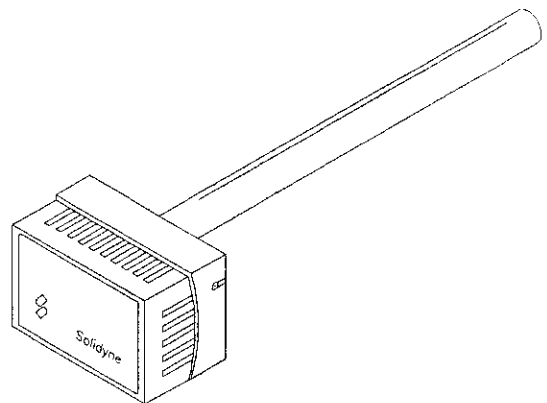




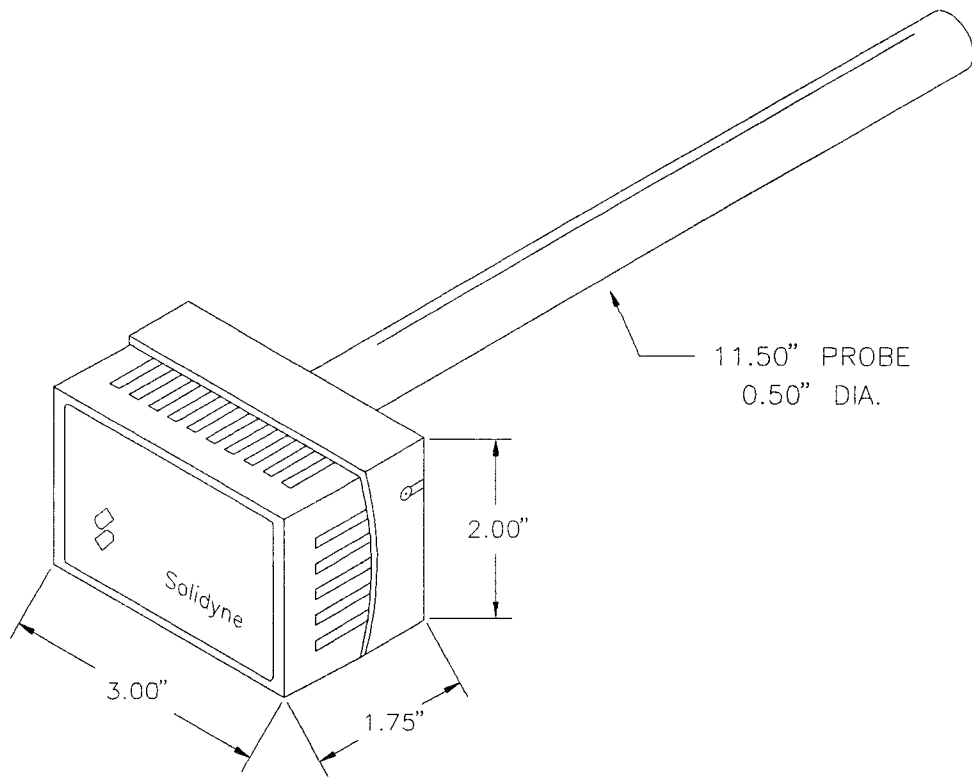
THE MODEL 3293D IS A RELATIVE HUMIDITY SENSOR AND VOLTAGE CONVERTER USED TO MEASURE RELATIVE HUMIDITY IN THE 0% TO 100% RH RANGE. THE 3293D SENSES RH AND CONVERTS IT INTO A D.C. VOLTAGE COMPATIBLE WITH SOLIDYNE MICROMIZER, CLIPPER AND XL9600 CONTROLLERS.

