



Gas Safety and Smart Metering Solutions

Cubic Introduction

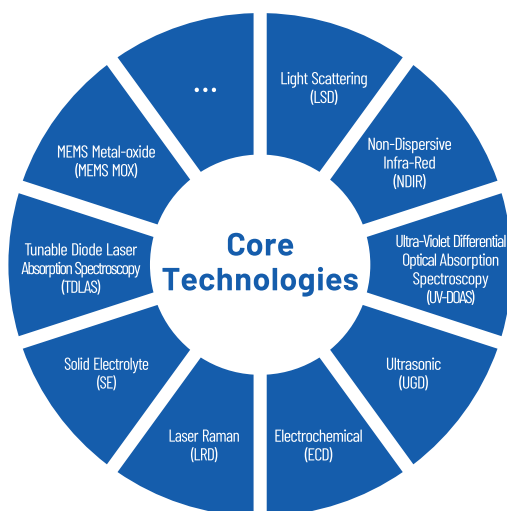


Cubic Sensor and Instrument Co., Ltd. (hereinafter referred to as "Cubic") is a publicly listed company in SSE STAR Market (stock code:688665), specializing in smart gas sensors and superior gas analyzers. Established in 2003 in Wuhan Optics Valley, Cubic has established gas sensing technology platforms including optical technologies (NDIR, Ultraviolet, Light Scattering, Laser Raman), ultrasonic technology, MEMS metal oxide semiconductor (MOX) technology, electrochemical technology, ceramic thick-film technology based high temperature solid electrolyte technology. Cubic has obtained more than 100 patents at home and abroad, with abundant products widely used in various fields of air quality, environmental monitoring, industrial processes, industrial safety monitoring, healthcare, smart metering and so on.

Cubic has a provincial-level enterprise technology center and a gas analysis instrumentation engineering technology research center in Hubei Province of China. Actively participating in the national technological innovation system, Cubic has successively obtained many national and provincial projects. Those projects contain the National Major Scientific Instrument and Equipment Development Project, the MIIT IOT Development Special Project, the MIIT Strong Foundation Engineering Sensor "One-stop" Project, the Ministry of Science and Technology's Key Special Project for Technology Assisting Economy in 2020, and major innovation projects in Hubei Province, etc. Recognized by authoritative domestic and international industry organizations as a major player and representative enterprise in China's gas sensor industry, Cubic has been honored with titles 'Most Influential IoT Sensor Enterprise Award' by the China IoT Industry Alliance.

With decade-long dedications in technical innovations, strict quality control and global business strategies, Cubic, as a leading manufacturer of high-quality gas sensors and sensor solutions, has obtained the recognition of many well-known Fortune 500 companies as well as other domestic and overseas leading companies in different fields. Cubic products have been exported to more than 80 countries and regions, besides, Cubic is moving towards a higher target to be the international brand in the field of gas sensors.

