High Temperature Pressure Transmitter

I. Product Definition

The QDW901A1 High-Temperature Pressure Transmitter is an industrial-grade pressure sensor developed by Anhui Qidian Automation Technology Co., Ltd. specifically for pressure measurement applications involving high-temperature media.

Based on diffused silicon pressure sensing technology, it employs a high-temperature heat dissipation structure to thermally isolate the high-temperature medium from the electronic components. It can stably measure the pressure of high-temperature liquids, gases, and steam over the long term, and linearly convert the pressure signal into standard industrial electrical signals (such as 4-20mA or 0-10V) for output. It serves as a core device for pressure monitoring, transmission, and feedback in industrial automation control systems.

Depending on the configuration, this product series is divided into three main categories: standard models without a display, digital display models (green screen/red screen), and models with long pressure-conducting tubes for heat dissipation. These variants cater to different temperature ratings, installation spaces, and on-site visualization requirements, and are widely used in industries such as petrochemicals, power generation, metallurgy, food and pharmaceuticals, and boiler and HVAC systems.

II. Working Principle

The operating process of the QDW901A1 high-temperature pressure transmitter can be divided into five core stages, explained in layman's terms as follows:

1. Pressure Signal Acquisition: The high-temperature medium being measured (such as steam or hot oil) comes into contact with the transmitter's stainless steel isolation diaphragm through the pressure connection port. The medium's pressure is transmitted through the diaphragm to the internal diffused silicon pressure-sensitive element.

2. Thermal Isolation and Heat Dissipation: The high-temperature heat carried by the medium is conducted to the external environment via the transmitter's long heat sink (or extended pressure tubing + heat dissipation spring), achieving thermal isolation between the high-temperature medium and the downstream electronic circuitry to prevent damage to the sensitive elements and circuits caused by high temperatures.

3. Pressure-to-Electrical Signal Conversion: Under pressure, the diffused silicon sensing element generates a faint voltage signal proportional to the pressure via an internal Wheatstone bridge, thereby converting the "pressure signal to an electrical signal."

4. Signal Amplification and Conditioning: The faint voltage signal is processed by internal high-precision amplification and temperature compensation circuits to eliminate temperature drift and nonlinear errors, resulting in a stable, linear electrical output signal.

5. Standard Signal Output: The conditioned signal is converted into an industry-standard 4–20 mA current signal (or 0–5 V/0–10 V voltage signal) and transmitted via aviation/Hirschmann connectors to control terminals such as PLCs, DCS systems, and digital displays, enabling remote pressure monitoring and control.

III. Core Value and Solutions to Industry Pain Points

3.1. Overview of Core Value

The core value of this product lies in addressing the three major industry pain points in high-temperature medium pressure measurement—"inaccurate readings, short service life, and susceptibility to damage." It simultaneously addresses installation convenience, signal stability, and on-site visualization needs, providing a highly reliable, low-cost measurement solution for industrial high-temperature pressure applications.

3.2. Pain Points and Solutions

1. Pain Point: In high-temperature media (such as steam and hot oil), the extreme heat can easily damage the electronic components of standard pressure transmitters, resulting in a short service life.
Solution: A dual-cooling structure featuring extended heat sinks and elongated pressure tubes combined with heat-dissipating springs is employed to conduct heat away from the medium, achieving thermal isolation. This design enables long-term operation in media temperatures up to 300°C.
Direct Benefit: Eliminates the need for frequent transmitter replacement, reducing equipment maintenance costs and downtime risks

2. Pain Point: In high-temperature environments, pressure signals are susceptible to temperature drift, leading to significant measurement errors and compromising production control accuracy
Solution: Built-in high-precision temperature compensation circuitry, combined with the linear characteristics of the diffused silicon sensor, ensures measurement accuracy (±0.25% FS) across a wide temperature range
Direct Benefits: Stable and reliable measurement data, preventing process runaway and quality non-conformities caused by misjudged pressure

3. Pain Point: Some field locations lack control terminals, making it impossible to view real-time pressure intuitively and causing inconvenience during commissioning and inspections
Solution: Supports an optional field display module (available in green or red screen versions), which directly displays real-time pressure values without the need for external instruments
Direct Benefit: On-site commissioning and inspections no longer rely on host computers, significantly improving operational efficiency and reducing costs for additional instruments

4. Pain Point: Installation space and medium temperature ratings vary significantly across different sites, making a single model unsuitable for all scenarios. Solution: Offers multiple configurations, including standard (non-display), digital display, and long-tube heat-dissipation models, allowing selection based on medium temperature and installation space.
Direct Benefit: Eliminates the need to purchase multiple sets of equipment for different scenarios, achieving "one product suitable for multiple high-temperature scenarios" and simplifying model selection and inventory management.

