# 2088 Corrosion-Resistant Level Transmitter

## I. Product Definition

The QDY60C 2088 Corrosion-Resistant Split-Type Submersible Level Transmitter is an industrial-grade pressure-based level measurement device specifically designed for measuring the level of highly corrosive media. It falls under the submersible level transmitter category and represents a specialized level measurement solution developed by Qidian Automation for highly corrosive environments in the chemical, environmental protection, and pharmaceutical industries.

The product features a split-type structure at its core, consisting of three components: the 2088-type explosion-proof/enclosed transmitter head, a corrosion-resistant PTFE cable, and a fully corrosion-resistant submersible probe. The probe collects the medium's static pressure signal, which is transmitted via the cable to the transmitter head and converted into a standard electrical signal. This enables continuous online monitoring of liquid levels in various corrosive liquids and remote signal transmission, making it a core terminal device for liquid level monitoring in industrial automation systems.

Its core functions can be categorized as follows:

1. Basic liquid level measurement: Based on the principle of liquid static pressure, it enables continuous, real-time measurement of highly corrosive media such as hydrochloric acid, sulfuric acid, caustic soda, and sodium hypochlorite. It offers high measurement accuracy and stability, and is suitable for various container scenarios including open-top and semi-open tanks, reactors, and sewage tanks.

2. Signal Conversion and Remote Transmission: Converts the hydrostatic pressure signal collected by the probe into industrial standard electrical signals (such as 4–20 mA current signals or RS485 digital signals). These signals can be directly connected to PLCs, DCS systems, digital displays, and control terminals to enable remote transmission of liquid level data, centralized monitoring, and automatic control.

3. Adaptability to Highly Corrosive Environments: The probe, cables, and all components in contact with the medium are made of polytetrafluoroethylene (PTFE / Teflon), offering excellent resistance to acids, alkalis, and organic solvents. This addresses the challenge that standard submersible level transmitters cannot operate stably over the long term in highly corrosive media.

4. Split-Type Installation Adaptability: The probe and display unit are designed as separate components. The display unit can be installed in a safe area away from corrosive media, high temperatures, or explosion hazards, while the probe is directly immersed in the medium. This design not only protects the display unit from corrosive media but also accommodates special installation scenarios such as high-temperature tanks, explosion-proof workshops, and underground tanks.

5. Protection and Stable Operation: The Model 2088 display unit features an IP65 or higher protection rating and optional explosion-proof certification. The probe's fully sealed structure is waterproof and leak-proof, allowing for long-term operation while submerged in corrosive media. It offers strong anti-interference capabilities and remains unaffected by media foaming or slight agitation.

Customization for Specific Operating Conditions: Supports customization of measurement range (selecting the appropriate range based on tank height), cable length, and signal output to meet the personalized level measurement needs of different industries and containers.

## II. Working Principle

In simple terms, the operating logic of this transmitter can be broken down into four steps: "Acquisition – Transmission – Conversion – Output." It achieves level measurement entirely based on the principle of liquid hydrostatic pressure. The specific process is as follows:

1. Hydrostatic Pressure Signal Acquisition (Probe End)

The submersible probe is directly immersed in the corrosive liquid. According to the hydrostatic pressure formula $P = \rho gh$ (where P is the hydrostatic pressure, ρ is the medium density, g is the gravitational acceleration, and h is the liquid level height), the pressure-sensitive element at the bottom of the probe detects liquid pressure that is directly proportional to the liquid level height. Since the medium density ρ and gravitational acceleration g are fixed values, the magnitude of pressure P directly corresponds to the liquid level height h.

The probe's fully PTFE-coated housing completely isolates the corrosive medium from the internal pressure-sensitive element, preventing the medium from corroding the component while ensuring that pressure is transmitted to the sensitive element without attenuation.

2. Signal Transmission (Cable End)

The faint piezoelectric signal collected by the probe is transmitted to the transmitter head via a corrosion-resistant PTFE cable. The cable integrates signal transmission lines and a vent tube (in some models). The vent tube transmits atmospheric pressure to eliminate the impact of atmospheric pressure changes on measurement accuracy, ensuring that measurement data is not affected by fluctuations in ambient air pressure.

3. Signal Conversion and Processing (Transmitter Head)

The 2088 transmitter head incorporates built-in signal conditioning circuits, amplification circuits, and a microprocessor. It amplifies, filters, temperature-compensates, and linearizes the weak electrical signals transmitted via the cable, converting the pressure signal—which is proportional to the liquid level height—into an industrial-standard 4–20 mA current signal (or RS485 digital signal).

The meter's protective housing shields the internal circuitry from dust, moisture, and corrosive gases. Additionally, select models offer an optional local display feature, allowing real-time liquid level readings to be viewed directly on the meter.

4. Signal Output and Applications

The converted standard signal is output to PLCs, DCS systems, digital displays, or control terminals. Users can read liquid level data in real time via terminal devices, or set upper and lower limit alarms and automatic feed/discharge controls based on the liquid level values, thereby achieving automated liquid level monitoring management.

## III. Core Value and Solutions to Pain Points

3.1 Core Product Value

"Specialized Level Measurement Solution" for Highly Corrosive Environments: This addresses the issues of standard submersible level transmitters being unable to withstand acids and alkalis and being prone to corrosion damage. It enables long-term, stable measurement of various highly corrosive media, significantly reducing equipment replacement frequency and maintenance costs.

"Safe Installation Guarantee" via a Split-Type Design: The display unit and probe are installed separately, preventing the display unit from coming into contact with corrosive media, high temperatures, or explosive environments, thereby extending the display unit's service life. This design also accommodates special installation scenarios such as underground tanks, elevated storage tanks, and explosion-proof workshops.

High-Precision, High-Stability "Continuous Online Monitoring": Unaffected by media foaming, agitation, or temperature fluctuations, it enables real-time, continuous level measurement. This provides reliable level data support for chemical production, environmental water treatment, and other applications, eliminating measurement errors and safety risks associated with manual measurements.

"Automation System Compatibility" with Standardized Signals: Outputs industrial-standard signals that can be directly integrated into various automation control systems, enabling remote monitoring, centralized management, and automatic control of liquid level data, thereby supporting the intelligent upgrading of industrial production.

"Maintenance-Free Operation" with High Protection and Long Service Life: Features a fully sealed, corrosion-resistant probe and an IP65-rated housing that is waterproof, dustproof, and corrosion-resistant. Requires no frequent maintenance, reducing on-site operational labor costs and the risk of equipment downtime.

3.2 Core Pain Points and Solutions

1. Customer Pain Point: In chemical and environmental protection applications, standard level transmitters are quickly corroded and damaged when exposed to acids, alkalis, and corrosive wastewater. Frequent equipment replacement is costly and disrupts production continuity.
Solution: The QDY60C fully corrosion-resistant submersible probe is made of polytetrafluoroethylene (PTFE), which can withstand the vast majority of highly corrosive media, including hydrochloric acid, sulfuric acid, caustic soda, and sodium hypochlorite. It poses no corrosion risk even during long-term immersion, significantly extending equipment service life and reducing replacement costs and downtime losses.

2. Customer Pain Point: Storage tanks are installed in explosion-proof workshops or high-temperature areas. Mounting the display unit directly on the tank top exposes it to corrosive gases and high temperatures, posing explosion-proof safety hazards and making it impossible to install an integrated transmitter.
Solution: A split-type design allows the probe to be submerged in the tank for measurement, while the display unit can be installed in a safe location away from hazardous areas. This not only protects the display unit from corrosive gases and high temperatures but also allows for the use of an explosion-proof 2088 display unit, meeting the safety standards required for explosion-proof workshops.

