GFX50

Residential Humidistat

User manual

Revision 1.1

READ AND SAVE
THESE INSTRUCTIONS

IMPORTANT

General Filter, Inc. (GFI) bases the development of its products on decades of experience in HVAC, on the continuous investments in techno-loical innovations to products, procedures and strict quality processes with in-circuit and functional testing on 100% of its products, and on the most innovative production technoloy available on the market. GFI and its subsidiaries nonetheless cannot guarantee that all the aspects of the product and the software included with the product respond to the requirements of the final application, despite the product being developed according to start-of-the-art techniques. The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment.
The GFI product is a state-of-the-art product, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from www.GeneralFilters.com.
Each GFI product, in relation to its advanced level o f technology, requires setup / configuration / programming / commissioning to be able to operate in the best possible way for the specific application. The failure to complete such operations, which are required/indicated in the user manual, may cause the final product to malfunction; GFI accepts no liability in such cases.
Only qualified personnel may install or carry out technical service on the product.
The customer must only use the product in the manner described in the documentation relating to the product.
In addition to observing any further warnings described in this manual, the following warnings must be heeded for all GFI products:

- prevent the electronic circuits from getting wet. Rain, humidity and all types of liquids or condensate contain corrosive minerals that may damage the electronic circuits. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not install the device in particularly hot environments. Too high temperatures may reduce the life of electronic devices, damage them and deform or melt the plastic parts. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not attempt to open the device in any way other than described in the manual;
- do not drop, hit or shake the device, as the internal circuits and mechanisms may be irreparably damaged;
- do not use corrosive chemicals, solvents or aggressive detergents to clean the device;
- do not use the product for applications other than those specified in the technical manual.

All of the above suggestions likewise apply to the controllers, serial boards, programming keys or any other product in the GFI product portfolio. GFI adopts a policy of continual development. Consequently, GFI reserves the right to make changes and improvements to any product described in this document without prior warning.

The technical specifications shown in the manual may be changed without prior warning.

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DISPOSAL
This product is made of metallic and plastic parts. All parts must be disposed of according to the local standards on waste disposal.

Contents

1. INTRODUCTION

The GFX50 Humidistat is a programable control for GeneralAire Elite Steam residential humidifiers. While the GFX50 may be used for control of other humidification or de-humidification appliances, its operating modes are designed for modulating control of the Elite Steam electrode steam humidifiers.

When properly installed and configured, the GFX50 will use information from the environment including Relative Humidity, Outdoor Temperature, and Home Construction to determine the Ideal Humidity and the Optimum Humidifier Output.

The GFX50 includes Indoor and Outdoor Temperature Sensors, Indoor Humidity Sensor and Control Unit.

2. INSTALLATION

2.1 Assembly

Open the product by detaching the front from the mounting base, as shown in Fig. 2.a:

- Remove the locking tab and screw from the the base underside.
- Slide the plastic tab back as shown to remove it from the base.
- Press the tab on the front with flat-head screwdriver into the slit in the middle on the bottom of the case while lifting the front panel upwards.

