

Measure Better



PRODUCT CATALOG

Measurement Microphones & Accessories



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The logo for Danetech srl, featuring a stylized "D" in blue and red, followed by the text "Danetech srl" in a bold, sans-serif font. To the right of the logo is a small red and white seal with the text "ISO 9001 BUREAU VERITAS Certified".

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Established in 1997, CRY SOUND is a trailblazing company that delivers top-tier acoustic measurement products and solutions. Guided by the visionary leadership of our founder, Mr. Ruiying Cao, we've achieved unparalleled expertise and pioneered groundbreaking technologies in acoustic measurement.

CRY SOUND offers an impressive range of products, including measurement microphones, electroacoustic analysis systems, acoustic cameras, and noise & vibration analysis systems. These diverse offerings enable us to cater to the unique needs of our clients with precision and innovation.

Our global footprint spans over 80 countries, serving a customer base of more than 10,000. We take immense pride in empowering engineers and technicians with our state-of-the-art solutions. From consumer electronics to energy production, our clients come from a variety of industries, harnessing our technology for unique applications all over the world.

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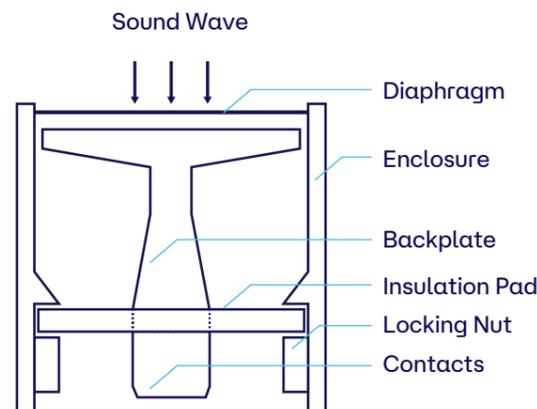
TECHNOLOGY INTRODUCTION

The following information will help you understand the characteristics of measurement microphones and choose the right one for your specific application(s).

- Polarization type
- Sound field
- Dynamic range
- Frequency range
- Noise floor

▲ Condenser Microphone

The two most common microphone types are dynamic microphones and condenser microphones. CRY SOUND's test and measurement microphones are all condenser microphones. Condenser microphones have advantages over other microphone types that make them superior for test and measurement applications. These advantages include: lightweight and thin diaphragms, high sensitivity to minute changes in sound pressure levels, wide frequency response, low noise, wide dynamic range, and excellent transient response. The diagram on the right illustrates the construction of a typical condenser microphone.



One of the electrodes is called the backplate, which remains fixed, while the other electrode is the diaphragm, typically made of a thin metal or metal-coated plastic film. Sound waves drive the diaphragm to vibrate, altering the distance between the two plates and causing a change in capacitance. This change in capacitance results in a variation of the current within the electrical circuit, generating an alternating current output voltage. This process effectively converts sound energy into electrical energy. Due to the small capacitance of the cartridge and the high output impedance, a preamplifier circuit is generally required to form an impedance converter, transforming the high impedance into a low impedance output. Condenser microphones require a bias voltage to operate. This bias voltage can be provided externally (external-polarization) or by a permanent charge injected into the polarized electrode on the backplate (pre-polarization). CRY SOUND provides both pre-polarized and external-polarized models.

▲ Polarization type

● Pre-polarized

Pre-polarized microphones are made with an electret material. The electret material is a permanently polarized dielectric, requiring no external polarization voltage. Pre-polarized microphones are lower in cost, mechanically simpler, easier to adjust, and exhibit higher reliability under extreme humidity conditions.

● External-polarized

External-polarized microphone typically can withstand higher temperatures, but the temperature tolerance is often limited by the preamplifier. External-polarized microphones require a precision power supply for optimal performance.

