AUDIOWELL

PRODUCT CATALOGUE

SENSOR APPLICATIONS

AUDIOWELL SENSOR TECHNOLOGY | Sensor technology shapes an intelligent life | audiowell.com

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COMPANY INTRODUCTION

Established in 1999, Audiowell Electronics (Guangdong) Co., Ltd. (NEEQ: 832491) is a leading provider of sensor components and sensing solutions with focus on the research, design, production and sales of sensitive components, sensors and corresponding modular solutions.

As a sensor manufacturer and solution provider, Audiowell has the most comprehensive sensor component product line in China. Our ultrasonic sensors, flow sensors, electro-acoustic devices and ultrasonic transducer devices are market leaders and widely used in a variety of industries and fields including automotive electronics, instruments and meters, intelligent security systems and health appliances. While serving Chinese customers, we have also provided professional products and services for the global customers in many countries and regions.

Audiowell will uphold the "Be good, do better, create the best future" business philosophy and continuously concentrate on cutting edge technologies as well as advanced manufacturing techniques, to provide innovative and superior products for our society and create a safe, convenient and comfortable life for everyone.

Our Strength

Ultrasonic technology leads domestic market and stays in front in the international market

A number of intellectual properties and over 140 patents

Three industrial parks covering over 60,000 square meters

Over 15 years of experience cooperating with Fortune 500 companies

AUDIOWELL

SENSOR TECHNOLOGY

Sensor technology shapes an intelligent life

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AUTOMOTIVE
APPLICATIONS & SOLUTIONS

APA Ultrasonic Sensor

UPA Ultrasonic Sensor

Digital Ultrasonic Sensor

Assembled Parking Sensor

Hall Speed Sensor

DEF/AdBlue Sensor

Vehicle Anti-intrusion Sensor

Gasoline Level Sensor

APA Ultrasonic Sensor

The APA ultrasonic sensor is the key component of the automatic parking assist system. It uses ultrasound to measure the distance to obstacles near the vehicle, from which the size of the parking space and the vehicle's position can be calculated. It operates at a different frequency from the reverse parking sensor to avoid interference.

Features

- Long detection range, up to 5000mm
- Excellent directivity
- No interference with reverse parking sensors

Applications

- Automatic parking system

Model	T/R48-15.5H279Z	T/R60-14H279Z
Resonant frequency	48±1.0 kHz	60±1.0 kHz
Overall sensitivity	480~1000μs	500~1000μs
Decay time	≤2.2 ms	≤2.2 ms
X-axle direction angle	60°	50°
Y-axle direction angle	60°	50°
Capacitance	1400±20% pF	1400±20% pF
Max. input voltage	160 Vp-p	160 Vp-p
Mean time to failure	50000h	50000h
Operating temperature	-40°C~+85°C	-40°C~+85°C

UPA Ultrasonic Sensor

UPA ultrasonic sensor is the core component of Parking System. It uses ultrasound to measure the distance between the vehicle and the front and rear obstructions.

Features

- Measuring range 150mm-2500mm
- Low power consumption
- High reliability
- Excellent waterproof performance and weatherability

Applications

- Parking assist system
- Blind zone detection

Model	T/R55.5-15. 5E279Z-L19-01	T/R58-14K279Z -L12-02
Resonant frequency	55.5±2.0 KHz	58±1.0KHz
Overall sensitivity	480-1000μS	3.0 ±1.0 Vp-p
Decay time	⩽2.20 mS	⩽1.80 mS
X-axle direction angle	90±15°	90±15°
Y-axle direction angle	45±10°	45±10°
Capacitance	1300±20%pF	2000±15% pF
Max. input voltage	160 Vp-p	140 Vp-p

Digital Ultrasonic Sensor

The Digital Ultrasonic Sensor adds signal processing to the traditional ultrasonic sensor and converts analog signals to digital signals. A variety of communication protocols such as LIN bus and I/O are available.

Features

- High sensitivity and stable performance
- Good consistency, short decay time
- Digital output for easy integration

Applications

- Intelligent parking system

Model	TK618	TK619
Resonant frequency	58±1.0KHz	58±1.0KHz
Detection range	2500mm	5000mm
Blind zone	250mm	350mm
Input voltage	12V	12V
Output signal	Digital signal	Digital signal

Assembled Parking Sensor

The assembled parking sensor is an assembled ultrasonic sensor module, which consists of sensor, silicone ring, plastic housing and cable. It can be connected directly with the signal processing module, and is the key component of a parking system.

