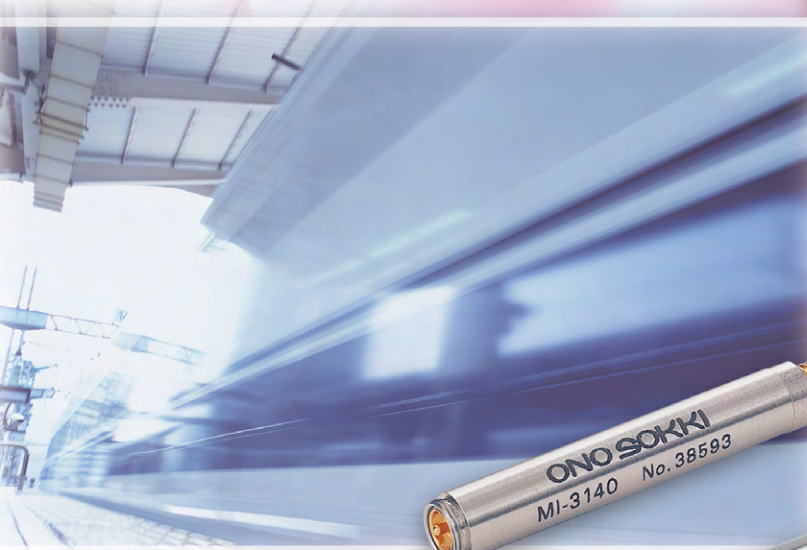
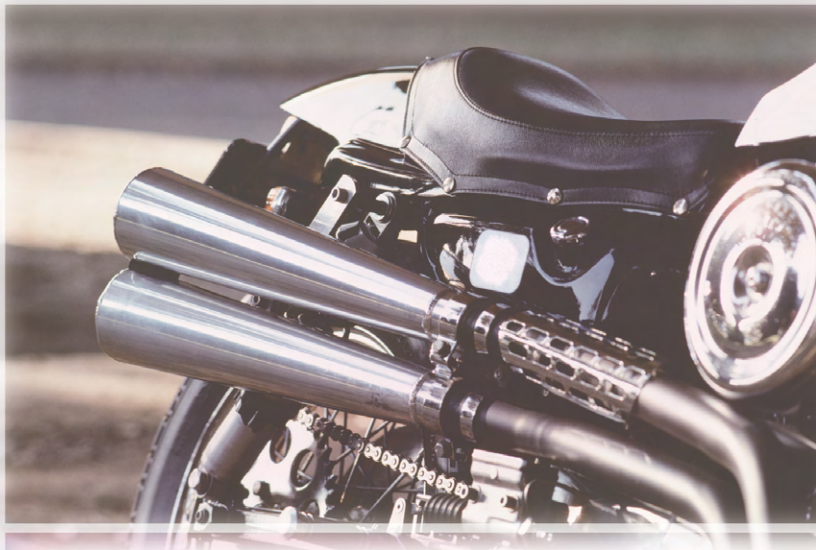


Measurement microphone

MI series



ONO SOKKI

Condenser-type microphone with high reliability and measurement accuracy

From a sound of air conditioner in serene living room to an engine sound coming from jet airplane, measurement for sound requires high accuracy as well as wide range of sound pressure level and frequency. To satisfy those requirements, condenser-type microphone is popularly used in sound and vibration measurement.

Our condenser microphone is equipped with a titanium diaphragm, which is infixed by laser welding. And also, our microphone keeps extremely high stability performance by all of our accumulated technology. Several types of microphone with various sensitivity ranges are provided according to sound pressure or frequency of object to be measured.



Measurement microphone

Condenser-type microphone features not only to be downsized with ease, but also to have flat frequency responses over a wide range of frequency, and provides markedly high stability. That's why they are popularly used as measurement microphone. The size designates a nominal diameter of the microphone. A wide variety of sizes such as 1-inch, 1/2-inch, and 1/4-inch is available depending on your requirements including measurement range of sound pressure or frequency. The larger size of diameter features to have higher sensitivity, the smaller can measure the sound at higher frequency.

The structure of condenser-type microphone

Condenser-type microphone is consisted of backplate and diaphragm which convert air vibration to electric signal. Vibration of diaphragm by pressure fluctuation (sound) makes change of capacitance which is formed between backplate and diaphragm. Applying voltage between diaphragm and backplate, the change of capacitance is received as voltage signal, and sound pressure is measured.

