

AMOURED THERMOCOUPLE SERIES

Application

The series normally cooperates with display instrument, recorder and computer, etc. to directly measure temperature of liquid, gas, steam and solid among $0^{\circ}\text{C} \sim 1300^{\circ}\text{C}$ during production process.

Features

1. Less thermal response time, reduce dynamic error.
2. Can bending mount
3. Wide measuring range.
4. High mechanical strength and pressure-resistance ability.

Measuring Range and Tolerance

| Model | Graduation | Tolerance | | | |
|--------|------------|---------------------------|---------------------------------------|---------------------------|---------------------------------------|
| | | I | | II | |
| | | Value | Measuring Range $^{\circ}\text{C}$ | value | Measuring Range $^{\circ}\text{C}$ |
| CMWRNK | K | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +375$ | $\pm 2.5^{\circ}\text{C}$ | $-40 \sim +333$ |
| | | $\pm 0.004\text{tI}$ | $375 \sim 1000$ | $\pm 0.0075\text{tI}$ | $333 \sim 1200$ |
| CMWRMK | N | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +375$ | $\pm 2.5^{\circ}\text{C}$ | $-40 \sim +333$ |
| | | $\pm 0.004\text{tI}$ | $375 \sim 1000$ | $\pm 0.0075\text{tI}$ | $333 \sim 1200$ |
| CMWREK | E | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +375$ | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +333$ |
| | | $\pm 0.004\text{tI}$ | $375 \sim 800$ | $\pm 0.004\text{tI}$ | $333 \sim 900$ |
| CMWRFK | J | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +375$ | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +333$ |
| | | $\pm 0.004\text{tI}$ | $375 \sim 750$ | $\pm 0.004\text{tI}$ | $333 \sim 750$ |
| CMWRCK | T | $\pm 1.5^{\circ}\text{C}$ | $-40 \sim +125$ | $\pm 1^{\circ}\text{C}$ | $-40 \sim +133$ |
| | | $\pm 0.004\text{tI}$ | $125 \sim 350$ | $\pm 0.0075\text{tI}$ | $133 \sim 350$ |
| CMWRPK | S | $\pm 1^{\circ}\text{C}$ | $0 \sim +1100$ | $\pm 2.5^{\circ}\text{C}$ | $0 \sim 600$ |
| | | $\pm [0.003(t-1100)]$ | $1100 \sim 1600$ | $\pm 0.0025\text{tI}$ | $600 \sim 1600$ |

