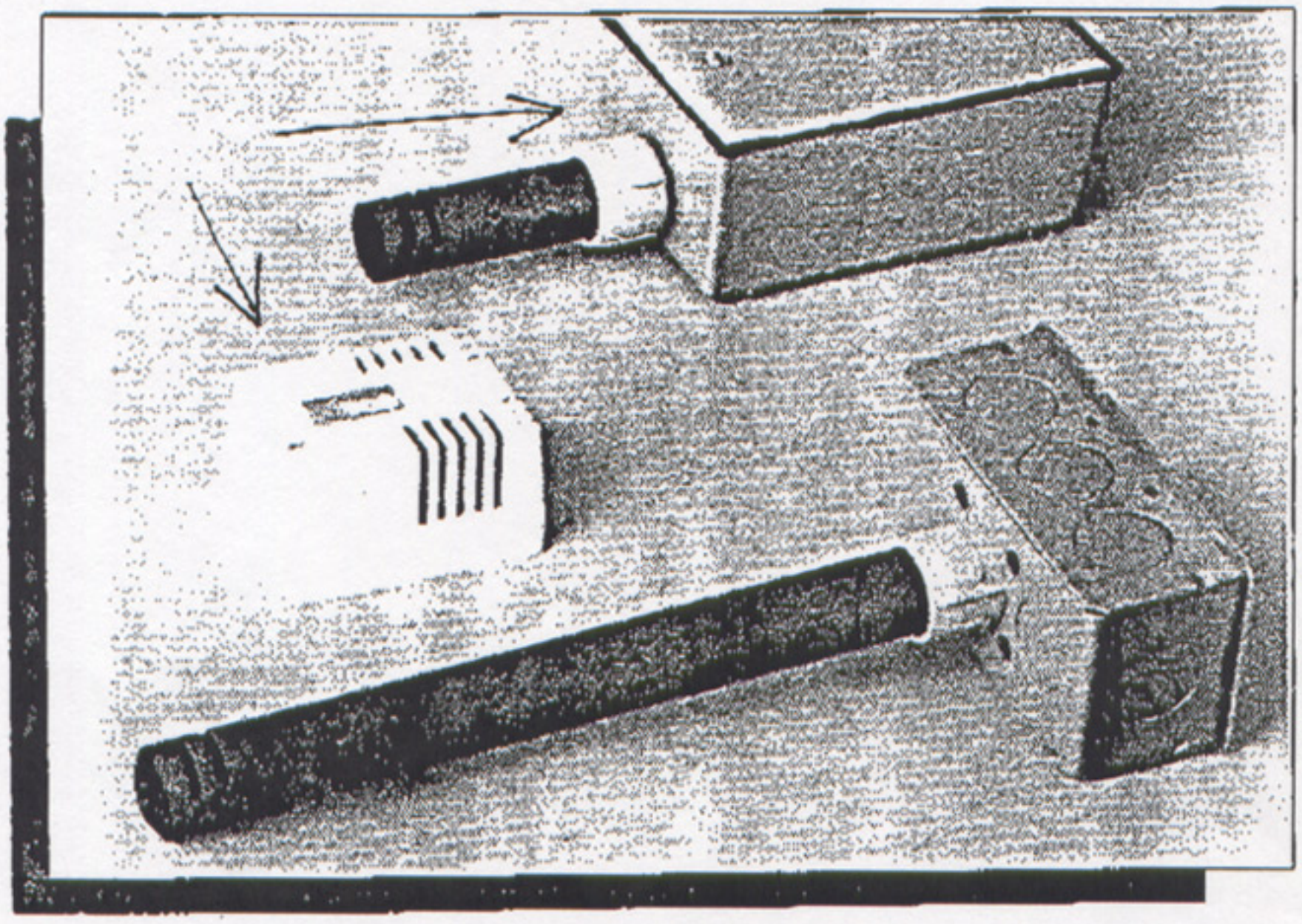
Humidity Transmitters

TCS/1200 H7 and H8
High Accuracy, Relative Humidity



General Description

The TCS/1200 series Relative Humidity Transmitters provide accurate and reliable humidity measurement for building automation and environment control systems. Percent relative humidity is perhaps the most widely used method for expressing the water vapor content of air, and is measured as the ratio of the prevailing water vapor pressure to the water vapor pressure of saturated air (times 100%). The TCS/1200 transmitter circuit converts the relative humidity measurement from an advanced macro-resistive polymer sensor into an electronic signal that can be processed by a control system. This signal is a 4-20 mA current that is directly proportional to 0-100% RH. The TCS/1200-H7 and H8 feature a high degree of sensitivity and repeatability, a wide humidity range, as well as effective temperature compensation.

The TCS/HS-1 Humidity Sensor

The TCS/1200 series sensing element is an advanced macro-resistive polymer humidity sensor. This device is composed of 2 electrode base-plates coated with a polymer resin the resistance of which varies according to changes in humidity.

The humidity sensitive material is prepared by polymerizing a solution of quaternary ammonium bases. The reaction of this functional base with a polymer resin produces a three-dimensional thermosetting resin that is characterized by its excellent stability in extreme conditions. The electrical resistance of this resin changes with humidity due to corresponding changes in the ionization level of the quaternary ammonium base.

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Unlike surface resistive elements, the TCS-HS1 is a bulk effect sensor in which the entire element reacts to changes in humidity. This characteristic dramatically minimizes sensor contamination effects as well as requisite sensor size.

Factory Calibration

The TCS/1200-H7 RH Transmitters are factory calibrated to an accuracy of +/- 2% RH using a multipoint calibration procedure. The TCS/1200-H8 is calibrated to an accuracy of +/- 1%. The calibration procedure for the TCS/1200 series utilizes a variety of chemically pure aqueous salt solutions to generate known humidities as specified in the ASTM standard E 104-85, "Standard Practice for Maintaining Constant Relative Humidity By Means of Aqueous Solutions". Due to the high sensitivity of relative humidity to temperature, TCS humidity transmitters are calibrated in a controlled environment.

