



5.0 CONFIG OF THIS APPLICATION model purchased

#	MEANING	SETTING
SET	Main set point	Limits between LoS & HiS
HYS	Thermostat differential (Hysteresis)	Limits 0...8
LoS	Minimum value for SET POINT parameter	Down scale to upper limit HiS (-55...HiS for temp. Controllers)
HiS	Maximum value for SET POINT parameter	Lower limit LoS to full scale (LoS...50 for temp. Controllers)
Act	Main output control action	0 = direct (cold) 1 = reverse (heat)
OFS	Offset, temperature calibration	Limits -10...+10
AcY	Anticycling time output (output 1 for LA mode)	Limits 0 – 254 sec
LoA	Minimum value alarm	Temp. Controllers: -55 to 50 °C absolute value
HiA	Maximum value alarm	Temp. Controllers: -55 to 50 °C absolute value
Alr	Alarm mode of operation	0:disabled 1:enabled HIT 2:enabled LOT 3:enabled HIT&LOT
Adi	alarm delay at PWR ON	Limits 0 - 99 min
Ald	Alarm delay on running time	Limits 0 - 99 min
CPF	Main output operating mode in case of probe failure	0: always OFF 1: always ON 2: ON/OFF by time
Con	Main output "ON" time in case of probe failure	Limits 0 - 99 min
CoF	Main output "OFF" time in case of probe failure	Limits 0 - 99 min
SLL	Scale lower point cal main in 4-20mA, 0-10V	Limits -55 to 200 scientific units SLL must be lower than SUL
SUL	Scale upper point cal main in 4-20mA, 0-10V	Limits -55 to 200 scientific units SUL must be greater than SLL

IMPORTANT:
THE PARAMETERS SLL AND SUL ARE SETTED IN FACTORY WITH A SPECIAL CALIBRATOR IN ORDER TO SHOW ON DISPLAY IN CASE OF PROBE 4...20mA THE VALUE "0" WHEN THE PROBE SIGNAL IS 4mA AND SHOW "100" WHEN THE PROBE SIGNAL IS 20mA. IN CASE OF PROBE 3...18 mA THE DISPLAY SHOW THE VALUE "0" WHEN THE PROBE SIGNAL IS 3mA AND SHOW "100" WHEN THE PROBE SIGNAL IS 18mA. DON'T CHANGE THESE PARAMETERS EVEN IF THE SCALE WILL BE WRONG.

6.0 PARAMETERS DESCRIPTION

SET- main Set Point: it is the value required for the main process variable. It can be adjusted between the values of parameters LoS and HiS.

HYS- main differential (hysteresis): is the value that controls the compressor operation, moving the value of the Set Point in such a way that the system do not oscillate.

LoS- low limit oper. of set point: a limit below of which is not possible to move the Set Point value. It can be used to avoid wrong settings.

HiS- High limit oper. of set point : a limit above of which is not possible to move the Set Point value. It can be used to avoid wrong settings.

Act- action main output: its value determines the type of action of the main output. This depends on the needed operation, and may be direct (cold), or reverse (heat).

OFS- offset: it is the value that should be added or subtracted to the measured value to compensate probe tolerances.

AcY- anticycling delay time: is the minimum time between two successive maneuvers ON (on - off – on cycle). This parameter is the same in the products with two outputs.

LoA- low value alarm: a limit below of which the system goes in alarm condition indicated by "LoT" displaying.

HiA- high value alarm: a limit above of which the system goes in alarm condition indicated by "HiT" displaying.

Alr- alarm mode of operation: enables alarm signaling, there are 4 possibilities:
0= all alarms disabled
1=only high value alarm enabled
2= only low value alarm enabled
3= high and low value alarms enabled.

Adi- alarm delay initialization: triggering alarm delay at start –up.

Ald- alarm delay during running time: it is the delay between the trigger of an alarm and the effective displayed state.

SLL- scale lower point calibration: is the parameter that allows to calibrate the lower end of the scale for instruments with 3-18mA or 0-10V input. The values can be set between -55 to 200 engineering units.

SUL- scale upper point calibration: is the parameter that allows to calibrate the upper end of the scale for instruments with 3-18mA or 0-10V input. The values can be set between -55 to 200 engineering units.

Note: When the difference between SUL-SLL is greater than 150 units may be missed codes in the output display this is due to the 8 bit precision of the instrument.

