

Sound measurement microphone



Preamplifier integrated microphone compatible with IEPE can be connected directly to FFT analyzer or other analyzers, enabling to measure with highly accurate resolution at low costs. Long-term stability realized by accelerated aging process under 360°C enables to use under 100°C or higher. Condenser microphone is to be used for measurements of sound pressure level with high resolution over wide frequency range. Varieties of microphone diaphragm diameter 1, 1/2, 1/4, 1/6, 1/8 inch and corresponding frequency characteristics would best support measurements of various purposes.

The sound field falls into disorder when the microphone is placed, and then sound pressure P is expressed as $P = P_0 + \Delta P$, sum of P_0 , sound pressure under the condition without the microphone and ΔP , pressure fluctuation by the disorder. Following three types are specified as microphone for measurement.

Pressure type

Pressure type is so designed as the frequency response is flat for $P_0 + \Delta P$, i.e., the sound pressure on the diaphragm under the condition with the existence of the microphone in the sound field, and better suited for the measurement of surface pressure, ground surface pressure, or calibrating pressure by using coupling devices.

Free field type

Free field type is so designed as the incoming sound pressure P_0 , pressure of incident angle 0° under the condition without the microphone, has flat response and better suited for outdoor measurement or those in anechoic room.

Random-incidence type

Random-incidence type is so designed as frequency response for the sound coming from all directions at random and equal probabilities and better suited for the measurement under reverberation room or reverberant spaces.

Preamp integrated microphone



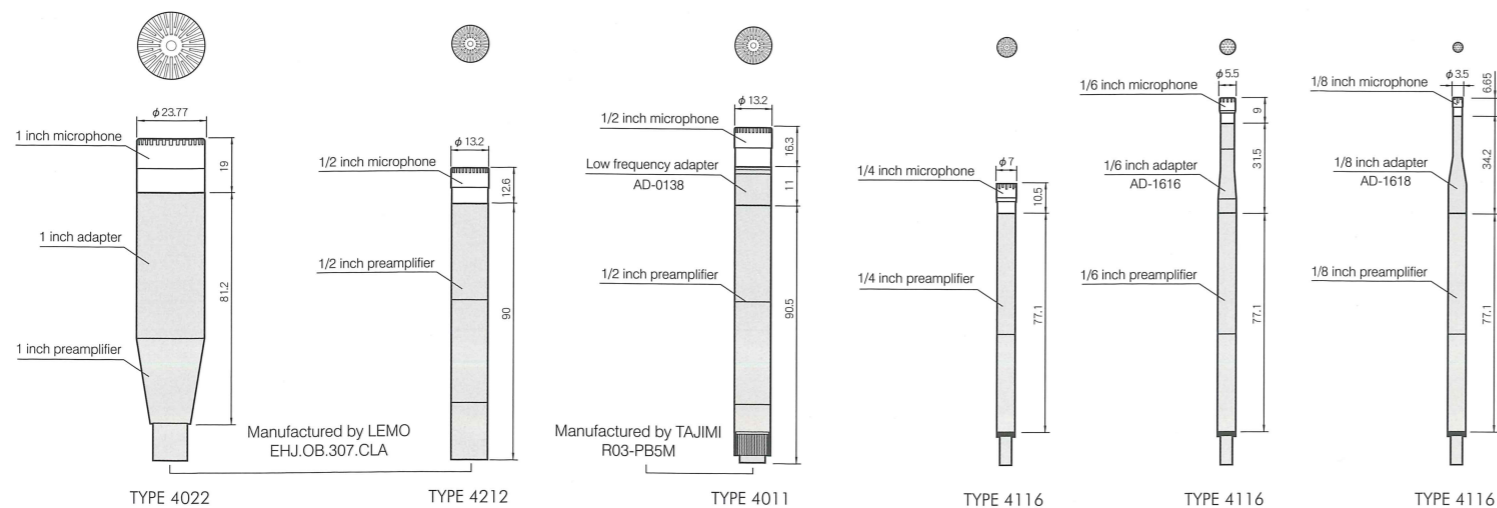
Type	TYPE 4156N (TYPE2)	TYPE 4158N (TYPE1)	TYPE 4160N (TYPE2)	TYPE 4152N (TYPE2)	TYPE 4153N (TYPE2)	TYPE 7146 (TYPE1)	TYPE 7147A (TYPE1)	TYPE 7312 (TYPE1)	TYPE 7313 (TYPE1)	
Frequency Response Characteristic	Free-Field	Array			Free-Field	Pressure-Field	Free-Field	Random-incidence	Free-Field	Pressure-Field
Nominal Diameter		1/4 inch			1/2 inch		1/2 inch			
Release voltage	-56dB (1.6mV/Pa)	-48dB (4.0mV/Pa)	—	-32dB (25.1mV/Pa)	-32dB (25.1mV/Pa)	-26dB (50.0mV/Pa)		-36dB (15.8mV/Pa)	-38dB (12.5mV/Pa)	
Pressure Sensitivity (dBreV/Pa) (Included preamplifier)	-58dB±3dB re 1V/Pa (1.3mV/Pa)	-50dB±3dB re 1V/Pa (3.2mV/Pa)	-40dB±3dB re 1V/Pa (10.0mV/Pa)	-33dB±3dB re 1V/Pa (22.4mV/Pa)	-33dB±3dB re 1V/Pa (22.4mV/Pa)	-27dB±2dB re 1V/Pa (44.7mV/Pa)		-37dB±2dB re 1V/Pa (14.1mV/Pa)	-39dB±2dB re 1V/Pa (11.2mV/Pa)	
Polarization voltage	0 V									
Frequency Characteristics (Hz)	20Hz~40kHz	20Hz~100kHz (Without grid)		20Hz~16kHz	20Hz~20kHz	20Hz~10kHz	20Hz~20kHz	20Hz~10kHz	20Hz~40kHz	20Hz~20kHz
Maximum sound pressure level	168dB	150dB		130dB	140dB	140dB	135dB		140dB	
Self-noise level	45dB(A)	23dB(A)			18dB(A)	18dB(A)	17dB(A)		20dB(A)	
Temperature coefficient	0.01dB/°C or less	0.009dB/°C or less		±0.7dB or less (at 250Hz)	0.01dB/°C or less	0.01dB/°C or less	0.009dB/°C or less			
Power supply and voltage	DC15~28V									
Constant current	0.5~4mA									
Output Impedance	Approx.100Ω									
Connector	SMB connector			BNC connector		BNC connector				
TEDS	noncompliant	compliant/noncompliant			noncompliant	noncompliant	compliant/noncompliant			
Operating Temperature · Range of Humidity	-10°C to +50°C · 90% RH (no condensation)					-10°C to +50°C · 90% RH (no condensation)				
Storage Temperature · Range of Humidity	40% or less (at room temperature)					40% or less (at room temperature)				
Cable	SMB-BNC Cable(3m)			BNC Cable(3m)		BNC Cable(3m)				
Outline size	φ 7 × 50			φ 13.2 × 74		φ 13.2 × 74		φ 13.2 × 74		
Weight	6 g			41 g		41 g		41 g		
Price (Preamplifier)	60,000円	220,000円	30,000円	40,000円	55,000円	90,000円	90,000円	90,000円	90,000円	90,000円

