FAQ During the Pre-Sales Phase

1. How should I choose between thermocouples and resistance temperature detectors (RTDs)?
Answer: This mainly depends on your temperature measurement range and accuracy requirements.
- Thermocouples: Suitable for medium- to high-temperature measurements. Our standard domestic Type K thermocouple wire has a measurement range of 0–1300°C. However, please note that Type K thermocouples cannot measure temperatures in the low-temperature range. If you need to measure temperatures below -40°C, we recommend customizing a low-temperature thermocouple wire (capable of measuring down to -40°C) or selecting a resistance temperature detector (RTD) instead.
- Resistance temperature detectors (RTDs) (e.g., PT100): Better suited for medium-to-low temperatures and high-precision measurements. If your operating conditions involve lower temperatures or require higher accuracy, an RTD is the better choice. If you're unsure, please provide us with your specific temperature measurement range and accuracy requirements, and we'll recommend the most suitable type for you.

2. The on-site temperature is very high. What material should I choose for the protection tube?
Answer: The choice of protection tube material directly affects the sensor's service life. Please select the appropriate material based on the maximum on-site temperature:
- 304/321/310/316 stainless steel: These materials can withstand temperatures up to 800°C over the long term and can briefly withstand temperatures up to 1000°C. Their corrosion resistance varies, primarily depending on their internal element content.
- 2520 stainless steel: If your operating temperature ranges between 1000°C and 1200°C, we strongly recommend selecting 2520. It can withstand temperatures up to 1200°C under normal conditions and can handle short-term exposure to 1300°C without issues.
- 3039 stainless steel: This grade can withstand temperatures up to 1200°C; however, due to its higher cost, we do not typically stock it. If required, please place a custom order in advance. Additionally, the thicker the probe diameter, the higher the temperature resistance. If the on-site medium is highly corrosive (e.g., strong acids or alkalis), you should select corrosion-resistant materials such as 316L or Hastelloy in addition to considering temperature requirements.

3. What is the difference between explosion-proof thermocouples with and without a cold junction?
Answer: The purpose of the cold junction is to protect the circuitry inside the junction box or the transmitter.
- Products with transmitter output: We strongly recommend selecting models with a cold junction. Since transmitters contain electronic components, if the on-site temperature is too high, heat will be conducted along the probe to the junction box, causing the internal circuitry to age or even become damaged. A cold junction effectively isolates the high temperature.
- Products that output only thermocouple or resistance signals: Either option is acceptable. Since pure thermocouple/resistance signals are not temperature-sensitive, adding a cold junction can still extend the service life of the junction box if the on-site ambient temperature is extremely high.

4. How should I select the probe diameter and pressure rating for pressurized pipelines?
Answer: Probe diameter is directly related to pressure rating. Please select based on the on-site static and dynamic pressure conditions:
- 6mm probe diameter: Standard pressure rating up to 1.6 MPa (static pressure).
- 8mm probe diameter: Standard pressure rating up to 2.5 MPa (static pressure).
- 10 mm rod diameter: The maximum available size is 10 mm, suitable for higher pressures or operating conditions involving impact vibrations.

If your pipeline pressure exceeds the above ranges, or if the medium flow rate is high or impact vibrations are severe, we recommend using a core-extraction product or increasing the pipe diameter. Additionally, if the insertion depth is too long and there is pressure inside the pipeline, it is best to use a larger rod diameter and install a protective sleeve, securing both the upper and lower ends to ensure safety.

5. How can you tell whether the signal inside the junction box is a thermocouple signal or a transmitter signal?
Answer: The simplest way is to examine the internal structure of the junction box:
- With a porcelain plate (ceramic terminals): This is a thermocouple signal. Porcelain plates are heat-resistant and have good insulation properties; they are specifically designed to transmit the weak millivolt-level voltage signals generated by thermocouples.
- With a plastic housing (built-in circuit board): This indicates a signal with transmitter functionality. The plastic housing contains an integrated transmitter circuit that converts the weak temperature signal into a standard current signal output, such as 4–20

mA.
If you are unsure, you can ask the on-site personnel to take a photo of the inside of the junction box and send it to us; we will help you confirm it.

