

Okazaki Manufacturing Company UK Limited  
Ashwood House, 66 Cardiff Road, Taffs Well, Cardiff, CF15 7QE  
Office: +44 (0)29 2081 4333 Email: sales@okazaki-mfg.co.uk



**OKAZAKI**  
MANUFACTURING COMPANY  
UK LIMITED

# Explosion/Flame Proof Temperature Sensor

**Compliant with standards of each country and region**  
**Achieves reliable performance in severe environments**

This hydrogen atmosphere grade explosion/flame proof temperature sensor is compliant with the explosions-proof standards of Japan, Europe, USA and many countries and regions worldwide, and IECEx. The sensor has acquired Type Approval from various inspection agencies. This sensor is rated IP66 and NEMA4&4X, and can be used reliably in severe environments. As such, the sensor is exempt from safety testing in the importing country, which enhances the flow of sale and distribution.



Conforms to global mutual recognition system on explosion-proof electrical equipment



## Basic specification for explosion/flameproof temperature sensors

|   | Japan (TIIS)  | *IECEX/ International ATEX/Europe (Baseefa)   | South Korea (KOSHA)                        | Russia: Kazakhstan: Belarus (TR CU)                   | India (PESO)      | Brazil (INMETRO)                                    | China (NEPSI)                           | The United States (FM)   | Canada (FMC)  | Taiwan (OSHA)   |
|---|---|---|--|---|-------------------|---|---|--|---|---|
| <b>Explosion proof rating</b>             | Ex d II C T6  | Ex db eb IIC T6 & T5 Gb<br>Ex tb IIC T85°C & T100°C Db  | Ex de IIC T5/T6                            | 1Ex de IIC T5/T6 Gb X<br>Ex tb IIC T95°C / T80°C Db X | Ex II 2G Ex dellC | Ex de IIC T6 & T5 Gb<br>Ex tb IIC T85°C & T100°C Db | Ex de IIC T5/T6 Gb<br>Ex tD A2I         | Class I, Div.1 Gr; A,B,C&D<br>Class II/ III Div.1 Gr:E,F&G   | Class I, Div.1 Gr; B,C&D<br>Class II/III Div.1 Gr:E,F&G | Ex de IIC T6 & T5 Gb<br>Ex tb IIC T85°C & T100°C Db   |
| <b>Enclosure Rating</b>                   | IP66<br>IP67  | IP66  |  |   |                   |   |   | NEMA4 &4X  | Type4 &4X   | IP66  |
| <b>Material</b>                           | A.D.C.12<br>SCS14   | A.D.C. 12/SCS14 (No paint)/CF8M(316SS eq. CAST) (No paint)<br>A.D.C.6 (COPPER FREE:Cu MAX.0.1%)   |  |   |                   |   |   |  |   |   |
| <b>Standard Coating (colour)</b>          | <ul style="list-style-type: none"> <li>Acrylic-Resin: Silver (standard)</li> <li>Epoxy-Resin</li> </ul>   | <ul style="list-style-type: none"> <li>Acrylic-Resin: Silver (standard)</li> <li>Epoxy-Resin</li> <li>Acrylic-Resin: Blue (COPPER FREETYPE ONLY)</li> </ul> |  |   |                   |   |   | <ul style="list-style-type: none"> <li>Acrylic-Resin: Silver (NEMA4&amp;Type4)</li> <li>Epoxy-Resin: Silver (NEMA4X&amp;Type4X)</li> <li>Acrylic-Resin: Blue (COPPER FREETYPE ONLY)</li> </ul> |   | <ul style="list-style-type: none"> <li>Acrylic-Resin: Silver (standard)</li> <li>Epoxy-Resin</li> </ul> |
| <b>Connection Thread</b>                  | <b>Output</b>   | G1/2,<br>G3/4,<br>PF1/2,<br>PF3/4   | G1/2,G3/4, NPT1/2, NPT3/4<br>M20, M24, M25 |   |                   |   | NPT1/2<br>NPT3/4<br>M20,<br>M24,<br>M25 | NPT1/2, NPT3/4   |   | G1/2,G3/4,<br>NPT1/2,<br>NPT3/4 M20,<br>M24, M25  |
|   | <b>Sensor</b>   | G1/2, G3/4,<br>PF1/2,<br>PF3/4  | G1/2,G3/4, NPT1/2, NPT3/4<br>BSP1/2,BSP3/4 |   |                   |   | G1/2,G3/4, NPT1/2,<br>NPT3/4            |  | G1/2,G3/4,<br>NPT1/2,<br>NPT3/4<br>BSP1/2,BSP3/4        |   |
| <b>Material of Terminal Board</b>         | Steatite/Epoxy Glass (for Multipoint)   |   |  |   |                   |   |   |  |   |   |
| <b>Wiring Method</b>                      | <b>Output</b>   | M4 recessed head and slotted screws   |  |   |                   |   |   |  |   |   |
|   | <b>Sensor</b>   | M3 recessed head and slotted screws   |  |   |                   |   |   |  |   |   |
| <b>Structure of Spring</b>                | Fitted on base plate of terminal block. Moveable together with sheath part<br>Spring range 10mm (Not applicable to Multipoint)  |   |  |   |                   |   |   |  |   |   |
| <b>Structure of Boundary with sensor</b>  | Flame path gap by machined sleeve (O-ring sealing)(Not applicable to Multipoint in Japan)   |   |  |   |                   |   |   |  |   |   |
| <b>Cable Gland</b>                        | Applied goods (ex. Shimada Electric or Lead engineering)  | Exd cable gland suitably certified for use in the location of site  |  |   |                   |   | Conduit pipes(NPT) (sealing fitting)    |  |   | Exd cable gland suitably certified for use in the location of site                                      |
| <b>Mass</b>                               | Approx.750g (A.D.C) Approx.2100g (SCS14)  |   |  |   |                   |   |   |  |   |   |
| <b>Model Name</b>                         | GE(1 entry),GED(2 entries),GES (1 entry),GESD(2 entries)  |   |  |   |                   |   |   |  |   |   |
| <b>Model number to be set with sensor</b> | T99,T409 (Mineral Insulated Thermocouple:AEROPAK)... 1 ~6points max(2P ~12P)<br>R99,R409 (Mineral Insulated Resistance Thermometer Sensor: RESIOPAK)... 1 ~4points max(3P ~12P) |   |  |   |                   |   |   |  |   |   |

