



Features & Benefits

- Weatherproof Housing
- Wide range of sensing element types
- Stainless steel probe
- Optional probe lengths, 65, 150 & 250mm
- Hinged lid with the facility of tamper proofing

Technical Overview

This range of duct temperature sensors are supplied with a neoprene gasket to ensure a good seal between the sensor and the duct. A flange plate is available for adjustment of penetration depth (order as TT-DFP). Units contain either a high quality thermistor, Nickel or Platinum sensing element.

The -CVO active output option combines 4 pre-set ranges and selectable output mode, customised output range scaling enabling a choice of outputs and ranges on one unit.

Product Codes

TDSN- Duct Sensor

Sensing Element (add type to above code)

Passive output:

| | |
|-----------|---|
| -A | (10K3A1) Trend, Cylon, Distech, Tridium |
| -B | (10K4A1) Andover, Delta Controls |
| -C | (20K6A1) Honeywell |
| -D | (PT100a) Serck |
| -E | (PT1000a) Cylon |
| -F | (NI1000a) Sauter |
| -G | (Ni1000a/TCR(LAN1)) Siemens |
| -H | (SAT1) Satchwell |
| -K | (STA1) Landis & Staefa |
| -L | (TAC1) TAC |
| -M | (2.2K3A1) Johnson Controls |
| -N | (3K3A1) Alerton |
| -P | (30K6A1) Drayton |
| -Q | (50K6A1) |
| -R | (100K6A1) York >40°C |
| -S | (SAT2) Satchwell |
| -T | (SAT3) Satchwell |
| -W | (SIE1) Siebe |
| -Y | (STA2) Landis & Staefa |
| -Z | (10K NTC) Carel |

Active output:

| | |
|---------------|--|
| -CVO | 4-20mA/0-10Vdc selectable output |
| -CVO-C | 4-20mA/0-10Vdc selectable output with custom temp. scaling -10 to +100°C |

Suffix (at extra cost):

| | |
|-------------|--------------------|
| -65 | 65mm Probe length |
| -250 | 250mm Probe length |

Accessory

TT-DFP Duct penetration adjustment flange plate

Specification

Output types:

| | |
|---------------------|-----------------------------------|
| Passive | Resistive |
| Active (selectable) | Current 4-20mA or Voltage 0-10Vdc |

Accuracy:

| | |
|------------|------------------|
| Thermistor | ±0.2°C 0 to 70°C |
| PT100a | ±0.2°C @ 25°C |
| PT1000a | ±0.2°C @ 25°C |
| NI1000 | ±0.4°C @ 0°C |
| -CVO | ±0.4°C @ 25°C |

Probe:

| | |
|------------|---------------------------|
| Material | Stainless steel |
| Dimensions | 65, 150, 250mm x 6mm dia. |

Housing:

| | |
|------------|---|
| Material | PC/GF (Halogen free, flame retardant & UV stabilized) |
| Dimensions | 80 x 79 x 44mm |
| Protection | IP65 |

Environmental:

| | |
|----------|-------------------------|
| Housing: | -30 to 70°C |
| | 0 to 95% non-condensing |
| Media: | -30 to +100°C |
| Weight | 160g |

Country of origin:

| | |
|--------|--------|
| TT-D-A | Poland |
| Others | UK |

WEEE Directive:



At the end of the products useful life please dispose as per the local regulations. Do not dispose of with normal household waste. Do not burn.



Installation

1. Select a location in the duct where the sensor probe will give a representative sample of the prevailing air condition.
2. If the sensor is to be fitted direct to the duct and drill a 7mm diameter hole in the duct, then use the housing as a template mark the hole centres, drill and fix the housing to the duct.
3. Sensors with optional flange, if depth adjustment is required, use the TT-DFP, insert the probe to the desired depth and tighten the grub screw.
4. Release the snap-fit lid by gently squeezing the locking tab and feed the cable through the waterproof gland & terminate the cores at the terminal block. Leaving some slack inside the unit, tighten the cable gland onto the cable to ensure water tightness.
5. If the sensor is to be mounted outside, it is recommended that the unit be mounted with the cable entry at the bottom. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
6. Snap shut the lid after the connections have been made.

