TEGAM

CSP SERIES

HUMITRAN-C

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This owner's manual was as current as possible when this product was manufactured. However, products are constantly being updated and improved. Because of this, some differences may occur between the description in this manual and the product you received.

RELATIVE HUMIDITY/TEMPERATURE CONTROLLER

A. GENERAL DESCRIPTION

The RH/Temp. controller is an economical panel-mounted instrument designed to monitor and control both relative humidity and temperature of air. There are four versions of this instrument-models for °F and °C temperature, and for 115 VAC or 230 VAC power inputs.

The controller features two integral relay contacts that provide simple ON/OFF control-one for humidity, the other for temperature. Independent setpoints (SP) for humidity and temperature are screwdriver selectable within the entire measuring range. The control deadbands (DB) are also screwdriver adjustable and digitally displayed as are the setpoints.

Two standard recorder outputs of 10MV/%RH and 10MV/degree enable interfacing with a computer or data logging device.

The stainless steel probe (see instruction booklet for the RH/Temp. PROBE TRANSMITTER specifications and mounting information) supplied with the controller contains a solid state humidity sensor and thin-film platinum RTD temperature sensor. The probe may be mounted virtually any distance away from the controller. Signal transmission from the probe to the instrument is via a current loop (4 to 20ma), eliminating RFI errors.

An adjustable duct flange permits mounting the probe at any depth between 1 and 9 inches. A wall mounting bracket is also provided.

B. UNPACKING

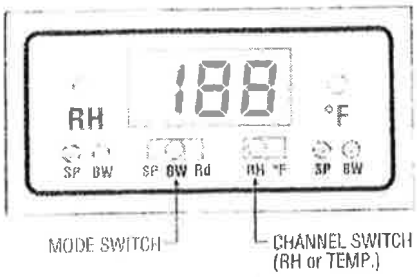
Verify that the following parts have been received.

1. Controller
2. Controller panel-mounting bracket with thumbscrew.
3. Instruction Manual
4. If Controller is supplied with probe, see "UNPACKING" list in Humitran-DP Instruction Manual for additional parts.

NOTE:
The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

C. OPERATION

The figure below shows the front face of the controller. The right side front panel switch toggles the large LED display between a continuous reading of either relative humidity or air temperature. The left side mode switch is used for the initial controller set-up and is explained below.



DISPLAY AND CONTROLS

DISPLAY AND CONTROLS

The independent set points (SP) for both humidity and temperature are screwdriver selectable within the entire measuring range. The control deadbands (DB) are also screwdriver adjustable.

The two LED lamps light when the relays are activated to indicate control action taking place.

1. TO SET CONTROL POINT FOR RELATIVE HUMIDITY.

A. Apply input power to unit. (See section D for connections.)
B. Set Channel "RH".
C. Set Mode Switch to "SP" (Set-point).
D. Adjust the relative humidity "SP" screw control to show desired % relative humidity set-point on the digital display.
E. Set the Mode Switch to "BW" (Band Width).
F. Adjust the relative humidity "BW" screw control to show the desired band width. For example, if ±5% is desired as a band width (deadband), adjust screw control to show "5" on the digital display.

NOTE: The band width setting is independent of the set point and need not be changed if set point is altered.

2. TO SET THE CONTROL POINT FOR TEMPERATURE

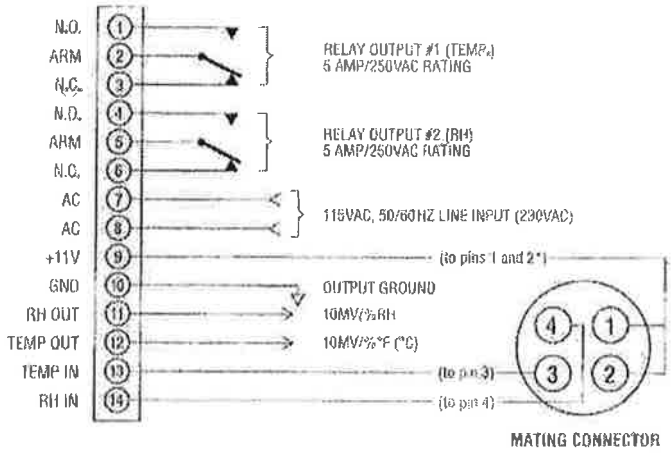
A. Set the Channel Switch to °F (or °C) and proceed through Steps 3 through 6 outlined above.

