

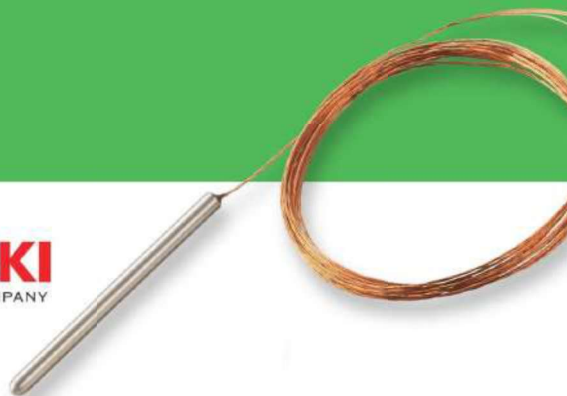
02

Resistance Thermometer Sensors

Catalog



OKAZAKI
MANUFACTURING COMPANY



Green Procurement

Okazaki Manufacturing Company has established a policy for the control of hazardous chemical substances as an environmental measure, and promotes green purchasing and procurement activities that take the environment into consideration.

Security Policy

Okazaki Manufacturing Company handles customer information as a critical asset. We thoroughly recognize the importance of ensuring confidentiality and protecting information, and have implemented security measures through company rules and regulations. To prevent the leakage of information, we take steps such as installing anti-virus software on company computers, implementing measures to prevent data leaks when exchanging data between computers, and prohibiting employees from taking computers out of company facilities and bringing their own private computers into company facilities.

Product Warranty

Okazaki Manufacturing Company conducts appropriate product inspections based on our own company standards. If a problem occurs with the product, contact your nearest service representative with the specific details of the problem.

Warranty Period

Period of warranty will be limited to one year from the date of the delivery.

Scope of Warranty

If, during the warranty period specified above, a problem occurs due to a fault attributable to Okazaki Manufacturing Company, the product shall be replaced or repaired.

However, this warranty does not apply in the following cases:

- (1) If the product has been handled or used improperly
- (2) If the cause of the problem is attributable to factors external to the purchased product
- (3) If modifications or repairs have been performed by a party other than Okazaki Manufacturing Company
- (4) If the product is used for purposes or applications in which the product is intended as a consumable item
- (5) In other cases such as a natural disaster or accident

Furthermore, the scope of the warranty is limited to the purchased product itself, and it does not cover other damage arising from the problem with the purchased product.



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Okazaki Manufacturing Company
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Petro Middle East
Energy Support Trading Est.
Technical Supplies International Co.LLC

Overseas Bases
Overseas Representatives

Main Manufacturing Factory



Head Office

Okazaki Manufacturing Company
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a wide range of industries.

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Petrochemicals



Gas



Fibers



Semiconductors



the world through “heat”



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Sensors and Heaters

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01 Thermocouples

AERO PAK®

02 Resistance Thermometer Sensors

RESI PAK®



MI Cables



03 Heaters

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04 Compensating Cable



05 Thermowells



RESIOPAK®**Sheathed Resistance Thermometer Sensors**

RESIOPAK is a trademark of our sheathed resistance thermometer sensor and consists of a stainless steel thin tube (sheath), conductor wires, a temperature sensing element inside the tube, and an inorganic insulator (MgO) firmly packed and insulated around them. We manufacture a variety of products based on this structure, which vary depending on the purpose of use. Compared to general protection tube type resistance thermometer sensors, sheathed resistance thermometer sensors have many superior characteristics.

Characteristics

RESIOPAK has the following characteristics compared to conventional protection tube type resistance thermometer sensors.

1. Wider application range
2. Better responsiveness
3. Easier handling
4. Longer product life
5. Excellent mechanical strength/vibration resistance
6. Able to handle specific needs

Since the sheath outer diameter is small and the bending processing is easy, the sensor can be installed in a small space without disturbing the flow of the target to be measured. We can also manufacture a single sheath with two elements (six conducting wires), and work with a wide range of different needs using our various outer diameters.

Types of Resistance Thermometer Sensor

JIS C1604

Nominal resistance value at 0°C	Class	Measuring current	R100/R0 (resistance ratio)
Pt100 (JPt100)	AA	2 mA, 1 mA, 0.5 mA	1.3851 (1.3916)
	A		
	B		
	C		

Notes

1. R100 is the resistance value of the resistance element at 100°C
2. R0 is the resistance value of the resistance element at 0°C

RESIOPAK® Standard Specifications of Sheathed Resistance Thermometer Sensor

	Sheath			Conductor wire		
	Outer diameter (mm)	Thickness (mm)	Material	Wire diameter (mm)	Resistance per wire (Ω/m)	Material
Single element 	φ 1.6	10% or more of sheath outer diameter	316SS	10% or more of sheath outer diameter	6.34Max.	Nickel
	φ 3.2				1.59Max.	
	φ 4.8				0.71Max.	
	φ 6.4				0.40Max.	
	φ 8.0				0.25Max.	
	φ 9.0				0.20Max.	
	φ 12.75				0.10Max.	
Double element 	φ 3.2	10% or more of sheath outer diameter	316SS	10% or more of sheath outer diameter	1.59Max.	
	φ 4.8				0.71Max.	
	φ 6.4				0.40Max.	
	φ 8.0				0.25Max.	
	φ 9.0				0.20Max.	
	φ 12.75				0.10Max.	
Single 4-conductor cable 	φ 0.8	10% or more of sheath outer diameter	316SS	10% or more of sheath outer diameter	25.37Max.	
	φ 3.2				1.59Max.	
	φ 4.8				0.71Max.	
	φ 6.4				0.40Max.	
	φ 8.0				0.25Max.	
	φ 4.8				0.14Max.	Copper

We can manufacture with sheath diameters and materials other than the above.

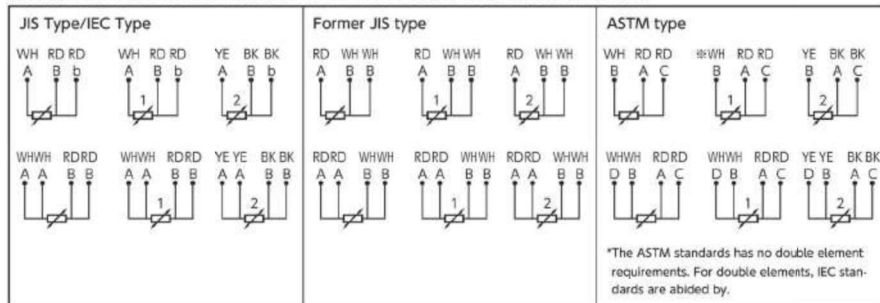
List of Temperature Tolerances and the Standards Applied by Each Country

Basic standard Nominal resistance value	Class	Tolerance (°C)	JIS C1604/IEC 60751		ASTM E1137
			Wire-wound element	Thin-film element	
			Temperature range (°C)		
Pt100 Ω at 0°C (R100/R0=1.3851)	AA	±[0.1 + 0.0017 t]	-196 to 450	0 to 150	-
	A	±[0.15 + 0.002 t]	-196 to 450	-30 to 300	-
		±[0.13 + 0.0017 t]	-	-	-200 to 650
	B	±[0.3 + 0.005 t]	-196 to 500	-50 to 500	-
		±[0.25 + 0.0042 t]	-	-	-200 to 650
	C	±[0.6 + 0.01 t]	-196 to 500	-50 to 600	-

Notes

1. The tolerance is the maximum allowable error of the value calculated by subtracting the measured temperature $|t|$ from the value obtained by converting in accordance to the standard resistance table the resistance value indicated by the resistance element.
2. The $|t|$ is the measured temperature which is indicated as a temperature (°C) unrelated to + and - signs.
3. The latest version is applied for the standard year.

Resistance Thermometer Sensor Wire Connection Methods and Colors



2-conductor type:

As the conductor resistance is added to the resistance value, it is necessary to make the conductor resistance smaller or to know the conductor resistance beforehand.

3-conductor type:

Caution should be exercised when transmitting over long distances, as the variations in conductor resistance in the 3 cables may affect accuracy. Most commonly used in general.

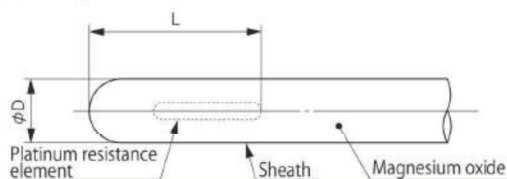
4-conductor type:

Used for high precision measurement because the conductor resistance does not significantly affect accuracy. A constant current is generally supplied and the resistance value is measured with the potential difference.

RESIOPAK® Operating Temperature Ranges JIS C1604-2013

Code	Classification	Operating temp. range (°C)
L	Use in lower temperatures	-196 to +100
N	Use in more moderate temperatures	-30 to +200
M	Use in higher temperatures	0 to 350
H	Use in high temperatures	0 to 500

RESIOPAK® Structure



Sheath outer diameter (φD)	Temperature sensor length (L mm) *	
	Double	Single
φ3.2	32	
φ4.8	43	27
φ6.4	45	29
φ8.0	46	30
φ9.0	47	31
φ12.7	51	35

*Lengths shown here are just an example. Other lengths may be available upon request.

RESIOPAK® Extension Cable

Code	Type	Core cable	Specifications	Resistance per core
LEA-3(6)	Extension cable for heat resistance	20/φ0.18 x 3(6)		0.034 Ω/m
LEC-3(6)	Extension cable for general use	20/φ0.18 x 3(6)		
LED-4-SS	Extension cable for general use	7/φ0.16 x 4		Approx. 0.121 Ω/m
LED-6	Extension cable for general use	12/φ0.18 x 6		Approx. 0.055 Ω/m
LEF-3(6)	Extension cable for heat resistance	30/φ0.08 x 3(6)		Approx. 0.022 Ω/m
Insulation material		Classification by use		Operating temp. range in °C
90°C heat resistance PVC		General use		-20 to 90
Glassfiber yarn		Heat resistance		-20 to 150
Silicone rubber		Heat resistance		-60 to 180



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RESIOPAK® Inspection Standards**Dimensional inspection**

RESIOPAK outer diameter	φ 3.0 to φ 4.8 mm	± 0.05 mm
	φ 6.0 to φ 6.4 mm	± 0.06 mm
	φ 8 to φ 12.75 mm	± 1 %
RESIOPAK length	≤ 150 mm	± 2.0 mm
	150 mm <	± 1.5 %
	Spring type Bellows type Maximum length is up to 1 m. If length exceeds 1 m, details will be provided separately.	± 3.0 mm ± 2.0 %
Nipple length		± 3 mm
Extension cable length	≤ 1000 mm	± 15 mm
	1000 mm <	± 1.5 %

Resistance value test

Measurement of basic resistance value	0°C	Freezing point
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Insulation resistance test

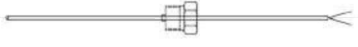
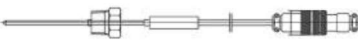
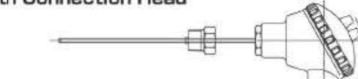
The resistance between the conductor cable and metallic sheath is measured in room temperature.

RESIOPAK outer diameter (mm)	Features
φ 3.0 to φ 12.75	100 MΩ/100 V DC

Documentation

The inspection certificate shall be attached to the product. Detailed test report shall be available upon request.



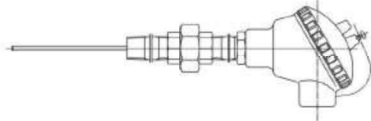
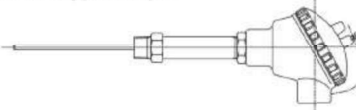
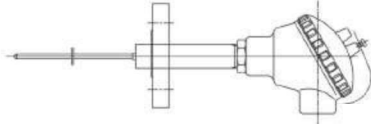
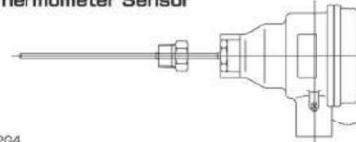
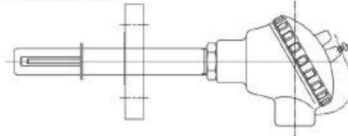
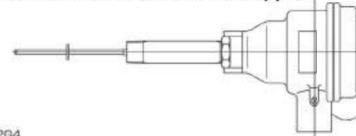
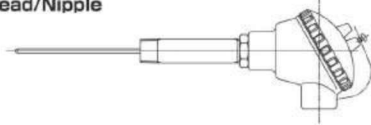
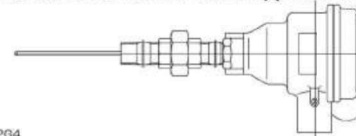
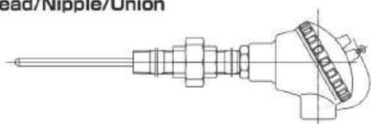
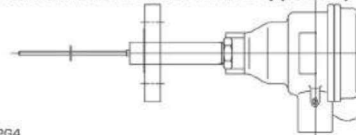
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R33 » D-12 Super Fine Sheathed Resistance Thermometer Sensor 	R90 » D-17 Sheathed Resistance Thermometer Sensor with A Type Connector 
R34 » D-13 Super Fine Sheathed Resistance Thermometer Sensor 	R102 » D-18 Sheathed Resistance Thermometer Sensor with A Type Connector/Extension Cable 
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R40 » D-15 Sheathed Resistance Thermometer Sensor with Flexible Armoured Lead 	R96 » D-20 Sheathed Resistance Thermometer Sensor with Connection Head 
	R96N » D-21 Sheathed Resistance Thermometer Sensor with Connection Head/Nipple 

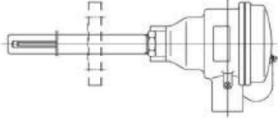
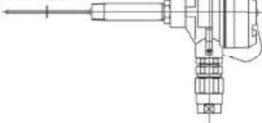
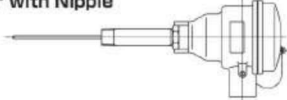
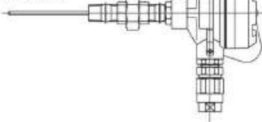
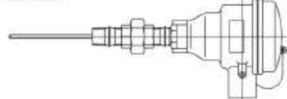
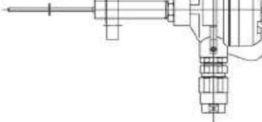
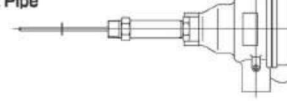
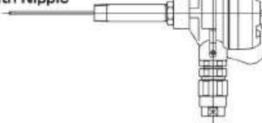
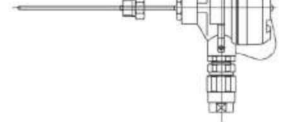
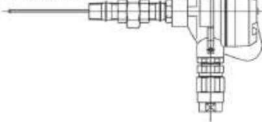


