Mechanical Pressure Gauge

I. Product Definition

The Qidian QDYLZ100 pointer-type mechanical pressure gauge is an industrial-grade Bourdon tube pressure gauge developed by Anhui Qidian Automation Technology Co., Ltd. It is specifically designed for monitoring the pressure of industrial fluids (gases/liquids) and is classified as a field-mounted, direct-reading pressure measurement instrument.

Its core functions cover the following areas:

1. Real-time pressure measurement and visual display: Directly reads the pressure value (in MPa) of the medium inside pipes and equipment without requiring an external power supply, enabling intuitive monitoring of pressure conditions.

2. Industrial Equipment Safety Alerts: Provides real-time feedback on pressure anomalies (overpressure/underpressure), offering operators a basis for adjusting process parameters and troubleshooting equipment failures, thereby preventing safety incidents such as leaks or pipe bursts caused by uncontrolled pressure.

3. Process Quality Control: Stably monitors pressure parameters during production processes, ensuring process stability in hydraulic, pneumatic, water treatment, and chemical systems, and improving product consistency.

4. Adaptability to Multiple Environments: Featuring a stainless steel case and shock-resistant design (on select models), it withstands industrial conditions such as mechanical vibration, humidity, and mildly corrosive media, meeting the long-term operational demands of general industrial applications.

5. Equipment Operation and Maintenance Support: Analyze equipment operating conditions (e.g., pump wear, pipe blockages) based on pressure data changes, providing data support for preventive maintenance and reducing the risk of equipment downtime.

II. Working Principle

The core of the QDYLZ100 pressure gauge's operation is the physical process of "elastic deformation → mechanical transmission → pointer display." Measurement is achieved entirely through mechanical structure, requiring no electrical power:

1. Pressure Reception Stage: The measured medium (gas/liquid) enters the Bourdon tube inside the pressure gauge through the bottom threaded port. The Bourdon tube is a C-shaped hollow metal tube sealed at one end, made of corrosion-resistant stainless steel or copper alloy. Like an inflated balloon, it undergoes slight deformation under the pressure of the medium (the open end remains fixed while the sealed end expands outward).

2. Deformation amplification and transmission stage: The minute displacement at the closed end of the Bourdon tube is amplified by the linkage-gear transmission mechanism inside the gauge. This mechanism functions like a "mechanical lever + gear set," amplifying the millimeter-level deformation of the Bourdon tube into a sufficiently clear angle of pointer rotation.

3. Pressure Display Stage: The amplified displacement drives the central gear to rotate, causing the pointer fixed to the gear to move along the dial, ultimately displaying the current medium pressure value at the corresponding scale. The scale on the dial (e.g., 0–1.6 MPa) represents the standard values calibrated at the factory, and the pointer position directly corresponds to the deformation of the Bourdon tube, establishing a one-to-one correspondence between pressure and displacement.

4. Reset Process: When the medium pressure decreases, the Bourdon tube returns to its original shape due to its elasticity. Through the transmission mechanism, it drives the pointer back to its original position, completing a full pressure measurement cycle.

Simply put, it functions like a "spring scale that reads pressure"—the medium pressure causes the Bourdon tube to deform, and the mechanical structure converts this deformation into a pointer reading, all without the involvement of any electronic components.

III. Core Value and Solutions to Pain Points

1. Pain Point: No power supply or unstable power supply at industrial sites, rendering electronic pressure gauges inoperable

Q: What should be done if there is no stable power supply on-site, making it impossible to install an electronic pressure gauge and leaving pressure monitoring completely unfeasible?

A: The QDYLZ100 features a purely mechanical Bourdon tube-driven design that requires no external power source or batteries throughout its operation; it is powered entirely by the pressure of the medium. Even in remote locations without electricity or in older workshops with frequent power outages, it delivers stable readings 24 hours a day. This completely eliminates power supply constraints, saving you the extra cost of power system upgrades and ensuring that pressure monitoring is no longer hindered by power issues.

2. Pain Point: In high-vibration environments, standard pressure gauges suffer from severe needle oscillation, inaccurate readings, and are prone to damage

Q: Our equipment vibrates heavily during operation. The pressure gauge needle keeps shaking, making it hard to read, and it breaks down quickly. Is there a solution?

A: The QDYLZ100 is specifically optimized for industrial vibration conditions. It features a one-piece stainless steel case and an anti-vibration movement structure, with an optional oil-filled shock-resistant configuration. It easily withstands high-frequency vibrations and water hammer impacts in industrial settings. The pointer remains stable and does not drift even in high-vibration environments, ensuring clear and consistent readings. This not only prevents process accidents caused by misreading but also significantly extends the instrument's service life, eliminating the need for frequent pressure gauge replacements.

3. Pain Point: Slightly corrosive media cause pressure gauges to rust and leak, resulting in high replacement costs and significant safety risks

Q: The media in the pipeline is slightly corrosive. Standard pressure gauges rust and leak after a short time, and replacing them is both troublesome and expensive. How can this be resolved?

A: The QDYLZ100 features key components in contact with the medium (bourdon tube, threaded fittings) made of corrosion-resistant stainless steel, making it suitable for water, compressed air, hydraulic oil, and mildly corrosive industrial media. Combined with an IP64-rated sealed structure, it effectively prevents rust and leaks. There is no need for frequent instrument replacement, significantly reducing long-term operational and maintenance costs while eliminating safety hazards caused by medium leaks—ensuring both peace of mind and safety.

4. Pain Point: Pressure abnormalities cannot be visually identified, making it difficult to detect overpressure conditions in a timely manner, which can easily lead to safety incidents

Q: Operators cannot tell at a glance if the pressure is out of range, and by the time the problem is discovered, the equipment has already failed. What should be done?