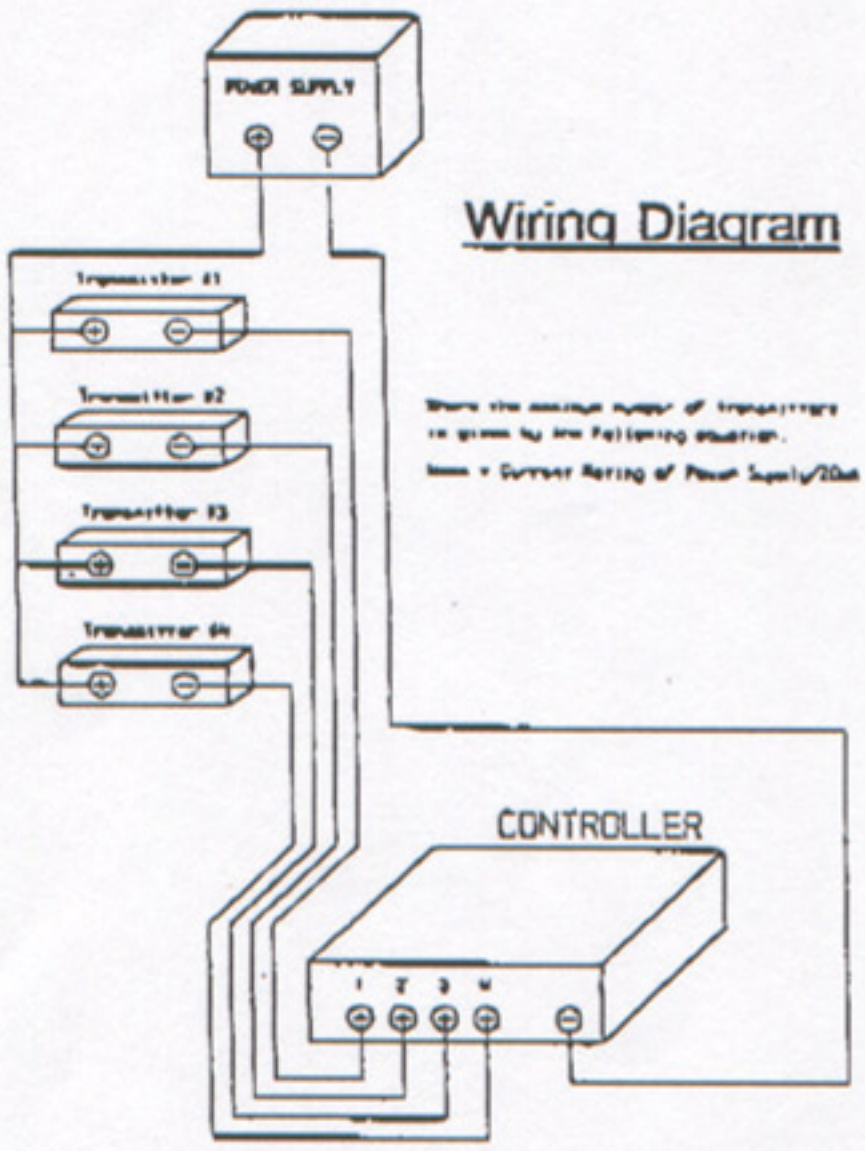
Product Specifications

General	
Accuracy	H7 +/-2.0% RH (from 20-95% RH @25 deg C) → H8 +/-1.0% RH (from 20-95% RH @25 deg C)
Repeatability	+/-0.5% RH from 20-90% RH
Stability	+/-1.0% RH drift/year
Hysteresis	less than 1%
Sensor Interchangeability	+/-3% RH
Time Constant	45 seconds (typical) from 30<->80% RH (w/ Air flow=3 m/s)
Zero Adjustment	+/- 20% RH, non-interactive
High Span Adjustment	+/- 10% RH, non-interactive
Environmental	
Sensor	
Humidity Range	0 to 99% RH
Operating Temp Range	-40 to 170 deg F, (-39 to 76.7 deg C)
Circuit	
Humidity Range	0 to <99% RH, non-condensing
Operating Temp Range	-40 to 130 deg F, (-39 to 54.4 deg C)
Storage Temp Range	-65 to 70 deg F, (-53 to 21.1 deg C)
Electrical	
Output Signal	4-20 mA DC, 2-wire
Supply Voltage	12-36 VDC

