Aviation Connector Pressure Transmitter

I. Product Definition

The Anhui Qidian QDW70A-C aviation connector diffused silicon pressure transmitter is a general-purpose pressure measurement device based on diffused silicon piezoresistive sensor technology, specifically designed for industrial field pressure measurement and signal transmission.

Its core function is to accurately convert pressure signals from media such as gases and liquids into standard industrial electrical signals (e.g., 4–20 mA current signals, 0–5 V/0–10 V voltage signals), and to provide fast, reliable electrical connections via an aviation connector interface, thereby supplying stable, collectable pressure data to control systems such as PLCs, DCSs, and digital display instruments.

As a core measurement unit in the field of industrial automation, this product delivers the following key capabilities:

1. Precise Pressure Measurement: Continuously and accurately monitors gauge pressure, absolute pressure, or vacuum within pipelines, tanks, and equipment. Its measurement range covers the standard industrial low- to medium-pressure range, making it suitable for the vast majority of typical operating conditions.

2. Standard Signal Conversion: Linearly converts non-electrical pressure physical quantities into standard electrical signals commonly used in industrial control systems, enabling long-distance transmission and centralized collection of pressure data.

3. Stable Signal Transmission: Features an aviation connector-style electrical interface that is vibration-resistant, tamper-proof, and offers a high protection rating. It meets the installation and operational demands of complex industrial environments, preventing signal transmission interruptions.

4. Multi-scenario Adaptability: Featuring an all-stainless-steel construction, it is compatible with various media including water, oil, and mildly corrosive gases/liquids. It is widely applicable in pressure monitoring scenarios across industries such as petroleum, chemicals, water treatment, machinery manufacturing, and HVAC.

5. Status Feedback and Control Support: The standard output signal can be directly integrated into control systems, providing a reliable basis for pressure limit alarms, automatic regulation, data logging, and analysis, thereby supporting the automated management of industrial processes.

II. Working Principle

The working principle of the QDW70A-C aviation connector diffused silicon pressure transmitter is fundamentally divided into four stages: “Pressure Sensing – Signal Conversion – Signal Conditioning – Standard Output.” A simplified explanation is as follows:

1. Pressure Sensing Stage (Core Sensing Unit)

A diffused silicon piezoresistive sensor chip is encapsulated inside the stainless steel pressure chamber at the front end of the transmitter. When the pressure of the measured medium is transmitted to the chip surface through the front threaded interface, the elastic diaphragm on the chip undergoes slight deformation, causing a change in resistance in the four piezoresistive strain gauges integrated onto the diaphragm.

2. Signal Conversion Stage (Wheatstone Bridge)

The four piezoresistive strain gauges form a Wheatstone bridge. Powered by the transmitter’s supply, the bridge converts these minute changes in resistance into a weak voltage signal output. The greater the pressure, the greater the diaphragm deformation, and the stronger the voltage signal output from the bridge; the two exhibit a linear relationship.

3. Signal Conditioning Stage (Amplification and Compensation)

Since the weak voltage signal cannot be transmitted over long distances directly, a dedicated signal conditioning circuit inside the transmitter amplifies, filters, temperature-compensates, and linearly corrects the signal.

Temperature compensation eliminates the impact of ambient temperature changes on the sensor chip, while linear correction ensures that the relationship between pressure and the output signal remains stable, guaranteeing measurement accuracy is unaffected by operating conditions.

4. Standard Output Stage (Aviation Connector Transmission)

The conditioned signal is ultimately converted into industrial standard signals such as 4–20 mA or 0–5 V and output through the aviation connector interface at the rear of the transmitter. The aviation connector not only provides an electrical connection but also features anti-loosening, waterproof, and anti-interference properties, ensuring stable signal transmission to the control system even in complex field environments.

Simply put, the workflow is as follows: medium pressure → chip deformation → change in bridge voltage → circuit conditioning and correction → standard signal output. Throughout this process, “invisible pressure” is converted into “electrical signals that the control system can interpret,” enabling automated monitoring of industrial pressure.

III. Core Value and Pain Point Solutions

1. Issues with Signal Interruption and Poor Connection Reliability in Industrial Field Environments

Q: Field equipment is subject to vibration and frequent plugging/unplugging. Standard terminal blocks are prone to loosening and poor contact, causing intermittent pressure signals that affect system operation. How can this be addressed?

A: The QDW70A-C features an aviation-style connector with anti-loosening clips and a metal latch design, offering strong vibration resistance and anti-loosening properties. It withstands industrial mechanical vibrations and frequent plugging/unplugging, preventing signal interruptions caused by loose connections. Additionally, the connector’s built-in protective structure enhances water and dust resistance, making it suitable for harsh, humid, and dusty environments to ensure stable and reliable signal transmission.

2. Low pressure measurement accuracy and significant data fluctuations affecting process control and equipment safety

Q: Conventional pressure sensors are susceptible to temperature changes and linearity errors, resulting in large measurement deviations and frequent fluctuations. How can we address this issue when they fail to meet the accuracy requirements for process control and safety alarms?

A: The QDW70A-C employs a high-precision diffused silicon sensing chip, paired with built-in temperature compensation and linear correction circuits. It achieves measurement accuracy up to Class 0.2 with minimal temperature drift, maintaining stable measurement accuracy across a wide temperature range. The output signal exhibits high linearity, ensuring a strict correspondence between pressure changes and signal output. This provides precise and stable pressure data, supporting accurate control of process parameters and reliable alarms for equipment pressure exceedances.

3. Issues with media corrosion and complex operating conditions leading to damage and short service life of standard transmitters

Q: The measured media are water, oil, or weakly corrosive fluids, and the on-site environment is humid and dusty. Standard transmitters are prone to corrosion and damage, and frequent replacements increase costs. How can this be addressed?

A: The QDW70A-C features a fully 304 stainless steel housing and pressure chamber design, making it resistant to water, oil, and mild corrosion, and compatible with the vast majority of standard industrial media. Additionally, its overall structure provides excellent sealing performance, enabling it to withstand harsh environments such as humidity and dust. This extends equipment service life and reduces downtime and replacement costs caused by transmitter failure.

4. Signal types are not universal, making direct connection to PLCs/DCS and other control systems impossible

Q: Different brands of control systems and digital displays have varying requirements for input signal types. Standard transmitters often produce incompatible output signals that cannot be directly connected, requiring additional conversion modules and increasing costs. How can this be addressed?