• Thread size in brackets are available from our standard stock

\*IECEX scheme is adopted by the following five countries (As of End of January, 2011)  
Australia, New Zealand, India, Singapore and South Korea



**AEROPAK® (Mineral Insulated Thermocouples)**

□ □ □ □ □ □ □ □ □ □ □ □ / □ □  
 1 2 3 4 5 6 7 8 9 10 11 / 12 13

|    |                              |   |   |
|----|------------------------------|---|---|
| 1  | Model (*1)                   | T99<br>T99N/U<br>T99S<br>T99M<br>T409N/U<br>T409S                           | Basic model<br>With nipple/union<br>With support pipe<br>Multipoint with support pipe<br>Spring loaded type with nipple/union<br>Spring loaded type with support pipe   |
| 2  | Authorisation Classification | Space<br>-EX<br>-EC<br>-FM<br>-NP<br>-PS<br>-FC<br>-KS<br>-TR<br>-IN<br>-TS | Unnecessary to fill out, for authorisation in Japan<br>Authorised by IECEx<br>Authorised by ATEX(Baseefa)<br>Authorised by FM<br>Authorised by NEPSI<br>Authorised by PESO<br>Authorised by FMC Not applicable to T99M<br>Authorised by KOSHA<br>Authorised by TR CU<br>Authorised by INMETRO<br>Authorised by OSHA |
| 3  | Shape (*2)                   | -1<br>-2<br>-3<br>-4<br>Space   | N=100(94) not welded<br>Support pipe in case of T99S<br>N=150(144) not welded<br>N=100(94) welded<br>N=150(144) welded<br>Unnecessary to fill out, for T99, T99M  |
| 4  | Terminal Head                | GE<br>GE-CFT<br>GED<br>GED-CFT<br>GES<br>GESD                               | Made of ADC<br>Made of ADC(COPPER FREE)<br>Made of ADC with dual entries<br>Made of ADC(COPPER FREE)with dual entries<br>Made of SCS<br>Made of SCS with dual entries   |
| 5  | Total Length                 | L   | unnecessary to fill out, for T99M   |
| 6  | Sheath O.D.                  | B,CN<br>D,DN<br>E,EN<br>F,FN<br>G   | φ1.6, φ2.0(out of application, for T409N/U)<br>φ3.2, φ3.0<br>φ4.8, φ4.5<br>φ6.4, φ6.0<br>φ8.0   |
| 7  | No. of Element               | 2<br>4  | Single<br>Double  |
| 8  | Type of Element              | N<br>K<br>E<br>J<br>T   | Ni-Cr-Si/ Ni-Si<br>Ni-Cr / Ni-Al<br>Ni-Cr / Cu-Ni<br>Fe / Cu-Ni<br>Cu / Cu-Ni   |
| 9  | Measuring Junction           | 5<br>8<br>9   | (#5) Ungrounded separate type<br>G (#8) Grounded type(Not allowed in Japan)<br>U (#9) Ungrounded type   |
| 10 | Sheath Material              | C<br>D<br>B   | 316SS<br>310S SS<br>NCF600eq  |
| 11 | Class                        | 01<br>02<br>03<br>04<br>05<br>06<br>07<br>08                                | 1 (JIS)<br>2 (JIS)<br>3 (JIS)<br>STD (ASTM)<br>SP (ASTM)<br>1 (IEC)<br>2 (IEC)<br>3 (IEC)   |
| 12 | Optional Parts               |   | Please contact your nearest sales office.<br>(Flange, Adaptor, Ped etc.)  |
| 13 | Insertion Length             | ℓ   | T99, T99N/U, T409N/U unnecessary to fill out<br>For T99M, please specify ℓ1 ~ ℓ6(6 points max / single element)   |