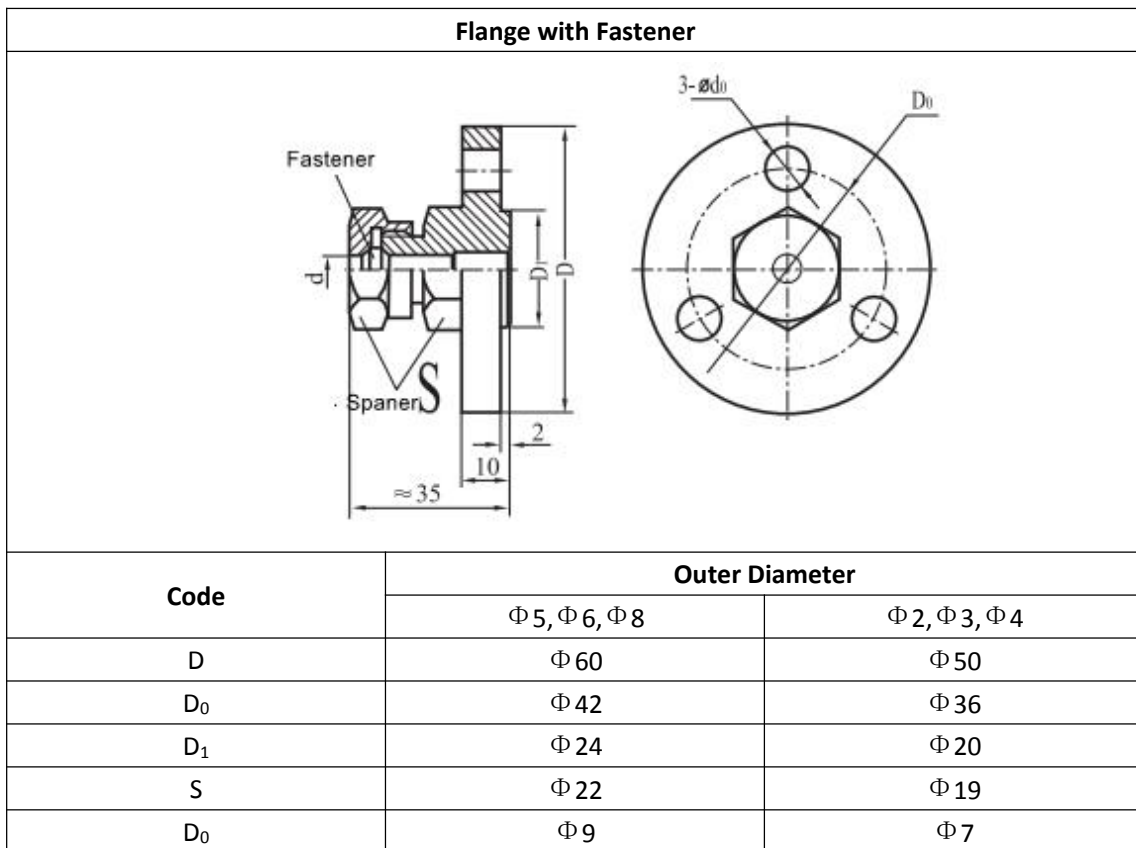
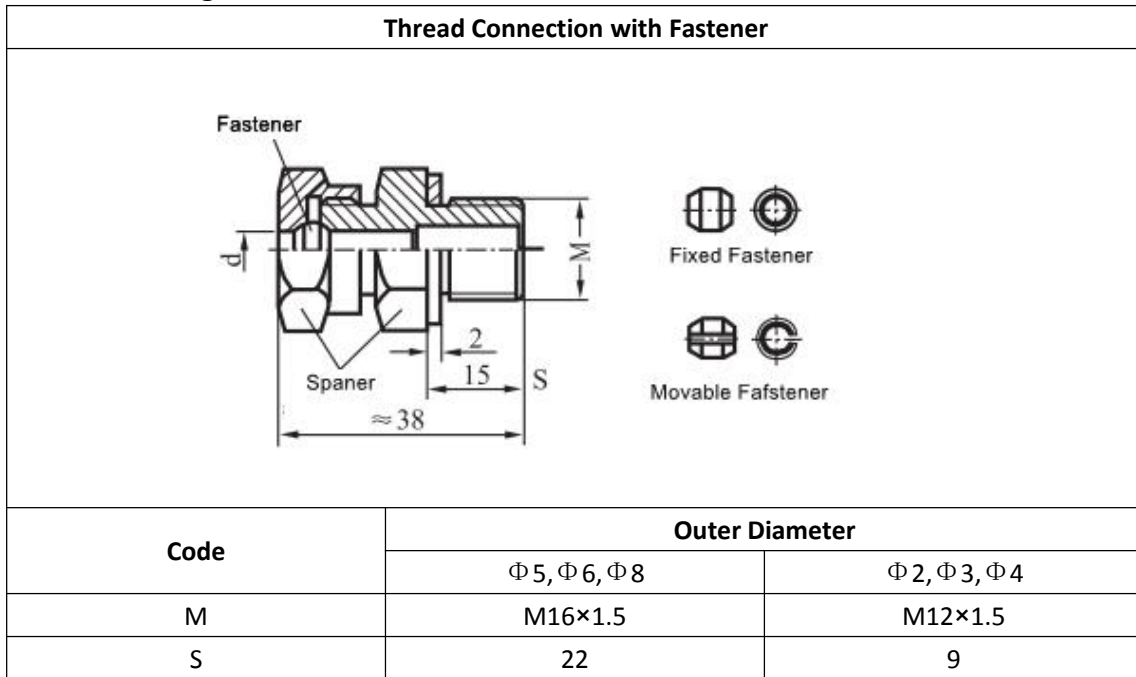
Insulation Resistance at Normal Temperature

The insulation resistance between electrode and protection tube is no less than $1000\text{M}\Omega \cdot \text{m}$ when environment temperature is $20 \pm 15^{\circ}\text{C}$, relative humidity is no more than 80% and test voltage is $500 \pm 50\text{V(DC)}$.

