



Micro-STAT®

ELECTRONIC HUMIDISTAT: H270



- ONE OR TWO STAGES
- HUMIDITY SUPPLY HIGH LIMIT
- OUTDOOR TEMPERATURE RESET

DESCRIPTION

The H270 series low voltage, microcomputer-based PI (proportional and integral) humidistats are designed for accurate humidification and/or dehumidification control in commercial applications such as: hospitals, schools, office buildings, retail stores, museums, computer rooms, etc.

The H270 series is available with one or two outputs for maximum flexibility. Outputs can be of the following type: proportional, on/off, and pulse width modulation (PWM). Two additional inputs are provided in order to perform unique functions: humidity setpoint reset based on outdoor air temperature and proportional high limit override. The former function minimizes condensation on window surfaces during cold outdoor temperatures by automatically lowering the humidity setpoint as the outdoor temperature drops. The latter function improves accuracy and safety by throttling back the humidifier control output if the humidity level reaches unacceptably high levels.

There are many different types of mounting configurations available. Sensing options include remote duct and room as well as integral room and duct. Setpoint adjustment can be either concealed or exposed, adding even more versatility to the product. Exposed models feature internally selectable minimum and maximum setpoint knob stops.

In order to facilitate periodic recalibration, the H270 series contains a unique autocal key, which permits

instant recalibration (see dimension drawing on page 5 for location).

Each humidistat is computer calibrated and factory programmed with default parameters. All control parameters (such as proportional band, stage differential, etc.) may be changed in the field with the H263 programming tool without having to remove the thermostat cover. The H263 also doubles as a diagnostic tool and indicates the status of all the inputs and outputs, and will reduce troubleshooting time by quickly identifying the specific problem.



Fig.1 Wall mounted humidistat

Features		Benefits
• Microcomputer-based design with PI algorithm	⇒	Exceptional accuracy
• One or two outputs	⇒	Controls humidification and dehumidification equipment
• On/off and/or proportional outputs	⇒	Greater flexibility
• Direct or reverse acting outputs	⇒	Controls humidification and dehumidification equipment
• Integrated and remote sensing	⇒	Larger choice of mounting options
• Autocal button	⇒	Permits instant recalibration
• Concealed or exposed set point	⇒	Can be used in a large variety of environments
• Output signal to digital indicating devices	⇒	Increases functionality of product
• Optional H263 diagnostic tool with digital display	⇒	Simplifies troubleshooting
• Sensor failure protection	⇒	Prevent water damage
• Humidity setpoint reset based on outdoor temp.	⇒	Prevents window condensation in colder climates
• Proportional high limit override	⇒	Prevents costly damage due to over-humidification
• CE approved	⇒	Can be sold in European markets

TABLE 1: ORDER CODE

H270 - **A-B** - **C-D** - **E-F** **G-H**

A Output no. 1 (controlled device)	
1	ON/OFF (15 min. time based)
4	(PWM) 24 VAC
5	(PWM) 5 VDC
6	Analog 0-10 Volts DC

B Output no. 2 (controlled device)	
0	Not installed
1	ON/OFF (15 min. time based)
4	(PWM) 24 Volts AC
5	(PWM) 5 Volts DC
6	Analog 0-10 Volts DC
8	Signal transmitter (0-10 VDC) (1V= 10% , 9V-90%)
9	Signal transmitter (0-5 VDC) (0.5V= 10% ; 4.5 V=90%)

C Output no. 1 and 2 control mode	
1	Humidify
2	Dehumidify
3	Humidify (no. 1) and dehumidify (no. 2)
4	Dehumidify (no. 1) and humidify (no. 2)

D Main sensor location	Sensor
0	None
1	Inside humidistat (Local)
2	Duct mount (stat on duct)
3	Duct mount (stat on wall)
4	Remote wall mount

E Setpoint adjustment	
1	User adjustable
2	Blind cover

F Future option	
0	Unused

G Duct humidity supply high limit	
0	Without sensor
3	With H71 duct mounted humidity sensor

H Outdoor temperature reset input	
0	Without sensor
1	With S71 duct mounted outdoor temp. sensor

Example: H270 - 61 - 32 - 10 - 31

One "SCR" 0 to 10 volts humidify output and one relay dehumidify output. Humidistat and sensor are duct mount. Setpoint is user adjustable. A remote duct mounted high limit is installed in the supply. An outdoor temperature sensor is installed to reset the humidity setpoint.

