

PRODUCT DATA

Sound Sources and Impact Sound Source for Building Acoustics:

Sound Sources: OmniSource™ Type 4295 and OmniPower™ Type 4292-L

Impact Sound Source: Tapping Machine Type 3207

Power Amplifiers Type 2734-A and 2734-B

For proper building acoustics measurements, a sound source which fulfils the relevant standards (for example, ISO 140) is required. Brüel & Kjær offers a complete range of sound sources for building acoustics measurements, including Tapping Machine Type 3207, single-speaker omnidirectional OmniSource™ Type 4295 and 12-speaker omnidirectional OmniPower™ Type 4292-L. Power Amplifier Type 2734 can drive both OmniPower and OmniSource. Optional carrying cases for the sound sources are available, as well as wireless control systems for use with Hand-held Analyzer Type 2250 and the dual channel Type 2270.



Uses and Features

Uses

- Architectural and building acoustics
- Measurement of:
 - Airborne sound insulation
 - Reverberation time
 - Impact sound level

Features

- Part of a complete building acoustics system featuring Brüel & Kjær's Hand-held Analyzer Type 2250 or 2270
- Two omnidirectional noise sources
- Tapping machine for impact sound level measurements
- Remote operation via cable or wireless remote control
- Satisfies national and international standards
- Robust
- Easily portable

Introduction

Architectural and building acoustic measurements require a range of noise sources for airborne noise and impact noise transmission measurements.

For airborne noise transmission measurements, an omnidirectional sound source is needed. Brüel & Kjær offers two solutions: OmniPower Sound Source Type 4292-L and OmniSource Sound Source Type 4295.

For impact sound measurements, Brüel & Kjær offers Tapping Machine Type 3207, a robust and portable device that fulfils national and international standards.

For a complete measurement system, combine the sound sources with a driving amplifier (such as Type 2734-A or 2734-B), a sound level analyzer (such as Type 2250 or 2270), and a PC with Building Acoustic analysis and reporting software.

Brüel & Kjær supplies all of these items and a range of carrying cases for storage and transportation:

- OmniPower Type 4292-L, 12-speaker high-power omnidirectional sound source
- OmniSource Type 4295, lightweight single-speaker omnidirectional sound source
- Tapping Machine Type 3207
- Power Amplifier Type 2734-A or 2734-B, amplifiers for driving sound sources
- Flight Case KE-0449 and Carrying Cases KE-0364 and KE-0392 for packing and transportation
- Cables and Wireless Remote Control accessories
- Battery Kit UA-1477 for Type 3207

Omnidirectional Sound Sources

For most building acoustics measurements, the sound source must radiate sound evenly in all directions to give reproducible and reliable results; therefore, the relevant building acoustics measurements standards (ISO 140 and ISO 3382) require the use of an omnidirectional sound source.

OmniPower Sound Source Type 4292-L

Fig. 1
OmniPower Sound
Source Type 4292-L



OmniPower Omnidirectional Sound Source Type 4292-L (see Fig. 1) uses a cluster of 12 loudspeakers in a dodecahedral configuration that radiates sound evenly with a spherical distribution. All 12 speakers are connected in a series-parallel network to ensure both in-phase operation and an impedance that matches the power amplifier. The entire assembly weighs no more than 8 kg and is fitted with a convenient lifting handle that does not measurably interfere with the sound field.

Powered by Power Amplifier Type 2734-A or 2734-B, the Sound Source can deliver a maximum sound power of 122 dB re 1 pW (100–3150 Hz). The high power output of Type 4292-L makes it ideal for sound insulation measurements.

Type 4292-L satisfies the requirements of DIN 52210, ISO 140 and ISO 3382 standards (see Fig. 2 through Fig. 5). Its directional response for the horizontal plane is shown in Fig. 6.

Fig. 2
Frequency response
for $1/3$ -octave
sound power levels
for OmniPower
Type 4292-L using
Power Amplifier Type
2734 and its internal
pink noise generator

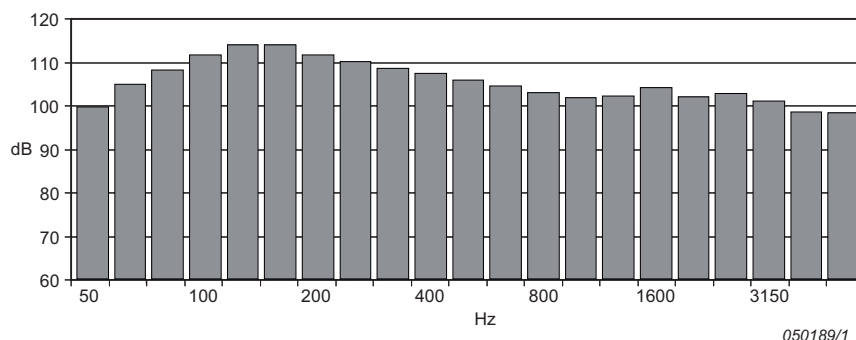


Fig. 3

Frequency response for $1/1$ -octave sound power levels for OmniPower Type 4292-L using Power Amplifier Type 2734 and its internal pink noise generator

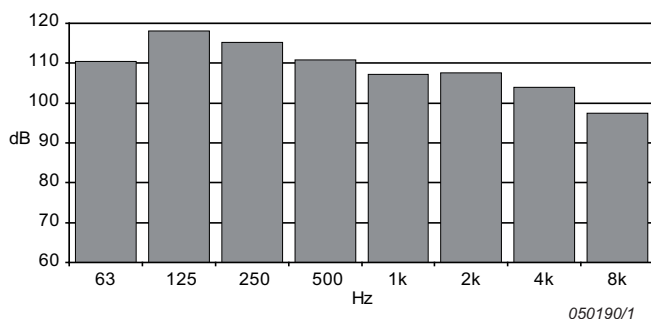


Fig. 4

Directivity for OmniPower Type 4292-L according to ISO 140: maximum deviation from mean for 'gliding' 30° arc. Upper and lower curves are the ISO 140 tolerances

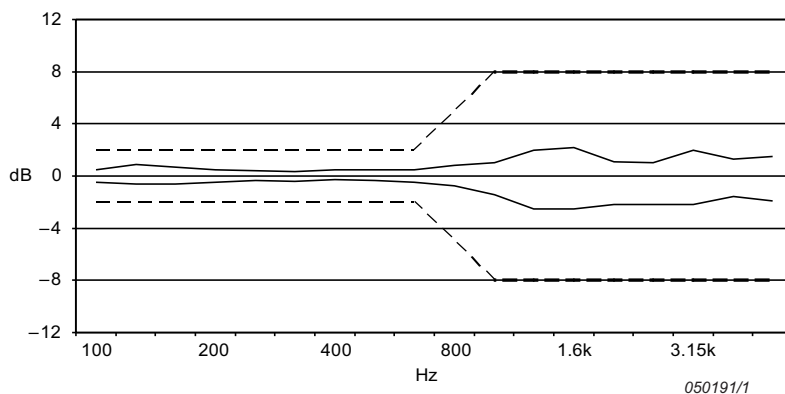


Fig. 5

Directivity for OmniPower Type 4292-L according to ISO 3382: maximum deviation from mean for 'gliding' 30° arc. Upper and lower curves are the ISO 3382 tolerances

