Strain-gauge Pressure Transmitter

I. Product Definition

The QDW90A-YK-1 port-type strain gauge pressure transmitter is an industrial-grade pressure measurement and signal transmission device developed by Anhui Qidian Automation Technology Co., Ltd. It is specifically designed for monitoring the pressure of media such as liquids, gases, and steam in industrial environments, serving as a core front-end sensor for pressure data acquisition, transmission, and monitoring in automation control systems.

Based on the strain gauge pressure measurement principle, this product integrates a high-stability metal strain bridge, signal conditioning circuitry, and a standardized output module. It directly converts medium pressure into a 4–20 mA standard current signal commonly used in industrial control systems and supports 24 V DC industrial-standard power supply. It is suitable for continuous pressure monitoring applications across various industries, including petroleum, chemical, power, metallurgy, pharmaceuticals, smart manufacturing, and water treatment. Its orifice-type structure is compatible with standard pipe/vessel threaded installations. Combined with a stainless steel integrated housing, it balances versatility, reliability, and environmental adaptability, making it a key device for replacing traditional mechanical pressure gauges and enabling digital transmission of pressure signals.

II. Working Principle

In simple terms, the operation of this transmitter consists of four core steps: “Pressure Sensing – Signal Conversion – Signal Conditioning - Standardized Output.” The entire process involves no mechanical transmission components, ensuring higher stability and accuracy:

1. Pressure Sensing: The measured medium (liquid/gas/steam) acts on the metal elastic element (strain diaphragm) inside the transmitter through the pressure ports. The elastic diaphragm undergoes minute elastic deformation in response to pressure changes (the degree of deformation is proportional to the pressure magnitude).

2. Signal Conversion Stage: High-precision metal strain gauges mounted on the diaphragm surface form a Wheatstone bridge. The deformation of the diaphragm causes a corresponding change in the resistance of the strain gauges. The originally balanced bridge output generates a weak voltage signal (mV level) proportional to the pressure, completing the physical conversion from “pressure signal to electrical signal.”

3. Signal Conditioning Stage: A dedicated internal amplification circuit amplifies, filters, and temperature-compensates the weak mV-level voltage signal, eliminating errors caused by temperature drift and electromagnetic interference, while correcting nonlinear deviations to adjust the signal into a stable, linear

4. standard analog signal.

Standardized Output Stage: The conditioned signal is converted into an industry-standard 4–20 mA current signal (corresponding to pressure values from the start to the end of the measurement range). This signal is transmitted via output cables to control devices such as PLCs, DCS systems, and digital displays, enabling remote monitoring, recording, and control integration of pressure data.

III. Core Value and Pain Point Solutions

3.1 Key Customer Pain Points and Corresponding Solutions

1. Pain Point: Traditional mechanical pressure gauges only allow on-site readings; they cannot output electrical signals or transmit pressure data remotely, making it impossible to integrate them into PLC or DCS automation systems. Manual on-site meter reading is labor-intensive, making it difficult to achieve automated centralized monitoring and unmanned operation.

Solution: The QDW90A-YK-1 port-type strain gauge pressure transmitter accurately converts medium pressure into an industrial standard 4-20mA current signal. It supports long-distance signal transmission and is directly compatible with various PLCs, DCS systems, digital displays, and industrial control systems.

Direct Benefits: Completely eliminates the need for manual on-site meter reading, enabling real-time remote collection of pressure data, centralized monitoring, and backend visualization management. It supports factory automation and unmanned operation and maintenance modes, significantly reducing labor costs for routine inspections, and provides an accurate data source for production scheduling, data logging, and intelligent control.

2. Pain Points: Industrial environments are complex, featuring fluctuations in ambient temperature, equipment vibration, and electromagnetic interference from variable frequency drives and motors. Conventional pressure sensors suffer from large measurement errors, severe zero-point drift, and unstable data, requiring frequent on-site calibration and potentially leading to production misjudgments.

Solution: The product utilizes a high-precision strain-gauge sensing element combined with a metal strain bridge circuit design. It features built-in professional temperature compensation circuits, signal filtering, and anti-interference optimization. The entire unit offers high linearity, stability, vibration resistance, and electromagnetic interference immunity, ensuring precise measurement under all operating conditions.

Direct Benefits: Measurement accuracy remains stable across a wide temperature range, effectively suppressing temperature drift, zero drift, and external interference. This reduces the frequency of on-site recalibration, ensuring measurement data is accurate and reliable, and preventing process control errors, equipment malfunctions, and production safety hazards caused by data deviations.

3. Pain Points: With the wide variety of industrial media, standard pressure products often suffer from poor compatibility of wetted materials. They are prone to corrosion and diaphragm blockage, have limited applicability to specific operating conditions, and are difficult to select. Consequently, equipment is prone to damage and requires frequent replacement.

Solution: Utilizes a pressure-tapping port design with wetted parts made of high-quality stainless steel. This material resists corrosion from common media, is resistant to clogging, and is compatible with the vast majority of non-highly corrosive industrial media—including liquids, gases, and steam—offering exceptional versatility.

Direct Benefits: Covers standard operating conditions across multiple industries without requiring custom corrosion-resistant materials, reducing selection complexity and procurement costs. Corrosion resistance and clogging resistance extend equipment lifespan and reduce the frequency of failure-related replacements.

4. Pain Point: Some pressure transmitters on the market have inconsistent power supply specifications and inconsistent output signals, making them incompatible with existing on-site industrial control equipment. This requires the installation of additional signal conversion modules, which is cumbersome to implement and increases investment costs.

Solution: Utilizes the industry-standard 24V DC power supply, features a standard 4-20mA analog output, and employs industry-standard interface protocols. No intermediate conversion devices are required, ensuring direct compatibility with the vast majority of on-site automation systems and secondary instruments.

Direct Benefits: Maximum compatibility enables plug-and-play operation without system modifications or additional conversion accessories, simplifying on-site wiring and commissioning processes, and reducing costs associated with system integration, retrofitting, and supporting equipment.

5. Pain Point: Conventional pressure measurement devices often contain complex mechanical transmission structures that are prone to wear and have high failure rates. In continuous industrial production, damage can easily lead to downtime, and daily maintenance is cumbersome, resulting in high operational and maintenance costs.