Connections

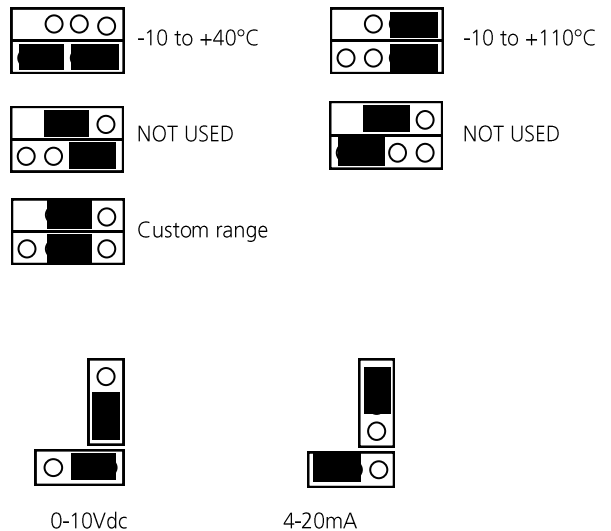
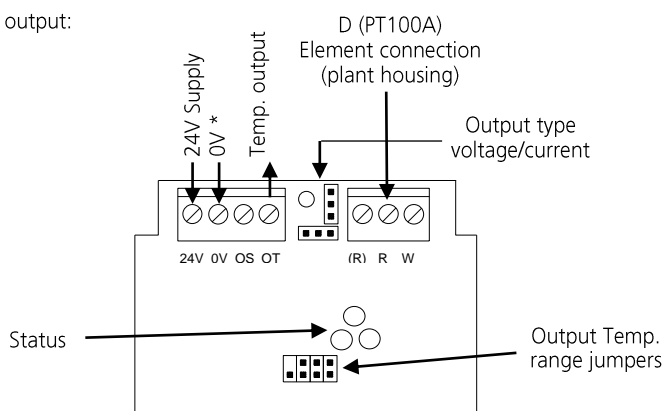
All connections to BEMS controllers, data recorders etc. should be made using screened cable. Normally, the screen should be earthed at one end only (usually the controller end) to avoid earth hum loops which can create noise. Low voltage signal and supply cables should be routed separately from high voltage or mains cabling. Separate conduit or cable trays should be used. Where possible, the controller's earth should be connected to a FUNCTIONAL EARTH, rather than the mains safety earth. This will provide better immunity to high frequency noise. Most modern buildings have a separate earth for this purpose.

Passive output:



Connections are made via the 2-way terminal block. Connections for thermistor, platinum and nickel sensing elements are polarity independent.

Active output:



* Not required with 4-20mA output

Notes:

Voltage output Nominal voltage 24Vac/dc.

Current output If using in current output mode, the sensor must only be used with a 24Vdc supply. The sensor may be damaged if supplied with AC.

The selectable output temperature ranges are dependent on sensor type, ambient and application.

For full connection and specification please refer to the TT-CVO data sheet.

