



Thermometers



- ★ Standart Gauges
- ★ Steel Case Gauges
- ★ Stainless Steel Gauges
- ★ Stainless Steel Safety Gauges

- ★ Differential Pressure Gauges
- ★ Capsule Pressure Gauges
- ★ Horizontal Diaphragm Gauges
- ★ Test Gauges

- ★ Electric Contact Gauges
- ★ Accessories
- ★ Diaphragm Seperate Gauges
- ★ Bimetal Thermometers
- ★ Thermowells



Bimetallic Thermometer

► **BT-P**

Summary

BT series bimetallic thermometers are designed to directly measure low and medium temperature of fluid steam. The sensing element "Bimetallic Coil" is composed of 2 indivisible metal sheets. Since the 2 metals have different rates of thermal expansion, the bimetal deforms varying with temperature. This expansion is almost in proportion to temperature. The one end of bimetal is fixed, the other end is connected to mechanism to drive pointer.

Features:

- ◆ The sensing elements adopt Japan bi-metal spirals. Quick response and high accuracy.
- ◆ The crimped and is from arc welded AISI 304 St.St. case has very good resistance to vibration, corrosion and splash.



Technical

| | |
|--------------|---|
| Model | BT-P (100), BT-P(127), BT-P(150) |
| Diameter | Φ 100mm; Φ 127mm; Φ 150mm |
| Accuracy | 1%; 1.5%; 2.5% Full scale |
| Range | -50~500°C |
| Enclosure | AISI304, crimped bezel (bayonet optional) |
| Wetted Parts | AISI304; AISI316; Optional AISI 316L |
| Connection | R1/2", 1/2" NPT, M20X1.5, Sanitary flanges |
| Stem | Φ 6mm; Φ 6.35mm; Φ 8mm; Φ 10mm; Φ 12mm |
| Remark | recalibrator, other connections & thermowells available |

How to Order

Please specify the following properties when the thermometer ordering.

- Model number,
- Dial size,
- Dry or Liquid filled (GD=Glycerin filled, SD=Silicone filled)
- Range and temperature unit (C or F)
- Enclosure (B=Bajonet C=Crimped)
- Connection type,
- Connection thread,
- Accuracy

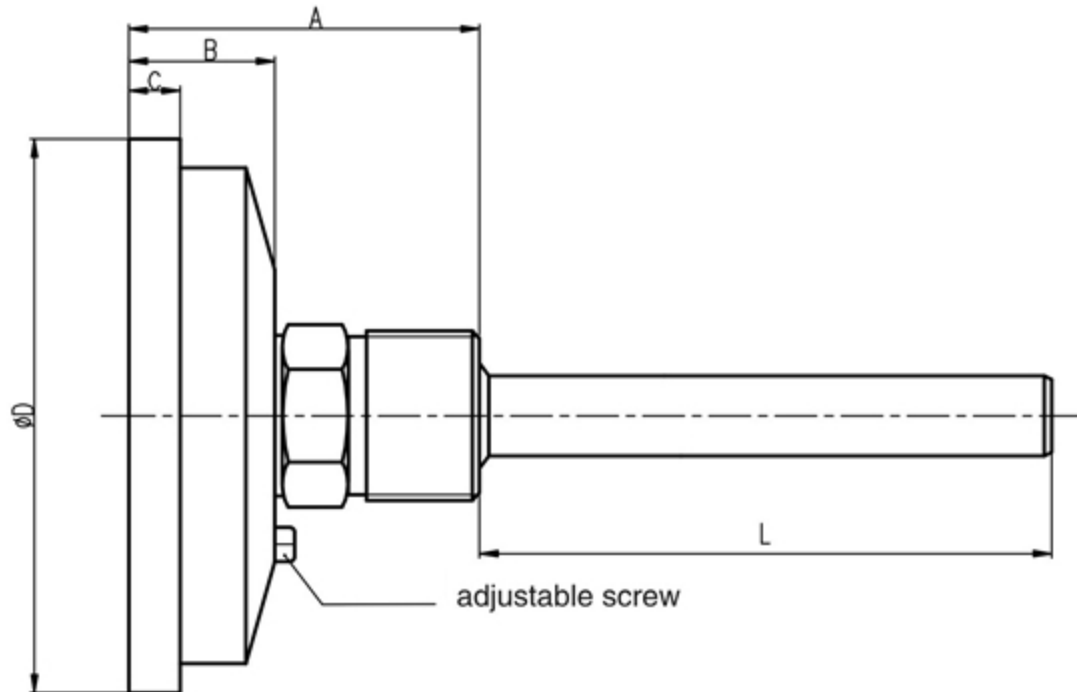
For example: **BT-P-100-(0/160 C)-B-Back-R1/2-1.6**



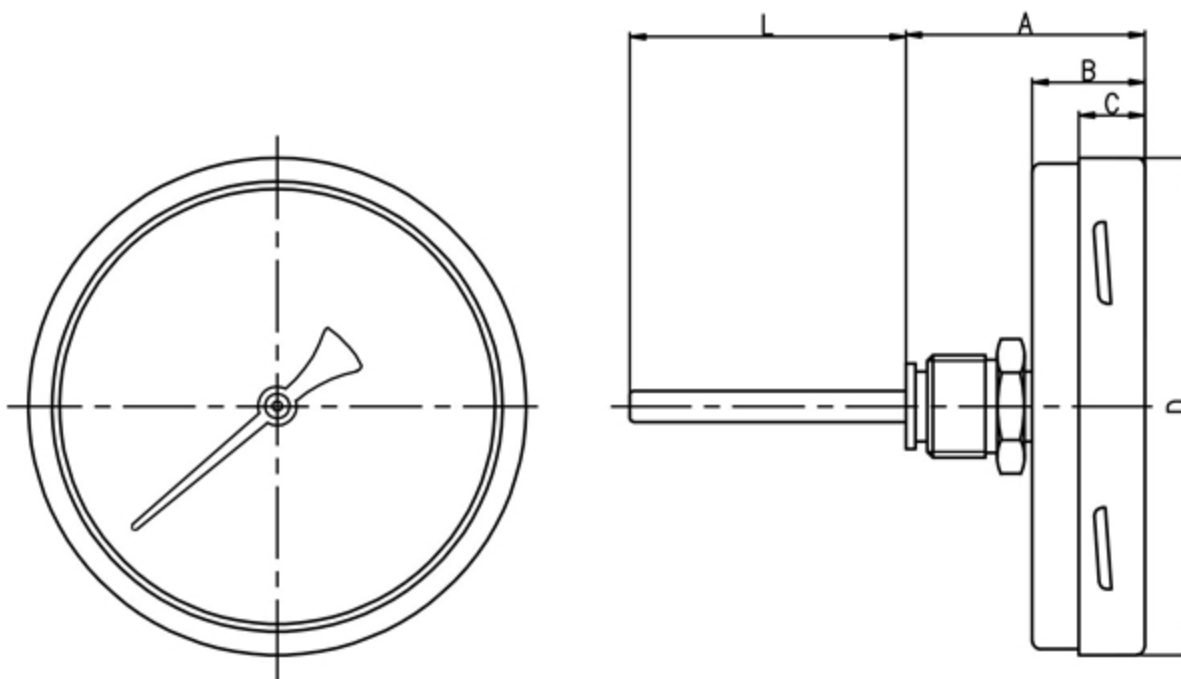
Bimetallic Thermometer

► BT-P

Dimensions (mm.)