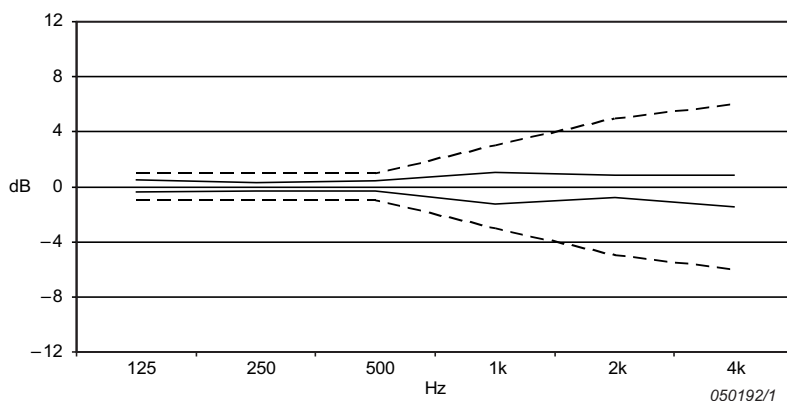
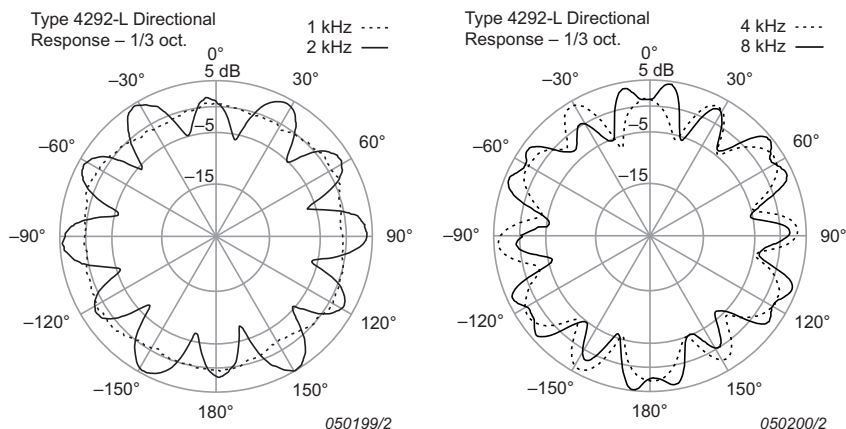


Fig. 6

Type 4292-L's directional response for the horizontal plane, measured in $1/3$ -octaves. Below 1 kHz there is no significant deviation from omnidirectionality



OmniSource Sound Source Type 4295

Fig. 7
OmniSource Sound
Source Type 4295



OmniSource Sound Source Type 4295 (see Fig. 7) presents a new solution to omnidirectional sound source design. Type 4295 is optimised for the measurement of room acoustic quantities such as reverberation time, sound distribution and spatial decay. The patented principle of the OmniSource Sound Source uses a single high-power loudspeaker, which directs the sound signal through a conical coupler to a circular orifice, and despite its compact dimensions and low weight, OmniSource Type 4295 is still capable of emitting a sound power of 105 dB re 1 pW (see Fig. 8 and Fig. 9).

The size of the orifice and the shape have been carefully engineered to radiate sound evenly in all directions. Thus, Type 4295 fulfils the national and international standards for omnidirectional sound sources (see Fig. 10 and Fig. 11). Type 4295's directional response for the plane through the axis is shown in Fig. 12.

Fig. 8
Maximum $1/3$ -octave
sound power levels
for OmniSource
Type 4295 using
Power Amplifier Type
2734

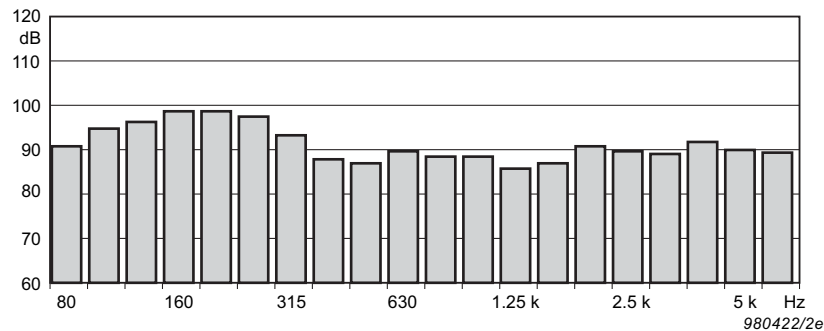


Fig. 9
Maximum $1/1$ -octave
sound power levels
for OmniSource
Type 4295 using
Power Amplifier Type
2734

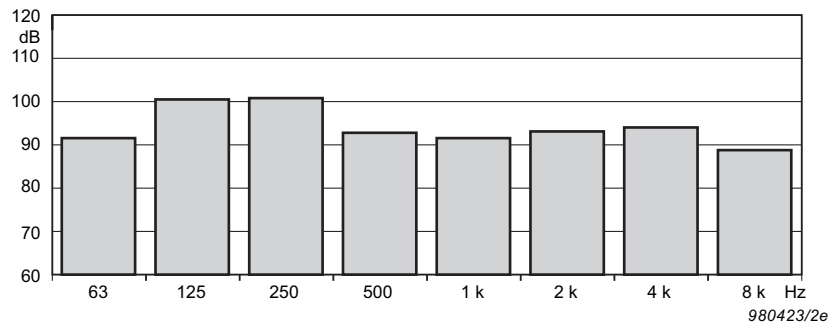


Fig. 10
Directivity for
OmniSource Type
4295 according to
ISO 140 maximum
deviation from mean
for 'gliding' 30° arc.
Upper and lower
curves are the
ISO tolerances

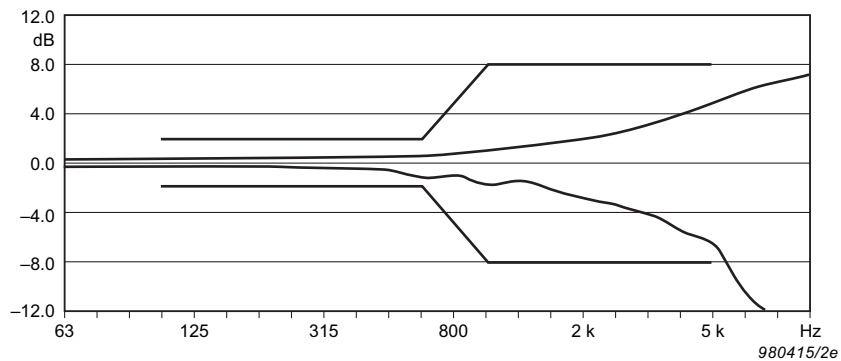


Fig. 11

Directivity for OmniSource Type 4295 according to ISO 3382: maximum deviation from mean for 'gliding' 30° arc. Upper and lower curves are the ISO tolerances

