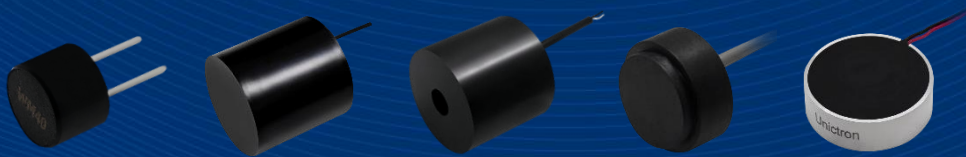


# Ultrasonic Transducers

Unique Ultrasonic Transducers You Need



# COMPANY PROFILE

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Unictron Technologies Corporation was established in 1988 and since then we have been keeping the pioneer title and position of the largest piezoceramics manufacturer in Taiwan. Unictron's piezo products have been implemented in a variety of applications by customers worldwide.

Piezo products need to provide reliable performance in tough environments. Therefore, besides complying with RoHS and REACH regulations, we are certified by ISO 14001 for Hazardous Substances Management. The strong manufacturing capabilities are underlined by passing the IATF 16949 certification, required in the automotive industry.

With over 20 years of experience in piezoceramics, Unictron's team is competent to provide tailor-made solutions for different types of ultrasonic applications to integrate customers' needs. We have extended production from piezo elements to assembled industrial ultrasonic transducers. Unictron's transducers are delivered with an extraordinary performance and reliability in the field of double feed detection, edge position control, non-contact level detection, flow metering and others.

# Catalogue

|                             |    |
|-----------------------------|----|
| Ultrasonic Transducer ..... | 04 |
| Main Features .....         | 04 |
| Certificates .....          | 05 |
| Product Family .....        | 06 |

## Double Feed Detection

|                                     |    |
|-------------------------------------|----|
| A280A1 280 kHz Air transducer ..... | 11 |
| A300A 300 kHz Air transducer .....  | 12 |
| A330A1 330 kHz Air transducer ..... | 12 |

## Edge Position Control

|                                     |    |
|-------------------------------------|----|
| A150A 150 kHz Air transducer .....  | 14 |
| A170W1 170 kHz Air transducer ..... | 15 |
| A200H1 200 kHz Air transducer ..... | 15 |

## Non-contact Ultrasonic Level Detection

### Enclosed Type

|                                     |    |
|-------------------------------------|----|
| A050A 50 kHz Air transducer .....   | 17 |
| A050B1 50 kHz Air transducer .....  | 18 |
| A054L1 54 kHz Air transducer .....  | 18 |
| A100A1 100 kHz Air transducer ..... | 19 |
| A100C1 100 kHz Air transducer ..... | 19 |
| A125A1 125 kHz Air transducer ..... | 20 |
| A125E 125 kHz Air transducer .....  | 20 |
| A180M1 180 kHz Air transducer ..... | 21 |
| A200A1 200 kHz Air transducer ..... | 21 |
| A240A1 240 kHz Air transducer ..... | 22 |
| A250M1 250 kHz Air transducer ..... | 22 |

## Exposed Matching Layer Type

|        |                              |    |
|--------|------------------------------|----|
| A100F1 | 100 kHz Air transducer ..... | 23 |
| A125F1 | 125 kHz Air transducer ..... | 23 |
| A200F1 | 200 kHz Air transducer ..... | 24 |
| A240F1 | 240 kHz Air transducer ..... | 24 |

## Ultrasonic Gas Flow Meter

|        |                              |    |
|--------|------------------------------|----|
| A200D1 | 200 kHz Air transducer ..... | 26 |
| A200M3 | 200 kHz Air transducer ..... | 27 |
| A240B1 | 240 kHz Air transducer ..... | 27 |
| A240M3 | 240 kHz Air transducer ..... | 28 |
| A500B1 | 500 kHz Air transducer ..... | 28 |

## Dual-frequency Non-contact Ultrasonic Level Detection

|        |                              |    |
|--------|------------------------------|----|
| Y050A1 | 50 kHz Air transducer .....  | 30 |
| Y050T1 | 50 kHz Air transducer .....  | 31 |
| Y100T1 | 100 kHz Air transducer ..... | 31 |

## Level Detection through Liquid

|      |                                     |    |
|------|-------------------------------------|----|
| LPY1 | 1 MHz Level sensor transducer ..... | 32 |
|------|-------------------------------------|----|

## Level Detection through Liquid

|      |                                           |    |
|------|-------------------------------------------|----|
| BPY3 | 40 kHz Ultrasonic sensor transducer ..... | 33 |
|------|-------------------------------------------|----|

## Flow Meter for Liquids

|      |                                   |    |
|------|-----------------------------------|----|
| MPYA | 1 MHz Flow meter transducer ..... | 34 |
|------|-----------------------------------|----|

## ULTRASONIC TRANSDUCER

An ultrasonic transducer can be used for short-range object detection. By calculating the time difference between emitting waves and reflected waves from objects (time of flight, ToF), the distance between the ultrasonic transducer and the detected object can be easily obtained.

In the field of ultrasonic detection, the types and properties of objects to be detected are not so restrictive. Solids, liquids or powders with various surface colors, transparencies and hardness can all be detected by using the ultrasonic transducer. Therefore, the ultrasonic transducer nowadays is widely used in the fields like parking sensors, level sensors, double feed detection, edge position control, flow meters, medical probes, etc.

## MAIN FEATURES

Unictron controls the whole manufacturing process. Starting with mixing own ceramic powders, manufacturing the piezo elements, to the assembly of the completed air transducers. With supervision over each production step, we are able to fine tune the mechanical and electrical properties of transducers. With such a background, it has been natural to develop and integrate our know-how:

- In-house piezoceramic element and acoustic matching layer
- Patented technologies
- Higher sensitivity with tighter process output distribution
- Outstanding reliability

Over the years, Unictron perfected its manufacturing proficiency which resulted in attracting customers from the automotive industry and passing certifications proving the automotive standards.



ISO 9001:2015  
(Taoyuan Factory)



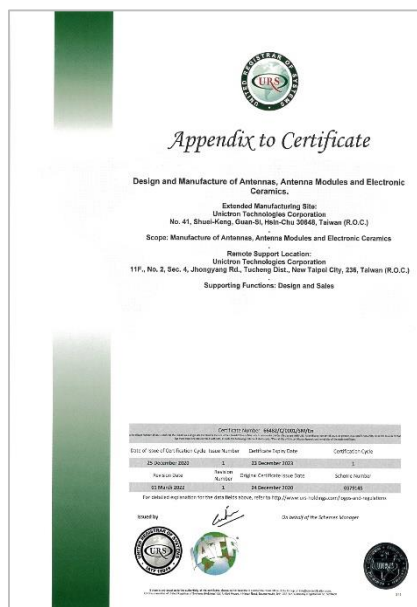
ISO 9001:2015  
(Hsinchu Factory)



ISO 9001:2015  
(Taipei Factory)



IATF 16949:2016



IATF 16949:2016



ISO 14001:2015



## Double Feed Detection / Edge Position Control

| Model Name               | A280A1                                                                            | A300A                                                                             | A330A1                                                                            | A150A                                                                              | A170W1                                                                              | A200H1                                                                              |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                          |  |  |  |  |  |  |
| Frequency (kHz)          | 280                                                                               | 300                                                                               | 330                                                                               | 150                                                                                | 170                                                                                 | 200                                                                                 |
| Dimensions (mm)          | OD 9.9<br>H 7.3                                                                   | OD 9.9<br>H 7.3                                                                   | OD 9.9<br>H 7.3                                                                   | OD 17.15<br>H 12.70                                                                | L54.6W18.2<br>H10.0                                                                 | OD 18.8<br>H 10.5                                                                   |
| Directivity (Full Angle) | $10 \pm 2^\circ$<br>(@-6 dB)                                                      | $10 \pm 2^\circ$<br>(@-6 dB)                                                      | $10 \pm 2^\circ$<br>(@-6 dB)                                                      | $8 \pm 2^\circ$<br>(@-3 dB)                                                        | $X 5 \pm 2^\circ$<br>$Y 25 \pm 2^\circ$<br>(@-6 dB)                                 | $10 \pm 2^\circ$<br>(@-6 dB)                                                        |
| Max. Sensing Range (cm)  | 70                                                                                | 60                                                                                | 50                                                                                | 250                                                                                | > 28 mm<br>(working range)                                                          | 200                                                                                 |
| Blind Zone (cm)          | < 3                                                                               | < 3                                                                               | < 3                                                                               | < 15                                                                               | < 15                                                                                | < 10                                                                                |
| Housing Material         | Plastic                                                                           | Plastic                                                                           | Plastic                                                                           | Aluminum                                                                           | Plastic                                                                             | Aluminum                                                                            |
| Major Applications       | Web guiding<br>Proximity<br>Double feed                                           | Web guiding<br>Proximity<br>Double feed                                           | Web guiding<br>Proximity<br>Double feed                                           | Web guiding<br>Proximity                                                           | Web guiding<br>Proximity                                                            | Web guiding<br>Proximity                                                            |

## Non-contact Ultrasonic Level Detection

| Model Name                      | A050A                                                                               | A050B1                                                                              | A054L1                                                                              | A100A1                                                                               | A100C1                                                                                | A125A1                                                                                |
|---------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                 |  |  |  |  |  |  |
| Frequency (kHz)                 | 50                                                                                  | 50                                                                                  | 54                                                                                  | 100                                                                                  | 100                                                                                   | 125                                                                                   |
| Dimensions (mm)                 | OD 47.0<br>H 48.0                                                                   | OD 56.0<br>H 51.0                                                                   | OD 47.0<br>H 48.0                                                                   | OD 29.0<br>H 30.0                                                                    | OD 29.0<br>H 56.1                                                                     | OD 25.0<br>H 25.0                                                                     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2^\circ$                                                                    | $10 \pm 2^\circ$                                                                    | $10 \pm 2^\circ$                                                                    | $10 \pm 2^\circ$                                                                     | $10 \pm 2^\circ$                                                                      | $10 \pm 2^\circ$                                                                      |
| Max. Sensing Range (meter)      | 10                                                                                  | 12                                                                                  | 10                                                                                  | 4                                                                                    | 4                                                                                     | 3                                                                                     |
| Blind Zone (cm)                 | < 30                                                                                | < 30                                                                                | < 20                                                                                | < 20                                                                                 | < 20                                                                                  | < 15                                                                                  |
| Housing Material                | PVDF                                                                                | PVDF                                                                                | PVDF                                                                                | PVDF                                                                                 | PVDF                                                                                  | PVDF                                                                                  |
| Major Applications              | Level detection                                                                     | Level detection                                                                     | Level detection                                                                     | Level detection                                                                      | Level detection                                                                       | Level detection                                                                       |