Features

- High sensitivity, low power consumption and strong anti-interference ability
- Adaptable to a diversity of ECUs and car models
- Excellent waterproof performance and weatherability, suitable for humid and dusty environments

Applications

- Parking assist system

Model	12U73-TK045L201-01	14.4A279-TK017L201-01
Resonant frequency	40±1.0KHz	40±1.0KHz
Overall sensitivity	⩾200mV	⩾600mV
Decay time	⩽1.2ms	⩽1.2ms
Capacitance	2000±15%pF	2000±15%pF
Max. input voltage	140Vp-p	140Vp-p

Hall Speed Sensor

The Hall Speed Sensor detects the speed and direction of gear rotation based on hall effect. Measurement is accomplished without contacting the target gear. It measures the change of magnetic field induced by gear tooth and tooth gap with dual differential signals. The output signals are two-channel square waves with 90° phase shift, and the direction of rotation is determined by their lead/lag phase shifting.

Features

- High reliability even in harsh environments
- Wide measurement range ensures high accuracy for high/low speed
- Digital output for easy programming

Applications

- Measuring the speed and direction of gear rotation

Model	HQ0059
Operating air gap	0.5-2 mm
Operating temperature	-40-150°C
Supply voltage	4.5-24V
Output signal type	Two-channel square wave
Duty cycle	50%±10%
Phase shift	90° ±15°
Frequency	20Hz-20 kHz
Ingress protection	IP65

DEF/AdBlue Sensor

DEF/AdBlue Sensor is designed to measure the level of the urea solution (DEF / AdBlue) in the Selective Catalytic Reduction (SCR) system for diesel engines. Unlike the traditional reed level sensor in which the float sender can get stuck, this sensor uses ultrasonic wave to measure the liquid level and therefore contains no moving part. It has higher accuracy and reliability than typical reed sensors. This product can also be used as a diesel level sensor.

Features

- Continuous measurement
- High accuracy (four times as high as the traditional reed level sensor)
- No moving part

Applications

- Measuring the level of the urea solution (DEF / AdBlue) and diesel tank

The sensor is installed at the bottom of the measuring pipe section

Model	UM0059-000
Measurement range	500mm (customizable)
Blind zone	40mm
Measurement accuracy	±5mm
Response time	⩽2s
Temperature detection range	-10~+85(No crystal or coagulation)
Output	Digital output
Operating temperature	-10~+85 ℃
Power	DC 12V
Operating current	⩽25mA

Range can be customized

Vehicle Anti-intrusion Sensor

The ultrasonic vehicle anti-theft sensor is designed to detect intrusion into the vehicle's interior and trigger the alarm. Using an inclination sensor, it also helps to protect against tow-away theft.

Features

- Active detection, triggers an alarm when intrusion happens
- High sensitivity
- Low false alarm rate

Applications

-Automotive anti-intrusion system

Model	UM0040
Measuring range	0~4000mm
Response time	⩽1s
Blind zone	0mm
Operating temperature	-40~85℃
Operating voltage	DC 12V
Operating current	⩽1mA

Gasoline Level Sensor

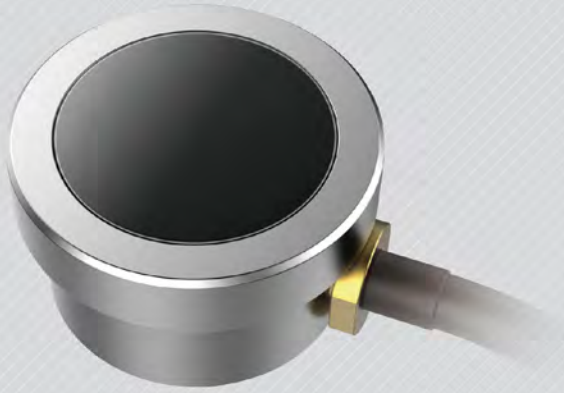
The Gasoline level sensor is a kind of high frequency liquid level sensor based on ultrasonic principle. It can achieve continuous high precision measurement for oil tanks and automobile gasoline tanks without any contact with the liquid. It's mainly applied in the measuring equipment and instrument of gasoline tank and oil tank.

