BRÜEL & KJÆR® | Acoustic Analysis Software

### PULSE Sound Power Using Sound Intensity Type 7882

PULSE™ Sound Power Using Sound Intensity Type 7882 is software for determining sound power levels using sound intensity measurements according to ISO 9614-1, ISO 9614-2 and ISO 9614-3, ideal for environments where background noise is too great to allow sound pressure measurements.

The standards require measurement of the average sound intensity for each segment of the surface enclosing the device under test (DUT). Measurements are made according to the standard, moving the sound intensity probe manually.

ISO 9614-1: Measurements at discrete points
ISO 9614-2: Measurements using a scanning method
ISO 9614-3: Precision method for measurements by scanning

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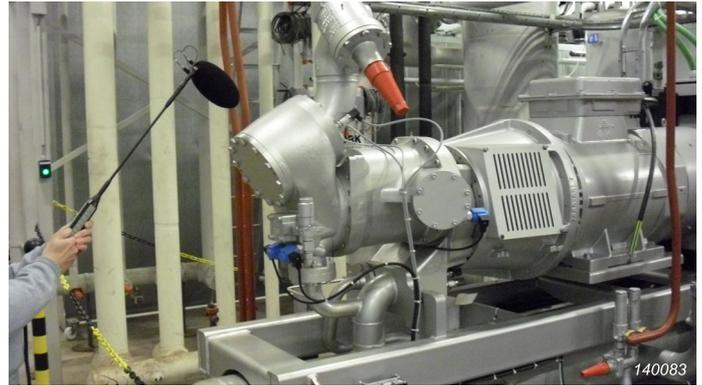
With this technique, it is possible to include location and ranking of noise sources.

Uses and Features

Uses

- Determining sound power levels according to ISO standards
- Determining product compliance with noise specifications
- Environments with a lot of background noise
- Comparing noise emissions of machinery and equipment
- Benchmarking
- Developing quieter products
- Mapping sound intensity and relevant parameters

Features

- Exceptional measurement accuracy
- Measurements at 6.3 kHz, 8 kHz and 10 kHz 1/3-octave bands with the 12 mm spacer using high-frequency corrections to intensity spectra
- Comprehensive, scalable solution
- Interactive measurement setup
- Guided measurement process
- In-application notes and help
- Seamless integration with Microsoft® Excel® for customized reporting and further post-processing

Description

Fig. 1 *Typical setup for determination of sound power using sound intensity according to ISO 9614*
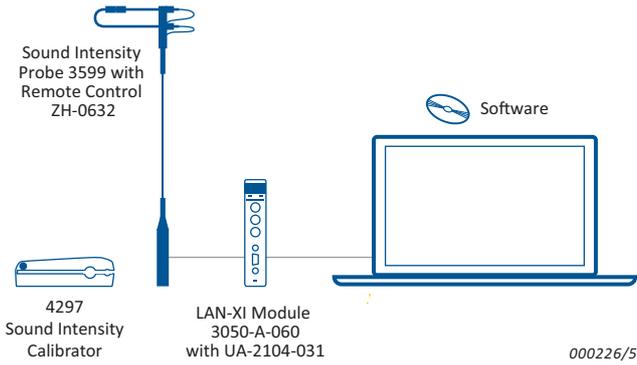
PULSE Sound Power Using Sound Intensity Type 7882 is a PULSE LabShop application for determining, storing and reporting sound power levels using sound intensity measurements according to ISO 9614-1, ISO 9614-2 and ISO 9614-3.

The application contains a dedicated template for each standard to lead you through all the necessary steps using a task-based workflow. Informative graphical features of the user interface and the ability to store calibration data and measurement setups for future use further simplify the measurement process.

Measurement Surfaces

In the Geometry Setup task, a representation (geometry) of the measurement surface is built by adding planar surfaces and segmenting them to obtain the desired accuracy. The geometry defines the measurement points of the surface and is represented in both graphical and tree views. The geometry can be adjusted between individual measurements.

For each measurement surface, the sound intensity level and the sound pressure are measured, the pressure-residual intensity index is calculated, and the dynamic capability index stored. The standard-specific Field Indicators for the measurement surface are calculated and compared with the criteria in the standard. Based on the results, actions are suggested to attain the desired grade of accuracy.

Table 1
Field indicators used in ISO 9614-1, -2, -3

FIELD INDICATOR		ISO 9614-1	ISO 9614-2	ISO 9614-3
Temporal variability indicator		✓		✓
Field non-uniformity indicator		✓		✓
Pressure intensity indicator	Unsigned	✓*	✓†	✓
	Signed	✓†	✓‡	✓

* Surface pressure intensity
† Negative partial power
‡ Sound field pressure-intensity index

Measurements

The probe is moved from measurement point to measurement point manually or scanned over the measurement surface. Measurements are recorded automatically (following the structure of the tree) or manually (a display indicates the status of each measurement position).

