JXK-7C OPen Loop Hall AC/DC Current Transducer

I. Product Overview

1.1 Product Introduction

The JXK-7C Hall-Effect Open-Loop AC/DC Current Transmitter is an industrial-grade current detection module designed based on the Hall effect principle.

Featuring an open-core design, the product enables online detection of AC, DC, and pulse current signals without the need to remove existing cables or disconnect the main circuit.

Through a high-performance Hall effect sensor chip and signal conditioning circuitry, it converts high primary-side currents into standard industrial analog output signals,

enabling:

- Current monitoring
- Data acquisition
- Automated control
- Fault protection
- Energy consumption analysis

The product is widely used in:

- Industrial automation control systems
- New energy equipment
- Variable frequency drive systems
- Power supply equipment
- Welding equipment
- Electrochemical equipment
- Motor drive systems

The JXK-7C supports current detection in the range of 10 A to 1,200 A and provides industrial-standard output formats such as 4–20 mA, 0–10 V, and RS-485.

II. Product Features

2.1 Open-type design for easier installation

Traditional current detection method:

Shut down the system

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Disconnect the wiring

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Install the sensor

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Reconnect the wiring

JXK-7C:

Open the sensor

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Insert the cable/busbar

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Lock the mechanism

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Completion of detection

Advantages:

- No downtime required
- No need to disconnect wires
- Reduced installation costs
- Ideal for equipment retrofit projects

2.2 AC/DC Bidirectional Detection

Based on Hall-effect detection technology:

Measurable:

Signal Type	Supported
DC Current	√
AC Current	√
Pulsed Current	√
Non-sinusoidal Current	√

Suitable for complex industrial current environments.

2.3 Electrical Isolation Safety Design

Implementation:

Primary high-voltage, high-current side

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Hall-effect isolation detection

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Secondary low-voltage control signal

Features:

- Input-output isolation
- Prevents damage to the control system
- Enhances equipment safety

2.4 Standard Industrial Signal Outputs

Supported:

Output Type	Application
4–20 mA	PLC/DCS industrial control
0–20 mA	Data acquisition
0–5 V	Analog input
0–10 V	Control systems
RS-485	Digital communication

III. Working Principle

3.1 Hall Effect Detection Principle

When primary-side current flows through the magnetic core: The primary current being measured passes through the magnetic-concentrating core, establishing a magnetic circuit excitation source.

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Magnetic field generation: The current-carrying conductor generates a magnetic field, and the magnetic core concentrates the magnetic flux; the magnetic field strength is linearly proportional to the measured current.

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Hall Sensor Detects Magnetic Field Changes: The Hall element captures real-time changes in magnetic flux within the air gap of the magnetic core.

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Conversion to a Voltage Signal: Based on the Hall effect, the physical quantity of the magnetic field is converted into a weak Hall voltage.

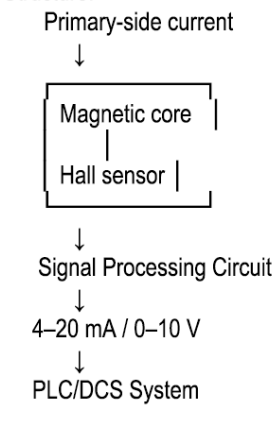
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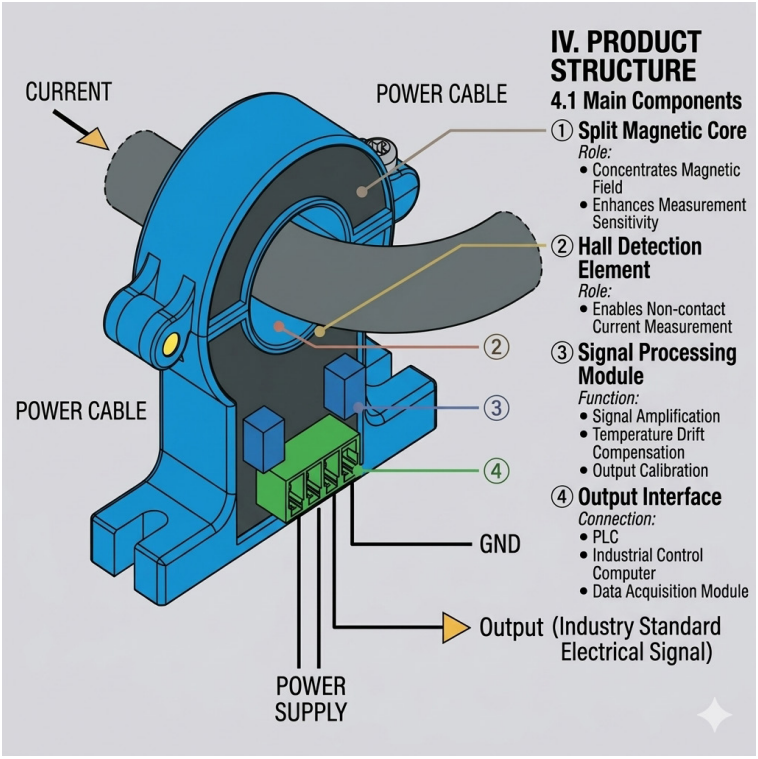
Signal Amplification and Processing: The back-end conditioning circuit amplifies, filters, and performs error compensation on the weak voltage signal.