3. Customer Pain Point: Liquid levels in underground sewage pits and deep storage tanks cannot be measured manually. Integrated transmitters are unsuitable for long-distance installations, resulting in unstable signal transmission and significant measurement errors.
Solution: Supports customization of corrosion-resistant cables in various lengths to accommodate tanks of different depths. The cable features a built-in shielding layer and a vent tube, ensuring stable signal transmission unaffected by distance. The vent tube also eliminates measurement errors caused by atmospheric pressure fluctuations, achieving an accuracy of ±0.5% FS.

4. Customer Pain Points: Corrosive media contain impurities and are prone to foaming. Conventional level transmitters are affected by media fluctuations and bubbles, resulting in unstable measurement data that fails to meet automation control requirements.
Solution: The probe base features an anti-clogging design that filters out impurities in the media. Additionally, the pressure-sensitive element uses a high-precision core with anti-interference and anti-fluctuation capabilities. It remains unaffected by media foaming or slight agitation, delivering stable and reliable output signals that meet the control requirements of automation systems.

5. Customer Pain Point: The on-site installation environment is complex, with high levels of dust, moisture, and corrosive gases. Standard transmitter housings have low protection ratings, making them susceptible to moisture ingress, short circuits, and damage, which complicates maintenance.
Solution: The 2088 industrial-grade display unit features an IP65 protection rating (with an optional IP67 model available). Its housing is corrosion-resistant, dust-proof, and moisture-proof, making it suitable for harsh field environments. It eliminates the need for frequent maintenance that requires opening the cover, thereby reducing operational and maintenance costs.

6. Customer Pain Point: Liquid level data cannot be monitored remotely, requiring manual on-site meter reading—a process that is inefficient, poses safety risks, and prevents automated control.
Solution: Outputs industrial-standard 4–20 mA or RS485 signals that can be directly integrated into PLCs, DCS systems, or remote monitoring terminals. This enables real-time remote transmission of liquid level data, centralized monitoring, and upper/lower limit alarms. It supports automatic feed/discharge control, achieving automated and intelligent liquid level management.

**IV. Key Product Parameters & Specifications**

4.1 Basic Electrical Parameters

Measurement Principle: Hydrostatic (P=ρgh)
Measured Media: Various corrosive liquids compatible with polytetrafluoroethylene (PTFE) (hydrochloric acid, sulfuric acid, caustic soda, sodium hypochlorite, chemical wastewater, organic solvents, etc.)
Measurement Range: Standard ranges: 0–1 m, 0–2 m, 0–5 m, 0–10 m, 0–20 m, 0–30 m
Custom ranges: 0–0.5 m to 0–100 m (Non-standard customization supported)
Accuracy Class: Standard: ±0.5% FS; Optional: ±0.25% FS, ±0.1% FS
Repeatability Error: ≤±0.1% FS
Hysteresis Error: ≤±0.1% FS
Long-term Stability: ≤±0.1% FS/year
Temperature Drift: Zero-point temperature coefficient: ≤±0.01% FS/°C
Full-scale temperature coefficient: ≤±0.02% FS/°C
Output Signal: Standard: 2-wire 4-20mA DC (load resistance ≤500Ω, when powered by 24V DC)
Optional: 0-5V/0-10V DC, RS485 (Modbus-RTU protocol), HART protocol
Signal Transmission Distance 4-20mA signal: ≤1000m (shielded cable)
RS485 signal: ≤1200m (shielded twisted pair)

4.2, Isolation Performance Parameters

Signal Isolation Method: Built-in electrical isolation module (isolation is standard for 4-20mA models; optional for RS485 models)
Isolation Withstand Voltage: Isolation voltage between input, output, and power supply: ≥1500 V AC (1 min, no breakdown)
Interference Immunity Design: Built-in EMC filter circuit; electromagnetic interference immunity level: GB/T 17626 standard; electrostatic discharge immunity: ±8 kV; electrical fast transient burst immunity: ±2 kV
Surge Protection: Optional built-in surge protection module; common-mode/differential-mode surge protection rating: ≥2 kV; suitable for industrial environments with strong electromagnetic interference
Media Isolation Method: Full PTFE (Polytetrafluoroethylene) probe housing isolation; corrosive media have no direct contact with the internal pressure sensing element; isolation rating fully suitable for highly corrosive operating conditions

4.3, Power Supply & Power Consumption Parameters

Supply Voltage: Standard: 24 V DC (two-wire loop power supply, compatible with PLC/DCS systems)
Optional: 12–36 V DC wide-range power supply (compatible with various industrial field power systems)
Voltage Fluctuation Range: ±10% (operates stably within 21.6–26.4 V DC when supplied with 24 V DC)
Full-Load Power Consumption: ≤0.5W (24V DC supply, 4–20mA output, maximum current 20mA, power consumption ≤0.48W)
Power Distribution Output: No additional power distribution output (two-wire loop-powered, no separate power supply required)
Reverse Polarity Protection: Built-in reverse polarity protection circuit; the device will not be damaged if the power supply polarity is reversed and will resume normal operation after the wiring is corrected
Overvoltage Protection: Built-in overvoltage protection module; withstands up to 40V DC transient overvoltage, preventing damage from power surges at the installation site

4.4 Environmental Specifications

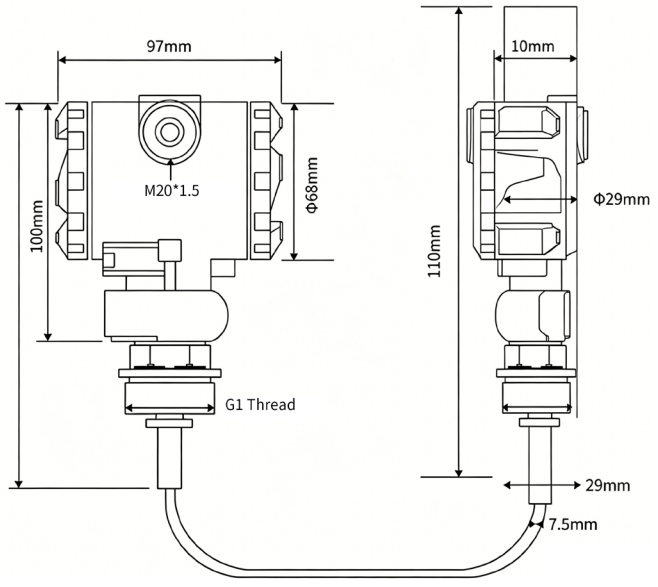
Operating Temperature Range: Medium Temperature: -20°C to +80°C (Standard Type); Optional High-Temperature Type: -20°C to +120°C
Ambient Temperature: -40°C to +85°C (Instrument housing installation environment)
Storage Temperature Range: -40°C to +100°C
Relative Humidity: 0–95% RH (non-condensing)
Protection Rating: Probe: IP68 (suitable for long-term immersion in liquids; waterproof, dustproof, and corrosion-resistant)
Indicator: IP65 (dustproof and protected against water jets; suitable for indoor/outdoor installation); optional IP67 protection rating
Explosion-proof rating: Optional intrinsically safe explosion-proof certification: Ex ia II C T4 Ga (suitable for explosion-proof chemical workshops; must be used with an intrinsically safe barrier)
Compatible barrier models: Recommended: Zener-type / isolated intrinsically safe barriers (e.g., P+F, MTL series intrinsically safe barriers,

compatible with 4–20 mA signal loops)
Media Compatibility: Compatible with most highly corrosive media, including hydrochloric acid, sulfuric acid, nitric acid, caustic soda, sodium hypochlorite, electroplating waste liquid, and chemical wastewater (specific media composition and concentration must be provided to confirm compatibility)