Solution: The unit features a fully solid-state, integrated design with no mechanical transmission components subject to wear. Its compact and robust structure, combined with industrial-grade protection, withstands harsh field environments such as dust, humidity, and vibration, ensuring extremely low failure rates during long-term operation.

Direct Benefits: The unit is durable and rugged with minimal failures, reducing the risk of unplanned downtime and ensuring continuous, stable production line operation. Daily maintenance is simple and hassle-free, significantly lowering long-term repair, operation, and replacement costs.

6. Pain Point: On-site piping and vessel mounting interfaces vary in specifications. Some pressure products have limited installation methods,

few compatible mounting points, and are difficult to adapt.
Solution: Standard threaded pressure tapping installation structure compatible with conventional industrial piping and vessel mounting interfaces. Installation is simple and highly versatile, suitable for the vast majority of on-site installation scenarios.

3.2 Core Value
Q: What is the core value of this transmitter?
A: Its core value lies in enabling the digital, standardized, and remote transmission of industrial pressure signals. It addresses the pain point where traditional pressure measurement cannot be integrated into automation systems, providing a stable and reliable front-end data source for pressure monitoring and control in industrial settings. It serves as a critical component for achieving automated pressure monitoring.

Q: Compared to ordinary pressure gauges, what core customer pain points does it resolve?
A: It resolves the "inability to monitor remotely" issue: The 4–20 mA signal can be directly integrated into control systems, enabling real-time remote monitoring of pressure data without the need for manual on-site meter reading.
It resolves the issue of "significant data errors and instability": With built-in temperature compensation and anti-interference circuits, it delivers high-precision measurement at 0.5% FS and ensures data stability across a wide temperature range, reducing the frequency of on-site calibration.
It resolves the issue of "inability to integrate with control systems": The standard output signal can be linked with PLCs and digital displays to enable automated control functions such as overpressure alarms and interlock protection, thereby avoiding safety risks caused by delays in manual operations.

Q: What direct production and management benefits does it offer customers?
A: Improved production efficiency: Eliminates the need for manual meter reading and enables real-time data upload, significantly reducing labor costs while minimizing production adjustment delays caused by data lag.
Simplified equipment operation and maintenance: The highly stable design reduces failure frequency, and the standardized structure adapts to most operating conditions, making maintenance convenient and lowering O&M costs.
Reduced Safety Risks: Real-time pressure monitoring and interlocked control provide early warnings for overpressure and underpressure faults, preventing equipment damage or safety incidents caused by abnormal pressure.
Strong System Compatibility: Standard 24V DC power supply + 4-20mA output allows direct integration with existing industrial control systems without additional modifications, reducing system integration costs.

Q: How does it ensure measurement reliability in complex industrial environments?
A: The fully stainless steel, integrated housing design is suitable for the humid, vibrating, and dusty environments of industrial sites, with a protection rating that meets the requirements of standard industrial scenarios.
Built-in temperature compensation circuitry eliminates measurement errors caused by temperature fluctuations, ensuring stable data across a wide temperature range.
Electromagnetic interference (EMI) resistant design minimizes the impact of electromagnetic interference from on-site equipment such as variable frequency drives and motors on signal transmission, ensuring stable and reliable data transmission.

Q: How does it demonstrate versatility for customers across different industries?
A: The universal threaded installation structure with pressure ports accommodates the installation requirements of the vast majority of industrial pipes and vessels, eliminating the need for custom mounting interfaces.
Wetted parts are made of stainless steel, making them suitable for most non-highly corrosive media in industries such as petroleum, chemicals, power generation, water treatment, and pharmaceuticals.
The measurement range can be customized according to customer requirements, and the output signal is the industry-standard 4–20 mA, making it compatible with control systems across various industries and resulting in low selection and integration costs.

IV. Key Product Parameters & Specifications
4.1 Basic Electrical Parameters
Measurement Principle: Strain-gauge pressure sensor, Wheatstone bridge detection
Pressure Range: Customizable; standard options include full-range negative pressure, gauge pressure, and positive pressure
Measurement Accuracy Class: ±0.5% FS (High-precision version available: ±0.25% FS)
Non-linearity: ≤±0.2% FS
Hysteresis: ≤±0.15% FS
Repeatability: ≤±0.1% FS
Output Signal: Standard 4–20 mA DC analog current output
Load Capacity: Maximum load resistance for 4–20 mA output ≤ 500 Ω
Response Time: ≤10 ms
Signal Type: Unidirectional standard analog output, free from interference noise, with excellent linearity
Zero Drift: ≤ ±0.1% FS per 10°C temperature change
Span Drift: ≤ ±0.1% FS per 10°C temperature change

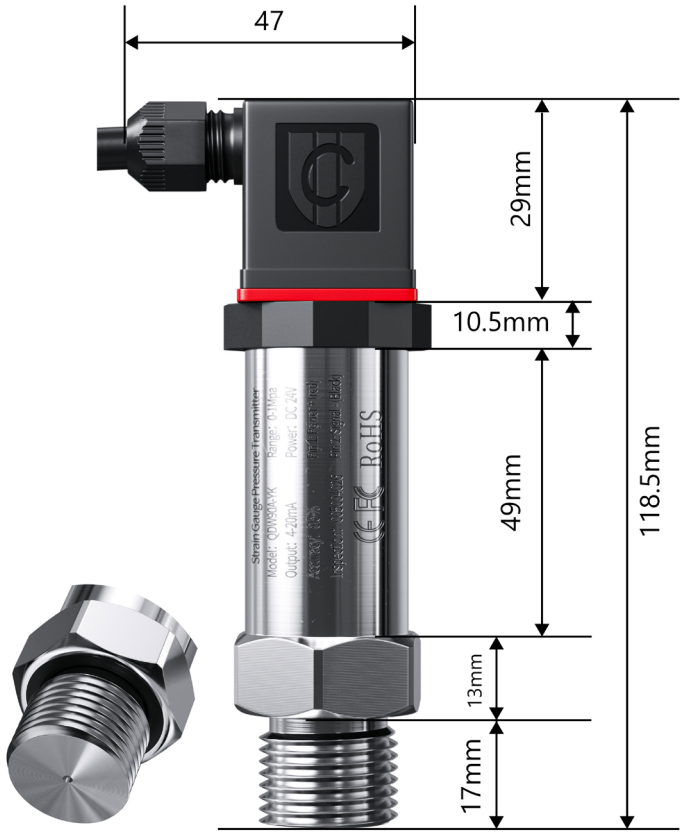
4.2 Isolation Performance Parameters
Electrical Isolation Method: Built-in electrical signal isolation design; three-terminal isolation (input, power supply, and output)
Isolation Withstand Voltage: Withstand voltage between terminals and housing: AC 1500 V/1 min without breakdown
Insulation Resistance: ≥100 MΩ (tested at 500 V DC)
Common-Mode Immunity: Effectively suppresses common-mode interference caused by on-site inverters, motors, and contactors
Differential-Mode Immunity: Built-in filter circuit attenuates line-coupled differential-mode interference
Isolation Characteristics: Eliminates ground loop current interference; suitable for multi-device common grounding and complex industrial control field wiring
Signal Isolation Attenuation: No signal attenuation; does not affect measurement linearity or accuracy