Condenser-type microphones are available in two types : bias-type and back electret-type. The difference is the way to apply the DC voltage.

• Bias-type

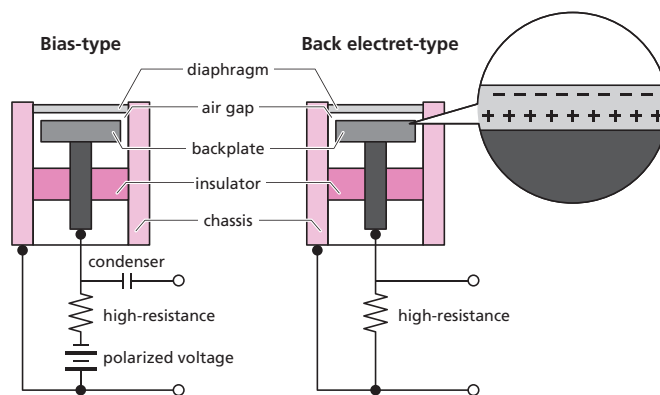
High voltage, generally DC voltage at 100V/200V is supplied from external.

- Features**
- High sensitivity
 - High stability

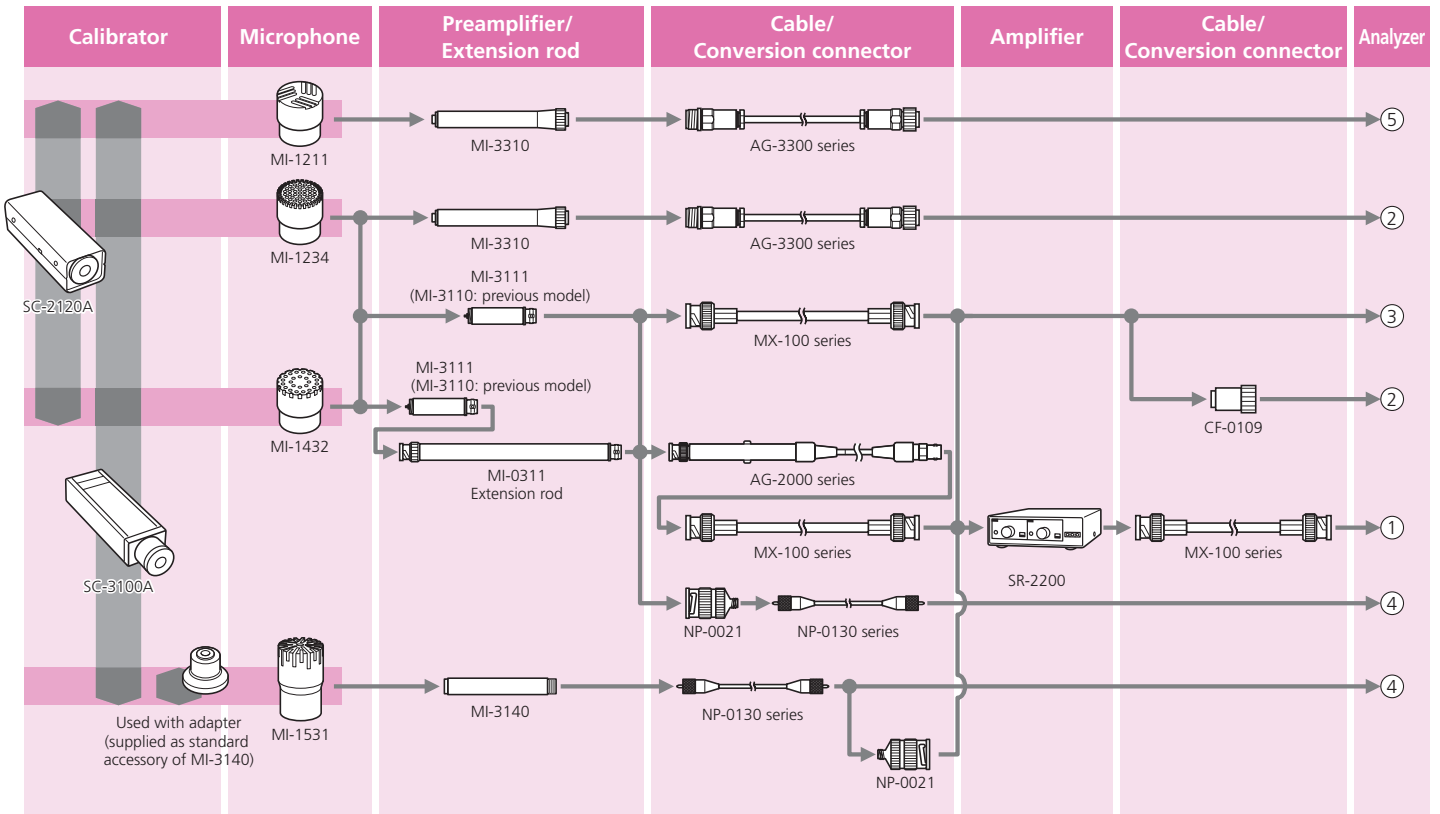
• Back electret-type

External voltage does not need since permanently electrically polarized polymer film is affixed to the surface of backplate in place of applying voltage.