3. TO COMPLETE THE CONTROLLER PROGRAMING

1. Set the "Mode" switch to "Rd" ("Read"). Next set the "Channel" switch to either "RH" or "°F" ("°C") depending on which measurement you wish to show on the digital display.

D. TERMINAL CONNECTING AND MOUNTING

Wire up your system using figure below as guide.



*Use separate wires to pin 1 and pin 2 for very long cables.

NOTE: Recorder output devices should share the same ground as Terminal No. 10.

1. MOUNTING THE CONTROLLER

a. Panel cut-out for 1/8 DIN is 3.62" x 1.77" (92mm X 45mm)
b. Position controller in panel. Place thumbscrew through hole in middle of mounting bracket into threaded hole above terminals at rear of controller. Tighten thumbscrew.

2. MOUNTING THE PROBE

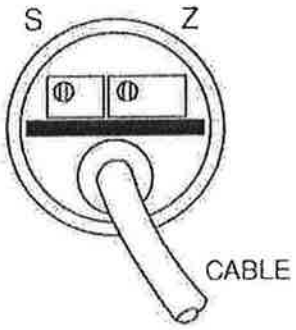
(See instruction booklet for Probe)

E. RH CALIBRATION

Since the controller is a general purpose instrument, the following calibration procedure must be used when inputting other current transmitters or probes.

The calibration adjustments on the controller are factory set and should not be changed unless another RH/TEMP probe are used. If the RH requires field calibration, adjustments are made on probe using the procedures below. The temperature of the probe is factory set and does not require recalibration.

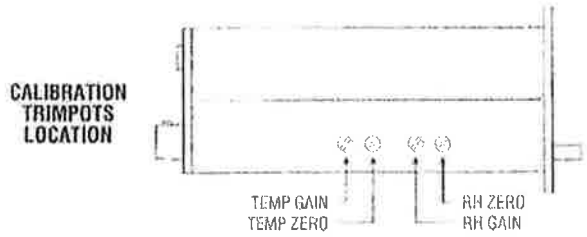
To expose the two trim pots on the probe for adjustment, remove the cable end cap. Refer to figure below for the location of trim pots S and Z.



The controller is calibrated using known current sources ranging from 4ma to 20ma.

NOTE: The TEGAM RH-CAL Relative Humidity Calibration Kit is recommended for providing the "low" and "high" RH environments for this procedure. The salt solutions in this kit are prepared according to ASTM standard E104-85 to provide 11.3% and 75.3% relative humidity environments. The containers provided in the kit are designed to fit with these instruments.

1. Turn the span (trim pot S) all the way up (clockwise).
2. Turn the zero (trim pot Z) all the way down (counter-clockwise).
3. Place the sensor in the low (11.3%) RH environment. Allow at least one hour for stabilization or until the output stops changing.
4. Verify the recorder output of the controller is 0 +/-1 mV. If it is not, return the unit to TEGAM for evaluation and repair.
5. Adjust the zero (trim pot Z) to the point where it just starts to cause a change in the controller recorder output.
6. Place the sensor in the high (75.3%) RH environment. Allow at least one hour for stabilization or until the output stops changing.
7. Adjust the span (trim pot S) so the controller recorder output is equivalent to the difference between low and high RH environments. Example: 75.3%-11.3%=64% which is equivalent to 0.64V.
8. Adjust the zero (trim pot Z) so the controller recorder output is equivalent to the high RH environment. Example: 75.3% is equivalent to 0.753V.
9. Place the sensor in the low RH environment and allow at least one hour for stabilization or until the output stops changing. Verify the controller recorder output is equivalent to the low RH environment. Example: 11.3% is equivalent to 0.113 V.