- Highly stable linear sensing element and associated circuitry to process variations in relative humidity
- Humidity variations are accurate within +/- 2% Rh from 0% to 100% Rh @ 70° F
- Built-in linearization circuitry compensates for variations due to temperature
- Sensing element is incorporated in a monolithic CMOS circuit to insure excellent reliability
- Can be used in conjunction with temperature sensors for enthalpy control
- Versatile mounting, Can be easily mounted in ducts or through walls (for outdoor applications)

## HUMIDITY DUCT SENSOR



# 3293D



*Fig. 1: Dimensions*

**DISCLAIMER**

Solidyne Corporation reserves the right to change product specifications without notice. Solidyne Corporation assumes no liability for damages incurred directly or indirectly from the use of this equipment or from errors, omissions or discrepancies between the equipment and the installation guides.

## DESCRIPTION

The Model 3293D is a relative humidity sensor and voltage converter used to measure relative humidity in the 0% to 100% Rh range. The sensor converts raw Rh data into a D.C. voltage which is compatible with Solidyne Micromizer, Clipper and XL9600 Controllers.

The 3293D incorporates a highly stable linear sensing element and associated circuitry to process variations in relative humidity. Humidity variations are accurate within +/- 2% Rh from 0% to 100% Rh @ 70° F. Built-in linearization circuitry compensates for variations due to temperature. The sensing element is incorporated in a monolithic CMOS circuit to insure excellent reliability.

**NOTE:** The 3293D is a static sensitive device. Please use appropriate precautions.

## SPECIFICATIONS

**MODEL NUMBER:** 3293D

**OUTPUT VOLTAGE:** 2.554 VDC to 3.109 VDC  
(corresponds to 0% Rh to +100% Rh)

**INPUT VOLTAGE:** 12-24 VAC/VDC

**ACCURACY:** +/- 2% Rh, 0-100% Rh @ 70° F

**OPERATING TEMPERATURE:** 32° F to 140° F

**STORAGE TEMPERATURE:** -40° F to 185° F

**LINE REGULATION:** 0.1% Rh per/volt fluctuation  
on the D.C. power supply.

**LINEARITY:** +/- 0.5% Rh

**REPEATABILITY:** +/- 0.5% Rh

**DIMENSIONS:** See Figure 1.

## INSTALLATION

### **CAUTION**

**BEFORE INSTALLING THE 3293D DISCONNECT POWER TO THE CONTROLLER. INCORRECT WIRING MAY DAMAGE THE 3293D. FOLLOW THESE INSTALLATION INSTRUCTIONS VERY CAREFULLY.**

1. Read installation instructions carefully.
2. Discharge any static you may have accumulated by touching a good earth ground before touching any components.
3. Check the range of operation and applicability of this sensor for your application.
4. This product should be installed by a trained, qualified service technician.
5. After the installation is complete, be sure to check the system out for proper operation.

## MOUNTING / LOCATION

The 3293D humidity sensing element (at the tip of the probe) can be mounted within ducts, through walls, or outdoors. Do not install:

- near hot water radiators
- behind bookcases or shelves
- near fireplaces
- in direct sunlight

The 3293D is ideally suited for most energy management environments. However, do not allow long term exposure to sulphur gases, oil, or oil mist as these will cause a calibration shift in the sensor.

Also any exposure to organic solvents will adversely affect the performance of the 3293D .

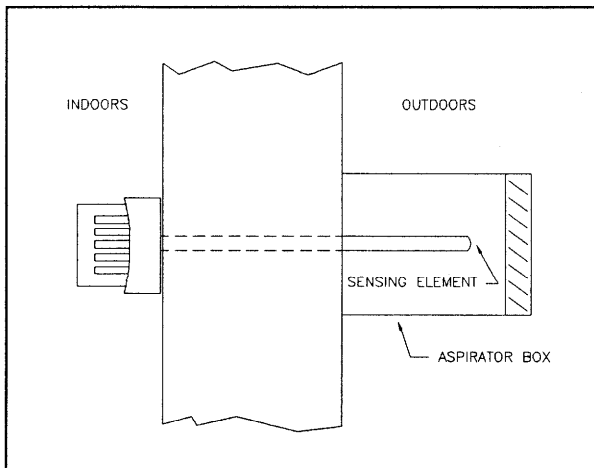


Figure 2: Outdoor Mounting

When the 3293D is used to measure the relative humidity outdoors, it is important that the sensing element not get wet. A protective device like an aspirator box may be used to keep the sensing element dry but still allow adequate ventilation for the 3293D to record humidity (See Figure 2).