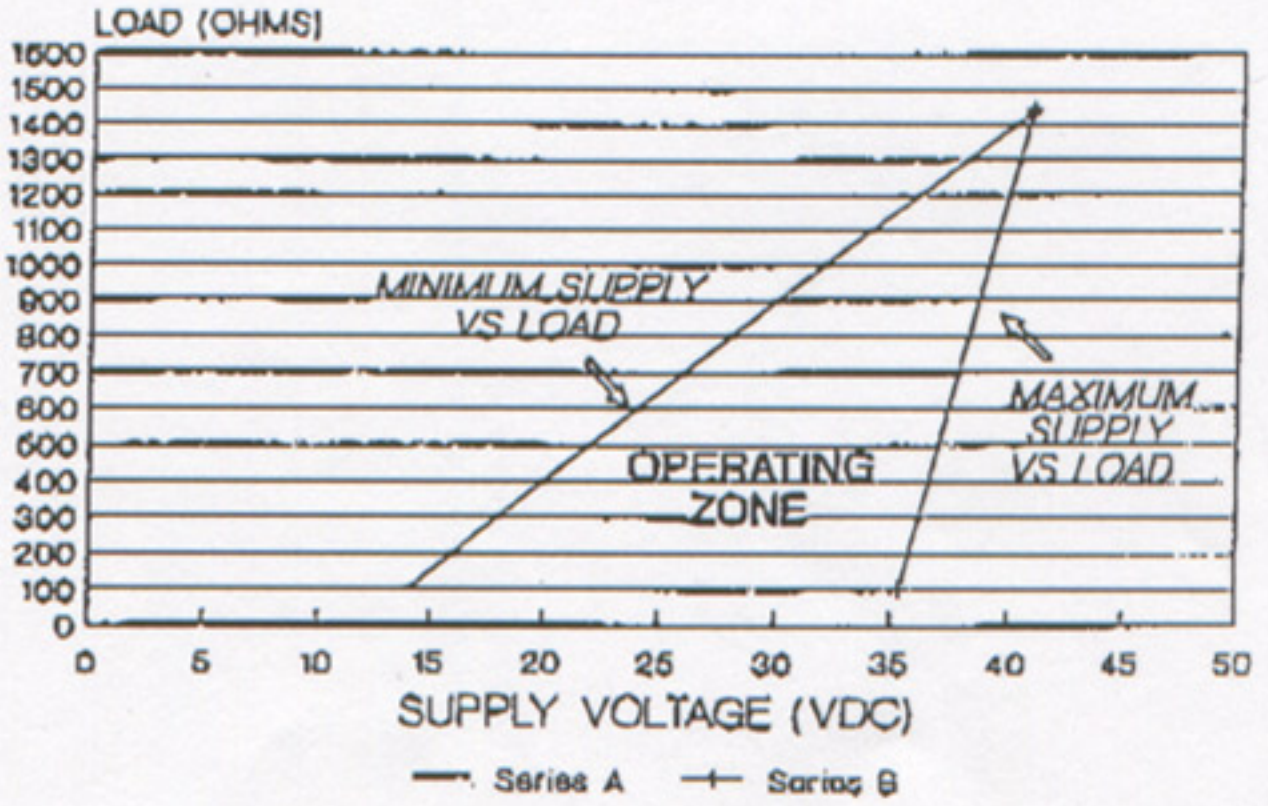
Maximum Load Resistance = (Supply voltage - 12 VDC) / 0.02 Amps
Maximum Supply Voltage = 36 VDC + (Load Resistance * .004 Amps)

Input Voltage Effect +/-0.003% RH/Volt for 12-30 VDC

Polarity Protection Reversed polarity diode protected
Wiring Connection Screw terminals, 14 AWG Max.



Wiring Diagram



Load Resistance vs Supply Voltage Relationship

Maximum Loop Resistance = (Supply Voltage-11.6 VDC) / 20mA
Maximum Supply Voltage = (Loop Resistance * 4 mA) + 35 VDC

Ordering Information

TCS/1200 - [ ] - [ ]

Model [Accuracy]

[H7]-(+/- 2%)
→ [H8]-(+/- 1%)

Enclosure

→ [R]-Room
[D]-Duct
→ [O]-Outside

Accessories

TCS/30-Regulated Power Supply
TCS/100-Loop Powered Indicator
TCS/HS-1-Replacement RH Sensor

Specification Suggestions

Section 1

A. Accuracy = 1.0% RH - Relative Humidity sensors and transmitters shall have a system accuracy of +/- 1% RH @ 25 degrees Celsius from 20-95% RH. The humidity transmitters shall be the TCS/1200-H8 model, made by the TCS/HVAC Sensors and Transducers Group, and shall use the TCS/HS-1 macro-resistive polymer humidity sensor.