Features

- High accuracy
- Stable and reliable performance
- No drilling, non-contact detection

Applications

- Automotive fuel tank monitoring
- Oil tank monitoring



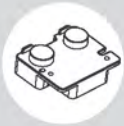
Model	AW9Y2000K01-01
Resonant frequency	2MHz±3%
Measuring range	50~1500mm
Capacitance	1600±15% pF
Max. input voltage	100Vp-p
Impedance	5±2(Ohm)
Insulation resistance	100M ohm min

smart

SMART HOME
APPLICATIONS&SOLUTIONS

Ultrasonic Transducer

Ultrasonic Level Sensor


Ultrasonic Rangefinder

Ultrasonic Rangefinder

Ultrasonic Proximity Sensor

Liquid Auto-fill Control Unit

Dust Sensor

Dust Sensor

Shock Sensor

Ultrasonic Flow Sensor Module

High Frequency Ultrasonic Transducer

Ultrasonic Transducer

The ultrasonic transducer utilizes piezoelectric effect to convert electricity to mechanical vibration and form ultrasonic waves. Therefore no coil is contained and electromagnetic interference can be greatly reduced. The ultrasonic wave has excellent directivity and strong penetrability, and is interfered by neither the dust and electromagnetic fields in the air, nor the color and temperature at object surfaces.

Features

- Large detection range
- Good immunity to interference

Applications

- Location tracking and gesture recognition for VR equipment, directional speaker, security alarm device, rangefinder.

Item	AW8TR40-16O C01-06	AW8T40-10O A01-00	AW8R40-10O A01-00
Central frequency	40±1.0KHz	40±1.0KHz	40±1.0KHz
Sound Pressure	⩾115dB	⩾113dB	-
Sensitivity	⩾-65dB	-	⩾-63dB
Beam Angle	55° typical	80° typical	80° typical
Capacitance	2100±20% pF	1700±20% pF	1700±20% pF
Max.Drive Voltage	20V rms	30V rms	30V rms

Ultrasonic Level Sensor

The liquid level sensor uses ultrasonic waves to measure the level of liquid continuously. It combines the transmitter and receiver in one unit and can be mounted at the external sidewall or bottom of a container. The ultrasonic waves emitted by the sensor travel through the container wall and propagate in the liquid. Part of them are reflected by the liquid surface and then received by the sensor. Accurate measurement is performed without any contact with the liquid or any drilling on the container.

Features

- High accuracy
- Good directivity
- Stable and reliable performance
- Water-proof

Applications

- Level control for appliances and equipment

Item	UM0017	UM0074
Measuring range	20~500mm	20~5000mm
Accuracy	±5mm	±20mm
Response time	⩽500ms	⩽500ms
Operating temperature	+5℃~+50℃	+5℃~+50℃
Operating voltage	DC 5±0.5 V	DC 5±0.5 V
Operating current	⩽30mA	⩽12mA

Ultrasonic Rangefinder

The Ultrasonic Rangefinder measures the time interval between emitting the ultrasonic pulses and receiving the echo to determine the distance to nearby objects. The distance value is indicated by the pulse width of output signals. Advanced signal processing technique is used in this module to enhance the measurement reliability and the anti-interference ability.

Item	UM0091-001
Range of measurement	20~3000mm
Accuracy	±10mm
Response time	<1ms
Rated working voltage	DC 5 V
Working current	⩽20 mA
Working temperature	-20°C~+65°C

Features

- Digital output
- Small blind zone
- Short response time

Applications

- UAV
- Robot
- Height measurement

Item	UM0090-000
Range of measurement	170~3000mm
Accuracy	±10mm
Response time	<1ms
Rated working voltage	DC 5 V
Working current	⩽10 mA
Working temperature	-40°C~+85°C

Ultrasonic Proximity Sensor

The proximity sensor can measure the distance between the object and the sensor, and output switching signals at one or several thresholds. It is mainly applied in industrial automation and water treatment applications.

Features

- Non-contact and continuous measurement
- Can work in humid and dusty environments
- Can detect transparent objects

Applications

- Liquid level detection
- Thickness detection
- Production line monitoring

Item	UM0001-001	UM0002-001
Operation frequency	200KHz	40KHz
Detect range	100~800mm	200~3000mm
Accuracy	±0.4mm	±20mm
Blind zone	100mm	200mm
Work environment	-10°C~50°C RH≤95%	-20°C~70°C RH≤95%
Input power	DC 20~30V	DC 8~12V
Output signal	Digital	Digital

Liquid Auto-fill Control Unit

By measuring the time of flight of ultrasonic waves, this unit calculates the depth of container and monitors the level of the liquid being added. Therefore it can control the liquid addition amount and prevent overfill regardless of the shape of containers. Non-contact measurement is performed to avoid contamination.

