Precisely perceive the world
Intelligently create value

PRODUCT MANUAL

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Precisely Perceive the World
Intelligently Create Value

CONTENTS

02

Electric Valve

HVS Electric Control Valve - Globe Valve

Product Overview

The HVS Electric Actuated Globe Valve is an automated valve that utilizes a linearly moving disc to alter the flow area between the disc and seat, thereby enabling continuous and precise regulation of fluid parameters (flow rate, pressure, temperature).

Due to its high-precision regulation and tight sealing characteristics, it is commonly used in high-temperature, high-pressure steam systems; high-pressure feedwater and boiler feedwater systems; critical processes in petrochemical and natural gas processing; precision chemical and pharmaceutical industries; heating networks; laboratories and test facilities; and other applications requiring tight sealing.

Product Advantages and Features

1. Multi-stage precision reduction mechanism with outstanding transmission accuracy, enabling high-precision positioning adjustments;
2. Adjustable range throughout the valve's full mechanical stroke, including opening/closing direction;
3. Supports linear/proportional adjustment modes to flexibly match diverse media characteristics and control curves;
4. Stable operation in environments from -20° C to 70° C, suitable for industrial plants, building HVAC systems, chemical pipelines, and other scenarios;
5. Utilizes stepper motors for precise step control;
6. Features built-in functional modules for seamless integration with building automation systems.
7. Dual indication via mechanical pointer and electronic display ensures both on-site visual monitoring and remote signal reading, providing dual safeguards for precise and traceable status tracking;
8. Dual-mechanism integrated fault signal output and indicator light alarm;
9. Supports 4-20mA, 0-10V analog signals, digital inputs/outputs, and Modbus control; optional infrared remote control (remote not included as standard);
10. Torque protection achieved through precise motor power control eliminates traditional mechanical switches, reducing failure points and mechanical wear while enhancing operational stability;
11. Electric-hydraulic technology delivers outstanding energy efficiency with high control precision and speed;
12. Compatible with cast iron, cast steel, and stainless steel valve bodies featuring equal percentage flow characteristics.

Technical Specifications

Categories	Parameter Details
Applicable Media	Chilled water, hot water, high-temperature hot water, saturated steam, thermal oil, clean water
Connection Method	Flange connection
Stroke	DN15~DN50: 20 mm, DN65~DN150: 40 mm
Communication Protocol	Modbus
Valve Body	Ductile iron, carbon steel, stainless steel
Valve Stem	Stainless steel
Valve Core, Valve Seat	Stainless steel
Sealing Components	Stainless steel FEPM (silicone-free)
Nominal Pressure	PN16/PN25
Media Temperature	-20~280° C
Leakage Rate	0~0.01%
Valve Flow Characteristics	Linear/Equal percentage
Communication Method	4-20mA current signal output/RS485/M-Bus

Model Selection

Example: HVS ① 100- DXX ② ③ M1 ④ I ⑤

① : Series name;

② : 100 denotes the standard model within this series, distinguishing it from custom models;

③ : D is nominal diameter. XX denotes the valve diameter value, with this model available in sizes ranging from DN15 to DN150;

④ : Represents communication protocol: M1 denotes Modbus protocol RS485 communication, M2 denotes M-Bus communication, C denotes current-type (4~20mA) communication, D denotes other protocols (e.g., LoRa/4G);

⑤ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HVB/A Electric Control Valve

Product Overview

HVB/A Electric Valves are fluid control devices capable of remote regulation and supporting local smart control. They not only enable valve opening and closing but also allow precise adjustment of valve opening, while supporting customized automatic control logic. These valves are widely used in water treatment and supply, petroleum, chemical and energy industries, industrial manufacturing, building environmental control, paper and pulp, food and pharmaceuticals, HVAC systems, and general industrial fluid control applications.

Product Advantages and Features

1. Compact structure, lightweight, high flow capacity (high CV value), minimal installation footprint, suitable for large-diameter piping systems;
2. High control accuracy and fast response speed, meeting stringent process parameter control requirements;
3. Strong adaptability, capable of handling complex conditions including high temperatures, high pressures, and corrosive media.Metal hard-seal models are also suitable for wear-resistant and high-temperature steam applications;
4. Polyester-coated valve body provides corrosion resistance for harsh environments;
5. Valve seat incorporates a specially designed molded-in O-ring, eliminating the need for additional gaskets during installation. Compatible with various flanges without requiring specialized butterfly valve flanges.

HVB Butterfly Valve

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1. Straight-through flow path design with flow resistance coefficient ⩽ 0.5, significantly lower than globe valves;
2. Full-stroke response time of 3-10 seconds, meeting high-precision rapid regulation requirements;
3. Suitable for complex operating conditions including high temperature, high pressure, and corrosive media;
4. W-shaped ball core shears particles and fibers in media, ideal for special fluids like slurries.
5. W-shaped ball core design delivers perfect equal percentage characteristics, preventing flow surges during valve opening;
6. Compact structure minimizes installation space; sealing surfaces and ball remain closed, resisting erosion by media;
7. Features intelligent functions including dual mechanical and electronic limit protection, over-temperature/over-pressure alarms, and automatic parameter adjustment;
8. Minimal contact area and low friction between ball and seat reduce erosion by media, ensuring extended service life;

HVA Ball Valve

Technical Parameters

Categories	Parameter Details
Applicable Media	Cold water, hot water, up to 50% ethylene glycol solution, certain refrigerants
Media Temperature	-20 ~ 120°C
Leakage Class	Bidirectional zero-leakage tight seal (gas tested)
Rated Pressure	PN16/PN25
Maximum Closing Differential Pressure	1600kPa/2500kPa
Rotation Angle	90°
Valve Body	Ductile iron/stainless steel
Valve Disc	Stainless steel
Valve Seat	EPDM/stainless steel
Valve Stem	Stainless steel
Communication Method	4-20mA current signal output/RS485/M-Bus
Power Supply Method	AC: AC220V (50/60Hz), AC380V; DC: DC24V (low-power models)
Regulation Accuracy	±1% (positioning accuracy); ±0.5% (high-precision custom models)
Output Torque	50N·m ~ 5000N·m
Nominal Diameter	Butterfly Valve: DN50~DN500, WWBall Valve: DN15 ~ DN300 (standard), DN300+ available upon request
Flow Characteristics	Equal Percentage Characteristic (mainstream), Linear Characteristic, Quick-Opening Characteristic

Model Selection

Example: HVS① 100-②DXX③ M1④ I⑤

① : Series name, where HVA denotes ball valves and HVB denotes butterfly valves;

② : 100 indicates the standard model within this series, distinct from custom models;

③ : D denotes the nominal diameter.XX represent the diameter value. XX denotes the diameter value. Ball valves are available in sizes ranging from DN15 to DN300, while butterfly valves are available from DN50 to DN500. Sizes outside this range require custom manufacturing.

④ : Represents communication protocol. M1 denotes Modbus protocol via RS485 communication.M2 denotes M-Bus communication.C denotes current-type (4~20mA) communication, D denotes other methods (e.g., LoRa/4G).

⑤ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HVA Electric Three-way Valve

Product Overview

The electric three-way valve is a regulating valve product specifically designed for diverting, merging, or switching the flow direction of media within industrial automation fluid control systems. By receiving 4-20mA analog or digital signals from control systems such as DCS or PLC, it achieves flow distribution, merging and mixing, or flow direction switching for two or three media streams, while enabling precise proportional adjustment of branch flow rates.

It is widely used in HVAC and building environmental control, industrial process control, energy equipment protection systems, fluid distribution, and process switching.

Based on the flow direction and function of the medium, electric three-way valves are primarily divided into two categories:

Combined-flow type(T-Type):Two media streams enter through separate inlets, are mixed via valve core adjustment, and exit through a single outlet. Suitable for media blending, temperature regulation(e.g., mixing hot and cold fluids for temperature control).

Diverter Type (L-Type):A single medium stream enters through the inlet, is distributed by the valve spool, and exits through two outlets. Suitable for scenarios such as medium diversion and pipeline branch switching (e.g., diverting fluid to different process sections).

Product Advantages and Features

1. Precise mixing ratios and flexible switching, with combined/split flow ratio adjustment accuracy of ±1%, supporting 0-100% continuous mixing; flow direction switching response time ⩽ 5 seconds for rapid pipeline process switching;
2. Integrated three-way valve body design eliminates additional piping connections, reducing system leakage points; straight-through/curved flow path design with flow resistance coefficient ⩽ 0.8 ensures low energy consumption;
3. Wide adjustable ratio and strong adaptability: standard models offer 50:1 ratio adjustment, with high-end models reaching 100:1; supports equal percentage/linear flow characteristics to accommodate diverse process control requirements;
4. High sealing integrity with zero leakage capability; wear-resistant and erosion-resistant valve core and seat ensure ⩾ 100,000 cycles service life;
5. Suitable for media including water, oil, steam, and acidic/alkaline solutions; High protection rating; Available in explosion-proof configuration; Suitable for hazardous and complex operating conditions;
6. Support Modbus/HART communication protocols and analog signals.

Technical Parameters

Categories	Parameter Details
Nominal Diameter (DN)	DN15 ~ DN300 (standard); DN300 and above available upon request
Nominal Pressure (PN)	PN16, PN25, PN40, PN64
Connection Method	Flange type (RF/RTJ), Welded type (Butt weld / Socket weld), Threaded type (small diameter)
Body Material	Carbon steel, Stainless steel, Duplex steel
Plug Structure	Ball core (converging/diverging), sleeve core, eccentric core
Sealing Type	Soft seal (PTFE/EPDM/PPL), hard seal (Stellite alloy spray welding)
Function Type	Converging type (T-pattern flow), diverging type (L-pattern flow)
Power Supply Type	AC: AC220V (50/60Hz), AC380V; DC: DC24V
Output Torque	50N・m ~ 3000N・m (Standard); Custom models up to 5000N・m
Control Signal	Analog Signal: 4-20mA, 0-10V; Digital Signal: RS485
Supported Protocols	Modbus, HART
Response Time	Full Stroke Time: 5~15 seconds (Depending on Nominal Diameter / Torque)
Protection Rating	IP65 (standard), IP67, IP68 (submersible)
Regulation Accuracy	±1% (standard); ±0.5% (high-precision custom models)
Flow Characteristics	Equal percentage characteristic, linear characteristic
Medium Type	Liquids: Water, oils, acid/alkali solutions, chemical slurries; Gases: Air, steam; Mixed media: Hot/cold fluid mixtures

Model Selection

Example: HVA ① 300 ② - DXX ③ M1 ④ T ⑤ I ⑥

① : Series name. ② : 300 is a standard model within the three-way valve range, distinct from custom-made variants.

③ : D denotes the nominal diameter.XX represent the diameter value. XX denotes the diameter value. Ball valves are available in sizes ranging from DN15 to DN300, while butterfly valves are available from DN50 to DN500. Sizes outside this range require custom manufacturing.

④ : Represents communication protocol. M1 denotes Modbus protocol via RS485 communication.M2 denotes M-Bus communication.C denotes current-type (4~20mA) communication, D denotes other methods (e.g., LoRa/4G).

⑤ : Indicates the valve structure type for three-way valves, where T denotes a T-type structure and L denotes an L-type structure.

⑥ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HVM Wired Remote Transmission Miniature Ball Valve

Product Overview

Wired Remote Control Miniature Ball Valve is a compact automated valve integrating a miniature electric actuator with a small-bore valve body. It enables remote control and status feedback via a wired communication link, primarily designed for precise regulation of low-flow media. This valve is widely compatible with smart home systems, HVAC, small-scale water treatment, and instrumentation support scenarios.

Product Advantages and Features

1. Wired transmission, Stability and interference resistance;
2. Low power consumption, easy system integration, reliable structure, and low maintenance costs;
3. Supports quick-connect functionality for convenient installation and replacement (optional);
4. RS485 wired remote transmission with Modbus communication protocol;
5. Features precision metal gears, compact size, 0-100% switchable at any angle, with 1% accuracy.

Technical Parameters

Categories	Parameter Details
Communication Methods	RS485
Operating Voltage	DC12-24V
Valve Service Life	100,000 cycles
Nominal Diameter	DN8/DN15/DN20/DN25/DN32/DN40
Valve Body Material	Brass
Opening Control	0-100%
Display (Optional)	LCD display/Mechanical position indicator + LED indicator
Valve Torque	3.5N · m ~ 4.5N · m
Power Consumption	Static <6mA, Dynamic <22mA
Medium Temperature	0-100°C
Ambient Temperature	-20-45°C

Model Selection

Example: HVM ① 100- DXX ② ③ M1 ④ I ⑤

① : Series name; ② : 100 denotes the standard model within this series, distinguishing it from custom models;
③ : D is nominal diameter. XX denotes the valve diameter value, with this model available in sizes ranging from DN15 to DN150;
④ : Represents communication protocol: M1 denotes Modbus protocol RS485 communication, M2 denotes M-Bus communication, C denotes current-type (4~20mA) communication, D denotes other protocols (e.g., LoRa/4G);
⑤ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HVM Wireless Remote Miniature Ball Valve

Product Overview

Wireless miniature ball valve is an intelligent valve integrating the valve body, electric actuator, and wireless communication module. It enables remote on/off control, position adjustment, and status feedback via wireless signals, eliminating the need for wiring to interface with control systems. This product overcomes the spatial constraints of wired connections and is widely used in fluid piping systems where wiring is difficult, in mobile scenarios, or for distributed control and management.

Product Advantages and Features

1. Flexible deployment with no wiring required, reducing construction costs;
2. Multi-protocol compatibility for easy integration and expansion, adapting to diverse application scenarios;
3. Precise control with high levels of intelligence;
4. Low power consumption and long battery life, suitable for unpowered environments;
5. Stable and reliable with environmental adaptability.

Technical Parameters

Categories	Parameter Details
Communication Methods	LoRa/LoRaWAN/4G
Operating Voltage	3.6V Lithium Battery
Valve Service Life	100,000 cycles
Nominal Diameter	DN8/DN15/DN20/DN25/DN32/DN40
Valve Body Material	Brass
Opening Control	0-100%
Display (Optional)	LCD Display/Mechanical Position Indicator
Valve Torque	3.5N · m ~ 4.5N · m
Power Consumption	Static 0mA, Dynamic <25mA
Medium Temperature	0-100°C
Ambient Temperature	-20-45°C

Model Selection

Example: HVM ① 100- DXX ② ③ D ④ I ⑤

① : Series name; ② : 100 denotes the standard model within this series, distinguishing it from custom models;
③ : D is nominal diameter. XX denotes the valve diameter value, with this model available in sizes ranging from DN15 to DN150;
④ : Represents communication protocol: M1 denotes Modbus protocol RS485 communication, M2 denotes M-Bus communication, C denotes current-type (4~20mA) communication, D denotes other protocols (e.g., LoRa/4G);
⑤ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HVI Solar Power Irrigation Valve

Product Overview

Solar-powered irrigation valves are wireless smart control valves specifically designed for modern agriculture, landscaping, and remote area irrigation. Utilizing solar power and wireless communication technology, they enable automated and precise management of irrigation systems, significantly reducing energy consumption and labor costs while enhancing water resource utilization efficiency. Suitable for various irrigation scenarios including grid-unconnected areas, large-scale farmlands, orchards, golf courses, and urban green spaces.

Product Advantages and Features

1. Solar-powered standalone system featuring 10-20W monocrystalline silicon solar panels with ⩾ 22% conversion efficiency. Capable of charging in low-light conditions. Built-in lithium-ion battery supports 7-15 days of continuous operation without sunlight when fully charged.
2. Low-power design with static current ⩽ 50μA. Automatically switches between photovoltaic and battery power modes.
3. Supports 4G/LoRaWAN wireless communication with a coverage range of 3-10km(Based on the communication method).
4. Real-time valve control via mobile app or computer web interface;
5. Compatible with soil moisture/rainfall sensors for intelligent “on-demand irrigation” decision-making;
6. Real-time feedback on valve status, battery level, and environmental parameters; supports historical data query and analysis;
7. Straight-through / Y-type flow channel design minimizes head loss with flow rate accuracy ⩽ ±5%;
8. Operating pressure: 0.2-10 bar (2-100m head), compatible with various irrigation systems;
9. Features overcurrent protection, overpressure protection, low-battery protection, short-circuit protection, and reverse-connection protection;
10. Automatically detects and reports faults such as valve sticking, communication errors, and low battery;
11. Equipped with a mechanical emergency switch for manual valve operation during power outages;
12. Supports OTA remote upgrades.

Technical Parameters

Categories	Parameter Details
Valve Material	UPVC and PP glass fiber reinforced
Housing Material	ABS material housing
Protection Rating	IP67 protection rating
Human-Machine Interaction Method	Bluetooth app for post-connection configuration parameter modification
PC Web-Based IoT Cloud Platform	Remote monitoring and modification of device operation data and control parameters
Mobile App Cloud Platform	Remote monitoring of device operation data and control parameters
Expandable Connectivity	Integration with electronic flow meters, pressure sensors, and soil moisture sensors
Supported Interfaces	1 digital input channel, 1 0-5V analog input channel, 1 RS485 interface (supports connection to dozens of devices)
Photovoltaic Panel	14V solar photovoltaic panel
Battery Type	Built-in rechargeable lithium battery pack
Remote Valve Control Matrix Topology	Real-time remote valve control grouping modification via Bluetooth app and cloud platform
Communication Method	LoRa/4G connectivity
Communication Protocol	Modbus communication, custom serial communication protocol
Remote OTA Upgrade	Remote wireless FOTA via Bluetooth, LoRa/4G

Model Selection

Example: HVI ① 100- ② DXX ③ D ④ P ⑤ I ⑥

① : Series name. ② : 300 is a standard model within the three-way valve range, distinct from custom-made variants.

③ : D denotes the nominal diameter.XX represent the diameter value. XX denotes the diameter value. Ball valves are available in sizes ranging from DN15 to DN300, while butterfly valves are available from DN50 to DN500. Sizes outside this range require custom manufacturing.

④ : Represents communication protocol. M1 denotes Modbus protocol via RS485 communication.M2 denotes M-Bus communication.C denotes current-type (4~20mA) communication, D denotes other methods (e.g., LoRa/4G).

⑤ : Indicates valve structure type, where P denotes a two-way valve, T denotes a T-type structure, and L denotes an L-type structure.

⑥ : Indicates device rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

03
Industrial Instruments

HPT series Miniature Type Pressure Transmitter

Product Overview

Miniature Type pressure transmitters are core sensing devices engineered for precision measurement and control in industrial automation. Integrating micro-sensing technology with intelligent signal processing, they utilize imported high-performance diffused silicon pressure sensors. Featuring an integrated cavity-free design, these lightweight units can be directly fitted into confined spaces such as pipe elbows and narrow equipment cavities, ensuring stable installation without additional brackets. Widely deployed across industries including petrochemicals, municipal water utilities, and power generation, it delivers efficient and reliable pressure monitoring solutions for complex operating conditions.

Product Advantages and Features

1. Features an integrated micro-structure design for compact dimensions and easy installation. Compatible with direct mounting on DN25 and larger pipes, supporting various mounting methods including brackets and flanges;
2. Wetted materials available in 316L stainless steel, Hastelloy C-276, or ceramic, offering resistance to strong acids and alkalis while meeting GMP hygiene standards for food and pharmaceutical industries. Protection rating reaches IP67/IP68;
3. Built-in multi-point temperature compensation algorithm maintains measurement accuracy within ±0.1%FS over -40° C to 85° C environments, with overload resistance up to 3 times rated pressure;
4. Self-diagnostic function automatically detects and alarms for sensor disconnection, over-range, and other anomalies; includes data retention during power loss;
5. High precision, fully stainless steel construction achieves measurement accuracy of ±0.1%FS;
6. Supports 4-20mA analog and RS485 digital signal outputs, compatible with HART 7.0 protocol. Seamlessly integrates with PLC, DCS systems, and industrial internet platforms for remote configuration and monitoring;
8. Customizable measurement ranges from 0 to 100MPa. Supports gauge pressure, absolute pressure, and differential pressure measurement types to accommodate diverse operational conditions.

