# SOUND POWER

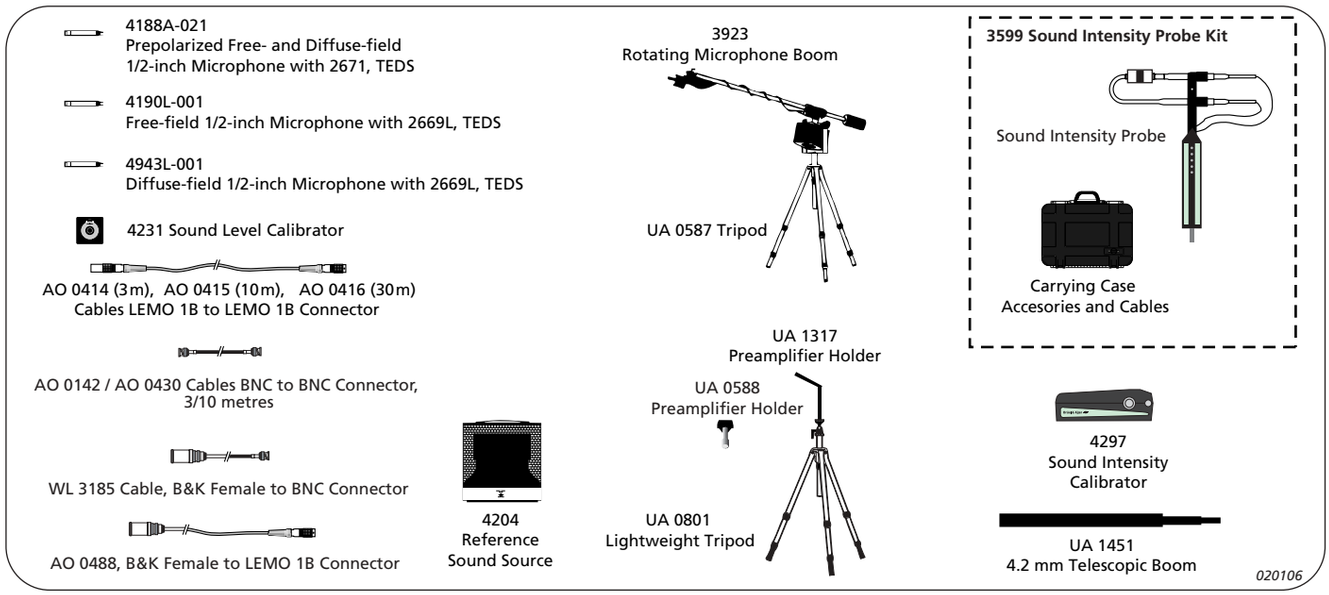
Sound Power has become the preferred quantity to measure when determining product noise emissions. This is because it is an absolute quantity, dependent only on the noise source itself, and independent of the acoustic environment. Sound Pressure, on the other hand, is dependent on both the noise source and on the acoustic environment.

Sound Power can be determined according to three main methods:

1. Measure the sound pressure due to the source in a diffuse sound field, and then determine its sound power from the sound pressure measurements.
2. As 1, but in a free sound field.
3. Direct measurements of sound intensity in any sound field to determine the sound power of the source.

The pressure-based methods are most often used for production audits and high-volume testing, while the intensity-based methods are used for engineering and in-situ measurements.

Regardless of the method you choose, Brüel & Kjær can provide a system to make the required measurements and determine the sound power of the source according to most international standards.




**FREE FIELD METHOD**

| | |
|---|---|
| **4190 L-001** | Free-field 1/2-inch Microphone with 2669 L, TEDS |
| **4188 A-021** | Prepolarized Free- and Diffuse- field 1/2-inch Microphone with 2671, TEDS |
| **4204** | Reference Sound Source |
| **4231** | Sound Pressure Calibrator |

**REVERBERANT FIELD METHOD**

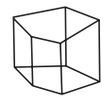
| | |
|---|---|
| **4188 A-021** | Prepolarized Free- and Diffuse-field 1/2-inch Microphone with 2671, TEDS. |
| **4943 L-001** | Diffuse-field 1/2-inch Microphone with 2669L, TEDS |
| **4204** | Reference Sound Source |
| **3923** | Rotating Microphone Boom |
| **UA 0587** | Heavy Duty Tripod for 3923 Rotating Boom |
| **WL 3185** | Cable, B&K Female to BNC Connector |
| **AO 0488** | Cable, B&K Female to LEMO 1B connector |
| **JP 0736** | BNC to B&K Socket Adaptor |
| **ZQ 0350** | LEMO B&K Socket Adaptor |
| **4231** | Sound Level Calibrator |