## Non-contact Ultrasonic Level Detection

| Model Name                      | A125E                                                                             | A180M1                                                                            | A200A1                                                                             | A240A1                                                                              | A250M1                                                                              |
|---------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                 |  |  |  |  |  |
| Frequency (kHz)                 | 125                                                                               | 180                                                                               | 200                                                                                | 240                                                                                 | 250                                                                                 |
| Dimensions (mm)                 | OD 29.0<br>H 126.6                                                                | OD 18.2<br>H 5.25                                                                 | OD 16.0<br>H 19.0                                                                  | OD 13.5<br>H 18.5                                                                   | OD 18.2<br>H 5.25                                                                   |
| Directivity (Full Angle @-3 dB) | $10 \pm 2^\circ$                                                                  | $10 \pm 2^\circ$                                                                  | $8 \pm 2^\circ$                                                                    | $8 \pm 2^\circ$                                                                     | $10 \pm 2^\circ$                                                                    |
| Max. Sensing Range (meter)      | 3                                                                                 | 2                                                                                 | 2                                                                                  | 1.2                                                                                 | 1                                                                                   |
| Blind Zone (cm)                 | < 15                                                                              | < 10                                                                              | < 5                                                                                | < 4                                                                                 | < 5                                                                                 |
| Housing Material                | PVDF                                                                              | Elastomer                                                                         | PVDF                                                                               | PVDF                                                                                | Elastomer                                                                           |
| Major Applications              | Level detection                                                                   | Level detection                                                                   | Level detection                                                                    | Level detection                                                                     | Level detection                                                                     |

## Non-contact Ultrasonic Level Detection

| Model Name                      | A100F1                                                                              | A125F1                                                                              | A200F1                                                                               | A240F1                                                                                |
|---------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                 |  |  |  |  |
| Frequency (kHz)                 | 100                                                                                 | 125                                                                                 | 200                                                                                  | 240                                                                                   |
| Dimensions (mm)                 | OD 29.0<br>H 28.5                                                                   | OD 25.0<br>H 23.5                                                                   | OD 16.0<br>H 18.0                                                                    | OD 13.5<br>H 17.5                                                                     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2^\circ$                                                                    | $10 \pm 2^\circ$                                                                    | $8 \pm 2^\circ$                                                                      | $8 \pm 2^\circ$                                                                       |
| Max. Sensing Range (meter)      | 4                                                                                   | 3                                                                                   | 2                                                                                    | 1.2                                                                                   |
| Blind Zone (cm)                 | < 20                                                                                | < 15                                                                                | < 5                                                                                  | < 4                                                                                   |
| Housing Material                | PVDF                                                                                | PVDF                                                                                | PVDF                                                                                 | PVDF                                                                                  |
| Major Applications              | Level detection                                                                     | Level detection                                                                     | Level detection                                                                      | Level detection                                                                       |



## Ultrasonic Gas Flow Meter / Anemometer

| Model Name                      | A200D1                                                                            | A200M3                                                                            | A240B1                                                                             | A240M3                                                                              | A500B1                                                                              |
|---------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                 |  |  |  |  |  |
| Frequency (kHz)                 | 200                                                                               | 200                                                                               | 240                                                                                | 240                                                                                 | 500                                                                                 |
| Dimensions (mm)                 | OD 16.0<br>H 19.0                                                                 | OD 18.2<br>H 7.7                                                                  | OD 13.5<br>H 18.5                                                                  | OD 18.2<br>H 7.0                                                                    | OD 18.2<br>H 6.35                                                                   |
| Directivity (Full Angle @-3 dB) | $8 \pm 2^\circ$                                                                   | $10 \pm 2^\circ$                                                                  | $8 \pm 2^\circ$                                                                    | $10 \pm 2^\circ$                                                                    | $7 \pm 2^\circ$                                                                     |
| Operating Temperature (°C)      | -30 ~ +60                                                                         | -30 ~ +60                                                                         | -30 ~ +60                                                                          | -30 ~ +60                                                                           | -30 ~ +60                                                                           |
| Housing Material                | PVDF                                                                              | Elastomer                                                                         | PVDF                                                                               | Elastomer                                                                           | Elastomer                                                                           |
| ZFD (Zero Flow Drift)           | < 1.0 ns                                                                          | < 1.0 ns                                                                          | < 1.0 ns                                                                           | < 1.0 ns                                                                            | < 1.0 ns                                                                            |
| Major Applications              | Gas flow meter                                                                    | Gas flow meter                                                                    | Anemometer                                                                         | Gas flow meter                                                                      | Gas flow meter                                                                      |

## Dual-frequency Non-contact Ultrasonic Level Detection

| Model Name                      | Y050A1                                                                              | Y050T1                                                                              | Y100T1                                                                               |
|---------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                 |  |  |  |
| Frequency (kHz)                 | 50/200                                                                              | 50/200                                                                              | 100/250                                                                              |
| Dimensions (mm)                 | OD 56.0<br>H 51.0                                                                   | OD 56.0<br>H 51.0                                                                   | OD 29.0<br>H 30.0                                                                    |
| Directivity (Full Angle @-3 dB) | $10^\circ$<br>(@50 kHz)<br>$6^\circ$<br>(@200 kHz)                                  | $10^\circ$<br>(@50 kHz)<br>$6^\circ$<br>(@200 kHz)                                  | $10^\circ$<br>(@100 kHz)<br>$5^\circ$<br>(@250 kHz)                                  |
| Max. Sensing Range (meter)      | 12                                                                                  | 12                                                                                  | 4                                                                                    |
| Blind Zone (cm)                 | 10                                                                                  | 10                                                                                  | 7                                                                                    |
| Housing Material                | PVDF                                                                                | PVDF                                                                                | PVDF                                                                                 |
| Major Applications              | Level detection                                                                     | Level detection                                                                     | Level detection                                                                      |

## Level Detection through Liquid

| Model Name                                                                        | LPY1             |
|-----------------------------------------------------------------------------------|------------------|
|  |                  |
| Frequency (MHz)                                                                   | 1                |
| Capacitance (@ 1 kHz) (pF)                                                        | 1250             |
| Echo Voltage (mV)                                                                 | > 50             |
| Maximum Driving Voltage (Vpp)                                                     | 50               |
| Dimensions (mm)                                                                   | OD 25.0<br>H 8.0 |
| Operating Temperature (°C)                                                        | -20 ~ 70         |
| Storage Temperature (°C)                                                          | -30 ~ 80         |
| Housing Material                                                                  | Aluminum         |

## Level Detection through Air

| Model Name                                                                          | BPY3             |
|-------------------------------------------------------------------------------------|------------------|
|  |                  |
| Frequency (kHz)                                                                     | 40               |
| Capacitance (@ 1 kHz) (pF)                                                          | 1800             |
| Echo Voltage (mV)                                                                   | > 200            |
| Resonant Impedance (ohm)                                                            | < 2000           |
| Dimensions (mm)                                                                     | OD 14.4<br>H 6.8 |
| Operating Temperature (°C)                                                          | -40 ~ 80         |
| Storage Temperature (°C)                                                            | -10 ~ 80         |
| Housing Material                                                                    | Aluminum         |

## Flow Meter for Liquids

| Model Name                                                                          | MPY1     |
|-------------------------------------------------------------------------------------|----------|
|  |          |
| Frequency (MHz)                                                                     | 1        |
| Capacitance (@ 1 kHz) (pF)                                                          | 1200     |
| Sensitivity dB                                                                      | -28 min  |
| Beam Angle (-3 dB full angle)                                                       | 5°       |
| Operation Voltage (Vpp)                                                             | 50 max   |
| Operating Temperature (°C)                                                          | 4 ~ 80   |
| Storage Temperature (°C)                                                            | -10 ~ 80 |
| Housing Material                                                                    | PPS      |



Web guiding

Double feed detection

Proximity measurement

### Industries & Applications

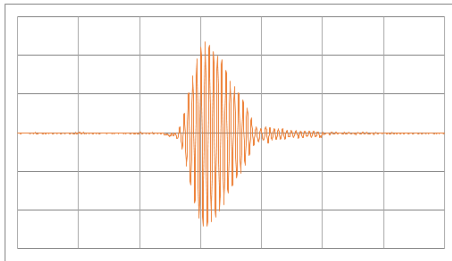
- Printer
- Multi-function printer (MFP)
- Scanner
- Splicing detection
- Banknote fitness
- Label detection

### Features

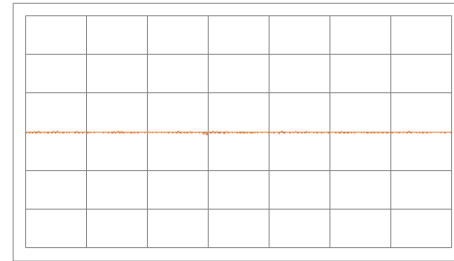
- High performance
- High reliability
- Patented technologies
- Suitable for most materials

Ultrasound can penetrate much more through a single sheet compared with multiple sheets. It has been widely used in automatic document feeders (ADF).

Signal with a single sheet



Signal with multiple sheets



## A280A1 280 kHz Air transducer

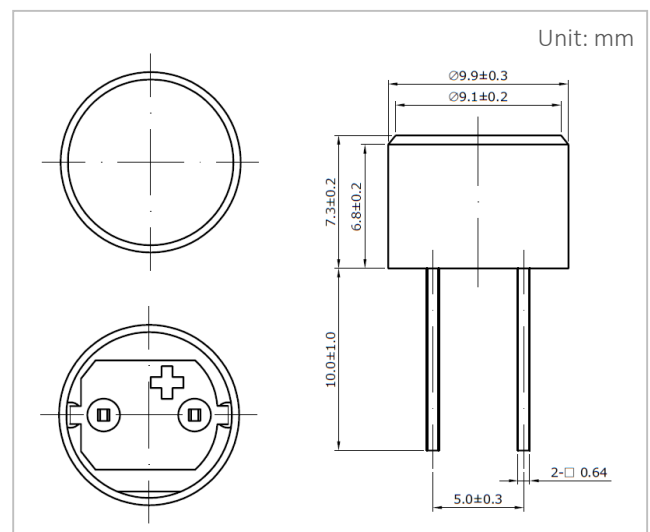
### Major Applications

Web guiding  
Double feed detection  
Proximity measurement

### Specifications

|                                  |                 |        |
|----------------------------------|-----------------|--------|
| Operation Frequency              | 280             | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)     | $1300 \pm 20\%$ | pF     |
| Directivity (Full Angle @ -6 dB) | $10 \pm 2$      | degree |
| Maximum Sensing Range            | 70              | cm     |
| Blind Zone                       | < 3             | cm     |
| Dimension-OD                     | 9.9             | mm     |
| Dimension-Height                 | 7.3             | mm     |
| Housing Material                 | PBT             |        |
| Wire                             | Lead            |        |