◆ Resolution: 0.5 % for retransmit only

■ See sensor specifications for dimensions of sensors

Note: the complete order code includes the sensor that will be shipped with the humidistat.

WIRING

2 ON/OFF OUTPUTS

Single transformer

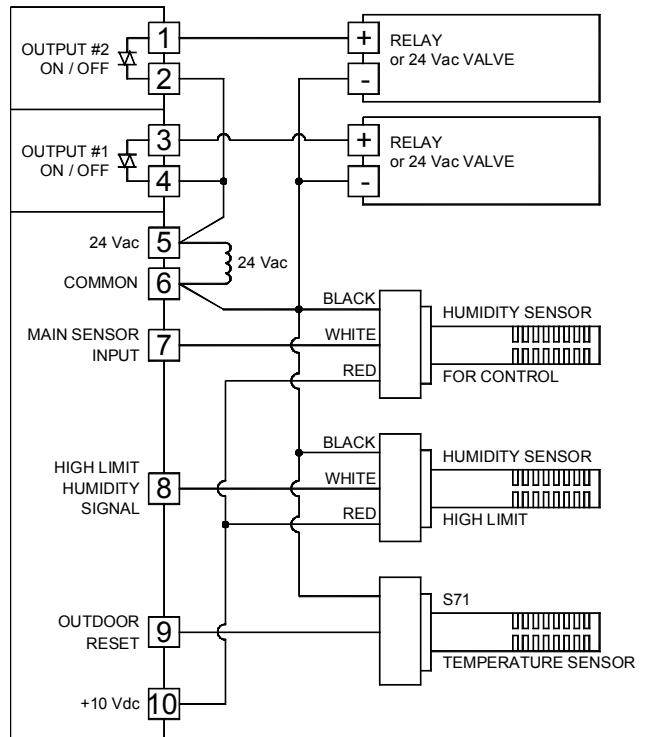


Fig.2: Wiring diagram with single transformer

Multiple transformers

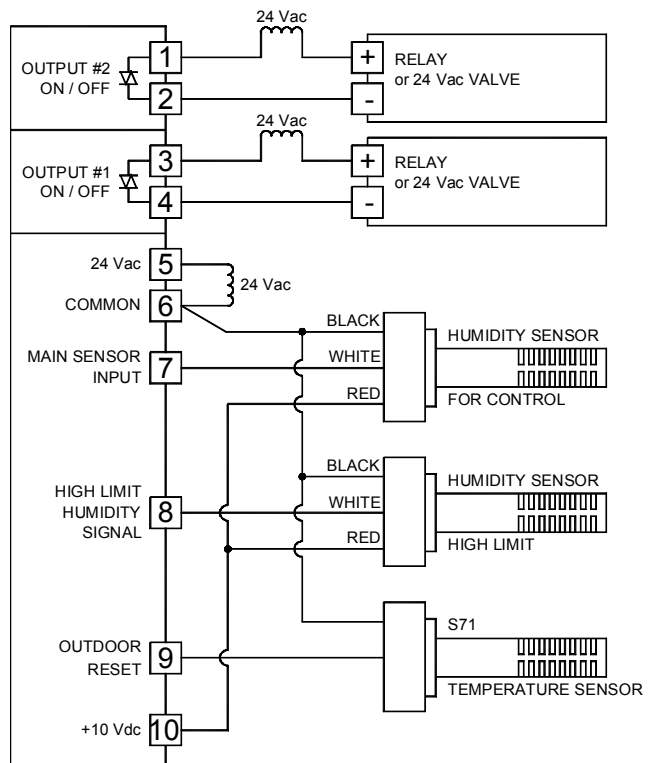


Fig.3: Wiring diagram with multiple transformers

Note: both of the above wiring diagrams show how to wire output of type 1, 2, 3 and 4 (switched 24 vac). For outputs of type 5 and 6 (vdc out) refer to wiring diagrams 3 and 4 on next page.