A: The QDW70A-C supports multiple standard signal outputs. The mainstream configuration is a 4–20 mA current signal (industry-standard), and it is also compatible with voltage signals such as 0–5 V and 0–10 V. It can be directly connected to the vast majority of industrial control systems—including PLCs, DCSs, and digital displays—without requiring additional conversion modules, thereby reducing system integration costs and improving compatibility.

5. Poor installation compatibility: What should be done if the thread specifications do not match the on-site pipe connections?
Q: On-site pipe connections come in a variety of thread specifications. If the transmitter's thread does not match, direct installation is not possible, requiring additional adapters that increase the risk of leakage and installation costs.
A: The QDW70A-C comes standard with a G1/4 universal industrial threaded connection, compatible with the vast majority of conventional industrial piping and tank interfaces, allowing for direct installation without additional adapters. It also supports customization of other thread specifications based on user requirements to accommodate different on-site installation needs, thereby reducing the risk of leaks and additional costs during installation.

6. Narrow power supply voltage range: How to address issues where on-site power fluctuations easily cause transmitter malfunctions?
Q: Power supply voltage fluctuates significantly in industrial environments. Standard transmitters have a narrow operating voltage range; excessively high voltage can burn them out, while excessively low voltage prevents normal operation, affecting usability. How should this be addressed?
A: The QDW70A-C features a wide-voltage power supply design with a standard operating range of 12–36 V DC. It is compatible with the 24 V DC power systems commonly used in industrial environments and can withstand a certain range of voltage fluctuations. This prevents transmitter malfunctions caused by unstable power supply, thereby enhancing equipment operational stability.

IV. Key Product Parameters & Specifications
4.1 Basic Electrical Parameters
Key Measurement Parameters
Standard Range: 0–0.1 MPa to 0–60 MPa (custom ranges available upon request)
Measurement Type: Gauge Pressure (Standard), Absolute Pressure / Vacuum (Customizable)
Measurement Accuracy: ±0.2% FS (Standard Grade), ±0.1% FS (High-Precision Custom)
Non-linearity Error: ≤±0.1% FS
Hysteresis Error: ≤±0.1% FS
Repeatability Error: ≤±0.05% FS
Temperature Drift: ≤±0.01% FS/°C (within the -20°C to 85°C range)
Zero Drift: ≤±0.02% FS/year
Signal Output Parameters
Standard Output: 4–20 mA DC (two-wire, industrial standard)
Optional Outputs: 0–5 V DC, 0–10 V DC, 1–5 V DC (three-wire)
Output Load Capacity:
4–20 mA Output: 0–750 Ω (when powered by 24 V DC)
Voltage Output: ≥2 kΩ (load impedance)
Response Time: ≤5 ms (Step Signal Response)
Signal Ripple: ≤10 mVpp (voltage output), ≤0.1 mA (current output)
Electrical Connection Characteristics
Interface Type: Aviation-style connector (standard M12×1 or Y27P series, with anti-loosening latch design)
Insulation Resistance: ≥100 MΩ (500 V DC, between housing and signal terminals)
Dielectric Strength: 500 V AC/1 min (no breakdown, no flashover)
Electromagnetic Compatibility: Complies with GB/T 17626 standard; resistant to electrostatic discharge and surge interference

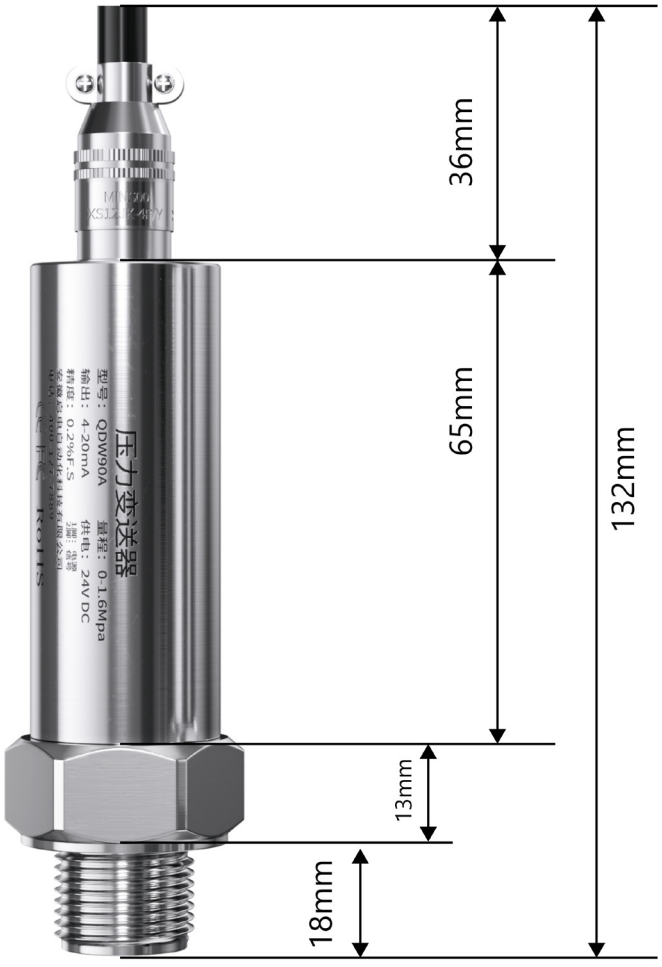
4.2 Isolation Performance Parameters
Signal Isolation Characteristics
Isolation Method: Built-in signal isolation circuit (electrical isolation as standard configuration; intrinsically safe isolation available as an option)
Isolation Voltage: 1500 V AC (1 minute, isolation at input/output/power supply terminals)
Common-Mode Rejection Ratio (CMRR): ≥80 dB (50 Hz)
Differential-Mode Rejection Ratio (DMRR): ≥60 dB
Isolation Leakage Current: ≤0.5 mA (at 500 V AC)
Safety Isolation Compatibility
Intrinsically Safe Explosion-Proof Compatibility: Compatible with standard intrinsically safe barriers (e.g., Zener-type or isolated safety barriers; compatible models depend on the specifications of the user's on-site safety barrier)
Function of Isolation Circuit: Disconnects the electrical circuit between the field and the control system to prevent ground loop interference and surge damage to downstream equipment, while meeting the intrinsically safe isolation requirements for explosion-proof environments