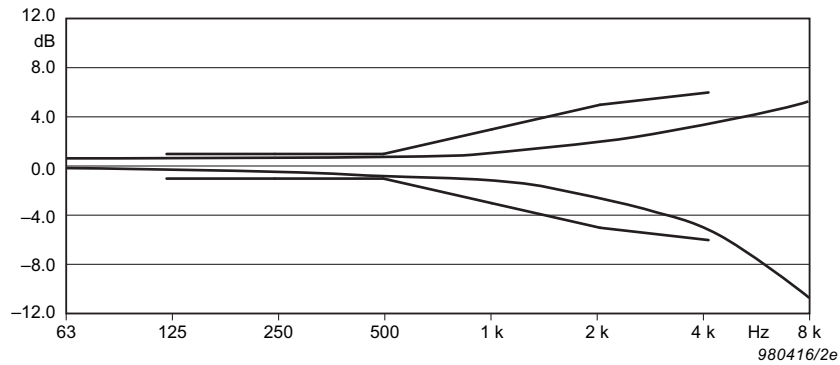
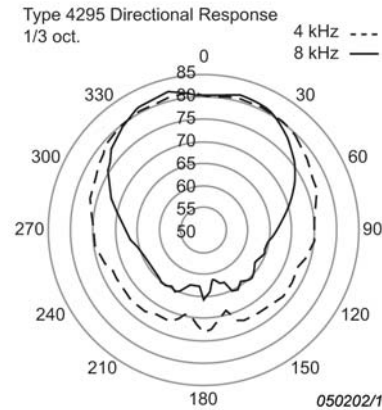
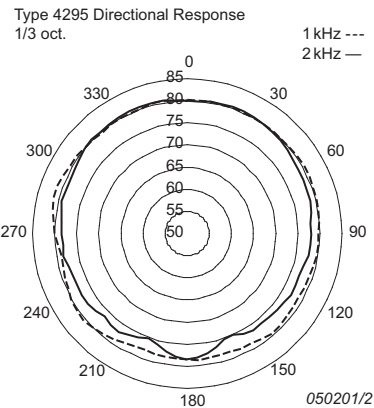


Fig. 12

Type 4295 directional response for the plane through the axis, measured in 1/3-octaves. Below 1 kHz and in the plane perpendicular to the axis, there is no significant deviation from omnidirectionality



Impact Sound Source

Tapping Machine Type 3207

Tapping Machine Type 3207 is an impact sound generator (see Fig. 13). It can be used for impact sound measurements to national and international standards. The unit is available with an optional battery kit and a remote control.

Type 3207 uses five hammers each weighing 500 g and operating at 2 Hz dropping from a height of 40 mm, giving an operating frequency of 10 Hz. This fulfils national and international standards. The hammers are operated via tappets on a single shaft. The shaft is driven by a DC motor via a toothed belt and gearbox.

Fig. 13

Tapping Machine
Type 3207



980417/1e

The unit is based around a welded aluminium chassis. Both size and weight have been minimised for easy transportation. Three extendable legs support the unit during operation with rubber feet that are height adjustable with supplied gauges. This gives stable and level mounting during operation in accordance with the relevant standards.

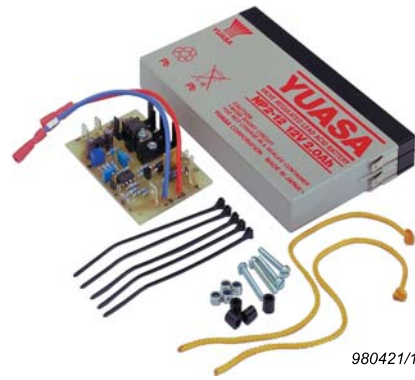
The unit is powered via the supplied mains adaptor or the optional battery kit (see Fig. 14), and can be remotely switched on and off via cable AQ-0633 or Wireless Remote Control Option UA-1476 (see Fig. 14).

Fig. 14

Accessories for
Tapping Machine.
Battery Kit
UA-1477 (right)
and Wireless
Remote Control
UA-1476 (left), which
may also be used to
control the internal
generator of Power
Amplifier Type 2734



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Power Amplifier Types 2734-A and 2734-B

Fig. 15

Top: Types 2734-A
and 2734-B are built
into robust flight cases

Middle: Type 2734-A
showing front mounted
controls and
connectors

Bottom: Type 2734-B
includes wireless audio
system UL-0256



Type 2734 is designed to power sound sources during building and room acoustic field measurements. Compact, light weight and built into a robust flight case, it is easy and safe to carry and transport to the measurement location. All connectors and controls are on the front for easy access.

It is simple to get the output level right and reproduce previous settings using the power amplifier's calibrator controls and level indicators. For flexibility, it has XLR, jack and BNC input sockets and BNC line and speaker output sockets. A sensitivity selector in 10 dB steps allows the amplifier to adapt to a variety of source signal levels and sound source ratings. Hand-held Analyzer Type 2250/2270's generator signal can be connected to the amplifier input, to provide the pink or white noise used in building acoustics.

In addition, Type 2734-B includes a wireless audio system (Fig. 23) to accommodate cable-free transmission of the building acoustics test signal, which could be white, pink or band-limited noise; or swept sine. Wireless operation also makes source and receiver position changes more convenient. Type 2734-A can be upgraded to Type 2734-B by installing optional Wireless Audio System UL-0256.

Type 2734 has a built-in generator providing pink or white noise in the 50–5000 Hz range. It can be controlled from the front panel, or with the optional Wireless Remote Control UA-1476 (the same control used to control Tapping Machine Type 3207, Fig. 14). Transmitter UA-1476 has a pushkey for manual control, and a cable connection for automatic control from an analyzer.

Carrying Case KE-0392

Fig. 16
Carrying Case
KE-0392



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OmniSource Sound Source Type 4295 has an optional, custom-designed carrying case with shoulder strap, KE-0392 (see Fig. 16), for easy storage and transportation. The case is foam lined and provides impact protection for the OmniSource inside.

Flight Case KE-0449

An optional transportation and storage case, KE-0449 is available for OmniPower Sound Source Type 4292-L (see Fig. 18, left). It is custom designed, features a foam lining to protect Type 4292-L and has two handles for ease of carriage.

Carrying Bag KE-0462

Carrying Bag KE-0462 is included with OmniPower Sound Source Type 4292-L. Padded and with handles as well as a shoulder strap, it offers basic protection (see Fig. 17).

Fig. 17
Carrying Bag KE-0462



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Carrying Case KE-0364

For the OmniPower tripod, Carrying Case KE-0364 (see Fig. 18, right) is equipped with both a shoulder strap and handles.

