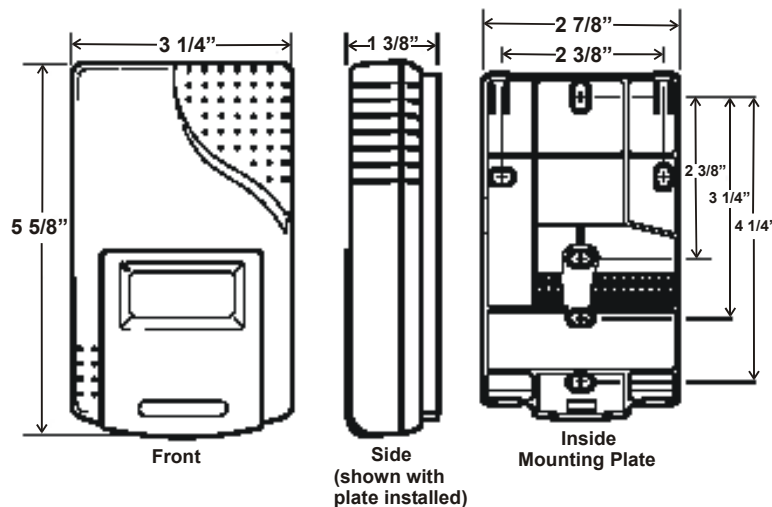


Wall-Mounted Dewpoint Sensor (P/N 210-2002) Installation Instructions for E2/Einstein, REFLECS

CPC specs a wall-mounted infrared absolute dewpoint sensor with a 0-5VDC output for use in building control and anti-sweat control applications using CPC input boards. Specifications:

Measurement Method	Non-Dispersive Infrared, Dual-Channel, Non-Interactive, Non-Saturating	Analog Output	0-5VDC; shielded two-conductor cable.
Sensor Output Units	°F Dewpoint or Grains/lb. Dry Air	Operating Temp Range	Room and Duct: 32°F to 120°F (0°C to 49°C) Outdoor: -20°F to 122°F (-29°C to 50°C) when installed inside 1551 enclosure
Measurement Range	0 to 140 Grains/lb. 0°F to 80°F (-18°C to 27°C Dewpoint)	Storage Temp	-40°F to 170°F (-40°C to 77°C)
Dewpoint Accuracy	±1.8F (1°C) Dewpoint Non-Linearity < 1% FS Temperature Dependence (typical value): 0.15% FSC	Input Power	18-30VAC, 50/60Hz (half wave rectified) 1.75 VA average, 2.75 VA peak
Calibration Interval	Calibrate the sensor annually with dry nitrogen. For optimum accuracy, it is recommended that you calibrate the sensor at start-up after a 10-minute warm-up period.	Outside Enclosure	Model 1551 - Outside Air Measurement Enclosure. Allows for measurement of outside water vapor concentration.

Sensor Mounting and Installation



1. Prepare for installation by using the mounting holes configured for US or European junction boxes.
2. Use the mounting plate as a template to mark mounting holes.
3. Secure the mounting plate to the wall or junction box and make necessary wire connections.
4. Mount the sensor on the base by aligning the top clips and then securing to the bottom clips. A “snap” sound will indicate that the sensor is secure. The sensor will now have power. A brief warm-up period will take place. After the two-minute warm-up period expires, the sensor will stabilize and display the main dewpoint screen.
5. Finish installation by sliding the cover over the menu keys and securing with the supplied screw.