4.5. Physical Parameters
1. Installation Method and Structural Parameters
Overall Structure: Split-type structure, consisting of three parts: the 2088 meter head, corrosion-resistant PTFE cable, and fully corrosion-resistant submersible probe
Installation Method:
Probe: Direct submersion installation (no mounting required; suitable for open/semi-open storage tanks and tanks)
Indicator: Wall-mounted / pipe-mounted installation (compatible with standard 35mm mounting rails or Φ25mm round pipes; optional mounting brackets available)
Process Connection: The indicator's cable outlet features a standard M20×1.5 external thread (compatible with standard cable glands / junction boxes)

2. Dimensions and Weight
2088 Display Unit Dimensions: L × W × H = 120mm × 100mm × 80mm (including blue protective end cap)
Cable entry thread: M20×1.5 Approx. 0.6 kg
Probe Diameter Φ32mm, Length L=150mm (standard model; extended or shortened lengths available upon request) Approx. 0.3 kg (excluding cable)
Cable Material: PTFE (Polytetrafluoroethylene) sheath, with shielding + air tube
Standard lengths: 5 m, 10 m, 15 m, 20 m (custom lengths up to 100 m available) Approx. 0.1 kg/m
Complete Unit Total weight: Approx. 1.0 kg (including 5m cable); increases with cable length -

3. Housing Material and Protection Details
Indicator Housing Die-cast aluminum alloy (powder-coated for corrosion resistance), standard blue/gray protective end caps Dustproof, resistant to corrosive gases, IP65 protection rating, internally potted for moisture resistance
Probe Housing Food-grade / industrial-grade polytetrafluoroethylene (PTFE / Teflon) one-piece molding Fully sealed structure, with anti-clogging filter holes at the bottom (optional), completely isolates corrosive media, IP68 protection
Cable Sheath PTFE sheath, with built-in braided shielding + air tube
Resistant to acid and alkali corrosion, aging, and tearing; air tube designed to prevent clogging; includes a filter plug
Seals Fluorocarbon rubber / perfluoroelastomer O-rings High-temperature resistant, highly corrosion-resistant; no risk of leakage during long-term immersion
Electrical Interface Stainless steel waterproof connector with locking nut IP65 protection at the cable-to-instrument connection point to prevent moisture and dust from entering the instrument




**V. Application-Specific Selection Guide**
5.1 Key Selection Criteria
1. Signal Type Selection
When connecting to standard PLCs, conventional instruments, or simple control systems on-site, prioritize standard 4–20 mA two-wire analog signals. For long-distance transmission, multi-device networking, remote centralized monitoring via a host computer, or integration with IoT platforms, select RS485 Modbus digital signals. For applications requiring smart instruments or bus communication, opt for HART protocol signals as needed to adapt to intelligent automation system architectures.

2. Channel Selection
For independent level monitoring of a single tank, single tank, or single point, the single-channel standard version QDY60C is sufficient. For centralized monitoring scenarios involving multiple storage tanks, reactors, or wastewater tanks in a plant, a single unit can be configured for each measurement point. This facilitates centralized cabling, unified integration into the central control system, and simplifies operation, maintenance, and data aggregation.

3. Power Supply Selection
When the standard industrial control cabinet at the site has a 24V DC power supply circuit, directly select the standard 24V DC two-wire version, which features simple wiring and requires no additional power distribution. For sites with significant voltage fluctuations, temporary operating conditions, or outdoor environments without voltage-stabilized power supplies, select the 12–36V DC wide-voltage version, which adapts to complex on-site power conditions and offers greater resistance to voltage fluctuations.

4. Selection Based on Explosion-Proof Requirements
For standard non-explosion-proof workshops, open-air sewage ponds, conventional water treatment plants, and environments free of flammable or explosive gases, the standard general-purpose model is sufficient. For chemical industrial parks, hazardous chemical storage tank areas, workshops containing flammable or explosive gases, and enclosed reactor areas, the intrinsically safe explosion-proof version must be selected and paired with a matching intrinsically safe isolation barrier to meet explosion-proof regulations and safety production requirements.

5. Selection Based on Installation Environment
In environments with strong acids or alkalis, corrosive mists, or pervasive chemical fumes, the unit must be equipped with a standard PTFE-coated corrosion-resistant probe and cable to prevent equipment damage from media corrosion and environmental gases. For high-temperature media and tank farm conditions, select the high-temperature-resistant version designed for long-term immersion in high-temperature media; For deep wells, underground sewage pits, and remote measurement points, choose the split-type version with extended cables, where the display unit is installed in a safe area on the ground and the probe is submerged in the tank for measurement; For outdoor, open-air environments with heavy rain, snow, or dust, select a 2088 display unit with an IP65 or higher protection rating to withstand wind, rain, and dust-induced aging.

6. Selection Based on Measurement Range and Medium Compatibility
Match the standard measurement range to the effective liquid level height of the storage tank, leaving a reasonable margin to avoid exceeding the range; when in contact with highly corrosive media such as strong acids, strong alkalis, organic solvents, and electroplating waste liquids, strictly select the QDY60C 2088 fully corrosion-resistant split-type model; do not substitute with standard economy-class submersible level transmitters.

5.2. Application Scenario Selection Guidelines
1. For highly corrosive level monitoring applications in the chemical industry—such as various acid and alkali storage tanks, reactors, neutralization tanks, wastewater collection tanks, and electroplating waste liquid tanks—the QDY60C 2088 corrosion-resistant split-type submersible level transmitter is the preferred choice. Its split-type design allows the display unit to be installed in a safe area, The fully corrosion-resistant PTFE construction withstands all types of highly corrosive media. An optional explosion-proof version is available for use in chemical plant explosion-proof workshops. The 4-20mA or RS485 signals can be seamlessly integrated into chemical DCS and PLC automation systems to achieve continuous online level monitoring and automatic

control.

2. In the power industry, for applications such as wastewater treatment plants at chemical plants, corrosion-prone water tanks in circulating water systems, and storage tanks for desulfurization and denitrification waste liquids, this transmitter model is highly suitable. It features a high protection rating and strong resistance to electromagnetic interference, making it capable of withstanding the intense electrical interference environments typical of power plant sites. The split-type installation facilitates wiring and subsequent inspection and maintenance, while the stable output of standard control signals ensures compatibility with power plant automation monitoring systems.

3. In the metallurgical industry, for applications such as pickling tanks, passivation solution storage tanks, and metallurgical wastewater treatment tanks—where high corrosion and high impurity levels are present—the QDY60C fully corrosion-resistant split-type submersible level transmitter is the ideal choice. The probe resists acid and alkali corrosion and prevents clogging by impurities, ensuring stable performance during long-term submersion. The split-type design keeps the display unit away from corrosive fumes and high-temperature environments, extending equipment lifespan and meeting the demands of long-term continuous monitoring in harsh metallurgical conditions.