## WIRING

1. Loosen the 2 allenhead screws on the sides of the 3293D enclosure. Remove the metal base plate and humidity sensor pcb. Drill a 1/2" hole through the duct or wall. Insert the probe through the hole, be careful not to damage the sensing element at

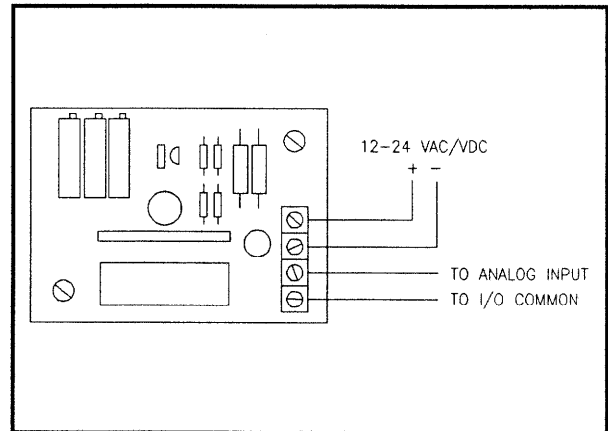


Fig. 3: Terminal Designations

the tip of the probe. Attach the base plate and the sensor to the desired location with 2 screws.

2. Run appropriate cabling from the controller to the sensor location. Follow local codes pertaining to low voltage wiring. This cable should be left unattached at the controller end.
3. Connect the cable coming from the controller to the appropriate sensor terminals. Figure 3 shows the terminal designations of the 3293D. The analog output terminal of the sensor is connected to the desired analog input of the controller.

## WIRING WITH CLIPPER

The 3293D has two terminals which must be wired to the Clipper baseplate. The common terminal of the sensor is connected to the terminal marked IN/OUT COM. The Analog Input terminal connects to one of the 8 inputs of the Clipper (See Figure 4).

Typically, a twisted-pair of 18 AWG wires should be used. Shielding is not necessary under most conditions and the sensor can be located up to 2000 feet from the controller.

## WIRING with XL9600

The XL9600 ICS-4 Board has three columns of terminal blocks. Each column has four 8-position terminal blocks for the 32 digital inputs, 32 analog inputs and 32 outputs the XL9600 can accommodate. The row of 8-position terminal blocks above these columns are for the digital input, analog voltage input, analog current input and digital/analog output commons.