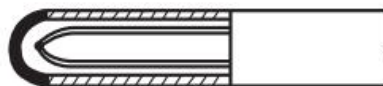
Diameter and Material of Thermocouple Wire

| Thermocouple Type | | Simplex | Duplex |
|-------------------|---------|------------------------------------------------|------------------------------------------|
| Tube Diameter | | $\Phi 2, \Phi 3, \Phi 4, \Phi 5, \Phi 6, \Phi$ | $\Phi 3, \Phi 4, \Phi 5, \Phi 6, \Phi 8$ |
| Tube Material | E, J, T | ICr18Ni9Ti | |
| | K, N | ICr18Ni9Ti / GH3030 | |
| | S | GH3039 | |

Installation Figure

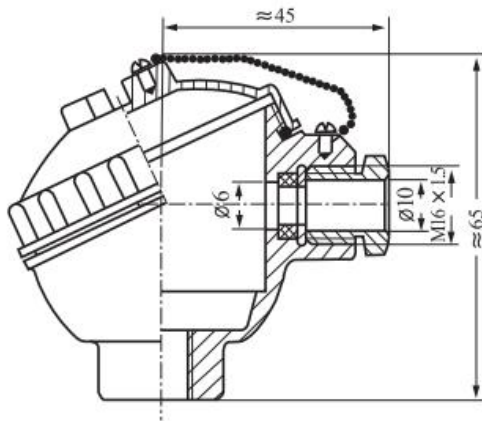


Measuring Tip Structure

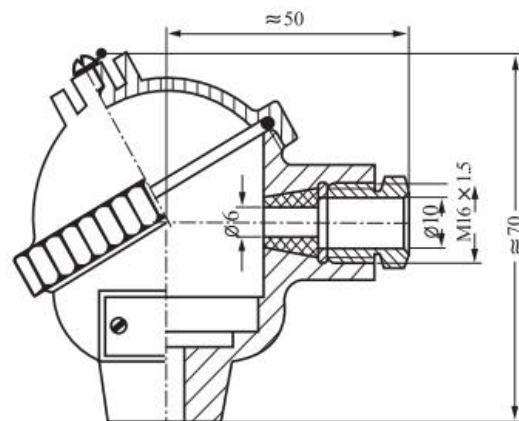


Insulation Type

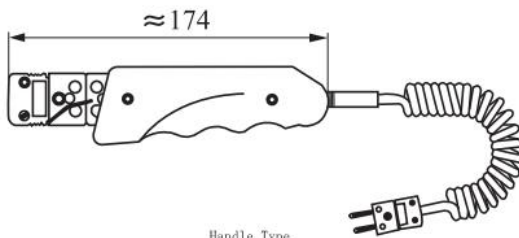
Junction Box



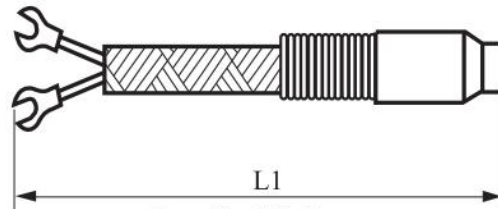
Anti-spray Type



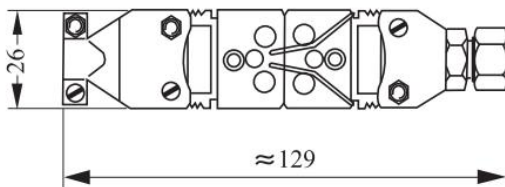
Water-proof Type



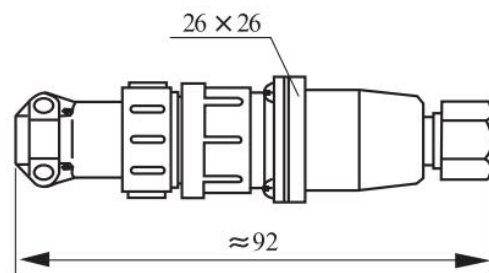
Handle Type



Compensational Wire Type



Flat Plug Type

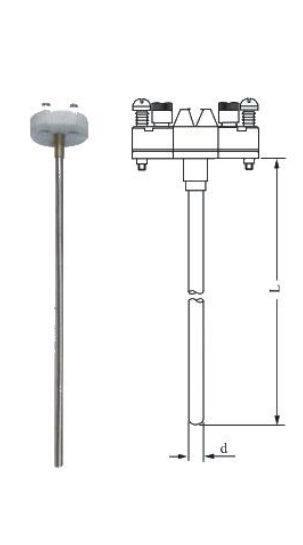


Round Plug Type

Recommend Operation Temperature

| Category | Tube Material | Outer Diameter (mm) | Operation Temperature (°C) | |
|-------------|---------------|---------------------|----------------------------|------------|
| | | | Long Term | Short Term |
| NiCr-NiSi | 1Cr18Ni9Ti | 2.0 | 600 | 700 |
| | | 3.0,4.0,5.0,6.0,8.0 | 800 | 900 |
| | GH3030 | 2.0,3.0 | 800 | 900 |
| | | 4.0,5.0 | 900 | 1000 |
| NiCrSi-NiSi | 1Cr18Ni9Ti | 2.0 | 600 | 700 |
| | | 3.0,4.0,5.0,6.0,8.0 | 800 | 900 |
| | GH3030 | 2.0,3.0 | 900 | 1000 |
| | | 4.0,5.0 | 1000 | 1100 |
| | | 6.0,8.0 | 1100 | 1200 |
| | GH3039 | 2.0,3.0,4.0 | 1000 | 1100 |