A: The QDYLZ100 features a large 100mm high-definition dial with clear, easy-to-read markings and supports customizable red warning lines, making the pressure status immediately apparent. Values can be quickly read even from a distance or under bright light, allowing for instant identification of overpressure or underpressure conditions. This helps you detect abnormal operating conditions early, adjust process parameters promptly, and prevent safety incidents such as equipment damage or pipe bursts caused by uncontrolled pressure, thereby strengthening the safety defenses of industrial production.

5. Pain Point: Data distortion in electronic pressure gauges under strong electromagnetic interference, rendering them unusable

Q: There are many motors and variable frequency drives in the workshop, causing severe electromagnetic interference. The electronic pressure gauge readings fluctuate erratically and are inaccurate—what should I do?

A: The QDYLZ100 contains no electronic components and has no signal transmission stages; it relies entirely on mechanical structures for measurement and display, making it completely immune to electromagnetic interference. Even in strong electromagnetic environments such as metallurgical, chemical, and electrical workshops,

it provides stable and reliable pressure readings with accurate, drift-free data, eliminating concerns about data distortion caused by electromagnetic interference.

6. Pain Point: Inability to visually assess pressure status during equipment maintenance; safety risks associated with pressurized operations
Q: Before depressurizing or performing maintenance on equipment, it's impossible to confirm whether the pressure has returned to zero. Disassembly and assembly under pressure can easily lead to accidents. How can this be avoided?
A: The QDYLZ100 can be directly installed on equipment or pipelines to display the current pressure status in real time. Before maintenance, the dial allows for a visual confirmation that the pressure has been fully released to zero, completely eliminating the safety risks associated with pressurized disassembly and assembly. This makes equipment maintenance safer and more standardized, eliminating safety hazards at the source.

7. Pain Point: Diverse range requirements across different operating conditions; a single gauge cannot accommodate all needs, making selection difficult
Q: Different pipelines and equipment have varying pressure ranges. It's difficult to find a suitable pressure gauge, and having to switch between different models is too cumbersome.
A: The QDYLZ100 offers customizable range options covering common industrial pressure ranges from 0–0.1 MPa to 0–60 MPa. Whether for water, oil, or gas pressure applications, you can find a suitable model. There is no longer a need to switch between different types of gauges for varying operating conditions, simplifying the selection process and reducing inventory management costs. A single solution covers the vast majority of industrial pressure monitoring needs.

IV. Key Parameters & Specifications

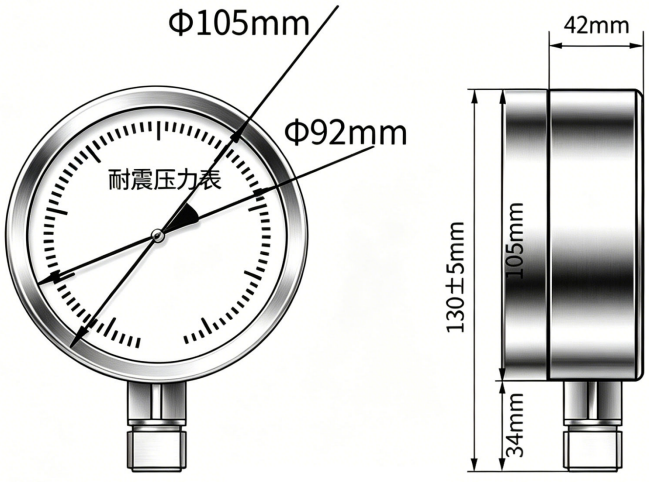
4.1 Basic Measurement Parameters
Nominal Diameter: Φ100 mm / Φ60 mm (Large dial design, suitable for long-distance reading requirements in industrial settings)
Measurement Accuracy Class: Class 1.6 (Error ≤ ±1.6% F.S., compliant with the GB/T 1226-2017 Industrial Pressure Gauge Standard)
Standard Measurement Ranges:
Standard Ranges: 0–0.1 MPa, 0–0.16 MPa, 0–0.25 MPa, 0–0.4 MPa, 0–0.6 MPa, 0–1.0 MPa, 0–1.6 MPa, 0–2.5 MPa, 0–4.0 MPa, 0–6.0 MPa, 0–10 MPa, 0–16 MPa, 0–25 MPa, 0–40 MPa, 0–60 MPa
Vacuum / Combined Ranges: -0.1 to 0 MPa, -0.1 to 0.15 MPa, -0.1 to 0.3 MPa, -0.1 to 0.5 MPa, -0.1 to 0.9 MPa, -0.1 to 1.5 MPa, -0.1 to 2.4 MPa
Permissible Overload Pressure: 1.25 times full-scale pressure (short-term); long-term operating pressure shall not exceed 2/3 of full scale
Media Compatibility: Suitable for non-corrosive, non-crystallizing, and non-solidifying gas/liquid media (e.g., compressed air, hydraulic oil, clean water); models with stainless steel wetted parts are available for weakly corrosive media
Temperature-induced error: ≤±0.4%/10°C (when operating temperature deviates from 20±5°C)

4.2. Electrical & Isolation Specifications
This product is a purely mechanically driven instrument with no electronic components, power supply circuits, or signal transmission modules. Therefore:
No basic electrical parameters: No voltage, current, resistance, or other electrical parameters; operation is entirely driven by medium pressure, requiring no external power supply or battery
No isolation performance parameters: There are no electrical isolation modules, nor is there a need for safety barriers, isolators, or other auxiliary equipment. It is naturally immune to electromagnetic interference and ground loop effects, making it suitable for industrial environments with strong electromagnetic fields
No power supply & power consumption parameters: No power supply is required; it operates with zero power consumption and has no power distribution output requirements, completely eliminating power supply constraints

