









# S1000/2000/3000 For Commercial HVAC Applications

## Product overview

Viconics' latest generation S1000/2000/3000 series sensors have been especially developed for the VT7600 programmable and non-programmable thermostats as well as future Viconics thermostats. These robust sensors have provide accurate and stable temperature reading using a 10 Kohm thermistor element.

The S3000 series include all wall/room sensors, the S2000 series include all the duct/outdoor air models, and the S1000 include in duct change over sensing and submersible water sensing . Temperature averaging applications using only two or three S3000 sensors can easily be done by setting the dip switches to the appropriate position. It is to be noted that temperature averaging with the usual 4, 9, 16, 25, etc sensors can also be done, both with the S2000 and S3000 series. See table below for specific model numbers:

## Models

Model:	Description:	Application:	Picture:
S1010E1000	Capsule type sensor for multi-purpose use, 1/4" dia. capsule with 65 inch leads	<ul style="list-style-type: none"> <li>Remote sensing easy to dissimulate for indoor and outdoor use</li> <li>Water temperature sensing strapped on pipe or in an immersion well</li> </ul>	
S3010W1000	Room sensor	<ul style="list-style-type: none"> <li>Remote room sensing</li> <li>3 thermistors with 2 dip switches are provided with each sensor for various averaging combinations</li> </ul>	
S3020W1000	Room sensor with temporary override key and occupancy LED	<ul style="list-style-type: none"> <li>Remote room sensing with override key and occupancy LED</li> <li>3 thermistors with 2 dip switches are provided with each sensor for various averaging combinations</li> </ul>	
S2000D1000	Duct sensor with junction box	<ul style="list-style-type: none"> <li>Remote return air temperature sensing with the sensor mounted on the return air duct.</li> <li>Outside air temperature sensing with the sensor installed in the fresh air plenum.</li> <li>Supply air temperature sensor</li> </ul>	
S2020E1000	Outside air sensor, NEMA 4 enclosure	<ul style="list-style-type: none"> <li>Outside air temperature sensing with the sensor installed directly exposed to the elements.</li> <li>Sensor uses a water resistant NEMA 4 PVC enclosure for outdoor applications</li> </ul>	
S1010D1000	Duct Mounted Change Over Sensor	<ul style="list-style-type: none"> <li>Change Over Duct Sensing</li> <li>Mounting: Through hole in duct, with eyelet</li> </ul>	

**028-0106**

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### Installation of room sensors (S3010W1000 and S3020W1000)

- Remove security screw on the bottom of sensor cover.
- Open up by pulling on the bottom side of sensor. (Fig.1)

#### Location:

- 1- Should not be installed on an outside wall.
- 2- Must be installed away from any heat source.
- 3- Should not be installed near an air discharge grill.
- 4- Should not be affected by direct sun radiation.
- 5- Nothing must restrain vertical air circulation to the sensor.

#### Installation:

1. Remove security screw on the bottom of thermostat cover.
2. Open up by pulling on the bottom side of thermostat.
3. Pull out cables 6" out of the wall.
4. Wall surface must be flat and clean.
5. Insert cable in the central hole of the base.
6. Flip printed circuit board to access mounting hole
7. Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.
8. Install anchors in the wall.
9. Insert screws in mounting holes on each side of the base. **DO NOT OVERTIGHTEN**
10. Strip each wire 1/4 inch.
11. Insert each wire according to wiring diagram.
12. Gently push back into hole excess wiring back into the wall.
13. Press back printed circuit board into place
14. Install the cover, top side
15. Install security screw.