Measurement data for ISO 9614-2 can be mapped as a contour plot and stored in a database.

BK Connect® Data Viewer (advanced) Type 8400-A enables data management for one user and allows you to add metadata (such as operator, location and test type) to your data, monitoring and resolving criteria warnings.

Results

The user interface clearly shows which criteria have been fulfilled and whether the standard is being followed or not.

Results can be exported to Excel® for report generation.

Fig. 2 *When one or more criteria "fail" (indicated by the red colour), you should apply the recommended action to improve the grade of accuracy of the measurement*
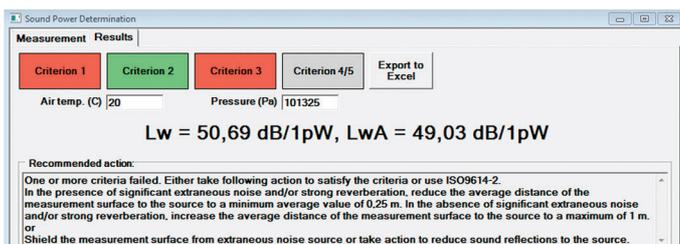
Fig. 3 *Criterion 1 has passed, but as the minimum scanning time has not been exceeded, the message "Standard not followed" is shown*
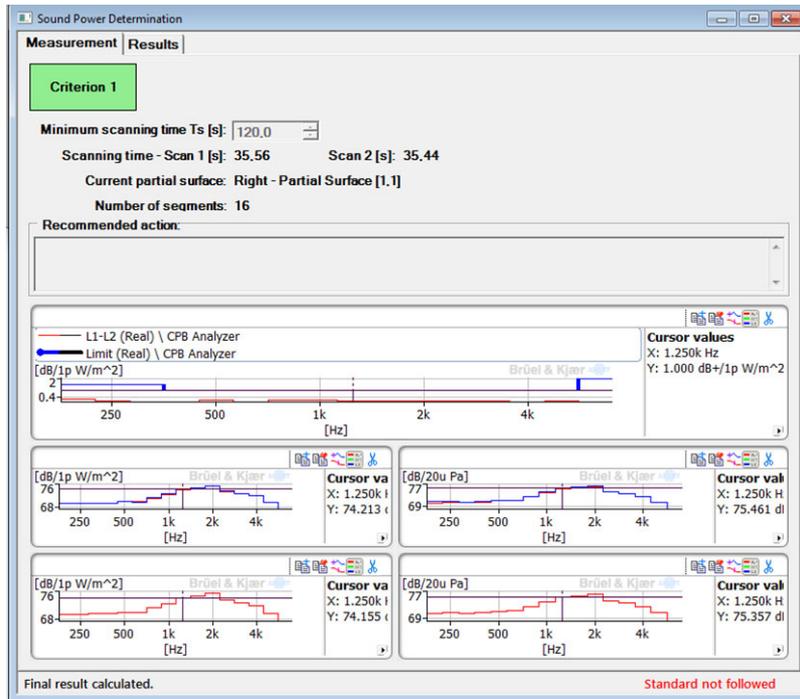

Fig. 4 *When the measurement is completed and all criteria are indicated as "passed", then the sound power determination has been made according to the precision method ISO 9614-3. If one or more of the criteria "fail" and the suggested actions do not result in a "pass", then you should use the ISO 9614-2 method*
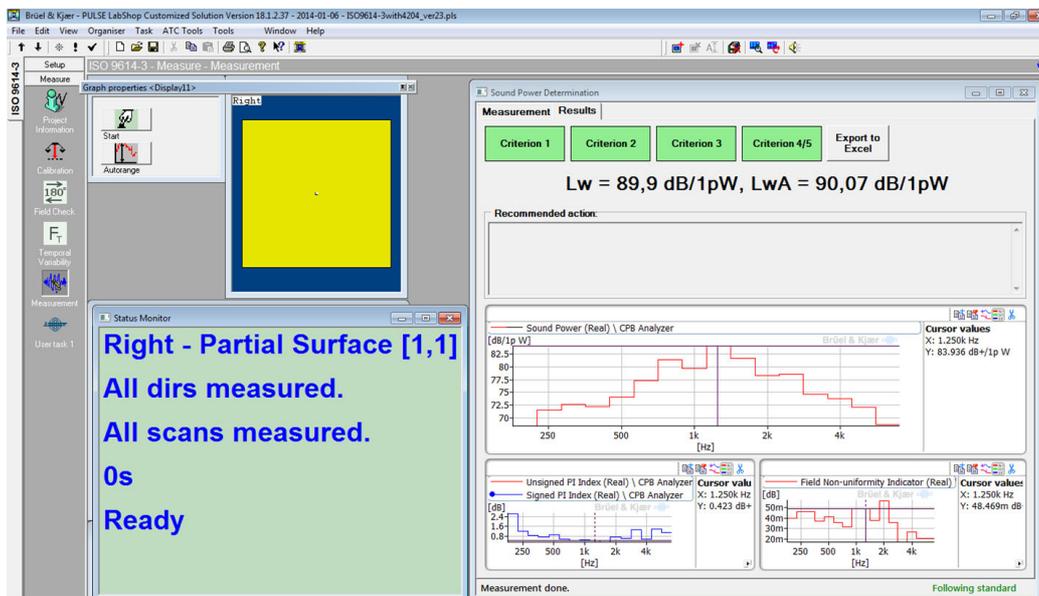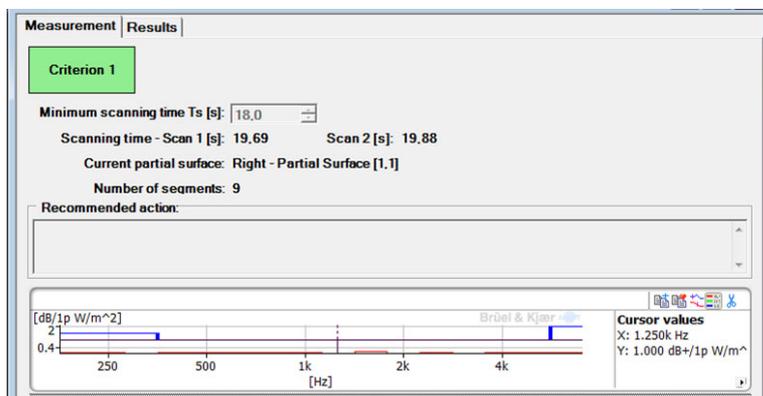