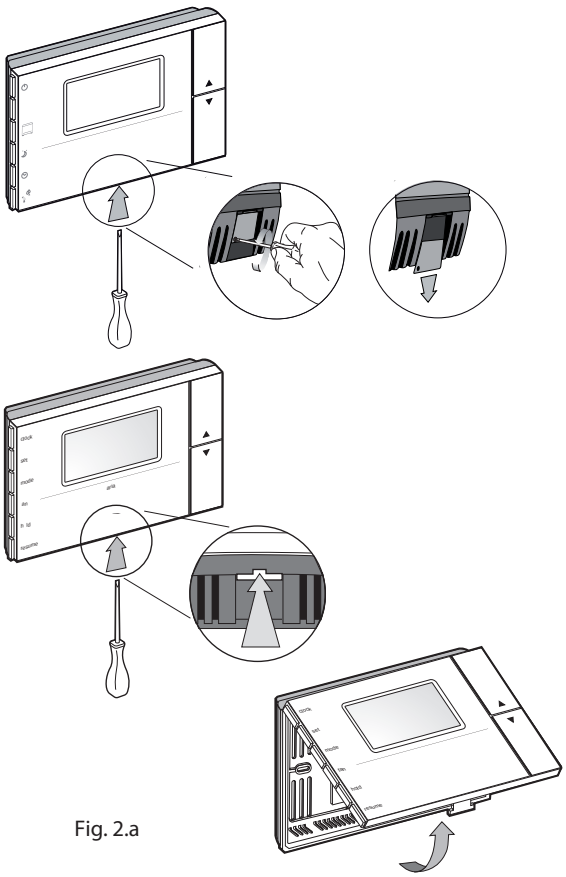

Fig. 2.a

- Disconnect the flat cable from the front panel.
- Fasten the humidistat base to the wall using the screws supplied.
- Access the terminal block by squeezing the clips on the terminal cover.
- Make the necessary connections and run the wires through the hole in the middle of the base. Separate the sensor wires from the control wires. The diagrams are shown in Section 2.3.

Important: Make sure all connections are complete before reconnecting the flat cable and front part of the humidistat.

Note: For the purposes of electrical safety (EN60730-1), once the controller has been installed, replace the plastic locking tab in the humidistat base.

Accessories and dipswitches (Fig. 2.b)

Connector	Function
J1	- Supervisor serial connection using code IROPZ48500. - Key connector for copying the parameters. The serial connection, if used, must be momentarily disconnected..
J2	Not Used.
FLAT Front-rear	The flat front/rear connection cable must be reconnected in the position defined by the plastic part to ensure correct polarity
Dipswitches	For configuring humidification/dehumidification modes

Tab. 2.a

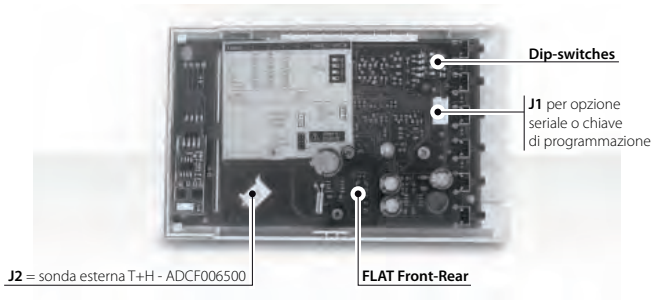

Fig. 2.b

2.2 Dimensions

For installation, see the drilling template included in the packaging.

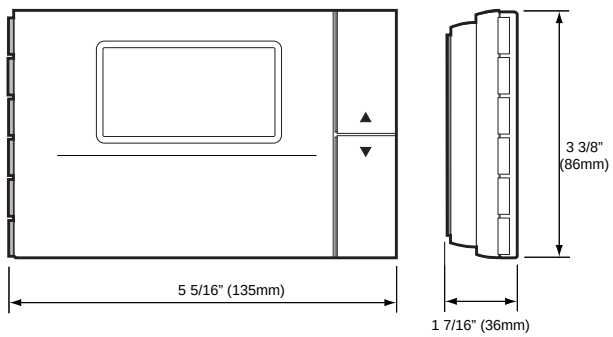

Fig. 2.c

2.3 Electrical connections:

2.3.1 Connect the GFX50 to Elite Steam for Modulating Operation
Connect Elite Steam terminals 24V and GND to GFX50 terminals GO 5 and G 6 respectivly. Do not reverse these connections. Connect GFX50 terminal A OUT 7 to Elite Steam terminal IN. See Fig.2.a.
Note:

1. Modulating Operation requires Elite Steam signal type be changed, See Elite Steam Manual.
2. Verify Dip Switch Settings per Figure.