4. In the pharmaceutical industry, for applications such as chemical waste liquid tanks, acid-base mixing tanks, and process wastewater storage tanks—which require high corrosion resistance and strict cleanliness standards—the PTFE corrosion-resistant version is recommended. This material is environmentally friendly with no leaching, resists corrosion from various pharmaceutical acids, bases, and solvents, and offers high measurement accuracy and stability. The split-type installation does not occupy the limited space of process equipment, signals can be integrated into pharmaceutical automation control systems, meeting the industry's standards for continuous monitoring and safe production.

5. For intelligent centralized monitoring scenarios in the smart manufacturing industry—such as corrosion-resistant waste liquid collection tanks for automated production lines, chemical storage tanks for smart warehousing, and centralized wastewater treatment stations in industrial parks—the QDY60C transmitter with RS485 communication is the preferred choice. It supports multi-point networking, remote data upload, and centralized backend management. Its split-body design aligns with standardized cabling and modular equipment installation in smart manufacturing environments, meeting the needs for intelligent and unmanned liquid level monitoring and control in factories.

5.3 Common Selection Pitfalls

1. Blind Selection Without Considering Isolation Level

Many users focus solely on measurement range and material, neglecting signal electrical isolation performance. In environments with strong electromagnetic interference, numerous variable frequency drives, or power cables routed in the same conduit, failing to select a version with electrical isolation can easily lead to issues such as level signal drift, value fluctuations, and interference-induced false alarms, thereby affecting the normal operation of the automation system.

2. Incorrect Signal Range Selection Leading to Wasted Resources or Measurement Failure

Selecting a full-scale model based solely on the total height of the storage tank without allowing for a safety margin results in reduced measurement accuracy in the low-level range. Alternatively, selecting a range that is too small causes the actual liquid level to exceed the measurement range, preventing normal monitoring and making it impossible to adapt to future process control requirements.

3. Neglecting load matching and arbitrarily pairing instruments

When selecting 4-20mA output models, the total load resistance of the PLC, digital display instruments, and intermediate isolators is not calculated. If the on-site load exceeds the transmitter's drive capacity, faults such as signal attenuation, unstable readings, and inability to output full-scale signals may occur, causing the entire measurement system to malfunction.

4. Incorrectly Selecting General-Purpose Models for Explosion-Proof Environments

In flammable and explosive chemical workshops or hazardous chemical storage tank areas, non-explosion-proof general-purpose models are often chosen to save costs. This fails to meet on-site explosion-proof safety regulations, creating safety hazards. Additionally, such equipment cannot pass safety inspections, necessitating the replacement with explosion-proof models later on, which increases procurement and installation costs.

5. Neglecting the Corrosion Grade of the Medium and Selecting Materials Arbitrarily

In environments involving high-concentration strong acids, strong alkalis, or organic solvents, using standard stainless steel probe transmitters results in corrosion, perforation, and failure within a short period. Frequent equipment replacement increases operational and maintenance costs as well as the risk of production downtime.

5.4 Customization Recommendations

1. Custom Signal Solutions

In addition to standard 4-20mA and RS485 signals, we offer customizable 0-5V and 0-10V analog voltage outputs, as well as HART protocol smart communication signals. These solutions accommodate non-standard signal integration needs for legacy instruments, specialized controllers, and smart bus systems, with support for fine-tuning signal logic and output slopes to match on-site process requirements.

2. Custom Solutions for Non-Standard Operating Conditions

We offer custom non-standard measurement ranges and extended lengths of corrosion-resistant cables to accommodate ultra-deep underground tanks and extra-tall storage tanks. We also provide versions resistant to high-temperature media and specialized material formulations for high-concentration, highly corrosive environments. Additionally, we offer custom mounting brackets, dedicated flanges, and anti-tangling counterweight structures to address non-standard complex conditions such as confined spaces, agitated environments, and fluctuating liquid levels.

3. Multi-Channel Integrated Customization Solutions

To meet the needs of centralized monitoring across multiple measurement points in a plant, we offer customized solutions including multi-point configuration selection, unified signal standards, and standardized installation accessories. These can be integrated with safety isolators, digital display controllers, and alarm controllers to provide a complete system for centralized multi-channel level data acquisition, local display, upper/lower limit alarms, and interlocked control, delivering a one-stop solution for customized plant-wide automated level monitoring.

4. Custom Solutions for Special Environments

We offer customized versions with enhanced protection against heavy rain and corrosive gases for outdoor use; corrosion-resistant coated transmitters designed for high-humidity and salt-fog environments; and wide-temperature versions tailored for high-altitude low-pressure and extremely cold conditions, meeting the operational requirements of regions with unique climates and extreme on-site conditions.

**VI. Installation and Commissioning Specifications**

6.1 Pre-installation Preparation

1. Verification of Components

After unpacking, verify each component of the complete unit, including the Model 2088 transmitter head, PTFE corrosion-resistant split-type insertion probe, corrosion-resistant gas-shielded cable, mounting bracket, waterproof cable gland, sealing gasket, mounting screws, product certificate of conformity, and factory calibration manual; Confirm that the probe shows no dents or deformation, the cable sheath has no tears or cracks, the meter terminal blocks are intact, and the threaded connections have no stripped threads or damage. Installation may proceed only after verifying that all accessories are complete with no missing parts and no visible quality defects.

2. Environmental Inspection

At the installation site, verify that the medium inside the tank, sewage tank, or reactor is a compatible highly corrosive liquid and contains no oversized hard particles that could block the probe; The display unit must be installed away from high-temperature heat sources, equipment subject

to strong vibrations, variable frequency drives, and areas exposed to radiation from high-power power cables; for outdoor installations, avoid low-lying areas prone to water accumulation and locations exposed to direct rain or immersion; in explosion-proof zones, verify that the on-site explosion-proof rating matches the product's explosion-proof model—it is strictly prohibited to use standard models in hazardous explosion-proof areas; Ambient temperature and humidity must remain within the product's rated operating range. In environments with high humidity, salt fog, or corrosive fumes, protective ventilation measures must be implemented in advance.

3. Tool List
Prepare the following tools in advance: Phillips screwdriver, flathead screwdriver, wire strippers, crimp terminals, multimeter, electrical tape, cable ties, spirit level, expansion anchors, grounding wire, and insulated gloves; In explosion-proof environments, use only explosion-proof-rated tools. Open the device while it is energized or in the presence of open flames is strictly prohibited.

4. Safety Precautions
Before installation, the on-site power supply must be disconnected to ensure work is performed under power-off conditions. In environments with corrosive media, wear protective gloves and safety goggles to prevent skin contact and corrosion injuries. For installations in elevated tank areas or deep pits, implement fall protection measures; In explosion-proof zones, strictly adhere to explosion-proof construction standards; unauthorized modifications to wiring or the pulling of unauthorized cables are strictly prohibited; shield grounding must comply with regulations to prevent electrical spark hazards.

6.2 Standard Installation Steps
1. Meter Head Rail Mounting
The 2088 meter head supports both wall-mounted and standard 35mm DIN rail mounting methods; For DIN rail installation, align the rear latches with the 35mm standard rail and press vertically to snap them into place. Ensure the latches are fully secured with no looseness or side-to-side movement. For wall-mounted installation, use the mounting bracket to mark drilling positions, align horizontally, and tighten the screws to ensure the meter is level and upright, with sufficient space for future wiring and maintenance; The meter head must be installed in a dry, well-ventilated area away from corrosive gases, moisture, and dust accumulation. Maintain a reasonable wiring distance from the submersible probe; ensure the cable is naturally straightened without forced pulling or sharp kinks.