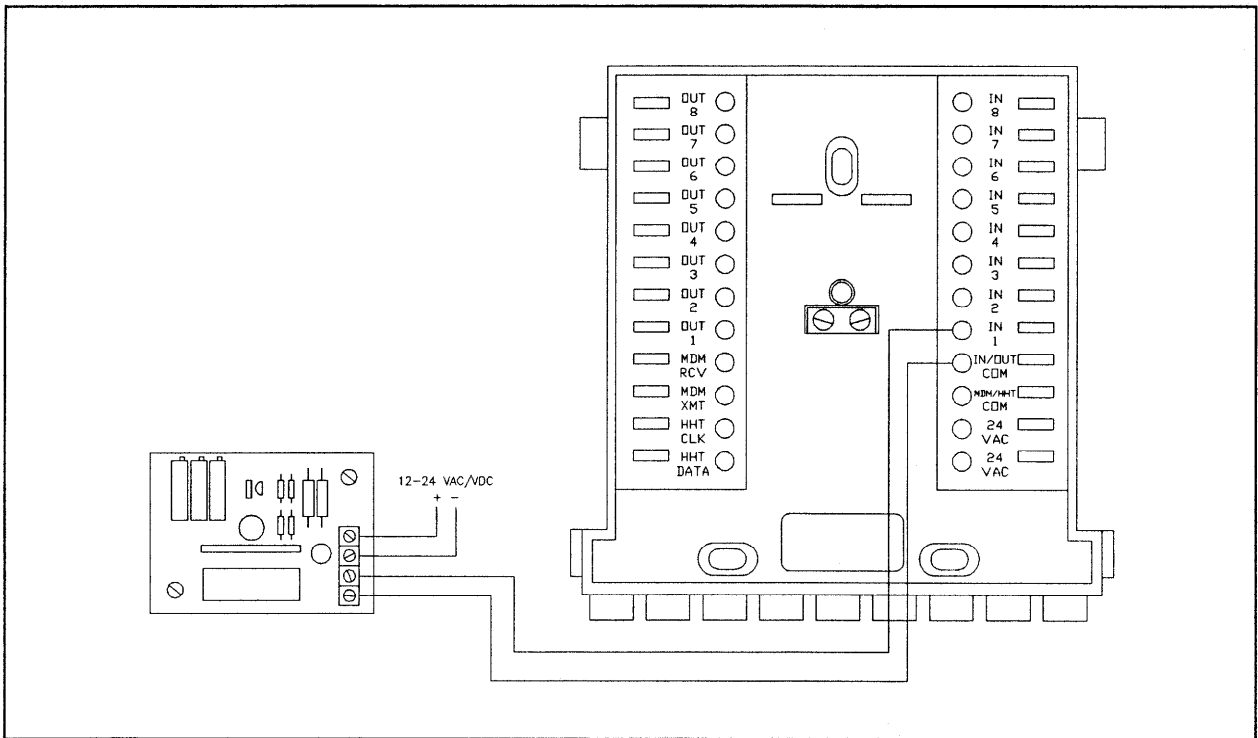


Figure 4: Clipper Connections

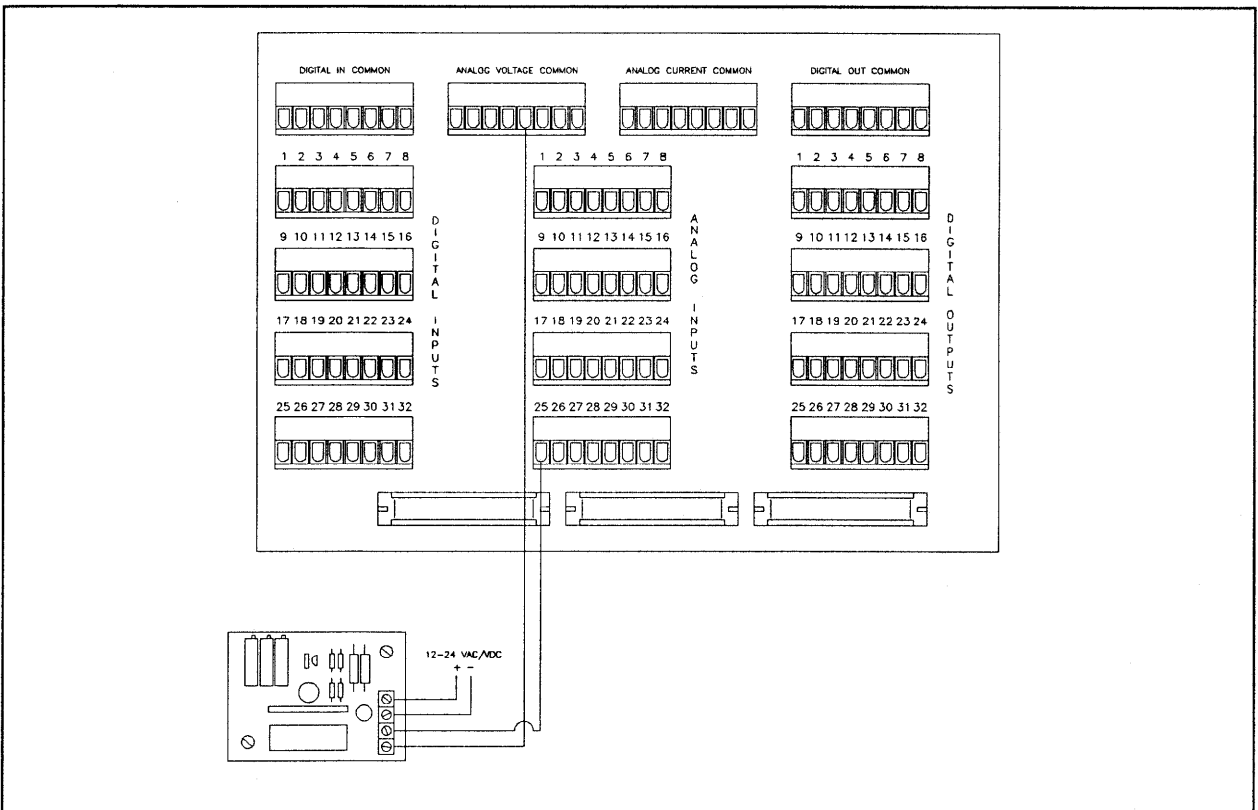


Figure 5: XL9600 Connections

The corresponding jumper (right bank) on the power supply board must be placed in the voltage (right) position.

4. After connecting the wires to the Clipper or XL9600, connect power to the sensor using the terminals provided.

**NOTE:** When using DC power supplies the wiring polarity must be observed.

5. Using a sling psychrometer or other device, measure the ambient humidity.
6. Return to the controller and, if after five minutes, the analog value does not correspond to ambient humidity, enter an analog offset value for the sensor's input. The value read by the controller should be the same as the ambient humidity in the area of the sensor once an offset is entered. See the instruction manual for the controller you are using for details on how to enter analog offsets.
7. Replace plastic enclosure cover and tighten the two allenhead screws.

This completes the installation of the 3293D humidity sensor.

**NOTE:** Do not run sensor wires in multi-conductor cable together with non-analog signals such as relay power.

**NOTE:** Do not locate the sensor more than 2000 feet from the controller.

6	2.587	40	2.776	74	2.965
7	2.593	41	2.782	75	2.970