4.3 Power Supply & Power Consumption Parameters
Standard Supply Voltage: DC 24V (18–36V DC wide-voltage operating range)
Rated Operating Voltage: DC 24V
Total Power Consumption at Full Load: ≤1.2W
Operating Current: Current remains stable under both static and full-load conditions, with no transient current surges
Power Distribution Characteristics: Reverse polarity protection, surge protection, and overvoltage protection
Power-up Time: ≤2s to stable output, no voltage fluctuations or drift
Compatible Power Distribution Methods: Directly compatible with PLC module power distribution, independent switching power supply distribution, and on-site cabinet DC power distribution

4.4 Environmental Adaptation Parameters
Operating Temperature of Medium: -20°C to +80°C
Operating Ambient Temperature: -30°C to +70°C
Storage temperature: -40°C to +85°C
Operating relative humidity: 10% RH to 90% RH (non-condensing)
Storage relative humidity: 5% RH to 95% RH (non-condensing)
Protection rating: IP65 (dust-tight and splash-proof), suitable for outdoor and workshop environments with high humidity and dust
Explosion-proof rating: Standard non-explosion-proof; compatible with intrinsically safe barriers for use in explosion-hazardous areas
Vibration Resistance: Complies with industrial vibration standards; no measurement drift in vibration environments from 10 to 1000 Hz
Suitable Media: Non-highly corrosive industrial media such as liquids, gases, and steam

4.5. Physical Parameters
Installation Method: Direct threaded installation via pressure tapping holes; industrial standard external threaded connection
Connection Specifications: Standard industrial pipe thread (standard for general applications; customizable)
Housing Material: High-quality 304 stainless steel monoblock housing
Wetted Parts Material: 304 stainless steel, resistant to weak acids and alkalis, and resistant to moisture corrosion

Housing Protection Details: Fully sealed structure with silicone O-rings, preventing dust, water, and condensation from entering the internal circuitry; brushed finish for corrosion resistance, resistant to on-site oxidation and aging
Dimensions: Compact overall structure
Overall Length × Outer Diameter × Terminal Height: Standard unit dimensions 118 mm × 58 mm × 32 mm
Unit Weight: Approx. 185 g
Cable Exit: Directly routed from the rear; secure wiring with pull-resistant design
Structural Features: Seamless, one-piece construction; impact-resistant and resistant to external impacts; suitable for on-site mounting on pipes and tanks





V. Application-Specific Selection Guide

5.1 Key Selection Criteria

1. Signal Type Selection

The QDW90A-YK-1 port-type strain gauge pressure transmitter comes standard with a 4–20 mA DC current output signal, which is compatible with the vast majority of PLCs, DCS systems, industrial digital displays, and data acquisition modules on the market; In applications involving long-distance field wiring, electromagnetic interference, or significant line voltage drops, the 4–20 mA current signal is the preferred choice. Compared to voltage signals, it offers more stable transmission without signal attenuation, making it suitable for long-distance pressure data acquisition and transmission.

2. Channel Selection

This model is designed as a single-channel, standalone pressure transmitter, with each unit corresponding to a single medium pressure monitoring point. It is ideal for scenarios involving single pipelines, single tanks, or single-point independent pressure acquisition. If there are multiple pressure monitoring points on-site, there is no need to select a multi-channel integrated model; instead, configure a QDW90A-YK-1 transmitter on a one-to-one basis for each point. This approach simplifies wiring, prevents mutual interference, and facilitates future maintenance and troubleshooting.

3. Power Supply Selection

The device supports the mainstream industrial DC24V standard and is compatible with a wide-range DC input of 18V to 36V. In scenarios where a switch-mode power supply in an industrial control cabinet, a PLC's built-in power distribution module, or a DC regulated power supply is available on-site, power can be drawn directly without the need for additional voltage conversion equipment. In environments without dedicated DC power supply points, the device can be adapted by pairing it with a standard industrial 24V DC switching power supply. Direct 220V AC power supply is not supported; the DC power supply system must be strictly matched during selection.

4. Selection Based on Explosion-Proof Requirements

In standard industrial non-explosion-proof areas, the standard QDW90A-YK-1 model can be selected and used directly; In high-risk explosion-proof environments such as chemical plants with flammable and explosive materials, oil and gas storage facilities, and sealed tanks, the standard model cannot be used directly. It must be paired with an intrinsically safe barrier to meet the pressure monitoring requirements for explosion-proof zones, and all components must strictly comply with on-site explosion-proof rating standards.

5. Selection Based on Installation Environment

In standard indoor workshop environments with constant temperature, dry conditions, and no dust or corrosion, the standard model is sufficient; For outdoor, open-air pipeline installation environments characterized by high humidity, moisture, significant dust and particulate matter, and minor vibrations, prioritize this model with an IP65 protection rating and pressure-tapping port design, which is dustproof, waterproof, and resistant to environmental temperature and humidity fluctuations; For applications involving weakly acidic or alkaline, mildly corrosive media, or steam, the version with 304 stainless steel wetted parts is suitable; For highly corrosive or special media applications, a custom version with specialized wetted parts materials must be ordered in advance.

