2088 Type Pressure Transmitter

I. Product Definition

The QDYL80A 2088 Hammer-Type Outdoor Dustproof and Explosion-Proof Pressure Transmitter is an industrial-grade, high-precision pressure measurement and signal conversion device developed by Anhui Qidian Automation Technology Co., Ltd. It is specifically designed for harsh on-site environments in industries such as petroleum, petrochemicals, power, metallurgy, pharmaceuticals, and smart manufacturing. It continuously monitors the pressure of media such as liquids, gases, and steam, and linearly converts the pressure signal into a standard electrical output for acquisition, control, and remote monitoring by systems such as PLCs, DCSs, and display instruments.

This product adopts the industry-standard 2088 hammer-style housing structure, integrating a high-precision diffused silicon pressure sensor, signal conditioning circuitry, an intelligent display unit, and explosion-proof protection design. It features outdoor dustproof, waterproof, explosion-proof, anti-interference, and wide-temperature adaptability, making it a highly versatile and reliable core instrument for industrial automation pressure measurement applications.

II. Working Principle

The entire device operates like an automated production line following the sequence of "pressure sensing → signal conversion → processing and output → on-site display," with each step precisely coordinated to ultimately achieve accurate pressure measurement and data transmission:

1. Pressure Sensing Stage
The pressure of the measured medium (liquid/gas/steam) acts on the built-in diffused silicon pressure sensor diaphragm through the process connection (external threaded port). The diaphragm undergoes minute deformation in response to pressure changes, with the magnitude of deformation being directly proportional to the pressure.

2. Signal Conversion Stage
The Wheatstone bridge integrated into the diffused silicon diaphragm converts the diaphragm's minute deformation into a weak voltage signal (millivolt level), achieving the physical conversion from "pressure signal → electrical signal."

3. Signal Conditioning and Processing Stage
The weak voltage signal is fed into the transmitter's internal signal conditioning circuit board, where it undergoes amplification, filtering, temperature compensation, and linear calibration. This process eliminates errors caused by ambient temperature fluctuations and medium interference, optimizing the signal into a stable standard signal source.

4. Standard Signal Output Stage
The processed signal is converted by the circuitry into an industrial-standard electrical signal (such as a 4–20 mA current signal or an RS485 digital signal). This signal is transmitted via electrical interfaces to higher-level control systems such as PLCs and DCSs, enabling remote monitoring and control.

5. On-Site Display Stage
Simultaneously, the processed pressure data is transmitted to the transmitter's built-in LCD display, where the current pressure value is displayed in real time in digital format. This allows on-site personnel to directly read, calibrate, and inspect the data without the need for additional secondary instruments.

III. Core Value and Solutions to Pain Points

3.1 Core Product Value

1. High Precision and Stability: Utilizing imported diffused silicon sensors and intelligent temperature compensation technology, the transmitter exhibits minimal zero-point drift and low measurement error during long-term operation, ensuring the accuracy and consistency of pressure data in industrial production.

2. Adaptability to All Environments: Featuring a 2088 hammer-style explosion-proof housing, it supports an IP65 or higher dust and water resistance rating, as well as flameproof and intrinsically safe explosion-proof certifications. It can be directly installed in outdoor, open-air, dusty, humid, or flammable and explosive industrial environments without the need for an additional protective enclosure.

3. High Reliability and Low Maintenance: Featuring a fully sealed metal construction, it offers strong resistance to vibration, impact, and electromagnetic interference. With no mechanical wear in core components, it boasts a long mean time between failures (MTBF), significantly reducing equipment failure rates and on-site maintenance costs.

4. Convenient On-Site Commissioning and Monitoring: Equipped with a built-in high-definition LCD display, it supports one-button on-site calibration of zero point and range without requiring specialized tools or host computer software, significantly improving the efficiency of on-site inspections and commissioning.

5. Wide Compatibility: Standard industrial signal outputs (4–20 mA/RS485) ensure compatibility with the vast majority of PLCs, DCS systems, and secondary instruments. Its strong adaptability allows for rapid integration into existing automation control systems.

6. Full media compatibility: By selecting liquid-contacting diaphragms made of different materials (such as 316L stainless steel), the device can handle a variety of media including water, oil, acidic and alkaline solutions, and steam, meeting the media compatibility requirements of various industries.

3.2 Customer Pain Points and Product Solutions

1. Harsh industrial environments—dusty, humid, and flammable/explosive—make ordinary pressure gauges prone to damage and pose safety hazards Features the 2088 hammer-type explosion-proof housing, which is certified for explosion protection and meets IP65/IP67 dust and water resistance ratings. It can be installed directly outdoors, in dusty workshops, or in flammable and explosive hazardous areas. The fully sealed housing design effectively prevents the ingress of media, dust, and moisture, eliminating safety risks.

2. Significant measurement errors and severe zero-point drift in pressure readings lead to inaccurate production control and process fluctuations. Equipped with a built-in high-precision diffused silicon pressure sensor, paired with intelligent temperature compensation and linear correction circuits, it automatically eliminates measurement errors caused by changes in ambient temperature and fluctuations in medium pressure. Long-term zero-point drift is ≤±0.1% FS per year, ensuring stable and reliable measurement accuracy.

3. On-site commissioning and calibration of pressure transmitters require specialized tools or a host computer, making operations complex and inefficient. Equipped with an LCD digital display and push-button calibration functions, it supports one-touch on-site zero and span calibration. No specialized tools are required, allowing on-site personnel to quickly complete commissioning, significantly reducing commissioning difficulty and time costs.

4. Transmitters are susceptible to electromagnetic interference from on-site equipment such as motors and variable frequency drives, leading to data fluctuations and unstable signals. Featuring an anti-electromagnetic interference circuit design and a fully metal-shielded housing, it effectively resists electromagnetic interference in industrial environments, ensuring a stable output signal without fluctuations and preventing system misjudgments caused by abnormal data.

5. Traditional pressure gauges lack on-site displays, requiring additional secondary instruments, which are costly and involve complex wiring. An integrated LCD digital display unit allows direct on-site reading of pressure values, eliminating the need for additional secondary instruments. This reduces equipment procurement costs and wiring effort while enabling field inspection personnel to quickly access data.

6. Transmitters often have poor compatibility with on-site systems and cannot be directly integrated into existing PLC/DCS systems. Supports

industrial standard signal outputs (4–20 mA current signal, RS485 Modbus digital signal), compatible with the vast majority of PLCs, DCS systems, and secondary instruments. No additional conversion modules are required, allowing direct integration into existing automation control systems.

7. Long-term operation is susceptible to vibration and shock, leading to component damage and reduced service life. Featuring an integrated, fully welded structure with no mechanical moving parts, the device offers excellent vibration and shock resistance. It is suitable for high-vibration installation environments such as pump housings and pipelines, extending equipment service life and reducing operational and maintenance costs.

