PRODUCT DATA

Hand-held Sound Intensity System
(2260 Investigator and Intensity Software BZ 7205 — Type 2260E
and Sound Intensity Probe Kit for 2260 — Type 3595)

Portable and battery-operated, the Hand-held Sound Intensity System makes it easy for one person to make and follow through a sound intensity measurement from beginning to end.The powerful combination of 2260 Investigator™, BZ 7205 software, and Sound Intensity Probe Kit Type 3595 makes it possible for you to make intensity measurements for sound power, source location and sound reduction. Automatic measurement guidance and aural feedback during measurements enable you to concentrate on making a smooth scan of the area under investigation. The system produces on-the-spot analyses of sound power and sound reduction, and it is part of the 2260 Investigator platform with its vast range of sound analysis applications.

2260

Brüel & Kjær

Uses and Features

USES

- ❍ Determines sound power with or without predefined surfaces and segmentation
- ❍ Sound power measurements in accordance with ISO 9614 – 2, ECMA – 160 and ANSI S12.12
- ❍ Noise source location and noise mapping
- ❍ Building acoustics measurements (Sound Reduction index) in accordance with ISO/DIS 15186 – 1 and ISO 717 – 1

FEATURES

- ❍ Complete hand-held, single unit sound intensity system
- ❍ Designed for practical field measurements
- ❍ Segmentation of the measurement surfaces
- ❍ Visual and aural feedback during measurements
- ❍ Detailed information regarding the quality of the sound field
- ❍ On-site calculation and display of measurement results
- ❍ Real-time octave and $^{1}/_{3}$-octave analysis
- ❍ General dual channel analyzer
- ❍ Frequency range of 50 Hz to 10 kHz using a 12 mm spacer
- ❍ Built-in noise generator for building acoustics measurements
- ❍ Visual data manager for easy bookkeeping
- ❍ Free Basic Sound Analysis software (BZ 7210) supplied with 2260 Investigator

Sound Intensity emerges from the Laboratory

Fig. 1 Getting to all those difficult places

Sound intensity made easy

Strict legislation and customer requirements have placed increasing pressure upon manufacturers to provide precise specifications for their products' noise levels. The need for sound power measurements escalates accordingly, but many a manufacturer pales at the thought of having to make such complicated and time-consuming measurements. Now, finally, sound power systems emerge from the laboratory and into the palm of your hand. Heavy equipment and a jungle of cables are made superfluous by this single unit, hand-held sound intensity analyzer consisting of 2260 Investigator, BZ 7205 software and Sound Intensity Probe Kit Type 3595. BZ 7205 software transforms 2260 Investigator sound level analyzer into a powerful measurement tool using the intensity technique to determine sound power levels and to do noise mapping. Simply swap 2260 Investigator's microphone for the intensity probe and start measuring. It is easy for just one person to make a sound intensity measurement from scanning to final result. If further post-processing is required use Noise Explorer™ Type 7815 for viewing and exporting data to spreadsheets, or Predictor™ Type 7810 for prediction of noise levels in the community. Due to a unique phase calibration technique it is possible to make all your measurements with a 12 mm spacer covering a frequency range extending between 50 – 10 kHz.

Sound Power Determination using the Hand-held Sound Intensity System

Fig. 2 Sound power spectrum with status information

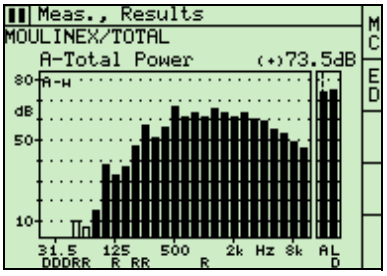


Fig. 3 Predefined surfaces on the screen (below) representing the imaginary surfaces surrounding the sound source (right)

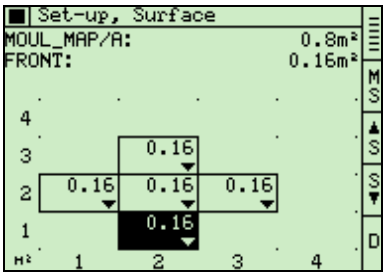
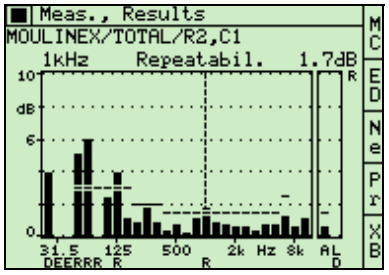
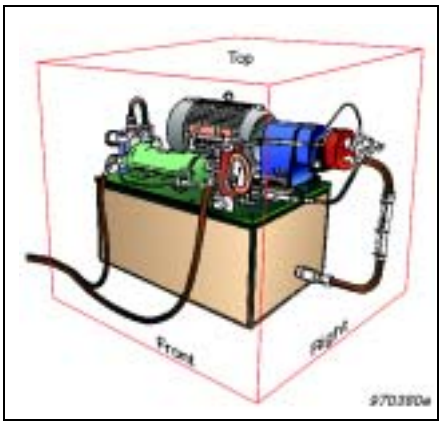