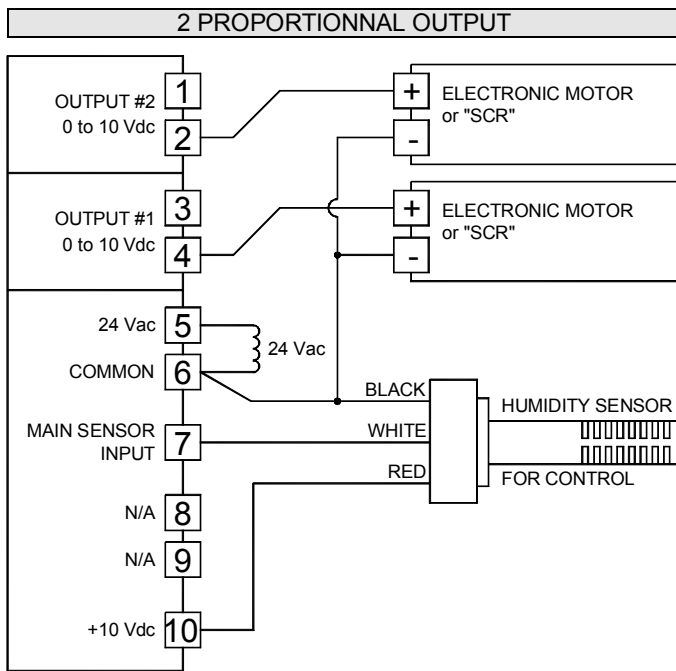


Fig.4: Wiring diagram with two analog outputs

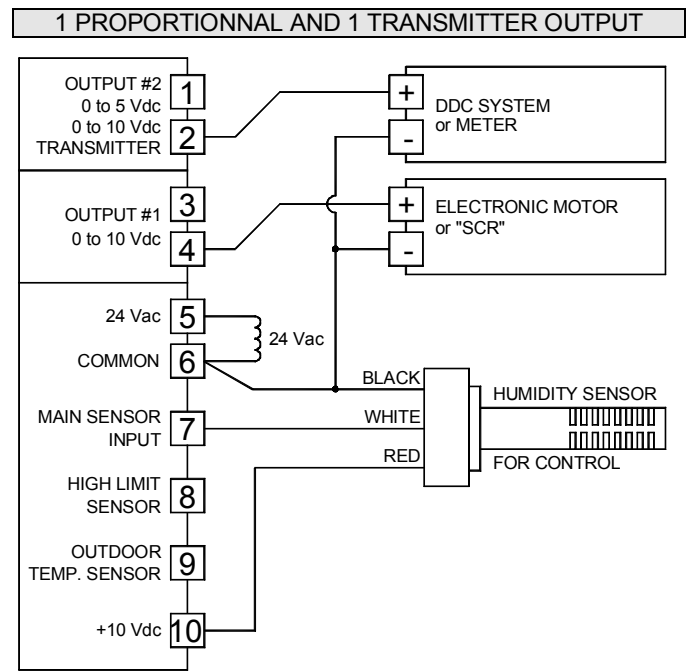


Fig.5: Wiring diagram with one analog and one transmitter output

APPLICATION EXAMPLE:

Steam humidification system controlled by a 0 to 10 Vdc valve wired to output #1. Remote humidity display using 0 to 5 Vdc signal is wired to output #2. The humidity sensor is located in the return air duct. A proportional high limit humidity sensor is installed in the supply duct. An outdoor temperature sensor is installed in the fresh air duct.