F. RH INPUT CALIBRATION

1. 4ma to 20ma input into pin (14), with ground at pin (10) represents 0%RH to 100% RH displayed, with the recorder output on pin (11), set controller switches to "Rd" and "RH".
2. With input power applied to controller and voltage meter connected to pin (11) (RH recorder output) and pin (10) (ground), apply 4.2ma to pin (14) (represents 1.25% RH). (unit does not read below "0", therefore calibration is done at a slightly higher value).
3. Adjust "RH ZERO" trimpot so that voltage meter reads .0125 volts. The display will indicate "01" for 1%RH.
4. Apply 19.2ma to pin (14). Output is limited to 100% RH, therefore calibration is done at a lower value. 19.2ma represents 95% RH.
5. Adjust "RH GAIN" until voltage meter reads .950 volts (display indicates "95%RH).
6. Steps 2 thru 5 may have to be repeated until both requirements are met. Check final results with an input of 12ma representing 50% RH (.500 volts at recorder output).

G. °F TEMPERATURE CALIBRATION

The probe is specified 0°C to 100°C (32°F to 212°F) for 4ma to 20ma output: The practical controller range is actually from 14°F to 199°F (the maximum that can be displayed, through the recorder output can reach 2.12 volts for 212°F).

1. Set controller switching to "Rd" and "°F". Apply power to controller with voltage meter connected to pin (12) (temperature output) and pin (10) (ground).
2. Apply 4ma to pin (13) (represents 32°F). Adjust "TEMP ZERO" trimpot so that voltage meter .320 volts (displayed as "32"°F)
3. Apply 17.6ma to pin (13) (represents 185°F). Adjust "TEMP GAIN" trimpot so that voltage meter reads 1.850 volts (displayed as "185"°F).
4. Repeat steps 2 and 3 until both requirements are met. Check calibration at 12ma input, should read 1.220 volts and displayed as "122"°F.

H. °C TEMPERATURE CALIBRATION

The probe is specified from 0°C to 100°C for 4ma to 20ma input: Since unit doesn't read below "0" we will calibrate slightly above 0°C

1. Set controller switching to "Rd" and "°C". Apply power to controller with voltage meter connected to pin (12) (temperature output) and pin (10) (ground).
2. Apply 4.2ma to pin (13) (represents 1.25°C). Adjust "TEMP ZERO" trimpot so that voltage meter reads .0125 volts (displayed as "01°C).
3. Apply 20ma to pin (13)(represents 100°C). Adjust "TEMP GAIN" trimpot so that voltage meter reads 1.000 volts (displayed as "100"°C).
4. Repeat steps 2 and 3 until both requirements are met. Check calibration at 12ma input, should read .500 volts and displayed as "50"°C.

NOTE: The above techniques may be used with other sensor current probes with different ranges and scales by applying the proper current inputs and using the "ZERO" and "GAIN" trimpots to display the correct values.

I. TROUBLE-SHOOTING

DISPLAY INDICATIONS	PROBABLE CAUSE
Overrange on RH and normal on temperature	Open RH wire, open RH sensor or missing sensor.
Normal on RH and overrange on temperature.	Open temperature wire.
"185"°F on temperature & normal on RH.	Open temperature sensor.
Overrange on RH and temperature	Open (+V) wire or entire cable.
100% RH and normal on temperature.	RH sensor is wet (it will dry out without damage to sensor), or shorted RH sensor.

Controller will indicate overage if input current is lower than 2.5ma for RH input, or lower than 1.0ma for the temperature input.

J. ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE, OPERATING
PROBE: -20°C to 85°C (-4°F to 185°F)
CONTROLLER: -10°C to 55°C (14°F to 131°F)

TEMPERATURE, STORAGE
PROBE: -20°C to 85°C (-4°F to 185°F)
CONTROLLER: -20°C to 70°C (-4°F to 158°F)

HUMIDITY, OPERATING
PROBE: 0 to 99% RH, non-condensing
CONTROLLER: 10% to 90% RH, non-condensing

HUMIDITY, STORAGE
PROBE: 0 to 100% RH
CONTROLLER: 0 TO 90% RH non-condensing

PRESSURE, OPERATING AND STORAGE
PROBE: 30 PSI
CONTROLLER: Ambient Pressure

The controller will be earth grounded using the grounding nut of unit marked ⏚.

The power input is fused using 1/16A (62.5mA) for the 230VAC model, and 1/10A(100mA) for the 115VAC model.

The controller conforms to the following directives for the "CE" label under the above conditions.

Emissions EN50081-1(1992); Immunity EN50082-1(1992); 89/336/EEC, Low Voltage Directive EN61010-1(1993) 73/23/EEC.

K. SPECIFICATIONS WITH RH/TEMP PROBE TRANSMITTER

MEASURING RANGES

RELATIVE HUMIDITY: 3% to 95%, temperature compensated -10 to 175°F
TEMPERATURE: 0 to 100°C, 32°F to 212°F

RECORDER OUTPUT ACCURACY *

RELATIVE HUMIDITY: ±2% RH
TEMPERATURE: ±1°F,±0.6°C

DISPLAY RESOLUTION: 1% RH, 1°F OR 1°C

RESPONSE TIME: Under 20 seconds

SET POINT CONTROLS: Digitally adjustable from 0% to 100% RH, 0 to 100°C, 32 to 199°F
Deadband adjustable from ±0% RH to ±50% RH and ±0°F or °C to ±50°F or °C

CONTROL OUTPUTS: Dual SPDT relays, 5 Amp/250 VAC

RECORDER OUTPUTS: 10mV/%RH, and 10mV/degree

DISPLAY: 0.56" high, LED, off scale indication for open input, relay "on" LED indication

INPUT POWER: 115 VAC±15%,50/60 Hz, 5 watts maximum (230 VAC)

CONNECTIONS: Screw terminals, 14 AWG maximum; probe supplied with 4-pin mating connector, 26 to 18 AWG wires.

MOUNTING
CONTROLLER: Panel mount with adjustable mounting bracket, adjusts up to 3/8 inch (9.5mm) thick panel.
Cut-out: 1.77 inch (45mm) x 3.62 inch (92mm)

DIMENSION: 1/8 DIN panel x 5.0 inch (127mm) deep

WEIGHT: 19 oz (539 grams)

* The error in displayed reading is larger than recorder output accuracy due to -1 count worst-case truncation error (Display is truncated not rounded.)

WARRANTY

Tegam, Inc. warrants this product to be free from defects in material and workmanship for a period of one year from date of shipment. During the warranty period, we will, at our option, either repair or replace any product that proves to be defective.

To exercise this warranty, write or call Tegam, Inc. in Geneva, Ohio. You will be given prompt assistance and return instructions. Send the instrument, transportation prepaid, to the indicated service facility. Repairs will be made and the instrument returned, transportation prepaid. Repaired products are warranted for the balance of the original warranty period, or at least 90 days.

LIMITATION OF WARRANTY

This warranty does not apply to defects resulting from unauthorized modification or misuse of any product or part. This warranty also does not apply to fuses, batteries, or damage from battery leakage.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. Tegam, Inc. shall not be liable for any indirect, special or consequential damages.

STATEMENT OF CALIBRATION

This instrument has been inspected and tested in accordance with specifications published by Tegam, Inc.

The accuracy and calibration of this instrument are traceable to the National Bureau of Standards through equipment which is calibrated at planned intervals by comparison to certified standards maintained in the Laboratories of Tegam, Inc.

TEGAM

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