JXK-7 Current Transducer

I. Product Definition

The Qidian JXK-7/QD-7 is a split-core, open-loop Hall-effect AC/DC current transmitter designed specifically for industrial field applications. Its core functions include non-contact measurement, isolation conversion, and standardized signal output for AC and DC currents, making it a critical device for current signal acquisition in power monitoring and industrial automation systems.

Its core functions can be broken down into the following modules:
1. Wide-Range Current Acquisition: Supports AC/DC current input, with typical ranges covering 0–100 A, 0–500 A, 0–1000 A, and 0–1500 A (customizable), making it suitable for the vast majority of AC and DC current monitoring scenarios in industrial environments.
2. Snap-on installation without cutting cables: Features a split snap-on design that requires no cutting of the cable being measured; it can be installed directly via snap-on mounting. It supports various cable diameters, including 20 mm, 38 mm, 50 mm, 75 mm, and 80 mm, significantly reducing installation complexity.
3. Open-loop Hall-effect measurement technology: Utilizes the Hall effect to achieve non-contact current measurement, supporting both AC and DC currents, thereby addressing the limitation of traditional current transformers that cannot measure DC currents.
4. Three-Point Electrical Isolation: Provides triple electrical isolation between the input side (measured current), output side (signal transmission), and power supply side. With an isolation withstand voltage of 2.5 kV at 50 Hz for 1 minute, it effectively blocks the impact of high-voltage power and interference signals from the field on the downstream control system.
5. Standard Signal Conversion and Output: Linearly converts the acquired current signal into industrial standard signals. The typical output is 4–20 mA DC, but it also supports various specifications such as 0–20 mA, 0–5 V, and 0–10 V, allowing direct integration with control systems such as PLCs, DCSs, and data loggers.
5. Signal Conditioning and Interference Suppression: Built-in signal amplification and filtering circuits suppress on-site electromagnetic interference to ensure measurement accuracy; also supports zero-point and full-scale potentiometer calibration to fine-tune measurement errors based on on-site conditions.
6. Wide Power Supply Compatibility: Supports power supply via the industrial standard 24 V DC; some models are compatible with 12 V DC or 15 V DC, making them suitable for the vast majority of industrial control cabinet power systems.

II. Working Principle

1. Core Principle: Hall Effect + Open-Loop Measurement
When the current being measured passes through a closed magnetic ring, a magnetic field proportional to the current's magnitude is generated inside the ring. The Hall element built into the air gap of the magnetic ring detects this magnetic field and outputs a weak voltage signal proportional to the magnetic field strength (i.e., the measured current).
2. Complete Operating Process
---Current → Magnetic Field Conversion: The measured current passes through the transmitter's open-closed magnetic ring. Both AC and DC currents generate a closed magnetic field within the ring, and the magnetic field strength is linearly related to the current magnitude.
--- Magnetic Field to Electrical Signal Conversion: The Hall element in the air gap of the magnetic ring detects changes in the magnetic field and outputs a weak millivolt-level voltage signal, which is proportional to the magnitude of the measured current.
--- Signal Conditioning and Amplification: Internal circuits amplify and filter the weak signal output by the Hall element, eliminating electromagnetic interference and ensuring signal linearity and stability.
--- Isolation and Electrical Safety: An isolation circuit provides electrical isolation between the input, output, and power supply, blocking the transmission path of high-voltage and interference signals from the field to protect the safety of the downstream control system.
--- Standardized Signal Output: The conditioned signal is converted into an industrial-standard 4–20 mA DC (or other specifications) signal, linearly corresponding to the 0–full-scale range of the measured current, for use by devices such as PLCs and DCS systems.

III. Core Value

1. Core Pain Points + Product Solutions (Q&A Format)
Core Pain Points + Product Solutions (Q&A Text-Only Version)
Question 1: Traditional current transformers cannot measure DC current, requiring the purchase of additional specialized equipment, which increases costs and the number of devices.
Answer: The Qidian JXK-7/QD-7 open-loop current transmitter utilizes open-loop Hall effect measurement technology, overcoming the limitation of traditional current transformers that can only measure AC current. It supports full-range linear measurement of both AC and DC currents simultaneously. A single device covers both measurement scenarios, eliminating the need to purchase dedicated DC measurement equipment and directly reducing procurement costs and equipment maintenance complexity.

Question 2: Traditional current measurement devices require cutting the cable under test during installation, leading to equipment downtime and production interruptions, which result in significant downtime losses and installation costs.
Answer: This product features a split-type snap-on design that requires neither cutting the cable under test nor any cable modifications. Installation is completed simply by snapping the transmitter onto the cable, enabling a "no-cable-cutting, no-downtime" installation that does not affect the normal operation of on-site equipment, significantly reducing installation costs and the risk of production interruptions.

Question 3: In industrial environments, strong electrical interference and high-voltage surges can easily be transmitted via current signals to downstream PLC/DCS equipment, causing damage to control systems and resulting in serious production accidents and economic losses.
Answer: The product features a built-in three-terminal electrical isolation circuit, achieving triple electrical isolation between the input side (measured current), output side (signal transmission), and power supply side. With an isolation withstand voltage of up to 2.5 kV at 50 Hz for 1 minute, it effectively blocks the transmission paths of high voltage and interference signals from the field, providing reliable electrical protection for downstream control systems and preventing equipment damage.

Question 4: The on-site electromagnetic environment is complex, and current signals are prone to interference during transmission, leading to distorted measurement data and significant fluctuations, which affect the accuracy and stability of the control system.
Answer: The transmitter features built-in high-precision signal amplification and filtering circuits that effectively suppress on-site electromagnetic interference. Additionally, it employs industrial-standard current signals (such as 4–20 mA) for output, significantly enhancing the signal transmission's resistance to interference. This ensures measurement accuracy of up to 0.5% F.S., delivering stable and reliable data to provide precise current monitoring data for PLC/DCS systems.

Question 5: Cable diameters in industrial environments vary widely. Traditional measurement devices with fixed diameters cannot adapt to these variations, requiring the customization of specialized equipment and prolonging project delivery times.
Answer: This product supports a variety of cable bore sizes, including mainstream dimensions such as 20 mm, 38 mm, 50 mm, 75 mm, and 80 mm. It can quickly adapt to the vast majority of on-site cable specifications without the need for customization, significantly shortening project design and delivery cycles while improving on-site installation efficiency.