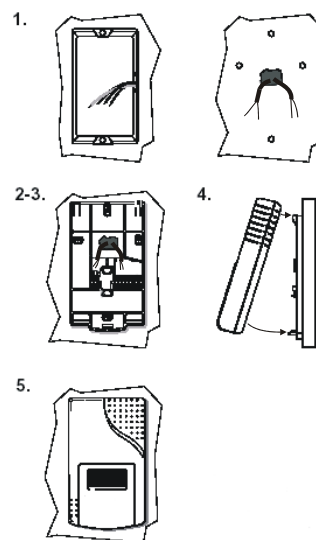


Figure 2 - Mounting Steps

Sensor Wiring

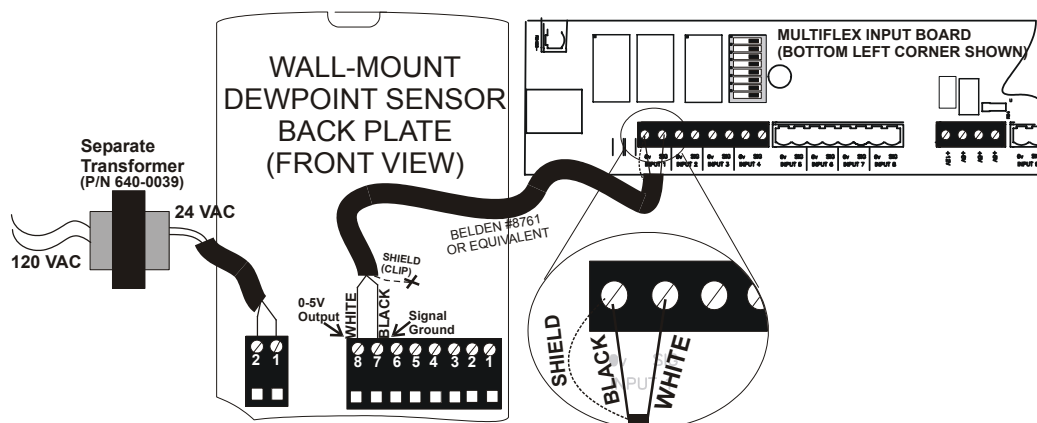


Figure 3 - Sensor and Input Board Wiring

1. For wiring the sensor to a CPC input board, use Belden #8761 shielded two-conductor cable or equivalent.
2. Connect the BLACK and WHITE wires to the screw terminals on the sensor’s connector as shown in Figure 3 (connect BLACK to Signal Ground and WHITE to 0-5V Output). Clip the SHIELD wire.
3. Connect the SHIELD and BLACK wires to the 0V terminal of the input board. Connect the WHITE wire to the SIG terminal of the input board.
4. Connect 24VAC (a separate 120VAC/24VAC transformer must be used P/N 640-0039) to the power terminal on the dewpoint sensor back plate using the BLACK and WHITE wires. (This 24VAC transformer must only be used to power this dewpoint sensor. Do not use this transformer to power additional devices.)
5. Locate the input dip switch for the sensor point, and set to the OFF position (LEFT for MultiFlex, DOWN for 16AI). Refer to the input board’s user manual for locations of the input dip switches.

Sensor Modes and Keypad Buttons

Operating Modes

- **Measurement Mode:** The initial, default mode in which the sensor operates.
- **Adjustment Mode:** Allows for the adjustment of sensor operational characteristics including selection of grains/lb. or dewpoint display/output, measurement range, relay setpoint, and deadband. Press the **Clear** and **Mode** buttons together and hold for three seconds to enter this mode.
- **Calibration Mode:** This mode can be used to calibrate the sensor to ambient concentrations with a zero gas. Press the **Clear** and **Enter** buttons together and hold for three seconds to enter this mode.

Keypad

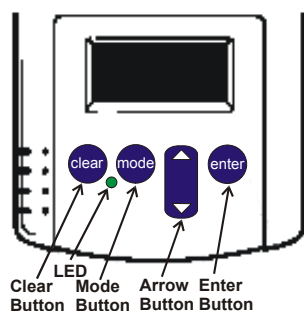


Figure 4 - Sensor Keypad

- **Clear:** Exits the Adjustment or Calibration mode and returns to the Measurement mode.
- **Mode:** When in the Adjustment mode, the **Mode** button will advance the sensor to the next variable that can be adjusted.
- **Arrow:** Allows the user to increase or decrease values or choose between selected variables in the sensor.
- **Enter:** When an adjustment is made to the sensor, pressing the **Enter** button will program the new setting or selection into the sensor.

Controller Setup



NOTE: DO NOT set this sensor up with a sensor type of “Dewpoint”; that setting is only for CPC Dewpoint Probes (P/N 203-1902). This dewpoint sensor MUST be set up as a linear sensor type.