| Type | A | B | C | D | L |
|----------|-------|------|-----|-----|---------|
| BT-P-100 | 32~48 | 20 | 7.5 | 100 | 50~2000 |
| BT-P-127 | 32~48 | 20 | 7.5 | 127 | 50~2000 |
| BT-P-150 | 32~50 | 23.5 | 8 | 150 | 50~2000 |



| Type | A | B | C | D ₁ | L |
|----------|-----------|------|----|----------------|---------|
| BT-P-100 | 36.5~58.5 | 24.5 | 17 | 101 | 50~2000 |
| BT-P-127 | 41~63 | 29 | 17 | 128 | 50~2000 |
| BT-P-150 | 41~63 | 29 | 17 | 149 | 50~2000 |



Bimetallic Thermometer

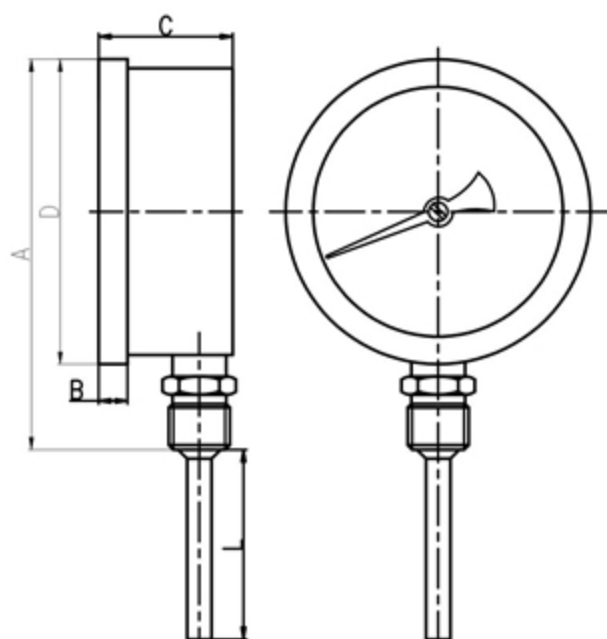
▶ BT-P

(Bottom Connection) Corrosion-Proof Bimetallic Thermometer



Technical

| | |
|--------------|---|
| Model | BT-P-(100), BT-P-(150) |
| Diameter | Φ 100mm; Φ 150mm; |
| Accuracy | 1%; 1.5%; 2.5% Full scale |
| Range | -50~500°C |
| Enclosure | AISI304, bayonet bezel |
| Wetted Parts | Optional: AISI304; AISI316; AISI316L |
| Connection | R1/2", 1/2" NPT, M20X1.5, Sanitary flanges |
| Stem | Φ 6mm; Φ 6.35mm; Φ 8mm; Φ 10mm; Φ 12mm |
| Remark | Sanitary flanges, other connections, thermowells & oil filling for vibration-proof available on request |



Dimensions (mm.)

| Type | A | B | C | D | L |
|----------|---------|-----|----|-----|---------|
| BT-P-100 | 123~135 | 9.5 | 44 | 100 | 50~1500 |
| BT-P-150 | 175~187 | 17 | 50 | 150 | 50~1500 |



Bimetallic Thermometer

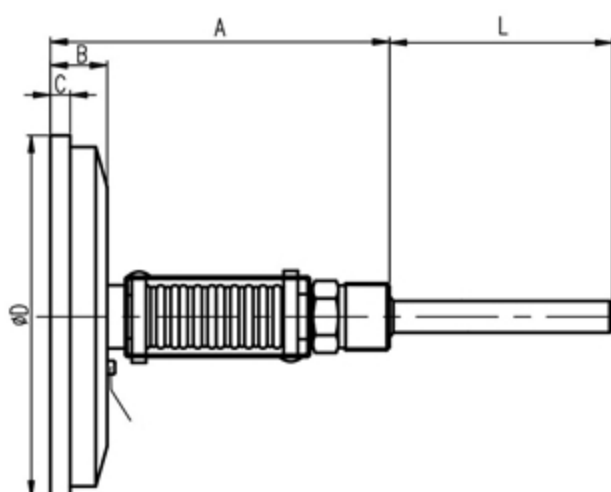
► **BT-P**

(Every Angle) Corrosion-Proof Bimetallic Thermometer



Technical

| | |
|--------------|--|
| Model | BT-PA-100, BT-PA-127, BT-PA-150 |
| Diameter | Φ 100mm; Φ 127mm; Φ 150mm |
| Accuracy | 1%; 1.5%; 2.5% |
| Range | -50~500°C |
| Enclosure | AISI 304, crimped bezel (bayonet optional) |
| Wetted Parts | Optional: AISI304; AISI 316; AISI316L |
| Connection | R1/2", 1/2" NPT, M20X1.5, Sanitary flanç |
| Stem | Φ 6mm; Φ 6.35mm; Φ 8mm; Φ 10mm; Φ 12mm |
| Remark | recalibrator, other connections & thermowells available on request |



Dimensions (mm.)

| Type | A | B | C | D | L |
|-----------|-------------|------|-----|-----|---------|
| BT-PA-100 | 98~135 | 20 | 7.5 | 100 | 50~1200 |
| BT-PA-127 | 98~135 | 20 | 7.5 | 127 | 50~1200 |
| BT-PA-150 | 101.5~138.5 | 23.5 | 8 | 150 | 50~1200 |