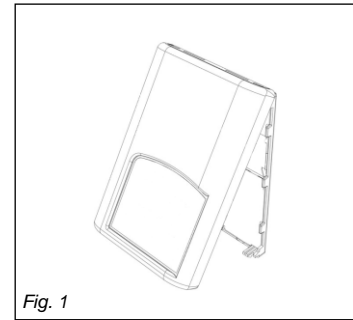


Fig. 1

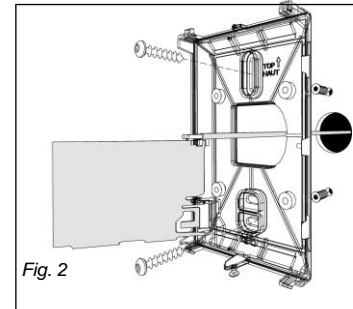


Fig. 2

### Installation of duct sensors (S2000D1000) – (Fig.3)

1. Drill 1" [25mm] hole mid height on the side of the duct to insert the probe.
2. Loosen swivel screw and direct the probe so that the flat side of probe tip is facing the airflow.
3. Mark the position of the two holes to be drilled for mounting the sensor on the duct. Fasten the sensor to the duct with the two screws provided. Do not overtighten!
4. Junction box must be directed downwards or sideways.
5. For best results, locate sensor as far as you can from heating/cooling source.

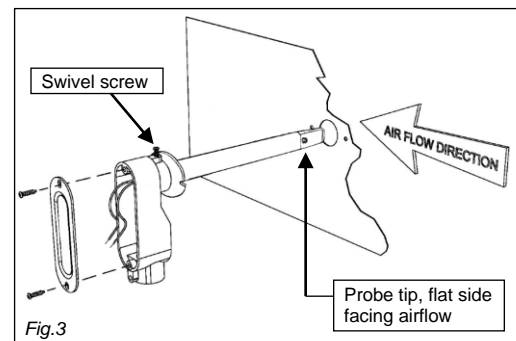


Fig.3

### Installation of averaging sensor (S2060A1000) - (Fig.4)

1. Drill 5/8" [16 mm] hole for the element to pass into the duct.
2. Run the sensing element into the duct.
3. Remove the cover from the unit.
4. Mark the position of the holes to be drilled for mounting the case on the duct.
5. Fasten the sensor element in an "S" shaped pattern in order to cover the entire duct section area. Ensure that the probe does not touch the duct.
6. Firmly support the element in the duct using perforated steel strap and wire fastenings.
7. For best results, locate sensor as far as you can from heating/cooling source.

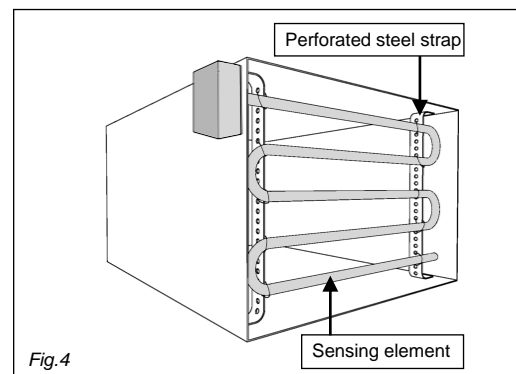


Fig.4

### Installation of outside air sensor (S2020E1000) – (Fig.5)

1. Install sensor using mounting holes on each side.
2. Install on a vertical surface, respect mounting orientation
3. Remove the four screws and remove the cover.
4. Strip each wire 1/4 inch.
5. Insert each wire according to wiring diagram.
6. Install the cover with supplied screws.
7. In snowy area allow sufficient height for snow accumulation.

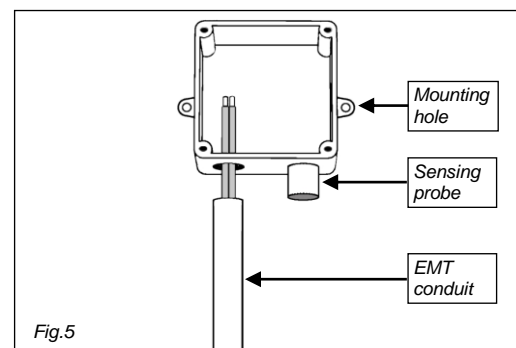
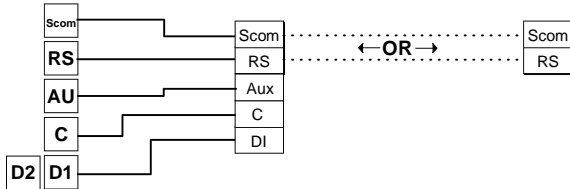