4.3 Power Supply & Power Consumption Parameters
Power Supply Parameters
Standard Supply Voltage: 24 V DC (typical)
Wide Supply Range: 12 V DC to 36 V DC (supports on-site voltage fluctuations)
Polarity Protection: Built-in reverse connection protection circuit; reverse connection will not damage the device
Power Distribution Output: No additional power distribution output (two-wire 4–20 mA output, powered by the control system loop)
Power Consumption Parameters
4-20mA Output Mode: Maximum power consumption ≤ 0.5W (24V DC supply, at full 20mA load)
Voltage Output Mode: Maximum power consumption ≤ 0.3W (24V DC supply, at full output)
Standby Power Consumption: ≤ 0.1W (no-load standby state)

4.4 Environmental Adaptation Parameters
Temperature Parameters
Operating temperature range: -20°C to +85°C (standard medium temperature); optional -40°C to +125°C (high-temperature custom model)
Medium temperature range: -20°C to +100°C (standard); up to 150°C (custom model with heat sink)
Storage Temperature Range: -40°C to +125°C
Temperature Compensation Range: -10°C to +70°C (full-range temperature compensation)
Humidity and Protection Parameters
Operating Relative Humidity: 10% to 95% RH (non-condensing)
Protection Rating: IP65 (water-jet and dust-proof when aviation connector is securely mated); IP67 (custom waterproof aviation connector version)
Vibration Resistance: 10–2000 Hz, 10g, 2 hours in each of the three axes without damage
Shock Resistance: 50g, 11 ms, half-sine wave, 3 times in each of the three axes without damage
Explosion-Proof and Safety Parameters
Explosion-Proof Rating: Standard model has no explosion-proof certification; optional intrinsically safe model Ex ia II C T4 Ga (must be used with an intrinsically safe barrier)
Safety Barrier Compatibility: Intrinsically safe models are compatible with isolated or Zener-type safety barriers; must meet the loop parameter requirements of the on-site explosion-proof zone (intrinsic safety certification subject to the certificate of the customized model)

4.5. Physical Parameters
Installation Method
Standard Installation: Direct threaded mounting (direct installation on pipes or tanks, no additional brackets required)
Thread Specifications: Standard G1/4 male thread; Optional industrial standard threads: M20×1.5, G1/2, NPT1/4, NPT1/2, etc.
Installation Orientation: Can be installed in any direction (no requirements regarding medium deposition; vertical installation is recommended for viscous media to prevent impurity buildup)
Dimensions (Standard Model)
Overall Length: Approx. 132 mm (including aviation connector, excluding cable)
Body Diameter: Φ28 mm (Stainless steel housing)
Threaded end length: Approx. 15 mm (G1/4 threaded section)
Hex mounting size: S24 (wrench face size, compatible with standard industrial wrenches)
Aviation connector diameter: Φ16 mm (standard connector size)
Dimension diagram notes:
The front end is the pressure measurement port, featuring a G1/4 male

thread and a pressure port (bore diameter Φ3mm)
The middle section is the stainless steel body, housing the sensor and signal conditioning circuitry, with laser-etched parameter markings
The rear end is the aviation connector port, featuring a locking mechanism and cable exit structure
Weight and Material Specifications
Unit Weight: Approx. 180g (standard model, excluding cable)
Housing Material: 304 stainless steel (standard); optional 316L stainless steel (Custom model for highly corrosive media)
Pressure chamber material: 304/316L stainless steel (integrally formed with the housing, eliminating leakage risks)
Seal material: Fluorocarbon rubber (standard, temperature range -20°C to +180°C, suitable for conventional media); optional PTFE / perfluoroelastomer (customized for highly corrosive / high-temperature media)
Protection Details:
The housing is constructed using a seamless welding process, providing a fully sealed design with no pathways for media leakage
The aviation connector features a rubber O-ring; when properly seated, it achieves IP65 protection, preventing the ingress of moisture and dust
The front end of the pressure-transmitting port has no additional damping, ensuring fast response; an optional built-in damper is available (for pulsating pressure conditions, custom version)



V. Application-Specific Selection Guide
5.1 Key Selection Criteria
1. Selection Based on Signal Type
Common types of backend access devices in industrial environments include PLCs, DCS systems, digital control instruments, and data acquisition modules. The industry-standard 4–20 mA two-wire current output is the preferred choice due to its long transmission distance and strong interference resistance, making it suitable for long-distance cabling and high-interference environments; For short-distance indoor wiring in the field or when instruments have built-in voltage input ports, 0–5 V, 0–10 V, or 1–5 V three-wire voltage outputs may be selected; when interfacing with legacy equipment or specialized data acquisition devices, confirm the interface protocol and voltage level in advance, and select the corresponding signal specifications as needed.

2. Selection Based on Number of Channels
The QDW70A-C is a single-channel, standalone pressure measurement model; a single unit corresponds to only one medium pressure measurement point; For single-station, single-pipe, or single-tank single-point pressure monitoring, the standard single-channel model is sufficient; for scenarios requiring simultaneous pressure acquisition from multiple points or pipes on a single device, there is no need to force the use of a single high-spec model. It is recommended to configure multiple QDW70A-C units on a one-to-one basis according to the number of measurement points to ensure independent, interference-free measurement at each point and prevent data interference.

3. Selection Based on Power Supply Method
Industrial automation sites typically feature a standard 24V DC power supply system, which is directly compatible with the QDW70A-C's standard power specifications, allowing for plug-and-play operation without the need for additional power conversion. In environments with voltage fluctuations or unstable power from aging wiring, prioritize the device's wide 12–36V DC voltage range to accommodate on-site voltage variations. In scenarios without a dedicated DC power circuit and where only AC power is available, an industrial switching power supply must be used to convert the power to 24 V DC before supplying the transmitter; direct connection to AC mains power is strictly prohibited.

4. Selection Based on Explosion-Proof Requirements
For ordinary non-explosion-proof indoor workshops, conventional water treatment, HVAC circulation, and civil machinery applications where no flammable or explosive media are present, the standard QDW70A-C model can be selected directly. which offers high cost-effectiveness and meets standard measurement requirements; for explosion-hazardous areas involving flammable or explosive gases, liquids, or dust—such as chemical process zones, tank farms, and hazardous material storage facilities—the standard model must be avoided. Instead, select the intrinsically safe custom version and pair it with a compatible isolated or Zener barrier. Wiring and installation must strictly adhere to explosion-proof regulations.

