AHC-80 *plus*

PSYCHROMETRIC CONTROLLER OF AIR RELATIVE HUMIDITY AND TEMPERATURE

Ver.01

AHC80PL1-10T-10842-2502

1. DESCRIPTION

The **AHC-80** *plus* is a psychrometric controller that has two totally configurable stages. It is designed to control the relative humidity of the air and temperature for the: acclimatization of stocking of fruits and flowers, air conditioning, textile industry, laboratories, operating rooms, concrete durability trials, wood drying, among other applications.

The measurement is made using the temperature difference between a dry bulb and a wet bulb. It is a psychrometric, acknowledged as a precise and stable method for determining the relative humidity of the air.

This controller is very user friendly, and offers the user a great deal of ease in adjusting the configuration parameters.

2. TECHNICAL SPECIFICATION

- **Power supply:** 115/230Vac (50/60Hz)
- **Control temperature:** -5.0 to 50.0°C (±0.1°C)
- **Control humidity:** 40 to 100%RH (±1%RH)
- **Operating temperature:** 0 to 50 ºC
- **Operating humidity:** 10 to 90%RH (without condensation)
- **Maximum current per output:** 8(3) A / 250Vac 1/4HP
- **Dimensions:** 71 x 28 x 71mm

3. CONFIGURATION

3.1 - Temperature and huimidity control (SETPOINTS)

- Press SET for two seconds until the following figure appears SEt.
- If the function St1 has a value of 0 or 1 t h will appear as well as with the values of the adjusted temperature and humidity.
- If the function St1 has a value of 2 or 3 h-1 h-2 will appear as well as with the value of the adjusted humidity.
- Use the keys ▼ and ▲ to modify the values, and when ready, press SET to confirm.

3.2 - Parameters alteration (advanced functions)

- Acess the advanced functions by pressing simultaneously the keys ▼ and ▲ for 2 seconds until appears Fun , releasing after that. Soon appears Cod , so press SET (short touch).
- Use the keys ▼ and ▲ to enter the acess code (123), when ready press SET .
- Use the keys ▼ and ▲ to acess the desired function.
- After select the function, press SET (short touch) to visualize the value configured for that function.
- Use the keys ▼ and ▲ to change the value and, when ready, press SET to save the configured value and return to functions menu.
- To return the normal operation, press SET (long touch) until --- appears.

3.3 - Advanced functions

Fun	Description	Minimum	Maximum	Unit
Cod	Access code (123)	-99	999	-
PrE	Atmospheric pressure	400	800	mmHg
St1	Operating mode for the 1st stage	(*)	(*)	-
Lo1	Minimum setpoint allowed for the 1st stage	-5.0 (1.0)	50.0 (100)	°C (%RH)
Hi1	Maximum setpoint allowed for the 1st stage	-5.0 (1.0)	50.0 (100)	°C (%RH)
dF1	Control differential (hysteresis) for the 1st stage	0.1 (1.0)	20.0	°C (%RH)
dL1	Delay for restart of the output for the 1st stage	0	999	sec.
St2	Operating mode for the 2nd stage	(**)	(**)	-
Lo2	Minimum setpoint allowed for the 2nd stage	1.0	100	%RH
Hi2	Maximum setpoint allowed for the 2nd stage	1.0	100	%RH
dF2	Control differential (hysteresis) for the 2nd stage	1.0	20.0	%RH
dL2	Delay for restart of the output for the 2nd stage	0	999	sec.
tOn	Cyclical timer for the 2nd stage - time on	0	999	sec.
tOF	Cyclical timer for the 2nd stage - time off	0	999	sec.
Ind	Preferential indication	(***)	(***)	-
Adr	Address of the instrument on the network RS-485	001	247	-

(*) Operating mode for the 1st stage
- rEF Refrigeration
- HEA Heating
- dEH Dehumidification
- HUM Humidification

(**) Operating mode for the 2nd stage
- dEH Dehumidification
- HUM Humidification

(***)Preferential indication
- t-h Temperature / humidity
- t Only temperature
- h Only humidity

4. STANDARDIZATION (LOCAL CALIBRATION)

Recommended execution when:
- the probe is substituted;
- the length of the sensor cable is altered.

In these cases, small deviations may arise when measuring temperatures, which may be compensated. For this purpose, proceed in the following manner:
- Place the probe fully into a bucket of water that is a temperature similar to that of the chamber;
- Keep this water moving, and monitor the temperature using a good quality thermometer (reference).
- Wait a few minutes for the temperatures of the dry bulb and the wet bulb to stabilize and equalize to the temperature indicated by the reference thermometer, pursuant to what is described below:
- Simultaneously press ▼ and ▲ for ten seconds until CAL appears.
-Releasing the keys, the temperature will appear to be adjusted, according to the reference thermometer.
- Use the keys ▼ and ▲ to adjust the value an, when ready, press SET to memorize the new value.