5.2. Recommended Selection Guidelines for Industry Applications

1. Chemical Industry

For pressure monitoring in process pipelines, reaction vessels, and transport lines in petrochemicals, fine chemicals, and chemical water treatment, where media typically include liquids, gases, and steam, and conditions involve mild corrosion, strong on-site electromagnetic interference, and significant temperature fluctuations, Prioritize the QDW90A-YK-1 pressure-tapping strain gauge pressure transmitter. Leveraging high-precision strain measurement and built-in anti-interference and temperature compensation designs, it meets the requirements for real-time pressure monitoring and process interlock control in continuous chemical production. It is the standard configuration for non-explosion-proof workstations and should be used with a safety barrier in explosion-proof workstations.

2. Power Industry
For fluid pressure monitoring applications in auxiliary equipment for thermal, hydro, and photovoltaic power plants, as well as in circulating water pipelines, boiler auxiliary piping, and power transmission and distribution systems—where on-site vibration is high, electromagnetic equipment is dense, and wiring distances are long—the QDW90A-YK-1 transmitter is recommended. It features stable long-distance transmission of the standard 4–20 mA signal and strong resistance to vibration and electromagnetic interference. It is compatible with PLCs and DCS centralized control systems in power systems, meeting the power industry's requirements for long-term, continuous, and stable operation.

3. Metallurgical Industry
In pressure monitoring applications for circulating water pipelines, cooling systems, and gas supply pipelines in steel and non-ferrous metal smelting, where sites are characterized by high dust levels, high ambient temperatures, and frequent equipment vibration, the QDW90A-YK-1 orifice-type pressure transmitter is selected. Its IP65 protection rating resists dust and moisture ingress, and its stainless steel housing withstands harsh environments, while the strain gauge core resists vibration and drift, making it suitable for long-term online pressure monitoring in metallurgical environments characterized by high temperatures, dust, and strong vibrations.

4. Pharmaceutical Industry
In pharmaceutical production lines—such as purified water pipelines, process fluid transfer tanks, and HVAC pressure balancing systems—where high measurement stability and compatibility with cleanroom environments are required, and where there are no highly corrosive media and the operating conditions are clean and mild, the standard QDW90A-YK-1 model is sufficient. With its compact design and ease of installation, high measurement accuracy, and stable data, it meets the pharmaceutical industry's requirements for precise pressure monitoring in automated processes and compliant operations and maintenance.

5. Smart Manufacturing Industry
For automated production lines, intelligent fluid control systems, pressure data acquisition for complete equipment sets, smart water supply networks, and built-in pressure monitoring points in custom automated equipment, the QDW90A-YK-1 orifice-type transmitter is the ideal choice. Its standard 4-20mA signal seamlessly integrates with various intelligent controllers and data acquisition terminals. With convenient installation and strong compatibility, it is well-suited for standardized equipment configurations and bulk selection applications in smart manufacturing.

5.3 Common Selection Pitfalls
1. Ignoring Isolation Levels and Selecting Models Blindly
Many users overlook issues such as ground loop interference and multi-device common-ground wiring during selection, directly opting for non-isolated, simplified transmitters. This often leads to signal drift, value fluctuations, and inaccurate data. In complex industrial control environments, scenarios with multiple instruments in parallel wiring, or conditions near variable frequency drives, the isolation level must be prioritized. Select the QDW90A-YK-1 version with three-terminal electrical isolation to eliminate ground loop interference and ensure measurement stability.

2. Incorrect pressure range selection leading to wasted resources or measurement failure
Casually selecting a wide-range model for small-scale applications during selection can result in reduced measurement accuracy and insufficient resolution; conversely, selecting a narrow-range model for applications involving transient high-pressure conditions can easily cause sensor overload damage and equipment failure. Selection must account for the actual normal operating pressure on-site with a reasonable margin, matching the corresponding standard range to ensure measurement accuracy while preventing equipment damage from overpressure.

3. Ignoring load matching leads to signal abnormalities
Failure to account for the load resistance of downstream PLCs and instruments, and blindly selecting a transmitter that exceeds its maximum load tolerance, can result in issues such as the 4–20 mA signal failing to drive the load, low output, or unstable readings. During selection, the total load resistance of downstream secondary instruments and wiring must be confirmed, and the device must strictly match the permitted load parameters to avoid signal failures caused by load mismatch.

4. Incorrect Selection of General-Purpose Models in Explosion-Proof Environments
In flammable and explosive chemical, oil, and gas areas, users often directly deploy general-purpose, non-explosion-proof transmitters, which violates safety regulations and poses significant safety hazards. In explosion-proof hazardous environments, the direct use of general-purpose models is strictly prohibited. Models must be selected according to explosion-proof rating requirements and used in conjunction with corresponding intrinsically safe barriers to ensure compliant selection and safe operation.

5.4, Customization Recommendations
1. Custom Signal Solutions
In addition to the standard 4–20 mA output, if the field requires special output types such as 0–5 V or 0–10 V voltage signals, or RS485 digital communication signals, the QDW90A-YK-1 base model can be customized with tailored programming and circuitry to accommodate non-standard signal requirements for legacy equipment, specialized controllers, and digital networking applications.

2. Custom Solutions for Non-Standard Operating Conditions
For non-standard field conditions such as highly corrosive media, extreme high or low temperatures, special high-pressure ranges, special threaded mounting interfaces, extended pressure-tapping structures, and special cable exit configurations, we can customize wetted materials, measurement ranges, interface specifications, structural dimensions, and temperature-rated versions based on the standard model to provide a one-to-one match for specific operational requirements.

3. Multi-Channel Integrated Customization Solutions
For centralized multi-point pressure monitoring at the site and cabinet-integrated applications, we can customize multi-channel integrated measurement modules based on the technical architecture of this single-channel transmitter. These modules integrate multi-channel pressure acquisition, signal transmission, and isolation protection functions, saving installation space, simplifying wiring, and facilitating centralized control. They are designed to meet the integration requirements of complete equipment sets and industrial control cabinets.