Temperature vs Resistance Charts

| °C | A | B | C | D | E | F | G | H | K | L | M | N |
|-----|---------|--------|--------|---------|----------|--------|--------|------|------|------|---------|--------|
| | 10K3A1 | 10K4A1 | 20K6A1 | PT 100A | PT 1000A | NI1000 | LAN1 | SAT1 | STA1 | TAC1 | 2.2K3A1 | 3K3A1 |
| | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω |
| -50 | 6678528 | 441667 | - | 80.3 | 803 | 743 | 790.8 | 9719 | - | - | 150395 | 200348 |
| -40 | 335671 | 239831 | - | 84.3 | 843 | 791 | 826.8 | 9584 | - | - | 75593 | 100701 |
| -30 | 176683 | 135233 | - | 88.2 | 882 | 842 | 871.7 | 9349 | - | - | 39789 | 53005 |
| -20 | 96974 | 78930 | - | 92.2 | 921 | 893 | 913.4 | 8968 | - | - | 21839 | 29092 |
| -15 | 72895 | 61030 | - | - | - | - | 934.7 | 8708 | - | - | 16416 | 21868 |
| -10 | 55298 | 47549 | - | 96.1 | 961 | 946 | 856.2 | 8396 | - | - | 12453 | 16589 |
| -5 | 42314 | 37316 | - | - | - | - | 978.0 | 8031 | - | - | 9529 | 12694 |
| 0 | 32650 | 29490 | 70204 | 100.0 | 1000 | 1000 | 1000.0 | 7614 | 2226 | 5085 | 7353 | 9795 |
| 1 | 31030 | 28157 | 66525 | - | - | - | 1004.4 | 7525 | 2236 | - | 6988 | 9309 |
| 2 | 29500 | 26891 | 63059 | - | - | - | 1008.9 | 7434 | 2246 | - | 6643 | 8850 |
| 3 | 28054 | 25689 | 59793 | - | - | - | 1013.3 | 7341 | 2256 | - | 6318 | 8416 |
| 4 | 26688 | 24547 | 56713 | - | - | - | 1017.8 | 7246 | 2266 | - | 6010 | 8006 |
| 5 | 25396 | 23462 | 53809 | - | - | - | 1022.3 | 7150 | 2276 | 4078 | 5719 | 7619 |
| 6 | 24173 | 22430 | 51070 | - | - | - | 1026.7 | 7053 | 2286 | - | 5444 | 7252 |
| 7 | 23016 | 21450 | 48484 | - | - | - | 1031.2 | 6954 | 2298 | - | 5183 | 6905 |
| 8 | 21921 | 20517 | 46044 | - | - | - | 1035.8 | 6853 | 2306 | - | 4937 | 6577 |
| 9 | 20885 | 19631 | 43739 | - | - | - | 1040.3 | 6752 | 2316 | - | 4703 | 6266 |
| 10 | 19904 | 18787 | 41563 | 103.9 | 1039 | 1056 | 1044.8 | 6649 | 2326 | 3294 | 4482 | 5971 |
| 11 | 18974 | 17983 | 39506 | - | - | - | 1049.3 | 6545 | 2337 | - | 4273 | 5692 |
| 12 | 18092 | 17219 | 37562 | - | - | - | 1053.9 | 6440 | 2347 | - | 4075 | 5428 |
| 13 | 17257 | 16490 | 35724 | - | - | - | 1058.4 | 6334 | 2357 | - | 3886 | 5177 |
| 14 | 16465 | 15797 | 33986 | - | - | - | 1063.0 | 6228 | 2367 | - | 3708 | 4940 |
| 15 | 15714 | 15136 | 32342 | - | - | - | 1067.6 | 6121 | 2377 | 2676 | 3539 | 4714 |
| 16 | 15001 | 14507 | 30786 | - | - | - | 1072.2 | 6013 | 2388 | - | 3378 | 4500 |
| 17 | 14325 | 13906 | 29213 | - | - | - | 1076.8 | 5905 | 2398 | - | 3226 | 4297 |
| 18 | 13623 | 13334 | 27918 | - | - | - | 1081.4 | 5786 | 2408 | - | 3081 | 4105 |
| 19 | 13053 | 12788 | 26598 | - | - | - | 1086.0 | 5684 | 2418 | - | 2940 | 3916 |
| 20 | 12494 | 12268 | 25346 | 107.8 | 1078 | 1112 | 1090.7 | 5580 | 2429 | 2188 | 2814 | 3748 |
| 21 | 11943 | 11771 | 24160 | - | - | - | 1095.3 | 5471 | 2439 | - | 2690 | 3583 |
| 22 | 11420 | 11297 | 23036 | - | - | - | 1100.0 | 5362 | 2449 | - | 2572 | 3426 |