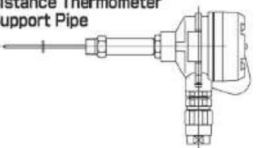
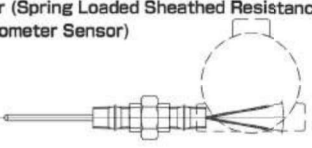
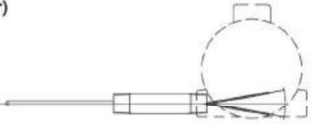
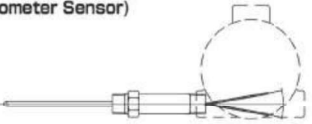
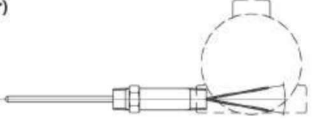
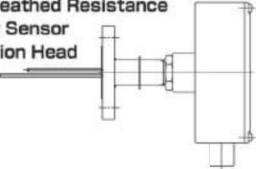
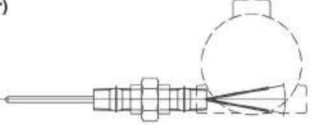
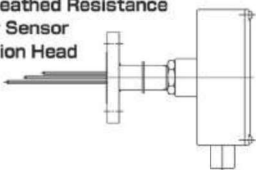
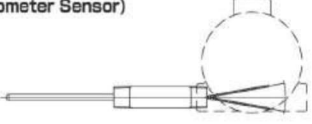
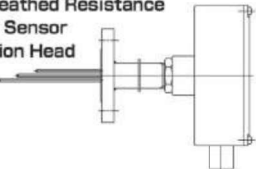
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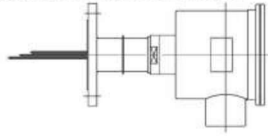
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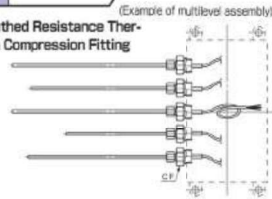
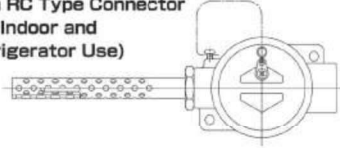
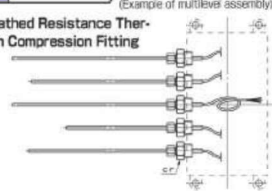
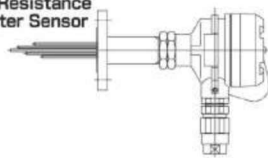
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R96S » D-23 Sheathed Resistance Thermometer Sensor with Connection Head/Support Pipe 	R97 » D-28 Explosion-Proof Sheathed Resistance Thermometer Sensor  d2G4
R96W » D-24 Sheathed Resistance Thermometer Sensor with Thermowell 	R97N » D-29 Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple  d2G4
R400N » D-25 Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Nipple 	R97U » D-30 Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple/Union  d2G4
R400U » D-26 Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Nipple/Union 	R97S » D-31 Explosion-Proof Sheathed Resistance Thermometer Sensor with Support Pipe  d2G4

R97W » D-32 Explosion-Proof Sheathed Resistance Thermometer Sensor with Thermowell  d2G4	R99N » D-37 IEC IECEx Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple 
R407N » D-33 Spring Loaded Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple  d2G4	R99U » D-38 IEC IECEx Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple/Union 
R407U » D-34 Spring Loaded Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple/Union  d2G4	R99S » D-39 IEC IECEx Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Support Pipe 
R407S » D-35 Spring Loaded Explosion-Proof Sheathed Resistance Thermometer Sensor with Support Pipe  d2G4	R409N » D-40 IEC IECEx Spring Loaded Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple 
R99 » D-36 IEC IECEx Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor 	R409U » D-41 IEC IECEx Spring Loaded Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple/Union 

R409S >> D-42 IEC IECEx Spring Loaded Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Support Pipe 	R49U >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Spring Loaded Sheathed Resistance Thermometer Sensor) 
R39N >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Sheathed Resistance Thermometer Sensor) 	R49S >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Spring Loaded Sheathed Resistance Thermometer Sensor) 
R39S >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Sheathed Resistance Thermometer Sensor) 	R96M(6) >> D-44 IEC IECEx Multipoint Sheathed Resistance Thermometer Sensor with Connection Head 
R39U >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Sheathed Resistance Thermometer Sensor) 	R96M(12) >> D-45 IEC IECEx Multipoint Sheathed Resistance Thermometer Sensor with Connection Head 
R49N >> D-43 IEC IECEx Explosion/Flame Proof Nipple Type Temperature Sensor (Spring Loaded Sheathed Resistance Thermometer Sensor) 	R96M(24) >> D-46 IEC IECEx Multipoint Sheathed Resistance Thermometer Sensor with Connection Head 

R97M(24) » D-47**Explosion-Proof Multipoint Sheathed Resistance Thermometer Sensor**

d204

R35EC**Explosion-Proof Sheathed Resistance Thermometer Sensor with Compression Fitting (European Spec.)****RC1 » D-48****Sheathed Resistance Thermometer Sensor with RC Type Connector (for Indoor and Refrigerator Use)****R35FM****Explosion-Proof Sheathed Resistance Thermometer Sensor with Compression Fitting (US Spec.)****R99M » D-49****Explosion-Proof (Hydrogen Protection) Multipoint Thermometer Sensor****Models with Intrinsic Safety Explosion-Proof Specifications**

- Received approval for combined use of terminal box with intrinsic safety explosion-proof specifications + certified safety barriers in each country/area + simple apparatus (resistance thermometer sensors)¹⁾
- Received approval for combined use of specified safety barrier + sensor (resistance thermometer sensor)²⁾
- Received approval for the sensor (device test) and can be used in the following combinations²⁾
 - Sensor + safety barrier
 - + wireless temperature transmitter
 - + temperature transmitter + safety barrier

Typical example of explosion proof marking

- *1 Exia II C T6
- *2 IISaG5/Exia II C T2 to T6 (TIS)
- Exia II C T4 or T3 Ga, Ga/Gb (CML)

Approved areas/countries

- *1 ATEX (Europe)
- *1 NEPSI (China)
- *1 PESO (India)
- *2 TIS or CML (Japan)
- *1 European specifications (not for use in Japan)
- *2 Japan specifications

*1 Simple apparatus

For electrical devices that do not exceed the rated values listed below, approval and description are not required. (According to EN 50020 section 5.4)

Rated voltage: 1.5 V

Rated current: 0.1 A

Power: 25 mW

(Resistance thermometer sensors fall under the category of simple apparatus)

*1 Terminal box with intrinsic safety explosion-proof specifications

We have received certification for the standard terminal boxes in our standard parts list, except for ES and EP types.

*2 As the types of devices that can be used with specified safety barriers, etc. are limited, please contact us for details.

As there are many different combinations possible for the sensor (device test) with safety barriers, etc., please contact us for details.

R35EC**Explosion-Proof Sheathed Resistance Thermometer Sensor with Compression Fitting (European Spec.)**

Main explosion-proof and protection ratings

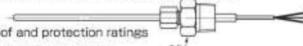
Exde II C T6 & T5, IP66

Approved areas/countries

*1 ATEX (Europe) *1 NEPSI (China) *1 PESO (India)

Contact us for details.

Certified sensor product with compression fitting.
Can be used in combination with temperature transmitters and terminal boxes certified in each country and area.
Not approved for use in Japan.

R35FM**Explosion-Proof Sheathed Resistance Thermometer Sensor with Compression Fitting (US Spec.)**

Main explosion-proof and protection ratings

Class I, Div 1 Gr.C to D NEMA 4 & 4X

Approved areas/countries

FM (US)

With specified terminal box (excluding hydrogen support)

Contact us for details.

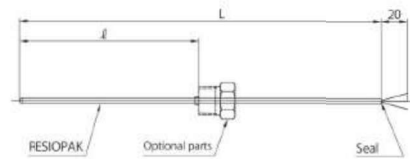
Certified sensor product with compression fitting.
Can be used in combination with temperature transmitters and terminal boxes certified in each country and area.
Not approved for use in Japan.

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D-10



Basic Sheathed Resistance Thermometer Sensor

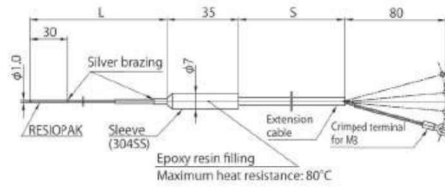


Model code R14

R14- ① ② ③ ④ ⑤ ⑥ ⑦ / ⑧

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D E F G S	φ3.2 φ4.8 φ6.4 φ8.0 φ9.0
③	Number of conductor cables	3 6	Single Double
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -I0 -I1 -I -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Optional parts		See the "Standard Parts" section
⑧	Immersion length (Unit: mm)	ℓ	

Super Fine Sheathed Resistance Thermometer Sensor



Model code R33

R33- ① ② ③ ④ ⑤ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	
②	Sheath outer diameter	Y	φ0.8
③	Number of conductor cables	4	Single (Note 1)
④	Operating temp. range	L M	-196 to 100°C 0 to 350°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	LED-4-SS	For general use
⑨	Optional parts		N/A
⑩	Immersion length (Unit: mm)		N/A

Note 1) When used with a 3-conductor type, the sheath length should be up to 1000 mm and be in the B class only.

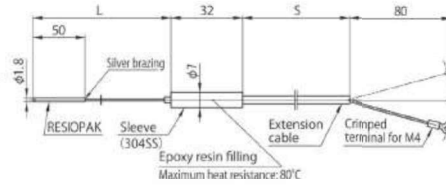


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D-12



Super Fine Sheathed Resistance Thermometer Sensor



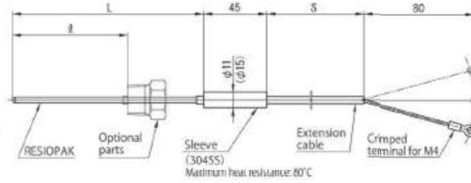
Model code R34

R34- ① ② ③ ④ ⑤ ⑥ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	(Note 1)
②	Sheath outer diameter	B	φ1.6
③	Number of conductor cables	3	Single
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	LEF	Extension cable for general use
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)		N/A

Note 1) Class A accuracy up to 1000 mm
Class B accuracy up to 2000 mm

Sheathed Resistance Thermometer Sensor with Extension Cable



Model code R35

R35- ① ② ③ ④ ⑤ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D	φ3.2
		E	φ4.8
		F	φ6.4
		G	φ8.0
③	Number of conductor cables	3	Single
		6	Double
④	Operating temp. range	L	-196 to 100°C
		N	-30 to 200°C
		M	0 to 350°C
		H	0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ	Pt100 Ω AA class (JIS-2013)
		-AJ	Pt100 Ω A class (JIS-2013)
		-BJ	Pt100 Ω B class (JIS-2013)
		-CJ	Pt100 Ω C class (JIS-2013)
		-A	Pt100 Ω A class (JIS-1997)
		-B	Pt100 Ω B class (JIS-1997)
		-AAI	Pt100 Ω AA class (IEC)
		-AI	Pt100 Ω A class (IEC)
		-BI	Pt100 Ω B class (IEC)
		-CI	Pt100 Ω C class (IEC)
		-10	Pt100 Ω B class (ASTM)
		-11	Pt100 Ω A class (ASTM)
		-1	JPt100 Ω B class
		-2	JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	LEA-3	Extension cable for heat resistance
		LEA-6	Extension cable for heat resistance
		LEC-3	Extension cable for general use
		LEC-6	Extension cable for general use
		LED-6	Extension cable for general use
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)		N/A

Sheath outer diameter	Sleeve outer diameter	
	Single	Double
φ3.2	φ11	φ11 or φ15
φ4.8	φ11	φ15
φ6.4	φ11	φ15
φ8.0	φ11	φ15
Extension cable	LEA-3 LEC-3	LEA-6 LEC-6 LED-6

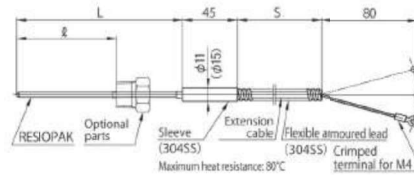


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D-14



Sheathed Resistance Thermometer Sensor with Flexible Armoured Lead



Model code R40

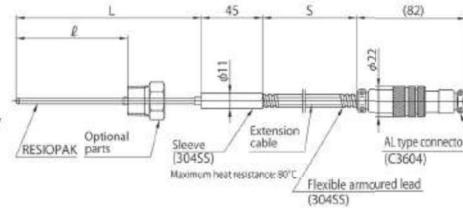
R40- ① ② ③ ④ ⑤ ⑥ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D E F G	φ3.2 φ4.8 φ6.4 φ8.0
③	Number of conductor cables	3 6	Single Double
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	LEA-3 LEA-6 LED-6	Extension cable for heat resistance Extension cable for heat resistance Extension cable for general use
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)	-L	

Sheath outer diameter	Sleeve outer diameter	
	Single	Double
φ3.2	φ11	φ15
φ4.8	φ11	φ15
φ6.4	φ11	φ15
φ8.0	φ11	φ15
Extension cable	LEA-3	LEA-6 LED-6

Sheathed Resistance Thermometer Sensor with A Type Connector/ Flexible Armoured Lead

Model code R68



R68- ① ② ③ ④ ⑤ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D E F G	ϕ 3.2 ϕ 4.8 ϕ 6.4 ϕ 8.0
③	Number of conductor cables	3	Single
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	LEA-3	Extension cable for heat resistance
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)	-Q	

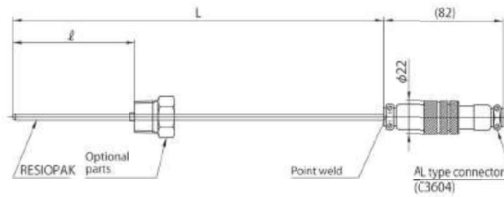


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D-16



Sheathed Resistance Thermometer Sensor with A Type Connector

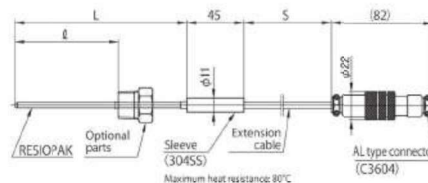


Model code R90

R90- ① ② ③ ④ ⑤ ⑥ ⑦ / ⑧

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D E F G	φ3.2 φ4.8 φ6.4 φ8.0
③	Number of conductor cables	3	Single
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Optional parts		See the "Standard Parts" section
⑧	Immersion length (Unit: mm)	· 2	

Sheathed Resistance Thermometer Sensor with A Type Connector/Extension Cable



Model code R102

R102- ① ② ③ ④ ⑤ ⑥ / ⑦ ⑧ / ⑨ ⑩

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D E F G	φ3.2 φ4.8 φ6.4 φ8.0
③	Number of conductor cables	3	Single
④	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑦	Extension cable length (Unit: mm)	S	
⑧	Extension cable types	IEA-3 IEC-3	Extension cable for heat resistance Extension cable for general use
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)	-ℓ	

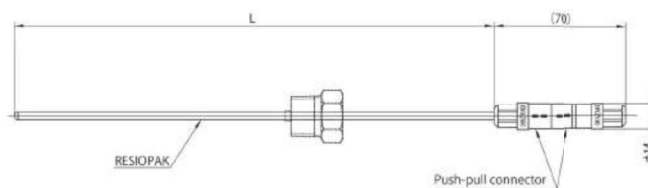


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D-18



Resistance Thermometer Sensor with Push-Pull Type Connector



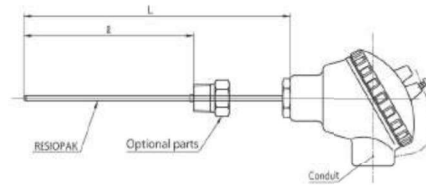
Model code R110

R110- ① ② ③ ④ ⑤ ⑥

①	Length (Unit: mm)	L	
②	Sheath outer diameter	D,E F,N,F	φ 3.2, φ 4.8 φ 6.0, φ 6.4
③	Number of conductor cables	3 4	3-conductor cable type (single) 4-conductor cable type (single)
④	Operating temp. range	L M H	-200 to 100°C 0 to 350°C 0 to 500°C
⑤	Resistance value	100	Pt100 Ω or JPt100 Ω
⑥	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class

- Please specify applicable cable diameter range up to φ6.5.
- Extension cables for resistance thermometer sensors can be added as an option.
- The connector parts are heat resistant up to 80°C.