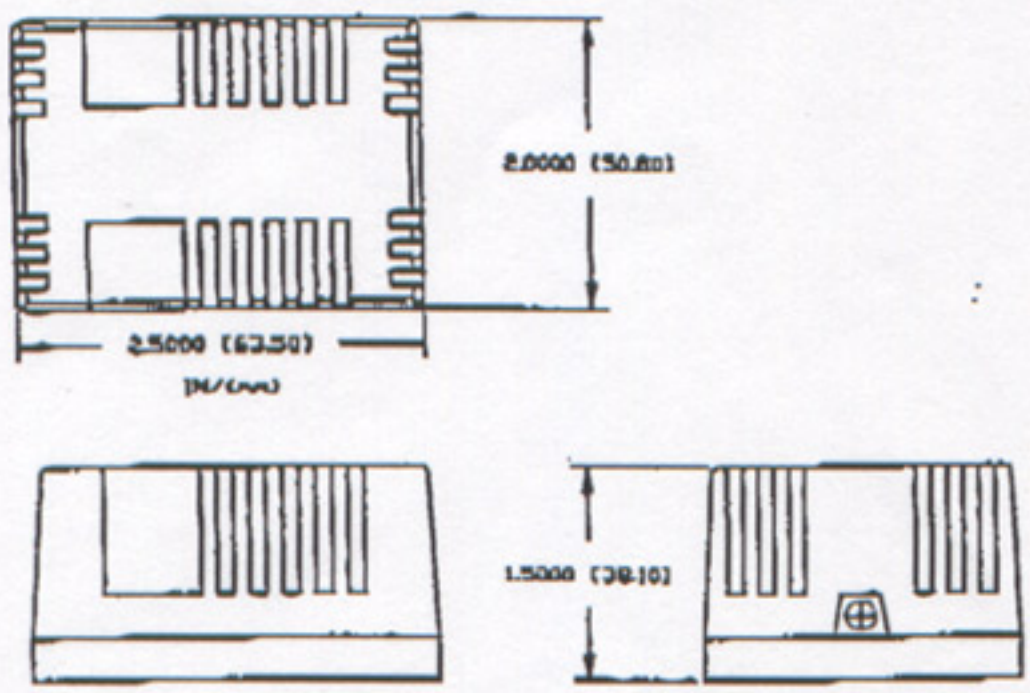
B. Accuracy = 2.0% RH - Relative Humidity sensors and transmitters shall have a system accuracy of +/- 2% RH @ 25 degrees Celsius from 20-95% RH. The humidity transmitters shall be the TCS/1200-H7 model, made by the TCS/HVAC Sensors and Transducers Group, and shall use the TCS/HS-1 macro-resistive polymer humidity sensor.

Section 2

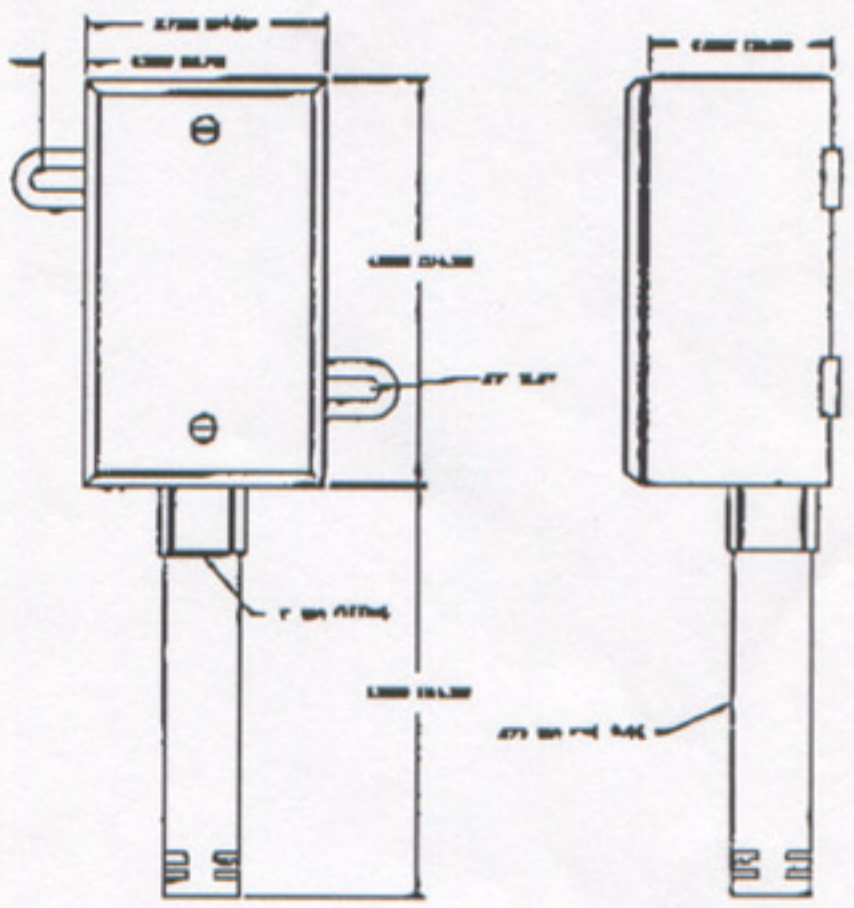
A transmitter shall be located at the sensor and shall provide a two wire 4-20 mA output, linear and proportional to 0-100% RH. The transmitter shall have the capability to be powered by an unregulated 12-35 VDC supply. All transmitters and sensors shall be calibrated in accordance with ASTM standard E104-85 and documentation shall be provided outlining calibration and testing results.