(\*1) The models approved in EX, EC, KS, NP, TR, PS, TS and IN are named OFF on the approval certificates.

(\*2) Dimensions in brackets are for products for overseas use.



**RESIOPAK® (Mineral Insulated Resistance Thermometer)**

□ □ □ □ □ □ □ □ □ □ / □ □  
 1 2 3 4 5 6 7 8 9 10 / 11 12

|           |                              |   |   |
|-----------|------------------------------|---|---|
| <b>1</b>  | Model (*1)                   | R99<br>R99N/U<br>R99S<br>R99M<br>R409N/U<br>R409S                           | Basic model<br>With nipple/union<br>With support pipe<br>Multipoint with support pipe<br>Spring loaded type with nipple/union<br>Spring loaded type with support pipe   |
| <b>2</b>  | Authorisation Classification | Space<br>-EX<br>-EC<br>-FM<br>-NP<br>-PS<br>-FC<br>-KS<br>-TR<br>-IN<br>-TS | Unnecessary to fill out, for authorisation in Japan<br>Authorised by IECEx<br>Authorised by ATEX(Baseefa)<br>Authorised by FM<br>Authorised by NEPSI<br>Authorised by PESO<br>Authorised by FMC Not applicable to R99M<br>Authorised by KOSHA<br>Authorised by TR CU<br>Authorised by INMETRO<br>Authorised by OSHA |
| <b>3</b>  | Shape (*2)                   | -1<br>-2<br>-3<br>-4<br>Space   | N=100(94) not welded<br>Support pipe in case of R99S<br>N=150(144) not welded<br>N=100(94) welded<br>N=150(144) welded<br>Unnecessary to fill out, for R99, R99M  |
| <b>4</b>  | Terminal Head                | GE<br>GE-CFT<br>GED<br>GED-CFT<br>GES<br>GESD                               | Made of ADC<br>Made of ADC(COPPER FREE)<br>Made of ADC with dual entries<br>Made of ADC(COPPER FREE)with dual entries<br>Made of SCS<br>Made of SCS with dual entries   |
| <b>5</b>  | Total Length                 | L   | unnecessary to fill out, for R99M   |
| <b>6</b>  | Sheath O.D.                  | D,DN<br>E,EN<br>F,FN<br>G   | φ3.2, φ3.0<br>φ4.8, φ4.5<br>φ6.4, φ6.0<br>φ8.0  |
| <b>7</b>  | No. of Wire                  | 3,4<br>6  | Single<br>Double  |
| <b>8</b>  | Temperature Range            | L<br>N<br>M<br>H  | -196°C ~ 100°C<br>-30°C ~ 200°C<br>0 ~ 350°C<br>0 ~ 500°C   |
| <b>9</b>  | Resistance Value             | 100   | Pt100 Ω or JPt100 Ω   |
| <b>10</b> | Class                        | -AAJ<br>-AJ<br>-BJ<br>-CJ<br>-A<br>-B<br>-AAI<br>-AI<br>-BI<br>-CI          | Pt 100 Ω class AA (JIS-2013)<br>Pt 100 Ω class A (JIS-2013)<br>Pt 100 Ω class B (JIS-2013)<br>Pt 100 Ω class C (JIS-2013)<br>Pt 100 Ω class A (JIS-1997)<br>Pt 100 Ω class B (JIS-1997)<br>Pt 100 Ω class AA (IEC)<br>Pt 100 Ω class A (IEC)<br>Pt 100 Ω class B (IEC)<br>Pt 100 Ω class C (IEC)                    |
| <b>11</b> | Optional Parts               |   | Please contact your nearest sales office.<br>(Flange, Adaptor, Ped etc.)  |
| <b>12</b> | Insertion Length             | ℓ   | R99, R99N/U, R409N/U unnecessary to fill out<br>For R99M, please specify ℓ1 ~ ℓ4(4 points max / single element 3-wire type)   |

