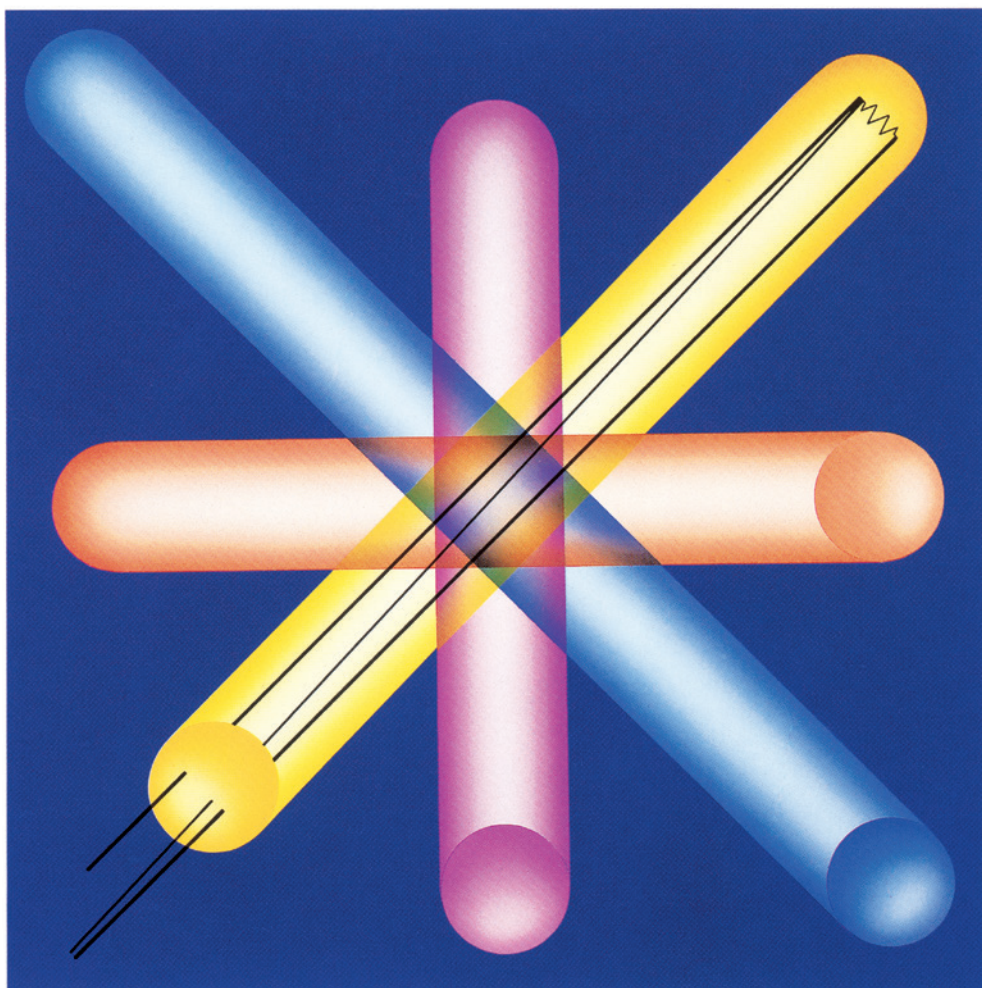




RESISTANCE BULB
MICA TYPE RTD

RESIMIC
SHEATHED TYPE RTD

RESISLIM
STEM TYPE RTD

THERMOWELL
THERMOWELL



YAMARI INDUSTRIES, LIMITED

LINE OF BUSINESS

Temperature Sensors:

Metal Sheathed Thermocouple, THERMIC
Beaded Type Thermocouple with
Protection Tube
Metal Sheathed Resistance Temperature
Detector, RESIMIC
Resistance Temperature Detector with
Protection Tube
Fine Diameter Resistance Temperature
Element, RESICERAM
Tubular Stem Type Resistance
Temperature Detector, RESISLIM
Special Thermocouple for Ultra-High
Temperature, HT-THERMIC
Special Thermocouple for Temperature
Measurement of Tube Skin
Multi-Point Thermocouple

Other products and Imported Equipment:

Metal Sheathed Heat Tracing Cable and
Micro Heater Assembly
Dissolved Oxygen Sensor for Molten
Copper Bath, METAL-OX
AM•FM Turbine Blade Tip Clearance
Measuring System
ISOTECH Precision Temperature
Calibration Apparatus and Standard
Thermometers
Turbine Blade and Aircraft Wing Models
for Wind-Tunnel Experiment
Computerized Two & Three Dimensional
Fine Traverser
Total, Static and YAW Probes for high
temperatures
Temperature Transmitters

Calibration Services for Temperature Sensors by JCSS Laboratory:

Precision calibration using Triple Point of
Water and Mercury. Fixed Point
Standards of pure metals and Standard
Platinum Resistance Thermometer
traceable to National Standard.
Comparison Calibration with Standard
Platinum Resistance Thermometer and
Standard Thermocouple using Liquid
Baths, Fluidized Bed Alumina powder
Bath, and Electric Furnace. A Certified
Calibration Report shall be issued.

ACCREDITATIONS OF QUALITY ASSURANCE, SAFETY AND P.L. WARRANTY



JQA-0797
Head Office / Takatsuki Factory
Tokyo / Nagoya / Fukuoka



JQA-EM4107
Takatsuki Factory

ISO 9001 : 2000 / JIS Q 9001 : 2000
ISO 14001 : 1996 / JIS Q 14001 : 1996



symbolizes the traceability system in accordance with the measurement law.
The Calibration results may be accepted internationally through ILAC/APLAC MRA.



CENELEC(KEMA)



ISO 9001

Since 1995, we maintain leading position
as one of the reliable manufacturers of
various temperature sensors under rigid
quality assurance system to ISO 9001
which has compatibility with the
qualification marks and logos (left).

ISO 14001

Beginning in July, 2004, a key objective of
all of Yamari's business operations has
been to reduce industrial pollution and
minimize damage to the environment.
The environmental protection programs
we have now established form part of our
commitment to continual improvement,
subject to a strict environmental
management system meeting all the
requirements of ISO 14001.

JCSS:

In order to certify accuracy and reliability
of the temperature sensors, we obtained
an accreditation by IA Japan (International
Accreditation Japan) in 1994 as a qualified
temperature calibration service laboratory
through an established traceability with
the National Standard. JCSS (Japan
Calibration Service System) is in
conformity with ISO/IEC 17025 to
provide measurement standards and
measured quantities, i.e., an authorized
certification of the temperature figures.

P.L.

Our products are fully inspected to
assure quality and proper functions, but
for warranty to the customers, sufficient
amount of P.L. Insurance is being
covered.

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RESISTANCE TEMPERATURE DETECTORS

What is Resistance Temperature Detector (RTD)?

Generally, electrical resistance of any metallic conductor varies according to temperature changes. The sensor for measurement of temperature by utilizing this phenomenon is called “Resistance Thermometer” or “RTD” and can measure temperatures more precisely than other temperature sensors.

Its Features

Resistance temperature detectors for industrial applications have the following features.

1. Good sensitivity.
2. Excellent stability and reproducibility.
3. High accuracy.



Structure and Measuring Methods

Structure:

Metal wire that changes its electric resistance to changes in temperature are utilized is called “Resistance Wire”. This resistance wire, normally of platinum, is used to manufacture a temperature sensor called “Resistance Temperature Detector(RTD)Element”. Generally speaking, RTD is composed of RTD element, lead wires, protection tube and terminals.

Measuring Methods:

2-Wires Connection: Type W

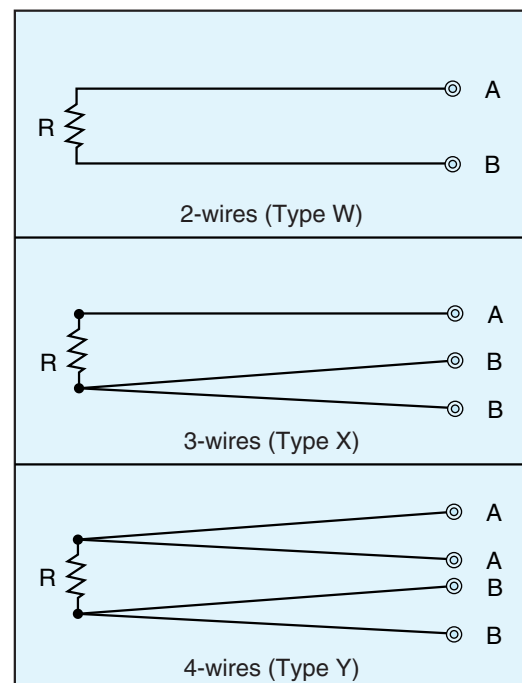
RTD element is connected to respective two wire leads. Although it is less expensive than other types, it is not recommendable for high precision measurement of temperature because it is susceptible to lead resistance and produces error.

3-Wires Connection: Type X

One end of RTD element is connected to two wire leads and the other end connected to single lead to eliminate the effect from lead resistance. This type is most widely used as a reliable method in industrial applications.

4-Wires Connection: Type Y

RTD element is connected to respective two wire leads to remove the effect from lead resistance. This connection cancels lead resistance effect and is especially recommendable for high precision measurement of temperature but somewhat expensive than other types.



R = RTD element. ⊙ = Terminal.
— = lead wire.
A or B = Code for terminal

Precautions in Practical Applications

Selection of proper RTD suitable for the application is the most important factor. For precision measurement of temperature, consideration should be given to selection of RTD element, protection tube, structure and fitting (location) according to the respective resistance to heat, corrosion, mechanical shock and other environmental conditions.

Characteristics and Standards

JIS C 1604-1997
JIS C 1604-1989 (JPt 100)
IEC 751-1986 (Amd. '95)

BS EN60751-1996
DIN EN60751-1996

Nominal Resistance

Code	Resistance Value (Ω at 0°C)	Resistance Ratio R_{100}/R_0
Pt 100	100	1.3851
(JPt 100)	100	1.3916

R100 is resistance value at 100°C.
R0 is resistance value at 0°C.

Operating Temperature Range

Code	Application	Operating Temperature
L	low temperature	-200~+100
M	medium temperature	0~350
H	high temperature	0~650*
S**	extra-high temperature	0~850

★ This shall be 500°C for sheathed type RTD

★★ Not applicable for sheathed type RTD

Temperature Tolerance

Measuring Temp.(°C)		-200	-100	0	100	200	300	400	500	600	650
Tolerance(°C)	Class A	±0.55	±0.35	±0.15	±0.35	±0.55	±0.75	±0.95	±1.15	±1.35	±1.45
	Class B	±1.3	±0.8	±0.3	±0.8	±1.3	±1.8	±2.3	±2.8	±3.3	±3.6

Class and Rated Current

Code	Class	Tolerance(°C)	Rated Current(mA)
Pt 100	A	$\pm(0.15+0.002 t)$	0.5, 1, 2
(JPt 100)	B	$\pm(0.3 +0.005 t)$	0.5, 1, 2, (5)

| t | means the measurement temperature expressed
by a temperature (°C) unrelated to signs +, -.