Measurement condenser microphone



Type	TYPE 7012 (TYPE1)	TYPE 7013 (TYPE1)	TYPE 7016 (TYPE1)	TYPE 7017 (TYPE1)	TYPE 7116 (TYPE1)	TYPE 7118 (TYPE1)	TYPE 7020 (TYPE1)	TYPE 7022 (TYPE1)	TYPE 7023 (TYPE1)	TYPE 7047A (TYPE1)	TYPE 7146NL (TYPE1)
Frequency Response Characteristic	Free-Field	Pressure-Field	Free-Field	Pressure-Field		Pressure-Field	Free-Field		Pressure-Field	Random-incidence	Ultra low frequency type
Nominal Diameter	1/2 inch		1/4 inch			1/8 inch	1 inch		1/2 inch		
Release voltage	-36dB (15.8mV/Pa)	-38dB (12.5mV/Pa)	-49dB (3.5mV/Pa)	-58dB (1.3mV/Pa)	-60dB (1.0mV/Pa)	-72dB (0.25mV/Pa)	-20dB (100.0mV/Pa)	-26dB (50.0mV/Pa)	-28dB (39.8mV/Pa)		-26dB (50.0mV/Pa)
Polarization voltage	200V					200V		0 V			
Frequency Characteristics (Hz)	10Hz~40kHz	10Hz~20kHz	20Hz~100kHz	20Hz~70kHz	20Hz~140kHz	20Hz~200kHz	10Hz~10kHz	10Hz~20kHz	146dB		1Hz~20kHz
Maximum sound pressure level	160dB	160dB	164dB	170dB	170dB	140dB	140dB	146dB	160dB		134dB
Self-noise level	19dB(A)	21dB(A)	34dB(A)	45dB(A)	65dB(A)	2dB(A)	11dB(A)	13dB(A)	20dB(A)	15dB(A)	15dB(A)
Temperature coefficient	0.007dB/°C or less					0.007dB/°C or less		0.007dB/°C or less			
Preamplifier Type	TYPE 4212		TYPE 4116			TYPE 4116	TYPE 4022 (with 1 inch adapter)		TYPE 4212	TYPE 4011	
Operating Temperature · Range of Humidity	-10°C to +50°C · 90% RH (no condensation)					-10°C to +50°C · 90% RH (no condensation)		-10°C to +50°C · 90% RH (no condensation)			
Storage Temperature · Range of Humidity	40% or less (at room temperature)					40% or less (at room temperature)		40% or less (at room temperature)			
Outline size	φ 13.2 × 12.6		φ 7 × 10.5			φ 5.5 × 9	φ 3.5 × 6.65	φ 23.77 × 27.5	φ 23.77 × 19		φ 13.2 × 16.3
Weight	6.0 g		1.6 g			0.9 g	0.3 g	46.5 g	27.6 g		7.4 g
Price	70,000円		100,000円			150,000円 (with adapter)	200,000円 (with adapter)	120,000円	70,000円		8.4 g