6. What are the available thread specifications for installation? Can they be customized?
Answer: We offer three standard thread sizes for our explosion-proof temperature sensors: M20×1.5, G1/2, and M27×2. Unless you have specific requirements, we will ship the standard threads along with a welded base.
- Regarding customization: Thread specifications can be customized, but you will need to provide accurate drawings or parameters.
- Important Note: Swivel ferrule threads do not provide a good seal and are not recommended for use in explosion-proof or high-pressure applications; we do not offer this type of thread. Please be sure to verify the thread specifications with the site before placing an order to avoid installation issues upon delivery.

7. Do your products have explosion-proof certification? For which hazardous areas are they suitable?
Answer: Yes. All our explosion-proof temperature sensors come with explosion-proof certification issued by national authorities. The explosion-proof marking is typically Ex d IIC T4 or higher, making them suitable for explosive gas environments such as Zone 1 and Zone 2.
- Underground Coal Mines: For use in underground coal mines, we offer mining-grade flameproof and intrinsically safe products with Coal Mine Safety Certification (MA), which meet the Ex d [ib]Mb explosion-proof requirements.
- Chemical/Petroleum Industries: Our standard chemical-grade explosion-proof products are suitable for these applications.
Please clearly specify your required explosion-proof rating when placing an order, and we will provide copies of the corresponding certificates.
Important Note: Under no circumstances should the housing of explosion-proof products be opened while the power is on; power must be disconnected before performing any operations!

8. How long does it take to customize an explosion-proof temperature sensor? What is the minimum order quantity?
Answer: - Standard Models: For products such as M20×1.5 threads, 6mm/8mm probe diameters, and standard lengths, we typically have them in stock and can ship within 1–3 days.
- Custom models: For products involving special materials (such as 2520 or Hastelloy), special threads, special lengths, or protective sleeves, the production cycle is generally 7–15 days, depending on the order quantity and the complexity of the manufacturing process.
- Minimum order quantity: There is no minimum order quantity for standard products; orders start at 1 unit. For custom products, we recommend a minimum order of 5 or 10 units to reduce production costs and lower the minimum order threshold. Volume purchases qualify for tiered discounts; please contact our sales team for a quote.

9. How is the insertion depth determined? Are there any standards?
Answer: The choice of insertion depth directly affects measurement accuracy and response speed:
- Pipeline temperature measurement: It is generally recommended to insert the sensor at a point between 1/2 and 2/3 of the pipeline's diameter.
- Exposed Length: Ensure the sensing end protrudes at least 10 times the sensor's outer diameter to guarantee sufficient contact with the medium.
- Prefer Whole Numbers: When placing an order, please specify lengths as whole numbers whenever possible to facilitate our production and inventory management.
If you are unsure, please provide the pipe diameter and medium flow direction, and we will recommend a suitable insertion depth. Additionally, the ordered length refers to the distance from the weld joint to the end cap; please be sure to verify this.

10. What types of protective sleeves are available? Can they be customized?
Answer: Protective sleeves are primarily used to secure and protect the sensor. We offer the following standard types:
- Pagoda-shaped welded protective sleeve: Shaft diameter 16 mm.
- Circular welded protective sleeve: Shaft diameter 12 mm.
- Male and female threaded protective sleeve: Shaft diameter 16 mm.
- Hexagonal welded protective sleeve: Shaft diameter 16 mm.
The threads on the protective sleeves can be customized (standard options include M20×1.5, G1/2, and M27×2), and the bore diameter is typically 16 mm. Length is measured from the soldering pad to the end cap; please specify an integer length when placing your order. Unless you have specific requirements, we recommend using standard threads and standard designs, as they offer faster lead times and lower costs.

FAQ During the Sales Process

1. What key parameters should be confirmed before placing an order?
Answer: To avoid receiving a product that cannot be used, please be sure to confirm the following information with us before placing an order:
- Signal type: Is it a thermocouple/RTD signal, or a 4–20 mA transmitter signal? (This can be confirmed by checking the internal structure of the junction box.)
- Mounting thread: M20×1.5, G1/2, or M27×2? Is a welded base required?
- Insertion depth: What is the total length from the welding base to the end cap?
- Probe material: 304, 321, 316, or 2520?
- Probe diameter: 6 mm, 8 mm, or 10 mm?
- Sheath requirements: Is a sheath required? What type? What thread size?
- Explosion-proof requirements: Standard explosion-proof or coal mine safety certification?

