

# SHEATH TYPE THERMOCOUPLE

NEW-FLOW sheath type thermocouple is high precision and reliability measuring temperature sensor.

## Technical Data

**Head housing:** IP65. Explosion proof available  
**K,E,J,T type available.**

**Dial size:**  $\varnothing 1.0 \sim \varnothing 8.0$  mm on request

**Sheath material:** SS316, SS310, inconel 600 on request

**Working temperature limited:**  $-200 \sim 1050^{\circ}\text{C}$   
 according to applicable standards table.

**Measuring junction type:** Grounded type, Ungrounded type,  
 Ungrounded separated type

## Element Material

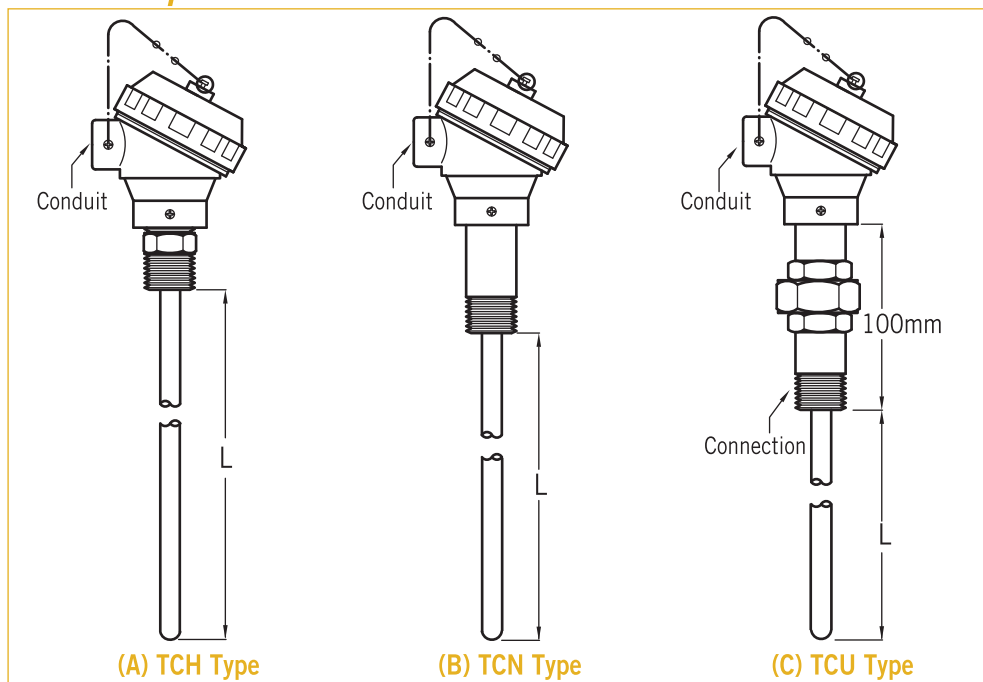
| Symbol   | Positive Polarity (+)                | Negative Polarity (-)      |
|----------|--------------------------------------|----------------------------|
| <b>N</b> | Alloy: nickel, chromium and silicone | Alloy: nickel and silicone |
| <b>K</b> | Alloy: nickel and chromium           | Alloy: nickel              |
| <b>E</b> | Alloy: nickel and chromium           | Alloy: copper and nickel   |
| <b>J</b> | Iron                                 | Alloy: copper and nickel   |
| <b>T</b> | Copper                               | Alloy: copper and nickel   |



Explosion proof

IP65

## Thermocouple Model

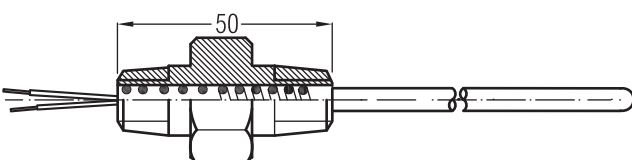
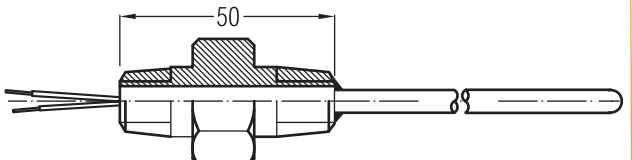
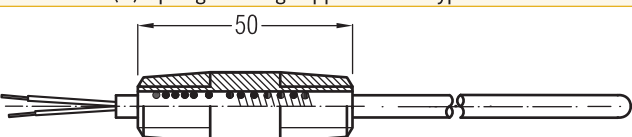
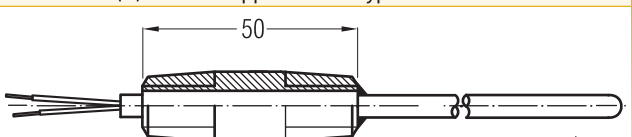