Fig.5

**Wiring example of single remote room sensor:**

VT7600 Series Thermostat      1x S3020W1000      Wiring 1 sensor      S2-1 = ON / S2-2 = ON

S3010W1000      Wiring 1 sensor      S2-1 = ON / S2-2 = ON

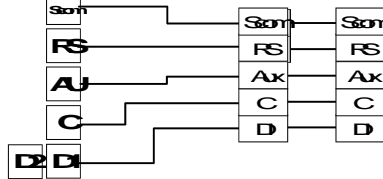


Dip switch setting for: **1 sensor**

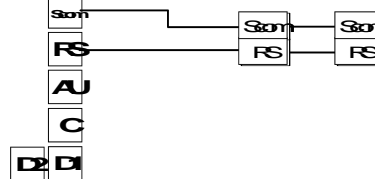
ON      S2-1 = ON  
OFF      S2-2 = ON

**Wiring examples of 2 remote room sensors for averaging applications:**

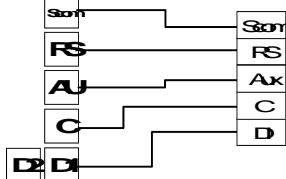
VT7600 Series Thermostat      2x S3020W1000      Wiring 2 sensors      S2-1 = OFF / S2-2 = ON



VT7600 Series      2x S3010W1000      Wiring 2 sensors      S2-1 = OFF / S2-2 = ON



VT7600 Series      1x S3010W1000 and 1x S3020W1000      Wiring 2 sensors      S2-1 = OFF / S2-2 = ON



**Notes for averaging applications:**

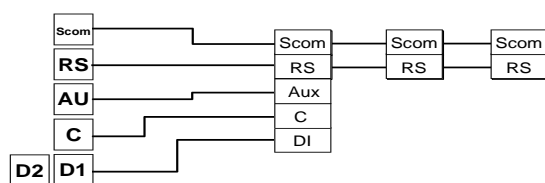
- S3010W1000 and S3020W1000 can be mixed matched.
- S3010W1000 and S3020W1000 are to be wired in parallel.
- Respect the dip switch setting in each remote sensor.

Dip switch setting for: **2 sensors**

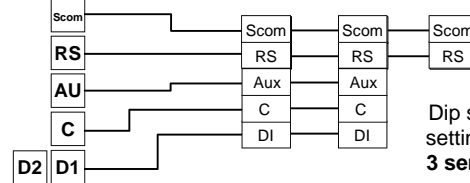
ON      S2-1 = OFF  
OFF      S2-2 = ON

**Wiring examples of 3 remote room sensors for averaging applications:**

VT7600 Series      2x S3010W1000 and 1x S3020W1000      Wiring 3 sensors      S2-1 = OFF / S2-2 = OFF



VT7600 Series Thermostat      1x S3010W1000 and 2x S3020W1000      Wiring 3 sensors      S2-1 = OFF / S2-2 = OFF



Dip switch setting for: **3 sensors**

ON      S2-1 = OFF  
OFF      S2-2 = OFF

**Temperature vs resistance chart for 10 kohm NTC thermistor**

(R<sub>25°C</sub> = 10KΩ±3% - B<sub>25/85°C</sub> = 3975K±1.5%)

°C	°F	kohms	°C	°F	kohms	°C	°F	kohms	°C	°F	kohms	°C	°F	kohms
-20	-4	94.5149	-10	14	54.1988	0	32	32.1910	10	50	19.7390	20	68	12.4601
-19	-2	89.2521	-9	16	51.3692	1	34	30.6120	11	52	18.8277	21	70	11.9177
-18	0	84.3147	-8	18	48.7042	2	36	29.1167	12	54	17.9636	22	72	11.4018
-17	1	79.6808	-7	19	46.1933	3	37	27.7088	13	55	17.1440	23	73	10.9112
-16	3	75.3299	-6	21	43.8268	4	39	26.3744	14	57	16.3665	24	75	10.4443
-15	5	71.2430	-5	23	41.5956	5	41	25.1119	15	59	15.6286	25	77	10.0000
-14	7	67.4028	-4	25	39.4912	6	43	23.9172	16	61	14.9280	26	79	9.5754
-13	9	63.7928	-3	27	37.5056	7	45	22.7861	17	63	14.2629	27	81	9.1711
-12	10	60.3980	-2	28	35.6316	8	46	21.7151	18	64	13.6310	28	82	8.7860
-11	12	57.2044	-1	30	33.8622	9	48	20.7004	19	66	13.0307	29	84	8.4190

