# PA-22 Frequency Signal Converter

## I. Product Definition

The Qidian PA-22 Black-Housing Frequency Transmitter is an industrial-grade signal conversion instrument developed by Anhui Qidian Automation. Its core function is to linearly convert various frequency and pulse signals from industrial environments (such as power grid line frequency, generator speed, and sensor pulses) into standard analog signals (e.g., 4–20 mA, 0–10 V) after electrical isolation, thereby enabling the long-distance transmission, acquisition, and monitoring of frequency signals. It is a three-terminal isolated transmitter (with input, output, and power supply mutually electrically isolated) housed in a black standard DIN-rail enclosure. Designed specifically for applications in power generation, industrial control, and energy management, it addresses the issue of frequency signals being unable to be directly connected to devices such as PLCs, DCS systems, and digital displays.

## II. Working Principle

The PA-22 Black-Housing Frequency Transmitter centers on digital measurement and isolated conversion. Its complete workflow consists of four steps, which can be simply understood as "signal cleaning → precise frequency measurement → linear conversion → standard output":

1. Signal Input and Preprocessing (Signal Cleaning)

Frequency/pulse signals from industrial environments (such as 45–65 Hz power frequency or 0–100 kHz rotational speed pulses) are fed into the input terminal. The internal circuitry first filters, shapes, and limits the signal to remove electromagnetic interference and noise spikes, transforming irregular signals into standard square waves or sine waves to prevent interference from affecting measurement accuracy.

2. Electrical Isolation (Safety Protection)

The pre-processed signal enters the optical/electromagnetic isolation unit, which completely breaks the electrical connection between the input, output, and power supply (isolation withstand voltage up to 2 kVrms AC). This prevents high-voltage conditions at the field site from damaging downstream control equipment and prevents the control system from interfering with the upstream signal, achieving "signal transmission with electrical isolation."

3. Frequency Measurement and Digital Processing (Precise Frequency Measurement)

The isolated signal is fed into a high-precision frequency measurement circuit (counter + MCU), which uses zero-crossing detection and period counting technology to accurately calculate the frequency value of the input signal (accuracy up to ±0.1%).

The MCU performs a linear proportional conversion based on the preset range (e.g., 45–65 Hz corresponds to 4–20 mA), converting the frequency value into a digital code representing the corresponding analog signal.

4. Standard Signal Output (Signal Transmission)

The digital code undergoes D/A conversion (digital-to-analog conversion) to output standard signals such as 4–20 mA current or 0–10 V voltage. The output circuit features voltage regulation and constant-current design, ensuring signal stability and strong load-carrying capacity (current signals can be transmitted over distances of more than 1 km), making it directly compatible with various industrial control systems.

A simple analogy: The PA-22 acts as a "translator and bodyguard" for frequency signals—translating the "language of frequency" into the "standard analog language" that control systems understand, while using isolation to protect the safety of both upstream and downstream equipment.

## III. Core Value

(1) Core Technical Value

1. High-precision measurement: Measurement accuracy of ±0.1%, temperature drift as low as 0.02% FS/°C, and precise, bias-free frequency data, making it suitable for high-precision monitoring scenarios.

2. Strong electrical isolation: Three-terminal full isolation with strong anti-interference capabilities, suitable for complex industrial electromagnetic environments, eliminating signal crosstalk and the risk of equipment breakdown.

3. Wide Compatibility: Supports a wide input frequency range of 0–100 kHz and outputs standard signals in full specifications, including 4–20 mA, 0–10 V, and 0–5 V, ensuring compatibility with all mainstream industrial control systems.

4. Stable and Reliable: Utilizes imported components and features high integration, eliminating the need for periodic calibration. With an operating temperature range of -20°C to +55°C, it is suitable for harsh industrial environments and ensures long-term stable operation.

5. Easy Installation and Maintenance: Mounts on a 35mm standard DIN rail with a compact black housing (119mm standard size). Wiring is simple, and it is ready to use immediately upon installation.

(II) Addressing Core Customer Challenges

1. Signal Incompatibility: On-site frequency/pulse signals cannot be directly connected to PLCs, DCS systems, or remote monitoring systems. The PA-22 standardizes these signals, establishing a seamless data acquisition link.

2. Interference and Safety: Industrial environments feature high levels of electromagnetic interference and high-voltage risks, which can easily cause signal distortion and equipment damage. Three-terminal isolation completely eliminates interference and safeguards the control system.