## TYPE 3560 C-S27

### Sound Power Test System (1 In)

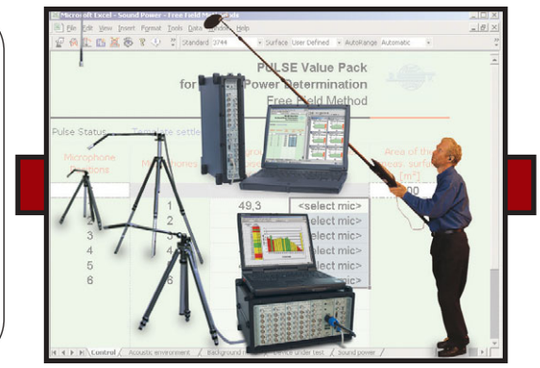
3560 C
7533
7771-N2
UA 1365
BZ 5305

- Low-cost solution for sound power determination in a free field or in a reverberant field using serial measurements according to ISO 374 × series standards
- Perfect for use with microphone boom in a reverberant field
- Uses a CCLD input



** One year SW maintenance*

*PULSE Value Pack software runs with various configurations, making the solution scalable to budget and needs. Easy to upgrade*

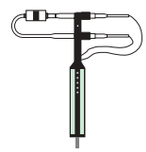



## TYPE 3560 C-S26

### Sound Power Test System – Intensity

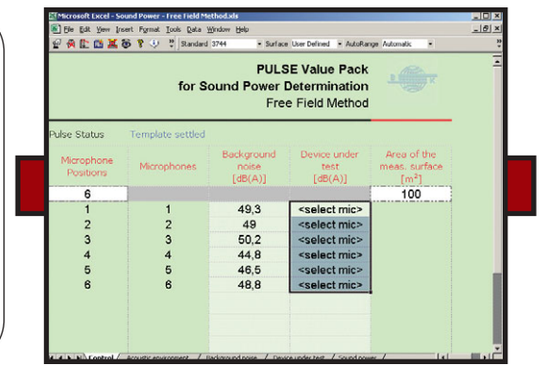
3560 C
7533
3032 A
7771-N2
BZ 5305

- For customers who want to take advantage of the scanning intensity method according to ISO 9614-2 while keeping costs in check
- Supports sound power in a free field and in reverberant field



** One year SW maintenance*

*The Excel-based user interface is familiar to many, making it easier to use the application. The solution is highly automated – only a few clicks are needed to complete the measurement procedure*



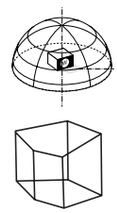

## TYPE 3560 C-S28

### Sound Power Test System (6 In)

3560 C
7533
3032 A
7771-N6
7707
BZ 5305

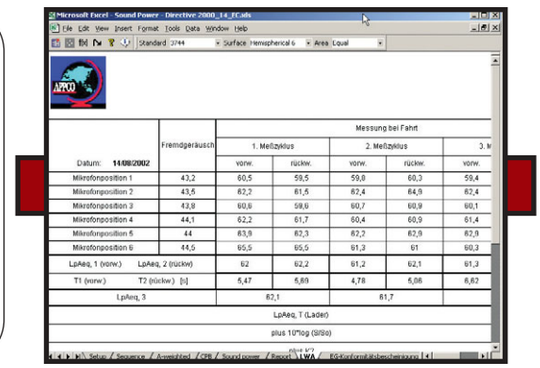
- For customers who need the increased productivity of parallel measurements over 6 channels
- Perfect for sound power:
  – In a reverberant field according to ISO 3741, ISO 3743
  – According to EU Directive 2000/14/EC

  Both require 6 microphone positions



** One year SW maintenance*

*The integration with Excel allows easy reporting according to corporate standard formats and in local languages*

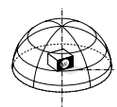



## TYPE 3560 D-S12

### Sound Power Test System (10 In)

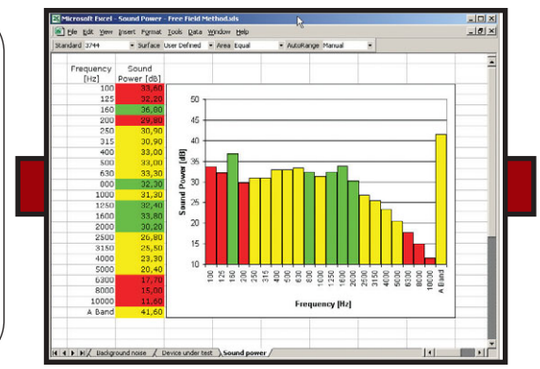
3560 D
7536
2 × 3032 A
7771-N12
7707
BZ 5305

- The most powerful solution, for users who need the increased productivity of parallel measurements in more than 6 channels at a time
- Choose between any of the sound power determination methods
- Ideal for Sound Power determination in a free-field according to ISO 3744 and ISO 3745 over 9 or 10 microphone positions



** One year SW maintenance*

*Sound power is determined according to the following international Standards: ISO 3741 to ISO 3746 and ISO 9614-2*




**SOUND INTENSITY METHOD**

| | |
|---|---|
| **3599** | Sound Intensity Probe Kit |
| **UA 1451** | Telescopic Boom Kit |
| **4297** | Sound Intensity Calibrator |