Fig. 4 Evaluation of repeatability criteria showing a tolerance mask



Noise labelling and standards

We live in a noisy world. As a result, our awareness of noise has escalated dramatically and we now demand noise-friendly surroundings. Manufacturers are aware of this and are labelling their machines, be they refrigerators or turbines, regarding noise output and according to national and international standards. Machines often consist of parts made by sub-suppliers, so the noise labelling of each part is important as it enables the manufacturer to predict the noise output from a new machine. The stringent EU Machine Directives have also played a major role in the enforcement of product labelling.



You may choose to make your sound intensity measurements by using predefined surfaces. This particular method involves defining the measurement surfaces prior to making the actual measurement. These imaginary surfaces should cover the sound source totally. During the sound power determination, the intensity probe traverses over the measurement surface at a constant speed covering equal areas in equal time. You can choose to make measurements according to standards or alternatively not according to a standard.

Measurements without predefined surfaces

With the hand-held sound intensity system it isn't necessary to make an advanced plan when making sound power measurements. You may immediately start scanning any segment that represents part of the total surface surrounding the noise source under investigation. Data is stored as it is collected in a way convenient for representing the segmentation of the surfaces.

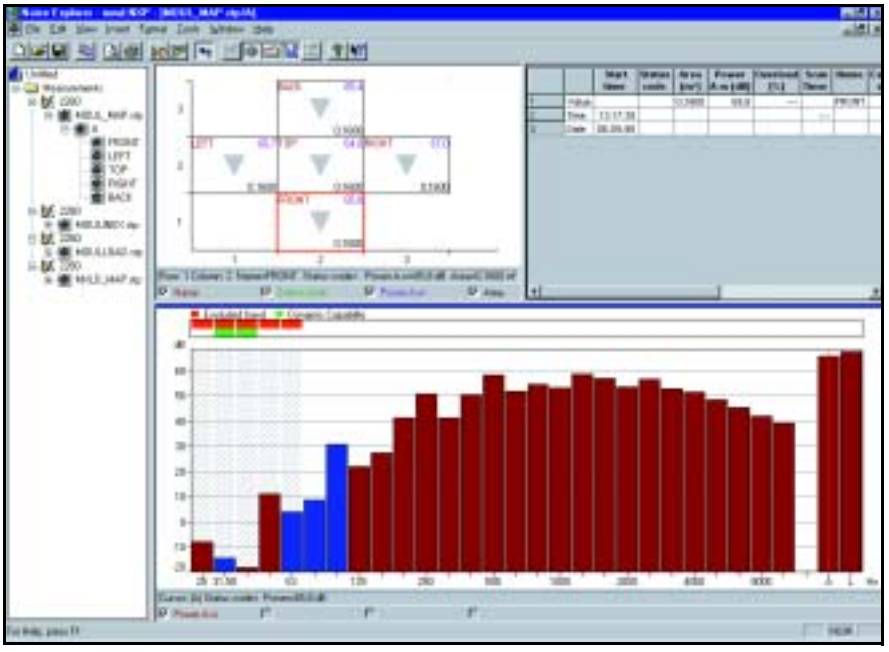
Support during measurement

Features during measurement include quality control of the measurement by means of status codes and a back-erase to the last pause or to the previous start of a scan and aural feedback to earphones for step-by-step guidance and information. This gives warnings regarding overloads and failed criteria, and a periodic sound signal assists you in keeping a steady scanning pace. Certain standards require that you scan each segment twice. The hand-held sound intensity system has a "repeat scan" feature which allows you to perform two separate scans with the utmost of ease. You merely press **Start 2nd scan** when the first scan is completed. Both scans are stored in the same segment as one measurement.

Post-processing with Noise Explorer

Sound power levels determined by the hand-held sound intensity system can be transferred to Noise Explorer Type 7815 software. Once your measurements are in Noise Explorer, select, view and copy your results. Data can be copied to the Windows®* clipboard for easy export to other Windows applications. Alternatively you can directly export to Microsoft Excel or a similar spreadsheet, or mapping software.