3. Long-Distance Transmission Issues: Direct transmission of frequency signals is prone to attenuation and distortion, whereas 4–20 mA current signals can be transmitted over 1 km without attenuation, meeting remote monitoring requirements.

4. Accuracy and Stability Issues: Standard transmitters suffer from poor accuracy, significant temperature drift, and require frequent calibration; the PA-22 offers high accuracy, low drift, and is calibration-free, reducing maintenance costs and ensuring data reliability.

5. Compatibility Issues: Signal specifications vary across different devices, requiring frequent customization; the PA-22 offers a wide measurement range and multiple output options, ensuring compatibility with various systems and simplifying selection.

(III) Benefits for Customers

1. Cost Reduction and Efficiency Improvement: Reduces the need for signal conversion components, calibration frequency, and downtime due to failures, thereby lowering system construction and operational costs.

2. Safety and Reliability: Isolation protection prevents equipment damage and production accidents, enhancing system operational stability and safety.

3. Flexible Adaptability: Suitable for multiple industries including power, petroleum, metallurgy, and municipal utilities, meeting diverse application scenarios such as power frequency monitoring, rotational speed measurement, and UPS monitoring.

4. Convenient Deployment: DIN-rail mounting and standardized wiring shorten installation cycles, enabling rapid system upgrades and retrofits.

5. Accurate Data: High-precision output provides reliable data support for automation control, energy management, and fault early warning, enhancing control accuracy and management efficiency.



**IV. Key Specifications**

4.1 Basic Electrical Specifications

Input Frequency Range Standard: 45–65 Hz (Mains Frequency), 0–100 kHz (Wide Range)

Input Signal Types Sine wave, square wave, pulse signal; Pulse width ≥ 10 μs

Input Level Low level VL ≤ 1 V; High level VH: 4 V–12 V (customizable)

Input Load ≤ 0.1 VA

Overload Capacity 2 times rated input (continuous); 10-second short-term tolerance

Measurement Accuracy ±0.1% FS (Full Scale Accuracy)

Temperature Drift 0.02% FS/°C (-20°C to +55°C)

Response Time <400 ms

Output Signal Current: 4–20 mA (default), 0–20 mA

Voltage: 0–5 V, 0–10 V, 1–5 V

Output Load Current Output: RL ≤ 500 Ω

Voltage Output: RL ≥ 10 kΩ

Output Ripple ≤ 0.5% RO

Compliance Standards GB/T 13850-1998, IEC 61326-1

4.2, Isolation Performance Parameters

Isolation Configuration Three-way full isolation (input / output / power supply / housing)

Withstand Voltage AC 2kVrms / 1 min (between input - output - power supply)

Insulation Resistance ≥ 100 MΩ at 500 V DC

Electromagnetic Compatibility Complies with GB/T 18268 (IEC 61326-1) industrial EMC standard

Immunity Stable operation in strong electromagnetic environments, with no signal crosstalk or distortion

4.3, Power Supply & Power Consumption Parameters

Supply Voltage Standard: DC 24V ±10%

Wide Range: AC/DC 85–265V (customizable)

Full-Load Power Consumption ≤ 2.5VA (typical at DC 24V)

Operating Current 24 V DC Power Supply: ≤ 50 mA (single output)

Power Distribution Output No external power distribution function (passive signal input)

4.4, Environmental Adaptation Parameters

Operating Temperature -20°C to +55°C

Operating Humidity 5% RH to 80% RH (non-condensing)

Storage Temperature -40°C to +70°C

Storage Humidity ≤ 70%RH (non-condensing)

Protection Rating Enclosure IP20 (finger protection)

Explosion-Proof Rating Non-explosion-proof; can be used with safety barriers for intrinsically safe applications

Compatible Safety Barriers Compatible with mainstream isolated safety barriers (e.g., P+F, MTL series)

Mean Time Between Failures ≥ 50,000 hours

4.5. Physical Parameters

1. Installation and Dimensions

Installation Method: 35mm standard DIN rail mounting (screw mounting optional)

Dimensions (L × W × H): 119mm × 22.5mm × 99mm (black housing, standard slim type)

2. Weight and Materials

Product Weight: Approx. 120g

Housing Material: Black flame-retardant PC engineering plastic (UL94 V-0 rating)

Housing Protection: Dustproof, splash-proof, and resistant to aging; suitable for installation inside industrial control cabinets