5. Pain Point: Strong electromagnetic interference in industrial environments makes signal transmission susceptible to disruption, leading to data fluctuations and control failures
Solution: Features an anti-interference circuit design; the standard current signal (4–20 mA) offers long transmission distances and strong interference resistance; the housing features a fully sealed stainless steel construction with an IP65 protection rating
Direct Benefits: Stable signal transmission unaffected by on-site electromagnetic interference from motors, inverters, and other sources, ensuring stable operation of the control system

6. Challenge: Traditional high-temperature pressure measurement solutions are costly, complex to install, and difficult to maintain
Solution: Features an integrated design with standard G1/4 external thread mounting, eliminating the need for auxiliary components such as condensers or buffer tanks, and enabling easy installation
Direct Benefits: Reduces initial equipment procurement and installation costs; maintenance requires only periodic cleaning of the heat sink, minimizing operational complexity

IV. Key Parameters & Specifications

4.1 Basic Electrical Parameters

Measurement Range: Selectable negative pressure, low pressure, or standard positive pressure; range can be customized
Output Signal: Standard 4–20 mA; optional voltage signals such as 0–5 V, 0–10 V, 1–5 V, etc.
Accuracy Class: Two options available: ±0.25% FS and ±0.5% FS
Linearity: ≤±0.2% FS
Hysteresis: ≤±0.15% FS
Repeatability: ≤±0.1% FS
Response Time: ≤5 ms
Zero Drift: ≤±0.1% FS per 10°C temperature change
Span Drift: ≤±0.1% FS per 10°C temperature change
Load Capacity: Maximum load resistance for 4-20mA output ≥600Ω
Signal Wiring: 2-wire or 3-wire configuration available; industrial

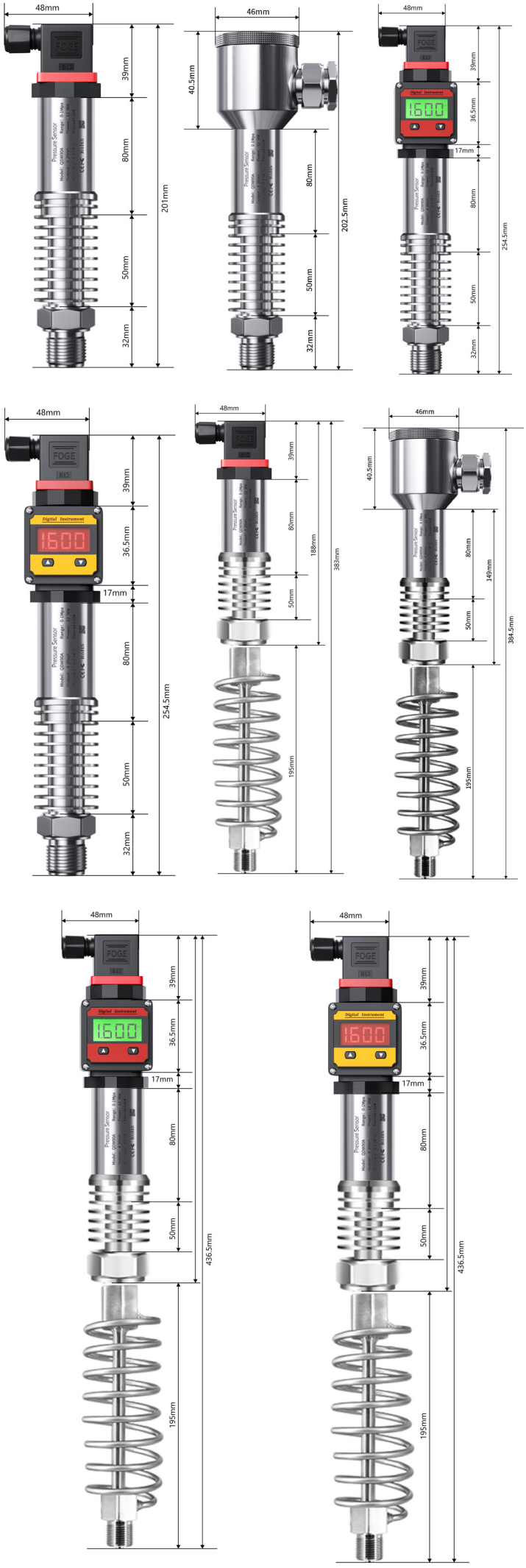
standard wiring definitions

4.2 Isolation Performance Parameters
Sensor Isolation Method: Mechanical isolation via stainless steel diaphragm; complete isolation between the medium and the circuit
Insulation Resistance: ≥100 MΩ between the housing and signal terminals (DC 500 V)
Dielectric Withstand Voltage: AC 1000 V for 1 minute without breakdown between the pressure port and the circuit
Common-Mode Immunity: Capable of suppressing electromagnetic interference from industrial field variable frequency drives and motor start/stop operations
Media Compatibility: Isolation diaphragm made of 304/316L stainless steel, suitable for water, oil, steam, and mildly corrosive liquids and gases
High-Temperature Isolation and Heat Dissipation: Extended heat dissipation columns / heat dissipation coil structure blocks heat transfer to the circuit, achieving thermal isolation between high-temperature media and electronic components

4.3 Power Supply & Power Consumption Parameters
Standard Supply Voltage: DC 24V (standard industrial power distribution)
Wide Supply Voltage Range: DC 12V–36V, suitable for variable on-site power distribution conditions
Operating Power Consumption: Standard 4–20mA models have a full-load power consumption of ≤0.8W
Power Supply Features: Built-in reverse polarity protection, overvoltage protection, and surge protection
No external power distribution losses; powered by a two-wire passive loop, eliminating the need for an additional independent power supply