Sheathed Resistance Thermometer Sensor with Connection Head



Model code R96

R96- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure		N/A
②	Terminal box	ES EL ED EF EP	Aluminum die-cast (ADC) (small) Aluminum die-cast (ADC) (large) Aluminum die-cast (ADC) (two-way) Cast iron Resin
③	Length (Unit: mm)	L	
④	Sheath outer diameter	D E F G S K	φ3.2 φ4.8 φ6.4 φ8.0 φ9.0 φ12.75
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)	-Q	

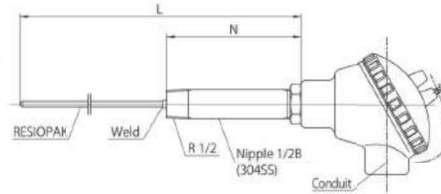


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D-20



Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Nipple

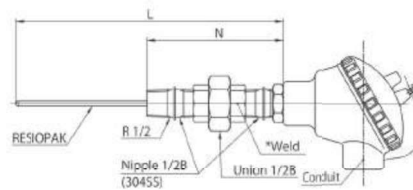


Model code R96N

R96N-① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1 2 3 4	N=100 *Not welded N=150 *Not welded N=100 *Welded N=150 *Welded
②	Terminal box	EL ED EF EP	Aluminum die-cast (ADC) Aluminum die-cast (ADC) (two-way) Cast iron Resin
③	Length (Unit: mm)	L	
④	Sheath outer diameter	D E F G S K	φ3.2 φ4.8 φ6.4 φ8.0 φ9.0 φ12.75
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)		N/A

Sheathed Resistance Thermometer Sensor with Connection Head/Nipple/ Union



Model code R96U

R96U- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	2	N=150 *Not welded			
		4	N=150 *Welded			
②	Terminal box	EL	Aluminum die-cast (ADC)			
		ED	Aluminum die-cast (ADC) (two-way)			
		EF	Cast iron			
		EP	Resin			
③	Length (Unit: mm)	L				
④	Sheath outer diameter	D	φ3.2			
		E	φ4.8			
		F	φ6.4			
		G	φ8.0			
		S	φ9.0			
		K	φ12.75			
⑤	Number of conductor cables	3	Single			
		6	Double			
⑥	Operating temp. range	L	-196 to 100°C			
		N	-30 to 200°C			
		M	0 to 350°C			
		H	0 to 500°C			
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω			
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)	
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)	
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)	
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)	
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)	
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class	
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class	
⑨	Optional parts		See the "Standard Parts" section			
⑩	Immersion length (Unit: mm)		N/A			



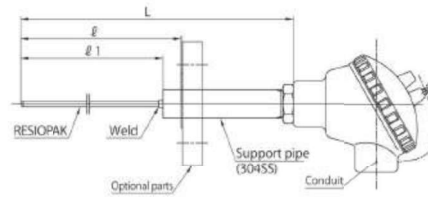
OKAZAKI
MANUFACTURING COMPANY

D-22



Sheathed Resistance Thermometer Sensor with Connection Head/Support Pipe

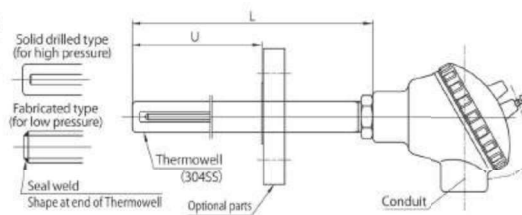
Model code R96S



R96S- ① — ② — ③ — ④ — ⑤ — ⑥ — ⑦ — ⑧ / ⑨ — ⑩

①	Structure	1 2 3	1/2B support pipe φ15 support pipe φ12 support pipe
②	Terminal box	EL ED EF EP	Aluminum die-cast (ADC) Aluminum die-cast (ADC) (two-way) Cast iron Resin
③	Length (Unit: mm)	L	
④	Sheath outer diameter	D E F G S	φ3.2 φ4.8 φ6.4 φ8.0 φ9.0
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)	· L (L 1)	

Sheathed Resistance Thermometer Sensor with Thermowell



Model code R96W

R96W- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ / ⑪ ⑫

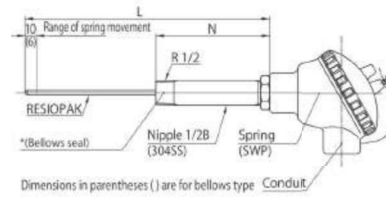
①	Structure	1	Fabricated type		
		2	Solid drilled type		
②	Terminal box	EL	Aluminum die-cast (ADC)	EF	Cast iron
		ED	Aluminum die-cast (ADC) (two-way)	EP	Resin
③	Length (Unit: mm)	L			
④	Sheath outer diameter	D	φ3.2	F	φ6.4
		E	φ4.8	G	φ8.0
⑤	Number of conductor cables	3	Single		
		6	Double		
⑥	Operating temp. range	L	-196 to 100°C	M	0 to 350°C
		N	-30 to 200°C	H	0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class
⑨	Thermowell dimensions	-10 -12 -15 -22	See the table below		
⑩	Thermowell materials	A C	304SS 316SS		
⑪	Optional parts		See the "Standard Parts" section		
⑫	Immersion length (Unit: mm)	-U			

Thermowell dimensions

Code	Outer diameter	Inner diameter for fabricated type	Inner diameter for solid drilled type
-10	φ10	φ7	φ7
-12	φ12	φ9	φ9
-15	φ15	φ11	φ9
-22	φ21.7 φ22	φ16.1 -	- φ9

Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Nipple

Model code R400N

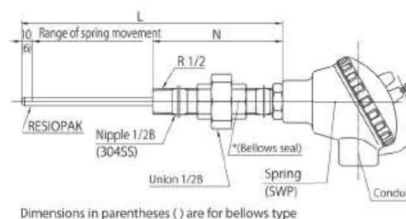


R400N- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1 2 3 4	N=100 N=150 N=100 *Bellows seal N=150 *Bellows seal
②	Terminal box	EL ED EF EP	Aluminum die-cast (ADC) Aluminum die-cast (ADC) (two-way) Cast iron Resin
③	Length (Unit: mm)	L	
④	Sheath outer diameter	D E F G S	φ3.2 φ4.8 φ6.4 φ8.0 φ9.0 (excluding bellows type)
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section
⑩	Immersion length (Unit: mm)		N/A

Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Nipple/Union

Model code R400U



R400U- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	2	N=150						
		4	N=150 *Bellows seal						
②	Terminal box	EL	Aluminum die-cast (ADC)						
		ED	Aluminum die-cast (ADC) (two-way)						
		EF	Cast iron						
		EP	Resin						
③	Length (Unit: mm)	L							
④	Sheath outer diameter	D	φ3.2						
		E	φ4.8						
		F	φ6.4						
		G	φ8.0						
		S	φ9.0 (excluding bellows type)						
⑤	Number of conductor cables	3	Single						
		6	Double						
⑥	Operating temp. range	L	-196 to 100°C						
		N	-30 to 200°C						
		M	0 to 350°C						
		H	0 to 500°C						
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω						
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)				
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)				
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)				
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)				
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)				
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class				
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class				
⑨	Optional parts		See the "Standard Parts" section						
⑩	Immersion length (Unit: mm)		N/A						



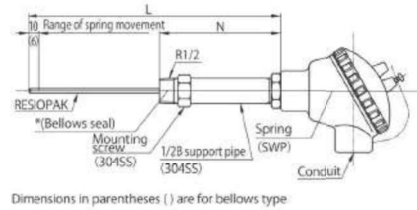
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D-26



Spring Loaded Sheathed Resistance Thermometer Sensor with Connection Head/Support Pipe

Model code R400S

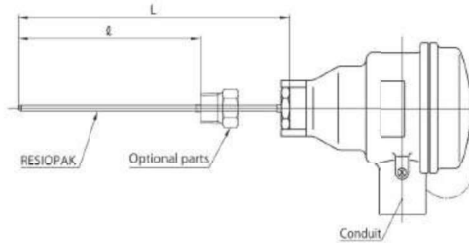


R400S- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1	N=100			
		2	N=150			
		3	N=100 *Bellows seal			
		4	N=150 *Bellows seal			
②	Terminal box	EL	Aluminum die-cast (ADC)			
		ED	Aluminum die-cast (ADC) (two-way)			
		EF	Cast iron			
		EP	Resin			
③	Length (Unit: mm)	L				
④	Sheath outer diameter	D	φ3.2			
		E	φ4.8			
		F	φ6.4			
		G	φ8.0			
		S	φ9.0 (excluding bellows type)			
⑤	Number of conductor cables	3	Single			
		6	Double			
⑥	Operating temp. range	L	-196 to 100°C			
		N	-30 to 200°C			
		M	0 to 350°C			
		H	0 to 500°C			
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω			
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)		-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)		-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)		-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)		-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)		-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)		-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)		-2	JPt100 Ω A class
⑨	Optional parts	See the "Standard Parts" section				
⑩	Immersion length (Unit: mm)	N/A				

Explosion-Proof Sheathed Resistance Thermometer Sensor

d2G4



Model code R97

R97 ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	N/A			
②	Terminal box	GA	Aluminum die-cast (ADC)	GAD	Aluminum die-cast (ADC) (two-way)
		GS	Stainless steel (ST/ST)	GM	Stainless steel (two-way)
③	Length (Unit: mm)	L			
④	Sheath outer diameter	D	φ3.2	G	φ8.0
		E	φ4.8	S	φ9.0
		F	φ6.4	K	φ12.75
⑤	Number of conductor cables	3	Single		
		6	Double		
⑥	Operating temp. range	L	-196 to 100°C		
		N	-30 to 200°C		
		M	0 to 350°C		
		H	0 to 500°C		
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class
⑨	Optional parts	See the "Standard Parts" section			
⑩	Immersion length (Unit: mm)	-ℓ			

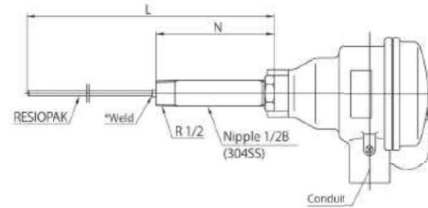
Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	△	□	□	□	□	□
-GS	-	△	-	□	-	-
-GAD	△	△	△	□	-	-
-GM	-	-	△	-	-	-

For the combinations indicated by the triangle symbol (△), consider a support that holds the terminal head for safety purposes. (See Y-3.)

Notes: The structure of the terminal head for the GM type is different from the standard structure. (See Y-2.)

Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple d2G4



Model code R97N

R97N- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1	N=100 *Not welded	3	N=100 *Welded
		2	N=150 *Not welded	4	N=150 *Welded
②	Terminal box	GA	Aluminum die-cast (ADC)	GAD	Aluminum die-cast (ADC) (two-way)
		GS	Stainless steel (ST/ST)	GM	Stainless steel (two-way)
③	Length (Unit: mm)	L			
④	Sheath outer diameter	D	φ3.2	G	φ8.0
		E	φ4.8	S	φ9.0
		F	φ6.4	K	φ12.75
⑤	Number of conductor cables	3	Single		
		6	Double		
⑥	Operating temp. range	L	-196 to 100°C		
		N	-30 to 200°C		
		M	0 to 350°C		
		H	0 to 500°C		
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section		
⑩	Immersion length (Unit: mm)		N/A		

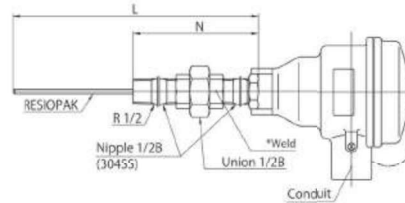
Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	□	□	□	□	□	□
-GS	-	□	-	□	-	-
-GAD	□	□	□	□	□	□
-GM	-	-	□	-	-	-

Notes: The structure of the terminal head for the GM type is different from the standard structure. (See Y-2.)

Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple/Union

d2G4



Model code R97U

R97U- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	2 4	N=150 *Not welded N=150 *Welded			
②	Terminal box	GA	Aluminum die-cast (ADC)			
		GS	Stainless steel (ST/ST)			
		GAD	Aluminum die-cast (ADC) (two-way)			
		GM	Stainless steel (two-way)			
③	Length (Unit: mm)	L				
④	Sheath outer diameter	D	φ3.2	G	φ8.0	
		E	φ4.8	S	φ9.0	
		F	φ6.4	K	φ12.75	
⑤	Number of conductor cables	3	Single			
		6	Double			
⑥	Operating temp. range	L	-196 to 100°C			
		N	-30 to 200°C			
		M	0 to 350°C			
		H	0 to 500°C			
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω			
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)	
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)	
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)	
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)	
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)	
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class	
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class	
⑨	Optional parts		See the "Standard Parts" section			
⑩	Immersion length (Unit: mm)		N/A			

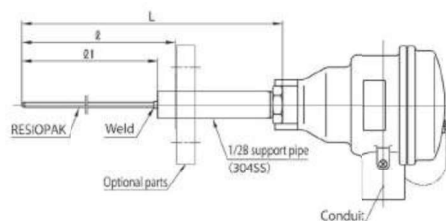
Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	○	○	○	○	○	○
-GS	-	○	-	○	-	-
-GAD	○	○	○	○	○	○
-GM	-	-	○	-	-	-

Notes: The structure of the terminal head for the GM type is different from the standard structure. (See Y-2.)

Explosion-Proof Sheathed Resistance Thermometer Sensor with Support Pipe d2G4

Model code R97S



R97S- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1	Support pipe		
②	Terminal box	GA GS	Aluminum die-cast (ADC) Stainless steel (ST/ST)	GAD GM	Aluminum die-cast (ADC) (two-way) Stainless steel (two-way)
③	Length (Unit: mm)	L			
④	Sheath outer diameter	D E F	φ3.2 φ4.8 φ6.4	G S K	φ8.0 φ9.0 φ12.75
⑤	Number of conductor cables	3 6	Single Double		
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C		
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section		
⑩	Immersion length (Unit: mm)	-L	(-L1)		

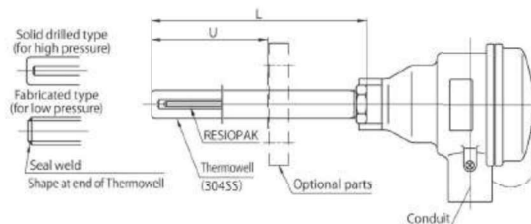
Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	○	○	○	○	○	○
-GS	-	○	-	○	-	-
-GAD	○	○	○	○	○	○
-GM	-	-	○	-	-	-

Notes: The structure of the terminal head for the GM type is different from the standard structure. (See Y-2.)

Explosion-Proof Sheathed Resistance Thermometer Sensor with Thermowell

d2G4



Model code R97W

R97W- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ / ⑪ ⑫

①	Structure	1	Fabricated type								
		2	Solid drilled type								
②	Terminal box	GA	Aluminum die-cast (ADC)								
③	Length (Unit: mm)	L									
④	Sheath outer diameter	D	φ3.2		F	φ6.4					
		E	φ4.8		G	φ8.0					
⑤	Number of conductor cables	3	Single								
		6	Double								
⑥	Operating temp. range	L	-196 to 100°C		M	0 to 350°C					
		N	-30 to 200°C		H	0 to 500°C					
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω								
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)		-AI	Pt100 Ω A class (IEC)					
		-AJ	Pt100 Ω A class (JIS-2013)		-BI	Pt100 Ω B class (IEC)					
		-BJ	Pt100 Ω B class (JIS-2013)		-CI	Pt100 Ω C class (IEC)					
		-CJ	Pt100 Ω C class (JIS-2013)		-10	Pt100 Ω B class (ASTM)					
		-A	Pt100 Ω A class (JIS-1997)		-11	Pt100 Ω A class (ASTM)					
		-B	Pt100 Ω B class (JIS-1997)		-1	JPt100 Ω B class					
		-AAI	Pt100 Ω AA class (IEC)		-2	JPt100 Ω A class					
⑨	Thermowell dimensions	-10									
		-12									
		-15	See the table below								
		-22									
⑩	Thermowell materials	A	304SS								
		C	316SS								
⑪	Optional parts		See the "Standard Parts" section								
⑫	Immersion length (Unit: mm)	-U									

Thermowell dimensions

Code	Outer diameter	Inner diameter for fabricated type	Inner diameter for solid drilled type
-10	φ10	φ7	φ5 to φ7
-12	φ12	φ9	φ7 to φ9
-15	φ15	φ11	φ9 to φ11
-22	φ21.7	φ16.1	-
	φ22	-	φ14.5 to φ16


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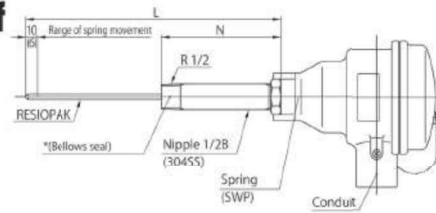
D-32



Spring Loaded Explosion-Proof Sheathed Resistance Thermometer Sensor with Nipple

d2G4

Model code R407N



R407N- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

①	Structure	1	N=100			
		2	N=150			
		3	N=100 *Bellows seal			
		4	N=150 *Bellows seal			
②	Terminal box	GA	Aluminum die-cast (ADC)			
		GS	Stainless steel (ST/ST)			
		GAD	Aluminum die-cast (ADC) (two-way)			
③	Length (Unit: mm)	L				
④	Sheath outer diameter	D	φ3.2			
		E	φ4.8			
		F	φ6.4			
		G	φ8.0			
⑤	Number of conductor cables	3	Single			
		6	Double			
⑥	Operating temp. range	L	-196 to 100°C			
		N	-30 to 200°C			
		M	0 to 350°C			
		H	0 to 500°C			
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω			
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)		-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)		-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)		-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)		-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)		-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)		-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)		-2	JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section			
⑩	Immersion length (Unit: mm)		N/A			

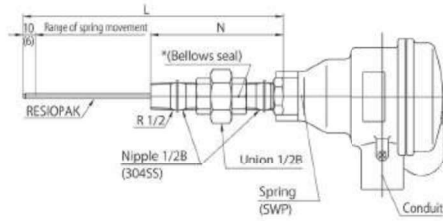
Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	○	○	○	○	-	-
-GS	-	○	○	○	-	-
-GAD	○	○	○	○	-	-
-GM	-	-	-	-	-	-

Spring Loaded Explosion- Proof Sheathed Resistance Thermometer Sensor with Nipple/Union

d2G4

Model code R407U



R407U- ① — ② — ③ — ④ — ⑤ — ⑥ — ⑦ — ⑧ — ⑨ — ⑩

①	Structure	2	N=150		
		4	N=150 *Bellows seal		
②	Terminal box	GA	Aluminum die-cast (ADC)		
		GS	Stainless steel (ST/ST)		
		GAD	Aluminum die-cast (ADC) (two-way)		
③	Length (Unit: mm)	L			
④	Sheath outer diameter	D	φ3.2		
		E	φ4.8		
		F	φ6.4		
		G	φ8.0		
⑤	Number of conductor cables	3	Single		
		6	Double		
⑥	Operating temp. range	L	-196 to 100°C		
		N	-30 to 200°C		
		M	0 to 350°C		
		H	0 to 500°C		
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section		
⑩	Immersion length (Unit: mm)		N/A		

Model codes and sheath outer diameters

Model code	φ3.2	φ4.8	φ6.4	φ8.0	φ9.0	φ12.75
-GA	○	○	○	○	-	-
-GS	-	○	○	○	-	-
-GAD	○	○	○	○	-	-
-GM	-	-	-	-	-	-


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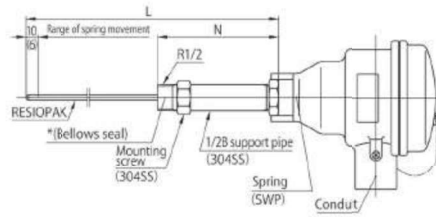
D-34



Spring Loaded Explosion- Proof Sheathed Resistance Thermometer Sensor with Support Pipe

d2G4

Model code R407S



R407S- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ / ⑨ ⑩

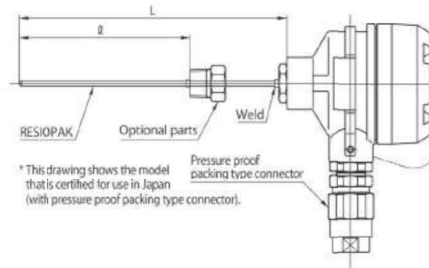
①	Structure	1	N=100			
		2	N=150			
		3	N=100 *Bellows seal			
		4	N=150 *Bellows seal			
②	Terminal box	GA	Aluminum die-cast (ADC)			
		GS	Stainless steel (ST/ST)			
		GAD	Aluminum die-cast (ADC) (two-way)			
③	Length (Unit: mm)	L				
④	Sheath outer diameter	D	φ3.2			
		E	φ4.8			
		F	φ6.4			
		G	φ8.0			
⑤	Number of conductor cables	3	Single			
		6	Double			
⑥	Operating temp. range	L	-196 to 100°C			
		N	-30 to 200°C			
		M	0 to 350°C			
		H	0 to 500°C			
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω			
⑧	Class	-AAJ	Pt100 Ω AA class (JIS-2013)		-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)		-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)		-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)		-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)		-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)		-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)		-2	JPt100 Ω A class
⑨	Optional parts		See the "Standard Parts" section			
⑩	Immersion length (Unit: mm)		N/A			

Model codes and sheath outer diameters

Model code	φ 3.2	φ 4.8	φ 6.4	φ 8.0	φ 9.0	φ 12.75
-GA	○	○	○	○	-	-
-GS	-	○	○	○	-	-
-GAD	○	○	○	○	-	-
-GM	-	-	-	-	-	-

Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor

Model code R99



*R99- ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank	Does not need to be filled out for certified products of Japan IECEX certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified products (Taiwan) INMETRO certified product (Brazil)
②	Structure		N/A		
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{1,2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{1,2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN	φ3.2, φ3.0 φ4.8, φ4.5	F,FN G	φ6.4, φ6.0 φ8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)	-Q			

Characteristics

- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T5/T6 & T5 Gb
Ex tb III C Dp T85°C & T110°C II 2 GD
Ex de II C ID A21 T6 T85°C & T5 T110°C (for international and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class III, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de II C T5/T6 Gb Ex ID A21 IP66 T85°C/T110°C

- Conforms to South Korea safety standards
Explosion proof class: Exde I C T6
- Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: IEx de II C T5/T6 Gb X
- Conforms to India safety standards
Explosion proof class: Ex II 2G/Exde IIC T6 Ta
- Excellent protection class: IP66 (for Japan, international, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
- Models with two-wire temperature transmitters (4 to 20 mA output) also supported
- Light and compact body: Made of aluminum die-cast (stainless steel also available)
- Pressure proof packing type connector: equipped as standard (for Japan)
- Multi-paired type also available (for Japan, certified by IECEX, ATEX, FMA, NEPSI, and PESO)

*1: The type names on the certification certificates are indicated in the table on the right.
*2: Cannot be used with products certified in Japan.
*3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF



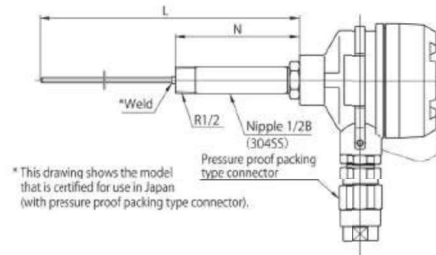
OKAZAKI
MANUFACTURING COMPANY

D-36



Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple

Model code R99N



*R99N- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank EX EC FM FC NP	Does not need to be filled out for certified products of Japan IECEX certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified product (Taiwan) INMETRO certified product (Brazil)
②	Structure	-1 -2	N=100 *Not welded N=150 *Not welded	-3 -4	N=100 *Welded N=150 *Welded
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D.DN E.EN	φ3.2, φ3.0 φ4.8, φ4.5	F.FN G	φ6.4, φ6.0 φ8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)		N/A		

Characteristics

• New technical standards that conform to IEC standard

Explosion proof class: Exd II C T6 (for Japan)

• Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking

Explosion proof class: Ex de II C T6 & T5 Gb

Ex db III C D0 T85°C & T100°C II 2 G0

Ex de II C D0 A21 T6 T85°C & T5 T100°C (for international and Europe)

• Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard

Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)

Class I, Div. 1 Gr. E, F & G (for US/Canada)

• Conforms to GB China explosion proof standards

Explosion proof class: Ex de II C T5/T6 Gb Ex d0 A21 IP66 T85°C/T100°C

• Conforms to South Korea safety standards

Explosion proof class: Exde II C T6

• Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus

Explosion proof class: Ex de II C T5/T6 Gb X

• Conforms to India safety standards

Explosion proof class: Ex II 2G/Exde II C T6 Ta

• Excellent protection class: IP66 (for Japan, international, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)

• Models with two-wire temperature transmitters (4 to 20 mA output) also supported

• Light and compact body: Made of aluminum die-cast (stainless steel also available)

• Pressure proof packing type connector equipped as standard for Japan

• Multipaired type also available (for Japan, certified by IECEx, ATEX, FM, NEPSI, and PESO)

*1: The type names on the certification certificates are indicated in the table on the right.

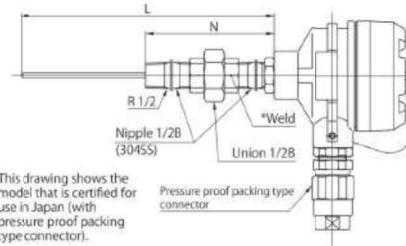
*2: Cannot be used with products certified in Japan.

