

R/S-TYPE

補償導線 R/S-TYPE / 熱電対 でんつい

Thermocouple R-TYPE / S-TYPE

適用領域 / Product Application

R/S TYPE 熱電偶因採用高純度 (99.9999%) 之鉑金以及高純度氧化鋁保護管及絕緣磁子所以能達到 $\pm 0.25\%$ 的高精度要求。此種熱電偶可在真空還元氧化氣體和金屬蒸氣中直接使用。安定性好，也適合於製作熱電偶表準件，但熱電動勢小，溫度誤差值主要來自於補償導線，所以 R/S Type 之補償導線皆採用 CMOCC-7N 精煉單晶無氧銅及精密級鍍銅。

R/S TYPE Thermocouple is made of high purity (99.9999%) platinum and protected by high purity aluminum tube, therefore, it's able to achieve high accuracy of $\pm 0.25\%$ requirement. Such thermocouple element has also high stability in vacuum, oxidizing gases, and metal vapors. Such type of thermocouple has a small thermal EMF. Temperature error value is mainly from the bad compensation wire. Therefore, R/S TYPE of compensation wires are made of refined CMOCC-7N OFC and high quality constantan.



美規 - 補償導線等級
US Thermocouple Grade



日規 JIS C 1610-1981
Japanese



德規 DIN 43710
German



國際等級 IEC 584-3
International

技術資料 / TECHNICAL DATA

種類 Material	適用溫度 Temp Range	耐燃性 Flame Retardant	耐磨性 Friction Resist.	耐油性 Oil Resist.	耐酸鹼性 Chemical Resist.	耐濕性 Waterproof	可繞性 Flexibility
塑膠 PVC	-10 ~ 105C	Bad	Good	Bad	Fair	Good	Excellent
橡膠 EPR/HYP Rubber	-15 ~ 110C	Bad	Good	Good	Good	Good	Excellent
矽膠 Silicone	-60 ~ 200C	Good	Good	Excellent	Excellent	Excellent	Excellent
矽膠 Silicone Waker 750	-60 ~ 300C	Good	Good	Excellent	Excellent	Excellent	Excellent
鐵氟龍 Teflon FEP	-100 ~ 200C	Excellent	Excellent	Excellent	Excellent	Excellent	Good
鐵氟龍 Teflon PFA	-267 ~ 260C	Excellent	Excellent	Excellent	Excellent	Excellent	Good
KAPTON	-267 ~ 316C	Good	Good	Good	Good	Fair	Fair
玻璃纖維 Fiberglass	-100 ~ 500C	Excellent	Fair	Fair	Excellent	Bad	Fair
二氧化矽玻璃纖維 Fiberglass	-100 ~ 710C	Excellent	Fair	Fair	Excellent	Bad	Fair
耐高溫陶瓷纖維 Ceramic Fiber	-100 ~ 1200C	Excellent	Bad	Fair	Excellent	Bad	Fair

縮寫對照表 / ABBREVIATION GUIDE

絕緣體縮寫表			導體縮寫表		
中文	English	Abbreviation	中文	English	Abbreviation
塑膠	PVC	P	無氧銅	Oxygen-Free Copper	OFC
橡膠	EPR/HYP Rubber	R	銅鎳合金	Ni-Copper	Ni-Cu
矽膠	Silicone Rubber	S	鎳鉻合金	Nickel-Chromium	Ni-Cr
鐵氟龍	Teflon FEP	T	鎳鋁合金	Nickel-Alumel	Ni-Al
鐵氟龍	Teflon PFA	T	鐵	Iron	Iron/Fe
KAPTON	KAPTON/Polymide	K	鍍錫銅	Tinned Copper	Tc
玻璃纖維	Fiberglass	G	不鏽鋼	Stainless Steel	SUS304
耐高溫陶瓷纖維	Ceramic Fiber	C			
雲母	Mica	M			

