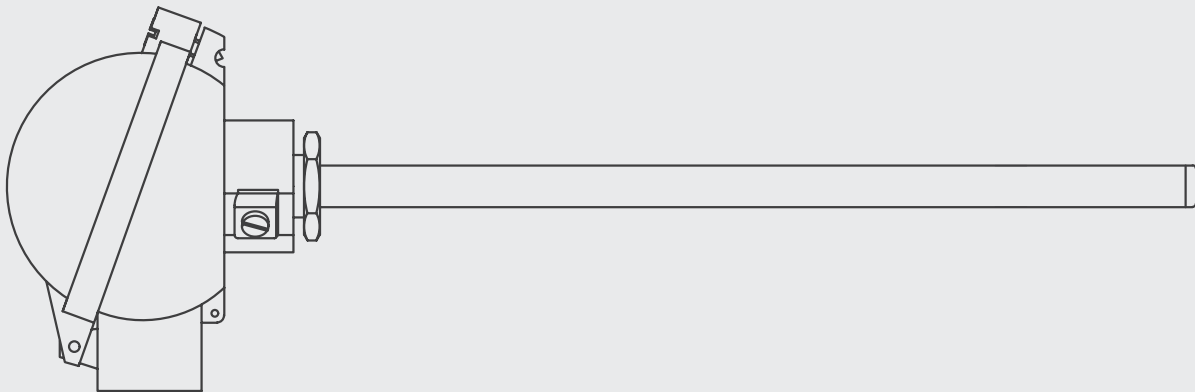


# Spring loaded thermocouple

THERMOWELL & REPLACEABLE INSERT

**C100-101-102-103-160-162**  
**CONFIGURATIONS**

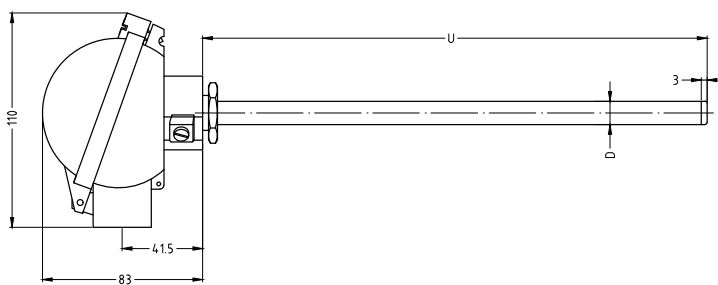
**General use TC**



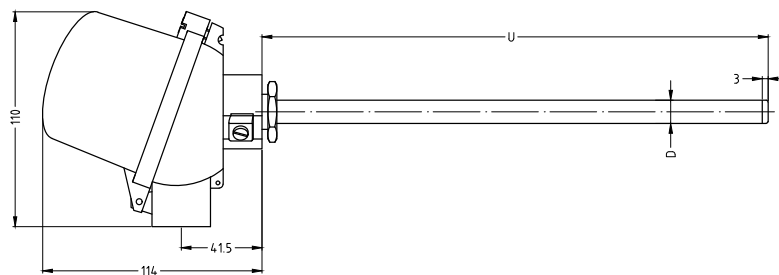
**RODAX**<sup>o</sup>  
new temperature solutions