*3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF

Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple/Union

Model code R99U



"R99U- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank	Does not need to be filled out for certified products of Japan IECEx certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified product (Taiwan) INMETRO certified product (Brazil)
②	Structure	-2 -4	N=150 *Not welded N=150		
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN	φ3.2, φ3.0 φ4.8, φ4.5	F,FN G	φ6.4, φ6.0 φ8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)		N/A		

Characteristics

- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T6 & T5 Gb
Ex to III C Db T85°C & T110°C II 2 GD
Ex de II C D A21 T6 T85°C & T5 T100°C (for international and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class II/III, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de II C T5/T6 Gb Ex tD A21 IP66 T85°C/T100°C

- Conforms to South Korea safety standards
Explosion proof class: Exde II C T6
- Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: IEx de II C T5/T6 Gb X
- Conforms to India safety standards
Explosion proof class: Ex II 2G/Exde IIC T6 Ta
- Excellent protection class: IP66 (for Japan, international, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
- Models with two-wire temperature transmitters (4 to 20 mA output) also supported
- Light and compact body: Made of aluminum die-cast (stainless steel also available)
- Pressure proof packing type connector equipped as standard (for Japan)
- Multi-ported type also available (for Japan, certified by IECEx, ATEX, FM, NEPSI, and PESO)

- *1: The type names on the certification certificates are indicated in the table on the right.
- *2: Cannot be used with products certified in Japan.
- *3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF



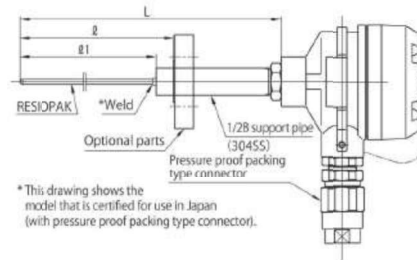
OKAZAKI
MANUFACTURING COMPANY

D-38



Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Support Pipe

Model code R99S



*R99S- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank EX EC FM FC NP	Does not need to be filled out for certified products of Japan IECEx certified product (International) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified product (Taiwan) INMETRO certified product (Brazil)
②	Structure	-1	With $\phi 22$ support pipe		
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GED	Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN	$\phi 3.2, \phi 3.0$ $\phi 4.8, \phi 4.5$	F,FN G	$\phi 6.4, \phi 6.0$ $\phi 8.0$
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)	-L	(-L)		

Characteristics

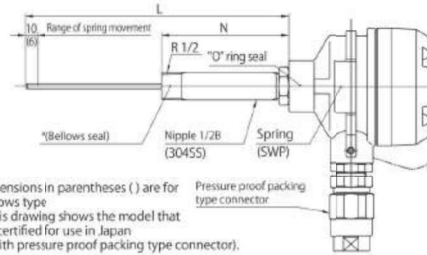
- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T6 & T5 Gb
Ex de III C Dd T85°C & T100°C II 2 Gb
Ex de II C Dd A21 T6 T85°C & T5 T100°C (for international and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class II, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de II C T5/T6 Gb Ex d I A21 IP66 T85°C/T100°C

- Conforms to South Korea safety standards
Explosion proof class: Exde II C T6
- Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: 1Ex de II C T5/T6 Gb X
- Conforms to India safety standards
Explosion proof class: Ex II 2G/Exde II C T6 Ta
- Excellent protection class: IP66 (for Japan, international, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
- Models with two-wire temperature transmitters (4 to 20 mA output) also supported
- Light and compact body: Made of aluminum die-cast (stainless steel also available)
- Pressure proof packing type connector equipped as standard (for Japan)
- Multi-paired type also available (for Japan, certified by IECEx, ATEX, FM, NEPSI, and PESO)

*1: The type names on the certification certificates are indicated in the table on the right.
*2: Cannot be used with products certified in Japan.
*3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF

Spring Loaded Explosion-Proof (Hydrogen Protection) Sheathed Resistance Ther- mometer Sensor with Nipple



Model code R409N

*R409N- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank	Does not need to be filled out for certified products of Japan IECEX certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus)
②	Structure	-1 -2	N=100 N=150	-3 -4	N=100 *Bellows seal N=150 *Bellows seal
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN	φ3.2, φ3.0 φ4.8, φ4.5	F,FN G	φ6.4, φ6.0 φ8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)		N/A		

Characteristics

- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with
IECEX and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T6 & T5 Gb
Ex tb II C D T85°C & T100°C II 2 GD
Ex de II C D A21 T6 T85°C & T5 T100°C (for International and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with
NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class II, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de I C T5/T6 Gb Ex ID A21 IP66 T85°C/T100°C

- Conforms to South Korea safety standards:
Explosion proof class: Exde II C T6
 - Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: Ex de II C T5/T6 Gb X
 - Conforms to India safety standards
Explosion proof class: Ex II 2G/Exde IIC T6 T6
 - Excellent protection class: IP66 (for Japan, International, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
 - Models with two-wire temperature transmitters (4 to 20 mA output) also supported
 - Light and compact body (Made of aluminum die-cast (stainless steel also available))
 - Pressure proof packing type connector equipped as standard (for Japan)
 - Multi-part type also available (for Japan, certified by IECEX, ATEX, FM, NEPSI, and PESO)
- 1: The type names on the certification certificates are indicated in the table on the right.
2: Cannot be used with products certified in Japan.
3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF



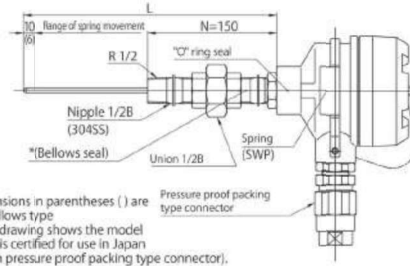
OKAZAKI
MANUFACTURING COMPANY

D-40



Spring Loaded Explosion-Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Nipple/Union

Model code R409U



*R409U- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank EX EC FM FC NP	Does not need to be filled out for certified products of Japan IECEx certified product (International) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified products (Taiwan) INMETRO certified product (Brazil)
②	Structure	-2 -4	N=150 N=150 *Bellows seal		
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{*2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{*2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D.DN E.EN	φ 3.2, φ 3.0 φ 4.8, φ 4.5	F.FN G	φ 6.4, φ 6.0 φ 8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)		N/A		

Characteristics

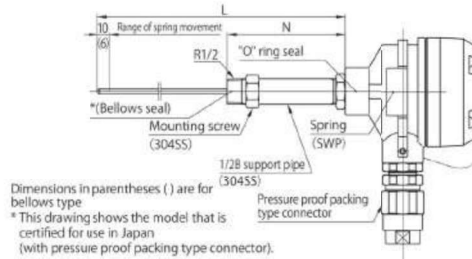
- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T6 & T5 Gb
Ex de II C Dd T85°C & T100°C II 2 Gb
Ex de II C Dd A21 T6 T85°C & T5 T100°C (for international and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class I, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de II C T5/T6 Gb Ex dD A21 IP66 T85°C/T100°C

- Conforms to South Korea safety standards
Explosion proof class: Exde II C T6
 - Conforms to EAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: Ex de II C T5/T6 Gb X
 - Conforms to India safety standards
Explosion proof class: Ex de II C T6 Ta
 - Excellent protection class: IP66 (for Japan, international, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
 - Models with two-wire temperature transmitters (4 to 20 mA output) also supported
 - Light and compact body: Made of aluminum die-cast (stainless steel also available)
 - Pressure proof packing type connector equipped as standard (for Japan)
 - Multipaired type also available (for Japan, certified by IECEx, ATEX, FM, NEPSI, and PESO)
- *1: The type names on the certification certificates are indicated in the table on the right.
*2: Cannot be used with products certified in Japan.
*3: The standard coating color is blue.

Certified product of Japan (T6)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF

Spring Loaded Explosion- Proof (Hydrogen Protection) Sheathed Resistance Thermometer Sensor with Support Pipe

Model code R409S



*R409S- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank EX EC FM FC NP	Does not need to be filled out for certified products of Japan IECEX certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US) FMC certified product (Canada) NEPSI certified product (China)	KS TR PS TS IN	KOSHA certified product (South Korea) TR CU certified product (Russia/Kazakhstan/Belarus) PESO certified product (India) OSHA certified products (Taiwan) INMETRO certified product (Brazil)
②	Structure	-1 -2	N=100 N=150	-3 -4	N=100 *Bellows seal N=150 *Bellows seal
③	Terminal box	GE GE-CFT GED	Aluminum die-cast (ADC) Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Aluminum die-cast (ADC) (two-way)	GED-CFT GES GESD	Aluminum die-cast (ADC) ^{2,3} (COPPER-FREE) Stainless steel Stainless steel (two-way)
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN	φ3.2, φ3.0 φ4.8, φ4.5	F, FN G	φ6.4, φ6.0 φ8.0
⑥	Number of conductor cables	3,4	Single	6	Double
⑦	Operating temp. range	L N	-196 to 100°C -30 to 200°C	M H	0 to 350°C 0 to 500°C
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)		N/A		

Characteristics

- New technical standards that conform to IEC standard
Explosion proof class: Exd II C T6 (for Japan)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with IECEx and ATEX directives, and supplied with CE marking
Explosion proof class: Ex de II C T6 & T5 Gb
Ex tb II C Dc T85°C & T100°C II 2 GD
Ex de II C Dc T85°C & T5 T100°C (for International and Europe)
- Suitable for use in environments with gas vapor, dust, etc. in conformance with NEC standard/CSA standard
Explosion proof class: Class I, Div. 1 Gr. A, B, C & D (for US)
Gr. B, C & D (for Canada)
Class II, Div. 1 Gr. E, F & G (for US/Canada)
- Conforms to GB China explosion proof standards
Explosion proof class: Ex de I C T5/T6 Gb Ex ID A21 IP66 T85°C/T100°C

- Conforms to South Korea safety standards:
Explosion proof class: Exde II C T6
 - Conforms to SAC TR CU customs union regulations for Russia, Kazakhstan, and Belarus
Explosion proof class: 1Ex de II C T5/T6 Gb X
 - Conforms to India safety standards
Explosion proof class: Ex II 2G/Exde IIC T6 T4
 - Excellent protection class: IP66 (for Japan, International, Europe, China, South Korea, Russia, Kazakhstan, Belarus, Taiwan, and India), NEMA 4 & 4X (for US), and Type 4 & 4X (for Canada)
 - Models with two-wire temperature transmitters (4 to 20 mA output) also supported
 - Light and compact body: Made of aluminum die-cast (stainless steel also available)
 - Pressure proof packing type connector equipped as standard (for Japan)
 - Multi-part type also available (for Japan, certified by IECEx, ATEX, FM, NEPSI, and PESO)
- 1: The type names on the certification certificates are indicated in the table on the right.
2: Cannot be used with products certified in Japan.
3: The standard coating color is blue.

Certified product of Japan (TIS)	R99
International/ATEX (Baseefa) certified product	OFF
FM certified product	R99
NEPSI certified product	OFF
TR CU certified product	OFF
KOSHA certified product	OFF
PESO certified product	OFF
OSHA certified product	OFF
INMETRO certified product	OFF



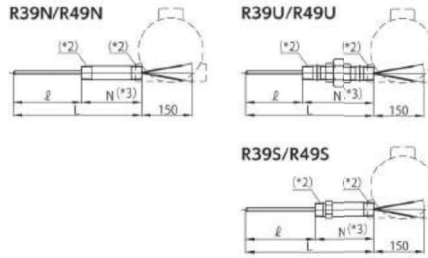
OKAZAKI
MANUFACTURING COMPANY

D-42



Explosion/Flame Proof Nipple Type Temperature Sensor

Model code



① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

①	Basic model ^(*)	R39N R39U R39S	With nipple With nipple/union With support pipe	R49N R49U R49S	Spring loaded with nipple Spring loaded with nipple/union Spring loaded with support pipe
②	Certification classification	-EX -EC -NP -IN	IECEX certified product And ATEX (Baseefa) certified product NEPSI certified product INMETRO certified product (Brazil)	-TR -PS -KS -FM	TRCU certified product PESO certified product KOSHA certified product (South Korea) FM certified product
③	Nipple length ^(*)	-1 -2	N=75 (39N,49N) N=160 (39U,49U)		
④	Length (Unit: mm)	L			
⑤	Sheath outer diameter	D,DN E,EN F,FN G	φ3.2, φ3.0 φ4.8, φ4.5 φ6.4, φ6.0 φ8.0		
⑥	Number of element wires	3,4 6	Single Double		
⑦	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C		
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)	-L			

(*) The type name is "PPN" on certificates for IECEX, EC, NP, TR, PS, KS, IN certified products, regardless of the structure.

(*) NPT 1/2, BSPT 1/2, BSPT 1/2, N20X 1.5, IEC (NP) (TR) (PS) (KS) (IN); NPT1/2, R1/2, IFM)

(*) Standard dimensions. Contact us if other dimensions are required.

Pay attention to the ambient temperature in the place where the terminal box is installed.

EX, EC, NP, TR, PS, KS, IN: -50°C to 60°C (T6), -50°C to 75°C (T5)

FM: -50°C to 75°C

For IECEX, an application procedure such as certification exemption confirmation may be required due to the requirements of the accepting country.

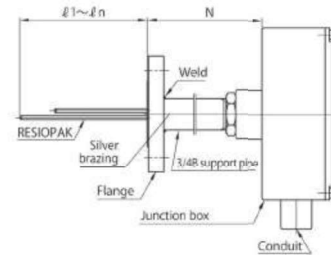
Please specify the screw size of the temperature transmitter or terminal box to be combined.

(Basically, the country (agency) that has certified the sensor must be the same as the country (agency) that has certified the temperature transmitter or terminal box in order to be combined with the sensor. Make sure to check manufacturer's latest information on acquisition. In addition, they cannot be used in dangerous places where Japanese explosion proof certification is required.

Note: Only for China (NEPSI), the screw sizes of G1/2 and G3/4 cannot be used to combine with the TM or terminal box.

Multipoint Sheathed Resistance Thermometer Sensor with Connection Head

Model code R96M (6)



R96M(6)- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩

①	Number of terminals	3 to 6	Number of terminals (support pipe 3/4B)
②	Terminal box	T Y	Vertical type JB6 Horizontal type JB6
③	Sheath length	$\varnothing 1$ to $\varnothing 2$	
④	Sheath outer diameter	D E F	$\varnothing 3.2$ $\varnothing 4.8$ $\varnothing 6.4$
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Support pipe length	-N	200 mm or more (specified)
⑩	Optional parts		See the "Standard Parts" section

Notes: The illustration shows the model with the horizontal terminal box. For the model with the vertical terminal box, the temperature sensor is connected where the conduit is shown.

Notes: Dimensions from $\varnothing 1$ to $\varnothing n$
Specification method
Example: 2-point model
 $\varnothing 1=5000$
 $\varnothing 2=4000$



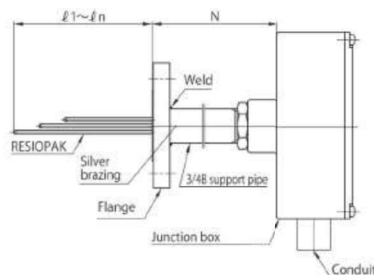
OKAZAKI
MANUFACTURING COMPANY

D-44



Multipoint Sheathed Resistance Thermometer Sensor with Connection Head

Model code R96M (12)



R96M(12)- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩

①	Number of terminals	9 to 12	Number of terminals (support pipe 3/4B)
②	Terminal box	T Y	Vertical type JB12 Horizontal type JB12
③	Sheath length	① 1 to ② 4	
④	Sheath outer diameter	D E F	φ3.2 φ4.8 φ6.4
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Support pipe length	-N	200 mm or more (specified)
⑩	Optional parts		See the "Standard Parts" section

Notes: The illustration shows the model with the horizontal terminal box. For the model with the vertical terminal box, the temperature sensor is connected where the conduit is shown.