4.4 Environmental Adaptation Parameters
Medium Operating Temperature: -40°C to +300°C (High-Temperature Core Specification)
Instrument Ambient Operating Temperature: -20°C to +70°C
Storage Temperature: -40°C to +85°C
Operating Humidity: 5% RH to 95% RH (non-condensing)
Protection Rating: IP65 (dust- and water-resistant), suitable for outdoor and damp, dusty workshop environments
Explosion-Proof Rating: Optional intrinsically safe type Ex ia II C T6 Ga
Compatible Safety Barriers: Compatible with standard isolated safety barriers or intrinsically safe safety barriers for use in explosion-proof systems
Vibration Resistance: Frequency 10 Hz to 1000 Hz, amplitude 0.1 mm; no drift or damage during long-term operation

4.5. Physical Parameters
Mounting Method: Standard G1/4 external thread for direct pipe mounting; optional M20×1.5 or G1/2 threaded connections
Housing Material: All-304 stainless steel housing, corrosion-resistant, rust-proof, and impact-resistant
Diaphragm Material: Standard 316L stainless steel isolation diaphragm, resistant to weak acids and alkalis, as well as oil and grease corrosion
Electrical Interface: Optional HARTING connector or aviation connector; wiring is waterproof and dustproof
Total Weight: Approx. 320g (standard heat dissipation type); approx. 450g (long heat dissipation tube type)
Dimensions:
Body Width: Approx. 58mm
Body height: approx. 62 mm
Total heat sink length: Standard type 110 mm; Extended high-temperature type 160 mm
Threaded connection length: 12 mm
Structural protection details: Fully sealed laser-welded construction, leak-free; internally potted to prevent moisture, condensation, and circuit oxidation; integrated heat sink chamber ensures uniform heat conduction and dissipation, with no deformation or failure under long-term high-temperature conditions



V. Application-Specific Selection Guide

5.1 Key Selection Criteria

1. Signal Type Selection: For conventional industrial automation systems, the 4–20 mA two-wire current output is the preferred choice due to its strong noise immunity and long transmission distance. When field devices need to be connected to digital displays or data acquisition modules, models with 0–5 V, 0–10 V, or 1–5 V voltage outputs can be selected. For applications requiring remote digital communication, a custom RS485 digital signal output version is available.

2. Channel Selection: For standard single-point high-temperature pressure monitoring, the single-channel standard model is sufficient; for scenarios requiring simultaneous monitoring of multiple steam or hot oil pressure points on the same equipment, pair with multi-point models from the same series to ensure uniform specifications, facilitating future maintenance and spare part replacement.

3. Power Supply Selection: For standard PLC or DCS cabinet power distribution in industrial environments, select the standard 24V DC model; for outdoor applications without a fixed regulated power supply or solar-powered conditions, choose the wide-voltage compatible model (12V–36V DC); in two-wire loop-powered scenarios, the standard model is supplied as standard, eliminating the need for an additional independent power source.

4. Selection Based on Explosion-Proof Requirements: For standard ventilated workshops and environments without flammable or explosive media, select the general-purpose standard model; for flammable and explosive hazardous areas such as petroleum, chemical, and oil/gas storage facilities, intrinsically safe models must be selected. These should be integrated with intrinsically safe barriers to form an explosion-proof measurement and control system that complies with on-site safety regulations.

5. Selection Based on Installation Environment: For standard indoor ambient temperature environments, select the standard model with short heat dissipation columns; for high-temperature steam, thermal oil, or other media operating continuously above 200°C, select the high-temperature-resistant model with extended heat dissipation tubes; for outdoor, open-air, dusty, humid, or spray-exposed environments, prioritize models with IP65 protection rating; if on-site pressure readings are required, select the version with a built-in digital display.

5.2 Industry Application Recommendations

1. For pressure monitoring in high-temperature pipelines, reactors, steam lines, and thermal oil circulation systems in the chemical industry, prioritize the QDW901A1 extended heat sink high-temperature model. The 316L diaphragm is suitable for weakly corrosive media, and an explosion-proof version is available for use in hazardous chemical areas. The standard 4-20mA signal is compatible with DCS control systems.

2. For pressure measurement in power plants (boilers, steam turbine auxiliary equipment, thermal networks, and high-temperature water-steam circuits), the standard high-temperature-resistant base model is sufficient. Its wide temperature range accommodates environmental temperature fluctuations in power plants, and its stable output signal is compatible with power plant PLCs and remote monitoring and control systems.

3. Metallurgy Industry: For pressure monitoring in smelting furnace cooling circuits, high-temperature oil and gas pipelines, and high-temperature media in heat treatment equipment, select the version with a long heat dissipation structure. This design withstands long-term continuous high-temperature conditions, and its vibration-resistant structure is suitable for the mechanical vibration environments found in metallurgical sites, ensuring long-term measurement stability.