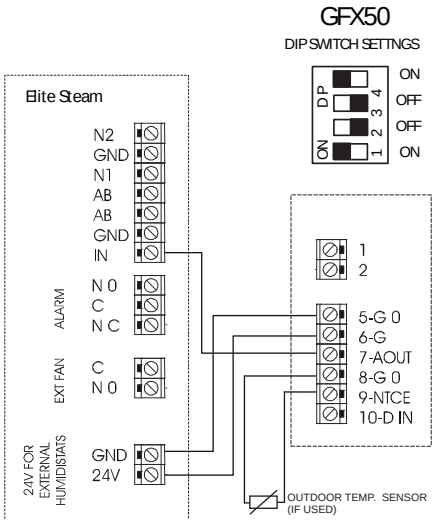

Fig. 2.a

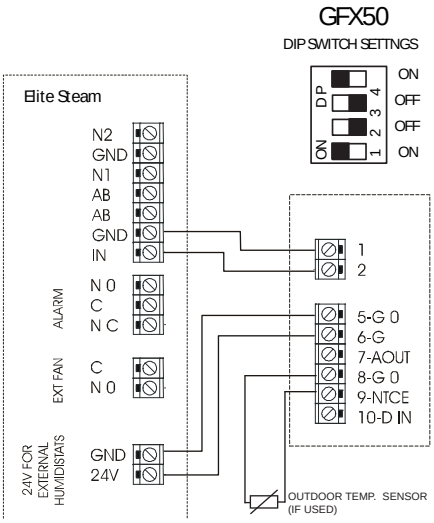

Fig. 2.b

2.3.2 Connect the GFX50 to Elite Steam for ON-OFF Operation
Connect Elite Steam terminals 24V and GND to GFX50 terminals GO 5 and G 6 respectivly. Do not reverse these connections. Connect GFX50 terminal 1 AND 2 to Elite Steam terminal GND and IN respectivly. Do not reverse these connectioins. See Fig.2.b.
Note:

1. Elite Steam Humidifiers are configured for ON-OFF operation from the factory. See Elite Steam Manual.
2. Verify Dip Switch Settings per Figure.

2.3.3 Connect the GFX50 to1137 and 1000 Humidifiers
Connect Red humidifier leads to GFX50 terminals GO 5 and G 6. Connect Yellow humidifier leads to GFX50 terminal 1 and 2.See Fig.3.x.

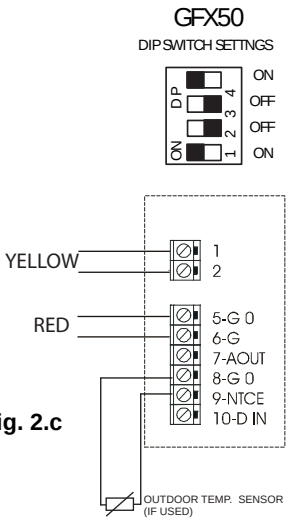

Fig. 2.c

2.3.4 Placement of Remote Outdoor Temperature Sensor

- Outdoor temperature sensor may not be mounted on the South side of the house or in direct sunlight.
- Outdoor temperature sensor may not be located closer than 4 feet to exhaust vents, dryer vents, etc.
- If outdoor temperature sensor is mounted in fresh air intake duct, make sure the probe is no further than 1 foot from outside wall.
- Make sure wiring for outdoor temperature sensor is not close to other wires particularly high voltage.
- Outdoor temperature sensor must be at least 6" above expected snow line.
- Maximum conductor length of the Outdoor Temperature Sensor is 90 feet (30M).

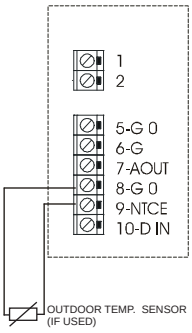

Fig. 2.d

3. USER INTERFACE AND MODES

3.1 Display and buttons

The figures below show the display and the representation of the corresponding symbols

side programming buttons | LCD display | immediately change the current set point

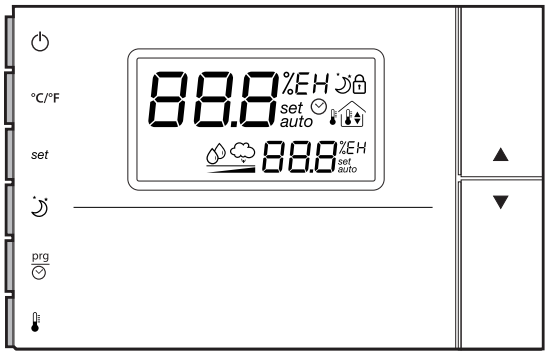

Fig. 3.a

Description of the display

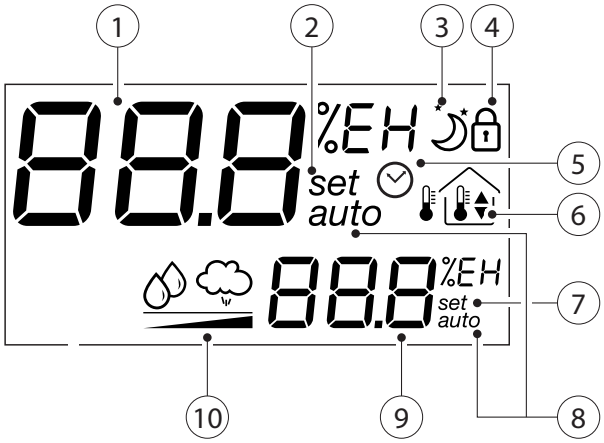

Fig. 3b

Key:

1. LARGE field - Displays the temperature/humidity;
2. Mode for setting the active value on the large display;
3. Night mode symbol. If off = daytime mode;
4. Lock mode. The parameter is not accessible;
5. Active time bands;
6. Outside/inside/maximum/minimum temperature symbol;
7. Mode for setting the active value on the small display;
8. Auto operating mode;
9. SMALL field - Displays the temperature/humidity;
10. Dehum. ( ) /humid. ( ) operation. When the ramp symbol is on the corresponding mode is active;

3.2 Description of the buttons

Button	Meaning
	On/Off. If the remote ON/OFF digital input is connected, the function of the button may be disabled..
°C/°F	Selects the temperature display mode, degrees Celsius or Fahrenheit. Whenever pressed switches the temperature units..
set	Used to display and where necessary change, using the UP and DOWN buttons, the set point displayed in the SMALL field. If held for more than 5 sec accesses the parameters menu. To scroll the various parameters use UP and DOWN. To edit hem press the SET button a second time and to exit the parameters menu press the PRG button. Access to the parameters is protected by password if parameter PS is enabled.
	Change mode manually: activates the opposite function (and the corresponding set point) to the current (night if day or day if night), for the set time. To change or reset the timer use the UP and DOWN buttons to increase or decrease the time. Press a second time to exit and return to the main menu. If sleep mode is already active, pressing the button shows the time remaining on the timer. E.g..: if in Night mode (moon symbol on) from time band, pressing this button activates daytime mode (moon symbol off) for the set time.
prg	Accesses the menu for setting the clock, the time bands, and the default value of the timer. When first pressed displays the current time (RTC); to display the other parameters, use the UP and DOWN arrows. To set a new value, press SET when displaying the desired parameter and change the value using the UP and DOWN buttons. Press a second time to exit and return to the main menu.
	Accesses the menu for displaying the temperature: current, maximum and minimum outside (from instrument power on), inside and outside. To display the various temperatures, press the button repeatedly. Their meaning is displayed in the box with the home symbol. Also displays the value of the analogue output when "Out" is shown in the SMALL field
▲	From the main menu increases the value of the set point displayed in the LARGE field. In the other menus displays the variables or the parameters, or alternatively sets the value after having pressed SET.
▼	From the main menu decreases the value of the set point displayed in the LARGE field. In the other menus displays the variables or the parameters, or alternatively sets the value after having pressed SET

Tab. 3.a

The values displayed in the LARGE and SMALL fields (Fig 3.b.) depend on the setting of parameter dyS as shown in the following table:

dyS	LARGE FIELD	SMALL FIELD
1	humidity	humidity set point
2	humidity set point	humidity
3	humidity set point	
4	humidity	

4. CONFIGURATIONS

4.1 Setting the Dip Switches

Important: Setting the dip switches incorrectly will cause the the humidistat to malfunction.

Before closing cover, the mode must be selected using the dip switches.

Dip Switch Settings

Dip1	Dip2	Dip3	Dip4	Tab. 4.a
ON	OFF	OFF	ON	Humidifier Control.
ON	OFF	OFF	OFF	De-Humidifier Control.

4.2 Setting Parameters

The parameters for all operating modes feature a default value. These values can be restored by running the "Factory set" operation. See the table of parameters for details of the default values and settings.

- **SET POINT:** depending on the operating mode, different set points are used. To set these, access (SET button – 5 seconds) the mode for setting the parameters and set the corresponding values. For the current mode only, the value can be accessed directly using UP, DOWN or set, UP, DOWN (for the SMALL field). Once having displayed the desired parameter using the UP/ DOWN buttons, press SET and the parameter starts flashing. Edit the value using the UP/DOWN buttons and then press SET. To exit the menu, press the PRG button again

- **Clock, TIME BANDS Prg/** (clock)**:** Press the corresponding button to display and if necessary set the default duration of the change mode timer, display or set the RTC clock and set the Day and Night time bands.

Initially at least the following parameters need to be checked/set:

- set point for humidity control
  Humidification set point (def. 30.0 % RH)
  Dehumidification set point (def. 70.0 % RH)

rtC	clock hh:mm	
SLP	manual changeover duration	def. 8 hours
dAy	start day band	def. 08:00
nIt	start night band	def. 20:00

To disable the time bands function, set parameter rtC off

- Select parameter rtC using PRG/CLOCK and set the value using the DOWN button :
- When reaching 00:00 using the DOWN button the function will be off.