3. Indicator Light Definitions

PWR (Green): On = Normal power supply; Off = No power / Power failure

ALM (Red): Off = Normal operation; On = Input overload / Signal abnormality / Output out of range

4. Terminal Blocks

Terminal Specifications: Plug-in screw terminals, wire gauge 0.5–2.5 mm²

Terminal Pitch: Standard 5.08 mm, secure wiring, anti-loosening

**V. Application-Specific Selection Guide**

5.1 Key Selection Criteria

When selecting the PA-22 frequency transmitter, prioritize the following six criteria to ensure the right choice from the start and avoid rework:

Input Signal Type

1. Power frequency monitoring: Select the 45–65 Hz standard range

RPM / Pulse / Encoder Signals: Select 0–10 kHz / 0–100 kHz wide range

Weak-Signal Sensors: Prioritize high-sensitivity input versions (supporting low-level triggering)

2. Output Signal Type

Prioritize long-distance transmission and anti-interference: 4–20 mA

Short-distance connection to digital displays / controllers: 0–10 V / 0–5 V

Standard industrial control acquisition: 1–5 V

3. Number of Channels

Single-channel monitoring: 1 input, 1 output (PA-22 standard model, smallest size, most cost-effective)

Redundancy / Dual-channel acquisition: 1 input, 2 outputs (one input to DCS, one to recorder / PLC)

Multi-channel centralized installation: Multiple units can be mounted side-by-side on a DIN rail; all-in-one multi-channel units are not recommended

4. Power Supply Method

Centralized power distribution from control cabinet: 24 VDC (most common)

No DC power available on-site: Select AC/DC 85–265 V wide-voltage version

5. Explosion-Proof and Safety Requirements

General workshops / electrical rooms: Standard black-enclosure models

Chemical / oil & gas / explosive zones: Must be used with isolated safety barriers

Strict intrinsically safe environments: Recommended to use Qidian intrinsically safe series transmitters + corresponding safety barriers

6. Installation Environment

Standard control cabinet: 35mm DIN rail mounting

High-vibration, high-dust environments: Recommended to install terminal mounting brackets and select flame-retardant black housing

5.2, Industry Application Selection

Power industry: Grid frequency monitoring, generator speed, UPS frequency detection

Petrochemical: Pump speed monitoring, motor frequency, instrument signals in explosion-proof zones

Metallurgy and Steel: Rolling mill speed, fan frequency, environments with high electromagnetic interference

Pharmaceuticals / Food: Mixer speed in cleanrooms, monitoring of variable-frequency equipment

Smart Manufacturing: Encoder pulses, servo speed, production line cycle time monitoring

Municipal Water Supply: Pump frequency, fan operation monitoring

New Energy: PV / wind power frequency monitoring, grid connection point signals

5.3 Common Selection Pitfalls

1. Ignoring isolation levels and directly selecting non-isolated models

Consequences: Severe on-site interference, signal fluctuations, and even burnout of downstream PLC/DCS modules.

Recommendation: Always select three-terminal fully isolated versions for industrial applications.

2. Arbitrary range selection leading to inaccurate measurements or overrange conditions

Using the 0–10 kHz range for power frequency: reduced accuracy

Using the 45–65 Hz range for high-speed pulses: immediate overload alarm

Recommendation: Select a range equal to 1.2 times the actual signal upper limit.

3. Output load mismatch, resulting in insufficient signal drive

4–20 mA load resistance exceeding 500 Ω: Output distortion and low output

Voltage output connected to a small load: Reduced accuracy

Recommendation: Calculate the total load (cable resistance + instrument internal resistance) before wiring.