| 5.0,6.0,8.0 | | 1100 | 1200 | |
| NiCr-CuNi | 1Cr18Ni9Ti | 2.0 | 500 | 600 |
| | | 3.0,4.0,5.0 | 600 | 700 |
| | | 6.0,8.0 | 700 | 800 |
| Fe-CuNi | 1Cr18Ni9Ti | 2.0 | 400 | 500 |
| | | 2.0,3.0,4.0,5.0 | 500 | 600 |
| | | 6.0,8.0 | 600 | 750 |
| Cu-CuNi | 1Cr18Ni9Ti | 2.0,3.0,4.0,5.0 | 250 | 300 |
| | | 6.0,8.0 | 300 | 350 |
| PtRh10-Pt | GH3039 | 2.0,3.0,4.0 | 1000 | 1100 |
| | | 5.0,6.0,8.0 | 1100 | 1200 |

Sensing Cell

|  | Description | Model | Graduation | Measuring Range (°C) | Dimension | | | |
|-------------------------------------------------------------------------------------|-------------|-----------|------------|----------------------|-----------|-------|----|-----|
| | | | | | d | L | | |
| | NiCrSi-NiSi | CMWRM-101 | N | 0~1000 | Φ3 | 310 | | |
| | NiCr-NiSi | CMWRN-101 | K | | | 360 | | |
| | NiCr-CuNi | CMWRE-101 | E | 0~800 | Φ4 | 60 | | |
| | Cu-CuSi | CMWRC-101 | T | | | 0~350 | Φ5 | 510 |
| | | | | | | | | Φ6 |
| | Fe-CuNi | CMWRF-101 | J | 0~600 | Φ8 | 660 | | |
| 910 | | | | | | | | |
| | | | | | | 1160 | | |

Ordering Code

CMW R K -

1=insulation type ; 2=shell-connecting type

- 2=anti-spray type
- 3=water-proof type
- 4=explosion-proof type
- 6=round plug type
- 7=flat plug type
- 8=handle type
- 9=compensational wire type

- 1=without fixing device
- 2= thread with fixed fastener
- 3=thread with movable fastener
- 4=flange with fixed fastener
- 5=flange with movable fastener

Blank=simplex ; 2=duplex

Amoured Thermocouple

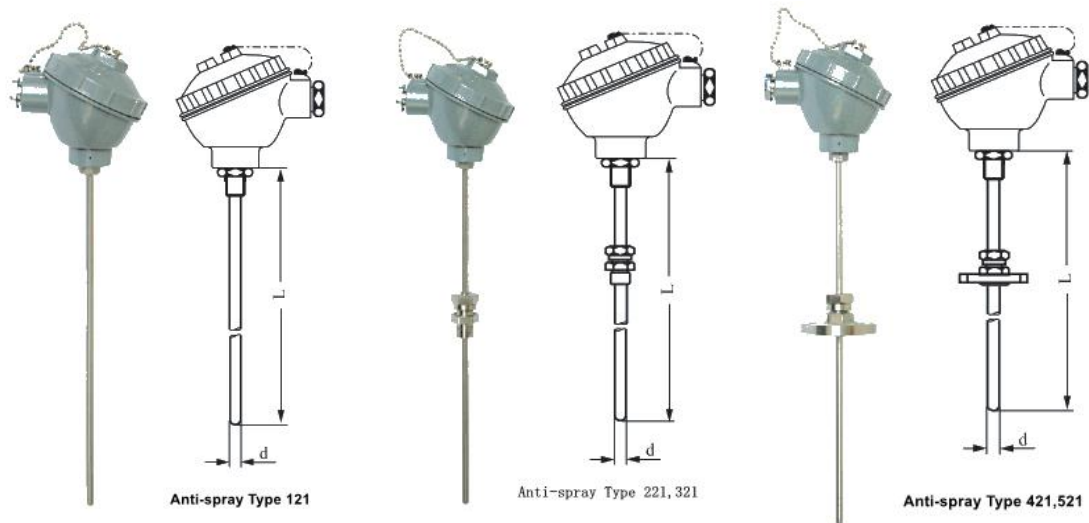
Sensing Cell Material:

- P=PtRh₁₀-Pt
- M=NiCrSi-NiSi
- N=NiCr-NiSi
- E=NiCr-CuNi
- C=Cu-CuNi
- F=Fe-CuNi

Thermocouple

Temperature Instrument

Models of Spray-proof Type



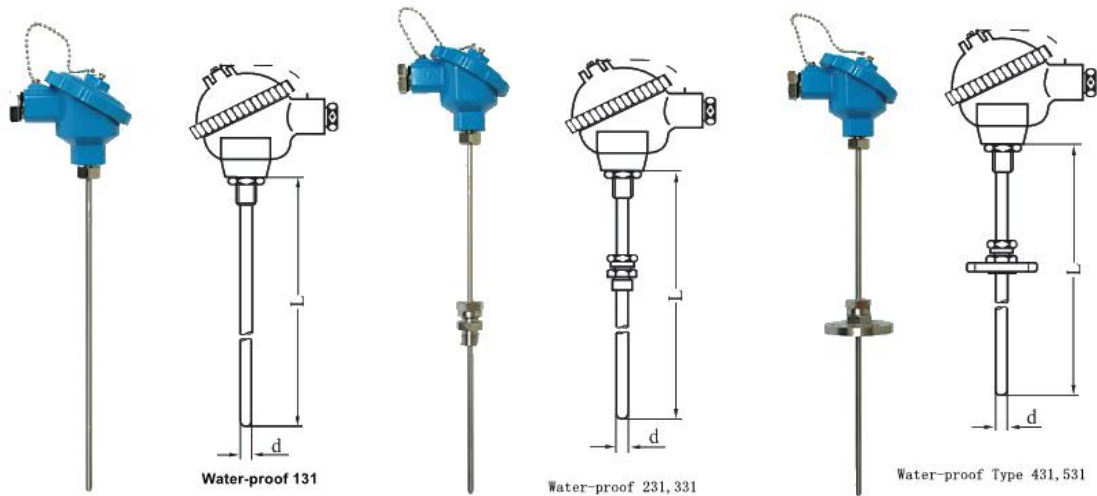
| Model | Graduation | Measuring Range (°C) | Protection Tube Material | Mounting & Fixing |
|--------------------------|------------|----------------------|--------------------------|------------------------------|
| CMWRPK-121 | S | 0~1300 | GH3039 | without fixing device |
| CMWRMK-121 | N | 0~1100 | GH3030 | |
| CMWRMK ₂ -121 | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-121 | K | 0~1100 | GH3030 | |
| CMWRNK ₂ -121 | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-121 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-121 | T | 0~350 | | |
| CMWRFK-121 | J | 0~500 | | |
| CMWRPK-221 | S | 0~1300 | GH3039 | thread with fixed fastener |
| CMWRMK-221 | N | 0~1100 | GH3030 | |
| CMWRMK ₂ -221 | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-221 | K | 0~1100 | GH3030 | |
| CMWRNK ₂ -221 | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-221 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-221 | T | 0~350 | | |
| CMWRFK-221 | J | 0~500 | | |
| CMWRPK-321 | S | 0~1300 | GH3039 | thread with movable fastener |
| CMWRMK-321 | N | 0~1100 | GH3030 | |
| CMWRMK ₂ -321 | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-321 | K | 0~1100 | GH3030 | |
| CMWRNK ₂ -321 | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-321 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-321 | T | 0~350 | | |
| CMWRFK-321 | J | 0~500 | | |