Technical Parameters

Categories	Parameter Details
Measurement Type	Gauge Pressure, Absolute Pressure, Differential Pressure
Measurement Range	0~1 kPa to 0~100 MPa (customizable)
Accuracy Class	±0.1% FS, ±0.25% FS (multiple options available)
Medium Temperature	-40° C to 125° C (standard), -196° C to 200° C (custom)
Ambient Temperature	-40° C to +85° C (extreme low-temperature version adaptable to -60° C)
Protection Rating	IP67/IP68 (optional)
Explosion-Proof Rating	ExdIICT6 Ga, Ex iaIICT6 Ga (optional)
Output Signal	4~20mA, RS485 (Modbus), HART protocol (optional)
Power Supply	DC 24V
Wetted Materials	316L stainless steel, Hastelloy C-276, ceramic (optional)
Response Time	⩽ 1ms (fastest)
Overload Capacity	3 times rated pressure

Model Selection

Example: HPT ① 100- ② F ③ B ④ D ⑤ I ⑥

① : Series name;

② : Belongs to the standard series, distinct from custom types. 200: Armored; 300: Type 2088;

③ : Denotes communication method. V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : Represents threaded interface type: A: M27*2.0, B: M20*1.5, C: M14*1.5, D: M12*1.5, E: M10*1.0, G: G1/4, H: G1/2, I: 7/16UNF, J: 1/2NPT, K: 1/4NPT, L: 1/8NPT;

⑤ : Pressure range representatives: A: 6 kPa, B: 40 kPa, C: 250 kPa, D: 1 MPa, E: 1.6 MPa, F: 2.5 MPa, G: 10 MPa, H: 25 MPa, I: 35 MPa, J: 40 MPa, K: 60 MPa;

⑥ : Indicates equipment rating. C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HPT Series Intelligent Pressure Transmitter

Product Overview

The intelligent pressure transmitter is a new type of pressure measurement instrument based on microprocessor technology. It accurately collects gauge pressure, absolute pressure, or differential pressure signals from media such as gases, liquids, and steam, converting them into standard electrical or digital signal outputs. It also supports data communication, remote debugging, and fault diagnosis. Widely applied in petrochemical, power metallurgy, water treatment, and smart manufacturing sectors, it provides reliable data support for real-time process monitoring, quality control, and energy-saving optimization.

Flange connection

Threaded connection

Product Advantages and Features

1. Supports monocrystalline silicon and diffused silicon sensors with accuracy up to ±0.075% FS, enabling precise capture of minute pressure changes;
2. Strong overload resistance ensures reliable output even in harsh industrial environments involving extreme temperatures, vibration, and shock;
3. Supports communication protocols including HART and Modbus, with simultaneous 4-20mA analog and digital signal outputs. Compatible with traditional PLC/DCS/PLC analog input modules while enabling remote monitoring, parameter configuration, and data sharing via digital communication;
4. Integrates with industrial IoT platforms to upload pressure data to the cloud, enabling remote real-time monitoring, analysis, and decision-making;
5. Achieves IP67/IP68 protection rating, offering dustproof, waterproof, and corrosion-resistant performance suitable for humid, dusty, or corrosive environments;
6. Low-power and energy-efficient design enables battery operation, ideal for remote monitoring points without external power sources;
7. Features power-fail data retention, ensuring parameter integrity during outages and rapid recovery upon power restoration to maintain system continuity.

Technical Parameters

Categories	Parameter Details
Communication Methods	4-20mA/RS485
Supported Protocols	HART/Modbus
Measured Medium	Gases, liquids, oils, and other media compatible with wetted parts
Measuring Range	-0.1 to 0 to 0.001 to 60 MPa
Overload Capacity	1.5 times the full scale
Pressure Type	Gauge pressure, absolute pressure, or sealed reference pressure
Accuracy	(Min ±0.075% FS, Typ ±0.1% FS, ±0.2% FS, Max ±0.5% FS)
Long-Term Stability	±0.1% FS/year
Operating Temperature	-40~85°C
Power Supply	DC 24V
Output Signal	4~20mA (2-wire) 0~10/20mA (3-wire) 0/1~5/10V (3-wire) RS485 Communication
Load Resistance	⩽ (U-15)/0.02Ω ⩽ (U-15)/0.02Ω >5k
Material	Housing: Stainless steel, Diaphragm: Stainless steel 316L, “O” -ring: Fluorocarbon rubber or Nitrile rubber
Sealing Type	Fluorocarbon “O” -ring or fully welded
Protection Rating	IP65 (connector type), IP67 (cable gland type)

Model Selection

Example: HPT 200 - F B D I (① ② ③ ④ ⑥ ⑦) or HPT 300 - F DXX RF D I (① ② ③ ④ ⑤ ⑥ ⑦)

① : Series name;

② : Indicates standard series model (distinguished from custom models). 200: Threaded connection, 300: Flanged connection;

③ : Denotes communication method. V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : Represents threaded interface type, A: M27*2.0, B: M20*1.5, C: M14*1.5, D: M12*1.5, E: M10*1.0, G: G1/4, H: G1/2, I: 7/16UNF, J: 1/2NPT, K: 1/4NPT, L: 1/8NPT, DXX denotes flange interface specifications;

⑤ : FF: Full Face, RF: Raised Face, FM: Flat Face, M: Male Face, T: Tenon Face, G: Grooved Face, RJ: Ring Joint;

⑥ Represents pressure range: A: 6 kPa, B: 40 kPa, C: 250 kPa, D: 1 MPa, E: 1.6 MPa, F: 2.5 MPa, G: 10 MPa, H: 25 MPa, I: 35 MPa, J: 40 MPa, K: 60 MPa;

⑦ : Indicates equipment rating: C: Civilian grade; I: Industrial grade; E: Explosion-proof grade.

HPT Series Intelligent Differential Pressure Transmitter

Product Overview

The HPT Series Intelligent Differential Pressure Transmitter is specifically designed for precise measurement of differential pressure between two pressure points. By converting differential pressure values into standard industrial signals, it is applied in flow calculation, liquid level monitoring, filter condition monitoring, pipeline leak detection, and more.

Its applications are extremely diverse, with core functionalities categorized into three primary areas:Flow measurement,Level measurement and Pressure/Differential pressure process monitoring

Product Advantages and Features

1. Utilizes second-generation monocrystalline silicon composite sensors or capacitive sensors with optimized diaphragm structures, achieving measurement accuracy of ±0.075% and maintaining precise response even in low differential pressure scenarios;
2. Long-term stability exceeds 0.1%/year, reducing calibration frequency;
3. Robust environmental adaptability with IP67 protection rating and electromagnetic interference resistance;
4. Supports 4–20mA current signal output with superimposed HART digital signals, offering strong EMI resistance; select models can be customized with LoRaWAN communication;
5. Enables remote parameter configuration and calibration via HART, Modbus, and other protocols, eliminating on-site operation;
6. Built-in EEPROM non-volatile memory retains calibration data after power loss, with raw data recovery capability;
7. Maximum turndown ratio of 100:1 covers measurement needs from micro-differential pressure (0-1 kPa) to high-differential pressure (0-10 MPa);
8. Incorporates built-in temperature and pressure nonlinearity compensation algorithms to eliminate environmental impacts on measurements;
9. Monitors sensor, circuit, and communication status, triggering alarms within 100 milliseconds and storing fault information;
10. Isolation diaphragms utilize 316L stainless steel, Hastelloy, or tantalum materials for compatibility with corrosive media;
11. Stores critical measurement data and event logs for traceability and analysis.

Technical Parameters

Categories	Parameter Details
Measured Medium	Liquid, Gas, Vapor
Measuring Range	0~10MPa
Accuracy Class	±0.075%/±0.1%/±0.2%
Stability	±0.2% of full scale over 36 months
Turndown Ratio	40:1, supports 100:1
Environmental Adaptability	Temperature: -50° C to 85° C Humidity: 0~95% RH
Output Signal	4~20mA current signal, RS485 output
Communication Method	HART, Modbus, LoRaWAN
Structure and Materials	Housing: Aluminum alloy, 316L stainless steel Diaphragm: 316L stainless steel, Hastelloy C, Monel, Tantalum
Power Supply Method	DC24V
Connection Method	Flange: DN15-DN200, PN16-PN400 Thread: M20×1.5, 1/2NPT (optional)
Response Time	⩽ 60ms
Protection Rating	IP65/IP67

Model Selection

Example: HPT ① 400 ② - M ③ 00 ④ D ⑤ I ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Denotes communication method: V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : Default value, no specific meaning;

⑤ : Represents pressure range: A: 6kPa, B: 40kPa, C: 250kPa, D: 1MPa, E: 1.6MPa, F: 2.5MPa, G: 10MPa, H: 25MPa, I: 35MPa, J: 40MPa, K: 60MPa;

⑥ : Indicates device rating: C: Consumer grade; I: Industrial grade; E: Explosion-proof grade.

HLP Series Flange Level Transmitter

Product Overview

The HLP Series Flanged Level Transmitter is a liquid level measurement instrument utilizing advanced sensor technology. Developed for precise and stable level measurement in complex media characterized by high temperatures, high viscosity, crystallization tendencies, strong corrosion, or suspended solids, it enables continuous monitoring of liquid levels within sealed vessels or process pipelines.

The core application areas for flanged level transmitters are petroleum, chemical, and natural gas industries. They are also widely used in power generation, water treatment and environmental protection, pharmaceuticals and food/beverage, papermaking, metallurgy, and mining.

Product Advantages and Features

1. Measurement accuracy reaches ±0.1% FS, meeting the high-precision liquid level measurement requirements of most industrial scenarios;
2. Built-in dynamic compensation function corrects the impact of temperature changes and static pressure fluctuations on measurement results in real time, ensuring stable and reliable data even when operating conditions vary;
3. Incorporates RF and electromagnetic interference filters, rigorously tested for electromagnetic compatibility to effectively withstand complex industrial electromagnetic disturbances;
4. Transmitter housing achieves IP68 protection rating, effectively withstanding process impacts, preventing dust ingress and water splashes, and adapting to humid, dusty industrial environments;
5. Offers multiple configurations including flat flange, insert flange, and dual flange; diaphragm materials include 316L, Hastelloy C-276, and tantalum; filling fluids can be customized for high-temperature or food-grade applications;
6. Supports 4-20mA analog signal transmission with optional HART protocol overlay for bidirectional analog/digital communication. Compatible with mainstream protocols like Modbus for seamless integration into diverse industrial automation systems;
7. Standard flange connections ensure easy installation. Multiple electrical interfaces available. Supports local zero and span adjustment (via magnetic wand or HART handheld communicator).

Technical Parameters

Categories	Parameter Details
Measurement Range	0~40 kPa/0~250 kPa/0~1 MPa
Measurement Accuracy	±0.1% FS/±0.2% FS
Process Temperature	-40° C ~ 200° C
Ambient Temperature	-40° C~85° C
Relative Humidity	0%~95% (non-condensing)
Protection Rating	Default IP67, optional IP68
Output Signal	4-20 mA DC analog signal with superimposed HART protocol; Modbus
Communication Protocol	HART, Modbus protocols
Wireless Signal	LoRaWAN, NB-IoT, 4G
Diaphragm Material	316L stainless steel, Hastelloy, Monel, tantalum, fluorinated coating (special customization)
Housing Material	Aluminum alloy (corrosion-resistant surface treatment) or stainless steel
Supply Voltage	DC 24V
Power Consumption	⩽ 1.5W during normal operation (DC 24V power supply)

Model Selection

Example: HLP 200 - F DXX RF A I

① ② ③ ④ ⑤ ⑥ ⑦

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Denotes communication method: V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : DXX denotes flange interface specifications;

⑤ : FF: Full Face, RF: Raised Face, FM: Flat Face, M: Male Face, T: Tongue Face, G: Grooved Face, RJ: Ring Joint Face;

⑥ Represents pressure range: A: 6kPa, B: 40kPa, C: 250kPa, D: 1MPa, E: 1.6MPa, F: 2.5MPa, G: 10MPa, H: 25MPa, I: 35MPa, J: 40MPa, K: 60MPa;

⑦ : Indicates equipment rating, categorized as C: Civilian Grade; I: Industrial Grade; E: Explosion-Proof Grade.

HLP Series Immersion Level Gauge

Product Overview

Submersible level transmitters (also known as hydrostatic level transmitters) are liquid level measurement instruments based on the principle that hydrostatic pressure is proportional to liquid height. By immersing the sensor probe directly into the liquid being measured, they continuously monitor liquid pressure in real time and convert it into a standard electrical signal output, enabling continuous liquid level monitoring and remote control. Submersible level transmitters are indispensable liquid level measurement devices in industrial automation and process control.

Product Advantages and Features

1. Immersion design for easy installation: The probe can be directly submerged in liquids without complex setup, suitable for various scenarios including storage tanks, reservoirs, and rivers. It is particularly ideal for large-diameter containers and deep well measurements.
2. Utilizes isolated diffused silicon or ceramic capacitive sensors with accuracy up to ±0.1% FS (full scale), meeting high-precision requirements for industrial automation.
3. Built-in temperature sensor automatically compensates for liquid density fluctuations caused by temperature changes, ensuring accurate measurement in environments ranging from -40° C to 125° C;
4. Optional corrosion-resistant materials including 316L stainless steel and PVDF, with Exd II CT6 explosion-proof design, suitable for hazardous environments such as chemical and petroleum industries;
5. Solid-state construction with no moving parts, resistant to vibration and shock, ensuring long service life;
6. Supports multiple standard signal outputs including 4-20mA, 0-5V, 0-10V, and RS485 for seamless integration with PLC, DCS, and other control systems;
7. Features 4G wireless communication, eliminating the need for control cabinet data loggers or related acquisition devices, enabling direct interaction with monitoring platforms;
8. Incorporates reverse polarity protection, overcurrent/overvoltage protection, and EMI electromagnetic interference shielding to ensure stable operation.

Technical Parameters

Categories	Parameter Details
Measurement Range	0.3~110m
Accuracy Class	±0.1%FS / ±0.25%FS
Power Supply	DC 24V
Output Signal	4-20mA, 0-5V, 0-10V, RS485 (Modbus)
Wireless Communication	4G/LoRaWAN
Medium Temperature	-30°C ~115°C
Ambient Temperature	-20°C ~85°C
Protection Rating	IP67/IP68
Overload Capacity	2× full-scale pressure
Response Time	⩽ 100ms
Diaphragm Material	316L stainless steel, Hastelloy, Monel, tantalum, fluorinated coating (special customization)
Housing Material	Aluminum alloy (corrosion-resistant surface treatment) or stainless steel
Power Consumption	⩽ 1.5W during normal operation (DC 24V supply)

Model Selection

Example: HLP 200 - F DXX RF A I
① ② ③ ④ ⑤ ⑥ ⑦

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Denotes communication method: V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : Default value, no specific meaning;

⑤: Represents pressure range: A: 0-5m, B: 0-10m, C: 0-15m, D: 0-20m, E: 0-30m, F: 0-40m, G: 0-50m, H: 0-60m, I: 0-70m, J: 0-80m, K: 0-90m, L: 0-100m;

⑥ : Indicates equipment grade, categorized as: C: Civilian Grade; I: Industrial Grade; E: Explosion-Proof Grade.

HOR Radar Level Gauge

Product Overview

The HOR radar level gauge series emits microwave pulses or continuous frequency-modulated waves toward the surface of the measured medium via its antenna, then receives the echoes. By calculating the time difference or frequency difference between transmission and reception, it precisely determines the distance from the antenna to the material surface. Radar level gauges cover nearly all industrial sectors and offer unique advantages in high-dust and extreme temperature environments. They are commonly used in petrochemicals, food and pharmaceuticals, water treatment, energy, power and building materials, metallurgy and mining, grain, and plastics industries.

Threaded type

Product Advantages and Features

1. Based on our proprietary CMOS millimeter-wave RF chip, it achieves a more compact RF architecture, higher signal-to-noise ratio, and smaller blind zones;
2. 5GHz operating bandwidth enables higher measurement resolution and accuracy;
3. Supports horn antenna design for narrow beam angles and concentrated energy, effectively avoiding interference from obstacles inside containers;
4. Shorter wavelength provides superior reflection characteristics on solid surfaces, eliminating the need for universal flanges for alignment;
5. Supports remote debugging and firmware upgrades, reducing wait times and enhancing operational efficiency;
6. Enables mobile Bluetooth debugging for convenient field maintenance by personnel;
7. Supports 4-20mA analog signal output with superimposed HART protocol, or RS485 digital interface with Modbus protocol;
8. Non-contact with materials, eliminating wear, contamination, and maintenance costs while ensuring long service life (up to 10+ years);

Flange type

9. Measurement accuracy of ±2mm to ±5mm with 1mm resolution, maximizing data precision;
10. Applicable to all media with dielectric constant ⩾ 2, operating temperature range -40° C to +300° C;
11. Features comprehensive self-diagnostics, self-monitoring, and fault alarm functions, with reverse polarity protection for power supply;
12. Supports split-type structure, enabling electronic component replacement without opening the tank for easier maintenance.

Technical Parameters

Categories	Parameter Details
Transmission Frequency	26GHz (Standard Type), 80GHz (High-Precision Type)
Measurement Range	Liquid: 0~30m (extendable to 70m); Solid: 0~20m (extendable to 35m)
Measurement Accuracy	±1mm
Measurement Interval	Fastest 100ms, Standard 1s
Turndown Ratio	40:1, supports 100:1
Beam Angle	3° /18° /20°
Operating Dielectric Constant Range	⩾ 2
Power Supply Range	DC 24V/AC 220V
Signal Output	4-20mA/HART (two-wire); RS485/Modbus (four-wire)
Industrial Temperature/ Humidity	-40-1000°C (optional)/ ⩽ 95 %RH;
Housing Material	Aluminum alloy, stainless steel
Process Connection Type	Pipe thread/Universal flange/Corrosion-resistant flange/Sanitary clamp/ Quartz isolation flange
Process Pressure	-1~20bar
Protection Rating	IP67
Explosion-Proof Rating	Ex dia II C T6

Model Selection

Example: HOR 100 - M F A I (① ② ③ ④ ⑥ ⑦) or HOR 200 - M DXX RF A I (① ② ③ ④ ⑤ ⑥ ⑦)

① : Series name;

② : Indicates standard series model, distinct from custom models. 100: Threaded connection, 200: Flanged connection;

③ : Denotes communication method. V: Voltage type (0-10V), C: Current type (4~20mA), M: RS485, F: 4G, I: NB-IoT, L: LoRa;

④ : Interface specification, F: G1½, DXX denotes flange specification;

⑤ : FF: Full face, RF: Raised face, FM: Flat face, M: Raised face, T: Tenon face, G: Grooved face, RJ: Ring joint face;

⑥ : Represents pressure range: A: 0-5m, B: 0-10m, C: 0-15m, D: 0-20m, E: 0-30m, F: 0-40m, G: 0-50m, H: 0-60m, I: 0-70m, J: 0-80m, K: 0-90m, L: 0-100m;

⑦ : Indicates equipment rating, categorized as: C: Civilian Grade; I: Industrial Grade; E: Explosion-Proof Grade.

04
Flow Meter

HFV Intelligent Vortex Flowmeter

Product Overview

The HFV intelligent vortex flowmeter is a flow measurement instrument based on the “Karman vortex street” principle. It measures flow rate by detecting the alternating vortex frequency generated when fluid flows past an obstruction, and integrates a microprocessor to achieve intelligent functionality. With its high versatility and cost-effectiveness, it is widely used for process flow monitoring in thermal power plants, heating systems, water treatment, gas metering, flue gas emission monitoring, as well as in petroleum, chemical, metallurgical, and power industries.