Issue 6: Installation spaces in industrial environments are often cramped, making it impossible to install traditional, bulky current transformers, which impacts project cabling and equipment layout.
Answer: The product features a miniaturized, compact design and supports both DIN rail and wall-mount installation. Its small, space-saving structure easily adapts to confined installation environments, reducing the difficulty of on-site cabling and equipment layout while enhancing installation flexibility.

Issue 7: Signal interfaces of PLC/DCS control systems from different brands and models are incompatible, requiring additional signal conversion modules, which increases system complexity and costs.
Answer: The transmitter supports multiple industrial standard signal

outputs, including 4–20 mA DC, 0–20 mA DC, 0–5 V DC, and 0–10 V DC. It can be directly connected to the vast majority of PLCs, DCS systems, and data acquisition devices without the need for additional signal conversion modules, simplifying the system architecture and reducing equipment costs and wiring complexity.

Question 8: Field conditions are complex, and factors such as temperature fluctuations and equipment aging can easily cause temperature drift in measurements, affecting data accuracy. This requires frequent on-site calibration, which increases the maintenance workload.
Answer: The product features an industrial-grade circuit design with low temperature drift. It also includes built-in zero-point and full-scale calibration potentiometers, supporting rapid on-site fine-tuning and calibration. This effectively compensates for measurement errors caused by temperature drift and aging, ensuring long-term measurement stability and significantly reducing the workload associated with maintenance and calibration.

2. Summary of Core Value Propositions
All-scenario adaptability: A single device supports both AC and DC current measurement, accommodates various cable diameters and signal output specifications, and meets the vast majority of industrial current monitoring needs.
Non-intrusive, no-downtime installation: The snap-on design requires no cable cutting and does not affect normal equipment operation, significantly reducing installation costs and the risk of production interruptions.
High Safety and Interference Resistance: Three-terminal electrical isolation combined with anti-interference design effectively protects downstream control systems, enhancing the stability and safety of equipment operation in industrial environments.
Cost-Effectiveness and Ease of Maintenance: Compact design, easy installation, support for on-site calibration, and strong long-term operational stability reduce lifecycle maintenance costs.
Industrial-grade reliability: Wide temperature range and vibration-resistant design make it suitable for harsh industrial environments such as power generation, chemical processing, metallurgy, and water treatment, ensuring a long service life.

IV. Key Product Parameters & Specifications
4.1 Basic Electrical Parameters
Measurement Type: Supports AC, DC, and pulsed current measurement; open-loop Hall effect principle; compatible with any waveform current signal
Input Range: Standard ranges cover 0–100 A, 0–200 A, 0–500 A, 0–1000 A, and 0–1500 A (Custom ranges available upon request)
Measurement Aperture: Five standard sizes available: 20mm, 38mm, 50mm, 75mm, and 80mm, compatible with the outer diameters of most industrial cables
Output Signal: Supports multiple industrial standard signals, including: 4–20mA DC, 0–20mA DC, 0–5V DC, and 0–10V DC (single-channel output selectable based on control system interface)
Accuracy Grade: Typical accuracy is 0.5% F.S.; some custom ranges can achieve 0.2% F.S.
Linearity Error: ≤±0.2% F.S.
Response Time: ≤200 ms
Bandwidth: DC to 5 kHz, covering low-frequency AC and DC measurement scenarios in industrial environments
Overload capacity: Can sustain 2 times the rated input current; can withstand short-term surges of up to 10 times the rated input current
Offset voltage: ≤20 mV
Load capacity: Maximum load resistance for current output models is 600 Ω; maximum load current for voltage output models is 5 mA

4.2 Isolation Performance Parameters
Isolation Structure: Three-terminal electrical isolation design, providing triple isolation between the input side (measured current), output side (signal transmission), and power supply side
Isolation Withstand Voltage: Withstands 2.5 kV/50 Hz/1 min power-frequency withstand voltage between input-output, input-power supply, and output-power supply, with no breakdown or flashover
Insulation Resistance: Insulation resistance between isolation terminals ≥100 MΩ (under DC 500 V test conditions)
Immunity: Built-in electromagnetic interference (EMI) suppression circuitry effectively suppresses strong on-site electrical interference and burst interference, complying with industrial-grade electromagnetic compatibility standards

4.3 Power Supply & Power Consumption Parameters
Supply Voltage: Typically 24 VDC; compatible with a wide voltage range of 12 VDC to 36 VDC, suitable for the power supply systems of most industrial control cabinets
Full-Load Power Consumption: When powered by 24 VDC, full-load power consumption ≤ 1.2 W; quiescent current ≤ 25 mA
Power Protection: Built-in reverse polarity protection circuit prevents device damage caused by reversed power supply polarity
Power Distribution Output: No additional power distribution output; provides a stable power supply solely for its own operation

4.4 Environmental Adaptation Parameters
Operating Temperature: -10°C to +70°C, suitable for standard industrial field conditions; a special low-temperature version is available with an extended range of -25°C to +85°C
Storage Temperature: -25°C to +85°C, meeting requirements for equipment transportation and long-term storage
Operating Humidity: 10% to 90% RH (non-condensing), suitable for high-humidity industrial environments
Protection Rating: IP40; dust- and splash-proof enclosure, suitable for distribution cabinets and standard industrial installation scenarios
Explosion-Proof Rating: No explosion-proof certification; not intended for direct use in flammable or explosive hazardous areas. For use in explosion-proof environments, must be used in conjunction with a safety barrier (recommended models: Zener safety barrier or isolated safety barrier to achieve intrinsically safe protection)
Vibration Resistance: Complies with GB/T 13850 standard; withstands vibrations at 10–55 Hz and 0.35 mm amplitude, meeting stability requirements for industrial field installations

4.5. Physical Parameters
Installation Methods: Supports two mounting methods—wall-mounted and screw-fixed—suitable for installation inside distribution cabinets and on-site wall-mounted applications
Dimensions (using the 50 mm aperture model as an example, units: mm):
Length: Approx. 118 mm
Width: Approx. 68 mm
Height: Approx. 138 mm
Weight: Net weight of a single unit is approximately 180g–250g, varying slightly by aperture size
Indicator Light Definition: The device does not have a dedicated ALM alarm indicator light; its operational status is determined solely by the power supply status and output signal. When the power supply is normal, the internal circuitry operates stably, and the output signal linearly corresponds to the measured current. If the output signal is abnormal (e.g., out of range or no signal change), the control system can assist in identifying device malfunctions
Housing Material and Protection Details:
The housing is made of industrial-grade ABS engineering plastic, featuring a blue flame-retardant shell with insulating, impact-resistant, and corrosion-resistant properties.
The hinged structure is secured with brass latches, ensuring smooth opening and closing with a tight seal to maintain a stable magnetic circuit.
The internal circuit board is potted with encapsulant to enhance moisture resistance, dust resistance, and vibration resistance, thereby extending the device's service life.