General Service Bimetallic Thermometer

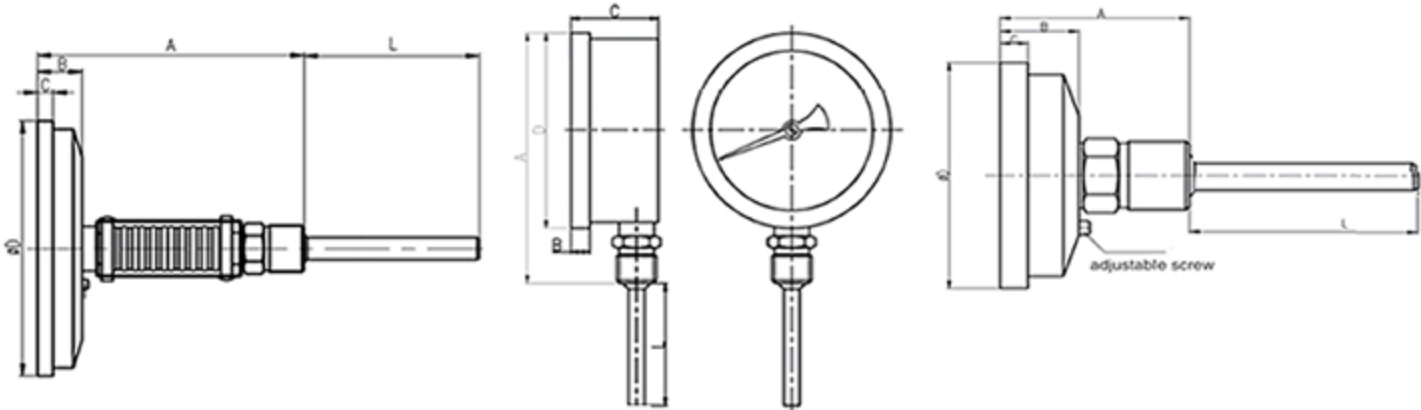
► BT-S



Technical

| | |
|--------------|-------------------------------|
| Model | BT-S-60 |
| Diameter | Ø60 mm |
| Accuracy | 1.5%; 2.5% Full scale |
| Range | 0~100, 0~120, 0~160, 0~250 °C |
| Enclosure | bayonet bezel, crimped bezel |
| Wetted Parts | Stainless Steel |
| Connection | R1/2", 1/2" NPT, M20X1.5 |
| Stem | Ø6 and 6,35 mm. |
| Mounting | Back, Bottom or Every Angle |

Dimensions (mm.)



| A | B | C | D | L |
|--------|----|---|----|---------|
| 98~135 | 20 | 5 | 63 | 50~1200 |

| A | B | C | D | L |
|-------|---|------|----|---------|
| 86~98 | 5 | 43.5 | 63 | 50~1500 |

| A | B | C | D | L |
|-------|----|---|----|---------|
| 32~48 | 20 | 5 | 63 | 50~2000 |

How to Order

Please specify the following properties when the thermometer ordering.

- Model number,
- Dial size,
- Dry or Liquid filled (GD=Glycerin filled, SD=Silicone filled)
- Range and temperature unit (C or F)
- Enclosure (B=Bajonet C=Crimped)
- Connection type,
- Connection thread,
- Accuracy

For example: **BT-S-60-(0/160 C)-B-Back-R 1/2-1.6**



Electric Contact Bimetallic Thermometer

▶ BT-P

General purpose electric-contact bi-metal thermometer



Contact principle: Magnetic (MK)

Explosion-proof inductive electric contact bi-metal thermometer



Contact principle: Inductive (EK)

All stainless steel electric-contact bi-metal thermometer



Contact principle: Solid model (SK)

All stainless steel electric-contact back mounting bi-metal thermometer



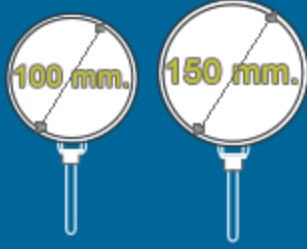
Contact principle: Solid model (SK)

How to Order

Please specify the following properties when the thermometer ordering.

- Model number,
- Dial size,
- Dry or Liquid filled (GD=Glycerin, SD=Silicone filled)
- Range and temperature unit (C or F)
- Enclosure (B=Bajonet C=Crimped)
- Connection thread,
- Immersion length (mm.),
- Accuracy,
- If any; contact principle (MK,SK,EK)
- Contact type

For example: **BT-P-100-(0/160 C)-B-Angle-R1/2-1.6-EK-831-1**



Snap Action Contact /Bimetallic Thermometer

► BT-S/P

Specifications

| | |
|--------------|------------------------------|
| Diameter | Φ 100mm ,Φ150mm |
| Accuracy | 1.5%; 2.5% Full scale |
| Range | 0~300°C |
| Enclosure | bayonet bezel, steel screwed |
| Wetted Parts | Copper alloy |
| Connection | R1/2", 1/2" NPT, M20X1.5 |
| Stem | Φ6mm , 10mm |



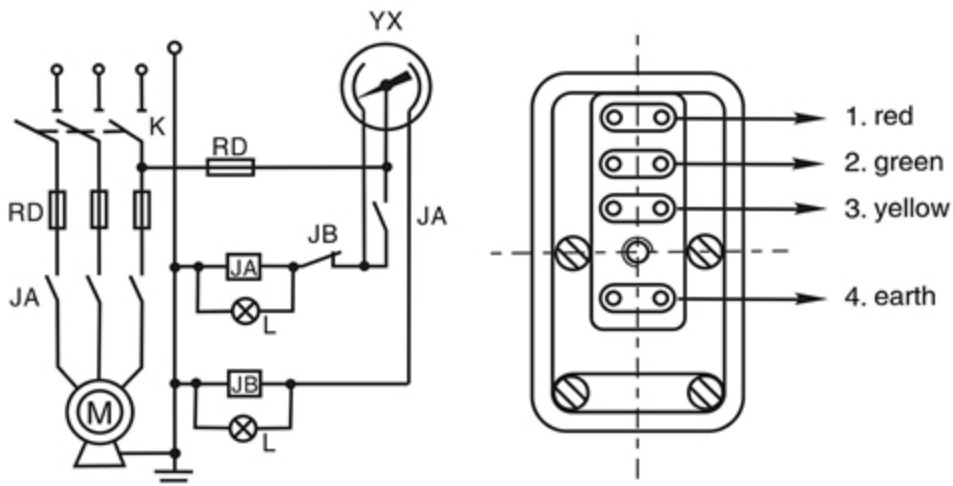
Electrical Specifications

| Contact Arrangement | |
|---------------------|-------------|
| Function | Type Number |
| N.O | 01 |
| N.C. | 02 |
| N.O., N.O. | 11 |
| N.O., N.C. | 12 |
| N.C., N.O | 21 |
| N.C., N.C. | 22 |

| | | |
|-----------------|--------------------|------|
| Maximum voltage | AC 380V or DC 220V | |
| Maximum current | 0.7A | 1A |
| Contact power | 10VA | 30VA |

Control mode: Upper lower limits contacts (unless two upper or lower limits specified)

Wiring Scheme



| | |
|----|------------------------------|
| YX | Electric Contact Thermometer |
| M | Power Generator |
| JA | Contactor & Its Contacts |
| JB | Medium relay & Its Contacts |
| K | Combination switch |
| L | Indicating Lamp |
| RD | Fuse |