2. Submersible Probe Installation
Gently lower the corrosion-resistant split-type probe vertically into the tank or tank interior, keeping the probe pointing straight down. Avoid placing it at an angle or horizontally against the tank wall; Position the bottom of the probe away from inlet and outlet ports, as well as areas of turbulence caused by agitators, to prevent measurement fluctuations caused by water flow impact and disturbance; allow the cable to hang naturally with adequate slack, and secure the cable and ensure a watertight seal at the tank opening to prevent the probe from being pulled or water and dust from entering.

3. Wiring Specifications (Distinguishing Power / Input / Output Terminals)
Strictly distinguish terminal definitions; power terminals and signal output terminals must be arranged in separate zones and must not be mixed or connected incorrectly. For two-wire 4-20mA models, there is no distinction between input and output; the circuit is wired uniformly to accommodate PLCs and digital display instruments in series circuits. For RS485 communication models, distinguish between A and B communication terminals; reverse polarity connection is strictly prohibited. All wires must be stripped to an appropriate length with no exposed or loose copper strands. Crimped terminals must be firmly inserted into the terminal blocks and tightened to prevent loose connections, poor contact, or incomplete crimping.

4. Grounding Requirements
The equipment housing must be reliably connected to the site protective ground, with a grounding resistance not exceeding 4 Ω; the cable shielding must be grounded at a single point, uniformly grounded on the meter side, while the shielding at the probe end must remain floating and ungrounded to avoid creating multi-point ground loops that introduce interference; in explosion-proof environments, an intrinsically safe grounding connection must be separately installed, with wiring routed separately from the power grounding to eliminate common-mode interference.

6.3 Specifications for Wiring Diagrams
1. Standard 4–20 mA Wiring Instructions
The meter's terminal block distinguishes between power supply + and power supply –. It uses a two-wire circuit for power supply: connect the DC 24 V positive terminal to the transmitter's positive terminal, and connect the negative terminal in series with the signal input terminal of the PLC or digital display meter to form a complete circuit; No external signal power supply is required; the circuit integrates power supply and signal transmission. Connect the cable shield to the meter's ground terminal to ensure reliable single-point grounding.

2. Wiring Instructions for RS485 Communication Models
Separate power supply terminals and communication terminals are provided. Connect the DC 24V positive and negative terminals to the corresponding power supply terminals. Strictly connect the communication A and B wires to the corresponding 485 terminals; reversing or short-circuiting A and B is prohibited. When configuring a bus network, all devices must be wired in a daisy-chain configuration with A connected to A and B connected to B. Terminating resistors may be added at the beginning and end of the chain as needed.

3. Dedicated Wiring Specifications for Isolated Models
Isolated models feature built-in electrical isolation circuits, ensuring complete electrical isolation between the power supply side and the signal side. When wiring, it is strictly prohibited to short-circuit or interconnect the power ground and signal ground. Run separate wiring for each side, using separate cable trays for high-voltage and low-voltage lines to reduce coupling interference and ensure effective isolation and anti-interference performance.

4. Wiring Specifications for Intrinsically Safe Explosion-Proof Models
Intrinsically safe explosion-proof models must be used in conjunction with an intrinsically safe barrier. In hazardous areas, only the intrinsically safe side terminals should be connected; the control system in non-hazardous areas should be connected to the side of the barrier. Sealed connectors must be tightly secured; excess cable must not be coiled or piled up inside the explosion-proof chamber to eliminate potential explosion hazards.

5. Comparison of Correct and Incorrect Wiring Practices
Correct Practices: Tightly secured terminals with no loose wires; shielding grounded at a single point; separate routing for power and signal lines; strict polarity matching; explosion-proof connectors properly sealed;
Incorrect Practice: Exposed loose copper wires, loose or faulty connections, shielding grounded at both ends, mixed power and signal terminals, high-voltage and signal cables routed in the same conduit, and explosion-proof connections not properly sealed. Any of these practices may cause signal drift, equipment damage, and failure of the explosion-proof integrity.

6.4 Power-On Commissioning Procedure
1. No-Load Test
After all wiring is complete, double-check that the connections are correct, grounding is compliant, and the installation is securely fastened. Ensure no personnel are in the vicinity of live terminals. Slowly apply the 24 VDC power supply and observe whether the equipment powers up normally. If there is no arcing, abnormal noise, or excessive heat, the no-load test is considered successful.

2. Signal Calibration
With the tank at zero liquid level (empty), use a multimeter to measure the output current or communication values to verify that the zero-point output falls within the standard range. Gradually fill the tank with liquid, recording corresponding signal values in stages from the low liquid level to the rated full liquid level. Verify linearity and responsiveness, ensuring that changes in liquid level are synchronized with the output signal without lag or sudden jumps.

3. Indicator Status Assessment
After power-on, a steady power indicator light indicates normal power supply; a stable, slow-flashing signal indicator light indicates normal signal output and communication; a rapidly flashing, intermittently extinguishing, or unlit indicator light indicates wiring errors, power supply abnormalities, circuit overload, or communication failures. Immediately disconnect power and inspect the terminals and wiring.

4. Calibration Method
If there is a slight zero-point offset, fine-tune the zero point using the local zero adjustment button on the meter or via the host computer software. Perform full-scale calibration when there is a full-level deviation. After calibration, let the unit stand for 10–30 minutes to ensure the readings stabilize without drift. Lock the parameters after calibration to prevent accidental changes to the calibrated values.

6.5 Installation Precautions
1. Overvoltage supply is strictly prohibited. Do not operate with a DC supply exceeding 36 V for extended periods; instantaneous overvoltage must not exceed 40 V DC to prevent internal circuit breakdown or damage to the transmitter core.

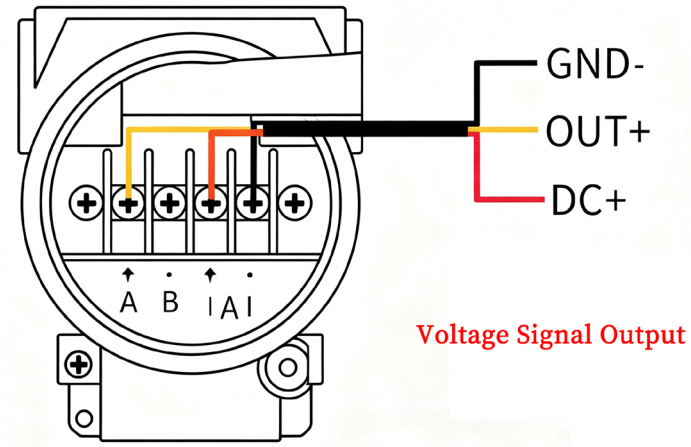
2. Avoid running the instrument in the same conduit or trench in close proximity to high-voltage power cables from variable frequency drives, motors, contactors, etc., to prevent electromagnetic interference that could cause level signal fluctuations, drift, or unstable readings.

3. In damp, outdoor, or corrosive environments, the instrument housing must never be left open for extended periods. All wiring ports must be sealed with waterproof connectors to prevent moisture, dust, or corrosive gases from entering and causing circuit board corrosion or short circuits.