Core Technologies



20+ Years Focus

Emission Monitoring Solutions

Core Technologies

Professional Technical Engineers

Quick Service Response

Technical Support

Intellectual Property

Numerous National Invention Patents

International PCT Patents

Cubic Certificates



ISO9001: 2015



ISO14001: 2015



ISO45001: 2018

Cubic Glance



Cubic Headquarter



Cubic R&D Center

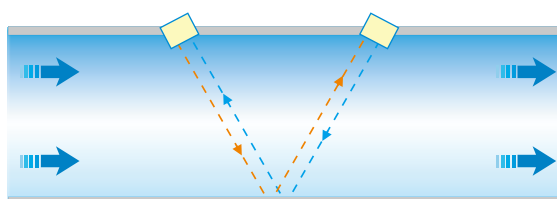


Cubic Jiashan Factory

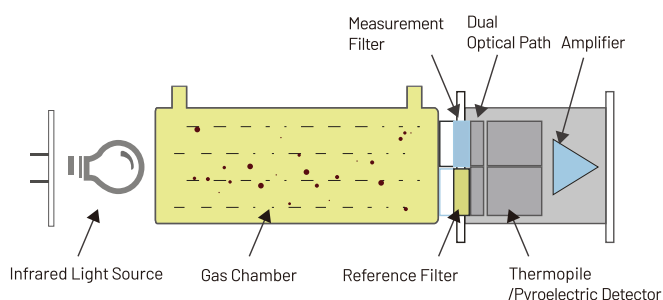


Core Technologies

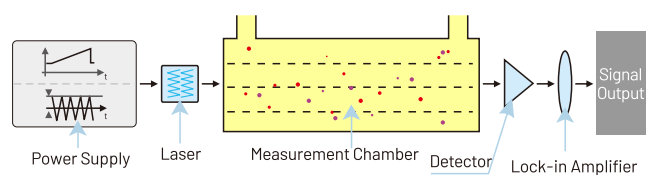
Ultrasonic Gas Sensor Technology



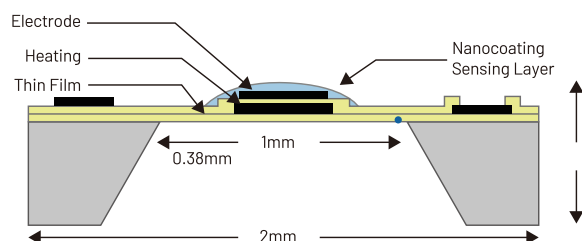
NDIR Gas Sensor Technology



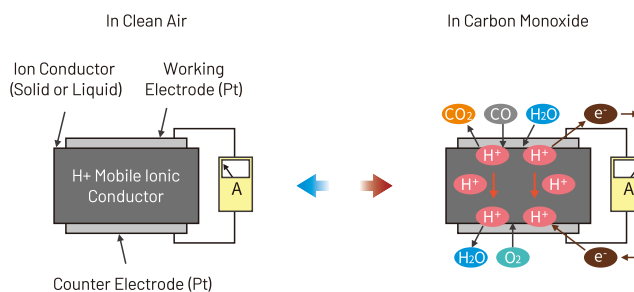
TDLAS Gas Sensor Technology



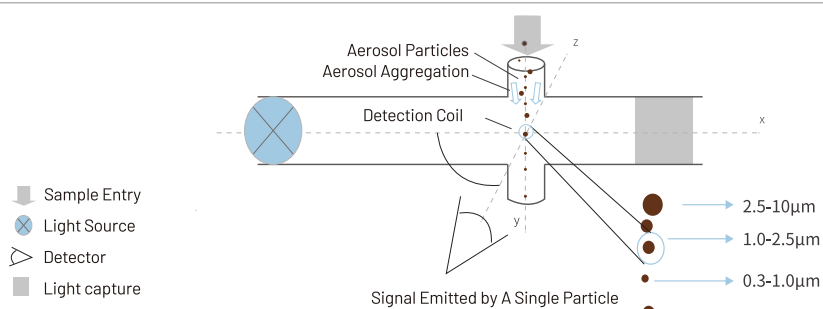
MEMS M0x Gas Sensor Technology



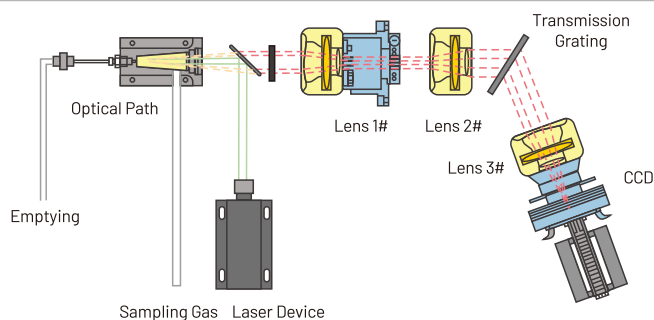
Electrochemical Gas Sensor Technology



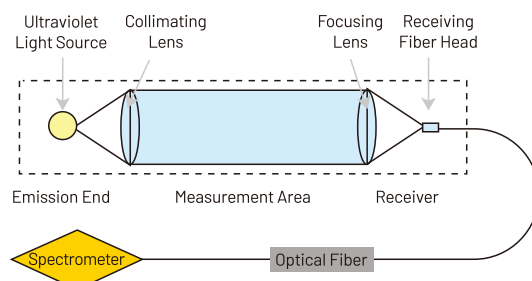
Light Scattering Gas Sensor Technology



Laser Raman Gas Sensor Technology



UV-DOAS Gas Sensor Technology



With innovative ultrasonic flow sensor technology, Cubic smart ultrasonic gas flow meters and modules realize high stability and high accuracy measurement for residential, commercial and industrial applications, especially for low flow range (Qmin) measurement. With built-in temperature and pressure compensation, along with intelligent software algorithm, Cubic gas flow meters and modules are accurate in air, 100% CH₄, LPG and different natural gases for full temperature range.