4. Using general-purpose transmitters in explosion-proof environments

Consequences: Non-compliance with safety regulations, safety hazards,

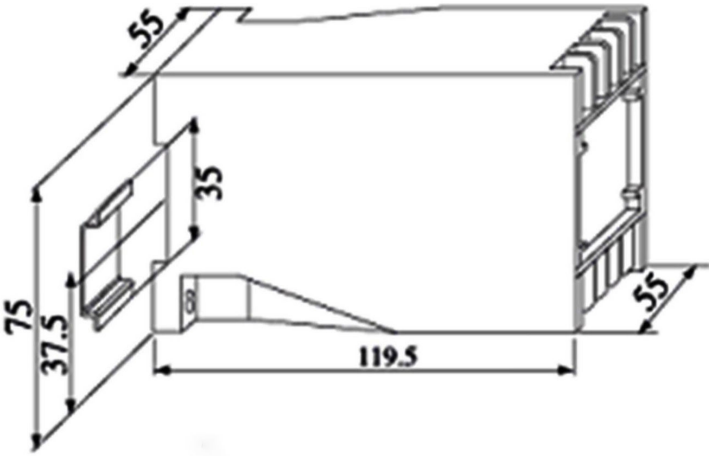
and failure to pass acceptance testing.
Recommendation: In explosion-proof zones, transmitters must be used in conjunction with safety barriers.
5. Focusing solely on price without considering power consumption and temperature drift
Consequences: Significant data drift in summer and winter, and high failure rates during long-term operation.
Recommendation: In industrial settings, prioritize industrial-grade models with low temperature drift and low power consumption.

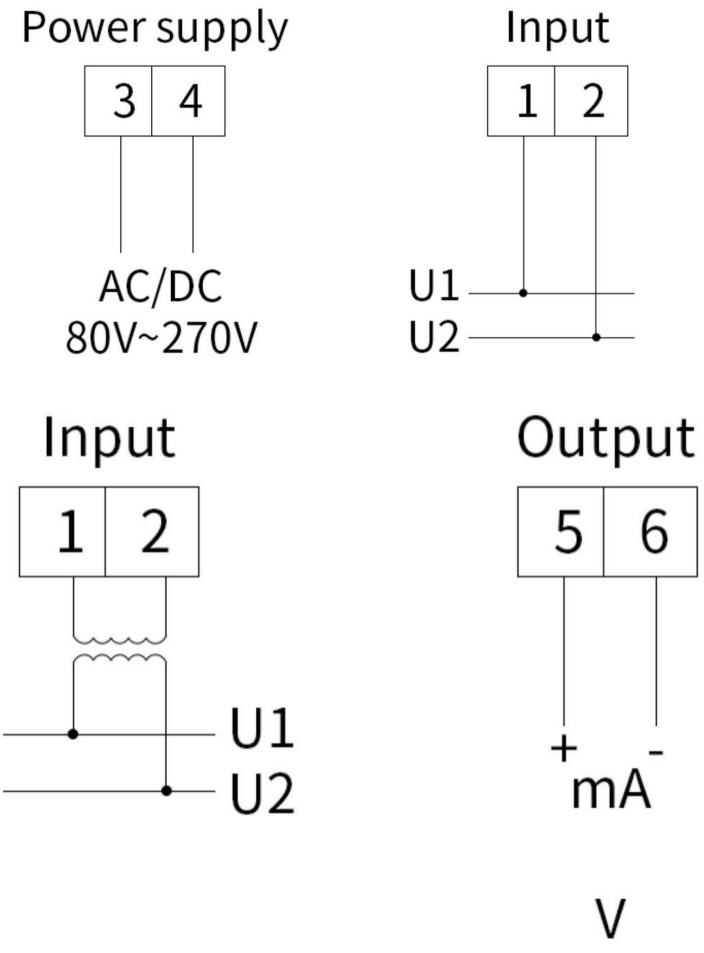
5.4 Customization Recommendations
For non-standard operating conditions, the Qidian PA-22 series supports the following customizations to meet special project requirements:
1. Custom Signal Configuration
Non-standard frequency ranges: e.g., 0–5 kHz, 10–50 Hz, 0–50 kHz, etc.
Special input levels: Support for 12V/24V pulses, differential signals, and weak sine wave inputs
2. Output Configuration Customization
Dual-channel output: 1 input, 2 outputs (two isolated 4-20mA channels)
Special outputs: 0-20mA, 2-10V, RS485 communication output (Modbus-RTU)
3. Power Supply Customization
Direct AC 110V/AC 220V Power Supply
Wide-Temperature Power Supply Module (Suitable for Extreme Low/High Temperature Environments)
4. Multi-Channel Integration Customization
Centralized transmission of 2-channel, 3-channel, or 4-channel frequency signals
Integrated black housing design saves cabinet space
5. Extreme Environment Customization
Wide-Temperature Version: -40°C to +85°C
High-vibration resistance and high-protection reinforced version (suitable for vehicle-mounted and mobile equipment)
6. Certification and Supporting Customization
Compliance with CE, ISO, and SIL-related parameter specifications
Comprehensive explosion-proof system design (transmitter + safety barrier + cables)