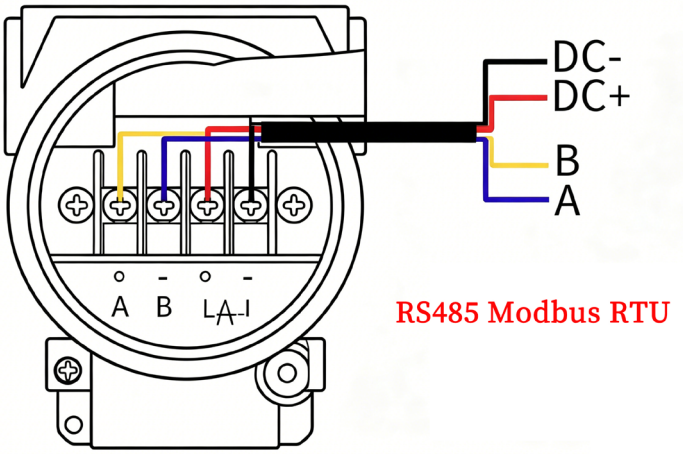
4. Do not arbitrarily cut the original factory-supplied corrosion-resistant venting cable or damage the shielding layer and venting tube structure. Unauthorized modifications will result in measurement inaccuracies, failure of pressure compensation, and a reduction in the corrosion protection rating.

5. Do not forcefully strike the probe against the tank bottom, bend the cable, or bind heavy objects to compress the cable. This prevents damage to the internal core, cable aging and cracking, and shortens the equipment's service life.

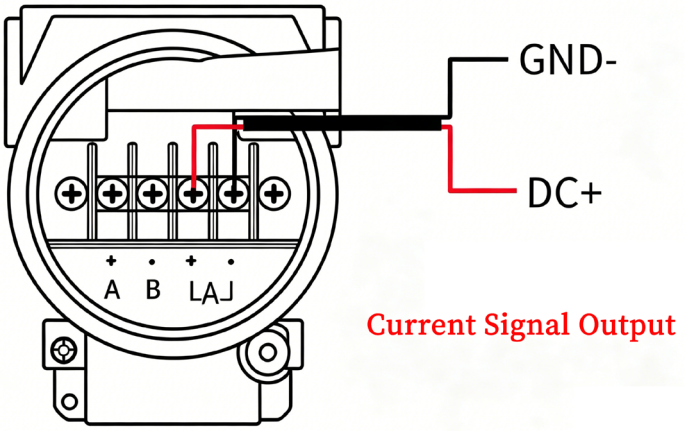
6. In explosion-proof environments, it is strictly prohibited to install or use standard, non-explosion-proof models as substitutes for explosion-proof models. Do not remove explosion-proof sealing connectors or alter the wiring configuration without authorization. Violating explosion-proof regulations creates significant safety hazards and will result in failure to pass safety inspections.



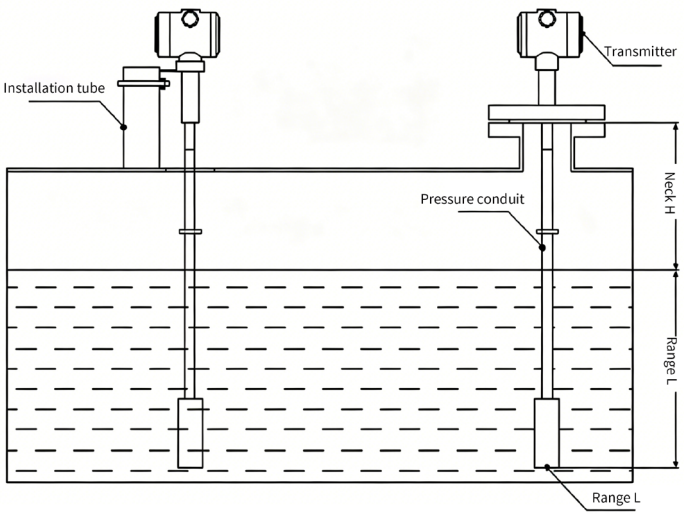
Voltage Signal Output



RS485 Modbus RTU



Current Signal Output



**VII. Recommendations for Daily Use & Operation and Maintenance**

7.1 Key Points for Daily Inspections

1. Inspection of Equipment Appearance and Installation Status

Inspect the probes and cables daily or at the start of each shift: Check the PTFE corrosion-resistant cables for damage, cracks, or signs of hardening and aging; check the probe surfaces for any buildup of medium crystals or dirt; ensure the probes remain in a vertical position without tilting, tangling, or being wrapped by foreign objects.

Inspect the condition of the 2088 meter head: Confirm that the meter head housing shows no signs of deformation, corrosion, or water ingress; ensure that the protective end caps and waterproof connectors are intact and secure; for explosion-proof models, check that the explosion-proof sealing connectors are not loose and that the O-rings have not aged.

Confirm the stability of the installation structure: Ensure the meter mounting bracket and rail clips are secure, that the cable fasteners at the tank opening are not loose, and that the probe is not displaced by water flow or striking the tank bottom.

2. Signal Stability Monitoring

Monitor the liquid level data in real time on the central control system or digital display instrument. Observe whether the values are stable without sudden jumps, abnormal fluctuations, continuous drift, fixed deviations, or anomalies such as full-scale or zero-point lockups.

During routine inspections, use a multimeter to spot-check the 4-20mA output signal. Verify that the output values for zero, intermediate, and full liquid levels match the calibrated values, and troubleshoot any signal transmission abnormalities; For RS485 models, check the communication connection status to ensure there are no packet loss, disconnections, or data delays.

Pay close attention to signal performance under conditions of medium fluctuation, agitation operation, and material inflow/outflow. If abnormal value fluctuations occur, simultaneously investigate potential on-site interference sources and equipment status.

3. Environmental Temperature, Humidity, and Operating Conditions Monitoring

Monitor the temperature and humidity of the meter's installation environment. Avoid prolonged exposure to high temperatures, high humidity, or highly corrosive mist. The ambient temperature must be maintained within the range of -40°C to +85°C, with humidity ≤95% RH and no condensation.

During routine inspections, verify that no new sources of strong electromagnetic interference (such as variable frequency drives or high-power motors) have been added on-site, and ensure that cables are not laid in close proximity to or crossed with power cables to prevent interference with signal transmission.

In explosion-proof zones, additionally monitor on-site gas concentrations and dust levels to ensure operating conditions consistently meet explosion-proof rating requirements, and prevent unauthorized hot work or open-cover operations.

7.2. Regular Maintenance Plan

1. Cleaning and Maintenance Schedule and Methods

Monthly Cleaning (Normal Operating Conditions):

Clean the probe surface monthly. Rinse off media crystallization and dirt from the probe surface using a neutral anti-corrosion solution or clean water. Avoid using sharp tools to scrape the PTFE probe housing to prevent scratching the anti-corrosion coating. Take care to protect the cables during cleaning to avoid pulling or kinking.

Quarterly Cleaning (High-Contamination / High-Crystallization Conditions):

For applications involving electroplating waste liquids, high-concentration acids and alkalis, or media prone to crystallization, perform an additional deep cleaning every quarter. Before disassembling the probe, disconnect the power supply and implement appropriate safety precautions. Clean the anti-clogging filter holes at the bottom of the probe to prevent impurities from blocking them and affecting pressure measurement. After cleaning, recalibrate the installation position to ensure the probe is vertical and free of tilt.