Temperature/Resistance Table

Std. °C	Pt100	JPt100	Std. °C	Pt100	JPt100	Std. °C	Pt100	JPt100	Std. °C	Pt100	JPt100	Std. °C	Pt100
-200	18.52	17.14	0	100.00	100.00	200	175.86	177.13	400	247.09	249.56	600	313.71
-190	22.83	21.46	10	103.90	103.97	210	179.53	180.86	410	250.53	253.06	610	316.92
-180	27.10	25.80	20	107.79	107.93	220	183.19	184.58	420	253.96	256.55	620	320.12
-170	31.34	30.12	30	111.67	111.88	230	186.84	188.29	430	257.38	260.02	630	323.30
-160	35.54	34.42	40	115.54	115.81	240	190.47	191.99	440	260.78	263.49	640	326.48
-150	39.72	38.68	50	119.40	119.73	250	194.10	195.67	450	264.18	266.94	650	329.64
-140	43.88	42.91	60	123.24	123.64	260	197.71	199.35	460	267.56	270.38	660	332.79
-130	48.00	47.11	70	127.08	127.54	270	201.31	203.01	470	270.93	273.80		
-120	52.11	51.29	80	130.90	131.42	280	204.90	206.66	480	274.29	277.22		
-110	56.19	55.44	90	134.71	135.30	290	208.48	210.30	490	277.64	280.63		
-100	60.26	59.57	100	138.51	139.16	300	212.05	213.93	500	280.98	284.02		
-90	64.30	63.68	110	142.29	143.01	310	215.61	217.54	510	284.30	287.40		
-80	68.33	67.77	120	146.07	146.85	320	219.15	221.15	520	287.62			
-70	72.33	71.85	130	149.83	150.67	330	222.68	224.74	530	290.92			
-60	76.33	75.91	140	153.58	154.49	340	226.21	228.32	540	294.21			
-50	80.31	79.96	150	157.33	158.29	350	229.72	231.89	550	297.49			
-40	84.27	83.99	160	161.05	162.08	360	233.21	235.45	560	300.75			
-30	88.22	88.01	170	164.77	165.86	370	236.70	238.99	570	304.01			
-20	92.16	92.02	180	168.48	169.63	380	240.18	242.53	580	307.25			
-10	96.09	96.02	190	172.17	173.38	390	243.64	246.05	590	310.49			

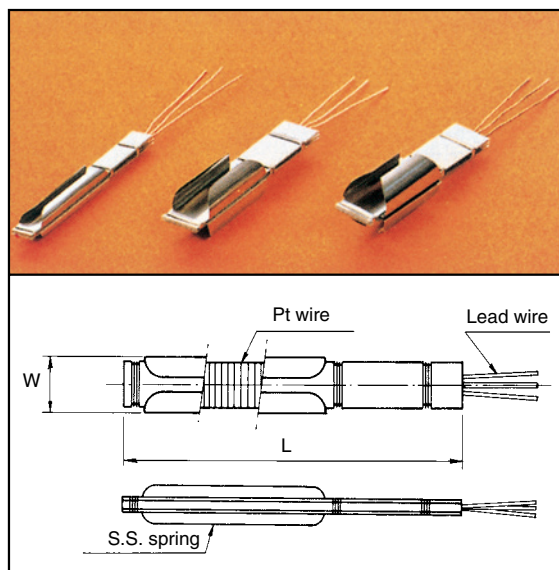
Types of RTD Element

RESIMICA

Mica Type Platinum RTD Element

Mica type Platinum RTD element is composed of a mica plate wound with a high purity platinum wire and sandwiched in between two mica plates for insulation and, again, sandwiched in between two stainless steel plate springs and, then, fixed tightly by stainless steel wires.

Because of ease in handling and rigid structure, it is being used widely in industrial applications.



Types

Type	Nominal Resistance(Ω)	Resistance Ratio R ₁₀₀ /R ₀	Nom. Dimensions(mm)		I.D. of Protection Tube (mm)	Operating Temp. (°C)	Rated Current (mA)	Class
			Length(L)	Width(W)				
M100/ 40S	100	1.3851	50	4.0	5.0	-200~250	Below 2	A B
M100/ 50S	100		50	5.0	6.0			
M100/ 50D	100×2		50	6.0	7.0			
M100/ 60S	100		50 (75)	7.0	8.0			
M100/ 60D	100×2		50 (75)	8.0	9.0			
M100/ 70S	100		50 (75)	9.0	10.0			
M100/ 70D	100×2		50 (75)	10.0~	11.0~16.0			
M100/ 80S	100		50 (75)	10.0~	11.0~16.0			
M100/ 80D	100×2		50 (75)	10.0~	11.0~16.0			
M100/ 90S	100		50 (75)	10.0~	11.0~16.0			
M100/ 90D	100×2		50 (75)	10.0~	11.0~16.0			
M100/100S	100	JIS IEC DIN BS	50	4.0	5.0		Below 2 Below 5	
M100/100D	100×2		50	5.0	6.0			
MJ100/40S	100		50	6.0	7.0			
MJ100/50S	100		50 (75)	7.0	8.0			
MJ100/50D	100×2		50 (75)	8.0	9.0			
MJ100/60S	100		50 (75)	9.0	10.0			
MJ100/60D	100×2		50 (75)	10.0~	11.0~16.0			
MJ100/70S	100		50 (75)	10.0~	11.0~16.0			
MJ100/70D	100×2		50 (75)	10.0~	11.0~16.0			
MJ100/80S	100		50 (75)	10.0~	11.0~16.0			
MJ100/80D	100×2	1.3916	50	4.0	5.0		Below 2 Below 5	
MJ100/90S	100		50	5.0	6.0			
MJ100/90D	100×2		50	6.0	7.0			
MJ100/100S	100		50	7.0	8.0			
MJ100/100D	100×2		50	8.0	9.0			
MJ100/110S	100	Old JIS	50	9.0	10.0		Below 2 Below 5	
MJ100/110D	100×2		50	10.0~	11.0~16.0			
MJ100/120S	100		50	11.0~	12.0~16.0			
MJ100/120D	100×2		50	12.0~	13.0~16.0			
MJ100/130S	100		50	13.0~	14.0~16.0			

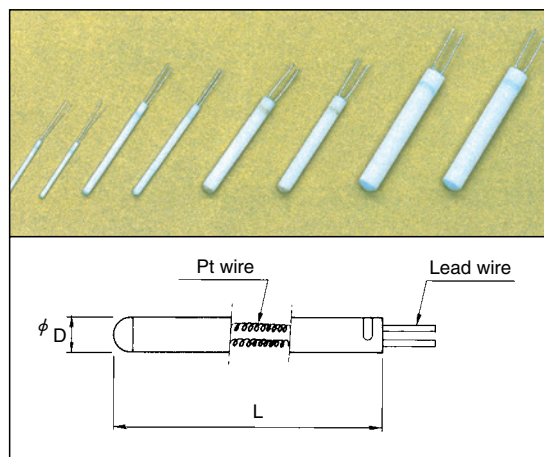
In the Nominal Resistance column, $\times 2$ means dual elements.

Other sizes and nominal resistance values (500 Ω , 1000 Ω) are also available upon request.

RESICERAM[®]

Ceramic Type Platinum RTD Element

RESICERAM[®] is composed of a coil-formed high purity platinum wire inserted into bores of a fine polished recrystallized Alumina ceramic body and fixed on its bottom by special heat resistant frit. As approximately 80% of the resistance wire is free of heat strain from temperature change, drift in resistivity is minimized and its reproducibility and long term stability are superior to any of conventional core-wound elements.



Types

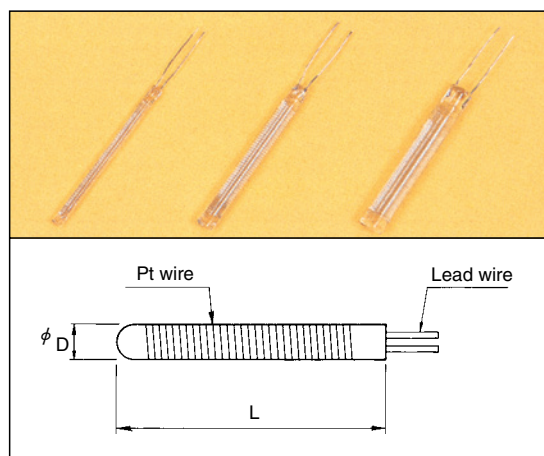
Type	Nominal Resistance(Ω)	Resistance Ratio R ₁₀₀ /R ₀	Nom. Dimensions(mm)		Operating Temp. (°C)	Rated Current (mA)	Class
			Length(L)	O. D. (D)			
C100 / 0715S	100	1.3851 JIS IEC DIN BS	15	0.75	-200~500	Below 1	A
C100 / 0915S	100		15	0.9			
C100 / 1210S	100		10	1.2			
C100 / 1615S	100		15	1.6			
C100 / 2815S	100		15	2.8			
C100 / 3025S	100		25	3.0			
C100 / 4530S	100		30	4.5			
CJ100/0715S	100	1.3916	15	0.75		Below 2	B
CJ100/0915S	100		15	0.9			
CJ100/1210S	100		10	1.2			
CJ100/1615S	100		15	1.6			
CJ100/2815S	100		15	2.8			
CJ100/3025S	100		25	3.0			
CJ100/4530S	100	Old JIS	30	4.5		Below 5	

On order for dual element, put suffix D instead of S. Other special sizes are also available.
For high temperature use (0-650°C) put suffix-H after S or D on element Types. Example — “C100/2815S-H”.

RESIGLASS

Glass-sealed Platinum RTD Element

It is composed of a high purity platinum wire wound non-inductively around a special glass body, of which resistivity at 0°C is adjusted to fall within the respective standard ranges, inserted into another special glass tube and heat sealed overall. Quick response and excellent in insulation, withstand voltage, vibration, and high resistance to liquid, chemicals and gases.



Types

Type	Nominal Resistance(Ω)	Resistance Ratio R ₁₀₀ /R ₀	Nom. Dimensions(mm)		Operating Temp. (°C)	Rated Current (mA)	Class
			Length(L)	O. D. (D)			
G100 / 2025S	100	1.3851	25	2.0	-200~350	Below 1	A
G100 / 3025S	100			3.0		Below 2	
G100 / 4025S	100			4.0			
GJ100/2025S	100	1.3916	25	2.0		Below 2	B
GJ100/3025S	100			3.0		Below 5	
GJ100/4025S	100	Old JIS		4.0			

Other sizes are also available.

RESISTANCE BULB (MODEL:RE)

Mica Type RTD

What is Mica Type RTD?

This is the most typical resistance temperature detector using RESIMICA (Mica type RTD element) as shown in the right picture.

Features

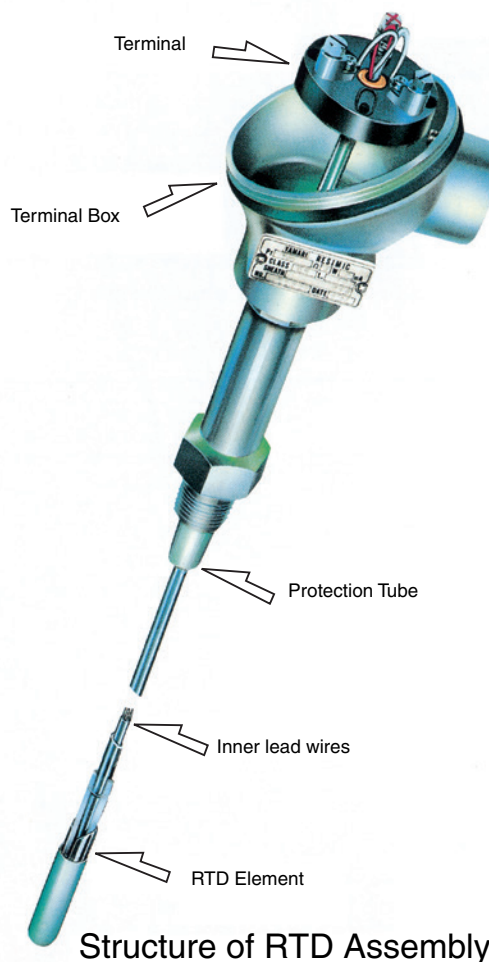
- 1) The use of high purity platinum resistance wire ensures precision measurement.
- 2) Excellent in stability and reproducibility.

Vibration & Shock Resistance

For the use under high flow-velocity, vibration or mechanical shock, RTD element and inner lead wires are protected by shock-resistant stainless steel inner tube support.

Low Temperature Treatment

Low temperatures often cause dew condensation in a protection tube that results in deterioration of insulation resistance. For use at sub-zero temperature, please specify "Low Temperature Treatment" that makes the sensing tip of RTD element covered with silicon or paraffin coating to protect from dewing.