Humidistat model number: **H270-69-13-10-31**

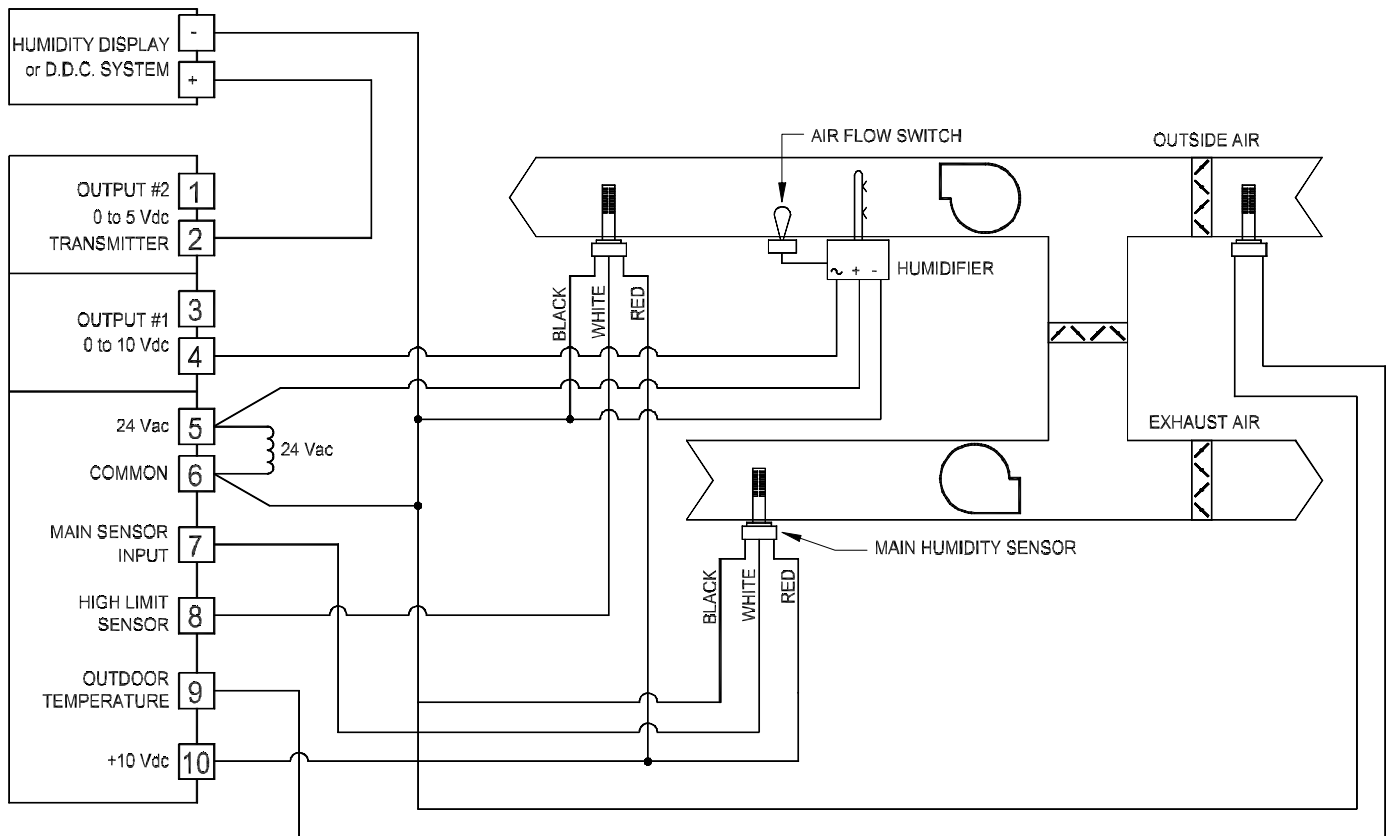
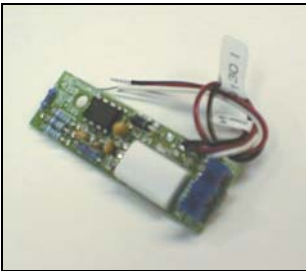


Fig.6: Application example

TABLE 2: HUMIDISTAT ACCESSORIES

H50	Internal humidity sensor for H270 humidistat and for H80 remote wall sensor.
H60	Duct humidity sensor to mount directly onto the back of any H270 humidistat.
H71	Duct humidity sensor to mount directly onto the supply or return of the ventilation duct.
H80	Wall humidity sensor to mount in any remote location.
S71	Outdoor temperature sensor to lower the setpoint in cold season.
H263	Programming tool for troubleshooting, viewing and modifying humidistat parameters.
008-0089	Replacement lexan (cover sticker) for H270 humidistat.
024-0048	Humidistat replacement base with connector (H50 internal humidity sensor not included).