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|--------------------------|---|--------|------------|------------------------------|
| CMWRPK-421 | S | 0~1300 | GH3039 | flange with fixed fastener |
| CMWRMK-421 | N | 0~1100 | GH3030 | |
| CMWRMK ₂ -421 | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-421 | K | 0~1100 | GH3030 | |
| CMWRNK ₂ -421 | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-421 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-421 | T | 0~350 | | |
| CMWRFK-421 | J | 0~500 | | |
| CMWRPK-521 | S | 0~1300 | GH3039 | flange with movable fastener |
| CMWRMK-521 | N | 0~1100 | GH3030 | |
| CMWRMK ₂ -521 | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-521 | K | 0~1100 | GH3030 | |
| CMWRNK ₂ -521 | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-521 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-521 | T | 0~350 | | |
| CMWRFK-521 | J | 0~500 | | |

Models of Water-proof Type



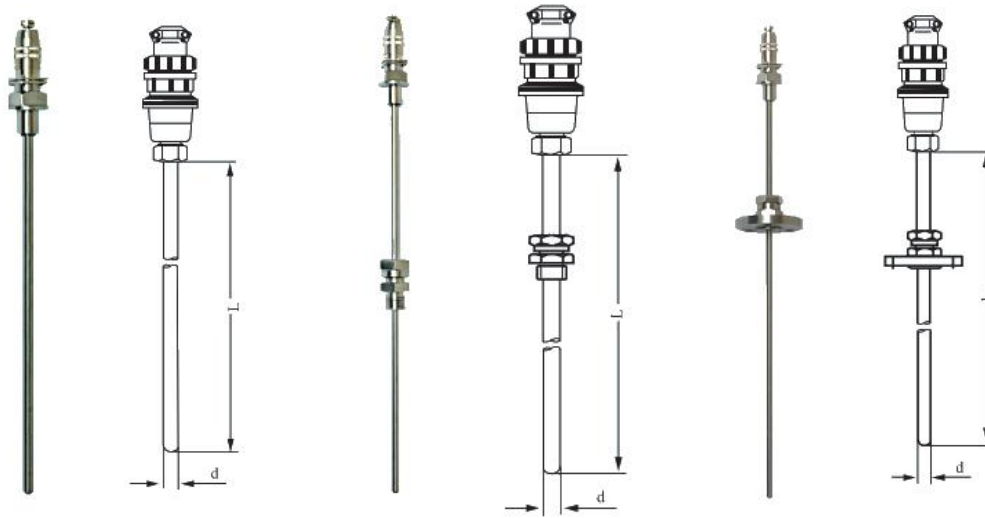
| Model | Graduation | Measuring Range (°C) | Protection Tube Material | Mounting & Fixing |
|------------|------------|----------------------|--------------------------|------------------------------|
| CMWRPK-131 | S | 0~1300 | GH3039 | without fixing device |
| CMWRMK-131 | N | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-131 | K | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-131 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-131 | T | 0~350 | | |
| CMWRFK-131 | J | 0~500 | | |
| CMWRPK-231 | S | 0~1300 | GH3039 | thread with fixed fastener |
| CMWRMK-231 | N | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-231 | K | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-231 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-231 | T | 0~350 | | |
| CMWRFK-231 | J | 0~500 | | |
| CMWRPK-331 | S | 0~1300 | GH3039 | thread with movable fastener |
| CMWRMK-331 | N | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWRNK-331 | K | 0~1100 | GH3030 | |
| | | 0~800 | 1Cr18Ni9Ti | |
| CMWREK-331 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-331 | T | 0~350 | | |
| CMWRFK-331 | J | 0~500 | | |
| CMWRPK-431 | S | 0~1300 | GH3039 | flange with fixed fastener |



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|------------|---|--------|------------|--|------------------------------|
| CMWRMK-431 | N | 0~1100 | GH3030 | | |
| | | 0~800 | 1Cr18Ni9Ti | | |
| CMWRNK-431 | K | 0~1100 | GH3030 | | |
| | | 0~800 | 1Cr18Ni9Ti | | |
| CMWREK-431 | E | 0~600 | 1Cr18Ni9Ti | | |
| CMWRCK-431 | T | 0~350 | | | |
| CMWRFK-431 | J | 0~500 | | | |
| CMWRPK-531 | S | 0~1300 | GH3039 | | flange with movable fastener |
| CMWRMK-531 | N | 0~1100 | GH3030 | | |
| | | 0~800 | 1Cr18Ni9Ti | | |
| CMWRNK-531 | K | 0~1100 | GH3030 | | |
| | | 0~800 | 1Cr18Ni9Ti | | |
| CMWREK-531 | E | 0~600 | 1Cr18Ni9Ti | | |
| CMWRCK-531 | T | 0~350 | | | |
| CMWRFK-531 | J | 0~500 | | | |