Fig. 18
Flight Case
KE-0449 (left)
and Carrying Case
KE-0364 (right)



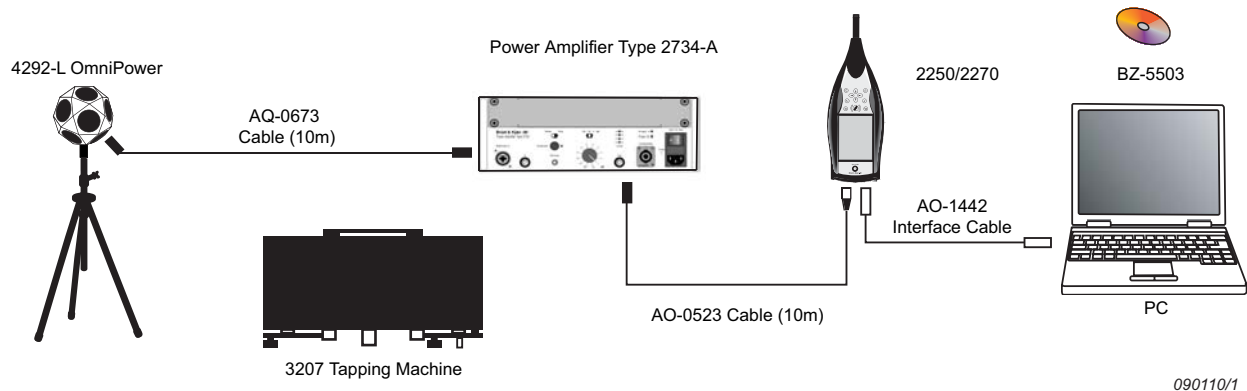
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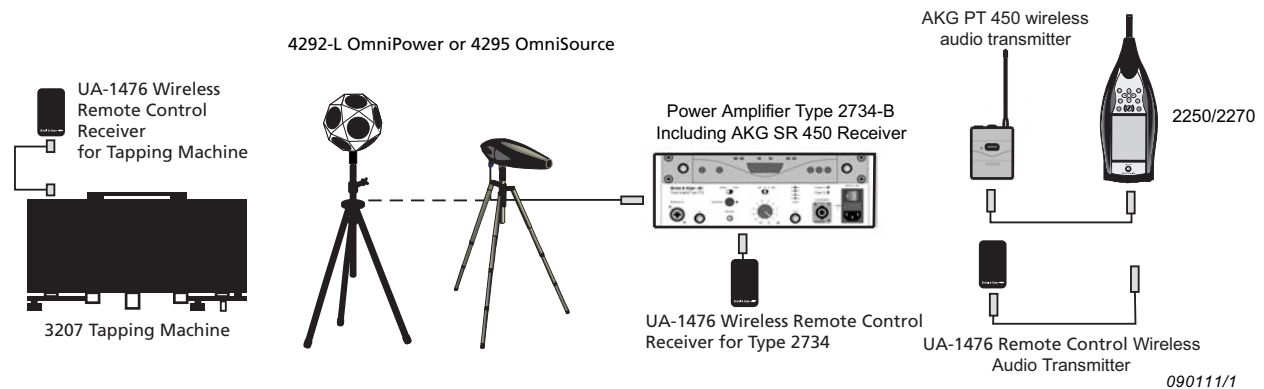
Complete Systems

Fig. 19 Complete system



The sound sources mentioned above belong to a range of complete measurement systems from Brüel & Kjær, including power amplifiers, sound-level analyzers, and PC-software for analysing documenting results.

Fig. 20 Sound sources with wireless remote control options



Hand-held Analyzer Types 2250 and 2270

Fig. 21
Hand-held Analyzer
Types 2250 and 2270



Types 2250 and 2270 are robust, hand-held instrument platforms designed to host a wide range of sound and vibration measurement applications. Their uses range from assessing environmental and workplace noise to industrial quality control and product development.

Easy to use, their robust, light and ergonomic design make them easy to grip, hold and operate with one hand. Their high-resolution colour touch screens show the instrument setup, status and data at a glance, and let you select what you want to see with the tap of a stylus. The “traffic light” indicator, positioned centrally on the push button panel, shows you the current measurement status, even from a distance.

The hand-held analyzers are built for the tough environment of field measurements. They will work reliably in rain, dust, heat, frost, day or night, and can be placed on a tripod.

For documentation, you can add spoken or written comments to your measurements, and make sound recordings during any of the measurements. (Note that sound recording requires Sound Recording Option BZ-7226.)

Type 2250 is a single-channel analyzer, while Type 2270 is dual-channel and has additional features such as a built-in camera allowing you to attach photos to your measurements and a LAN interface.

The high precision hand-held analyzers offer a wide range of optional software application modules, including prominent applications such as Reverberation Time Software and Building Acoustics Software.

Reverberation Time and Building Acoustics

Reverberation Time

Reverberation time is an important feature of spaces where sound level, the intelligibility of speech, or perception of music is important. It is the time that it takes for a sound to decay by 60 dB. Usually, the time taken for the signal to drop 20 or 30 dB is measured and extrapolated to find the time that it would take the signal to dissipate by 60 dB.

Fig. 22
Reverberation Time measurement – measured using the interrupted noise method

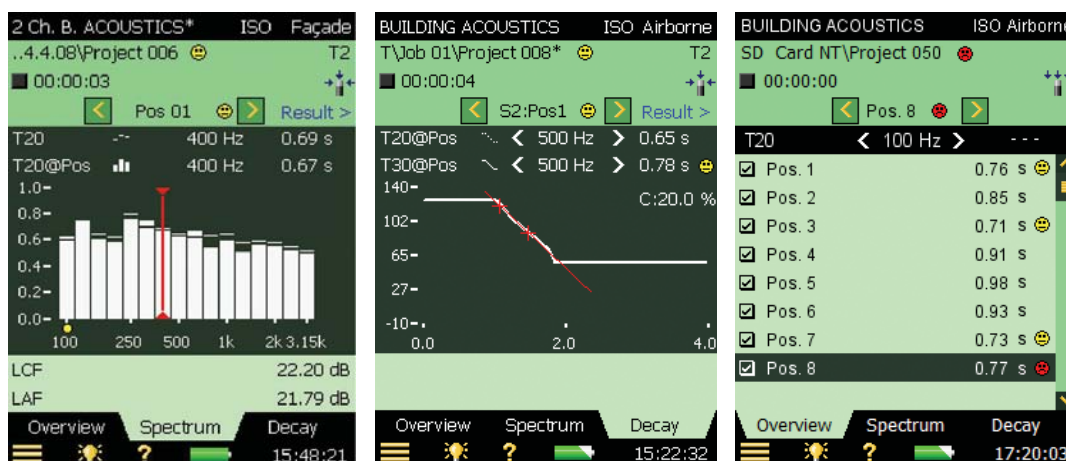


Reverberation time is measured, using an impulse or an interrupted noise, at several positions, which are then averaged together.

To measure reverberation time, simply press the Start/Pause push button on the hand-held analyzer and, if you are using impulse excitation, burst the balloon.

A yellow 'smiley' icon indicates that you may be able to improve the measurement at one (or more) frequency bands, a red smiley indicates that the measurement should be retaken. Tap the relevant smiley icon to read the explanation.

Fig. 23
Reverberation time spectrum (left); Reverberation decay curve (centre); and Overview of results (right)



Building Acoustics

Building acoustics is the assessment of airborne, façade or impact sound insulation in buildings. The assessment is based on measured 1/1-octave or 1/3-octave spectra within the 50–5000 Hz range. Measurements may be serial (one frequency band at a time) or parallel (all bands simultaneously).