### Dimensions





## A300A 300 kHz Air transducer

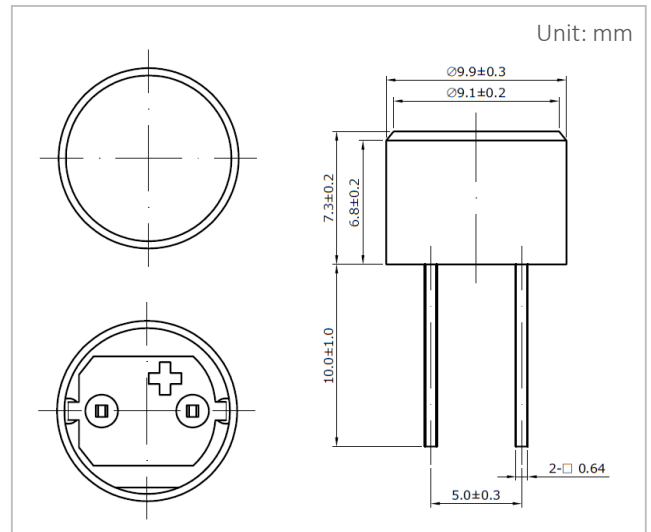
### Major Applications

Web guiding  
Double feed detection  
Proximity measurement

### Specifications

|                                 |            |        |
|---------------------------------|------------|--------|
| Operation Frequency             | 300        | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 1300 ± 20% | pF     |
| Directivity (Full Angle @-6 dB) | 10 ± 2     | degree |
| Maximum Sensing Range           | 60         | cm     |
| Blind Zone                      | < 3        | cm     |
| Dimension-OD                    | 9.9        | mm     |
| Dimension-Height                | 7.3        | mm     |
| Housing Material                | PBT        |        |
| Wire                            | Lead       |        |

### Dimensions



## A330A1 330 kHz Air transducer

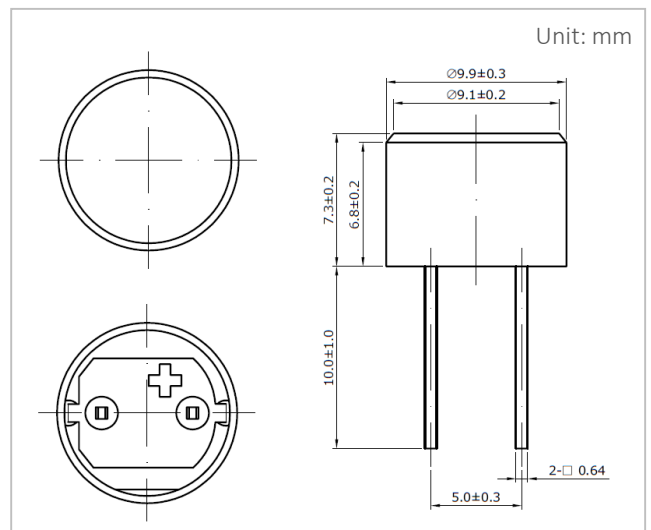
### Major Applications

Web guiding  
Double feed detection  
Proximity measurement

### Specifications

|                                 |            |        |
|---------------------------------|------------|--------|
| Operation Frequency             | 330        | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 1300 ± 20% | pF     |
| Directivity (Full Angle @-6 dB) | 10 ± 2     | degree |
| Maximum Sensing Range           | 50         | cm     |
| Blind Zone                      | < 3        | cm     |
| Dimension-OD                    | 9.9        | mm     |
| Dimension-Height                | 7.3        | mm     |
| Housing Material                | PBT        |        |
| Wire                            | Lead       |        |

### Dimensions







WEB guiding

Edge position control

Proximity sensing

### Industries & Applications

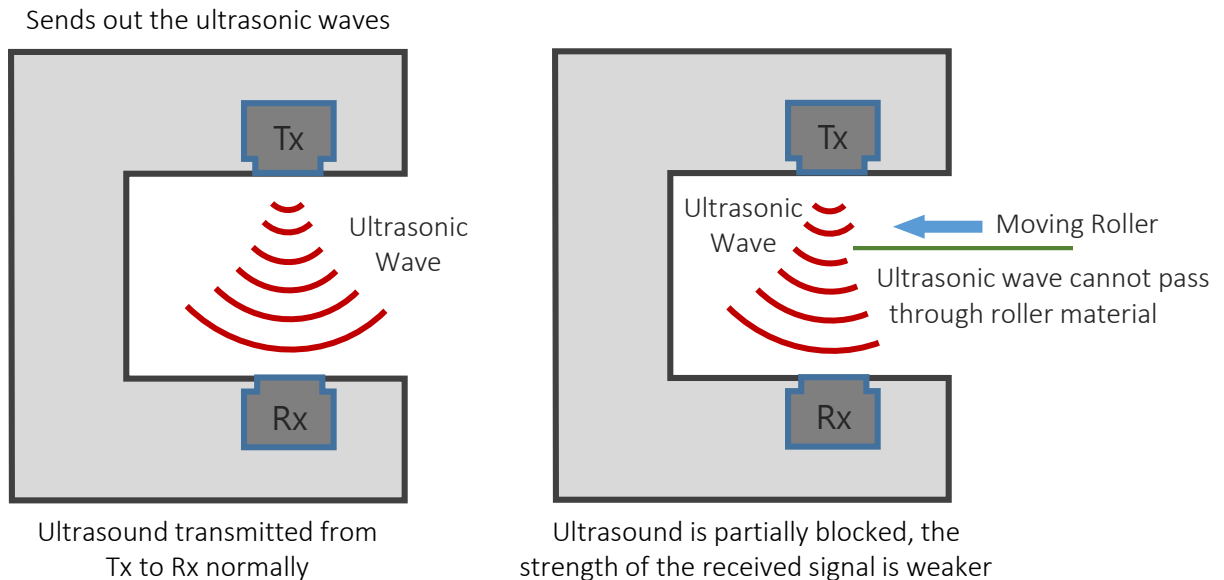
- Paper plant
- Printing industry
- Package manufacturing
- Textile industry
- Steel plant
- Plastic and rubber industry
- Panel manufacturing
- Film manufacturing
- Edge position control
- Proximity measurement

### Features

- High sensitivity
- High response
- High performance
- High reliability
- Suitable for most materials



The EPC system equipped with ultrasonic transducers is suitable for most materials, including metal or non-metal, transparent or opaque sheet, mesh or film, and any color of object, etc.



## A150A 150 kHz Air transducer

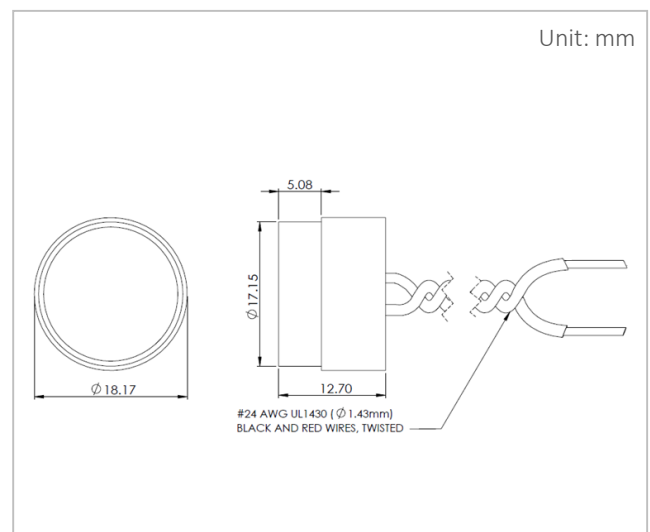
### Major Applications

Web guiding  
Proximity measurement

### Specifications

|                                 |                       |        |
|---------------------------------|-----------------------|--------|
| Operation Frequency             | 150                   | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 1000 ± 20%            | pF     |
| Directivity (Full Angle @-3 dB) | 8 ± 2                 | degree |
| Maximum Sensing Range           | 250                   | cm     |
| Blind Zone                      | < 15                  | cm     |
| Dimension-OD                    | 17.15                 | mm     |
| Dimension-Height                | 12.70                 | mm     |
| Housing Material                | Aluminum              |        |
| Wire                            | UL1430 #24AWG Ø1.43mm |        |

### Dimensions





## A170W1 170 kHz Air transducer

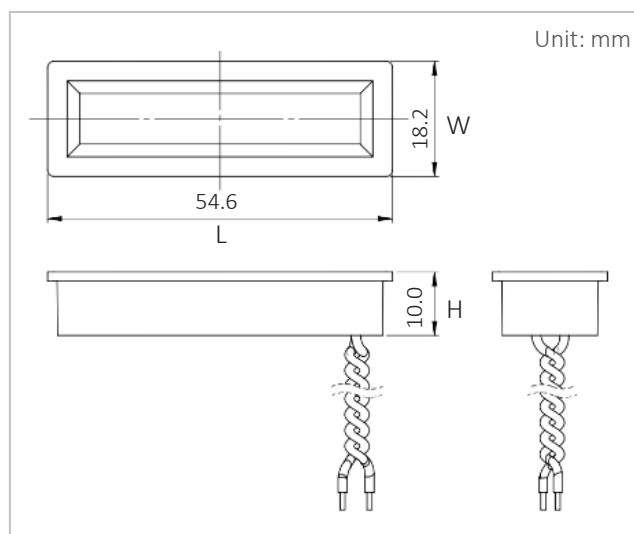
### Major Applications

Web guiding  
Proximity measurement

### Specifications

|                                    |                                           |        |
|------------------------------------|-------------------------------------------|--------|
| Operation Frequency                | 170                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)       | $3000 \pm 20\%$                           | pF     |
| Directivity<br>(Full Angle @-6 dB) | X $5 \pm 2$<br>Y $25 \pm 2$               | degree |
| Working Rang                       | > 28                                      | mm     |
| Dimension-Length                   | 54.6                                      | cm     |
| Dimension-Width                    | 18.2                                      | mm     |
| Dimension-Height                   | 10.0                                      | mm     |
| Housing Material                   | Plastic                                   |        |
| Wire                               | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



## A200H1 200 kHz Air transducer

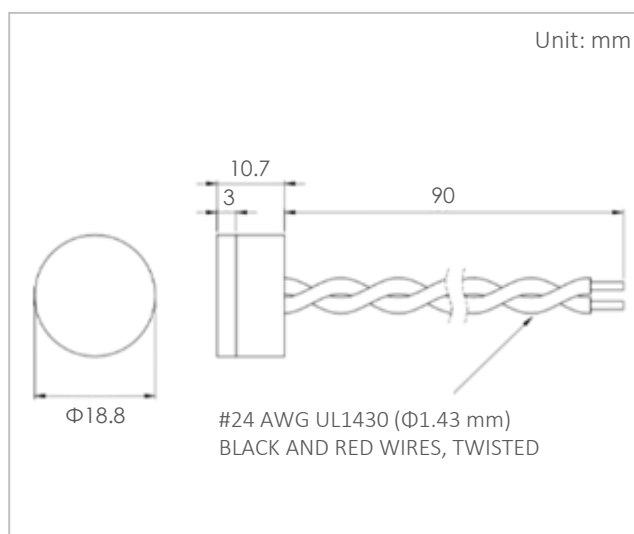
### Major Applications

Web guiding  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 200                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $500 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-6 dB) | $10 \pm 2$                                | degree |
| Maximum Sensing Range           | 200                                       | cm     |
| Blind Zone                      | < 10                                      | cm     |
| Dimension-OD                    | 18.8                                      | mm     |
| Dimension-Height                | 10.7                                      | mm     |
| Housing Material                | Aluminum                                  |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions





## Non-contact level detection

## Proximity measurement

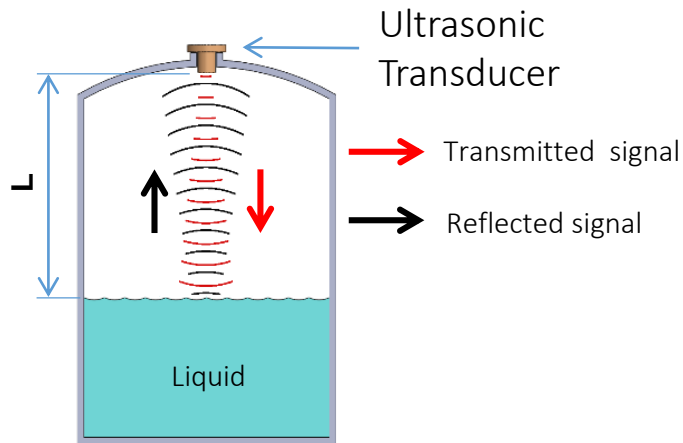
### Industries & Applications

- Petrochemical industry
- Water supply and drainage industry
- River level monitoring
- Food and beverage industry
- Vehicle fuel level detection
- Grain, powder, granular material level detection

### Features

- High performance
- High reliability
- PVDF housing
- Chemical resistance
- Waterproof IP68
- Patented technologies
- Suitable for most materials

Level depth can be detected with an ultrasonic transducer, acting as a transmitting and a receiving unit within one body, based on ToF calculations.



$$\text{ToF} = t ; \text{Sound Velocity} = V$$

$$\text{Level depth} = L$$

$$L = (V \cdot t) / 2$$



## A050A 50 kHz Air transducer

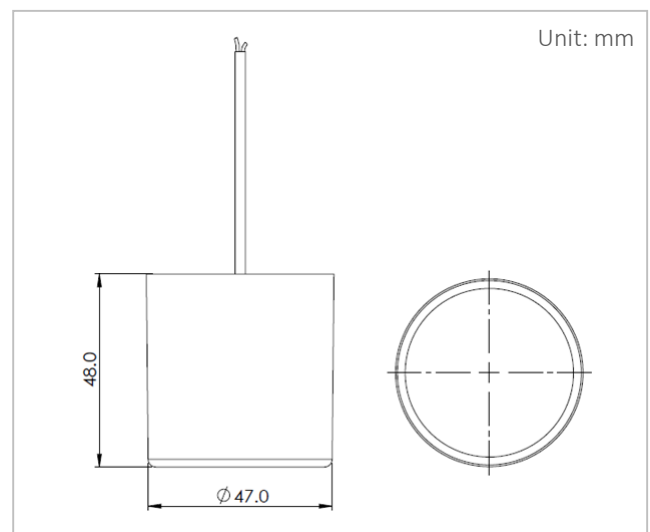
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 50             | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 3500 ± 20%     | pF     |
| Directivity (Full Angle @-3 dB) | 10 ± 2         | degree |
| Maximum Sensing Range           | 10             | meter  |
| Blind Zone                      | < 30           | cm     |
| Dimension-OD                    | 47.0           | mm     |
| Dimension-Height                | 48.0           | mm     |
| Housing Material                | PVDF           |        |
| Wire                            | RG174/U 50 ohm | Ø2.7mm |

### Dimensions



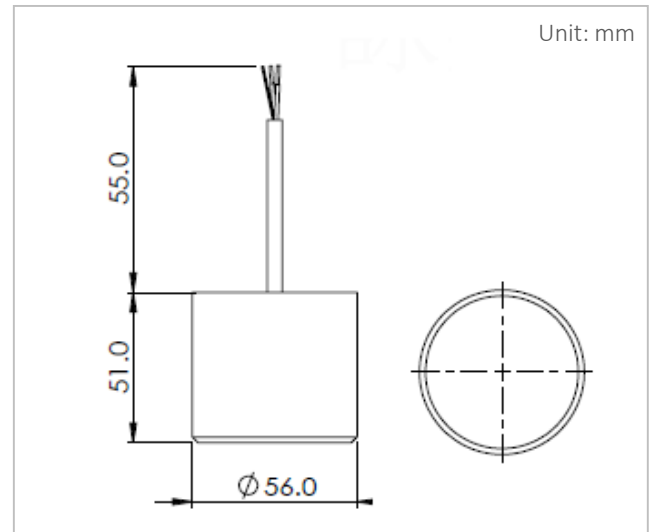


## A050B1 50 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                 |                      |        |
|---------------------------------|----------------------|--------|
| Operation Frequency             | 50                   | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 5000 ± 20%           | pF     |
| Directivity (Full Angle @-3 dB) | 10 ± 2               | degree |
| Maximum Sensing Range           | 12                   | meter  |
| Blind Zone                      | < 30                 | cm     |
| Dimension-OD                    | 56.0                 | mm     |
| Dimension-Height                | 51.0                 | mm     |
| Housing Material                | PVDF                 |        |
| Wire                            | UL2464 #22AWG Ø4.0mm |        |

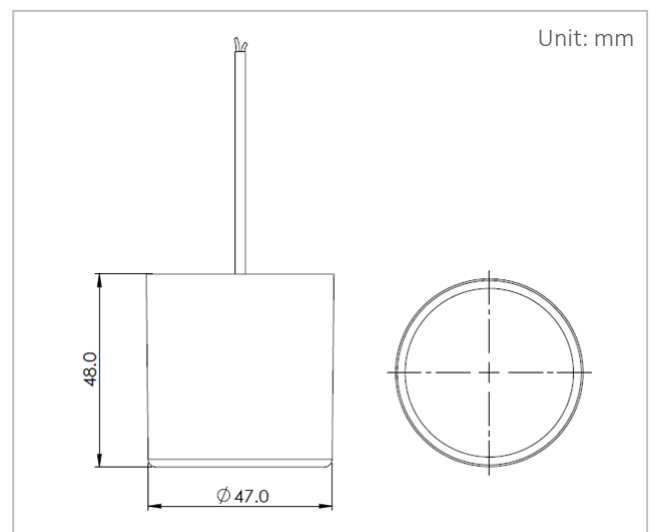


## A054L1 54 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                 |                      |        |
|---------------------------------|----------------------|--------|
| Operation Frequency             | 54                   | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 2600 ± 20%           | pF     |
| Directivity (Full Angle @-3 dB) | 10 ± 2               | degree |
| Maximum Sensing Range           | 10                   | meter  |
| Blind Zone                      | < 20                 | cm     |
| Dimension-OD                    | 47.0                 | mm     |
| Dimension-Height                | 48.0                 | mm     |
| Housing Material                | PVDF                 |        |
| Wire                            | UL2464 #22AWG Ø4.0mm |        |





## A100A1 100 kHz Air transducer

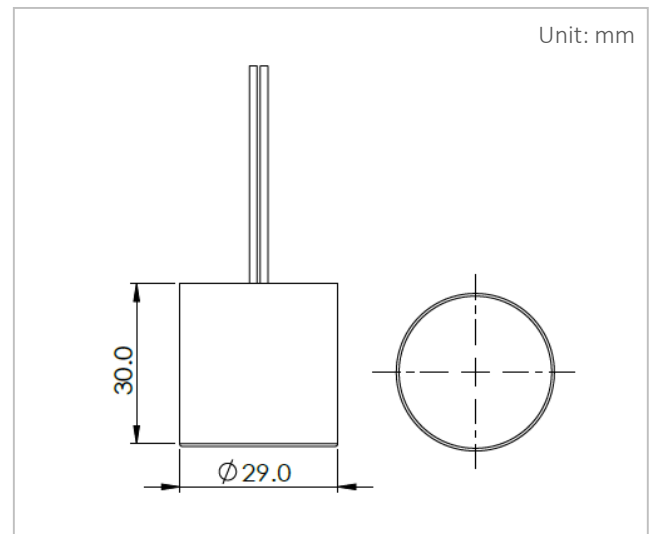
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                       |        |
|---------------------------------|-----------------------|--------|
| Operation Frequency             | 100                   | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 1600 ± 20%            | pF     |
| Directivity (Full Angle @-3 dB) | 10 ± 2                | degree |
| Maximum Sensing Range           | 4                     | meter  |
| Blind Zone                      | < 20                  | cm     |
| Dimension-OD                    | 29.0                  | mm     |
| Dimension-Height                | 30.0                  | mm     |
| Housing Material                | PVDF                  |        |
| Wire                            | UL1430 #24AWG Ø1.43mm |        |

### Dimensions



## A100C1 100 kHz Air transducer

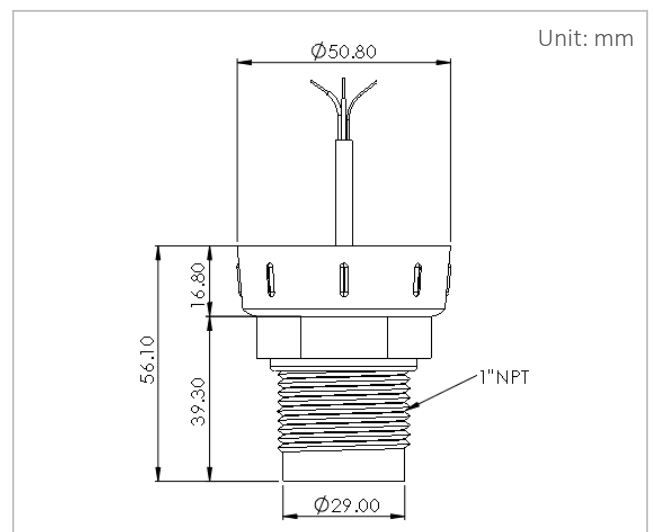
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                      |        |
|---------------------------------|----------------------|--------|
| Operation Frequency             | 100                  | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 3400 ± 20%           | pF     |
| Directivity (Full Angle @-3 dB) | 10 ± 2               | degree |
| Maximum Sensing Range           | 4                    | meter  |
| Blind Zone                      | < 20                 | cm     |
| Dimension-OD                    | 29.0                 | mm     |
| Dimension-Height                | 56.1                 | mm     |
| Housing Material                | PVDF                 |        |
| Wire                            | UL2464 #22AWG Ø4.0mm |        |

### Dimensions





## A125A1 125 kHz Air transducer

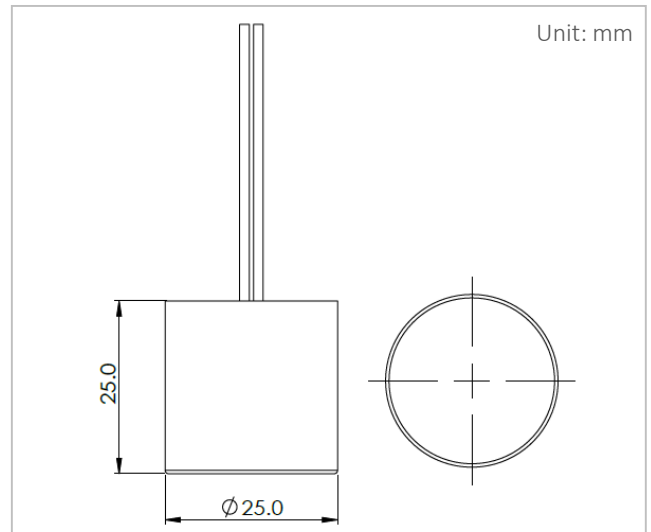
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 125                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $1000 \pm 20\%$                           | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$                                | degree |
| Maximum Sensing Range           | 3                                         | meter  |
| Blind Zone                      | < 15                                      | cm     |
| Dimension-OD                    | 25.0                                      | mm     |
| Dimension-Height                | 25.0                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