IV. Key Product Parameters & Specifications

4.1 Basic Electrical Parameters

Measured Media: Liquids, gases, steam (non-corrosive media; 316L or Hastelloy wetted parts available for corrosive media)

Pressure Type: Gauge pressure, absolute pressure, vacuum, combined positive and negative pressure ranges

Measurement Range:

Standard Range: -100 kPa to 0 to 100 MPa (Custom ranges available)

Recommended Common Ranges: 0–100 kPa, 0–1 MPa, 0–1.6 MPa, 0–2.5 MPa, 0–6 MPa, 0–10 MPa, 0–25 MPa, 0–40 MPa, 0–60 MPa

Measurement Accuracy: ±0.1% FS (High-Precision Version) / ±0.25% FS (Standard Version) / ±0.5% FS (Economy Version)

Stability: Long-term zero drift ≤ ±0.1% FS/year

Output Signal:

Standard Output: 4–20 mA DC (2-wire)

Optional Outputs: RS485 Modbus-RTU digital signal, 0-5V/0-10V voltage signal (3-wire)

Load Capacity: For 4-20mA output, maximum load resistance ≤ 600Ω (when powered by 24V DC)

Response Time: ≤ 100ms (customizable slow-response filtering parameters for pulsating pressure applications)

Signal resolution: 16-bit (digital signal output) / 12-bit (analog signal output)

4.2 Isolation Performance Parameters

Electrical isolation method: Triple isolation (input, output, and power supply; non-isolated standard version available)

Isolation withstand voltage: ≥ 1500 V AC between input, output, and power supply (1 minute, no breakdown)

Insulation Resistance: ≥ 100 MΩ (500 V DC, between terminals)

Immunity:

Common-Mode Rejection Ratio (CMRR): ≥ 80 dB

Differential-Mode Rejection Ratio (DMRR): ≥ 60 dB

Complies with GB/T 17626 industrial electromagnetic compatibility standard; resistant to surges, burst pulses, and RF interference

4.3 Power Supply & Power Consumption Parameters

Supply Voltage:

Standard Supply: 24 V DC (rated value, operating range 12–36 V DC)

Optional Supply: 220 V AC (custom version, requires additional specification)

Full-Load Power Consumption: ≤ 1.2 W (4–20 mA output, when powered by 24 V DC)

Power Distribution Output: No additional power distribution output (two-wire transmitter; no external power module required; loop-powered only)

Reverse Polarity Protection: Built-in reverse polarity protection circuit; incorrect polarity connection will not damage the device

Overvoltage Protection: Built-in transient suppression diodes on the power supply side; withstands short-term ±40V DC overvoltage surges

4.4 Environmental Adaptation Parameters

Operating Temperature Range:

Medium Temperature: -40°C to +125°C (Standard Model); -40°C to +200°C (Custom High-Temperature Heatsink Version)

Ambient Temperature: -40°C to +85°C (LCD display normal operating temperature: -20°C to +70°C)

Storage Temperature Range: -55°C to +125°C

Operating Humidity Range: 0–95% RH (non-condensing)

Protection Rating: IP65 (Standard) / IP67 (Customized Enhanced Sealing Version), outdoor dustproof and waterproof, resistant to rain, dust, and humid environments

Explosion-Proof Rating:

Flameproof: Ex d IIC T6 Gb (Suitable for Zone 1 and Zone 2 flammable and explosive gas environments)

Intrinsically Safe: Ex ia IIC T4 Ga (Optional, compatible with intrinsically safe barriers)

Compatible Safety Barrier Models: Recommended for use with intrinsically safe safety barriers, such as MTL5541, P+F KFD2-STC4-Ex1, and Chen Zhu GS8500 series (must be matched according to the on-site explosion-proof certification system)

Vibration Resistance: Complies with GB/T 13823 standard; no damage or data anomalies under 2g vibration at 10–2000 Hz

Shock Resistance: 10g, 11ms half-sine wave shock; no mechanical damage or performance degradation

4.5. Physical Parameters

Mounting Methods: 35mm DIN rail mounting (indoor control cabinet) / Direct pipe thread mounting (field piping) / Bracket mounting (wall-mounted / post-mounted); default is direct pipe thread mounting

Dimensions (2088 Hammer-Type Standard Model):

Overall Height (including threaded connector): Approx. 170 mm

Body Width (including blue explosion-proof housing): Approx. 110 mm

Body Thickness: Approx. 95 mm

Electrical Interface: M20×1.5 male thread (standard cable connector)

Process Connection Thread: Standard male thread G1/2“, M20×1.5 (customizable to NPT 1/4”, NPT 1/2", etc.)

Weight: Approx. 1.1 kg (standard stainless steel wetted parts version)

Housing Material and Protection Details:

Main Housing: Die-cast aluminum alloy, electrostatic powder-coated surface, corrosion-resistant, anti-aging, and resistant to acid and alkali corrosion in industrial environments

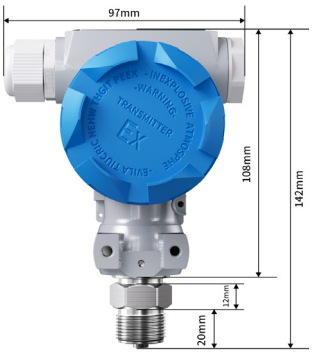
Wetted Parts: Standard 316L stainless steel (optional Hastelloy C276 or titanium alloy for highly corrosive media)

Explosion-Proof Housing: Cast aluminum explosion-proof housing; blue protective ring made of high-strength engineering plastic with explosion-proof warning markings; sealed with fluororubber O-rings, resistant to high and low temperatures and aging

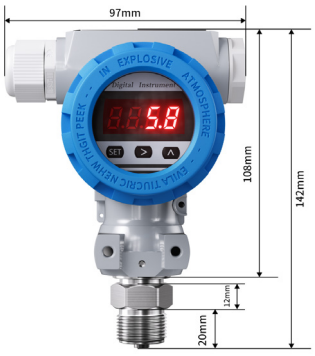
Electrical interface: Built-in rubber gasket, with cable clamps; IP65 or higher protection rating to prevent moisture and dust from entering the wiring compartment

Display window: Tempered glass, impact-resistant and scratch-resistant, with excellent visibility under strong light

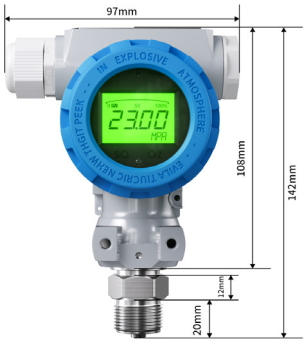
Process connection: Fully welded sealed structure, with no risk of leakage, capable of withstanding high-pressure medium impacts



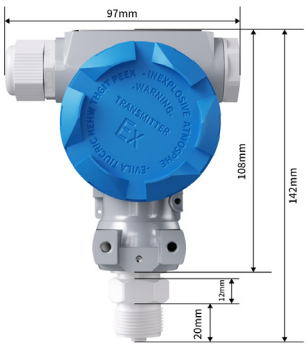
Non Display Type



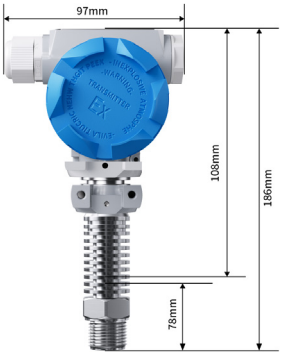
LED Display Type



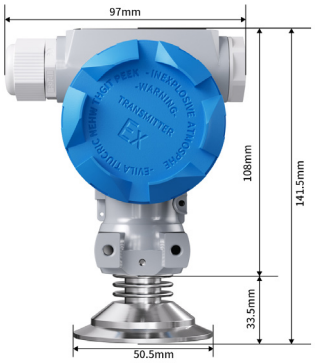
LCD Display Type



Anti-corrosion Type



High Temperature Type



Flat-film Tyle

V. Application-Specific Selection Guide

5.1 Key Selection Criteria

1. Signal Type Selection

For applications involving conventional automation control systems, PLCs, DCSs, and secondary display instruments, the standard 4–20 mA two-wire analog signal version is recommended. It offers the highest versatility, simple wiring, and compatibility with the vast majority of industrial control systems. For applications requiring remote networking, centralized bus monitoring of multiple devices, or data acquisition via a host computer, the RS485 Modbus-RTU digital signal version is recommended. This supports parallel communication among multiple transmitters and independent address-based identification, facilitating centralized system management and remote data retrieval.