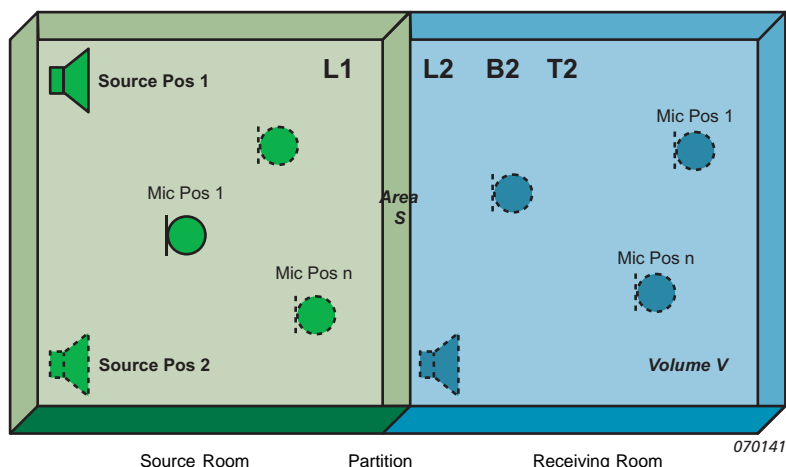
Airborne Sound Insulation

Fig. 24 shows a typical airborne task setup using a loudspeaker (emitting pink noise) and a number of microphone positions to measure the average source room spectrum L1, and the average receiving room spectrum L2. The average background noise spectrum B2 is measured to verify the true L2 spectrum. The average reverberation time spectrum T2 is measured, to correct for the amount of absorption in the receiving room. Finally the single number result (for example D_{nTW}) is calculated from the L1, L2, B2 and

T2 spectra, and the result can then be compared with the minimum requirements stated in the building regulations.

Fig. 24
Sound source and microphone positions for measuring airborne sound insulation

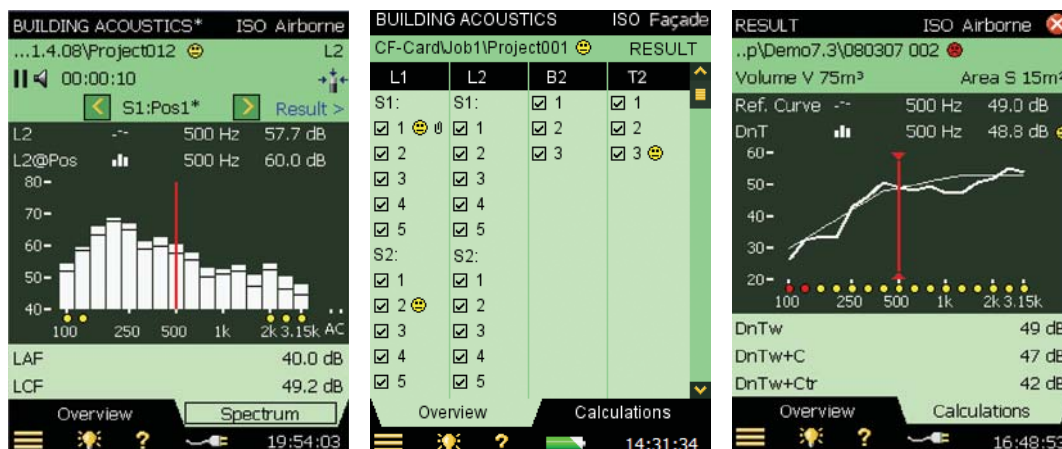
L1 = Source room level
L2 = Receiving room level
B2 = Background level
T2 = Reverberation Time



The sound level depends on the position in the rooms, so several microphone positions are used to measure the average of the source room level, L1, the average of the receiving room level L2 and the average of the background noise level B2. The average reverberation time T2 is also measured using several positions.

Examples of measurements and results are shown in Fig. 25.

Fig. 25
Examples of building acoustic measurements using Type 2250/2270: L2 average and L2 at one position (Left) Overview of measurements (Centre) Final result (Right)



Façade Sound Insulation

Façade sound insulation is a variant of airborne sound insulation, with its own standards. The “source room” is the space outside the façade, and the sound source may be road traffic or a loudspeaker representing outdoor noise. When using traffic noise, the indoor and outdoor sound levels must be measured simultaneously, requiring dual-channel measurements (Type 2270). The outdoor microphone positions are flush with the façade, or 2 m in front of it. Calculations are similar to those of airborne sound insulation, but take the pressure increase at the microphone positions into account.

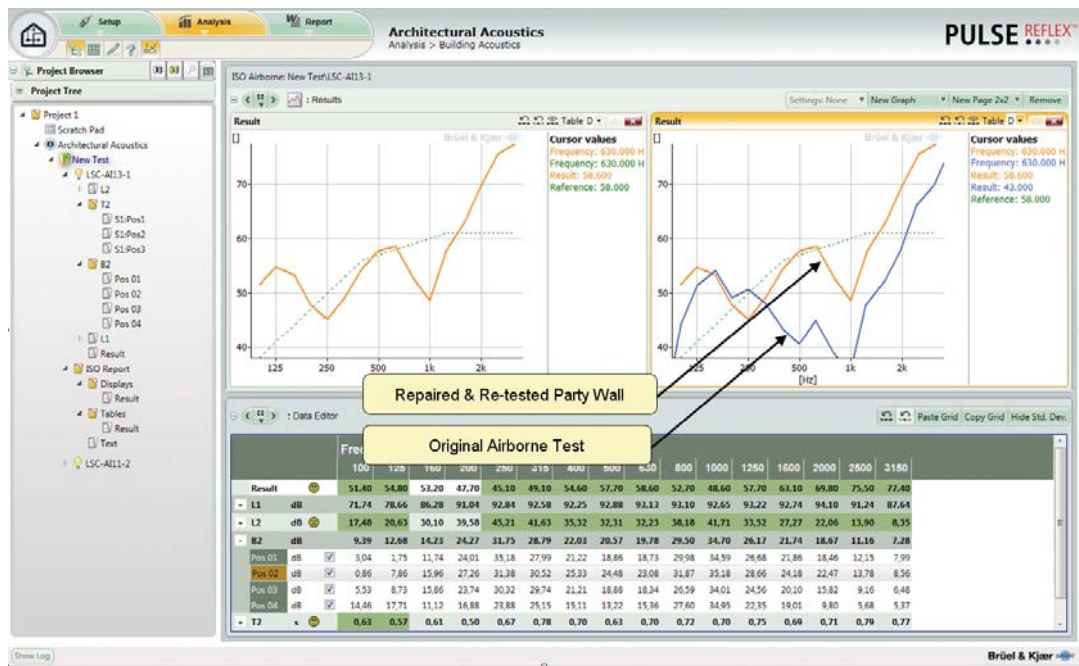
Impact Sound Insulation

Impact sound is typically caused by footsteps, and to measure impact sound insulation a standardised impact sound source (tapping machine) is placed in the source room. The receiving room levels are measured as for airborne sound insulation, with several positions of the tapping machine. Calculations are like those for airborne sound insulation, except the results represent absolute (not relative) levels.

