GLG Signal Isolator

1. Product Definition

The GLG signal isolator is a standard signal processing module used in industrial automation systems for isolation, conversion, anti-interference, and power distribution of analog signals. It adopts a three-terminal fully isolated (input/output/power) design to cut off ground loops, suppress electromagnetic interference, protect downstream equipment, and stabilize the transmission of standard signals such as 4-20mA/0-10V. It is suitable for safe signal transmission between PLC/DCS, instruments, and field sensors.

2. Core Functions

2.1 Electrical Isolation

Completely severs the direct electrical connection between the input, output, and power supply, blocking ground potential differences, common-mode voltages, and ground loops to eliminate strong interference in industrial environments at its source.

2.2 Signal Conversion

Supports isolated conversion of standard signals such as 4-20mA and 0-10V, as well as one-to-one or one-to-two signal distribution. It standardizes signal specifications to adapt to different device interfaces, enabling lossless long-distance transmission.

2.3 Interference Suppression

Built-in filtering and isolation circuits suppress EMI, surges, and spike pulse interference caused by inverters, motors, and cable induction, ensuring signals remain stable without drift, jitter, or false triggering.

2.4 Power Distribution

Provides isolated 24V power supply for two-wire transmitters while simultaneously acquiring and isolating output signals, simplifying field

3. Operating Principle

3.1 Workflow:

Input: Receives raw current/voltage signals from sensors/transmitters

Isolation: Achieves signal transmission without electrical connection via optical or electromagnetic coupling

Processing: Filters, amplifies, and linearly calibrates to restore a clean, standard signal

Output: Outputs stable, interference-free standard signals to PLCs/DCS systems

3.2 Core Advantages of Three-Port Isolation:

Complete electrical independence between input, output, and power supply, with no mutual interference. Completely eliminates ground loop interference and prevents signal drift.High-voltage surges cannot propagate to the downstream circuit, protecting PLCs and I/O modules from breakdown. Meets isolation requirements for explosion-proof and safety barrier applications, ensuring higher reliability

4.Care Value

Stable Transmission:

Without an isolator: Signals are prone to interference, drift, and distortion;

With a GLG isolator: Signals remain accurate over long distances, ensuring stable and reliable data.

Equipment Protection:

Without an isolator: Lightning strikes, surges, and high-voltage crosstalk can easily damage PLCs and instruments;

With a GLG isolator: Three-terminal isolation blocks hazardous voltages, extending equipment lifespan.

Reduced Failures and Maintenance:

Without isolators: Complex grounding, difficult-to-troubleshoot interference, and systems prone to false triggering;

With GLG isolators: Strong interference resistance, simple wiring, and significantly reduced failure rates.

Compliance and Explosion-Proof Adaptability:

Without isolators: Unable to meet safety requirements in hazardous environments;

With GLG isolators: Meets industrial explosion-proof, safety, and system grounding standards, suitable for demanding environments such as chemical, power, and metallurgical industries.

I. Basic Electrical Parameters

Input Signal Types: 4–20 mA, 0–20 mA, 0–10 mA, 0–5 V, 0–10 V, 1–5 V (customizable)

Output Signal Types: 4–20 mA, 0–20 mA, 0–10 mA, 0–5 V, 0–10 V, 1–5 V (Customizable)

Channel: 1 In 1 Out / 1 In 2 Out / 1 In 3 Out / 1 In 4 Out / 2 In 2 Out / 2 In 4 Out

Load Capacity: Current Output: ≤500 Ω (4–20 mA)

Voltage Output: ≥10 kΩ (0–5 V/0–10 V)

Input Impedance: Current Input: ≤50 Ω

Voltage Input: ≥300 kΩ

Accuracy Class: 0.1% F.S. (Full Scale)

II. Isolation Performance Parameters

Dielectric Strength: 1500 V AC / 1 min (between input–output–power supply)

Insulation Resistance: ≥100 MΩ (between input–output–power supply)

Electromagnetic Compatibility: Compliant with IEC 61326-3 / GB/T 18268

Response Time: ≤10 ms (0–90%, typical)

Temperature Drift: 0.005% F.S./°C (-20°C to +55°C)

III. Power Supply & Power Consumption Parameters

Supply Voltage: DC 24V (typical), DC 12V, AC/DC 85–265V, AC 220V

Full-Load Power Consumption: Single-channel: ≤70mA @24V DC

Dual-channel: ≤120mA @24V DC

Power Distribution Output:24V DC, maximum drive current 45mA (for powering two-wire transmitters)

