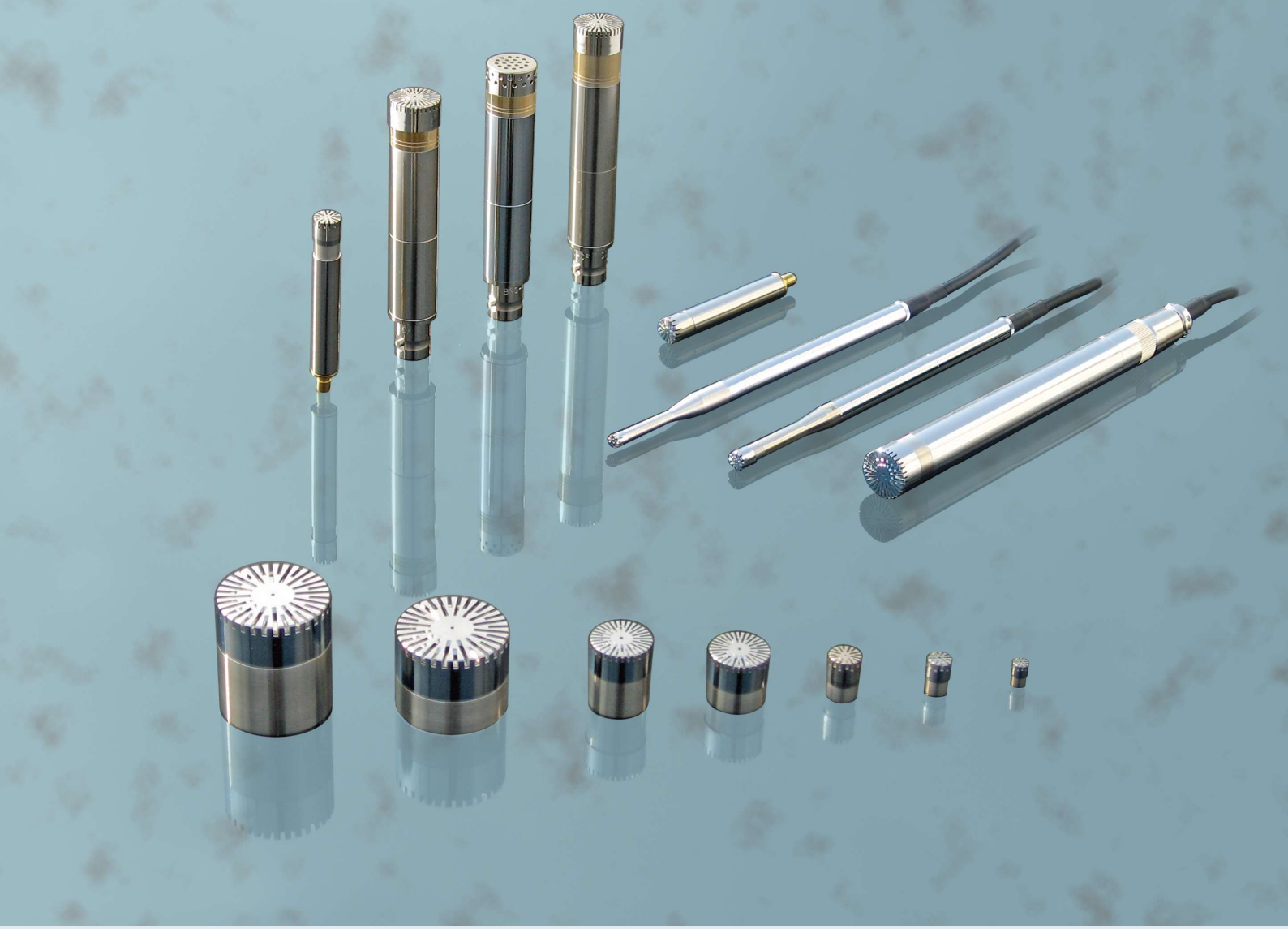
Sound measurement microphone



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 under100°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 ot 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.