## A125E 125 kHz Air transducer

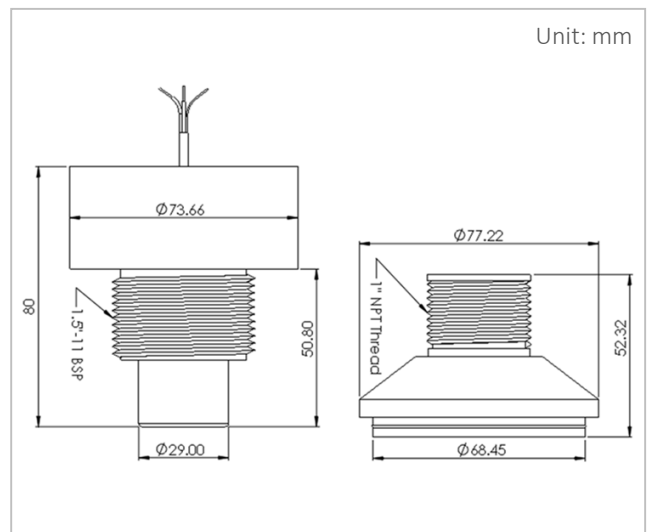
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                       |                                          |        |
|---------------------------------------|------------------------------------------|--------|
| Operation Frequency                   | 125                                      | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)          | $1000 \pm 20\%$                          | pF     |
| Directivity (Full Angle @-3 dB)       | $10 \pm 2$                               | degree |
| Maximum Sensing Range                 | 3                                        | meter  |
| Blind Zone                            | < 15                                     | cm     |
| Dimension-OD                          | 29.0                                     | mm     |
| Dimension-Height (transducer + cover) | 126.6                                    | mm     |
| Housing Material                      | PVDF                                     |        |
| Wire                                  | UL2464 #22AWG $\varnothing 4.0\text{mm}$ |        |

### Dimensions





## A180M1 180 kHz Air transducer

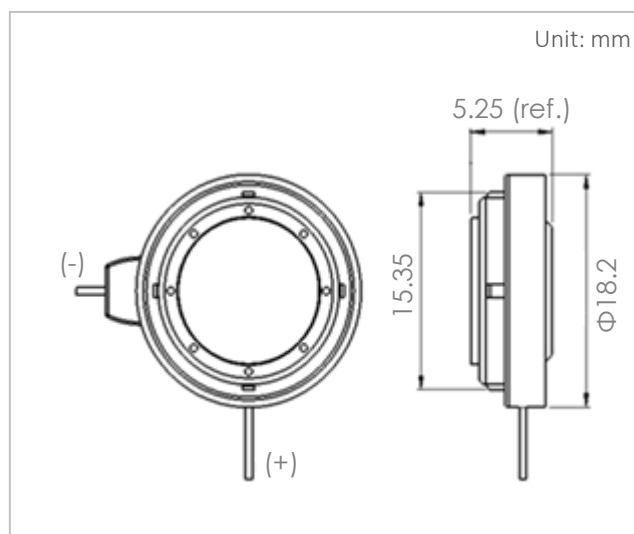
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 180                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$                                | degree |
| Maximum Sensing Range           | 2                                         | meter  |
| Blind Zone                      | < 10                                      | cm     |
| Dimension-OD                    | 18.2                                      | mm     |
| Dimension-Height                | 5.25                                      | mm     |
| Housing Material                | Elastomer                                 |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



## A200A1 200 kHz Air transducer

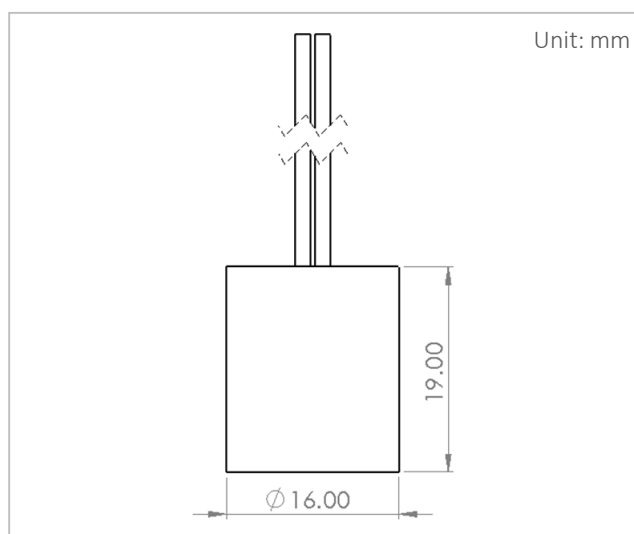
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 200                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $500 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$                                 | degree |
| Maximum Sensing Range           | 2                                         | meter  |
| Blind Zone                      | < 5                                       | cm     |
| Dimension-OD                    | 16.0                                      | mm     |
| Dimension-Height                | 19.0                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions





## A240A1 240 kHz Air transducer

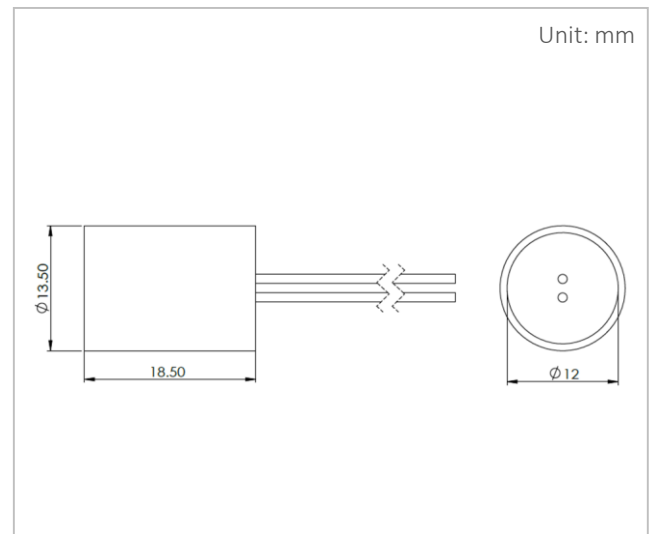
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 240                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$                                 | degree |
| Maximum Sensing Range           | 1.2                                       | meter  |
| Blind Zone                      | < 4                                       | cm     |
| Dimension-OD                    | 13.5                                      | mm     |
| Dimension-Height                | 18.5                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



## A250M1 250 kHz Air transducer

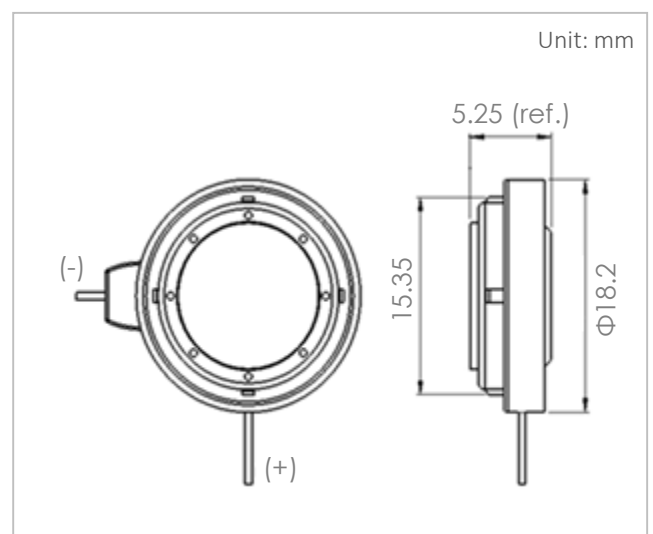
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 250                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$                                 | degree |
| Maximum Sensing Range           | 1                                         | meter  |
| Blind Zone                      | < 5                                       | cm     |
| Dimension-OD                    | 18.2                                      | mm     |
| Dimension-Height                | 5.25                                      | mm     |
| Housing Material                | Elastomer                                 |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions





## A100F1 100 kHz Air transducer

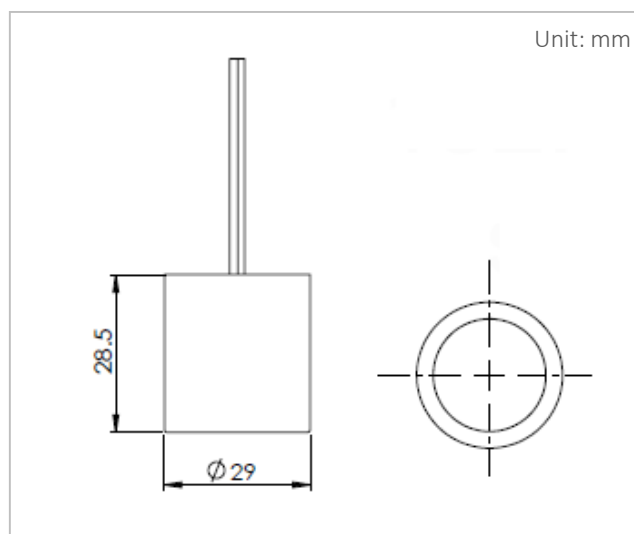
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 100                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $1600 \pm 20\%$                           | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$                                | degree |
| Maximum Sensing Range           | 4                                         | meter  |
| Blind Zone                      | < 20                                      | cm     |
| Dimension-OD                    | 29.0                                      | mm     |
| Dimension-Height                | 28.5                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



## A125F1 125 kHz Air transducer

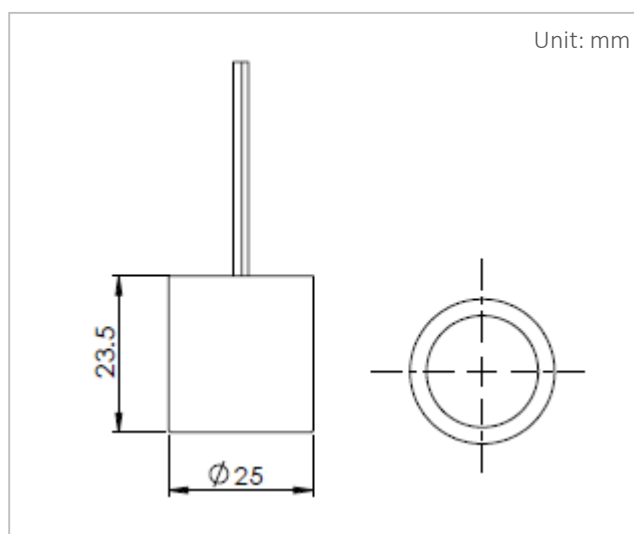
### Major Applications

Level detection  
Proximity measurement

### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 125                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $1000 \pm 20\%$                           | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$                                | degree |
| Maximum Sensing Range           | 3                                         | meter  |
| Blind Zone                      | < 15                                      | cm     |
| Dimension-OD                    | 25.0                                      | mm     |
| Dimension-Height                | 23.5                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

