B&K 2245 Sound Level Meter with Exhaust Noise Partner

B&K 2245 Sound Level Meter with Exhaust Noise Partner is a complete solution for exhaust noise level measurements.

Whether you are a complete novice, occasional user or an acoustics specialist – sometimes all you need is a simple sound level meter – one that provides you with reliable, accurate results without all the fuss. That is what B&K 2245 delivers.

This robust, class 1 sound level meter puts functionality, ease-of-use and versatility into the palm of your hand together with the reliability and confidence that is ensured with the Brüel & Kjær brand.

190053

Uses and Features

Uses

- Stationary exhaust noise measurements at vehicle inspection garages/stations
- On-the-spot vehicle inspections by police and transport authorities

Features

- Single measurement range: 15.8 – 140.9 dB(A) from noise floor to maximum level
- Frequency range: 6 Hz – 20 kHz
- 16 GB internal storage
- Wireless remote measurement control from driver's seat
- Lockable measurement settings
- Measurement annotation using photos, audio, text or video
- Robust design for both indoor and outdoor measurements
- Simplified user interface using either the sound level meter or your iOS mobile device
- Automatic measurement transfer to network or USB storage media for backup and analysis
- PC software for data storage, viewing and reporting
- Calibrator auto-detection
- Windscreen auto-detection and compensation

Brüel & Kjær

A Complete Solution

B&K 2245 Sound Level Meter is a complete package solution that is designed with your specific needs in mind. Each purpose-built package includes:

- An ergonomically designed instrument for effortless usability, with a dust- and water-resistant body that is rubberized for a secure grip and ensured compliance to IP 55
- Apps for both mobile measurement control, display and data transfer, and a PC-based application for analysis and documentation

While the instrument can be used as a stand-alone noise measurement device, together with its specially-created mobile and PC apps, B&K 2245 brings an entirely new level of efficiency and control to the market. Accurate noise measurement, analysis and documentation has never been so streamlined and simple.

Hassle-free Licencing

B&K 2245 licences are installed in the instrument, enabling measurement functions on the instrument and administering connections to licenced mobile apps and post-processing in the PC apps.

This means there are no licence files to install on the PC, and no dongles. Mobile and desktop apps can be freely downloaded and installed on any supported iOS mobile device and PC, and measurements made with the instrument can be easily and seamlessly edited by the desktop app on a PC without extra requirements.

Fig. 1 *The complete solution: B&K 2245 Sound Level Meter and the Noise Partner app installed on a mobile device and PC*

190054

The Exhaust Noise Partner App

The Exhaust Noise Partner licence comes tailored for exhaust noise level testing, with an intuitive app for your mobile device and the exact parameters you need for the job.

When the app is installed on your mobile device, you can confidently control B&K 2245 remotely to make measurements from the driver's seat (so only one person is needed per test), with photo embedding tools for easy vehicle reference.

Fig. 2 *Control, view and annotate measurements directly from your mobile device*

Quickly confirm connection to the instrument

View the measured level

Start, stop, pause and annotate the measurement

190055

Transfer Data for Analysis

When you are done measuring, you can quickly and securely transfer data to your PC. All data is stored in the instrument, which can be set up to automatically transfer data whenever it connects to your local network.

The Noise Partner PC software, which is simple to install and use with preconfigured, user-friendly tools for presenting and sharing results, organizes the data intuitively, ready for further analysis and reporting.