Product series TCRB/WT

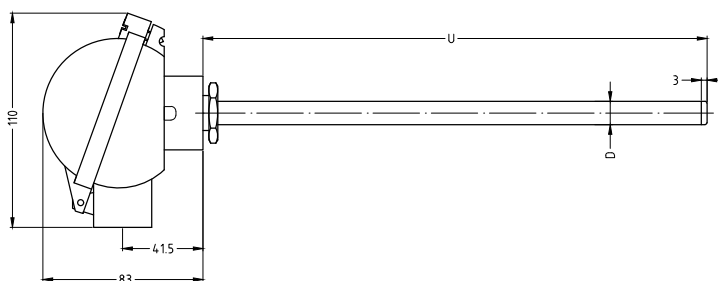
C100



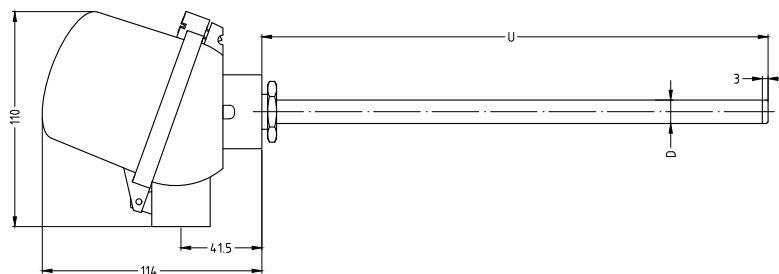
C101



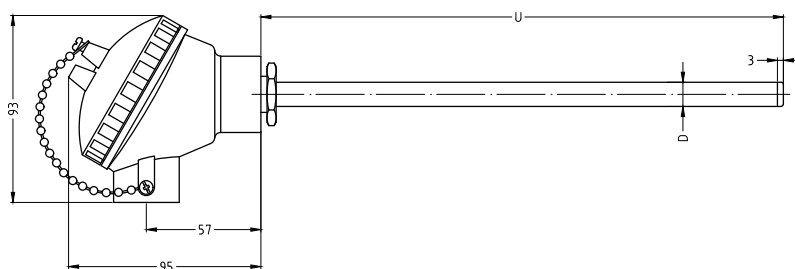
C102



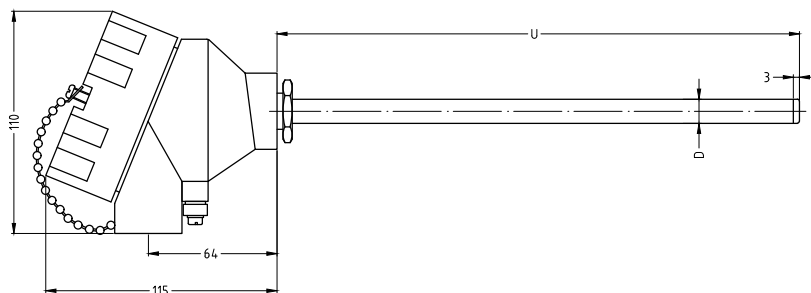
C103



C160



C162



## Features assembly

The industrial spring loaded configuration guarantees a positive contact between the sensing part of the temperature probe and the bottom of the thermowell, thus reducing the response time. Process connection can be realized by e.g. adjustable compression fittings.

The assemblies can be delivered with an aluminium or stainless steel connection head combined with a high quality thermocouple element with MgO mineral insulated metal sheathed cable, providing excellent stability and reproducibility.  
Sensor diameters up to 12,7mm.

## Technical specification assembly

- Connection head aluminium (C100-C101-C102-C103-C160-162).
- Ambient temperature range assembly: -45/+80 °C; this can be limited depending on the materials applied or in case a temperature transmitter is used.
- IP-68 protection degree (body – cover) with silicone rubber O-ring. The assembly protection degree (IP-68) can be attained but depends on the use of correct cable gland(s) and on the correct mounting to thermowells.
- Cover: hinged type or screw type with chain.
- Several sensor diameters and lengths are possible.

**Table 1: Configuration**

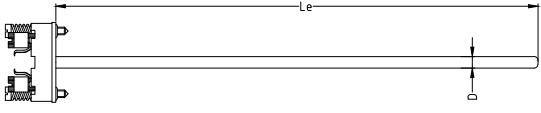
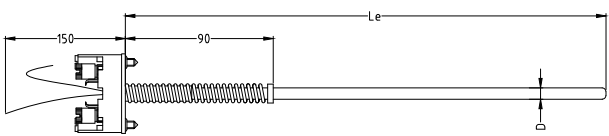
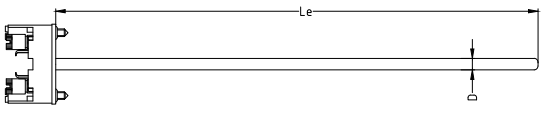
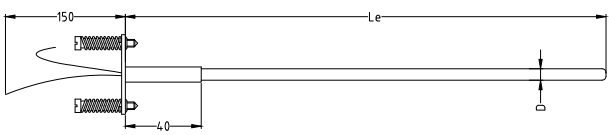
## Connection head type

Choice between:

- Connection head types C100 / C101 / C102 / C103 with hinged type cover with 1 or 2 conduit openings.
- Connection head types C160 / C162 with screw type cover with 1 or 2 conduit openings.
- Connection head supplied with O-ring in silicone rubber (between body and cover).

