






Level 1 – Setpoints Adjustment

This level contains the 3 setpoints, **SP 1**, **SP2** and **SP3**. They define the RH and the temperature for the process. The display shows the parameter name alternating with the current value. Set the desired value by pressing the keys  and .

SP 1 <i>Set Point 1</i>	Set point adjustment for control OUTPUT 1. The setting range is limited by the values in SL 1 and SH 1 (this parameter belong to the Configuration level).
SP2 <i>Set Point 2</i>	Set point adjustment for control OUTPUT 2. The setting range is limited by the values in SL2 and SH2 .
SP3 <i>Set Point 3</i>	Set point adjustment for control OUTPUT 3. The setting range is limited by the values in SL 3 and SH3 .

Level 2 – Configuration Level


Presents a sequence of other parameters that shall be defined by the user. The parameters are shown alternately with the respective values. In order to obtain the desired values, use the keys  and .

rHt <i>RH - Temp</i>	Defines how the variables, relative humidity and temperature, will be displayed: 0 Humidity 1 Temperature 2 Toggles the indications of relative humidity and temperature every 2 seconds. 3 Toggles the indications of relative humidity and temperature every 3 seconds. 4 Toggles the indications of relative humidity and temperature every 4 seconds. 5 Toggles the indications of relative humidity and temperature every 5 seconds. For options 0 and 1 , a fast click on the  key forces the other variable to be displayed for 10 seconds.
Unt <i>Unit</i>	Temperature Unit - Allows the user to choose the measured temperature presentation unit. 0 Temperature in degrees Celsius. 1 Temperature in degrees Fahrenheit
OFH <i>Offset Humidity</i>	Correction value for humidity indication. Allows the user to perform small adjustments on the relative humidity indication, trying to correct measurement errors that appear, for example, in the sensor replacement. Adjustment range: between –10.0 and 10.0 % of RH. Default value: 0.0
OFt <i>Offset temperature</i>	Correction value for Temperature indication. Allows the user to perform small adjustments on the relative temperature indication, trying to correct measurement errors that appear, for example, in the sensor replacement. Adjustment range: between –10.0 and 10.0 % of RH. Default value: 0.0
SL 1 <i>SP Low Limit 1</i>	Lower limit value for SP 1 (minimum value with which SP 1 can be configured). SL 1 must be programmed with a lower value than SH 1 .
SH 1 <i>SP High Limit 1</i>	Upper limit for SP 1 (maximum allowed value for SP 1). SH 1 must be programmed with a value lower than the one configured in SL 1 .
SL2 <i>SP Low Limit 2</i>	Lower limit value for SP2 (minimum value with which SP2 can be configured). SL2 must be programmed with a lower value than SH2 .
SH2 <i>SP High Limit 2</i>	Upper limit for SP2 (maximum allowed value for SP 1). SH2 must be programmed with a value lower than the one in SL2 .
SL3 <i>SP Low Limit 3</i>	Lower limit value for SP3 (minimum value with which SP3 can be configured). SL3 must be programmed with a lower value than SH3 .
SH3 <i>SP High Limit 3</i>	Upper limit for SP3 (maximum allowed value for SP3). SH3 must be programmed with a value lower than the one in SL3 .
AC 1 <i>Action 1</i>	Control action for OUTPUT 1: 0 Reverse: For heating or humidification; 1 Direct: For cooling or dehumidification (*); 2 Low (minimum value) alarm; 3 High (maximum value) alarm; 4 Low alarm with initial blocking; 5 High alarm with initial blocking.