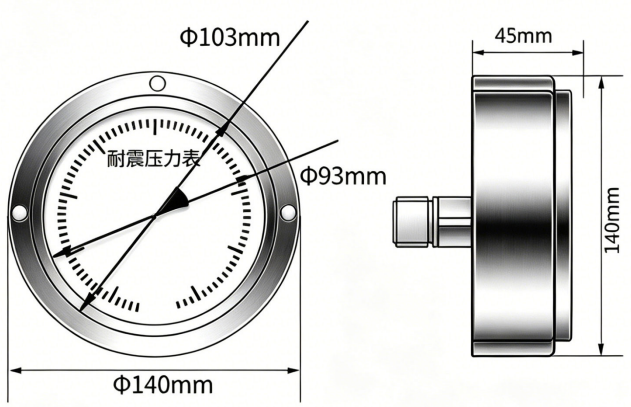
4.3 Environmental Adaptation Parameters
Operating temperature range: -40°C to +70°C (Standard Type); -25°C to +55°C (Oil-filled Shock-resistant Type; avoid low temperatures to prevent silicone oil solidification)
Working medium temperature range: -40°C to +100°C (Standard Type); custom models with heat dissipation tubes are available for high-temperature applications
Storage temperature range: -50°C to +80°C
Operating Humidity: ≤85% RH (non-condensing, non-corrosive gas environment)
Protection Rating: IP64 (sealed housing design, dustproof and splash-proof, capable of withstanding mildly humid industrial environments)
Explosion-Proof Rating: This product features a purely mechanical structure with no electrical spark sources and no explosion-proof certification restrictions; it can be directly applied in non-high-risk explosion zones. In high-risk explosion zones, it must be used in conjunction with explosion-proof isolation devices
Vibration Resistance: Standard models support V.H.3 vibration rating; oil-filled shock-resistant models support V.H.4 vibration rating, capable of withstanding pipeline water hammer and high-frequency vibrations from equipment operation

4.4, Physical Parameters & Structural Specifications
Mounting Method: Radial direct mounting (bottom threaded connection, standard installation); optional axial flanged or axial flangeless mounting (custom)
Connection Thread Specifications:
Standard Thread: M20×1.5 (universal industrial pressure gauge thread)
Optional Threads: G1/2“, G1/4”, NPT 1/2“, NPT 1/4” (for different pipe connections)
Dimensions (Standard Radial Type):
Dial Diameter: Φ100mm / Φ60mm
Case Thickness: 45mm (excluding fitting)
Fitting Length: 20mm (standard threaded section length)
Total Height (including fitting): Approx. 75mm
Fitting Diameter: Φ20mm (M20×1.5 thread outer diameter)
Weight: Approx. 0.35 kg (standard brass fitting type); Approx. 0.45 kg (all-stainless steel type)
Housing Material and Protection Details:
Case Material: One-piece 304 stainless steel, brushed finish, rust-resistant, wear-resistant, and resistant to minor impacts in industrial environments
Dial Glass Material: High-strength tempered glass, impact-resistant and scratch-resistant, ensuring long-term clarity of markings; optional acrylic / PC material (Customizable)
Movement Material: Copper alloy / stainless steel (selectable by model); precision-machined gear train ensures smooth operation without jamming or slippage
Wetted Parts Material:
Standard Type: Copper alloy Bourdon tube + copper fittings, suitable for non-corrosive media
All-Stainless Steel Model: 304/316 stainless steel Bourdon tube + stainless steel fittings, suitable for mildly corrosive media
Sealing Structure: The case and dial are sealed with rubber gaskets to prevent dust and moisture from entering the movement; fittings and Bourdon tubes are joined via silver brazing or TIG welding, eliminating the risk of leaks
Overpressure Protection: Some models feature a built-in pressure-limiting mechanism to prevent overpressure shocks from damaging the movement

SS304 Pressure Gauge



Radial Type



Axial Type

V. Application-Specific Selection Guide

5.1 Key Selection Criteria

Signal Type

The QDYLZ100 is a purely mechanical pointer-type pressure gauge with no electronic signal output capability. It provides only direct on-site scale display and does not require a signal acquisition module. When selecting this model, there is no need to consider analog or digital signal types; simply verify that the range, accuracy, and mounting method meet on-site requirements.

Number of Channels

This product is a single-channel pressure measurement instrument; a single unit supports monitoring of only one medium pressure point. If simultaneous monitoring of multiple pressure points is required, configure the corresponding number of pressure gauges based on the number of measurement points; there are no multi-channel integrated models available.

Power Supply

Featuring a purely mechanical design, this product requires no external power source or batteries and operates with zero power consumption. When selecting a model, there is no need to consider issues such as supply voltage or power stability; it is suitable for all industrial sites without power, with frequent power outages, or where power supply retrofitting is not feasible.

Explosion-Proof Requirements

This product features a purely mechanical structure with no electrical components, eliminating electrical sparks and heat sources. It does not inherently contain ignition sources and is not subject to explosion-proof certification restrictions. Standard models can be used directly in non-highly explosive hazardous areas. For use in Zone 1 or Zone 2 explosive hazardous areas (e.g., chemical, oil and gas industries), an additional explosion-proof isolation housing or installation within an explosion-proof enclosure is required. When selecting a model, prioritize those with all-stainless-steel wetted parts to avoid the risk of leakage caused by medium corrosion.

Installation Environment

The following three aspects must be carefully confirmed:

Installation Location: For direct installation on radial pipelines, prioritize radial models; for panel or wall mounting, prioritize axial models with flanges;

Environmental Vibration: Select standard models for general vibration conditions; select oil-filled shock-resistant models for high-frequency vibration or water hammer impact conditions;

Medium Corrosivity: Select copper wetted parts models for clean water, air, or hydraulic oil; select all-stainless steel models for weakly corrosive media.

Range and Accuracy

For standard industrial applications, prioritize models with a full-scale range of 1.5 to 2 times the actual working pressure. Ensure the long-term working pressure does not exceed two-thirds of the full-scale range to prevent damage from overpressure. For general applications, Class 1.6 accuracy is the default; for precision applications with extremely high pressure control requirements, Class 1.0 accuracy models can be customized.