2. Channel Selection

The QDYL80A 2088 hammer-type pressure transmitter is designed for single-channel independent measurement; each unit corresponds to only one pressure measurement point, making it suitable for independent monitoring of single-point pipelines, tanks, and equipment. If multiple pressure measurement points exist on-site, there is no need to force the use of a single multi-channel device. It is recommended to match the number of transmitters to the number of measurement points to ensure that measurement accuracy at each point is not interfered with and that failures remain isolated without affecting other points.

3. Power Supply Selection

Under standard industrial conditions, a standard 24V DC loop power supply is uniformly adopted. This is compatible with standard power distribution in control cabinets and safety barrier circuits. The two-wire connection eliminates the need for separate power cables, ensuring simple and stable installation. For older facilities or retrofit projects lacking 24V DC power distribution and relying solely on mains power, a custom AC-powered version can be selected to adapt to existing on-site power conditions, eliminating the need for additional DC power modules.

4. Selection Based on Explosion-Proof Requirements

For standard operating conditions in ordinary indoor equipment rooms—where there are no flammable or explosive gases, dust, or high-risk media—the standard dustproof and waterproof version is sufficient; In Zone 1 and Zone 2 hazardous locations—such as petroleum, chemical, oil and gas transmission facilities, hazardous materials storage areas, and spray painting workshops—where flammable or explosive gases or dust are present, explosion-proof versions (flameproof or intrinsically safe) must be strictly selected and used in conjunction with corresponding intrinsically safe barriers to meet on-site explosion-proof regulations and safety production requirements.

5. Selection Based on Installation Environment

For indoor control cabinets and enclosed machine rooms with constant-temperature, dry environments, the standard enclosure version may be selected; For outdoor open-air installations, rooftop pipe racks, open-air pipelines within plant premises, and outdoor conditions with heavy rainfall, high dust levels, or significant diurnal temperature fluctuations, the QDYL80A 2088 hammer-style outdoor dustproof and explosion-proof model must be selected. This model features a high-protection-rated enclosure and a fully sealed structure to withstand rain, dust, frost, and sun exposure; For high-temperature steam pipelines, humid and corrosive workshops, and areas near pumps and valves with significant vibration, prioritize versions with corrosion-resistant wetted parts and anti-vibration structures to ensure long-term stable operation in harsh conditions.

5.2. Selection Guidelines for Industry-Specific Applications

1. Chemical Industry (including fine chemicals, coal chemicals, chemical storage tanks, reactors, and pipeline transportation. Since the media often exhibit mild corrosion and the sites are typically dusty or contain flammable and explosive environments, the QDYL80A 2088 hammer-style explosion-proof and dust-proof model is the preferred choice. It is equipped with a 316L stainless steel wetted diaphragm; for highly corrosive media, the material can be upgraded to Hastelloy. This model is suitable for continuous monitoring of process pipeline pressure, tank static pressure, and circulation system pressure.

2. The power industry encompasses scenarios such as thermal power plants, hydroelectric power stations, and substations, including circulating water systems, steam systems, and fuel and gas supply pipelines. These sites feature strong electromagnetic interference and significant equipment vibration. We recommend the standard anti-interference QDYL80A transmitter, which supports 4–20 mA signals compatible with power plant DCS systems. For outdoor pipe rack locations, directly select the outdoor dustproof and explosion-proof model, which withstands extreme temperatures and harsh outdoor weather conditions.

3. The metallurgical industry involves steel smelting, coking, sintering, circulating cooling water, and blast furnace piping systems. These environments feature high dust levels, wide temperature ranges, and significant mechanical vibration. The 2088 hammer-style high-protection version is uniformly recommended for these applications. It offers strong vibration resistance, dustproofing, and temperature tolerance, enabling long-term, stable monitoring of pipeline network pressure and cooling water system pressure, and is suitable for heavy-duty industrial environments in metallurgy.

4. The pharmaceutical industry encompasses biopharmaceuticals, active pharmaceutical ingredient (API) production, purified water pipelines, reaction vessels, and cleanrooms. These environments demand high standards for equipment sealing, stability, and cleanliness. The QDYL80A standard dustproof and explosion-proof model is selected, featuring 316L food-grade wetted materials and a leak-free sealing structure to meet the pressure measurement requirements for pharmaceutical cleanrooms and process fluids.

5. The smart manufacturing industry covers general automation scenarios such as automated production lines, smart water plants, environmental water treatment, air compressor systems, and hydraulic and pneumatic equipment. For standard indoor locations, the standard version is selected; for outdoor water tanks, open-air pipelines, and outdoor pump stations, the 2088 hammer-style outdoor dustproof and explosion-proof model is used. 4-20mA or RS485 signals can be freely configured to support centralized configuration and automated closed-loop control in smart factories.

5.3 Common Selection Pitfalls

1. Ignoring Isolation Levels and Selecting Models Blindly

Many users focus solely on measurement range and output signals during selection, neglecting electrical isolation performance. In power, metallurgy, and industrial control environments with dense concentrations of variable frequency drives and motors, as well as severe electromagnetic interference, using non-isolated standard versions can easily lead to data jumps, signal drift, and unstable readings. In severe cases, this can affect the automatic control logic of the entire system.

2. Measurement Failure Due to Incorrect Pressure Range Selection

Selecting a range that is too wide can result in significantly reduced measurement accuracy and insufficient resolution in the low-pressure range; conversely, selecting a range that is too narrow can lead to over-range overloads, sensor damage, and equipment failure, while also failing to accommodate peak pressure fluctuations in the process. This is the most common selection error encountered in the field.

3. Signal Abnormalities Due to Neglected Load Matching

When selecting 4-20mA output models, failure to account for the total load—comprising on-site cable length, instrument internal resistance,

and safety barrier resistance—can result in the transmitter exceeding its maximum allowable load resistance. This leads to insufficient signal pull-up, output linearity distortion, inaccurate data, and the inability to integrate normally into the control system.

4. Incorrect Selection of General-Purpose Models in Explosion-Proof Environments
In hazardous areas such as flammable and explosive chemical plants, oil and gas facilities, and spray painting operations, using general-purpose transmitters without explosion-proof certification to save costs fails to meet safety inspection standards. This poses significant safety hazards, may result in failure to pass safety inspections later on, and can lead to workplace safety risks.

5.4 Customization Recommendations
1. Custom Signal Solutions
In addition to standard 4-20mA and RS485 signals, we offer customizable 0-5V and 0-10V voltage outputs, as well as wide-range non-standard current signals. We also provide dual-signal output configurations—combining analog and digital signals in parallel—to meet dual signal acquisition requirements for both retrofitting legacy equipment and ensuring compatibility with new systems.

2. Custom Solutions for Non-Standard Operating Conditions
For media with extremely high or low temperatures, as well as highly corrosive media such as strong acids and alkalis, we can customize special wetted materials such as Hastelloy and titanium alloys. For high-temperature steam applications, we can incorporate custom heat sink structures. High-pressure, negative-pressure, and combined positive/negative-pressure non-standard ranges can all be individually calibrated and customized to accommodate special process conditions.