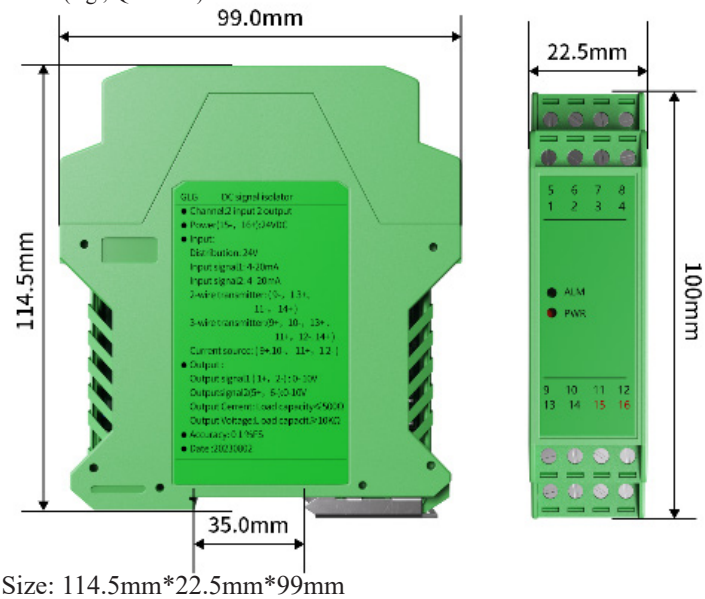
IV. Environmental Adaptation Parameters

Operating Temperature and Humidity: -20°C to +55°C; Humidity 5%–95% RH (non-condensing)

Storage Temperature and Humidity: -40°C to +85°C; Humidity 5%–95% RH (non-condensing)

Protection Rating:IP20 (DIN rail mounting)

Explosion-Proof / Safety Barrier Compatibility:Non-explosion-proof; for intrinsically safe applications, can be paired with Qidian QD-6000 series safety barriers (e.g., QD-6045)



Size: 114.5mm*22.5mm*99mm

Install: 35mm DIN Rail

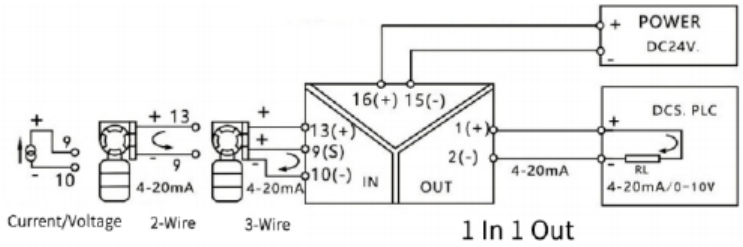
Indicator definitions: PWR (Power) / ALM (Alarm)

Chemical Industry—Reactor level/pressure monitoring, signal transmission for transmitters in hazardous areas, corrosive environments—GLG Standard Model + QD-6000 safety barrier combination—4–20 mA signal, high isolation, intrinsically safe explosion-proof compatibility, wide temperature range operation

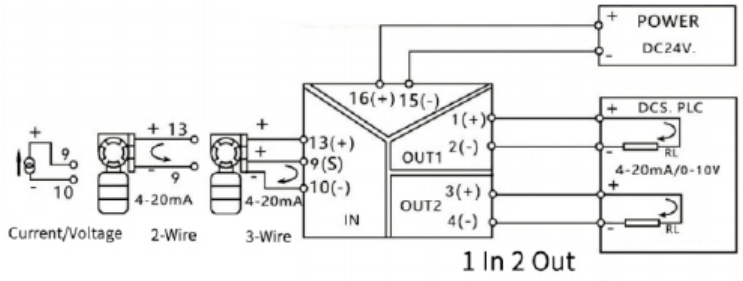
Power Industry - Current and voltage acquisition in substations, distribution cabinet monitoring, environments with strong electromagnetic interference - GLG 1-in-1-out/2-in-2-out - 0-10V/4-20mA conversion, high dielectric strength, IEC 61326-3 electromagnetic compatibility

Metallurgy Industry - Furnace and kiln temperature monitoring, rolling mill signal transmission, high-temperature and high-interference environments - GLG Wide Temperature Enhanced Model - Low temperature drift, strong anti-interference, high load capacity, high-temperature resistance

