Infinity
Duct and Immersion Temperature Sensor

TAC Duct and Immersion Temperature Sensors provide accurate measurement of air temperature and fluids as part of an TAC building automation system. Both the duct and immersion sensors have a wide operating range of -30°F to 230°F (-34°C to 110°C), making them suitable for all types of duct, pipe and tank temperature applications.

The sensor’s design completely seals the precision 10K thermistor sensing element, within a stainless steel tube. The tube is filled with thermal epoxy, making it immune to moisture and condensation.

The sensor’s housing is a two-piece, plenum-rated plastic enclosure designed so that the sensor can be replaced without having to remove the housing. Simply take off the cover, withdraw the existing sensing element, and replace with a new sensor.

Duct Sensor
The duct sensor is designed for direct mounting on sheet metal duct systems. You simply secure the base to a duct using 3 standard sheet metal screws. The probe is then inserted through the hole in the base and tightened. The sensor wiring is guided into the 3/4 inch opening at the bottom of the base and connected to the probe using the two wire nuts included with the sensor.

Four lengths of duct sensor are available: 4, 6, 9 and 15.75 inches. An optional O-Ring/Gasket kit is available if the sensor is being mounted outside or in a high moisture environment. Also available is a Duct-to-Immersion Conversion kit that allows you to easily convert all or part of your duct sensor inventory for immersion applications.

Immersion Sensor
The immersion sensor uses the same housing as the duct sensor, but includes a mounting bracket for securing the thermowell. In addition, the immersion sensor comes equipped with gaskets at all potential leakage points, providing a Nema 4 waterproof enclosure.

Brass or Type 304 stainless steel thermowells are available in 4 inch and 6 inch immersion lengths. They are available with either a 1/2 inch or 3/4 inch threaded NPT connection. To utilize existing Andover 1/2 inch or 3/4 inch NPT thermowells with the immersion sensor, an optional adapter is available.

Strap-on Sensor
The strap-on sensor is designed for direct application to pipe surfaces for chilled or hot water measurement. It uses the same housing as both the duct and immersion sensors, but includes a strap for pipes 2 to 6 inches in diameter.

Features
• Accurate, reliable Type III thermistor
• Completely encapsulated for protection from moisture and condensation
• Easy installation and wiring
• Immersion sensor utilizes Nema Type 4 design
• Fast and efficient removal of the sensing element - no need to replace the entire unit
• Brass or stainless steel thermowells available in different sizes
• Money saving bulk packs
SPECIFICATIONS

GENERAL
Sensing Element
Type III Thermistor, 10,000 ohms @ 77°F (25°C)

Range
-30° to 230°F (-34° to 110°C)

Accuracy
± .36°F from 32° to 158°F (± .2°C from 0° to 70°C)  
± .90°F (± .5°C) over full range

Stability
Thermistor will not deviate from accuracy spec for minimum of 5 years

Thermal Epoxy
High resistivity epoxy filling probe's length

Housing
Two piece Polylac, Grade PA765; Plenum-rated (UL-94-5V Flame Retardant Rating)

Wiring Connections
Wire nuts

Wire Size
22 gauge, 2 conductor, unshielded

Maximum Distance to Sensor:
(with less than .1°F error)
Temperatures below 75°F (24°C)
22 gauge wire - 1,550 ft. (144 m)
18 gauge wire - 3,900 ft. (362 m)
Temperatures above 160°F (71°C)
22 gauge wire - 125 ft. (11.6 m)
18 gauge wire - 310 ft. (29 m)

DUCT SENSOR
Probe Diameter
.25” (6.3 mm)

Probe Lengths
4”, 6”, 9”, and 15.75” (10, 15.2, 22.9 and 40 cm)

Probe Material
Stainless Steel, Type 316

Electrical Piping Connection
1/2” NPSM Female Thread

IMMERSION SENSOR
Thermowell Material
Brass or Type 304 Stainless Steel

Thermowell Piping Connection
1/2” or 3/4” Male NPT

Thermowell Dimensions
3/4” (1.9 cm) shank diameter (3/4” NPT)  
5/8” (1.6 cm) shank diameter (1/2” NPT)

<table>
<thead>
<tr>
<th>Overall Length</th>
<th>Insertion Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” Sensor:</td>
<td>4” (10.16 cm)</td>
</tr>
<tr>
<td>6” Sensor:</td>
<td>6” (15.24 cm)</td>
</tr>
</tbody>
</table>