| 23 | 10923 | 10845 | 21970 | - | - | - | 1104.6 | 5254 | 2460 | - | 2460 | 3277 |
| 24 | 10450 | 10413 | 20959 | - | - | - | 1109.3 | 5147 | 2470 | - | 2353 | 3135 |
| 25 | 10000 | 10000 | 20000 | 109.8 | 1098 | - | 1114.0 | 5039 | 2480 | 1800 | 2252 | 3000 |
| 26 | 9572 | 9606 | 19090 | - | - | - | 1120.0 | 4933 | 2491 | - | 2156 | 2871 |
| 27 | 9165 | 9229 | 18226 | - | - | - | 1123.4 | 4827 | 2501 | - | 2064 | 2749 |
| 28 | 8777 | 8869 | 17405 | - | - | - | 1127.1 | 4721 | 2512 | - | 1977 | 2633 |
| 29 | 8408 | 8525 | 16626 | - | - | - | 1132.9 | 4617 | 2522 | - | 1893 | 2522 |
| 30 | 8056 | 8197 | 15886 | 111.7 | 1117 | 1171 | 1137.6 | 4513 | 2532 | 1488 | 1814 | 2417 |
| 35 | 6530 | 6754 | 12697 | - | - | - | 1161.5 | 4012 | 2585 | 1237 | 1471 | 1959 |
| 40 | 5325 | 5594 | 10211 | 115.5 | 1155 | 1230 | 1185.7 | 3545 | 2638 | 1034 | 1199 | 1598 |
| 45 | 4367 | 4656 | 8260 | - | - | - | 1210.2 | 3117 | - | - | 983.4 | 1310 |
| 50 | 3601 | 3893 | 6719 | 119.4 | 1194 | 1291 | 1235.0 | 2730 | - | 740 | 810.9 | 1080 |
| 55 | 2985 | 3271 | 5496 | - | - | - | 1260.1 | 2386 | - | - | 672.2 | 895.5 |
| 60 | 2487 | 2760 | 4518 | 123.2 | 1232 | 1353 | 1285.4 | 2082 | - | 540 | 560.1 | 746.2 |
| 65 | 2082 | 2339 | - | - | - | - | 1311.1 | 1816 | - | - | 468.9 | 624.7 |
| 70 | 1751 | 1990 | - | 127.1 | 1271 | 1417 | 1337.1 | 1585 | - | 400 | 394.5 | 525.5 |
| 75 | 1480 | 1700 | - | - | - | - | 1363.5 | 1385 | - | - | 333.3 | 444.0 |
| 80 | 1256 | 1458 | - | 130.9 | 1309 | 1483 | 1390.1 | 1213 | - | 300 | 282.9 | 376.9 |
| 85 | 1070 | 1255 | - | - | - | - | 1417.1 | 1064 | - | - | 241.1 | 321.2 |
| 90 | 916.1 | 1084 | - | 134.7 | 1347 | 1549 | 1444.4 | 937 | - | 230 | 206.3 | 274.8 |
| 95 | 787.0 | 939.6 | - | - | - | - | 1472.0 | 828 | - | - | 177.2 | 236.1 |
| 100 | 678.6 | 817.2 | - | 138.5 | 1385 | 1618 | 1500.0 | 734 | - | 180 | 152.8 | 203.6 |
| 105 | 587.3 | 713.0 | - | - | - | - | 1528.3 | 654 | - | - | 132.3 | 176.2 |
| 110 | 510.1 | 624.1 | - | 142.3 | 1423 | 1688 | 1557.0 | 585 | - | - | 114.9 | 153.0 |
| 115 | 444.5 | 547.9 | - | - | - | - | 1586.0 | 525 | - | - | 100.1 | 133.3 |
| 120 | 388.6 | 482.5 | - | 146.1 | 1461 | 1760 | 1625.4 | 474 | - | - | 87.51 | 116.6 |
| 125 | 340.8 | 426.0 | - | - | - | - | - | 429 | - | - | 76.75 | 102.2 |
| 130 | 300.0 | 377.2 | - | 149.8 | 1498 | 1833 | - | 391 | - | - | 67.52 | 89.95 |
| 140 | 234.1 | 298.1 | - | 153.6 | 1536 | 1909 | - | 329 | - | - | 52.72 | 70.23 |
| 150 | 184.8 | 238.0 | - | 157.3 | 1573 | 1987 | - | 281 | - | - | 41.61 | 55.44 |
| 200 | - | - | - | 157.8 | 1758 | - | - | - | - | - | - | - |
| 250 | - | - | - | 194.1 | 1941 | - | - | - | - | - | - | - |
| 300 | - | - | - | 212.0 | 2121 | - | - | - | - | - | - | - |
| 350 | - | - | - | 229.7 | 2297 | - | - | - | - | - | - | - |
| 400 | - | - | - | 247.0 | 2470 | - | - | - | - | - | - | - |