- Features**
- No need for applying bias voltage.
 - Amplifier with lower price can be used compared with bias-type.



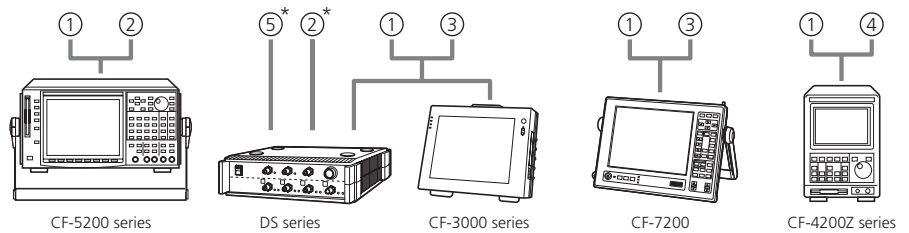
System configurations



Analyzer

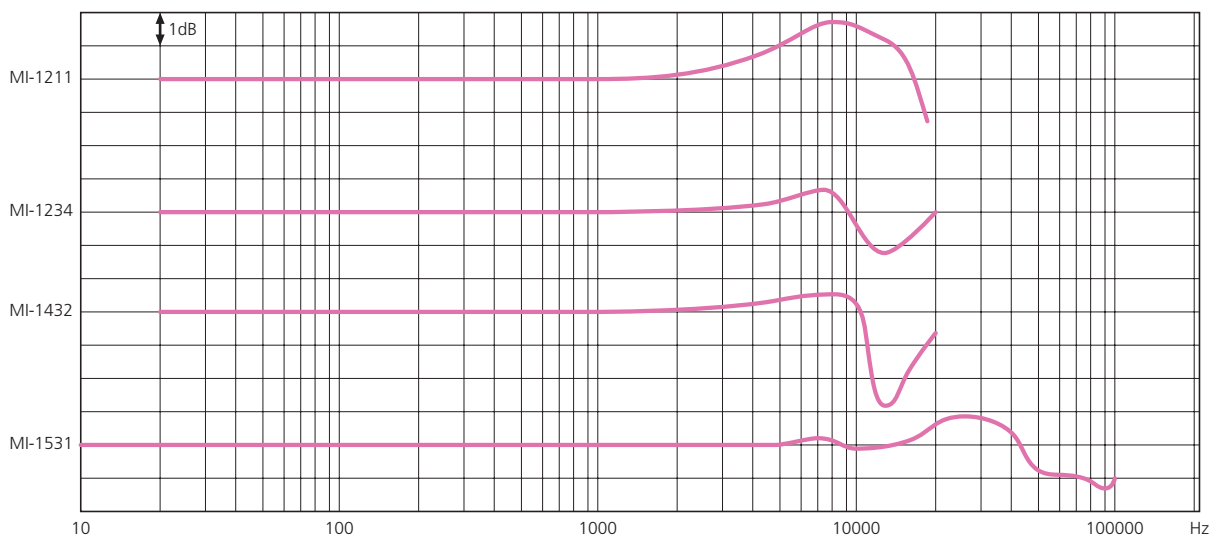
- ① : Voltage input (BNC connector)
- ② : Sensor input (6-pin connector)
- ③ : Sensor input (BNC connector)
- ④ : Sensor input (miniature connector)
- ⑤ : DS microphone unit

* DS-0286/0287 (Microphone input unit) is required.