▲ Sound Field

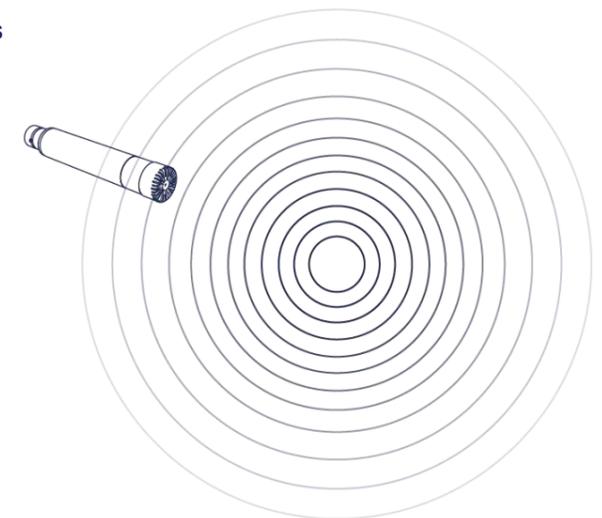
Measurement microphones are typically divided into three categories:

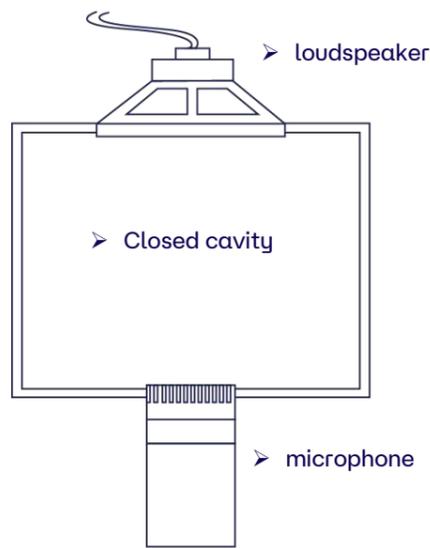
- Free Field
- Pressure Field
- Diffuse Field

The size and shape of a measurement microphone can affect sound pressure measurements. This influence depends on the type of sound field and is considered in the design of each microphone. By optimizing the microphone frequency response to compensate for this effect, a flat response can be achieved for a given sound field.

● Free Field

Free-field microphones are generally used for acoustic measurements in open environments or anechoic chambers with no acoustic reflections. Free-field microphones can also be applied in noise testing to accurately measure the noise level generated by sound sources. Free-field microphones can be used for conventional electroacoustic measurements of various speakers and transducers and can be applied in acoustic research to help understand the propagation characteristics of sound in free-field conditions.





● **Pressure Field**

In a pressure field, the sound pressure at any location is the same in magnitude and phase. A sound field close to a pressure field can be created in small cavities (with small wavelengths) such as ear simulators. A pressure field microphone is for measuring the real sound pressure on the surface of the microphone's diaphragm. It is typically used in conjunction with a coupler chamber and can also be used to measure the sound pressure level inside enclosed cavities. Pressure-field microphones can measure the sound pressure on flat wall (object) surfaces or can be used for random incidence measurements and 90° incidence free-field measurements. Wide frequency range and high dynamic range make pressure field microphones suitable for component testing in various fields such as telecommunications, electroacoustics, automotive, and aerospace industries.