5. Selection Based on Installation Environment
For mild conditions such as dry, dust-free indoor environments, areas near electrical control cabinets, or enclosed machine rooms, the standard housing and conventional aviation connector versions are sufficient. For harsh outdoor environments—including open-air, damp, rain-exposed, dusty conditions, machine tool oil mist, or areas near water treatment tanks—special attention must be paid to the IP protection rating. Prioritize IP65 or higher protection configurations paired with sealed aviation connectors. In environments with high-frequency vibrations or impact vibrations from equipment start-up and shutdown, prioritize versions with anti-vibration structures and latching aviation connectors to prevent loose connections and signal interruptions. In environments with strong electromagnetic interference, such as variable frequency drive (VFD) workshops or areas near high-voltage power distribution, select versions with electrical isolation and enhanced electromagnetic compatibility to avoid ground loop interference and signal drift.

5.2. Selection Guidelines for Industry Scenarios
1. For pressure monitoring of various reactors, 输 送 pipelines, pressure vessels, and circulating water circuits in the chemical industry—where media typically include water, oils, and mildly corrosive fluids, and the site features dusty and humid conditions—prioritize the standard QDW70A-C aviation connector diffused silicon pressure transmitter. For highly corrosive media, upgrade to 316L stainless steel construction and fluororubber seals. and the Benan custom version is sufficient to meet process monitoring and safety control requirements in explosion-proof zones.

2. Power Industry: Pressure data acquisition for power plant circulating water, heating networks, condensation systems, and downstream sections of fans and pumps. Given the long on-site cabling distances and strong electromagnetic interference, the standard 4-20mA current output QDW70A-C model is recommended. Leveraging the reliable connections and strong anti-interference characteristics of the aviation connector, it supports long-distance signal transmission and stable integration with the power plant's DCS control system.

3. For pressure detection in cooling water circuits, hydraulic oil lines, and gas supply pipelines in steelmaking and rolling operations within the metallurgical industry—where high temperatures, high dust levels, and significant mechanical vibrations are present—we recommend the ruggedized version with vibration-resistant aviation connectors. Combined with wide-temperature operating specifications, this design withstands on-site temperature fluctuations and mechanical shocks, ensuring stable, long-term continuous measurement.

4. Pharmaceutical Industry: Pressure monitoring in pharmaceutical water supply systems, purified water pipelines, and process fluid pressure-stabilization circuits. Given the high requirements for equipment material cleanliness and sealing integrity, the QDW70A-C custom model—featuring a 316L stainless steel diaphragm and food-grade sealing materials—is recommended. The unit meets sealing protection standards, ensures no medium residue, and offers corrosion resistance, complying with pharmaceutical cleanroom standards.

5. Smart Manufacturing and Mechanical Manufacturing Industries: Pressure measurement and control for automated production lines, hydraulic machine tools, air compressors, hydraulic stations, and injection molding equipment. With dispersed equipment locations and frequent plug-and-play maintenance, the aviation connector interface facilitates quick disassembly and maintenance. The standard 4-20mA output version can be directly connected to PLCs and industrial control data acquisition systems, supporting closed-loop control in automated processes.

6. HVAC and Water Treatment Industries: For pressure monitoring in water supply and drainage networks, sewage pumping stations, central air conditioning circulating water systems, and boiler makeup water systems—where environments are humid and vapor-laden—the QDW70A-C with IP65 protection rating is recommended. It offers easy installation and requires no routine maintenance, making it suitable for standardized selection in applications with multiple measurement points.

5.3 Common Selection Misconceptions

1. Misconception of Ignoring Isolation Level Selection

Many users focus solely on measurement range and signal type during selection, neglecting electrical isolation performance. In environments with multiple devices sharing a common ground, strong electromagnetic interference, or conditions near variable frequency drives, selecting non-isolated base models can lead to signal drift, value fluctuations, and ground loop interference. In severe cases, this may damage the downstream PLC data acquisition ports. Actual selection must prioritize confirmation of the on-site interference environment; in high-interference conditions, versions with three-terminal electrical isolation must be selected.

2. Common Mistakes in Selecting the Wrong Signal Range

Blindly choosing a wide range to replace a narrow range measurement results in reduced accuracy and insufficient resolution in low-pressure ranges, making it impossible to accurately capture subtle process pressure changes; conversely, selecting a range that is too narrow can cause sensor overload and failure when actual peak pressures exceed the range. When selecting a model, a safety margin of 20%–30% should be reserved based on the daily operating pressure, and the range should be matched to the nearest standard range—neither too large nor too small.

3. Common Mistakes in Ignoring Load Matching

When selecting a 4–20 mA current output, failing to account for the total load of the downstream instrument and PLC input impedance can result in the load resistance exceeding the transmitter's permissible range, leading to signal drop, non-linear output, and an inability to span the full measurement range; in voltage output applications, neglecting input impedance matching causes severe signal attenuation and data distortion; selection must involve calculating the total loop load in advance to ensure it remains within the device's permissible load range.

4. Common Mistakes in Selecting General-Purpose Models for Explosion-Proof Applications

In flammable and explosive hazardous areas, arbitrarily selecting standard general-purpose models like the QDW70A-C without intrinsic safety configuration or safety barriers poses serious safety hazards and violates safety production regulations. Additionally, some users, despite selecting explosion-proof models, pair them with incompatible safety barriers, resulting in intrinsic safety circuit parameters that fail to meet standards and rendering the explosion-proof protection ineffective. In explosion-proof applications, the model, safety barrier, and wiring standards must be fully compatible and matched.

5.4 Customization Recommendations

1. Custom Signal Solutions

In addition to standard signals such as 4–20 mA, 0–5 V, and 0–10 V, non-standard output signals such as 1–5 V and 0–20 mA can be customized. For specialized data acquisition instruments or legacy imported equipment with specific interface specifications, we offer one-to-one customization of special output parameters and linear calibration to ensure perfect signal compatibility with downstream devices.

2. Custom Solutions for Non-Standard Operating Conditions

For special high-temperature or low-temperature media conditions, versions with wide-temperature measurement capabilities and heat dissipation structures can be customized; for strong acids, alkalis, or highly corrosive media, 316L stainless steel, Hastelloy diaphragms, and special corrosion-resistant sealing materials can be customized; For limited on-site installation space, we can customize shorter body lengths and non-standard threaded interfaces, such as M20×1.5, G1/2, and NPT threads; for pulsating pressure and water hammer conditions, we can customize built-in damping structures to buffer pressure fluctuations and stabilize measurement values.