AC2 <i>Action 2</i>	Control OUTPUT 2 and OUTPUT 3 action: 0 Reverse control action (heating or humidification); 1 Direct control action (cooling or dehumidification) (*); 2 Low (minimum value) alarm; 3 High (maximum value) alarm; 4 Low alarm with initial blocking; 5 High alarm with initial blocking; 6 Alarm inside the range; 7 Alarm outside the range; 8 Inside the range alarm with initial blocking; 9 Outside the range alarm with initial blocking; 10 Free Timer (available only for AC3).
AC3 <i>Action 3</i>	The section Working With The Controller describes how these functions work.
Cnt <i>Control</i>	Defines the outputs positioning in relation to the variables. 0 OUTPUT 1 = RH; OUTPUT 2 = RH and OUTPUT 3 = RH 1 OUTPUT 1 = RH; OUTPUT 2 = RH and OUTPUT 3 = Temperature 2 OUTPUT 1 = RH; OUTPUT 2 = Temperature and OUTPUT 3 =RH 3 OUTPUT 1 = RH; OUTPUT 2 = Temperature and OUTPUT 3 =Temperature 4 OUTPUT 1 = Temperature; OUTPUT 2 = RH and OUTPUT 3 = RH 5 OUTPUT 1 = Temperature; OUTPUT 2 = RH and OUTPUT 3 = Temperature 6 OUTPUT 1 = Temperature; OUTPUT 2 = Temperature and OUTPUT 3 = RH 7 OUTPUT 1 = Temperature; OUTPUT 2 = Temperature and OUTPUT 3 = Temperature
HY 1 HY2 HY3 <i>Hysteresis</i>	Control hysteresis: Differential between the point of switching on and off the relay of the output, set up as a control output . Adjustable between 0.1 and 50.0.
dl 1 dl2 dl3 <i>Delay</i>	Time of delay for starting the control. After the controller has been switched on, the output (1, 2 or 3) will only be switched on when the time programmed in this parameter has passed. Used in large refrigeration systems to impede simultaneous routing of compressors upon recovery of power supply interruption. Value in seconds, 0 to 250 s.
(*) OF 1 OF2 OF3 <i>Off time</i>	Level available when AC 1 , AC2 and AC3 set to 1 . Defines the minimum off time for control OUTPUT. Once OUTPUT 1 is turned off, it remains so for at least the time programmed in OF 1 . This parameter is useful in extending compressor life in refrigeration systems. For heating systems, program OF 1 to zero. Value in seconds, 0 to 999 s.
(*) On 1 On2 On3 <i>on time</i>	Level available when AC 1 , AC2 and AC3 set to 1 . Defines the minimum on time for control OUTPUT 1. Once turned on, OUTPUT 1 remains so for at least the time programmed in On 1 . This parameter is intended for refrigeration systems where increased compressor life is desired. For heating systems, program On 1 to zero. Value in seconds, 0 to 999 s.
1t 1 2t 1 <i>Timer T1</i>	Time interval T1 for alarm temporization. Defines the temporization mode and intervals, as shown in Table 1 . Not available when outputs 1 and 2 are configured as direct action. Adjustable from 0 to 1999 seconds.
3t 1 <i>Timer T1</i>	Time interval T1 for temporization. Defines the temporization mode and intervals for OUTPUT 3 (see Table 1). Not available when OUTPUT 3 is configured as direct action. Adjustable from 0 to 1999 seconds. If AC3 is configured as Free Timer , the unit of time is given in minutes. Timer output activation duration (<i>timer</i>).
1t2 2t2 <i>Timer T2</i>	Time interval T2 for alarm temporization. Defines the temporization mode and intervals, as shown in Table 1 . Not available when outputs 1 and 2 are configured as direct action. Adjustable from 0 to 1999 seconds.
3t2 <i>Timer T2</i>	Time interval T2 for temporization. Defines the temporization mode and intervals, as shown in Table 1 . Not available when OUTPUT 3 is configured as direct action. Adjustable from 0 to 1999 seconds. If AC3 is configured as Free Timer , the unit of time is given in minutes. Interval between the timer output activation operations (<i>timer</i>).
Adr <i>Address</i>	The controllers with incorporated serial communication interface RS485 present the parameter Adr in their programming level. In this parameter, the user defines a communication address for each network element. The defined address shall be between 1 and 247.

Note 3: The correct use of the delays **dl 1** and **dl2** contributes to a smooth start-up following a energy fail; the compressors will be turned on in sequence, according to the programmed temporization, reducing the energy demand after power-up.

Level 3 – Calibration Level


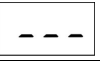

The controller is factory adjusted and calibrated using traceable standards. The following parameters should be accessed only by experienced personnel. To enter this cycle, the  key must be kept pressed for 3 seconds.

In case of accidental access, the keys  and  shall not be pressed; Just pass through all parameters, till the controller goes back to the measuring screen.

PR5	Password - Enter the correct password to unlock write operations on the parameters in the following levels.
CrH	RH Calibration low . Offset calibration for RH.
CtP	T Calibration low . Offset calibration for Temperature.
PrL	Protection - Defines the levels of parameters that will be password protected.
PAC	Password Change - Allows changing the current password to a new one. Values from 1 to 999 are allowed.
Sn2	Shows the first two digits of the controller electronic serial number.
Sn 1	Shows the three central digits of the controller electronic serial number.
Sn0	Shows the three last digits of the controller electronic serial number.

ERROR MESSAGES

The controller shows messages on the display that correspond to the problems related to the humidity measurement. The control output relay is immediately switched off, when they are shown.

	Indicates that: the measurement exceeded the upper level of the sensor range. Possible sensor problem.
	Indicates that: the measurement exceeded the lower level of the sensor range. Possible sensor problem.
	Sensor problem. Revise sensor wiring. If problem persists, contact the factory.

CONFIGURATION PROTECTION

A protection system to avoid unwanted changes to the controller parameters is implemented. The level of protection can be selected from partial to full. The following parameters are part of the protection system:

- PR5:** When this parameter is presented, the correct **password** must be entered to allow changes of parameters in the following levels.
- PrL:** Defines the level of parameters that will be password protected:
1 - Only **calibration** level is protected (factory configuration);
2 - **Calibration** and **Configuration** levels are protected;
3 - All levels are protected - **calibration**, **configuration** and **setpoints**.
- PAC** Parameter for definition of a new password. Since it is located in the calibration level, can only be changed by a user that knows the current password. Valid passwords are in the range 1 to 999.

CONFIGURATION PROTECTION USAGE

The **PR5** parameter is displayed before entering a protected level. If the correct password is entered, parameters in all following levels can be changed. If wrong or no password is entered, parameters in the following levels will be read only.

Important notes:

- After **five** consecutive attempts to enter a wrong password, new tentative will be blocked for the next 10 minutes. If the current valid password is unknown, the **master password** can be used **only** to define a new password for the controller.
- The factory default password is 111.

MASTER PASSWORD

The master password allows user to define a new password for the controller, even if the current password is unknown. The master password is based in the serial number of the controller, and calculated as following:

[1] + [higher digit of SN2] + [higher digit of SN1] + [higher digit of SN0]

For example the master password for the device with serial number 987123465 is: **1 9 3 6**

As follows: **1 + Sn2= 987; Sn 1= 123; Sn0= 465 = 1 + 9 + 3 + 6**

How to use the master password:

- Enter the master password value at **PR5** prompt.
- Go to **PAC** parameter and enter the new password, which must not be zero (**0**).
- Now you can use this new password to access all controller parameters with modify rights.

WARRANTY

Warranty conditions are available on our website www.novusautomation.com/warranty.