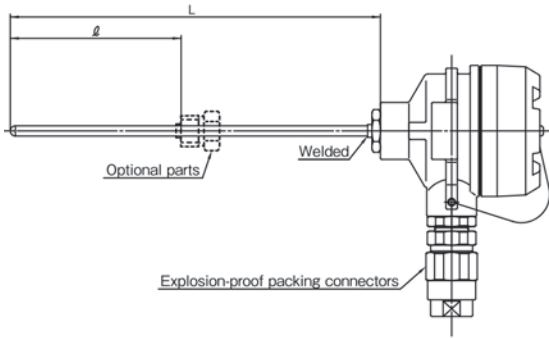
(\*1) The models approved in EX,EC,KS,NP,TR,PS,TS and IN are named OFF on the approval certificates.

(\*2) Dimensions in brackets are for products for overseas use.

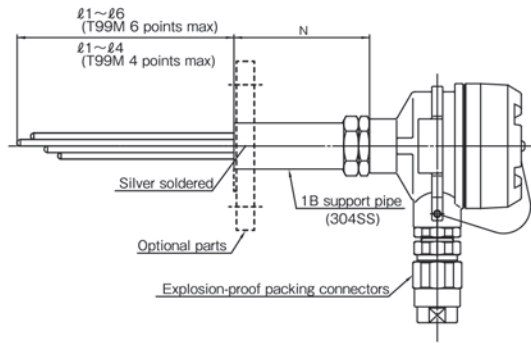


Figures of Basic Models **AEROPAK® T99/T409**  
**RESIOPAK® R99/R409**

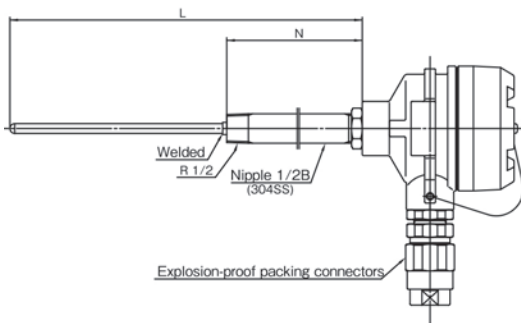
□ 99



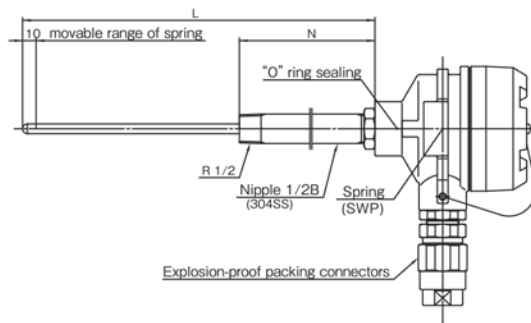
□ 99M



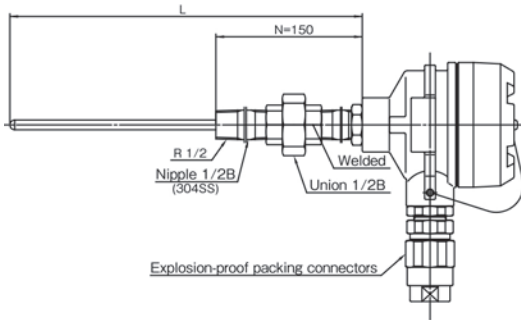
□ 99N



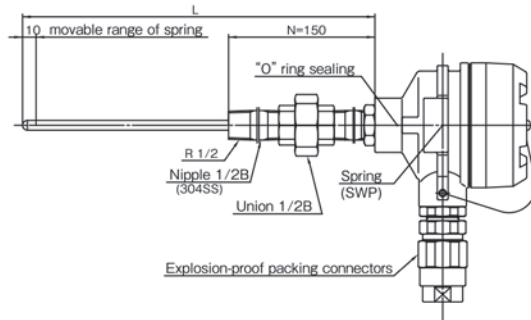
□ 409N



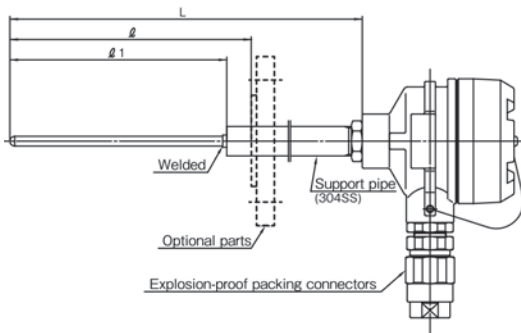
□ 99U



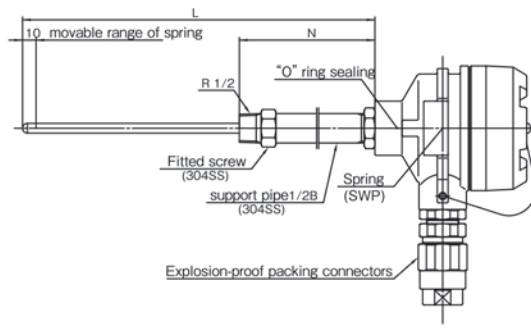
□ 409U



□ 99S



□ 409S



Above figures are on the model of sensors approved in Japan (with explosion Proof Packing Connector).  
Explosion Proof Packing Connector or lock nut below terminal head does not come as standard for overseas use.

## Critical Points which require caution when specifying these parts:

- Ambient temperature range can affect these Explosion-proof Temperature Sensors. Please confirm that the ambient temperature in which the terminal head is installed is within the following temperature range.

|  |  |
|--|--|
| Japan  | -20°C ~ +55°C                          |
| IECEX / Europe / China,<br>South Korea, Russia,<br>Kazakhstan, Belarus,<br>India, Taiwan, Brazil | -50°C ~ +60°C (T6), -50°C ~ +75°C (T5) |
| The United States and Canada   | -50°C ~ +75°C                          |

- IP66 approved by Baseefa
- In Japan, Explosion-proof temperature sensors need to be fitted with explosion-proof packing connectors. Details on the material of the adaptor and the outer diameter of sheath is required.  
Applicable cable diameter: G1/2( $\phi 5 \sim \phi 12$ ), G3/4( $\phi 5 \sim \phi 16$ )
- For items approved in Europe, Russia, Kazakhstan, Belarus, China, South Korea, India, Taiwan and Brazil, be sure to use cable glands that conform to explosion-proof standards.  
If using conversion screws, it is necessary to use similar certified adaptors.
- In some cases, it may be required to apply for confirmation of exemption from certification process etc in IECEX joined countries.
- Sensors approved in the U.S. and Canada require a sealing fitting to a conduit pipe, when the length is less than 457mm for wiring.  
Please note if any other method is applied, we cannot guarantee the explosion-proof performance.
- After installing the temperature sensor, please fully tighten the cover of the terminal head. Do not open the cover of the terminal head in operation.
- Explosion-proof temperature sensors are certified as a finished unit. Therefore, any modification by the user is strictly prohibited. Please refrain from disassembling or modifying the product.