|                 | Conduit                  | Material      | Coating  | Colour                |
|-----------------|--------------------------|---------------|--|-----------------------|
| <b>C100</b>     | 00A1<br>1x conduit       | Aluminium     | Epoxy<br>Corrosion category<br>EN ISO 12944-2: C4                          | RAL9002<br>Grey white |
| <b>C101</b>     | 01A1<br>1x conduit       | Aluminium     | Epoxy<br>Corrosion category<br>EN ISO 12944-2: C4                          | RAL9002<br>Grey white |
| <b>C100/101</b> | 00A2/01A2<br>2x conduits | Aluminium     | Epoxy<br>Corrosion category<br>EN ISO 12944-2: C4                          | RAL9002<br>Grey white |
| <b>C102</b>     | 02S1<br>1x conduit       | Polyamide PA6 | None   | Blue                  |
| <b>C103</b>     | 03S1<br>1x conduit       | Polyamide PA6 | None   | Blue                  |
| <b>C160</b>     | 60B1<br>1x conduit       | Aluminium     | Epoxy<br>Corrosion category<br>EN ISO 12944-2: C4                          | RAL9002<br>Grey white |
| <b>C162</b>     | 62B2<br>2x conduits      | Aluminium     | Polyurethane spray on primer<br>Corrosion category<br>EN ISO 12944-2: C5-M | RAL7035<br>Light grey |

**Table 2: Measuring inserts main models**

|             | <b>Terminal</b>  | <b>Total spring</b>                                |  |
|-------------|--|--|--|
| <b>TCAA</b> | Ceramic spring loaded terminal block 2/4/6 or 8 terminals                                      | 10 mm<br>We recommend a spring loading of +/-5 mm  |    |
| <b>TCBB</b> | Hi-tech spring loaded thermoplast (moisture and shock proof) terminal block 2/4 or 6 terminals | 40 mm<br>We recommend a spring loading of +/-20 mm |    |
| <b>TCBA</b> | Hi-tech spring loaded thermoplast (moisture and shock proof) terminal block 2/4 or 6 terminals | 10 mm<br>We recommend a spring loading of +/-5 mm  |   |
| <b>TCEA</b> | Spring loaded mounting plate with flying leads of 150 mm                                       | 10 mm<br>We recommend a spring loading of +/-5 mm  |  |

**Table 3: Measuring inserts details**

## Details

- Thermocouple types: J/K/T/E/N/S/R/B
- Thermocouple standards: EN/IEC 60584 and/or ANSI MC96-1
- Minimum insulation resistance: 1000 MOhm at 500VDC,  $T_{amb}=20\text{ °C}$
- Conductors: thermocouple material
- Metal sheath: see table

## TC Type

| <b>J</b>                                      | <b>K</b>                                      | <b>T</b>                                      | <b>E</b>                                      | <b>N</b>                                      |
|---|---|---|---|---|
| Fe – CuNi                                     | NiCr – NiAl                                   | Cu – CuNi                                     | NiCr – CuNi                                   | NiCrSi – NiSi                                 |
| ±1.5 between -40 °C and 375 °C or ±0.004xT °C | ±1.5 between -40 °C and 375 °C or ±0.004xT °C | ±0.5 between -40 °C and 125 °C or ±0.004xT °C | ±1.5 between -40 °C and 375 °C or ±0.004xT °C | ±1.5 between -40 °C and 375 °C or ±0.004xT °C |

## Colour code

| <b>ANSI</b>   | <b>IEC</b>     | <b>Other</b> |
|---------------|----------------|--------------|
| ANSI – MC96-1 | EN/IEC 60584-1 |              |

## TC element

| <b>S</b>            | <b>D</b>          | <b>T</b>            |
|---------------------|-------------------|---------------------|
| Single thermocouple | Dual thermocouple | Triple thermocouple |

## Diameter ØD

| <b>D3</b> | <b>D3,2</b> | <b>D4,5</b> | <b>D4,8</b> | <b>D6</b> | <b>D6,35</b> | <b>D8</b> | <b>D9,53</b> | <b>D12,7</b> | <b>Other diameters on request</b> |
|-----------|-------------|-------------|-------------|-----------|--------------|-----------|--------------|--------------|-----------------------------------|
| 3,0 mm    | 3,2 mm      | 4,5 mm      | 4,8 mm      | 6,0 mm    | 6,35 mm      | 8,0 mm    | 9,53 mm      | 12,7 mm      |                                   |

## Sheath material

| <b>M2102</b> | <b>M2107</b>                 | <b>M2110</b> | <b>M0601</b>                     | <b>M0701</b> | <b>M0704</b> | <b>M0809</b> |
|--------------|------------------------------|--------------|----------------------------------|--------------|--------------|--------------|
| SS304        | SS316<br>Standard for TC J/T | SS310        | Inconel 600<br>Standard for TC K | Alloy 800H   | Alloy 825    | Hastelloy X  |

## Hot junction

|           |                       |  |
|-----------|-----------------------|--|
| <b>I</b>  | Individually isolated | Hot junction electrically isolated from and shielded by the sheath.  |
| <b>CI</b> | Commonly isolated     | Multiple hot junctions joined to one hot junction electrically isolated from and shielded by the sheath.   |
| <b>DI</b> | Dually isolated       | Hot junction electrically isolated from and shielded by the sheath.<br>For dual and triple: all circuits isolated from each other and from the sheath. |
| <b>G</b>  | Grounded              | Hot junction welded to the sheath.   |

**Table 4: Thermowell–Protection tube**

### Protection tube

Stainless steel tube with 3 mm welded plug with rotatable or not-rotatable connection to head.