Structure of RTD Assembly

Standard Specifications

Nominal Resistance (at 0°C)	Code
Pt 100Ω	100
JPt 100Ω	J100

No. of Element	Code
1 (Single)	S
2 (Double)	D

Lead Connection	Code
2-wires	W
3-wires	X
4-wires	Y

Rated Current	Code
0.5 mA	005
1 mA	01
2 mA	02
5 mA※	05

※: 5 mA for JPt100

Lead Wires to Applications

Application	Code	Operating Temperature	Inner Lead Wires
Low Temperature	L	-200~100°C	Silver
Mid. Temperature	M	0~250°C	Silver
High Temperature	H	0~400°C	Nickel

Properties of Insulating Tubes

Material	Code	Operating Temp.	Maximum Temp.	Properties
Ceramic 1	PS1	1400°C	1600°C	Highest insulation among insulation materials. Solid.
Teflon	FEP	180°C	200°C	Excellent resistance to heat, chemicals, etc. Flexible.
Polyimide	PM	220°C	—	Characteristics similar to FEP but tougher and thin-wall thickness.

Properties of Metal Protection Tubes

Material	Code	Operating Temp.	Properties
Copper	CU	250°C	Good heat conductivity and excellent corrosion-resistance.
Brass	BS	Oxidizing 400°C Reducing 150°C	Similar to Copper and good workability.
304S. S.	304	980°C	High resistance to heat and corrosion.
316S. S.	316	980°C	Excellent resistance to heat, acids and alkalis.
316L.S. S.	316L	980°C	Excellent resistance to grain boundary corrosion.
Titanium	TI	Oxidizing 250°C Reducing 1000°C	Excellent resistance to corrosion at low temp. but easily oxidized and embrittled at high temperature.
Monel	MN	Oxidizing 500°C Reducing 600°C	Excellent resistance to heat, high pressure and corrosion.

Other special tubes are also available. Operating and maximum temperatures vary depending on atmospheres.

Standard Dimensions of Protection Tubes

(○=Available)

material size(mm)	Regular Type single			Regular Type double			Shock Proof Type single			Shock Proof Type double			Remarks
	304	316	316L	304	316	316L	304	316	316L	304	316	316L	
7 × 5	○												
8 × 6	○	○											
9 × 7	○			○									
10 × 8	○	○	○	○	○	○	○	○	○				
11 × 9	○			○			○			○			
12 × 9	○	○	○	○	○	○	○	○	○	○	○	○	
13 × 9	○			○			○			○			
13.8 × 9.4	○	○	○	○	○	○	○	○	○	○	○	○	8A SCH.40
15 × 11	○	○	○	○	○	○	○	○	○	○	○	○	
16 × 12	○			○			○			○			
17.3 × 12.7	○	○	○	○	○	○	○	○	○	○	○	○	10A SCH.40
20 × 16	○			○			○			○			
21.7 × 16.1	○	○	○	○	○	○	○	○	○	○	○	○	15A SCH.40

SURFACE COATINGS

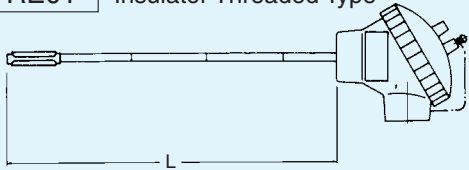
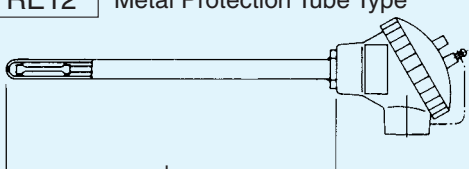
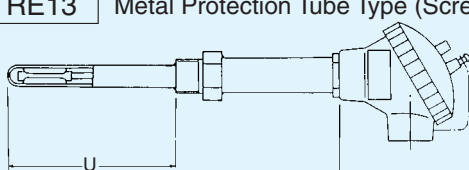
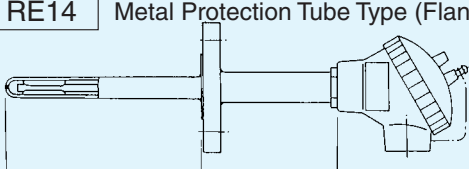
Corrosion Resistant Lining & Coating

Coating Material	Thickness (mm)	Structure	Max Oper. Temp.	Characteristics
Glass-lining	1~1.2	Steel+Glass	450°C	Good protection against oxidation and gas penetration but poor thermal shock resistance.
Teflon(FEP)coating	0.3	Metal+FEP	120°C	Suitable in concentrated 2HCl, H ₂ SO ₄ and HNO ₃ and most of chemicals but depending on temperature conditions.

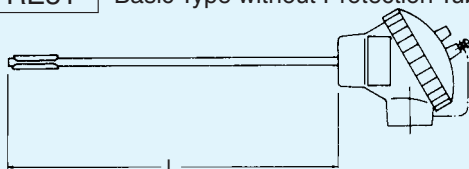
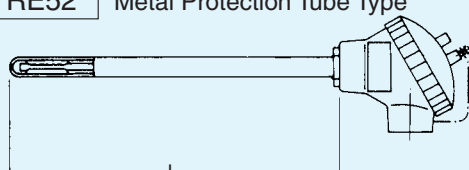
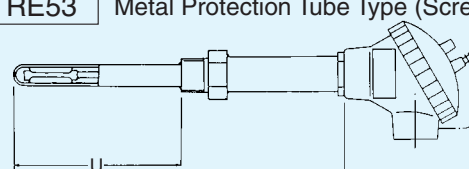
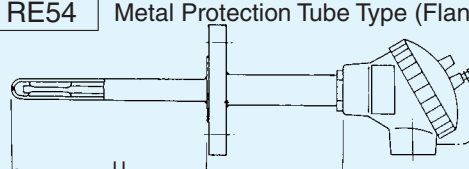
For Abrasion Resistance..... Stellite, Colmonoy, Tungsten and other materials can be processed to improve abrasion resistance of metal protection tubes. For further details, please consult factory.

Standard Assemblies of Mica Type RTD

(MODEL:RE)

RE01 Insulator Threaded Type 	Order Code : RE01 - M 100 S X 02 - L - Type Inner Leads Resist- No. of Lead Rated Length P8 P8 P8 P8 Ref Page : 11 + KN Applicable tube I.D. Term. Box P6 P11
RE12 Metal Protection Tube Type 	Order Code : RE12 - M J100 S X 02 - L - KN - Type Inner Leads Resist- No. of Lead Rated Length Term. Box P8 P8 P8 P8 P11 Ref Page : 15 / 316 Dimensions of Prot. Tube Material P9 P9
RE13 Metal Protection Tube Type (Screwed) 	Order Code : RE13 - M 100 S X 02 - L / U - Type Inner Leads Resist- No. of Lead Rated Length Insert Length P8 P8 P8 P8 Ref Page : KN - 15 / 316 + R 1/2 / 316 Term. Box Dimensions of Prot. Tube Material Thread Std Material P11 P9 P9
RE14 Metal Protection Tube Type (Flanged) 	Order Code : RE14 - M 100 S X 02 - L / U - KN - Type Inner Leads Resist- No. of Lead Rated Length Insert Length Term. Box P8 P8 P8 P8 P11 Ref Page : 15 / 316 + JIS10K25ARF / 316 Dimensions of Prot. Tube Material Flange Rating Material P9 P9 P21

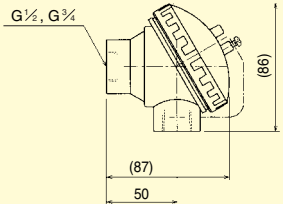
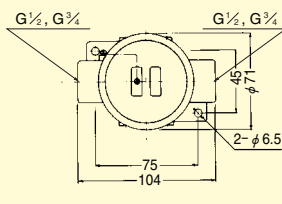
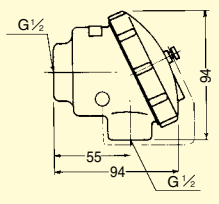
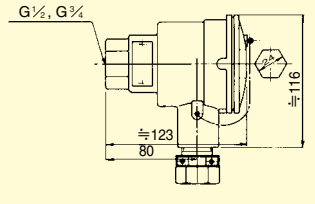
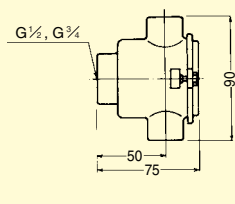
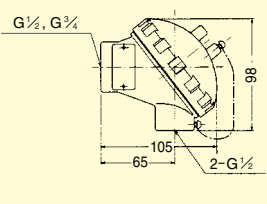
Shock Proof Models

RE51 Basic Type without Protection Tube 	Order Code : RE51 - M 100 S X 02 - L - Type Inner Leads Resist- No. of Lead Rated Length P8 P8 P8 P8 Ref Page : 11 + KN Applicable tube I.D. Term. Box P6 P11
RE52 Metal Protection Tube Type 	Order Code : RE52 - M 100 S X 02 - L - Type Inner Leads Resist- No. of Lead Rated Length P8 P8 P8 P8 Ref Page : KN - 15 / 316 Term. Box Dimensions of Prot. Tube Material P11 P9 P9
RE53 Metal Protection Tube Type (Screwed) 	Order Code : RE53 - M 100 S X 02 - L / U - Type Inner Leads Resist- No. of Lead Rated Length Insert Length P8 P8 P8 P8 Ref Page : KN - 15 / 316 + R 1/2 / 316 Term. Box Dimensions of Prot. Tube Material Thread Std Material P11 P9 P9
RE54 Metal Protection Tube Type (Flanged) 	Order Code : RE54 - M J100 S X 02 - L / U - KN - Type Inner Leads Resist- No. of Lead Rated Length Insert Length Term. Box P8 P8 P8 P8 P11 Ref Page : 15 / 316 + JIS10K25ARF / 316 Dimensions of Prot. Tube Material Flange Rating Material P9 P9 P21

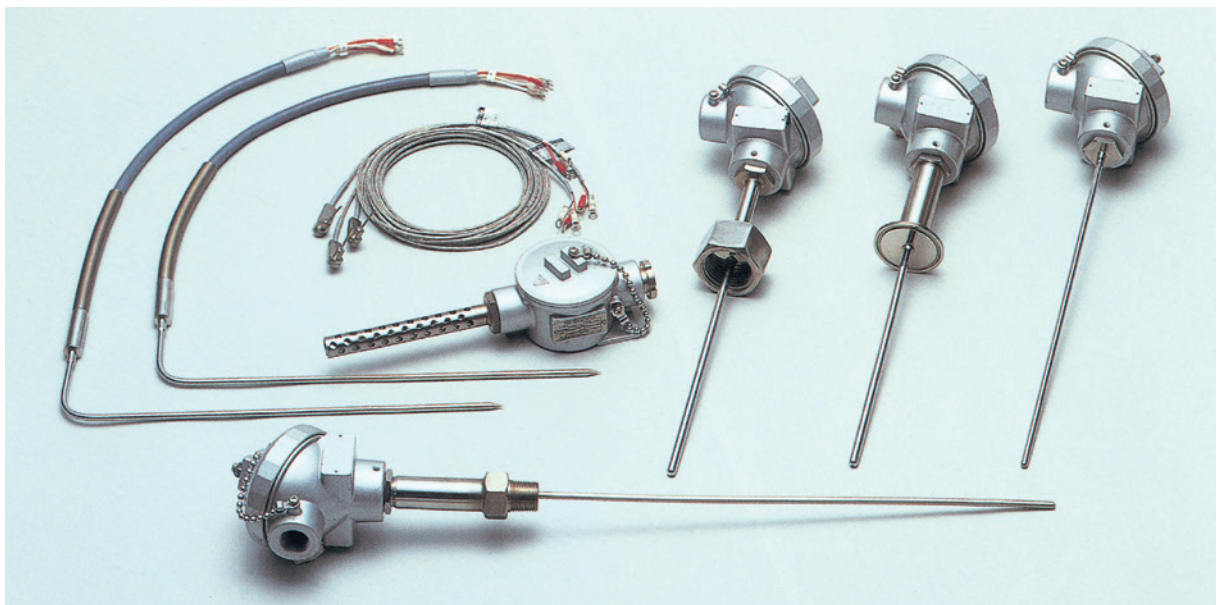
In case of JPt ($R_{100}/R_0=1.3916$), put a suffix-J, Example see code RE 12 and RE 54.