Fig. 5 Noise Explorer displays the surfaces and segments together with the spectrum for the selected surface or segment. Frequency bands can be excluded from calculation



Calibration and Verification

Fig. 6 Pressure calibration made with sound level meter calibrator

Complete calibration can be made using a Sound Intensity Calibrator Type 3541. This includes pressure calibration of both channels, phase calibration of the two channels and verification of the Pressure-residual intensity index. Phase calibration enhances the usable frequency range down to 50 Hz using a 12 mm spacer. Pressure calibration alone can be performed using Sound Level Calibrator Type 4231 with Coupler DP 0888. 2260 automatically compensates for resonances between microphone and spacer on the frequency range 5 kHz to 10 kHz, thus enhancing the usable frequency range up to 10 kHz with a 12 mm spacer.

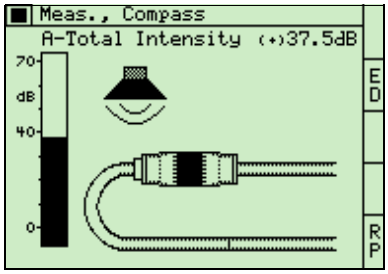
*__Note:__ Windows® is a registered trademark of Microsoft®

Noise Source Location

Hand-held power

The potent combination of 2260 Investigator and BZ 7205 tracks down puzzling and problematic noise sources efficiently and effortlessly. This veritable hand-held system makes it easy for you to manoeuvre around complex surfaces when solving problems.

Fig. 7 Compass display for noise source location

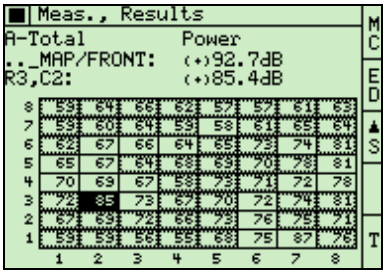


As a simple compass

A compass display and instantaneous spectrum display are available for on-line source location. These will quickly navigate you to the problem area. The compass data is used to show the direction of incidence of the sound energy in relation to the probe for a specific frequency band or for the overall A or L level. The spectrum display shows the complete picture of the spectrum.

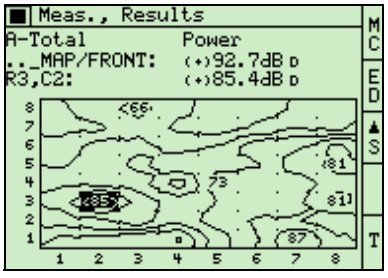
Noise Mapping

Fig. 8 An 8 × 8 noise number map



A complicated machine or structure radiates sound from several sources and absorbs sounds in other places. In order to evaluate the effectiveness of noise reduction methods you need to know how much noise is radiated by the individual components of the machine. This means finding the sound power of those components. With its advanced bookkeeping features, the hand-held sound intensity system is capable of collecting and storing a large number of measurements in a simple, flexible and effective way. Divide the surface of the structure into a number of segments and predefine a corresponding grid on the screen.

Fig. 9 An 8 × 8 contour map



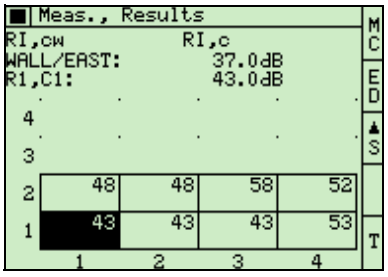
Collect data by measuring at the centre of each segment. As you make the measurements one at a time, the system automatically helps you along by offering extensive information and guidance, which includes automatic selection of the next predefined segment, evaluation of the sound field as soon as the relevant information is available, and quick and easy overview facilities.Results can be analysed as number or contour maps in grids of 4 × 4 or 8 × 8. You can study maps of single frequency bands or alternatively look at total levels. Noise Explorer can export data to mapping software such as Noise Source Identification Type 7752 or Surfer® from Golden Software, Inc., see **www.goldensoftware.com**.

Building acoustics applications such as reduction indices and leakage detection benefit enormously from the intensity technique.

Fig. 10 Mapping the sound reduction to find leakages between studio and control room

As an alternative to a pressure-based measurement of the apparent sound insulation index R' for a given partition, this measurement system allows the corrected intensity sound reduction index, $R_{I,c}$ to be measured. This enables extra information regarding the contribution of various flanking and leakage transmissions to be gathered. In a traditional pressure-based measurement you get an apparent sound insulation index R' which takes every type of transmission into account. However, traditional measurements cannot identify individual transmission paths. But with this application you can choose specific details of any particular segment of any given partition or surface. If a compound partition is to be studied, for example a wall containing a window, the respective corrected intensity sound reduction index, $R_{I,c}$ for both the wall material and for the window can be found.