H50 INTERNAL SENSOR



This humidity sensor can be mounted directly on 024-0048 humidistat base.

H60 DUCT SENSOR



This humidity sensor can be mounted directly onto the back of any H270 humidistat, with the supplied hardware. This transforms the humidistat into a duct-mounted humidistat.

H71 REMOTE DUCT SENSOR



This humidity sensor can be mounted directly onto the supply or return of the ventilation duct. The H270 may be located on the wall with humidity sensing from the remote H71 sensor location.

H80 REMOTE WALL SENSOR



This humidity sensor can be wall mounted in any remote location. The humidistat may be located on the duct or other location, with humidity sensing from the H80 sensor location.

S71 OUTDOOR TEMPERATURE SENSOR



This outdoor temperature sensor is used to lower the humidity setpoint to prevent condensation on windows and structures. It is usually installed in the fresh air duct.

H263 PROGRAMMING TOOL



This tool is used to change humidistat parameters. It is also useful for troubleshooting. Just plug it in the humidistat through the casing. See page 6 for more details.



WARNING:

All H270 humidistats are intended to control equipment under normal operating conditions. Where failure or malfunction of H270 series humidistats could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of H270 humidistats must be incorporated into and maintained as part of the control system.

CONTROL SCHEMATIC:

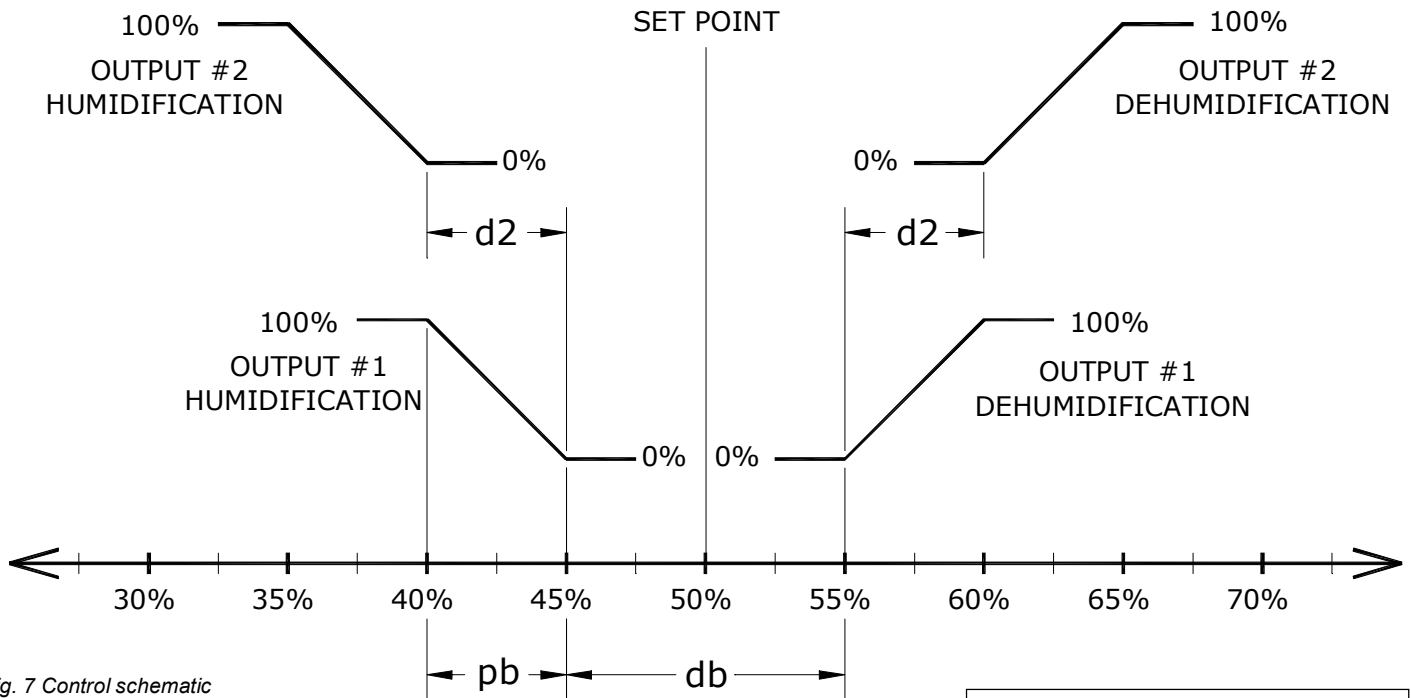
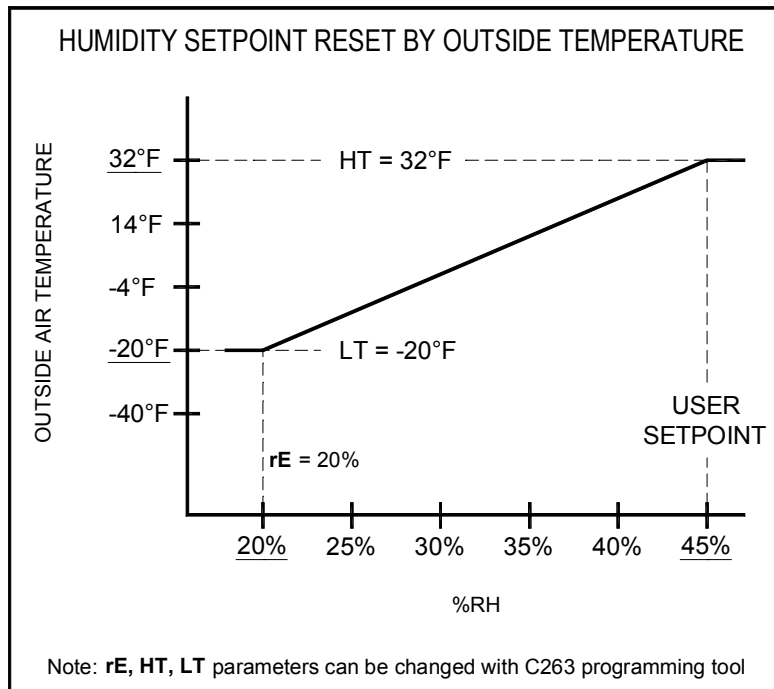


Fig. 7 Control schematic

pb = proportional band
d2 = differential between output #1 and #2
db = dead band between humidification and dehumidification

FIGURE 8: HUMIDITY SETPOINT RESET BY OUTSIDE TEMPERATURE



The H270 humidistat has an optional outdoor temperature sensor. This sensor is used to reset the humidity setpoint during the cold season to minimize condensation on windows and building structures.

When the outdoor temperature falls below the selected high temperature, parameter HT (32°F in the example Figure 8), the humidity setpoint will start to decrease. The lowest humidity setpoint will be reached at selected low temperature, parameter LT (-20°F).

The setpoint decrease from original setpoint down to the lowest setpoint determined by the parameter rE. In the example, Figure 8, rE was set to 20%, therefore the humidity setpoint dropped from 45% to 20%.

If you don't use the outdoor reset feature, put a jumper between terminals 6 and 9 (supplied with the humidistat.)