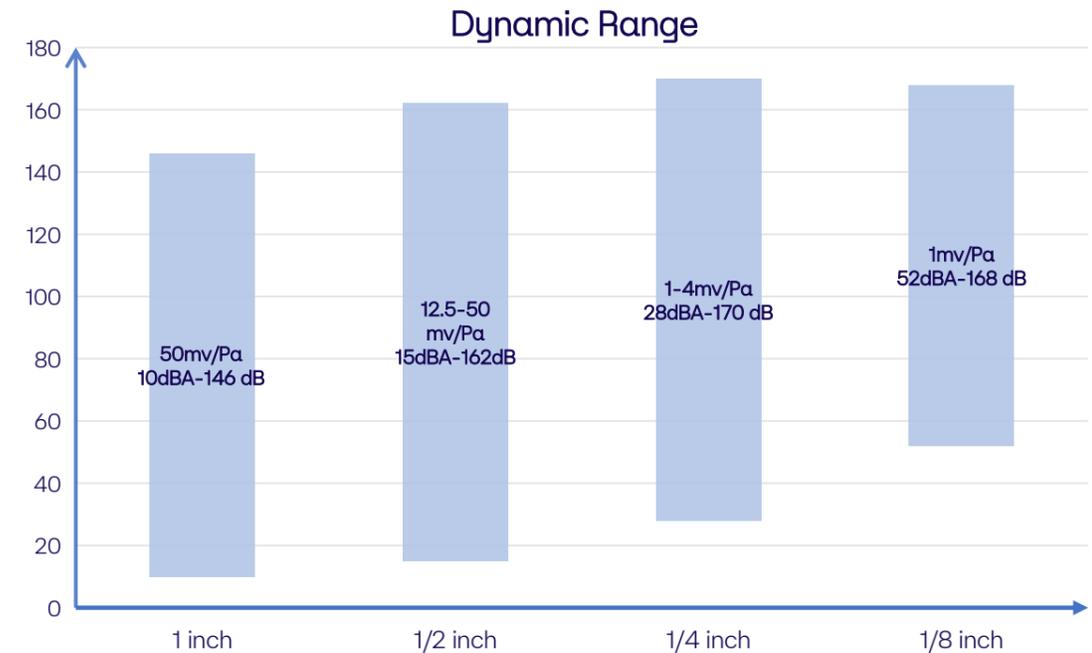
● **Diffuse Field**

Diffuse field refers to an acoustic environment in a closed space where sound is uniformly distributed in all directions. In a diffuse field, sound reflects, diffracts, and scatters in a uniform manner from various directions, making it difficult for listeners to determine the exact location of the sound source. Instead, they perceive a surrounding and evenly distributed sound environment. Diffuse field microphones are used for measurements in specific acoustic environments, such as reverberation chambers, vehicle interior noise testing, architectural acoustics testing or other highly reflective environments.



▲ **Dynamic Range**

The dynamic range of a measurement microphone (such as 16dBA–143 dB) refers to the range in which the microphone functions as a linear sensor. This is a combined function of the microphone and the preamplifier used with the microphone. The dynamic range of a microphone is largely dependent on its sensitivity. The sensitivity of a microphone is determined by the size of the microphone and the tension of its diaphragm. The larger the microphone and the looser its diaphragm, the higher the sensitivity. Highly sensitive microphones can measure very low sound pressure levels - low sensitivity microphones are able to measure very high sound pressure levels.



The first number represents the microphone's inherent noise. Under absolute quiet conditions, even when the diaphragm of the microphone is not subjected to any sound waves, a condenser microphone will produce an extremely low-level output signal due to the limitations of electronic components and Brownian motion. The voltage generated by this noise level is the same as the voltage generated by the microphone's self-noise, making it impossible to measure sound stimulus signals below the inherent noise signal.

The second number represents the maximum sound pressure level that can be measured with a specified total harmonic distortion. Just as the low-level signals of a microphone are limited by equivalent noise thresholds, high-level signals are limited by overload distortion. The maximum sound pressure level indicates the sound pressure that the microphone can withstand before the output signal reaches 3% total harmonic distortion.

▲ **Frequency range**

Frequency range represents the range of frequencies in which a transducer can effectively perceive or generate sound signals. The frequency range of a transducer is typically expressed in Hertz (Hz). Different types of transducers have different frequency response characteristics, covering different frequency ranges. The frequency range of a transducer is usually determined by its design and construction.

▲ **Noise floor**

Noise floor refers to the level of noise generated by a transducer in the absence of external sound sources. The noise floor is typically caused by electronic components and circuit noise in the transducer, such as thermal noise from electronic amplifiers or inherent thermal noise from the transducer itself. The noise floor level is usually measured in decibels (dB) and represents the lowest measurable signal level of the transducer in a quiet environment.

Measurement Microphones



Titanium

Diaphragm and Protection Grid



MEASUREMENT MICROPHONES

CRY SOUND measurement microphones use a Titanium Protection Grid for superior impact resistance, and a Titanium film diaphragm structure, which has extremely high stability and accuracy even in harsh environments. We assemble these microphones in a clean room.

Each measurement microphone undergoes rigorous aging tests before leaving the factory to ensure stability. Based on application, microphone capsules are paired with preamplifiers to make measurement microphone sets. Industry standard connection interfaces are provided to facilitate connection to professional measurement systems.