E2/Einstein

- After logging into the controller, press **Alt** + **I** to open the Input Status screen or press the **Menu** key, **7** (System Configuration), **1** (Input Summary). (If using an Einstein, press **F8** (ACTIONS) from the Home screen. Press **Y** (System Setup). Press **6** (Input and Output Point Setup). Press **1** (Input Summary) to open the Input Summary screen.)

Board Type	Brd	Pt	Type	Application	Association	Value
16AI	2	7	-			
16AI	2	8	-			
16AI	2	9	-			
16AI	2	10	-			
16AI	2	11	-			
16AI	2	12	-			
16AI	2	13	-			
16AI	2	14	-			
16AI	2	15	-			
16AI	2	16	-			
16AI	3	1	-			
16AI	3	2	-			
16AI	3	3	-			
16AI	3	4	-			
16AI	3	5	-			
16AI	3	6	-			
16AI	3	7	-			
16AI	3	8	-			
16AI	3	9	-			
16AI	3	10	-			
16AI	3	11	-			
16AI	3	12	-			

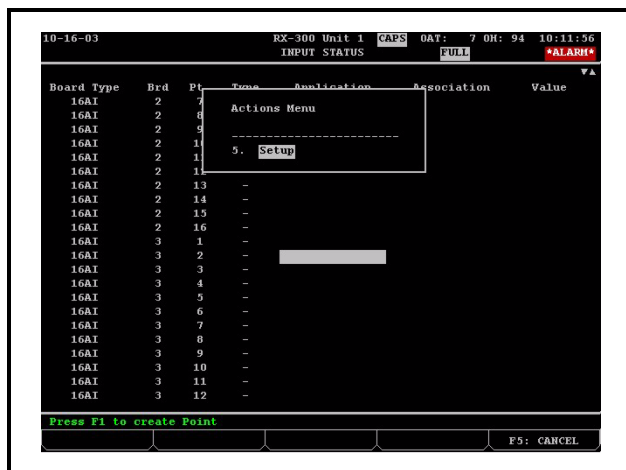
Press F1 to create Point

F1: SETUP

Input Status Screen

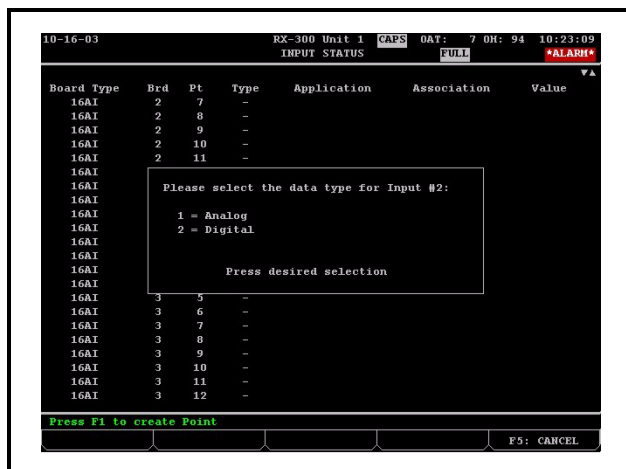
- Highlight the input point the sensor is attached to and press **F1** (SETUP) to set up the input, or press **Enter** to open the Actions Menu and select 5 (Setup). (If using an Einstein, select an input point and press **F7** (SETUP IN) to open the Analog Input screen.)

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E2 Actions Menu For Selected Input

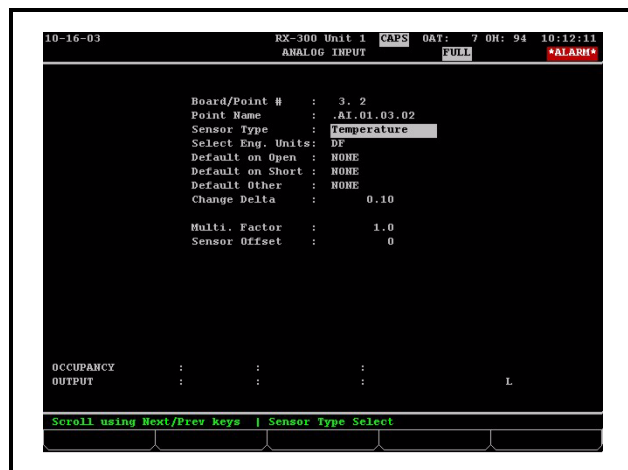
The Data Type menu for the selected input will display:



Set Up Input As Analog

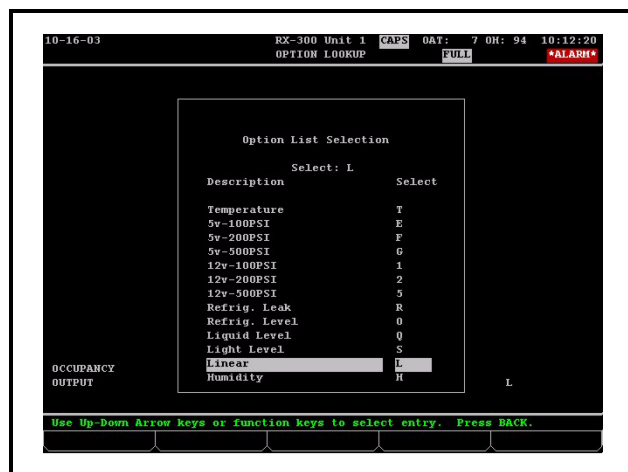
3. Select **Analog** to set up the input as analog. The Analog Input screen will display:

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Set Sensor Type To Linear

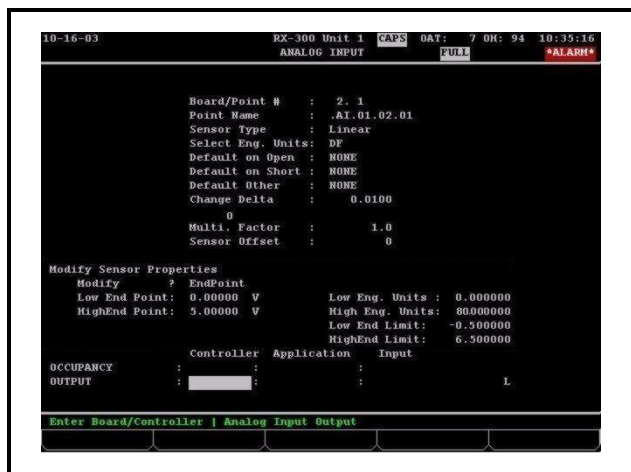
- Once on the Analog Input screen, move the cursor to the **Sensor Type** field, press **F4** (LOOK UP), and set to **Linear**. (If using an Einstein, press **F7** (LOOK UP) and set to **Linear**.)



Option List Selection Menu For Sensor Type

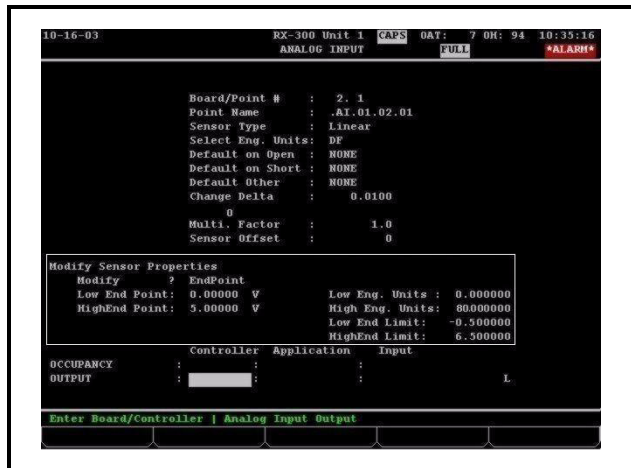
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- Move cursor to **Select Eng. Units** and press **F4** (LOOK UP). Set this field to **DF** (for Degrees Fahrenheit). (If using an Einstein, press **F7** (LOOK UP) and set to **DF**.)