Temperature vs Resistance Charts (continued)

| | P | Q | R | S | T | W | Y | Z |
|-----|--------|--------|---------|------|------|-------|------|---------|
| | 30K6A1 | 50K6A1 | 100K6A1 | SAT2 | SAT3 | SIE1 | STA2 | 10K NTC |
| °C | Ω | Ω | Ω | Ω | Ω | Ω | Ω | Ω |
| -50 | 2497k | 4168k | 8337k | - | - | 10732 | - | - |
| -40 | 1219k | 2033k | 4067k | - | - | 10517 | - | - |
| -30 | 622911 | 1038k | 2077k | - | - | 10172 | - | - |
| -20 | 331876 | 553243 | 1106k | - | - | 9654 | - | - |
| -15 | 24785 | 409689 | 819378 | - | - | 6320 | - | - |
| -10 | 183697 | 306183 | 612366 | - | - | 8933 | - | 42218 |
| -5 | 138502 | 230842 | 461683 | - | - | 8496 | - | 33784 |
| 0 | 105305 | 175508 | 351017 | 2094 | - | 8044 | 7490 | 27197 |
| 1 | 99787 | 166310 | 332619 | 2079 | - | 7910 | - | - |
| 2 | 94588 | 157644 | 315288 | 2061 | - | 7807 | - | - |
| 3 | 89689 | 149480 | 298959 | 2046 | - | 7702 | - | - |
| 4 | 85069 | 141779 | 283558 | 2027 | - | 7596 | - | - |
| 5 | 80713 | 134521 | 269041 | 2010 | - | 7489 | 6340 | 22023 |
| 6 | 76604 | 127669 | 255337 | 1992 | - | 7381 | - | - |
| 7 | 72726 | 121207 | 242414 | 1973 | - | 7271 | - | - |
| 8 | 69064 | 115105 | 230210 | 1951 | - | 7161 | - | - |
| 9 | 65608 | 109344 | 218688 | 1934 | - | 7050 | - | - |
| 10 | 62347 | 103903 | 207807 | 1911 | - | 6938 | 5360 | 17933 |
| 11 | 59257 | 98761 | 197521 | 1897 | - | 6825 | - | - |
| 12 | 56346 | 93901 | 187803 | 1872 | - | 6712 | - | - |
| 13 | 53585 | 89307 | 178613 | 1851 | - | 6598 | - | - |
| 14 | 50978 | 84962 | 169924 | 1810 | - | 6485 | - | - |
| 15 | 45811 | 80851 | 161702 | 1809 | - | 6370 | 4540 | 14684 |
| 16 | 46178 | 76961 | 153923 | 1787 | - | 6256 | - | - |
| 17 | 43969 | 73280 | 146560 | 1764 | - | 6141 | - | - |
| 18 | 41877 | 69794 | 139588 | 1740 | - | 6028 | - | - |
| 19 | 39895 | 66492 | 132984 | 1716 | - | 5913 | - | - |
| 20 | 38019 | 63364 | 126729 | 1690 | 2708 | 5798 | 3840 | 12087 |
| 21 | 36240 | 60400 | 120799 | 1667 | 2681 | 5686 | - | - |
| 22 | 34554 | 57589 | 115179 | 1644 | 2659 | 5573 | - | - |