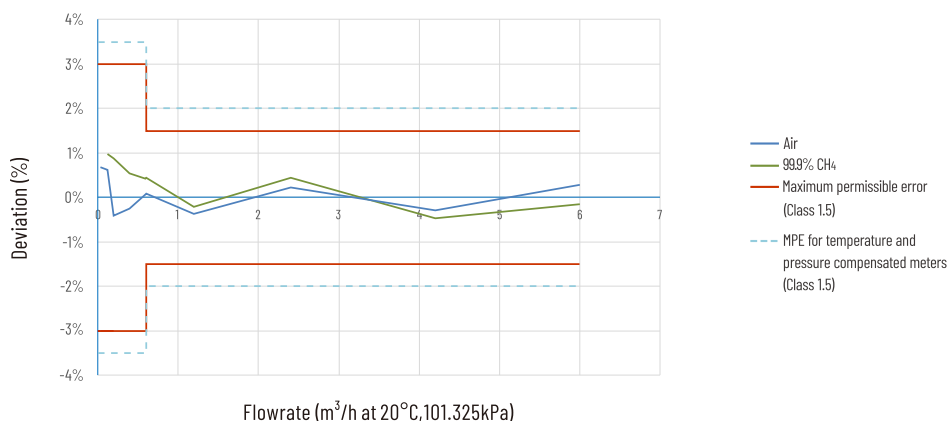
Thanks to full electronic design without moving parts, ultrasonic gas meter technology has no issue of mechanical wear which leads to degradation of accuracy and has the advantage of anti-contamination. Therefore, long-term stability and accuracy can be guaranteed for ultrasonic gas meter solutions and there is no need for periodical maintenance.

Besides, Cubic smart ultrasonic gas flow meters and modules are equipped with temperature sensor, pressure sensor and shut-off valve, which facilitates the accurate monitoring of gas flow, and the gas leakage check system realized by valve ensures user safety by automatically shutting down gas supply in case of inconspicuous leakage.

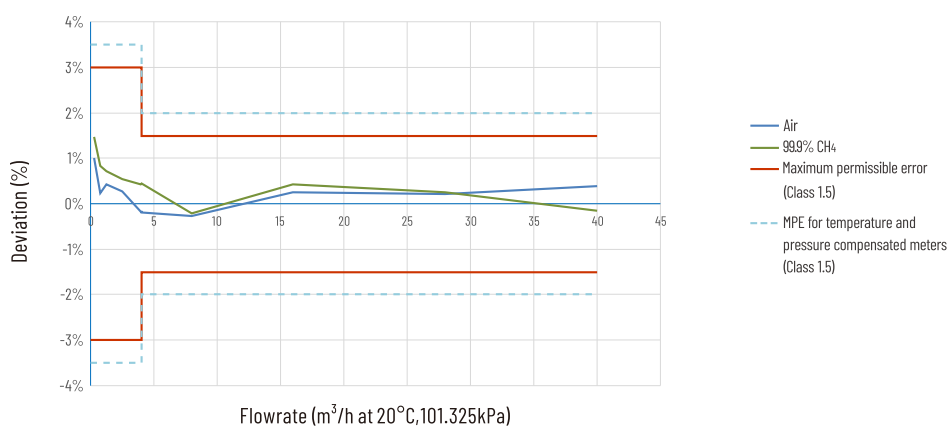
What's more, Cubic ultrasonic gas flow meters could also achieve low power consumption, which is a basis for smart gas metering market demand. To meet ever growing smart gas metering need, Cubic has developed gas flow meters combined with wireless communication GPRS and NB-IoT, which enables users to read data of remaining gas volume and arrange top-up remotely.



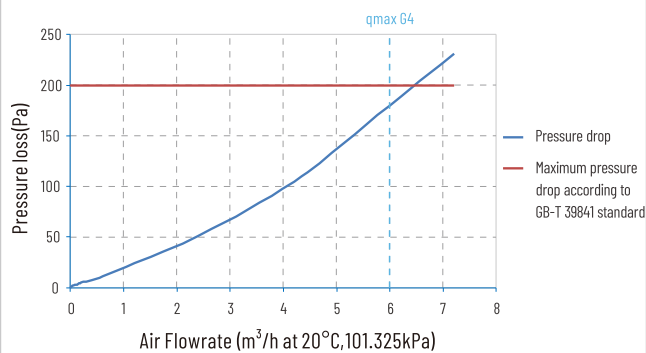
G4 Accuracy in Air and Gas-99.9%CH₄ Accuracy



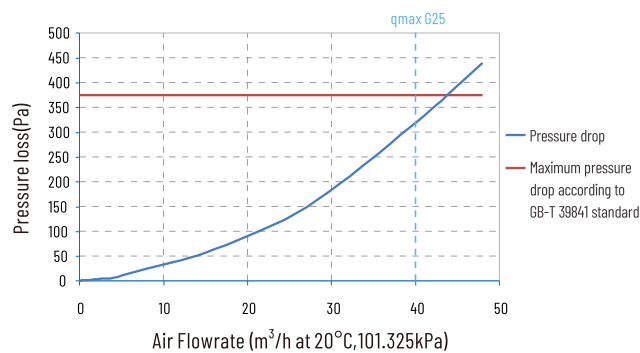
G25 Accuracy in Air and Gas-99.9%CH₄ Accuracy