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Output of Standard Analog Signals: After calibration, the signal is output as an industrially standardized analog current or voltage signal.

Structure:





V. Technical Specifications

5.1 Basic Specifications

Product Model:	JXK-7C
Measurement Method:	Open-Loop Hall Effect Detection
Measurement Type:	AC/DC Current
Input Range:	10A–1200A
Output Signal:	4–20mA / 0–20mA / 0–5V / 0–10V / RS485
Power Supply:	12–32V DC (standard: 24V DC)
Sensing Aperture:	Φ12.5 / Φ20 / Φ35 / Φ45 / Φ55 / Φ72 / Φ75 mm
Frequency Response:	DC–20 kHz
Response Time:	≤100 ms
Accuracy Class:	±0.5% FS
Linearity:	≤0.5% FS
Isolation Withstand Voltage:	2500 VAC/min
Operating Temperature:	–20°C to +70°C
Storage Temperature:	–25°C to +85°C

VI. Model Selection

6.1 Product Model Conventions

JXK-7C-XXX-Y

Example:
JXK-7C-AC500A-4-20mA

Indicates:
AC500A input
4–20 mA output

6.2 Common Specifications

Model	Input Range	Output
JXK-7C-100	0–100 A	4–20 mA
JXK-7C-300	0–300 A	4–20 mA
JXK-7C-500	0–500 A	4–20 mA
JXK-7C-1000	0–1000 A	4–20 mA
JXK-7C-1200	0–1200 A	4–20 mA

Support:
Customizable input range
Customizable output format
Customizable enclosure design

Core Value:
The JXK-7C open-loop Hall-effect current transmitter with direct wiring output offers a cost-effective, isolated current acquisition solution. It features non-contact measurement and complete isolation between high- and low-voltage circuits; its pre-wired design eliminates the need for on-site wiring, enabling faster and more reliable assembly; and it includes built-in temperature compensation and filtering to adapt to complex industrial environments. Balancing measurement stability with cost efficiency, it is ideal for mass production applications in energy storage, variable-frequency drives, and charging stations, enhancing overall system reliability while reducing production and after-sales costs.

Challenges & Solutions

Challenge 1: What if shunt resistors lack electrical isolation, posing high-voltage safety risks?
Solution 1: Magnetic isolation enables non-contact sampling, blocking high-voltage intrusion and protecting downstream industrial control equipment.

Question 2: Terminal-style connectors are cumbersome to wire and prone to loose connections and failures in vibrating environments.
Answer 2: The pre-wired, straight-out design reduces connection points, ensuring a more stable and reliable connection.

Question 3: Does the sensor drift significantly and cause measurement inaccuracies under large temperature differences?
Answer 3: A built-in temperature compensation circuit ensures stable measurement values across a wide temperature range.

Question 4: Closed-loop Hall sensors are too expensive, and the project budget is limited?
Answer 4: A simplified open-loop architecture meets industrial control accuracy requirements while significantly reducing procurement costs.