Semi-Annual Cleaning (Display Unit and Terminals):

Every six months, disconnect the power supply and inspect the display unit's wiring compartment. Use dry compressed air to blow out internal dust and moisture, and check the terminals for signs of oxidation or corrosion. For explosion-proof models, do not open the cover without authorization. If cleaning is required, it must be performed by personnel with explosion-proof certification, and the explosion-proof seal must be resealed after the operation.

2. Wiring and Installation Fastening Inspection

Quarterly Fastening Inspection:

Conduct a fastening inspection of the meter terminal blocks, cable waterproof connectors, and mounting bracket screws every quarter. Tighten any loose terminal blocks and re-crimp oxidized or loose cable copper cores to ensure good contact; verify that the cable shielding is securely grounded with no detachment or loose connections.

Semi-Annual Special Inspection (Explosion-Proof / Outdoor Conditions):

For outdoor, high-humidity, and explosion-proof environments, conduct an additional inspection every six months to verify the sealing performance of cable sheaths and waterproof connectors, and replace aged O-rings; for explosion-proof models, inspect the explosion-proof sealing gaskets and flameproof surfaces to ensure they are intact and undamaged, thereby ensuring compliance with explosion-proof performance standards.

3. Recommendations for Accuracy Retesting and Calibration

Quarterly Accuracy Spot Checks (Critical Process Conditions):

For critical process conditions in industries such as chemicals and pharmaceuticals that require high level measurement accuracy, conduct an accuracy retest every quarter. Use the clean water calibration method to verify zero and full-scale readings, record deviation values, and perform fine-tuning calibration promptly if the deviation exceeds ±0.5% FS.

Annual Comprehensive Calibration (All Operating Conditions):

Conduct full-range accuracy calibration once a year. Qualified personnel must use standard pressure sources or level calibration equipment to calibrate the transmitter's zero point, full scale, and linearity, and issue a calibration record. Calibration of explosion-proof models must be performed in a safe area or by personnel with explosion-proof operation qualifications; it is strictly prohibited to open the cover and perform calibration under power in hazardous areas.

Calibration Upon Operating Condition Changes:

Immediate accuracy re-testing and calibration must be performed when there are significant changes in medium density or temperature, or following tank process modifications or changes in installation location, to prevent measurement errors caused by operating condition changes.

7.3 Long-Term Maintenance Tips

1. Optimizing Dust and Moisture Protection

When installing the transmitter, prioritize locations that are dry, well-ventilated, free of standing water, and free of dust accumulation. For outdoor installations, install a rain and dust cover to prevent direct exposure to rain and long-term dust buildup. In high-humidity environments, desiccant can be placed inside the transmitter's terminal compartment (for non-explosion-proof models); for explosion-proof models, select a model with an IP67 protection rating.

When routing cables, avoid laying them in low-lying areas prone to water accumulation. Ensure both ends of conduit are waterproofed, and use waterproof junction boxes to protect cable joints, preventing moisture and corrosive gases from entering the cable interior.

2. Optimization of Anti-Interference Performance

Route signal cables through separate shielded conduits, maintaining a minimum distance of 30 cm from power cables and variable frequency drive (VFD) cables; avoid running them in the same trench or conduit. Strictly implement single-point grounding for the cable shield (grounded at the meter end, floating at the probe end) to eliminate multi-point ground loop interference.

In environments with strong electromagnetic interference, select models with electrical isolation or install signal isolators in the signal loop to further enhance interference resistance; for RS485 communication models, install terminating resistors at the bus end to reduce signal reflection interference.

3. Specialized Protection for Extreme Environments

High-temperature conditions: When the medium temperature exceeds 80°C, specialized high-temperature-resistant models must be selected. Keep the probe cable away from high-temperature heat sources, install the meter head in a location distant from high-temperature tank areas, and install heat shields if necessary to prevent the meter head and cable from

being exposed to high temperatures.
Highly Corrosive Mist Environments: In environments with pervasive corrosive mists, such as chemical plants or acid washing workshops, select models with corrosion-resistant coated enclosures or install the meter in a sealed junction box to prevent corrosive gases from eroding the meter housing and terminals; regularly inspect the cable sheath and replace it immediately if hardening or cracking is detected.
Low-temperature / Extreme cold conditions: When the ambient temperature is below -20°C, use a wide-temperature-range transmitter. Avoid forcefully bending the cable at low temperatures to prevent the PTFE sheath from becoming brittle and cracking. In tank environments prone to ice formation, implement anti-icing measures in advance to prevent the probe from being damaged by ice buildup.

4. Long-Term Maintenance of Corrosion Resistance
Never immerse the probe or cables directly in organic solvents or strong acid/alkali cleaners. Use a neutral solution for cleaning to avoid damaging the PTFE corrosion-resistant coating. When storing the probe for extended periods of inactivity, rinse the surface with clean water to remove any residual medium. After drying, store it in a sealed container in a cool, dry place to prevent cable aging caused by direct sunlight or high-temperature exposure.
For applications involving high-concentration, highly corrosive media, it is recommended to inspect the corrosion-resistant coating on the probe every 1–2 years. If micro-pores or signs of corrosion are detected on the surface, replace the probe promptly to prevent media penetration and damage to the internal core.

**VIII. Troubleshooting & Emergency Response**
8.1 List of Common Faults
No output signal after powering on the transmitter; the instrument displays no readings and shows no current changes
Level readings drift continuously or shift gradually; the zero point drifts on its own; full-scale readings are inaccurate
Abnormal power/operation indicator lights: not lit, constantly on, frequent flashing, or intermittent lighting
System frequently triggers high/low level alarms when the actual level has not reached the set alarm values
Signal interference and distortion: value jumps, up-and-down fluctuations, erratic jumps, or unstable readings
RS485 communication issues: disconnections, packet loss, inability to form a network, or host computer cannot detect the device
Probe is operational but stuck in a fixed range, remaining permanently at zero or full scale without change

8.2. Analysis of Fault Causes
1. Wiring-related causes
Reversed power supply polarity, reversed signal lines A/B, shield grounded at both ends, loose or faulty terminal connections, mixing of high- and low-voltage circuits, or moisture ingress due to unsealed explosion-proof connectors.

2. Power Supply Issues
Supply voltage is too low or exceeds the rated range of 12–36 V DC; excessive power supply ripple; loop load resistance exceeds specifications; power supply surge; poor grounding of the DC power supply.

3. Signal Overload and Impedance Mismatch Causes
The total load of downstream PLCs, digital displays, and isolators exceeds the transmitter's drive capacity; lack of signal isolation, with multiple devices sharing a common ground, causing loop current interference; selection of an insufficient measurement range or lack of margin leading to saturation and lockup.

4. Causes Related to Environmental and Operating Conditions
Co-installation in the same trench with variable frequency drives, high-power motors, or power cables; corrosive mist or high-humidity condensation entering the meter housing; medium crystallization blocking the sensor surface, or blocked gas tubes causing pressure compensation failure.

5. Causes of Equipment Body Damage
Aging and cracking of PTFE corrosion-resistant cables; breakage of internal gas tubes; corrosion or damage to the pressure sensing element due to prolonged overpressure; moisture ingress, oxidation, or lightning surge damage to the 2088 meter head circuit board; water ingress due to seal failure causing circuit short circuits.