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Preamplifier integrated microphone

Type	TYPE 4156N(TYPE2)	TYPE 4157N(TYPE1)	TYPE 4158N(TYPE1)	TYPE 4160N(TYPE2)	TYPE 4170N(TYPE2)	TYPE 4152N(TYPE2)	TYPE 4153N(TYPE2)	TYPE 7146N(TYPE1)	TYPE 7146NL (TYPE1)	TYPE 7147NA(TYPE1)	TYPE 7152N (TYPE1)	TYPE 7312N (TYPE1)	TYPE 7313N(TYPE1)
Sound Field Characteristic	Array	Pressure-Field	Array			Free-Field	Pressure-Field	Free-Field	Ultra low frequency type	Random-incidence	Free-Field	Free-Field	Pressure-Field
Nominal Diameter	1/4 inch					1/2 inch							
Release voltage	-50dB (3.2mV/Pa)	-57dB (1.4mV/Pa)	-48dB (4.0mV/Pa)	-41dB (8.9mV/Pa)	-41dB (8.9mV/Pa)	-32dB (25.1mV/Pa)	-32dB (25.1mV/Pa)	-26dB (50.0mV/Pa)	-26dB (50.0mV/Pa)	-26dB (50.0mV/Pa)	-30dB (31.6mV/Pa)	-36dB (15.8mV/Pa)	-38dB (12.5mV/Pa)
Pressure Sensitivity (Included preamplifier)	-53dB±3dB re 1V/Pa (2.2mV/Pa)	-59dB±3dB re 1V/Pa (1.1mV/Pa)	-50dB±3dB re 1V/Pa (3.2mV/Pa)	-44dB±3dB re 1V/Pa (6.3mV/Pa)	-43dB±3dB/-0dB re 1V/Pa (7.1mV/Pa)	-33dB±2dB re 1V/Pa (22.4mV/Pa)	-33dB±2dB re 1V/Pa (22.4mV/Pa)	-27dB±2dB re 1V/Pa (44.7mV/Pa)	-27dB±2dB re 1V/Pa (44.7mV/Pa)	-27dB±2dB re 1V/Pa (44.7mV/Pa)	-31dB±1dB re 1V/Pa (28.1mV/Pa)	-37dB±2dB re 1V/Pa (14.1mV/Pa)	-39dB±2dB re 1V/Pa (11.2mV/Pa)
Polarization voltage	0V					0V							
Frequency Characteristics (Hz)	20Hz ～ 80kHz	20Hz ～ 70kHz	20Hz ～ 100kHz (Without grid)	20Hz ～ 20kHz	20Hz ～ 20kHz	20Hz ～ 20kHz	20Hz ～ 10kHz	20Hz ～ 20kHz	1Hz ～ 20kHz	20Hz ～ 10kHz	20Hz～20kHz	20Hz～40kHz	20Hz ～ 20kHz
Maximum sound pressure level	155dB	161dB	149dB	152dB	151dB	140dB	140dB	135dB	130dB	135dB	140dB	140dB	140dB
Self-noise level	42dB(A)	48dB(A)	38dB(A)	33dB(A)	29dB(A)	18dB(A)	18dB(A)	17dB(A)	17dB(A)	17dB(A)	20dB(A)	20dB(A)	20dB(A)
Temperature coefficient	0.02dB/℃ or less	0.009dB/℃ or less	0.009dB/℃ or less	0.02dB/℃ or less	0.02dB/℃ or less	0.01dB/℃ or less	0.01dB/℃ or less	0.009dB/℃ or less	0.009dB/℃ or less	0.009dB/℃ or less	0.009dB/℃ or less	0.009dB/℃以下	0.009dB/℃以下
Power supply and voltage	DC15 ～ 28V					DC15 ～ 28V							
Constant current	0.5 ～ 4mA					0.5 ～ 4mA							
Output Impedance	Approx.100Ω					Approx.100Ω							
Connector	SMB connector					BNC connector							
TEDS	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant	noncompliant	noncompliant	noncompliant	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant	compliant/noncompliant
Operating Temperature・Range of Humidity	-10℃ to +50℃・90% RH(no condensation)					-10℃ to +50℃・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)							
Outline size	Φ7×50	Φ7×50	Φ7×50	Φ7×50	Φ7×27	Φ13.2×74	Φ13.2×74	Φ13.2×77.6	Φ13.2×88.3	Φ13.2×77.6	Φ13.2×74	Φ13.2×73.6	Φ13.2×73.6
Weight	6g	6g	6g	6g	5g	35g	35g	35g	40g	35g	35g	35g	35g
Price (Preamplifier)	JPY 100,000	JPY 220,000	JPY 220,000	JPY 40,000	JPY 40,000	JPY 40,000	JPY 55,000	JPY 90,000	JPY 140,000	JPY 90,000	JPY 90,000	JPY 90,000	JPY 90,000