Features

- Highly intelligent
- High accuracy
- Short response time
- High stability

Applications

- Water dispenser, water purifier, coffee machine and other liquid fill-in machines

Model	UM0034
Measuring range	20-250mm
Cup-in response time	≤3s
Cup-out response time	< 1s
Operating temperature	0~85°C
Operating voltage	< 12mA

Dust Sensor

Dust sensor is a photoelectric sensor, which detects the concentration of dust in the air by the reflection of light. It can effectively detect and monitor PM 2.5 particles in the air,which is mainly aplied in the equipment for environmental and air quality monitoring.

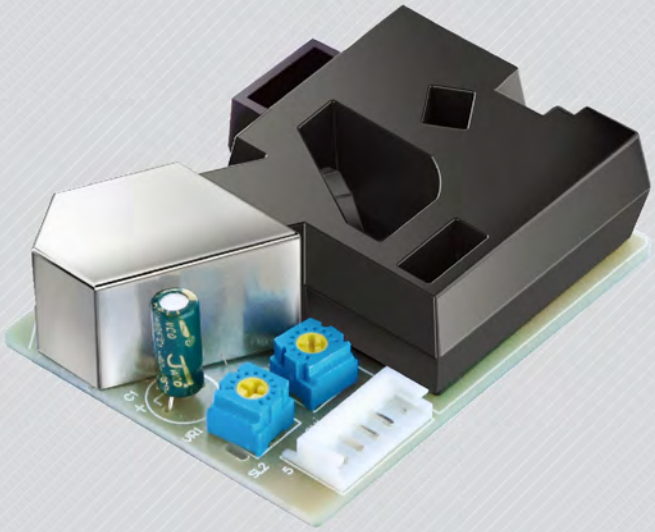
Features

- High sensitivity
- Excellent consistency

Applications

- Air cleaners, air conditioners, air quality monitor, etc.

Model	DW0001-004
Operating Supply voltage	5±0.5V
Detectable Dust Size	0.5μm~2.5μm
Sensitivity	0.5V/ (0.1mg/m^3)



Model	DC0001-000
Operating Supply voltage	DC 5±5%,Ripple<30mV
Detectable Dust Size	1μm~2.5μm
Dust Density Range	0~8000pcs/283ml

Shock Sensor

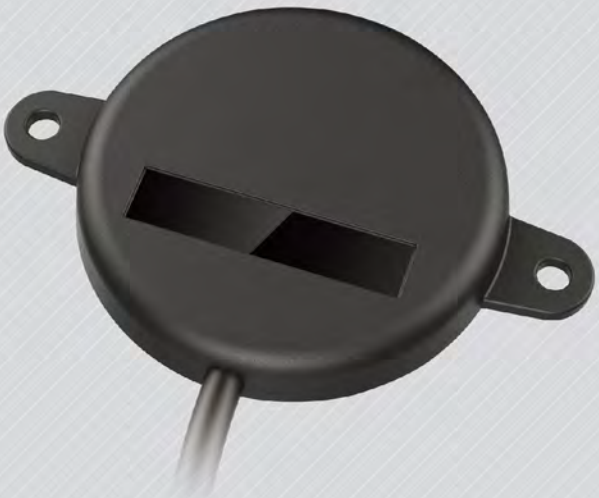
The shock sensor uses the piezoelectric effect to convert vibration signals into electrical signals. It is widely applied in various occasions which require detecting vibration or shock signals.

Features

- Compact structure
- High sensitivity, can detect for slight vibration and impact
- High strength structure ensures long lifespan

Applications

- Home appliances
- Textile machines



Model	AW2T24TEL-4A1
Output voltage	40mVp/G typ.
Capacitance	12000pF±30%
Insulation resistance	100MΩ
Operating temperature	-20°C~70°C
Storge temperature	-30°C~80°C
Weight	24.6g

Ultrasonic Flow Sensor Module

The Ultrasonic Flow Sensor Module measures the flow rate of liquid by calculating the transit time difference between upstream and downstream ultrasonic pulses. It contains no moving part in the pipe section, and therefore has lower pressure loss and higher accuracy than traditional flow meters.