STRAP-ON SENSOR
Strap Length
Appropriate for 2 to 6 inch diameter pipes

Probe Material
Aluminum
### Product Identification

**DUCT TEMPERATURE SENSORS**
- Duct Temperature Sensor, 4” Probe
  - TT-D-4-1
- Duct Temperature Sensor, 6” Probe
  - TT-D-6-1
- Duct Temperature Sensor, 9” Probe
  - TT-D-9-1
- Duct Temperature Sensor, 15.75” Probe
  - TT-D-15.75-1

**IMMERSION TEMPERATURE SENSORS**
- Immersion Sensor, 4”
  - TT-I-4-1
- Immersion Sensor, 6”
  - TT-I-6-1

**THERMOWELLS**
- 4” Well, Brass, 1/2” NPT
  - W-B-4-1/2-1
- 6” Well, Brass, 1/2” NPT
  - W-B-6-1/2-1
- 4” Well, Brass, 3/4” NPT
  - W-B-4-3/4-1
- 6” Well, Brass, 3/4” NPT
  - W-B-6-3/4-1
- 4” Well, Stainless Steel, 1/2” NPT
  - W-S-4-1/2-1
- 6” Well, Stainless Steel, 1/2” NPT
  - W-S-6-1/2-1
- 4” Well, Stainless Steel, 3/4” NPT
  - W-S-4-3/4-1
- 6” Well, Stainless Steel, 3/4” NPT
  - W-S-6-3/4-1

All Duct and Immersion Sensors and Thermowells are available in Bulk Packs of 4, 12 and 16

### Accessories

- **Duct-to-Immersion Conversion Kit:**
  - TT-CONVRSN-KIT
- **Well Adapter Kit:**
  - Stainless Steel: W-ADAPTER-SS
  - Brass: W-ADAPTER-B
- **Replacement Sensor:**
  - 4”: TT-RPLC-4
  - 6”: TT-RPLC-6
  - 9”: TT-RPLC-9
  - 15.75”: TT-RPLC-15.75
- **O-Ring/Gasket Kit:**
  - TT-O-RING-KIT
## Sensor Resistance Chart