V. Application-Specific Selection Guide
5.1 Key Selection Criteria
1. Prioritize selecting the signal type. Choose the appropriate output specification based on the requirements of the downstream interface equipment. Mainstream options include current-type (4–20 mA, 0–20 mA) and voltage-type (0–5 V, 0–10 V). Distinguish between scenarios involving AC current measurement, DC current measurement, and mixed usage. This open-close Hall effect product is compatible with both AC and DC operating conditions, eliminating the need for separate selection.

2. Determine the number of channels. The standard models in this series feature a single-input, single-output configuration, where one current input corresponds to one standard signal output, meeting the needs of

the vast majority of single-channel current acquisition applications. For multi-channel monitoring scenarios, multiple units can be connected in parallel; there is no built-in single-input, dual-output expansion version. When selecting a model, avoid misinterpreting the default single-channel functionality.

3. Confirm the on-site power supply method. The standard industrial power supply for this device is 24 VDC, and it is compatible with a wide voltage range from 12 VDC to 36 VDC. When selecting a model, verify the specifications of the cabinet and on-site power distribution. It is compatible with low-voltage distribution, vehicle-mounted DC power, and standard 24 VDC cabinet power supplies. There is no version designed for direct 220 VAC power supply; do not mistakenly select an AC-powered model.

4. Verify on-site explosion-proof requirements. This model is a standard industrial version with no inherent explosion-proof rating. It must not be used as a bare unit in flammable or explosive chemical environments, hazardous chemical workshops, or enclosed explosion-proof zones; it must be paired with intrinsically safe isolation barriers. For standard non-explosion-proof facilities, the standard model may be selected directly.

5. Select the model based on the installation environment. For standard environments such as indoor distribution cabinets, temperature-controlled server rooms, and water treatment workshops, the standard version is sufficient. For outdoor auxiliary control environments in metallurgical settings with high humidity, high dust levels, strong electromagnetic interference, or significant vibration, prioritize models that leverage the product's three-terminal isolation and sealed structure advantages. Additionally, avoid harsh water exposure scenarios such as prolonged rain or immersion.

6. Match the cable aperture size: Based on the outer diameter of the power cables to be tested on-site, select models with corresponding aperture sizes of 20 mm, 38 mm, 50 mm, 75 mm, or 80 mm. An aperture that is too small will prevent the cable from fitting securely, while one that is too large will affect magnetic circuit accuracy; this is a critical foundational requirement for selection.

5.2. Selection Guidelines for Industry Applications

1. Given the complex operating conditions in the chemical industry, where on-site electromagnetic interference is strong, high- and low-voltage wiring is commonly mixed, and certain high-risk isolation requirements exist, the QD-7/JXK-7 three-terminal isolating, switchable current transmitters are the preferred choice. Relying on their triple isolation capabilities—for input, output, and power supply—these devices prevent high-voltage crosstalk and signal interference. The snap-in design meets the requirements for maintenance without shutting down chemical equipment and retrofitting without cutting wires, making it suitable for current monitoring in circulation pumps, reactor power circuits, and wastewater and chemical transport equipment.

2. In the power industry, which includes current data acquisition scenarios in distribution rooms, low-voltage switchgear, photovoltaic auxiliary control systems, and charging station front-ends, the open-loop Hall-effect transmitters in this series are suitable. They can simultaneously monitor both AC and DC currents, are compatible with the 35mm standard DIN rail mounting method in distribution cabinets, and provide linear and stable measurement data. They are convenient for integration with power monitoring systems and energy consumption data collection terminals, making them perfectly suited for long-term current monitoring in low-voltage distribution circuits, DC power panels, and inverter equipment.

3. The metallurgical industry is characterized by high levels of vibration, heavy dust, and harsh electromagnetic environments. Since production equipment operates continuously and cannot be arbitrarily shut down for modifications, we recommend the JXK-7/QD-7 models with blue housings and snap-on designs. These allow for quick installation without the need to disconnect the main power cables. The industrial-grade housing and internal sealing structure withstand dust and mechanical vibrations, while the three-terminal isolation design effectively resists electromagnetic pulse interference generated by high-power metallurgical equipment, making it suitable for current data acquisition in smelting equipment, conveying machinery, and variable-frequency drives.

4. The pharmaceutical industry demands high levels of cleanliness in production environments and requires continuous equipment operation; power outages or production halts during construction are not permitted. We recommend this snap-on, non-contact measurement transmitter, which offers easy installation without the risk of wiring modifications. It provides stable signal output free from noise interference and meets the data acquisition standards for pharmaceutical workshop automation control systems. It is suitable for real-time current monitoring of power equipment, HVAC systems, and water treatment and purification equipment on pharmaceutical production lines.

5. Smart manufacturing encompasses automated production lines, robotic workstations, variable-frequency control equipment, and intelligent warehouse electrical control systems. The QD-7/JXK-7 standard models are ideal for these applications. Their compact size fits well within the layout of compact electrical control cabinets. Standard analog signals can be directly interfaced with PLCs, industrial gateways, and data acquisition modules. With universal AC/DC measurement capabilities, they meet the mixed monitoring requirements for variable-frequency equipment, DC motors, and AC power equipment on production lines.

6. In the water treatment and water utilities sectors, where water tanks, pump stations, sewage lifting equipment, and aeration units operate continuously for extended periods in environments with high humidity, this series of snap-in current transmitters offers convenient installation and maintenance along with excellent isolation and protection. Designed for stable, long-term use in outdoor enclosures and damp pump rooms, these models are the preferred choice for water utility automation upgrades and smart water management energy consumption monitoring.

5.3 Common Selection Pitfalls

1. Ignoring isolation levels when selecting models: Many users focus solely on measurement range while neglecting electrical isolation parameters. Standard non-isolated modules are prone to high-voltage crosstalk, PLC burnout, and signal drift. In industrial environments with strong interference, it is essential to select this product's three-terminal isolation configuration to eliminate safety hazards caused by insufficient isolation levels.