Example of microphone characteristic

Response to a Free Sound Field Incident From the Front of the Microphone



Measurement microphone

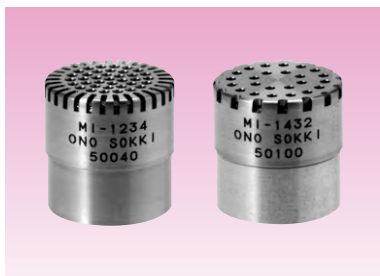
MI-1211 1/2-inch High-Sensitivity Bias-type



The MI-1211, bias-type microphone with high sensitivity, is ideal for measurement of low level noise. Infixing titanium diaphragm with laser welding makes it possible to achieve wide range, high sensitivity and high stability.

High sensitivity

MI-1234/1432 1/2-inch Back Electret-type



Infixing titanium diaphragm with laser welding, the MI-1234/1432 provides higher performance in environmental proof as compared to conventional models. Bias power supply is not required since it is back electret-type microphone. There are two types to be selected; the MI-1234, which is being designed to emphasize on characteristic of frequency, and the MI-1432, which achieves excellent environmental resistance in spite of its low price.

High stability

MI-1531 1/4-inch Back Electret-type



The MI-1531, 1/4-inch diameter back electret-type microphone, is developed for high frequency measurement at 100kHz and high sound pressure measurement. High sound pressure at 157dB can be measured by combination with the MI-3140.

High frequency

MI-1211/1234/1432/1531 Specifications

	Bias-type	Back electret-type		
	MI-1211	MI-1234	MI-1432	MI-1531
Frequency range	20Hz to 14kHz	20Hz to 20kHz	20Hz to 8kHz	10Hz to 100kHz
Response type	Free field type			
Polarized voltage	200V	0V		
Sensitivity	-20 ±1.5dB (0dB=1V/Pa)	-29 ±3dB (0dB=1V/Pa)		-48 ±3dB (0dB=1V/Pa)
Capacitance	12 ±1pF	12.5 ±1pF		7pF (Typical)
Maximum sound pressure level	132dB (MI-3310 in used)	140dB (MI-3310 in used)		157dB (MI-3140 in used)
Intrinsic noise level	12dB (A) or less	19dB (A) or less		30dB (A) or less
Operating temperature range	-10 to +50°C			
Operating humidity range	30 to 90%RH (with no condensation)			0 to 90%RH (with no condensation)
Temperature characteristics	0.007dB/°C or less	0.01dB/°C or less		
Humidity characteristics	0.003dB/%RH or less			-
Aging drift	0.1dB/year or less			-
Storage temperature range	-20 to +80°C	-20 to +60°C		-40 to +150°C
Storage humidity range	10 to 90%RH (with no condensation)			0 to 90%RH (with no condensation)
Outer dimension	φ13.2 × 15.2mm	φ13.2 × 13.7mm	φ13.2 × 13.2mm	φ6.9 × 10.5mm
Weight	Approx. 5g	Approx. 6g		Approx. 1.5g
Accessories	Manual × 1 copy, Calibration chart × 1 copy			

Preamplifier

MI-3310 High Performance Preamplifier for 1/2-inch Microphone



Preamplifier for 1/2-inch condenser-type microphone. The MI-3310 accepts both of bias-type and back electret-type microphones and is high performance preamplifier with lower intrinsic noise and high frequency range.

MI-3111 Preamplifier for 1/2-inch Back Electret-type Microphone



The MI-3111 is an exclusive preamplifier for 1/2-inch back electret-type microphone and applicable for CE marking*. Various types of microphone or instrument including FFT analyzer can be connected directly by adapting CCLD (=Constant Current Line Drive) technology.

* Applicable condition for CE marking ; cable extension for 30m or less.

MI-3140 Preamplifier for 1/4-inch Back Electret-type Microphone



The MI-3140 is a preamplifier for 1/4-inch back electret-type microphone. Various types of microphone or instrument including FFT analyzer can be connected directly by adapting CCLD(=Constant Current Line Drive) technology. Combination with the MI-1531 enables to measure sound pressure level at 157dB as maximum.