Set Select Engineering Units To DF

- Then set the following sensor properties:
 - Set the **Modify** field to: **EndPoint** (If using an Einstein, press **F7** (LOOK UP) and set to **EndPoint**.)
 - Set the **Low End Point** field to: **0**
 - Set the **HighEnd Point** field to: **5.0**
 - Set the **Low Eng. Units** field to: **0**
 - Set the **High Eng. Units** field to: **80**
 - Set the **Low End Limit** field to: **-0.5**
 - Set the **HighEnd Limit** field to: **6.5**



Analog Input Screen - Set Sensor Properties

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REFLECS

1. Log onto the controller:

```
RMCC                                     12:00
                                     10/02/03
Password: 
Password required to change setpoints.
Press ENT for viewing only...
Enter Your Password (up to 6 digits)
```

REFLECS Logon Screen

2. From the Main Menu, select **4-Sensor Control**:

```
MAIN MENU                                     12:00
1-Pressure Control      5-Status
2-Condenser Control    6-Power Monitor
3-Circ/Defr Control    7-Configuration
4-Sensor Control       8-Graphs
                       9-Alarms
SELECT NUMBER          ENT=LOGOFF
```

REFLECS Main Menu Screen

3. From the Sensor Control screen, select **2-Setup**:

```
SENSOR CONTROL                               12:00
1-Status      5-Logs
2-Setup       6-Alarm Overrides
3-Setpoints   7-Override Status
4-Alarms     8-Shut off Sched.
              9-I/O Control Modules
SELECT NUMBER          0=MENU
```

Sensor Control Screen

4. From the Select Sensor screen, choose the sensor you wish to set up:

```
--SELECT ITEM--
01 SENS01      06 SENS06  12:00
02 SENS02      07 SENS07
03 SENS03      08 SENS08
04 SENS04      09 SENS09
05 SENS05     10 SENS10
Enter Item:
Arrows to Move (ENT)accept (CLR)Escape
```

Select The Desired Sensor From The Select Item Screen

Once you select a sensor, the Sensor Setup screen opens:

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```

SENSOR SETUP                                     12:00
#:01 Status:OFF Name:DEWPOINT
Type: Linear

Logging Interval (HH:MM:SS): 00:03:00
↑=PREV ↓=NEXT      ->=SET-DATA      0=MENU
  
```

Sensor Setup Screen

5. Enter a name for the sensor in the **Name** field (for example, **DEWPOINT**) and set the **Type** field to **Linear** by using the scroll keys or pressing the red button + the  (L) button.
6. Press **0** to go back to the Sensor Control screen. Select **3-Setpoints** and then choose the sensor to set Gain and Offset.

```

SENSOR CONTROL                                   12:00

1-Status      5-Logs
2-Setup        6-Alarm Overrides
3-Setpoints    7-Override Status
4-Alarms       8-Shut off Sched.
                9-I/O Control Modules

SELECT NUMBER                                0=MENU
  
```

Sensor Control Screen

```

SENSOR SETPOINTS LINEAR INPUT                   12:00
#:01 Status:ON Name:DEWPOINT
Stay ON for:000 min Eng.Unit: DEGF
Using Diff of 01 00 00 00
      0 of 0      0 0 0
Gain 16 Offset 00000 mV
ON: 0 Dly: 0000 OFF:0 Dly:0000
↑=PREV ↓=NEXT      ->=SET      0=MENU
  
```

Sensor Setpoints For Linear Input Screen

7. Set **Gain** to **16**, **Offset** to **0** (the default) and enter degrees fahrenheit units into the **Eng. Unit** field (for example, type **DEGF**).
8. To check the sensor input value, press **0** to go back to the Sensor Control screen and select **1-Status**.