代號 Wire Code	規格 Specification	線徑 Dimension		絕緣材質 Insulation Material	導體材質 Conductor Material		環境溫度 Temp. Range	米 / 卷 Mt/ Coils
		ID (mm)	OD (mm) H x L		正極 (+)	負極 (-)		
PP-RC-22S	0.3/4 x 2 (22 AWG)	1.45	2.60 x 3.80	PVC	OFC	Ni-Copper	0 ~ 105C	200
PP-RC-20S	0.3/7 x 2 (20 AWG)	1.50	2.60 x 3.80	PVC	OFC	Ni-Copper	0 ~ 105C	200
PP-RC-16S	0.6/4 x 2 (16 AWG)	2.45	4.40 x 6.70	PVC	OFC	Ni-Copper	0 ~ 105C	200
PP-RC-14S	0.6/7 x 2 (14 AWG)	3.00	4.55 x 7.65	PVC	OFC	Ni-Copper	0 ~ 105C	200
PSP-RC-14S	0.6/7 x 2 (14 AWG)	3.00	4.90 x 7.80	PVC-SUS304	OFC	Ni-Copper	0 ~ 105C	200
SPP-RC-14S	0.6/7 x 2 (14 AWG)	3.00	5.80 x 8.20	PVC-SUS304	OFC	Ni-Copper	0 ~ 105C	200
GG-RX-28	0.3 x 2 (28 AWG)	0.75	1.40 x 2.50	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
GG-RX-22	0.6 x 2 (22 AWG)	1.10	2.00 x 3.20	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
GG-RX-22S	0.3/4 x 2 (22 AWG)	1.20	2.05 x 3.30	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
GG-RX-20S	0.3/7 x 2 (20 AWG)	1.50	2.00 x 3.50	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
GG-RX-16S	0.6/4 x 2 (16 AWG)	2.15	2.90 x 4.60	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
GG-RX-14S	0.6/7 x 2 (14 AWG)	2.40	3.30 x 5.20	玻璃纖維 Fiberglass	OFC	Ni-Copper	0 ~ 200C	200
SGG-RX-24	0.5 x 2 (24 AWG)	1.00	1.65 x 2.85	玻璃纖維 - 不銹鋼網 Fiberglass-SUS304	OFC	Ni-Copper	0 ~ 200C	200
SGG-RX-22	0.6 x 2 (22 AWG)	1.10	1.75 x 2.95	玻璃纖維 - 不銹鋼網 Fiberglass-SUS305	OFC	Ni-Copper	0 ~ 200C	200
SGG-RX-22S	0.3/4 x 2 (22 AWG)	1.20	1.80 x 3.05	玻璃纖維 - 不銹鋼網 Fiberglass-SUS306	OFC	Ni-Copper	0 ~ 200C	200
HH-R-36	0.127 x 2 (36 AWG)	0.50	0.95 x 1.45	二氧化矽玻璃纖維 Silica Fiber	OFC	Ni-Copper	0 ~ 710C	200
HH-R-33	0.254 x 2 (30 AWG)	0.65	1.10 x 1.55	二氧化矽玻璃纖維 Silica Fiber	OFC	Ni-Copper	0 ~ 710C	200
HH-R-24	0.5 x 2 (24 AWG)	1.00	1.20 x 1.90	二氧化矽玻璃纖維 Silica Fiber	OFC	Ni-Copper	0 ~ 710C	200
HH-R-22	0.6 x 2 (22 AWG)	1.10	1.70 x 2.70	二氧化矽玻璃纖維 Silica Fiber	OFC	Ni-Copper	0 ~ 710C	200
HH-R-20	0.8 x 2 (20 AWG)	1.30	1.75 x 2.75	二氧化矽玻璃纖維 Silica Fiber	OFC	Ni-Copper	0 ~ 710C	200
CC-R-24	0.5 x 2 (24 AWG)	1.00	1.20 x 1.90	陶瓷纖維 Ceramics Fiber	OFC	Ni-Copper	0 ~ 1200C	200
CC-R-20	0.8 x 2 (20 AWG)	1.30	1.75 x 2.75	陶瓷纖維 Ceramics Fiber	OFC	Ni-Copper	0 ~ 1200C	200
TT-RX-36	0.127 x 2 (36 AWG)	0.29	0.42 x 0.75	鐵氟龍 Teflon	OFC	Ni-Copper	0 ~ 200C	200
TT-RX-28	0.3 x 2 (28 AWG)	0.65	1.20 x 1.80	鐵氟龍 Teflon	OFC	Ni-Copper	0 ~ 200C	200
TT-RX-24	0.5 x 2 (24 AWG)	0.85	1.20 x 1.85	鐵氟龍 Teflon	OFC	Ni-Copper	1 ~ 200C	200
TT-RX-22	0.6 x 2 (22 AWG)	1.05	1.60x 2.70	鐵氟龍 Teflon	OFC	Ni-Copper	0 ~ 200C	200
KK-R-24 KK-R-24S	0.5 x 2 (24 AWG) 0.2/7 x 2 (24 AWG)	1.00	1.20 x 2.20	KAPTON	OFC	Ni-Copper	0 ~ 400C	200

ANSI and IEC Color Codes

For Thermocouples, Wire and Connectors

補償導線國際色規 / 各国規格による補償導線カラーコード

All NIZING® Thermocouple Wire, Probes and Connectors are available with either ANSI or IEC Color Codes.



補償導線

ANSI Code	Comments Environment- Bare Wire	Color Coding		International IEC 584-3	International IEC 584-3 Intrinsically Safe	CZECH British to BS 1843	Netherlands German to DIN 43710	Japanese to JIS C 1610- 1981	French to NFE-18801
		Thermocouple Grade	Extension Grade						
J	Reducing Vacuum, Inert, Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.								
K	Clean Oxidizing and Inert, Limited Use in Vacuum or Reducing. Wide Temperature Range. Most Popular Calibration.								
V*	Alternative to KX Type Extension Wire for Low Temperature. Not Recommended for General Use.	None Established	None Established						
T	Mild Oxidizing, Reducing Vacuum or Inert. Good Where Moisture is Present Low Temperature and Cryogenic Applications.								
E	Oxidizing or Inert. Limited Use in Vacuum or Reducing Highest EMF Change Per Degree								
N	Alternative to Type K. More stable at High Temperature						No Standard Use American Color Code		
R	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination High Temperature	None Established							
S	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination High Temperature	None Established							
U*	Extension Guide Connecting Wire for R and S Thermocouples Also Known as RX and SX Extension Wire	None Established							
B	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination High Temperature. Common Use in Glass Industry.	None Established				No Color Standard			No Color Standard
G* (W)	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F) Not for Oxidizing Atmosphere.	None Established				No Standard Use American Color Code			
C* (W5)	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F) Not for Oxidizing Atmosphere.	None Established				No Standard Use American Color Code			
D* (W3)	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F) Not for Oxidizing Atmosphere.	None Established				No Standard Use American Color Code			

補償導線系列

Thermocouple Wire Series