Features

- No moving parts
- Low power consumption
- Active alert for abnormal status such as pipe dripping, transducer failure, etc.
- Water-contact materials conform with drinking water standards

Applications

- Smart irrigation system
- Intelligent water management system
- Industrial equipment

Model	FS0001-000	FS0002-000
Nominal diamenter	DN15	DN10
Accuracy	±5% (15-25L/h) ±2%(25-2500L/h)	±5% (15-25L/h) ±2%(25-1600L/h)
Power Consumption	8μA (standby) 200μA (data transmission)	
Q3/Q1	160	80
Max. Operating Pressure	1.6MPa	1.6MPa
Power Supply	3.1-3.7V	3.1-3.7V
Operating temperature	0°C±50°C	0°C ± 50°C

High Frequency Ultrasonic Transducer

The High Frequency Ultrasonic Transducer generates 300 KHz high-frequency ultrasonic wave and transmits it to the air through special coupling material, which is very useful in short-range precision detection.

Features

- High precision
- Good directivity
- Excellent consistency

Applications

- Double-sheet detection for scanners, printers, ATM etc.

Model	AW24Y0300K01-01
Drive frequency	300kHz
Sensitivity	⩾4Vp-p
Directivity	12° (typical)
Capacitance	800 PF±20%
Insulation resistance	100Mohm Min.
Max. input voltage	50 Vp-p
Operating temperature	-20°C ~ +70°C

SMART METERING APPLICATIONS

Household Ultrasonic Flow Sensor

Industrial Ultrasonic Flow Sensor

Flow Sensor for Water Meter

Flow Sensor for Gas Meter

Temperature Sensor

Brass Pipe for Heat Meter

Ultrasonic Flow Sensor with Plastic Pipe

Plastic Ball Valve

Household Ultrasonic Flow Sensor

The ultrasonic flow sensor measures liquid flow rate by transmitting ultrasonic wave in the liquid medium. In addition to flow metering, it can also be used for liquid level measurement.

Features

- Excellent consistency
- Stable performance
- High reliability

Applications

- Heat meter

Model	T/R975-US0020L391-01	T/R975-US0014L393-01	T/R975-US0004L406-01
Resonant frequency	975±30KHz	975±30KHz	975±30KHz
Resonant impedance	≤110Ω	≤110Ω	≤110Ω
Static capacitance	1150±20%pF	1150±20%pF	1150±20%pF
Pressure-resistant	2.5MPa	2.5MPa	2.5MPa
Operating temperature	+4°C~+100°C	+4°C~+90°C	+4°C~+90°C

Industrial Ultrasonic Flow Sensor

The heat meter flow sensor, which measures water flow rate with ultrasonic waves, is the key component of a smart heat meter. By measuring the water velocity, the volume of the water going through the pipe in a certain period of time can be calculated, which can be further used to calculate the energy used for heating.

Features

- High pressure and wearing resistance
- High reliability

Applications

- Heat meter

Model	T/R975-US0012L391-01	T/R975-US0021L391-01	T/R975-US0017L475-01
Resonant frequency	975±30KHz	975±30KHz	975±30KHz
Resonant impedance	⩽110Ω	⩽110Ω	⩽110Ω
Static capacitance	1150±20%pF	1150±20%pF	1150±20%pF
Pressure-resistant	3.5MPa	3.5MPa	3.5MPa
Operating temperature	+4°C~+130°C	+4°C~+130°C	+4°C~+130°C

Flow Sensor for Water Meter

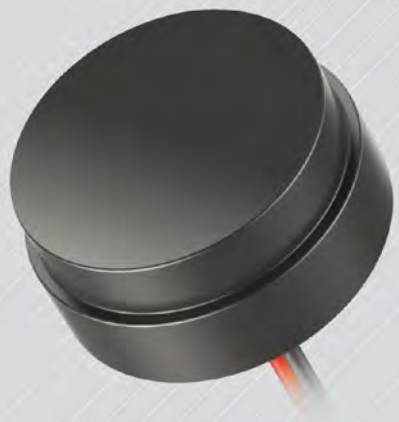
Water meter flow sensor is the core component of intelligent water meter, wihich is a kind of ultasonic sensor with liquid medium. The liquid flow speed can be calculated by measuring the change of ultrasonic speed in the pipe, so that the liquid flow volunm during a certain period of time can be calculated.