REMARKS 1 The length of the sensors cable may be increased by the user itself, using a PP 2x24 AWG cable, additionally supplied by Full Gauge Controls upon request.
Substitute the cordon that covers the humid bulb by another one double cordon made of white cotton, when necessary.

REMARKS 2: In order to obtain a reliable humidity indication, wait at least 20 minutes for the temperatures to stabilize, then reinstall the probe.

5. VISUALIZATION OF THE TEMPERATURE OF THE WET BULB

To visualize the temperature of the wet bulb, all you have to do is touch the key SET .
The message t-2 will appear, and then the temperature measured by the wet bulb.

6. MAXIMUM AND MINIMUM LOGS

Press ▲ . The display will indicate t followed by the maximum and minimum temperatures registered. Then the h will appear, followed by the minimum and maximum humidity levels registered.

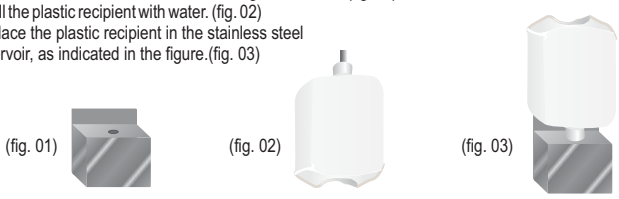
Note: To restart the records you just have to keep the ▲ key pressed during the viewing of the minimum and maximum temperatures until rSt is displayed.

7. VISUALIZATION OF THE OTHER VARIABLE

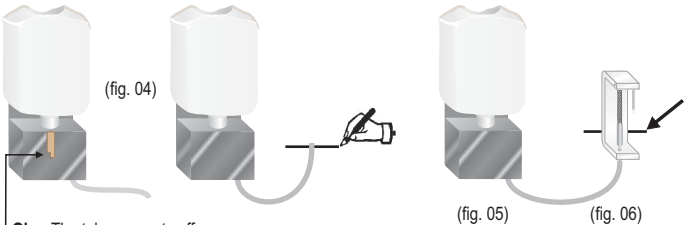
If the function Ind is configured to only visualize the temperature or only visualize the humidity, you may visualize the other variable through a simple touch of the key ▼ .

8. INSTALLATION OF THE PROBE FOR THE AHC-80 *plus*

1. Attach the stainless steel reservoir through the 2 holes. (fig. 01)
2. Fill the plastic recipient with water. (fig. 02)
3. Place the plastic recipient in the stainless steel reservoir, as indicated in the figure.(fig. 03)


(fig. 01) (fig. 02) (fig. 03)

4. Leave the silicon hose (disconnected from the probe) with it pointing down, let the water run until you notice bubbles of air rising in the plastic recipient. This process will guarantee that there is no air inside the hose.
5. Slowly lift the end of the silicon hose (fig. 04), using the upper level of the water in the hose to determine the level inside the reservoir. Using chalk, mark this level on the wall..
6. Use the mark made on the wall to position the probe (fig. 05) so that the stainless steel part (fig. 06) of the probe has its middle positioned to the center of the mark. Guaranteeing that through communication vessels, there is water up to half of the stainless steel part, and so we have the humid covering in the liquid.
7. Connect the silicon hose to the probe. Take care that the covering is in contact with the water, and that there is plenty of water in the plastic recipient.


(fig. 04) (fig. 05) (fig. 06)

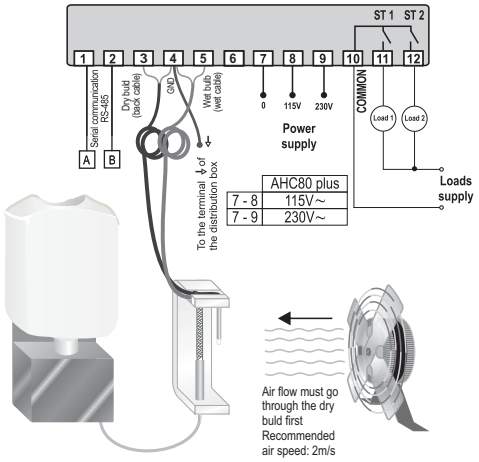
Obs: The tube can not suffer alterations in the cut.