Product Advantages and Features

1. Liquid measurement accuracy reaches ±1.0% R, while gas and vapor accuracy reaches ±1.5% R;
2. Real-time acquisition of medium temperature and pressure data, with algorithmic error correction for precise output of standard volume flow or mass flow;
3. No mechanical moving parts, ensuring wear resistance, extended service life, and low maintenance costs;
4. Standard 4-20mA current signal and pulse output; supports RS485 (Modbus) and HART communication protocols for seamless integration with PLCs, SCADA systems, and other industrial controls, enabling remote monitoring and configuration;
5. Wide operating temperature range (-40° C to 400° C) and pressure rating up to PN63, suitable for demanding conditions;
6. Supports on-site button configuration for parameters like medium density and instrument coefficients, with real-time flow data displayed on the LCD screen;
7. Features cumulative flow reset and small signal cut-off functions. Models powered by lithium batteries can operate continuously for over one year;
8. Maximum pressure rating up to 25MPa. Utilizes shock-resistant sensor technology for stable operation in environments with strong vibrations ⩽ 1g. Main body constructed from corrosion-resistant materials like SUS304 or 316L;
9. Multiple connection options for convenient installation.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN15 to DN300 (sizes larger than 300 can be made as insert types)
Accuracy Class	Accuracy for gas measurement exceeds ±1.5%; Accuracy for liquid measurement exceeds ±1.0%; Accuracy for insertion measurement exceeds ±2.5%.
Temperature Requirements	Medium temperature: -40° C to 400° C; Ambient temperature: -20° C to 70° C
Body Material	304 material is used for routine measurement of mildly corrosive media. 316 material is used for corrosive or sanitary media.
Sensor Material	304, 316L, and special materials available upon request.
Applicable Media	Gases: Air, oxygen, natural gas, liquefied gas, and other gases Liquids: Water, light oil, liquefied petroleum, acids, alkalis, and other liquids Steam: Saturated steam and superheated steam
Flow Rate Range	Gas: 5–60 m/s, Liquid: 0.5–7 m/s
Repeatability	Accuracy: Better than ±0.3%
Pressure Rating	1.6MPa, 2.5MPa, 4.0MPa, 6.3MPa (customizable for special requirements)
Explosion-Proof Rating	Ex db IIC T6 Gb
Power Supply	DC24V, 3.6V lithium battery
Output Signal	(4-20)mA analog signal, pulse signal
Communication Protocol	RS485 (Modbus), HART protocol
Connection Method	Flange connection, flange clamp connection, insertion connection, threaded connection, clamp connection

Model Selection

Example: HFV 100 - D100 M A B
① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, with a diameter range of DN15 to DN300. Models exceeding DN300 can be customized;

④ : Indicates communication method: C denotes current type (4–20 mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFT Intelligent Turbine Flowmeter

Product Overview

The HFT Intelligent Turbine Flowmeter is an instrument that utilizes fluid kinetic energy to drive the impeller rotation, measuring volumetric flow rate by detecting rotational speed. It is specifically designed for metering clean, low-viscosity liquid or gas media. The instrument incorporates an integrated temperature and pressure compensation unit that automatically corrects measurement errors caused by changes in medium temperature and pressure. Featuring an obstruction-free flow path design, it offers low pressure loss and fast response times. Supporting both local display and remote data transmission, it finds extensive application in trade settlement for the Oil and Chemical Industry and natural gas sectors, precision measurement in aviation and laboratories, and high-accuracy process control in industrial settings.

Product Advantages and Features

1. Low turbine inertia enables ⩽ 100ms response time to flow changes, accurately capturing instantaneous flow variations;
2. Liquid measurement accuracy reaches ±0.5% R, gas measurement accuracy ±1.0% R, with repeatability error ⩽ 0.2%, meeting trade settlement-grade metering requirements;
3. Smooth, obstruction-free flow path with pressure loss only 1/3 that of traditional orifice plate meters, reducing pipeline transportation energy consumption;
4. Supports dual battery/mains power supply with IP67 protection rating, suitable for outdoor installation; lithium battery models offer 3–5 years of continuous operation;
6. Built-in temperature and pressure sensors automatically correct for medium condition deviations, eliminating need for additional compensation devices;
7. Turbine options include hard alloy or ceramic materials; housing constructed from SUS304/316L stainless steel, compatible with clean media such as gasoline, diesel, methanol, and compressed air;
8. Standard 4-20mA current signal and pulse signal output; optional RS485 (Modbus) or HART communication protocols enable seamless integration with PLC, DCS, SCADA, and other industrial control systems;
9. Electromagnetic shielding design resists strong electromagnetic interference in industrial environments.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN4 to DN200 (DN200+ available as insertion type)
Accuracy Class	±1%R, ±0.5%R
Ambient Temperature	-20° C to 60° C
Medium Temperature	Standard: -20° C to 80° C; Customizable: -20° C to 150° C
Material	Housing Material: 304; 316; PTFE (custom-made) Impeller Material: Stainless Iron; Duplex Steel; PTFE (custom-made)
Measured Medium	Impurity-free, low-viscosity, non-aggressively corrosive liquid
Flow Rate Range	0.4–8 m/s
Repeatability	⩽ 0.15%, ⩽ 0.1%
Pressure Rating	Flange connection: 1.0MPa to 10MPa; Threaded connection: 6.3MPa; Clamp connection: 1.0MPa; Wafer connection: 1.6MPa to 40MPa
Explosion-Proof Rating	Ex d II C T6 Gb
Power Supply Method	3.6V lithium battery; DC24V
Output Signal	Output: Pulse, 4-20mA
Communication Protocol	RS485 (Modbus); HART protocol
Connection Method	Flange connection, threaded connection, clamp connection, wafer connection, insertion connection

Model Selection

Example: HFT 100 - D100 M A P2

① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, with a diameter range of DN4 to DN200. Models exceeding DN200 can be customized;

④ : Indicates communication method: C denotes current type (4–20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

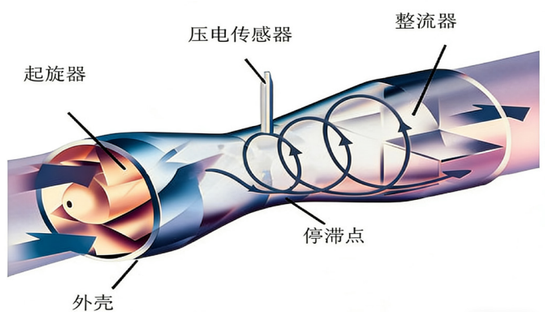
⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFS Spiral Vortex Flowmeter

Product Overview

The HFS Spiral Vortex Flow Meter operates on the principle of vortex precession. Fluid passing through the vortex generator forms vortices that are forced to rotate within the venturi tube. Flow measurement is achieved by detecting the frequency of this vortex precession, where frequency is directly proportional to flow rate. Suitable for gaseous media such as natural gas, liquefied petroleum gas, and air, it is widely applied in small-to-medium diameter natural gas metering, boiler and burner gas metering, and industrial process gas metering due to its self-rectifying capability and strong resistance to interference.



Schematic

Product Advantages and Features

1. Utilizes dual detection technology and intelligent anti-vibration technology to effectively enhance detection signal strength, suppress interference caused by vibrations and pressure fluctuations, and achieve high measurement accuracy;
2. Capable of measuring gases containing trace impurities with strong anti-interference capability;
3. Incorporates a 16-bit computer chip integrating flow probe, microprocessor, pressure, and temperature sensors to directly measure fluid flow rate, pressure, and temperature, with automatic real-time tracking compensation and compression factor correction;
4. Low pressure loss (⩽ 0.02MPa) delivers significant energy savings;
5. All-metal construction with temperature tolerance from -40° C to 120° C, suitable for harsh environments; long-term stable instrument coefficient requires minimal recalibration;
6. No mechanical moving parts, corrosion-resistant, long service life, requiring no special maintenance during prolonged operation;
7. Standard 4-20mA current signal output, optional RS485 (Modbus protocol) or HART protocol, enabling seamless integration with industrial control systems such as PLC, DCS, and SCADA.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN15~DN200
Accuracy Class	Class 1.0; Class 1.5
Temperature Requirements	Ambient temperature: -30° C to 65° C; Medium temperature: -20° C to 80° C (High-temperature versions available upon request)
Housing Material	Aluminum alloy, stainless steel
Applicable Media	Natural gas, air, and general gases
Flow Rate Range	Lower limit ⩾ 3 m/s; Upper limit ⩽ 30 m/s
Pressure Rating	Aluminum alloy ⩽ 1.6 MPa; Stainless steel ⩾ 1.6 MPa (High-pressure versions available upon request)
Explosion-Proof Rating	EX d II C T6 Gb
Power Supply Method	DC24V, 3.6V Lithium Battery
Output Signal	4-20mA Output, Pulse Output
Communication Protocol	Modbus, HART Protocol
Output Method	4-20mA/RS485
Connection Method	Flange Connection

Model Selection

Example: HFS 100 - D100 M A P2
① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, ranging from DN15 to DN200;

④ : Indicates communication method: C denotes current type (4–20 mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFE Intelligent Electromagnetic Flowmeter

Product Overview

The HFE Smart Electromagnetic Flowmeter is a high-precision flow measurement device developed based on Faraday's law of electromagnetic induction. Renowned for its smooth, obstruction-free measurement channel, zero pressure loss, high accuracy, and excellent adaptability to complex fluids, it is specifically designed for conductive liquids and liquid-solid two-phase fluids. It is widely used in process control and flow monitoring across water industries and environmental protection, chemical and process industries, food and pharmaceuticals, as well as energy and HVAC applications.

Product Advantages and Features

1. High measurement accuracy (±0.5% FS), maintaining stable error control even at low flow rates (0.3 m/s), with repeatability ⩽ 0.067%. Unaffected by fluid density, viscosity, temperature, or pressure—only dependent on flow velocity—delivering excellent linearity;
2. No mechanical wear parts, ensuring long service life and low maintenance costs;
3. Full-bore pipe design with zero pressure loss delivers significant energy savings;
4. Measures bidirectional flow with rapid response (⩽ 0.5 seconds);
5. Multiple liner materials (PTFE, rubber, etc.) and electrode options (stainless steel, Hastelloy, etc.) withstand strong acids, alkalis, high temperatures, and harsh conditions;
6. Standard 4-20mA current signal output, optional RS485 (Modbus protocol) or HART protocol for seamless integration with PLC, DCS, SCADA, and other industrial control systems;
7. Utilizes programmable low-frequency square wave excitation technology; high-frequency excitation adapts to special media (e.g., slurries), effectively eliminating noise interference;
8. Integrated self-diagnostics, empty pipe detection, and lightning protection. Provides early warnings for liner aging and electrode contamination, reducing annual maintenance time to 1 hour;
9. Supports plug-in installation with a ball valve base, enabling installation and maintenance without production interruption, minimizing industrial downtime risks.

plug-in

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN6 to DN3000 (DN150 and above available as insert type)
Accuracy Class	Bore-type: ±0.5% of reading, better than 1% for DN400 and above Insertion-type: ±2.5% of reading
Ambient Temperature	-20°C ~70°C
Lining Material	Polytetrafluoroethylene (PTFE), Polychloroprene Rubber, Polyurethane Rubber, Polysiloxane Fluororubber, Polyfluoroethylene Propylene (F46), PFA
Electrode Material	316L, Hastelloy B, Hastelloy C, Titanium, Tantalum, Platinum/Iridium Alloy, Tungsten Carbide
Applicable Media	Various acids, alkalis, salt solutions, pulp, slurry, and any conductive liquids
Flow Rate Range	0.5 m/s to 10 m/s
Pressure Rating	1.0MPa, 1.6MPa, 2.5MPa, 4.0MPa (High pressure customizable)
Explosion-Proof Rating	Ex db IIC T6 Gb
Power Supply Method	AC220V 50Hz/DC24V/3.6V Lithium Battery
Output Signal	4-20mA, RS485, Pulse
Communication Protocol	Modbus, HART
Connection Method	Flange Connection, Insertion Type (Other types customizable)

Model Selection

Example: HFE 100 - D100 C A P2
① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes measurable pipe nominal diameter, range DN6–3000; insertion type supports DN150 and above only;

④ : Indicates communication method: C denotes current loop (4–20 mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: In-line, B: Insertion, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFTA Target Flowmeter

Product Overview

Designed based on the principle of force equilibrium, this flowmeter measures flow rate by detecting the force generated when fluid impacts the target plate. It is suitable for high-viscosity, low-Reynolds-number fluids (such as crude oil, asphalt, and syrup) and media containing fine particles. Featuring strong anti-clogging properties and a wide measurement range, it is widely used in process control and metering across industries including petroleum, chemical, and food processing.

Product Advantages and Features

1. Insensitive to changes in fluid viscosity, capable of measuring Reynolds numbers as low as 500;
2. Non-throttling orifice design prevents clogging and allows measurement of fluids containing impurities;
3. Measurement accuracy ±0.5% FS, repeatability ±0.2%;
4. Simple structure with easy maintenance; target plate can be replaced online;
5. Operating temperature range: -20° C to 450° C; operating pressure up to 42 MPa, suitable for extreme conditions;
6. Throttle-free design effectively prevents clogging common in traditional orifice plate flowmeters, compatible with complex fluids like asphalt, crude oil, pulp, and sewage;
7. Optimized streamlined target plate structure minimizes medium adhesion and retention, maintaining stable measurement accuracy even at low flow rates;
8. Equipped with adaptive filtering algorithms to suppress interference signals like pipeline vibrations and pressure fluctuations, resolving frequent false alarms caused by flow pulsations;
9. Built-in dual temperature/pressure sensors suitable for gas or temperature-sensitive liquid measurement;
10. Supports 4-20mA analog and pulse signal outputs, with RS485 communication interface and Modbus/HART protocols for integration with PLC systems or cloud platforms, enabling remote data collection and centralized management;
11. IP65-IP68 protection rating for outdoor use, with explosion-proof certification for hazardous and complex environments.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	Flange type DN15~DN500; Wafer type DN15~DN300; Insertion type DN80~DN5000
Accuracy Class	±0.5%, ±1.0%, ±1.5%,
Medium Temperature	-20~450° C or higher temperatures
Body Material	Carbon steel, stainless steel
Measured Medium	Liquids, gases, steam
Rangeability	1:5 (liquid); 1:10 (liquid) 1:10 (steam, gas);
Repeatability	0.05%~0.08%
Nominal Pressure	0.6~42MPa
Explosion-Proof Marking	Intrinsically safe (Ex ia IIC T4); Flameproof (Ex db IIC T6 Gb)
Power Supply	Built-in 3.6V lithium battery power supply, external DC24V power supply
Output Type	Local display, 4~20mA, pulse output, RS485, GPRS wireless remote transmission
Compensation Type	Temperature compensation, pressure compensation
Protection Rating	IP65~IP68

Model Selection

Example: HFTA 100 - D100 C A B
① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes measurable pipe nominal diameter: flanged type supports DN15–DN500, clamp-on type supports DN15–DN300, insertion type supports DN80–DN5000;

④ : Indicates communication method: C denotes current type (4–20 mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

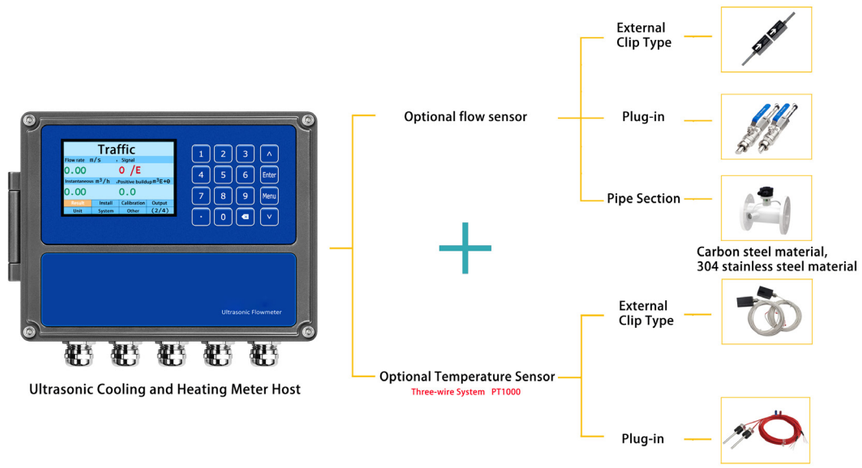
⑤ : Indicates installation type: A: Pipe section type, B: Insertion type, C: Clamp-on type;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFU Ultrasonic Flowmeter

Product Overview

This series of ultrasonic flow meters represents industrial-grade time-of-flight ultrasonic flow measurement technology. Compared to other ultrasonic flow meters on the market, it features high responsiveness, low power consumption, and exceptional stability. Incorporating our proprietary TGA technology, this product finds extensive application in building HVAC systems, thermal power plants, petrochemical facilities, water treatment plants, and other industries. It supports three operating modes: clamp-on, insertion, and in-line.



Product Advantages and Features

1. Time-of-flight ultrasonic flowmeter capable of over 300 measurements per second, with precision strictly controlled below 1.0%;
2. Utilizes the latest 700K gate industrial-grade FPGA chip, significantly enhancing signal sampling frequency and bubble tolerance, with timing accuracy reaching tens of picoseconds;
3. Proprietary TGA technology enables processing of complex logic and operations, achieving more precise and faster measurements;
4. Features high response rate, low power consumption, and exceptional stability;
5. Withstands intermittent bubbles or impurities for up to 5 seconds;
6. Simple installation and user-friendly operation, allowing setup without pipe damage, water shutdown, or work interruption;
7. Metal housing provides high protection, excellent conductivity and thermal performance, outstanding durability, and impact resistance;
8. New color LCD display offers high resolution and rich color reproduction.

Technical Parameters

Categories	Parameter Details
Range	±0.03 m/s to ±12 m/s
Accuracy	±1%
Pipe Diameter	DN15 to DN1200
Output	Analog Output: 4 to 20 mA, max load 750Ω. Pulse Output: 0 to 10 kHz
Communication	RS232/RS485 Modbus
Power Supply	10 to 36 VDC / 90 to 245 VAC
Display	320*480 Color TFT Display
Operating Temperature	Transmitter: -20° C to 60° C, Sensor: -40° C to 180° C, Small Diameter Sensor: 0° C to 115° C
Humidity	99% RH, non-condensing
Transmitter	Aluminum Alloy, IP65
Sensor	Sealed Design, IP68 Twisted Shielded Cable Standard: 9m, Maximum Cable Length: 300m

Model Selection

Example: HFU 100 - D100 C A P2
① ② ③ ④ ⑤

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes measurable pipe nominal diameter:

- Pipe-mounted and clamp-on types: DN15 to DN1200

- Insertion type: DN80 to DN5000;

④ : Indicates communication method: C denotes current type (4~20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC220V, P2: DC24V, B: 3.6V lithium battery.

HFO Orifice Plate Flowmeter

Product Overview

This device is a differential pressure flow meter based on the throttling principle, consisting of a standard orifice plate, pressure tapping assembly, and differential pressure transmitter. It calculates flow rate by measuring the differential pressure generated as fluid flows through the orifice plate. Suitable for single-phase fluids such as gases, liquids, and steam, it features a simple structure, low cost, and high standardization. It is one of the most widely used flow meters in industrial measurement.

Product Advantages and Features

1. Supports a wide temperature range of -50° C to 550° C and high-pressure conditions from 0.25MPa to 32MPa;
2. Simple and robust construction with no moving parts ensures long service life;
3. Suitable for a wide range of pipe diameters (DN25 to DN3000) and extensive pressure-temperature ranges;
4. Measures high-viscosity, high-temperature, and high-pressure media; adapts to various conditions with different pressure tapping methods (angle-welded, flanged, etc.); enables intelligent digital measurement when paired with differential pressure transmitters;
5. Measurement accuracy ranges from ±0.5% to ±1.0%, with repeatability better than 0.2% and stable linearity within rated flow range;
6. Orifice plate material can be flexibly selected based on medium characteristics, offering diverse material options;
7. Suitable for a wide range of media, including water, steam, air, natural gas, and other single-phase clean fluids;
8. The orifice plate features an integral forged or welded structure with high pressure resistance, suitable for hazardous conditions such as high temperature, high pressure, flammability, and explosiveness;
9. The intelligent totalizer features automatic temperature and pressure compensation, enabling real-time correction for density variations affecting measurement. For gaseous media, it also performs compression factor correction to enhance measurement accuracy under variable conditions;
10. Supports 4-20mA analog signal and pulse signal outputs. Equipped with an RS485 communication interface supporting Modbus protocol, it can interface with PLC control systems, DCS systems, or cloud platforms to enable remote data acquisition and centralized management.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN25~DN3000
Accuracy Class	±0.5%, ±1.0%, ±1.5%
Operating Temperature	-50°C < t < 550°C
Body Material	Carbon steel, stainless steel
Measured Medium	Liquid, gas, steam
Turndown Ratio	1:10; 1:15
Nominal Pressure	0.25MPa~32MPa
Pressure Tapping Method	Flange pressure tapping, angle pressure tapping
Output Signal	4~20mA

Note: This product must be used in conjunction with a differential pressure transmitter and a flow totalizer.

Model Selection

Example: HFO 100 - D100 C A B

① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, ranging from DN25 to DN3000;

④ : Indicates communication method: C denotes current type (4~20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC220V, P2: DC24V, B: 3.6V lithium battery.