Terminal Boxes

Other entry threads of R, NPT or Metrics can be specified.

Type	Weather Proof K N	Wall Mount KW	Plastics Molded KP
Material: Conduit Dia: No. of Terminals: Terminal Block: Surface Finish: Surface Color:	Al-alloy diecast $G\frac{1}{2} \cdot G\frac{3}{4}$ 2, 3, 4, 6 Ceramic Melamin baked Metallic Silver	Al-alloy diecast $G\frac{1}{2} \cdot G\frac{3}{4}$ 2, 3, 4, 6 Ceramic Melamin baked Metallic Silver	Phenolic Resin $G\frac{1}{2}$ 2, 3, 4 Ceramic — Black
Dimensions			
Type	Flame Proof KG (d2G4, Exd IIC T6) *	Two Way Cable Entry KR	Dual Cable Entry KF
Material: Conduit Dia: No. of Terminals: Terminal Block: Surface Finish: Surface Color:	Al-alloy diecast, Stainless Steel M16, 20, 25 2, 3, 4, 6 Bakelite Melamin baked Metallic Silver	Al-alloy diecast $G\frac{1}{2} \times 2$ 4, 6 Ceramic Melamin baked Metallic Silver	Al-alloy diecast $G\frac{1}{2} \times 2$ 4, 6 Ceramic Melamin baked Metallic Silver
Dimensions			

* Approved by KEMA for "II2G EEEx d IIC T6" to CENELEC EN 50018.
Two way entry model also available.



RESIMIC® (MODEL:RM)

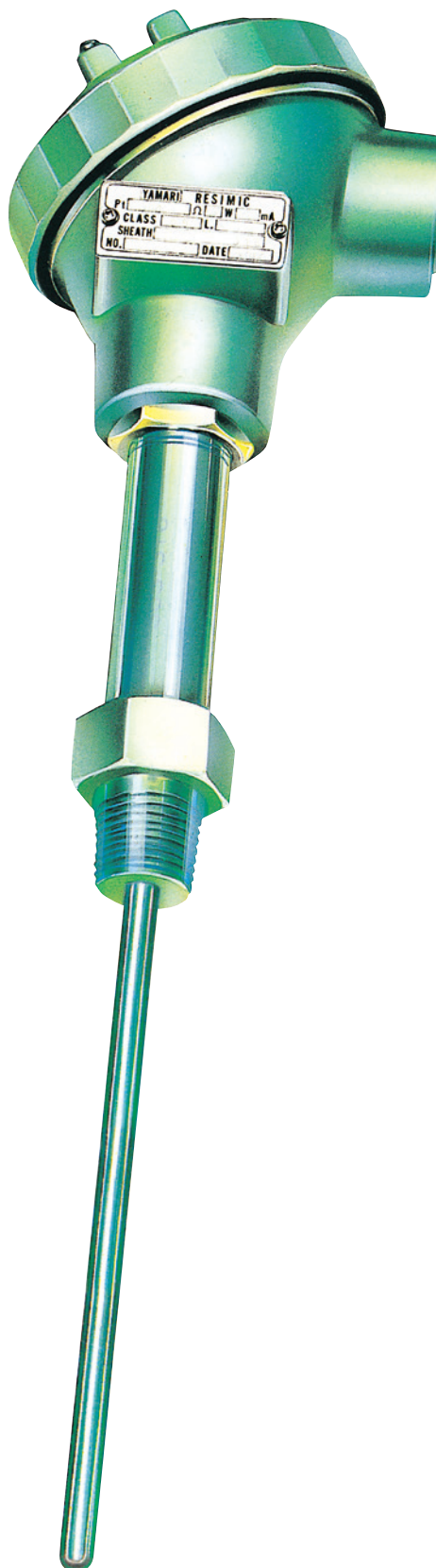
Sheathed Type RTD

RESIMIC® What is RESIMIC?

RESIMIC® is a registered trade name of YAMARI's metal sheathed RTD that has a monolithic structure comprising of RESICERAM® element and MI cable (MgO compacted, metal sheathed lead wires). This newly developed RTD has very quick response, longer service life and high accuracy under critical conditions.

RESIMIC® Its Features

- 1) Quick Response:
Since RESIMIC® sensing part is filled with high purity alumina powder and protected by a metal sheath, it has much faster response than those of ordinary RTD's and can follow any slight change in temperature.
- 2) High Flexibility:
Except for the sensing part of up to 60mm from the tip, it can be bent to the radius equal to 2 times of the sheath O.D.
- 3) High Accuracy:
Since high purity platinum resistance wire is used, it has high accuracy falling within the class of A or B stipulated by JIS C1604-1997, or other internationally known Standards.
- 4) Wide Variety of Specifications:
Outer diameters from 3.2mm to 8.0mm and total length up to 150 meters are available.
- 5) Wide Range of Measuring Temperatures:
From cryogenic (-200°C) to high temperature ($+500^{\circ}\text{C}$) can be measured although it may vary depending on surrounding atmospheres.



RESIMIC® Types and Codes

Nominal Resistance (at 0°C)	Code
Pt 100Ω	100
JPt 100Ω	J100

Number of Element	Code
1 (single)	S
2 (double)	D

Lead Connection	Code
3 wires	X
4 wires	Y

Rated Current	Code
0.5 mA	005
1 mA	01
2 mA	02
5 mA※	05

※: 5 mA for JPt100

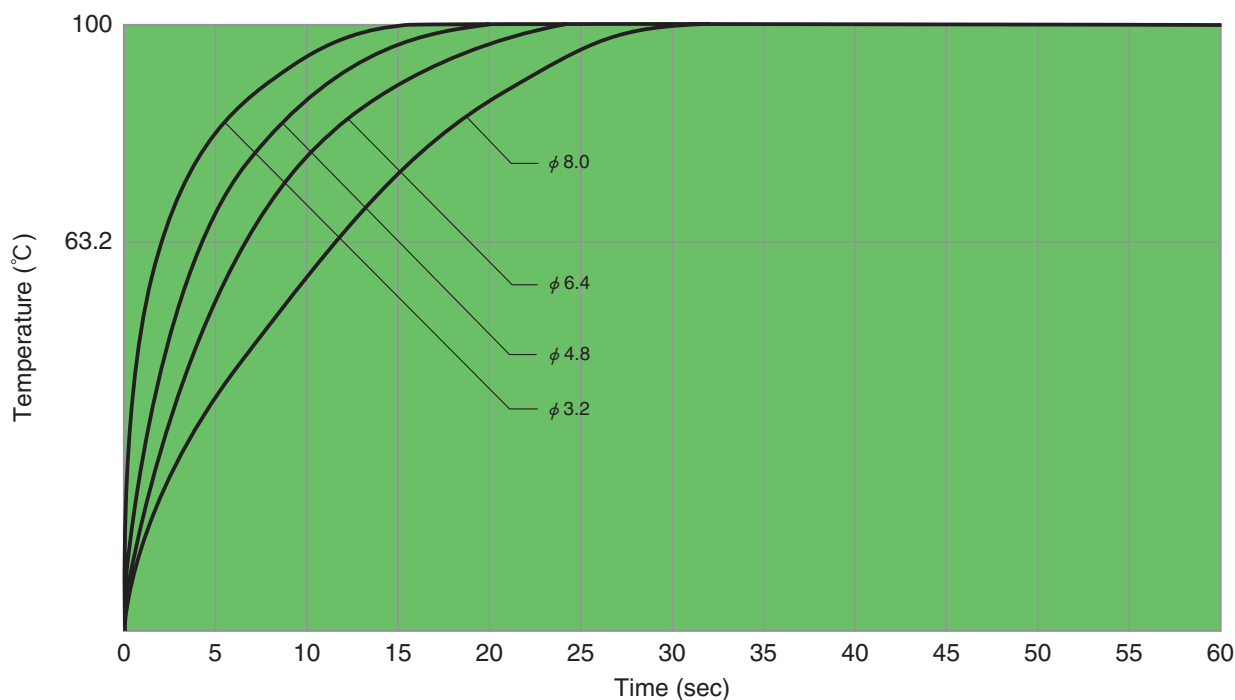
RESIMIC® Sheathed Leads

	Sheath O. D. (mm)	Conductor Dia. (mm)	Lead Resistance (Ω/m at 20°C)	Sheath Wall(mm)	Sheath Material	Max Length (m)
	3.2	0.33	1.106	0.30	316 SS	150
	4.8	0.51	0.467	0.43	316 SS	60
	6.4	0.66	0.276	0.58	316 SS	30
	8.0	0.81	0.177	0.74	316 SS	15
	4.8	0.51	0.467	0.43	316 SS	60
	6.4	0.66	0.276	0.58	316 SS	30
	8.0	0.81	0.177	0.74	316 SS	15

RESIMIC® Response Time

The “ τ ” Constants (63.2%) when RESIMIC® is immersed into 100°C (boiling water) from 0°C (ice bath).

- φ 3.2 less than 2 sec.
- φ 4.8 less than 4 sec.
- φ 6.4 less than 6 sec.
- φ 8.0 less than 11 sec.



RESISLIM (MODEL:RS)

Stem Type RTD

RESISLIM What is RESISLIM?

RESISLIM is a newly developed RTD assembly that is composed of a fine diameter metal protection tube in which high purity Al_2O_3 powder is tightly compacted and sealed around RESICERAM® element.

RESISLIM Its Features

- 1) Due to small mass of heat and finer diameter, it is possible to measure temperatures in such places where conventional types are not accessible.
- 2) It has quicker response than Mica type RTD or RESIMIC®.
- 3) It has accuracies of class A or B stipulated by JIS C1604-1997, or other internationally known standards due to use of RESICERAM® elements.
- 4) It has wide range of operating temperatures from -200°C to $+650^\circ\text{C}$ depending on surrounding atmospheres as in the case of RESIMIC®.

RESISLIM Types and Codes

Nominal Resistance (at 0°C)	Code
Pt 100 Ω	100
JPt 100 Ω	J100

Number. of Element	Code
1 (single)	S
2 (double)	D

Lead Connection	Code
3-wires	X
4-wires	Y

Rated Current	Code
0.5 mA	005
1 mA	01
2 mA	02
5 mA※	05

※: 5 mA for JPt100

Inner Lead Material to Operating Temperature

Application	Code	Operating Temperature	Lead Material
Mid. Temperature	M	$-200\sim 250^\circ\text{C}$	Silver
High Temperature	H	$0\sim 650^\circ\text{C}$ ※	Nickel

※: Operating temperature of Old JIS JPt is up to 500°C .