9. MESSAGES AND SIGNS

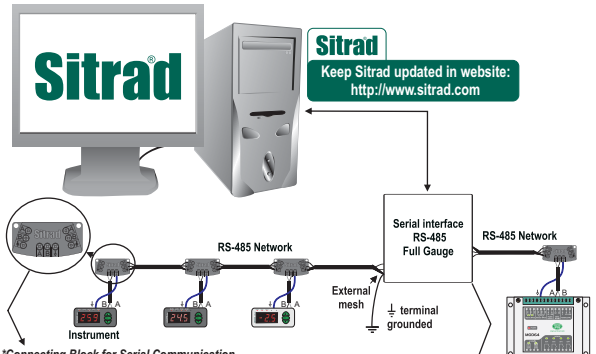
- Er1 Sensor for the dry bulb is disconnected or is not in operating range
- Er2 Sensor for the wet bulb is disconnected or is not in operating range
- LLL Excessive difference in temperature between the dry and wet bulbs
- HHH Temperature of the wet bulb is higher than the dry bulb

Atmospheric pressure (in mmHg): PrE
The formula for calculating the atmospheric pressure based on the altitude is:
$P\,(mmHg) \cong 0{,}00000446171\,x^2 - 0{,}091019\,x + 759{,}787$
where x = altitude (in meters)

10. ELECTRICAL CONNECTIONS



Integrating Controllers, RS-485 Serial Interface and Computer

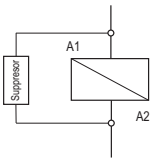


Connecting Block for Serial Communication
Used to connect more than one instrument to the Interface. The wire's connections must be made in agreement with the following rules: terminal **A** of the instrument connects to the terminal **A** of the connecting block, that must be connected with the terminal **A** of the Interface. Repeat the action for terminals **B** and ⏚ , being ⏚ the cable shield. The terminal ⏚ of connecting block must be connected to the respective terminals ⏚ of each instrument.
***Sold Separately**

RS-485 Serial Interface
Device used to establish the connection Full Gauge Controls' instruments with the Sitrad®.

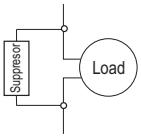
IMPORTANT
According to the chapters of norm IEC 60364:
1: Install protector against overvoltage on the power supply
2: Signal cables of the computer may not be joined with electric conduit through which the electric input and the activation of the loads run
3: Install transient suppresors (RC filters) parallel to the loads as to increase the product life of the relays.

Schematic for the connection of supresors to contactors



A1 and A2 are the contactor coil terminals.

Schematic for the connection of supresors to direct activation loads



For direct activation the maximum specified current should be taken into consideration.

ENVIRONMENTAL INFORMATION

Packaging:
The materials used in the packaging of Full Gauge products are 100% recyclable. Try to dispose of it through specialized recycling agents.

Product:
Components used in Full Gauge controllers can be recycled and reused if disassembled by specialized companies.

Disposal:
Do not burn or dispose of controllers that reach the end of their service life. Observe the legislation in your area regarding the disposal of electronic waste. If you have any questions, please contact Full Gauge Controls.

WARRANTY TERM- FULL GAUGE CONTROLS

Products manufactured by Full Gauge Controls, as of May 2005, have a warranty period of 10 (ten) years directly with the factory and 01 (one) year with accredited resellers, starting from the date of the consigned sale that appears on the tax receipt. After this year with resellers, the warranty will continue to be in force if the instrument is sent directly to Full Gauge Controls. This period is valid for the Brazilian market. Other countries have a warranty of 2 (two) years. Products are warranted in the event of manufacturing failure that makes them unsuitable or inadequate for their intended applications. The warranty is limited to the maintenance of instruments manufactured by Full Gauge Controls, disregarding other types of expenses, such as indemnity due to damage caused to other equipment.

EXCEPTIONS OF THE WARRANTY

The Warranty does not cover shipping and/or insurance costs for shipping products with indications of defect or malfunction to Technical Support. Also, the following events are not covered: natural wear of parts, external damage caused by falls, or improper packaging of products.

LOSS OF WARRANTY

The product will lose the warranty automatically if:
- Failure to follow the instructions for use and assembly contained in the technical description and the installation procedures contained in Standard NBR5410;
- It is subjected to conditions beyond the limits specified in its technical description;
- It is tampered with or repaired by a person not on Full Gauge's technical team;
- Damage is caused by falling, hitting and/or impact, water infiltration, overload and/or atmospheric discharge.

WARRANTY USE

In order to receive the warranty, the customer must send the duly packaged product, along with the corresponding purchase Tax Receipt, to Full Gauge Controls. The shipping charge of the products is at the customer's expense. It is also necessary to send as much information as possible regarding the detected defect, thus enabling faster analysis, testing and execution of the service.

These processes and the eventual maintenance of the product will only be carried out by Full Gauge Controls Technical Assistance, at the Company's headquarters - Rua Júlio de Castilhos 250 - CEP 92120-030 - Canoas - Rio Grande do Sul – Brazil.

Rev. 03