Appearance diagram of condenser microphone and preamplifier



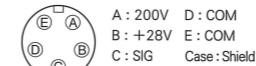
Combination of microphone and preamplifier

Manufactured by LEMO
EHJ.OB.307.CLA

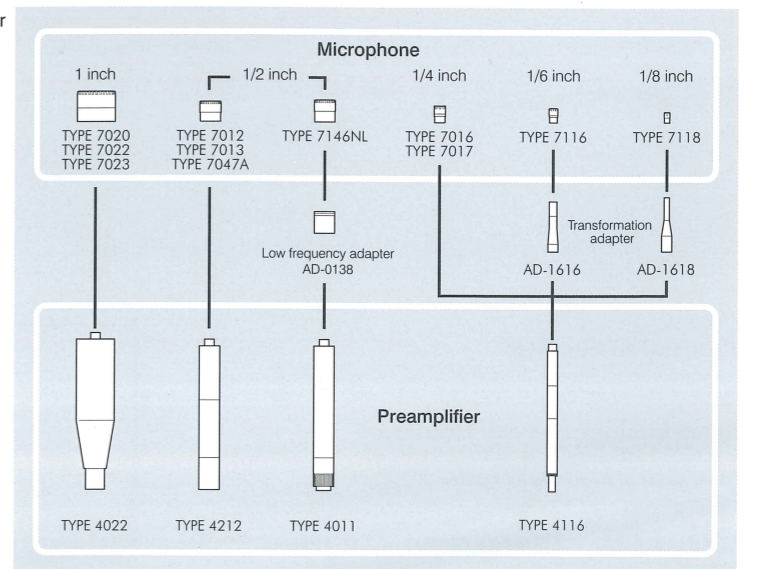


- 1: NC
- 2: COMs
- 3: 200V
- 4: SIG
- 5: NC
- 6: +14V
- 7: -14V/COMp
- Case: Shield

Manufactured by TAJIMI
R03-PB5M



- A: 200V
- B: +28V
- C: SIG
- D: COM
- E: COM
- Case: Shield



Features

Wide frequency range

Wide range of measurement from low-frequency to ultrasonic frequency (1Hz~200kHz) is possible.

Wide dynamic range

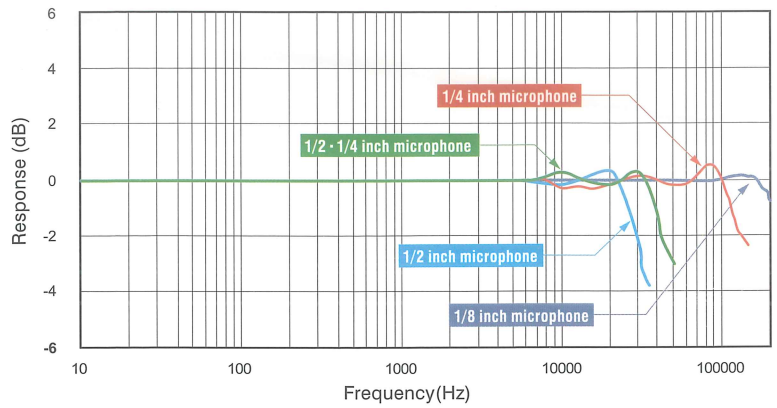
Measurement of high sound pressure level up to 170dB is possible.