Notes: Dimensions from ① 1 to ② 4

Specification method

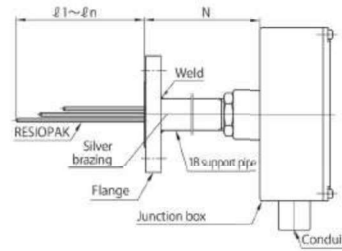
Example: 4-point model

① 1=5000
② 2=4000
③ 3=3000
④ 4=2000

Please indicate each position

Multipoint Sheathed Resistance Thermometer Sensor with Connection Head

Model code R96M (24)



R96M(24)- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩

①	Number of terminals	15 to 24	Number of terminals (support pipe 1B)
②	Terminal box	T Y	Vertical type JB24 Horizontal type JB24 (shown in illustration above)
③	Sheath length	$\varnothing 1$ to $\varnothing 8$	
④	Sheath outer diameter	D E F	$\varnothing 3.2$ $\varnothing 4.8$ $\varnothing 6.4$
⑤	Number of conductor cables	3 6	Single Double
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Support pipe length	-N	200 mm or more (specified)
⑩	Optional parts		See the "Standard Parts" section

Notes: The illustration shows the model with the horizontal terminal box. For the model with the vertical terminal box, the temperature sensor is connected where the conduit is shown.

Notes: Dimensions from $\varnothing 1$ to $\varnothing n$

Specification method

Example: 8-point model

$\varnothing 1=8000$

$\varnothing 2=7000$

$\varnothing 7=2000$

$\varnothing 8=1000$

—Please indicate each position



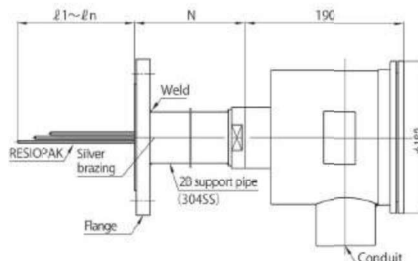
OKAZAKI
MANUFACTURING COMPANY

D-46



Explosion-Proof Multipoint Sheathed Resistance Thermometer Sensor

d2G4 (Note 1)



Model code R97M (24)

R97M(24)- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩

①	Number of terminals	6 to 24	6 to 24 terminals
②	Terminal box	GM24 25 40 60	Stainless steel (ST/ST) G1 -1 location G1-1/2 -1 location G2 -1 location
③	Sheath length	21 to 28	(2 to 8 points)
④	Sheath outer diameter	D E F	φ3.2 φ4.8 φ6.4
⑤	Number of conductor cables	3	Single
⑥	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C
⑦	Resistance value	100	Pt100 Ω or JPt100 Ω
⑧	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)
		-AI -BI -CI -10 -11 -1 -2	Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑨	Support pipe length	-N	200 mm or more (specified) (support pipe 2B)
⑩	Optional parts		See the "Standard Parts" section

For this model, there are some cases that have not received certification due to the combination of the sheath outer diameter and the conduit. Please contact us to confirm the details.

Notes: Dimensions from 21 to 28
Specification method
Example: 8-point model

21~8000

2~7000

7~2000

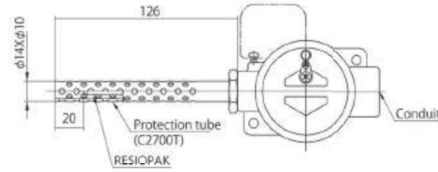
8~1000

Please indicate each position

(Note1)
The R97M (12) and (24) models, which conform to explosion proof class of Ex d IIB T4 (SUS terminal box), are also available.

Sheathed Resistance Thermometer Sensor with RC Type Connector (for In- door and Refrigerator Use)

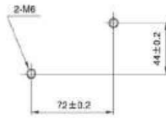
Model code RC1



RC1 ① ② ③ ④ ⑤ / ⑥

①	Sheath outer diameter	E	φ4.8
		F	φ6.4
②	Number of conductor cables	3	Single
		6	Double
③	Operating temp. range	L	-196 to 60°C with paraffin filling
		H	61°C or more without paraffin filling
④	Resistance value	100	Pt100 Ω or JPt100 Ω
⑤	Class	-AAJ	Pt100 Ω AA class (JIS-2013)
		-AJ	Pt100 Ω A class (JIS-2013)
		-BJ	Pt100 Ω B class (JIS-2013)
		-CJ	Pt100 Ω C class (JIS-2013)
		-A	Pt100 Ω A class (JIS-1997)
		-B	Pt100 Ω B class (JIS-1997)
		-AAI	Pt100 Ω AA class (IEC)
		-AI	Pt100 Ω A class (IEC)
		-BI	Pt100 Ω B class (IEC)
		-CI	Pt100 Ω C class (IEC)
		-10	Pt100 Ω B class (ASTM)
		-11	Pt100 Ω A class (ASTM)
		-1	JPt100 Ω B class
		-2	JPt100 Ω A class
⑥	Optional parts		See the "Standard Parts" section

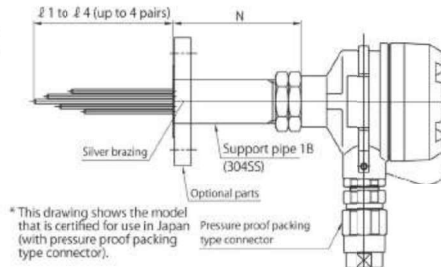
*: The operating temperature range code L.H. of this model is not associated with the JIS standards.



Terminal box mounting hole machining diagram

Explosion-Proof (Hydrogen Protection) Multipoint Sheathed Resistance Thermometer Sensor

Model code R99M



R99M- ① ② - ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Certification classification	Blank EX EC FM	Does not need to be filled out for certified products of Japan IECEX certified product (international) ATEX (Baseefa) certified product (Europe) FM certified product (US)	
②	Structure		N/A	
③	Terminal box	GE GED GES GESD	Aluminum die-cast (ADC) Aluminum die-cast (ADC) (two-way) Cast steel Cast steel (two-way)	
④	Length		N/A	
⑤	Sheath outer diameter	D.DN E.EN F.FN G	φ 3.2, φ 3.0 φ 4.8, φ 4.5 φ 6.4, φ 6.0 φ 8.0	
⑥	Number of conductor cables	3,4 6	Single Double	
⑦	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 500°C	
⑧	Resistance value	100	Pt100 Ω or JPt100 Ω	
⑨	Class	-AAJ -AJ -BJ -CJ -A -B -AAI	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC)	-AI -BI -CI -10 -11 -1 -2 Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑩	Optional parts		See the "Standard Parts" section	
⑪	Immersion length (Unit: mm)	l 1 to 2.4		

Characteristics

- New technical standards that conform to IEC standard

Explosion proof class: Exd II C T6 (for Japan)

- Conforms with IECEx and ATEX directives, and supplied with CE marking

Explosion proof class: Exd I C T6 & T5, Exd A21 (for international & Europe)

- Suitable for use in environments with gas vapor, dust, etc. in conformance with IEC standards

Explosion proof class: Class I, Div. 1 Gr. A, B, C & D

Class II/III, Div. 1 Gr. E, F & G (for US)

- Excellent protection class: IP66 (for Japan, international, and Europe), NEMA 4 & 4X (for US)

- Light and compact body: Made of aluminum die-cast

(Stainless steel also available)

- Pressure proof packing type connector equipped as standard (for Japan)

*1: The type names on the certification certificates are indicated in the table on the right.

Certified product of Japan (TIS)	R99
International ATEX (Baseefa) certified product	OFF
FM certified product	R99

OKAZAKI**Resistance Thermometer Sensor**

Generally, the electrical resistance of the metal varies depending on the temperature. In particular, platinum is more linear than other metals in terms of its temperature coefficient and is suitable for temperature measurement. Platinum has excellent chemical and physical properties, making it easy to be obtained in a highly pure form. It can be used stably for a long time as a resistance element for temperature measurement. Its characteristics are standardized under the JIS and other foreign standards, and it makes accurate temperature measurements possible.

Construction

A resistance thermometer sensor consists of various components such as a temperature sensing element, conductor wires, insulator, protection tube, terminal box, and other mounting brackets needed.

1. Temperature sensing element
2. Conductor wires
3. Insulator
4. Protection tube
5. Terminal box and terminal block
6. Mounting bracket

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E-1



Resistance Thermometer Sensor Types

JIS C1604

Nominal resistance value at 0°C	Class	Measuring current	(Resistance ratio)
Pt100 (JPt100)	AA	2 mA, 1 mA, 0.5 mA	1.3851 (1.3916)
	A		
	B		
	C		

Notes

1. R100 is the resistance value of the resistance element at 100°C
2. R0 is the resistance value of the resistance element at 0°C

List of Temperature Tolerances and the Standards Applied by Each Country

Nominal resistance	Basic standard	Class	Tolerance (°C)	JIS C1604/IEC 60751		ASTM E1137
				Winding element	Thin-film element	
				Temperature range (°C)		
Pt100 Ω at 0°C (R100/R0=1.3851)	AA	±[0.1 + 0.0017 t]	-196 to 450	0 to 150	-	
	A	±[0.15 + 0.002 t]	-196 to 450	-30 to 300	-	
		±[0.13 + 0.0017 t]	-	-	-200 to 650	
	B	±[0.3 + 0.005 t]	-196 to 500	-50 to 500	-	
		±[0.25 + 0.0042 t]	-	-	-200 to 650	
	C	±[0.6 + 0.01 t]	-196 to 500	-50 to 600	-	

Notes

1. The tolerance is the maximum allowable error of the value calculated by subtracting the measured temperature|t| from the value obtained by converting in accordance to the standard resistance table the resistance value indicated by the resistance element.
2. |t| is the measured temperature which is indicated as a temperature (°C) unrelated to + and - signs.
3. The latest version is applied for the standard year.

Resistance Thermometer Sensor Wire Connection Methods and Colors

JIS type/IEC type	Former JIS type	ASTM type
*The ASTM standards has no double element requirements. For double elements, IEC standards are abided by.		

2-conductor cable type:

As the conductor resistance is added to the resistance value, it is necessary to make the conductor resistance smaller or to know the conductor resistance beforehand. In comparison with the other types, it is not often used unless in the case of high resistance.

3-conductor cable type:

Caution should be exercised when transmitting over long distances, as the variations in conductor resistance in the 3 cables may affect accuracy. This is generally the most often used.

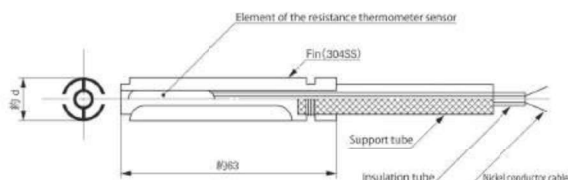
4-conductor cable type:

Used for high precision measurement because the conductor resistance does not significantly affect accuracy. A constant current is generally supplied and the resistance value is measured with the potential difference.

Resistance Thermometer Sensor Operating Temperature Ranges JIS C1604

Code	Classification	Operating temp. range (°C)
L	Use in lower temperatures	-196 to +100
N	Use in more moderate temperatures	-30 to +200
M	Use in higher temperatures	0 to 350
H	Use in high temperatures	0 to 600

The Structure of a Resistance Thermometer Sensor



Model	Approximate diameter			
Pt100 (JPt100)	7	9	11	16

Materials and Standard Dimensions of Metal Protection Tubes

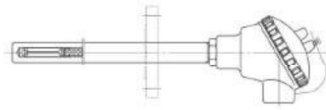
Type Code in the () is the JIS code	Material code	Dimensions (φ /mm)		Max. length (mm)	General operating temp. limit (°C)*1	Characteristics
		Outer diameter	Inner diameter			
304SS (SUS304)	A	10	7	2000	900	Excellent heat/acid/alkali resistance. Weak against sulfur and reducing gas.
		12	9	3950		
		15	11			
		21.7	15.7			
316SS (SUS316)	C	10	7	2000	900	The heat/acid/alkali resistance is the same as that of 304SS, and the corrosion resistance is excellent at high temperatures.
		12	9	3950		
		15	11			
		21.7	15.7			
316LSS (SUS316L)	CL	10	7	2000	900	The amount of C is less than that of 316SS, and the material has grain-boundary corrosion resistance.
		12	9	3950		
		15	11			
		21.7	16.1			
TITANIUM	T	15	11	3950	250	This material shows excellent corrosion resistance at low temperatures, but the material becomes fragile with oxidation at high temperatures.
		17.3	12.7			
		21.7	16.1			
		27.2	21.6			

*1 The normal operation temperature limit values listed here are reference values from JIS and the manufacturer's catalog. These are not guaranteed values. For additional information, refer to "Protection Tubes/Thermowells."

With terminal box

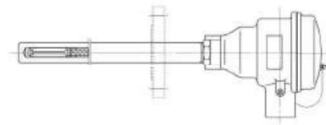
RBW

● RBW Metal Thermowell type resistance thermometer sensor



RBG

● RBG Explosion-Proof/Metal Thermowell Type Resistance Thermometer Sensor (d2G4)



Flattened type

RBF

Type	Flattened case material	Resistance element	Flattened length/Width/Thickness	Schematic
RBF-1	Glass PPS resin mold	Ceracoil	200/8/3	
RBF-2	Silicone glass laminate	Mica wrapping	150, 250/8/3	
RBF-3	Silicone glass laminate	Ceracoil	200/8/3	
RBF-4	Glass PPS resin mold Outer heat shrink tubing	Resin surface Spiral wrapping	50, 100, 150, 200, 250/8/3	

Resistance Thermometer Sensor Inspection Standards

External/ Structural inspection

Perform visual inspection of terminal head, welds, brazed parts, fastened parts, nameplate, and other parts. Perform penetrant inspection and airtightness inspection for welded and brazed parts as required.

Dimension inspection

Protection tube outer diameter	$\phi 3.0$ to $\phi 4.8$ mm $\phi 6.0$ to $\phi 6.4$ mm $\phi 8$ to $\phi 22$ mm	± 0.05 mm ± 0.06 mm $\pm 1\%$
Protection tube length	≤ 150 mm 150 mm <	± 2.0 mm $\pm 1.5\%$
Nipple length		± 3 mm
Other parts	Use a measuring instrument to measure the dimensions of parts specified in the production drawings. In accordance to JIS B 0405 medium grade unless specified otherwise.	