Note: rE, HT, LT parameters can be changed with C263 programming tool

TABLE 3: H263 HUMIDISTAT PROGRAMMING TOOL

CODE	VALUES	DEFAULT VALUE	DESCRIPTION
Db	0 to 40 % R.H.	25% R.H.	Dead Band between humidification and dehumidification.
SL	30 to 100 % R.H.	85% R.H.	Supply Limitation: High humidity limit in the supply duct (H270 only)
d2	0 to 199 % (of proportional band)	100%	Differential for output #2": Shift for output 2 relative to output 1
Pb	0 = 1.6 % R.H. 1 = 3.2 % R.H. 2 = 6.4 % R.H. 3 = 12.8 % R.H. 4 = 25.6 % R.H.	2= 6.4% R.H.	Proportional Band
o1	0 = Humidification 1 = Dehumidification		"Output #1" Action for output no 1
o2	0 = Humidification 1 = Dehumidification		"Output #2" Action for output no 2
cc	2 = Without integral 3 = With integral	3	"Control Code"
t1	0 = On/off 1 = 8 minutes 2 = 1 second		"Time #1" Time period for output no 1
t2	0 = On/off 1 = 8 minutes 2 = 1 second		"Time #2" Time period for output no. 2
rA	0 = °C 1 = °F	1 DO NOT CHANGE	"Range" Temperature Scale
Ca	± 13 %		Calibration (deviation mode: <u>DO NOT MODIFY: USE AUTOCAL PROCEDURE; FOR H100 TRANSMITTER, USE THE ZERO POTENTIOMETER ON THE TRANSMITTER.</u>
hA	0 à 127		"Hardware assembly" Code related to thermostat model and entered at initial setup at the factory.
it	1 to 99 = 1 TO 99 MINUTES	60	"Integral time" Error integration time.
Lt	-40 à +40 °C (-40 à 105 °F)	-20 °F	"Lower temperature" minimum outside temperature for setpoint reset (model H270 only)
Ht	-40 à +40 °C (-40 à 105 °F)	32 °F	"Higher temperature" maximum outside temperature for setpoint reset (model H270 only)
rE	1 à 99 % R.H.	20 % R.H.	"Reset" Minimum humidity value (% HR) (model H270 only) Example: rE = 20%. Humidity setpoint will be reset from selected setpoint to 20%, from Ht to Lt

AIR SUPPLY HIGH LIMIT HUMIDITY SENSOR

The H270 includes a high limit circuit. This allows the use of a second humidity sensor to limit the humidity in the supply air. Input signal goes to terminals #8 on the humidistat. High limit setpoint is preprogrammed at 85%. It can be readjusted using the C263 service tool.

If you don't use the high limit feature, connect a 4.7 Meg Ω, ¼ watt resistor between terminals 8 and 10 (supplied with the humidistat.)

Remember: this high limit function is not a safety device. For critical situations, provide installation with normal protections required to ensure a safe operation.

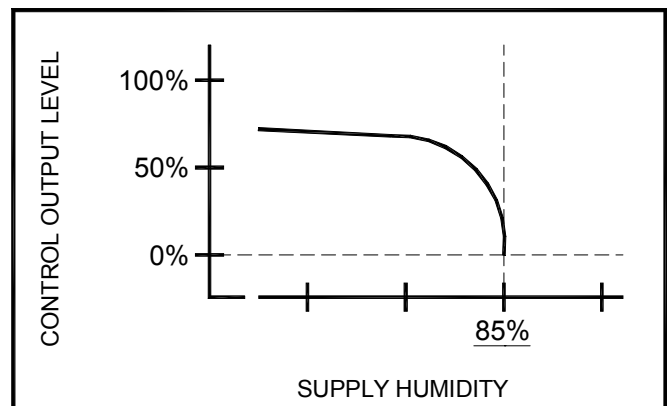


TABLE 4 Example showing proportional high limit override signal in supply duct.

AUTOCAL PROCEDURE

1. Measure the room humidity near the Viconics humidistat with an accurate hygrometer.
2. Turn the humidistat set point dial to match the reading of the hygrometer.
3. Push and hold the Autocal button for more than 3 seconds or until the internal red light turns On and Off.

SENSOR FAILURE PROTECTION

The sensor is the most sensitive part of the humidistat and also the most exposed. In the case of a sensor failure in humidification mode, the H200 will automatically assume a failsafe output of 0%.