Fig. 11 The $R_{I,cw}$ in surface display



The single-number weighted and corrected intensity sound reduction index, $R_{I,cw}$, is automatically calculated for each segment and the whole surface.

To create a sound field on one side of the wall (in the source room) use the internal white noise generator together with Power Amplifier Type 2716 and OmniPower™ Sound Source Type 4296.

Leakages

If measurements reveal a leakage problem or “hidden” flanking transmission, the hand-held sound intensity system can conveniently be used for noise source location with respect to either a single band or the whole spectrum.

Facade Insulation

To measure facade insulation using traffic noise, the sound pressure must be measured outside and inside the facade simultaneously. This measurement system is capable of doing this and displaying the difference. See Application Note BO 0465 on 2-channel Measurement using 2260 Investigator.

Accessories

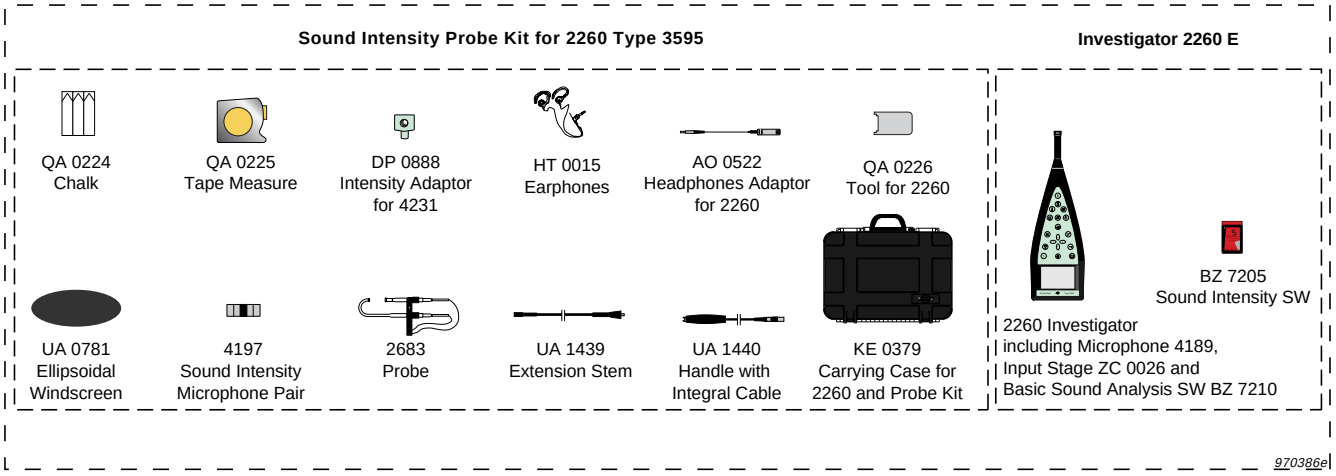
When the ladder's too short...

Accessories included with the hand-held sound intensity system include weatherproof case, handle with integrated extension cable, measuring tape, earphones – in fact everything you need for making sound intensity measurements is included right down to chalk for marking grids.

A telescopic boom with a range of 4.2 m is also available as an optional extra for the sound intensity probe. With the telescopic boom you can reach distances of up to 5 m thus avoiding trouble with ladders or the expense of hiring an aerial lift.

A harness is available for mounting 2260 Investigator, probe and telescopic boom when climbing, or for single-hand operation together with handle.

2260 Investigator - Hand-held Sound Intensity System



Specifications Hand-held Sound Intensity System

Specifications are given for Type 2260 with software BZ 7205 installed and fitted with Sound Intensity Probe Type 3595, consisting of $^1/_2$″ Microphone Pair Type 4181 or Type 4197 and Dual Preamplifier Type 2683.

Unless otherwise noted, values are given under reference ambient conditions with nominal sensitivities for the microphones and preamplifiers (see Product Data sheet for Type 3595) and with a 12 mm spacer.