3. Installation and Structural Customization Solutions
Non-standard process connection threads can be customized, including NPT threads, special flange connections, and extended pressure tubing structures; electrical interface specifications and cable exit directions can be adjusted as needed to accommodate installation requirements in confined spaces or with complex piping layouts.

4. Multi-Point Measurement Integration Solutions
When multiple pressure measurement points are concentrated in a single location, we offer a complete custom solution comprising multiple QDYL80A transmitters with unified measurement ranges and communication address codes, along with matching mounting brackets and wiring accessories. This facilitates bulk installation, unified commissioning, and standardized management during subsequent operation and maintenance.

VI. How to Choose the Right Product for Your Needs?
6.1 Common Features Across the Entire Series
1. Consistent Main Structure
The entire series features the classic 2088 hammer-style housing, with uniform external dimensions, mounting interfaces, electrical interfaces, and explosion-proof housing structures. The external mounting dimensions are fully interchangeable, allowing for direct on-site replacement.

2. Consistent Core Measurement Principles
All models utilize a diffused silicon pressure sensor core. The principles of pressure sensing, signal conversion, temperature compensation, and linear calibration are identical, ensuring consistent underlying performance in terms of basic measurement accuracy, stability, and noise immunity.

3. Universal Electrical and Output Specifications
Uniform support for 12–36 V DC wide-range power supply; standard 4–20 mA two-wire output; optional RS485 Modbus communication; uniform reverse polarity protection, overvoltage protection, and industrial EMC interference resistance.

4. Common Protection and Explosion-Proof Ratings
The entire series meets the IP65 standard for dust and water resistance. All models can be configured with explosion-proof ratings (Ex d II C T6) or intrinsically safe (Ex ia II C) configurations, making them suitable for outdoor, open-air, dusty, and humid environments.

5. Fully Compatible Installation Methods
Uniformly supports direct pipe thread mounting, column bracket mounting, and wall-mounted installation. The default process thread is M20×1.5 / G1/2, requiring no modifications to installation cutouts or pipe connections.

6. Universal Industry Applicability
Suitable for industrial pressure measurement applications in chemical, power, metallurgy, pharmaceutical, water treatment, smart manufacturing, and oil and gas pipeline networks, with consistent compatibility across standard operating conditions.

6.2. Detailed Comparison of Core Differences Between Versions
1. Model Without Display (Basic Economy Model)
Features:
No on-site display window, no LED display, and no LCD screen; features a fully sealed, meter-head-only structure.
It features the simplest structure, lowest failure rate, and best cost-performance ratio.
With a streamlined internal circuit, it is suitable for scenarios requiring only remote transmission signals and no on-site reading.
Advantages: Low price, superior sealing integrity, strong outdoor weather resistance, and extremely low failure rate.
Disadvantages: Pressure values cannot be read directly on-site; commissioning requires a host computer or a multimeter to measure current.

2. LED Digital Display Model
Features:
High-brightness red LED numeric display with striking font.
High luminance ensures clear visibility under strong light and direct sunlight.
No LCD aging or blackout issues at low temperatures; superior high/low temperature resistance compared to LCD.
Advantages: Visible in strong outdoor light, fast response, long lifespan, wide temperature range, and resistant to aging.
Disadvantages: Only supports numeric display; no menu settings; cannot view auxiliary parameters such as range or temperature.

3. LCD Display Model
Features:
Large LCD screen capable of displaying multiple fields: real-time pressure, range, units, and temperature compensation parameters.
On-site calibration via buttons, allowing for local zeroing, range adjustment, and unit switching.
High-resolution display with text and icon prompts, offering the best human-machine interaction.
Advantages: Most comprehensive functionality, tool-free on-site calibration, visual parameter display, suitable for frequent debugging scenarios.
Disadvantages: Slightly reduced visibility under direct strong light; LCD response slows in extremely low-temperature environments.

4. Corrosion-Resistant Model (For Highly Corrosive Environments)
Features:
Upgraded internal wetted parts: 316L stainless steel upgraded to Hastelloy C276, titanium alloy, or Monel.
Diaphragm with special anti-corrosion coating; seals made of corrosion-resistant fluororubber.
Specifically optimized for acids, alkalis, salt spray, and corrosive chemical media.
Advantages: Resistant to strong acids, strong alkalis, chloride ions, and corrosive chemical media; prevents corrosion and leakage; doubles service life.
Disadvantages: Higher cost than the standard model; structural design and appearance are identical to the standard model, but internal materials are upgraded.

5. High-Temperature Model (for Steam / High-Temperature Media)
Features:
Integrated heat dissipation structure with an extended heat-dissipating pressure rod and integrated heat sink design.

Internal sensors are calibrated for high-temperature resistance, and the circuitry undergoes high-temperature aging and reinforcement.
Significantly improved media temperature tolerance, far exceeding that of the standard model.
Advantages: Can directly measure high-temperature steam, high-temperature thermal oil, and high-temperature process fluids, preventing sensor damage from high temperatures.
Disadvantages: Slightly longer overall length; installation requires reserved space for heat dissipation and cannot be installed tightly against the pipe wall.

6. Sanitary Flat Diaphragm Model (Food and Pharmaceutical Clean Grade)
Features:
Flat diaphragm structure with no recesses, eliminating dead corners, preventing material buildup, and facilitating easy cleaning.
Sanitary quick-connect chuck interface, compliant with pharmaceutical and food hygiene standards.
Fully polished 316L sanitary-grade material; seals use food-grade silicone or fluorocarbon rubber.
Advantages: Clean and sterile; supports in-line cleaning; suitable for biopharmaceutical, food and beverage, and purified water applications.
Disadvantages: Can only be used with clean, non-viscous media free of particles; not suitable for applications with large particulate impurities; relatively high price.

6.3 Summary of Differences Among the Six Models
1. Consider display requirements
No need to view pressure on-site → Choose the model without a display
Clear digits required in bright outdoor light → Choose the LED display model
On-site button calibration and multi-parameter viewing required → Choose the LCD display model

2. Consider the corrosiveness of the medium
Clean water, oils, common gases → Standard model is sufficient
Acids, alkalis, chemical waste liquids, salt spray, or highly corrosive media → Must select the corrosion-resistant model

3. Consider the medium temperature
Ambient temperature – 40–85°C → Any standard model
High-temperature steam, high-temperature hot oil, or media above 120°C → Must select the high-temperature model

4. Check industry cleanliness requirements
Pharmaceuticals, biotechnology, food, beverages, purified water → Must select the sanitary flat-film model

6.4. Simplified Model Selection Guide (Simply follow these guidelines)
1. Construction site piping networks, water treatment plants, general industrial control, remote transmission only (no on-site reading required) → Model without display

2. Outdoor open-air environments, intense sunlight, on-site direct reading required → LED numeric display model

3. Requires on-site zero adjustment and range change at any time; standard indoor workshop conditions → LCD model

4. Chemical acids/alkalis, electroplating, corrosive liquids/gases → Corrosion-resistant model

5. Steam pipelines, high-temperature thermal oil, high-temperature process piping → High-temperature model

6. Pharmaceutical, food, dairy, biotech cleanrooms; requires hygienic design with no dead corners → Sanitary flat-film model

VII. Installation and Commissioning Specifications
7.1 Pre-installation Preparation
1. Verification of Accessories
After unpacking, verify the completeness of the main unit and all accompanying accessories one by one, including the QDYL80A 2088 pressure transmitter main unit, explosion-proof cable gland, process connection gasket, mounting bracket, user manual, product certificate of conformity, and factory calibration report; Verify that the model, range, explosion-proof rating, and output signal version match the procurement requirements. Ensure the exterior has no dents or scratches, the housing has no cracks, the wiring compartment is properly sealed, and the threaded connections show no stripped threads or damage.