2. Selecting the wrong current or voltage output range: Blindly choosing a general-purpose wide-range model can lead to insufficient measurement accuracy for small currents if the range is too broad, or to out-of-range saturation and data loss if the range is too narrow. Selection must be based on the equipment's actual rated operating current, with a reasonable margin reserved for precise sizing.

3. Neglecting downstream load matching conditions: Current output models have maximum load resistance limits, while voltage output models have limited load-carrying capacity. Failing to account for cable length and the internal resistance of downstream data acquisition devices during selection can cause signal attenuation and data fluctuations, compromising the stability of the entire control system.

4. Incorrectly selecting general-purpose models for explosion-proof environments: Using standard transmitters directly in flammable and explosive hazardous chemical areas violates safety production regulations and poses safety hazards. In such scenarios, isolated safety barriers must be used in conjunction with the transmitters; they must not be installed and used as bare units.

5. Confusing closed-loop and open-loop Hall effect principles during selection can lead to the mistaken choice of closed-loop models, increasing costs. For standard industrial monitoring applications at power frequency, open-loop Hall effect structures offer better cost-effectiveness and easier installation, fully meeting standard monitoring accuracy requirements without the need for over-specified configurations.

5.4 Customization Recommendations

1. Customized Signal Solutions: To address the non-standard interface requirements of legacy equipment and specialized industrial control modules, we offer customized non-standard analog output signals and custom current/voltage ranges. Additionally, we provide dedicated parameters for zero-point shifting and range scaling to meet the specific data acquisition needs of retrofit projects.

2. Customization for Non-Standard Operating Conditions: For extreme environments such as sub-zero temperatures, high heat and humidity, or highly corrosive conditions, we offer customized solutions including reinforced moisture-proof potting, anti-corrosion housing coatings, and extended temperature range versions. These are designed for long-term, stable operation in outdoor enclosures, high-temperature workshops, and environments with corrosive gases.

3. Customization of special aperture sizes and structures: For large-diameter cables, simultaneous monitoring of multiple cables, and confined installation spaces, we offer non-standard aperture sizes, extended clip structures, and custom mounting fixtures to accommodate non-standard cabling and equipment space constraints.

4. Multi-scenario functional customization: For centralized multi-channel current acquisition projects, we offer complete system configuration solutions with multiple devices, featuring unified power supply specifications and signal output standards to facilitate centralized cabling and system debugging. If integrated alarm linkage is required, we can provide modified versions with out-of-limit signal feedback to meet out-of-limit early warning and linked control needs.

5. Multi-channel integrated solutions: In the absence of standalone multi-channel models, we offer integrated DIN-rail mounting kits with uniform dimensions and installation specifications. This facilitates standardized layout in electrical control cabinets and reduces the complexity of future maintenance and component replacement.

VI. Installation and Commissioning Guidelines

Compatible Models: Qidian QD-7 / JXK-7 Blue Housing, Three-Terminal Isolated, Snap-On Open-Loop Hall-Effect AC/DC Current Transmitter

This document consists entirely of text and provides practical, hands-on guidance tailored for on-site installation, electrical commissioning, and post-sales maintenance. It is designed to help prevent installation errors and subsequent malfunctions.

6.1 Pre-Installation Preparation

1. Check Accessories: After unpacking, thoroughly inspect the device's exterior. Ensure the blue housing has no cracks, the snap-on latches are intact, the magnetic ring closes tightly with no damage, and the terminal block has no loose, oxidized, or broken pins. Verify that the product's range, output type, and mounting hole specifications match the procurement requirements. The standard package includes no additional accessories; if mounting clips or shielded cables are needed, prepare them in advance.

2. Environmental Inspection: Survey the installation area in advance to ensure the location is free from excessive dust, corrosive gases, water accumulation, severe vibration, and high-temperature heat sources. Keep the unit away from strong electromagnetic interference sources such as variable frequency drives, high-power contactors, and high-frequency equipment. Reserve adequate ventilation space inside the distribution cabinet to prevent heat buildup in a confined, stuffy environment.

3. Prepare the tool list: Prepare a Phillips screwdriver, electrician's wire strippers, a multimeter, electrical tape, cold-pressed terminal blocks, shielded control cables, and standard DIN rail accessories in advance. For high-precision commissioning scenarios, a signal calibrator may be provided to support the entire process of wiring, mounting, and power-on testing.

4. Safety Precautions: All installation operations must be performed with the power completely disconnected. It is strictly prohibited to disconnect or connect wires, or to open or close the magnetic rings of current transformers while the system is energized. Ensure proper insulation protection in areas with high-voltage power cables; operators must wear insulated gloves and strictly adhere to electrical safety operating procedures to prevent electric shock and short-circuit accidents. Do not forcibly open or close the magnetic rings while the cables are under load to avoid sudden changes in the magnetic field that could affect equipment lifespan.

6.2 Standard Installation Steps

1. DIN Rail Mounting: The device is compatible with standard 35mm DIN rails. Align the rail latches on the back of the device with the rail slots, press down vertically to secure it, and gently shake the device to ensure it is not loose or prone to falling off. If no DIN rail is available on-site, use the pre-drilled mounting holes on the housing to secure the device with wall-mounting screws, ensuring a firm installation with even force distribution.

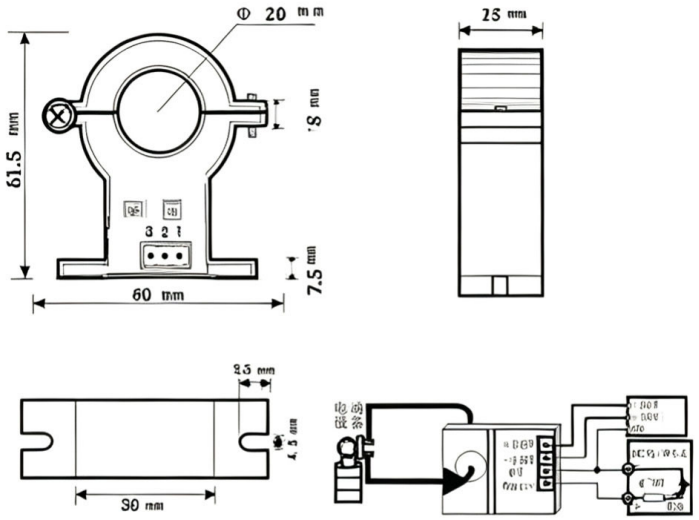
2. Secure the snap-on magnetic ring: Open the snap-on clasp of the transmitter's magnetic ring, slide it over the main conductor of the power cable to be monitored, ensure the cable is centered within the magnetic ring without any offset or compression, and fully close the snap-on clasp to ensure the upper and lower magnetic circuits are tightly sealed with no gaps or misalignment, thereby preventing a loss of measurement accuracy.