REFERENCE CONDITIONS:
Reference Sound Pressure Level: 94 dB
Reference Frequency: 250 Hz
Reference Temperature: +20°C
Reference Static Pressure: 1013.25 hPa
Reference Relative Humidity: 65%

INSTRUMENTATION STANDARDS:
Conforms with the following standards:
- IEC 61043 (1993)/EN 61043:1994 Class 1
- IEC 61260 (1995)/EN 61260:1995 Octave and $^1/_3$-Octave Bands Class 0
- ANSI S1.11 – 1986 Octave and $^1/_3$-Octave Bands, Order 3, Type 0 – C. Optional Range

MEASUREMENT AND CALCULATION STANDARDS:
Measurement and calculations can be made according to the following standards:
- **Sound Power:** ISO 9614 – 2:1996, ECMA – 160 (1992), ANSI S12.12 – 1992 and ISO 9614 – 1:1993 except calculations of F_1, F_2 and F_4
- **Building Acoustics:** ISO/DIS 15186 – 1 and ISO 717 – 1:1996

FREQUENCY RANGE:
Octave and $^1/_3$-Octave spectral measurements based on a linear electrical frequency response
For Intensity Measurements: 9.3 Hz – 21.6 kHz (–3 dB points)
For Dual-channel Measurements: 5.2 Hz – 21.6 kHz (–3 dB points)

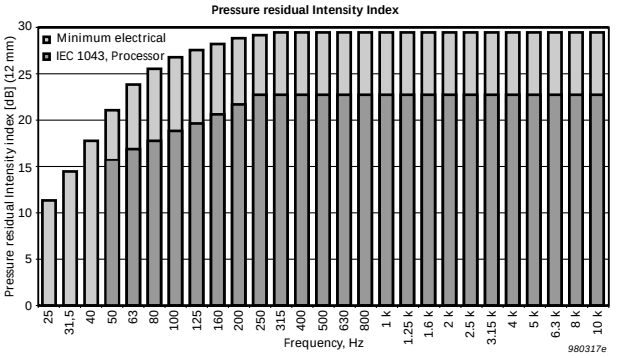
OCTAVE BAND CENTRE FREQUENCIES:
31.5 Hz to 8 kHz

$^1/_3$-OCTAVE BAND CENTRE FREQUENCIES:
25 Hz to 10 kHz

FREQUENCY WEIGHTING:
Lin and A-weighted total results are based on weighted summation of spectral bands in the frequency range 22 Hz – 11.3 kHz. Frequency bands can be manually excluded from calculation.

PRESSURE-RESIDUAL INTENSITY INDEX:
The minimum Pressure-residual intensity index for the analyzer (the "Processor" in IEC 61043), measured with pink noise at a band-filtered level of 114 dB in the 143 dB Full scale range, is given in Fig. 12

Fig. 12 Minimum Pressure-residual intensity index for the analyzer



ENHANCED PHASE MATCHING:
The phase match of the sound intensity system can be enhanced in the frequency range 31.5 Hz – 500 Hz using a Sound Intensity Calibrator Type 3451. This can increase the Pressure-residual intensity index for the sound intensity system up to 10 dB, depending on frequency.

HIGH FREQUENCY COMPENSATION:
Selectable high frequency compensation for the $^1/_2$″ microphone and 12 mm spacer combination. The Mean pressure and the Sound intensity spectrum can then be measured at frequencies up to 10 kHz (one octave higher than the normal theoretical limit).

DETECTORS:
Linear integration: 1 s to 59 min. 59 s in 1 s steps

RESOLUTION:
Discrete Parameters: 0.1 dB

OVERLOAD INDICATION:
Latching overload indicators are displayed on all measuring screens.
An overload percentage is measured and attached to all measurements.

AUTORANGE:
Manual and automatic range control are provided

SPACER SETTINGS:
Spacer Length: 6 – 200 mm in 0.5 mm steps

MEASURING RANGE:
Mean Pressure:
Full Scale is the maximum level of a sinusoidal input signal (Crest Factor 1.4) that does not give overload.

Upper Limit is the maximum pressure level for each band that does not give overload with a pink noise input signal. Pink noise has a Crest Factor of 4 and is band-limited from 20 Hz to 20 kHz

Lower Limit is the input level that gives the stated error in the measured value for the worst-case filter band. For other filter bands the limit will be lower
7 ranges giving:

Specifications (cont.)

Octave Band:

Full Scale	Upper Limit Pink Noise	Lower Limit Error +0.3 dB	Lower Limit Error +1 dB	Lower Limit Error +3 dB
143 dB	121 dB	<29.7 dB	<24.1 dB	<18.2 dB

!/3-Octave Band:

Full Scale	Upper Limit Pink Noise	Lower Limit Error +0.3 dB	Lower Limit Error +1 dB	Lower Limit Error +3 dB
143 dB	116 dB	<25.0 dB	<19.4 dB	<13.5 dB

Individual channel pressure
When the 2260 is used as a dual-channel analyzer the inherent noise in each channel is 3 dB higher than when measuring Mean pressure. Therefore, add 3 dB to the Lower limit figures stated for Mean pressure to get the Lower limit for individual channels.