Dimensions

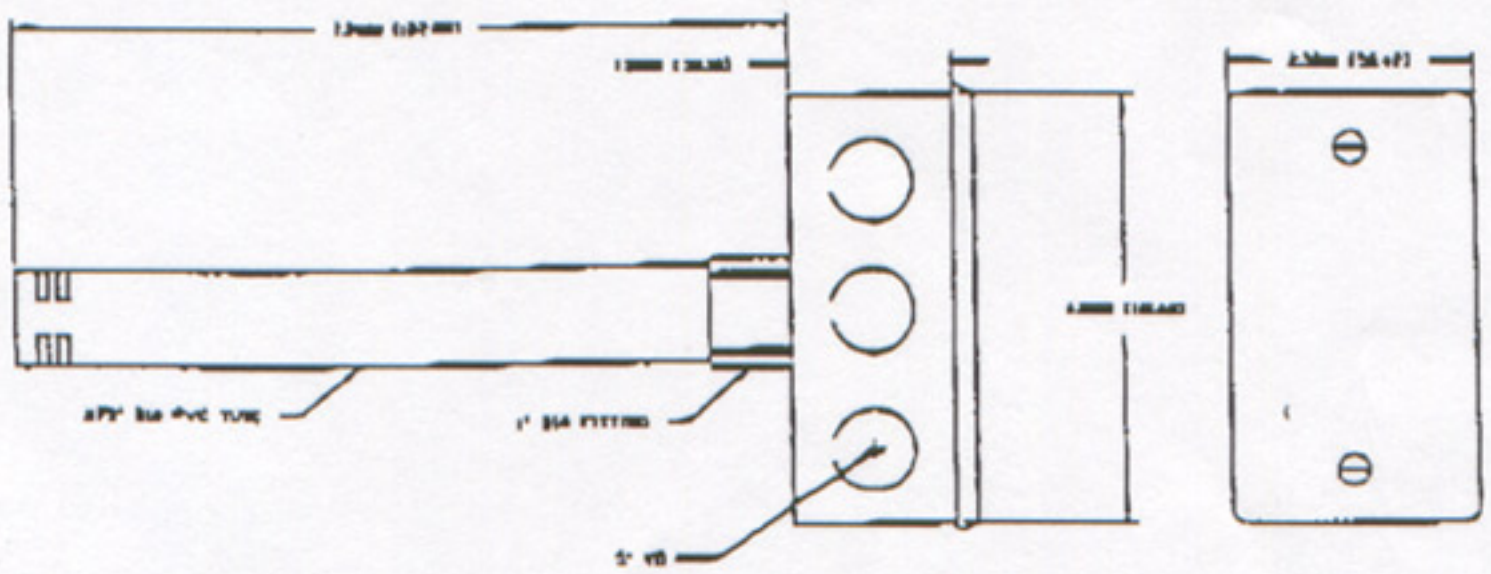
Room Mount



Outside Mount



Duct Mount



Specifications subject to change without notice

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