2. Environmental Inspection
Confirm that the installation site is free from severe mechanical impact and prolonged exposure to highly corrosive gases. For outdoor installations, avoid low-lying areas prone to water accumulation and locations where the unit is directly exposed to rain from above; In flammable and explosive areas, ensure that the on-site explosion-proof zone classification matches the device's explosion-proof parameters; standard transmitters must never be used in hazardous areas. Ambient temperature and humidity must fall within the device's rated operating range. Reserve sufficient space around the installation for heat dissipation, maintenance, and wiring operations, and keep the device away from strong electromagnetic radiation sources such as variable frequency drives and high-power motors.

3. Tool List
Prepare an adjustable wrench, Allen wrench, Phillips screwdriver, multimeter, electrical tape, shielded signal cable, grounding copper wire, PTFE tape, sealing gaskets, and a portable signal calibrator. In explosion-proof areas, only explosion-proof tools may be used; open the cover while the power is on or in the presence of open flames is strictly prohibited.

4. Safety Precautions
In explosion-proof zones, strictly adhere to explosion-proof installation regulations; open the cover and perform wiring only after power has been disconnected. It is strictly prohibited to connect or disconnect terminal blocks under live conditions in flammable or explosive environments. Do not open the cover for installation or commissioning outdoors in rainy weather. Installation personnel must wear proper insulation protection to avoid accidental contact with high-voltage electricity. Wiring operations may only be performed after the equipment has been securely installed and fixed to prevent measurement errors caused by equipment swaying or falling from heights.

7.2 Standard Installation Steps
1. Mounting the Main Unit
The 2088 features a hammer-head standard design, supporting three installation methods: direct pipe thread mounting, column bracket mounting, and wall-mounted installation. For direct pipe mounting, evenly wrap PTFE tape around the external threads of the process connection, then gently screw it into the pressure measurement port and tighten it moderately; do not use excessive force, as this may damage the internal sensor diaphragm. For bracket mounting, secure the transmitter to the dedicated mounting bracket, then fasten the bracket to a column or wall. Ensure the device is installed vertically or horizontally to prevent long-term tilting from affecting measurement stability. This model does not support 35mm DIN rail mounting; it is intended solely for on-site piping and wall-mounted installations.

2. Wiring Specifications and Terminal Identification
The device's wiring compartment contains power terminals, signal output terminals, and ground terminals, each with strictly defined functions:
The power terminals are for connecting to the system power supply; the signal terminals transmit 4–20 mA or RS485 signals to PLCs, DCS systems, or secondary instruments; Distinguish between positive and negative signal terminals, and wire strictly according to the markings; do not connect incorrectly or short-circuit.
The two-wire 4-20mA version does not distinguish between input signal terminals and uses a common wiring method for both power supply and signal circuits; the isolated version has separate terminal blocks, with power, input, and output isolated from each other; terminal blocks must not be mixed.

3. Grounding Requirements
The metal housing of the transmitter must be reliably grounded. Use a copper grounding wire of sufficient gauge, with one end connected to the device's dedicated grounding terminal and the other to the on-site industrial protective ground. Shielded cables must be grounded at a single point, with grounding performed uniformly only on the control cabinet side; the shielding layer at the transmitter end must remain floating and ungrounded to prevent the formation of multi-point ground loop interference signals; In explosion-proof areas, the grounding resistance must comply with safety regulations to ensure anti-static, anti-interference, and explosion-proof safety performance.

7.3 Specifications for Wiring Diagrams
1. General Standard Wiring Labeling Specifications
Terminals in the wiring compartment of the entire unit must be clearly labeled as power positive, power negative, signal positive, signal negative, and ground. For two-wire 4-20mA circuits, a series power supply connection method is used, forming a closed loop between the 24V DC power supply, the transmitter, and the load instrument. For RS485 digital models, distinguish between A and B communication terminals; reversing A and B connections is strictly prohibited.

2. Shielded Cable Grounding Specifications
Signal lines must use shielded twisted-pair cables. The shield must fully enclose the conductors; after stripping the outer jacket, the shield must be neatly gathered. A single, reliable grounding point must be established on the control cabinet side. The internal shield of the transmitter must be insulated so that it does not contact the housing or connect to any terminals, thereby preventing interference signals from entering.

3. Specific Wiring Guidelines for Power-Supply and Isolated Models
The power-supply model requires no external power supply circuit; it operates normally when powered directly from the control system circuit. The isolated model features electrical isolation between the internal power supply, input, and output terminals. During wiring, terminals must not be short-circuited across terminals. Power circuits and signal circuits must be routed independently, with separate cabling and must not be run in the same conduit as power cables.

4. Comparison of Common Correct and Incorrect Wiring Practices
Correct Practices: One-to-one terminal matching, correct polarity (positive and negative), single-point shield grounding, separate routing of high- and low-voltage circuits, and reliable enclosure grounding;
Incorrect Practices: Reversed polarity wiring, swapping RS485 A/B terminals, grounding the shield at both ends, routing power and signal cables in the same conduit, omitting enclosure grounding, or opening the cover under power in explosion-proof areas. Any of these actions may cause signal drift, equipment damage, or failure of explosion protection.

7.4 Power-On Commissioning Procedure
1. No-Load Test
After all wiring, grounding, and sealing have been completed, ensure the pressure measurement valve is closed and in a no-load state, with no medium pressure input in the piping. Verify that the wiring is correct, terminals are secure, the wiring compartment seal is properly locked, and the explosion-proof seal is firmly compressed. Slowly apply the 24 V DC power supply and observe for any abnormal heating, unusual noises, or burning odors. If no abnormalities are detected, the no-load power-up is considered normal.

2. Signal Calibration
Connect a multimeter in series with the 4–20 mA loop to measure the no-load standard current value; the normal reading should be around 4 mA at the reference zero point. For the RS485 version, use the host computer to configure communication and verify that the device address and baud rate are correct, and that data can be read normally. Connect a standard pressure calibrator to apply calibration pressure, and test the linearity of the output signal at the range's start, midpoint, and full-scale points.

3. Indicator Status Assessment
For models without a display, a stable loop current without fluctuations indicates normal operation; for LED models, a steady-on LED and stable readings without flickering indicate normal operation; For LCD models, the screen should light up upon power-on, and the parameter interface should display normally without screen distortion, black screens, or garbled characters; if numerical fluctuations, frequent LED flashing, or erratic current levels occur, this indicates wiring interference or improper grounding during installation.

4. Calibration Methods
On-site calibration can be performed using the meter's buttons to zero the reading, adjust the range, and switch units; for models without a display, zero and full-scale calibration must be performed via a host computer or handheld calibrator; after calibration, let the device stand for 10 to 30 minutes to ensure readings do not drift or fluctuate, and verify that measurement accuracy meets factory standards before putting it into official use.

