MICROPROCESSED CONTROLLER OF TWO STAGES

AHC-40

FOR CONTROL OF RELATIVE HUMIDITY OF AIR AND TEMPERATURE

AHC-40

Full Gauge CONTROLS

Find manuals of all line in Internet:
www.fullgauge.com
fullgauge@fullgauge.com

MADE IN BRAZIL

Phone/Fax: +55 51 34753308

1. INTRODUCTION

1.1 - DESCRIPTION

AHC 40 is a microprocessor-based controller featuring two fully configurable stages. It is designed to control relative air humidity and temperature.

Measurement is obtained by using the "wet and dry bulb" technique, i.e. by the difference of temperature between both bulbs. Psychrometry is a recognized, accurate, and stable way to determine relative air humidity.

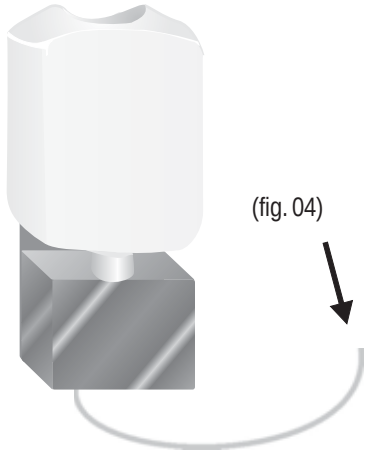
This controller is quite user-friendly, and its configuration parameters can be easily set by the user.

Application: acclimatization and stocking of fruit and flowers, air conditioning, textile industry, laboratories, operating theatres, concrete hardness tests, and wood drying, among others.

1.2 - TECHNICAL SPECIFICATIONS

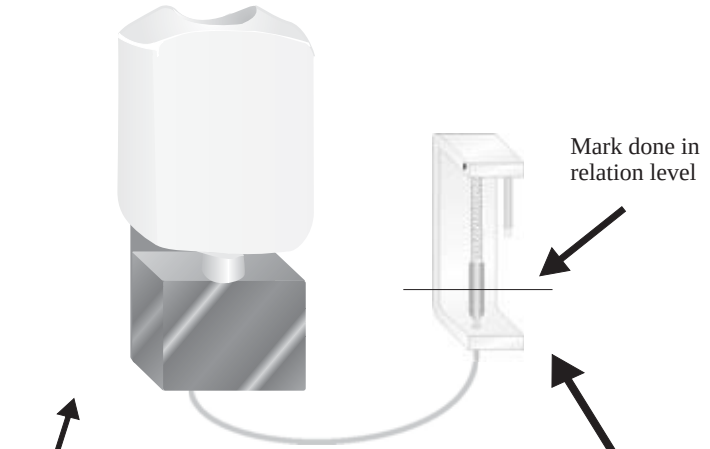
- *Power supply:* 220 VAC (50/60 Hz)
  Other values available on request: 110 VAC or
  12 VAC/DC - 24 VAC/DC
- *Control temperature :* 0 - 100 °C
- *Control humidity :* 1 - 100% RH (without condensation)
- *Resolution:* 0.5% R.H. and 0.1°C
- *Working temperature of the instrument:* 0 to 70 °C
- *Working humidity of the instrument:* 10 to 90% RH (without condensation)
- *Consumption:* 3 W
- *Maximum load:* 5 A per output (resistive load)

5. It slowly raises the tip of the silica hose (fig. 04), using the superior level of the water in the interior of the hose to inside determine the level of the resevoir. With the aid of a pen marks this level in the wall.



(fig. 04)

6. Use de mark made in the wall to locate the probe (fig. 05) thus the part of inox (fig.06) of the probe is with its half one located to the center of the mark. Guaranteeing that for communicator vases have water until the half of the part of inox, with this we have humid cotton cord in the liquid.

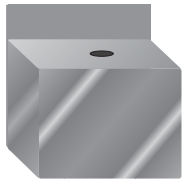


(fig. 05) (fig. 06)

7. Connect the silica hose in the probe. Observes that the tip of cotton cord is in contact with water and that does not lack water in the plastic container.