3. Structural and Adaptation Customization Solutions

Extended pressure-conducting rods and heat sink structures can be customized to accommodate long-distance pressure measurement in high-temperature media; aviation connectors can be upgraded with waterproofing and customized with straight or angled cable exits to suit confined installation spaces and outdoor rain exposure; additionally, laser-engraved model numbers, range markings, and company logos can be customized per customer requirements to facilitate on-site equipment management and standardized record-keeping.

4. Multi-Point Integrated Customization Solutions

For scenarios involving centralized pressure data collection across multiple pipelines and workstations, rather than modifying individual devices, we offer bulk customization of multiple QDW70A-C units with uniform measurement ranges, signal formats, and installation specifications. These are supplied with standardized aviation connector harnesses and mounting adapters to enable standardized on-site installation, unified commissioning, and universal replacement during maintenance, thereby reducing overall project selection and operational costs.

VI. Installation and Commissioning Guidelines

6.1. Pre-installation Preparation

1. Verification of Accessories

After unpacking, verify the completeness of the standard accessories one by one: the main unit, aviation connectors, sealing gaskets, user manual, and product certificate of conformity. If custom threaded adapters, mounting brackets, or dedicated shielded cables are included, count them as well to ensure no parts are missing, there are no visible dents or scratches, the threads are not stripped, and the aviation connector latches are intact and secure.

2. Environmental Inspection

The installation site must be free from highly corrosive gases and areas subject to prolonged water immersion; it must be located away from sources of strong electromagnetic interference such as variable frequency drives, high-voltage contactors, and high-power motors; sufficient installation clearance must be provided near equipment subject to severe vibration; for outdoor or humid environments, ensure that rain, dust, and splash protection measures are in place to guarantee the equipment meets the required protection rating for long-term operation; In explosion-proof zones, confirm the zone classification in advance and strictly match the intrinsically safe model with the corresponding safety barrier.

3. Tool List

Prepare adjustable wrenches, Allen wrenches, a multimeter, electrical tape, shielded signal cables, cable ties, grounding wires, and PTFE tape.

For calibration scenarios, equip a standard pressure calibrator, a DC regulated power supply, and standard digital ammeters/voltmeters.

4. Safety Precautions

The main power supply to on-site equipment must be disconnected before installation. Under no circumstances should aviation connectors be plugged in or unplugged while the system is energized. Do not install or remove transmitters directly on pressurized pipelines; first relieve pressure and close the upstream valve before proceeding. When routing cables, separate power and signal lines; do not run them in the same conduit as power cables. In explosion-proof zones, strictly adhere to explosion-proof construction standards; unauthorized modifications to wiring or disassembly of the unit are strictly prohibited. Do not power on the unit for testing until installation is complete to prevent circuit burnout due to incorrect wiring.

6.2 Standard Installation Steps

1. Mechanical Installation and Securing

This model features a threaded direct-mount design and does not require a mounting rail. Apply an appropriate amount of PTFE tape to the reserved interface on the pipeline or tank, then manually screw the unit into the threaded connection and tighten it moderately with a wrench. Do not use excessive force, as this may strip the threads or damage the internal sensor structure; The unit may be installed at any angle. For viscous or impurity-laden media, vertical installation is recommended to minimize sediment buildup and blockage of the pressure-sensing orifices. In vibrating environments, install shock-absorbing pads or mounting brackets to reduce the impact of prolonged vibration on measurement accuracy and connection integrity.

2. Wiring Specifications (Power / Signal Polarity Distinction)

Standardized wiring is implemented using aviation connector pin definitions. Strictly distinguish between power supply positive and negative terminals and signal positive and negative terminals. Reverse or incorrect connections are prohibited:

Two-wire 4-20mA Standard Model: Only two wires; the power supply and signal share the same circuit. Distinguish between the power supply positive terminal and the signal circuit negative terminal; no spare pins are left unused.

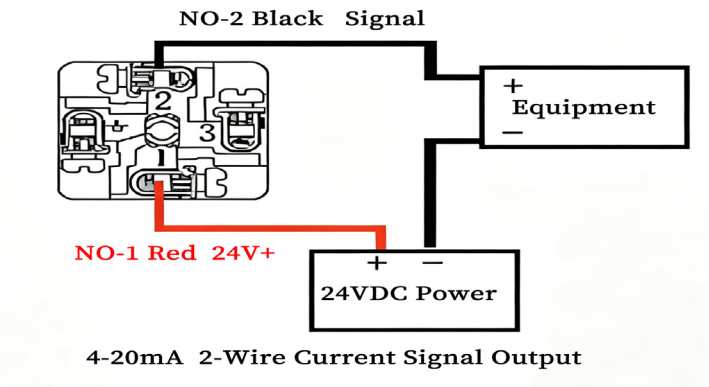
Three-wire voltage output model: Separate power supply positive, power supply negative, and signal output positive terminals; the shielding wire is routed separately.

Isolated version: Strictly distinguish between the power supply terminal, input ground, and signal output terminal according to pin definitions; do not short-circuit the common terminal.

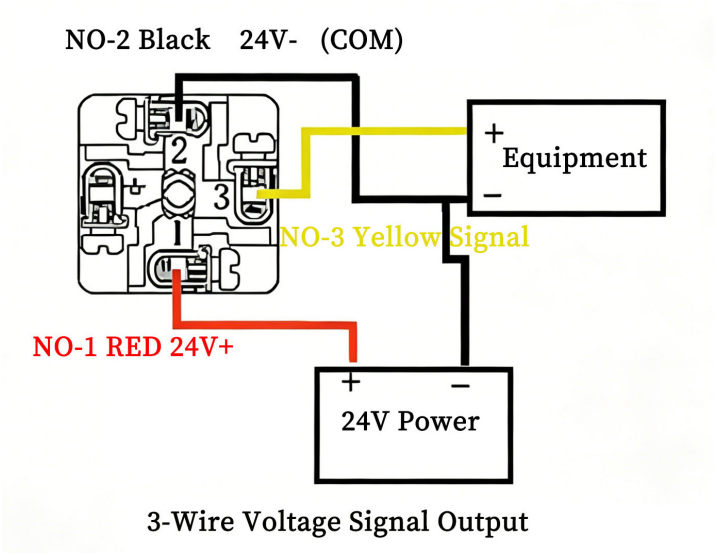
3. Grounding Requirements

The transmitter's metal housing must be reliably grounded and connected to the field protective grounding busbar. The signal line shield must be grounded at a single end—only at the control cabinet end—while the shield on the transmitter side must remain floating (ungrounded) to prevent ground loop interference caused by double-ended grounding. In high-interference environments, an additional independent ground wire must be installed, with grounding resistance controlled within 4 Ω.