VI. Installation and Commissioning Guidelines
6.1 Pre-installation Preparation
1. Inspection of Components
Upon receipt of the QDW90A-YK-1 bore-type strain gauge pressure transmitter, first inspect the unit to ensure there are no dents or scratches on the exterior, no cracks in the housing, and no deformation or damage to the threaded connections; Verify that the model number, measurement range, and output parameters on the product nameplate match the procurement requirements; additionally, check that the sealing gaskets, threaded seal rings, mounting accessories, factory certificate of conformity, and parameter manual are complete. Do not proceed with installation if any items are missing or visibly damaged.

2. Environmental Inspection
Ensure the installation site is free from continuous exposure to highly corrosive gases, violent mechanical shocks, or prolonged immersion in water. Verify that the installation points on pipes and tanks are secure, with no noticeable swaying or deformation. Ensure that the ambient temperature and medium temperature fall within the product's rated operating temperature range. Keep the unit away from strong electromagnetic radiation sources such as variable frequency drives, high-power motors, and high-voltage switchgear, and reserve sufficient space for future maintenance and disassembly operations.

3. Tool List
Prepare the following tools: wrenches, Allen wrenches, Phillips/flathead screwdrivers, wire strippers, a multimeter, standard signal cables, shielded twisted-pair cables, electrical tape, waterproof terminal blocks, PTFE tape, and a pressure gauge calibrator. Never use an oversized wrench to forcefully tighten the transmitter's threaded connections, as this may cause housing deformation or damage to internal components.

4. Safety Precautions

Before installation, the pressure of the medium in the on-site piping must be shut off and the power supply to the equipment disconnected to ensure that no work is performed under pressure or with live electrical circuits. In flammable and explosive areas, strictly adhere to explosion-proof regulations; connecting or disconnecting wires while the equipment is energized is strictly prohibited. When installing at heights, appropriate protective measures must be taken. Under pressurized pipeline conditions, unauthorized disassembly of the transmitter is strictly prohibited to prevent injury from medium ejection. Wiring operations must strictly comply with low-voltage electrical safety regulations to prevent exposed wires, incorrect connections, or short circuits.

6.2 Standard Installation Steps

1. Mounting the Transmitter Body

This product features a pressure-tapping port with direct threaded mounting and does not require a mounting rail; Apply an appropriate amount of Teflon tape to the standard internal threaded connection on the pipe or tank. Align the transmitter body with the connection and tighten it smoothly in a clockwise direction by hand. Use a wrench to lightly tighten and secure it; apply moderate force and avoid excessive force that could cause diaphragm deformation or stripped threads. Install the unit vertically or horizontally in the correct orientation, ensuring the pressure ports face the direction of the medium flow to prevent measurement lag caused by reverse installation.

2. Wiring Specifications (Clearly Distinguish Power Supply / Output Terminals)

The device's terminal blocks are divided into two main groups: power supply terminals and signal output terminals. Strictly distinguish between positive and negative terminals:

Power supply terminals: 24 VDC power supply; connect the positive terminal to the power supply + and the negative terminal to the power supply -. Reversing the polarity is strictly prohibited;

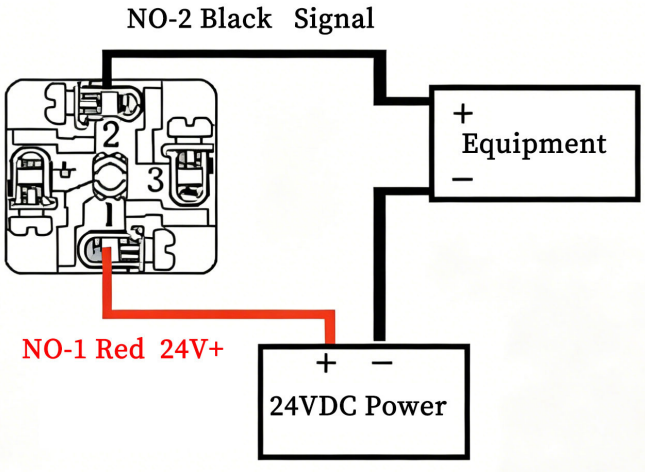
Signal Output Terminals: 4–20 mA analog output. Connect to the corresponding analog input terminals of the PLC, DCS, or digital display instrument. Distinguish between signal positive and signal negative; do not connect to the power supply terminals.

Use standard shielded twisted-pair cable throughout the installation. The wire gauge must meet on-site current transmission requirements. Ensure the stripped length is appropriate, and crimp connections are secure with no looseness or exposed bare wire.

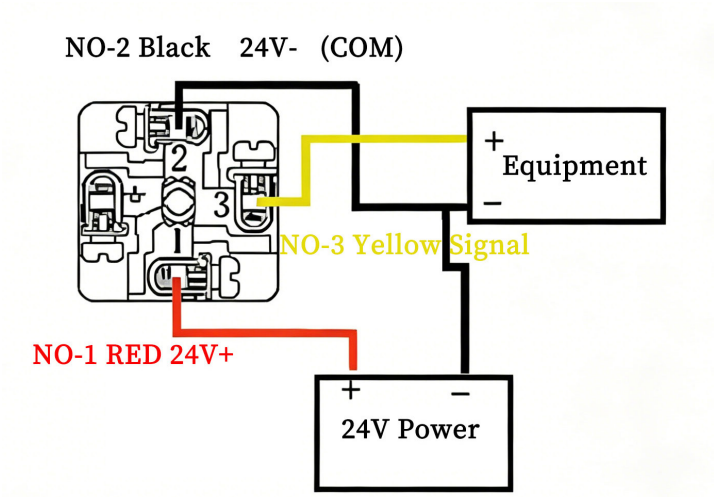
3. Grounding Requirements

The transmitter housing ground terminal must be reliably connected to the site protective ground. Shielded cables must be grounded at a single end, preferably at the control cabinet side. The shield at the transmitter end must remain floating (ungrounded) to avoid ground loop interference caused by dual-end grounding. Grounding lines must have good contact, be free of corrosion and breaks, and have ground resistance compliant with industrial electrical standards to effectively resist electromagnetic interference and prevent signal drift or fluctuations.