4. For pressure detection in high-temperature steam sterilization pipelines and heat exchange circulation systems in pharmaceutical production workshops, select models with a sanitary-grade design and 316L corrosion-resistant diaphragms. These models prevent contaminant leaching, meet pharmaceutical cleanroom requirements, and offer an optional digital display version for convenient on-site inspection readings.

5. For pressure data acquisition in high-temperature hydraulic and pneumatic circuits, as well as constant-temperature heating equipment on automated production lines in the smart manufacturing industry, standard general-purpose models are selected. These are compatible with automated control system signal interfaces, feature a compact design for easy installation, and can be adapted to the limited installation space of assembly lines.

5.3 Common Selection Pitfalls

1. Ignoring isolation ratings and selecting models blindly: Many users focus only on range and temperature while neglecting the corrosiveness of the medium and thermal isolation ratings. Using standard short-heat-dissipation models directly in 300°C high-temperature steam applications can easily cause circuit overheating, damage, and measurement drift. Failing to select 316L diaphragms for corrosive media containing acids, alkalis, or oil contaminants will result in diaphragm corrosion and leakage over time, shortening the equipment's lifespan.

2. Incorrect Selection of Pressure Signal Range: Selecting a range that is too large reduces measurement accuracy in the low-pressure range, while selecting a range that is too small exceeds the device's measurement capacity, leading to overload damage or data freezing. Failing to account for process pressure fluctuations means that minor adjustments to operating conditions later on will require replacing the transmitter, increasing procurement and installation costs.

3. Neglecting load matching parameters: When selecting 4–20 mA output models, failure to account for the input load resistance of downstream instruments or PLCs can result in signal attenuation and data fluctuations due to excessively long field wiring or overloaded circuits, leading to unstable system control.

4. Incorrect selection of general-purpose models in explosion-proof environments: In flammable and explosive chemical, oil, and gas areas, ordinary general-purpose transmitters are arbitrarily selected without matching the explosion-proof rating or installing appropriate safety barriers. This violates safety production regulations, poses safety hazards, and fails to pass on-site safety evaluations.

5.4 Customization Recommendations

1. Custom Signal Options: In addition to standard 4-20mA and voltage signals, digital output signals such as RS485 communication and HART protocol can be customized to support networked remote centralized monitoring; non-standard signal ranges can be defined to meet the integration requirements of legacy or specialized measurement and control equipment.

2. Customization for Non-Standard Operating Conditions: For media with ultra-high temperatures exceeding 300°C or highly corrosive special media, we can customize special corrosion-resistant diaphragms and extended, thickened heat dissipation structures; non-standard threaded interfaces such as M20×1.5, G1/2, and special mounting flange structures are all available; for high-temperature, low-temperature, and extremely cold environments, wide-temperature temperature-compensated versions can be customized to eliminate temperature drift errors under extreme conditions.

3. Multi-Channel Integrated Customization: For scenarios requiring centralized monitoring of high-temperature pressure at multiple points, we offer customized multi-channel integrated transmitter solutions. These consolidate multiple signal outputs into a single output, saving installation space, simplifying wiring, and facilitating centralized commissioning and unified operational maintenance.

VI. Installation and Commissioning Guidelines

6.1 Pre-installation Preparation

1. Checking Accessories

Unpack the unit and verify that the main body, heat sink assembly, sealing gaskets, threaded installation seals, waterproof connectors, and mounting hardware are complete; Check the product nameplate to ensure the range, output signal, power supply specifications, and temperature rating match the on-site operating conditions, and that there are no model mismatches or parameter discrepancies; Inspect the housing, threaded connections, and diaphragm for dents, deformation, or scratches, and ensure the sealing structure is intact and undamaged.

2. Environmental Inspection

The installation location must avoid prolonged exposure to direct high-temperature heat sources, open flames, and areas with strong corrosive gas spray; keep it away from equipment that generates strong electromagnetic interference, such as variable frequency drives, high-power motors, and contactors; ensure the site is free from violent impacts or sustained strong vibrations; if vibrations are excessive, install vibration-damping brackets; The environment must be well-ventilated and dry. In dusty or outdoor settings, confirm protective installation conditions to prevent water accumulation from soaking the probe area.

3. Tool List

Prepare an adjustable wrench, Allen wrench, Phillips screwdriver, wire strippers, multimeter, electrical tape, cable ties, shielded signal cable, grounding copper wire, and a standard pressure gauge (for calibration).

4. Safety Precautions

Before installation, the main power supply to on-site equipment must be disconnected, and the valves on the medium pipelines must be shut off. Work may only proceed after pressure has been relieved. For high-temperature pipelines, wait until the medium has cooled and the pipeline is completely depressurized before disassembly or installation to prevent burns from high temperatures or injuries from splashing medium. Strictly adhere to low-voltage electrical safety regulations during wiring operations; do not connect bare wires while the system is energized. In explosion-proof environments, strictly follow explosion-proof construction regulations; do not modify the housing or wiring structure without authorization.