3. Follow wiring specifications: Strictly distinguish between the three terminal definitions. The power supply terminals and signal output terminals are low-voltage, low-current circuits; the measured current is detected via non-contact induction and requires no wiring. The power supply circuit strictly distinguishes between positive and negative terminals. The positive and negative terminals of the output signal correspond to the terminal definitions of the downstream PLC and data acquisition instruments to prevent reverse connection, incorrect connection, or mixed connection.

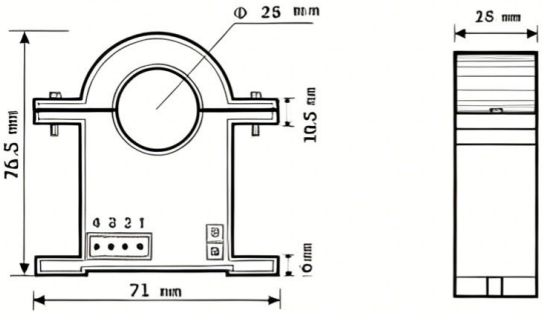
4. Grounding Requirements: The equipment housing is made of insulating, flame-retardant plastic and does not require mandatory grounding. In three-terminal isolated signal lines, the shielded control cable is grounded at a single end—specifically on the control system side—while the shield at the transmitter end is left floating. This prevents loop current interference caused by dual-end grounding and enhances signal stability.

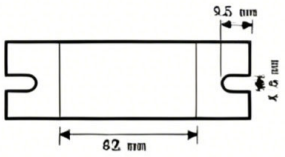
6.3 Wiring Diagram Specifications

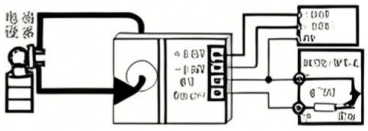
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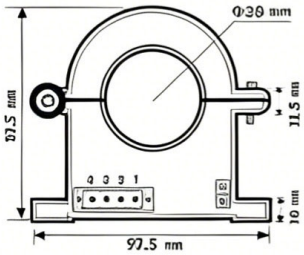




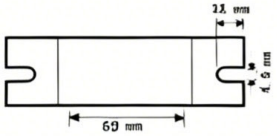
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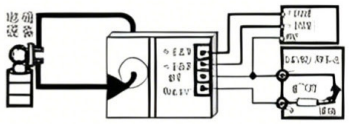
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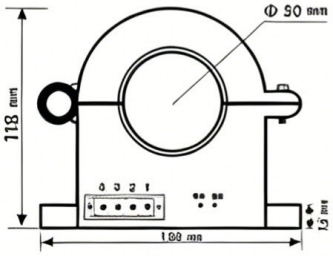




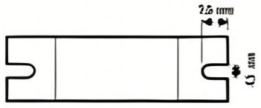
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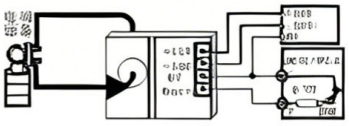
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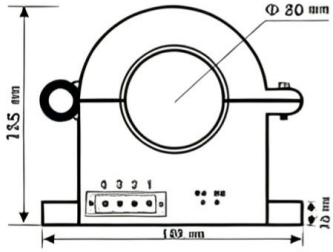




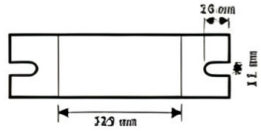
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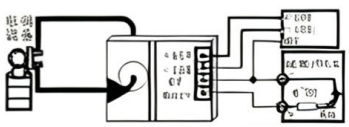
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JXK-7-80





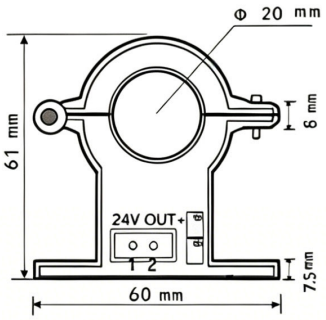


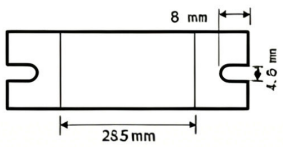


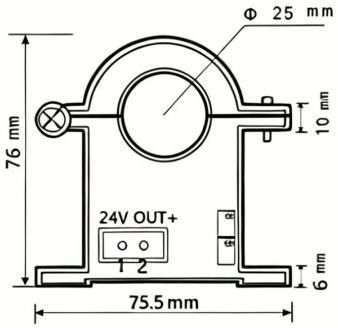
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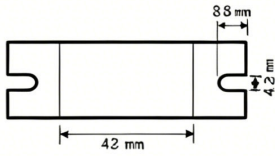
3: OUT 4: 0V

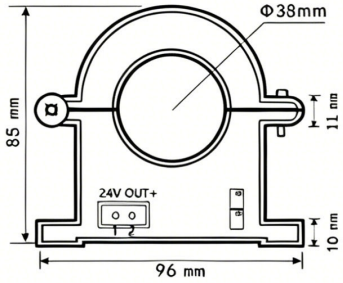
2-Wiring

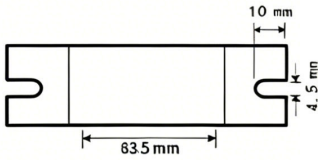


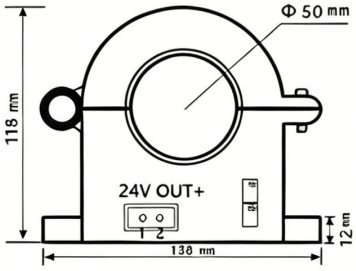


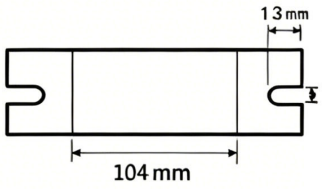


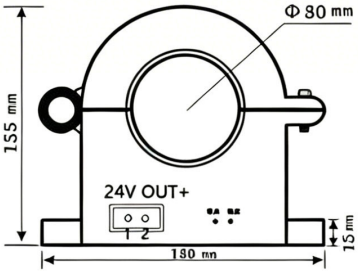


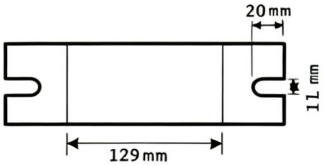












6.4 Power-On Commissioning Procedure

1. No-Load Test: After all wiring is complete and verified, turn on the control power supply and apply the rated operating voltage to the transmitter. Observe the overall operating status of the device. This series of models does not have a separate power indicator light; after power-on, the internal circuitry enters normal standby mode. If there is no abnormal heat generation or unusual noise, the no-load operation is considered normal.

