

Introduction


AKS temperature sensors are temperature dependent resistance sensors. The sensor unit consists of a platinum element the resistance value of which changes proportionally with the temperature. Sensors are Pt 1000 ohm units.

The sensors are adjusted and meet the tolerance requirements of EN 60751 class B.

Sensors are mainly for commercial and industrial refrigeration plant use where the requirements on grade of enclosure and temperature range are high.

Technical data

| Type | Sensor / sensor body | Connection / cable | Enclosure | Time constant τ in seconds |
|---------|---|--|------------------------------|---------------------------------|
| AKS 21M | 18/8 stainless steel tube | Fire-resistive silicone rubber cable 14/2 AWG ($2 \times 0.2 \text{ mm}^2$) | IP 67 (\approx NEMA 6) | 6 ¹⁾ |
| | | | | 14 ²⁾ |
| | | | | 35 ³⁾ |
| AKS 21W | Sensor probe: 18/8 stainless steel tube | Fire-resistive silicone rubber cable 14/2 AWG ($2 \times 0.2 \text{ mm}^2$) | IP 56 (\approx NEMA 4) | 18 ¹⁾ |
| | Threaded nipple: Free cutting steel | | | |
| | Top part: 18/8 - 18/12 stainless steel | Terminal box | | |
| | Terminal box: Aluminium - brass | | | |

¹⁾ Agitated liquid.

²⁾ Clamped to pipe.

³⁾ Air 13 ft/s (4 m/s).

Technical data

Resistance values, Pt 1000 ohm

| °C | °F | Ohm | °C | °F | Ohm | °C | °F | Ohm | °C | °F | Ohm |
|----|------|--------|-----|-------|--------|----|-------|--------|-----|-------|-------|
| 0 | 32.0 | 1000.0 | 0 | 32.0 | 1000.0 | 26 | 78.8 | 1101.2 | -26 | -14.8 | 898.0 |
| 1 | 33.8 | 1003.9 | -1 | 30.2 | 996.1 | 27 | 80.6 | 1105.1 | -27 | -16.6 | 894.0 |
| 2 | 35.6 | 1007.8 | -2 | 28.4 | 992.2 | 28 | 82.4 | 1109.0 | -28 | -18.4 | 890.1 |
| 3 | 37.4 | 1011.7 | -3 | 26.6 | 988.3 | 29 | 84.2 | 1112.8 | -29 | -20.2 | 886.2 |
| 4 | 39.2 | 1015.6 | -4 | 24.8 | 984.4 | 30 | 86.0 | 1116.7 | -30 | -22.0 | 882.2 |
| 5 | 41.0 | 1019.5 | -5 | 23.0 | 980.4 | 31 | 87.8 | 1120.6 | -31 | -23.8 | 878.3 |
| 6 | 42.8 | 1023.4 | -6 | 21.2 | 976.5 | 32 | 89.6 | 1124.5 | -32 | -25.6 | 874.3 |
| 7 | 44.6 | 1027.3 | -7 | 19.4 | 972.6 | 33 | 91.4 | 1128.3 | -33 | -27.4 | 870.4 |
| 8 | 46.4 | 1031.2 | -8 | 17.6 | 968.7 | 34 | 93.2 | 1132.2 | -34 | -29.2 | 866.4 |
| 9 | 48.2 | 1035.1 | -9 | 15.8 | 964.8 | 35 | 95.0 | 1136.1 | -35 | -31.0 | 862.5 |
| 10 | 50.0 | 1039.0 | -10 | 14.0 | 960.9 | 36 | 96.8 | 1139.9 | -36 | -32.8 | 858.5 |
| 11 | 51.8 | 1042.9 | -11 | 12.2 | 956.9 | 37 | 98.6 | 1143.8 | -37 | -34.6 | 854.6 |
| 12 | 53.6 | 1046.8 | -12 | 10.4 | 953.0 | 38 | 100.4 | 1147.7 | -38 | -36.4 | 850.6 |
| 13 | 55.4 | 1050.7 | -13 | 8.6 | 949.1 | 39 | 102.2 | 1151.5 | -39 | -38.2 | 846.7 |
| 14 | 57.2 | 1054.6 | -14 | 6.8 | 945.2 | 40 | 104.0 | 1155.4 | -40 | -40.0 | 842.7 |
| 15 | 59.0 | 1058.5 | -15 | 5.0 | 941.2 | 41 | 105.8 | 1159.3 | -41 | -41.8 | 838.8 |
| 16 | 60.8 | 1062.4 | -16 | 3.2 | 937.3 | 42 | 107.6 | 1163.1 | -42 | -43.6 | 835.0 |
| 17 | 62.6 | 1066.3 | -17 | 1.4 | 933.4 | 43 | 109.4 | 1167.0 | -43 | -45.4 | 830.8 |
| 18 | 64.4 | 1070.2 | -18 | -0.4 | 929.5 | 44 | 111.2 | 1170.8 | -44 | -47.2 | 826.9 |
| 19 | 66.2 | 1074.0 | -19 | -2.2 | 925.5 | 45 | 113.0 | 1174.7 | -45 | -49.0 | 822.9 |
| 20 | 68.0 | 1077.9 | -20 | -4.0 | 921.6 | 46 | 114.8 | 1178.5 | -46 | -50.8 | 818.9 |
| 21 | 69.8 | 1081.8 | -21 | -5.8 | 917.7 | 47 | 116.6 | 1182.4 | -47 | -52.6 | 815.0 |
| 22 | 71.6 | 1085.7 | -22 | -7.6 | 913.7 | 48 | 118.4 | 1186.3 | -48 | -54.4 | 811.0 |
| 23 | 73.4 | 1089.6 | -23 | -9.4 | 909.8 | 49 | 120.2 | 1190.1 | -49 | -56.2 | 807.0 |
| 24 | 75.2 | 1093.5 | -24 | -11.2 | 905.9 | 50 | 122.0 | 1194.0 | -50 | -58.0 | 803.1 |
| 25 | 77.0 | 1097.3 | -25 | -13.0 | 901.9 | | | | | | |

Extension of sensor cables

When extending a sensor cable, the new resistance value of the longer cable may give rise to indication error.