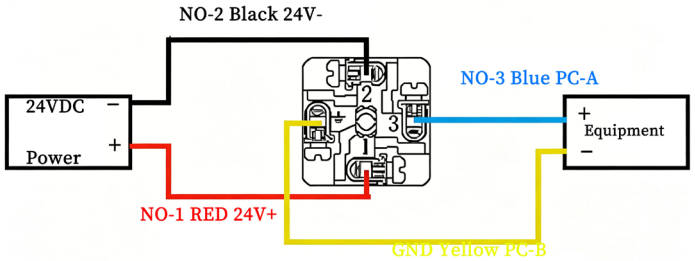
6.3 Textual Specifications for Wiring Diagrams



4-20mA 2-Wire Current Signal Output



3-Wire Voltage Signal Output



RS485 Output 4-Wire

4. Wiring Specifications for Isolated Systems

Isolated power supplies, inputs, and outputs must be electrically isolated at all three terminals; short-circuiting of common terminals is strictly prohibited. The power supply must be independently powered and must not share a ground connection with the signal ground. Signal terminals must be connected independently to downstream data acquisition equipment, and the shielding layer must be grounded at a single point in accordance with standard practices to prevent ground loops from causing data fluctuations.

5. Comparison of Correct and Incorrect Wiring

Correct Wiring: Color-coded wiring, positive and negative terminals not mixed, shield grounded at a single point, and separate circuits for high-voltage and low-voltage lines;

Incorrect Wiring: Reversed polarity of power supply signals, shield grounded at both ends, high-voltage and low-voltage lines routed through the same conduit, and arbitrary shorting of unused pins. All of the above errors can cause equipment burnout, signal drift, and value fluctuations.

5.4 Power-On Debugging Procedure

1. No-Load Test

Power on the device with the pipeline under no pressure, connect to a standard 24V DC power supply, and observe the device's operating status. If there is no overheating, no abnormal noise, and no instantaneous tripping, the power supply is normal; let the device stand for 3 to 5 minutes to warm up, allowing the circuit to reach a stable operating state.

2. Signal Verification

Under no-load, zero-pressure conditions, use a multimeter to measure the output signal: for 4–20 mA models, the zero point should be close to 4 mA; for voltage-output models, the zero point corresponds to the lowest standard voltage value. Connect a pressure calibrator to apply pressure in stages, and calibrate linearity at five points (0%, 25%, 50%, 75%, 100%) according to the measurement range. Record whether the output values correspond to the standard values.

3. Operational Status Assessment

This model has no external indicator lights; the status is determined based on the values collected by downstream instruments or PLCs: stable values with no fluctuations indicate normal operation; fixed values that do not

change with pressure indicate a wiring or circuit fault; drifting values or slight fluctuations indicate grounding or interference issues.

4. Calibration Methods
Zero-point deviation: If the zero-point shifts under no-pressure conditions, adjust it via the zero-point fine-tuning function on the downstream instrument system;
Span deviation: Compare with a standard calibrator under full-scale pressure and perform span ratio correction within the control system;
Under no circumstances should you disassemble the transmitter housing to adjust internal potentiometers. The unit is precisely calibrated at the factory; unauthorized disassembly will void the warranty and compromise the explosion-proof seal.

6.5 Installation Precautions
1. Overvoltage supply is strictly prohibited. Do not connect to a power source exceeding 36 V DC, and do not connect directly to 220 V AC mains power, as this will burn out the internal circuitry.

2. Avoid running cables in close parallel proximity to variable frequency drives, high-power motors, or high-voltage power cables. Maintain a minimum parallel distance of 30 cm. Use vertical cross-connections to minimize electromagnetic interference.

3. In damp, open-air, or rain-exposed environments, the aviation connector must be securely locked to ensure the sealing ring is properly seated and maintain full IP65 protection. Do not operate the device for extended periods with the connector partially inserted or the sealing ring missing, to prevent moisture and dust from entering the interior and causing circuit corrosion or short circuits.

4. Do not exceed the rated pressure range. The actual operating pressure must not exceed the upper limit of the device's rated range. Prolonged overpressure can cause permanent deformation of the sensing diaphragm, loss of accuracy, or even direct damage.

5. Do not disassemble or modify the wiring configuration in explosion-hazardous areas without authorization. Do not force the connection of incompatible safety barriers into explosion-proof circuits, as this violates safety regulations and poses significant safety hazards.

VII. Recommendations for Daily Use and Maintenance
7.1 Key Points for Daily Inspections
1. Visual and Structural Inspection
Conduct daily inspections to ensure the transmitter's exterior shows no rust, deformation, or signs of impact damage; verify that the pressure inlet ports at the front end are free of debris, oil residue, or scale buildup; confirm that the locking tabs on the aviation connectors are securely engaged with no looseness, detachment, or signs of cracking or aging, and that the sealing O-rings are intact and not missing.

2. Signal Stability Monitoring
Monitor the pressure readings acquired by the PLC, DCS, or digital display in real time. Observe whether the readings are stable, without frequent fluctuations, unexplained drift, or persistent lock-up. Under normal operating conditions, pressure readings should vary linearly with actual operating conditions, without sudden changes or erratic step-like jumps. If minor fluctuations or sudden spikes occur, promptly investigate grounding, wiring, and interference issues.

3. Operating Temperature and Humidity Monitoring
Continuously monitor the ambient temperature and humidity at the installation site to ensure the equipment operates within the rated temperature range over the long term, avoiding prolonged operation under extremely high or low temperatures. In humid environments, check the equipment surface for condensation or water droplets to prevent moisture from seeping into the unit through gaps in the aviation connectors, which could cause circuit dampness and reduced insulation.

4. Operating Conditions and Load Inspection
Regularly verify the actual operating pressure. Never allow the transmitter to operate near or beyond its rated full-scale range for extended periods. Avoid subjecting the sensor diaphragm to frequent water hammer or prolonged instantaneous pressure surges to prevent diaphragm fatigue, deformation, and accuracy degradation. Inspect the area around vibrating equipment to check for loose connections or misalignment of the unit.