Once everything has been confirmed, we will issue a formal technical confirmation form or drawing. Please sign to confirm before we arrange production.

2. What should be noted when customizing special materials or lengths?
Answer:
- Special Materials: For materials such as 2520, 3039, or Hastelloy, delivery times and prices must be confirmed in advance. Due to its high cost, 3039 is not kept in stock and requires separate production scheduling.
- Special Lengths: Extremely long or short dimensions may affect the manufacturing process; feasibility must be confirmed. For example, if the insertion depth is too long and the pipeline is under pressure, the rod diameter must be increased or a protective sleeve added.
- Special Threads: For non-standard threads, please provide drawings or physical samples; we will confirm manufacturing feasibility before accepting the order.
- Communication and Confirmation: Once an order for a custom product is placed, returns or exchanges are not accepted unless there is a quality issue. Please ensure thorough communication and written confirmation before placing your order.

3. What is the packaging method for shipment? How should the goods be inspected upon receipt?
Answer: - Packaging: All products are packaged with shock-absorbing materials. Single units are wrapped in bubble wrap; multiple units are separated by foam inserts inside a cardboard box. The outer box is labeled with product information (including model, specifications, explosion-proof markings, etc.). Custom products are accompanied by a copy of the technical confirmation form.
- Inspection Criteria: - The outer packaging must be intact, with no damage or water stains.
- Verify that the model, specifications, and quantity on the label match the order.
- Check the probe rod for bending or deformation, and inspect the threads for damage.
- Check the junction box for cracks and ensure the threads of the cable entry holes are intact.
- Verify that the explosion-proof certification, product certification, and user manual are all included.

If any abnormalities are found, please take photos and report them to us within 24 hours; we will address the issue immediately.

4. Can you provide installation guides or wiring diagrams?
Answer: Of course. We include printed copies of the “Product Manual” and “Wiring Diagram” in the shipment. You can also access digital versions on our official website or by contacting customer service, including:
- Installation diagrams (including insertion depth, installation orientation, bending radius, etc.)
- Wiring diagrams (wiring methods for thermocouples, RTDs, and transmitters)
- Explosion-proof installation precautions
- Troubleshooting guide If you encounter any issues during installation, feel free to call our technical support hotline at any time; our engineers will provide remote guidance.

5. Can I change the parameters after placing an order?
Answer:
- Not yet in production: If the order has not yet entered the production phase, you can modify the parameters free of charge. Please contact us promptly.
- In Production/Completed: If production has begun or the order is complete, modifying parameters may result in material scrap and rework; the corresponding costs will need to be negotiated and borne by the customer.
- Shipped: Modifications, returns, or exchanges are not supported for non-quality-related issues. Therefore, please be sure to carefully verify all parameters before placing your order and sign to confirm only after ensuring everything is correct.

6. Can we sign a contract for bulk purchases? How should the warranty terms be worded?
Answer: You can sign a formal purchase contract. The warranty terms are typically as follows:
- Warranty Period: 12 months from the date of shipment, or 6 months from the date of successful installation and acceptance, whichever comes first.
- Scope of Warranty: Under normal use, proper installation, and in the absence of human damage or use beyond specified operating conditions, we will repair or replace the product free of charge for any malfunctions caused by product quality issues.
- Exclusions from Warranty: Issues resulting from incorrect model selection, improper installation, operation beyond temperature or pressure limits, damage caused by external forces, or unauthorized disassembly are not covered by the warranty; however, paid repair services are available. Specific terms can be detailed in the contract, and we will provide a standard contract template for your review.

7. Can you provide a copy of the explosion-proof certification?
Answer: Yes. We will include a copy of the explosion-proof certification (bearing our official seal) and the product conformity certificate in the shipment. If you need to review these documents in advance, please contact us before placing your order, and we will send you scanned copies of the certificates. Please note: The product model number on the explosion-proof certification must match the model you are purchasing. If there are minor differences in the model number (such as a different suffix), we will provide an annex to the certificate or a letter of explanation to verify that the explosion-proof performance is equivalent.