PULSE Reflex™ Building Acoustics Type 8780

PULSE Reflex Building Acoustics Type 8780 is the software package for post-processing and reporting of building acoustics measurements made with Type 2250/2270. It is the first module in the PULSE Architectural Acoustics Suite, which will, in the future, provide a number of applications for all your needs. Measured data can be directly imported from Type 2250/2270 into Type 8780 for viewing, further analysis/re-analysis and reporting of data. In addition to being a post-processing tool, Type 8780 allows you to control Type 2250/2270 software upgrades and licensing of the Type 2250/2270 applications.

Fig. 26
Typical building acoustics project using Type 8780. Data are presented graphically and numerically with detailed data quality indications, using Type 2250/2270's smiley system



Compliance with Environmental Standards for Types 4292-L and 4295

Temperature	IEC 60068-2-1 & IEC 60068-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: +5 to +40°C (41 to 104°F) Storage Temperature: -25 to +70°C (-13 to 158°F) IEC 60068-2-14: Change of Temperature: -10 to +40°C (2 cycles, 1°C/min.)
Humidity	IEC 60068-2-78: Damp Heat: 93% RH (non-condensing at 40°C (104°F))
Mechanical	Non-operating: IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s ² , 10-500 Hz IEC 60068-2-27: Shock: 1000 m/s ² IEC 60068-2-29: Bump: 1000 bumps at 250 m/s ²

Specifications – OmniPower Sound Source Type 4292-L

STANDARDS

Conforms to the following:
ISO 140-3
ISO 3382
DIN 52210

NOMINAL IMPEDANCE

6 Ω

POWER HANDLING

300 W continuous broadband
1000 W short duration (duty cycle 1/10, on time 10 s)

OPERATING FREQUENCY RANGE

50 – 5000 Hz (1/3-octave band centre frequencies)

CONNECTION

Four-pin Neutrik® Speakon® socket, pins 1 + and 1 -

SOUND POWER LEVEL

(with Power Amplifier Type 2734, duty cycle 1/3,
100 – 3150 Hz pink-noise signal)

Broadband: 122 dB re 1 pW

Spectral: Min. 100 dB/1 pW in each 1/3-octave band

TRIPOD

Adjustable to give a speaker height of between 131 and 207 cm

FLOOR MOUNTING

Rubber feet provided for floor mounting

DIAMETER

Speaker Enclosure: 39 cm (15.35")

WEIGHT

Speaker Enclosure: 8.0 kg (17.6 lb.)

Tripod: 2.3 kg (5.1 lb.)

Specifications – OmniSource Sound Source Type 4295

STANDARDS

Conforms to the following:

ISO 140–3
ISO 3382
DIN 52210
ISO 14257 (Draft)

OPERATING FREQUENCY RANGE

80–6300 Hz

NOMINAL IMPEDANCE

6 Ω

POWER HANDLING

50 W continuous

SOUND POWER LEVEL

(with Power Amplifier Type 2734, 80–6300 Hz pink-noise signal)

Broadband: 105 dB re 1 pW

Spectral: Min. 85 dB in each 1/3-octave band

CONNECTION

Four-pin Neutrik® Speakon® socket, pins 1 + and 1 –

TRIPOD THREADS (LARGE TYPE)

One at rear end, one below centre of gravity

CARRYING CASE

Nylon with padded inlay, adjustable carrying strap


MECHANICAL SPECIFICATIONS

Material: Dense polyurethane plastic, painted black

Dimensions: $\varnothing 145 \times 560$ mm ($\varnothing 5.7 \times 22$ ")

Weight: 3.5 kg (7.7 lb.)

Compliance with Regulations and Environmental Standards for Type 3207

	CE-mark indicates compliance with: EMC Directive, Low Voltage Directive and Machinery Directive Remote Control UA-1476: CE-mark means compliance with R&TTE Directive C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand
Safety	EN/IEC 61010–1 and UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use
EMC Emission	EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light-industrial environments CISPR 22: Radio disturbance characteristics of information technology equipment. Class B limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device This ISM device complies with Canadian ICES–001
EMC Immunity	EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements Note: The above is only guaranteed using accessories listed in this Product Data Sheet.
Temperature	IEC 60068–2–1 & IEC 60068–2–2: Environmental testing. Cold and dry heat. Operating Temperature: 0 to +40°C (32 to 104°F) Storage Temperature: –25 to +70°C (–13 to 158°F)
Humidity	IEC 60068–2–78: Damp heat: 90% RH (non-condensing at 40°C (104°F))
Mechanical	Non-operating: IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s ² , 10–500 Hz IEC 60068–2–27: Shock: 500 m/s ² , 6 directions IEC 60068–2–29: Bump: 1000 bumps at 250 m/s ²
Enclosure	IEC 60529: Protection provided by enclosures: IP 20

Specifications – Tapping Machine Type 3207

STANDARDS

ISO 140
ISO 717
DIN 52210
BS 5821
ASTME 492

HAMMERS

Five in line, 100 mm between each hammer, single hammer weight
500 \pm 12 g

IMPACT FREQUENCY

Each hammer operates at 2 Hz, tapping frequency for unit is 10 \pm 0.5 Hz

IMPACT DYNAMICS

Equivalent free-fall height of hammers 40 mm, extra drop below impact plane at least 4 mm

REMOTE OPERATION

Socket: LEMO 4-pole

Pin 1: 0 V DC, GND

Pin 2: Power supply for external unit, max. 24 V DC, 1 A

Pin 3: For "On": +5 V DC (TTL-Level)

Pin 4: For "On": connect to Pin 1

Housing: Shield

REMOTE OPERATION WIRELESS CONTROL KIT UA-1476 (OPTIONAL)

Operating Frequency: 433.92 MHz

Transmitter Unit:

- Connector: LEMO-coaxial socket
- Centre pin: +5 V DC for "on"; Outer ring 0 V DC
- Batteries: 2 \times AAA/LR03/Micro 1.5 V
- Dimensions: 105 \times 58 \times 18.5 mm (4.13 \times 2.28 \times 0.73")
- Weight: 90 g

Receiver Unit

Connector: LEMO 4-pole plug with cable

For details of pin connections see "Remote Operation"

- Power supply: From the remote control socket
- Dimensions: 85 × 46 × 16 mm (3.35 × 1.81 × 0.63")
- Weight: 80 g

BATTERY KIT UA-1477 (OPTIONAL)**Mounting Position:** Internally in unit housing**Battery Life:** 1.5 hours**Battery Type:** Maintenance free 12 V/2 Ah Lead Acid battery**Charger Type:** Same as Mains Adaptor (see below)**Charging Time:** 24 hours for a completely discharged battery**ON/OFF SWITCH****3 Positions:** Remote, Off, On**MAINS ADAPTOR**

10.5–35 V DC, min. 25 W

Socket: LEMO coaxial (can also be used as charging socket)**Middle Pin:** +10.5–35 V DC, Outer ring: 0 V**Mains Adaptor:** Mains Adaptor ZG-0400