HFM Thermal Gas Mass Flowmeter

Product Overview

The HFM thermal gas mass flow meter operates on the principle of fluid heat transfer, specifically designed for measuring various steady-state gases. The instrument constructs a measurement loop using a pair of reference-grade platinum resistance temperature sensors: one continuously monitors the medium temperature, while the other maintains a constant temperature difference above the medium temperature. It calculates precise flow rates by converting changes in heat conduction during gas flow. Its core advantage lies in eliminating the need for additional temperature-pressure compensation devices, enabling direct output of gas volume flow or mass flow under standard conditions. Featuring no moving parts, the sensor accommodates a wide measurement range from low to high flow rates. It finds extensive application in gas energy management and efficiency monitoring, environmental monitoring and process control, as well as measuring large-section airflow in HVAC systems.

Product Advantages and Features

1. Directly measures gas mass flow without being affected by fluctuations in medium temperature or pressure, eliminating the need for additional investment in temperature/pressure compensation equipment and its installation/calibration steps. This significantly reduces measurement errors, allowing direct reading of standard-condition volumetric flow data.
2. Flow velocity measurement range covers 0.5 to 100 nm/s, with custom models extending down to 0.1 nm/s. This enables precise capture of low-velocity gases from minute leaks while maintaining stable measurement of high-speed flows. Measurement accuracy reaches ±1% with strong repeatability, making it suitable for complex conditions with significant flow fluctuations;
3. The sensor utilizes corrosion-resistant materials like 316L stainless steel, features no moving parts or pressure-sensing components, and offers excellent shock resistance. This prevents mechanical wear caused by impurities in the medium, extending service life;
4. Supports plug-in installation with a ball valve base, enabling maintenance without production interruption to minimize industrial downtime risks;
5. Integrated digital circuit design provides strong electromagnetic interference resistance. Optional intrinsically safe or explosion-proof configurations suit flammable hazardous environments. IP67 protection rating withstands outdoor humidity, dust, and harsh conditions;
6. Standard 4-20mA current signal output, with optional RS485 (Modbus protocol) or HART protocol, enabling seamless integration with industrial control systems such as PLC, DCS, and SCADA.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	In-line type: DN10 to DN300; Insertion type: DN25 to DN2000 (Custom sizes available upon request)
Accuracy Class	In-line: ±1.5%; Insertion: ±2.5%
Temperature Requirements	Ambient temperature: -20° C to 80° C; Medium temperature: 0° C to 350° C
Sensor Material	Hastelloy, 316L, PTFE coating, PFA coating
Sensor Diameter	ϕ20 (customizable for special requirements)
Probe Material (Protective Tube)	304 Stainless Steel, 316L
Applicable Media	Generally dry gases
Flow Velocity Range	0.5~120 nm/s
Pressure Range	⩽ 6.3 MPa
Explosion-Proof Rating	Ex db IIC T6 Gb
Power Supply Method	AC 220V, DC 24V
Output Method	4-20mA, RS485, HART
Connection Method	Flange, Clamp, Wafer, Threaded, and Insert

Model Selection

Example: HFM 100 - D100 C A P1
① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes.

Diameter range:

- Pipe-mounted: DN10 to DN300
- Insertion-type: DN25 to DN2000 (customizable for special requirements);

④ : Indicates communication method: C denotes current loop (4~20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: In-line, B: Insertion, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC 220V, P2: DC 24V, B: 3.6V lithium battery.

HFG Intelligent Gas Turbine Flow meter

Product Overview

The intelligent gas turbine flowmeter is a velocity-type instrument designed to measure the flow rate of gaseous media. It consists of a turbine sensor and an intelligent converter, achieving measurement through the linear relationship between turbine rotational speed and flow rate. Suitable for clean gases such as natural gas, coalbed methane, and nitrogen, it features high measurement accuracy and minimal pressure loss. This flowmeter is widely applied in gas transmission and distribution, energy metering, and other related fields.

Product Advantages and Features

1. High measurement accuracy (±1.0% R) with excellent repeatability (⩽ 0.2%);
2. Wide turndown ratio, suitable for scenarios with significant flow fluctuations;
3. Built-in temperature and pressure sensors support real-time compensation for standard-condition volumetric measurement;
4. Low pressure loss (⩽ 0.03MPa) delivers significant energy savings;
5. IP65 protection rating for outdoor and hazardous environments;
6. Large data storage capacity permanently retains up to 12 months of monthly flow data and 360 days of daily average flow data, with no parameter loss during sudden power outages;
7. Low sensitivity to gas flow disturbances ensures strong measurement stability;
8. Supports dual power supply via lithium battery and DC24V, with low battery voltage alarm function;
9. Features self-diagnostic capabilities to automatically identify temperature and pressure sensor failures, displaying alerts on screen for rapid troubleshooting;
10. Supports pulse signal and 4-20mA analog signal outputs; select models compatible with HART protocol;
11. Optional wireless transmission module enables long-distance data transfer. Paired with dedicated management software, it generates data reports and graphs to facilitate flow data analysis.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN25~DN300
Accuracy Class	±1.5% (±1.0% requires customization)
Temperature Requirements	Medium temperature: -20~80° C; Ambient temperature: -20~70° C
Instrument Material	Housing: 304 stainless steel or cast aluminum; Impeller: Corrosion-resistant ABS or high-grade aluminum alloy; Transducer: Cast aluminum
Applicable Media	Suitable for natural gas, coal gas, liquefied gas, hydrocarbon gas, and other gases
Flow Range	See selection table for details
Pressure Rating	Aluminum alloy ⩽ 1.6MPa, stainless steel ⩾ 1.6MPa
Explosion-Proof Rating	Ex db IIC T6 Gb
Power Supply	DC24V, 3.6V lithium battery
Signal Output	Pulse signal, 4~20mA, RS485
Communication Protocol	Modbus, HART protocol
Connection Method	Flange connection

Model Selection

Example: HFG 100 - D100 C A P2

① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, ranging from DN25 to DN300;

④ : Indicates communication method: C denotes current type (4~20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC220V, P2: DC24V, B: 3.6V lithium battery.

HFR Intelligent Gas Roots Flowmeter

Product Overview

The intelligent gas Roots flowmeter is a positive displacement metering instrument that measures gas volume by counting the revolutions of a pair of figure-eight Roots rotors within the metering chamber. It features high measurement accuracy and excellent stability, making it suitable for trade measurement of medium-to-high pressure gases such as natural gas, coal gas, and propane. It is widely used in high-precision metering applications across sectors including urban gas transmission and distribution, petrochemicals, and more.

Product Advantages and Features

1. Exceptionally high measurement accuracy (±1% R) with outstanding repeatability (⩽ 0.2%), meeting trade measurement requirements;
2. Wide turndown ratio with exceptional low-flow measurement performance;
3. Built-in high-precision temperature and pressure sensors support online compensation for standard-condition volume/energy measurement;
4. High-precision synchronous gear-driven rotor operates contact-free with minimal wear and extended service life;
5. Features data power-off protection and self-diagnostic fault detection;
6. IP67 protection rating for harsh outdoor environments;
7. Supports pulse signal and 4-20mA analog output, compatible with Modbus protocol for smart pipeline integration;
8. Dual power supply design with 3.6V lithium battery and DC 12–24V, delivering up to 5 years of battery life;
9. Features low-voltage alarm and data retention during power loss, permanently storing up to 12 months of historical data;
10. Integrated self-diagnostic function automatically identifies temperature/pressure sensor failures with real-time alerts;
11. Generates data reports and trend curves with dedicated management software, supporting flow data analysis and energy consumption control;
12. Stores real-time data, logs start/stop events and daily data, with historical data query capability;
13. Optional GSM wireless transmission module generates data reports and trend curves with dedicated management software, aiding flow data analysis and energy consumption management.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN25~DN150
Accuracy Class	±1.0%; ±1.5%
Temperature Requirements	Medium Temperature: -20° C to 60° C; Ambient Temperature: -25° C to 80° C
Body Material	Aluminum Alloy; Cast Iron
Applicable Media	Non-corrosive gases such as natural gas, city gas, industrial inert gases
Pressure Rating	Nominal Pressure: 1.6MPa
Explosion-Proof Rating	Ex db IIC T6 Gb
Power Supply	DC 24V; 3.6V Lithium Battery
Output Signal	4-20mA, RS485
Communication Protocol	Modbus Protocol
Connection Method	Flange Connection, Threaded Connection

Model Selection

Example: HFR 100 - D100 C A B

① ② ③ ④ ⑤ ⑥

① : Series name;

② : Indicates standard series model, distinct from custom models;

③ : Dxx denotes the nominal diameter of measurable pipes, ranging from DN25 to DN150;

④ : Indicates communication method: C denotes current type (4~20mA), M denotes Modbus, F denotes 4G, I denotes NB-IoT;

⑤ : Indicates installation type: A: Pipe-mounted, B: Insertion-type, C: Clamp-on;

⑥ : Indicates power supply type: P1: AC220V, P2: DC24V, B: 3.6V lithium battery.

05

IoT Water Meter

Issues we can resolve

- Difficulty in meter reading
- Difficulty in collecting fees
- Management challenges
- Control challenges

suitable location

- Residential Buildings
- Commercial Buildings
- Factory and enterprise
- Government and schools
- Towns and Villages

Features and Specifications

Proactive reporting Submit data proactively and on time. The reporting cycle may be adjusted as needed.	**Automatic Networking** Features self-organizing networking capabilities, eliminating the need for debugging and reducing labor costs.	**Wide coverage** Utilizing narrowband IoT technology, it offers broader coverage and stronger signals.	**Massive Connectivity** High spectrum efficiency enables a single base station to connect tens of thousands of water meters without signal interference.	**Low power consumption** The entire watch features an ultra-low power consumption design, enabling battery life of up to 6 years.
Data Security Employ encrypted data channels to prevent data loss during collection and ensure data security.	**Bluetooth communication** The device can be controlled via Bluetooth communication for near-field operation.	**Abnormal Reporting** When abnormal events occur with the water meter, they are automatically recorded and reported to the service platform.	**Battery replaceable** The equipment is battery-powered, easy to operate, and simple to maintain.	**Data Storage** Features local storage functionality, ensuring data remains intact even if the water meter loses power.
Protection Rating Special coating process with sealed plastic housing, achieving an IP68 protection rating.	**Valve Control** Supports prepaid or postpaid functions for convenient billing management.	**IC card swipe** Supports IC card swiping for convenient IC card top-ups.	**Mobile App** Supports mobile app functionality for convenient water meter management, with the option to enable app features for users.	

Advantages of Smart Water Meters

Compared to data security issues with traditional smart water meters, the NB-IoT/4G smart water meter end-to-service security management solution ensures data reliability. Networks based on authorized spectrum components offer high security guarantees in terms of anti-interference capability, data security, and data services, while being easy to deploy. This provides reliable protection for the overall security of billing water meter data.

Compared to the power consumption issues of traditional water meters, NB-IoT/4G smart water meters employ low-power processing mechanisms to significantly reduce energy usage. Under normal conditions, with data collection occurring once daily, the battery can meet specifications for continuous operation exceeding 10 years.

Addressing the large-scale connectivity challenges of traditional smart meters, a unified cloud platform can be established to support diverse IoT applications. This resolves compatibility issues among multiple vendor protocols and simplifies integration across different suppliers. It meets the requirement for convenient meter terminal access while addressing the large-scale connectivity demands of internet interoperability.

Compared to traditional water utilities plagued by heavy meter reading workloads, human-error-prone manual readings, lack of systematic data analysis, and prolonged fault detection cycles, NB-IoT/4G smart water meters enable reduced meter reading costs, real-time data analysis, scientific meter management, and timely fault troubleshooting.

Compared to traditional wired smart water meters requiring complex wiring installations, NB-IoT/4G smart water meters offer simplified installation. They enable rapid deployment with automatic network formation, eliminating the need for wiring construction or on-site personnel debugging, saving both time and labor.

Compared to LoRa water meters, NB-IoT/4G smart water meters utilize carrier-grade narrowband cellular technology. They operate on legally authorized signal bands by the Ministry of Industry and Information Technology, ensuring stability, security, and reliability through carrier communication base stations. In contrast, LoRa water meters employ linear frequency modulation spread spectrum technology on unlicensed frequency bands. They require self-deployed base stations, increasing installation costs while offering poor signal stability.

HWM Series IoT Magnetic Water Meter

Product Overview

Utilizing a new microprocessor to collect and record the volume of drinking water flowing through municipal water pipes, and transmitting this data via NB-IoT/4G to the water utility platform to enable remote meter reading and billing.

Model Selection Example: HWM 100 - DXX F B

① ② ③ ④ ⑤

Product Advantages and Features

1. Based on carrier-grade network communication, it ensures stable, reliable, and secure transmission with deep signal coverage, low power consumption, and stable, dependable communication;
2. Dynamic network self-maintenance technology: The system periodically performs automatic network maintenance, enabling zero-configuration, zero-maintenance, plug-and-play functionality, rapid network deployment, and bidirectional communication with the software platform;
3. Circuit boards are fully encapsulated with imported soft epoxy resin adhesive. Waterproof batteries are used with an independent battery compartment design, ensuring both circuit waterproofing and easy battery replacement. The entire device meets IP68 waterproof rating;
4. Supports periodic scheduled meter reading with active wake-up capability for real-time water volume reporting. Threshold-based design triggers immediate alerts upon threshold exceedance;
5. Wireless real-time monitoring: Proactively alerts for magnetic tampering, low battery, and other critical conditions;
6. Material options include cast iron, copper, or nylon.

Measurement Technical Parameters

DN	Rank	Level	Class	Temperature Class	Maximum Pressure	Pressure Loss	Maximum permissible error			Sensitivity Level	Operating Voltage
							low ($Q_1 \leqslant Q < Q_2$)	high($Q_2 \leqslant Q \leqslant Q_4$)			
								temp ⩽ 30℃	temp > 30℃		
15	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
20	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
25	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V

Flow Technical Parameters

Nominal diameter	Range ratio R	Overload current Q_4	Common flow Q_3	Threshold flow Q_2	Minimum flow Q_1	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
15	80	3.1	2.5	0.050	0.031	0.0001	9,999.9999
15	100	3.1	2.5	0.040	0.025	0.0001	9,999.9999
20	80	5	4	0.080	0.050	0.0001	9,999.9999
20	100	5	4	0.064	0.040	0.0001	9,999.9999
25	80	7.9	6.3	0.126	0.079	0.0001	9,999.9999
25	100	7.9	6.3	0.101	0.063	0.0001	9,999.9999

HWM Series IoT Non-magnetic Water Meter

Product Overview

Utilizing a new microprocessor to collect and record the volume of drinking water flowing through municipal water pipes, and transmitting this data via NB-IoT/4G to the water utility platform to enable remote meter reading and billing.

Model Selection Example: HWM 100 - DXX F B

① ② ③ ④ ⑤

Product Advantages and Features

1. Features deep signal network coverage, low power consumption, stable and reliable communication, plug-and-play functionality, rapid networking, and bidirectional communication with software platforms.
2. Proprietary contactless electronic sensor utilizing non-magnetic signal detection technology to directly read impeller rotation count signals. Performs flow rate correction based on rotational speed, significantly enhancing flow measurement accuracy and resolution.
3. Hysteresis sampling technology filters and evaluates signals, effectively mitigating errors caused by pipeline vibration and water hammer pressure. Non-magnetic signal acquisition resists interference from external magnetic materials and rust;
4. Supports periodic scheduled meter reading with active wake-up capability for real-time water volume reporting. Threshold-based design triggers immediate alerts upon threshold exceedance;
5. Wireless real-time monitoring: Proactively alerts for magnetic attacks, low battery, and other critical conditions;
6. Ultra-low power consumption design: Utilizes high-density lithium-ion batteries combined with voltage-stabilizing capacitor technology for over 6 years of operation;
7. IP68 triple-proof rating: Fully encapsulated with imported soft epoxy resin, ensuring normal performance even in moisture or submersion;
8. High-definition LCD display: Clearly shows water consumption, battery level, signal strength, and other key metrics;
9. Includes an IC card for network-based or card-based top-ups, eliminating recharge issues during network outages or poor signal conditions.

Measurement Technical Parameters

DN	Rank	Level	Class	Temperature Class	Maximum Pressure	Pressure Loss	Maximum permissible error			Sensitivity Level	Operating Voltage
							low ($Q_1 \leqslant Q < Q_2$)	high($Q_2 \leqslant Q \leqslant Q_4$)			
								temp ⩽ 30℃	temp > 30℃		
15	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
20	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
25	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V

Flow Technical Parameters

Nominal diameter	Range ratio R	Overload current Q_4	Common flow Q_3	Threshold flow Q_2	Minimum flow Q_1	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
15	80	3.1	2.5	0.050	0.031	0.0001	9,999.9999
15	100	3.1	2.5	0.040	0.025	0.0001	9,999.9999
20	80	5	4	0.080	0.050	0.0001	9,999.9999
20	100	5	4	0.064	0.040	0.0001	9,999.9999
25	80	7.9	6.3	0.126	0.079	0.0001	9,999.9999
25	100	7.9	6.3	0.101	0.063	0.0001	9,999.9999

HWM Series IC Card Intelligent Magnetic Water Meter

Product Overview

IC card smart water meters are prepaid smart meters that utilize IC cards for recharging. They automatically control valves based on remaining credit, requiring users to pay upfront before water usage to achieve the purpose of prepaid tap water. These meters are widely used in residential homes, apartment buildings, hotels, schools, rural areas, and other locations.

Model Selection Example: HWM ① 100 ② - DXX ③ F ④ B ⑤

Product Advantages and Features

1. Prepaid Functionality: IC card smart water meters operate on a “pay first, use later” model, effectively resolving the issue of unpaid bills associated with traditional meters while accelerating cash flow recovery;
2. Inquiry Function: Users can check cumulative water consumption, remaining balance, and current purchase volume;
3. Accurate Measurement: Utilizing modern sensor and microelectronics technology, IC card smart meters deliver high measurement precision, reducing manual reading errors and enhancing water usage fairness;
4. Automated Management: Eliminates the need for meter readers to visit premises, cutting labor costs while enabling remote monitoring and automatic water flow control;
5. Alarm Valve Closure: When remaining water volume reaches 5 cubic meters (configurable), the meter triggers an “alarm” and closes the valve, prompting users to purchase water promptly. The valve reopens only when the paired user card is placed near the meter, continuing until water volume reaches zero, at which point the IC card smart meter automatically closes the valve;
6. Low-voltage protection: When power voltage falls below the preset threshold, the IC card smart water meter displays “Low Voltage” and shuts off the valve within 1 minute.
7. Water conservation and environmental protection: Users can monitor real-time water consumption, enhancing water-saving awareness and reducing waste.
8. High security: Features anti-counterfeiting capabilities to prevent tampering and automatically alerts for abnormal conditions.

Flow Technical Parameters

DN	Rank	Level	Class	Temperature Class	Maximum Pressure	Pressure Loss	Maximum permissible error			Sensitivity Level	Operating Voltage
							low ($Q_1 \leqslant Q < Q_2$)	high($Q_2 \leqslant Q \leqslant Q_4$)			
								temp ⩽ 30℃	temp ＞ 30℃		
15	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
20	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
25	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V

Measurement Technical Parameters

Nominal diameter	Range ratio R	Overload current Q_4	Common flow Q_3	Threshold flow Q_2	Minimum flow Q_1	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
15	80	3.1	2.5	0.050	0.031	0.0001	9,999.9999
15	100	3.1	2.5	0.040	0.025	0.0001	9,999.9999
20	80	5	4	0.080	0.050	0.0001	9,999.9999
20	100	5	4	0.064	0.040	0.0001	9,999.9999
25	80	7.9	6.3	0.126	0.079	0.0001	9,999.9999
25	100	7.9	6.3	0.101	0.063	0.0001	9,999.9999

HWM series electronic remote water meter

Product Overview

Utilizing a new microprocessor to collect and record the volume of drinking water flowing through municipal pipelines, data is transmitted via M-Bus or RS485 bus to a central hub. From there, it is uploaded to the water utility platform through fiber optic or 4G networks, enabling remote meter reading and billing management.