8. What is the drawing confirmation process for custom products?
Answer: To ensure custom products meet your requirements 100%, we follow a strict drawing confirmation process:
1. You provide the required specifications or a sketch.
2. Our engineers create formal production drawings (including all details such as dimensions, materials, threads, and protective sleeves).
3. We send the drawings to you for review. Once you confirm they are correct, please sign them or reply via email with “Confirmed.”
4. Upon receiving your confirmation, we arrange for production.
5. If changes are required during production, the confirmation process must be repeated. We will never proceed with production without your written confirmation. Drawing confirmation is the final line of defense against customization errors; please be sure to carefully verify every dimension.

FAQ About the Post-Sales Phase

1. During installation, in which direction should the cable outlet of the junction box face?
Answer: The cable outlet of the junction box must face downward! This is a basic installation requirement for explosion-proof temperature sensors.
- Reason: Having the cable outlet face downward prevents rainwater, condensation, or water from on-site cleaning from seeping into the junction box, thereby avoiding short circuits, reduced insulation, or even failure of the explosion-proof protection.
- Consequences of incorrect installation: If the cable exit port faces upward or is horizontal, moisture accumulation can cause signal fluctuations or loss of output; in severe cases, this may lead to safety incidents. Be sure to check this during installation and ensure that the cable gland is tightened to provide a watertight seal.

2. What happens if the compensation leads for a thermocouple are connected incorrectly?
Answer: Thermocouples must use matching compensation leads, and the positive and negative terminals must not be reversed.
- Consequences of Reversal: If the polarity of the compensation leads is reversed, the thermoelectric potentials in the circuit will cancel each other out, causing the temperature indicated by the display instrument to be significantly lower than the actual temperature, or even result in a negative value. The greater the temperature difference, the larger the error.
- Solution: Immediately turn off the power, check the color coding of the compensation leads (typically red for positive and blue or black for negative), and reconnect them correctly. After reconnecting, turn the power back on to verify the reading.
- Note: Compensation leads must only be used within the specified temperature range (typically not exceeding 100°C); exceeding this temperature will cause additional errors.

3. The on-site signal keeps fluctuating and is unstable. How should I troubleshoot this?
Answer: Signal fluctuations are typically caused by the following reasons. Please troubleshoot in the order listed below:
1. Loose connections: Check whether the terminal screws are tightened and whether there are any loose connections in the compensation leads or RTD leads.
2. Decreased insulation: Use a megohmmeter to measure the insulation resistance between the probe and the terminal blocks; it should be greater than 20 MΩ. If moisture is present, dry the components.
3. Electromagnetic interference: Check whether the signal lines are routed parallel to power cables, whether shielded cables are

4. Can the probe be bent during installation? Are there any restrictions?
Answer: The probe (armored tube) can be bent, but there are strict restrictions:
- Bending is strictly prohibited in the temperature-sensing zone: The approximately 30 mm at the front end of the armored tube is the core temperature-sensing area, where the internal thermocouple wires or resistive elements are located. Bending is absolutely prohibited in this area; otherwise, it will result in measurement failure or damage.
- Minimum bending radius: When bending the entire length, the bending radius must not be less than 5 times the outer diameter of the armored tube. For example, the minimum bending radius for an 8mm-diameter probe is 40mm.
- Bending Tools: Specialized tube-bending tools must be used; striking with a hammer or forcibly cold-bending is prohibited.
- Vertical Installation Preferred: To prevent the protective tube from bending or deforming under its own weight at high temperatures, vertical installation is preferred. If horizontal installation is necessary, additional supports must be used to secure it.

5. What safety precautions should be taken when installing explosion-proof products on-site?
Answer: Explosion-proof safety is a serious matter; please strictly adhere to the following regulations:
1. Never open the cover while energized: Before disassembling or opening an explosion-proof junction box, the power supply must be disconnected, and a “Do Not Close” warning sign must be posted. 2. Reliable grounding: The grounding terminal on the sensor housing must be reliably connected to the site grounding grid, with a grounding resistance of less than 4 Ω.
3. Protection of Explosion-Proof Surfaces: During installation, do not bump or scratch the flameproof joint surfaces; bolts must be tightened securely, and none may be missing.
4. Integrity of Seals: Cable entry points must use the matching sealing rings and compression nuts; unused entry points must be sealed with explosion-proof plugs.
5. Environmental Compatibility: Verify that the category, level, and group of explosive gases/dusts at the site match the product’s explosion-proof marking.