Question 5: Internal equipment space is limited, making sensor installation difficult?
Answer 5: A compact through-hole design with a small footprint facilitates integration inside the equipment.

Question 6: Is there strong industrial electromagnetic interference causing signal fluctuations that trigger false trips?
Answer 6: Magnetic shielding combined with built-in filtering ensures a stable output signal, preventing system malfunctions.

Question 7: Does shunt sampling cause significant heat loss and accelerate component aging?
Answer 7: Non-contact measurement consumes virtually no power, extending the service life of the entire unit.

Question 8: Do you need to detect multiple types of current, including AC, DC, and pulsed currents?
Answer 8: A single model compatible with AC, DC, and pulsed currents simplifies product selection and spare parts management.

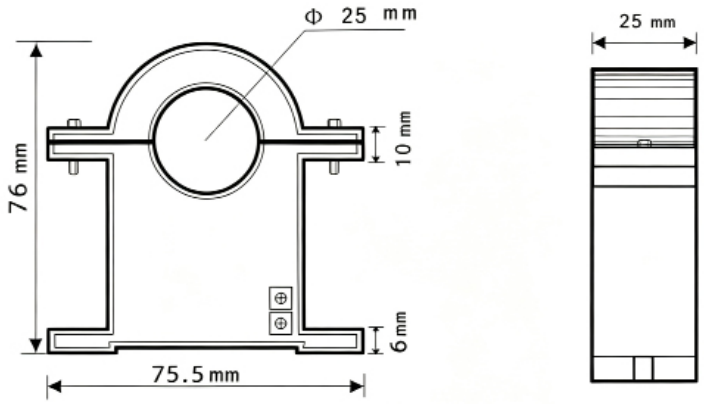
Question 9: Are there many assembly steps in mass production, resulting in low production efficiency?
Answer 9: Pre-wired units reduce assembly time and improve mass production efficiency.

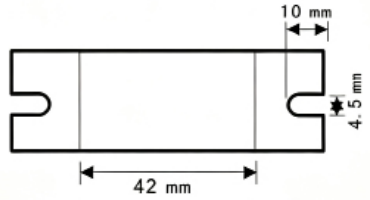
Question 10: Are there frequent wiring faults, leading to high post-sales maintenance costs?
Answer 10: Fewer potential wiring failure points reduce the costs of troubleshooting and maintenance.

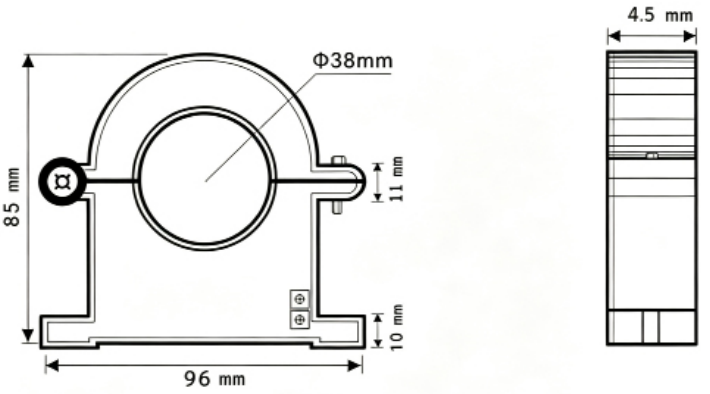
Installation Method: Through-hole installation, secured with screws; the busbar passes directly through the mounting holes for easy assembly.

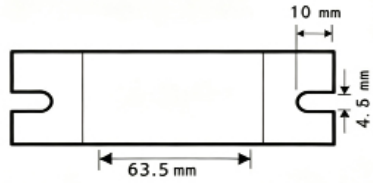
Weight: Approximately 110 g (unit only); approximately 140 g including standard cables.

Housing Material and Protection Details: UL94-V0 flame-retardant ABS housing; IP40 protection rating for use inside cabinets; cable exit ports are equipped with rubber cable boots that prevent kinking, resist abrasion, and provide shock and pull resistance.