Job done.
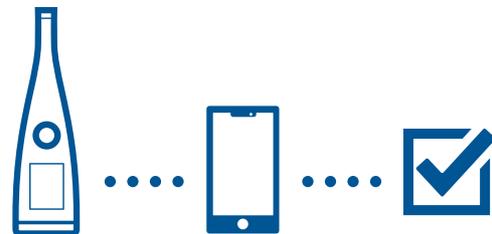
Compliance with Standards

NOTE: Below is only guaranteed using accessories listed in this document

CE ℞ ⑤ 🗑 FC	The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives. For this product it is the Radio Equipment Directive 2014/53/EU. RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME. China RoHS mark indicates all items shipped to China have to be marked as to whether the items are compliant or non-compliant with the Chinese restriction of hazardous substances. WEEE mark indicates compliance with the EU WEEE Directive. FCC mark is a certification mark employed on electronic products manufactured or sold in the United States, which certifies that the electromagnetic interference from the device is under limits approved by the Federal Communications Commission
Electrical Safety	EN/IEC 61010-1, ANSI/UL 61010-1 and CSA C22.2 No.1010.1: Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements CB Scheme: • Battery: EN/IEC 62133-2:2017: Secondary cells and batteries containing alkaline or other non-acid electrolytes. Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems
Radio Spectrum	ETSI EN 300 328 V2.1.1: Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU. EN 303 413 V1.1.1: Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1164 – 1300 MHz and 1559 – 1610 MHz frequency bands
EMC Emission and Immunity	EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. EN/IEC 61000-6-2: Generic standard – Immunity for industrial environments. EN/IEC 61000-6-3: Generic emission standard for residential, commercial and light industrial environments, class B. CISPR 32: Radio disturbance characteristics of multimedia equipment. Class B limits. EN 301 489-1 V2.2.0: Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. EN 301 489-17 V3.2.0: Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for broadband data transmission systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU. EN 301 489-19 V2.1.0: For radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1.5 GHz band providing data communications and GNSS Receivers Operating in the RNSS band (ROGNSS) providing positioning, navigation, and timing data. 47 CFR FCC Part 15, subpart B
Product-specific Standards (incl. EMC)	EN/IEC 61672-1:2013: Electroacoustics – Sound level meters – Part 1: Specifications EN/IEC 61260-1:2014: Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications
Specific Absorption Rate (SAR)	RED (Europe): • 1999/519/EC: Council recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz – 300 GHz) • EN 62311: General radio frequency (RF) exposure standard that effectively refers to specific absorption rate (SAR) standards for devices where other assessment methods are not relevant • IEC 62209-2: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz) FCC (US): • FCC CFR 2.1093: Radio frequency radiation exposure evaluation: Portable devices • KDB 447498 D01: General RF exposure guidance • KDB 865664 D01: SAR measurement 100 MHz – 6 GHz • KDB 248227 D01: SAR guidance for IEEE 802.11 (Wi-Fi) transmitters • IEEE standard 1528 IEEE: Recommended practice for determining the peak spatial-average Specific Absorption Rate (SAR) in the human head from wireless communications devices: measurement techniques ISED (Canada): • RSS-102: Radio frequency (RF) exposure compliance of radio communication apparatus
Temperature	IEC 60068-2-1 & IEC 60068-2-2: Environmental Testing. Cold and Dry Heat • Storage Temperature: −25 to +70 °C (−13 to +158 °F)
Humidity	IEC 60068-2-78: Damp Heat: 93% RH (non-condensing at +40 °C (104 °F)). Recovery time 2 – 4 hours
Mechanical	Non-operating: • IEC 60068-2-6: Vibration: 0.15 mm, 20 m/s^2, 10 – 500 Hz • IEC 60068-2-27: Bump: 4000 bumps at 400 m/s^2 • IEC 60068-2-27: Shock: 1000 m/s^2, 5 directions • EN 60068-2-32: Free fall: 100 cm, 10 directions
Enclosure	EN/IEC 60529 (1989): Protection provided by enclosures: IP 55

Specifications – B&K 2245 Sound Level Meter with Exhaust Noise Partner BZ-7304

The following specifications are specifically for use of B&K 2245 with Exhaust Noise Partner licence. For general specifications of the sound level meter, see product data BP 0029.

System Requirements for Apps

PC OPERATING SYSTEM	Windows® 7 (SP1), 8.1 or 10 (64-bit)
PC FRAMEWORK[*]	Microsoft® .NET 4.7.2
MOBILE DEVICE	iOS-based phone or tablet
iOS	See supported iOS versions for current app version in the App Store, under **Noise Partner** > **Information** > **Compatibility**

[*] The software will check if pre-installed. If it is not, it will start auto-installation. Accept the installation to run the app.

Recommended PC for PC App

Intel® Core™ i5 or better	8 GB of memory
Sound card	At least one available USB port
Solid State Drive	Microsoft Office 2016 (32-bit) or later

Standards

NOTE: The international IEC standards are adopted as European standards by CENELEC. When this happens, the letters IEC are replaced with EN and the number is retained. The sound level meter also conforms to these EN standards

The sound level meter part of B&K 2245 conforms to the following national and international standards and classes/types/groups with the standard accessories and configurations:

IEC – INTERNATIONAL ELECTROTECHNICAL COMMISSION (Commission électrotechnique internationale)	IEC 61672-1:2002-05 class 1, group X/Z
	IEC 61672-1 (2013) class 1, group X/Z
	IEC 60651 (1979) plus Amendment 1 (1993-02) and Amendment 2 (2000-10), type 1, group X/Z
	IEC 60804 (2000-10), type 1, group X/Z
	PTB approved: Certificate No. DE-20-M-PTB-0026
DIN – DEUTSCHES INSTITUT FÜR NORMUNG E.V. (the German Institute for Standardization)	DIN 45657 (1997-07)
ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE	ANSI S1.4-1983 plus ANSI S1.4A-1985 Amendment, type 1
	ANSI/ASA S1.4−2014, class 1
	ANSI S1.43−1997, type 1