Solid Model Contact /Bimetallic Thermometer

► BT-P

Technical

| | |
|--------------|---|
| Model | BT-P, BT-S |
| Diameter | Φ 100mm |
| Accuracy | ± 1.5% Full scale |
| Range | All stainless steel: -60~500°C; General: 0~300°C |
| Enclosure | Inside bayonet bezel, AISI304; |
| Wetted Parts | Optional: AISI304; AISI 316; AISI316L |
| Connection | R1/2", 1/2" NPT, M20X1.5 |
| Stem | Φ 6mm; Φ 6.35mm; Φ 8mm; Φ 10mm; Φ 12mm |
| Remark | 220V 140mA ≈ 30.8W single upper limit, double upper limit, upper-lower limit, double lower limit, |



Switch control method of electric contacts

| Code of contacts | Code title | Quantity | Switch function of deasil rotating pointer | Sketchmap |
|-----------------------------|------------|----------|--|-----------|
| One upper limits | 821.1 | 1 | Over the setpoint, circuit is turned on (N.O.) | |
| One lower limits | 821.2 | | Over the set point, circuit is cut off (N.C.) | |
| Two upper limits | 821.11 | 2 | Over the setpoint, circuit is turned by contact 1 and 2 | |
| Two lower limits | 821.22 | | Over the setpoint, circuit is cut by contact 1 and 2 | |
| N.O. upper and lower limits | 821.21 | | Over the setpoint, circuit is cut by contact 2, turned on by contact 1 | |
| N.C. upper and lower limits | 821.12 | | Over the setpoint, circuit is cut by contact 1, turned on by contact 2 | |

Notes

1. When ordering, please specify the name or No. of contacts referring to the table.
2. Leads of single or double contacts: lower limits is contact 2, upper limits setpoint is contact 1, contact 3 is public port.
3. Turn on and cut function details: The table shows the turn on and cut situations as pointer moves deasil, and the function is opposite while the pointer moves widdershins



Ex-Proof Inductive Contact

▶ BT-P

Summary

The switch of BT-Ex series explosion-proof inductive bi-metal thermometer is inductive approach form, because of non-direct contact type, it has no spoilage to the power supply system. Without electric spark, long using life, little impact on the measurement accuracy, it is not only applicable to certain dangerous places, but also suitable for frequent turn on/off occasions. It has the testing function, automatic control, and automatic warning to the liquid medium. BT-Ex series bimetallic thermometers are designed to directly measure low and medium temperature of fluid steam.

The sensing element "Bimetallic Coil" is composed of 2 indivisible metal sheets. Since the 2 metals have different rates of thermal expansion, the bimetal deforms varying with temperature. This expansion is almost in proportion to temperature. The one end of bimetal is fixed, the other is connected to mechanism to drive pointer. It is used for measuring medium temperature from -60 to $+500^{\circ}\text{C}$ of liquid, steam and gas in the auto-controlling & auto-alarm warning system.

BT-Ex series explosion-proof inductive bi-metal thermometer is based on IEC 60079-0 the request of the electric equipment used in explosive gas environment > " IEC 60079-11 < safe explosive gas environment electrical equipment intrinsically safety-type " I ">, and qualified the relevant departments for the national explosion test.

BT-Ex series explosion-proof inductive bi-metal thermometer should match with safety bar P+F to be a system of intrinsically safe explosion-proof. This system is applied to 1 area and 2 area with explosive gas.

Specifications

1. Diameter: $\Phi 100\text{mm}$
2. Structure: bottom & cent back
3. Controlling: inductive approach switch,
4. Accuracy: $\pm 1.5\%$
5. Range: $-60^{\circ}\text{C} \sim 500^{\circ}\text{C}$
6. Inductive approach switch electrical parameter:
 - ① Working voltage: 8VDC
 - ② Working current: Opening $\geq 3\text{mA}$, Closed $\leq 1\text{mA}$
 - ③ On/off frequency $\leq 5000\text{Hz}$
 - ④ Inductance: $100 \mu\text{H}$
 - ⑤ Electric capacitance: 30nF
 - ⑥ Safe working current: $I_i < 52\text{mA}$
 - ⑦ Safe working voltage: $U_i < 16\text{VDC}$
 - ⑧ Maximum working power: $P_{\text{max}} < 169\text{mW}$
7. Ambient temperature : $-20^{\circ}\text{C} \sim +80^{\circ}\text{C}$
8. Protection class: Exib II CT69
9. Type of gauge: Ip65, oil-filling vibration-proof
10. Number of conducts: 1 or 2
11. Wetted parts: AISI 316, AISI 316L, AISI 304
12. Case material: AISI 304(AISI 316 optional)
13. Window: tempered glass
14. IP: general type: IP54 sealed & vibration-proof type: IP65
15. Connection: thread, flanged, clamped
16. Filling oil: instrument's oil




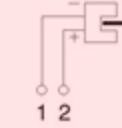
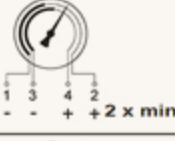
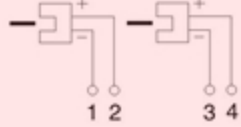
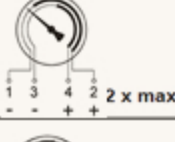
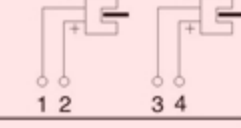
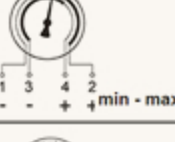

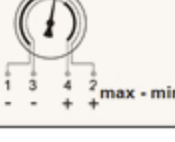
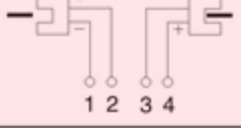




Ex-Proof Inductive Contact

► BT-P

Switch control method and wiring diagram of electric inductive approach switch

| Code of contacts | Model code | Contact ea. | Contact function (principle) | Wiring scheme |
|---|------------|-------------|--|---|
|  | 831.2 | 1 | Contact breaks by rising pressure (NC normally closed) |  |
|  | 831.1 | | Contact makes by rising pressure (NO normally open) |  |
|  | 831.22 | 2 | Contact breaks by rising pressure (NC normally closed) |  |
|  | 831.11 | | Contact makes by rising pressure (NO normally open) |  |
|  | 831.12 | | Contact breaks by falling and rising (1NO-1 NC) |  |
|  | 831.21 | | Contact makes by falling and rising (1NC-1 NO) |  |

Notice:

1. When ordering, please specify the name or No. of contacts referring to the table.
2. Turn on and cut function details: The table shows the turn on and cut situations as pointer moves deasil, and the function is opposite while the pointer moves widdershins.