### Dimensions



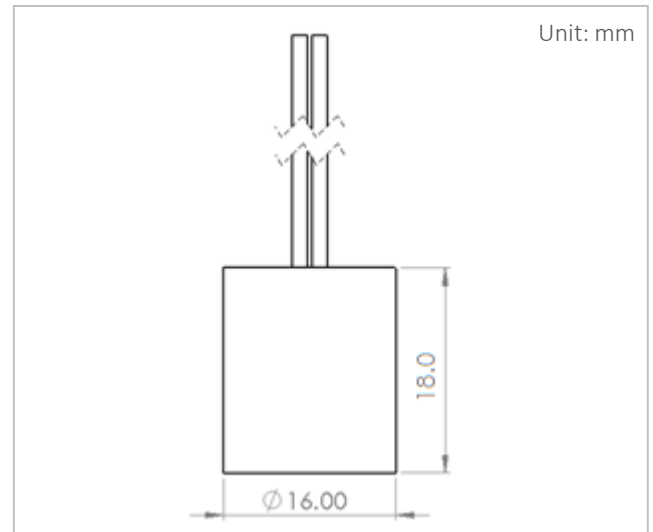


## A200F1 200 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 200                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $500 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$                                 | degree |
| Maximum Sensing Range           | 2                                         | meter  |
| Blind Zone                      | < 5                                       | cm     |
| Dimension-OD                    | 16.0                                      | mm     |
| Dimension-Height                | 18.0                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |

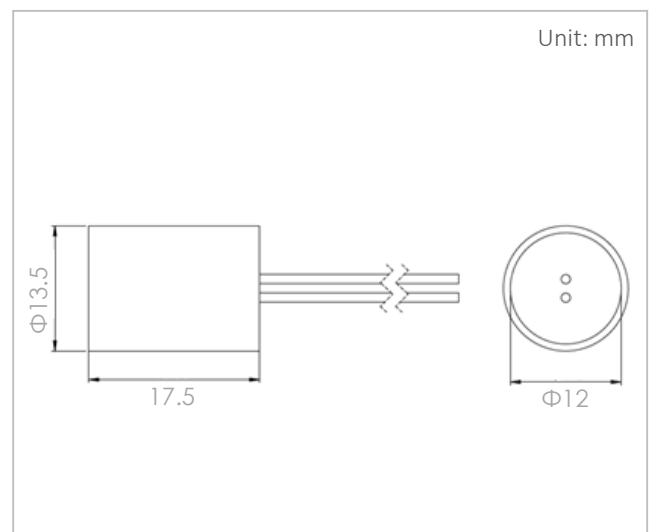


## A240F1 240 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                 |                                           |        |
|---------------------------------|-------------------------------------------|--------|
| Operation Frequency             | 240                                       | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$                            | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$                                 | degree |
| Maximum Sensing Range           | 1.2                                       | meter  |
| Blind Zone                      | < 4                                       | cm     |
| Dimension-OD                    | 13.5                                      | mm     |
| Dimension-Height                | 17.5                                      | mm     |
| Housing Material                | PVDF                                      |        |
| Wire                            | UL1430 #24AWG $\varnothing 1.43\text{mm}$ |        |





Anemometer

Gas flow meter

Gas concentration meter

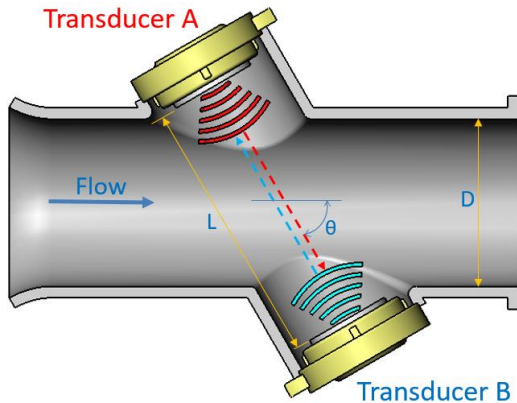
## Industries & Applications

- Anemometer
- Gas flow meter
- Gas concentration meter
- Non-contact level detection

## Features

- Patented technologies
- In house advanced Piezoceramics
- Unique matching layer formulation
- Good chemical resistance
- High precision: meet AGA-9, JIS B8571 standard
- FDA compliance
- High sensitivity
- Good reliability
- Waterproof IP68
- Low noise

Gas or water flow rate can be detected using a pair of ultrasonic transducers, based on ToF difference between upstream and downstream directions.



$$V = L / 2 \cos \theta [ 1/T_{AB} - 1/T_{BA} ]$$

V = Gas flow rate

T<sub>AB</sub>: downstream ToF

T<sub>BA</sub>: upstream ToF



## A200D1 200 kHz Air transducer

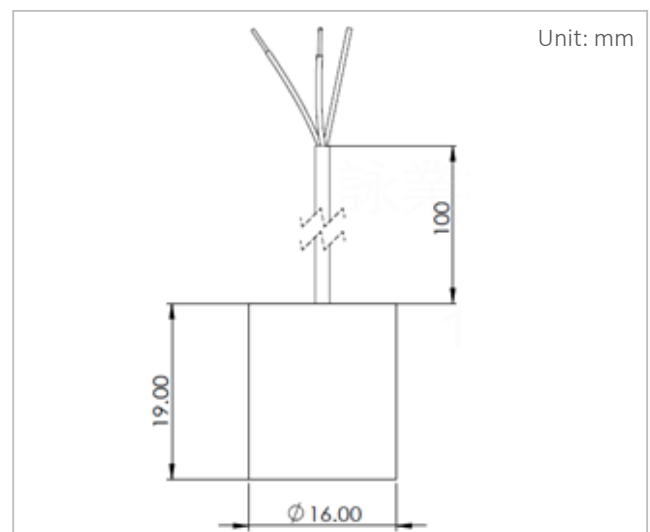
Major Applications

Gas flow meter

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 200            | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | 500 ± 20%      | pF     |
| Directivity (Full Angle @-3 dB) | 8 ± 2          | degree |
| Dimension-OD                    | 16.0           | mm     |
| Dimension-Height                | 19.0           | mm     |
| ZFD (Zero Flow Drift)           | < 1.0          | ns     |
| Housing Material                | PVDF           |        |
| Operating Temperature           | -30°C to +60°C |        |
| Storage Temperature             | -40°C to +85°C |        |

### Dimensions





## A200M3 200 kHz Air transducer

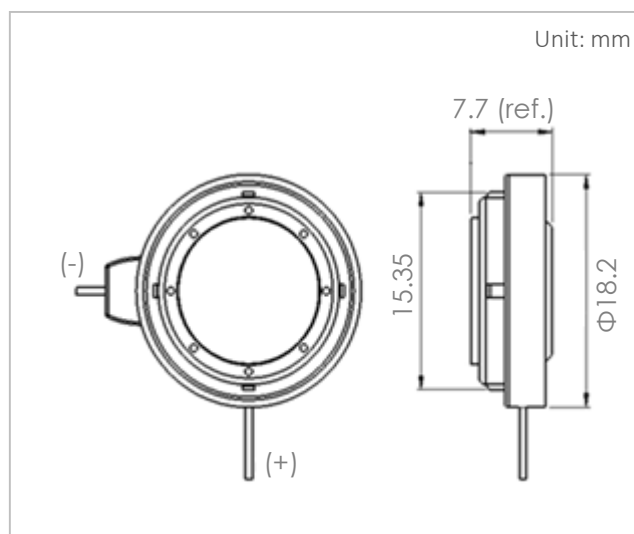
### Major Applications

Gas flow meter  
Proximity measurement

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 200            | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $500 \pm 20\%$ | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$     | degree |
| Dimension-OD                    | 18.2           | mm     |
| Dimension-Height                | 7.7            | mm     |
| ZFD (Zero Flow Drift)           | < 1.0          | ns     |
| Housing Material                | Elastomer      |        |
| Operating Temperature           | -30°C to +60°C |        |
| Storage Temperature             | -40°C to +85°C |        |

### Dimensions



## A240B1 240 kHz Air transducer

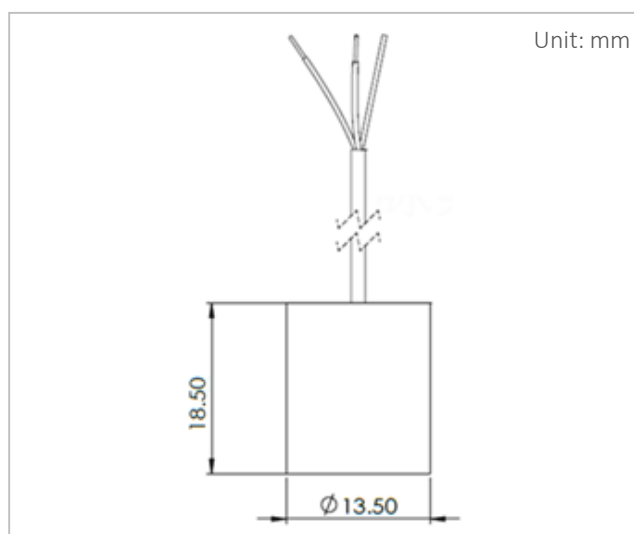
### Major Applications

Anemometer  
Gas flow meter

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 240            | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$ | pF     |
| Directivity (Full Angle @-3 dB) | $8 \pm 2$      | degree |
| Dimension-OD                    | 13.5           | mm     |
| Dimension-Height                | 18.5           | mm     |
| ZFD (Zero Flow Drift)           | < 1.0          | ns     |
| Housing Material                | PVDF           |        |
| Operating Temperature           | -30°C to +60°C |        |
| Storage Temperature             | -40°C to +85°C |        |

### Dimensions





## A240M3 240 kHz Air transducer

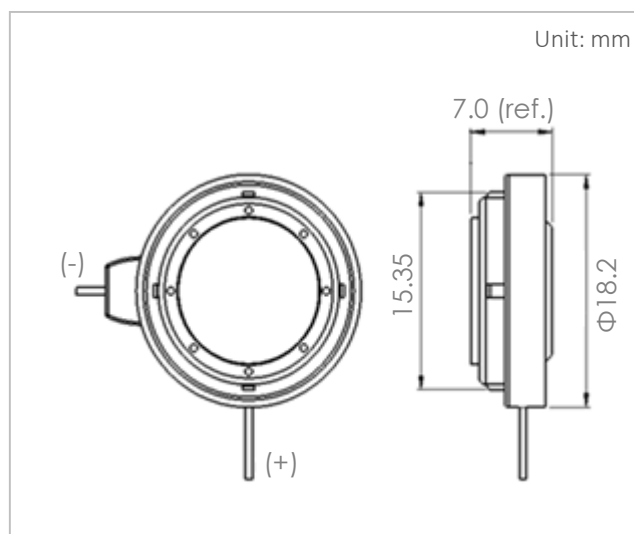
### Major Applications

Gas flow meter  
Proximity measurement

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 240            | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $400 \pm 20\%$ | pF     |
| Directivity (Full Angle @-3 dB) | $10 \pm 2$     | degree |
| Dimension-OD                    | 18.2           | mm     |
| Dimension-Height                | 7.0            | mm     |
| ZFD (Zero Flow Drift)           | < 1.0          | ns     |
| Housing Material                | Elastomer      |        |
| Operating Temperature           | -30°C to +60°C |        |
| Storage Temperature             | -40°C to +85°C |        |