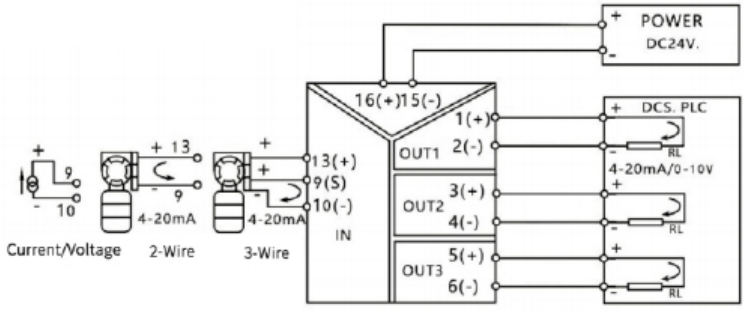
Pharmaceutical Industry - Cleanroom temperature and humidity data acquisition, signal isolation in sterile zones, high-precision measurement - GLG High-Precision Model - 0.1% FS accuracy, fast response, condensation-free adaptation, sanitary-grade conditions



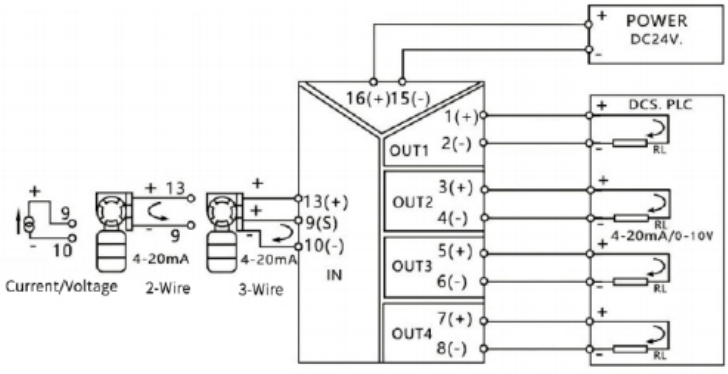
1 In 1 Out



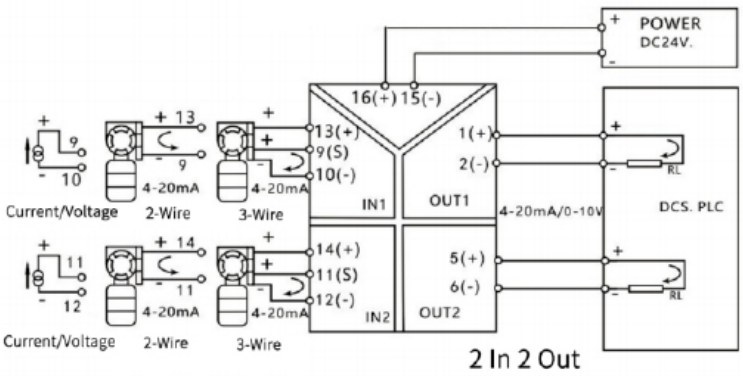
1 In 2 Out



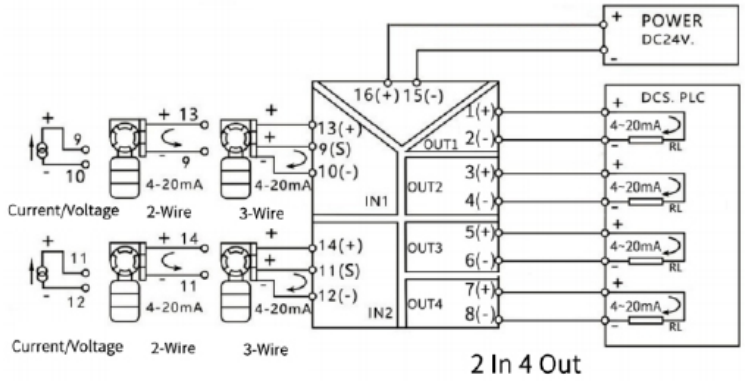
1 In 3 Out



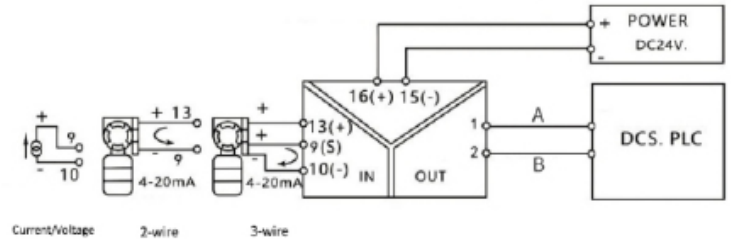
1 In 4 Out

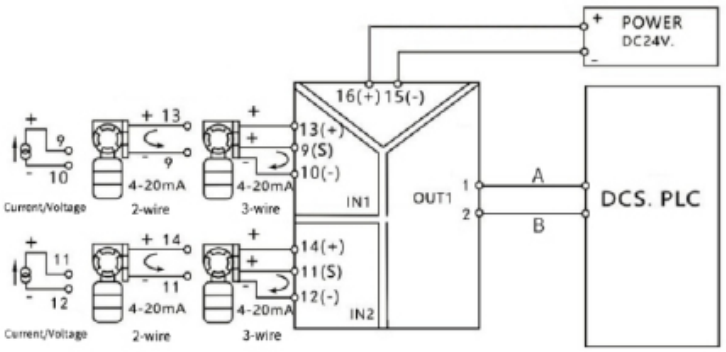


2 In 2 Out



2 In 4 Out





5: Installation and Commissioning Guidelines

We provide hands-on guidance for on-site construction, strictly control installation details, and minimize issues such as wiring faults, signal interference, and equipment burnout, adhering to the principles of safety, standardization, and efficiency throughout the process.

5.1 Pre-Installation Preparation

Component Verification

• Verify that the GLG isolator model, channel count, and signal specifications match the selection sheet; inspect for no physical damage or pin deformation

• Ensure all required accessories are available: 35mm standard DIN rail, rail mounting brackets, flame-retardant terminal blocks, shielded cables, and grounding wires

• For explosion-proof environments, additionally verify the safety barrier model and explosion-proof certification to ensure accessories are compliant and compatible

Environmental Inspection

• The installation area must be free of severe vibrations and strong corrosive gases, and must be located away from high-temperature heat sources and strong electromagnetic interference sources (such as variable frequency drives and high-voltage switchgear)

• Ambient temperature and humidity must comply with product specifications: operating temperature -20°C to +55°C, humidity 5% to 95% RH (non-condensing)

• Strictly adhere to explosion-proof work procedures in hazardous areas; work may only commence after the on-site power supply has been disconnected

Tool List

• Essential tools: Phillips screwdriver, wire strippers, crimping pliers, multimeter, torque wrench, voltage tester

• Auxiliary tools: Cable ties, label paper, anti-static wrist straps (required for high-precision/explosion-proof applications)