AMBIENT CONDITIONS SETTINGS:
Temperature
Static Pressure

CALIBRATION:
External (acoustic): Individual (Pressure) gain calibration of the two input channels can be performed using Sound Intensity Calibrator Type 3541, Sound Intensity Calibrator Type 4297, Sound Level Calibrator Type 4231 with Coupler DP 0888 or an unknown calibrator.
A Preamplifier gain can be set.
Internal: Using internally generated electrical signal combined with keyed-in value of the microphone's open circuit sensitivity
A Preamplifier gain can be set.
Phase Calibration: The phase difference between the two channels in the frequency range 31.5–500 Hz can be calibrated to a minimum using Sound Intensity Calibrator Type 3541
Verification: Verification of the Pressure-residual intensity index can be made using Sound Intensity Calibrator Type 3541. Pressure-residual intensity index is stored with the calibration and in the measurement job for documentation purposes.

Measurements are automatically compensated for keyed-in changes in temperature and ambient pressure.

Field Check: A field check of the intensity measured with the probe in normal and reversed position can be performed.

INTERNAL GENERATOR:
Pseudo-random white noise generator

MODES:
The four main modes are:
System: Used to install software, change application, set the internal clock, copy files, etc.
Set-up: Used to set up measurement and control parameters
Calibrate: Used when calibrating the analyzer
Measurement: Used to view current and recalled measurements

MEASUREMENTS:
For Sound Power and Sound Reduction Applications: Simultaneous measurement of Mean pressure and Intensity
For General Dual-channel Applications: Choose between simultaneous measurement of: Mean pressure and Intensity, Mean pressure and Reactive intensity, Mean pressure and Particle velocity, Particle velocity and Intensity, pressure Ch. 1 and Real part of cross spectrum, or Pressure Ch. 1 and Pressure Ch. 2

MEASUREMENT CONTROL:
Manual or semi-automatic. Measurements are started manually and the user is guided through the different scannings for each segment (according to the selected standard). After storing the scans for one segment, the analyzer is automatically ready to make measurements for the next segment. 16 different measurement sequences are available.
Pause/Continue: A measurement can be paused or continued
Pause/Back Erase: It is possible to erase backwards to the last pause or to the start of the last scan

SURFACE DEFINITION:
One or more surfaces can be defined.

A surface consists of a number of segments and/or other surfaces.

A segment contains one measurement.

Surfaces can be defined as segments organised in a grid, in a box with five grids, in a hemisphere or in a cylinder.

Surfaces can be defined as a number of rows and columns of segments with dimensions set for each segment or for the total surface.

Dimensions of a segment can be defined as height and width or as an area.

Definitions of surfaces and segments can be modified at any time (before, during or after a measurement).

Measurements can be stored within defined segments, or in empty grids until segments and surfaces for the measurements are defined later.

Measurements can be stored in previously measured segments, overwriting existing data (a warning is issued).

Set-ups and measurements for a given measurement session are stored in a job.

Jobs, surfaces and segments can be deleted.

The content of a segment can be copied to other positions.

A job can contain up to 20 surfaces with up to 150 segments per surface (95 segments per surface for ANSI S12.12 jobs).

For ANSI S12.12 jobs only: It is possible to divide a segment into halves and re-use measurements that have been made for the segment.

Specifications (cont.)

CALCULATIONS:
Calculations of sound power can be done on each segment or surface in conformance with ISO 9614–2, ECMA–160 and ANSI S12.12 standards, or for non-standard measurements.

Calculations of corrected intensity sound reduction index ($R_{I,c}$ or $R_{I45°,c}$) and weighted corrected intensity sound reduction index ($R_{I,cw}$ or $R_{I45°,cw}$) can be done on each segment or surface in conformance with ISO/DIS 15186 – 1 and ISO 717–1.

Frequency bands, segments or surfaces can be manually included in or excluded from calculations.

The following status information is available for each frequency band, segment or surface: Data excluded, Dynamic capability failed, Repeatability failed, Convergence Index failed, Extraneous noise too high, Scan time too short, Area not defined, Missing data in segment, Overload, Copied data, A-weighted total level contains high levels in bands outside standard-defined frequency range.