### Dimensions



## A500B1 500 kHz Air transducer

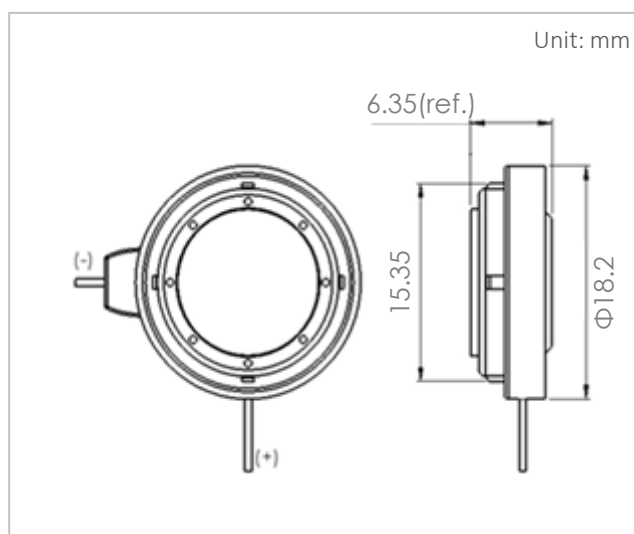
### Major Applications

Gas flow meter  
Proximity measurement

### Specifications

|                                 |                |        |
|---------------------------------|----------------|--------|
| Operation Frequency             | 500            | kHz    |
| Capacitance (@ 1 kHz, 1Vrms)    | $320 \pm 10\%$ | pF     |
| Directivity (Full Angle @-3 dB) | $7 \pm 2$      | degree |
| Dimension-OD                    | 18.2           | mm     |
| Dimension-Height                | 6.35           | mm     |
| ZFD (Zero Flow Drift)           | < 1.0          | ns     |
| Housing Material                | Elastomer      |        |
| Operating Temperature           | -30°C to +60°C |        |
| Storage Temperature             | -40°C to +85°C |        |

### Dimensions







## Dual-frequency non-contact level detection

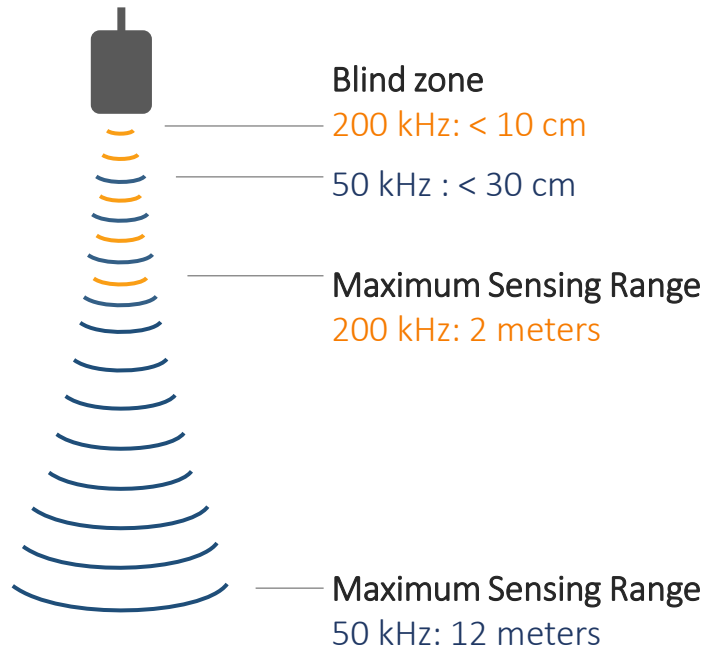
### Industries & Applications

- Proximity measurement
- Non-contact level detection
- River level monitoring
- Petrochemical industry
- Food and beverage industry
- Water supply and drainage industry
- Grain, powder, granular material level detection

### Features

- Long sensing range
- Short blind zone
- High resolution
- High reliability
- PVDF housing
- Patented technologies

Unictron has successfully developed a novel type of dual-frequency non-contact ultrasonic air transducer with innovative technologies. This provides the advantage of maximizing detection distance and minimizing the blind zone in one transducer, making the application of the transducer more flexible.

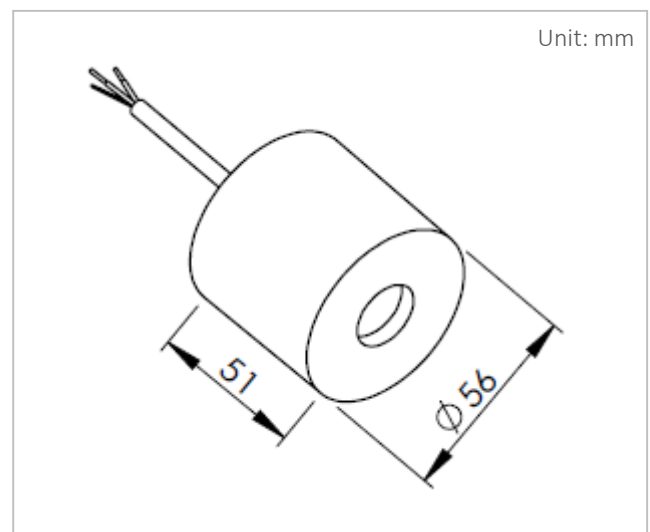


## Y050A1 50/200 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                    | 50 kHz         | 200 kHz   |        |
|------------------------------------|----------------|-----------|--------|
| Operation Frequency                | 50             | 200       | kHz    |
| Capacitance<br>(@ 1 kHz, 1Vrms)    | 1500 $\pm$ 20% |           | pF     |
| Directivity<br>(Full Angle @-3 dB) | 10 $\pm$ 2     | 6 $\pm$ 2 | degree |
| Maximum Sensing Range              | 12             | 2         | meter  |
| Blind Zone                         | < 30           | < 10      | cm     |
| Housing Material                   | PVDF           |           |        |



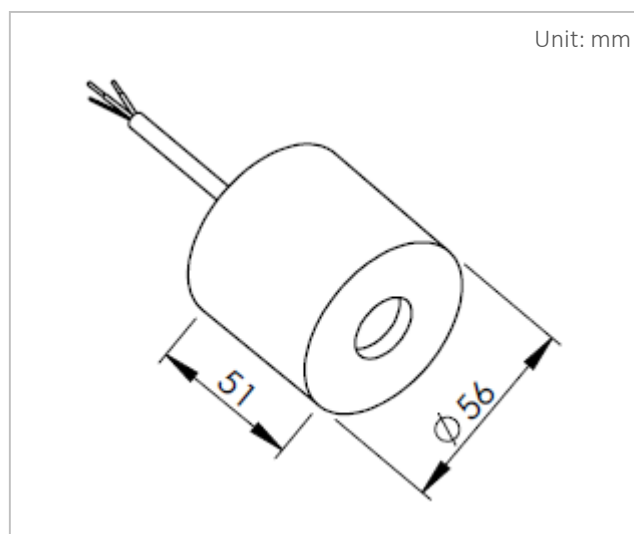


## Y050T1 50/200 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                    | 50 kHz     | 200 kHz |        |
|------------------------------------|------------|---------|--------|
| Operation Frequency                | 50         | 200     | kHz    |
| Capacitance<br>(@ 1 kHz, 1Vrms)    | 1500 ± 20% |         | pF     |
| Directivity<br>(Full Angle @-3 dB) | 10 ± 2     | 6 ± 2   | degree |
| Maximum Sensing Range              | 12         | 2       | meter  |
| Blind Zone                         | < 30       | < 10    | cm     |
| Housing Material                   | PVDF       |         |        |

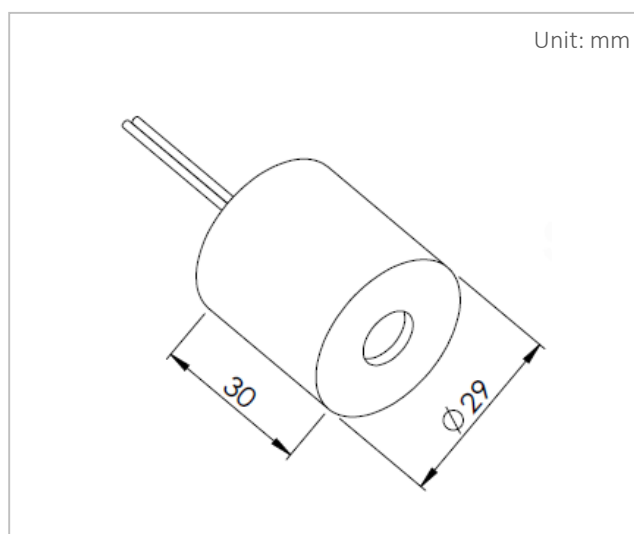


## Y100T1 100/250 kHz Air transducer

### Major Applications

Level detection  
Proximity measurement

### Dimensions



### Specifications

|                                    | 100 kHz   | 250 kHz |        |
|------------------------------------|-----------|---------|--------|
| Operation Frequency                | 100       | 250     | kHz    |
| Capacitance<br>(@ 1 kHz, 1Vrms)    | 720 ± 20% |         | pF     |
| Directivity<br>(Full Angle @-3 dB) | 10 ± 2    | 5 ± 2   | degree |
| Maximum Sensing Range              | 4         | 0.8     | meter  |
| Blind Zone                         | < 20      | < 7     | cm     |
| Housing Material                   | PVDF      |         |        |



## LPY1 1 MHz Level sensor transducer

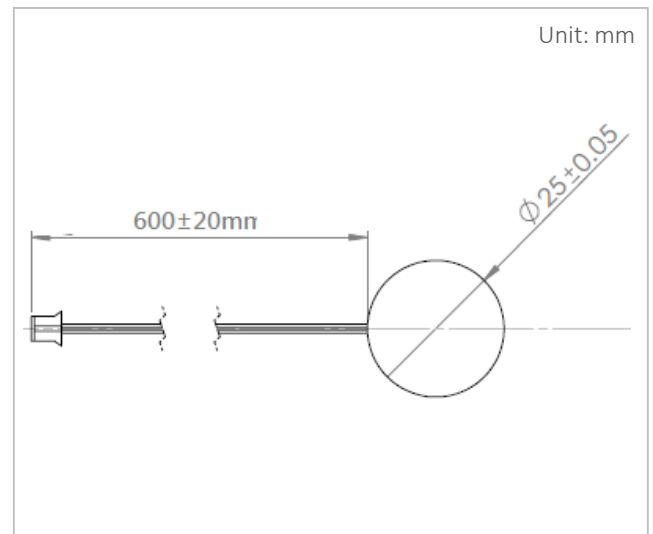
### Major Applications

Level detection

### Specifications

|                         |                                           |                 |
|-------------------------|-------------------------------------------|-----------------|
| Operation Frequency     | 1                                         | MHz             |
| Echo Voltage            | > 50                                      | mV              |
| Capacitance (@ 1 kHz)   | $1250 \pm 20\%$                           | pF              |
| Maximum Driving Voltage | 50                                        | V <sub>pp</sub> |
| Operating Temperature   | -20 ~ 70                                  | °C              |
| Storage Temperature     | -30 ~ 80                                  | °C              |
| Dimension-Height        | 8                                         | mm              |
| Housing Material        | Aluminum                                  |                 |
| Wire                    | UL10368 #30AWG $\varnothing 0.8\text{mm}$ |                 |