7.0 ANOMALIES SIGNALING

MSG	CAUSE	OUTPUT
HIT blinking	Measured value is higher than HiA	*Alarm output ON *other outputs not change (Relay resettable)
LOT blinking	Measured value is lower than LoA	*Alarm output ON *other outputs not change (Relay resettable)
PF1	The probe input line is open or short circuited (cold room)	*Displays PF1 *Alarm output ON * Main output operation is according to CPF *other outputs not change
EEP	Memory data failure	All outputs OFF

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RH-3x

series

RED LINE

Installation and operating instructions

Program C99

Electronic humidity ON-OFF Regulator

by ATEX

1.0 GENERAL DESCRIPTION

The RH models by Beta Electronics are low cost regulators suitable for a wide range of applications. They can support 4-20 mA , 3-18 mA probes, depending to the application.

Under the RH series you can have one stage regulators, dead band controllers and two independent stages regulators. This type of controller is particularly indicated, either for the manufactures of economical moisture units or for contractors / end-installers.

The RH series can support one sensor, which can be located, if installed with properly shielded cable, up to 50m from the instrument without readjust. Also the device offers one relay output for alarm control.

The RH are available, on request, with a built in transformer to feed it from the main line (230 Vac or 110 Vac on request). This important feature reduce and optimize the external wiring.

The RH models can measure and control by a direct action the relative humidity with a 3.. 18 mA or 4.. 20 mA probe.

They can be used where is necessary to have a humidity control with 3-18 mA or 4-20 mA probe; RH30 is only a humidity indicator, RH31 works at direct action: the control output is switched ON when the relative humidity reaches the value Set point + Hys and switched OFF when the relative humidity falls below the Set point.

All the RH models shows on display the value of **relative humidity**.

The access to operating parameters can be prevented by a specific procedure and a combination of keys. This avoid accidental wrong setting of the parameters by "curious people".

3.00 INSTALLATION

3.10 GENERAL

The controller must be installed in a place protected from extreme vibration, impact, water, corrosive gases, and where temperatures and moisture do not exceed the maximum rating levels indicated in the specifications. The same directives are valid for probe installation.

3.11 PROBE

The probe must be installed in a place protected from direct air flow, particularly far from fans and doors, so the average temperature of the room will be measured. If the probe is not waterproof, place it with the head upward, so drops cannot penetrate into the bulb and damage the sensor. Maintain the length of the electrical wires short as possible in order to keep low the noise picked by them, otherwise you will need to use shielded conductor where the shield will be connected to ground.

3.12 ELECTRICAL WIRING

We recommend to protect the power supply of the controller from electrical noise, spikes, and specially from voltage surges a dips. This can be easily done following this recommendations:

- separate the power supply of the loads (compressor, heaters, fans, etc) from the power supply of the controller. This can alleviate problems related to voltage dips that can arise during the switch-on of the loads, that may interfere with the controller's microprocessor causing unexpected resets.
- the cables of the probes, and the ones of the controller supply or the loads must be separate and not close, to reduce spikes and noise on the sensor. This improves the stability of the readings, and also the precise commutation of the device.

3.13 CRITICAL ENVIRONMENT

For applications in heavy industrial environment the following rules could be valuable

- After identifying the source of noise/spikes try to apply a line filter for such source of the type specifically designed to solve EMC (Electromagnetic compatibility) related problems. Sometimes, may be sufficient an RC type filter, also called "snubber", connected in parallel to the external relays coils, or circuit breakers.
- Use an independent power supply to feed the device in extreme cases.

3.20 MOUNTING

The RH models are a "flush" panel instruments. We recommend to leave on the rear panel enough room to avoid compression or excessive bending of the cables.

2.00 SPECIFICATIONS general

DISPLAY: 3 digit, 12.5 mm, high intensity red, available also green

INPUT: one 4-20 mA , 3-18 mA (**500 ohm load**) .

OUTPUTS: 1 up 2 relays depending to the models

RH 31: 1 SPDT relay 250 Vac 8A (opt 16 A)
(both 12/24 Vac/dc – 230 Vac)

RH 31 with alarm relay: 1 SPDT 250 Vac 8A
(12/24 Vac/dc power supply)

Opt 2: 1 SPDT 250 Vac 8 A + 1 SPST 250 Vac 5A
(230 Vac power supply)

MEASURING RANGE: 15 to 90% Relative Humidity

ACCURACY @ 25°C: +/-0.5%, +/- 1 digit

RESOLUTION: +/- 1°C plus +/- 1digit (8 bit mechanization)

POWER SUPPLY: 12 Vac/dc ± 10%

opt1: 230 Vac +5/-10% (50/60 Hz)

opt2: 24 Vac/dc +10/-5%

ENVIRONMENTAL CONDITIONS:

- operating temperature -5°C to 50°C
- storage temperature -20°C to 70°C
- relative humidity 30-90% non condensing
- no shocks or vibrations
- protection grade: showy series front panel IP64, enclosure IP32

MECHANICAL DATA:

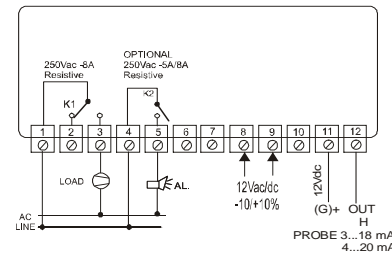
- rectangular hole panel mounting for showy series
- plastic housing self extinguishing type UL94V0
- connections through terminal block for 2,5 mm² gauge wire.