7.5 Installation Precautions
1. Never exceed the pressure or measurement range limits. Do not subject the device to test pressures exceeding its rated upper limit during installation, as this may cause direct rupture of the sensor diaphragm and result in permanent damage.

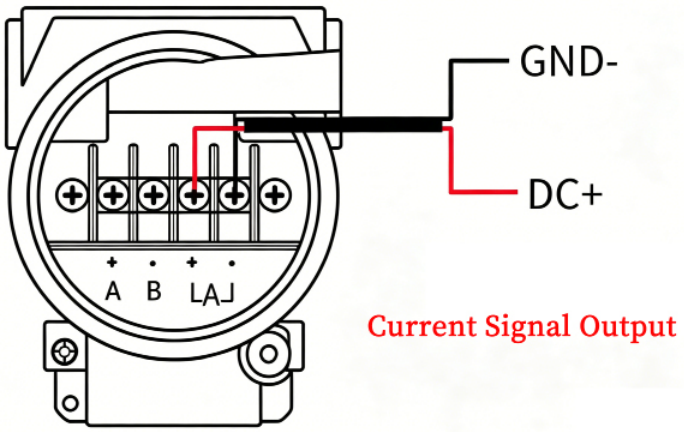
2. Never connect to voltages exceeding the specified supply range. Use only standard 12–36 V DC power; do not connect to 220 V AC mains power to prevent instantaneous burnout of internal circuits.

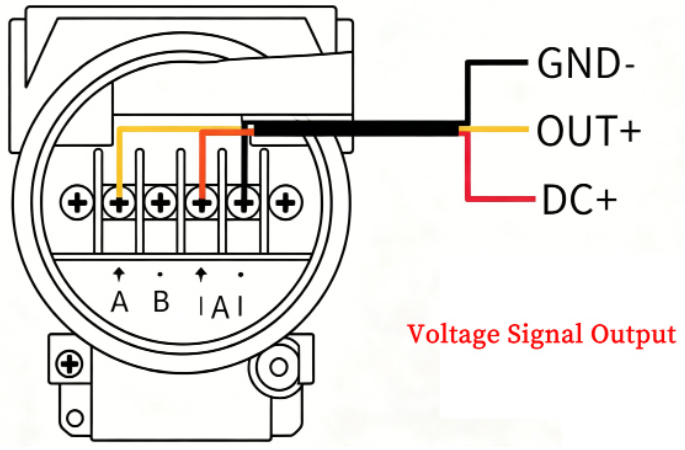
3. Avoid running wiring in close proximity to variable frequency drives, high-power motors, or power cables. High- and low-voltage cables must be routed through separate conduits or cable trays to minimize signal fluctuations caused by electromagnetic interference.

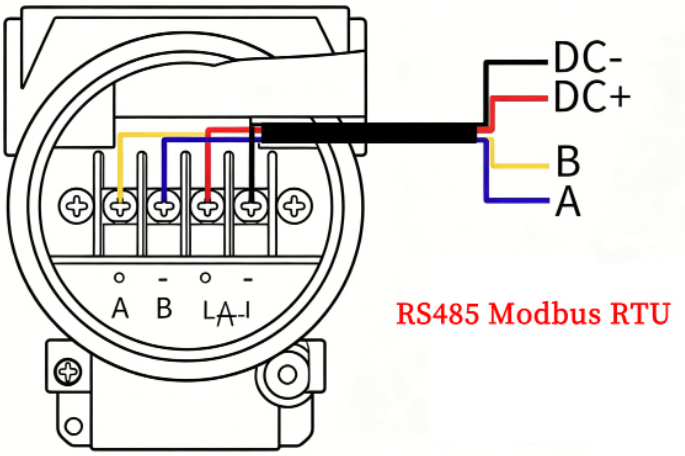
4. Under no circumstances should the cover be opened for work on the bare unit in damp, rainy, or outdoor environments. The terminal compartment must be securely locked and sealed, and explosion-proof connectors must be tightly compressed to ensure water and dust resistance, preventing moisture and dust from entering the terminal compartment and causing short circuits, corrosion, or failure of the explosion-proof seal.

5. Do not use excessive force when tightening process connection threads, and do not strike the transmitter housing. This prevents displacement or deformation of internal sensors, which could cause permanent measurement inaccuracies.

6. In explosion-proof zones, it is strictly prohibited to alter the wiring configuration, remove sealing components, or replace sealing parts with non-original equipment manufacturer (OEM) components. Failure to comply will invalidate the explosion-proof rating and create significant safety hazards.







VIII. Recommendations for Daily Use & Operation and Maintenance

8.1. Daily Maintenance Principles by Model

Develop differentiated maintenance strategies based on the structural characteristics of different models, balancing efficiency and equipment lifespan:

Models without a display: The primary maintenance focus is on terminal blocks and housing seals. Since there is no display window, there are no additional maintenance points; attention should be directed solely toward the stability of signal circuits and the integrity of the protection rating.

LED/LCD Display Models: In addition to basic sealing maintenance, pay special attention to the cleanliness of the display window and the display status. Regularly inspect for risks of LCD screen aging and LED display malfunctions.

Corrosion-Resistant Models: Focus on the compatibility of wetted parts with the process medium. Regularly inspect diaphragms and seals for corrosion to prevent leaks caused by long-term exposure to corrosive media.

High-Temperature Models: The core maintenance focus is on the heat dissipation structure. Regularly clean dust and oil residue from the heat sinks to prevent sensor damage caused by overheating due to heat dissipation failure.

Sanitary Flat Diaphragm Models: These must be integrated with in-process cleaning (CIP/SIP) procedures. Regularly inspect the cleanliness of the flat diaphragm and ensure a seamless, dead-space-free seal to prevent contamination from material residues.

8.2 Key Points for Daily Inspections

1. Signal Stability Monitoring

Daily, use the PLC/DCS or local display to observe whether pressure data is stable, with no sudden jumps, zero-point drift, or data freezing; record pressure values under critical operating conditions, compare them with historical data, and promptly investigate any abnormal fluctuations.

2. Temperature, Humidity, and Environmental Monitoring

Inspect the equipment's surrounding environment to ensure there is no exposure to high temperatures, water accumulation, or strong corrosive gases. Check that the equipment housing temperature is normal and not abnormally hot. For models with LCD displays, verify that the screen functions normally in low-temperature environments, with no black screens or slow response times.

3. Visual Inspection and Integrity Check

Inspect the transmitter housing for cracks or dents; ensure explosion-proof seals and cable connectors are securely fastened with no looseness or signs of water ingress. For outdoor models, pay special attention to the protective ring and display window for damage, and check that the sealing O-rings show no signs of aging or cracking.

4. Installation and Piping Condition Inspection

Confirm that the transmitter is securely fastened, with no looseness or tilting; ensure process connection threads are free of leaks and corrosion, and that pressure-sensing lines are free of blockages and kinks to prevent media buildup from affecting measurement accuracy.

8.3 Periodic Maintenance Plan

1. Cleaning Frequency and Requirements

Standard operating conditions (indoor/outdoor, non-dusty environments): Clean once per quarter by wiping the housing and display window with a dry, soft cloth. Avoid using organic solvents or strong acid/alkali cleaning agents.

High-dust / humid / chemical environments: Clean once a month, focusing on removing dust and oil residue from the housing, heat sinks, and display window. For high-temperature models, clear any obstructions from the heat sinks to ensure efficient heat dissipation.