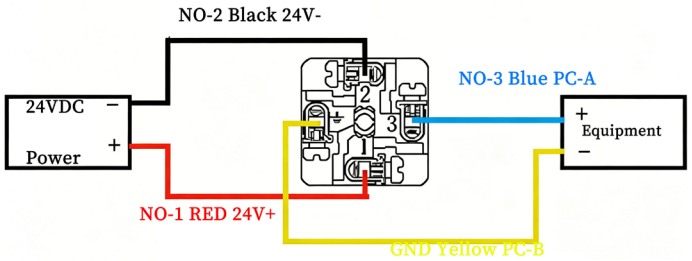
6.3, Wiring Diagram Text Specifications



4-20mA 2-Wire Current Signal Output



3-Wire Voltage Signal Output



RS485 Output 4-Wire

3. Wiring Specifications for Isolated Models

Isolated models strictly maintain electrical isolation between the power supply, input, and output terminals. The power supply circuit and signal circuit are completely separate, with no shared neutral or ground connections. Shielded cables must be grounded at a single point in accordance with the single-point grounding principle. Short-circuiting the negative terminals of the power supply and signal lines is strictly prohibited to prevent interference caused by compromised isolation.

4. Grounding Specifications for Shielded Cables

The outer shield of shielded twisted-pair cable must be grounded at a single point on the control cabinet side only. The shield at the transmitter terminals must be trimmed and insulated; it must not contact the housing or be connected to a ground terminal. Avoid double-ended grounding, which can cause loop currents, resulting in measurement fluctuations and zero-point drift.

5. Comparison of Correct and Incorrect Wiring

☒ Correct Wiring: Power supply positive and negative terminals, and signal positive and negative terminals must be wired separately; the shielding wire must be grounded at a single point; wiring must be separated from high-voltage power lines; terminals must be securely crimped with intact insulation;

☒ Incorrect Wiring: Mixing power and signal terminals, reversing positive and negative polarities, grounding the shielding wire at both ends, running high- and low-voltage wires in the same conduit, or exposing bare wires with loose connections—all of which can easily burn out equipment and cause signal interference.

6.4 Power-On Commissioning Procedure

1. No-Load Test

After installation and wiring are complete, do not apply medium pressure; keep the transmitter in a no-load state. Turn on the power supply and observe the device's power-up status. If there are no abnormal noises, overheating, or tripped circuit breakers, the power supply is normal. Let the device sit for 1–2 minutes to allow the internal circuitry to stabilize.

2. Signal Calibration

Connect a multimeter in series with the 4–20 mA signal loop. Under no-load conditions, verify that the zero-point output signal matches the standard baseline value. Connect a standard pressure calibrator and apply

standard pressures in increments within the rated range. Observe whether the output current varies linearly with pressure to confirm that the signal response is normal, with no sudden jumps or hysteresis.

3. Indicator Light Status Assessment
After powering on the device, a steady power indicator light indicates normal power supply; the absence of alarm flashing indicates a normal measurement circuit. If the indicator light flashes frequently or exhibits abnormal brightness, this indicates wiring errors, overload interference, or internal circuit abnormalities. Immediately disconnect the power and inspect the wiring and supply voltage.

4. Calibration Method
If there is a slight deviation between the measured value and the standard pressure, perform zero adjustment and span calibration via the downstream instrument or system backend; under no circumstances should the transmitter housing be opened to adjust internal potentiometers; perform calibration in a stable operating environment free from vibration and interference; after calibration, allow the unit to stand undisturbed before retesting to ensure measurement accuracy meets specifications and linearity is stable.

6.5 Installation Precautions
1. Never operate the device beyond its rated pressure or measurement range. Do not introduce media exceeding the product's rated pressure, as this may directly damage the sensing element and permanently disable the transmitter. Additionally, never supply power outside the 18–36 V DC wide-voltage range to prevent circuit burnout due to overvoltage.

2. Avoid running wiring in close proximity to high-power inverters, motors, or high-voltage power cables. High- and low-voltage circuits must be routed in separate channels or conduits to prevent signal drift and value fluctuations caused by strong electromagnetic interference.

3. In humid, outdoor, or high-moisture environments, ensure the wiring ports are waterproofed. Use waterproof connectors and sealant to seal the wiring ports to prevent rainwater or condensation from entering the interior, which could cause short circuits or corrode the circuit board.

4. Do not forcefully disassemble or reassemble the device, and do not use a wrench to grip and turn the meter housing. Operate only by gripping the threaded mounting points to prevent displacement of the internal strain gauge and loss of accuracy.

5. In explosion-hazardous areas, unauthorized modification of wiring or replacement of components is strictly prohibited. Strictly adhere to explosion-proof installation standards; do not use standard models directly in high-risk explosion-hazardous conditions.

VII. Recommendations for Daily Use and Maintenance
7.1 Key Points for Daily Inspections
1. Equipment Operational Status Inspection
Conduct daily on-site inspections to verify the overall condition of the QDW90A-YK-1 pressure-tube strain gauge pressure transmitter. Ensure the housing shows no deformation, rust, or water seepage/condensation; check that threaded connections have no media leakage, looseness, or displacement; confirm that the equipment operates without abnormal overheating or unusual noises; and ensure overall stable operation with no physical damage.

2. Signal Stability Monitoring
Monitor pressure measurement values in real-time via the PLC, DCS, or digital display backend. Focus on verifying that the values remain stable without sudden jumps or erratic fluctuations; compare them with the actual on-site process pressure to confirm that the transmitter's output signal is linear, free of lag, and does not become stuck. If frequent fluctuations or spontaneous zero-point shifts occur, record them promptly and investigate potential interference or wiring issues.

3. Environmental Temperature and Humidity Monitoring
Continuously monitor whether the ambient temperature and medium temperature around the transmitter exceed the rated operating range over extended periods, and avoid prolonged operation under high-temperature or low-temperature conditions that could cause overload. Inspect the on-site air humidity; in high-humidity, misty, or condensation-prone environments, pay special attention to the wiring terminals and housing seals to prevent moisture from penetrating the internal circuitry, which could lead to reduced insulation and signal abnormalities.