G4 Meter-Pressure Drop



G25 Meter-Pressure Drop



Infrared Communication & LED Indicator Lights

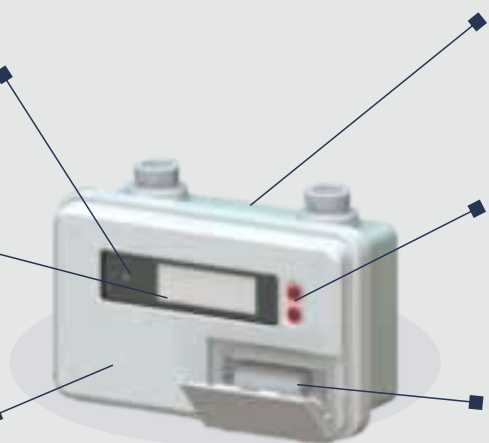
Infrared communication is used for data exchange; LEDs are used for flow calibration and wireless communication indication.

LED Display

Mode change, flow direction, temperature/pressure alternate display, instant flow rate display, accumulated volume display, battery capacity, motor valve status, low battery alarm sign and so on.

Battery 2

Built-in Lithium battery ER26500/3.6V powers the test module.



Residential Steel Ultrasonic Gas Meter

Shut-off Value

Integrated shut-off value, which can be remotely controlled.

Upper Button

Support the scrolling of display screens and specific functions for mode switching and valve on/off;

Lower Button

Wireless communication, long press to upload communication.

Battery 1

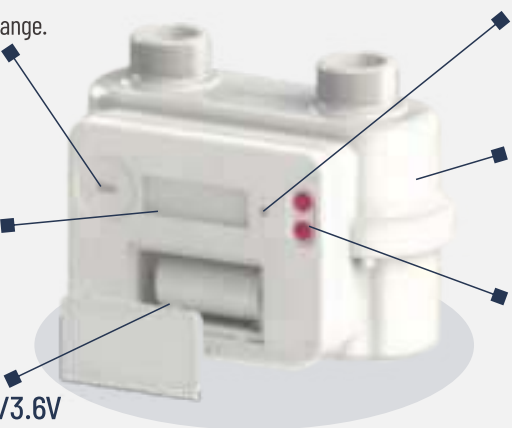
4 sections AA alkaline battery or a Lithium battery ER26500/3.6V, power the mainboard and wireless transmission module, with transmission of low battery and battery-removal alarms.

Infrared Communication

Infrared communication is used for data exchange.

LED Display

Mode change, flow direction, temperature/pressure alternate display, instant flow rate display, accumulated volume display, battery capacity, motor valve status, low battery alarm sign and so on.



Residential Aluminum Ultrasonic Gas Meter

LEDs Indicator

LEDs are used for flow calibration and wireless communication indication.

Shut-off Value

Integrated shut-off value, which can be remotely controlled.

Upper Button

Support the scrolling of display screens and specific functions for mode switching and valve on/off;

Lower Button

Wireless communication, long press to upload communication.

- Internal or External Antennas Optional
- Data Archive
 - Hourly consumption storage for 720 records
 - Daily consumption storage for 120 records
 - Monthly consumption storage for 120 records
- Small Size
 - Compact size, light weight, easy installation
- Compliant to OIML R137 and EN14236 class 1.5
- Battery Cap
 - Battery cap removable with screw and seal
- Software Upgrade
 - The application software can be remotely updated

- Alarms
 - Alarms to illegal meter tampering, low battery and battery removal. Logger to record alarms and events.
- Replaceable SIM
 - Replace the SIM card from the battery slot.
 - It's accessible from the battery compartment.
- Encryption/Authentication
 - AES 128-bit encrypted communication
- Built-in Temperature Compensation
- GPRS and NB-IoT Solutions are Optional.

Infrared Communication & LED Indicator Lights

Infrared communication is used for data exchange;
LEDs are used for flow calibration and wireless communication indication.

Shut-off Value

Integrated shut-off value, which can be remotely controlled.

LED Display

Mode change, Flow direction, Temperature/Pressure alternate display, Instant flow rate display, Accumulated volume display, Battery capacity, Motor valve status, Low battery alarm sign and so on.

Upper Button

Support the scrolling of display screens and specific functions for mode switching and valve on/off;

Lower Button

Wireless communication, long press to upload communication.



Built-in Lithium battery ER34615/3.6V

Commercial Ultrasonic Gas Meter

- Internal or External Antennas Optional
- Data Archive
 - Hourly consumption storage for 720 records
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Residential Ultrasonic Gas Meter and Module CUBIC

USM Series Ultrasonic Gas Flow Meter is a type of electronic meter that adopts ultrasonic transit time difference method and a unique patented structure to measure the medium flow rate, which is suitable for natural gas flow measurement.



Performance Characteristics

USM-G1.6/G2.5/G4 Class 1.5



Small Size, Stable Measuring Performance

Simple structure, small volume, no moving parts, no mechanical wear, and no magnetic field effects.