6.2 Standard Installation Steps

1. Mounting the Main Unit

Use a threaded direct-mount method. Align with the on-site pressure measurement port, wrap with sealing tape or install a sealing gasket, and tighten moderately with a wrench. Do not forcefully tighten or twist the heat dissipation tube to prevent deformation of the internal sensing structure. Prioritize vertical or horizontal forward-facing installation. Position the diaphragm downward or sideways to prevent long-term liquid accumulation at the pressure measurement port. For models with long heat dissipation tubes, ensure the heat dissipation section remains naturally vertical; do not bend or compress the heat dissipation structure to ensure unobstructed heat dissipation.

2. Wiring Specifications

Distinguish between power terminals and signal output terminals, and wire strictly according to the markings to prevent reverse polarity connection; For two-wire 4–20 mA models, do not confuse input and output polarity; follow circuit distribution principles; for three-wire voltage output models, strictly distinguish between power positive, power negative, and signal lines, and connect them one-to-one to PLC or instrument terminals; use shielded signal cables for all wiring, route cables away from power cables, and do not run high-voltage and low-voltage cables in the same conduit.

3. Grounding Requirements

The metal housing of the transmitter must be reliably grounded, with a grounding resistance $\leq 4\Omega$; the shielding layer must be grounded at a single point, specifically at the central control cabinet end only; the shielding layer on the transmitter side must remain floating (ungrounded) to prevent loop current interference; dedicated grounding terminals for explosion-proof environments must be connected separately to the explosion-proof grounding network and must not share a grounding point with ordinary equipment.

6.3 Specifications for Wiring Diagrams

1. General 2-Wire 4-20mA Wiring

Connect the positive terminal of the 24V DC power supply to the transmitter's power supply terminal. Connect the negative terminal in series with the current input terminal of the downstream PLC or digital display instrument to form a complete current loop. There is no separate signal negative terminal; the circuit will function normally as long as the loop is closed.

2. Three-Wire Voltage Output Wiring

Terminals are labeled as follows: Power Positive, Power Negative, and Signal Output Positive. The power negative and signal negative share a common ground and must be connected to the control system's common ground terminal to prevent signal drift caused by potential differences.

3. Specifications for Shielded Cable Handling

Trim the outer braided shield neatly, ensure the insulation is fully intact, and connect it to the control cabinet's grounding busbar; the internal shield terminals of the transmitter must not come into contact with any wiring terminals to prevent short-circuit interference.

4. Specific Wiring for Power-Supply Type / Isolated Type

The power-supply type does not require an external power source; it is powered directly from the control system circuit and should be wired according to two-wire system standards. The isolated type transmitter has a built-in signal isolation circuit; no external isolation module is required for wiring. Simply ensure proper shield grounding and separate routing for high- and low-voltage lines.

5. Correct vs. Incorrect Wiring Comparison

Correct: Correct wire sequence, single-point shield grounding, separate routing of high- and low-voltage lines, and reliable enclosure grounding;
Incorrect: Reversed polarity, double-ended shield grounding, high- and low-voltage lines in the same conduit, lack of grounding or loose connections, or unauthorized shorting of terminals.

6.4 Power-On and Commissioning Procedure

1. No-Load Test

Keep the pipeline in a pressure-free, no-load state. Connect the standard 24 VDC power supply and observe whether the device powers up normally. For the digital display version, the screen should light up normally without black screens, flickering, or error messages. For the standard non-display version, use a multimeter to measure the loop current; the no-load output should match the zero-point standard value.

2. Signal Calibration

Connect a standard precision pressure gauge as a reference. Slowly pressurize the pipeline and perform segmented calibration across multiple range points. Successively test the signals at four points: zero, 25%, 50%, and 75% of full scale. Compare the results with standard values to verify whether the transmitter output corresponds linearly.

3. Indicator Light Status Assessment

A steady power indicator light indicates normal power supply; a flashing light indicates loose connections, overload, or signal interference; for versions without indicator lights, use the current and voltage values measured with a multimeter as the basis for determining operational status.

4. Accuracy Calibration Method

If there is a slight zero-point deviation, it can be corrected via the instrument's zero-point fine-tuning or the transmitter's built-in fine-tuning points. Never calibrate by applying over-range pressure. During calibration, slowly increase and decrease the pressure, and record the data only after the readings have stabilized to ensure measurement accuracy meets specifications.

6.5 Installation Precautions

1. Never operate the device under overpressure or excessive temperatures. Do not exceed the medium temperature and pressure ranges specified on the nameplate to prevent diaphragm rupture or internal circuit burnout.