RESISLIM Types

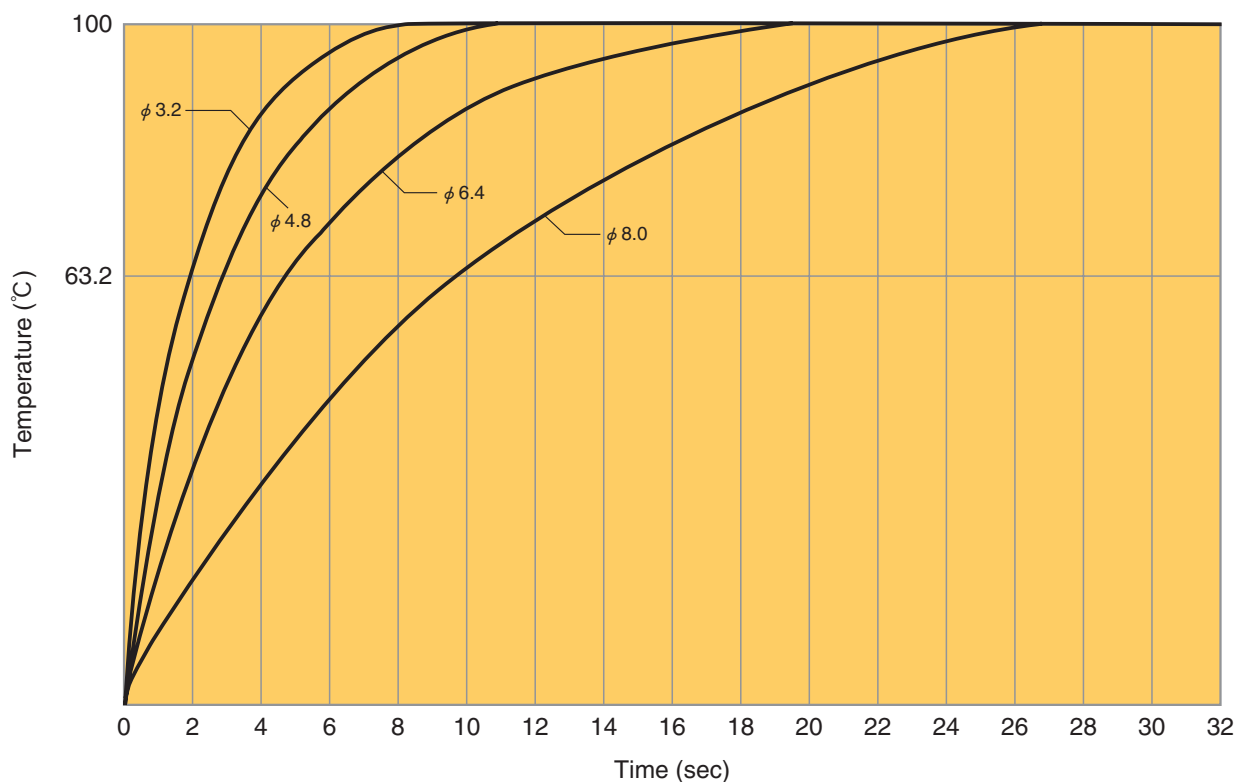
Nominal Resistance (at 0°C)	Nom. O.D. (mm)	Manufacturable Range to Operating Temp.		Maximum Length (mm)
		−200~250°C	250~650°C※	
Pt 100Ω JPt 100Ω	1.0	○		200
	1.2	○		〃
	1.6	○		1,000
	2.0	○		〃
	2.5	○		〃
	3.2	○	○	2,000
	4.0	○	○	〃
	4.8	○	○※	〃
	6.4	○	○※	〃
	8.0	○	○※	〃
Pt 100Ω × 2 JPt 100Ω × 2	3.2	○		2,000
	4.0	○		〃
	4.8	○	○	〃
	6.4	○	○※	〃
	8.0	○	○※	〃

※High temperature models of up to 650°C are available upon request.

RESISLIM Response Time

The “ τ ” Constants (63.2%) when RESISLIM is immersed into 100°C (boiling water) from 0°C (ice bath).

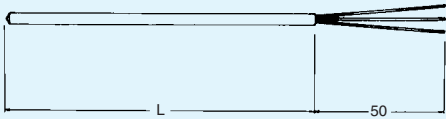
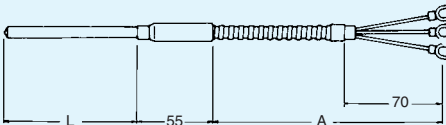
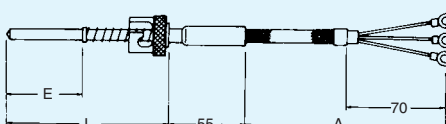
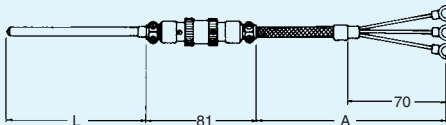
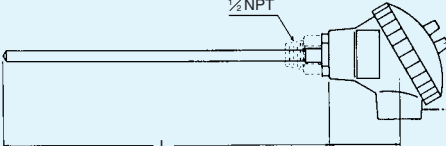
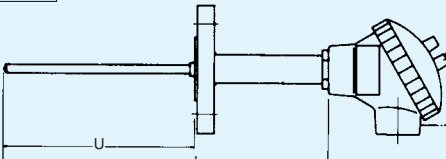
- φ 3.2 less than 2 sec.
- φ 4.8 less than 3 sec.
- φ 6.4 less than 5 sec.
- φ 8.0 less than 10 sec.

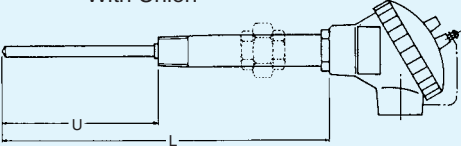
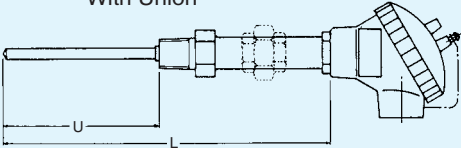
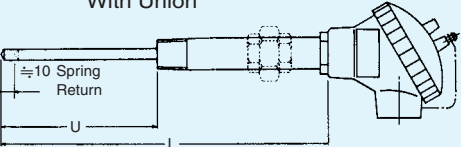
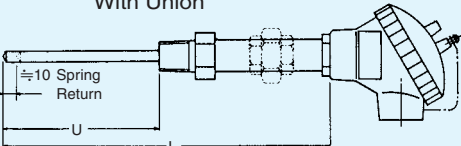
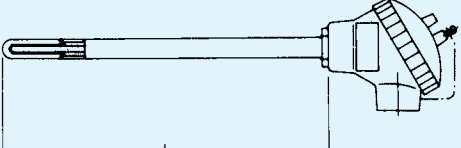
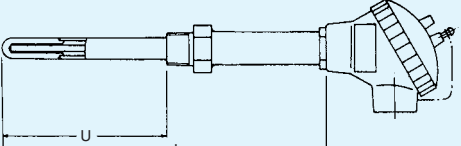
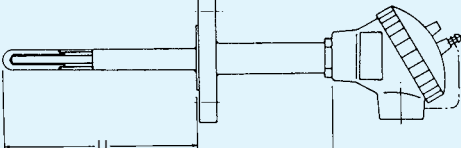


Standard Assemblies of

RESIMIC® (MODEL:RM)

RESISLIM (MODEL:RS)

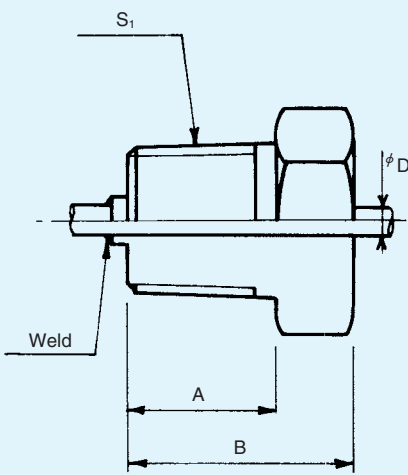
RM RS A Basic Type 	Order Code : RMA Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 32 O.D. P13,P15 L Length
RM RS B Flexible Lead Type 	Order Code : RMB Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 32 O.D. P13,P15 L Length WR13 Lead P19 A Lead Length
RM RS BF Armoured Lead Type 	Order Code : RMBF Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 32 O.D. P13,P15 48 O.D. P13,P15 L Length WR13 Lead P19 A Insert Length
RM RS BYS Bayonet Mount Type 	Order Code : RMBYS Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 32 O.D. P13,P15 48 O.D. P13,P15 L Length WR13 Lead P19 A Insert Length
RM RS ES Metal Connector Type 	Order Code : RMES Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 32 O.D. P13,P15 48 O.D. P13,P15 L Length WR13 Lead P19 A Insert Length
RM RS H Basic Type with Terminal Box 	Order Code : RMH Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 48 O.D. P13,P15 L Length KN Term. Box P11 + NPT 1/2 BU Bushing
RM RS NF Flanged Type 	Order Code : RMNF Type M Inner Leads 100 Resistance S No. of Element X Lead Connection 02 Rated Current / 48 O.D. P13,P15 L Length U Insert Length KN Term. Box P11 JIS10K25ARF Flange Rating P21 304 Material

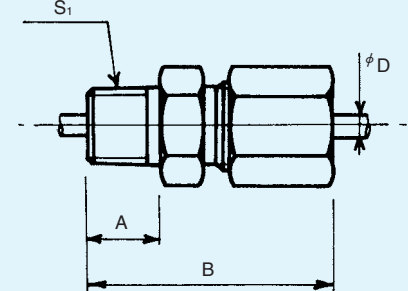
RM N RS UN With Union Screwed Type 	Order Code : RMN — M 100 S X 02 / 48 — RMUN Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — R$\frac{1}{2}$ / 304 Length Insert Length Term. Box P11 Thread Std Material
RM NB RS UNB With Union Screwed Type 	Order Code : RMNB — M 100 S X 02 / 48 — RMUNB Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — R$\frac{1}{2}$ / 304 Length Insert Length Term. Box P11 Thread Std Material
RM NS RS UNS With Union Spring-Loaded Type 	Order Code : RMNS — M J100 S X 02 / 48 — RMUNS Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — R$\frac{1}{2}$ / 304 Length Insert Length Term. Box P11 Thread Std Material
RM NBS RS UNBS With Union Spring-Loaded Type 	Order Code : RMNBS — M J100 S X 02 / 48 — RMUNBS Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — R$\frac{1}{2}$ / 304 Length Insert Length Term. Box P11 Thread Std Material
RM P Metal Protection Tube Type 	Order Code : RMP — M 100 S X 02 / 48 — Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L — KN — 15 / 304 Length Term. Box P11 Dimensions of Prot. Tube P9 Material
RM PB Metal Protection Tube Type (Screwed) 	Order Code : RMPB — M 100 S X 02 / 48 — Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — 15 / 304 Length Insert Length Term. Box P11 Dimensions of Prot. Tube P9 Material R$\frac{1}{2}$ / 304 Thread Std Material
RM PF Metal Protection Tube Type (Flanged) 	Order Code : RMPF — M 100 S X 02 / 48 — Type Inner Leads Resist-ance No. of Element Lead Connection Rated Current P13,P14 o.d. P13,P15 L / U — KN — 15 / 304 Length Insert Length Term. Box P11 Dimensions of Prot. Tube P9 Material JIS10K25ARF / 304 Flange Rating P21 Material

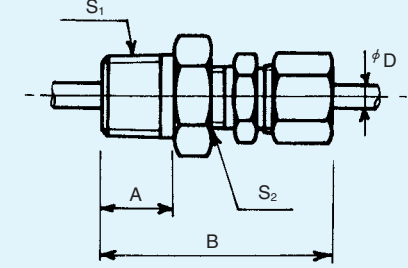
In case of JPt ($R_{100}/R_0=1.3916$), put suffix-J. Example see code RMNF and RMNS.