Installation of AHC 40 instrument probe

1. It fixes the reservoir of inox through 2 holes. (fig. 01)



(fig. 01)

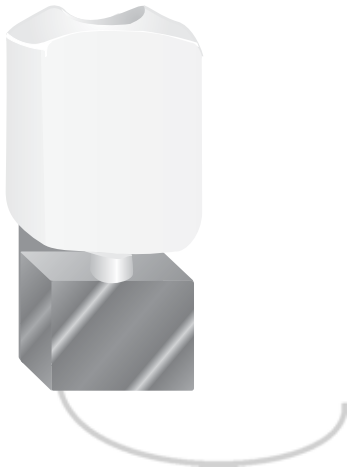
2. It fulls the plastic container with water. (fig. 02)

(fig. 02)

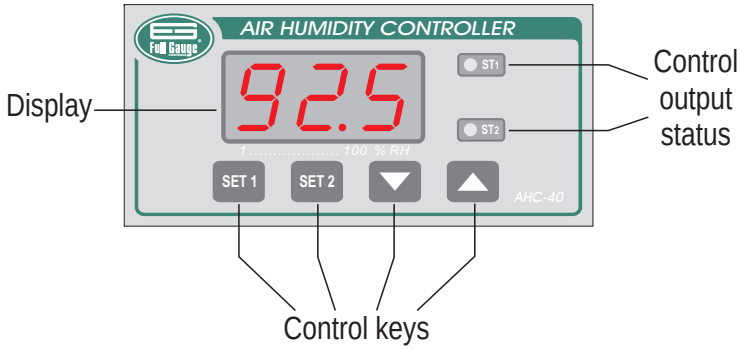
3. It places the plastic container in the inox reservoir as in the figure .(fig. 03)

(fig. 03)

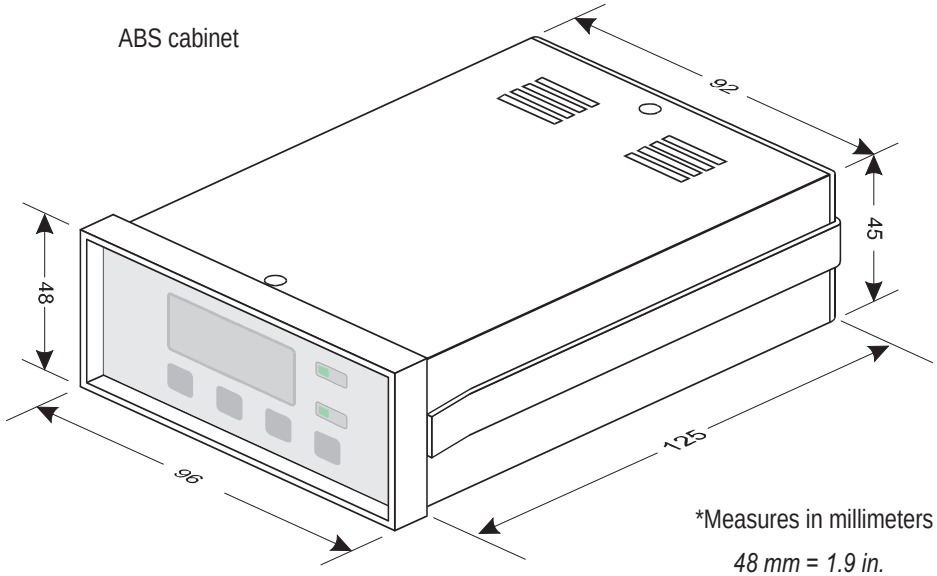
4. Leaving the silica hose (detached from the probe) with the tip for low it observes to drain water until noticing you bubble of air gone up in the plastic container.



1.3 - FRONT PANEL



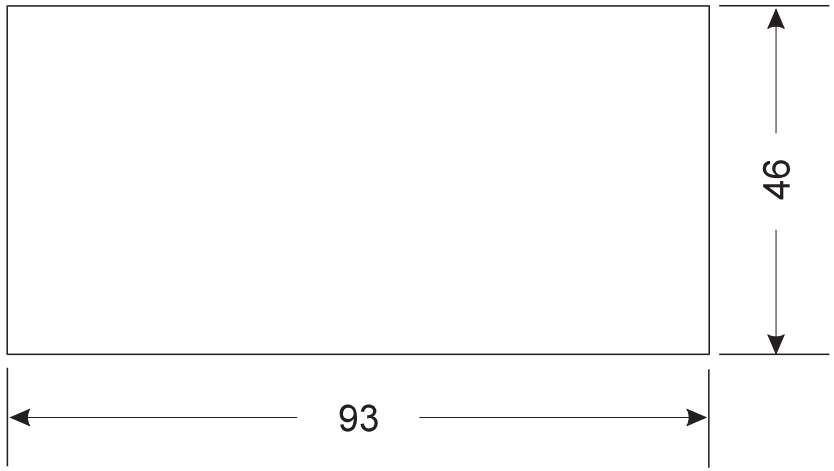
1.4 - DIMENSIONS



*Measures in millimeters

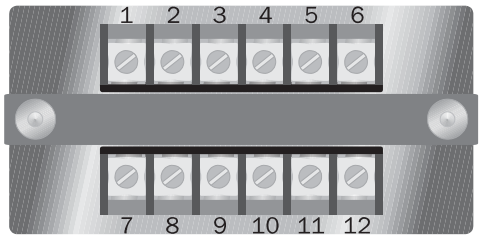
48 mm = 1.9 in.
96 mm = 3.8 in.
125 mm = 4.9 in.
45 mm = 1.8 in.
92 mm = 3.6 in.