(A) TCH Type

(B) TCN Type

(C) TCU Type

## Sensor Type

|                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| (A) Spring Loading Hexagonal Head Thread Type                                       | (C) Welded Hexagonal Head Thread Type                                                |
|  |  |
| (B) Spring Loading Nipple Thread Type                                               | (D) Welded Nipple Thread Type                                                        |
|  |  |

unit=mm

## Measuring Junction Type



(A) Grounded Type



(B) Ungrounded Type



(C) Ungrounded Separated Type

(A) It is not suitable for using in location such as electromagnetic induction interfered by radio frequency.

(B) It has response slower than grounded. But ensured a long life, it is available for measuring in various location.

(C) It could be used in two control loop separately.

## Thermocouple Sensor Size

| SINGLE ELEMENT | Sheath (mm) |      | Wire dia. (mm) | Maximum Temperature Range (in air) Limited (unit:°C) |                     |                     |                    |                    | Maximum Length Available (unit:M) |
|----------------|-------------|------|----------------|------------------------------------------------------|---------------------|---------------------|--------------------|--------------------|-----------------------------------|
|                | O.D         | t    |                | N                                                    | K                   | E                   | J                  | T                  |                                   |
|                | Ø1.0        | 0.17 | Ø0.17          | 900 <sup>(3)</sup>                                   | 650 <sup>(1)</sup>  | 650 <sup>(1)</sup>  | 450 <sup>(1)</sup> | 300 <sup>(1)</sup> | 400                               |
|                | Ø1.6        | 0.27 | Ø0.27          | 1200 <sup>(3)</sup>                                  | 650 <sup>(1)</sup>  | 650 <sup>(1)</sup>  | 450 <sup>(1)</sup> | 300 <sup>(1)</sup> | 180                               |
|                | Ø3.2        | 0.47 | Ø0.51          | 1260 <sup>(3)</sup>                                  | 750 <sup>(1)</sup>  | 750 <sup>(1)</sup>  | 650 <sup>(1)</sup> | 350 <sup>(1)</sup> | 130                               |
|                | Ø4.8        | 0.72 | Ø0.76          | 1260 <sup>(3)</sup>                                  | 800 <sup>(1)</sup>  | 800 <sup>(1)</sup>  | 750 <sup>(1)</sup> | 350 <sup>(1)</sup> | 140                               |
|                | Ø6.4        | 0.93 | Ø1.0           | 1260 <sup>(3)</sup>                                  | 1000 <sup>(3)</sup> | 900 <sup>(2)</sup>  | 800 <sup>(1)</sup> | 750 <sup>(1)</sup> | 80                                |
|                | Ø8.0        | 1.16 | Ø1.3           | —                                                    | 1050 <sup>(3)</sup> | 1000 <sup>(2)</sup> | 900 <sup>(1)</sup> | 800 <sup>(1)</sup> | 50                                |
|                | Ø3.2        | 0.47 | Ø0.51          | —                                                    | 750 <sup>(1)</sup>  | 750 <sup>(1)</sup>  | 650 <sup>(1)</sup> | 350 <sup>(1)</sup> | 130                               |
|                | Ø4.8        | 0.72 | Ø0.76          | —                                                    | 800 <sup>(1)</sup>  | 800 <sup>(1)</sup>  | 750 <sup>(1)</sup> | 350 <sup>(1)</sup> | 140                               |
|                | Ø6.4        | 0.93 | Ø1.0           | —                                                    | 1000 <sup>(3)</sup> | 900 <sup>(2)</sup>  | 800 <sup>(1)</sup> | 750 <sup>(1)</sup> | 80                                |
|                | Ø8.0        | 1.16 | Ø1.3           | —                                                    | 1050 <sup>(3)</sup> | 1000 <sup>(2)</sup> | 900 <sup>(1)</sup> | 800 <sup>(1)</sup> | 50                                |