MI-3310/3111/3140 Specifications

	MI-3310	MI-3111	MI-3140
Applicable microphone	MI-1211/1234/1432/1233/1431	MI-1234/1432/1233/1431	MI-1531
Frequency range	10Hz to 100kHz	10Hz to 20kHz	10Hz to 100kHz
Gain	-2.4dB \pm 1.0dB (at 1kHz)	-2.0dB \pm 1.0dB (at 1kHz)	-0.25dB (Typical)
Input impedance	Approx. 5G Ω		Approx. 20G Ω
Intrinsic noise	6.3 μ Vrms or less (at FLAT)	22.3 μ Vrms or less (at FLAT)	6 μ Vrms or less (at FLAT)
Distortion	0.5% or less	1.0% or less	3.0% or less
Operating temperature range	-10 to +50°C		-30 to +60°C
Operating humidity range	30 to 90%RH (with no condensation)		0 to 90%RH (with no condensation)
Maximum output voltage	7Vrms	3Vrms	\pm 8V or less
Power supply voltage	\pm 15V	CCLD* 0.5 to 5mA/15 to 25V	CCLD* 2 to 20mA/15 to 25V
Outer dimension	ϕ 12.7 x 129.5mm	ϕ 12.7 x 61mm	ϕ 6.35 x 44mm
Weight	Approx. 60g	Approx. 30g	Approx. 5.5g
Accessories	Manual x 1 copy, Input protection cap x 1	Manual x 1 copy, Input protection cap x 1, MI-0301 (for mounting tripod)	Manual x 1 copy, Input protection cap x 1, 1/2 to 1/4 conversion adapter for calibration
Extension cable	AG-3300 series	MX-100 series, AG-2000 series	NP-0130 series

*CCLD= Constant Current Line Drive

SR-2200 2ch Sensor Amplifier



The SR-2200 is compact and lightweight sensor amplifier with CCLD* technology, suitable for field measurement. It can be connected with microphone preamplifier with CCLD* technology. Dual power supply of AC adapter (100VAC input) and batteries allows to be used anytime and anywhere. Also, it provides 2 channels and is able to record stereo sound or measure sound and vibration simultaneously.

Features

- Type AA battery can be used. AC adapter (sold separately: 100VAC input) is also applicable.
- 2 channels' inputs
- Enable to connect with microphone preamplifier or accelerometer with CCLD* technology.
- Providing A and C-frequency weighting filters

*CCLD=Constant Current Line Drive

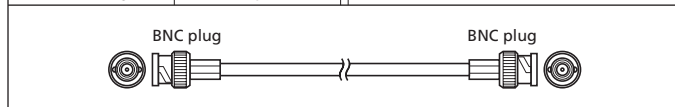
SR-2200 Specifications

Input section	
Constant current power supply	Current : 2.4mA (±20%) /Applied voltage: Approx. 18V
Number of channels	2 channels
Operating frequency range	1Hz to 20kHz (±0.5dB), output load impedance 100kΩ or more.
Input impedance	1MΩ±0.5%
Input cutoff frequency	Approx. 0.16Hz
Input voltage range	12.5dBVrms max (±6V)
Gain	-10, 0, 10, 20, 30, 40, 50, 60dB (8 stages selectable in 10dB steps, ±0.2dB)
Frequency weighting	A, C, FLAT (Comforming standards; IEC 60651-1979 Type1, JIS C 1505-1988)
Output cutoff frequency	Approx. 0.2Hz (load impedance 100kΩ or more), Approx. 0.4Hz (load impedance 50kΩ or more)
Input-converted intrinsic noise	-105dBVrms or less (A), -100dBVrms or less (C) , -95dBVrms (FLAT) or less
Input/output connector	BNC (C02 type)
Output section	
Output voltage range	12.6dBVrms max. (±6V)
Maximum output cable length	30m or less
General specification	
Power supply	Battery: type AA battery ×4 pcs., external power supply: PB-703 AC adapter (sold separately: 100VAC input)
Continuous operating time with battery	20 hours or more with type AA alkaline battery ×4 pcs.
Operating temperature range	-10 to +50°C
Operating humidity range	30 to 90%RH (with no condensation)
Storage temperature range	-20 to +60°C
Storage humidity range	10 to 90%RH (with no condensation)
Outer dimension	140(W) × 40(H) × 125(D)mm (not including protruded sections)
Weight	Approx. 500g (including batteries)
Accessories	Manual ×1 copy, Type AA alkaline battery (LR06) ×4 pcs.