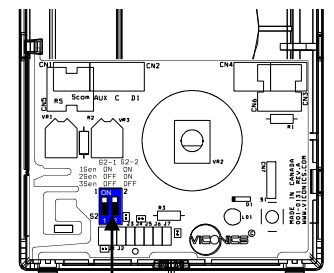
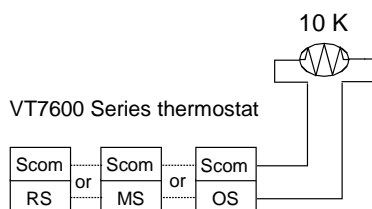


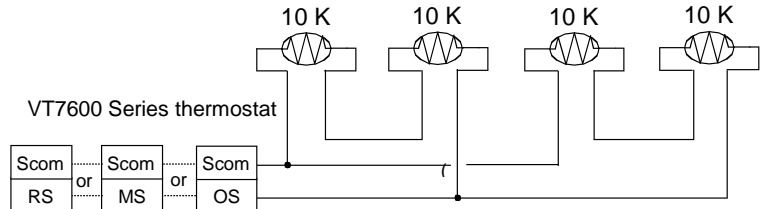
Fig.6  
Wall mounted sensor  
Dip switch location

**WIRING S2000D1000, S2060A1000 and S2020E1000**

Remote wiring 1 sensor



Remote wiring 4 sensors



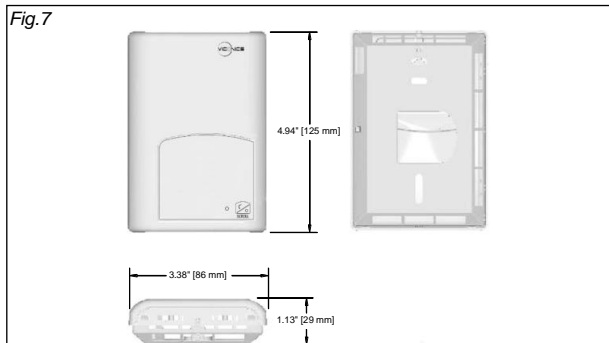
itions:

or all sensors

Sensor type: 10 K ohm NTC thermistor  
 Maximum wire length: 5,000 feet [1,525 m]  
 for 24 GA wire and up

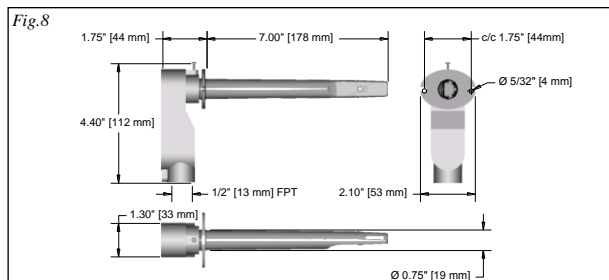
**Room sensors (S3010W1000 and S3020W1000)**

Operating conditions: 0 °C to 50 °C ( 32 °F to 122 °F )  
 0% to 95% R.H. non-condensing  
 Storage conditions: -30 °C to 50 °C ( -22 °F to 122 °F )  
 0% to 95% R.H. non-condensing  
 Dimensions: 4.94" [125 mm] high  
 3.38" [86 mm] wide  
 1.13" [29 mm] thick  
 Approximate shipping weight: 0.34 LBS (155 grams)  
 Enclosure plastic type: ABS - FRI [WT1337V] UV stabilized