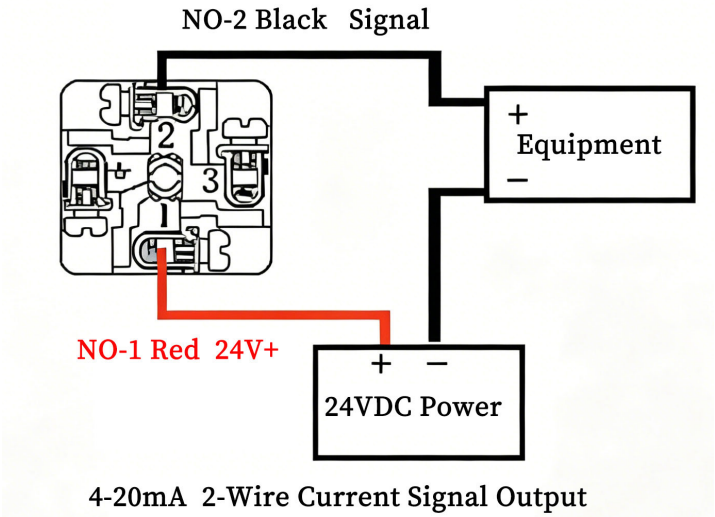
2. Never supply power at voltages exceeding the rated range; do not connect to a power source higher than 36 V DC to prevent overvoltage

from damaging electronic components or causing permanent damage to the device.
Avoid running the device in close proximity to high-power variable frequency drives, motors, or power cables to prevent signal fluctuations and measurement drift caused by strong electromagnetic interference.

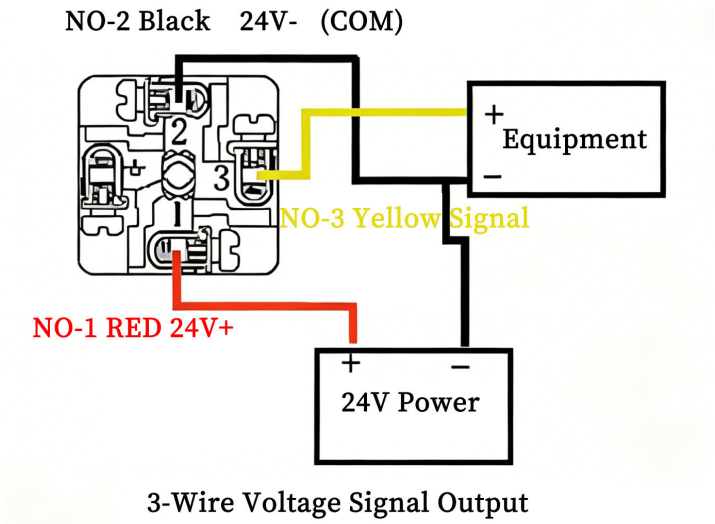
3. In damp, outdoor, or spray environments, do not leave wiring exposed. Ensure the wiring ports are waterproof and sealed by installing waterproof connectors and applying insulating seals to prevent short circuits or terminal corrosion caused by water ingress or condensation.

4. Do not bend, cut, or modify the heat sink structure. Damaging the heat dissipation channels will directly cause circuit overheating and failure under high-temperature conditions.

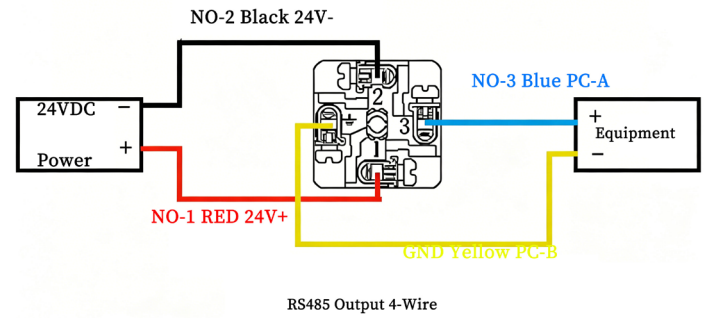
5. Do not use standard, non-explosion-proof models in hazardous areas. Do not disassemble the explosion-proof housing or alter the wiring configuration without authorization, as this violates explosion-proof safety regulations.



4-20mA 2-Wire Current Signal Output



3-Wire Voltage Signal Output



RS485 Output 4-Wire

VII. Recommendations for Daily Use and Maintenance

7.1 Key Points for Daily Inspections

1. Inspection of Equipment Appearance and Installation Status

Conduct daily inspections to ensure the transmitter's overall housing shows no deformation, rust, or leaks; that there are no media drips or coking/scaling at the pressure connection threads; that the extended heat dissipation tube is free of kinks, crushing, or deformation; that the installation threads are tight with no looseness; and that the overall installation posture remains neat with no obvious displacement or wobbling.

2. Signal Stability Monitoring

Monitor pressure readings in real time on the central control PLC, DCS, or on-site digital display instruments. Observe whether the readings are stable without sudden jumps or erratic fluctuations; compare pressure parameters with adjacent equipment under the same operating conditions. If sudden changes, prolonged stagnation, or abnormal fluctuations occur, promptly investigate potential faults in wiring, grounding, or the transmitter itself.

3. Operating Temperature and Humidity Monitoring

Continuously monitor the ambient temperature around the transmitter and the actual operating temperature of the medium; strictly prohibit prolonged operation outside the product's rated temperature range. Inspect the installation area for condensation, water accumulation, fog, or excessive heat. In humid workshops or outdoor environments, pay special attention to wiring connections for signs of moisture, condensation, or water ingress.

4. Visual Inspection of Operating Status

For models with digital displays, verify that the screen display is clear and free of screen distortion, black screens, or garbled characters. For standard models without displays, check the central control system to ensure loop current/voltage outputs fall within the standard range. Ensure there are no abnormal operating conditions such as excessive heat, strange odors, or unusual noises around the equipment.