2. Initial Signal Verification: With the power cable in a no-load state, use a multimeter to measure the output signal. Under no-load conditions, the output should correspond to the zero-point value; current-type outputs should approach 4 mA, and voltage-type outputs should approach the minimum reference voltage. Confirm that there is no zero-point drift or abnormally high values.

3. Load Testing: Activate the on-site equipment to ensure the cable under test operates under normal load conditions. Compare the output signal to the equipment's rated current to verify linear variation. As current increases, the output should rise linearly in sync; the signal should remain continuous and stable, with no sudden jumps or interruptions.

Accuracy Calibration Method: The device is equipped with zero-point and full-scale fine-tuning potentiometers. In the event of minor measurement errors, use a small flathead screwdriver to slowly adjust the zero-point potentiometer to correct no-load deviations, and adjust the full-scale potentiometer to correct full-load range deviations. Perform adjustments incrementally to avoid overcorrection in a single step.

4. Troubleshooting: If, after power-on, the output signal remains static, is saturated, or fluctuates violently, first check the wiring polarity, potential short circuits in the isolation circuit, and nearby sources of strong interference. If there is absolutely no signal output, check whether the power supply is interrupted or if the terminal connections are loose or faulty.

6.5 Installation Precautions

1. Never operate the device under overvoltage conditions. Strictly adhere to the specified DC 12–36 V power supply range. Do not connect the device to high-voltage AC power or DC power exceeding 36 V. Prolonged overvoltage will burn out the internal isolation circuitry and signal conditioning chips, causing permanent damage to the device.

Avoid layouts prone to high-voltage interference. Signal control cables must not be routed in the same cable tray or conduit as high-voltage power lines, variable frequency cables, or motor control cables. Separate high-voltage and low-voltage circuits, maintain safe distances, and minimize electromagnetic coupling interference.

2. Do not use excessive force when opening or closing the structure. The magnetic ring latch is a precision magnetic circuit component; do not forcefully pry, strike, or squeeze it. If the magnetic ring does not close tightly, measurement accuracy will be directly reduced, and prolonged misalignment will cause data errors to continuously increase.

3. Protective measures for humid environments: In high-humidity areas such as pump rooms, chemical processing zones, and outdoor enclosures, ensure that distribution cabinets are sealed to prevent dust and moisture ingress. Avoid direct contact of equipment with water vapor or condensation. If necessary, install dehumidification devices inside the cabinet to prevent terminal oxidation and short circuits caused by moisture on circuit boards.

4. Do not operate the device beyond its rated range for extended periods. If the selected range is insufficient, do not force the device to monitor at currents exceeding its rated capacity for long periods. Prolonged overloading will cause magnetic circuit saturation and loss of linearity, shortening the device's service life.

5. Unauthorized disassembly or modification is strictly prohibited. The device features an internal isolation structure sealed with potting compound. Non-professionals must not disassemble the housing or alter the circuitry. Unauthorized modifications will compromise the three-terminal isolation performance, eliminate electrical safety protection, and immediately void the product warranty.

VII. Recommendations for Daily Use & Operation and Maintenance

Compatible Models: Qidian QD-7 / JXK-7 (blue housing, three-terminal isolation, open-loop Hall-effect AC/DC current transducers)

This document provides a step-by-step guide to practical inspection, maintenance, and servicing procedures designed to ensure the long-term stable operation of the equipment, extend its service life, and reduce the likelihood of failures.

7.1 Key Points for Daily Inspections

1. Power Supply and Operating Status Check: Although this series does not have a dedicated power indicator light, the device's operating status can be determined by its output signal: Under no-load conditions, the output signal should be stable and correspond to the zero-point value (e.g., 4 mA/0 V). Under load, the output should vary linearly with current; normal operation is indicated by the absence of a fixed saturation value or persistent fluctuations. If the output signal shows no change at all, or the value remains at full scale or the lower limit for an extended period, prioritize checking the power supply circuit and terminal block status.

2. Signal Stability Monitoring: During routine inspections, verify the transmitter's output signal using a PLC, DCS, or handheld signal analyzer to ensure there are no periodic fluctuations, jumps, or abnormal drifts in the data. Pay particular attention to signal changes during the start-up and shutdown of variable frequency drives (VFDs) and high-power motors. If significant jumps occur, investigate potential sources of strong interference and verify that shielding and grounding are properly implemented.

3. Monitor the installation environment's temperature and humidity. Check the ambient conditions at the installation site during routine inspections. The operating temperature must be maintained within the range of -10°C to +70°C, with no condensation, excessive heat, or freezing. Humidity should be kept between 10% and 90% RH without condensation. Ensure there is no standing water or moisture accumulation inside the distribution cabinet to prevent terminal oxidation and circuit board moisture damage.

4. Inspect the exterior of the device: ensure the blue housing has no cracks or deformation; check that the snap-on magnetic ring latches are secure and properly aligned, with the magnetic ring closing tightly without gaps; verify that terminal blocks show no oxidation or burn marks, and that wiring is secure with no loosening, overheating, or discoloration; confirm that the device is installed without wobbling or displacement.

5. Inspect the cables and wiring: Ensure that power cables are not compressed or rubbing against the transmitter's magnetic ring; signal and control wires are free of damage or aging; high- and low-voltage lines are not crossed or tangled; shielded wires are not exposed or damaged; and grounding terminals are secure and free of corrosion.