Safety Precautions

• Never connect wires or insert/remove modules while the system is energized; disconnect the power supply and verify absence of voltage before work begins

• Implement proper anti-static measures to prevent static discharge from damaging internal chips; unauthorized open flames and live-wire operations are strictly prohibited in explosion-proof zones

• Wiring personnel must be certified, familiar with electrical safety regulations, and maintain detailed work records

5.2 Standard Installation Procedure

Mounting the Rail

1. Securely mount the 35mm DIN rail horizontally inside the control cabinet, ensuring it is stable and does not wobble.

2. Slide the GLG isolator into the rail slots, snap the locking tabs into place, and leave a minimum of 5mm of space between modules for heat dissipation.

3. When installing multiple modules side-by-side, arrange them by power supply, input, and output zones to avoid mixing high-voltage and low-voltage circuits.

Wiring Specifications (Terminal Identification + Polarity)
- Power Terminals: Labeled V+/V- (24V DC). Strictly distinguish between positive and negative terminals; reverse connection is strictly prohibited. For wide-voltage models, identify the AC/DC common terminal.
- Input Terminals: Labeled IN+/IN-; connect to transmitter/instrument signal terminals; current signals in series, voltage signals in parallel
- Output Terminals: Labeled OUT+/OUT-; connect to PLC/recorder/actuator; signal type must match the input
- Power Distribution Modules: Connect to additional power distribution terminals to provide 24V DC power to two-wire transmitters; short circuits are strictly prohibited

Grounding Requirements
- Single-ended shield grounding: Ground the shield only on the control cabinet side; leave it floating on the field side to prevent loop current interference
- Connect the module's grounding terminal to the control cabinet's dedicated protective ground; grounding resistance must be ≤4Ω; mixing with power ground is strictly prohibited
- In explosion-proof environments, grounding must comply with intrinsically safe system grounding specifications; install a separate intrinsically safe grounding electrode