Long Life and Maintenance-free

No moving parts, long lifetime
No need for factory repairs, convenient maintenance.



Strong Expandability

Fully electronic structure, easily expandable for additional functions, such as remote charging, valve control, alarms, etc.



High Sensitivity

Instantaneous flow monitoring to deal with various technical gas theft methods; Real-time temperature and pressure corrections, effectively improving supply-demand imbalance.

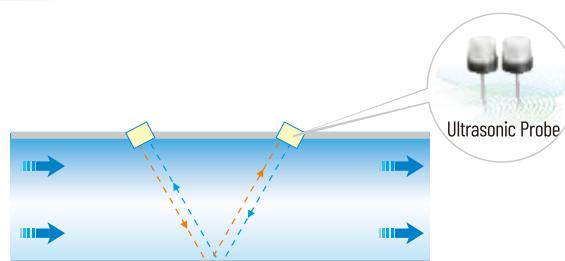


High Security

Prevent minor leaks, and perform valve closing protection based on preset plan features including reverse installation alarm valve shutdown, abnormal large flow management, and illegal removal behavior monitoring function.

Working Principle

USM Series Ultrasonic Gas Flow Meter is a type of electronic meter that adopts TOF (Time of Speed) principle to measure flow velocity of gas medium. With class 1.5 accuracy and high stability, USM-G2.5/G4 is widely applied for residential natural gas metering application.

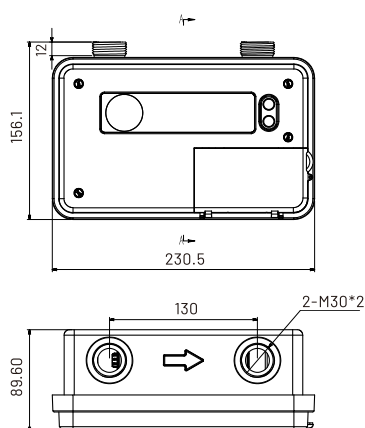


**CUBIC**

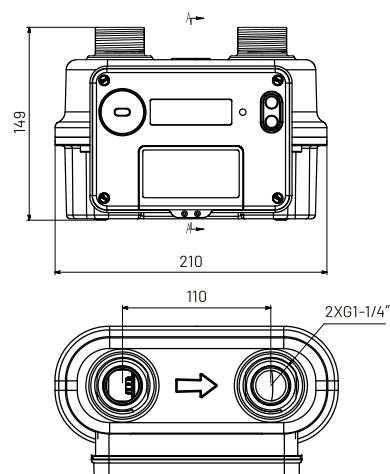
Specifications

Product Name		Residential Aluminum Ultrasonic Gas Meter			Residential Steel Ultrasonic Gas Meter			Residential Ultrasonic Gas Meter Module		
Model		USM-G1.6A	USM-G2.5A	USM-G4A	USM-G1.6S	USM-G2.5S	USM-G4S	USM-G1.6M	USM-G2.5M	USM-G4M
Measurement Range (m ³ /h)		0.016~2.5	0.025~4	0.04~6	0.016~2.5	0.025~4	0.04~6	0.016~2.5	0.025~4	0.04~6
Pressure Loss		≤200Pa (Factory verification with control valve)			≤200Pa (Factory verification with control valve)			≤200Pa (Factory verification with control valve)		
Working Pressure		0~20kPa			0~20kPa			0~20kPa		
Dimensions (mm)		210*113.5*149			230.5*156.1*89.6			128.7*42.8*55.2		
Weight (kg)		1.1			1.6			/		
Center Distance of Connectors (mm)		110			130			/		
Connector Type		Screw thread, G1-1/4			Screw thread, M30*2			URAT-TTL		
Protection Class		IP65			IP65 (Lithium battery); IP54 (4 AA Alkaline battery)			/		
Flow Compensation		Default is temperature compensation, and pressure compensation is optional			Default is temperature compensation, and pressure compensation is optional			Default is temperature compensation, and pressure compensation is optional		
Batteries		Lithium battery ER34615/3.6V			4 sections AA alkaline battery Lithium battery ER26500/3.6V			2.7~3.6VDC		
Accuracy Standard		Class 1.5			Class 1.5			Class 1.5		
Error	Q _{min} ≤Q<Q _t	±3%			±3%			±3%		
	Q _t ≤Q≤Q _{max}	±1.5%			±1.5%			±1.5%		
Working Temperature		-25°C~55°C			-25°C~55°C			-25°C~55°C		
Storage Temperature		-25°C~60°C			-25°C~60°C			-25°C~60°C		
Ex-Proof Approval		ExibIIBT4 Gb			ExibIIBT4 Gb			ExibIIBT4 Gb		
Verification Method		Optional: 1. LED optical pulse 2. EN62056-21 Standard infrared interface			Optional: 1. LED optical pulse 2. EN62056-21 Standard infrared interface			Optional: 1. LED optical pulse 2. EN62056-21 Standard infrared interface		

Dimension (mm)



USM-G1.6/G2.5/G4
Residential Steel Ultrasonic Gas Meter



USM-G1.6/G2.5/G4
Residential Aluminum Ultrasonic Gas Meter



CUBIC

Commercial Ultrasonic Gas Meter

USM Series Ultrasonic Gas Flow Meter is a type of electronic meter that adopts ultrasonic transit time difference method to measure the medium flow rate, which is suitable for natural gas flow measurement.