5.2. Industry-Specific Selection Recommendations

Chemical Industry Applications

Suitable Applications: Pressure monitoring of mildly corrosive media in chemical pipelines, local pressure display for reactors, and safety pressure alerts for storage tanks. We recommend the QDYLZ100 radial/axial flanged shock-resistant pressure gauge with all-stainless-steel wetted parts. Select models with a range from 0–1.6 MPa to 0–16 MPa based on the working pressure of the medium. Featuring an IP64 protection rating, it withstands on-site dust, moisture, and mildly corrosive gases, providing stable monitoring without the need for power supply and avoiding signal distortion issues common with electronic instruments in complex chemical environments.

Power Industry Applications

Suitable for: Pressure monitoring of power plant boiler feedwater and steam pipelines, local pressure display in circulating water systems, and pressure monitoring in hydraulic oil stations. We recommend the oil-filled, shock-resistant radial-type QDYLZ100 pressure gauge, with a range covering 0–1.0 MPa to 0–25 MPa. It is suitable for high-frequency vibration conditions in boilers and pipelines. The stainless steel case resists on-site oil contamination and humid environments, providing real-time pressure feedback to assist equipment maintenance personnel in quickly troubleshooting issues such as pipeline blockages and pump wear.

Metallurgical Industry Applications

Suitable Applications: Pressure monitoring of rolling mill hydraulic systems, pressure monitoring of blast furnace cooling water pipelines, and pressure display for air compressor station storage tanks. We recommend the all-stainless-steel, shock-resistant QDYLZ100 pressure gauge, prioritizing high-range models from 0–1.6 MPa to 0–40 MPa. These gauges withstand V.H.4-grade vibration and shock, making them suitable for the strong electromagnetic and high-vibration environments of metallurgical workshops. With no electronic components, they are immune to electromagnetic interference, ensuring stable monitoring of hydraulic system pressure and preventing equipment damage caused by overpressure.

Pharmaceutical Industry Applications

Suitable Applications: Pressure monitoring of purified water/injection water pipelines, pressure display for pharmaceutical equipment pneumatic systems, and on-site pressure monitoring of sterilization cabinets. We recommend the QDYLZ100 pressure gauge with food-grade stainless steel wetted parts. Its primary ranges are 0–0.6 MPa to 0–1.6 MPa. It poses no risk of media contamination and is suitable for cleanroom environments. Its purely mechanical design, free of electronic components, prevents electromagnetic interference from affecting other precision equipment. It also supports customization with a red safety warning line, allowing operators to quickly identify pressure anomalies.

Smart Manufacturing / Automated Production Line Scenarios

Suitable Applications: Pressure monitoring for automated equipment pneumatic systems, pressure display for hydraulic fixtures, and pressure monitoring for assembly line water supply systems. We recommend the QDYLZ100 axial flanged pressure gauge, designed for panel-mounted installation. Select models with ranges from 0–0.4 MPa to 0–10 MPa based on the operating pressure of the pneumatic or hydraulic system. An optional oil-filled, shock-resistant configuration is available to withstand equipment vibrations. The gauge displays real-time pressure status, enabling production line operators to quickly adjust process parameters and ensure production stability.

Water Treatment Industry Applications

Suitable Applications: Pressure monitoring of water supply pipelines in water treatment plants, pressure monitoring of aeration tanks in wastewater treatment plants, and on-site pressure display for reverse osmosis equipment. We recommend the standard copper-welded or stainless steel-welded radial-type QDYLZ100 pressure gauge, primarily with ranges from 0–0.6 MPa to 0–2.5 MPa. Its IP64 protection rating withstands humid on-site environments, and its purely mechanical structure requires no power supply, making it suitable for remote, off-grid monitoring points in water treatment plants. It reliably monitors pipeline pressure and assists in troubleshooting issues such as pipeline leaks and pump failures.

5.3 Common Selection Misconceptions

Misconception: Confusing Electrical Isolation Levels with Mechanical Pressure Gauge Selection

Some users mistakenly apply the selection logic for electrical isolators to mechanical pressure gauges, worrying that electromagnetic interference will affect measurement accuracy. In fact, the QDYLZ100 features a purely mechanical design with no electronic circuits or signal transmission components. It is inherently immune to electromagnetic interference, requires no additional isolation modules, and has no specific isolation rating requirements. Therefore, there is no need to incur extra costs for "interference resistance."

Misconception: Selecting the Wrong Pressure Range, Leading to Long-Term Operation in Overpressure or Underpressure Zones

A common issue is directly selecting a model with a range equal to the working pressure, or allowing the pressure gauge to operate at 90% or more of full scale for extended periods, resulting in long-term fatigue deformation of the Bourdon tube and a shortened service life; Some users, seeking "safety," choose a range far exceeding the actual pressure, resulting in low scale resolution and an inability to accurately read pressure changes. Correct selection should follow the principle that "operating pressure should be between 1/3 and 2/3 of full scale" to ensure measurement accuracy and instrument longevity.

Misconception: Neglecting load matching and using pressure gauges in ultra-high-pressure or high-impact conditions

Some users overlook the pressure gauge's overload capacity, using standard QDYLZ100 models in high-pressure pipelines prone to frequent water hammer impacts, or operating them at pressures exceeding 1.25 times the short-term overload limit. This results in bourdon tube rupture and movement damage. When selecting a model, verify whether the operating conditions involve water hammer or pulsating pressure, and prioritize shock-resistant models or those equipped with shock absorbers to prevent direct impact damage to the instrument.

Misconception: Directly using standard general-purpose models in explosion-hazardous areas poses safety risks

Some users believe that mechanical pressure gauges are fully suitable for explosion-hazardous areas simply because they lack electrical components, and directly use standard copper wetted models in highly corrosive explosion-hazardous environments such as chemical and oil & gas facilities. In reality, standard copper wetted parts are prone to rust and leakage in corrosive media, posing a risk of media leakage. Furthermore, explosion-proof zones require additional explosion-proof installation measures; only by selecting fully stainless steel shock-resistant models and ensuring proper explosion-proof isolation can safety requirements be met.