5.3 Power-On Debugging Procedure
1. No-Load Test: Connect the power supply and observe the module's indicator light. Under normal conditions, it should remain lit or flash slowly; there should be no flickering or overheating. Use a multimeter to verify that the supply voltage is stable at 24 V DC ±10%
2. Signal Verification: Connect a standard signal source (4mA/12mA/20mA) and use a multimeter to measure the output signal; an error of ≤0.1% FS is considered acceptable.
3. Indicator Light Status Interpretation: Green light steady = normal operation; red light flashing = power failure/signal overload/wiring error; off = no power supply/module damage.
4. Accuracy Calibration: The standard model is factory-calibrated and requires no on-site adjustment; for the high-precision model, if fine-tuning is required, adjust slowly using the dedicated potentiometer—do not forcefully turn it

5.4 Installation Precautions
• Never supply power at excessive voltage; do not connect to >30V DC or strong AC power to prevent module burnout
• Never route signal cables through the same conduit as power or high-voltage lines; keep them away from interference sources such as inverters and transformers
• In humid or condensation-prone environments, install moisture-proof heaters and sealed cable trays; do not allow the module to be directly exposed to moisture
• Never forcefully pull on terminals or install the module with excessive force to avoid damaging internal components

6: Recommendations for Daily Use and Maintenance
Conduct regular inspections and maintenance to extend the service life of the GLG isolator, ensure long-term stable signal transmission, and minimize downtime caused by malfunctions.

6.1 Key Points for Daily Inspections (Daily/Per-Shift Checks)
• Indicator Light Inspection: Visually inspect the status of the module's indicator lights to confirm there are no red warning lights or extinguished lights, and record any abnormal lighting conditions.
• Signal Stability Monitoring: View real-time data via the host computer or field instruments to ensure there are no signal jumps, drifts, or interruptions.
• Temperature and Humidity Monitoring: Ensure the module housing does not feel abnormally hot to the touch; verify that the temperature and humidity inside the control cabinet remain within normal ranges, with no condensation or unusual odors.
• For Explosion-Proof Environments: Additionally inspect the integrity of seals and wiring compartments to ensure there are no loose or damaged components.

6.2 Regular Maintenance Plan (Performed on a Scheduled Basis)
• Monthly Maintenance
Check the tightness of terminal connections and clean surface dust; verify signal fluctuation ranges and record data
• Quarterly Maintenance
Thoroughly clean the interior of the control cabinet; inspect the integrity of shielding cables and grounding wires; test load matching
• Annual Maintenance
Re-calibrate for accuracy; verify insulation resistance and dielectric strength; replace aged wiring and damaged components

6.3 Long-Term Maintenance Tips
• Dust and Moisture Protection: Install dust filters and sealing strips on the control cabinet; clean the filters regularly. During humid seasons, activate dehumidifiers to prevent condensation from corroding terminals.
• Interference Mitigation: Use double-shielded cables for signal lines; route high- and low-voltage cables in separate channels. Regularly inspect the control cabinet's grounding system.
• Protection Against Extreme Environments: Install cooling fans in high-temperature environments and thermal insulation in low-temperature environments; select corrosion-resistant enclosure modules for corrosive environments
• Avoid Frequent Power Cuts and Live Plugging/Unplugging to Reduce Module Stress and Wear

6.4 Parameter Backup & Adjustment
• Parameter Settings: For programmable GLG isolators, configure signal ranges and channel parameters using dedicated configuration software; strictly follow the manual and do not modify settings arbitrarily
• Parameter Backup: Export and archive configuration parameters, labeling them with model number, commissioning date, and operating conditions to facilitate rapid recovery in the event of a failure
• Adjustment Guidelines: Parameter modifications must be verified by two personnel; after modification, power the unit back on for verification and retain commissioning records; non-professionals are prohibited from adjusting internal parameters without authorization

7: Troubleshooting & Emergency Response
Quickly identify the root cause of faults and perform repairs independently to minimize downtime and reduce production losses, while accommodating both hands-on training for beginners and professional emergency response.

