPh**.	3
58	t.PP	Access Password to parameter functions	oF ÷ 999	oF
59	t.Ad	MODBUS address (serial communication)	0 ÷ 255	1

8 PROBLEMS AND MAINTENANCE

8.1 Error messages

Error	Reason	Action
E1	The TRH probe (humidity and temperature) is not connected, in error or measures a value outside the allowed range	Check the correct connection of the probe with the instrument and check the probe works correctly
E2 -E2	The **Pr2** probe may be interrupted (E) or in short circuit (-E), or may measure a value outside the range allowed	
EPr	Internal EEPROM memory error (parameters checksum 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
H it	Maximum temperature alarm in progress
Lot	Minimum temperature alarm in progress
H ih	Maximum humidity alarm in progress
Loh	Minimum humidity alarm in progress
AL	Digital input alarm in progress
oP	Opern Door alarm
At	Autotunig running
AtS	Autotuning Start
AtE	Autotuning End

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's 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:

- 12 V: 3 VA approx.;
- 12... 24 VAC/VDC, 100... 240 VAC: 4 VA approx.;
- with ARS1: 5 VA approx.;

Inputs: 1 input for digital temperature and humidity probe TRH03 1 usable for NTC temperature probe (103AT-2, 10 kΩ @ 25 °C) or alternatively as a digital input for voltage free contacts;

Output/s: up to 3 relay outputs

	EN 61810	EN 60730	UL 60730
Out1 (H) - SPST-NO - 16A - 1HP 250V, 1/2HP 125 VAC	16 (9) A	10 (4) A	12 A Res., 30 LRA, 5 FLA
Out1 (Q) - SPST-NO SSR - 0.1... 2 A/250 VAC	-	-	-
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 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 (EN60730): accessible parts 75°C, support live parts 125°C;

Dimensions: 78 x 35 mm, depth 64 mm

Weight: 115 g approx.;

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

Connections:

- Power supply/Outputs: Screw terminals block or extractable screw terminals block or Faston for 0.2 ÷ 2.5 mm²/AWG 24 ÷ 14 cables;
- Inputs: Screw terminals block or extractable screw terminals block 0.2 ÷ 2.5 mm²/AWG 24 ÷ 14 cables;

Front panel protection degree: IP65 (NEMA 3S) mounted with the optional screw type bracket;

Note: To order the optional screw type bracket, contact your local Ascon Tecnologic representative.

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 or PID mode;
Humidity Control: ON/OFF mode;
Measurement range:

- **TRH**: -40... 80°C/-40... 176°F; 0… 95% RH,
- **NTC**: -50 ÷ 109°C/-58 ÷ 228°F;

Display resolution: 1°/%RH o 0.1°/%RH
(in the range -99.9... 99.9);
Overall input accuracy: **NTC**: ±(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 LV 2014/35/EU (EN 60730-1, EN 60730-2-9);
- Directive EMC 2014/30/EU (EN55011: class B;
  EN61000-4-2: 8 kV air, 4 kV cont.;
  EN61000-4-3:10 V/m;
  EN61000-4-4: 2 kV supply and relay outputs, 1 kV inputs;
  EN61000-4-5: supply 2 kV com. mode, 1 kV\ diff. mode;
  EN61000-4-6: 3 V).

11 HOW TO ORDER

MODEL
Y39H - Instrument with mechanical keyboard

a: POWER SUPPLY
H = 100 ÷ 240 VAC
G = 12 ÷ 24 VAC/VDC
F = 12 VAC/VDC

b: OUT1 OUTPUT
R Relay SPST-NO 16 A-AC1 (for resistive loads)
Q SSR Relay 2 A (for resistive loads)

c: OUT2 OUTPUT
R = Relay SPDT 8A-AC1 (for resistive loads)
- = Not present

d: OUT3 OUTPUT
R = Relay SPST-NO 5A-AC1 (for resistive loads)
- = Not present

e: Buzzer
B = Buzzer
- = Not present

f: Terminals
- = Fixed Screw power terminals (standard);
E = Removable screw power terminals;
N = Removable screw power terminals (the fixed part only).

g: DISPLAY
R = Red
U = Blue

Y39H	-	a	b	c	d	e	f	g	h	i	j	kk	ll

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

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