**VI. Installation and Commissioning Guidelines**
6.1. Pre-installation Preparation
1. Verification of Components
Verify product model: PA-22 Black-Housed Frequency Transmitter (confirm that the range, output, and power supply match the order)
Check components: Transmitter unit, pluggable terminal block, certificate of conformity, instruction manual
Preparation of Auxiliary Materials: 0.5–2.5 mm² GB-standard copper-core cable, shielded cable, cable lugs, cable ties, DIN rail mounting clips
2. Environmental Inspection
Installation Location: Inside a control cabinet, away from direct sunlight, severe vibration, and strong corrosive gases
Environmental Conditions: Temperature -20°C to +55°C, humidity 5%–80% RH, no condensation or standing water
Electromagnetic Environment: Keep away from strong interference sources such as inverter outputs, high-power contactors, and high-voltage busbars
3. Tool List
Phillips screwdriver, wire strippers, crimping pliers, multimeter (voltage / current / frequency ranges)
Insulation tape, cable ties, marker pen, signal generator (for calibration)
4. Safety Precautions
Never connect, disconnect, or modify wiring while the power is on.
Verify that the supply voltage matches the product specifications to prevent damage from reverse polarity or overvoltage.
Installation in explosion-proof areas must comply with intrinsic safety standards and be performed with the power disconnected.
Ensure proper insulation to prevent equipment damage caused by input-output short circuits.

6.2 Standard Installation Procedure
1. Mounting on the Rail
Clip the PA-22 black-cased transmitter onto a standard 35mm DIN rail.
When installing multiple units side by side, it is recommended to leave a 5–10mm gap between them to facilitate heat dissipation.
In environments with significant vibration, rail end caps or side mounting brackets may be installed.
Wiring Specifications (Strictly distinguish between terminals)
2. Standard Terminal Layout (General Version):
Power Terminals: DC24V+, DC0V/GND
Input Terminals: FIN+, FIN- (Frequency / Pulse Signal Input)
Output Terminals: OUT+, OUT- (4–20 mA / 0–10 V Output)
3. Wiring Sequence
1) Connect power ground / shield ground first
2) Connect input signals next
3) Connect output signals next
4) Connect the power positive terminal last
4. Grounding Requirements
Shielding layer single-point grounding (recommended to ground on the instrument side of the control cabinet to avoid loop current interference)
Ground resistance ≤4Ω; grounding terminals must be secure and reliable
Do not connect to power grounding or lightning protection grounding

6.3 Wiring Diagram



2. Shielding Cable Grounding Specifications
The signal shield must be grounded at only one end (the control cabinet end); the field end must remain floating and insulated.
The shield must never be left floating, must never be grounded at both ends, and must never share a ground with power cables.
3. Correct vs. Incorrect
☒ Correct: Shielding cable grounded at one end; power and signal cables routed separately
☒ Incorrect: Sharing the same cable for input and output; grounding the shield at both ends; installing in the same cable tray as power cables
☒ Incorrect: Reversing the polarity of the power supply; short-circuiting the input and output
4. Specific Notes on Isolation
The PA-22 features three-terminal full isolation, with the input, output, and power supply being mutually independent. No common ground is required, and it can be directly connected to systems with different potentials.

6.4 Power-On Debugging Procedure
1. No-Load Test
After completing the wiring and verifying that it is correct, apply power.
Observe that the green PWR indicator remains lit, indicating normal power supply.
The red ALM indicator is off, indicating no overload or abnormalities.
2. Signal Verification
Apply a standard frequency signal (e.g., 50.00 Hz).
Measure the output with a multimeter:
45–65 Hz range → 50 Hz corresponds to approximately 8.00 mA.
The displayed error should be ≤±0.1% FS.
3. Indicator Status Assessment
PWR green light steady: Power supply normal.
PWR green light off: No power supply / Reversed polarity / Internal fault.
ALM red light steady: Input overload / Signal abnormality / Output short circuit
ALM red light flashing: Signal fluctuation too large or out of range
4. Calibration Method
This product is an industrial-grade, zero-calibration model. It has been factory-calibrated to high precision and does not require on-site potentiometer adjustment.
If significant deviations occur, first check: wiring, grounding, interference, and power supply stability.
For special operating conditions, the unit may be returned to the manufacturer for professional calibration.