When parameter rtC is set to off the operating mode is always daytime, and consequently only the daytime set points are used, the night settings are only used when the NIGHT button is pressed, manually changing mode.
The same is true for models without the RTC function.
When the time bands are set, the CLOCK symbol is shown on the display.

- **PARAMETERS:** check/set the other parameters (dIF, dS1,...) based on the mode used.

Note: The values of the parameters are specific for each individual operating mode (T, T2, T2A,...), the user can therefore define a different set of parameters for each of the 8 control modes. The specific set of parameters will be loaded by the GFX50 when changing the configuration of the dipswitches.

4.3 AUTO humidity control

In addition to the modes featured by the control algorithms, the humidity can be controlled automatically, based on the reading of the outside temperature sensor. The aim of this type of control is to simplify the setting of the GFX50, changing the humidity control according to the outside environmental conditions and therefore minimize the discomfort of the user when moving into/out of the air-conditioned environment.
This operating mode is selected by setting parameter AUT.

According to the level set using the up/down buttons, with a value from 1 to 7, a different humidity set point trend is defined.
To disable this operating mode, in the parameters menu set the value of Aut = 0.
AUTO mode for the humidification control is only possible if the outside temperature sensor is installed.

Note: If AUTO humidity mode is enabled, the humidity setpoint is reduced to 10% when the outdoor temperature is greater than 50° F. Disable AUTO for operation in warm outdoor temperatures.

code	description of the parameter	range	def.	UOM
AUt	Humidity set point level compensated according to the outside temperature If humidity control is featured, the ambient humidity is controlled with an automatic set point, defined from 1H to 7H using the buttons, as specified in Table 4.g. If set to OFF, the mode is disabled. Setting one of the levels shown in the table, the controller independently sets a humidity set point in relation to the outside temperature measurement.	OFF 1H to 7H	OFF	-

Table: humidity set point according to the setting of AUT (outside temperature)

Level Level	Below: 9 °F Below: -23 °C	-9 °F to 1 °F -23 °C to -17 °C	1 °F to 10 °F -17 °C to -12 °C	10 °F to 21 ° -12 °C to -6 °C	21 °F to 30 °F -6 °C to -1 °C	30°F to 39° -1 °C to 4 °C	39°F to 50 °F 4 °C to 10 °C	Above: 50 °F Above: 10 °C
1	10%	10%	10%	10%	15%	20%	25%	25%
2	10%	10%	10%	15%	20%	25%	30%	30%
3	10%	10%	15%	20%	25%	30%	35%	35%
4	10%	15%	20%	25%	30%	35%	40%	40%
5	10%	20%	25%	30%	35%	40%	45%	45%
6	10%	25%	30%	35%	40%	45%	45%	45%
7	10%	30%	35%	40%	45%	45%	45%	45%

Tab. 4.b

4.4 Sensor calibration

To make up for any errors due to the length of the cables or the sensors connected, the controller features two parameters for calibrating the values read by the sensors.

The following parameters are used:

code	description of the parameter	range	def.	UOM
CAL+ Int	Inside temperature calibration, digital sensor or NTC Within a maximum of ± 10 °C	-10 to 10	0.0	°C
CAL+ ESt	Outside temperature calibration, NTC sensor Within a maximum of ± 10 °C	-10 to 10	0.0	°C
CAL+HUn	Digital humidity sensor calibration. Within a maximum of ± 15% rH	-15 to 15	0.0	% rH

Tab. 4.c

4.5 Additional functions

The controller, as well as the control algorithms for the various types of applications (air-conditioners, boilers, heat pumps, condensing units,...), features a series of additional functions, as described below.

Change night/day mode manually (NIGHT)

This activates the opposite function to the current (night if day or day if night), for the set time.
Pressing the NIGHT button once accesses the timer menu and displays the duration.
To change the duration of the temporary mode use the UP/DOWN buttons.
To change the value of the timer permanently, access the Prg menu and set parameter SLP. To set the current timer to zero and return the instrument to the original mode, press the NIGHT button, the remaining time is displayed, then press DOWN until reaching the value 0. The instrument, after having briefly displayed the message OFF SLP, automatically returns to the main menu. Once having set the timer, pressing the NIGHT button displays the time remaining on the timer. This value can be changed at any time.
To exit the menu press the NIGHT button again.