VII. Installation Method

Installation Steps

Step 1: Open the Product Latches
Gently press the latches on both sides of the housing with both hands and lift the upper hinged magnetic core assembly upward. Use gentle force to avoid breaking the latches. Once opened, set it down carefully to prevent the magnetic core from being damaged by impact.

Step 2: Thread the Busbar or Cable Through the Test Opening
Gently place the busbar or cable to be tested into the semicircular groove of the lower magnetic core. Center the conductor and do not press it against the inner wall of the magnetic core; leave a small gap. Only a single cable should be threaded through at a time; do not thread multiple cables side by side.

Step 3 Close the Core
Align the contact surfaces of the upper and lower core halves, then gently snap the top cover into place. Ensure the core mating surfaces are fully flush with no gaps, as gaps will directly affect measurement accuracy.

Step 4 Secure the Screws
Snap the latches on both sides into place and tighten the positioning and locking screws to ensure the housing is completely secured with no play. This prevents core misalignment and measurement drift caused by equipment vibration. Use the appropriate torque when tightening; do not use excessive force that could strip the threads.

Step 5 Connect Power and Output
Follow the product's wiring specifications to connect the power supply and signal output cables in sequence. After wiring is complete, check the connections for firmness and ensure there are no short circuits or loose connections. Power on the device to begin current measurement.



VIII: Scenario-Based Selection Guide

Solve the problems of difficult selection and choosing the wrong model; quickly identify the right product

##Core Selection Criteria:

1. Signal Type: Determine whether the measured signal is DC, AC, or pulsed current to select the appropriate range and output signal
2. Number of Channels: For single-channel monitoring, select a standalone unit; for multi-channel monitoring, evaluate multi-channel solutions
3. Power Supply: Confirm the on-site supply voltage and match it to the transmitter's power specifications
4. Explosion-Proof Requirements: Use standard models in non-hazardous areas; explosion-proof models are mandatory in hazardous environments
5. Installation Environment: Assess temperature, dust, and electromagnetic interference; select a 25mm or 38mm mounting hole diameter based on the cable outer diameter

Industry-Specific Selection Recommendations:

Chemical Industry: For general electrical control applications, use the JXK-7C standard cutout model; for explosion-hazardous areas, use dedicated explosion-proof models that support retrofitting without shutdown.
Power Industry: For photovoltaic, energy storage, and power distribution cabinets, prioritize cutout-style products that allow for retrofitting without power interruption and support both AC and DC monitoring.
Metallurgy: In high-power variable-frequency environments with strong electromagnetic interference, select cutout transmitters with enhanced shielding and wide-temperature operation.
Pharmaceuticals: For control cabinets in cleanrooms, use economical, dust-proof standard models to meet routine monitoring requirements.
Smart Manufacturing: Choose the 25mm aperture for confined spaces; select the 38mm aperture open-close model for thick cables and high currents to facilitate future retrofitting and modifications.
New Energy Charging Stations: The open-close structure allows installation without power interruption and is used for DC current monitoring.

Common Selection Pitfalls

1. Neglecting isolation voltage rating, which poses safety hazards in high-voltage environments
2. Selecting a measurement range that is too large or too small, resulting in substandard measurement accuracy
3. Failing to verify the downstream load impedance, causing signal attenuation and fluctuations
4. Incorrectly using standard, general-purpose models in explosion-hazardous areas, leading to project acceptance failure
5. Failing to confirm the cable outer diameter, resulting in installation failure due to mismatched hole diameters
6. Selecting enclosed sensors for retrofit projects, requiring shutdown and power disconnection during installation

Customization Recommendations:

1. Special Signals: Custom ranges and output ratios available
2. Non-standard operating conditions: Customization supported for wide temperature ranges, high protection ratings, and special housing dimensions
3. Multi-channel data acquisition: Complete calibration solutions for multiple sensors provided
4. Special wiring harnesses: Customized extended cables and aviation connector interfaces available
5. Export projects: Versions compliant with overseas regulations and explosion-proof certifications provided upon request

Installation and Commissioning Guidelines
Core Objective: Standardize installation procedures, eliminate installation errors, ensure successful commissioning on the first attempt, and reduce on-site malfunctions.