```

SENSOR CONTROL                                   12:00

1-Status      5-Logs
2-Setup        6-Alarm Overrides
3-Setpoints    7-Override Status
4-Alarms       8-Shut off Sched.
                9-I/O Control Modules

SELECT NUMBER                                0=MENU
  
```

Sensor Control Screen

SENSOR STATUS					12:00
#	Name	Status	Value	CI	CO
1	DEWPOINT		79.8	0	0
2					
3					
4					
5					
↑=PREV ↓=NEXT					0=MENU

Sensor Status Screen - Sensor Value

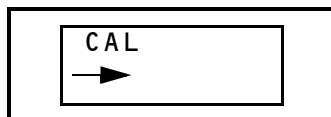
Set Up Zero Calibration

The Zero Calibration mode allows the user to calibrate the sensor to a verified zero concentration of water vapor. For best results, allow the sensor to warm up for at least 10 minutes.

For zero calibration, all tubing should be connected between the gas bottle and the sensor inlet flow port. Before initiating calibration using the sensor keypad, the gas should be flowed to the sensor at a rate of 80-100 cc\minute for a period of five minutes.

Observe the following steps to set up Zero Calibration mode and refer to *Figure 5 on page 12* for the zero calibration diagram.

1. Attach the short hose to the bottom port on the flowmeter.
2. Attach the long hose to the top port on the flowmeter.
3. To ensure the meter is kept in the vertical position, secure the flowmeter to the side of the gas bottle using the supplied tie wrap.
4. Remove the protective cap from the nitrogen bottle and attach the gas regulator.
5. Attach the open end of the bottom hose (located on the flowmeter) to the gas regulator. Slide the hose far enough on the gas port to ensure a secure, airtight connection.
6. Insert the male luer fitting (located on the longer hose) into the calibration port, located on the bottom of the dewpoint sensor.
7. Verify that all components are installed correctly and initiate the calibration process by turning the knob on the regulator. Turn the knob until the indicator reaches 7 PSI.
8. Turn the flowmeter knob until the floater reaches 80-100 cc\minute.
9. Allow the gas to flow for at least five minutes before proceeding.
10. Press the **Clear** and **Enter** buttons together and hold for five seconds. The word **CAL** will appear in the top line of the LCD display:

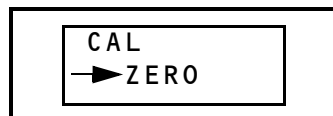


11. Use the arrow buttons to toggle to the Zero Calibration mode.



NOTE: Prior to pressing the **Enter** button, the zero gas should be flowing to the dewpoint sensor for at least five minutes.

12. When **ZERO** is displayed, press the **Enter** button to initiate the calibration process.



13. Once the **Enter** button is pressed, the calibration process will take five to seven minutes during which time the green LED below the display will flash. Once calibration is complete, the sensor will revert to its normal display mode.

Calibration Layout

See the diagram below for zero calibration layout. Contact your CPC sales representative for calibration kit (P/N 210-2005) purchasing information.

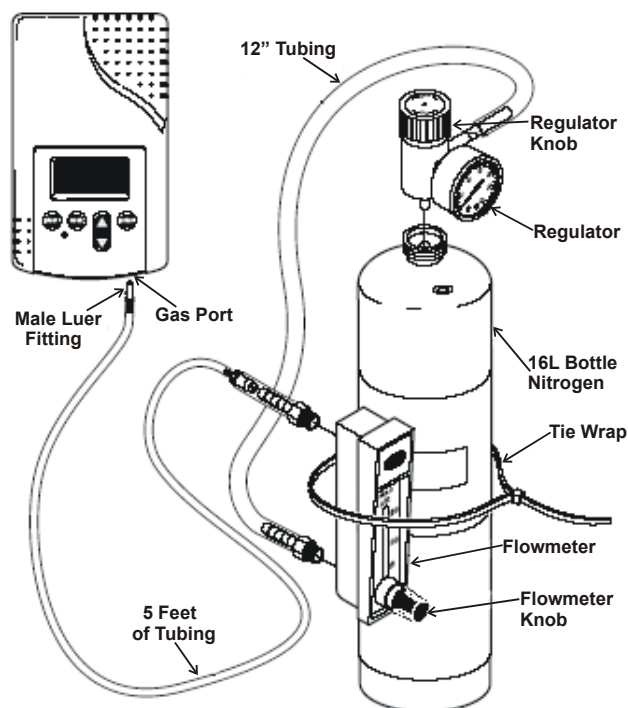


Figure 5 - Zero Calibration Diagram