Measurement condenser microphone

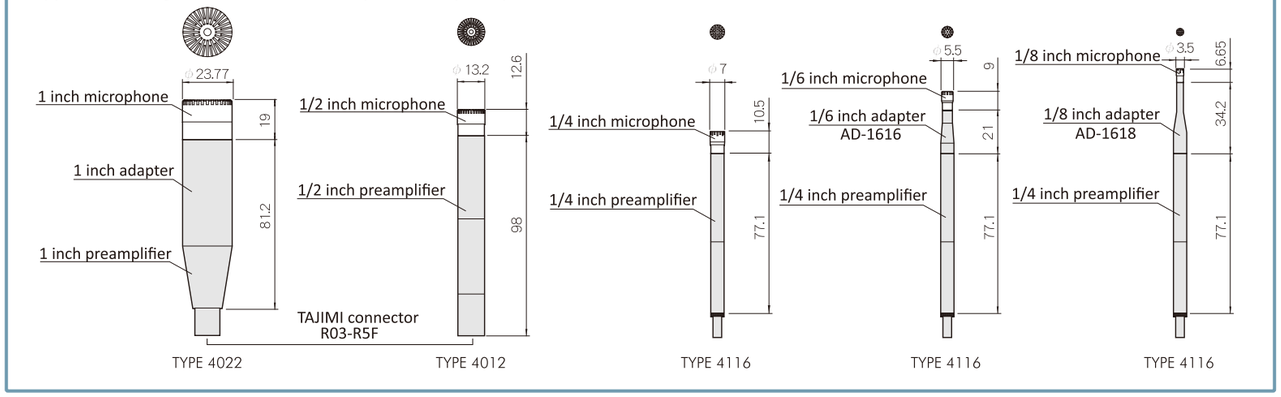
Type	TYPE 7012 (TYPE1)	TYPE 7013 (TYPE1)	TYPE 7016 (TYPE1)	TYPE 7017 (TYPE1)	TYPE 7116 (TYPE1)	TYPE 7118 (TYPE1)	TYPE 7020 (TYPE1)	TYPE 7022 (TYPE1)	TYPE 7023 (TYPE1)	TYPE 7047A (TYPE1)
Sound Field Characteristic	Free-Field	Pressure-Field	Free-Field	Pressure-Field	Pressure-Field	Pressure-Field	Free-Field		Pressure-Field	Random-incidence
Nominal Diameter	1/2 inch		1/4 inch		1/6 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)	-65dB (0.56mV/Pa)	-20dB (100.0mV/Pa)	-26dB (50.0mV/Pa)	-28dB (39.8mV/Pa)	-28dB (39.8mV/Pa)
Polarization voltage	200V		200V		200V		200V			200V
Frequency Characteristics (Hz)	10Hz ～ 40kHz	10Hz ～ 20kHz	20Hz ～ 100kHz	20Hz ～ 70kHz	20Hz ～ 140kHz	20Hz ～ 200kHz	10Hz ～ 10kHz	10Hz ～ 20kHz	10Hz ～ 10kHz	10Hz ～ 10kHz
Maximum sound pressure level	160dB	160dB	164dB	164dB	170dB	170dB	140dB	146dB	146dB	160dB
Self-noise level	19dB(A)	21dB(A)	34dB(A)	46dB(A)	45dB(A)	50dB(A)	2dB(A)	11dB(A)	13dB(A)	20dB(A)
Temperature coefficient	0.007dB/℃ or less		0.007dB/℃ or less		0.007dB/℃ or less		0.007dB/℃ or less			0.007dB/℃ or less
Preamplifier Type	TYPE 4012	TYPE 4012	TYPE 4116	TYPE 4116	TYPE 4116	TYPE 4116	TYPE 4022 (With 1inch adapter)			TYPE 4012
Operating Temperature・Range of Humidity	-10℃ to +50℃・90% RH(no condensation)		-10℃ to +50℃・90% RH(no condensation)		-10℃ to +50℃・90% RH(no condensation)		-10℃ to +50℃・90% RH(no condensation)			-10℃ to +50℃・90% RH ※1
Storage Temperature・Range of Humidity	40% or less(at room temperature)		40% or less(at room temperature)		40% or less(at room temperature)		40% or less(at room temperature)			40% or less ※2
Outline size	Φ13.2×12.6	Φ13.2×12.6	Φ7×10.5	Φ7×10.5	Φ5.5×9	Φ3.5×6.65	Φ23.77×27.5	Φ23.77×19	Φ23.77×19	Φ13.2×16.3
Weight	6g	6g	1.6g	1.6g	0.9g	0.3g	46.5g	27.6g	27.6g	8.4g
Price	JPY 70,000	JPY 70,000	JPY 100,000	JPY 100,000	JPY 150,000(With adapter)	JPY 600,000(With Priamplifier)	JPY 120,000	JPY 70,000	JPY 70,000	JPY 70,000