Preamplifier integrated microphone

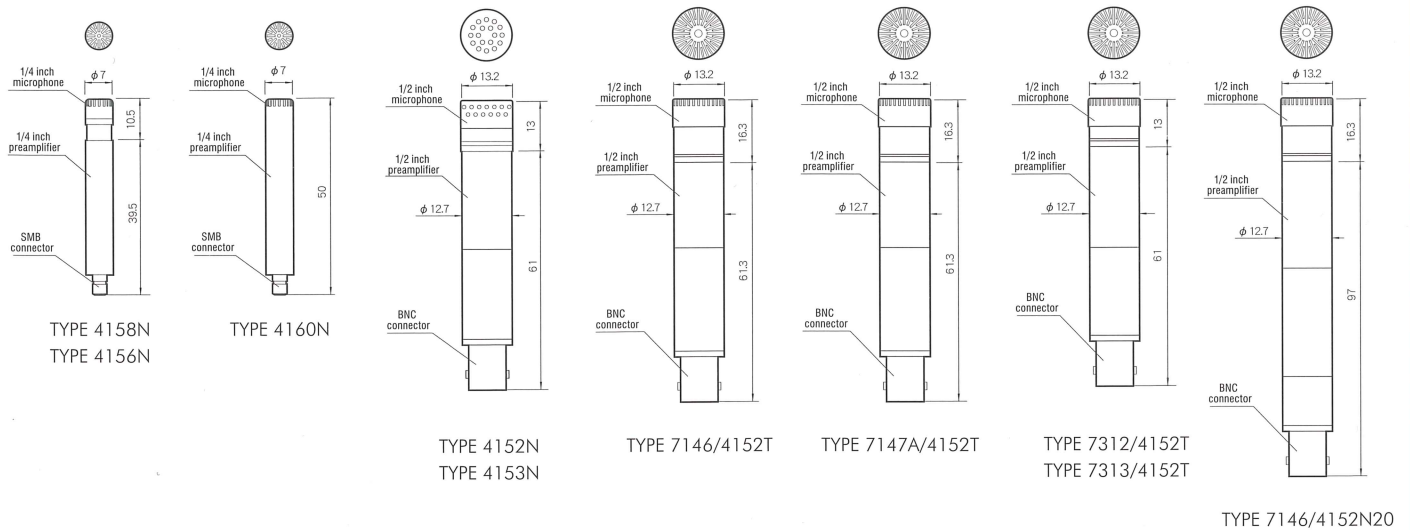
It is also possible to connect directly to analyzer by using BNC cable.

High sensitivity and certain measurement

TYPE 7146/4152N20 is a high sensitivity microphone of 500mV/Pa at output voltage. It is possible to connect directly to analyzer such as FFT and is easy to use enabling to start measurement with low sound pressure level.

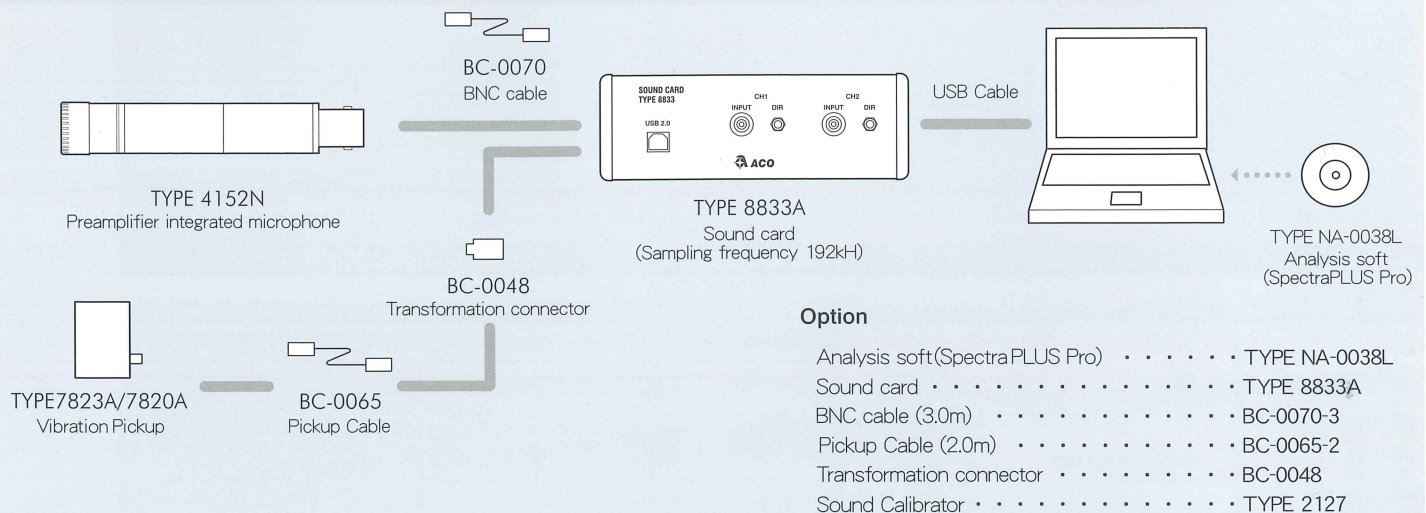


Appearance diagram of Preamplifier integrated microphone



System configuration

Various measurements are possible due to easy connection.



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