Optional Accessories

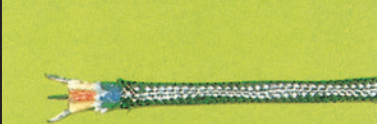
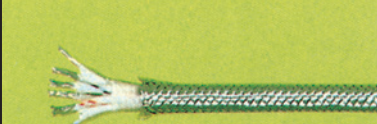
Unit : mm

1. Fixed Type Bushing 304SS 		φ D	TYPE	S ₁	S ₂	A	B
		1.0	BN 101	R ⅛	—	10	16
		1.6	BN 161	R ⅛	—	10	16
		2.2	BN 221	R ⅛	—	10	16
		3.2	BN 321	R ⅛	—	10	16
			BN 322	R ¼	—	12	20
			BN 324	R ½	—	20	35
		4.8	BN 481	R ⅛	—	10	16
			BN 482	R ¼	—	12	20
			BN 484	R ½	—	20	35
			BN 486	R ¾	—	20	35
		6.4	BN 642	R ¼	—	12	20
			BN 644	R ½	—	20	35
BN 646	R ¾		—	20	35		
8.0	BN 802	R ¼	—	12	20		
	BN 804	R ½	—	20	35		
	BN 806	R ¾	—	20	35		

2. Compression Fitting 304SS  Note: The standard cotter is Stainless Steel but Teflon cotter (Type TCF) is also available.		1.0	CF 101	R ⅛	—	10	33
		1.5	CF 151	R ⅛	—	10	33
			CF 152	R ¼	—	12	35
		1.6	CF 161	R ⅛	—	10	33
			CF 162	R ¼	—	12	35
		2.0	CF 201	R ⅛	—	10	33
			CF 202	R ¼	—	12	35
		2.2	CF 221	R ⅛	—	10	33
			CF 222	R ¼	—	12	35
		3.0	CF 301	R ⅛	—	10	33
			CF 302	R ¼	—	12	35
		3.2	CF 321	R ⅛	—	10	33
			CF 322	R ¼	—	12	35
		4.5	CF 451	R ⅛	—	10	33
			CF 452	R ¼	—	12	35
		4.8	CF 481	R ⅛	—	10	33
			CF 482	R ¼	—	12	35
		6.0	CF 602	R ¼	—	12	35
		6.4	CF 642	R ¼	—	12	35
		8.0	CF 802	R ¼	—	12	35

3. Compression Fitting with Bushing 304SS 		3.2	CF 323	R ⅜	R ⅛	15	54
			CF 324	R ½	R ⅛	20	59
			CF 326	R ¾	R ⅛	20	59
		4.8	CF 483	R ⅜	R ⅛	15	54
			CF 484	R ½	R ⅛	20	59
			CF 486	R ¾	R ⅛	20	59
		6.4	CF 643	R ⅜	R ¼	15	54
			CF 644	R ½	R ¼	20	59
			CF 646	R ¾	R ¼	20	59
		8.0	CF 803	R ⅜	R ¼	15	54
			CF 804	R ½	R ¼	20	59
			CF 806	R ¾	R ¼	20	59

Types of Lead Wires

Appearance	Type	Color Coding	Dimensions	Covering	Application
	WR12	Black (Red, White, Blue)	Conductor 0.4/7 Nom. O.D. φ 9.0mm	Outer: PVC insulating sheath. Inner: Copper shield	General
	WR13	Grey (Red, White, White)	Conductor 0.18/20 Nom. O.D. φ 5.0mm	Outer: Stainless Steel shield. Inner: Glass braided insulating sheath.	High Temp.
	WR13D	Grey (R,W,W) (R,W,W)	Conductor 0.18/20 Nom. O.D. φ 6.6mm	〃	〃
	WR15A	Grey (R,W,W)	Conductor 0.18/20 Nom. O.D. φ 5.0mm	Outer: Heat-resistant PVC insulating sheath. Inner: Copper shield.	General
	WR15D	Grey (R,W,W) (R,W,W)	Conductor 0.18/20 Nom. O.D. φ 6.8mm	〃	〃
	WR16	Grey (R,W,W)	Conductor 0.18/20 Nom. O.D. φ 5.8mm	Outer: Silicon insula- ting sheath. Inner: Copper shield.	High Temp.
	WR17	White (R,W,W)	Conductor 0.18/12 Nom. O.D. φ 4.0mm	Outer: Stainless Steel shield. Inner: Glass insulating sheath.	〃
	WR17D	White (R,W,W) (R,W,W)	Conductor 0.18/12 Nom. O.D. φ 5.0mm	〃	〃
	WR18	Grey (R,W,W)	Conductor 0.18/7 Nom. O.D. φ 3.5mm	Heat-resistant PVC insulating sheath.	General

Other special types are also available. (R=Red, W=White)

THERMOWELL (MODEL:WL)

THERMOWELL (Drilled Bar Stock Type Protection Tube) is usually being used to ensure longer service life under critical conditions such as very corrosive gases or liquids, high temperature, high pressure, vibration, shock or high flow velocity.

At YAMARI, various THERMOWELLS durable under these conditions are manufactured.

THERMOWELL Bores & Depths

Bore (mm)	Max.Depth (mm)
4.0	500
5.5	700
7.0	800
8.5	1,000
10.0	1,200
11.0	1,200
12.0	1,200
16.0	1,200



THERMOWELL Raw Material Sizes

Round Bar (O.D.): mm

25, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55

Hexagonal Bar: mm

26, 29, 32, 35, 38, 41

THERMOWELL Standard Materials

304 SS, 316 SS, 316L SS, 310S SS, 321 SS, Inconel, Hastelloy B, Hastelloy C, Hastelloy X, Monel, Nickel and its alloys, 50Co-30Cr, Titanium and its alloys. Other special materials are also available upon request.

Tests and Inspection

☒ Pressure Test

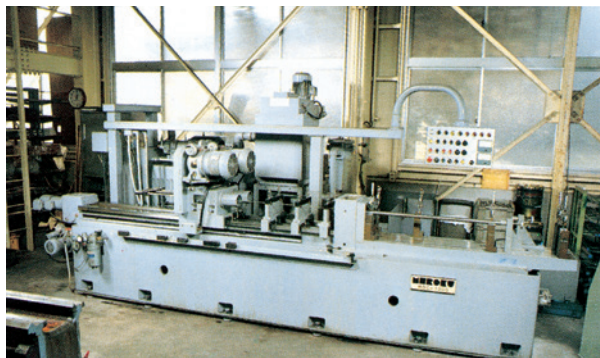
N₂ gass pressure test up to 10MPa is conducted upon request.

☒ Hydrostatic Pressure Test

Internal pressure test up to 40MPa is conducted upon request.

☒ X-Ray Inspection

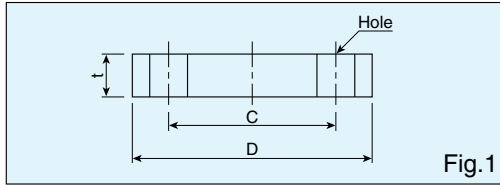
X-ray inspection to insure uniform wall thickness or complete finish is also performed upon request.



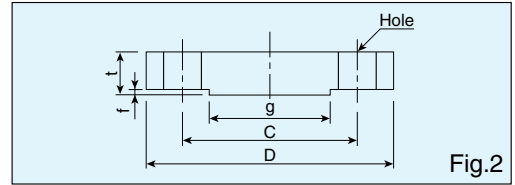
Flanges

JIS Flange

Flat Face (FF)



Raised Face (RF)



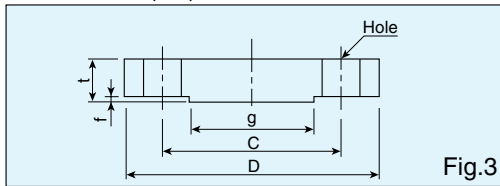
Dimensional Specifications

Unit : mm

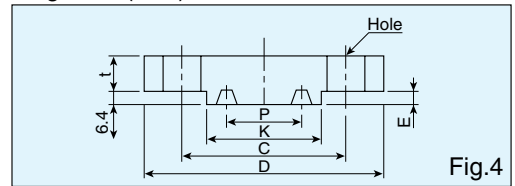
Flange Rating	Size A	Size B	D	t	f	g	C	f	No. of Bolt Holes	Hole Dia.	Bolt Size	Nom. Weight(kg)
JIS 5K	15	1/2	80	9	1	44	60	1	4	12	M10	0.32
	20	3/4	85	10	1	49	65	1	4	12	M10	0.41
	25	1	95	10	1	59	75	1	4	12	M10	0.52
	32	1 1/4	115	12	2	70	90	2	4	15	M12	0.91
	40	1 1/2	120	12	2	75	95	2	4	15	M12	0.99
JIS 10K	15	1/2	95	12	1	51	70	1	4	15	M12	0.63
	20	3/4	100	14	1	56	75	1	4	15	M12	0.78
	25	1	125	14	1	67	90	1	4	19	M16	1.22
	32	1 1/4	135	16	2	76	100	2	4	19	M16	1.66
	40	1 1/2	140	16	2	81	105	2	4	19	M16	1.80

ANSI Flange

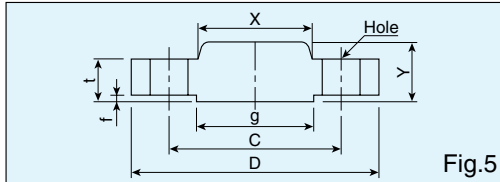
Raised Face (RF)



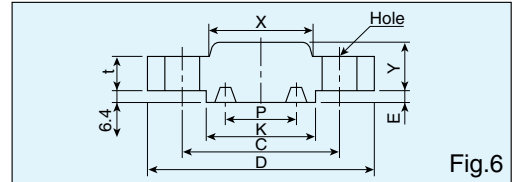
Ring Joint (RTJ)



Raised Face (RF)



Ring Joint (RTJ)



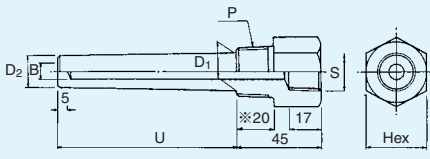
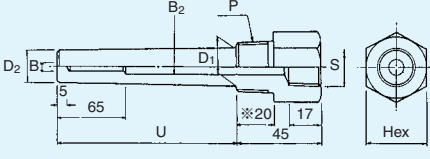
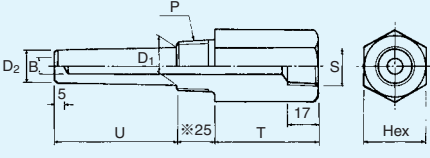
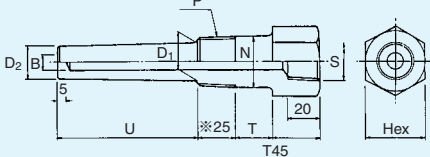
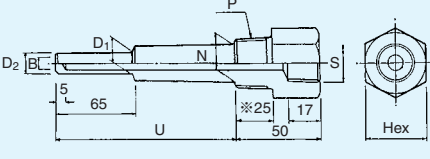
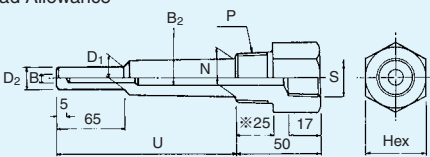
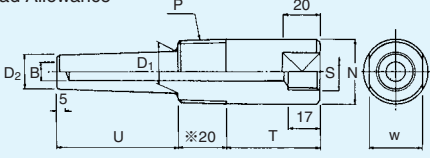
Dimensional Specifications