Type III 10,000 ohm at 77°F ± 0.36°F from 32°F

<table>
<thead>
<tr>
<th>Temp °F</th>
<th>Resistance</th>
<th>Temp °F</th>
<th>Resistance</th>
<th>Temp °F</th>
<th>Resistance</th>
<th>Temp °F</th>
<th>Resistance</th>
<th>Temp °F</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30</td>
<td>17363.00</td>
<td>-29</td>
<td>16822.00</td>
<td>-28</td>
<td>162998.00</td>
<td>-27</td>
<td>157954.00</td>
<td>-26</td>
<td>153083.00</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td></td>
<td>24</td>
<td></td>
<td>25</td>
<td></td>
<td>26</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>37304.00</td>
<td></td>
<td>36328.80</td>
<td></td>
<td>35382.10</td>
<td></td>
<td>34463.00</td>
<td></td>
<td>33570.70</td>
</tr>
<tr>
<td>-25</td>
<td>148378.00</td>
<td>-24</td>
<td>143833.00</td>
<td>-23</td>
<td>139442.00</td>
<td>-22</td>
<td>135200.00</td>
<td>-21</td>
<td>131010.00</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td></td>
<td>29</td>
<td></td>
<td>30</td>
<td></td>
<td>31</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>32704.20</td>
<td></td>
<td>31862.80</td>
<td></td>
<td>31045.70</td>
<td></td>
<td>30252.00</td>
<td></td>
<td>29481.10</td>
</tr>
<tr>
<td>-20</td>
<td>127139.00</td>
<td>-19</td>
<td>123310.00</td>
<td>-18</td>
<td>119609.00</td>
<td>-17</td>
<td>116031.00</td>
<td>-16</td>
<td>112571.00</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td></td>
<td>35</td>
<td></td>
<td>36</td>
<td></td>
<td>37</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>28004.60</td>
<td></td>
<td>27297.70</td>
<td></td>
<td>26610.80</td>
<td></td>
<td>25943.40</td>
<td></td>
<td>24664.20</td>
</tr>
<tr>
<td>-15</td>
<td>109226.00</td>
<td>-14</td>
<td>105992.00</td>
<td>-13</td>
<td>102863.00</td>
<td>-12</td>
<td>99837.30</td>
<td>-11</td>
<td>96910.20</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td></td>
<td>39</td>
<td></td>
<td>40</td>
<td></td>
<td>41</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>19222.40</td>
<td></td>
<td>19722.40</td>
<td></td>
<td>2051.40</td>
<td></td>
<td>23455.60</td>
<td></td>
<td>22876.50</td>
</tr>
<tr>
<td>-10</td>
<td>94078.40</td>
<td>-9</td>
<td>91338.60</td>
<td>-8</td>
<td>86867.30</td>
<td>-7</td>
<td>86121.60</td>
<td>-6</td>
<td>83638.40</td>
</tr>
<tr>
<td></td>
<td>43</td>
<td></td>
<td>44</td>
<td></td>
<td>45</td>
<td></td>
<td>46</td>
<td></td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>22313.40</td>
<td></td>
<td>21765.90</td>
<td></td>
<td>20715.70</td>
<td></td>
<td>20212.20</td>
<td></td>
<td>19245.90</td>
</tr>
<tr>
<td>-5</td>
<td>76655.30</td>
<td>-4</td>
<td>74474.20</td>
<td>-3</td>
<td>72362.10</td>
<td>-2</td>
<td>70317.60</td>
<td>-1</td>
<td>68335.60</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td></td>
<td>51</td>
<td></td>
<td>52</td>
<td></td>
<td>53</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>18331.50</td>
<td></td>
<td>17892.80</td>
<td></td>
<td>17165.90</td>
<td></td>
<td>17456.90</td>
<td></td>
<td>17600.40</td>
</tr>
<tr>
<td>0</td>
<td>64973.90</td>
<td>1</td>
<td>66416.70</td>
<td>2</td>
<td>64597.90</td>
<td>3</td>
<td>62756.90</td>
<td>4</td>
<td>6196.90</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td></td>
<td>57</td>
<td></td>
<td>58</td>
<td></td>
<td>59</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>15869.60</td>
<td></td>
<td>15946.80</td>
<td></td>
<td>15946.80</td>
<td></td>
<td>15946.80</td>
<td></td>
<td>15946.80</td>
</tr>
<tr>
<td>1</td>
<td>58</td>
<td></td>
<td>59</td>
<td></td>
<td>60</td>
<td></td>
<td>61</td>
<td></td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>14011.30</td>
<td></td>
<td>14101.30</td>
<td></td>
<td>14780.40</td>
<td></td>
<td>14046.40</td>
<td></td>
<td>14883.00</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td></td>
<td>65</td>
<td></td>
<td>66</td>
<td></td>
<td>67</td>
<td></td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>12266.80</td>
<td></td>
<td>12266.80</td>
<td></td>
<td>12266.80</td>
<td></td>
<td>12266.80</td>
<td></td>
<td>12266.80</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td></td>
<td>66</td>
<td></td>
<td>67</td>
<td></td>
<td>68</td>
<td></td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>11194.20</td>
<td></td>
<td>11194.20</td>
<td></td>
<td>11194.20</td>
<td></td>
<td>11194.20</td>
<td></td>
<td>11194.20</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td></td>
<td>61</td>
<td></td>
<td>62</td>
<td></td>
<td>63</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>10943.00</td>
<td></td>
<td>10943.00</td>
<td></td>
<td>10943.00</td>
<td></td>
<td>10943.00</td>
<td></td>
<td>10943.00</td>
</tr>
<tr>
<td>5</td>
<td>59</td>
<td></td>
<td>60</td>
<td></td>
<td>61</td>
<td></td>
<td>62</td>
<td></td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>10698.10</td>
<td></td>
<td>10698.10</td>
<td></td>
<td>10698.10</td>
<td></td>
<td>10698.10</td>
<td></td>
<td>10698.10</td>
</tr>
<tr>
<td>6</td>
<td>57</td>
<td></td>
<td>64</td>
<td></td>
<td>65</td>
<td></td>
<td>66</td>
<td></td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>3465.86</td>
<td></td>
<td>3465.86</td>
<td></td>
<td>3465.86</td>
<td></td>
<td>3465.86</td>
<td></td>
<td>3465.86</td>
</tr>
</tbody>
</table>

Copyright © 2008, TAC
All brand names, trademarks and registered trademarks are the property of their respective owners. Information contained within this document is subject to change without notice. All rights reserved.

F-27594
September 2008

TAC
1354 Clifford Avenue
PO Box 2940
Loves Park, IL 61107-2940
www.tac.com

Copyright © 2008, TAC
All brand names, trademarks and registered trademarks are the property of their respective owners. Information contained within this document is subject to change without notice. All rights reserved.