| 23 | 32955 | 54925 | 108950 | 1621 | 2618 | 5461 | - | - |
| 24 | 31438 | 52398 | 104796 | 1598 | 2616 | 5349 | - | - |
| 25 | 30000 | 50000 | 100000 | 1574 | 2592 | 5238 | 3250 | 10000 |
| 26 | 28635 | 47724 | 95449 | 1549 | 2567 | 5128 | - | - |
| 27 | 27339 | 45564 | 91128 | 1524 | 2544 | 5019 | - | - |
| 28 | 26108 | 43513 | 87026 | 1500 | 2520 | 4910 | - | - |
| 29 | 24939 | 41565 | 83129 | 1476 | 2496 | 4803 | - | - |
| 30 | 23828 | 39714 | 79428 | 1452 | 2474 | 4696 | 2750 | 8315 |
| 35 | 19046 | 31744 | 62489 | 1336 | 2346 | 4135 | 2320 | 6947 |
| 40 | 15317 | 25529 | 51058 | 1219 | 2216 | 3707 | - | 5831 |
| 45 | 12390 | 20650 | 41301 | 1113 | 2086 | 3271 | - | 4916 |
| 50 | 10079 | 16799 | 33598 | 1011 | 1850 | 2875 | - | 4163 |
| 55 | 8243 | 13740 | 274479 | - | 1818 | 2521 | - | 3540 |
| 60 | 6777 | 11297 | 22593 | - | 1694 | 2203 | - | 3023 |
| 65 | 5600 | 9334 | 18669 | - | 1758 | 1929 | - | 2591 |
| 70 | 4650 | 7751 | 15502 | - | 1461 | 1685 | - | 2230 |
| 75 | 3879 | 6466 | 12932 | - | 1353 | 1472 | - | 1926 |
| 80 | 3251 | 5419 | 10837 | - | 1258 | 1287 | - | 1669 |
| 85 | 2737 | 4560 | 9121 | - | 1171 | 1127 | - | 1451 |
| 90 | 2313 | 3855 | 7710 | - | 1089 | 986 | - | 1266 |
| 95 | 1963 | 3271 | 6543 | - | 1020 | 866 | - | 1109 |
| 100 | 1672 | 2787 | 5574 | - | 950 | 760 | - | 973 |
| 105 | 1430 | 22384 | 4767 | - | - | 670 | - | - |
| 110 | 1228 | 2046 | 4092 | - | - | 590 | - | - |
| 115 | 1058 | 1962 | 3525 | - | - | 522 | - | - |
| 120 | 914.6 | 1523 | 3047 | - | - | 462 | - | - |
| 125 | 793.2 | 1321 | 2642 | - | - | 410 | - | - |
| 130 | 690.2 | 1149 | 2299 | - | - | 365 | - | - |
| 140 | 527.4 | 878.2 | 1756 | - | - | 290 | - | - |
| 150 | 407.7 | 678.8 | 1357 | - | - | 233 | - | - |
| 200 | - | - | - | - | - | - | - | - |
| 250 | - | - | - | - | - | - | - | - |
| 300 | - | - | - | - | - | - | - | - |
| 350 | - | - | - | - | - | - | - | - |
| 400 | - | - | - | - | - | - | - | - |

Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.