Models of Round Plug Type



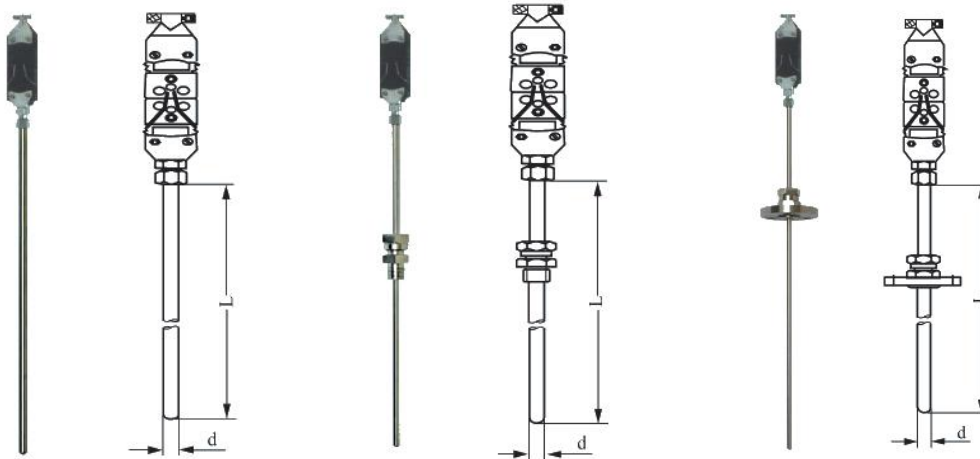
| Model | Graduation | Measuring Range (°C) | Protection Tube Material | Mounting & Fixing |
|------------|------------|----------------------|--------------------------|------------------------------|
| CMWRPK-161 | S | 0~1300 | GH3039 | without fixing device |
| CMWRMK-161 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-161 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-161 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-161 | T | 0~350 | | |
| CMWRFK-161 | J | 0~500 | | |
| CMWRPK-261 | S | 0~1300 | GH3039 | thread with fixed fastener |
| CMWRMK-261 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-261 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-261 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-261 | T | 0~350 | | |
| CMWRFK-261 | J | 0~500 | | |
| CMWRPK-361 | S | 0~1300 | GH3039 | thread with movable fastener |
| CMWRMK-361 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-361 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-361 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-361 | T | 0~350 | | |
| CMWRFK-361 | J | 0~500 | | |
| CMWRPK-461 | S | 0~1300 | GH3039 | flange with fixed fastener |



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|------------|---|------------|------------|--|
| CMWRMK-461 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-461 | K | GH3030 | | |
| | | 1Cr18Ni9Ti | | |
| CMWREK-461 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-461 | T | 0~350 | | |
| CMWRFK-461 | J | 0~500 | | |
| CMWRPK-561 | S | 0~1300 | GH3039 | |
| CMWRMK-561 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-561 | K | GH3030 | | |
| | | 1Cr18Ni9Ti | | |
| CMWREK-561 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-561 | T | 0~350 | | |
| CMWRFK-561 | J | 0~500 | | |

