



JS8746

Harsh Environment Temperature Sensor



Ensuring a temperature-controlled environment for transportation of goods by land, sea or air is of the utmost importance to guarantee that the merchandise does not deteriorate during shipment due to temperature. In many cases, such as medical products, the shipping companies have a statutory duty to demonstrate that the product has been kept within strict temperature limits. Failure to do so can lead to the write-off and destruction of large quantities of expensive product.

The marine environment is especially complex and susceptible to change; container ships are subject to the extremes of arctic and tropical weather systems. Sea water is highly corrosive, containing large quantities of chlorides and sulfates. Ozone, ultraviolet sunlight (UV) and cleaning detergents provide additional degradation potential to exposed materials.

Although the JS8746 Harsh Environment Temperature Sensor has been designed to address all aspects of temperature measurement for HVAC control systems in the container-ship market, this sensor can also be used in a variety of other applications. Employing materials and build standards that enhance the sensor's ability to withstand water ingress and degradation, the sensor meets statutory requirements for temperature measurement and performance expectations.

Highly Accelerated Corrosion Test (HACT)

Highly Accelerated Corrosion Test (HACT) was developed by Delta (DK) and has been accepted throughout the marine shipping market to demonstrate long-term performance of electrical equipment exposed to this environment. Each day of HACT testing equates to 1 year of marine environment exposure. The JS8746 has exceeded 14 days of testing, substantially outperforming competitor products.

Applications

- Marine container ship applications
- Compressors
- Condensing units
- Heat pumps
- Air conditioning
- Refrigerated truck and trailer
- Reefer containers

Features

- HACT Exposure: +14 days
- Temp Tolerance Rating: $\pm 0.2^{\circ}\text{C}$ and $\pm 0.15^{\circ}\text{C}$
- Temp Rating: -40°C to 120°C
- Environmental Protection: IP68
- Resistant to: Salt solutions, Ozone, UV and a variety of marine environment cleaning detergents
- Inert to trace levels of airborne R134a refrigerant
- Stainless steel hard shell, with class corrosion resistance A2 or better according to ISO3506
- Double insulated cable, multicore copper conductors and tin-coated, conductors cross-sectional area 0.25 mm^2 (23 AWG) min, configured as $19\text{mm} \times 0.14\text{mm}$
- Crimp caps, tin-coated brass, with integral strain relief for the conductor

JS8746 Specifications

Resistance at 25°C:

10,000 Ω nominal

Thermal Equilibrium Temperature Tolerance:

±0.2°C or ±0.15°C

(Temperature Range: 0°C to 70°C)

B25/85:

3977K nominal

Withstand Voltage:

2.5kV rms for minimum of 1 minute, where a broadly sinusoidal wave-form at 50 Hz is applied between the stainless steel housing and the conductors of the cable. A failure is recorded if the current exceeds 1mA.

Temperature Range:

-40°C to 125°C

Time Constant:

20 seconds or less to register 63% of a known temperature transient

Housing:

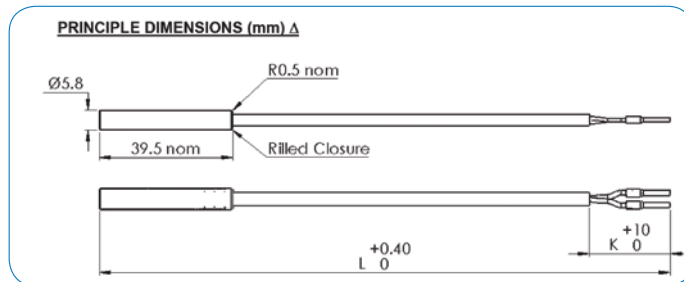
Stainless steel hard shell, with class corrosion resistance A2 or better according to ISO3506

Cable:

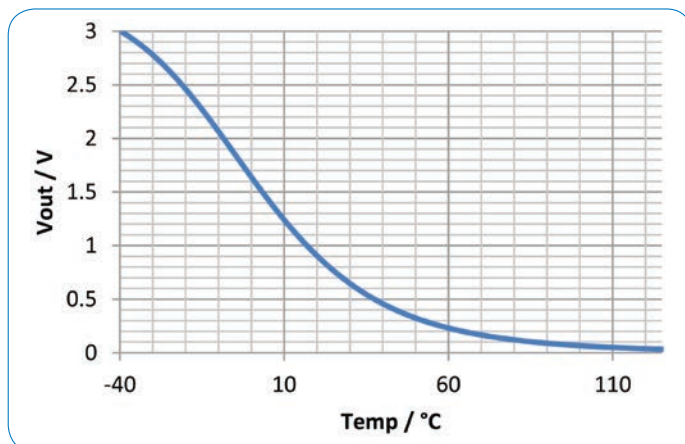
Double-insulated, multicore copper conductors and tin-coated conductors cross-sectional area 0.25 mm² (23 AWG) min, configured as 19mm x 0.14mm

Crimp Caps:

Tin-coated brass with integral strain relief for the conductor



| Part Number | L / mm | K / mm | Tolerance 0-70°C / ± °C |
|--------------|--------|--------|-------------------------|
| JS8746A-0.20 | 1000 | 50 | 0.20 |
| JS8746B-0.20 | 2000 | 50 | 0.20 |
| JS8746C-0.20 | 3000 | 50 | 0.20 |
| JS8746A-0.15 | 1000 | 50 | 0.15 |
| JS8746B-0.15 | 2000 | 50 | 0.15 |
| JS8746C-0.15 | 3000 | 50 | 0.15 |



Thermal Equilibrium Resistance Versus Temperature Properties

Thermal Equilibrium Resistance Vs. Temperature Table

Note: Temperature tolerances for $\pm 0.2^\circ\text{C}$ between 0°C and 70°C are shown.

| Temp $^\circ\text{C}$ | R nom / Ω | R min / Ω | R max / Ω | R Tol - % | R Tol + % | Temp Tol + $^\circ\text{C}$ | Temp Tol - $^\circ\text{C}$ |
|--------------------------|---------------------|---------------------|---------------------|--------------|--------------|--------------------------------|--------------------------------|
| -40 | 333560 | 328250 | 338930 | -1.59 | 1.61 | 0.24 | -0.24 |
| -35 | 241070 | 237420 | 244750 | -1.51 | 1.53 | 0.24 | -0.24 |
| -30 | 176080 | 173550 | 178630 | -1.44 | 1.45 | 0.23 | -0.23 |
| -25 | 129930 | 128160 | 131700 | -1.36 | 1.37 | 0.23 | -0.23 |
| -20 | 96807 | 95560 | 98061 | -1.29 | 1.30 | 0.22 | -0.22 |
| -15 | 72809 | 71922 | 73699 | -1.22 | 1.22 | 0.22 | -0.22 |
| -10 | 55253 | 54617 | 55890 | -1.15 | 1.15 | 0.21 | -0.21 |
| -5 | 42292 | 41834 | 42751 | -1.08 | 1.09 | 0.21 | -0.21 |
| 0 | 32639 | 32382 | 32897 | -0.79 | 0.79 | 0.15 | -0.15 |
| 5 | 25391 | 25139 | 25642 | -0.99 | 0.99 | 0.20 | -0.20 |
| 10 | 19902 | 19711 | 20093 | -0.96 | 0.96 | 0.20 | -0.20 |
| 15 | 15713 | 15567 | 15860 | -0.93 | 0.93 | 0.20 | -0.20 |
| 20 | 12493 | 12380 | 12606 | -0.90 | 0.90 | 0.20 | -0.20 |
| 25 | 10000 | 9912.2 | 10088 | -0.88 | 0.88 | 0.20 | -0.20 |
| 30 | 8055.9 | 7987.3 | 8124.6 | -0.85 | 0.85 | 0.20 | -0.20 |
| 35 | 6530.0 | 6475.9 | 6584.1 | -0.83 | 0.83 | 0.20 | -0.20 |
| 40 | 5324.6 | 5281.8 | 5367.5 | -0.80 | 0.80 | 0.20 | -0.20 |
| 45 | 4366.5 | 4332.4 | 4400.7 | -0.78 | 0.78 | 0.20 | -0.20 |
| 50 | 3600.5 | 3573.1 | 3627.9 | -0.76 | 0.76 | 0.20 | -0.20 |
| 55 | 2984.6 | 2962.5 | 3006.7 | -0.74 | 0.74 | 0.20 | -0.20 |
| 60 | 2486.6 | 2468.7 | 2504.5 | -0.72 | 0.72 | 0.20 | -0.20 |
| 65 | 2081.8 | 2067.2 | 2096.4 | -0.70 | 0.70 | 0.20 | -0.20 |
| 70 | 1751.1 | 1739.1 | 1763.0 | -0.68 | 0.68 | 0.20 | -0.20 |
| 75 | 1479.6 | 1468.8 | 1490.3 | -0.72 | 0.73 | 0.22 | -0.22 |
| 80 | 1255.6 | 1246.0 | 1265.2 | -0.77 | 0.77 | 0.24 | -0.24 |
| 85 | 1070.0 | 1061.4 | 1078.6 | -0.81 | 0.81 | 0.25 | -0.26 |
| 90 | 915.55 | 907.82 | 923.29 | -0.84 | 0.85 | 0.27 | -0.27 |
| 95 | 786.43 | 779.50 | 793.39 | -0.88 | 0.88 | 0.29 | -0.29 |
| 100 | 678.07 | 671.84 | 684.32 | -0.92 | 0.92 | 0.31 | -0.31 |
| 105 | 586.75 | 581.16 | 592.38 | -0.95 | 0.96 | 0.33 | -0.34 |
| 110 | 509.52 | 504.48 | 514.58 | -0.99 | 0.99 | 0.35 | -0.36 |
| 115 | 443.94 | 439.40 | 448.51 | -1.02 | 1.03 | 0.38 | -0.38 |
| 120 | 388.06 | 383.97 | 392.19 | -1.06 | 1.06 | 0.40 | -0.40 |
| 125 | 340.29 | 336.59 | 344.02 | -1.09 | 1.10 | 0.42 | -0.42 |

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