7.2. Regular Maintenance Plan

1. Cleaning Frequency and Method: Perform a visual cleaning of the equipment once every quarter. Use a dry, soft-bristled brush or compressed air to remove dust from the housing surface, gaps in the magnetic rings, and terminal blocks. Do not use wet cloths or cleaning agents to wipe the equipment directly, to prevent moisture from entering the terminal blocks and internal circuits. In dusty environments such as metallurgical or chemical workshops, cleaning frequency may be increased to once a month.

2. Wiring Tightness Inspection: Tighten all terminal blocks every six months, including power terminals, signal output terminals, and ground terminals. Re-crimp any loose cold-pressed terminals and inspect wire lugs for oxidation or loose connections. In environments with severe vibration (such as metallurgical conveyor lines), it is recommended to tighten terminals quarterly to prevent signal interruption or equipment damage caused by loose terminals.

3. Accuracy Retesting and Calibration: Conduct an accuracy retest on the transmitter every 12 months using a standard current source or load-bearing calibration equipment to verify that the zero-point and full-scale outputs meet the rated accuracy. If the deviation exceeds 0.5% F.S., perform on-site calibration using the transmitter's built-in zero-point/full-scale fine-tuning potentiometers, and document the results for archiving. For critical process monitoring applications, it is recommended to perform re-testing every 6 months.

4. Magnetic Circuit Inspection: Conduct a comprehensive inspection of the closure of the split magnetic ring once a year to ensure that the latches show no signs of wear or breakage and that the upper and lower halves of the magnetic ring fit together perfectly without any gaps. If the magnetic ring is found to be improperly closed, re-secure it and adjust its position to prevent a decline in measurement accuracy caused by magnetic leakage.

5. Random Isolation Performance Testing: For transmitters used in critical safety circuits, conduct random isolation withstand voltage tests every 2–3 years. Use a withstand voltage tester to test the insulation performance between input–output, input–power supply, and output–power supply according to the 2.5 kV/50 Hz/1 min standard to ensure effective three-terminal isolation protection. Replace any equipment that fails to meet the standard promptly.

7.3, Long-Term Maintenance Tips

1. Optimize dust and moisture protection: When installing equipment inside a distribution cabinet, ensure the cabinet is properly sealed and install dust filters and dehumidifiers to prevent dust and moisture from entering. In high-humidity environments (such as pump rooms or chemical workshops), place desiccants around the equipment or select custom versions with moisture-resistant coatings. Install insulated dust covers on terminal blocks to prevent oxidation and short circuits.

2. Long-Term Optimization for Interference Resistance: Use two-core shielded cables for all signal control lines; ground the shield only at a single point on the control system side, leaving the transmitter end floating. Separate high- and low-voltage circuits; avoid routing them in the same conduit or cable tray as power cables. If necessary, install signal isolators or ferrite ring filters to further suppress electromagnetic interference. Keep a safe installation distance from high-EMF equipment such as variable frequency drives and contactors.

3. Protective measures for extreme environments: In high-temperature environments, ensure adequate ventilation around the equipment, avoid direct sunlight and enclosed, stuffy conditions, and install cooling fans if necessary; in low-temperature environments, avoid prolonged exposure of the equipment to temperatures below -25°C; consider using a wide-temperature version or installing insulation inside the enclosure; Outdoor enclosures must be designed to protect against rain, intense sunlight, and condensation; avoid installing the equipment directly on the inner walls of the enclosure where condensation is likely to form.

4. Load and operating condition adaptation and maintenance: Avoid prolonged operation of the equipment at currents exceeding the rated value. Regularly verify the actual current of the measured equipment against the transmitter's measurement range; if operating conditions change, promptly replace the transmitter with one of an appropriate range; Avoid frequent opening and closing of the magnetic ring to reduce wear on the magnetic circuit; do not disassemble the opening/closing mechanism unless necessary for maintenance or repair.

5. Spare Parts and Data Management: For critical monitoring circuits, it is recommended to keep a spare transmitter of the same model on hand for quick replacement in case of failure; establish an equipment operation and maintenance log to record the dates and data of each inspection, maintenance, and calibration, facilitating tracking of equipment operating status and early prediction of potential failures.

VIII. Troubleshooting & Emergency Response

Compatible Models: Qidian QD-7 / JXK-7 (blue housing, 3-terminal isolated, open-loop Hall-effect AC/DC current transducers)

This document provides comprehensive written instructions to help field personnel quickly identify faults, resolve issues independently, and minimize downtime losses.

8.1 List of Common Faults

--- The transmitter has no signal output; no standard signal is output under either no-load or loaded conditions, and the downstream PLC/DCS cannot acquire valid data

--- Signal drift or zero-point offset; output is not zero or 4 mA under no-load conditions; data deviates significantly from actual current under loaded conditions

---The output signal remains saturated, consistently staying at the full-scale upper limit, and does not vary with changes in the measured current

---Signal interference and distortion, with frequent data fluctuations and periodic noise interference

---Abnormal equipment operation, such as excessive heat in the housing, discoloration of the terminal block, or unusual internal noises

---Failure of the magnetic ring closure; the snap-on latch fails to engage or does not close securely, affecting the stability of the magnetic circuit

8.2 Analysis of Failure Causes

1. Wiring errors: Reversed power supply polarity, reversed signal output terminals, short circuit between power and signal circuits, both ends of the shielding wire grounded, loose or faulty terminal connections

2. Power supply abnormalities: Supply voltage outside the DC 12V–36V range, excessive voltage fluctuations, open circuit in the power supply, insufficient power supply

3. Signal Overload Issues: Measured current exceeds the transmitter's rated range; prolonged overload operation leading to magnetic circuit saturation

4. Environmental Interference Issues: Co-routing of high- and low-voltage cables in the same conduit; proximity to strong interference sources such as inverters or high-power equipment; severe electromagnetic pulse interference at the site

5. Equipment Damage Issues: Internal isolation circuit burnout; damaged Hall effect sensors; moisture-induced short circuits on the circuit board; broken magnetic ring latches; failed potting compound sealing

8.3 Step-by-Step Troubleshooting

Fault 1: Transmitter has no signal output

Check the power supply circuit. Use a multimeter to measure the voltage at the transmitter's power terminals to confirm that the 12–36 V DC supply is normal and that there are no open circuits or loose connections. If the voltage is abnormal, inspect the power supply, circuit breaker, and power cables

Verify wiring polarity to ensure the power supply positive and negative terminals and signal output terminals are not reversed. Confirm that terminals are securely crimped and free of oxidation or burn marks. Recrimp loose terminals and replace damaged cables.