8.3 Step-by-Step Troubleshooting
1. Issue 1: No output when device is powered on; no signal from the meter
Troubleshooting Steps
① First, disconnect power and visually inspect the wiring. Verify whether the 24V DC positive and negative terminals are reversed, whether terminals are loose, or whether frayed copper wires have caused a short circuit;
② Use a multimeter to measure the supply voltage and confirm it is within the normal range of 12–36V DC;
③ Check the total load resistance of the circuit to ensure it does not exceed the rated load range;
④ Open the meter's wiring compartment to check for moisture, oxidation, or signs of blackening or burn damage;
⑤ Inspect the corrosion-resistant cable for signs of external pulling, breaks, or damaged insulation.
Remedial Actions
Re-crimp the cable terminals and correct the positive and negative polarity connections; replace the unstable DC power supply; clean the oxidation layer from the terminals and tighten them; seal damaged cables or replace the entire corrosion-resistant cable.
Emergency Workaround
Temporarily replace the unit with a spare QDY60C of the same specification, install and wire it in the same position, quickly restore level monitoring, and take the faulty unit offline for repair.

2. Fault 2: Signal Drift, Zero-Point Shift, and Inaccurate Measurements
Troubleshooting Steps
① Observe whether readings drift spontaneously when the tank is empty and stationary to rule out the influence of significant fluctuations in medium temperature;
② Check whether the probe is too close to the tank wall, wrapped in debris, or subjected to vortex impact at the water inlet;
③ Check whether the vent tube is kinked, blocked, or has water ingress, causing atmospheric pressure compensation to fail;
④ Verify whether the shielding layer is grounded at both ends and whether it is routed through the same conduit as high-voltage power lines;
⑤ Compare with factory calibration parameters to determine if zero-point and full-scale calibration is required.
Remedial Actions
Adjust the probe to a vertical, suspended position in the center of the tank, away from the inlet and outlet ports; clear or replace the corrosion-resistant vent cable; change the shielding layer grounding to single-ended grounding on the meter side; Perform zero and full-scale accuracy calibration; install a signal isolator to suppress ground loop interference.
Emergency Workaround
Temporarily lock the central control instrument to a fixed value to maintain process production; perform full-unit calibration or replace the probe cable assembly during the next shutdown window.

3. Fault 3: Abnormal Indicator Light Status
Troubleshooting Steps
① Indicator light does not illuminate at all: First check for power supply, open circuits in the power supply circuit, blown fuses, or damaged internal circuits;
② Indicator light remains constantly on without switching: Short circuit in the signal circuit, abnormal clamping in the internal circuit;
③ Indicator light flashes rapidly and frequently: Wiring errors, communication conflicts, load exceeding limits, severe electromagnetic interference.
Remedial Actions
Correct power connections and restore standard supply voltage; eliminate potential short-circuit hazards at terminals; reconfigure RS485 A/B wiring according to specifications; enhance shielding and isolation, and move the unit away from power interference sources; if the circuit board is damp, dry and reseal it or return it to the factory for repair.
Temporary Workaround

Do not rely on the indicator light; use a multimeter to directly measure the 4–20 mA current to determine if the device is functioning normally, and temporarily disregard the indicator light status to continue operation.

4. Fault 4: Unjustified Triggering of High/Low Liquid Level Alarms
Troubleshooting Steps
① Determine whether the issue is caused by actual liquid level changes or false triggers due to signal fluctuations;
② Check for interference causing sudden value jumps;
③ Verify whether the measurement range and alarm threshold settings are inappropriate;
④ Check whether the probe is covered by foam or floating debris, causing false pressure readings.
Remedial Actions
Optimize cabling to keep it away from interference sources and install signal isolators; reset the upper and lower alarm thresholds to appropriate levels; clean foam and floating debris from the probe surface; adjust the installation position to avoid areas with liquid surface fluctuations.
Emergency Workaround
Temporarily widen the alarm thresholds appropriately to avoid frequent false alarms and ensure continuous process operation; thoroughly investigate interference and installation issues afterward.

5. Fault 5: Signal Interference, Distortion, and Fluctuating Readings
Troubleshooting Steps
① Check whether signal cables run in close proximity to variable frequency drives (VFDs) or power cables;
② Check whether the shielding layer is grounded incorrectly or if multiple grounding points are causing ground loops;
③ Check whether high-power equipment has been added on-site or if fluctuations worsen after VFDs are activated;
④ Check whether the meter is damp or if terminal oxidation is causing poor contact.
Remedial Measures
Route high- and low-voltage cables in separate conduits, maintaining safe distances; strictly implement single-point shield grounding; install external signal isolators and surge protection modules; clean oxidized terminals and ensure the meter is sealed against dust and moisture.
Emergency Workaround
Apply digital filtering and smoothing at the central control unit to temporarily mask fluctuating interference, ensuring usable readings, and rectify the on-site cabling later.

6. Issue 6: RS485 Communication Disconnection, Unable to Read Data
Troubleshooting Steps
Verify whether the A/B wires are reversed, whether the bus is daisy-chained in parallel, and whether the terminating resistors are properly matched; check if the address code and baud rate settings match those of the host computer; verify that cable shielding and grounding are compliant.
Remedial Measures
Swap the A/B wiring and standardize communication parameters; Install terminating resistors at both ends of the bus; ensure shielding grounding and independent cabling are done according to specifications.
Emergency Workaround
Temporarily switch to connecting the instrument in 4-20mA analog mode to restore monitoring; debug the communication network later.

8.4, After-Sales Service Request Guidelines
1. Criteria for Determining Faults and Requesting Service
If the following situations occur and cannot be resolved on-site, you may request official after-sales service:
Water ingress causing corrosion in the housing, burnt circuit boards, or obvious physical damage or deformation;
Corrosion or perforation of the probe's PTFE protective coating, permanent damage to the sensing element, or complete lack of calibration response;
Persistent out-of-tolerance readings despite repeated calibration, permanent communication failure, or indicator lights that do not function at all;
Hardware failures in the main unit caused by lightning strikes, power surges, water ingress, or highly corrosive media;
Damage to the sealing structure of explosion-proof models, resulting in loss of explosion-proof integrity that cannot be repaired on-site.

2. Repair Process
Record the complete product model: QDY60C 2088 Corrosion-Resistant Split-Type Submersible Level Transmitter, along with the measurement range, output signal, and purchase date;
Clearly describe the fault symptoms, on-site operating conditions, installation environment, and troubleshooting steps already taken;
Provide photos of the device's exterior, wiring layout, and on-site operating environment;
Submit the information to Qidian Automation's after-sales service channel and await remote guidance from a technical specialist or return the unit for factory repair.

3. Warranty Coverage
Under normal operating conditions, the product is covered by the official standard warranty provided there is no human-caused damage or unauthorized disassembly or modification;
Warranty coverage includes: internal sensor elements, indicator circuit, original anti-corrosion cables, and defects in the sealing structure;
Exclusions from warranty coverage: unauthorized cutting or modification of cables, damage caused by impact or force, damage caused by improper installation, misuse under excessive or highly corrosive conditions, and damage resulting from unauthorized opening of the housing or modification of the explosion-proof structure.

4. Usage Guidelines
It is strictly prohibited to disassemble the 2088 meter head, damage the explosion-proof seal, or cut the original gas-conducting corrosion-resistant cables. Do not leave the cover open while the unit is powered on for extended periods before the fault has been identified, to prevent moisture or corrosive gases from entering and causing secondary damage.