4. Inspection of Installation Site Conditions
Regularly inspect installation pipes and tanks for severe vibration or impact-induced shaking; reinforce mounting brackets in environments with prolonged intense vibration. Be aware of any newly installed high-interference equipment nearby, such as variable frequency drives, high-power motors, or high-voltage switchgear, to prevent new interference sources from affecting measurement accuracy.

7.2. Regular Maintenance Plan
1. Unit Cleaning Schedule
In standard industrial workshop environments, perform exterior cleaning every 3 months; in high-dust environments such as metallurgy and chemical plants, clean monthly. Use a dry, lint-free cloth to wipe dust and oil residue from the housing surface. Do not rinse the unit directly with water, and do not use corrosive solvents to wipe the housing or liquid-contact threaded areas, to avoid damaging the housing's anti-corrosion coating and sealing structures.

2. Wiring Tightness Inspection
Conduct a routine inspection and tightening of terminal connections every 6 months. Check whether the power supply terminals and signal output terminals are loose, oxidized, or have poor contact. Inspect the outer sheath of shielded cables for damage or aging, and ensure that grounding terminals are secure and free of corrosion. If loose connections or oxidized wire ends are found, re-crimp or replace the wires promptly to prevent signal failures caused by poor contact.

3. Inspection of Seals and Pressure Inlet Points
Every six months, inspect the pressure inlet ports and threaded installation gaskets for signs of aging, leakage, or blockage due to scaling. If the medium is prone to scaling or is slightly viscous, promptly clean impurities from the pressure inlet ports to prevent blockages that could cause pressure transmission lag or measurement distortion.

4. Recommendations for Accuracy Recalibration
Under normal operating conditions, perform accuracy calibration and retesting once every 12 months; for chemical, power, and critical process interlock applications, calibrate once every 6 months. Use a standard pressure calibrator to verify the zero and full-scale points of the measurement range and check the accuracy of the 4-20mA output. If minor deviations are found, perform fine-tuning calibration through the backend system; do not disassemble the unit or adjust internal components on your own.

7.3 Long-Term Maintenance Tips
1. Long-Term Dust and Moisture Protection
During long-term operation, ensure the transmitter's terminal connections and housing remain fully sealed. In outdoor, humid, or damp environments, install waterproof junction boxes and properly seal cable entries. Avoid exposing the equipment to standing water, direct water exposure, or confined, high-humidity, poorly ventilated locations. Maintain the integrity of the housing's anti-corrosion coating; address minor rust promptly with anti-corrosion treatment to delay housing degradation.

2. Optimized Maintenance for Interference Resistance
Strictly separate high- and low-voltage wiring during installation. Run the transmitter's shielded signal cables through separate conduits throughout the entire route; do not route them in the same channel or conduit as power cables. Adhere to the standard of grounding the shielded cable at a single point, and regularly inspect the grounding circuit to ensure it is intact and free of loose connections or breaks. When high-power electrical equipment is added nearby, promptly implement isolation shielding and route cables to avoid interference, thereby reducing the impact of electromagnetic interference on the signal.

3. Protection Techniques for Extreme Environments
In high-temperature conditions, keep the transmitter away from heat sources and radiation; install heat-insulating protective brackets if

necessary to prevent prolonged exposure to direct sunlight or high temperatures. In low-temperature winter conditions, implement freeze protection and insulation to prevent the medium inside the pressure ports from freezing and causing damage to the sensor element due to expansion. In environments with highly corrosive media, regularly inspect the corrosion status of wetted parts; if necessary, replace them with versions made of compatible materials in advance to extend the equipment's service life.

4. Maintenance During Downtime and Idle Periods
When production lines are shut down for extended periods, disconnect the transmitter's power supply, clean the surface of dust and dirt, and store the equipment under dust-proof and moisture-proof covers. Avoid prolonged power outages that could lead to moisture ingress and terminal oxidation. Before restarting and putting the equipment back into service, perform wiring inspections, no-load power-on tests, and accuracy re-verification. Only resume process use after confirming normal operation.

VIII. Troubleshooting & Emergency Response
8.1 List of Common Faults
No output signal after powering on the transmitter; no 4–20 mA current feedback to the PLC/instrument
Zero drift in the measurement signal; persistent value deviation; readings fluctuate spontaneously despite unchanged operating conditions
Abnormal device indicator status: not lit, constantly lit, or frequent flashing indicating an alarm
Process conditions are normal, but the system triggers overpressure/underpressure alarms; false alarms occur frequently
Signal interference and distortion; values jump erratically, fluctuate wildly, or are unstable; stable readings cannot be obtained
Measured values lag or respond sluggishly; signal fails to follow pressure changes for an extended period
Interface leakage or failed threaded seals; minor medium leakage affects measurement accuracy

8.2 Analysis of Failure Causes
1. Wiring Errors
Reversed polarity of power supply; reversed signal positive and negative terminals; mixed or loose connections between power and signal wires; short circuits in bare wires; ground loop interference caused by shielding wires grounded at both ends; crosstalk caused by high- and low-voltage wires being routed in the same conduit.

2. Power Supply Abnormalities
Input voltage exceeds the 18–36 VDC wide-range specification; unstable switching power supply with fluctuating voltage; insufficient power supply or excessive circuit voltage drop; power surges, reverse polarity, or overvoltage spikes damaging internal circuits.

3. Signal Overload and Load Mismatch
The load resistance of downstream PLCs or instruments exceeds the transmitter's maximum capacity; Signal attenuation caused by excessively long cables or insufficient wire gauge; selection of an insufficient measurement range, resulting in process pressure exceeding the range and causing overloading of the sensing element.

4. Environmental Interference
Installation location is near variable frequency drives, high-power motors, or high-voltage distribution cabinets; severe on-site vibration causing displacement of internal components; temperature and humidity exceeding rated ranges, with condensation or moisture entering the housing; accumulation of dust and oil causing reduced heat dissipation and insulation performance.