5. FUNCTIONS

This section describes the humidity control modes available. The control modes are based on parameters divided into two levels:

- **Level 1, basic:** main settings, always required;
- **Level 2, advanced:** used to customize the features of the controller.

Important note: Some parameters included in the advanced level, are forced to take on default values in the basic level or are linked to other parameters in the basic level. This especially applies to the control differentials. In each operating mode, the links between the various basic and avanced levels are specified.

- if level 1 is active, the level 2 parameters are not used but rather replaced by the default values or by the link value with the level 1 parameters; the supervisor can read and set the level 2 parameters that are however not effectively used for the control functions.
- the level 2 parameters are effectively used when level 2 is activated.

5.1 (H) humidity control

This type of control is used to send a start signal to a humidifier or dehumidifier. The modulating output can only be used for humidification control. Examples of using modulating output:

- for proportional humidity control of GeneralAire Elite Steam humidifiers
- as an additional step to the relay for humidity control.

Dipswitch configuration:
dip1: ON
dip2: OFF
dip3: OFF
dip4 = ON for humidification
dip4 = OFF for dehumidification

LE=1

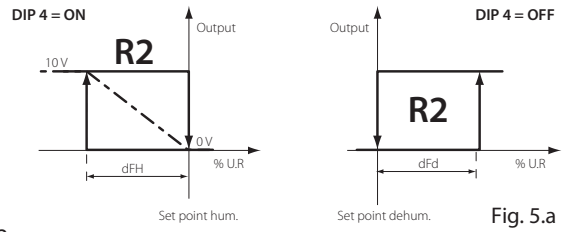

Fig. 5.a

LE=2

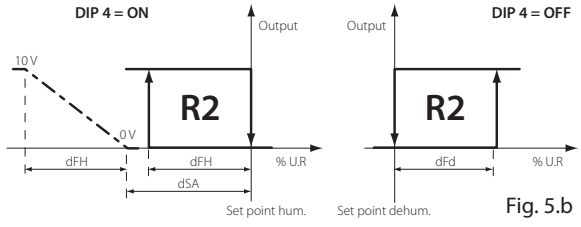

Fig. 5.b

Parameters involved:

Code	Description	Default	LE	Value or link if LE = 1
	humidification set point	50.0 % rH	1	-
	dehumidification set point	70.0 % rH	1	-
dFH	humidification differential	5.0 % rH	1	-
dFd	dehumidification differential	5.0 % rH	1	-
dSA	analogue output offset	0.0 % rH	2	=0

Tab. 5.a

6. TABLE OF PARAMETERS

The parameters available depend on the level set (LE = 1 or 2).
NOTE: There are many other parameters available for use in other versions of this control. For purposes of humidification/dehumidification they may be ignored.

code	parameter	range	default	UOM	note
dSA	Analogue output offset from to the set point This value is added to or subtracted from to the set point according to the operating mode, cooling or heating.	-10 to 10	0.0	°C/ % rH	
	Humidification set point	10 to 70	50.0	% rH	
	Dehumidification set point	10 to 70	70.0	% rH	
dFH	Humidity differential for the activation of the analogue output and the relay.	1 to 20	5.0	% rH	
dFd	Dehumidification differential for the activation of the relay.	1 to 20	5.0	% rH	
SFH	Parameter to define the humidification/dehumidification status in day and night mode Activates or deactivates humidification or dehumidification control (based on DIP 4) with the time bands. The parameter can have the following three values 0 - Time bands disabled. The humidification/dehumidification control is always active, if featured, and is configured in relation to dip4 1 - Time bands enabled: When switching to the daytime band, humidification/dehumidification control (depends on dip4) is activated. When switching to the night band, humidification/dehumidification control (depends on dip4) is deactivated. 2 - Time bands enabled: When switching to the daytime band, humidification/dehumidification control (depends on dip4) is deactivated. When switching to the night band, humidification/dehumidification control (depends on dip4) is activated.	0 to 2	0	-	
AUt	Humidity set point automatically compensated by the outside temperature If humidity control is featured, the ambient humidity is controlled with an automatic set point, defined from 1H to 7H using the buttons, as specified in the corresponding table (see page 15). If set to OFF the mode is disabled. Setting one of the levels in the table, the controller independently sets a humidity set point in relation to the outside temperature.	OFF 1H to 7H	OFF	-	
CAL+ Int	Inside temperature calibration, digital sensor or NTC Within a maximum of ± 10 °C	-10 to 10	0.0	°C	
CAL+ ESt	Outside temperature calibration, NTC sensor Within a maximum of ± 10 °C	-10 to 10	0.0	°C	
CAL+HUn	Digital humidity sensor calibration. Within a maximum of ± 15% rH	-15 to 15	0.0	% rH	
LE	Parameter access level Level of access the control parameters for the active mode: **Level 1:** basic access, only the essential parameters for correct operation. **Level 2:** advanced access, used to set all the parameters for the selected control mode.	1, 2	1	-	
Unt	Temperature display mode Sets the temperature display mode, in degrees Fahrenheit or Centigrade. Unlike direct selection using the button, if changing the temperature display mode using parameter Unt, this becomes the default display mode when switching the instrument on.	°C, °F	°C	-	