Safe bar option

| Function | Code | Quantity | Safe bar code (power supply voltage 24V) | Safe bar code (power supply voltage 220V) |
|----------------------|------|----------|---|--|
| One up limit | 2 | 1 | KFD2-SR2-Ex1.W | KFA6-SR2-Ex 1.W |
| One down limit | 1 | | | |
| Two up limit | 22 | 2 | KFD2-SR2-Ex2.W | KFA6-SR2-Ex 2.W |
| Two down limit | 11 | | | |
| N.O. up & down limit | 12 | | | |
| N.C. up & down limit | 21 | | | |

Safe bar option Specifications

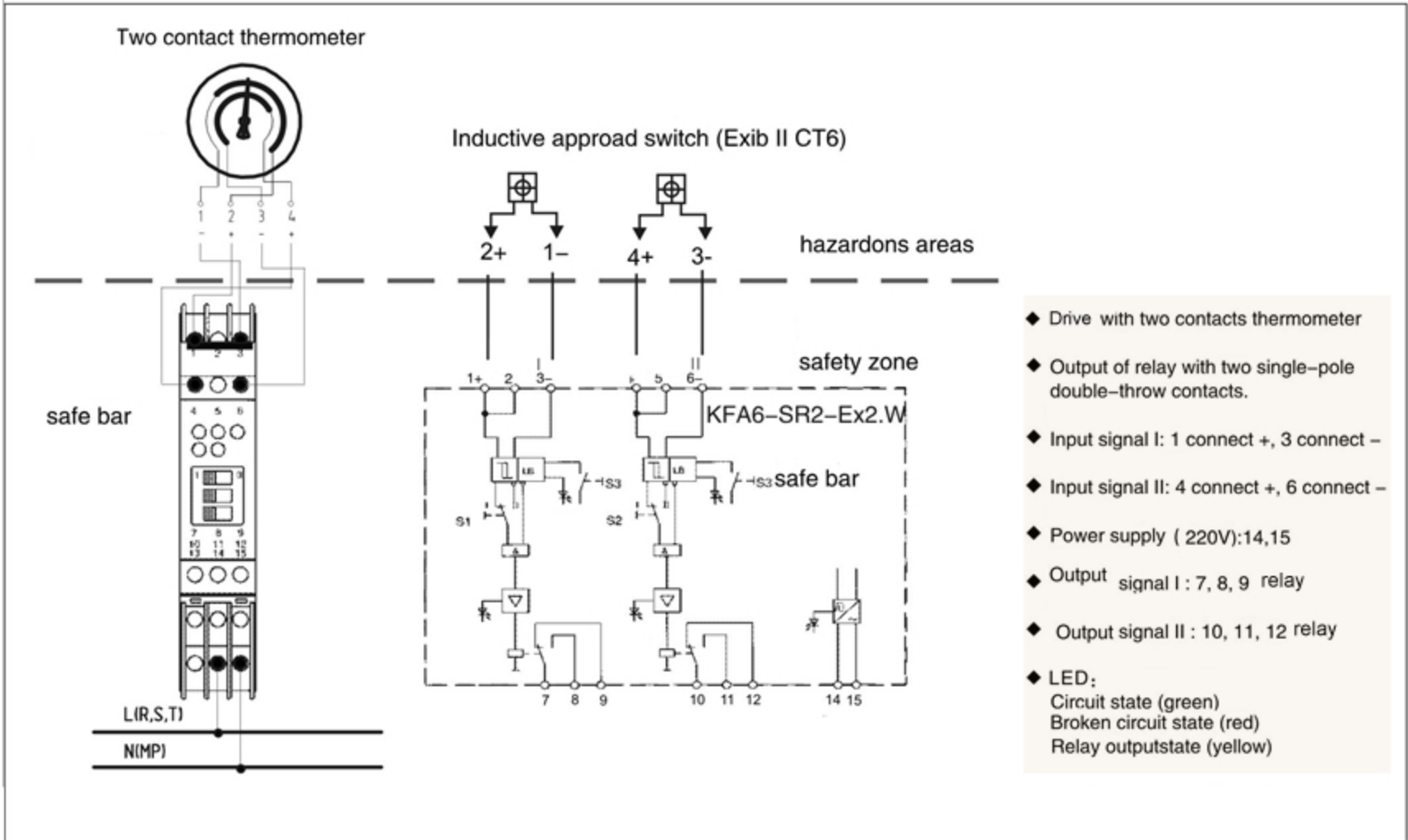
| Type | KFD2-SR2-Ex1.W | KFD2-SR2-Ex2.W | KFA6-SR2-Ex1.W | KFA6-SR2-Ex2.W |
|---------------|--|----------------|--|----------------|
| Specification | 1. Power supply: 24VDC 2. No-coad voltage: 8VDC 3. Max current : 8mA 4. Intrinsic safety circuit:Ex(ia) II C $U_o \leq 10.5VDC$ $I_o \leq 13mA$ $P_o \leq 34mW$ $C_o=2.41 \mu F$ $L_o=210mH$ | | 1. Power supply: 220VAC 2. No-coad voltage: 8VDC 3. Max current : 8mA 4. Intrinsic safety circuit:Ex(ia) II C $U_o \leq 10.5VDC$ $I_o \leq 19mA$ $P_o \leq 51mW$ $C_o=2.9 \mu F$ $L_o=100mH$ | |