Resistance value test

Measurement of basic resistance value	0°C	Freezing point
---------------------------------------	-----	----------------

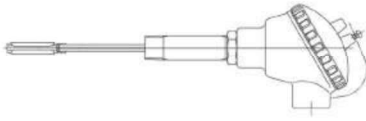
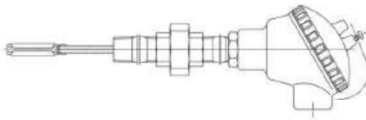
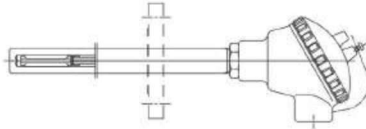
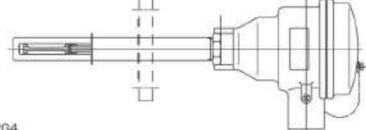
The resistance between the conductor cable and protection tube is measured in room temperature.

Insulation resistance test

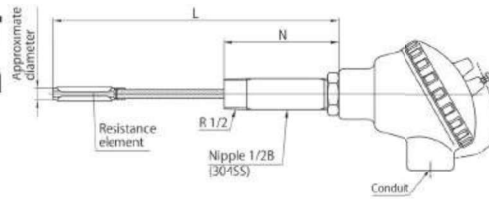
Protection tube outer diameter (mm)	Features
$\phi 3.0$ to $\phi 22$	100 M Ω /100 V DC

Documentation

The inspection certificate shall be attached to the product. Detailed test report shall be available upon request.

RBN » E-6 Resistance Thermometer Sensor with Connection Head/Nipple 	R800-1 » E-11 Built-in Lead Easy Sensor 
RBU » E-7 Resistance Thermometer Sensor with Connection Head/Nipple/Union 	R800-2 » E-12 Easy Sensor with Metal Tip 
RBW » E-8 Resistance Thermometer Sensor with Thermowell 	R800-3 » E-13 Easy Sensor with Silicone Pad 
RBG » E-9 Explosion-Proof Resistance Thermometer Sensor with Thermowell 	R800-4 » E-14 Button Cell Type Easy Sensor 
RBF » E-10 Flattened Type Resistance Thermometer Sensor 	

Resistance Thermometer Sensor with Connection Head/Nipple



Model code RBN

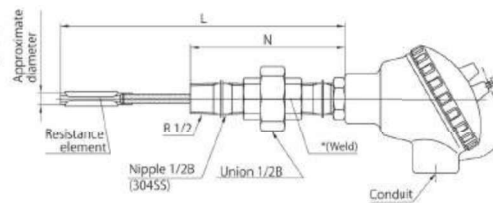
RBN-① ② ③ ④ ⑤ ⑥ / ⑦ ⑧

①	Structure	1	N=100
		2	N=150
②	Terminal box	-EL	Aluminum die-cast (ADC)
		-ED	Aluminum die-cast (ADC) (two-way)
		-EF	Cast iron
		-EP	Resin
③	Length (Unit: mm)	L	
④	Number of conductor cables	3	Single
		6	Double
⑤	Operating temp. range	L	-196 to 100°C
		N	-30 to 200°C
		M	0 to 350°C
		H	0 to 600°C
⑥	Resistance value	100	Pt100 Ω or JPt100 Ω
⑦	Class	-AAJ	Pt100 Ω AA class (JIS-2013)
		-AJ	Pt100 Ω A class (JIS-2013)
		-BJ	Pt100 Ω B class (JIS-2013)
		-CJ	Pt100 Ω C class (JIS-2013)
		-A	Pt100 Ω A class (JIS-1997)
		-B	Pt100 Ω B class (JIS-1997)
		-AAI	Pt100 Ω AA class (IEC)
		-AI	Pt100 Ω A class (IEC)
		-BI	Pt100 Ω B class (IEC)
		-CI	Pt100 Ω C class (IEC)
		-10	Pt100 Ω B class (ASTM)
		-11	Pt100 Ω A class (ASTM)
		-1	JPt100 Ω B class
		-2	JPt100 Ω A class
⑧	Optional parts		See the "Standard Parts" section

Platinum resistance element outer diameter and protection tube inner diameter

	Minimum inner diameter of protection tube		
	8	10	12
Element outer diameter	φ7	φ9	φ11

Resistant Thermometer Sensor with Connection Head/Nipple/Union



Model code RBU

RBU- ① / ② ③ ④ ⑤ ⑥ ⑦ / ⑧

①	Structure	2	N=150
②	Terminal box	-EL -ED -EF -EP	Aluminum die-cast (ADC) Aluminum die-cast (ADC) (two-way) Cast iron Resin
③	Length (Unit: mm)	L	
④	Number of conductor cables	3 6	Single Double
⑤	Operating temp. range	L N M H	-196 to 100°C -30 to 200°C 0 to 350°C 0 to 600°C
⑥	Resistance value	100	Pt100 Ω or JPt100 Ω
⑦	Class	-AAJ -AJ -BJ -CJ -A -B -AAI -AI -BI -CI -10 -11 -1 -2	Pt100 Ω AA class (JIS-2013) Pt100 Ω A class (JIS-2013) Pt100 Ω B class (JIS-2013) Pt100 Ω C class (JIS-2013) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-1997) Pt100 Ω AA class (IEC) Pt100 Ω A class (IEC) Pt100 Ω B class (IEC) Pt100 Ω C class (IEC) Pt100 Ω B class (ASTM) Pt100 Ω A class (ASTM) JPt100 Ω B class JPt100 Ω A class
⑧	Optional parts		See the "Standard Parts" section

Platinum resistance element: outer diameter and Thermowell inner diameter

	Minimum inner diameter of Thermowell		
	8	10	12
Element outer diameter	φ7	φ9	φ11

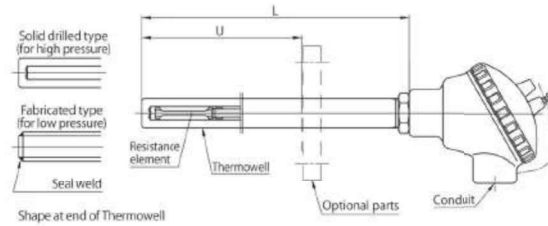


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Resistance Thermometer Sensor with Thermowell



Model code RBW

RBW- ① — ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

①	Structure	1	Fabricated type							
		2	Solid drilled type							
②	Terminal box	EL	Aluminum die-cast (ADC)							
		ED	Aluminum die-cast (ADC) (two-way)							
		EF	Cast iron							
		EP	Resin							
③	Length (Unit: mm)	L								
④	Number of conductor cables	3	Single							
		6	Double							
⑤	Operating temp. range	L	-196 to 100°C							
		N	-30 to 200°C							
		M	0 to 350°C							
		H	0 to 600°C							
⑥	Resistance value	100	Pt100 Ω or JPt100 Ω							
⑦	Class	-AAJ	Pt100 Ω AA class (JIS-2013)		-AI	Pt100 Ω A class (IEC)				
		-AJ	Pt100 Ω A class (JIS-2013)		-BI	Pt100 Ω B class (IEC)				
		-BJ	Pt100 Ω B class (JIS-2013)		-CI	Pt100 Ω C class (IEC)				
		-CJ	Pt100 Ω C class (JIS-2013)		-10	Pt100 Ω B class (ASTM)				
		-A	Pt100 Ω A class (JIS-1997)		-11	Pt100 Ω A class (ASTM)				
		-B	Pt100 Ω B class (JIS-1997)		-1	JPt100 Ω B class				
		-AAI	Pt100 Ω AA class (IEC)		-2	JPt100 Ω A class				
⑧	Thermowell dimensions	-10								
		-12								
		-15	See the table below							
		-22								
⑨	Thermowell materials	A	304SS							
		C	316SS							
⑩	Optional parts		See the "Standard Parts" section							
⑪	Immersion length (Unit: mm)	-U								

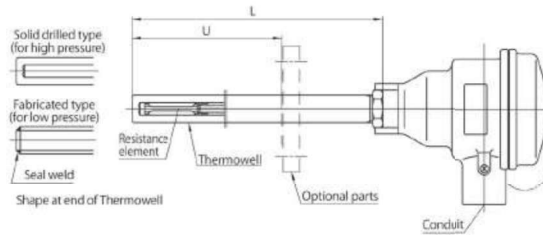
Thermowell dimensions

Code	Outer diameter	Inner diameter for fabricated type	Inner diameter for solid drilled type
-10	φ10	φ7	φ7
-12	φ12	φ9	φ9
-15	φ15	φ11	φ9
-22	φ21.7	φ16.1	-
	φ22	-	φ9

Please contact us for details about sizes other than the above.

Explosion-Proof Resistance Thermometer Sensor with Thermowell

d2G4



Model code RBG

RBG- ① - ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ / ⑩ ⑪

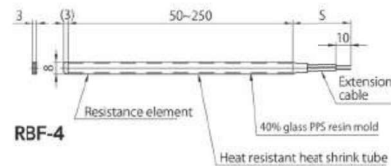
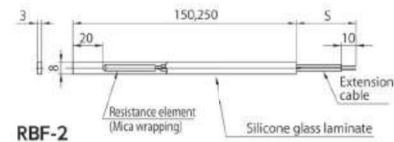
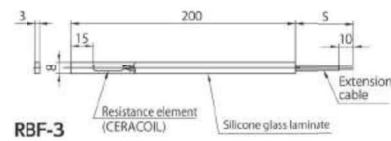
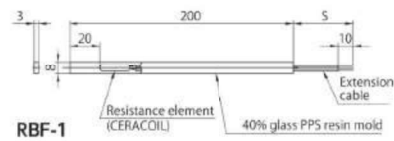
①	Structure	1	Fabricated type		
		2	Solid drilled type		
②	Terminal box	GA	Aluminum die-cast (ADC)		
③	Length (Unit: mm)	L			
④	Number of conductor cables	3	Single		
		6	Double		
⑤	Operating temp. range	L	-196 to 100°C		
		N	-30 to 200°C		
		M	0 to 350°C		
		H	0 to 600°C		
⑥	Resistance value	100	Pt100 Ω or JPt100 Ω		
⑦	Class	-AAJ	Pt100 Ω AA class (JIS-2013)	-AI	Pt100 Ω A class (IEC)
		-AJ	Pt100 Ω A class (JIS-2013)	-BI	Pt100 Ω B class (IEC)
		-BJ	Pt100 Ω B class (JIS-2013)	-CI	Pt100 Ω C class (IEC)
		-CJ	Pt100 Ω C class (JIS-2013)	-10	Pt100 Ω B class (ASTM)
		-A	Pt100 Ω A class (JIS-1997)	-11	Pt100 Ω A class (ASTM)
		-B	Pt100 Ω B class (JIS-1997)	-1	JPt100 Ω B class
		-AAI	Pt100 Ω AA class (IEC)	-2	JPt100 Ω A class
⑧	Thermowell dimensions	-10 -12 -15 -22	See the table below		
⑨	Thermowell materials	A C	304SS 316SS		
⑩	Optional parts		See the "Standard Parts" section		
⑪	Immersion length (Unit: mm)	-U			

Thermowell dimensions

Code	Outer diameter	Inner diameter for fabricated type	Inner diameter for solid drilled type
-10	φ10	φ7	φ5 to φ7
-12	φ12	φ9	φ7 to φ9
-15	φ15	φ11	φ9 to φ11
-22	φ21.7	φ16.1	-
	φ22	-	φ14.5 to φ16


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Flattened Type Resistance Thermometer Sensor



Model code RBF

RBF- ① — ② — ③ — ④ — ⑤

①	Structure	1	Mold shape
		2	Silicone resin case
		3	Silicone resin case
		4	Mold shape
②	Type	P	Pt
		J	JPt
		C	Cu (RBF-2, 4 only)
③	Resistance value	100	Pt100 or JPt100
		25	Cu25 Ω at 0°C
		10	Cu10 Ω at 25°C
④	Case length	L	Selected from the table below
⑤	Extension cable length (Unit: mm)	S	

Application standards: JIS C1604-1997
JEM 1252-1991
Tolerance: Class B

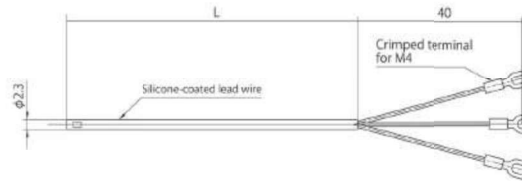
Standard usage

Nominal resistance value	Operating temp. range	Specified current
Pt100 Ω at 0°C JPt100 Ω at 0°C	0 to +180°C	2mA
Cu10 Ω at 25°C Cu25 Ω at 0°C	0 to +130°C	5mA

Case length

L (mm)	50	100	150	200	250
RBF-1	×	×	×	○	×
RBF-2	×	×	○	×	○
RBF-3	×	×	×	○	×
RBF-4	○	○	○	○	○

Built-in Lead Easy Sensor



Model code R800-1

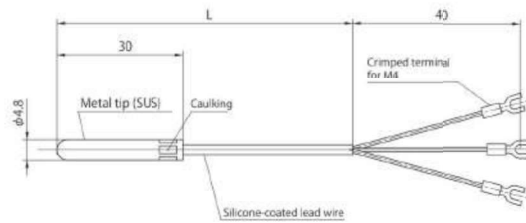
R800- ① - ② ③ ④

①	Structure	1	Built-in lead type
②	Length (Unit: mm)	L	
③	Class	-B -BJ	Pt100 Ω B class (JIS-1997) Pt100 Ω B class (JIS-2013)
④	Lead color	1 2	JIS C 1604-1997 JIS C 1604-2013

Characteristics

- The remarkably simple structure allows for the production of a large amount of high quality products at a low cost.
- Suitable for measuring the temperature of water and oil, high-temperature and high-humidity environments, as well as the temperatures of various surfaces, etc. because of its waterproof structure.

Easy Sensor with Metal Tip



Model code R800-2

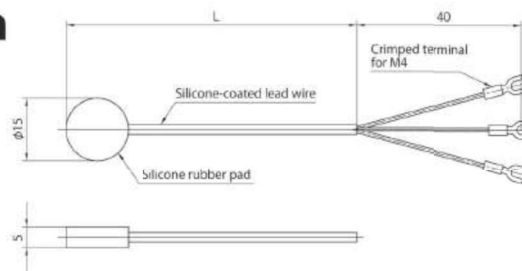
R800- ① - ② ③ ④

①	Structure	2	Metal tip type
②	Length (Unit: mm)	L	
③	Class	-B -A -BJ -AJ	Pt100 Ω B class (JIS-1997) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-2013) Pt100 Ω A class (JIS-2013)
④	Lead color	1 2	JIS C 1604-1997 JIS C 1604-2013

Characteristics

- The remarkably simple structure allows for the production of a large amount of high quality products at a low cost.
- Suitable for measuring the temperature of water and oil, high-temperature and high-humidity environments, as well as the temperatures of various surfaces, etc. because of its waterproof structure.