Extension cable

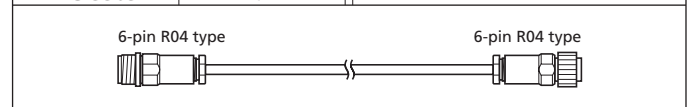
MX-100 series

Model	Length	Model	Length
MX-101	1.5m	MX-115	15m
MX-105	5m	MX-120	20m
MX-110	10m		



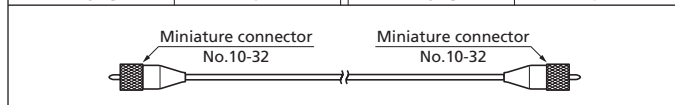
AG-3300 series

Model	Length	Model	Length
AG-3301	5m	AG-3304	30m
AG-3302	10m	AG-3305	100m*
AG-3303	20m		



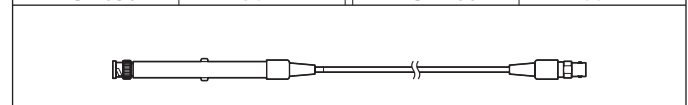
NP-0130 series

Model	Length	Model	Length
NP-0131	1.5m	NP-0133	5m
NP-0132	3m	NP-0134	10m



AG-2000 series

Model	Length	Model	Length
AG-2010	10m	AG-2050	50m*
AG-2030	30m	AG-2100	100m*



* with code reel

SC-3100A/2120A Sound Calibrator for Microphone



SC-3100A

Pistonphone-type sound source for use in calibration of measurement microphone. It enables to calibrate for high sound pressure level.

- Able to calibrate with accuracy at ± 0.4 dB or less.
- Applicable for 1/2-inch, 1/4-inch microphone.



SC-2120A

Dynamic speaker-type simplified sound calibrator for 1/2-inch microphone which is used in operational checking. Adapting dynamic speaker method makes it possible to operate long time operation (up to twenty hours of continuous operation) and low price.