100–240 V AC input, 24 V DC output, max. 45 W

Operating temperature max. +40° C

Can also be used to charge optional battery pack


SUPPORTS

3 extendable and height adjustable feet

DIMENSIONS**W × H × D:** 480 × 273 × 155 mm (18.9 × 10.7 × 6.1")
(feet retracted)**W × H × D:** 590 × 273 × 285 mm (23.2 × 10.7 × 11.2")
(feet extended)**Weight:** 11.5 kg (25 lb.) with Mains Adaptor**MAINTENANCE REQUIREMENTS**

After 24 hr operation or once a year (whichever comes first), lubricate with the supplied sewing machine oil according to instructions

Compliance with Regulations and Environmental Standards for Type 2734

	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand
Safety	EN/IEC 61010–1 and ANSI/UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use.
EMC Emission	EN/IEC 61000–6–4: Generic emission standard for industrial environments. CISPR 22: Radio disturbance characteristics of information technology equipment. Class A Limits. FCC Rules, Part 15: Complies with the limits for a Class A digital device
EMC Immunity	EN/IEC 61000–6–1: Generic standards - Immunity for residential, commercial and light-industrial environments. EN/IEC 61000–6–2: Generic standards - Immunity for industrial environments. EN/IEC 61326–1: Electrical equipment for measurement, control and laboratory use – EMC requirements Note 1: The above is only guaranteed using accessories included in this Product Data.
Temperature	IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat. Operating Temperature: 0 to +50°C (32 to 122°F) Storage Temperature: 0 to +70°C (32 to 158°F)
Humidity	IEC 60068–2–78: Damp Heat: 90% RH (non-condensing at 40°C (104°F))
Mechanical	Non-operating: IEC 60068–2–6: Vibration: 2 g _{rms} 3 x 20 minutes IEC 60068–2–27: Bump: 1000 bumps at 10 g, 6 directions IEC 60068–2–27: Shock: 70 g, 6 directions
Enclosure	IEC 60529 (1989): Protection provided by enclosures: IP 20

Specifications – Power Amplifier Types 2734-A and 2734-B**MAXIMUM OUTPUT POWER**

(TA = 25 °C, 1 kHz, 0.1% THD)

4 Ω: 500 W

6 Ω: 330 W

8 Ω: 250 W

CONTINUOUS OUTPUT POWER (1 kHz, 6 Ω)**With Air Filter:** TA = 25 °C: 250 W**Without Air Filter:**

– TA = 25 °C: 330 W

– TA = 35 °C: 175 W

INPUT VOLTAGE**Nominal voltage @ Sensitivity =**

0 dB: 0.3 V

–10 dB: 1 V

–20 dB: 3 V

Headroom at nominal input voltage

Balanced: 18 dB**Unbalanced @ Sensitivity =**

0 dB: 17 dB

–10 dB: 15 dB

–20 dB: 12 dB

Common Mode Rejection (1 kHz): > 50 dB**Maximum DC Voltage:** ±25 V**INPUT IMPEDANCE****1 kHz:**

– Balanced: 20 kΩ ±1%

– Unbalanced: 10 kΩ ±1%

DC:

– Balanced: 220 kΩ ±1%

– Unbalanced: 110 kΩ ±1%

OUTPUT VOLTAGE**Line Output Peak Voltage:** 9 V**Power Output Peak Voltage:** 80 V**Power Output DC Voltage:** 40 V

OUTPUT IMPEDANCE (1 kHz)

Line Output: 100 Ω

Line Output Load: $\geq 0 \Omega$

Power Output: 10 mW

Power Output Load: $\geq 2 \Omega$

FREQUENCY RESPONSE (20 Hz – 20 kHz)

Line Output: +0, -1 dB

Power Output: ± 1 dB

See also figure 1 below

SNR (MAX POWER 1 kHz)/(SILENCE 0...20 kHz)

Line Output: 101 dB

Power Output: 90 dB

THD+N (20 Hz – 20 kHz)

Line Output: 1 kHz: < -78 dB

Power Output: 1 – 500 W, 4 Ω : < -60 dB

SENSITIVITY, ATTENUATION AND GAIN

Sensitivity: -20, -10, 0 dB

Sensitivity Error (no error @ 0 dB): ± 0.1 dB

Attenuation: -30, -24, -18, -12, -9, -6, -5, -4, -3, -2, -1, 0 dB

Attenuation Error (no error @ 0 dB): ± 0.1 dB

Total Gain (Sensitivity = Attenuation = 0 dB):

– Any Input to Line Output: 16 ± 0.2 dB

– Any Input to Power Output: 43.1 ± 0.4 dB

LEVEL INDICATOR

Trigger levels re power output clip level

Red LED: +3 dB

Yellow LED: 0 dB (Power Output clip indicator)

Green LED: -6 dB

Blue LED: -30 dB (Signal Present indicator)

FAN

Switch On Heatsink Temperature: 40 °C

L_w at Min Speed: 25 dB re 1 pW

L_w at Max Speed: 52 dB re 1 pW

NOISE GENERATOR

Noise Types: white, pink

Frequency Range: 50 – 5000 Hz 1/3 octave bands

Crest Factor: 12 dB

Period Time: 22.5 s

Third Octave Spectral Error: ± 0.3 dB

Line Output Voltage (Sensitivity = Attenuation = 0 dB): 2.16 V_{rms}

Switch Off: Equivalent RT in 1/3 octaves: <50 ms @ 50 Hz, <4 ms @ 5 kHz

CONNECTORS

Balanced Input Socket: Neutrik® Combo XLR-type: 3-pin and 1/4" jack

Unbalanced Input Socket: BNC

Unbalanced Line Output Socket: BNC

Power (Speaker) Output Socket: Neutrik® 4-pole Speakon® type

Mains Power Inlet: IEC type

CONTROLS

Generator Button: Toggling between On and Off

Generator Slide Switch: 2-state, White/Pink noise Sensitivity slide switch: 3-state, -20, -10, 0 dB

Attenuation Rotary Knob: 12-state, -30, -24, -18, -12, -9, -6, -5, -4, -3, -2, -1, 0 dB

Mains Power Rocker Switch: 2-pole

STATUS INDICATORS

Protect Indicator: Red LED, power output over-current, overheat, overload or long-term high frequency

Power On Indicator: Green LED

MAINS POWER

Voltage Selector (Rear Panel): 230/115 V

Mains Voltage Range:

– @ 230 V: 200 - 240 V

– @ 115 V: 100 - 125 V

Mains Frequency Range: 45 – 65 Hz

Fuse: Wickmann/Littlefuse series 215 (or 181)

– @ 230 V: T 3.15 AH 250 V

– @ 115 V: T 6.3 AH 125 V

Maximum Power Consumption: 650 W

MECHANICAL

Weight (including mains cord in lid):

– Type 2734-A: 6.0 kg

– Type 2734-B: 7.0 kg

Dimensions W × H × D: 330 × 130 × 310 mm (13 × 5.1 × 12 ")

TRANSMITTER AKG PT 450 (OPTIONAL)

Specifications from manufacturer's technical data

Rf Carrier Frequency Ranges: 7 channels over 650 – 865 MHz

Modulation: FM

Audio Bandwidth: 35 to 20000 Hz

THD (typical at rated deviation/1 kHz): <0.7%

S/N Ratio: 120 dB(A)

RF Output: 50 mW max. (ERP)

Battery Life:

1.5 V AA Dry Battery: 6 hours; 1.2 V NiMH, 2100 mAh AA size

Rechargeable Battery: 8 hrs

– Size: 60 × 73.5 × 30 mm (2.4 × 2.9 × 1.2")

– Net weight: 90 g (3.2 oz.)