Misconception: Incorrect installation method selection leads to on-site installation failure or inconvenient reading

Some users fail to confirm the on-site installation location, mistakenly selecting radial models for panel mounting or axial models for direct pipe mounting, resulting in the instrument being unable to be secured or the reading direction being incorrect. When selecting a model, the installation method must be confirmed in advance: choose a radial model for direct pipe mounting, and an axial model with flanges for panel or wall-mounted installation. Additionally, ensure that the thread specifications match the on-site connections.

5.4 Customization Recommendations

Customization of Special Signals and Scales

If pressure transmission functionality is required in addition to mechanical display, an integrated pressure gauge with a transmitter can be customized. Based on the QDYLZ100 mechanical display, a 4-20mA/RS485 signal output module can be integrated to achieve dual functionality: on-site display and remote signal transmission. Non-standard scales, multi-unit (MPa/bar/psi) dials, or red safety warning lines can also be customized to meet specific reading requirements for special operating conditions.

Customization for Non-Standard Operating Conditions

Ultra-high pressure / ultra-low pressure conditions: Customizable ultra-high pressure ranges exceeding 0–60 MPa, or vacuum/combined range models exceeding –0.1 to 0 MPa;

Highly Corrosive Media Applications: Customizable with 316L stainless steel wetted parts or special models with PTFE lining for corrosion resistance, suitable for highly corrosive media such as strong acids and alkalis;

High and Low Temperature Applications: For high-temperature media, models with heat dissipation tubes are available; for low-temperature environments, models filled with low-temperature-resistant silicone oil are available, suitable for extreme conditions ranging from -40°C to +200°C.

Customization for Multi-Channel and Integrated Solutions

For centralized monitoring of multiple pressure points, a multi-gauge panel solution can be customized, integrating multiple QDYLZ100 pressure gauges onto a single panel to meet the requirements for centralized local display in control rooms. Alternatively, an integrated unit with a pressure gauge switch can be customized to provide both local pressure display and automatic overpressure control, simplifying on-site installation.

Installation and Structural Customization

Non-standard thread specifications (e.g., G3/4", NPT 3/8", etc.), extended connectors, and swivel joints can be customized to accommodate special pipe connections. Models with flange mounting or hose connections, as well as special installation structures such as axial flangeless or radial flanged designs, can also be customized to meet the installation space and method requirements of various on-site environments.

VI. Installation and Commissioning Guidelines

6.1. Pre-installation Preparation

1. Verification of Components

After unpacking, first verify that the instrument body, certificate of conformity, and instruction manual are complete; confirm that the pressure gauge's range, accuracy class, and thread specifications match the order; inspect the case, glass, and connections for dents, deformation, or cracks, and ensure the pointer is not bent or loose; verify that the included accessories (such as O-rings, buffer tubes, and elbow fittings) are intact.

2. Environmental Inspection

Ensure the installation location is free from severe vibration, strong corrosive gases, and direct water spray; the ambient temperature must be within the range of -40°C to +70°C (standard type) or -25°C to +55°C (shock-resistant type); verify that the temperature and corrosiveness of the measured medium are compatible with the pressure gauge's wetted materials; for highly corrosive media, replace with an all-stainless-steel model in advance.

3. Tool List

Prepare an adjustable wrench (matching the thread size, e.g., a 24 mm wrench for M20×1.5), PTFE tape or thread sealant, a spirit level (optional, for installation alignment), a pressure gauge calibrator (as needed, for pre-installation accuracy verification), and protective gloves (to prevent media splashes).

4. Safety Precautions

Before installation, the valve of the pipeline or equipment being tested must be closed, and the system must be completely depressurized. Confirm that the pressure inside the pipeline is 0 before proceeding. Under no circumstances should a pressure gauge be installed while the system is under pressure to avoid injury from media splashes. If the medium is corrosive or high-temperature, wear protective gloves and safety goggles to ensure proper personal protection.

6.2 Standard Installation Steps

1.Pipe Connection Preparation

Clean the threaded connections of the pipe or equipment to be measured, removing burrs, rust, and impurities to prevent debris from entering the pressure gauge and causing blockages. Wrap PTFE tape evenly around the pressure gauge's external threads (wind clockwise with moderate thickness to prevent excess tape from entering the pipe), or apply a small amount of thread sealant to prevent medium leakage.

2. Pressure Gauge Mounting

Align the pressure gauge fitting with the pipe connection and gently

screw it in by hand. After confirming that the threads are aligned and not skewed, use a wrench to slowly tighten it. Never tighten the gauge by directly turning the case (as this may cause case deformation or damage to the movement). For radial models, keep the dial perpendicular to the ground. For axial models, adjust the dial angle to ensure the operator's line of sight is directly facing the dial.

3. Installation of Buffer Devices (Optional)
If the measured medium is subject to water hammer or pulsating pressure, install a buffer elbow or dampener between the pressure gauge and the pipeline to prevent pressure surges from directly impacting the bourdon tube, thereby extending the instrument's service life. For high-temperature media (>100°C), install a heat-dissipating elbow to reduce the temperature of the medium entering the pressure gauge and prevent high temperatures from damaging the movement.

4. Leak Test
Slowly open the pipeline valve to allow the medium to enter the pressure gauge gradually, and observe whether there is any leakage at the connection points; if leakage is detected, immediately close the valve to relieve pressure, re-wrap with PTFE tape, and tighten the connection. Under no circumstances should disassembly or forced tightening be performed under pressure.

5.3 Installation Details
The QDYLZ100 is a purely mechanical pressure gauge with no electrical components such as power terminals, signal terminals, or ground terminals. It requires no wiring operations and has no wiring specifications for power distribution or isolation types. During installation, only mechanical threaded connections need to be completed; there is no need to handle shielding wires, grounding, or other electrical aspects, and there are no issues regarding correct or incorrect wiring.