7.2 Periodic Maintenance Plan
1. Overall Cleaning Schedule
In standard industrial environments, perform surface cleaning every 3 months; in environments with high dust or oil contamination, such as metallurgical and chemical plants, clean monthly. Use a dry, lint-free cloth to wipe the housing, the exterior of the aviation connectors, and threaded mounting areas. Do not rinse the entire unit directly with water, and do not use corrosive solvents to wipe the housing to avoid damaging the surface protective coating and sealing structure.

2. Wiring and Fastening Inspection Schedule
Conduct a comprehensive wiring inspection every six months: Check whether aviation connectors are securely locked; inspect for oxidation, looseness, or poor contact in pin connections; verify that shielding wires are securely grounded and ground connections are intact; check for loose pipe installation threads or signs of minor leaks; if wiring oxidation or loose terminals are found, re-crimp and retighten them immediately.

3. Recommendations for Accuracy Retesting and Calibration
Conduct annual accuracy retests for standard water treatment, HVAC, and general mechanical applications; perform semi-annual accuracy calibrations for high-demand scenarios such as chemical processing, pharmaceuticals, and precision process control. Use a standard pressure calibrator to compare zero-point, full-scale, and intermediate points, and record error data. If deviations exceed the allowable range, perform linear correction in the downstream control system; under no circumstances should the transmitter be disassembled for internal calibration.

4. Seal and Aging Inspection
Inspect the aging, hardening, and cracking of the aviation connector O-rings and threaded gaskets once a year. In outdoor or humid environments, replace aged seals in advance to ensure the IP65 protection rating remains effective and prevent dust and moisture from entering the housing.

7.3 Long-Term Maintenance Tips
1. Long-Term Dust and Moisture Protection
In environments with persistent dust, install a simple protective cover over the transmitter to prevent long-term dust accumulation in the gaps of the aviation connector and the housing. In humid, outdoor, or water treatment tank environments, ensure the aviation connector is fully inserted and locked in place; the sealing ring must not be missing. Idle or spare equipment must be stored in a dry, well-ventilated room, sealed in its original packaging to prevent moisture absorption and oxidation.

2. Optimized Maintenance for Interference Resistance
Use shielded twisted-pair cables for the entire signal line; do not run them in the same conduit or cable tray as power cables or variable frequency drive (VFD) cables. Maintain a safe distance between high-voltage and low-voltage lines, and use a perpendicular crossing method for intersecting cables. Strictly adhere to the single-end shield grounding standard to prevent ground loop interference caused by double-end grounding. In environments with strong electromagnetic interference, install a separate grounding busbar to reduce the impact of common-mode interference.

3. Protection Techniques for Extreme Environments
In high-temperature environments, avoid prolonged direct exposure of the transmitter to heat sources; install auxiliary cooling structures if necessary. In low-temperature outdoor environments, ensure proper thermal insulation to prevent frost or ice buildup on the housing, which could affect measurement stability. In highly corrosive environments, regularly inspect the housing and diaphragm for corrosion and upgrade to 316L stainless steel and special seals as needed. For pulsating pressure or water hammer conditions, select custom damped versions to extend sensor service life.

4. Spare Parts and Maintenance Management
Keep a stock of QDW70A-C units of the same model, spare aviation connectors, sealing gaskets, and matching shielded cables on-site to facilitate rapid replacement and maintenance without downtime.

Maintain a unified equipment inventory, recording installation locations, measurement ranges, maintenance dates, and calibration data to ensure standardized, long-term management.

VIII. Troubleshooting & Emergency Response

8.1 List of Common Faults

The transmitter outputs no signal; the downstream PLC or instrument displays no values.

Pressure readings drift, zero point shifts spontaneously, or readings slowly rise or fall when the device is idle.

Pressure signals fluctuate frequently, readings fluctuate erratically, or exhibit irregular, distorted fluctuations.

Actual pressure changes, but the output signal remains fixed or locked at a specific value.

The system frequently triggers pressure over-limit alarms, yet actual operating conditions are normal with no abnormal pressure

Operating conditions are normal, but measured values deviate significantly from those of the on-site standard pressure gauge

Signal abnormalities or intermittent operation after use in humid or rainy environments

8.2 Classification and Analysis of Failure Causes

1. Wiring-related causes

Aviation connectors not securely locked; loose pin connections; reversed power supply polarity; incorrect signal line polarity; shielding wire grounded at both ends; high- and low-voltage lines routed through the same conduit; idle pins arbitrarily short-circuited; oxidized or loose wire cores.

2. Power Supply Issues

Supply voltage is below 12 V DC or above 36 V DC; excessive ripple in the switching power supply, poor contact in the power supply circuit, or excessive voltage drop; the load resistance in a two-wire circuit exceeds the transmitter's permissible range, resulting in the transmitter being unable to drive the load.

3. Signal and Operating Conditions

Actual operating pressure is close to or exceeds the upper limit of the measurement range, causing sensor overload and saturation; water hammer or pulsating pressure in the pipeline causes erratic readings; pressure-conducting holes are blocked by scale, impurities, or oil, preventing normal pressure transmission to the sensor chip.

4. Environmental Interference Causes

Excessive proximity to variable frequency drives, high-power motors, or high-voltage power cables, resulting in strong electromagnetic radiation interference; poor grounding at the site, with ground potential differences creating ground loop interference; dust or moisture entering the aviation connector or the interior of the housing, causing reduced insulation and leakage current interference.

5. Equipment Malfunction Causes

Long-term overpressure leading to deformation and failure of the diffused silicon diaphragm; Moisture-induced corrosion of internal circuits and component aging; prolonged severe vibration causing internal solder joint detachment and circuit malfunctions; aging seals allowing water ingress, resulting in circuit short circuits and damage.

8.3 Step-by-Step Troubleshooting + Solutions

1. Issue 1: No Output, No Display on the Instrument

Troubleshooting Steps

Use a multimeter to measure the supply voltage and confirm it is within the normal range of 12–36 V DC.

Check whether the aviation connector is fully seated and locked; inspect for looseness, pin disengagement, or oxidation/blackening.

Verify that the positive and negative pins for both power and signal are not reversed or misconnected.

Check whether the downstream PLC analog module or digital display instrument channel is damaged, or if parameters are incorrectly set.

Measure the loop load resistance to confirm it does not exceed the transmitter's allowable load range.