Easy Sensor with Silicone Pad



Model code R800-3

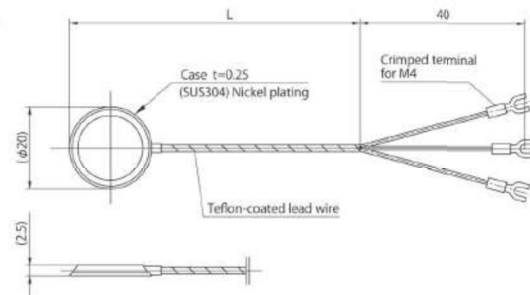
R800- ① - ② ③ ④

①	Structure	3	Silicone pad type
②	Length (Unit: mm)	L	
③	Class	-B -A -BJ -AJ	Pt100 Ω B class (JIS-1997) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-2013) Pt100 Ω A class (JIS-2013)
④	Lead color	1 2	JIS C 1604-1997 JIS C 1604-2013

Characteristics

- The remarkably simple structure allows for the production of a large amount of high quality products at a low cost.
- Suitable for measuring the temperature of water and oil, high-temperature and high-humidity environments, as well as the temperatures of various surfaces, etc. because of its waterproof structure.

Button Cell Type Easy Sensor



Model code R800-4

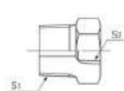
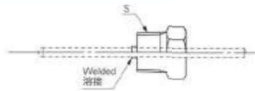
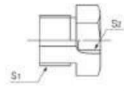
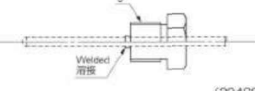
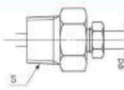
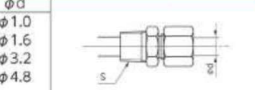
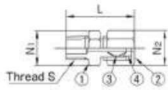
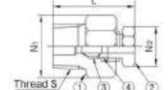
R800- ① — ② ③ ④

①	Structure	4	Button cell type
②	Length (Unit: mm)	L	
③	Class	-B -A -BJ -AJ	Pt100 Ω B class (JIS-1997) Pt100 Ω A class (JIS-1997) Pt100 Ω B class (JIS-2013) Pt100 Ω A class (JIS-2013)
④	Lead color	1 2	JIS C 1604-1997 JIS C 1604-2013

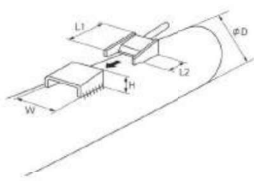
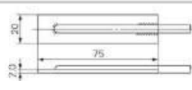
Characteristics

- The remarkably simple structure allows for the production of a large amount of high quality products at a low cost.
- Suitable for measuring the temperature of water and oil, high-temperature and high-humidity environments, as well as the temperatures of various surfaces, etc. because of its waterproof structure.

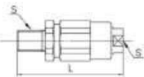
Standard Parts

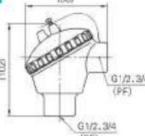
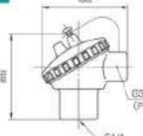
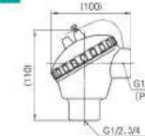
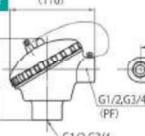
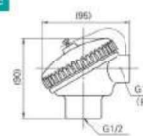
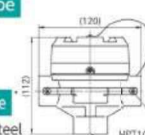
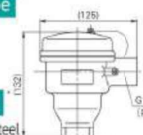
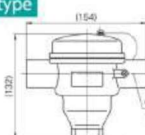
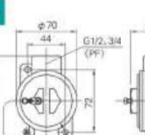
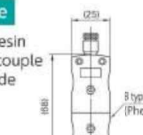
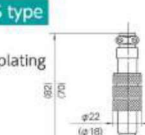
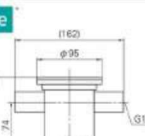
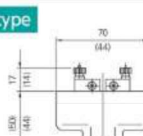
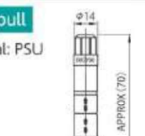
Double threaded adapter				Single threaded adapter			
S ₁		S ₂		S			
AD-2T1T	R1/4	R1/8		AS-1T	R1/8		
AD-3T1T	R3/8	R1/8		AS-2T	R1/4		
AD-4T1T	R1/2	R1/8		AS-3T	R3/8		
AD-6T1T	R3/4	R1/8		AS-4T	R1/2		
AD-4T2T	R1/2	R1/4		AS-6T	R3/4		
AD-6T2T	R3/4	R1/4					
			(304SS)				(304SS)
S ₁		S ₂		S			
AD-2F1T	G1/4	R1/8		AS-1F	G1/8		
AD-3F1T	G3/8	R1/8		AS-2F	G1/4		
AD-4F1T	G1/2	R1/8		AS-3F	G3/8		
AD-6F1T	G3/4	R1/8		AS-4F	G1/2		
AD-4F2T	G1/2	R1/4		AS-6F	G3/4		
AD-6F2T	G3/4	R1/4					
			(304SS)				(304SS)
Compression fitting							
S		φd		S		φd	
CF2T64	R1/4	φ6.4		CF1T10	R1/8	φ1.0	
CF2T80	R1/4	φ8.0		CF1T16	R1/8	φ1.6	
CF4T64	R1/2	φ6.4		CF1T32	R1/8	φ3.2	
CF4T80	R1/2	φ8.0		CF1T48	R1/8	φ4.8	
				(304SS)			
Structure	Code	Specifications				Sheath outer diameter applied	
	/CF1T10	R1/8	14×16.2	14×16.2	30	① Main body (304SS) ② Cap nut (304SS) ③ Ferrule (C3604) ④ Ferrule holder (SS400)	φ1.0 ^(*)
	/CF1T16				32		φ1.6
	/CF1T32				33		φ3.2
	/CF1T48				33		φ4.8
	/CF2T64	R1/4	17×19.6	14×16.2	40		φ6.4
	/CF2T80				42		φ8.0
	/CF4T64	R1/2	24×27.7	14×16.2	36		φ6.4
	/CF4T80				37		φ8.0

* The ferrule ③ for φ1.0 is made of wound ceramic yarn.

Surface pads			
Strap (304SS) Strap ST-D φ3.2 ST-E φ4.8		U Pad (304SS) U Pad PD-L/D φ3.2 φD: φ38 to φ120 PD-U/E φ4.8 φD: φ80 to φ200 (Unwelded type)	
RESIOPAD (304SS) RESIOPAD PD-R φ3.2, φ4.8, φ6.4			

* Each dimension can be designed to suit your needs. Please contact our branch office nearest you.

Pressure proof packing type connector		S type fin anti-vibration/heat collection plate	
GL-155-BC (BC Plated) GL-155-SUS (304SS) S: PF1/2 or G1/2 L=107			
GL-205-BC (BC Plated) GL-205-SUS (304SS) S: PF3/4 or G3/4 L=110			

Terminal boxes/Connectors		
EL type A.D.C Silver 390g 	ES type A.D.C Silver 150g 	EF type F.C Silver 1250g 
ED type A.D.C Silver 670g 	EP type Phenol resin Black 380g 	GE type A.D.C Silver 750g 
GED type A.D.C Silver 800g 	GA type A.D.C Silver 630g 	GAD type A.D.C Silver 700g 
RC type A.D.C Silver 230g 	CB type Phenol resin Thermocouple color code (IBJIS) 150g 	AL/AS type Brass Nickel plating 70g (50g) 
GM type Stainless steel 2050g 	TL/TS type Al Silver 120 g (40 g) 	Push-pull Material: PSU 20g 

* Explosion-proof
A.D.C: Aluminum die-cast
F.C: Cast iron The weight (g) is an approximate value.

Mounting plate

Structure	Code	Specifications	Description
	/PL-KSW	Material: 304SS	For holding the terminal head (Main Manufacturing Factory)
	/CP22E	Material: 304SS	For holding the terminal head (Kobe-Iwoka Factory)

Flange

Structure		
FF	RF	RJ

Model code

/ ① ② ③ / ④ ⑤

①	Flange rating	J05 J10 J20 A15 A30 A60	JIS 5K JIS 10K JIS 20K ASME 150LB ASME 300LB ASME 600LB	P15 P30 P60 F-Z	JPI 150LB JPI 300LB JPI 600LB Other flange (Z=□, □)
②	Flange face	FF RF	Flat face Raised face	RJ Z	Ring joint Other seating surface (Z=□, □)
③	Flange size	15 20 25	15A or 1/2B 20A or 3/4B 25A or 1B	40 50 Z	40A or 1-1/2B 50A or 2B Other size (Z=□, □)
④	Flange material	A C	304SS 316SS	D Z	3105 SS Other material (Z=□, □)
⑤	Immersion length (Unit: mm)	-L			

Reference Thermoelectromotive Force Table

B Thermocouple											μV		ITS-90	
$^{\circ}C$	0	10	20	30	40	50	60	70	80	90	100	110	120	130
0	0	-2	-3	-2	0	2	6	11	17	25	33			
100	33	43	53	65	78	92	107	123	141	159	178			
200	178	199	220	243	267	291	317	344	372	401	431			
300	431	462	494	527	561	596	632	669	707	746	787			
400	787	828	870	913	957	1002	1048	1095	1143	1192	1242			
500	1242	1293	1344	1397	1451	1505	1561	1617	1675	1733	1792			
600	1792	1852	1913	1975	2037	2101	2165	2230	2296	2363	2431			
700	2431	2499	2569	2639	2710	2782	2854	2928	3002	3078	3154			
800	3154	3230	3308	3386	3466	3546	3626	3708	3790	3873	3957			
900	3957	4041	4127	4213	4299	4387	4475	4564	4653	4743	4834			
1000	4834	4926	5018	5111	5205	5299	5394	5489	5585	5682	5780			
1100	5780	5878	5976	6075	6175	6276	6377	6478	6580	6683	6786			
1200	6786	6890	6995	7100	7205	7311	7417	7524	7632	7740	7848			
1300	7848	7957	8066	8176	8286	8397	8508	8620	8731	8844	8956			
1400	8956	9069	9182	9296	9410	9524	9639	9753	9868	9984	10099			
1500	10099	10215	10331	10447	10563	10679	10796	10913	11029	11146	11263			
1600	11263	11380	11497	11614	11731	11848	11965	12082	12199	12316	12433			
1700	12433	12549	12666	12782	12898	13014	13130	13246	13361	13476	13591			
1800	13591	13706	13820											

R Thermocouple											μV		ITS-90	
$^{\circ}C$	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120	-130
0	0	-51	-100	-145	-188	-226								
100	647	723	800	879	959	1041	1124	1208	1294	1381	1469			
200	1469	1558	1648	1739	1831	1923	2017	2112	2207	2304	2401			
300	2401	2498	2597	2696	2796	2896	2997	3099	3201	3304	3408			
400	3408	3512	3616	3721	3827	3933	4040	4147	4255	4363	4471			
500	4471	4580	4690	4800	4910	5021	5133	5245	5357	5470	5583			
600	5583	5697	5812	5926	6041	6157	6273	6390	6507	6625	6743			
700	6743	6861	6980	7100	7220	7340	7461	7583	7705	7827	7950			
800	7950	8073	8197	8321	8446	8571	8697	8823	8950	9077	9205			
900	9205	9333	9461	9590	9720	9850	9980	10111	10242	10374	10506			
1000	10506	10638	10771	10905	11039	11173	11307	11442	11578	11714	11850			
1100	11850	11986	12123	12260	12397	12535	12673	12812	12950	13089	13228			
1200	13228	13367	13507	13646	13786	13926	14066	14207	14347	14488	14629			
1300	14629	14770	14911	15052	15193	15334	15475	15616	15758	15899	16040			
1400	16040	16181	16323	16464	16605	16746	16887	17028	17169	17310	17451			
1500	17451	17591	17732	17872	18012	18152	18292	18431	18571	18710	18849			
1600	18849	18989	19129	19269	19409	19549	19687	19826	19965	20104	20242			
1700	20242	20381	20520	20659	20798	20937	21075	21214	21352	21491	21629			

S Thermocouple											μV		ITS-90	
$^{\circ}C$	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120	-130
0	0	-53	-103	-150	-194	-236								
100	646	720	795	872	950	1029	1110	1191	1273	1357	1441			
200	1441	1526	1612	1698	1786	1874	1962	2052	2141	2232	2323			
300	2323	2415	2507	2599	2692	2786	2880	2974	3069	3164	3259			
400	3259	3355	3451	3548	3645	3742	3840	3938	4036	4134	4233			
500	4233	4332	4432	4532	4632	4732	4833	4934	5035	5137	5239			
600	5239	5341	5443	5546	5649	5753	5857	5961	6065	6170	6275			
700	6275	6381	6486	6593	6699	6806	6913	7020	7128	7236	7345			
800	7345	7454	7563	7673	7783	7893	8003	8114	8226	8337	8449			
900	8449	8562	8674	8787	8900	9014	9128	9242	9357	9472	9587			
1000	9587	9703	9819	9935	10051	10168	10285	10403	10520	10638	10757			
1100	10757	10875	10994	11113	11232	11351	11471	11590	11710	11830	11951			
1200	11951	12071	12191	12312	12433	12554	12675	12796	12917	13038	13159			
1300	13159	13280	13402	13523	13644	13766	13887	14009	14130	14251	14373			
1400	14373	14494	14615	14736	14857	14978	15099	15220	15341	15461	15582			
1500	15582	15702	15822	15942	16062	16182	16301	16420	16539	16658	16777			
1600	16777	16895	17013	17131	17249	17366	17483	17600	17717	17832	17947			
1700	17947	18061	18174	18285	18395	18503	18609							





Identification of Compensating Cables for Each National Standard

Standard Type	BC	RCA (RCB) SCA (SCB)	NX/NC	KX/KCA/ KCB	EX	JX	TX
 JIS C 1610 :2012 IEC 584-3 :2007							
 JIS C 1610 :1995 Category 2							
 ASTM E230							

The JIS C 1610 standard for thermocouple compensating cables was revised in June 2012. We are continuing to apply the former JIS C 1610:1995 standard (color codes: Category 2) on a temporary basis. Please contact us if you wish to purchase products that conform to the new standard. However, note that we currently do not have all types of products in stock, so it may take some time to ship items after purchase. In addition, Category 2 has been eliminated in the 2012 version of the standard.

Identification of Thermocouple Wires for ASTM Standard

Standard Type	N	K	E	J	T
ASTM E230					



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Information in this catalog is subject to change without notice.

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CAT.NO.OMC-P706-2-E
First Ver. Mar 2020 300 parts