Model Selection Example: HWM ① 100 ② - DXX ③ M ④ B ⑤

Product Advantages and Features

1. Powered by M-Bus/RS485 bus transmission, ensuring stable, reliable, and secure data transfer;
2. Structural innovation: The electronic components of the direct-reading meter have no mechanical contact with the meter's internal counter mechanism, preserving original measurement sensitivity;
3. Zero cumulative error: Utilizes infrared photoelectric transmission to directly read the absolute encoding of the water meter's dial wheels. Combined with data accumulation and carry-over technology, this eliminates all measurement errors;
4. Remote meter reading captures real-time water meter values without requiring initialization;
5. Passive power system: Power outages do not affect metering. No continuous power supply is needed—only momentary power during reading. Low failure rate, minimal power consumption, and extended service life;
6. Technically sealed structure: Dial readings remain unaffected by water quality, ensuring permanently clear readings.

Flow Technical Parameters

DN	Rank	Level	Class	Temperature Class	Maximum Pressure	Pressure Loss	Maximum permissible error			Sensitivity Level	Operating Voltage
							low ($Q_1 \leqslant Q < Q_2$)	high($Q_2 \leqslant Q \leqslant Q_4$)			
								temp ⩽ 30℃	temp ＞ 30℃		
15	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
20	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
25	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V

Measurement Technical Parameters

Nominal diameter	Range ratio R	Overload current Q_4	Common flow Q_3	Threshold flow Q_2	Minimum flow Q_1	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
15	80	3.1	2.5	0.050	0.031	0.0001	9,999.9999
15	100	3.1	2.5	0.040	0.025	0.0001	9,999.9999
20	80	5	4	0.080	0.050	0.0001	9,999.9999
20	100	5	4	0.064	0.040	0.0001	9,999.9999
25	80	7.9	6.3	0.126	0.079	0.0001	9,999.9999
25	100	7.9	6.3	0.101	0.063	0.0001	9,999.9999

HWM Series IoT Valve Controlled Water Meter

Product Overview

Utilizing a new microprocessor to collect and record the volume of drinking water flowing through municipal water pipes, data is transmitted via NB-IoT/4G to the water utility platform. This enables remote meter reading and billing through functions such as remotely opening/closing valves and flow restriction.

Model Selection Example: HWM 100 - DXX F B
① ② ③ ④ ⑤

Product Advantages and Features

1. Utilizes carrier network communication for stable, reliable, and secure transmission. Features deep signal network coverage, low power consumption, and stable, dependable communication. Plug-and-play functionality enables rapid network deployment with bidirectional communication to software platforms;
2. Employing hysteresis sampling technology, it filters and evaluates sampled signals to effectively mitigate errors caused by pipeline vibration and water hammer pressure. Signals are captured magnetically-free, ensuring immunity to interference from external magnetic substances and rust;
3. IP68 protection rating with full coverage by imported soft epoxy resin sealant ensures normal operation even in damp or submerged conditions.
4. Ultra-low power consumption design utilizes high-density lithium-ion batteries combined with voltage-stabilizing capacitor technology, delivering a lifespan exceeding 6 years.
5. Supports periodic scheduled meter reading with active wake-up capability for real-time water consumption reporting. Threshold-based design triggers immediate reporting upon threshold exceedance;
6. Wireless real-time monitoring: Proactively alerts for magnetic attacks, valve malfunctions, low battery, or water leakage;
7. High-definition LCD display clearly shows water consumption, battery level, signal strength, and other data.

Measurement Technical Parameters

DN	Rank	Level	Class	Temperature Class	Maximum Pressure	Pressure Loss	Maximum permissible error			Sensitivity Level	Operating Voltage
							low ($Q_1 \leqslant Q < Q_2$)	high($Q_2 \leqslant Q \leqslant Q_4$)			
								temp ⩽ 30°C	temp > 30°C		
15	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
20	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V
25	B 级	E1 级	2 级	0.1℃ -30℃	⩽ 1MPa	⩽ 0.063MPa	±5%	±2%	±3%	U10/D5	DC3.6V

Flow Technical Parameters

Nominal diameter	Range ratio R	Overload current Q_4	Common flow Q_3	Threshold flow Q_2	Minimum flow Q_1	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
15	80	3.1	2.5	0.050	0.031	0.0001	9,999.9999
15	100	3.1	2.5	0.040	0.025	0.0001	9,999.9999
20	80	5	4	0.080	0.050	0.0001	9,999.9999
20	100	5	4	0.064	0.040	0.0001	9,999.9999
25	80	7.9	6.3	0.126	0.079	0.0001	9,999.9999
25	100	7.9	6.3	0.101	0.063	0.0001	9,999.9999

HWM Series IoT Vertical Spiral Wing Water Meter

Product Overview

Vertical spiral wing water meters are designed for high-flow measurement applications. Featuring a wing shaft perpendicular to the water flow direction, they are widely used in urban water supply and industrial production sectors. Data is transmitted to water utility platforms via NB-IoT/4G for remote meter reading and billing. These meters can also be equipped with valve control functionality, enabling precise measurement alongside remote water flow regulation—ideal for prepaid management systems.

Non-valve-controlled water meter

Model Selection Example: HWM 100 - DXXX F B
① ② ③ ④ ⑤

Product Advantages and Features

1.Valve Control Functionality: Integrated control valve enabling local or remote valve operation. Supports prepaid billing, remote water cutoff/restoration, and other features for streamlined water management. For instance, automatic valve closure upon unpaid bills ensures water supply security.
2. Low Flow Measurement: Its low starting flow design ensures high-precision measurement even under low flow conditions;
3. Complex Water Quality Environments: Built-in stainless steel filter mesh design effectively prevents contamination and adapts to harsh water quality conditions;
4. Installation Flexibility: No straight pipe run required, simple installation, suitable for confined spaces or restricted piping conditions;
5. Smart requirements: Supports remote meter reading via wireless transmission modules (e.g., NB-IoT/4G) for remote monitoring and data management.
6. Maximum permissible error:
a. ±5% in the low range (from minimum flow to below the boundary flow, inclusive);
b. ±2% in the high range (from the boundary flow to overload flow, inclusive).
7. Feature-rich: Some models feature self-diagnostics, enabling real-time monitoring of meter status (e.g., sensor failures, valve anomalies) with alert notifications. Additional capabilities include data storage and historical record queries for analyzing water usage trends.

Adaptable Valve-Controlled Water Meter

Measurement Technical Parameters

Nominal diameter	Range ratio R	Minimum flow Q_1	Threshold flow Q_2	Common flow Q_3	Overload current Q_4	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
50	R200	0.2	0.32	40	50	0.001	9999999
80	R200	0.32	0.5	63	78	0.001	9999999
100	R200	0.5	0.8	100	125	0.001	9999999
150	R200	1.25	2	250	313	0.001	9999999
200	R200	2	3.2	400	500	0.001	9999999

HWM Series IoT Horizontal Spiral Wing Water Meter

Product Overview

Utilizing a new microprocessor to collect and record the volume of drinking water flowing through municipal pipelines, data is transmitted via NB-IoT/4G to the water utility platform, enabling remote meter reading and billing. The system can also be adapted for valve control functionality, allowing valve-controlled water meters to provide precise measurement while remotely managing water flow, facilitating prepaid management.

Non-valve-controlled water meter

Model Selection Example: HWM 100 - DXXX F B

① ② ③ ④ ⑤

Product Advantages and Features

1. Valve Control Function: Integrated control valve enables local or remote valve operation, supporting prepaid billing, remote water cutoff/restoration, and other features for streamlined water management. For instance, automatic valve closure upon unpaid bills ensures water supply security;
2. Structural Innovation: The electronic components of the direct-reading meter have no mechanical contact with the internal counter mechanism, preserving the original measurement sensitivity;
3. Data Security: Pure digital signal encryption ensures secure and accurate data transmission.
4. Ultra-low power consumption design utilizes high-density lithium-ion batteries combined with voltage-stabilizing capacitor technology, delivering a lifespan exceeding 6 years.
5. Supports periodic scheduled meter reading with active wake-up capability for real-time water volume reporting. Threshold-based design triggers immediate reporting upon threshold exceedance.
6.Feature-rich: Select models include self-diagnostic capabilities to monitor meter status in real time (e.g., sensor failures, valve anomalies) with alert notifications. Also supports data storage and historical record queries for analyzing water usage trends.

Adaptable Valve-Controlled Water Meter

Measurement Technical Parameters

Nominal diameter	Range ratio R	Minimum flow Q_1	Threshold flow Q_2	Common flow Q_3	Overload current Q_4	Minimum reading	Maximum reading
DN	Q_3/Q_1	m^3/h				m^3	
40	R50	0.32	0.51	16	20	0.02	999999
50	R50	0.5	0.8	25	31.25	0.02	999999
65	R50	0.8	1.28	40	50	0.02	999999
80	R50	1.26	2	63	78.75	0.02	999999
100	R50	2.0	3.2	100	125	0.02	999999
125	R50	3.2	5.12	160	200	0.02	999999
150	R50	5.0	8	250	312.5	0.02	999999
200	R50	8.0	12.8	400	500	0.02	999999
250	R50	12.6	20.2	630	787.5	0.2	9999999
300	R50	20	32	1000	1250	0.2	9999999

HWC IoT Camera Direct Reading Module

Product Overview

For upgrading small-diameter mechanical water meters in the field, this solution employs a backend recognition algorithm based on deep learning technology combined with front-end feature template recognition technology. It enables accurate identification of water meter readings, providing water utilities with both meter counter images and numerical data to facilitate water usage analysis and billing settlement.

(Requires use with a gateway)

Model Selection Example: HWC 100 - F B

① ② ④ ⑤

Product Advantages and Features

1. Retains the metering and installation advantages of mechanical water meters;
2. No wiring required, simple installation, and convenient on-site debugging;
3. Zero-error collection of water meter binary images/original images/digital data, enabling simultaneous reading, collection, and verification;
4. Modules are 100% separable from water meters for easy disassembly and reuse;
5. Free meter reading frequency band, LPWAN low-power network, with expandable protocols;
6. Advanced image recognition algorithm achieving over 99% accuracy;
7. LPWAN self-organizing network and NB-IoT network heterogeneous architecture reduces service fees;
8. Built-in lithium battery with ultra-low power consumption, low voltage alarm, and service life exceeding 6 years.

Technical Parameters

Categories	Parameter Details
Product Power Consumption	Standby current <3μA, maximum operating current <30mA
Operating Voltage	3.6V (built-in battery)
Operating Environment	Operating temperature -25~65°C
Communication Rate	Micro-power 200kbps high-speed image reading
Recognition Rate	>99%
Meter Reading Time	Less than 3s
Receiver Sensitivity	-112d
Protection Rating	IP68

HWC Large Aperture Camera Direct Reading Module

Product Overview

For upgrading large-diameter mechanical water meters in the field, this solution employs a backend recognition algorithm based on deep learning technology and frontend feature template recognition technology to achieve accurate identification of water meter readings. When paired with large-diameter IoT terminals or remote flow/pressure monitoring terminals, it provides water utilities with water meter counter images and numerical data, facilitating water usage analysis and billing settlement.

(Requires use with a gateway)

Model Selection Example: HWC 100 - F B

① ② ④ ⑤

Product Advantages and Features

1. Retains the metering and installation advantages of mechanical water meters, suitable for harsh environments such as pits;
2. No wiring required, simple installation, and convenient on-site debugging;
3. Zero-error capture of water meter binary images and original images;
4. Module is 100% separable from the water meter, easy to disassemble and reuse;
5. Advanced image recognition algorithm with over 99% accuracy;
6. LPWAN self-organizing network with NB-IoT network for heterogeneous operation, reducing service fees;
7. Built-in lithium battery, ultra-low power consumption, with low-voltage alarm.

Technical Parameters

Categories	Technical Parameters
Power Consumption	Standby current <3μA, maximum operating current <30mA
Operating Voltage	3.6V (built-in battery)
Operating Environment	Operating temperature -25~65℃ , relative humidity 5-95%
Communication Rate	Micro-power 200kbps high-speed image reading
Recognition Rate	>99%
Meter Reading Time	Less than 3s
Receiver Sensitivity	-112d
Protection Rating	IP68

HGCA IoT Camera Gateway

Product Overview

Suitable for installation in water meter wells or floor-level applications without continuous power supply, this solution employs micro-power wireless networks alongside NB-IoT/4G communication technologies. Utilizing Bluetooth for data collection and monitoring of multiple device types, it transmits data to the cloud platform via uplink.

Model Selection Example: HGCA 100 -O A B P8

① ② ③ ④ ⑤ ⑥

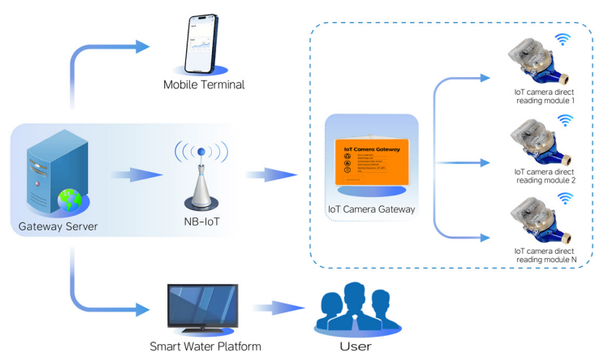
Product Advantages and Features

1. Compact dimensions for installation in confined spaces; mountable anywhere with strong signal strength inside or outside manholes;
2. Wirelessly collects data from pulse-type wireless cold water meters and wireless camera direct-read modules;
3. Triple waterproofing, moisture resistance, and protection with fully potted encapsulation;
4. Supports storage of identification numbers, binarized images, and original images;
5. Enables scheduled meter reading tasks dispatched by the master station at designated time points;
6. Operates in “Superframe + Bidirectional Sniffing” mode, entering offline sleep during idle periods and waking up when active;
7. Supports on-site debugging via mobile app or mini-program, along with signal strength testing at collection points for convenient and efficient operation.

Technical Parameters

Categories	Parameter Details
Power Supply Method	Lithium Battery
Device Power Consumption	Battery Type: Standby Current < 3μA, Maximum Operating Current < 0.6A (3.6V)
Load Capacity	16 Nodes
Wireless Output	470MHz–510MHz (Dedicated Meter Reading Band)
Transmission Rate	50kbps~200kbps
Wireless Transmission Power	<14dBm
Wireless Reception Sensitivity	-112dBm
Data Storage	2MByte

System Architecture Topology Diagram



HWC IoT Camera Remote Transmission Module

Product Overview

For upgrading small-diameter mechanical water meters in the field, this solution employs a backend recognition algorithm based on deep learning technology and frontend feature template recognition technology to accurately identify water meter readings. Data is transmitted via NB-IoT networks to customer servers, providing water utilities with water meter counter images and numerical values to facilitate water usage analysis and billing settlement.

Model Selection Example: HWC 100 - F B
① ② ④ ⑤

Product Advantages and Features

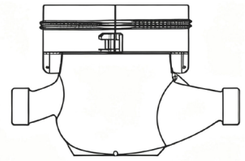
1. Retains the advantages of existing water meter metering and installation;
2. No wiring required, simple installation;
3. Zero-error capture of water meter binary images, original images, and digital data;
4. Module is 100% separable from the water meter, easy to disassemble and reuse;
5. Advanced image recognition algorithm with over 99% accuracy;
6. Direct data transmission via NB-IoT network ensures high stability.

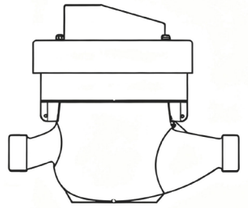
Technical Parameters

Categories	Parameter Details
Operating Temperature	-25℃ ~65℃
Power Supply	lithium battery
Battery Model	ER18505(Energy Type)
Battery Capacity	4000mAh
Communication Method	NB-IoT
Standby Current	<3μA
Sensor Resolution	30W
Data Acquisition Interval	Once a week
Waterproof and Dustproof Rating	IP68

Installation Guide

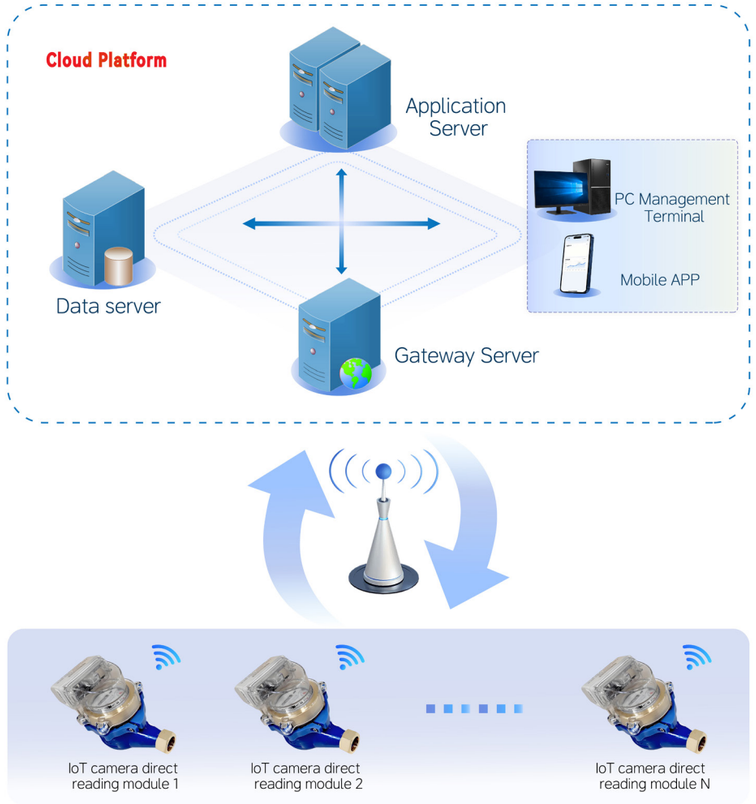
①Buckle and rotate the locking ring seat.





②Tighten the camera module.

③Image parameter settings.



AI Remote Water Meter Reader

Product Overview

This product is a smart remote transmission terminal for water meters based on AI edge computing technology. Equipped with built-in low-power recognition algorithms and an independent communication module (with SIM card), it adopts Cat.1 communication technology to guarantee stable wireless data transmission. Extremely easy to install, it can be deployed in just two simple steps: place the meter and fasten the strap. Featuring coordinated hardware and software design, the device delivers round-the-clock stable operation in all harsh environments. It also supports offline meter reading without heavy reliance on the network, effectively boosting the monitoring efficiency and intelligence of water service management.

Product Advantages and Features

1. Low-power AI recognition algorithm;
2. Complete remote transmission upgrades for more water meters with the same investment;
3. No meter replacement required; direct retrofitting, installation takes merely 2 minutes;
4. Stable long-distance data transmission & ultra-low power consumption;
5. 78% reduction in equipment cost and 90% saving on installation cost.

Technical Parameters

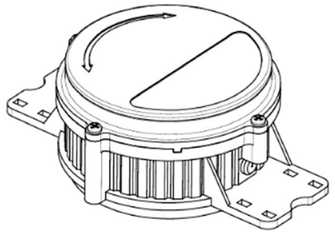
AI Remote Water Meter Reader	
Power Supply	Built-in lithium battery
Collection Mode	Meter-side AI recognition / Cloud AI recognition
Communication Mode	4G Cat.1
Waterproof Rating	IP68
Standby Duration	7 years (2 meter readings per month)
Warranty Period	1 year
Operating Temperature	-20°C ~ 60°C
OTA Upgrade	Remote online upgrade for AI model and firmware

Meter Type	Small household meter	Large-caliber meter
Applicable Caliber	DN ＜ 40	DN ⩾ 40
Battery Capacity	2700mAh (customizable)	4000mAh (customizable)
Adapter Fitting	Not equipped	Included

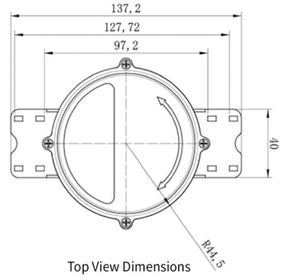
International Version

Detailed Terminal Parameters			
Processor Chip		Industrial-grade RISC-V MCU	
Network Type	4G Cat.1	4G Reception Sensitivity	-104dBm
Supported Networks & Frequency Bands	Supports mainstream global frequency bands, compatible with FDD-LTE and TDD-LTE standards	Input Voltage Range	3.0–3.6V
SIM Card Type	Plug-in SIM Card	Max Pulse Current	200mA
Max 4G Transmit Power	23dBm	Average Operating Current	40mA
Camera	80,000 pixels	Standby Current	Less than 10μA
Operating Temperature	-20°C ~ 60°C		

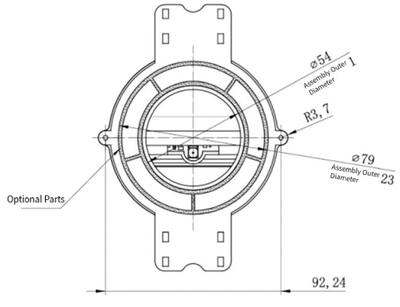
Overall Dimensions



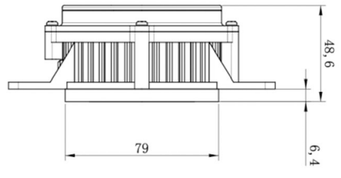
Overall Appearance



Top View Dimensions



Bottom View Dimensions



Side View Dimensions

AI Remote Gas Meter Reader

Product Overview

This product is a smart remote transmission terminal for water meters based on AI edge computing technology. Equipped with built-in low-power recognition algorithms and an independent communication module (with SIM card), it adopts Cat.1 communication technology to guarantee stable wireless data transmission. Extremely easy to install, it can be deployed in just two simple steps: place the meter and fasten the strap. Featuring coordinated hardware and software design, the device delivers round-the-clock stable operation in all harsh environments. It also supports offline meter reading without heavy reliance on the network, effectively boosting the monitoring efficiency and intelligence of water service management.