DISPLAYS:
Spectrum: For display of one of the two measured spectra, both spectra simultaneously, power, p-I index with dynamic capability, repeatability with the allowed limit, convergence index with the allowed limit, extraneous noise with the allowed limit, the difference between the two measured spectra, or the corrected intensity sound reduction index ($R_{I,c}$ or $R_{I45°,c}$).

Status codes are shown below each frequency band.

The A-weighted or Linear spectrum can be displayed together with A-weighted and Linear total bands.

The Y-axis can be zoomed to 5, 10, 20, 40, 60, 80 or 100 dB.

Surface: For display of number map or contour map with 4×4 or 8×8 segmentation with results from the segments or surfaces within a surface.

It is possible to display the values from a selectable frequency band together with status information.

It is also possible to display the following quantities (together with status information): one of the total values from one of the two measured spectra, power, p-I index, repeatability, convergence index, extraneous noise, the difference between the two measured spectra or (weighted) corrected intensity sound reduction index.

Maxima are annotated on contour map displays.

Compass: For display of the direction of the sound field near the probe.

All displays have cursor read-out capability.

GPS DATA:
A position can be attached to a measurement job by inputting data from a GPS (Global Positioning System) receiver via the serial interface.
Receiver Standards Supported: NMEA 0183 ver. 2.20, optional corrected to Differential GPS using RTCM 104 ver. 2.1
Baud Rate: 4800

STORAGE SYSTEM:
Internal: Up to 32 Mbyte disk for application software and storage of set-ups and measurement data within jobs. Jobs can be recalled for calculation and display, continuation of measurements or re-use of set-ups
Capacity: 5, 10, 20 or 32 Mbyte. The supplied application software requires approximately 1.6 Mbyte. A $^1/_3$-octave job containing 100 segments requires approximately 40 kbyte
External Memory Card: For storage/recall of measurement data and transfer of data to and from a PC. Available as 5, 10, 20 or 32 Mbyte ATA flash cards of SanDisk type
MS-DOS®: Compatible file system (from ver. 3.3)

SERIAL PRINTER/OUTPUT:
Set-ups and measurement data can be printed on a Portable Printer Type 2322 or on an IBM Proprinter (or compatible). It is possible to print screen dumps or tables.

Measurement data can also be output in spread sheet format for post-processing on a PC.

Baud Rate: 1200 to 38 400

REMOTE/LOCAL:
Commands for transfer of measurement data (files) in binary form to a PC for use with Brüel & Kjær application software.

Commands for start and stop of measurement and transfer of current measurement in ASCII form to a PC.

Baud Rate: 1200 to 115 200

HELP:
Concise context-sensitive help for keys and menus

LANGUAGES:
All software is available in English, German, French, Spanish or Czech

CLOCK:
Back-up battery powered clock. Accuracy better than 1 minute per month

DISPLAY HARDWARE:
Transflective back-lit LCD 192×128 dot matrix with internal temperature compensation

INPUT STAGE CONNECTION:
10-pin LEMO

AUXILIARY OUTPUTS:
AUX. 1: Can be set to either the Internal Generator (White Noise) or an internal signal from the digital signal processor. That is, Channel 1, Channel 2, Sum of Channel 1 and 2, Difference between Channel 1 and 2 or Integrated Difference between Channel 1 and 2
AUX. 2: Can be set to output the input signal, the aural feedback signal, a combination of the input signal and the aural feedback or an internal signal from the digital signal processor. Available signals from the digital signal processor: Channel 1, Channel 2, Sum of Channel 1 and 2, Difference between Channel 1 and 2 or Integrated Difference between Channel 1 and 2

Specifications (cont.)

Gain for AUX. 1 and 2: Can be set separately from 0 to –80 dB in 1 dB steps

AC INPUTS/OUTPUTS:
As Output: Buffered, unweighted microphone signal
As Input: Alternative to microphone preamplifier input

SETTLING TIME:
From power on: 1 minute

EXTERNAL DC POWER SUPPLY:
Voltage: Regulated or smoothed 10 to 14 V, max. ripple 100 mV
Power: 3.5 W
Current: 300 mA
Inrush Current: 1000 mA
Socket: 5.5 mm diameter, 2 mm pin (positive)

BATTERIES:
Type: 6 × LR14/C-size 1.5 V alkaline, Type QB 0009
Lifetime: (at 20°C) 5 to 6 hours of typical use (decreases significantly at low temperatures)

WEIGHT:
1.1 kg including batteries, excluding probe

DIMENSIONS:

290 × 120 × 52 mm without probe

Compliance with Standards

CE	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive.
Safety	EN 61010–1 and IEC 1010–1: Safety requirements for electrical equipment for measurement, control and laboratory use.
EMC Emission	EN 50081–1: Generic emission standard. Part 1: Residential, commercial and light industry. EN 50081–2: Generic emission standard. Part 2: Industrial environment. 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.
EMC Immunity	EN 50082–1: Generic immunity standard. Part 1: Residential, commercial and light industry. EN 50082–2: Generic immunity standard. Part 2: Industrial environment.
Temperature	IEC 68–2–1 & IEC 68–2–2: Environmental Testing. Cold and Dry Heat. Operating Temperature: –10 to +50°C Storage Temperature: –25 to +70°C
Humidity	IEC 68–2–3: Damp Heat: 90% RH (non-condensing at 40°C)
Mechanical	Non-operating: IEC 68–2–6: Vibration: 0.3 mm, 20 m/s^2, 10 – 500 Hz IEC 68–2–27: Shock: 1000 m/s^2 IEC 68–2–29: Bump: 1000 bumps at 250 m/s^2
Note	RF immunity implies that mean pressure levels of 78 dB or greater will be affected by no more than ±0.5 dB EMC specifications are valid for the following configuration: SLM 2260, Handle with Integral Cable UA 1440, Extension Stem UA 1439, Dual Preamplifier Type 2683.

Ordering Information — Hand-held Sound Intensity System

Type 2260E Modular Precision Sound Analyzer with Sound Intensity Software BZ 7205

Accessories included (Type 2260E):

BZ 7205:	Sound Intensity Software
BZ 7210:	Basic Sound Analysis Software
Type 4189:	Prepolarized Free-field 1/2" Microphone
ZC 0026:	Input Stage
ZF 0023:	20 dB Capacitive Attenuator
UA 1236:	Protective Cover
DH 0696:	Wrist Strap
KE 0342:	Shoulder Bag (with room for 2260 and4231)
6 × QB 0009:	1.5 V LR 14/C size alkaline cells

Accessories included (Type 3595):

Type 4197:	Sound Intensity Microphone Pair
Type 2683:	Dual Preamplifier
UA 1439:	Extension Stem
UA 1440:	Handle with Integral Cable
UA 0781:	Ellipsoidal Windscreen
DP 0888:	Intensity Adaptor for 4231
HT 0015:	Earphones
AO 0522:	Headphone Adaptor
QA 0224:	Chalk
QA 0225:	Tape Measure
QA 0226:	Tool for 2260
KE 0379:	Carrying Case for 2260 and Probe Kit

Optional Accessories:

CALIBRATION:

Type 3541:	Sound Intensity Calibrator
Type 4297:	Sound Intensity Calibrator
Type 4231:	Sound Level Calibrator
2260 CAI:	Accredited Initial Calibration of Type 2260
2260 CAF:	Accredited Calibration of Type 2260
2260 CAP:	Accredited Calibration with Pre-Calibration of Type 2260
2260E CVI:	Initial Pressure-Residual Intensity Index Verification of Types 2260E and 3595
2260E CVF:	Pressure-Residual Intensity Index Verification of Types 2260E and 3595
4181 CFF:	Factory Standard Calibration of Type 4181
4197 CFF:	Factory Standard Calibration of Type 4197

INTERFACING:

Type 7810:	Predictor software
Type 7815:	Noise Explorer – data-viewing software
Type 7752:	Noise Source Identification software
Type 2322:	Portable Printer
AO 1442:	9-pin to 25-pin PC or Serial Printer Interface Cable
UL 1008:	32 MB ATA Flash Memory Card

MAINS POWER SUPPLIES:

ZG 0386:	Mains Power Supply (EU)
ZG 0387:	Mains Power Supply (UK)
ZG 0388:	Mains Power Supply (US)

MEASURING:

DH 0713:	Harness for 2260
UA 1451:	4.2 m Telescopic Boom
UA 0801:	Lightweight Tripod
UA 0587:	Tripod
KE 0371:	Carrying Case for 2260 and accessories
UA 0237:	Large Round Windscreen
UA 0459:	Small Round Windscreen
UA 1317:	Microphone Holder
AO 0440:	AC Input/Output cable
AO 0441:	Microphone Extension Cable (3 m)
AO 0442:	Microphone Extension Cable (10 m)
UA 1450:	32 MB Disk Upgrade Kit, including BZ 7210

Brüel & Kjær reserves the right to change specifications and accessories without notice

BP 1755 – 13 02/03 Rosendahls Bogtrykkeri

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