CRY SOUND offer a 10-year limited warranty - one of the best in the business. Each microphone is accompanied by a calibration report upon factory shipment.

MEASUREMENT MICROPHONES

PRE-POLARIZED / FREE-FIELD



◀ CRY3101 (1")

CRY3101 is a high-sensitivity microphone with a typical background noise level of less than 12dBA. It can measure sound pressure levels up to 140dB. Commonly used for capturing low-frequency signals in free-field testing environments.



◀ CRY3201 (1/2")

CRY3201 is a high-precision microphone for measuring with frequency from 3.15Hz to 40kHz. Can measure high sound pressure levels up to 160dB.



◀ CRY3203 (1/2")

CRY3203 is a high-sensitivity microphone with a frequency range from 3.15Hz-20kHz. The frequency range is the same as the audible frequency range of the human ear which makes it ideal for environmental noise measurements.



◀ CRY3401 (1/4")

The CRY3401 is a high-sensitivity 1/4-inch microphone with a frequency range of 4Hz to 40kHz. It is suitable for applications that require high sensitivity in tight spaces.



◀ CRY3403 (1/4")

CRY3403 is a low-sensitivity microphone with a high-frequency range of up to 90kHz and high sound pressure level up to 165dB. Its unique design and smaller size make it ideal for high-frequency and high sound pressure measurement.

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Sound Field	Polarized Voltage
CRY3101	1 inch	50mV/Pa	4Hz-16kHz	12dBA-140dB	Free-field	0V
CRY3201	1/2inch	12.5mV/Pa	3.15Hz-40kHz	23dBA-160dB	Free-field	0V
CRY3203	1/2 inch	50mV/Pa	3.15Hz-20kHz	16dBA-146dB	Free-field	0V
CRY3401	1/4 inch	15.8mV/Pa	4Hz-40kHz	26dBA-144dB	Free-field	0V
CRY3403	1/4 inch	4mV/Pa	4Hz-90kHz	35dBA-165dB	Free-field	0V

PRE-POLARIZED/PRESSURE-FIELD



◀ CRY3102 (1")

CRY3102 is a high-sensitivity microphone with a typical background noise level of less than 12dBA. It can measure sound pressure levels up to 146dB. Commonly used for capturing low-frequency signals in pressure-field testing environments



◀ CRY3202 (1/2")

CRY3202 is suitable for high-frequency response and high sound pressure level measurements making it highly suitable for production line testing of headphones and earbuds.



◀ CRY3204 (1/2")

CRY3204 is a high-sensitivity microphone with frequency response from 3.15Hz-10kHz, and sound pressure levels from 16dBA-146dB. Its small size makes it suitable for low-noise testing, audio information acquisition, and audio recording.



◀ CRY3402 (1/4")

CRY3402 is a low-sensitivity microphone with a high frequency range of up to 70kHz and high sound pressure level up to 170dB.



◀ CRY3404 (1/4")

CRY3404 is a low-noise microphone with frequency from 4Hz-20kHz, and sound pressure levels from 59dBA-175dB.



◀ CRY3406 (1/4")

CRY3406 is a low-noise microphone with frequency from 4Hz-20kHz. Its small size makes it suitable for low-noise testing, audio information acquisition, audio recording. Can measure sound pressure levels from 26dBA-144dB.

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Sound Field	Polarized Voltage
CRY3102	1 inch	50mV/Pa	4Hz-8kHz	12dBA-146dB	Pressure-field	0V
CRY3202	1/2 inch	12.5mV/Pa	3.15Hz-20kHz	23dBA-160dB	Pressure-field	0V
CRY3204	1/2 inch	50mV/Pa	3.15Hz-10kHz	16dBA-146dB	Pressure-field	0V
CRY3402	1/4 inch	1.6mV/Pa	4Hz-70kHz	45dBA-170dB	Pressure-field	0V
CRY3404	1/4 inch	0.56mV/Pa	10Hz-20kHz	59dBA-175dB	Pressure-field	0V
CRY3406	1/4 inch	15.8mV/Pa	4Hz-20kHz	26dBA-144dB	Pressure-field	0V

MEASUREMENT MICROPHONES

EXTERNAL-POLARIZED FREE-FIELD



◀ CRY3281 (1/2")

CRY3281 is a low-sensitivity microphone with a frequency range of 3.15Hz-40kHz, and sound pressure levels from 23dBA-160dB. The CRY3281 is designed for high-frequency and high sound pressure measurements in free-field environments.