6.4 Commissioning and Calibration Procedures
1. No-Load Verification
After installation is complete and before pressurizing the pipeline, observe whether the pressure gauge pointer points to the "0" mark. If the pointer deviates from zero, gently adjust it using the zero-adjustment screw on the back of the case (some models do not have this feature; refer to the product for details) to return the pointer to zero.

2. Slow Pressure Increase Test
Slowly open the pipeline valve to gradually increase the medium pressure. Observe whether the pointer moves smoothly without any sticking or jumping. Increase the pressure to the 1/3 and 2/3 ranges of the normal operating pressure, pause to observe the pointer's stability, and confirm there is no drift or wobble.

3. Accuracy Calibration (As Needed)
If accuracy calibration is required, remove the pressure gauge and connect it to a pressure gauge calibrator. Test at standard pressure points (e.g., 25%, 50%, 75%, and 100% of full scale). The error must be ≤±1.6% F.S. If the error exceeds this range, the gauge must be returned to the factory for calibration; the movement's accuracy cannot be adjusted on-site.

4. Long-Term Operating Conditions Verification
After the instrument is put into operation, observe it for 10–30 minutes to confirm that there are no leaks at the connections and that the pointer does not exhibit abnormal oscillation. For oil-filled shock-resistant models, observe whether the silicone oil level is normal, with no leaks or bubbles, to ensure proper shock resistance.

6.5 Installation Contraindications and Precautions
1. Strictly Prohibit Overpressure Installation and Use
Never use the pressure gauge with media pressures exceeding its rated range. Short-term overload pressure must not exceed 1.25 times the full scale, and long-term operating pressure must not exceed two-thirds of the full scale. Overpressure use will cause permanent deformation of the Bourdon tube and damage to the movement, rendering the gauge irreparable.

2. Avoid Severe Impacts and Vigorous Vibrations
Standard pressure gauges must not be installed on equipment subject to severe vibration, as strong vibrations can cause gear wear in the movement and the detachment of the pointer. In operating conditions where water hammer impacts occur, a shock absorber must be installed; direct installation on pipelines subject to frequent impacts is prohibited.

3. Protection in Humid/Corrosive Environments
When installing in humid environments, ensure the case is properly sealed to prevent moisture from entering the movement and causing corrosion. For corrosive media, models with all-stainless-steel wetted parts must be selected. It is strictly prohibited to use standard copper-jointed models in contact with corrosive media to prevent joint corrosion and leakage.

4. Strictly Prohibit Unauthorized Disassembly and Modification
Non-professionals are strictly prohibited from disassembling the pressure gauge case or adjusting the movement structure, as this will result in loss of accuracy and damage to seals. Do not drill holes or modify the case yourself, as this will compromise the IP64 protection rating and shorten the service life.

5. Avoid Installation in High-Temperature / High-Radiation Areas
Do not install the pressure gauge directly on the surface of high-temperature equipment or in locations exposed to direct sunlight. High temperatures can degrade the performance of the movement's elastic elements, affecting measurement accuracy; if the ambient temperature is too high, install thermal insulation.

VII. Recommendations for Daily Use & Operation and Maintenance
7.1 Key Points for Daily Inspections
1. Inspection of Dial Pointer Status
Conduct a daily on-site visual inspection to verify that the pressure gauge pointer returns to zero normally and operates smoothly, without sticking, jumping, jamming, or wobbling. Under normal operating conditions, the pointer should rise and fall smoothly with the pressure, without sudden jumps or remaining stationary at a fixed scale.
Checking Pressure Stability
Compare the dial reading against the equipment's standard operating pressure range to ensure it remains consistently within a reasonable range (ideally between 1/3 and 2/3 of full scale). If readings fluctuate erratically or drift without cause, promptly investigate potential issues such as water hammer in the piping, abnormal valve throttling, or internal blockages.

2. Visual Inspection and Seal Check
Inspect the case and tempered glass surface for damage, cracks, fogging, or water ingress; check threaded connections and sealing areas for signs of medium leakage, water seepage, or condensation; ensure the case sealing gasket shows no signs of aging, cracking, or detachment.
Inspection of Installation and Mounting Condition
Inspect whether the pressure gauge mounting threads are loose and whether the gauge body is tilted or wobbling; check if pipeline vibrations are transmitted to the instrument body. If looseness is detected, shut down the system immediately, relieve pressure, and retighten the fasteners.

3. On-Site Monitoring of Ambient Temperature and Humidity
Maintain long-term records of ambient temperature and humidity at the installation site. Ensure the operating environment remains within the product's specified temperature range, with relative humidity not exceeding 85% RH and no condensation. Avoid locations subject to prolonged exposure to high temperatures, direct sunlight, freezing temperatures, or high humidity and fog.

4. Media and Operating Conditions Inspection
Observe the measured medium for crystallization, viscosity, or sedimentation of impurities to prevent contaminants from entering the pressure gauge and causing internal blockages; In high-temperature or corrosive environments, pay special attention to checking for rust and discoloration at connection points.

7.2. Regular Maintenance Plan
1. Cleaning Frequency Guidelines
In standard industrial environments, clean the exterior once a month; in environments with heavy dust, high humidity, or chemical corrosion, clean every two weeks. Use a dry, soft cloth to wipe the dial glass and case surface. Do not rinse directly with water or wipe with corrosive solvents to avoid damaging the case coating and sealing structure.

2. Installation Tightness and Seal Inspection
Conduct a comprehensive tightness inspection quarterly: After shutting down and depressurizing the system, check whether threaded connections are loose and whether PTFE tape seals have deteriorated. For fittings equipped with buffer bends, dampers, or heat dissipation tubes, inspect the tightness of connections and check for leaks; replace any aged seals immediately upon discovery.

3. Inspection for Structural and Cosmetic Deterioration
Inspect the case, glass face, O-rings, and metal surfaces of the joints every six months for rust, peeling, deformation, or fogging and water ingress in the glass. For oil-filled shock-resistant models, check for abnormalities such as silicone oil leakage, a drop in liquid level, or air bubbles.