Models of Flat Plug Type



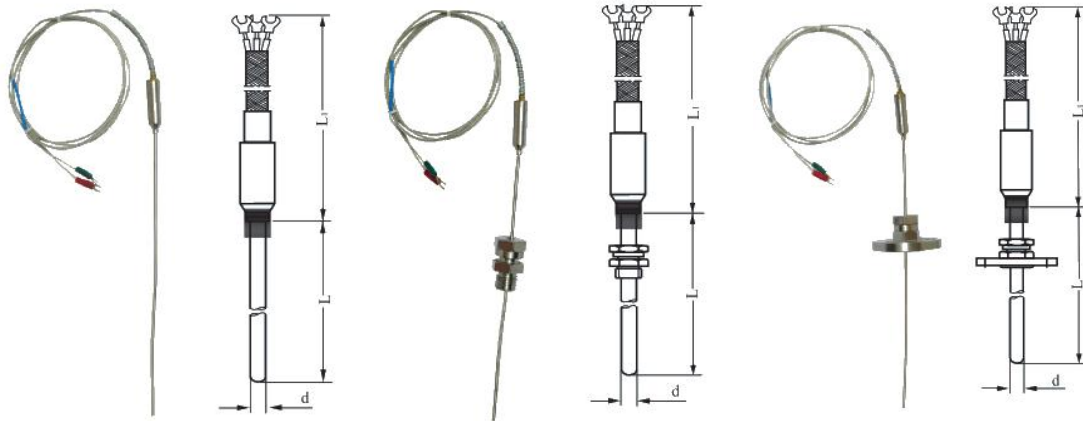
| Model | Graduation | Measuring Range (°C) | Protection Tube Material | Mounting & Fixing |
|------------|------------|----------------------|--------------------------|------------------------------|
| CMWRPK-171 | S | 0~1300 | GH3039 | without fixing device |
| CMWRMK-171 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-171 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-171 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-171 | T | 0~350 | | |
| CMWRFK-171 | J | 0~500 | | |
| CMWRPK-271 | S | 0~1300 | GH3039 | thread with fixed fastener |
| CMWRMK-271 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-271 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-271 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-271 | T | 0~350 | | |
| CMWRFK-271 | J | 0~500 | | |
| CMWRPK-371 | S | 0~1300 | GH3039 | thread with movable fastener |
| CMWRMK-371 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-371 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-371 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-371 | T | 0~350 | | |
| CMWRFK-371 | J | 0~500 | | |
| CMWRPK-471 | S | 0~1300 | GH3039 | flange with fixed fastener |
| CMWRMK-471 | N | 0~1100 | GH3030 | |



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|------------|---|--------|------------|------------------------------|
| | | | 1Cr18Ni9Ti | |
| CMWRNK-471 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-471 | E | 0~600 | 1Cr18Ni9Ti | flange with movable fastener |
| CMWRCK-471 | T | 0~350 | | |
| CMWRFK-471 | J | 0~500 | | |
| CMWRPK-571 | S | 0~1300 | GH3039 | |
| CMWRMK-571 | N | 0~1100 | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWRNK-571 | K | | GH3030 | |
| | | | 1Cr18Ni9Ti | |
| CMWREK-571 | E | 0~600 | 1Cr18Ni9Ti | |
| CMWRCK-571 | T | 0~350 | | |
| CMWRFK-571 | J | 0~500 | | |

Models of Compensational Wire Type



| Model | Graduation | Measuring Range (°C) | Length | | Mounting & Fixing |
|------------|------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------|
| | | | L | L1 | |
| CMWRPK-191 | S | 0~1300 | 100 200 300 400 500 750 1000 1500 2000 3000 4000 5000 7500 10000 15000 25000 | 500 750 1500 2000 3000 4000 10000 15000 25000 | without fixing device |
| CMWRMK-191 | N | 0~1100 | | | |
| CMWRNK-191 | K | | | | |
| CMWREK-191 | E | 0~600 | | | |
| CMWRCK-191 | T | 0~350 | | | |
| CMWRFK-191 | J | 0~500 | | | |
| CMWRPK-291 | S | 0~1300 | | | thread with fixed fastener |
| CMWRMK-291 | N | 0~1100 | | | |
| CMWRNK-291 | K | | | | |
| CMWREK-291 | E | 0~600 | | | |
| CMWRCK-291 | T | 0~350 | | | |
| CMWRFK-291 | J | 0~500 | | | |
| CMWRPK-391 | S | 0~1300 | | | thread with movable fastener |
| CMWRMK-391 | N | 0~1100 | | | |
| CMWRNK-391 | K | | | | |
| CMWREK-391 | E | 0~600 | | | |
| CMWRCK-391 | T | 0~350 | | | |
| CMWRFK-391 | J | 0~500 | | | |
| CMWRPK-491 | S | 0~1300 | flange with fixed fastener | | |
| CMWRMK-491 | N | 0~1100 | | | |
| CMWRNK-491 | K | | | | |
| CMWREK-491 | E | 0~600 | | | |
| CMWRCK-491 | T | 0~350 | | | |
| CMWRFK-491 | J | 0~500 | | | |
| CMWRPK-591 | S | 0~1300 | flange with movable fastener | | |
| CMWRMK-591 | N | 0~1100 | | | |
| CMWRNK-591 | K | | | | |



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|------------|---|-------|--|--|--|
| CMWREK-591 | E | 0~600 | | | |
| CMWRCK-591 | T | 0~350 | | | |
| CMWRFK-591 | J | 0~500 | | | |