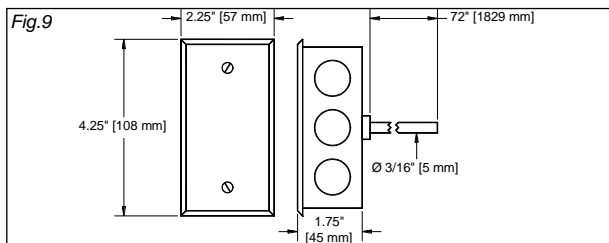
**Duct sensor (S2000D1000)**

Operating conditions: -40 °C to 50 °C ( -40 °F to 122 °F )  
 0% to 95% R.H. non-condensing  
 Storage conditions: -40 °C to 70 °C ( -40 °F to 122 °F )  
 0% to 95% R.H. non-condensing (refer to drawing Fig.8)  
 Dimensions: 1.75" [44 mm] high  
 Approximate shipping weight: 0.7 LBS [0.3 Kg]  
 Probe tip plastic type: Fire retarding grade "HB" ABS



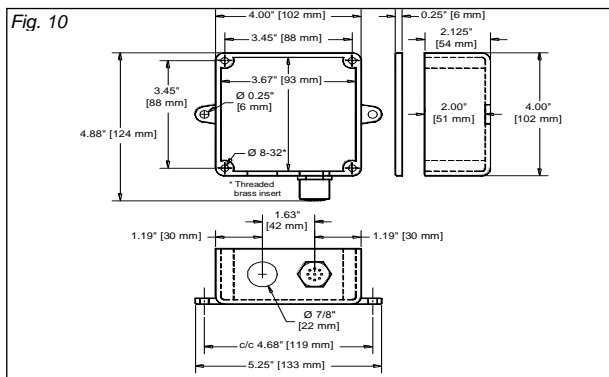
**Averaging sensor (S2060A1000)**

Operating conditions: -40 °C to 50 °C ( -40 °F to 122 °F )  
 0% to 95% R.H. non-condensing  
 Storage conditions: -40 °C to 70 °C ( -40 °F to 158 °F )  
 0% to 95% R.H. non-condensing  
 Sensing element length: 72 in [1,83 m]  
 Sensing element diameter / material: 3/16" [5 mm] / copper tube  
 Dimensions: (refer to drawing Fig.9)  
 Approximate shipping weight: 1.6 LBS [0.7 Kg]



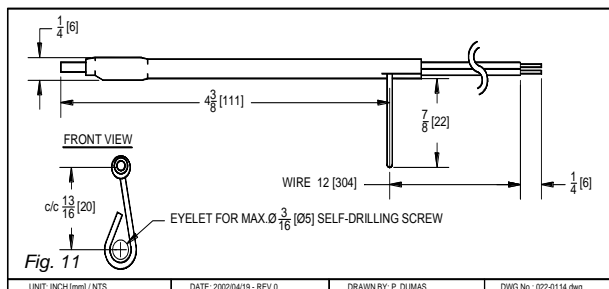
**Outside air sensor (S2020E1000)**

Operating and storage conditions: -40 °C to 50 °C ( -40 °F to 122 °F )  
 0% to 100% R.H.  
 Dimensions: (refer to drawing Fig.10)  
 Approximate shipping weight: 1.1 LBS [0.5 Kg]  
 Enclosure plastic type: NEMA 4 PVC



**Duct Mounted Temperature Sensor (S1010D1000)**

Operating conditions: Up to 85°C [185°F]  
 Sensing Bulb Type: Plastic Heatshrink  
 Dimensions: (refer to drawing Fig.11)  
 Wire Length: 12" [305 mm]  
 Probe length / Diameter: 4-1/2" [114 mm]/ 1/4" [6 mm]



UNIT: INCH/[mm] / NTS DATE: 2002/04/19 - REV.0 DRAWN BY: P. DUMAS DWG No.: 022-0114.dwg

**Important notice**



All S1000, S2000 and S3000 series sensors are for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verifications prior to shipment to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user / installer / electrical system designer to incorporate safety devices ( such as relays, flow switch, thermal protections, etc...) and/or alarm system to protect the entire system against such catastrophic failures. Tampering of the devices or miss application of the device will void warranty.