Product Advantages and Features

1. Low-power AI recognition algorithm;
2. Complete remote transmission upgrades for more water meters with the same investment;
3. No meter replacement required; direct retrofitting, installation takes merely 2 minutes;
4. Stable long-distance data transmission & ultra-low power consumption;
5. 78% reduction in equipment cost and 90% saving on installation cost.

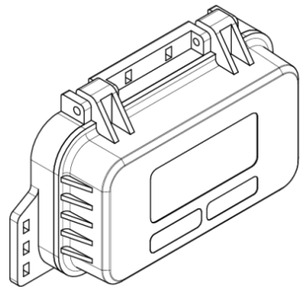
Technical Parameters

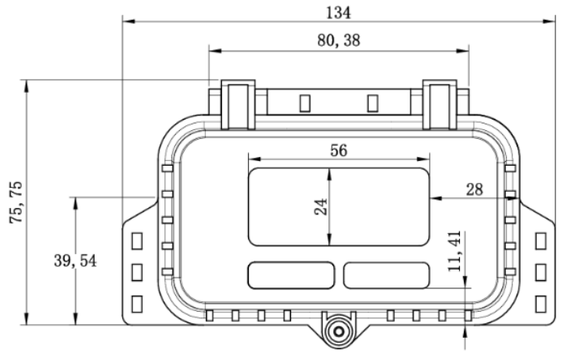
Household Meter (for gas meter retrofit)	
Power Supply	Built-in lithium battery
Collection Mode	Meter-side AI recognition / Cloud AI recognition
Communication Mode	4G Cat.1
Battery	2700mAh (Customizable)
Standby Duration	10 years (2 meter readings per month)
Operating Temperature	-20°C ~ 60°C
OTA Upgrade	Remote online upgrade for AI model and firmware

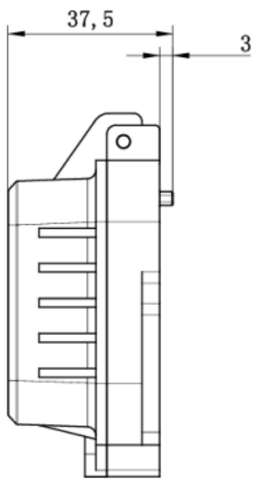
International Version

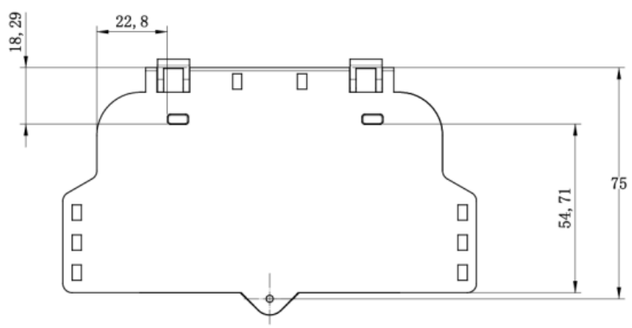
Detailed Terminal Parameters			
Processor Chip		Industrial-grade RISC-V MCU	
Network Type	4G Cat.1	4G Reception Sensitivity	-104dBm
Supported Networks & Frequency Bands	Supports mainstream global frequency bands, compatible with FDD-LTE and TDD-LTE standards	Input Voltage Range	3.0–3.6V
SIM Card Type	Plug-in SIM Card	Max Pulse Current	200mA
Max 4G Transmit Power	23dBm	Average Operating Current	40mA
Camera	80,000 pixels	Standby Current	Less than 10μA
Operating Temperature	-20°C ~ 60°C		

Overall Dimensions







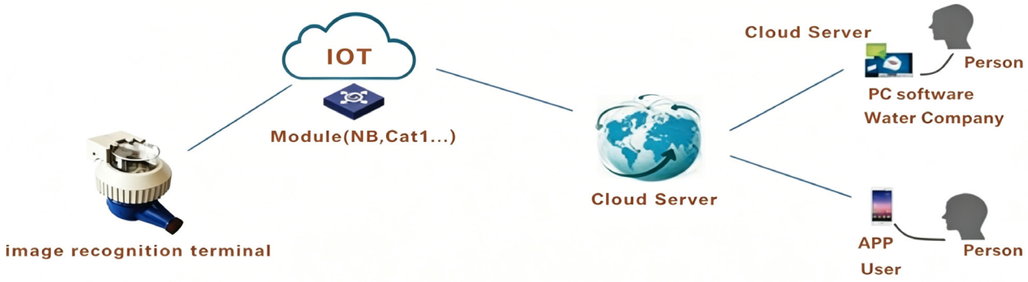


Wireless Remote Camera Water Meter

Product Overview

Universal camera acquisition module with ultra-low standby power consumption supports multiple adaptive IoT access modes to guarantee reliable data collection. Remote customizable meter reading schemes (including reading time, acquisition frequency, valve control, etc.) are available to accommodate diverse application requirements.

Based on computer vision technology, the wireless camera water meter supports adaptive IoT access modes of multiple operators. It delivers cost-effective optimal solutions for the digital upgrading, retrofitting and management of water meter reading systems. Integrated with intelligent metering management and real-time



Product Advantages and Features

1. Split design with strong adaptability;
2. Remote customization and excellent expandability;
3. Dynamic monitoring for easy maintenance;
4. Double-thread design enabling quick installation;
5. Low power consumption for long service life.

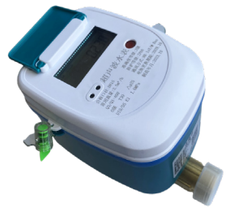
Technical Parameters

Modulation Mode	CAT1/4G，NB-IOT
Supported Frequency Bands	TDD-LET：B34/B38/B39/B40/B41 FDD-LET：B1/B3/B5/B8
Collection Frequency	Remote customization (Unit: minute, hour, day)
Upload Method	On-demand remote configuration (Items: upload time, upload frequency)
Recognition Accuracy	Recognition accuracy over 99% (Image quality: distinguishable to the naked eye)
Standby Power Consumption	⩽ 1μA
Product Service Life	8–10 years (1 upload per day)
Waterproof Rating	IP68
Battery Specification	3.6V, Capacity: 4000–9000mAh
Operating Voltage	2.8V-3.6V
Operating Temperature	-40-80°C
Anti-electromagnetic Interference Level	Class E1

HWU Series IoT Ultrasonic Water Meter

Product Overview

The flow velocity of the fluid is measured by calculating the difference between the time taken for an ultrasonic pulse to propagate downstream and upstream in the fluid. This enables the calculation of the flow rate within the pipeline, with compensation applied based on the collected fluid temperature for enhanced measurement accuracy. The meter contains no mechanical moving parts, ensuring no wear, a long service life, and low maintenance costs. Supports multiple communication protocols, enabling remote meter reading for centralized management. Widely applied in municipal water supply, industrial production, agricultural irrigation, and other sectors.



选型型号示例：

HWU	100	-	DXX	F	B
①	②		③	④	⑤

Product Advantages and Features

1. Utilizes picosecond-level high-precision metering chips, featuring low starting flow rate, wide measurement range, high metering accuracy, and capable of measuring dripping water;
2. Fully sealed electronic components provide waterproof, moisture-proof, dust-proof, dirt-resistant, and sand-resistant properties;
3. Beyond water volume recording and meter reading, ultrasonic water meters support flow monitoring, leak alerts, and over-flow detection. They enable remote meter reading and data transmission for centralized management;
4. Installation is non-directional, accommodating horizontal or vertical mounting to adapt to complex environments. Performance remains unaffected by external factors like water quality, temperature, or pressure;
5. Utilizes ultra-low power technology for extended battery life and minimal operational energy consumption, contributing to energy savings and reduced maintenance costs;
6. Compact and structurally stable, it operates reliably under high pressure, low temperatures, and submersion conditions with strong electromagnetic interference resistance;
7. Stores 24 monthly records, 360 daily records, and 192 hourly records with long-term data retention after power loss;
8. Monitors battery, temperature, and flow in real time. Detects, logs, and alerts for anomalies like low battery voltage, transducer malfunction, or non-full pipe (empty pipe) conditions, with corresponding on-screen prompts;
9. Supports multiple communication protocols (RS485, M-Bus, NB-IoT, LoRa, 4G, TTL, etc.) for centralized meter reading and parameter configuration;
10. Enables remote online upgrades at the meter end, continuously meeting evolving water meter requirements and eliminating user concerns;
11. No mechanical components, extended service life: With no internal moving parts or flow-restricting elements, ultrasonic water meters are less susceptible to water impurities, offering a long service life (typically 15-20 years) and low maintenance costs;
12. Note: Material options include ductile iron, brass, stainless steel, etc. Supports single-channel, dual-channel, or quad-channel data acquisition based on requirements.

Technical Parameters

Performance	Parameters
Measured Medium	Domestic water
Power Supply Method	DC3.6V(Lithium battery)
Accuracy Class	2 级
Maximum Allowable Working Pressure	1.6MPa
Environmental Rating	O 级
Temperature Rating	T30/T50/T90
Upstream/Downstream Flow Field Sensitivity Rating	U10/D5
Electromagnetic Compatibility Rating	E1 级
Communication Interface	RS485/M-Bus/NB-IoT/LoRa/4G /TTL
Protection Rating	IP68
Buttons	Touch button

Measurement Technical Parameters

Nominal diameter	Range ratio R	Starting flow Q_s	Minimum flow Q_1	Threshold flow Q_2	Common flow Q_3	Overload current Q_4
DN	Q_3/Q_1	L/h				L/h
15	R250	2.4	10	16	2500	3125
20	R250	4	16	25	4000	5000
25	R250	6.4	25	40	6300	7875
32	R250	10.2	40	64	10000	12500
40	R250	16	64	100	16000	20000
15	R400	2.4	6	10	2500	3125
20	R400	4	10	16	4000	5000
25	R400	6.4	16	25	6300	7875
32	R400	10.2	25	40	10000	12500
40	R400	16	40	64	16000	20000

Nominal diameter	Range ratio R	Starting flow Q_s	Minimum flow Q_1	Threshold flow Q_2	Common flow Q_3	Overload current Q_4
DN	Q_3/Q_1	m^3/h				m^3/h
50	R250	0.04	0.16	0.25	40	50
65	R250	0.064	0.25	0.4	63	78.75
80	R250	0.102	0.4	0.64	100	125
100	R250	0.16	0.64	1.0	160	200
125	R250	0.24	1	1.6	250	312.5
150	R250	0.4	1.6	2.5	400	500
200	R250	0.64	2.5	4.0	630	787.5
250	R250	1.02	4	6.4	1000	1250
300	R250	1.6	6.4	10	1600	2000
50	R400	0.04	0.1	0.16	40	50
65	R400	0.064	0.16	0.252	63	78.75
80	R400	0.102	0.25	0.4	100	125
100	R400	0.16	0.4	0.64	160	200
125	R400	0.24	0.625	1	250	312.5
150	R400	0.4	1	1.6	400	500
200	R400	0.64	1.575	2.52	630	787.5
250	R400	1.02	2.5	4	1000	1250
300	R400	1.6	4	6.4	1600	2000

Note:

1. Select the corresponding nominal diameter (DN) based on the actual operating conditions and typical flow rate to avoid sizing for “large diameter with low flow” or “small diameter with high flow,” which may result in insufficient measurement accuracy or instrument overload.

2. Table parameters are reference values under standard conditions. Actual use requires verification based on operating conditions such as medium temperature, pressure, and viscosity. Special media or extreme conditions necessitate additional sizing validation.

3. Daily operation should remain within the standard flow range. Short-term overloads must not exceed the overload flow rate Q4. Avoid frequent, drastic flow fluctuations to ensure measurement stability and extend the instrument's service life.

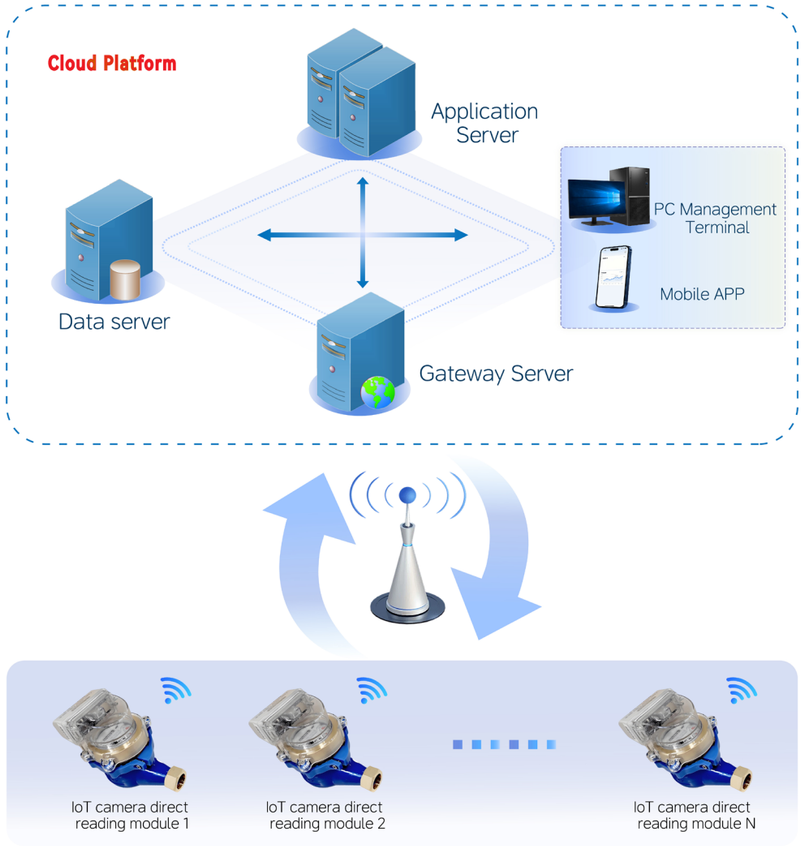
Water Meter Series and Accessories Selection Table

Serial Number	①	②	③	④	⑤
Name	Series	Standard	Caliber	Communication Type	Power Supply Method
IoT magnetic water meters	HWM	100	Dxx: xx-digit number, nominal diameter	F: 4G Cat.1 I: NB-IoT L: LoRa M: M-Bus	P1: AC220V P2: DC24V B: 3.6V lithium battery
IoT Non-magnetic Water Meter	HWM	100			
IC Card Intelligent Magnetic Water Meter	HWM	100			
electronic remote water meter	HWM	100			
IoT Valve Controlled Water Meter	HWM	100			
Large-diameter IoT Vertical Spiral Wing Water Meter	HWM	100			
Large-diameter IoT Horizontal Spiral Wing Water Meter	HWM	100			
IoT Ultrasonic Water Meter	HWU	100			
IoT Camera Direct Reading Module	HWC	100			
Large Aperture Camera Direct Reading Module	HWC	100	A: Household meter B: Large-caliber		
IoT Camera Remote Transmission Module	HWC	100			

Serial Number	①	②	③	④	⑤	⑥
Name	Series	Standard	Caliber	Communication Type	Power Supply Method	Protection Rating
IoT Camera Gateway	HGCA	100	B:Building I:Industry O:Outdoors	A: 4G/4G Cat.1 B: 5G L: LoRa	B: Bluetooth	P4: IP64 P5: IP65 P6: IP66 P7: IP67 P8: IP68 P8: IP69

Smart Water System Architecture

Background: The water supply industry has long been plagued by numerous pain points. Most water utilities still rely on traditional manual meter reading, with readings taken only once every one or two months—or even longer. In extreme weather conditions that hinder meter reading, some utilities resort to estimating water consumption based on residents' historical usage, leading to supply conflicts. Simultaneously, the lengthy manual management cycle of pipeline networks facilitates illegal water usage. Annually, high production-sales discrepancies persist due to pipeline leaks, metering losses, courtesy water, and theft, directly impacting the economic performance of water utilities. While many utilities have implemented various countermeasures, the situation remains severe—with discrepancies exceeding 20%—due to vast service areas, high manual monitoring costs, and lagging manual management. Water meters serve as the critical basis for settlement between water utilities and customers. Malfunctions or manual reading errors can result in losses for both parties, while also increasing the likelihood of disputes and complicating their resolution. Consequently, smart water meters are gaining widespread adoption among water utilities.



System Architecture Overview

The NB-IoT/4G-based smart water meter is constructed according to a system architecture comprising the terminal layer, network layer, and cloud platform management layer. It integrates these layers through technologies such as the Internet of Things, cloud computing, and big data to meet future evolution requirements.

一、Terminal Layer

The terminal layer consists of countless NB-IoT/4G terminals, each internally integrated with an NB-IoT/4G standard module capable of connecting to base stations via air interfaces. As the fundamental carriers of IoT, terminals become controllable, manageable, and interoperable by adding sensors for water quality monitoring, water pressure monitoring, flow monitoring, and NB-IoT/4G communication modules.

二、Network Layer

The network layer operates on carrier-based base stations, facilitating data exchange and integration with IoT devices through authorized channels.

三、 Cloud Platform Management Layer

The cloud platform management layer comprises gateway servers, data servers, application servers, and cloud platform control software, serving as the upper-level control core for IoT operations.

1. Gateway Server: Enables access for diverse terminals through unified protocols and interfaces. It aggregates data and command information from various access networks, sorts the data for transmission to the data server, and simultaneously sends real-time command information to the application server. This ensures the data server can execute immediate commands even during data accumulation while supporting simultaneous communication for millions of devices.

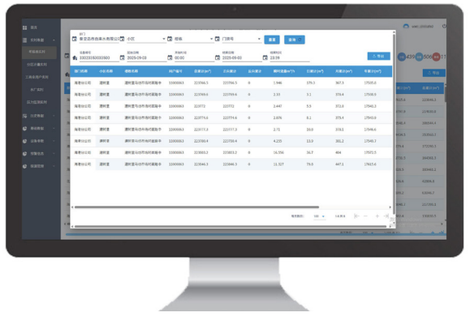
2. Data Server: Aggregates IoT data from the gateway server, categorizes and systematically stores it for efficient retrieval and utilization by the application server.

3. Application Server: Serves as the ultimate convergence point for IoT data and the upper-layer control core for IoT operations. It processes data according to customer requirements, retrieves information from the device layer via the gateway and data servers, and centrally manages water utilities equipment such as water meters and flow meters.

4. Cloud Platform Control Software: This software facilitates interaction between device data and user requirements, available on both PC and mobile platforms. Its functionality can be customized based on actual user needs.