◀ CRY3285 (1/2")

CRY3285 is a high sensitivity microphone with a frequency range of 3.15Hz-20kHz, and sound pressure level from 16dBA-146dB. Suitable for acoustic testing instruments, multi-channel noise analyzers, sound level meters, and other similar devices.



◀ CRY3485 (1/4")

CRY3485 is low-sensitivity microphone with ultra high frequency range of 4Hz - 90k Hz and sound pressure levels of 35dBA-165dB.

EXTERNAL-POLARIZED PRESSURE-FIELD



◀ CRY3282 (1/2")

CRY3282 is a low-sensitivity microphone with a frequency range of 3.15Hz-20kHz, and sound pressure levels from 23dBA-160dB.



◀ CRY3284 (1/2")

CRY3284 is a low-noise, high-sensitivity microphone with a frequency range 3.15Hz-10kHz and sound pressure level from 16dBA-146dB.



◀ CRY3482 (1/4")

CRY3482 is low-sensitivity, wide frequency response and high sound pressure level microphone. Boasting a frequency range of 4Hz-70kHz frequency and sound pressure levels from 45dBA-170dB.

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Sound Field	Polarized Voltage
CRY3281	1/2 inch	12.5mV/Pa	3.15Hz-40kHz	23dBA-160dB	Free-field	200V
CRY3285	1/2 inch	50mV/Pa	3.15Hz-20kHz	16dBA-146dB	Free-field	200V
CRY3485	1/4 inch	4mV/Pa	4Hz-90kHz	35dBA-165dB	Free-field	200V

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Sound Field	Polarized Voltage
CRY3282	1/2 inch	12.5mV/Pa	3.15Hz-20kHz	23dBA-160dB	Pressure-field	200V
CRY3284	1/2 inch	50mV/Pa	3.15Hz-10kHz	16dBA-146dB	Pressure-field	200V
CRY3482	1/4 inch	1.6mV/Pa	4Hz-70kHz	45dBA-170dB	Pressure-field	200V

PREAMPLIFIERS



◀ CRY3501 (1/2")

CRY3501 is an IEPE preamplifier with a TEDS reader and BNC connector. Its high input impedance, low background noise, and broadband frequency range makes it the ideal general-purpose preamplifier for 1/2" pre-polarized microphones.



◀ CRY3502 (1/2")

CRY3502 is an IEPE preamplifier with TEDS reader and SMB connector. Its high input impedance, low background noise, and broadband frequency range makes it the ideal general-purpose preamplifier for 1/2" pre-polarized microphones.



◀ CRY3521 (1/2")

CRY3521 is an IEPE preamplifier with base, TEDS reader and BNC connector. Its high input impedance, low background noise, and broadband frequency range makes it the ideal general-purpose preamplifier for 1/2" pre-polarized microphones.



◀ CRY3541 (1/4")

CRY3541 is an IEPE preamplifier with TEDS reader and SMB connector.



◀ CRY3542 (1/4")

CRY3542 is powered by a constant current source with TEDS reader and SMB connector.

Model	Diameter	Frequency Range	Input Impedance	Output Impedance	Connector	Noise-Linear	Noise(A-weighted)
CRY3501	1/2 inch	20Hz-50kHz (±0.2dB) 10Hz-100kHz (±0.5dB)	>10GΩ/0.5pF	<20Ω	BNC	<5.0μVrms (typically 4.3)	<4.0μVrms (typically 3.1)
CRY3502	1/2 inch	20Hz-50kHz (±0.2dB) 10Hz-100kHz (±0.5dB)	>10GΩ/0.5pF	<20Ω	SMB	<5.5μVrms (typically 4.4)	<4.0μVrms (typically 3.1)
CRY3521	1/2 inch	20Hz-50kHz (±0.2dB) 10Hz-100kHz (±0.5dB)	>10GΩ/0.5pF	<20Ω	BNC	<5.5μVrms (typically 4.6)	<4.0μVrms (typically 3.2)
CRY3541	1/4 inch	10Hz-80kHz (±0.2dB)	>2GΩ/50pF	<20Ω	SMB	<5.5μVrms (typically 4.4)	<4.0μVrms (typically 3.2)
CRY3542	1/4 inch	10Hz-100kHz (±0.2dB)	>2GΩ/50pF	<20Ω	SMB	<5.0μVrms (typically 4.3)	<4.0μVrms (typically 3.0)