**OTHER ACCESSORIES**

| | |
|---|---|
| **UA 0801** | Lightweight Tripod |
| **UA 1317** | Preamplifier Holder |
| **UA 0588** | Preamplifier Holder |
| **AO 0142/AO 0430** | Cables BNC to BNC Connector, 3/10 m |
| **AO 0414/AO 0415/AO 0416** | LEMO 1B to LEMO 1B Connector (3 m/10 m/30 m) |
| **UA 0459/UA 0237** | Windscreen for 1/2-inch Microphones, 65/90 mm diameter |

# SOUND POWER ACCESSORIES

| ACCESSORIES FOR SOUND POWER DETERMINATION BASED ON SOUND PRESSURE MEASUREMENTS | | | ISO 3741 | ISO 3743-1 | ISO 3743-2 | ISO 3744 | ISO 3745 | ISO 3746 |
|---|---|---|---|---|---|---|---|---|
| 4188 A-021 | Prepolarized Free- and Diffuse-field ½-inch Microphone with 2671, TEDS | When used in diffuse field, microphone has to be fitted with the Random-incidence Corrector DZ 9566 supplied. Prepolarized microphone makes it particularly suitable outdoors | X | X | X | X | X | X |
| 4190 L-001 | Free-field ½-inch Microphone with 2669 L, TEDS | Greater sensitivity, wider frequency range and lower inherent noise than 4188 A-021 make it very well suited for a wide range of precision sound measurements | | | | X | X | X |
| 4943 L-001 | Diffuse-field ½-inch Microphone with 2669 L, TEDS | Greater sensitivity, wider frequency range and lower inherent noise than 4188 A-021 make it very well suited for a wide range of precision sound measurements | X | X | X | | | |
| 4231 | Sound Level Calibrator | Conforms to IEC 60942 Class 1 and ANSI S1.40-1984 (R1997) | R | R | R | R | R | R |
| 4204 | Reference Sound Source | Calibrated in accordance with ISO 6926 | O | O | O | O | | |
| 3923 | Rotating Microphone Boom | Typical emitted sound power equal to 26 dB(A) | X(a) | X(a) | X(a) | | | |
| 4231 CAI | Sound Level Calibrator, Class 1 Accredited Initial Calibration | Calibration according to IEC 60942 | R | R | R | R | R | R |
| UA 0801 | Lightweight Tripod | | O | O | O | O | O | O |
| UA 1317 | Preamplifier Holder | When using 4190 L-001 and 4943 L-001 (or other combinations with 2669 B/L Preamplifier) | O | O | O | O | O | O |
| UA 0588 | Preamplifier Holder | When using 4188 A-021 (or other combinations with 2671 Preamplifier) | O | O | O | O | O | O |
| AO 0414/ 0415/0416 | Cables LEMO 1B to LEMO 1B Connector, 3 / 10 / 30 metres | | O | O | O | O | O | O |
| AO 0142/ AO 0430 | Cables BNC to BNC Connector, 3 / 10 metres | | O | O | O | O | O | O |
| UA 0587 | Heavy Duty Tripod for 3923 Rotating Boom | | X(a) | X(a) | X(a) | | | |
| WL 3185 | Cable, B&K Female to BNC Connector | When using 4188 A-021 (or other combinations with 2671 Preamplifier) with 3923 Rotating Boom | X(a) | X(a) | X(a) | | | |
| JP 0736 | BNC to B&K Socket Adaptor | When using 4188 A-021 (or other combinations with 2671 Preamplifier) with 3923 Rotating Boom | X(a) | X(a) | X(a) | | | |
| AO 0488 | Cable, B&K Female to LEMO 1B Connector | When using 4943 L-001 (or other combinations with 2669 L Preamplifier) with 3923 Rotating Boom | X(a) | X(a) | X(a) | | | |
| ZG 0350 | LEMO to B&K Socket Adaptor | When using 4943 L-001 (or other combinations with 2669 B/L Preamplifier) with 3923 Rotating Boom | X(a) | X(a) | X(a) | | | |
| UA 0459 (b) | Windscreen for ½-inch microphones, 65 mm diameter | | O | O | O | O | O | O |
| UA 0237 (b) | Windscreen for ½-inch microphones, 90 mm diameter | | O | O | O | O | O | O |

(a) When using the continuous microphone traverse method
(b) UA 0459, UA 0237 are also delivered in packages of 6 with order number UA 0469 and UA 0254, respectively

X = Mandatory
O = Optional
R = Recommended

| ACCESSORIES FOR SOUND POWER DETERMINATION BASED ON SOUND INTENSITY MEASUREMENTS | | | ISO 9614-2 |
|---|---|---|---|
| 3599 | Sound Intensity Probe Kit | Fulfils IEC 61043 Class 1 probe requirements. | X |
| 4297 | Sound Intensity Calibrator | Measurement and verification of pressure-residual intensity index. Conforms to IEC 60942 Class 1 sound pressure calibration at 251.2 Hz. | R |
| UA 1451 | Telescopic Boom Kit | | O |