Unit : mm

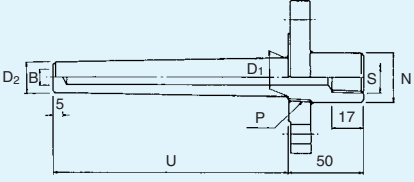
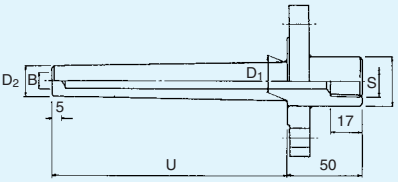
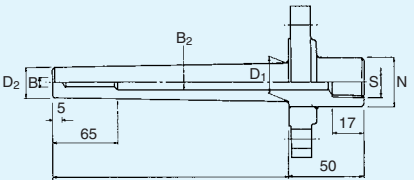
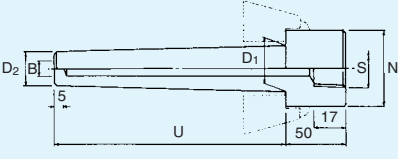
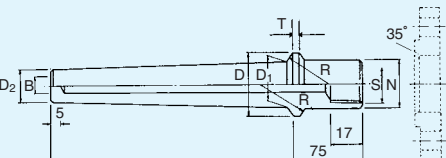
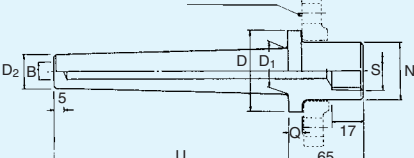
Flange	Size A	Size B	D	Min.t	f	g	C	No. of Bolt Holes	Hole Dia.	Bolt Size (inch)	Nom. Weight(kg)	Hub		RTJ		
												X	Y	Min.K	P	E
ANSI 150lbs	15	1/2	89	11.5	1.6	35.1	60.5	4	15.8	1/2	0.43	30.2	16.0	--	--	--
	20	3/4	99	13.0	1.6	42.9	69.9	4	15.8	1/2	0.62	38.1	16.0	--	--	--
	25	1	108	14.5	1.6	50.8	79.2	4	15.8	1/2	0.87	49.5	18.0	63.5	74.62	6.4
	32	1 1/4	117	16.0	1.6	63.5	88.9	4	15.8	1/2	1.16	58.7	21.0	73.5	57.15	6.4
	40	1 1/2	127	18.0	1.6	73.2	98.6	4	15.8	1/2	1.54	65.1	22.4	83.0	65.07	6.4
ANSI 300lbs	15	1/2	95	14.5	1.6	35.1	66.5	4	15.8	1/2	0.65	38.1	22.4	51.0	34.14	6.4
	20	3/4	117	16.0	1.6	42.9	82.5	4	19.0	5/8	1.09	48.0	25.4	63.5	42.88	6.4
	25	1	124	18.0	1.6	50.8	88.9	4	19.0	5/8	1.38	54.0	27.0	70.0	50.80	6.4
	32	1 1/4	133	19.5	1.6	63.5	98.6	4	19.0	5/8	1.82	63.5	27.0	63.5	60.32	6.4
ANSI 400lbs & 600lbs	40	1 1/2	155	21.0	1.6	73.2	114.5	4	22.4	3/4	2.70	70.0	30.3	90.5	68.28	6.4
	15	1/2	95	14.5	6.4	35.1	66.5	4	15.8	1/2	0.76	38.1	22.4	51.0	34.14	6.4
	20	3/4	117	16.0	6.4	42.9	82.6	4	19.0	5/8	1.27	48.0	25.4	63.5	42.88	6.4
	25	1	124	18.0	6.4	50.8	88.9	4	19.0	5/8	1.59	54.0	27.0	70.0	50.80	6.4
ANSI 900lbs & 1,500lbs	32	1 1/4	133	21.0	6.4	63.5	98.5	4	19.0	5/8	2.24	63.5	28.5	79.5	60.32	6.4
	40	1 1/2	155	22.5	6.4	73.2	114.5	4	22.4	3/4	3.30	70.0	32.0	90.5	68.28	6.4
	15	1/2	121	22.5	6.4	35.1	82.5	4	22.4	3/4	1.79	38.1	32.0	60.5	39.67	6.4
	20	3/4	130	25.5	6.4	42.9	88.9	4	22.4	3/4	2.40	44.5	35.1	67.0	44.45	6.4
	25	1	149	28.5	6.4	50.8	101.6	4	25.4	7/8	3.44	52.5	41.2	71.5	50.80	6.4
	32	1 1/4	159	28.5	6.4	63.5	111.3	4	25.4	7/8	3.95	63.5	41.2	81.5	60.32	6.4
	40	1 1/2	178	32.0	6.4	73.2	124.0	4	28.5	1	5.41	70.0	44.5	92.0	68.28	6.4

Standard Thermowells

(MODEL:WL)

WL-01 Hexagonal Screwed-in Type ※ Thread Allowance 	Order Code : WL-01 / 316 - 250 / R 1/2 - 9 / 15 Model No. Material "U" Length "P" Thread Std. "B" Bore "D2" Dia × 18 - 45/20/29×33.5Hex - Rc 1/2 "D2" Dia For Tapered Well Only Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-11 Hexagonal Screwed-in Type ※ Thread Allowance 	Order Code : WL-11 / 304 - 300 / R 3/4 - 8.5×65 / Model No. Material "U" Length "P" Thread Std. "B" × Length Bore Size 11 / 17 × 21 - 45/20/35×40.4Hex - Rc 1/2 "B2" Dia "D2" Dia "D1" Dia For Tapered Well Only Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-12 Hexagonal Lagging Extension Type ※ Thread Allowance 	Order Code : WL-12 / 310 - 450 / R1 - 11 / 17 Model No. Material "U" Length Std. "B" Bore "D2" Dia × 26 - 75 - 25/38×43.9Hex - Rc 1/2 "D2" Dia For Tapered Well Only "T" Length Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-02 Hexagonal Lagging Extension Type ※ Thread Allowance 	Order Code : WL-02 / 321 - 300 / R1 - 11 / Model No. Material "U" Length Std. "B" Bore 17 × 26 - 75 × 34 - 25/34/41×47.3Hex - Rc 1/2 "D2" Dia "D1" Dia For Tapered Well Only "T" Length "N" Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-21 Hexagonal Heavy Duty Type ※ Thread Allowance 	Order Code : WL-21 / 321 - 350×65 / R1 1/2 - 11 / Model No. Material "U" Length "P" Thread Std. "B" Bore 17 × 26 - 34 - 50/25/50×57.7Hex - Rc 1/2 "D2" Dia "D1" Dia For Tapered Well Only "N" Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-22 Hexagonal Heavy Duty Type ※ Thread Allowance 	Order Code : WL-22 / 316 - 400×65 / R1 - 7×65 / 11 Model No. Material "U" Length "P" Thread Std. "B" × Length Bore Size "D2" Dia 17 × 26 - 34 - 50/25/35×40.4Hex - Rc 1/2 "D2" Dia "D1" Dia For Tapered Well Only "N" Factory Standard Unless Otherwise Specified "S" Thread Std.
WL-04 Screwed-in Weld Type ※ Thread Allowance 	Order Code : WL-04 / 304 - 300 / R 3/4 - 11 / 17 Model No. Material "U" Length "P" Thread Std. "B" Bore "D2" Dia × 21 - 75 - 28-20 - Rc 1/2 "D2" Dia For Tapered Well Only "T" Length "N" Factory Standard Unless Otherwise Specified "S" Thread Std.

Other special types are also available upon request.

WL・05 Flanged (Screwed-in) Type 	Order Code : WL・05 / 304 - 500 / R 3/4 / JIS10K20ARF / 304 Model No. Material 304SS "U" Length "P" Thread Flange Rating Material 304SS - 11 / 17 × 21 - 50×28 - Rc 1/2 "B" Bore "D2" Dia "D1" Dia For Tapered Well Only Neck Dimension Length×"N" "S" Thread Std.
WL・06 Flanged (Weld) Type 	Order Code : WL・06 / 316 - 1250 / JIS10K20ARF / 316 Model No. Material 316SS "U" Length Flange Rating Material 316SS - 9 / 15 × 18 - 50×28 - Rc 1/2 "B" Bore "D2" Dia "D1" Dia For Tapered Well Only Neck Dimension Length×"N" "S" Thread Std.
WL・61 Flanged (Weld) Type 	Order Code : WL・61 / 310 - 600 / ANSI1"600LBRF / 310 Model No. Material 310SS "U" Length Flange Rating Material 310SS 8.5×65 / 11 / 17 × 26 - 50×34 / Rc 1/2 "B"×Length Bore Size "B2" Dia "D2" Dia For Tapered Well Only Neck Dimension Length×"N" "S" Thread Std.
WL・07 Plain Weld Type 	Order Code : WL・07 / 304 - 300 - 9 / 17 - Model No. Material 304SS "U" Length "B" Bore "D2" Dia 75×38 - Rc 1/2 Neck Dimension Length×"N" "S" Thread Std.
WL・08 Weld Type 	Order Code : WL・08 / 321 - 500 - 11 / 22 × 25 - Model No. Material 321SS "U" Length "B" Bore "D2" Dia "D1" Dia For Tapered Well Only 50×41 - Rc 1/2 Neck Dimension Length×"N" "S" Thread Std.
WL・09 Ball Joint Type 	Order Code : WL・09 / 316 - 1300 / 25.4R×34.9D×3.2T Model No. Material 316SS "U" Length Ball Joint Dimension "R"×"D"×"T" - 10 / 14.3 / 19 - 75×26.6 - Rc 1/2 "B" Bore "D2" Dia "D1" Dia For Tapered Well Only Neck Dimension Length×"N" "S" Thread Std.
WL・10 Van Stone Type 	Order Code : WL・10 / 304 - 250 / 50×6.5 - 11 / Model No. Material 304SS "U" Length Raised Face "D"×"Q" "B" Bore 17 × 26 - 65×34 - Rc 1/2 "D2" Dia "D1" Dia For Tapered Well Only Neck Dimension Length×"N" "S" Thread Std.

Other special types are also available upon request.

Inspections and Tests

At YAMARI, all products (Mica Type, RESIMIC®, RESISLIM and Thermowell) are inspected and tested before delivery in accordance with the following inspection procedures.

1. Check on Appearance and Structure:

Visual inspection is made on joints, junctions, welds, name plate and other parts.

Color penetration check also made on welds.

2. Dimensional Check:

Dimensions specified in the drawing are checked by a scale or calipers.

Unless otherwise specified, dimensional check is made according to the tables below.



Length of Mica Type RTD Unit:mm

Nominal Length	Tolerance
Under 1,000	±3.0
1,000~2,000	±5.0
Above 2,000	±7.0

Length of RESIMIC® and RESISLIM Unit:mm

Nominal Length	Tolerance
Under 250	±3.0
250~1,000	±5.0
Above 1,000	±1.0%

Note : For those assembled with protection tube or thermowell, the length within the range of giving no functional trouble is regard as passed.

3. Insulation Resistance Inspection

Insulation resistance is checked at room temperature by a DC 100V or 500V megohmmeter in accordance with the following table.

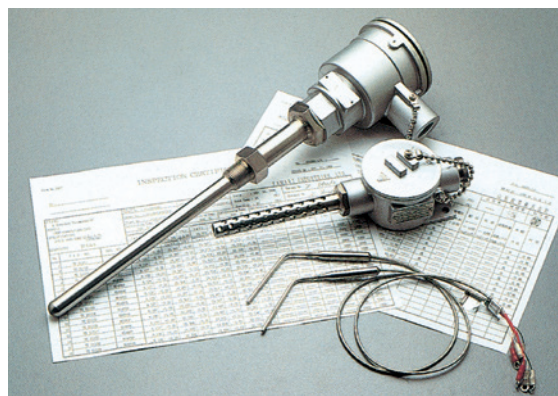
Type of RTD	Voltage Applied	Insulation Resistance
Mica Type RTD	500V D.C.	Above 10MΩ
RESIMIC®, RESISLIM (<φ2.0)	100V D.C.	Above 20MΩ
RESIMIC®, RESISLIM	500V D.C.	Above 100MΩ

4. Temperature Resistance Calibration

Each product is calibrated on resistance value at ice point (0°C) and/or boiling point of water (100°C). Comparison test in the range of -50°C to +500°C or the fixed point test at respective freezing points of Indium, Tin, Cadmium or Zinc are also conducted upon request.

Metal	Freezing Temp. ITS-90(°C)	Accuracy (°C)
Indium (In)	156.5985	※
Tin (Sn)	231.928	±0.01
Cadmium (Cd)	321.069	※
Zinc (Zn)	419.527	±0.001

※= Accuracy varies depending on respective purities of the metals refined.