SPECIFICATIONS

Operating Conditions: 5 °C to 50 °C (32 °F to 122 °F)
 •Control: 0% to 95% R.H. non-condensing
 •Sensor: 0% to 100% R.H. (see Note 1.)

Resolution: ± 0.1 %
 Repeatability: 0.5 %
 Accuracy and sensor interchangeability:
 ± 2 % R.H. from 0 to 100 % R.H.

Range: 10 % to 90 % R.H. for 5 to 50 °C
 (41 °F to 122 °F)

Temperature effect: 0.05 % / °F

Outputs: Isolated Triac: 30 Vac at ½ A max.*
 0 to 5 VDC into 1KΩ resistance min.
 0 to 10 VDC into 2KΩ resistance min.
 0/5 VDC at 20 mA max. for both outputs

Power: 24 VAC -15%, +10%; 50/60 Hz; 2 VA

Base and casing: Off-white; self extinguishing
 ABS plastic

* Triac outputs can only switch AC loads. Use relays when switching dc loads.

Note 1. Humidity sensor: Solid state humidity sensor. Suitable for normal, clean air. Not to be used in corrosive or harmful environment.

DIMENSIONS

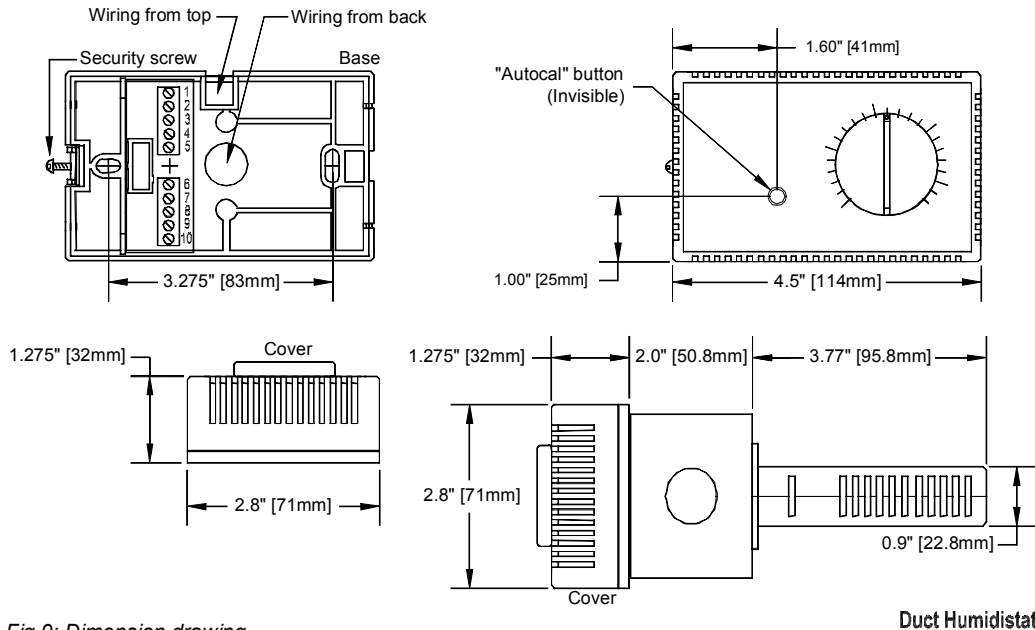


Fig.9: Dimension drawing

TABLE 5: SENSOR CHARACTERISTICS

Voltage between black and white wire, terminals #6 and #7

HUMIDITY	SENSOR OUTPUT
0 %	1.05 V
5 %	1.19 V
10 %	1.34 V
15 %	1.48 V
20 %	1.63 V
25 %	1.77 V
30 %	1.92 V
35 %	2.06 V
40 %	2.20 V
45 %	2.35 V
50 %	2.49 V
55 %	2.64 V
60 %	2.78 V
65 %	2.93 V
70 %	3.07 V
75 %	3.21 V
80 %	3.36 V
85 %	3.50 V
90 %	3.65 V
95 %	3.79 V
100 %	3.94 V

Note: Specifications and equipment are subject to change without prior notice.