Features

- High sensitivity, stability and reliability
- High and low temperature resistance, moisture resistance, impact and shock resistance.
- Good consistency temperatures.

Applications

- Water meter



Model	T/R965-US0013L455-01	T/R980-US0019L065-01	T/R965-US0011L430-01
Resonant frequency	965±30KHz	980±30KHz	965±30KHz
Resonant impedance	⩽220Ω	⩽220Ω	⩽110Ω
Static capacitance	900±20%pF	550±20%pF	1150±20%pF
Pressure-resistant	2.5MPa	2.5MPa	2.5MPa
Operating temperature	+0°C~+ 50°C	+0°C~+ 50°C	+0°C~+ 50°C

Flow Sensor for Gas Meter

Gas meter flow sensor is the core component of ultrasonic gas meter, which is a kind of ultrasonic sensor wiht gas medium. This gas flow sensor has utilized novel acoustic matching material to enhance the transmission ability of ultrasonic signal in gas medium.

Features

- Self-developed advanceded material
- High stability and reliability
- Good consistency

Applications

- Gas meter

Model	HT0008-000
Resonant impedance	≤400Ω
Resonant frequency	200±10KHz
Static capacitance	1200±20%pF
Storage humidity range	15~90%RH
Max. Endure pressure	0.2MPa

Temperature Sensor

The sensing element of the temperature sensor is the platinum metal. It has a predictable change in resistance as the temperature changes, which can be used to determine temperature. The temperature sensor has been widely used to measure the temperature of air, soil and water.

Features

- Stable performance
- High reliability

Applications

- Heat Meter

Item	HQ0057-000
Accuracy	≤0.1℃
Resonant impedance(R)	100MΩ
Temperature sensing element type	Pt1000
Operating temperature	0℃~+105℃

Brass Pipe for Heat Meter

The Brass Pipe for Heat Meter contains a pair of ultrasonic sensors to detect the fluid flow in the pipe. When the ultrasonic wave and liquid flow direction runs in the same or reverse direction, the speed for the ultrasonic wave in liquid may be accelerated or decelerated accordingly. By this principle, the ultrasonic flow sensor detects the liquid flow speed in the pipe, and thus obtains the flow data for energy metering.