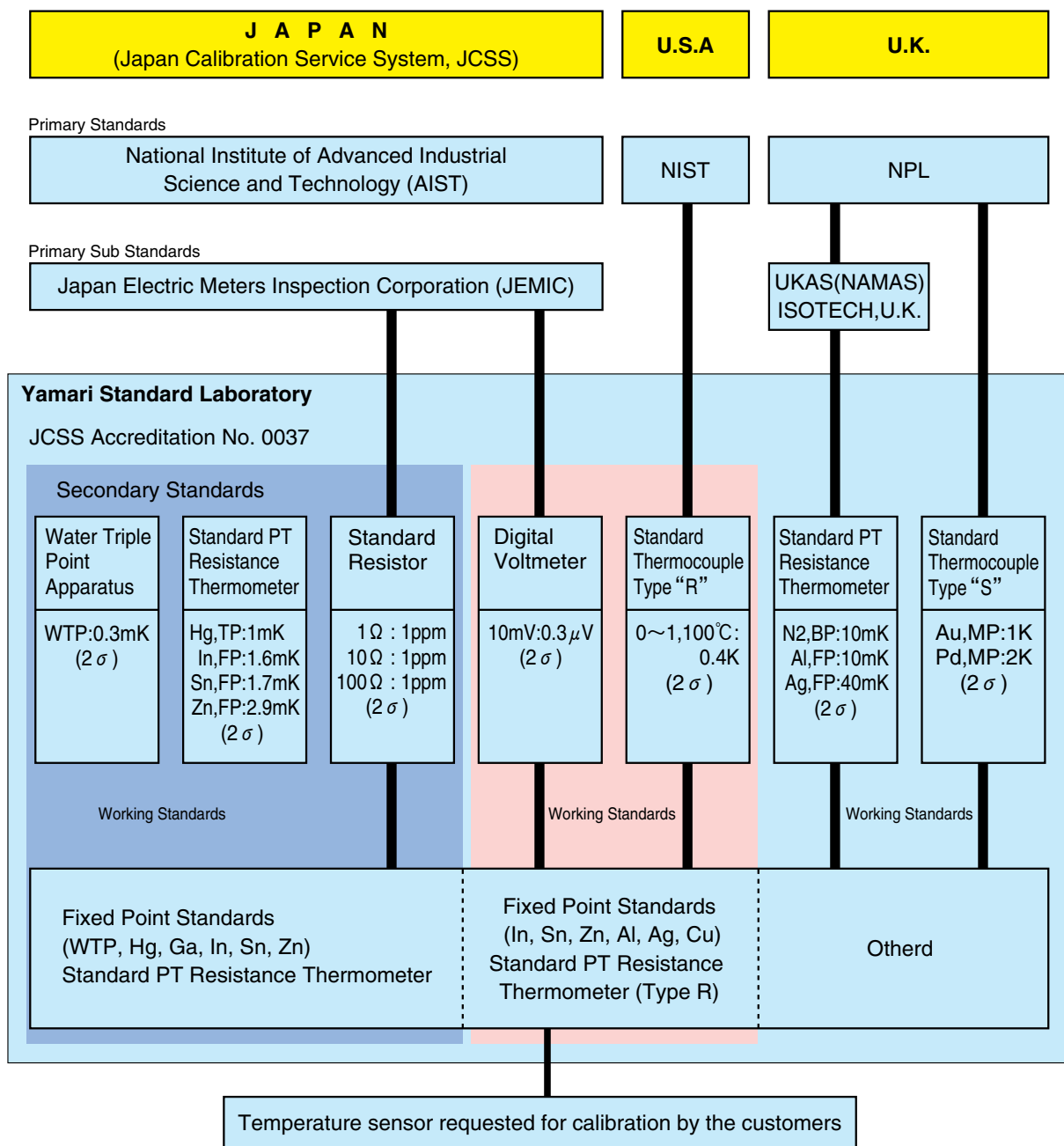


5. Others Tests

Voltage Withstand Test, X-Ray Test, Vibration Test, Pressure Test, Helium Leak Test, etc. are also performed upon request.

Temperature Calibration Services

Traceability System of Temperature Laboratory



AIST : National Institute of Advanced Industrial Science and Technology
 NIST : National Institute of Standards and Technology
 NPL : National Physical Laboratory
 UKAS : United Kingdom Accreditation Service
 NAMAS : National Measurement Accreditation Service
 JEMIC : Japan Electric Meters Inspection Corporation
 JCSS : Japan Calibration Service System



Chemical Resistance of Protection Tube Material

Corrosives	Concentration	Temp. (°C)	304SS	321SS	316SS	316LSS	316J1LSS	310S SS	347SS	Carpenter 20	Inconel 600	Nimonic	Hastelloy B	Hastelloy C-276	Hastelloy X	Titanium	Monel	Tantalum	Teflon	Copper	Zirconium	Nickel	PVC	Cupro-nickel	Aluminium	Brass	Lead	Common steel	50Co-30Cr	Haynes alloy 25
H ₂ SO ₄	5%	30	B	B	B	B	B	B	B	A	B	C	C	A	A	B	B	A	A	B	A	B	A	B	C	C	A	A	C	A
	10%	30	B	B	B	B	B	B	B	A	B	B	B	A	A	B	B	A	A	B	B	A	B	B	C	C	A	A	C	A
	50%	30	C	C	C	C	C	C	C	A	C	C	C	A	B	C	C	A	A	B	B	A	B	B	C	C	A	A	C	A
	90%	30	B	B	B	B	B	B	B	A	B	B	B	A	A	B	B	A	A	B	B	A	B	B	C	C	A	A	C	A
			B.P	C	C	C	C	C	C	A	C	C	C	A	A	C	C	A		C	B	B	A	C	C	C	A	A	C	A
2HCl	5%	30	C	C	C	C	C	C	C	B	B	B	B	A	A	A	B	A	A	B	B		A	C	C	C	C	B	C	B
	10%	30	C	C	C	C	C	C	C	B	B	B	B	A	A	A	B	A	A	B	B		A	C	C	C	C	B	C	B
	20%	30	C	C	C	C	C	C	C	B	B	B	B	A	A	A	B	A	A	B	B		A	C	C	C	C	B	C	B
			B.P	C	C	C	C	C	C	C	B	B	B	A	A	A	B	A	A	B	B		A	C	C	C	C	B	C	B
HNO ₃	20%	30	A	A	A	A	A	A	A	A	A	A	A	C	A	A	C	A	B	C		C	B	C	B	C	C	C	C	B
	40%	30	A	A	A	A	A	A	A	A	A	A	A	C	A	A	C	A	A	C		C	B	C	B	C	C	C	C	B
	75%	30	A	A	A	A	A	A	A	A	A	A	A	C	A	A	C	A	A	C		C	B	C	B	C	C	C	C	B
			B.P	A	A	A	A	A	A	A	A	A	A	C	A	A	C	A	A	C		C	B	C	B	C	C	C	C	B
CH ₃ CO ₂ H	10%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	B	A	B	A	B	A	B	B	B	C	A
	50%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	B	A	B	A	B	A	B	B	B	C	A
	80%	30	B	A	A	A	A	A	A	A	B	A	A	A	A	A	B	A	A	B	A	B	A	B	A	C	B	B	C	A
			B.P	B	A	A	A	A	A	A	B	A	A	A	A	A	B	A	A	B	A	B	A	B	B	C	B	B	C	A
H ₃ PO ₄	5%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	B	A	B	C	C	B	A	A	A
	50%	30	B	B	B	B	B	B	B	A	A	B	A	A	A	A	A	A	A	B	A	B	A	B	C	C	B	A	A	A
	85%	30	B	B	B	B	B	B	B	A	B	B	A	A	A	A	A	A	A	B	A	B	A	B	C	C	B	A	B	B
			B.P	B	B	B	B	B	B	A	B	B	A	A	A	A	B	A	A	B	A	B	A	B	C	C	B	A	B	B
H ₂ F ₂	30%	30	C	C	C	C	C	C	C	C	C			A	A	C	A		A	C		A	C	C	B	B	C	C	C	C
	70%	30	C	C	C	C	C	C	C	C	C			C	C	C	B		C	C		C	C	C	C	C	C	C	C	C
HCl	30	30	B	B	B	B	B	B	B	B	B	B	B	A	A				A		A						A	A	A	A
	200	200	B	B	B	B	B	B	B	B	B	B	B	A	A												A	A	A	A
NaOH	10%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B
	50%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B
	70%	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B
			B.P	B	B	B	B	B	B	A	A	A	A	A	A	A	B	A	A	B	A	A	A	B	B	B	B	B	B	B
KOH	25%	B.P	A	A	A	A	A	A	A	A	A	A	A	A	A	C	A	C		C	A	B	B	C	C	B	B	B	B	B
	50%	B.P	B	B	B	B	B	B	B	A	A	A	A	A	A	C	A	C		C	A	B	B	C	C	B	B	B	B	B
HCl (dry) / (wet)	30	30	C	C	C	C	C	C	C	A				A	A	A	A	A	A	A			A	C	B	C	C	A	A	A
	30	30	C	C	C	C	C	C	C	C				C	C	A	A	A	A	A			C	C	C	B	C	C	A	A
HCl vapor			C	C	C	C	C	C	C	B									A					C	C	B	C			
HF			C	C	C	C	C	C	C	A	C						B	C	A		B	A	C	C	C	B	C			C
H ₂ (SiF ₆)	5%	20	C	C	C	C	C	C	C	A	A			A	A		B	C	A			C	A	C	C	C	B	C		
F	10%	30	C	C	C	C	C	C	C	A	A			A	A		B	C	A			C	A	C	C	C	B	C		
NaOH	10%	B.P	B	A	A	A	A	A	A	A									A				A	C	C	B	C			
	75%	100	B	A	A	A	A	A	A	A									A				A	C	C	B	C			
CO ₂	10%	200	A	A	A	A	A	A	A	A				A	A			A	A				A	C	C	B	C			
SO ₂			A	A	A	A	A	A	A	A							A	A	A				A		C		C			
Na ₅ P ₃ O ₁₀	10%	30	B	B	B	B	B	B	B	B	C	C	C	A			C			C	B	C	C				C			
CHCl ₃		30	C	C	C	C	C	C	C								C			C			B	C	C		C			
AlF ₃	50%	30	B		B												B			A	B	A	C							
Fatty Acids		100	A	A	A	A	A	A	A	A	A			A	A		A	A				A								
NH ₃			A	A	A	A	A	A	A	A									A											
NaCl			A	A	A	A	A	A	A	A	A									B	A		A	C	B		B			
CrO ₄										A									A											
H ₂ O ₄			A	A	A	A	A	A	A	A	A			A	A		A	A	A											
S (liquid)			A	A	A	A	A	A	A	A	A						A		A					A						
CaCl ₂			A	A	A	A	A	A	A	A	A			A	A		A		A	B		A	A	A	B		B			

Note: A = Almost no corrosion in critical conditions. B = Small corrosion but permissible in general use other than specific parts.
C = Heavy corrosion and unsuitable.

OVERSEAS SUBSIDIARIES

M.I. CABLE TECHNOLOGIES, INC. (MICT)

Establishment : October 1995
Annual Turnover : CA\$6,100,000
Address : Bay6, 5905-11th Street S.E. Calgary Alberta Canada T2H2A6
TEL: 403-571-8266 FAX: 403-571-8267
<http://www.mict.ab.ca>
Capital : CA\$1,350,000.00
Number of Employees : 33
Major Businesses : Manufacturing and Sales of Various Kinds of MI Thermocouple Cable,
MI Extension Cable, MI Heat Tracing Cable



YAMARI SINGAPORE PTE. LTD. | where accuracy and precision is everything

Establishment : November 1997
Annual Turnover : S\$9,090,000
Address : 541 Bukit Batok St23, #04-00 Tacam Industrial Building, Singapore 659546
TEL: +65-6268-0090 FAX: +65-6262-0013
<http://www.yamari.com.sg>
Capital : S\$1,511,400
Number of Employees : 63
Major Businesses : Manufacturing and Sales of Thermocouples, Resistance Temperature
Detectors and Thermowells
Sales Area : Southeast Asia except P.R.China, Taiwan, Korea





YAMARI INDUSTRIES, LIMITED

山里産業株式会社

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Tel: +81-72-678-4897 Fax: +81-72-678-3516
E-mail: overseas_sales@yamari.co.jp
URL: <http://www.yamari.co.jp>
- Takatsuki Factory : No. 5-4, 1-chome, Mishimae,
Takatsuki-shi, Osaka, Japan, 569-0835
Tel: +81-72-678-1313 Fax: +81-72-679-2006
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URL: <http://www.micabletechnologies.com>
- in Singapore : Yamari Singapore Pte. Ltd. (YSG)
Tel: +65-6268-0090 Fax: +65-6262-0013
URL: <http://www.yamari.com.sg>
- in South Korea : Yamari Korea Co., Ltd. (YKC)
Tel: +82-31-427-4896-7 Fax: +82-31-427-3516
URL: <http://www.yamari.co.kr>
- in India : Yamari India Temperature Sensor Pvt Ltd. (YIN)
Tel: +91-44-2681-0025 / 86 / 96 Fax: +91-44-2681-0016
URL: <http://www.yamari.co.in>
- Overseas Sales Agencies
in Taiwan : Wade Enterprise Co., Ltd.
Tel: +886-2-8912-1688 Fax: +886-2-8912-1168
URL: <http://www.wade.com.tw>
- in China : Hansin International Trading (Shanghai) Ltd.
Tel: +86-21-3392-6688 Fax: +86-21-3392-7045
URL: <http://www.hansin.com.cn>