※1 : no condensation
※2 : at room temperature

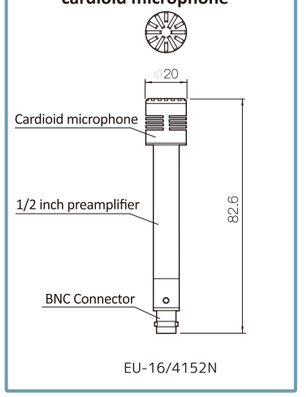
Cardioid microphone

Type	EU-16/4152N
Pressure Sensitivity (Included preamplifier)	-40dB re 1V/Pa±3dB (10mV/Pa)
Directional Characteristic	-15dB or more at 1kHz(Uni-Directional)
Polarization voltage	0V
Frequency Characteristics (Hz)	50Hz ～ 18kHz
Maximum sound pressure level	130dB
Self-noise level	20dB(A)
Power supply and voltage	DC+15V ～ +28V
Cable	BNC Cable
Output Impedance	Approx.100Ω
Operating Temperature・Range of Humidity	-10℃ to +50℃・90% RH(no condensation)
Storage Temperature・Range of Humidity	0℃ to +40℃・90% RH(no condensation)
Outline size	Φ20×82.6
Weight	45g
Price	JPY 100,000

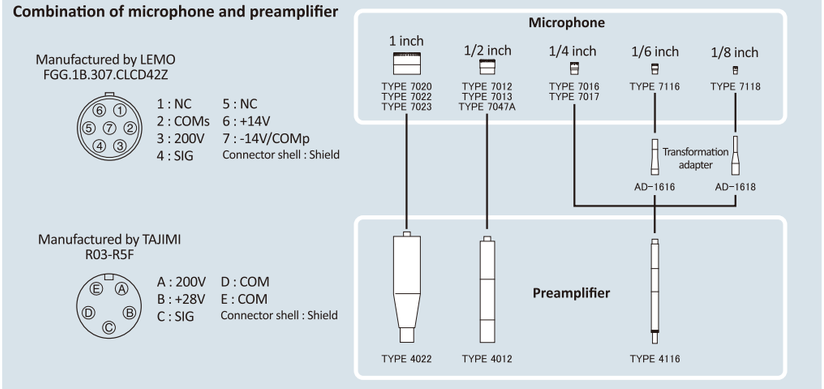
Appearance diagram of condenser microphone and priamplifier