Sanitary flat-diaphragm models: Align with the process cleaning cycle. After each in-line cleaning, inspect the diaphragm surface for material residue; if necessary, wipe with purified water to clean, taking care not to scratch the flat diaphragm.

2. Wiring Tightness and Sealing Inspection

Conduct a tightening inspection of all terminal blocks and cable connectors every six months to ensure terminals are secure and free of oxidation, and that shielded cables are properly grounded. In explosion-proof areas, opening the cover while the unit is energized is strictly prohibited; inspect the wiring compartment seal only after power has been disconnected.

Replace aged O-rings and cable joint gaskets annually to ensure the IP65 / explosion-proof protection rating remains effective and to prevent the ingress of moisture and dust.

3. Recommendations for Accuracy Retesting and Calibration

Standard Industrial Conditions: Conduct an annual accuracy re-test and use a standard pressure calibrator to calibrate the zero point, range, and linearity. Recalibration is required if the error exceeds ±0.2% FS.

Harsh Conditions (e.g., Chemical, Metallurgical, High-Temperature): Conduct a re-test every six months, focusing on checking the stability of temperature compensation and the impact of medium corrosion on measurement accuracy. Perform zero-point drift correction as necessary.

Hygienic Pharmaceutical Industry: Perform accuracy re-testing quarterly to ensure stable measurement accuracy under clean process conditions and to meet production process and GMP requirements.

8.4 Long-Term Maintenance Tips

1. Optimizing Dust and Moisture Protection

For outdoor installations, install a rain and sun shield to prevent direct sunlight and rain exposure, thereby slowing down housing aging and yellowing of the display window.

In humid environments, place desiccant inside the wiring compartment (use explosion-proof desiccant in explosion-hazard areas) to prevent

internal condensation from corroding the circuitry; ensure the cable entry points are properly sealed to prevent moisture from entering along the cables.
For transmitters that will be out of service for an extended period, remove them from the piping, clean residual media from the wetted parts, and store them in a dry, well-ventilated environment to prevent the media from drying out and crystallizing, which could damage the diaphragm.

2. Measures to Optimize Interference Resistance
Use shielded twisted-pair cables throughout the signal line, ensure reliable single-point grounding, and avoid routing them in the same cable tray as power cables or variable frequency drive (VFD) cables to minimize electromagnetic interference.
Regularly inspect the grounding system to ensure the transmitter housing grounding resistance is ≤4Ω, preventing loop current interference caused by multiple grounding points.
In environments with severe electromagnetic interference, install signal isolators in the signal loop to further filter out interference and ensure data stability.

3. Special Protection for Extreme Environments
High-temperature conditions: Regularly clean the heat sinks to prevent oil and dust from blocking heat dissipation channels; avoid installing the transmitter in locations directly exposed to heat radiation from pipes; install thermal shields if necessary.
Low-Temperature Conditions: For models with LCD displays, install a low-temperature insulation sleeve to prevent display malfunctions at extremely low temperatures; simultaneously check for the risk of medium freezing to prevent pressure tubing from freezing and cracking, which could damage the equipment.
Highly Corrosive Conditions: Regularly inspect the wetted diaphragm and seals; replace them immediately if signs of corrosion are found; avoid prolonged exposure of the transmitter to highly corrosive gases; install a corrosion-resistant protective cover if necessary.

4. Medium Compatibility and Long-Term Stability Assurance
Never operate beyond the rated range or pressure limits. In applications with significant process pressure fluctuations, install dampers on the pressure-sensing tubes to prevent pressure surges from damaging the sensor diaphragm.
For media containing solid particles, install a filter at the pressure-sensing port to prevent particles from blocking the ports or scratching the diaphragm.
Before restarting after a long period of inactivity, perform a no-load test on the transmitter. Only after confirming that the equipment is undamaged and leak-free should you slowly increase the pressure and put it back into service.

IX. Troubleshooting & Emergency Procedures
9.1 List of Common Faults (Sorted by Frequency of Occurrence)
No output signal / Output is 0 mA / No communication
Signal drift / Value fluctuations / Severe zero-point offset
Display abnormalities (LCD/LED not lighting up, garbled characters, distorted screen, values not updating)
Alarm Triggered (System alerts for out-of-range, open circuit, or communication failure)
Signal Interference or Distortion (Irregular value fluctuations, affected by equipment startup/shutdown)

9.2 Causes of Faults and Step-by-Step Solutions
1. No Output Signal / Output is 0mA / No Communication
Core Cause Analysis:
Power supply circuit failure: Power not connected, insufficient supply voltage, reversed polarity
Terminal block failure: Loose terminals, broken wires, incorrect shielding wire handling
Hardware damage: Burned-out power circuit, sensor breakdown, communication module failure
Load limit exceeded: 4-20mA loop load resistance exceeds the transmitter's rated upper limit
Step-by-Step Troubleshooting:
Inspect wiring with power off: Verify that the DC+ and GND- terminals are secure and free of oxidation; ensure the 4-20mA two-wire loop wiring complies with series connection specifications; confirm that the A/B terminals on the RS485 version are not reversed.
Measure supply voltage with power on: Use a multimeter to measure the voltage at the transmitter's power terminals and confirm it is within the 12–36 V DC range; If the voltage is 0, check the upstream power supply, fuses, and safety barrier circuit.
Measure the loop current: Under no-load conditions, the normal output of a 4–20 mA transmitter should be approximately 4 mA. If the current is 0, check for an open circuit; if the current exceeds 24 mA, verify that the load resistance does not exceed the 600 Ω limit.
Communication Troubleshooting (RS485 Model): Verify that the baud rate, address, and parity bit settings match those of the host computer. Use a Modbus debugging tool to test communication and rule out bus conflicts or incorrect terminating resistor settings.
Emergency Procedure: If hardware damage is confirmed, temporarily replace the transmitter with a spare unit. Calibrate it quickly according to the on-site measurement range before connecting it to the loop to minimize downtime.

2. Signal Drift / Value Jumps / Severe Zero-Point Offset
Root Cause Analysis:
Installation Environment Impact: Equipment vibration, blocked or leaking pressure tubing, or installation tilt causing static pressure errors
Temperature Impact: Sudden changes in ambient or medium temperature exceeding the temperature compensation range
Electromagnetic Interference: Interference from power cables, poor grounding, or radiation interference from variable frequency drives (VFDs) or motors
Sensor Aging / Damage: Diaphragm fatigue, zero-point drift exceeding tolerance limits, aging of circuit components
Pressure-transmitting medium issues: Medium crystallization, residual air bubbles causing abnormal pressure transmission
Step-by-Step Troubleshooting:
On-site condition inspection: Verify that pressure tubing is free of blockages and leaks; ensure the transmitter is securely installed without vibration; avoid long-term installation at an angle; purge air bubbles from the pressure tubing to prevent pressure transmission lag caused by air locks.
Interference Troubleshooting: Run signal lines separately from power cables; verify that the single-ended ground connection of the shielded cable is secure; ensure the transmitter housing ground resistance is ≤4Ω; temporarily disconnect nearby high-power equipment to observe if the signal stabilizes.
Zero Calibration: Under no-load, ambient temperature conditions, perform a zero reset via the transmitter buttons or a host computer to eliminate human calibration errors; if zero drift exceeds ±0.1% FS, perform a full-scale calibration.
Temperature Troubleshooting: For high-temperature models, check if the heat sink is blocked to prevent equipment overheating; in cryogenic conditions, check if the medium has frozen or if the pressure tubing is frozen and blocked.
Emergency Measures: In the short term, reduce signal fluctuations by adjusting the filter parameters via the host computer. Replace the transmitter with a spare unit during a shutdown window, then return the original unit to the factory for comprehensive calibration and aging tests.