6.5 Installation Precautions
1. Overvoltage supply is strictly prohibited.
Do not connect AC 220V directly to the DC 24V terminals, as this will instantly burn out the module.
2. Never route signal and power cables in the same conduit
Signal and output cables must never be routed in parallel with power cables (such as those for inverters or motors).
They must be routed separately or isolated using a metal partition.
3. Never install in damp or condensing environments without a protective enclosure
In high-humidity, outdoor, or spray environments, a sealed control cabinet must be installed; otherwise, insulation degradation and short circuits may occur.
4. Do not operate with input signals exceeding the measurement range for extended periods.
Exceeding the upper limit of the rated frequency will trigger an alarm; prolonged operation may damage the measurement circuitry.
5. Do not short-circuit the output terminals directly.
Short-circuiting the 4-20mA output will trigger protective actions; frequent short-circuiting will reduce the device's lifespan.
6. Do not use unshielded cabling in strong electromagnetic environments.
Double-shielded cables must be used near inverters, medium-frequency furnaces, and welding machines; otherwise, severe data fluctuations will occur.

**VII. Recommendations for Daily Use & Maintenance**
7.1 Key Points for Daily Inspections
1. Inspection of Indicator Light Status
During daily inspections, observe the panel indicator lights:
PWR (green light) steady: Power supply is normal; this indicates standard operating status.
ALM (red light) off: Signal is normal; no overload or abnormalities.
If the green light is off: Check the power supply circuit, terminal blocks, and power switch.
If the red light is constantly on or flashing: Check whether the input signal is out of range, if there is a broken wire, or if there is a short circuit
2. Signal Stability Inspection
Observe the frequency and current values via the PLC, DCS, or digital display:
Under normal operating conditions, the values should be stable with no sudden fluctuations or drift
If frequent fluctuations or sudden spikes/drops occur, prioritize troubleshooting for interference, grounding issues, or loose connections
Key Records: Power-frequency signal fluctuations should be ≤±0.1 Hz; speed signals should show no unexplained sudden changes
3. Temperature and Humidity Environmental Inspection
Check the temperature inside the control cabinet to ensure it remains within the range of -20°C to +55°C
Check for condensation, water accumulation, or signs of mold inside the cabinet
Increase inspection frequency during high summer temperatures, low winter temperatures, and the rainy season
7.2. Regular Maintenance Schedule
1. Cleaning Schedule
Standard environments: Clean once every 6 months
Dusty, textile, metallurgical, and cement environments: Clean once every 3 months
Cleaning method: After powering down, use dry compressed air to blow away dust from the enclosure and around terminals; never wipe with water or a damp cloth
2. Wiring Tightness Inspection
Tighten all terminal connections once every 12 months
Key inspection points: Power terminals, input/output terminals, shielding and grounding terminals
In high-vibration environments (near fans or pumps): Inspect every 6 months to prevent loosening due to vibration
3. Accuracy Retest Recommendations
This product requires no commissioning or potentiometer calibration; factory-set accuracy remains stable over the long term
Recommended annual spot-check of accuracy:
Input a standard frequency using a standard signal source
Measure the 4–20 mA output with a multimeter and compare the error
Critical control loops (generators, grid connection points, safety interlocks): May be retested every six months
If retest results exceed tolerance limits, prioritize investigating external factors: interference, grounding, power supply, cable aging—not product-related issues
7.3 Long-Term Maintenance Tips
1. Dust and Moisture Protection
Keep the control cabinet closed to minimize dust ingress
Recommendations for high-humidity environments (underground rooms, coastal areas, water treatment facilities):
Install a dehumidifying heater and a temperature/humidity controller inside the cabinet
Install sealing strips at the bottom and along the edges of the cabinet to prevent moisture intrusion
When the unit is idle for extended periods, disconnect power and store it in a sealed environment to prevent moisture-induced corrosion of terminals
2. Long-Term Interference Mitigation
Use shielded twisted-pair cables throughout the signal path, and keep them away from inverters and power lines
Ensure shielded cables are grounded at a single point to eliminate ground loop interference
When installing multiple transmitters side-by-side, maintain spacing to prevent mutual electromagnetic coupling
In high-interference environments, use ferrite cores, shielded cable trays, and isolation transformers to enhance interference protection

3. Protection in Extreme Environments
High-temperature environments: Ensure adequate ventilation inside the cabinet and avoid direct sunlight on the transmitters.
Low-temperature environments: Install internal cabinet heaters to prevent condensation and low-temperature drift.
Vibration environments: Install rail end caps and cabinet vibration dampers; apply anti-loosening treatment to terminals if necessary.
Corrosive environments (chemical plants, acid/alkali workshops): Select sealed enclosures and periodically inspect terminals for oxidation
7.4. Simple and Memorable Maintenance Mnemonic
Before powering on, check the indicator light; proceed only when the green light is on;
If readings do not fluctuate, grounding is key;
Tighten wires every six months; inspect all points once a year;
Prevent dust, moisture, and interference; enjoy long-term stability without worries.