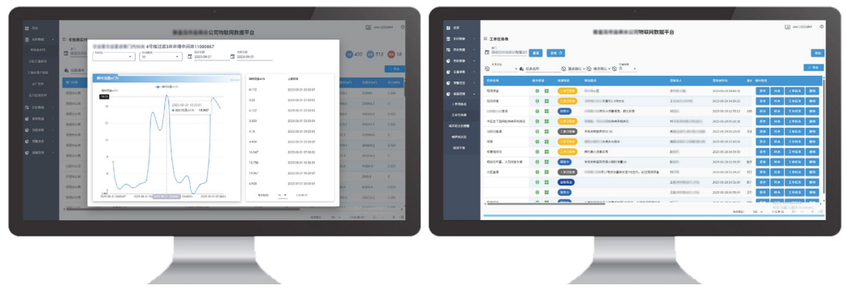
HSW Smart Water System Platform

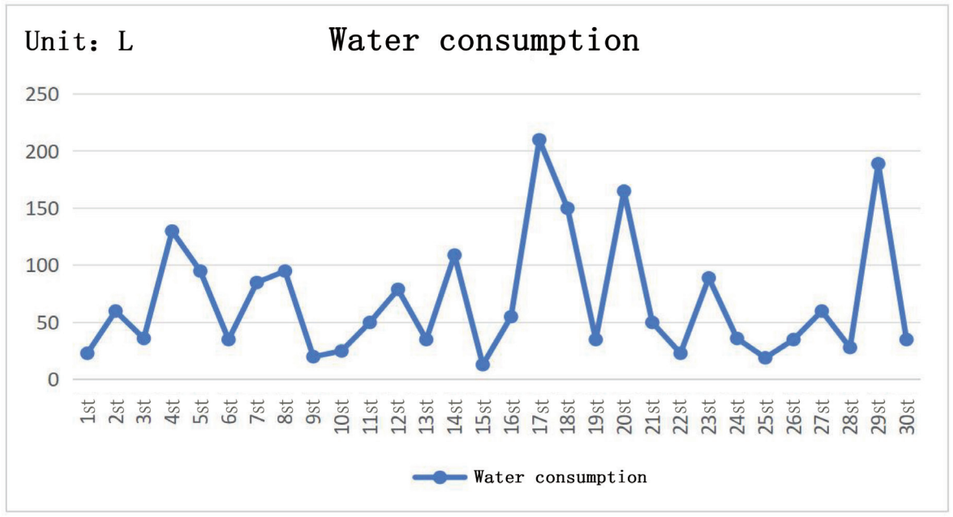
HSW Smart Water Management Platform is a proprietary water management system software developed by our company, available in web-based, PC, and mobile app versions. Additionally, our platform features robust protocol adaptation capabilities, supporting the connection of a vast array of diverse terminal devices. It enables unified access and management of water meters and other terminal devices across different brands and models, ensuring interoperability for greater convenience and efficiency. This facilitates unified management of equipment within the jurisdiction for water supply enterprises.



System Architecture Overview

1. Flow monitoring and early warning capabilities, including real-time data monitoring and tracking of daily, monthly, and annual accumulation metrics;
2. The system platform provides low-battery alerts, data anomaly warnings, and nighttime low-flow monitoring to flag potential leaks;
3. Data visualization and historical queries. Water consumption over specific time periods is presented to users via charts, graphs, and other visual interfaces, enabling autonomous monitoring and management of terminal operational and communication statuses. This prevents property losses from water leakage, disputes, and other issues;
4. The platform integrates leak detection management. Using noise correlation meters, it precisely identifies leak types and issues real-time alerts. Alert data syncs to the platform, enabling staff to assign repair orders to technicians. Technicians log in via mobile app with their personal ID to accept orders. This feature helps technicians quickly locate anomalies and pinpoint causes, enhancing operational efficiency while safeguarding user water experience.
5. The platform supports historical data queries, presenting water consumption over specific time intervals through visual interfaces like charts and graphs. This fulfills customer needs for real-time self-monitoring and management of terminal operational and communication statuses, preventing disputes over water usage (this feature can be made available to users based on water utility requirements).



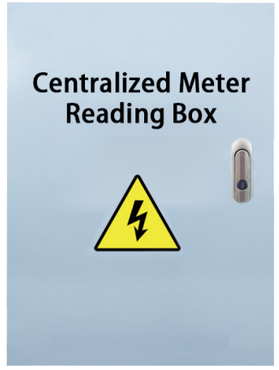


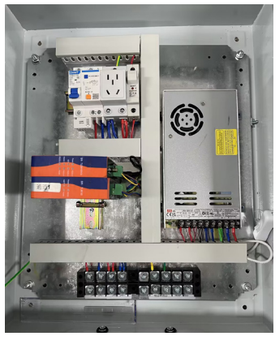
HSW Smart Water Management Control Platform (Mobile Version)

The mobile app version of the HSW Smart Water Supply Platform offers the same functionality as the web version. After logging in with an administrator account, users can view real-time platform data anytime, anywhere, and control the platform remotely. This convenient and efficient solution is ideal for field operations personnel, significantly boosting work efficiency.

06
Data Collection

HGC Centralized Meter Reader





Product Overview

Centralized meter readers are primarily used in the remote meter reading industry, enabling the centralized collection of heat meter readings, water meter readings, gas meters, and valve control, along with remote data transmission. Widely adopted in heating, power, water management, and natural gas sectors, it provides M-Bus and RS485 bus interfaces. The device stores read data locally and connects to the internet via multiple communication methods—4G/5G/LAN/WiFi—enabling remote meter reading and monitoring capabilities.

Model Selection Example: HGC ① 100- ② B ③ A ④ R1 ⑤ M1 P4 ⑦

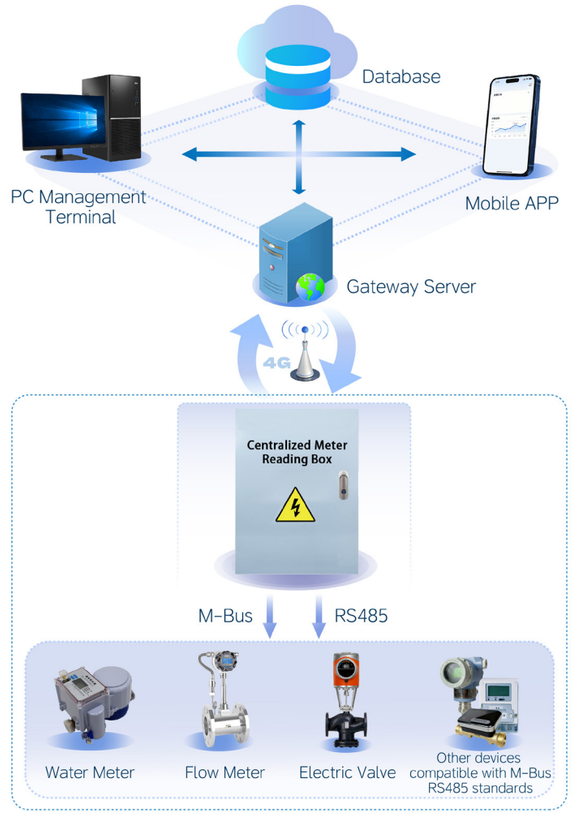
Product Advantages and Features

1. Supports online remote upgrades, remote management, and maintenance;
2. Provides multiple secondary development interfaces for seamless integration with third-party meter reading management systems;
3. Supports scheduled automatic meter reading, automatic protocol parsing, offline operation, local data storage, fault reporting, and resume-from-breakpoint functionality;
4. Simultaneously supports multiple mainstream domestic and international water meters, electricity meters, heat meters, gas meters, ultrasonic heat meters, flow meters.
5. Embedded web server enables users to manage the concentrator via web interface, including configuring operating parameters, manual meter reading, downloading ID information, retrieving historical data, and setting collection cycles;
6. Supports two data collection modes: real-time active meter reading from the management center and local scheduled meter reading;
7. The concentrator and gateway server support automatic time synchronization, defaulting to once every 24 hours;
8. Supports fault localization and diagnosis for the data collection system, along with the capability to report fault information to the data center.
9.The system automatically resets or restarts upon abnormal operation or power loss followed by power restoration.

Technical Parameters

Categories	Parameter Details
Processor and Memory	32-bit industrial-grade processor:256KBvte Ram& 16Mbits Flash; Optional:256KByte Ra256KBvte Ram& 64Mbits Flashm& 32Mbits Flash; 256KBvte Ram& 48Mbits Flash ;

Categories	Parameter Details
Supported Protocols	CI/T188, EN1434-3, Modbus, DL/T645-2007, DL/T645-1997 ;
M-BUS Data Format	Baud rate: 1200 bps to 9600 bps; 8-bit/9-bit data bits; Even parity/Odd parity/No parity; 1 stop bit;
M-BUS Load Capacity	Available in four load specifications: 150W, 350W, 600W, and 800W;
RS485 Data Format	Baud rate: 1200 bps to 9600 bps; 8-bit/9-bit data bits; Even parity/Odd parity/No parity; 1 stop bit;
RS485 Load Capacity	Provides 128-point load specifications;
M-BUS Bus Voltage	High level: 36V, Low level: 20V;
Upstream Communication	Uplink communication supports 4G, 5G, LAN (Ethernet), and Wi-Fi
Downstream Interface	RS485 interface, M-Bus interface, LoRa,RS232 (debug port)
Data Storage	Storage Duration: 100 years Storage Capacity: : 16MB
Meter Reader C/V	Voltage: DC 12V Current: 1.5A Power consumption: 1.8W
Meter Box Voltage	Voltage: AC 220V, Current: 3A; average power consumption < 20W;
Operating Temperature	-20℃ ~80℃ ;
Operating Humidity	5~90%;
Clock	Accuracy: <5s/d;operating time after power failure: ⩾ 36 months;
Meter Box Dimensions	400x300x150MM.Adjust and increase as needed based on Categories;
Waterproof Rating	Standard IP54 rating, upgradeable to IP65 as required;



HGE Edge Data Acquisition Computer

Product Overview

The HGE Edge Data Acquisition Computer supports data collection from various instruments and sensors. It can perform centralized meter reading for large-diameter meters and valves, enabling control over large-diameter valves and pumps. The system can be expanded to collect and monitor data from underground pipeline wells, including temperature, humidity, pressure, water level, methane levels, and other instrumentation.

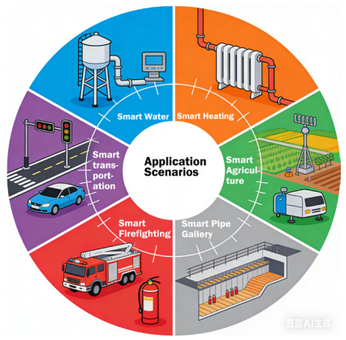
Equipped with built-in intelligent algorithms and edge computing capabilities, the device handles local data collection, real-time processing, intelligent analysis, storage, and device interlock control. This effectively addresses issues inherent in traditional cloud computing models, such as high data transmission latency, significant bandwidth consumption, and prominent privacy and security risks. The device first performs localized filtering and preprocessing of massive raw data, uploading only valuable results or streamlined data to the cloud.

Widely deployed across smart environment, smart agriculture, smart water management, smart property management, smart manhole covers, smart transportation, smart fire protection, smart utility tunnels, and smart industrial applications.

Model Selection Example: HGE 100 - I A R1 M1 DI4 AI2 P9

①	②	③	④	⑤	⑥	⑦
Series	Standard	Caliber	Communication Type	Power Supply Method	Digital Interface & Analog Interface	Protection Rating
HGE	100	B: Building I: Industrial O: Outdoors	A: 4G/4G Cat.1 B: 5G L: LoRa	R: R1~N, RS485 M: M1~N, M-Bus (1~N: channel quantity)	DI: DI1~N, Digital Input Interface DO: DO1~N, Digital Output Interface AI: AI1~N, Analog Input Interface AO: AO1~N, Analog Output Interface (1~N:channel quantity)	P4: IP64 P5: IP65 P6: IP66 P7: IP67 P8: IP68 P8: IP69

Product Advantages and Features

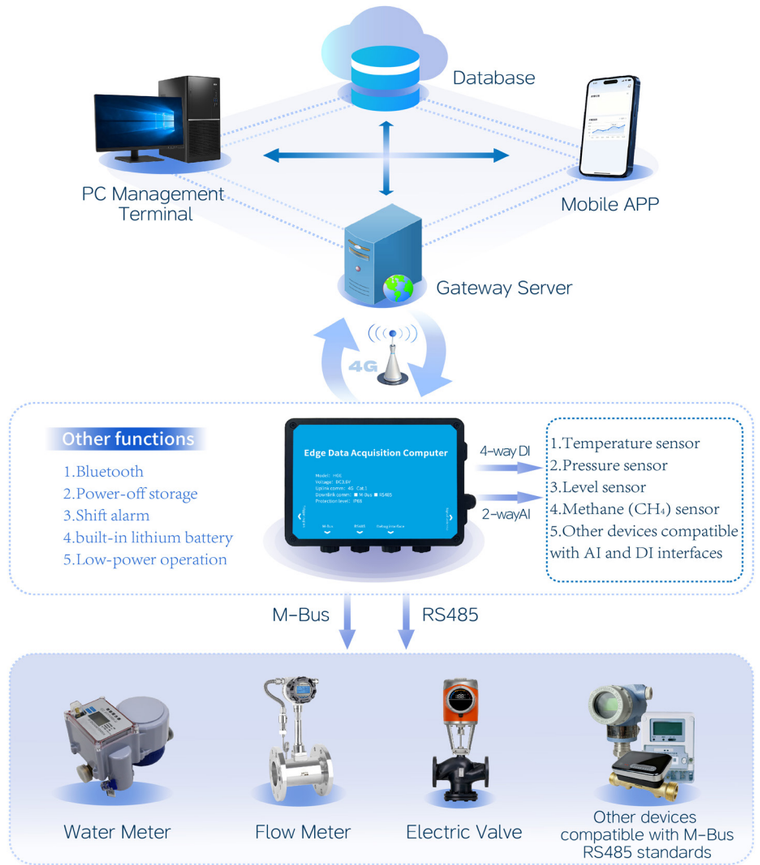


1. Computing power is distributed to the edge, eliminating the need for long-distance data transmission to the cloud. End-to-end latency can be controlled within 10–50ms, meeting the stringent real-time requirements of industrial control, intelligent transportation, and other demanding scenarios;
2. Supports optional sensors for temperature, humidity, pressure, liquid level, and hazardous gases like CH ☒ , H ☒ S, and CO, enabling comprehensive monitoring of equipment and pipeline conditions;
3. Features 4G uplink communication and supports various instruments with RS485, M-Bus, or analog (4–20mA) communication interfaces. Compatible with common domestic and international protocols for heat meters, water meters, and valves; custom interfaces available upon request;
4. Powered by lithium batteries with ultra-low power consumption (standby current <2μA), enabling up to 10 years of battery-powered standby operation. Simple and convenient battery replacement.
5. Compact size for easy installation in confined spaces. Simple set up with no wiring required
6. Accurate data acquisition with excellent stability, eliminating the need for subsequent calibration.
7. IP68 waterproof and dustproof rating with electromagnetic interference resistance, ensuring reliable operation in harsh environments.

Technical Parameters

Categories	Parameter Details
Uplink Communication	4G
Downlink Communication	Various heat meters, water meters, and valves with digital signals (M-Bus, RS485, etc.) and analog signals (4-20mA)
Extended Data Acquisition	Temperature, humidity, pressure, liquid level, methane, etc.
Power Supply Method	Power Supply
Standby Current	Less than 2 μA
Operating Voltage	3.6V
Battery Capacity	38000mAh (default), housing supports up to 76000mAh
Protection Rating	IP68
Data Acquisition Cycle	Default 30 minutes to 30 days, customizable
Upload Cycle	Default 30 minutes to 30 days, customizable
Housing Material	Aluminum alloy
Dimensions	194mm x 135mm x 50mm
Mounting Method	Wall-mounted

Note: Under conditions of good communication signal, a collection and upload cycle of every 2 hours ensures the device can operate for 6 years with a 38000mAh battery.



07
HVAC

HVC Fan Coil Temperature Control Valve

Product Overview

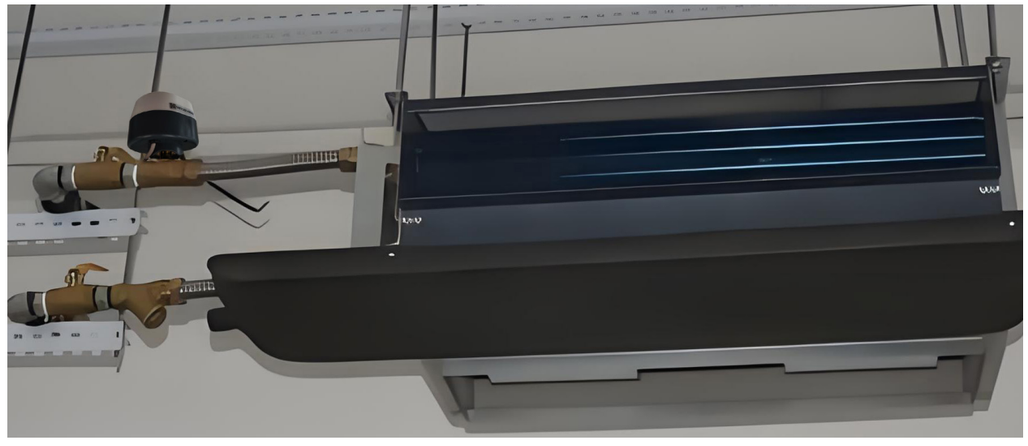
The fan coil unit thermostatic valve serves as a core component in HVAC systems for precisely regulating the flow of heating or cooling media through fan coil units. By adjusting the flow of hot or cold water entering the fan coil, it matches the actual indoor load demand, ultimately achieving stable room temperatures and energy-saving objectives. Its performance directly impacts the comfort level, operational efficiency, and energy consumption of the air conditioning system.

Technical Parameters

Categories	Parameter Details
Nominal Diameter	DN15, DN20, DN25 (compatible with fan coil units of varying airflow rates)
Working Pressure	1.6MPa (Standard Type), 2.5MPa (High-Pressure Type)
Body Material	Brass (H59-1), Stainless Steel (304, Customized Corrosion-Resistant Version)
Leakage Rate	⩽ 0.01% Kv Value (Soft Seal), ⩽ 0.1% Kv Value (Hard Seal)
Supply Voltage	AC220V±10%, DC24V±5%
Drive Power	⩽ 10W (active state), ⩽ 0.1W (standby state)
Operational Life	Electric 2-way valve ⩾ 50,000 cycles, Electric ball valve ⩾ 100,000 cycles
Communication Method	RS485
Control Accuracy	±0.5°C
Operating Temperature	Valve body: 5°C ~120°C (medium temperature); Actuator: -10°C ~50°C (ambient temperature)
Protection Rating	IP54
Water Medium Temperature	0~95°C

Product Advantages and Features

1. Precise Room Temperature Control: Automatically adjusts valve opening based on feedback from indoor temperature sensors to regulate refrigerant flow, maintaining room temperature at the setpoint.
2. Energy Efficiency: Avoid excessive transport of hot and cold media to minimize idle energy consumption of air conditioning units and water pumps, achieving energy savings of up to 15%–30%.
3. Extended Service Life: Features "freeze protection"and "overcurrent protection" functions to prolong operational lifespan;
4. Interlocked Control: Synchronizes with fan coil unit airflow speed. Automatically reduces airflow velocity when valve opening is minimal, further lowering fan energy consumption;
5. Rapid Response & Timely Load Adaptation: The actuator responds to thermostat commands within seconds, swiftly adjusting valve opening. When occupancy increases (raising heat load) or sunlight intensifies (boosting cooling load), the valve rapidly opens to supplement refrigerant flow. Conversely, it promptly closes during load reduction to prevent temperature lag;
6. Direct RS485 connection to indoor thermostats enables direct on/off control via the thermostat;
7. Flexible power supply options: Supports AC220V ±10% and DC24V ±5% power inputs.



Model Selection

Model Example: HVC 100 - D20 M1 I
① ② ③ ④ ⑤

①	②	③	④	⑤
Series	Standard	Caliber	Interface Type	Application Scenarios
HVC	100	Dxx: xx-digit, nominal diameter	M1: Modbus M2: MBUS C: Current-type (4~20ma) D: Other type (LoRa/4G)	C: Civilian-grade; I: Industrial-grade; E: Explosion-proof;

HVA Unit IoT Intelligent Valve

Product Overview

The V9 IoT Smart Flow Balancing Valve is primarily used in centralized cooling network systems, installed on the return pipe in front of buildings or within units. It automatically regulates temperature balance within the network. The valve incorporates a high-precision temperature sensor for real-time monitoring of return water temperature. Data is transmitted to the platform via M-Bus/RS485 wired or NB-IoT/4G/LoRa wireless communication. Employing return water temperature balancing and network-wide equilibrium control principles, the cloud platform intelligently calculates and issues valve opening adjustment commands. This achieves temperature balance between buildings and units within the network, fundamentally resolving temperature imbalance issues in cooling distribution systems.