8	2.598	42	2.787	76	2.976
9	2.604	43	2.793	77	2.982
10	2.609	44	2.798	78	2.987
11	2.615	45	2.804	79	2.993
12	2.620	46	2.809	80	2.998
13	2.626	47	2.815	81	3.004
14	2.632	48	2.820	82	3.009
15	2.637	49	2.826	83	3.015
16	2.643	50	2.832	84	3.020
17	2.648	51	2.837	85	3.026
18	2.654	52	2.843	86	3.032
19	2.659	53	2.848	87	3.037
20	2.665	54	2.854	88	3.043
21	2.670	55	2.859	89	3.048
22	2.676	56	2.865	90	3.054
23	2.682	57	2.870	91	3.059
24	2.687	58	2.876	92	3.065
25	2.693	59	2.882	93	3.070
26	2.698	60	2.887	94	3.076
27	2.704	61	2.893	95	3.082
28	2.709	62	2.898	96	3.087
29	2.715	63	2.904	97	3.093
30	2.720	64	2.909	98	3.098
31	2.726	65	2.915	99	3.104
32	2.732	66	2.920	100	3.109
33	2.737	67	2.926		

*Table 1, %Rh to Voltage Reading*

Table 1 shows the output voltages the 3293D creates based on the relative humidity it senses.

## ORDERING KEY

Refer to your authorized SOLIDYNE Wholesaler or Blue Sheet price list for complete ordering information.

If you have additional questions or need further information related to this product or any other SOLIDYNE products, call (800) 648-3980 for order information, or call (708) 394-3333 for technical help and support.

1. Order Part # 3293D.
2. For use with the Solidyne Micromizer, 8008 Clipper, and ClipperNet controllers.
3. For use with the XL9600 Controller.