6. Why is a three-wire or four-wire system used for RTD wiring?
Answer: The resistance value of a resistance temperature detector (such as a PT100) is very low (100 Ω at 0°C), and lead resistance directly affects measurement accuracy.
- Two-wire system: The lead resistance is fully factored into the measured value, resulting in significant error; this is only suitable for applications with low accuracy requirements and very short distances. - Three-wire system: The effect of one lead’s resistance is eliminated via a bridge circuit; this is the most commonly used wiring method in industrial settings and effectively reduces errors caused by lead resistance.
- Four-wire system: Completely eliminates the influence of lead resistance, offering the highest accuracy; suitable for laboratory or high-precision measurement applications.
Recommendation: In industrial settings, prioritize the three-wire connection method and ensure that the three leads are identical in material, length, and cross-sectional area.

7. The sensor is not outputting a signal. How can I determine whether the problem lies with the sensor or the instrument?
Answer: You can quickly pinpoint the issue by following these steps:
1. Check the power supply: Verify that the transmitter’s supply voltage is normal (typically 24 VDC) and that the polarity is correct.
2. Short-circuit test: Short-circuit the sensor terminals (for thermocouples) or connect a standard resistance box (for RTDs). If the instrument displays a normal reading, the problem lies with the sensor or the wiring; if there is still no display, the problem lies with the instrument or the DCS channel.
3. Measure the output: Use a multimeter to measure the transmitter’s output current. If there is no 4–20 mA output, the transmitter is faulty.
4. Measure Resistance/Millivolts: Measure the resistance or millivolt value directly at the sensor terminal and compare it with the temperature reference table to determine if the sensor is functioning properly.
5. Check the Wiring: Test the signal wires for continuity, insulation, and short circuits. By following the steps above, you should be able to pinpoint the fault. If the issue persists, please contact our technical support.

8. How long is the product warranty period? Under what circumstances is the warranty void?
Answer:
- Warranty Period: 12 months from the date of shipment, or 6 months from the date of successful installation and acceptance, whichever comes first.
- Warranty Coverage: Under normal use, proper installation, and in the absence of human-caused damage or operation beyond specified conditions, we will repair or replace the product free of charge for failures caused by product quality issues.
- Exclusions: Issues resulting from incorrect model selection, improper installation, operation beyond temperature or pressure limits, damage caused by external forces, or unauthorized disassembly are not covered by the warranty; however, paid repair services

are available.
Specific terms can be detailed in the contract; we will provide a standard contract template for your review.

9. How do I calibrate a sensor that displays a temperature that is too high or too low?
Answer: Temperature deviation is a common issue in the field. Follow these steps to troubleshoot and calibrate:
1. First, confirm that the insertion depth is sufficient (1/2 to 2/3 of the pipe diameter); insufficient depth is a common cause of high readings.
2. Check the outer wall of the protection tube for scale or dust buildup; clean it and take a new measurement.
3. Use a portable standard temperature measuring device (such as a dry-well oven with a standard platinum resistance thermometer) to compare readings at the same location and confirm the deviation value.
4. If the deviation falls within the range permitted by national standards (±1.4°C below 400°C, ±1.6°C above 400°C; approximately ±3°C in actual use), no action is required.
5. If the deviation exceeds the permitted range, contact the manufacturer to calibrate or replace the sensor.
Recommendation: Calibrate at least once a year; under harsh operating conditions, it is recommended to calibrate every six months.

10. How long does a sensor last? When should it be replaced?
Answer: The service life of a sensor is influenced by various factors, including operating temperature, medium corrosiveness, vibration levels, and installation method. General guidelines are as follows:
- Normal operating conditions (temperatures below 800°C, no severe corrosion, no intense vibration): Service life can reach 3–5 years.
- Harsh operating conditions (high temperatures, severe corrosion, intense vibration): Service life may be reduced to 1–2 years.
Replacement is recommended immediately if any of the following conditions occur:
1. Severe corrosion, deformation, or perforation of the protective tube.
2. A continuous decline in insulation resistance that cannot be restored after drying.
3. Measurement accuracy is significantly out of tolerance and remains unsatisfactory even after calibration.
4. Internal wire breakage (open circuit) or short circuit in the armored cable.
5. The flameproof surface of the explosion-proof junction box is severely damaged and cannot be repaired.
It is recommended to maintain an equipment logbook to record the installation date, operating conditions, and replacement history for each sensor, facilitating advance planning for spare parts procurement.