7.2. Regular Maintenance Plan

1. Cleaning Frequency Guidelines

Standard workshop environments with normal temperatures and dust: Clean the exterior and heat dissipation structures every 3 months;
Chemical, greasy, or steam-heavy environments: Clean once a month;
Outdoor, open-air, or damp and corrosive environments: Perform a comprehensive cleaning and protective treatment every 1–2 months.
When cleaning, use a dry, soft cloth to wipe dust, grease, and caked-on residue from the housing, heat sinks, and pressure port surfaces. Do not directly rinse the housing or wiring ports with water.

2. Wiring Tightness Inspection

Every six months, individually tighten the transmitter terminal blocks, aviation/Hirschmann connectors, and shielded cable crimp terminals; inspect for loose, oxidized, discolored, or faulty connections; ensure shield grounding points are free of corrosion, broken wires, or poor contact to prevent signal fluctuations or contact failure caused by loose wiring.

3. Recommendations for Accuracy Recalibration

Standard process conditions: Every 6 months, connect an external precision pressure gauge to perform segmented recalibration of the zero point and full scale range;
High-precision production processes and metrological control conditions: Perform accuracy calibration every 3 months;
Long-term continuous operation in high-temperature steam or thermal oil environments: Perform accuracy recalibration during every equipment shutdown for maintenance to promptly correct zero drift and range deviation.

7.3 Long-Term Maintenance Tips

1. Dust and Moisture Protection

For equipment in long-term storage or continuous operation, ensure waterproof connectors at wiring ports remain securely sealed to prevent moisture ingress; apply sealant to gaps in the equipment housing and wiring ports; in humid, underground, or semi-outdoor environments, install rain and dust covers to prevent dust accumulation and condensation

from penetrating internal circuits, thereby extending the service life of the entire unit.

2. Anti-Interference Optimization Maintenance
Use shielded cables throughout the signal lines and strictly adhere to single-point grounding standards; regularly inspect the integrity of the shielding layer to ensure there are no breaks or exposed wires; route signal lines and high-voltage power cables separately using dedicated conduit, and avoid running them in close parallel proximity; for transmitters located near on-site variable frequency drives or high-power motors, install metal isolation shields to mitigate electromagnetic interference.

3. Protection in Extreme Environments
In high-temperature conditions, it is strictly prohibited to cover or wrap heat dissipation tubes; ensure the heat dissipation structure remains well-ventilated, free from obstructions or accumulated debris; In extremely cold winter conditions, insulate piping in advance to prevent the medium from freezing and damaging the diaphragm and internal components; In environments with corrosive gases or acid/alkali mists, install an additional corrosion-resistant protective housing, select the 316L diaphragm version, and regularly inspect the diaphragm for corrosion; In high-vibration metallurgical and heavy industry sites, install vibration-damping mounting brackets to mitigate long-term mechanical vibration damage to the sensing elements.

VIII. Troubleshooting & Emergency Response
8.1 List of Common Faults
The transmitter produces no signal output; the central control panel and PLC display no values.
Severe pressure signal drift; values fluctuate wildly, and the zero point shifts on its own.
Abnormalities with the digital display: black screen, distorted screen, flickering, or values frozen in place.
System triggers frequent alarms; false alarms due to pressure values exceeding limits
Signal distortion due to interference; values jump or fluctuate erratically
No response when power is applied; entire unit fails to operate
Values become unreliable and output becomes chaotic after operating for a period under high-temperature conditions

8.2. Analysis of Fault Causes
1. Wiring Errors
Reversed polarity, mixed signal and power lines, shielding wire grounded at both ends, loose, missing, or shorted terminals, resulting in open circuits or signal disruption.

2. Power Supply Abnormalities
Supply voltage below 12 V DC or above 36 V DC, excessive power supply ripple, loose ground connection on the negative terminal, or circuit load resistance exceeding specifications, causing transmitter malfunction or no output.

3. Signal Overload and Range Mismatch
Operating pressures exceeding the transmitter's rated range or prolonged overpressure operation can cause slight deformation of the diaphragm and fatigue of the sensing elements, leading to reduced accuracy and drift.

4. Environmental Interference
Installation near variable frequency drives, high-power motors, or contactors; co-routing of high- and low-voltage cables; severe on-site vibrations, high-temperature radiation, or moisture/condensation causing corrosion of circuit terminals—all of which induce interference and distortion.

5. Damage to the Transmitter Unit
Prolonged operation at excessive temperatures leads to aging of internal circuits and failure of heat dissipation structures; the diaphragm becomes clogged by impurities in the medium or suffers corrosion and damage; components in the internal temperature compensation and amplification circuits are damaged.