Check the output circuit load: for current-output transmitters, ensure the load resistance is ≤600Ω; for voltage-output transmitters, ensure the internal resistance of the downstream equipment is matched and there are no open circuits. Disconnect the downstream equipment and use a multimeter to measure the transmitter's output terminals directly to determine if the fault lies with the downstream equipment.

Emergency procedure: If there is still no output after confirming that the wiring and power supply are correct, determine that it is a hardware failure of the device, immediately replace it with a spare transmitter, and restore system operation.

Fault 2: Signal Drift / Zero-Point Offset

Check the no-load condition: disconnect the load from the device under test and use a multimeter to measure the output signal to verify if the zero point is stable. If the signal is too high or too low under no-load conditions, prioritize checking for power supply ripple and grounding issues.

Inspect the shield grounding: confirm that the signal shield is grounded at a single point on the control system side only, with the transmitter end left floating. If both ends are grounded, immediately rectify this to single-end grounding to eliminate loop current interference.

Perform on-site calibration and adjustment: Use a flathead screwdriver to fine-tune the zero-point potentiometer on the transmitter to correct the no-load deviation. If the deviation is significant, simultaneously check the full-scale potentiometer to avoid overcorrection in a single adjustment.

Handling long-term drift: If drift persists after calibration, inspect the temperature and humidity of the equipment's installation environment to rule out temperature drift caused by condensation or high temperatures. Replace the transmitter with a wide-temperature version if necessary.

Fault 3: Output signal remains saturated

Verify the measured current. Use a clamp meter to measure the actual current in the power cable and confirm whether it exceeds the transmitter's rated range. If the actual current exceeds the range, replace the transmitter with a higher-capacity model.

Check the installation of the ferrite ring to ensure it is fully engaged with no gaps, and that the cable passes through the center of the ring without any offset or compression; re-engage the ferrite ring to ensure the magnetic circuit is tightly closed

Troubleshoot the signal loop to confirm that the output terminals are not shorted, are not shorted to the power supply, and that no internal short circuits in downstream equipment are pulling the output signal to the upper limit; disconnect the downstream equipment and measure the transmitter's output directly to verify.

Hardware fault resolution: If saturation persists after ruling out the above issues, determine that the internal Hall element or amplification circuit is damaged, and replace the device directly.

Fault 4: Signal Interference/Distortion / Data Jitter

Check wiring standards to ensure signal control cables are not routed in the same conduit or cable tray as power cables or variable frequency drive cables; maintain a safe distance between high-voltage and low-voltage lines. Rewire if necessary to separate high-voltage and low-voltage lines.

Optimize shielding and grounding: Replace with two-core shielded control cables, ensuring the shield is grounded at a single point and is free of exposed or damaged sections. Check whether the grounding terminal is corroded or loose, and retighten the grounding terminal.

Keep the transmitter away from strong interference sources. Install the transmitter away from inverters, contactors, and high-frequency equipment. If necessary, install signal isolators or ferrite ring filters to suppress electromagnetic interference.

Inspect the equipment installation. Ensure the transmitter housing is undamaged and that the ferrite ring is closed without gaps to prevent signal fluctuations caused by magnetic leakage. Re-secure the ferrite ring and adjust the cable position to center it.

Fault 5: Abnormal Equipment Heating / Discoloration of Terminals

Check the supply voltage to ensure it does not exceed 36 V DC and that there is no prolonged overvoltage. If the voltage is too high, immediately replace the power supply to prevent internal circuit burnout.

Inspect the terminal blocks to ensure there are no loose connections or oxidation, and that no high currents are passing through the signal terminals. Re-crimp the terminals, treat oxidized contact surfaces, and replace damaged terminal blocks.

Verify the load and operating conditions to ensure the measured current has not been operating outside the range for an extended period, and that the device is not exposed to high-temperature heat sources. Adjust the installation location to avoid direct sunlight and enclosed, stuffy environments.

Safety Precautions: If the housing temperature is excessively high or the terminal blocks show severe discoloration, immediately disconnect the power and stop using the device to prevent short circuits or fires. Replace the device with a new one.

Fault 6: Magnetic Ring Latch Broken / Incomplete Closure

Inspect the latch condition to confirm whether the hinged latch is broken or worn; replace with a latch of the same specification for minor wear; replace the transmitter directly if the latch is severely broken

Adjust the magnetic ring installation: When snapping the magnetic ring into place, ensure the upper and lower halves are fully aligned with no misalignment or pinching; avoid forcefully prying the latch to minimize wear on the magnetic circuit.

Emergency Procedure: For temporary use, secure the magnetic ring with electrical tape, but replace the device as soon as possible to prevent a continuous decline in measurement accuracy due to magnetic leakage.

8.4 After-Sales Repair Guidelines

1. Criteria for Determining a Malfunction

If, after following the troubleshooting steps above, the device still does not produce a normal output, the signal remains abnormal, or there is hardware damage or severe overheating, the device is deemed defective and you must contact after-sales service for repair.

Devices that have not been damaged by human error and are still within the warranty period are eligible for free warranty service. Malfunctions caused by disassembly, unauthorized modification, overpressure/over-range use, or installation in non-compliant environments are not covered by the warranty.

2. Repair Process

Step 1: Gather device information, including model number (QD-7/JXK-7), specifications, purchase date, installation and usage environment, and details of the malfunction.

Step 2: Contact the relevant sales channel or official after-sales service, submit the device information and description of the malfunction, and request after-sales support.

Step 3: Follow the after-sales instructions to provide photos of the device, wiring diagrams, and test data to assist technicians with remote diagnosis.

Step 4: Based on the diagnostic results, follow the procedure to request repair or replacement services, and return the faulty equipment as required (if applicable)

3. Contact Information and Warranty Coverage

Warranty Period: Standard products are covered by a 12-month warranty starting from the date of purchase

Warranty Coverage: During the warranty period, faults resulting from non-human-induced damage under normal usage conditions are eligible for free repair or replacement services

Contact Information: Report repairs and seek technical support through your point of purchase, the official website's customer service, or the designated after-sales service hotline

Important Notes

Do not disassemble or modify the equipment on your own; unauthorized disassembly will immediately void the warranty

Before returning the equipment, disconnect the power supply, remove all wiring, and ensure it is securely packaged to prevent further damage during transit

For critical production circuits, we recommend preparing a spare unit of the same model in advance to minimize downtime losses during the repair period