4. Recommendations for Accuracy Retesting and Calibration
For general-purpose applications, send the gauge for accuracy retesting once a year. For applications with high process requirements, critical safety pipelines, or frequent pressure fluctuations, perform accuracy calibration every six months. Use a standard pressure calibrator to perform multi-point scale calibration. If the error exceeds the allowable range for Class 1.6 accuracy, return the gauge to the factory for calibration; do not disassemble or adjust the movement on-site without authorization.

5. Regular Replacement of Worn Components
Wear-prone parts such as sealing gaskets, PTFE tape, and buffer fittings should be replaced annually as a standard practice. Pressure gauges with severe corrosion or deformation that cannot be repaired should be replaced immediately to prevent safety hazards caused by continued operation in a compromised state.

7.3 Long-Term Maintenance Tips
1. Long-Term Dust and Moisture Protection
For long-term storage or locations with high dust levels, install a simple dust cover to prevent dust accumulation in the meter's crevices. In humid, outdoor, or water-spray environments, prioritize models with an IP64 protection rating to maintain the integrity of the case seal, prevent moisture and condensation from penetrating the movement, and avoid rust and jamming of gears and bourdon tubes.

2. Vibration Damping and Operational Interference Mitigation
When installing near pump outlets, compressors, or vibrating equipment, buffer bends and dampers must be installed to reduce water hammer impacts and the transmission of mechanical vibrations. Direct, rigid mounting against high-vibration equipment is strictly prohibited to minimize pointer oscillation and movement wear, thereby extending service life.

3. Protection in Extreme High-Temperature Environments
When the medium temperature is excessively high, a heat-dissipating elbow must be installed to lower the temperature and prevent direct heat transfer to the pressure gauge's elastic elements. Avoid prolonged exposure to direct sunlight; if necessary, install sunshades or heat-insulating baffles to prevent temperature drift from affecting measurement accuracy.

4. Protection in Extreme Low-Temperature Environments
In winter or low-temperature operating conditions, select low-temperature-resistant, oil-filled, shock-resistant models to prevent the internal medium or silicone oil from solidifying and causing the pointer to jam; for outdoor installations in cold environments, implement windbreak and frost protection measures to prevent frost buildup on the meter body and freezing damage to the sealing structure.

5. Special Maintenance for Corrosive Environments
In chemical or mildly corrosive environments, use models with all-stainless-steel wetted parts throughout the system; Regularly clean corrosion deposits from the surface of the connections; promptly replace components upon detecting pitting, rust, or signs of leakage to eliminate the risk of medium leakage and instrument failure.

6. Maintenance During Storage
When the instrument is disassembled and stored for an extended period, wipe the exterior clean and seal the pressure ports to prevent dust and moisture from entering; store it in a dry, well-ventilated indoor environment free from corrosive gases and heavy impacts, and avoid outdoor storage to prevent moisture absorption and rusting.

VIII. Troubleshooting & Emergency Procedures
8.1 List of Common Faults
The pressure gauge needle does not return to zero accurately; after shutting down and relieving pressure, the needle does not remain at the zero mark.
The pressure gauge needle fluctuates severely or shakes continuously, making the reading difficult to read.
The pressure gauge does not respond to rising pressure; the needle remains stationary.
The pressure has changed, but the pointer reacts sluggishly or exhibits severe lag
Fogging, water ingress, or condensation inside the dial glass
Fluid seepage, air leaks, or leakage at threaded connections
Rusting, surface corrosion, or discoloration after short-term use
The pointer locks and fails to return to zero after slight over-range pressure
Distant readings are blurry, and the scale is unclear

8.2 Analysis of Failure Causes
Installation and Operation-Related Causes
Forced installation under pressure; using a wrench directly on the case causes deformation of the movement; excessive Teflon tape wrapping blocks the pressure port; installation at an angle or torsional stress causes the internal transmission mechanism to jam.
Operating Environment-Related Causes
Installation near equipment with strong vibrations, without buffer bends or damping devices; high humidity, moisture, and dust in the environment, compromising the case seal; excessively high medium temperature or crystalline impurities entering the gauge, causing blockages.
Causes Related to Selection and Matching
Selecting a range that is too small, leading to long-term overpressure operation and causing elastic fatigue in the Bourdon tube; using standard copper pressure gauges in corrosive media environments; failing to select shock-resistant, oil-filled models for vibration-prone conditions.
Causes Related to Product Body Damage
Internal gear mechanism wear, loosening, or misalignment; deformation or micro-cracks in the Bourdon tube; aging and cracking of sealing O-rings; silicone oil leakage or air ingress in oil-filled shock-resistant models.
Pipeline Operating Conditions
Frequent water hammer impacts and large pressure pulses; accumulation of impurities or rust inside the pipeline blocking the pressure tapping port; instantaneous high-pressure surges caused by rapid valve opening or closing.

8.3 Step-by-Step Troubleshooting
Fault 1: Pointer does not return to zero after pressure relief; deviates from zero
Troubleshooting Steps:
Close the upstream valve, fully depressurize the system, and confirm there is no pressure in the pipeline;
Observe the extent of the pointer deviation—whether it is slight or significant;
Check if the internal movement was deformed due to the meter case being jostled during installation.
Repair Measures:
For minor zero-point deviations, fine-tune and reset using the dedicated zero-adjustment knob on the dial; if the deviation is excessive or the movement is deformed, immediately take the meter out of service and replace it.
Temporary Replacement: Install a pressure gauge with the same range and thread specifications as a temporary replacement; this will not affect production line operations.

Fault 2: The pointer shakes violently and vibrates continuously during operation
Troubleshooting Steps:
Check if the installation location is near pumps, air compressors, or vibrating machinery;
Check if a buffer elbow or damper has been installed;

Confirm whether a standard model was used in a high-vibration environment.
Remedial Actions:
Install a pressure gauge buffer tube or damper to mitigate pressure shocks; replace with the oil-filled shock-resistant model QDYLZ100; relocate the gauge away from sources of strong vibration.
Temporary Workaround: Temporarily install a simple throttle valve to reduce pressure fluctuations and maintain on-site readability.