G6/G10/G16/G25/G40/G65 Class 1.5

Performance Characteristics



Small Size, Stable Measuring Performance

Simple structure, small volume, no moving parts, no mechanical wear, and no magnetic field effects.



Long Life and Maintenance-free

No moving parts, long lifetime
No need for factory repairs, convenient maintenance.



Strong Expandability

Fully electronic structure, easily expandable for additional functions, such as remote charging, valve control, alarms, etc.



High Sensitivity

Instantaneous flow monitoring to deal with various technical gas theft methods; Real-time temperature and pressure corrections, effectively improving supply-demand imbalance.



High Security

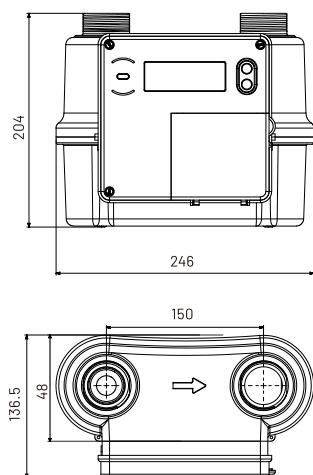
Prevent minor leaks, and perform valve closing protection based on preset plan features including reverse installation alarm valve shutdown, abnormal large flow management, and illegal removal behavior monitoring function.

**CUBIC**

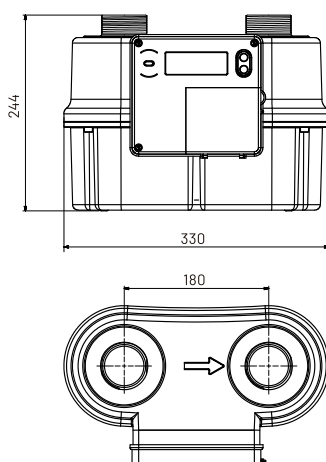
Specifications

Model		USM-G6	USM-G10	USM-G16	USM-G25		USM-G40	USM-G65
Measurement Range (m³/h)		0.06~10	0.1~16	0.16~25	0.25~40		0.4~65	0.65~100
Pressure Loss		≤200Pa (Factory verification with control value)	≤375Pa (Factory verification with control value)				≤300Pa (Without control valve Factory verification)	≤400Pa (Without control valve Factory verification)
Working Pressure		0~50kPa						
Dimensions (mm)		246*204*110.5				330*248*167		
Weight (kg)		2.3				4		
Center Distance of Connectors (mm)		150				180		
Connector Type		Screw thread, G1-1/2				Screw thread, G2	Screw thread, G2-1/2	
Protection Class		IP65						
Flow Compensation		Temperature and pressure compensation						
Batteries		Lithium battery ER34615/3.6V						
Accuracy Standard		Class 1.5						
Error	Qmin≤Q<Qt	±3%						
	Qt≤Q≤Qmax	±1.5%						
Working Temperature		-25°C~55°C						
Storage Temperature		-25°C~60°C						
Ex-Proof Approval		ExibIBT4 Gb						
Verification Method		Optional: 1) LED optical pulse 2) EN62056-21 Standard infrared interface						

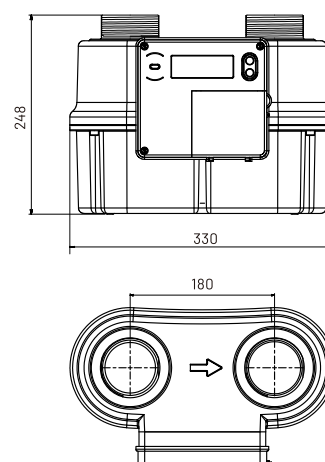
Dimension (mm)