5. Equipment Damage
Blocked pressure ports or fouled/stuck diaphragms causing pressure transmission failure; long-term overpressure operation resulting in fatigue damage to the strain gauge; aging seals allowing water ingress and corrosion of circuit boards; long-term aging and component failure leading to permanent accuracy drift.

8.3 Step-by-Step Troubleshooting
1. Issue 1: No Output Signal, No Display on the Instrument
Troubleshooting Steps
① First, disconnect the power supply, check the power wiring, and confirm that the DC 24V positive and negative terminals are not reversed or loose;
② Use a multimeter to measure the input supply voltage and confirm it is within the normal range of 18–36 VDC;
③ Check whether the signal output terminals are incorrectly connected or loose, and re-crimp and tighten them;
④ Disconnect the downstream load and measure the transmitter's output separately to determine whether the fault lies with the device or the downstream instrument.
Repair Measures
Correct the positive and negative wiring and re-tighten the terminals; replace an unstable switching power supply; clear short-circuit points in the wiring and replace damaged signal cables.
Emergency Workaround
When immediate resumption of production is required on-site, temporarily replace the unit with a spare QDW90A-YK-1 model of the same measurement range. Simply align and install it, then connect the wiring according to standard procedures for rapid deployment.

2. Fault 2: Signal Drift, Spontaneous Value Deviation
Troubleshooting Steps
① Observe whether the ambient temperature has undergone sudden changes (e.g., extreme cold or heat) and whether the unit is located in an area with strong vibration or interference;
② Check whether the shielded cable is grounded at both ends; rectify this by grounding it at a single point in the control cabinet;
③ Inspect whether the pressure ports are blocked or scaled; clean any debris from the ports;
④ Observe whether the zero point shifts under no-load conditions to determine if the issue is caused by operational interference or inherent accuracy drift.
Remedial Measures
Optimize cabling and ensure separate routing for high- and low-voltage lines; Clear blockages from the pressure ports; perform zero-point and span micro-calibration on the downstream system; relocate the transmitter away from strong interference sources.
Emergency Workaround
Temporarily lock the system's fixed parameters to maintain process operation; perform calibration or replace the transmitter during the next scheduled shutdown window.

3. Fault 3: Abnormal Indicator Lights (Not Lit / Constant On / Flashing Alarm)
Troubleshooting Steps
① Indicator light is off: First check for power supply and whether there is a break in the wiring;
② Indicator light is constantly on with no change: Check for a short circuit in the signal loop or internal circuit overload;
③ Frequent flashing: Determine if caused by overpressure, abnormal temperature, loop interference, or internal failure.
Remedial Measures
Repair the power supply circuit and eliminate short circuits; correct wiring and grounding methods; if the issue persists, determine that the device itself is faulty and stop using it.
Emergency Workaround
Disable the automatic interlock at this point, switch to manual on-site monitoring using a pressure gauge, and await equipment replacement.

4. Fault 4: Frequent Alarm Triggers Despite No Process Abnormalities
Troubleshooting Steps
① Verify that the transmitter's range matches the system's set range;
② Investigate whether signal fluctuations or interference are causing false triggers;
③ Check for installation tilt or partial blockage of the pressure port causing pressure sensing distortion.
Remedial Actions
Standardize the on-site range with system parameters; optimize shield grounding and isolate interference sources; realign the installation angle and clean debris from the pressure ports.
Emergency Workaround
Temporarily raise the system alarm threshold to ensure uninterrupted production, followed by a thorough investigation and rectification.

5. Fault 5: Signal Interference, Distortion, and Erratic/Unstable Readings
Troubleshooting Steps
① Check whether signal cables are routed in the same conduit or pipe as power cables;
② Verify that the shielding grounding method complies with standards;
③ Check if any new variable frequency drives or high-power electrical equipment have been installed nearby.
Remedial Measures
Separate power and signal wiring; route shielded cables through dedicated metal conduits; strictly enforce single-point grounding of shielded cables; install isolation components or relocate mounting points.
Emergency Workaround
Temporarily reduce the system's sampling frequency to filter out fluctuating interference and maintain stable production monitoring.

6. Fault 6: Measurement Lag and Slow Response
Troubleshooting Steps
① Check whether the pressure tapping holes are contaminated with oil, scaled, or partially blocked;
② Check whether the installed piping is excessively long or has too many bends, causing pressure transmission delays.
Remedial Measures
Clean and unblock the pressure tapping holes; simplify the piping and shorten the pressure transmission distance to ensure unobstructed medium flow.

8.4, After-Sales Repair Guidelines
1. Failure Determination Criteria (Situations Where Direct Repair Reporting Is Recommended)
No output or persistent signal interference remains after all wiring, power supply, and grounding issues have been investigated and rectified;
Abnormal indicator light flashing, error upon power-up, and inability to resume normal operation;
Obvious overpressure damage, diaphragm deformation, water ingress and corrosion in the housing, or physical damage;
Accuracy cannot be restored even after multiple calibrations, with permanent zero-point or span shifts;
Persistent seal leakage, or inability to perform normal measurements even after cleaning and maintenance.

2. Repair Process
Record the complete equipment model: QDW90A-YK-1, measurement range, installation conditions, and fault symptoms;
Take on-site photos: equipment nameplate, installation site, terminal blocks, and fault display;
Contact Qidian After-Sales Technical Support and provide the model, operating conditions, fault description, and photos;
A technician will provide remote troubleshooting guidance; if on-site repair is not possible, proceed with the replacement or repair process;
Return the faulty device according to after-sales instructions and await repair or replacement.

3. Warranty Coverage
Under normal operating conditions and when installed and used in accordance with specifications, the product is covered by the original manufacturer's warranty for non-human-induced damage;
The warranty covers circuit failures, sensor accuracy drift, and factory-seal or manufacturing defects;
Damage resulting from violent disassembly, overpressure operation, unauthorized disassembly or modification, natural disasters, or use under non-compliant operating conditions is not covered by the free warranty; paid repair services are available.

4. Usage Guidelines
Under no circumstances should you disassemble the transmitter housing or adjust internal potentiometers during troubleshooting; doing so will immediately void the warranty. For complex electrical or hardware failures, we recommend contacting the manufacturer's after-sales service directly for guidance from professional technicians.