7.1 List of Common Faults (Sorted by Frequency of Occurrence)
- No Output/Signal Interruption: After the module is powered on, there is no current or voltage signal at the output terminal; the host computer displays a "line break" or "no data" message
- Signal Drift/Distortion: Significant data fluctuations, inaccurate readings, values outside the standard range, and errors exceeding 0.1% FS
- Indicator Light Abnormalities: Red light stays on or flashes, green light is off, or lights flash erratically; no normal operating status
- Alarm Triggered: Interlock system alarm, module overload protection, or explosion-proof safety barrier interlock alarm
- Interference/signal fluctuations: Data fluctuates wildly; noise caused by inverters or high-voltage equipment

7.2 In-depth Analysis of Fault Causes
- Wiring errors: Reversed polarity, loose or missing terminal connections, incorrect shield grounding, short circuits due to mixing of high- and low-voltage circuits
- Power supply abnormalities: Voltage too low or too high, significant power fluctuations, loose connections, power distribution circuit failures
- Signal Overload/Mismatch: Input signal out of range, load resistance exceeds specifications, incompatible signal types
- Environmental Interference/Operating Conditions Exceeding Limits: Strong electromagnetic interference, temperature and humidity exceeding limits, condensation corrosion, excessive vibration
- Hardware Damage: Electrostatic discharge, burnout due to overvoltage, aging failure, internal component failure

7.3 Step-by-Step Troubleshooting (Faults + Emergency Solutions)

Fault 1: No Output/Signal Interruption

1. Turn off power and verify absence of voltage. Check wiring at the power supply terminals V+/V-. Use a multimeter to verify that the supply voltage is 24V DC ±10%
2. Verify the polarity of the input/output terminals. Re-tighten the terminal screws to eliminate loose or reversed connections
3. Test for a standard signal at the input to rule out faults in the transmitter or upstream equipment
4. Workaround: Replace with a spare GLG module; temporarily short-circuit the signal loop (in non-explosion-proof environments) to quickly restore communication

Fault 2: Signal Drift/Distortion

1. Inspect the grounding system; correct issues such as both ends of shielded cables being grounded or mixed grounding with power lines
2. Verify load resistance: ensure current output is ≤500Ω and voltage output is ≥10kΩ
3. Clean dust from terminals, check for moisture, and improve the on-site temperature and humidity conditions
4. Contingency plan: Recalibrate the signal, route wiring away from interference sources, and replace shielded cables

Fault 3: Abnormal indicator lights

1. Green light off: Prioritize checking the power supply circuit; replace the power supply or repair broken connections
2. Red light flashing: Check for signal overload, terminal short circuits, or out-of-range inputs; disconnect the overloaded signal
3. Erratic flashing/dim light: Investigate static electricity interference or poor grounding; implement anti-static measures
4. Emergency procedure: Power off and restart the module; reset the circuit; if the issue persists, replace the component

Fault 4: Alarm Triggered

1. Immediately cut power and check for short circuits, overloads, or abnormal interlocks in the explosion-proof circuit
2. Verify that safety barrier configuration and explosion-proof grounding comply with regulations; eliminate safety hazards in hazardous chemical environments
3. Reset the alarm circuit, troubleshoot upstream equipment faults, and only restore power after confirming everything is normal
4. Emergency procedure: Do not reset the system yourself in explosion-proof environments; switch to the backup circuit and await professional intervention

Fault 5: Interference Noise/Signal Fluctuations

1. Organize wiring; route signal and power cables in separate channels or conduits, keeping them away from variable frequency drives and high-voltage switchgear
2. Optimize ground resistance to ensure it is ≤4Ω; use single-ended shielded grounding
3. Install ferrite cores and filter modules to enhance interference resistance
4. Emergency Procedure: Temporarily adjust the equipment's operating frequency and replace the cables with anti-interference ones to stabilize the signal

7.4 After-Sales Repair Guidelines

Fault Determination Criteria (Scenarios Requiring Repair)

- If the fault persists after troubleshooting wiring, power supply, and interference, confirm hardware damage
- Module overheating, unusual odors, scorched casing, or signs of burnout or breakdown
- Faults in explosion-proof or high-precision models that cannot be resolved by non-professionals
- Faults caused by non-human factors within the warranty period

Repair Process

1. Record the GLG module model, serial number, fault symptoms, and on-site conditions
2. Take photos of the fault, indicator light status, and wiring layout; retain debugging records
3. Contact the official after-sales service channel, submit the fault details, and obtain preliminary guidance
4. Follow after-sales instructions for factory repair or replacement of parts, and cooperate with acceptance testing and commissioning

Warranty Coverage

- Free repair or replacement for hardware failures caused by non-human factors or non-violation of operating procedures within the warranty period
- The following situations are not covered by the warranty: overvoltage supply, violent disassembly or reassembly, improper wiring, environmental conditions exceeding specifications, unauthorized disassembly or modification, and damage due to force majeure