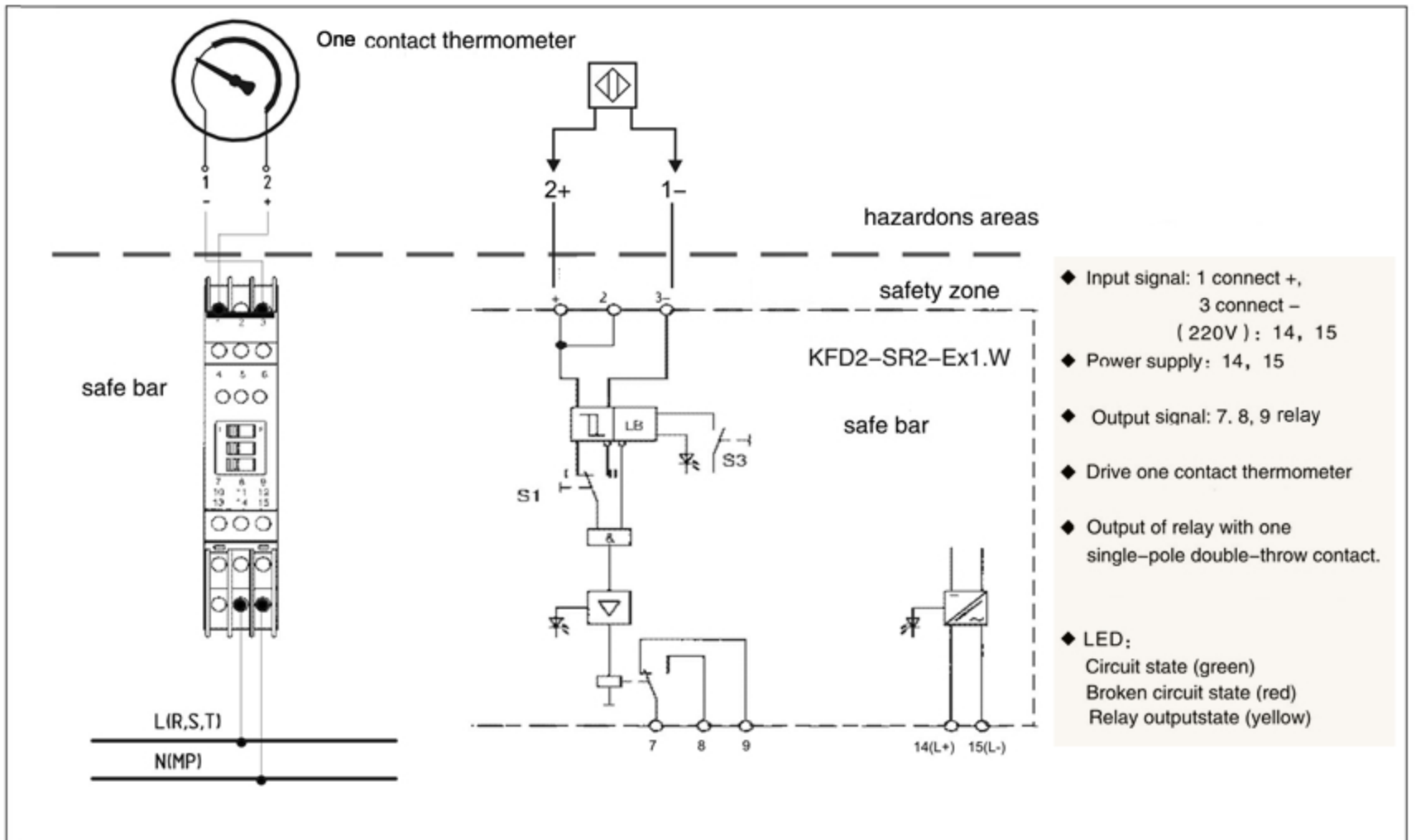
Ex-Proof Inductive Contact

▶ BT-P

Power supply 220 VAC



Power supply 24 V

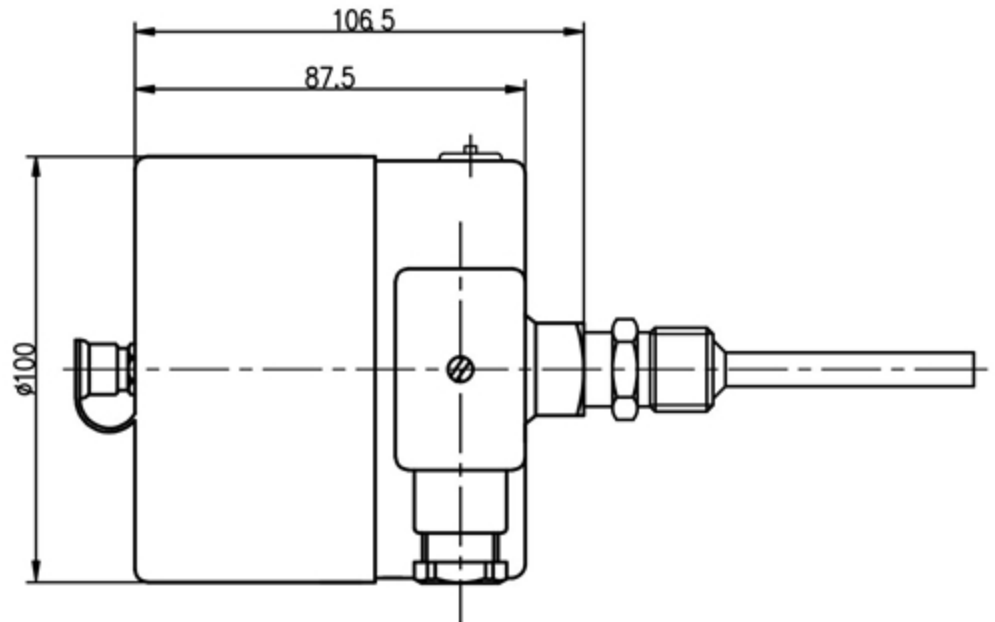
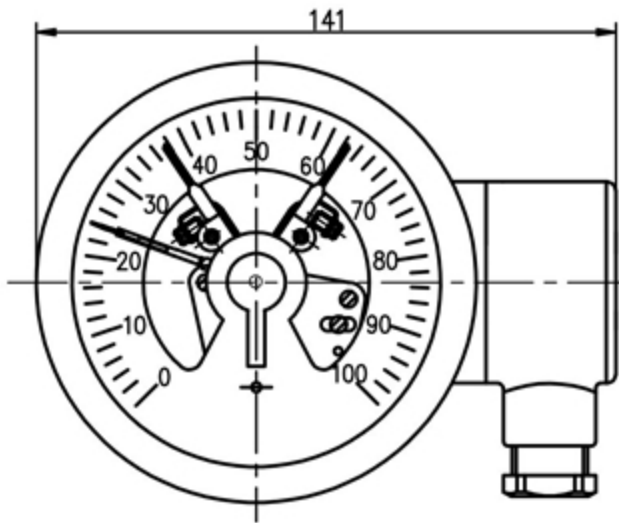
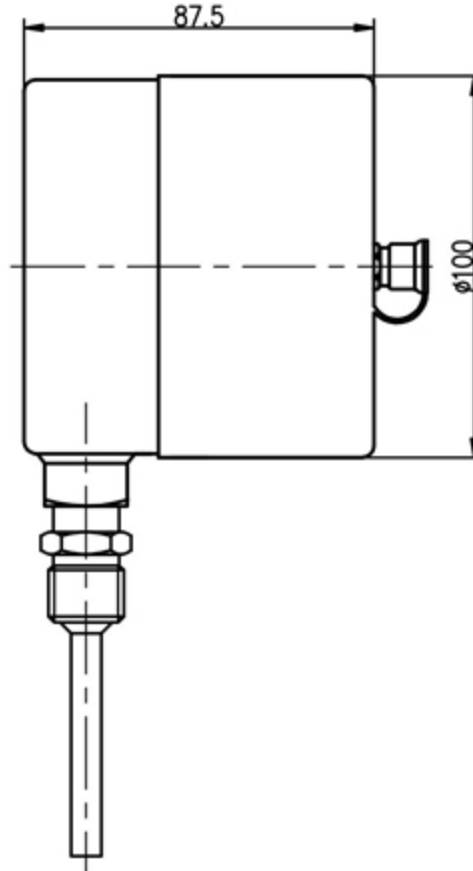
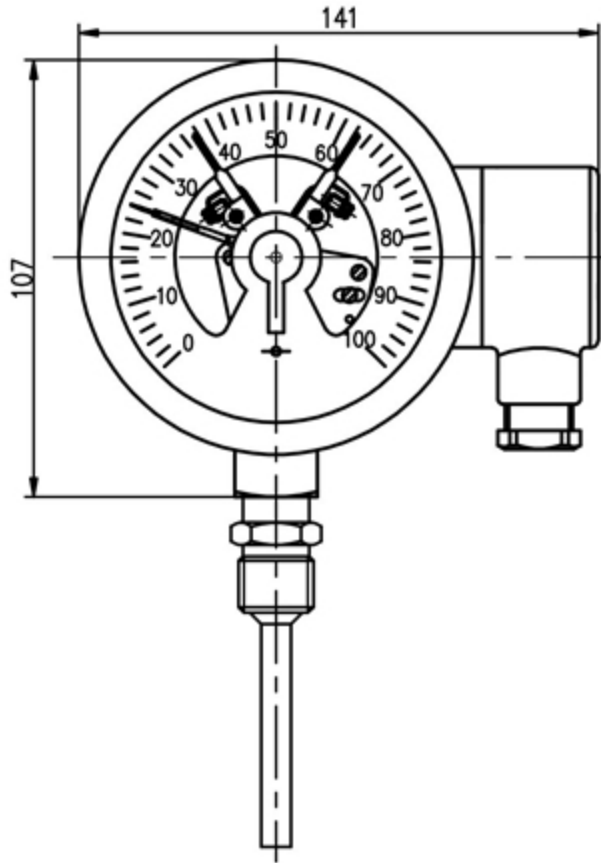