1.5 - DIMENSIONS OF HOLES TO PANELS



*Measures in millimeters

1.6 - TERMINALS ON THE REAR COVER



1 - DRY BULB (red)
2 - COMMON OF SENSORS (net)
3 - WET BULB (white)
4 - GND
5 - - - -
6 - - - -
7 - STAGE 1
8 - STAGE 1
9 - STAGE 2
10 - STAGE 2
11 - 220VAC
12 - 220VAC

- Now the device should display 100% relative humidity, as the temperatures in both bulbs are the same.
- Take the probe away from the bucket, dry its dry bulb and install it definitively.

(1)Probe cable length can be increased by the user himself, by using 2x26 AWG coaxial cable supplied for Full Gauge Controls on request. Replace, whenever necessary, the wet bulb lining with a white cotton lining.

Note: to obtain a reliable humidity reading, wait at least 20 minutes after reinstalling the probe, to allow temperatures to stabilize.

3.0 ERROR MESSAGES

	CODE	ERROR DESCRIPTION
①	Er0	Dry bulb sensor short-circuited
	Er1	Dry bulb sensor open
	Er2	Wet bulb sensor short-circuited
	Er3	Wet bulb sensor open
②	Er4	Dry bulb temperature outside range (-5 to 100°C)
	Er5	Wet bulb temperature outside range (-5 to 100°C)
	Er6	Wet bulb temperature higher than dry bulb temperature
	Er7	Excessive temperature difference between bulbs

① Outputs are turned off.

② Outputs remain as they were before the error occurred.

When one of these errors occurs, the corresponding message will flash on the display.

If the error condition is temporary, the device will return to normal operation.

Atmospheric pressure (mmHg): PrE

P(mmHg) ≅ 0,00000446171 x^2 - 0,091019 x + 759,787 where x = altitude (in meters)

Readings display mode: Ind

h Humidity only

h-t Alternate humidity / temperature

- Use the ▼ and ▲ keys to change the parameters and, once you're ready, press SET 1 or SET 2 to store the changes.

2.4 - DISPLAYING TEMPERATURES

To display:

- dry bulb temperature: press ▼.
- wet bulb temperature: press ▲.

2.5 - Standardization (local calibration)

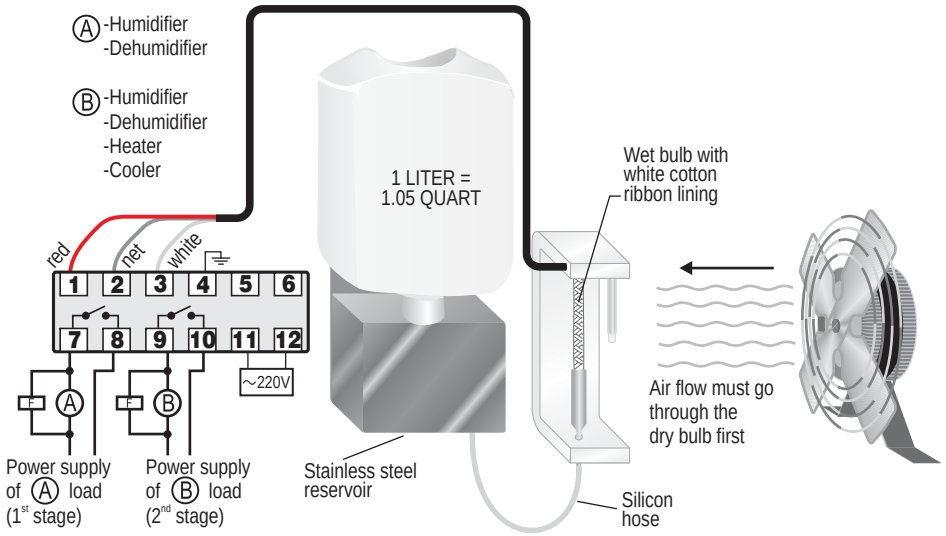
Carry out this procedure whenever:

- you change the probe
- you alter probe cable length

In these cases, small deviations may occur when measuring temperature. In order to offset them, you should do the following:

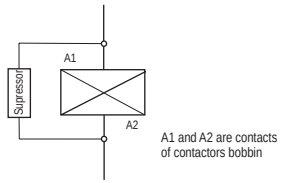
- Plunge the whole probe into a bucket full of water whose temperature is close to that of the cold room.
- Keep water moving, and monitor its temperature with a good quality thermometer (reference).
- Wait some minutes until temperature stabilizes, and then equalize the wet and dry bulb temperatures with the temperature measured by the reference thermometer, with the following procedure:
  - Press the ▼ and ▲ keys at the same for 5 seconds until CAL appears.
    Upon releasing the key, will be displayed the temperature to be adjusted as the reference thermoneter.
  - Use ▼ and ▲ keys to adjust the value and when ready press SET 1 or SET 2 to record the new value.

1.7 - INSTALLATION



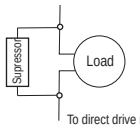
- The AHC 40 must be installed in rooms protected from extreme vibrations, corrosive gases, and bad weather.
- We recommend separating the power supply of loads from that of the controller.
- In order to avoid possible electrical interference, install the suppressing filters in parallel with Ⓐ and Ⓑ loads.

Diagram of supressors input in contactors



A1 and A2 are contacts of contactors bobbin

Diagram of supressors input in loads of direct drive



To direct drive remember of the load current specified

- For greater safety, use fuses in series with the loads.
- If readings oscillate, connect terminal 4 to the ground (GND).

Note: Contactors should be used in case of currents whose values exceed those specified.

Important: a micromotor rated 1/40 or 1/30 HP must be installed about 50 cm (20") away from the probe to favor wet bulb evaporation.

2. CONFIGURATION PARAMETERS

2.1 - CONTROL POINTS

1st stage:

- Press SET 1 for 1 second until SEt appears. Upon releasing the key, the humidity to be controlled in the first stage will be displayed.
- Use the ▼ and ▲ keys to change this value and, once you're ready, press SET 1 to store the new value.

2nd stage:

- Press SET 2 for 1 second until SEt appears. Upon releasing the key, the temperature (or humidity) to be controlled in the second stage will be displayed.
- Use the ▼ and ▲ keys to change this value and, once you're ready, press SET 2 to store the new value.

2.2 - CONTROL DIFFERENTIAL (HYSTERESIS)

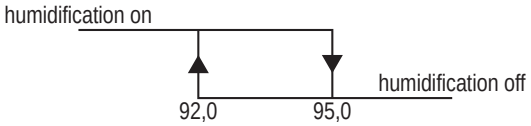
Control differential, also known as hysteresis, defines the difference between the points at which the control output will TURN ON and TURN OFF the load.

Differential values can be either negative or positive, depending on the desired operating mode.

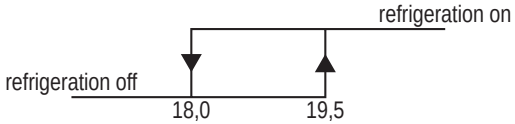
- Positive differential to dehumidify or refrigerate.
- Negative differential to humidify or heat.

Example: In a chamber for ripening bananas, at the height of summertime, you wish to control humidity at 95% RH with a differential of 3% RH, and temperature at 18°C with a differential of 1.5°C. Therefore, the first stage will be configured for humidification (negative differential) and the second stage for refrigeration (positive differential).

- The output of the first stage will turn humidification off when humidity reaches 95% RH, and it will turn it on again when humidity reaches 92.0% RH (i.e. 95.0 - 3.0).



- The output of the second stage will turn refrigeration off at 18.0°C, and it will turn it on again when temperature reaches 19.5°C (i.e. 18.0 + 1.5).



1st stage:

- Press SET 1 for 5 seconds until d 1F appears. Upon releasing the key, the humidity differential set for the first stage will be displayed.
- Use the ▼ and ▲ keys to change this value and, once you're ready, press SET 1 to store the new value.

2nd stage:

- Press SET 2 for 5 seconds until d 1F appears. Upon releasing the key, the temperature (or humidity) differential set for the second stage will be displayed.
- Use the ▼ and ▲ keys to change this value and, once you're ready, press SET 2 to store the new value.

2.3 - OTHER CONFIGURATIONS

To set the remaining configuration parameters, press SET 1 and SET 2 at the same time for 5 seconds, until Fun appears. Upon releasing these keys, the following parameters will be displayed:

Function of 2nd stage: St2

t Temperature control (thermostat)

h Humidity control (humidistat)

To modify the parameters use	*To record the alterations press*
▼ *or* ▲	SET 1 *or* SET 2