VIII. Troubleshooting & Emergency Procedures
8.1. List of Common Faults
1. No output signal after power-on (neither 4-20mA nor 0-10V)
2. Signal drift, fluctuation, or erratic variations; unstable readings
3. Abnormal indicator lights (power light does not illuminate; alarm light remains on or flashes)
4. Output at full scale / saturated (20mA stuck or 10V fully offset)
5. Output is too low or insufficient, failing to reach the corresponding value
6. Signal distortion caused by strong on-site interference
7. Occasional system freeze; recovers after power cycle

8.2. Analysis of Fault Causes
Wiring-related: Reversed power connection, reversed input/output, loose terminals, incorrect shield grounding
Power Supply Issues: Insufficient voltage, no power supply, high power supply ripple, ground loop interference
Signal Issues: Input out of range, signal open circuit / short circuit, sensor has no output
Environmental Issues: Strong electromagnetic interference, humidity/condensation, high/low temperatures, vibration causing loosening
Equipment Issues: Internal product damage, lightning surge impact, long-term overload

8.3 Step-by-Step Troubleshooting
1. Fault: No Output / Output is 0
First, check the PWR green LED:
Not lit → Check power supply: Is 24V normal? Are the positive and negative terminals reversed? Is the fuse or switch open?
Green LED lit but no output →
Use a multimeter to check if the output terminals are shorted
Check if the output wires are open or if the connectors are loose
Emergency Solution:
Temporarily replace with a spare transmitter to quickly restore the system
Confirm whether the load is excessive (Current output > 500Ω will prevent output)
2. Fault: Signal drift, fluctuation, or instability
Check if the shielded cable is grounded at a single point or routed in the same cable tray as power lines
Check if terminals are loose or oxidized; retighten them
Check if the power supply is stable; check for interference from inverters or welders
Emergency solution:
Add a ferrite core; replace the shielded cable
Temporarily connect the signal ground to the system ground at a single point
3. Fault: Abnormal indicator lights
PWR green light is off
Cause: Power supply missing / reverse polarity / internal power supply failure
Action: Verify power supply polarity and voltage, then reconnect; if the light remains off, return the unit to the factory
ALM red light is constantly on
Causes: Input out of range, input short circuit, signal abnormality
Action: Check if input frequency is out of range or if there is a short circuit; the alarm will automatically clear once the signal returns to normal
ALM red light flashing
Cause: Significant signal fluctuations, intermittent loss, severe interference
Action: Optimize grounding and wiring; check for sensor failure
4. Fault: Output at full scale / consistently 20 mA
Input signal open circuit; no frequency signal input
Input frequency far exceeds the set range
Internal detection circuit protection
Action: Restore signal input; check range configuration; power off and restart
5. Fault: Output too low
Supply voltage too low
Output load resistance too high
Weak input signal; insufficient amplitude
Action: Improve power supply quality; reduce load; check front-end sensor
6. Fault: Severe interference, signal distortion
Keep away from inverters, reactors, and high-voltage cabinets
Separate high- and low-voltage wiring
Use shielded twisted-pair cable with single-ended grounding
Install an isolator or filter

8.4 After-Sales Repair Guidelines
1. Criteria for Determining a Malfunction
A product is deemed to have a malfunction if any of the following conditions are met:
Power supply, wiring, and signals are all normal, but there is absolutely no response
Accuracy is significantly out of tolerance and all external factors have been ruled out
Internal noise, burning smell, or burnt terminals
Abnormal operation persists after multiple power cycles
2. Repair Process
Take photos: Product nameplate, indicator light status, and wiring setup
Documentation: Model, range, power supply, output, and fault symptoms
Contact sales or technical support to submit the information
After assessment: Return for repair / Replacement
3. Warranty Coverage
Warranty Period: 12 months
Warranty Coverage: Component failure and manufacturing defects under normal use
Exclusions: Damage caused by incorrect wiring, overvoltage, lightning strikes, water ingress, unauthorized disassembly, or non-standard use