USM-G6/G10/G16
Commercial Ultrasonic Gas Meter



USM-G25
Commercial Ultrasonic Gas Meter

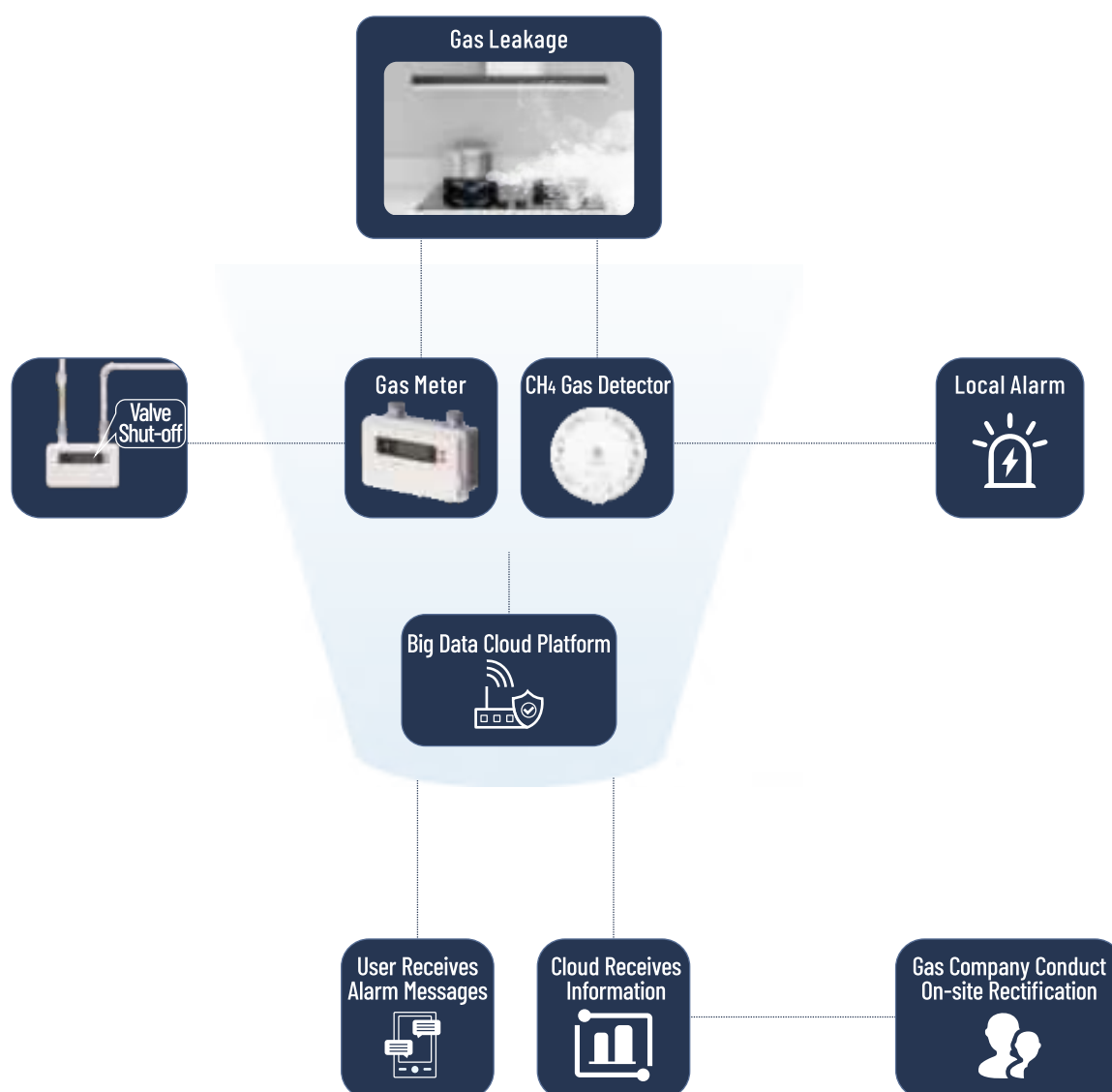


USM-G40/G65
Commercial Ultrasonic Gas Meter

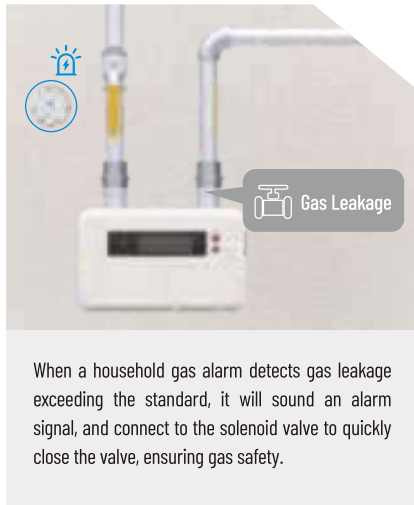


Gas Safety Solution

- Cubic Gas Safety Solution provides precise detection for various gas usage scenarios 24/7. In the event of a gas leak, the gas meter and gas alarm will promptly capture the leakage information, triggering the alarm and automatically shutting off the gas valve.
- Timely send gas leakage information to self-developed apps and synchronize it to the gas company's server.
- Gas company can immediately dispatch personnel to conduct on-site investigations and rectifications, ensuring gas safety, when abnormal information is received.