Fig. 5 *Results for criterion 1 for a particular partial surface, containing nine segments*

Specifications – PULSE Sound Power Using Sound Intensity Type 7882

Type 7882 is a Windows®-based application for PULSE Sound Power (SPW), a suite of sound power applications for the PULSE LabShop platform. The software is delivered via DVD or USB

System

SYSTEM REQUIREMENTS
- Microsoft® Windows® 10 Pro or Enterprise (x64) with either Current Branch (CB) or Current Branch for Business (CBB) servicing model
- Microsoft® Office 2016 (x32 or x64) or Office 2019 (x32 or x64)
- Microsoft® SQL Server® 2017

NOTE: Microsoft SQL Server 2017 Express is included in the installation

RECOMMENDED SYSTEM CONFIGURATION
- Intel® Core™ i9, 3 GHz processor or better
- 32 GB RAM
- 1 TB Solid State Drive (SSD) with 100 GB free space, or better
- 1 Gbit Ethernet network*
- Microsoft® Windows® 10 Pro or Enterprise (x64) with CB
- Microsoft® Office 2019 (x32)
- Microsoft® SQL Server® 2017
- Screen resolution of 1920 × 1080 pixels (full HD)

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* A dedicated data acquisition network (LAN or WAN) is recommended. A network that only handles data from the front end improves the stability of the data

OPTIONAL SOFTWARE FOR ADDITIONAL CAPABILITIES
- BK Connect Data Viewer Type 8400
- BK Connect Hardware Setup Type 8401
- BK Connect Data Processing Type 8403

Calibration

Use PULSE LabShop's integrated Calibration Master, which initiates microphone calibration while you move the calibrator from one microphone to the next. The full calibration history for a transducer can be retained in the Transducer Database, which allows monitoring calibration data variations over a period of time

Sound Intensity Based Method (PULSE Templates)

Provides measurement and calculation procedures for the determination of the sound power of noise sources using sound intensity, as described in the following international standards

STANDARDS
ISO 9614-1:1993 Discrete point method
ISO 9614-2:1996 Scanning method
ISO 9614-3:2009 Precision scanning method

SUITABLE TEST ENVIRONMENTS
The methods are applicable in situ or in special-purpose test environments

Ordering Information†

Type 7882-X	**PULSE Sound Power Using Sound Intensity**

HARDWARE FOR SOUND INTENSITY METHOD

Type 3599	Sound Intensity Probe Kit
Type 4297	Sound Intensity Calibrator
Type 3050-A-060	LAN-XI 6-ch. Input Module 51.2 kHz (Mic, CCLD, V)
UA-2104-031	LAN-XI Sound Intensity Front Panel

SOFTWARE MAINTENANCE AND SUPPORT AGREEMENTS

M1-7882-X	Agreement for Type 7882

RECOMMENDED SOFTWARE

Type 8400-X	BK Connect Data Viewer
Type 8400-A-X	BK Connect Data Viewer (advanced)
Type 8401-X	BK Connect Hardware Setup
Type 8403-X	BK Connect Data Processing

OTHER SOFTWARE AND ACCESSORIES

Type 8403-A-X	BK Connect Data Processing Specialist (instead of Type 8403)
Type 4204	Reference Sound Source
UA-0801	Lightweight Tripod

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† X is the licence type. If X = N, the licence is node-locked to PC host ID or dongle. If X = F, the licence is floating, that is, shared via a licence server

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