Appearance diagram of cardioid microphone



Combination of microphone and preamplifier



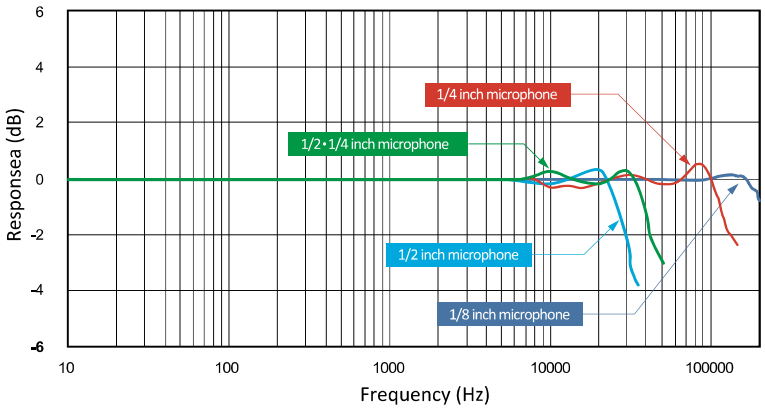
Features

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

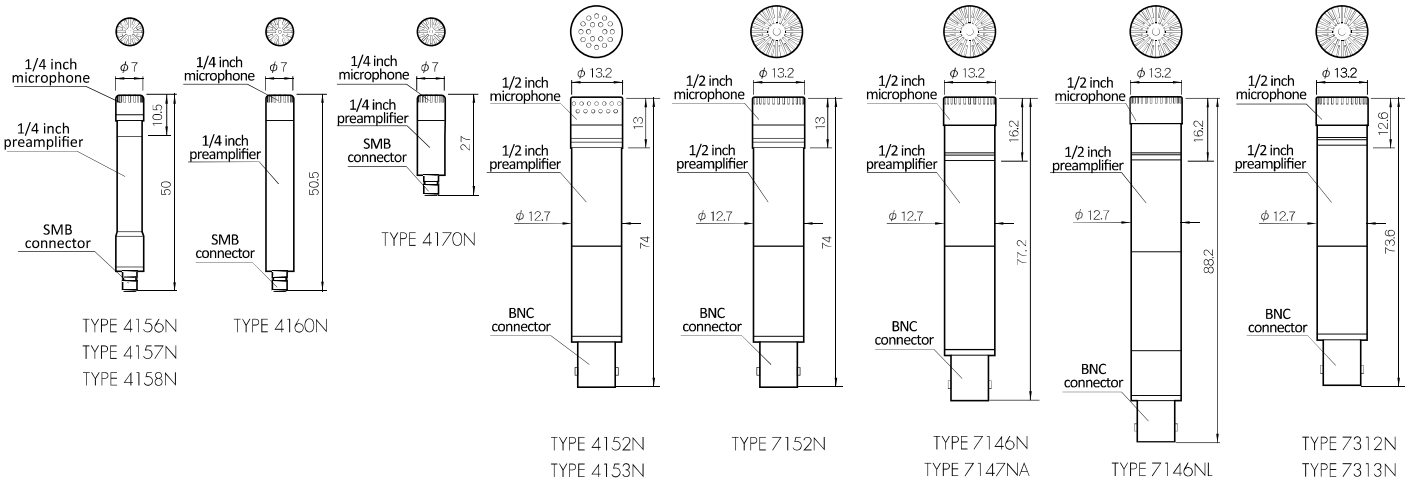
Wide dynamic range
Measurement of high sound pressure level up to 170dB is possible.

Preamplifier integrated microphone
It is also possible to connect directry to analyzer by using BNC cable.

High sensitivity and certain measurement
It is possible to connect directry to analyzer such as FFT and is easy to use enabling to start measurement with low sound pressure level.

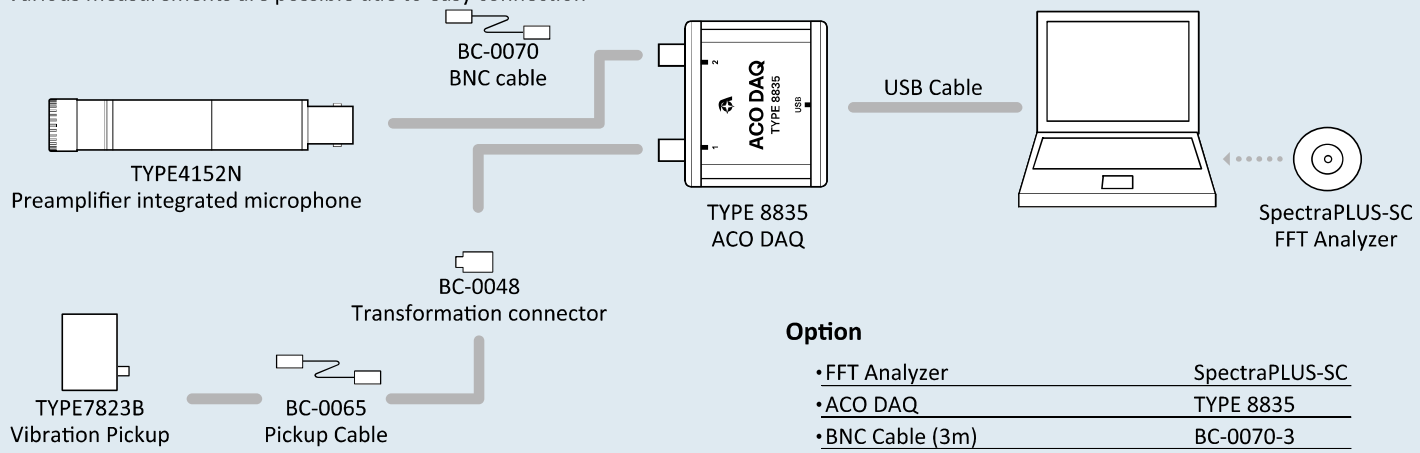


Appearance diagram of condenser microphone and priamplifier



System configration

Various measurements are possible due to easy connection



Option

•FFT Analyzer	SpectraPLUS-SC
•ACO DAQ	TYPE 8835
•BNC Cable (3m)	BC-0070-3
•Pickup cable (3m)	BC-0065-3
•Transformation connctor	BC-0048
•Sound calibrator	TYPE 2127

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