Physical

START-UP TIME	From power off: <30 s
DUST AND WATER RESISTANCE	In compliance with IP 55. When exposed to heavy rainfall, water may pass through the static pressure vent between the microphone and preamplifier. The instrument will not be damaged by water that has passed through the vent, but measurement operation will be disturbed until the microphone and preamplifier are dry

Analysis

DETECTORS
Broadband frequency weighting A with F, S and I exponential time weighting

Overload Detector	Monitors the overload outputs

MEASUREMENT PARAMETERS

Sound Input for Display and Storage	L_{AFmax}	L_{ASmax}	L_{AFmin}	L_{ASmin}
Sound Input Only for Display as Numbers or Quasi-analog Bars	L_{AF}	L_{AS}	$L_{AF(SPL)}$	$L_{AS(SPL)}$

MEASURING RANGES
With Microphone Type 4966

Dynamic Range	From typical noise floor to max. level for a 1 kHz pure tone signal): A-weighted: 15.8 to 140.9 dB
Primary Indicator Range	In accordance with IEC 60651: A-weighted: 21.5 dB to 123.6 dB
Linearity Range	In accordance with IEC 60804: A-weighted: 19.4 dB to 142.1 dB
Linear Operating Range	In accordance with IEC 61672: A-weighted: 1 kHz: 22.8 dB to 140.9 dB

Displays on Instrument

SLM VIEW	One quasi-analogue instantaneous bar and one broadband value
ABOUT DATA VIEW	Latitude, longitude, microphone used, microphone sensitivity, calibrated date, time zone, software version and hardware version for current measurement

Displays on Mobile App

MEASUREMENT DATA	Displayed as numbers of various sizes and one quasi-analogue bar
MEASURED SOUND DATA	Displayed as dB values
INSTANTANEOUS MEASUREMENT L_{AF} OR L_{AS}	Displayed as a quasi-analogue bar and dB values

Software Interface

PREFERENCES	Date, time and number formats can be specified
LANGUAGE	User interface in Catalan, Czech, Danish, Dutch, English, French, German, Italian, Japanese, Portuguese, Romanian, Slovenian, Slovakian and Spanish
HELP	On app: Concise context-sensitive help in English, French, German, Italian and Spanish
UPDATE OF SOFTWARE	Update to latest version using Internet*
REMOTE ACCESS	Connect to the instrument using: • Noise Partner BZ-7300 • Other optional apps also available – see Ordering Information Remote display (non-interactive) via internal web server

* For WELMEC type-approved instruments, updates must be performed at a Brüel & Kjær service centre.

Input

CORRECTION FILTERS
The software is able to correct the frequency response to compensate for sound field and accessories

Sound Field	Free-field or diffuse-field for Type 4966
Accessories	Windscreen UA-1650 (automatically detected)

Calibration

Initial calibration is stored for comparison with later calibrations

ACOUSTIC	Using Sound Calibrator Type 4231 or custom calibrator. The calibration process automatically detects the calibration level when Sound Calibrator Type 4231 is used
CALIBRATION HISTORY	Calibrations and calibration checks are listed and can be viewed on the instrument

Data Management

MEASUREMENT DATA	Measurements are automatically stored on measurement stop. Data is stored in folders by date, with individual measurements numbered sequentially
ANNOTATION DATA	Annotations (photos, videos, text and voice notes) made using the mobile app are embedded into measurement data and stored on the instrument
DATA RETENTION	The instrument can be configured to automatically move data to trash after a user-defined retention period

BACKUP	Measurement and annotation data can be automatically backed up to a USB stick or server message block (SMB) network share
INTERNAL DISK CAPACITY	The internal disk can hold up to 600,000 single measurements with just one broadband parameter, or up to 330,000 single measurements with all broadband parameters, including statistics and five 1/3-octave spectra. The internal disk can hold 35 years logging of a single parameter with 1 s intervals, or 300 days logging of all broadband parameters, including statistics and five 1/3-octave spectra with 1 s intervals, or 23 days when audio recording is stored too

Measurement Control

FREE SETTING	Manually controlled single measurement
PRESET SETTING	Preset measurement time from 1 second to 31 days in 1 s steps (exactly 31 days, 23 hours, 59 minutes and 59 seconds, that is 31.23.59.59)
MANUAL CONTROLS	Start, Pause, Continue and Stop the measurement manually
BACK-ERASE	The last 1 to 10 s of data can be erased without resetting the measurement