RECEIVER AKG SR 450 (OPTIONAL)

Specifications from manufacturer's technical data

RF Carrier Frequency Ranges: 7 channels over 650 – 865 MHz

Modulation: FM

Audio Bandwidth: 35 to 20000 Hz

THD at 1 kHz: <0.3%

S/N Ratio: 120 dB(A)

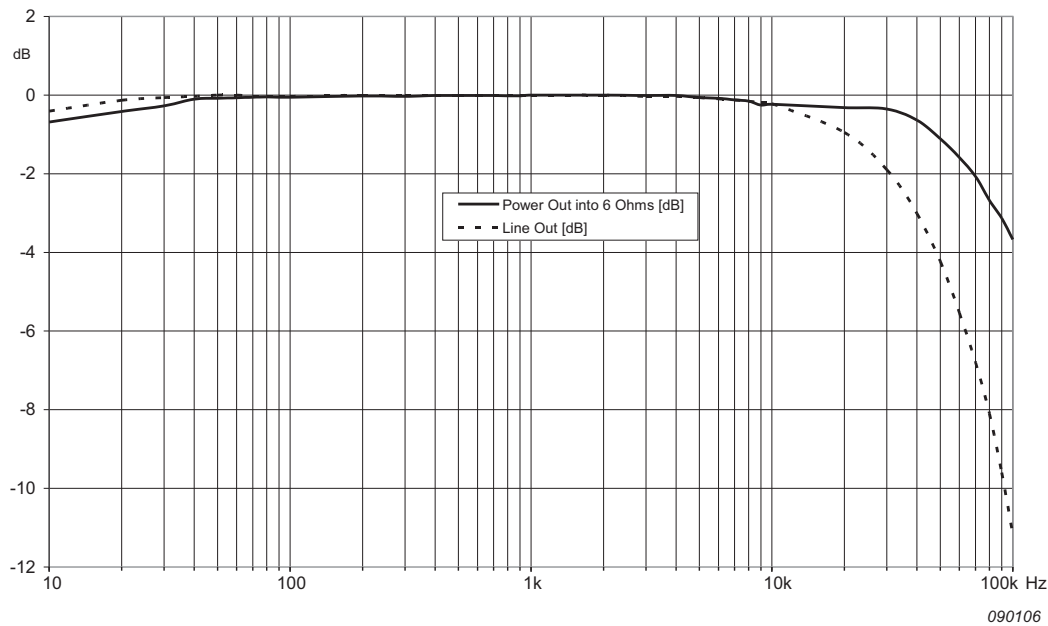
Audio Outputs: Balanced XLR and unbalanced TS 1/4" jack, balanced level switchable to -30 or 0 dBm

MECHANICAL

Dimensions: 200 × 44 × 190 mm (7.8 × 1.7 × 7.4")

Weight: 972 g (2.2 lbs)

Fig. 26 Frequency Responses measured at a 0 dB output power of 300 W into 6Ω up to 20 kHz and of 20 W up from 20 kHz



Ordering Information

Type 4292-L	OmniPower Sound Source
Type 4295	OmniSource Sound Source
Type 3207	Tapping Machine

Included Accessories

ACCESSORIES INCLUDED WITH TYPE 4292-L

KE-0462	Carrying Bag for Type 4292-L
UA-1690	Tripod

ACCESSORIES INCLUDED WITH TYPE 3207

ZG-0429	Mains adaptor (mains cable country dependent)
	2 Gauges for drop height adjustment
	Oil canister for maintenance

Optional Accessories

OPTIONAL ACCESSORIES

Type 2734-A	Power Amplifier
Type 2734-B	Power Amplifier with built-in UL-0256 Wireless Audio System
UL-0256	Wireless Audio System
KE-0392	Carrying Case for Type 4295
KE-0449	Flight Case for Type 4292-L
KE-0364	Carrying Case for Type 4292 Tripod (UA-1690)
UA-0801	Lightweight Tripod
AO-0523	Signal cable from Hand-held analyzer to Power Amplifier, 10 m (32.8 ft)
AO-0524	Signal cable from Hand-held Analyzer to BNC, 10 m (32.8 ft)
AQ-0673	Speaker cable from Type 2734 to Types 4292, 4295 or equivalent, 10 m (32.8 ft)
Type 2250-F	Hand-held Analyzer Type 2250 with Sound Level Meter Software BZ-7222 and Reverberation Time Software BZ-7227
Type 2270-F	Hand-held Analyzer Type 2270 with Sound Level Meter Software BZ-7222 and Reverberation Time Software BZ-7227
Type 2250-J	Hand-held Analyzer Type 2250 with Sound Level Meter Software BZ-7222 and Building Acoustics Software BZ-7228

Type 2270-J	Hand-held Analyzer Type 2270 with Sound Level Meter Software BZ-7222 and Building Acoustics Software BZ-7228
Type 2270-K	Hand-held Analyzer Type 2270 with Sound Level Meter Software BZ-7222 and Dual-channel Building Acoustics Software BZ-7229
Type 2250-J-001	Building Acoustics System including Type 2250-J, OmniPower Sound Source Type 4292 and Power Amplifier Type 2734-A
Type 2270-J-001	Building Acoustics System including Type 2270-J, OmniPower Sound Source Type 4292 and Power Amplifier Type 2734-A
Type 2270-K-001	Dual-channel Building Acoustics System including Type 2270-K, OmniPower Sound Source Type 4292 and Power Amplifier Type 2734-A
BZ-7228-200	Building Acoustics Kit as per Type 2250-J-001, or Type 2270-J-001, excluding Hand-held Analyzer (for Types 2250 and 2270 users intending to upgrade to a full Building Acoustics measurement system)
BZ-7229-200	Dual-channel Building Acoustics Kit as per Type 2270-K-001, excluding Type 2270 (for Type 2270 users intending to upgrade to a full Dual-channel Building Acoustics measurement system)
Type 8780	PULSE Reflex Building Acoustics Software
Type 7830	Qualifier PC Software for Building Acoustics reporting
Type 7831	Qualifier Light PC Software for reverberation time reporting

Go to www.bksv.com for more information on [Types 2250 and 2270](#) and Brüel & Kjær's [Building Acoustics](#) applications.

OPTIONAL ACCESSORIES FOR TYPE 3207

AQ-0633	Remote Cable connecting Type 2260 Investigator to Type 3207, 10 m (32.8 ft)
UA-1476	Wireless Remote Control (includes AO-1439 Cable for Hand-held Analyzer Types 2250 and 2270)
UA-1477	Battery Kit
QB-0055	Replacement battery

TRADEMARKS

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