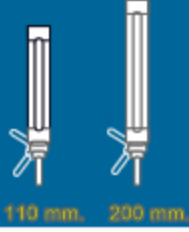


Ex-Proof Inductive Contact

▶ BT-P

Dimensions (mm.)





Glass Thermometers




CT-110 CT-200

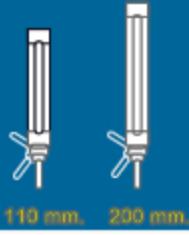
Summary

Glass thermometers for machines are used for temperature measurement in gaseous and liquid media and vapours in pipelines and tanks.

V-shaped glass thermometers are generally suited to rough operating conditions. They are resistant to humidity, ammonia gas or salt-laden air (seawater) and many aggressive media.

According to DIN 16181-Straight, DIN 16182-Vertical and Angle 110x30 mm. V-shape body.
According to DIN 16189-Straight, DIN 16190-Vertical and DIN 16191-Angle 200x36 V-shape body.

| Type | Standart | Model | Range °C | Scale Division |
|---|--|------------------|----------|----------------|
|  <p>Straight</p> | 110x30 mm. DIN16181 200x36 mm. DIN16189 | CT-110 CT-200 | -30 +50 | 1 |
| | | | 0 +60 | 1 |
| | | | 0 +100 | 1 |
| | | | 0 +120 | 1 |
| | | | 0 +160 | 2 |
| | | | 0 +200 | 2 |
| | | | 0 +300 | 2 |
| | | | 0 +400 | 5 |
| | | | 0 +500 | 5 |
| | | | 0 +600 | 5 |
|  <p>Vertical</p> | 110x30 mm. DIN16182 200x36 mm. DIN16190 | CT-110 CT-200 | -30 +50 | 1 |
| | | | 0 +60 | 1 |
| | | | 0 +100 | 1 |
| | | | 0 +120 | 1 |
| | | | 0 +160 | 2 |
| | | | 0 +200 | 2 |
| | | | 0 +300 | 2 |
| | | | 0 +400 | 5 |
| | | | 0 +500 | 5 |
| | | | 0 +600 | 5 |
|  <p>Angle</p> | 110x30 mm. 200x36 mm. DIN16191 | CT-110 CT-200 | -30 +50 | 1 |
| | | | 0 +60 | 1 |
| | | | 0 +100 | 1 |
| | | | 0 +120 | 1 |
| | | | 0 +160 | 2 |
| | | | 0 +200 | 2 |
| | | | 0 +300 | 2 |
| | | | 0 +400 | 5 |
| | | | 0 +500 | 5 |
| | | | 0 +600 | 5 |



Glass Thermometers

CT-110

CT-200

Technical

- ◆ Body: Cast Aluminum, golden yellow anodized
- ◆ Dimensions: 110x30mm. and 200x36 mm
- ◆ Connection type: Straight (DIN 16181), Vertical (DIN 16182) and Angle-135° for 110x30 mm.
Straight (DIN 16189), Vertical (DIN 16190) and Angle-135° (DIN 16191) for 200x36 mm.
- ◆ Range: -30/50 °C to +600 °C
- ◆ Immersion length: 63,100,160, 250, 400 mm.
- ◆ Working pressure: 6 Bar for Brass immersion tube.
25 Bar for Stainless steel immersion tube.
- ◆ Immersion tube material: Brass or Stainless Steel,
- ◆ Immersion tube diameter: 10 mm.
- ◆ Connection: R 1/2", option 1/2" NPT, M20x1.5,..
- ◆ Accuracy: 1% of F.S.
- ◆ Capillary glass: prismatic capillaries.
- ◆ Liquid filled: toluen for <200 °C, mercury for >200 °C.
- ◆ Scale: Black print on Body.