Fault 3: Pressure rises, but the pointer remains completely stationary
Troubleshooting Steps:
Confirm that the actual pressure in the pipeline has increased;
Dismantle the pressure gauge to check if the pressure taps are blocked by PTFE tape, rust, or debris;
Check for a seized internal mechanism or a ruptured, failed bourdon tube.
Remedial Actions:
Clear debris from the connections; re-wrap with PTFE tape and reinstall after clearing the connections; if the mechanism is seized or the bourdon tube is damaged, replace the gauge immediately.
Emergency Workaround: Immediately replace with a spare gauge of the same model; disassemble the unit for return inspection and repair.

Fault 4: Pressure changes are normal, but the pointer responds sluggishly or with lag
Troubleshooting Steps:
Check whether the internal drive gears are stiff or jammed;
Check whether the pressure tap is partially blocked, preventing smooth flow of gas or liquid;
Check whether prolonged overpressure operation has caused a decrease in the sensitivity of the elastic element.
Remedial Measures:
Clear debris blocking the pressure tap; if operating conditions fluctuate frequently, replace with a shock-resistant model; replace the instrument directly if it has aged and lost accuracy.
Temporary Workaround: Temporarily replace with a spare gauge of the same range to ensure uninterrupted process monitoring.

Fault 5: Fogging or condensation inside the dial glass
Troubleshooting Steps:
Check if the case gasket is aged or cracked;
High ambient humidity, exposure to spray water, or unprotected outdoor installation;
Deformation of the dial glass under pressure causing seal failure.
Remedial Actions:
Replace the sealing gasket and reapply sealant; Install a dustproof and waterproof protective cover; if severe water ingress has caused rusting of the movement, replace the gauge directly.
Emergency Workaround: Wipe the exterior dry and provide protection; continue monitoring temporarily, and replace the gauge during a scheduled shutdown window.

Fault 6: Leakage from threaded connections, air leaks, or joint leaks
Troubleshooting Steps:
After depressurizing, check for aging or insufficient wrapping of the PTFE tape on the threads;
Check for damaged or stripped threads, or uneven joint surfaces;
Long-term corrosion causing micro-gaps and seepage at the joint.
Repair Measures:
Reapply PTFE tape or switch to thread sealant; replace the pressure gauge if threads are stripped; replace with a stainless steel model if corrosion is severe.
Emergency Workaround: For minor seepage, temporarily tighten with a sealing gasket; replace completely after shutdown.

Fault 7: Rapid Rusting and Corrosion of the Gauge Body and Fittings
Troubleshooting Steps:
Standard copper material used in weakly corrosive water or chemical media;
High levels of acid or alkali mist on-site, or a humid, salt-fog environment;
Damaged surface coating exposing bare metal.
Remedial Actions:
Replace with the all-stainless-steel wetted-part model QDYLZ100; ensure proper ventilation and corrosion-proof isolation on-site; regularly clean corrosion deposits from the exterior.
Emergency Workaround: Temporarily install an isolation valve to isolate the medium; replace with a corrosion-resistant model as soon as possible.

Fault 8: Pointer sticks and fails to return after slight overpressure
Troubleshooting Steps:
Actual operating pressure exceeds 2/3 of the range or approaches full scale;
Instantaneous water hammer impact causing deformation of the bourdon tube;
Internal gear skipping, misalignment, or jamming.
Remedial Measures:
Deformation due to overpressure cannot be repaired on-site; discard and replace immediately; for future selection, choose a model with a one-step higher range to ensure operating pressure remains within the 1/3–2/3 range.
Emergency Workaround: Immediately install a spare gauge with a larger range to prevent further damage from overpressure.

Fault 9: Blurred or illegible readings at a distance
Troubleshooting Steps:
Improper installation angle; backlighting or glare on the dial;
Heavy accumulation of dust or grease on the glass;
Dial size is too small (this model features a 100mm large dial, suitable for long-distance viewing).
Remedial Measures:
Adjust the installation angle to align with the operator's line of sight; regularly clean the dial face with a soft cloth to remove grease and dust; standardize the QDYLZ100 100mm large dial for fixed operating conditions.
Temporary Workaround: Temporarily install a small reflector to aid in reading.

8.4. After-Sales Repair Guidelines
1. Criteria for Determining Faults and Reporting Repairs
If any of the following conditions occur, on-site disassembly and repair is not recommended; instead, directly request after-sales repair or replacement:
Pointer is stuck, cannot be reset to zero, or the movement is visibly damaged;
Ruptured bourdon tube, severe water ingress, or extensive corrosion;
Accuracy out of tolerance, with calibration error exceeding the allowable range for Class 1.6;
Stripped threads, deformed case, or broken glass;
Frequent leakage or malfunction during the normal service life.

2. Repair Process
Document the on-site details: Model QDYLZ100, measurement range, installation conditions, fault symptoms, and duration of use;
Take photos of the product's front, nameplate, and installation site;
Contact the sales representative and submit a description of the fault along with the photos;
Follow the instructions to return the faulty instrument for inspection; once non-human-induced damage is confirmed, proceed with the warranty claim or replacement process.

3. Warranty Coverage
Under normal industrial conditions, excluding accidental impact, forced installation under pressure, or unauthorized disassembly or modification;
Failures such as movement malfunction, seal leakage, or deviations from factory accuracy occurring within the specified temperature, humidity, and pressure ranges are covered under the standard warranty;
Damage caused by accidental impact, unauthorized disassembly, overpressure use, or the misuse of standard models in highly corrosive environments is not covered by the free warranty; however, repair and replacement services at cost are available.

4. Usage Recommendations
Do not disassemble or modify a faulty instrument yourself, as this may cause permanent damage and void the warranty; prioritize using a spare pressure gauge of the same model for emergency replacement on-site to avoid disrupting equipment production and operation.