### Material Protection tube

| <b>M2108</b> | <b>M2102</b> | <b>M2110/8</b> | <b>M0601</b> | <b>M0805</b>   | Other materials on request |
|--------------|--------------|----------------|--------------|----------------|----------------------------|
| SS316L       | SS304L       | SS310/310S     | Inconel 600  | Hastelloy C276 |                            |

### Dimensions Protection tube

| <b>D0610</b>        | <b>D0810</b>        | <b>D1015</b>           | <b>D1215</b>           | <b>D1425</b>           | Other dimensions on request |
|---------------------|---------------------|------------------------|------------------------|------------------------|-----------------------------|
| 6 mm OD x Wall 1 mm | 8 mm OD x Wall 1 mm | 10 mm OD x Wall 1,5 mm | 12 mm OD x Wall 1,5 mm | 14 mm OD x Wall 2,5 mm |                             |

### Positioning connection head

|           |                           |
|-----------|---------------------------|
| <b>YR</b> | Rotatable connection head |
| <b>NR</b> | Fixed connection head     |

### Insertion length

|          |              |
|----------|--------------|
| <b>U</b> | Length in mm |
|          |              |

**Table 5: Connection head details**

### Connection head single/double conduits (SC/DC)

| <b>SC173</b> | <b>SC405</b> | <b>DC173</b> | <b>DC405</b> |
|--------------|--------------|--------------|--------------|
| 1X M20x1.5   | 1X ½"NPT     | 2x M20x1.5   | 2X ½"NPT     |

**Table 6: Connection head accessories**

## DC heads

- **For DC connection heads: One conduit plugged**

Please use the following code

|                 |                       |               |
|-----------------|-----------------------|---------------|
| <b>Material</b> | Brass                 | <b>PM0200</b> |
|                 | Nickel plated brass   | <b>PM0210</b> |
|                 | Stainless steel SS316 | <b>PM2107</b> |

**Table 7: Certification possibilities**

## Certificates

Following tests and certificates are possible and are either done in-house or done by an external party.

| <b>Code</b>   | <b>Certificates</b>   |
|---------------|---|
| <b>Q04210</b> | Functional test report sensor   |
| <b>Q04230</b> | Calibration report (measuring points to be indicated) E.g. 100/200 °C                                     |
| <b>Q05220</b> | Calibration report by accredited calibration lab retraceable (measuring points to be indicated)           |
| <b>Q05230</b> | Calibration report by accredited calibration lab ISO/IEC 17025 (BELAC) (measuring points to be indicated) |
| <b>Q02040</b> | Test report EN10204-2.2   |
| <b>Q04250</b> | Transmitter programming. Range and burn-out settings to be indicated                                      |

## HOW TO ORDER (example)

| Code                               |             | Example | Your code |
|------------------------------------|-------------|---------|-----------|
| <b>Configuration</b>               | See table 1 | C101    |           |
| <b>Main model</b>                  | See table 2 | KAA     |           |
| <b>TC type</b>                     | See table 3 | K       |           |
| <b>Colour code</b>                 | See table 3 | IEC     |           |
| <b>TC element</b>                  | See table 3 | D       |           |
| <b>Diameter ØD</b>                 | See table 3 | D6      |           |
| <b>Sheath material</b>             | See table 3 | M0601   |           |
| <b>Hot junction</b>                | See table 3 | I       |           |
| <b>Material protection tube</b>    | See table 4 | M2108   |           |
| <b>Dimensions protection tube</b>  | See table 4 | D1215   |           |
| <b>Positioning connection head</b> | See table 4 | YR      |           |
| <b>Insertion length U (mm)</b>     | See table 4 | U200    |           |
| <b>Connection head SC/DC</b>       | See table 5 | DC173   |           |
| <b>Connection head accessories</b> | See table 6 | PM0200  |           |

Ordering code example:

C101 KAA K IEC D D6 M0601 I M2108 D1215 YR U200 DC173 PM0200

**For all options: please contact Rodax**



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Santvoortbeeklaan 33, 2100 Antwerp - Belgium

T +32 (0)3 360 90 00

E [quotationdesk@rodax-europe.com](mailto:quotationdesk@rodax-europe.com)

[www.rodax-europe.com](http://www.rodax-europe.com)

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**C100-Gen-TC GB 201901**