8.3 Step-by-Step Troubleshooting

1. Issue 1: No Output, No Display on the Instrument
Troubleshooting Steps:
① First, use a multimeter to measure the supply voltage and confirm it is within the standard range of DC 12V to 36V;
② Check whether the terminal connections are loose or disconnected, and verify that the positive and negative terminals are not reversed;
③ Measure the loop load resistance to ensure it does not exceed the transmitter's maximum load capacity;
④ Check whether the shielding wire is short-circuited or if water has entered the connection ports causing oxidation;
Remedial Actions: Recheck the wiring sequence, tighten the terminals, replace the regulated power supply, and reduce the number of devices connected in series downstream if the load exceeds the limit;
Emergency Workaround: Directly replace with a spare transmitter of the same specification using a threaded connection and reconnect according to the original wiring method to quickly resume production.

2. Fault 2: Signal Drift, Zero Point Shift, and Inaccurate Readings
Troubleshooting Steps:
① Depressurize the pipeline and observe whether the zero point returns to zero to determine if it is a zero point drift;
② Verify whether the medium temperature exceeds the device's maximum temperature limit, and check if the heat dissipation tubes are obstructed or kinked;
③ Check for nearby high-voltage equipment causing interference and ensure proper grounding;
④ Perform multi-point range comparisons using a standard pressure gauge to determine whether the issue stems from operating conditions or the instrument's inherent accuracy;
Remedial Actions: Re-calibrate the zero point, clean dust and debris from the heat dissipation tubes, reposition the instrument away from interference sources, and ensure proper single-point grounding;
Emergency Workaround: Temporarily switch to a backup measurement point within the same range; calibrate or replace the device after shutdown.

3. Fault 3: Digital Display Models – Black Screen, Distorted Display, Flickering, or Freezing
Troubleshooting Steps:
① Check if the power supply is stable and if there are any voltage fluctuations;
② Inspect the aviation/Hirschmann connectors for looseness, water ingress, or oxidation;
③ Check if ambient temperature and humidity are too high or if condensation has formed in the junction box;
Remedial Actions: Reinsert and secure the connectors, apply waterproof sealing, and replace the power supply with a stable one; if the screen hardware is damaged, replace the entire unit.

4. Issue 4: Frequent false alarms or alarms triggered by out-of-range readings
Troubleshooting Steps:
① Verify if the transmitter's selected range is too small or if process pressure fluctuations exceed the range;
② Investigate whether signal interference is causing fluctuations, resulting in momentary out-of-range readings;
③ Check for momentary pressure surges or water hammer effects in the piping;
Remedial Actions: Re-select an appropriately sized range model, enhance signal shielding and isolation, install pressure-stabilizing measures in the piping; optimize system alarm delay parameters.

5. Issue 5: Signal Interference, Distortion, or Erratic Readings
Troubleshooting Steps:
① Check whether signal cables are routed in the same conduit as power cables or laid in close parallel proximity;
② Verify that the shielding layer is grounded at both ends and that the housing is reliably grounded;
③ Check whether new variable frequency drives or high-power start-stop equipment have been added in the vicinity;
Remedial Measures: Separate power and signal cables into different conduits; switch to single-ended grounding for shielded cables; install metal isolation baffles; optimize grounding resistance;

Emergency Response: Temporarily extend the shielded cable to bypass high-voltage areas to quickly suppress interference.

6. Issue 6: Output failure after operating for a period under high-temperature conditions
Troubleshooting Steps:
① Check whether the heat sinks or heat pipes are covered with dust, coke buildup, or obstructed by foreign objects;
② Verify if the actual medium temperature exceeds the product's rated temperature tolerance;
③ Installation method causes poor heat dissipation, allowing heat to transfer to the circuitry;
Remedial Measures: Thoroughly clean the heat dissipation structure to restore ventilation and cooling space; in cases of excessive temperature, replace with an extended, high-temperature-resistant version.

8.4. After-Sales Repair Guidelines
1. Failure Determination Criteria (Recommended Conditions for Reporting a Repair)
Wiring, power supply, grounding, and circuit checks are all normal, yet the device still has no output or response;
Zero point and range cannot be calibrated, with persistent severe drift affecting process control;
Digital display permanently blacked out, damaged, or corroded due to internal water ingress;
Diaphragm deformation, leakage, media backflow, or physical structural damage;
Recurring interference or malfunction; the device remains inoperable even after ruling out on-site environmental issues.

2. Repair Process
Record the equipment model, range, output signal, installation conditions, and fault symptoms;
Take on-site photos of the equipment nameplate, installation site, and wiring layout;
Contact after-sales technical support and submit a fault description + photos + operating conditions;
Technical staff will provide remote guidance for secondary troubleshooting; if the issue cannot be resolved, proceed with the repair or replacement process.

3. Warranty Coverage
Under normal temperature and pressure conditions and when installed and used in accordance with specifications, the entire unit is covered by the standard warranty, provided there is no human-caused damage;
The warranty covers quality issues with the main unit, including circuit failures, sensor element malfunctions, and factory calibration deviations;
The warranty does not cover issues resulting from human disassembly or modification, use under excessive pressure or temperature, damage from external impact, corrosion, water ingress, or unauthorized disassembly.

4. After-Sales Support
We provide remote technical guidance, remote fault diagnosis, recommendations for model selection and replacement, factory recalibration, repair, and full unit replacement services. We offer full technical coordination throughout the process to minimize on-site downtime.