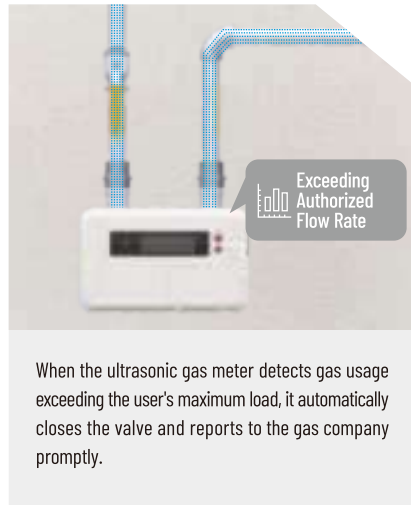


Alarm Scenarios



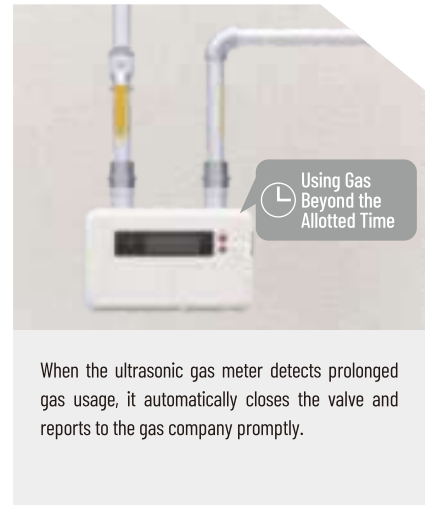
When a household gas alarm detects gas leakage exceeding the standard, it will sound an alarm signal, and connect to the solenoid valve to quickly close the valve, ensuring gas safety.

01 Gas Leakage



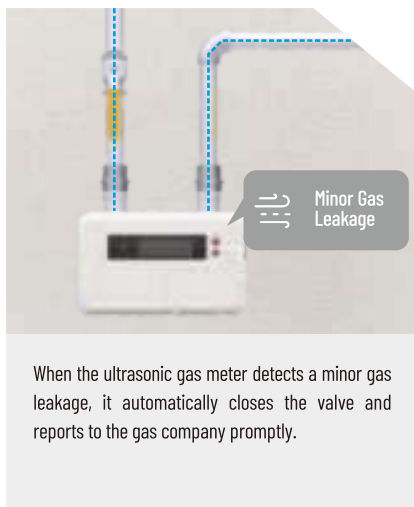
When the ultrasonic gas meter detects gas usage exceeding the user's maximum load, it automatically closes the valve and reports to the gas company promptly.

02 Abnormal High Flow Cut-off and Alarm



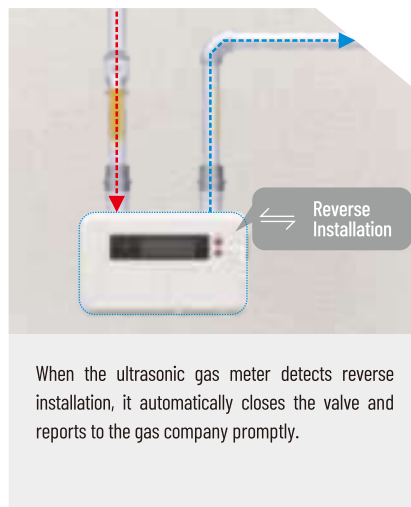
When the ultrasonic gas meter detects prolonged gas usage, it automatically closes the valve and reports to the gas company promptly.

03 Extended Continuous Gas Usage Cut-off with Alarm



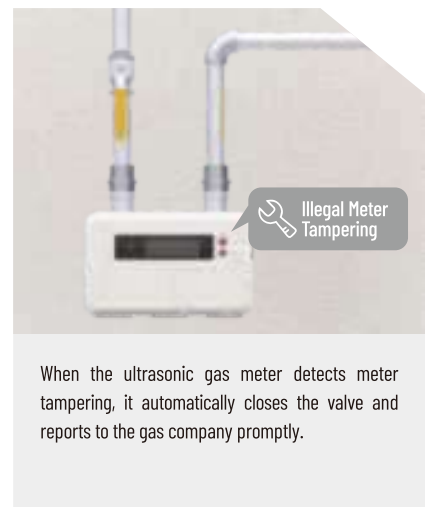
When the ultrasonic gas meter detects a minor gas leakage, it automatically closes the valve and reports to the gas company promptly.

04 Microflow Cut-off with Alarm



When the ultrasonic gas meter detects reverse installation, it automatically closes the valve and reports to the gas company promptly.

05 Reverse Installation Cut-off with Alarm



When the ultrasonic gas meter detects meter tampering, it automatically closes the valve and reports to the gas company promptly.

06 Illegal Meter Tampering Alarm Cut-off



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All products are in continuous development and therefore specifications may be subject to change without prior notice.