MEASUREMENT MICROPHONE SETS

FREE-FIELD



◀ CRY3101-S01 (1")

CRY3101-S01 is a low-noise and cost-effective microphone set that includes a CRY3101 microphone, and CRY3501 preamplifier.



◀ CRY3261-S01 (1/2")

CRY3261-S01 is a specialty ultra low-noise microphone set that includes a CRY3261 microphone, CRY516 preamplifier, and CRY575L power supply.



◀ CRY3201-S01 (1/2")

CRY3201-S01 is high-frequency microphone set that includes a CRY3201 microphone and CRY3501 preamplifier.



◀ CRY3203-S01 (1/2")

CRY3203-S01 is a general-purpose microphone set that includes a CRY3203 microphone and CRY3501 preamplifier.



◀ CRY3401-S01 (1/4")

CRY3401-S01 is a low-noise microphone set that includes a CRY3401 microphone and CRY3541 preamplifier.



◀ CRY3403-S01 (1/4")

CRY3403-S01 is an ultra high-frequency and high sound pressure level microphone set that includes a CRY3403 microphone and CRY3541 preamplifier.

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Connector
CRY3101-S01	1 inch	50mV/Pa	4Hz-16kHz	12dBA-132dB	BNC
CRY3261-S01	1/2 inch	354 mV/Pa	3.15Hz-20kHz	7.5dBA-115dB	DB9
CRY3201-S01	1/2 inch	12.5mV/Pa	3.15Hz-40kHz	23dBA-144dB	BNC
CRY3203-S01	1/2 inch	50mV/Pa	3.15Hz-20kHz	16dBA-132dB	BNC
CRY3401-S01	1/4 inch	15.8mV/Pa	4Hz-40kHz	26dBA-142dB	SMB
CRY3403-S01	1/4 inch	4mV/Pa	4Hz-90kHz	35dBA-154dB	SMB

MEASUREMENT MICROPHONE SETS

PRESSURE-FIELD



◀ CRY3102-S01 (1")

CRY3102-S01 is a low-noise and cost-effective microphone set that includes a CRY3102 microphone, and CRY3501 preamplifier.



◀ CRY3202-S01 (1/2")

CRY3202-S01 is high-frequency microphone set that includes a CRY3202 microphone and CRY3501 preamplifier.



◀ CRY3204-S01 (1/2")

CRY3204-S01 is a high-sensitivity microphone set that includes a CRY3204 microphone and CRY3501 preamplifier.



◀ CRY3402-S01 (1/4")

CRY3402-S01 is a high-frequency and high sound pressure level microphone set that includes a CRY3402 microphone and CRY3541 preamplifier.



◀ CRY3406-S01 (1/4")

CRY3406-S01 is a low-noise microphone set that includes a CRY3406 microphone and CRY3541 preamplifier.

Model	Diameter	Sensitivity	Frequency Response	Dynamic Range	Connector
CRY3102-S01	1 inch	50mV/Pa	4Hz-8kHz	12dBA-132dB	BNC
CRY3202-S01	1/2 inch	12.5mV/Pa	3.15Hz-20kHz	23dBA-144dB	BNC
CRY3204-S01	1/2 inch	50mV/Pa	3.15Hz-10kHz	16dBA-132dB	BNC
CRY3402-S01	1/4 inch	1.6mV/Pa	4Hz-70kHz	45dBA-161dB	SMB
CRY3406-S01	1/4 inch	15.8mV/Pa	4Hz-20kHz	26dBA-142dB	SMB