Technical Specifications

Project	V901 Technical Specifications	V902 Technical Specifications
Communication Method	M-Bus/RS485	NB-IoT/4G/LoRa
Nominal Diameter	DN40~DN400	DN40~DN150
Valve Service Life	100,000 cycles	
Valve Body Material	304 stainless steel/carbon steel/ductile iron	
Sensor (Optional)	Supports dual temperature probes, high-precision digital sensors, pressure probes (optional)	
Power Supply Method	DC24V/battery powered	
Battery Capacity	Standard 38000mAh, optional 76000mAh	
Actuator Output Torque	80N · m, 120N · m, customizable to 250N · m, 500N · m, 1000N · m, etc.	
Protection Rating	Standard IP65, optional IP68 waterproof	
Static Power Consumption	Wired power consumption <6mA, wireless <10μA	
Actuator Housing	Die-cast aluminum alloy housing	
Water Medium Temperature	0~95°C	

Product Advantages and Features

1. High precision gear machining ensures low noise, high transmission efficiency, and minimal energy loss;
2. Motor delivers high starting torque with low temperature rise for enhanced transmission efficiency;
3. 40Cr gear material offers superior wear resistance, strength, and toughness compared to standard powder metallurgy;
4. Custom integrated terminal board with flame-retardant bakelite material, stainless steel terminals, and high-conductivity copper alloy clamping plates;
5. Communication: Default M-Bus bus communication transmits signals to centralized meter reading cabinets. Optional communication protocols include NB-IoT/4G/M-Bus/RS485/LoRa;
6. Integrated manual switch with scale display for on-site position verification and manual adjustment;
7. Valve body and plug entirely constructed from high-strength 304 stainless steel for superior strength and wear resistance;
8. (Optional) Monthly automatic self-rotation to prevent scaling and sticking;
9. Maintains default position during communication bus failure or power outage;
10. Opening adjustment with 1% increments, 0–100% range; supports individual opening settings for each unit (optional);
11. Supports dual temperature probes for inlet and return water (optional);
12. Actuator sold separately, compatible with most standard valve bodies.

Model Selection

Model Example: HVC 100 - D65 M1 I

① ② ③ ④ ⑤

①	②	③	④	⑤
Series	Standard	Caliber	Interface Type	Application Scenarios
HVA	100	Dxx: xx-digit, nominal diameter	M1: Modbus M2: MBUS C: Current Loop (4–20 mA) D: Other Methods (e.g., LoRa/4G)	C: Consumer grade; I: Industrial grade; E: Explosion-proof

PICV Pressure Independent Flow Control Valve

Product Overview

The pressure independent flow control valve delivers more precise and stable flow distribution with remote control capabilities. Combined with secondary dynamic adjustment based on platform data, it enables the hydraulic system to effectively reduce operating flow while maintaining hydraulic balance in the pipe network. This enhances the supply-return temperature differential, lowers energy consumption, and achieves overall system energy savings exceeding 25%.

Product Advantages

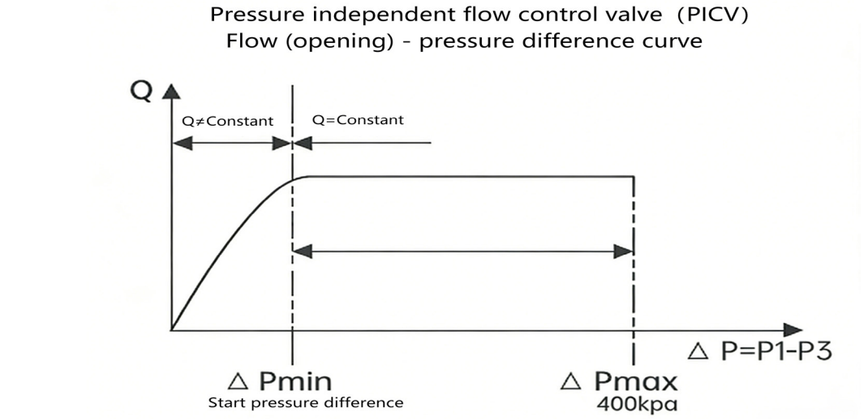
1. Spend less time calculating and setting other parameters in dynamic balancing systems (only flow data is required);
2. Unaffected by system pressure differential fluctuations, ensuring full-range regulation control across any flow setting range;
3. The three-valve-in-one design reduces the total number of valves required, eliminating the need for additional traditional balancing valves or differential pressure control valves at the system end, effectively lowering system resistance;
4. Automatic valve balancing significantly reduces commissioning time, enhances system stability, and maximizes ΔT;
5. Delivers high-comfort room temperatures to end-users through precise temperature control;
6. Constant differential pressure regulation components ensure 100% valve authority;
7. Stepless analog dial enables more accurate flow presetting;
8. Optimized regulation minimizes system over-flow and pump load, significantly reducing overall energy consumption;
9. Features flow preset functionality (pre-set flow adjustment range);
10. Independent quick-connect valve core design resists clogging and enables convenient online cleaning for easy maintenance;
11. Dynamic balancing ensures flow never exceeds the preset maximum flow rate.

Technical Specifications

Project	Technical Specifications
Caliber	DN15, DN20, DN25，DN32，DN40，DN50
Pressure	1.6 MPa

Project	Technical Specifications
Material	Copper(H59-1)
Valve capacity	100%
Adjustable ratio	＞100:1
Differential pressure range	400kpa
Communication method	RS485/NB-IoT/LoRa/WiFi
Three-speed fan control	Supported models (supporting pipe sizes from DN15 to DN32)
Power supply method	AC220V/DC12V
Medium temperature	0°C ~120°C

Traffic Curve



1. A differential pressure gauge can be used to measure the pressure difference △ P across the valve. Simply verify whether the measured value exceeds the initial differential pressure to determine if the valve is operating within its specified range. Within this range, flow remains constant;
2. If the measured △ P value falls below the initial differential pressure, the valve will function as a static balancing valve.

Model Selection

Model Examples: PICV 100 - D20 M1 I

①	②	③	④	⑤
Series	Standard	Caliber	Interface Type	Application Scenarios
PICV	100	Dxx：xx-digit, nominal diameter	M1: Modbus M2: MBUS C: Current Loop (4~20mA) D: Other Methods (e.g., LoRa/4G)	C: Consumer grade; I: Industrial grade; E: Explosion-proof

08

Smart City

HMC Intelligent Manhole Cover Monitoring Instrument

Product Overview

The Smart Manhole Cover Monitor is a product independently developed by our company to serve smart cities. It is a device designed to monitor the status of manhole covers. Installed on the underside of the cover, it triggers an alarm when abnormal movement meets the alert criteria or when the manhole becomes flooded. The monitor then wirelessly transmits data—including cover status and device parameters—to the monitoring center. The center analyzes this data to assess the alarm situation. This product is widely applied in smart city municipal construction.

Product Advantages and Features

1. Built-in tilt, displacement, and vibration sensors continuously monitor manhole cover status. Data synchronizes with the management platform. Anomalies immediately trigger audible and visual alarms or platform alerts;
2. Equipped with low-power communication modules (4G/LoRa), enabling remote access to operational data and remote locking/unlocking of covers (requires integrated locking covers);
3. Integrated GPS/BeiDou positioning for rapid identification of fault points or missing points;
4. Housing constructed from high-strength helmet material, offering impact resistance, collision protection, and corrosion resistance, suitable for complex municipal environments;
5. Features low-battery alerts and self-diagnostic capabilities for equipment failures. Generates maintenance logs to replace manual inspections, boosting municipal manhole cover inspection efficiency by over 60% while reducing labor costs;
6. Supports integration with sensors for water level, gas/biogas concentration, temperature, and humidity. Adaptable to drainage, gas, power, and telecommunications scenarios, enabling predictive detection of underground pipeline leaks and water accumulation hazards.

Model Selection

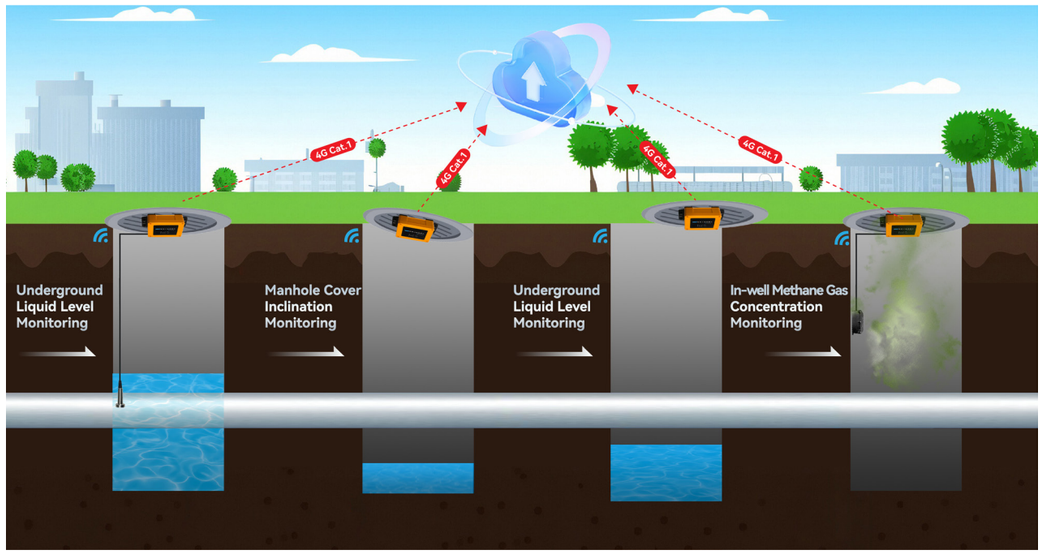
Model Example: HMC 100 - O A B (DL) P7

①	②	③	④	⑤	⑥		⑦
Series	Standard	Application Scenarios	Communication Methods	Positioning Systems (Customized)	Sensor	Sensor delimiter	Protection Rating
HMC	100	B: Building I: Industrial O: Outdoors	A: 4G/4G Cat.1 B: 5G L: LoRa	B: BeiDou Navigation Satellite System G: Global Positioning System L: Location-Based Services Base Station	T: Ambient Temperature Category D: Gas Monitoring L: Liquid Level Category	( )	P4: IP64 P5: IP65 P6: IP66 P7: IP67 P8: IP68 P9: IP69

Technical Parameters

Categories	Basic model	Standard model	Enhanced Edition
Monitoring Function	Tilt displacement; water immersion	Tilt displacement; water immersion; liquid level	Tilt displacement; Water immersion Liquid level; Methane
Communication Method	4G + Bluetooth		
Power Supply Method	Lithium battery		
Battery Life	6 years (with good and stable communication)		
Response Time	Less than 10 seconds		
Battery Capacity	19000mAh		
Operating Temperature	-30° C to 75° C		
Housing Material	ABS helmet material		
Dimensions	Length 142mm x Width 105mm x Height 63mm		
Mounting Location	Manhole cover back		
Protection Rating	IP67 / IP68		
Mechanical Lock	Function customization, requires adaptation to the entire manhole cover		

Applicable Scenarios



HEM Environmental Monitoring Meteorological Station

Product Overview

Environmental Monitoring Weather Stations offer highly integrated solutions for over 30 station types tailored to campus, residential forest fire prevention, agricultural cultivation, construction sites, and other user needs. The system employs advanced sensing technology and a cloud-based architecture to collect environmental data including temperature, humidity, atmospheric pressure, wind speed and direction, precipitation, air quality, organic pollutants, soil nutrient analysis. Data is transmitted wirelessly via NB-IoT/4G to the cloud for automated storage and online analysis. Users access the management platform or app to analyze regional environmental data, enabling real-time monitoring and precise analysis.

Product Advantages and Features

1. Low-power design minimizes energy consumption;
2. Metal powder-coated corrosion-resistant control box;
3. High-strength carbon steel pole with superior impact resistance for long-term use in harsh environments;
4. Multiple configurations to address diverse monitoring requirements;
5. Optional wireless communication for remote data transmission and control;
6. Optional solar panel power supply eliminates wiring for outdoor applications;
7. Optional waterproof LED display provides high-brightness real-time data visualization.

Host Parameters

Categories	Parameter Details
Power Supply Method	Mains power supply 220V AC / Solar power supply 12V DC
Voltage Range	220V mains power system / 9–30VDC
Solar System	Photovoltaic battery array 20AH output 12V, 60W monocrystalline silicon solar panel (high efficiency, sufficient wattage)
Wireless Communication Method	NB-IoT, 4G
Wired Communication Interface	RS485
Wired Communication Protocol	Modbus
Equipment Rack	3-piece, 114mm to 76mm segmented, 2mm wall thickness high-strength upright pole
LED Protection	Outdoor-specific LED plug-in display screen, 960x480mm, 6x3 Chinese character dot matrix display
Operating Environment	-20° C to 65° C, 0% to 100% RH

Sensor Parameters

Environmental monitoring stations can accurately measure multiple parameters: PM2.5, PM10, noise, temperature, humidity, wind speed, wind direction, atmospheric pressure, as well as precipitation, radiation, soil temperature and humidity, electrical conductivity, and pH levels.

Categories	Measurement Range	Accuracy
Temperature	-40~80°C	±0.3°C
Humidity	0~100%RH	±5%
PM2.5	0~500ug/m3	±10%（25°C，⩾ 100ug/m3）
PM10	0~500ug/m3	±10%（25°C，⩾ 100ug/m3）
Barometric Pressure	30~110kPa	±0. 15kPa（30kPa~ 110kPa，0~65°C）
Illuminance	0~65535Lux	±7%（25°C）
Wind Speed	0~50m/s	±3%FS
Wind Direction	0~360°	±3
Noise	30~120dB	±0.5dB
Rainfall	0~4mm/miniute	±3%
Soil Temperature	-40~80°C	±0.5
Soil Moisture	0~100%RH	±5%（50~100% RH）
Soil pH	3~9PH	±0.3
SO2	0~20ppm	±3.5%FS（25°C）
NO2	0~20ppm	±3.5%FS（25°C）
CO	0~100ppm	±(0.5ppm+3%FS)
O3	0~10ppm	±(0.05ppm+5%FS)
CO2	400~5000ppm	±50ppm+5% Read Value

Recommended Combinations

Forest Area Environmental Monitoring

① Weather Station Package 2 (Temperature, Humidity, Barometric Pressure, Light Intensity)
② Soil Temperature and Humidity Sensor
③ Solar Power Supply System
④ 4G Environmental Monitoring Host
⑤ System Control Cabinet
⑥ Heavy-Duty Pole Kit (Includes Sectional Pole, Crossarms, and Combination Ground Anchor)

Environmental Monitoring in Scenic Areas

① Weather Station Package 5 (Temperature/Humidity, Barometric Pressure, PM2.5/PM10, Noise)
② Wind Speed Sensor
③ Wind Direction Sensor
④ 4G Environmental Monitoring Host
⑤ System Control Cabinet (Includes 220V AC Power Supply Assembly)
⑥ Heavy-Duty Mast Kit (Includes Sectional Mast, Crossarms, and Combination Ground Anchor)

Construction Site Dust Monitoring

① Weather Station Package 3 (Temperature, Humidity, Noise, PM2.5/PM10)
② Waterproof LED Outdoor Display Screen
③ System Control Cabinet (Includes 220V AC Power Supply Assembly)
④ Heavy-Duty Mast Kit (Includes Sectional Mast, Crossarms, and Combination Ground Anchor)

Urban Air Quality Monitoring

① Weather Station Package 5 (Temperature/Humidity, Barometric Pressure, PM2.5/PM10, Noise)
② Air Quality Monitoring Package (CO/SO ☒ 2/NO ☒ 2/O ☒ 3)
③ Wind Speed Sensor
④ Wind Direction Sensor
⑤ 4G Environmental Monitoring Host
⑥ System Control Cabinet (includes 220V mains power supply assembly)
⑦ Heavy-Duty Mast Kit (includes sectional mast, cross-arm, and ground anchor assembly)

Compact Meteorological Monitoring Station

① Weather Station Package 2 (Temperature, Humidity, Barometric Pressure, Illuminance)
② Wind Speed Sensor
③ Wind Direction Sensor
④ Rain Gauge
⑤ Waterproof LED Outdoor Display 4G Environmental Monitoring Host
⑥ System Control Cabinet (Includes 220V AC Power Supply Assembly)
⑦ Heavy-Duty Mast Kit (Includes Sectional Mast, Crossarms, and Combination Ground Anchor)

Organic Gas Monitoring

① Weather Station Package 2 (Temperature & Humidity, Barometric Pressure, Illuminance)
② Air Velocity Sensor
③ Air Direction Sensor
④ VOC Sensor
⑤ Waterproof LED Outdoor Display Screen
⑥ 4G Environmental Monitoring Host
⑦ System Control Cabinet (Includes 220V AC Power Supply Assembly)
⑧ High-Strength Pole Kit (Includes Sectional Pole, Cross Arm, and Combination Ground Cage)

Model Selection

Model Example: HEM 100 - O A B (FRS) P7
① ② ③ ④ ⑤ ⑥ ⑦

①	②	③	④	⑤	⑥		⑦
Series	Standard	Application Scenarios	Communication Methods	Positioning Systems (Customized)	Sensor	Sensor delimiter	Protection Rating
HEM	100	B: Building I: Industrial O: Outdoors	A: 4G/4G Cat.1 B: 5G L: LoRa	B: BeiDou Navigation Satellite System G: GPS Satellite Positioning System L: LBS base station	F: Wind Speed and Direction R: Rain Gauge S: Soil A: Air Monitoring N: Noise L: Liquid Level E: Other Sensors	( )	P4: IP64 P5: IP65 P6: IP66 P7: IP67 P8: IP68 P9: IP69

HLL Smart Logistics Locator

Product Overview

The Smart Logistics Locator is an integrated intelligent terminal device leveraging IoT technology that combines multi-mode positioning, smart sensing, high-speed communication, and cloud-based management. Its core mission is to overcome the "information silos" challenge in the logistics industry, enabling transparent, digital management throughout the entire lifecycle of logistics assets. It is widely applicable across diverse scenarios including reusable logistics packaging, logistics cage trucks, cold chain transportation, high-value goods escort services, outdoor critical asset tracking, and multimodal transport.

Product Advantages and Features

1. Utilizes BeiDou satellite positioning technology to achieve seamless indoor and outdoor positioning coverage. In open environments, positioning accuracy reaches 1–10 meters;
2. Vibration and tilt sensors detect abnormal conditions such as cargo drops, collisions, or tilting in real time, effectively preventing damage during transportation;
3. 4G high-speed communication enables real-time data push to cloud platforms and mobile devices, empowering managers to monitor cargo status;
3. Low-power Bluetooth controller with intelligent mode switching technology significantly reduces device energy consumption and extends battery life;
4. Powered by AA alkaline batteries, substantially lowering fire risk compared to lithium batteries;
5. Operates in environments spanning -45° C to 85° C temperatures and 5% to 95% humidity;
6. Paired with a smart cloud platform featuring core capabilities like data visualization, global control, and intelligent analysis. Supports centralized management of multiple devices, displaying real-time global data including device online status, geographic location, environmental parameters, and alarm information. Presents asset distribution and operational status intuitively through dashboard systems;
7. Supports customizable electronic fencing settings. Triggers automatic alerts when goods deviate from preset routes or enter/exit designated zones, effectively preventing theft and unauthorized movement risks;
8. Supports API integration for seamless connectivity with existing enterprise systems like ERP and WMS, enabling end-to-end digital transformation of the supply chain.

Model Selection

Model Example: HLL 100 - O A L P5

①	②	③	④	⑤	⑥
Series	Standard	Application Scenarios	Communication Methods	Positioning System (Customized)	Protection Rating
HLL	100	B: Building I: Industrial O: Outdoors	A: 4G/4G Cat.1 B: 5G L: LoRa	B: BeiDou Navigation Satellite System G: GPS Satellite Positioning System L: LBS base station	P4: IP64 P7: IP67 P5: IP65 P8: IP68 P6: IP66 P9: IP69

Technical Parameters

Categories	Parameter Details
Positioning System	LBS base station positioning, BLE near-field communication positioning; supports customizable BeiDou (BDS) positioning
Positioning Accuracy	Single-point positioning accuracy: 1-10m
Communication Method	4G
Operating Environment	Operating temperature: -40° C to 85° C; Operating humidity: 0% to 95% RH (non-condensing)
Bluetooth Version	Bluetooth 4.2 BLE
Power Supply Method	3 x AA alkaline batteries, customizable rechargeable lithium battery
Standby Time	7-10 days, customizable for extended duration
Protection Rating	IP65 to IP68

Applicable Scenarios