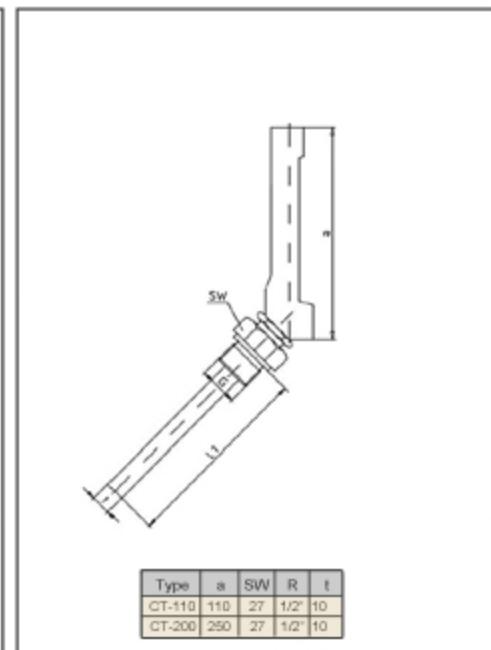
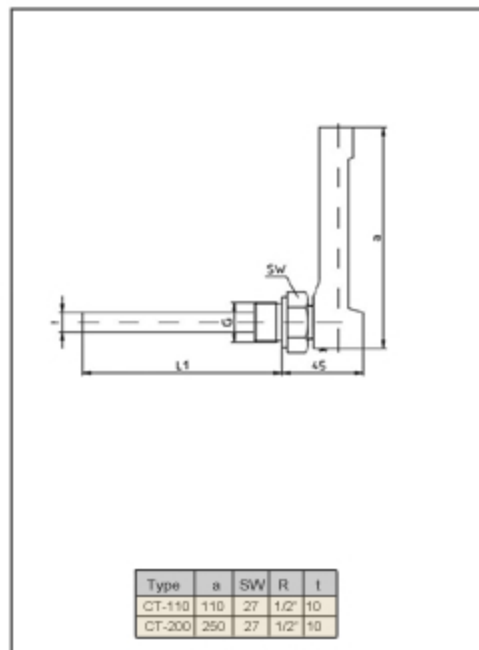
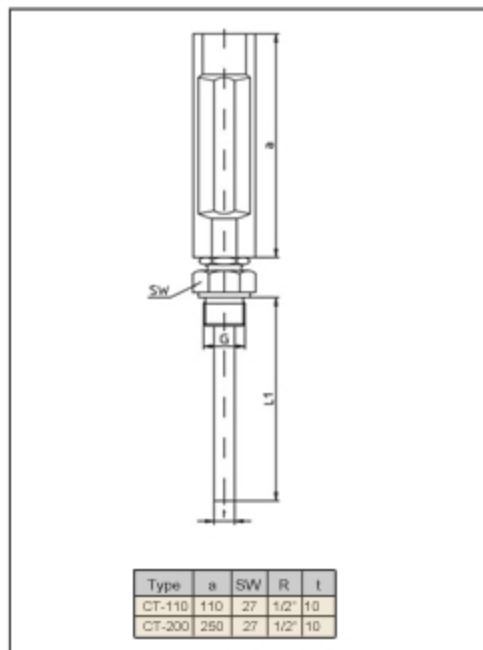
How to Order

Please specify the following properties when the thermometer ordering.

- Model,
- Body length,
- Connection type (Straight, Vertical,Angle),
- Range and Temperature unit (°C, F),
- Immersion tube material (Pa-Stainless,Pi-Brass),
- Connection thread,
- Immersion length,
- (Option; Thermowell,special scale..)

For example: **CT-200-Pa-160 C-Vertical-R1/2-63**

Dimensions (mm.)



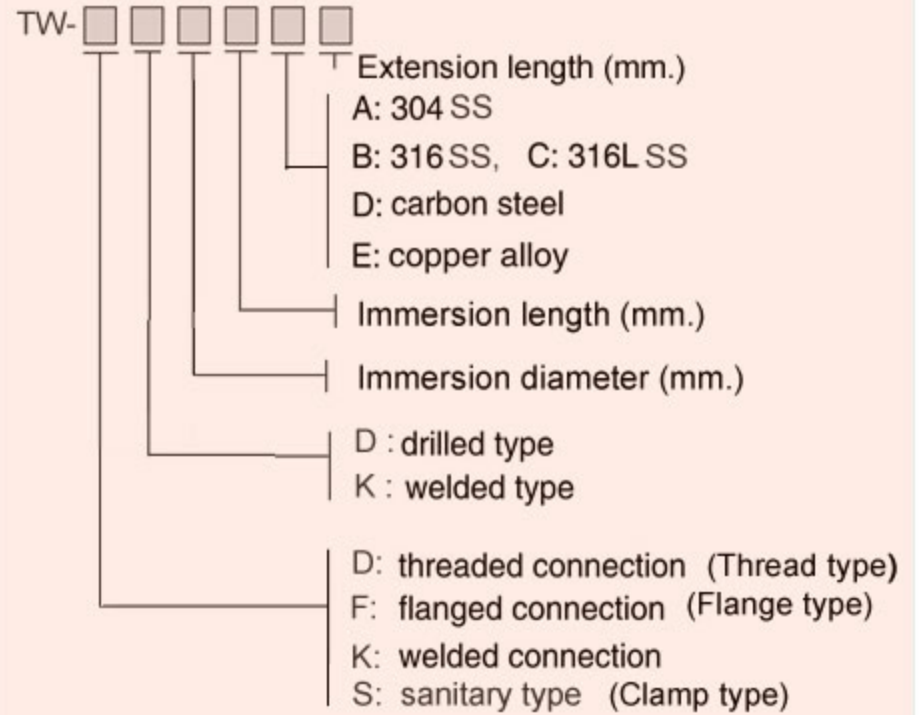
Thermometer Thermowells

Use & Maintenance

- ◆ To ensure the accuracy of the instrument, the length of immersion to measured media shall be at least 2/3 of the stem length.
- ◆ The bimetallic thermometer shall be protected from bend during transit, installation and operation. Do not turn case when installation.



Design Code



For example: TW-1/2"150lb-15-225-B-50

Thermowells are recommended for process systems where pressure, Velocity, and corrosive media are a concern. The thermowell allows the bimetal thermometer to be replaced without affecting the process media or the system.

Options

- ◆ Custom dial face
- ◆ Other type and size of connection
- ◆ Safety glass
- ◆ Field recalibrator
- ◆ Protection IP 65

Ordering Information

- ◆ When order, please specify model number, measuring range, length and diameter of stem, connection thread.
- ◆ Consult factory for special requirements.
- ◆ Free after-sales service offered for one year upon sales contract.

Thermometer Thermowells

Models

TW-S..

Sanitary type

Tri-clamp connection 1", 1.5" and 2"
Material AISI 304, AISI 316
Surface finish 16-32 Ra



TW-D-D..

1-piece drilled

Max.working temperature: steel 600°C
Max. working pressure: 150bar



TW-D-K..

1-piece welded

Max.working temperature: steel 600°C
Max.working pressure: steel 150bar



TW-F-K..

Flanged connection welded

Max.working temperature: steel 600°C
Max. working pressure: steel 40bar



TW-F-D..

Flanged connection drilled

Max.working temperature: steel 600°C
Max.working pressure: steel 150bar



For more corrosion-proof, a PTFE coating is practicable on all thermowells.

Max.working temperature: 200°C
Max. working pressure: 40bar



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"correct measures, infallible"

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