Resolution Steps

Reinsert the aviation connector properly and lock it in place; Correct the wiring polarity and rewire according to standard pin definitions; replace with an industrial regulated power supply with low ripple; if the load exceeds the limit, add a signal isolation power distributor or replace with a compatible acquisition channel; verify that the parameters of the downstream instrument channel match the output model.

Emergency Workaround

Directly replace the faulty unit with a spare QDW70A-C unit at the same location, plug it in using the original wiring, quickly resume production, and take the faulty equipment offline for repair.

2. Fault 2: Signal Drift, Spontaneous Zero-Point Shift

Troubleshooting Steps

Fully depressurize and let the system stand; observe whether the zero point drifts on its own.

Check whether the ambient temperature at the site has undergone sudden cooling or heating, exceeding the normal compensation range.

Check whether the shielding wire is grounded at both ends, forming a ground loop.

Check whether the pressure-conducting holes are slightly blocked or have media deposits.

Check whether the system has been operating under slight overpressure for an extended period.

Resolution Measures

Ground the shielding wire at a single point in the control cabinet; leave the shielding on the transmitter side floating. Clean debris and scale from the front pressure-conducting orifices. Avoid prolonged operation near full scale. Perform a minor zero-point correction on the control system side. Implement proper thermal insulation and heat protection in environments with extreme temperature differentials.

Emergency Workaround

Temporarily lock the zero-point compensation at the instrument end and replace or calibrate the transmitter during a scheduled shutdown window.

3. Issue 3: Signal Interference, Distortion, and Frequent Value Fluctuations

Troubleshooting Steps

Check whether signal cables are running parallel to power cables or variable frequency drive (VFD) cables in the same cable tray or conduit.

Verify that the instrument housing is properly grounded and check for excessively high ground resistance.

Check for the presence of welding machines or high-frequency VFD equipment in the vicinity.

Check whether moisture or condensation has accumulated inside the aviation connectors.

Resolution Measures

Replace signal cables with shielded twisted-pair cables; route power and signal cables in separate cable trays or conduits, maintaining a minimum parallel distance of 30 cm, and cross them at a 90-degree angle; re-establish a reliable protective ground; in humid environments, retighten aviation connectors and replace aged sealing gaskets; in high-interference environments, replace the transmitter with an isolated version.

Emergency Workaround

Temporarily install a signal filter module in the signal loop to reduce fluctuation amplitude and ensure temporary process stability.

4. Fault 4: Pressure Changes, but Output Value Remains Stuck

Troubleshooting Steps

Manually depressurize and pressurize to observe whether the value follows the changes.

Check whether the pressure-conducting orifices are completely blocked.

Check whether the internal circuitry has caused the output to clamp or lock due to overvoltage or reverse connection.

Check whether the downstream data acquisition module is frozen or the program is locked.

Resolution

Remove and clean debris blocking the pressure ports; power off and restart the transmitter and downstream control system; verify there are no short circuits or reverse connections before powering on; if no change occurs, determine that the sensor or the circuit itself is damaged.

Emergency Workaround

Directly replace the entire unit with the same model; return the faulty device to the factory for repair.

5. Fault 5: Frequent Pressure Alarms Under Normal Operating Conditions

Troubleshooting Steps

On-site, compare the actual pressure with the transmitter reading using a standard mechanical pressure gauge.
Check whether the range settings and alarm threshold parameters are set improperly.
Investigate whether minor signal fluctuations are causing frequent triggering of the critical thresholds.
Check for interference or fluctuations caused by poor grounding.
Resolution
Recalibrate the instrument's range and upper/lower alarm thresholds; enable the instrument's digital filtering function to smooth out fluctuating values; optimize grounding and wiring to eliminate interference and fluctuations; perform range correction or return the unit to the factory for calibration if deviations exceed tolerance limits.
Emergency Workaround
Temporarily adjust the alarm thresholds to a suitable level to ensure production continuity, and conduct a comprehensive investigation and rectification during downtime.

6. Issue 6: Significant measurement accuracy deviation; comparison error exceeds limits
Troubleshooting Steps
Perform a three-point calibration using a standard pressure calibrator: zero, 50% of full scale, and full scale.
Verify whether the selected range is too large, as low pressures may lack sufficient resolution within a wide range.
Check whether the medium temperature and ambient temperature exceed the compensation range.
Resolution Measures
Perform range linearity correction in the PLC or on the instrument; When operating pressure is consistently in the low range, replace with a model with a smaller, more suitable range; for high- or low-temperature conditions, switch to a custom wide-temperature model.
Emergency Workaround
First, correct the deviation via system software; after shutdown, replace with a model with a suitable range.

8.4, After-Sales Repair Guidelines
1. Criteria for Determining Equipment Failure
The following situations are deemed equipment failures requiring an after-sales repair request:
No output or completely abnormal readings persist even after all wiring, power supply, grounding, and cabling have been thoroughly checked and confirmed correct.
Severe zero-point drift under no-pressure conditions that cannot be corrected via the system.
The device shows no response due to water ingress, moisture, lightning strikes, or overpressure.
Diaphragm overload damage, physical deformation, or housing damage resulting in oil or gas leaks.
Frequent malfunctions persist despite repeated troubleshooting, preventing stable operation.

2. Information Required for Service Requests
Complete product model: QDW70A-C
Purchase date and duration of installation/use
On-site operating conditions: medium type, operating pressure, ambient temperature
Detailed description of the fault, on-site wiring configuration, and output signal type
On-site photos: overall unit appearance, aviation connector wiring, and installation location

3. Repair Process
First, perform basic troubleshooting according to the steps in this manual to rule out wiring, power supply, and human-induced interference factors.
Compile the model number, operating conditions, fault symptoms, and on-site photos, then contact your sales representative or the manufacturer's technical support.
Technical support will provide remote guidance for a secondary troubleshooting session. If the issue remains unresolved, proceed with the return for repair or replacement process.
Properly disconnect power from the faulty device, disassemble it according to specifications, and securely package it for return to the manufacturer for inspection and repair.

4. Warranty Coverage
Under normal operating conditions and when used in accordance with installation specifications, the unit is covered by a 12-month warranty.
The warranty covers non-human-induced damage, including internal circuit failures, natural sensor failure, and factory-specified accuracy drift exceeding limits.
The following situations are not covered by the free warranty:
Unauthorized disassembly or modification of wiring; diaphragm damage caused by overpressure or overload; water immersion or damage from external impact; burnout caused by unauthorized use of non-compliant power sources; corrosion damage resulting from the use of corrosive media with incompatible materials.