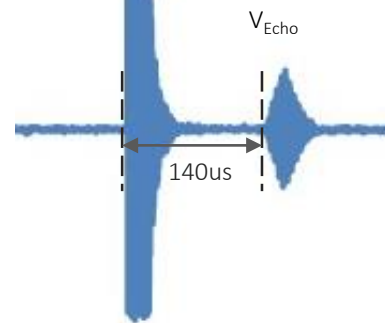
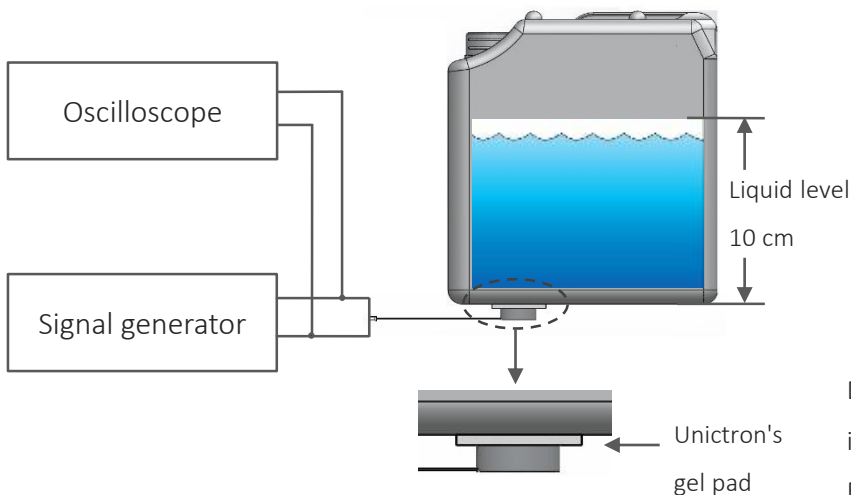
### Dimensions



### Sensitivity Measurement Diagram

Sensitivity measurement

Liquid level: 10 cm (olive oil) / container: HDPE



Drive Signal (VDriving): 1 MHz 3.3v 20 pulses, Drive interval: 10 ms

Echo Signal (VEcho) : For 10 cm olive oil level, echo signal appears at around 140 us



## BPY3 40 kHz Ultrasonic meter transducer

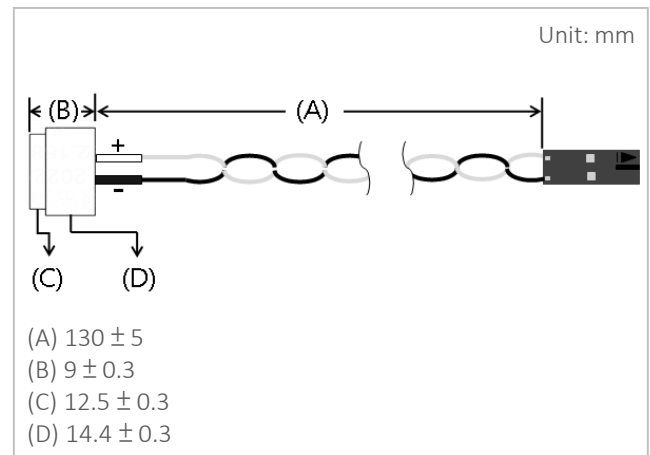
### Major Applications

Ultrasonic meter

### Specifications

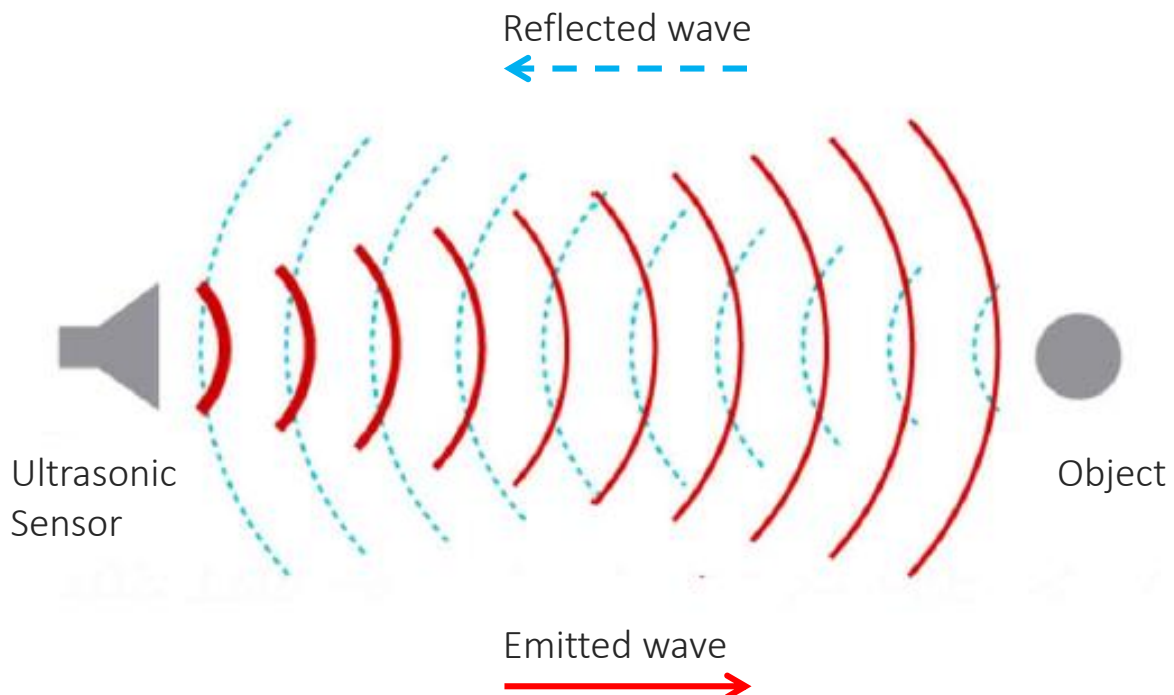
|                       |                                           |     |
|-----------------------|-------------------------------------------|-----|
| Operation Frequency   | 40                                        | kHz |
| Echo Voltage*         | > 200                                     | mV  |
| Capacitance (@ 1 kHz) | $1800 \pm 20\%$                           | pF  |
| Resonant Impedance    | < 2000                                    | ohm |
| Operating Temperature | -40 ~ 80                                  | °C  |
| Storage Temperature   | -10 ~ 80                                  | °C  |
| Dimension-Height      | 6.8                                       | mm  |
| Housing Material      | Aluminum                                  |     |
| Wire                  | UL1007 #24AWG $\varnothing 1.45\text{mm}$ |     |

### Dimensions



\* burst: 20 cycles, gain: 330 @distance: 100cm

## Ultrasonic Time-of-Flight Measurement





## MPYA 1 MHz Flow meter transducer

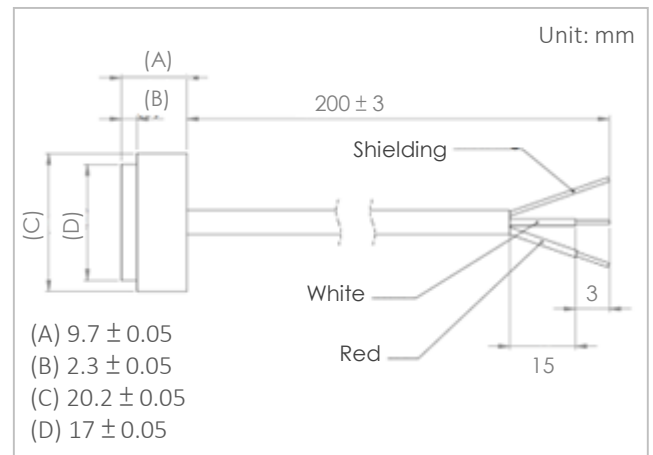
### Major Applications

Liquid flow meter

### Specifications

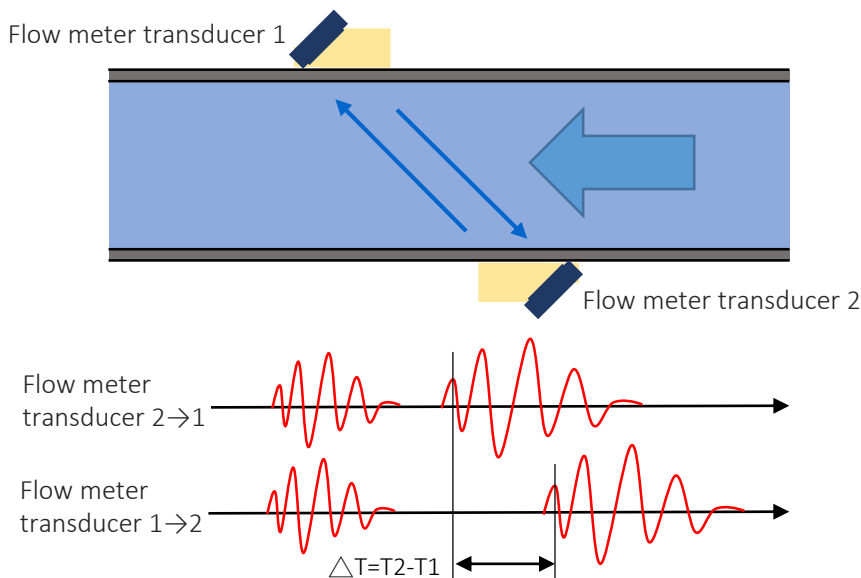
|                              |                                          |        |
|------------------------------|------------------------------------------|--------|
| Operation Frequency          | 1                                        | MHz    |
| Capacitance (@ 1 kHz)        | $1200 \pm 20\%$                          | pF     |
| Sensitivity dB*              | -28 min                                  | dB     |
| Beam Angle (-3dB full angle) | 5                                        | degree |
| Operation Voltage            | 50 max                                   | Vpp    |
| Operation Temperature        | 4 ~ 80                                   | °C     |
| Storage Temperature          | -10 ~ 80                                 | °C     |
| Housing Material             | PPS                                      |        |
| Wire                         | UL2547 #28AWG $\varnothing 2.8\text{mm}$ |        |

### Dimensions



\* Applied voltage Vpp = 3.3V, sine wave, 20 cycles burst, Water level 10 cm; Water temperature 25°C

### Sensitivity Measurement Diagram





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