\*Material:  
(1) SS316  
(2) SS310  
(3) Inconel 600

## Applicable Standards Table

| Standard | IEC 584-2-1982 / JIS C1605-1995 |                 |               | ASTM E230-1996 |                 |                 |
|----------|---------------------------------|-----------------|---------------|----------------|-----------------|-----------------|
|          | Class                           | Temp. Range(°C) | Tolerance(°C) | Class          | Temp. Range(°C) | Tolerance(°C)   |
| N & K    | 1                               | -40~+375        | ±1.5          | STD.           | 0~+1260         | ±2.2 or ±0.75 % |
|          |                                 | +375~+1000      | ±0.004 t      |                |                 |                 |
|          | 2                               | -40~+333        | ±2.5          | SP.            | 0~+1260         | ±1.1 or ±0.4 %  |
|          |                                 | +333~+1200      | ±0.0075 t     |                |                 |                 |
|          | 3                               | -167~+40        | ±2.5          | STD.           | -200~0          | ±2.2 or ±2 %    |
|          |                                 | -200~-167       | ±0.015 t      |                |                 |                 |
| E        | 1                               | -40~+375        | ±1.5          | STD.           | 0~+870          | ±1.7 or ±0.5 %  |
|          |                                 | +375~+800       | ±0.004 t      |                |                 |                 |
|          | 2                               | -40~+333        | ±2.5          | SP.            | 0~+870          | ±1 or ±0.4 %    |
|          |                                 | +333~+900       | ±0.0075 t     |                |                 |                 |
|          | 3                               | -167~+40        | ±2.5          | STD.           | -200~0          | ±1.7 or ±1 %    |
|          |                                 | -200~-167       | ±0.015 t      |                |                 |                 |
| J        | 1                               | -40~+375        | ±1.5          | STD.           | 0~+760          | ±2.2 or ±0.75 % |
|          |                                 | +375~+750       | ±0.004 t      |                |                 |                 |
|          | 2                               | -40~+333        | ±2.5          | SP.            | 0~+760          | ±1.1 or ±0.4 %  |
|          |                                 | +333~+750       | ±0.0075 t     |                |                 |                 |
| T        | 1                               | -40~+125        | ±0.5          | STD.           | 0~+370          | ±1 or ±0.75 %   |
|          |                                 | +125~+350       | ±0.004 t      |                |                 |                 |
|          | 2                               | -40~+133        | ±1.0          | SP.            | 0~+370          | ±0.5 or ±0.4 %  |
|          |                                 | +133~+350       | ±0.0075 t     |                |                 |                 |
|          | 3                               | -67~+40         | ±1.0          | STD.           | -200~0          | ±1 or ±1.5 %    |
|          |                                 | -200~-67        | ±0.0075 t     |                |                 |                 |

## Ordering Information

|              |                                                            |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|--------------|------------------------------------------------------------|-----|-----|---|-------|--|---|-----------------------------------|-------------|--|--|---|--------|--|-------------------------------|
| <b>Model</b> | TCH                                                        | TCN | TCU |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Head Housing Protection</b>                             |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | IP65 (1) HN (2) HP (3) HD (4) HI (5) HB                    |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | Explosion proof (6) XDS (7) S1 (8) S2                      |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sensor Type</b>                                         |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| A            | Spring Loading Hexagonal Head Thread Type                  |     |     |   |       |  | C | Welded Hexagonal Head Thread Type |             |  |  |   |        |  |                               |
| B            | Spring Loading Nipple Thread Type                          |     |     |   |       |  | D | Welded Nipple Thread Type         |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sensor Connection Size</b>                              |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | Thread type (1) ½" NPT (2) ¾" NPT (3) Option               |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Conduit Connection</b>                                  |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | (A) ½" NPT Female (B) ¾" NPT Female (O) option             |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sensor Dimensions "O.D" mm</b>                          |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | (1) 1.0 (2) 1.6 (3) 3.2 (4) 4.8 (5) 6.4 (6) 8.0 (O) option |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sheath Material</b>                                     |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| A            | SS316                                                      |     |     | B | SS310 |  |   | C                                 | Inconel 600 |  |  | O | Option |  |                               |
| <b>Code</b>  | <b>Element Type</b>                                        |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | N                                                          |     | K   |   | E     |  | J |                                   | T           |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Element No</b>                                          |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| S            | Single                                                     |     |     |   |       |  | D |                                   | Double      |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Measuring Junction</b>                                  |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| G            | Grounded type                                              |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| U            | Ungrounded type                                            |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| US           | Ungrounded separated type                                  |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sensor Class</b>                                        |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | (1) Class 1 (2) Class 2 (3) Class 3                        |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
| <b>Code</b>  | <b>Sensor insertion Length "L"</b>                         |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              | Please directly fill in requesting length (mm).            |     |     |   |       |  |   |                                   |             |  |  |   |        |  |                               |
|              |                                                            |     |     |   |       |  |   |                                   |             |  |  |   |        |  | <b>Complete Ordering Code</b> |