3.30 WIRING DIAGRAMS

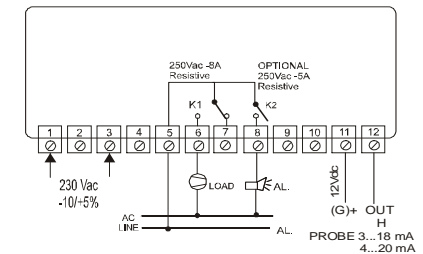
We recommend to use wires of proper gauge, according to the power of the load; in any case do not exceed 2,5 mm² to avoid damage of the connector.

IMPORTANT: FOR THE CORRECT WIRING DIAGRAM OF YOUR INSTRUMENT SEE THE LABEL ON THE BOX.

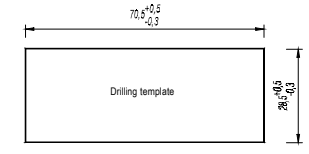
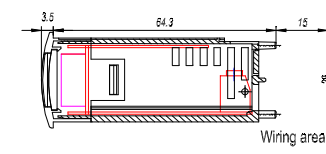
RH 31 POWER SUPPLY 12/24 VAC/DC



RH 31 POWER SUPPLY 230 VAC



RH models (showy case)



4.00 FRONT PANEL FUNCTIONS

4.20 KEY USER FUNCTIONS



Has two functions: **1)** To increase the value of the selected parameter; **2)** To scroll the parameters in SET mode.



Has two functions: **1)** To decrease the value of the selected parameter; **3)** To reset the output relay of a resettable alarm condition.



Displays the main set point, and by a specific procedure, as described below, goes in the parameter menu, its acts as a "ENTER", and it is a confirmation for new values entered. Push this key for 10s during normal operation to display, in sequence, the codes of the operating parameters.



Keep pressed simultaneously for 10s these keys to lock and unlock the access to operating parameters (if enabled)

4.21 HOW TO DISPLAY THE MAIN SET POINT

Pushing the SET key, appear the label "Set", the main set point will appear on the display after push newly the SET button.

4.24 HOW TO ADJUST THE SET POINT

- Push the SET key, and choose SET or St2 if enabled, and push newly SET, the actual set point appear, and the LED 3 will start blinking.
- within 10s modify the displayed value by pushing UP or DOWN accordingly. **Note:** only values laying within the upper and lower limits Par LoS, and Par HiS can be selected.
- Within 10s confirm the new selected value by pushing the SET key. This allows to modify the previous(next) set point with a similar operation. If you want to leave the menu, continue to push the SET key until the controller display the value of the process variable.
- The new SET POINT VALUE will be operative when you leave the menu.
- If no key is pushed within 10s, the controller will leave the modification procedure and return to normal operation.

4.25 HOW TO ADJUST OPERATING PARAMETERS

- Push for 10s the SET key. First will appear the label "SET", and after the first parameter HYS, now with UP and DW button choose the parameter that you need to modify, and press SET newly, the LED 3 (left) will start blinking.
- On the display will appear, the value of the parameter previously showed.
- Within 10s modify the displayed value by pushing UP or DOWN .
- Within 10s confirm the new entered value by pushing the SET key. The display will show the name of parameter just modified
- With UP and DW choose another parameter if you want.
- To modify the value follow the stated above procedure.
- To leave the modification menu proceed as follow: from the value modification option (display if led 3 is blinking), and after to choose the proper value press the SET button until the display change to temperature mode. (Led 3 stop to blinking), from the menu names of parameter display simply leave the time run for a few seconds, the display will change to the temperature indication, and the new values will be stored

Note: If no key is pushed within 10s, the controller will leave the modification procedure and return to normal operation. Changes that modify timings will be effective after elapsed the current ones while changes on other variables have immediate effect.

4.30 DISPLAY FUNCTIONS

The display has tree digit, seven segment type. During normal working it shows the value of the average of the process variable sensed by probe 1, in alarm condition it shows the proper indication as per "anomalies signaling". Led 1 (right): lights stable when the main output is active.