SC-3100A/2120A Specifications

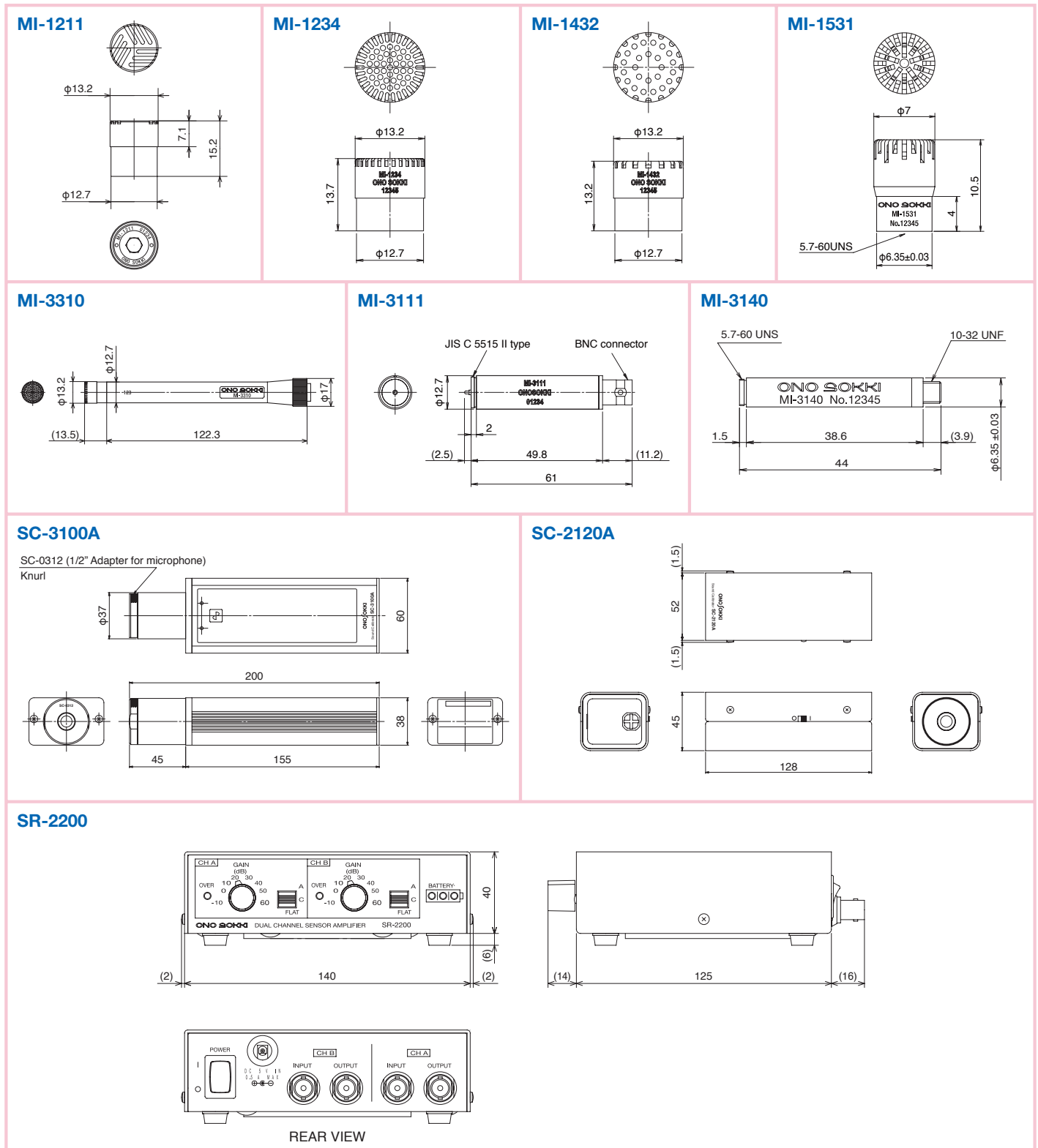
	SC-3100A	SC-2120A
Comforming standards	JIS C 1515-2004 Class1/C, IEC 60942-2003 Class 1/C	JIS C 1515-2004 Class2, IEC 60942-2003 Class2
Sound source	Pistonphone	Dynamic speaker
Applicable microphone	1/2-inch (MI-1233/1234/1431/1432), 1/4-inch (MI-1531)	1/2-inch (MI-1233/1234/1431/1432)
Sound pressure level	124dB SPL	94dB SPL
Calibration accuracy	± 0.4 dB	± 0.5 dB
Distortion	2.5% or less	0.5% or less
Frequency	250Hz $\pm 0.4\%$	1000Hz $\pm 1\%$
Operating temperature range	-10 to +50°C	
Storage temperature range	-20 to +70°C	-20 to +60°C
Power supply	Type AA battery $\times 3$ pcs.	9-V battery: 6F22 or 6LR61
Battery life	2.5 hours of continuous operation (using manganese batteries)	20 hours of continuous operation (using 6F22)
Outer dimension	60(W) \times 38(H) \times 200(D)mm	52(W) \times 45(H) \times 130(D)mm
Weight	Approx. 600g	Approx. 300g
Accessories	Manual $\times 1$ copy, Barometer $\times 1$ set, Type AA battery $\times 3$ pcs., Case $\times 1$ set	Manual $\times 1$ copy, 9-V battery (6F22) $\times 1$ pc.

Accessories (sold separately)

Model	Description
Microphone holder	MI-0301 Microphone holder for 1/2-inch microphone to mount tripod (supplied as standard accessory for MI-3111/3110, AG-3300 series)
Extension cable	AG-3300 series Extension cable for MI-3310: 5m, 10m, 20m, 30m, 100m (with code reel) *MI-0301 is supplied as standard accessory.
	AG-2000 series Extension cable for MI-3111/MI-3110: 10m, 30m, 50m (with code reel), 100m (with code reel)
	MX-100 series Extension cable for MI-3111/MI-3110: 1.5m, 5m, 10m, 15m, 20m
	NP-0130 series Extension cable for MI-3140: 1.5m, 3m, 5m, 10m
Conversion connector	CF-0109 Conversion connector (convert R04 type to BNC) * Required when connecting MI-3111/3110 to R04 connector.
Conversion connector	NP-0021 Conversion connector (convert micro-dot connector to BNC) * Required when connecting MI-3140 to our FFT analyzer.
Microphone holder adapter	MI-0302 Screw conversion adapter for MI-0301 (convert 1/4-inch screw to 3/8-inch screw)
Extension rod	MI-0311 Extension rod for MI-3111/3110
AC adapter	PB-703 AC power supply adapter for SR-2200 (for 100VAC input)

Outer Dimension

unit: mm



ONOSOKKI

* Outer appearance and specifications are subject to change without prior notice.
 URL: <http://www.onosokki.co.jp/English/english.htm>

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