Measurement Status

ON SCREEN	Information such as overload and running/ paused are displayed on screen as icons	
MEASUREMENT STATUS LIGHT RING RGB light ring shows the measurement status and instantaneous overload as follows	Green on constantly:	Measuring
	Yellow flashing every 5 s:	Stopped, ready to measure
	Yellow flashing slowly:	Paused, measurement not stored
	Red flashing quickly:	Intermittent overload, calibration failed
	Purple on constantly:	Latched overload
	White flashing slowly:	Instrument off and charging
	Blue flashing quickly:	Pairing with mobile device

Type 2245-X-L   **B&K 2245 Sound Level Meter with Exhaust Noise Partner Software**

which includes the following in a hard-shell transport case (KE-1034):
- B&K 2245 Sound Level Meter
- BZ-7304-N: Exhaust Noise Partner
- Type 4966: ½″ Free-field Microphone
- ZG-0486: Mains Power Supply
- AO-0821-D-010: USB 3, USB C to USB A Cable (1.0 m/3.3 ft)
- UA-1650: 90 mm dia. Windscreen with AutoDetect
- DH-0819: Wrist Strap, for sound level meter

Type 2245-X-LC   **B&K 2245 Sound Level Meter with Exhaust Noise Partner Software and Sound Calibrator Type 4231**

which includes the following in a hard-shell transport case (KE-1034):
- B&K 2245 Sound Level Meter
- BZ-7304-N: Exhaust Noise Partner
- Type 4966: ½″ Free-field Microphone
- Type 4231: Sound Calibrator
- ZG-0486: Mains Power Supply
- AO-0821-D-010: USB 3, USB C to USB A Cable (1.0 m/3.3 ft)
- UA-1650: 90 mm dia. Windscreen with AutoDetect
- DH-0819: Wrist Strap, for sound level meter

Firmware Variants

B&K 2245 has three firmware variants. In countries where a WELMEC-compliant instrument is required for legal metrology (currently Germany and Spain), the WELMEC firmware variant for that country should be selected. For all others who require a type-approved SLM, the standard variant should be suitable

FW-2245-000   **General type-approved firmware (standard)**
FW-2245-001   **WELMEC type-approved firmware, Germany**
FW-2245-002   **WELMEC type-approved firmware, Spain**

For more information on B&K 2245 firmware variants and versions, go to www.bksv.com/2245-updates.

Supported Brüel & Kjær Products and Services

SOFTWARE MODULES

BZ-7300	Noise Partner Licence (see product data BP 0029)
BZ-7301	Enviro Noise Partner Licence (see product data BP 0030)
BZ-7302	Work Noise Partner Licence (see product data BP 0031)
BZ-7400	Open Interface for B&K 2245 Licence (see product data BP 2635)

All mobile apps are available for free download via the App Store. All PC apps can be downloaded at www.bksv.com

INTERFACING

UL-1073	4.7″ App Control Unit, 32 GB
AO-0846	USB-C™ to AC or DC Output Cable, with power

CALIBRATION

Type 4231	Sound Calibrator (fits in transport case)

MOUNTING

UA-0750	Tripod
UA-0801	Lightweight Tripod
UA-1651	Tripod Extension

ACCREDITED CALIBRATION

SLM-SIM-CAI	Initial Accredited Calibration incl. microphone (according to IEC 61672)
SLM-SIM-CAF	Accredited Calibration incl. microphone (according to IEC 61672)

For more information about our calibration services, go to www.bksv.com/Service/Calibration-and-verification

SERVICE

Standard Product Warranty: Two years

Calibration Plus Service Contract: Calibration contract with up to 5 years coverage, extended warranty for sound level meters up to 10 years old, plus more. For details, go to www.bksv.com/calibration-plus

Extended Warranty Contract: Extend your standard product warranty up to 10 years. For details, go to www.bksv.com/extended-warranty-hardware

Online Service: Online services such as downloading your calibration certificate and scheduling your services. Access the calibration cloud at www.bksv.com/calibrationdata

NOTE: Wear and tear on parts like windscreens and cables are not covered by the Standard Product Warranty or Extended Warranty.

Brüel & Kjær

Although reasonable care has been taken to ensure the information in this document is accurate, nothing herein can be construed to imply representation or warranty as to its accuracy, currency or completeness, nor is it intended to form the basis of any contract. Content is subject to change without notice – contact Brüel & Kjær for the latest version of this document.

Brüel & Kjær

2020-07

BP 0032 – 13