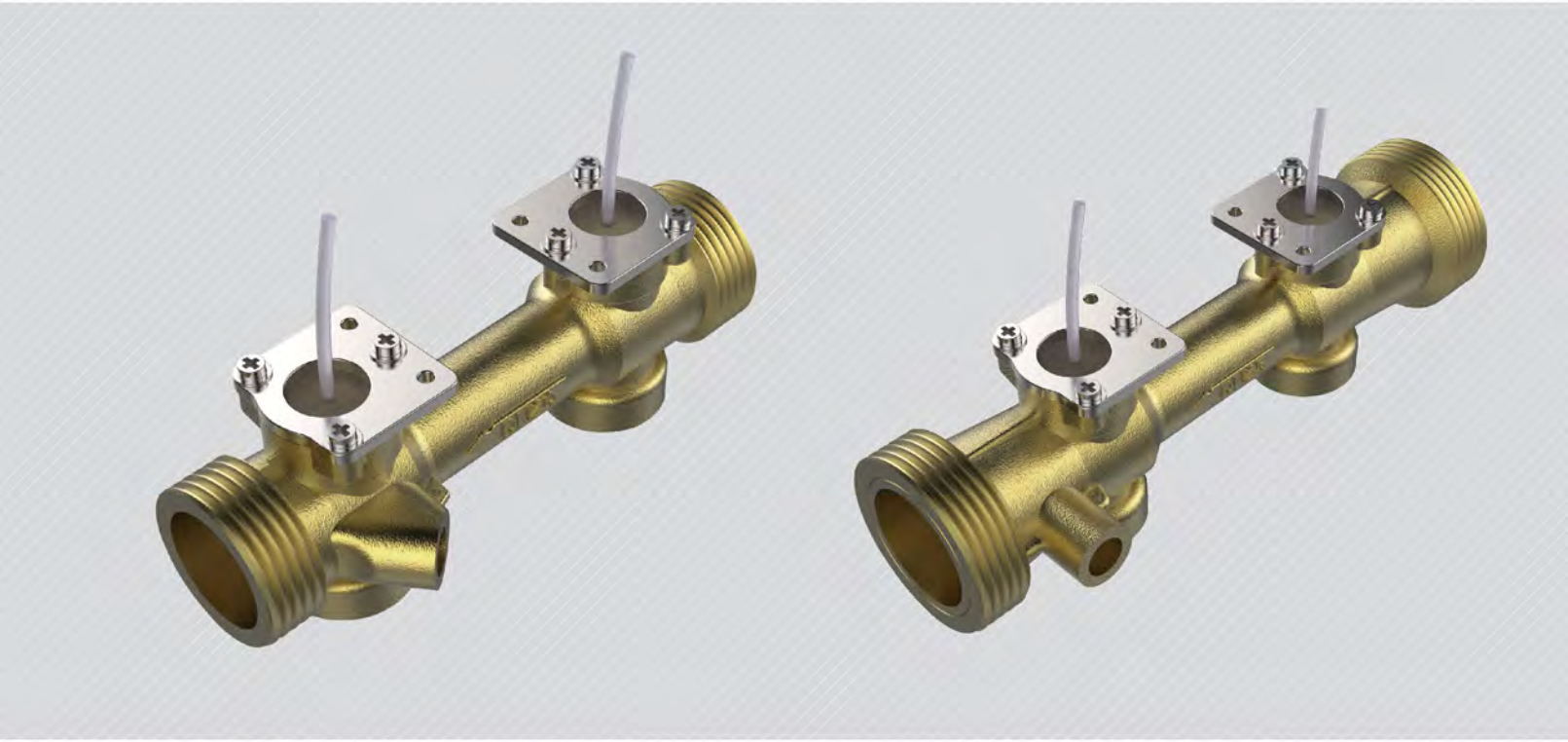
Features

- Streamlined design to reduce eddy currents and pressure loss
- Uniform velocity distribution to maintain a stable flow rate
- All-metal structure and all-in-one design

Applications

- Heat Meter
- Water Meter

Item	DN20	DN25
Max operating pressure	2.5MPa	2.5MPa
Pressure loss	≤25KPa	≤25KPa
Receiving voltage	380mv	380mv
Input signal	1MHz/1Vp-p 20/ sine wave/20 pulse	1MHz/1Vp-p 20/ sine wave/20 pulse



Ultrasonic Flow Sensor with Plastic Pipe

The Ultrasonic Flow Sensor with Plastic Pipe measures the flow rate of the water flowing through it by transmitting and receiving ultrasonic pulses. It is comprised of a pair of ultrasonic flow sensors and a polymer pipe.

Features

- Low pressure loss
- Anti-deformation material
- High-temperature resistance
- High accuracy and consistency

Applications

- Water Meter

Item	HS0014-000	HS0016-000	HS0017-000
Nominal Diamenter	DN 15	DN 20	DN 25
Resonant frequency	975±30KHz	975±30KHz	975±30KHz
Resonant impedance(R)	⩽110Ω	⩽110Ω	⩽110Ω
Static capacitance	1150±20%pF	1150±20%pF	1150±20%pF
Ultimate Pressure	1.6MPa	1.6MPa	1.6MPa

Plastic Ball Valve

The Plastic Ball Valve is made of toxic free and contamination free components. It can be directly connected with a water meter to make it a valve meter, or used as a separate valve to control the flow or shut off the flow under abnormal conditions.

Features

- Compliance of materials for drinking water
- No scaling
- Easy installation

Applications

- Intelligent water meter

Size	DN15
Tightness	2.0 Mpa (1min) 1.6 MPa (15min)
Max. Operating Pressure	1.6MPa
Pressure Loss	0Kpa
Torque	≤1.5 N*M

140
+ Countries

500
+ Customers

2
Billion Users

SMART HOME
APPLICATIONS & SOLUTIONS

AUTOMOTIVE
APPLICATIONS & SOLUTIONS

SMART METERING APPLICATIONS

2016 — Audiowell's <The Standard of Ultrasonic Distance Measurement Sensor> adopted in the Chinese industry standards

2015 — Successfully listed on NEEQ

2014 — Listed on the "Chinese Top 100 Electronic Companies"

2012 — Listed on the"Chinese most potential private company of Forbes 2012"

2008 — Awarded the "Guangdong high-tech enterprise"

2006 — Passed the ISO/TS16949 Quality Management System Certification

2002 — Ultrasonic sensor production line established

1999 — Audiowell established

17 YEARS MILESTONES