3. Display Abnormalities (LCD/LED not lighting up, garbled characters, distorted screen, values not updating)
Root Cause Analysis:
Abnormal supply voltage: Voltage too low or too high causing the display module to malfunction
Display module failure: LCD/LED hardware damage, loose ribbon cable
Electromagnetic interference: Strong interference causes garbled text or program malfunctions
Low/high temperature effects: LCD response slows at extremely low temperatures; display module degradation at high temperatures
Software failure: Internal program freeze or parameter errors causing value lockup
Step-by-step troubleshooting:
Basic power supply check: Verify supply voltage is within the rated range; rule out voltage fluctuations and poor contact issues; power off and restart the device to observe if the display returns to normal.
Display Module Inspection: After powering down, open the cover (in non-explosion-proof areas) to check if the display module ribbon cable is loose; for LCD models, verify that the backlight power supply is

functioning normally. In explosion-proof areas, opening the cover while the device is powered on is strictly prohibited; power must be completely shut off before proceeding.
Environmental Inspection: In extremely low-temperature conditions, check for LCD low-temperature response issues; an insulating sleeve may be installed for testing. In high-temperature conditions, confirm that the device temperature does not exceed the rated upper limit to prevent module burnout.
Interference Troubleshooting: Check grounding and shielding wires to reduce electromagnetic interference; if the issue is a program freeze, and garbled characters persist after powering off and restarting, determine that the display module or main control circuit is faulty.
Emergency Procedures: If on-site repair is not possible, prioritize ensuring normal signal output; rely on data displayed by the PLC/DCS, and replace the display module or install a spare transmitter during a shutdown window.

4. Alarm Triggering (System Alerts for Out-of-Range, Line Break, or Communication Failure)
Root Cause Analysis:
Process pressure out of range: Actual pressure exceeds the transmitter's rated upper limit, triggering out-of-range protection
Circuit break / poor contact: Signal line break or loose terminals cause the system to detect a line break
Communication failure: RS485 bus failure, address conflict, or device disconnection
Device hardware failure: Sensor damage or circuit failure causing abnormal output, triggering a system alarm
Step-by-Step Troubleshooting:
Process pressure check: Verify whether the current operating pressure exceeds the transmitter's range. If out of range, replace with a transmitter with a higher range to prevent sensor damage from prolonged overpressure.
Loop Disconnection Troubleshooting: Inspect terminal blocks and cables for breaks; check if safety barriers/isolators are faulty; verify loop resistance is normal; and resolve any poor contact issues.
Communication Failure Troubleshooting: Check RS485 bus wiring, terminating resistors, and device address settings; investigate bus conflicts and baud rate mismatches; and reconfigure communication parameters.
Hardware Troubleshooting: If the process pressure is normal and there are no circuit breaks, but an alarm is still triggered, this indicates a transmitter hardware failure; replace the unit with a spare.
Emergency Response: Temporarily monitor pressure via a bypass for a short period to prioritize resuming production; replace the transmitter and investigate the root cause of the alarm during a scheduled shutdown.

5. Signal Interference and Distortion (Irregular fluctuations in readings, affected by equipment start/stop cycles)
Core Cause Analysis:
Electromagnetic Interference: Interference caused by electromagnetic radiation from equipment such as variable frequency drives, motors, and welding machines
Ground Loop Interference: Interference caused by ground potential differences resulting from multiple grounding points or poor grounding
Wiring Interference: Signal cables and power cables are routed in the same cable tray or are too close to each other
Power Supply Interference: Signal distortion caused by excessive power supply ripple or voltage fluctuations
Step-by-Step Troubleshooting and Resolution:
Wiring Optimization: Replace signal cables with shielded twisted-pair cables; route them in separate cable trays or conduits from power cables, maintaining a minimum distance of 30 cm, and avoid parallel routing.
Grounding Correction: Ground the transmitter housing and shielding wire to a single point on the control cabinet side to eliminate ground potential differences; ensure grounding resistance $\leq 4\ \Omega$, and avoid sharing grounding electrodes with high-power equipment.
Power Filtering: Install a power filter in the transmitter's power supply circuit to reduce power supply ripple interference; if electromagnetic interference is severe, install a signal isolator to isolate interfering signals.
Equipment Isolation: Install a metal shielding enclosure between interference sources (such as variable frequency drives and motors) and the transmitter to reduce radiated interference; if necessary, adjust the transmitter's installation location to move it away from high-interference equipment.
Emergency Measures: In the short term, increase the signal filtering time via the host computer to mitigate the impact of interference fluctuations, and complete wiring and grounding rectifications during the next scheduled shutdown window.

9.3, After-Sales Repair Guidelines
1. Failure Diagnosis Criteria (Situations Requiring Repair)
Power supply is normal and wiring is correct, but the transmitter has no output signal; normal operation is restored after replacing with a spare unit of the same model
Severe signal drift; accuracy cannot be restored even after multiple on-site zero-point calibrations and full-range calibrations
Display module is damaged or displays garbled characters; normal display cannot be restored after powering off and restarting
Sensor is damaged or diaphragm is ruptured; pressure tubing shows no leaks, but output remains consistently out of range or unchanged
In explosion-proof areas, the equipment housing is damaged or the seal has failed, and the explosion-proof rating cannot be guaranteed
Communication failure occurred; investigation revealed damage to an internal module, which could not be repaired through on-site debugging

2. Repair Process
On-site Troubleshooting: Complete basic troubleshooting according to the steps above to rule out wiring, power supply, interference, and process issues, and confirm that the fault lies with the device itself.
Information Preparation: Record the device model, measurement range, serial number, installation date, fault symptoms, on-site operating conditions (medium, temperature, pressure, environment), and the troubleshooting process and results.
Contact After-Sales Support: Contact the after-sales support team at Anhui Qidian Automation Technology Co., Ltd. via phone, WeChat, or email to submit the equipment information and fault description.
After-Sales Support: An after-sales engineer will provide remote guidance for further troubleshooting. Once the fault is confirmed, a repair or replacement plan will be provided. If factory repair is required, the equipment return procedures will be processed according to the established workflow.
Repair and Delivery: Upon return to the factory, the equipment will undergo comprehensive testing, repair, and calibration. A repair report will be issued. After repair is completed, the equipment will be shipped back, and on-site installation and commissioning guidance will be provided.

3. Contact Information
After-sales Hotline: 19715617532
Technical Support Email: sales008@qd-zdk.com
Address: After-Sales Department, Anhui Qidian Automation Technology Co., Ltd., Fenghuangshan Industrial Park, Huaibei City, Anhui Province

4. Warranty Scope and Terms
Warranty Period: Within 12 months from the date of manufacture, equipment failures not caused by human error or use beyond specified operating conditions are eligible for free repair or replacement.
Warranty Coverage: Covers quality issues with the main components of the equipment, including sensors, circuit modules, display modules, and enclosures. Excludes wear-and-tear parts (seals, cable connectors), as well as damage caused by human error, over-range operation, or corrosion resulting from failure to select a corrosion-resistant model.
Post-Warranty Services: Paid repair services are available for equipment outside the warranty period. Costs are charged based on the specific repair items, and an extended warranty is provided following the repair.