Pre-Installation Preparation

1. Verify that the product model, cables, and accessories are complete;
2. Confirm that the on-site temperature, dust levels, and electromagnetic environment meet the operating standards for the cabinet.
3. Prepare a Phillips-head screwdriver, a multimeter, and insulated tools. Disconnect power before beginning work;
4. Never perform wiring while the equipment is energized to ensure personal and equipment safety.

Standard Installation Steps

1. Securely mount the equipment on the cabinet rails or mounting base plate, and tighten the mounting screws.
2. Strictly distinguish between power, signal input, and signal output lines to prevent incorrect or reversed connections.
3. Ensure the product's shielding layer is reliably grounded at a single point to reduce interference and guarantee stable signals and accurate measurements.

Key Wiring Guidelines

1. Follow the wiring diagram for the specific model strictly; clearly distinguish between positive and negative terminals and signal terminals.
2. Ground the shielded cable at only one end; do not ground both ends.
3. Follow the specific wiring requirements for standard power distribution and isolated types; do not mix wiring configurations.
4. Prevent loose connections, incorrect connections, and short circuits to avoid equipment damage and signal abnormalities.

Power-On and Commissioning Procedure

1. First, power on the device under no-load conditions and observe whether the operational indicator lights are functioning normally.
2. Use a multimeter to verify the output signal, checking the range and accuracy.
3. If there is only a slight data deviation, perform on-site fine-tuning and calibration. Only after confirming that the signal is linear and stable should the device be connected to the system for operation under load.

Installation Precautions

1. Never supply power exceeding the rated voltage to prevent equipment burnout.
2. Keep the device away from strong sources of interference, such as variable frequency drives and high-power cables.
3. Do not use the device in damp, condensation-prone, or unprotected outdoor environments.
4. Never pull on cables with excessive force or disassemble the housing without authorization to avoid damaging the equipment's insulation and internal circuitry.

Recommendations for Daily Use & Operation and Maintenance
Primary Objective: Reduce wear and tear, maintain long-term measurement stability, and extend the product's service life

Key Points for Daily Inspections

Regularly check that the output signal is stable and free of fluctuations;
Monitor the temperature and humidity inside the cabinet to avoid high temperatures and condensation;
Verify that the enclosure and cables show no signs of damage or aging.

Scheduled Maintenance Plan

Conduct routine maintenance on the cabinet environment every 6 months;
Clean dust from the enclosure surface; recheck that terminal blocks and cable entry points are secure;
Re-test measurement accuracy annually to ensure data accuracy.

Long-Term Maintenance Tips

Keep the control cabinet sealed to prevent dust and moisture ingress;
Route signal cables and power cables separately to reduce electromagnetic interference;
In high-temperature, high-humidity, or high-dust environments, it is recommended to install protective partitions and cooling devices.

Troubleshooting & Emergency Response
Core Objective: Quickly pinpoint faults, minimize downtime, and reduce production losses

List of Common Faults
No output signal; significant measurement drift or deviation; abnormal operational indicator lights; false system alarms; signal waveform jitter or distortion.

Analysis of Fault Causes
Reversed or loose positive/negative wiring;
Supply voltage exceeds or falls below specifications;
Measured current exceeds the measurement range;
Strong electromagnetic interference at the site;
Aged or damaged components.

Step-by-Step Troubleshooting
Step 1: Verify that the power supply is functioning normally;
Step 2: Recheck all wiring, shielding, and grounding;
Step 3: Investigate interference caused by high-power equipment on-site; perform a no-load test to verify output accuracy.
For temporary repairs, replace the sensor with a spare to quickly resume operation; if hardware damage is confirmed, follow the after-sales service procedure.

After-Sales Service Request Guidelines
If the fault persists after ruling out wiring, power supply, and external interference issues, you may submit an after-sales service request. When submitting the request, provide the model number, operating conditions, and fault symptoms; products within the warranty period are eligible for free maintenance and repair, but damage caused by human error or use exceeding specified operating conditions is not covered by the warranty.