7. ALARMS AND SIGNALS

7.1 Table of alarms

Note: When the value is not shown in the SMALL or LARGE field, three dashes "---" are displayed.

code on display	description	reset	effect
EE	system/memory error	manual	stops all outputs
Eth	temperature+humidity sensor fault	automatic	stops all outputs and disables the calculation of the dewpoint
E1	built-in NTC temperature sensor fault	automatic	stops all outputs
E2	remote temperature sensor fault	automatic	stops compensation if active, and control on average if enabled
Ert	RTC alarm	automatic	-
ALE	external alarm from digital input	automatic	signal-only alarm from external contact (humidifier)

Tab. 7.a

8. TECHNICAL SPECIFICATIONS

8.1 Technical specifications

Power supply	24 Vac +10 to -15%, 50/60Hz, 1 VA 22 to 35 Vdc, 0.5W Class 2 safety power supply Min. cable cross-section 0.5 mm^2. Power supply compatible with compactSteam (G – G0)
Operating temperature	0 to 60°C, 32 to 140°F, 10 to 90% rH not-condensing
Storage temperature	-20 to 70°C, -4 to 140°F, 10 to 90% rH not-condensing
Precision of inside temperature measurement	±1°C from 0 to 60 °C, ±2°F from 32 to 140 °F
Precision of outside temperature measurement	± 1.5°C from 0 to 40°C ± 2.0°C from -40 to 0 and 40 to 80 °C ± 3°F from 32 to 104°F ± 4°F from -40 to 32and 104 to 176 °F
0 to 10 V analogue output, not isolated, for proportional control	precision ±5% max load 5 kΩ, max current 2 mA
Relay approval	EN60730-1: NO 1(1)A 250 Vac cos = 0.4, 100,000 cycles UL-873: NO 1A resistive 24 Vac, 30 Vdc, 100,000 cycles PILOT DUTY: 24 Vac, peak 15 A, continuous 1 A, 30,000 cycles
Precision of humidity measurement (in models where featured) range 10 to 90%%	± 3% rH at 25°C , 77 °F ± 5% rH 0 to 60°C, 32 to 140°F
Dimensions (mm):	135x86x36mm

Tab. 5.a

8.2 Wiring

Digital input	Non-isolated version: direct connection of the voltage-free contact; contact closing current: 3 to 5 mA. Isolated version: with external power supply to 24 Vac contact: class 2 safety external power supply separate from the 24 Vac power supply to the instrument
Outside temperature sensor connection with standard sensor (10 K 25 °C B=3435):	Maximum length: 30 m, min. cable cross-section 0.5 mm^2.
Digital input connection	Maximum length 10 m, min. cable cross-section 0.5 mm^2.
Analogue output connection	Maximum length 10 m, min. cable cross-section 0.5 mm^2.
Relay output connections:	Maximum length 30 m, cable cross-section from 1.5 to 2.5 mm^2, class 2 reinforced insulation from the instrument. Basic insulation between the relays.
UL specifications for connections:	Use copper wires approved for a temperature of 75 C. Minimum cross-section AWG 22-14 rigid or flexible. To tighten the terminals, apply a torque of 7 Lb/In for the black terminals (SAURO) To use the instrument in compliance with UL-873, a load with a maximum voltage 24 Vac, class 2, can be connected to the relay output.

Tab. 5.b

Warning: All the connections, except for the relays, must be connected to very low voltage circuits with reinforced insulation.

Note

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