It is recommended that the total cable resistance should not exceed 2 ohm corresponding to an indication error of 1 °F (0.5°C) (Pt 1000 ohm).

Ordering

| Symbol | Type | Description | Temperature Range °F (°C) | Electrical Connection | Code No. |
|--------|---------|---|--------------------------------|-------------------------|--|
| | AKS 21M | Surface/Air Temperature Sensor | -94 to + 356 (-70 to + 180) | 8.2 ft. (2.5m) cable | 084N2003 |
| | AKS 21W | Immersion Temperature Sensor with 1/2" NPT Well, ≈1" Insertion Length | -94 to + 356 (-70 to + 180) | 8.2 ft. (2.5m) cable | 084N2043 (sensor)** 084N2045 (well)** |
| | AKS 21W | Immersion Temperature Sensor with 1/2" NPT Thread, ≈ 4" (100mm) Insertion Length* | -94 to + 320 (-70 to + 160) | Terminal Box | 084N2031* |

* This sensor can be special ordered with an extended probe, for ≈ 6.3" (160mm) use Code No. 068N2032, for ≈ 9.8" (250mm) use Code No. 084N2033.

** The temperature sensor and well must be ordered as separate items.

Dimensions and weights

| <p>DANFOSS AB4NT64.11.11</p> <p>AKS 21M</p> <p>Weight: 2.5 oz</p> | <table border="1"> <thead> <tr> <th></th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>in.</td> <td>0.19</td> <td>1.58</td> <td>1.22</td> <td>0.2</td> <td>0.22</td> </tr> <tr> <td>mm.</td> <td>4.8</td> <td>40</td> <td>31</td> <td>5</td> <td>5.7</td> </tr> </tbody> </table> | | a | b | c | d | e | in. | 0.19 | 1.58 | 1.22 | 0.2 | 0.22 | mm. | 4.8 | 40 | 31 | 5 | 5.7 | | | |
|---|--|------|------|---------------|------|------|---|-----|------|------|------|---------------|------|------|------|-----|-----|---------------|-----|----|-----|----|
| | a | b | c | d | e | | | | | | | | | | | | | | | | | |
| in. | 0.19 | 1.58 | 1.22 | 0.2 | 0.22 | | | | | | | | | | | | | | | | | |
| mm. | 4.8 | 40 | 31 | 5 | 5.7 | | | | | | | | | | | | | | | | | |
| <p>DANFOSS AB4NT65.13.11</p> <p>AKS 21W with 1/2" NPT thread</p> <p>Weight: 8.8 oz</p> | <table border="1"> <thead> <tr> <th></th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> </tr> </thead> <tbody> <tr> <td>in.</td> <td>0.19</td> <td>0.43</td> <td>1.58</td> <td>0.91</td> <td>0.27</td> <td>0.67</td> </tr> <tr> <td>mm.</td> <td>4.8</td> <td>11</td> <td>40</td> <td>23</td> <td>6.8</td> <td>17</td> </tr> </tbody> </table> | | a | b | c | d | e | f | in. | 0.19 | 0.43 | 1.58 | 0.91 | 0.27 | 0.67 | mm. | 4.8 | 11 | 40 | 23 | 6.8 | 17 |
| | a | b | c | d | e | f | | | | | | | | | | | | | | | | |
| in. | 0.19 | 0.43 | 1.58 | 0.91 | 0.27 | 0.67 | | | | | | | | | | | | | | | | |
| mm. | 4.8 | 11 | 40 | 23 | 6.8 | 17 | | | | | | | | | | | | | | | | |
| <p>DANFOSS AB4NT63.13.10</p> <p>Pg 13.5</p> <p>AKS 21W with 1/2" NPT thread</p> <p>Weight: 7.9 oz (3.9" probe) 8.8 oz (6.3" probe) 10.6 oz (9.8" probe)</p> | <table border="1"> <thead> <tr> <th></th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>in.</td> <td>5.75</td> <td>2.76</td> <td>0.59</td> <td>3.9, 6.3, 9.8</td> <td>0.31</td> </tr> <tr> <td>mm.</td> <td>146</td> <td>70</td> <td>15</td> <td>100, 160, 250</td> <td>8</td> </tr> </tbody> </table> | | a | b | c | d | e | in. | 5.75 | 2.76 | 0.59 | 3.9, 6.3, 9.8 | 0.31 | mm. | 146 | 70 | 15 | 100, 160, 250 | 8 | | | |
| | a | b | c | d | e | | | | | | | | | | | | | | | | | |
| in. | 5.75 | 2.76 | 0.59 | 3.9, 6.3, 9.8 | 0.31 | | | | | | | | | | | | | | | | | |
| mm. | 146 | 70 | 15 | 100, 160, 250 | 8 | | | | | | | | | | | | | | | | | |

