



Datasheet

Sound Power SETUP

SI-PA-PR/PM/PI-SCT2

SOUND POWER SETUP

Noise radiation characterization at non-anechoic conditions.

ISO 9614 quality parameters

The sound power software module included in the VELO platform allows point by point acquisition of Sound pressure and acoustic Particle Velocity. With these two quantities Sound Intensity and power are directly calculated.

The measurement process is totally guided, providing the user clear indications of the next measurement step required to complete an entire test campaign. All measurements are carried out on a simple 3D geometry which is meant to simplify the real shape of the studied sound source.

The software provides feedback over the quality level achieved in comparison with the selected ISO 9614 accuracy grade. Indicating the sections that are not according to standard and allowing to re-capture the data.

A full description of quality indicators can be provided per-position as well as per-complete measurement. The final outcome of the measurement is reported as the Total Sound power.

The combination of this tool with the Microflowns' PU sensor capability to measure in the presence of background noise and reflections, creates a hugely useful tool for noise radiation characterization of big machinery. These features make the Sound Power system a perfect solution for in-factory equipment testing, or tests of any other device that cannot be transported to an anechoic chamber.

I. SOUND POWER QUALITY PARAMETERS

SEGMENT RELATED CHECKS:

EVALUATION OF THE MEASUREMENT CONDITIONS: TEMPORAL VARIABILITY INDICATOR, F1

Checks the stationarity of the sound field within each segment, by evaluating a series of short time averaged intensity estimates.

- Related user settings: Length of the measurement (T)

EVALUATION OF THE INSTRUMENTATION: REACTIVITY CRITERIA:

If the reactivity (the ratio of the reactive to the active intensity in logarithmic form) takes a high value, as for example in the near field of a source, then even a very small phase mismatch error between the two transducers (microphone and particle velocity sensor) gives rise to a considerable bias error. The (active) intensity describes the net flow of sound energy, the reactive intensity describes the non-propagating part of the energy that is merely flowing back and forth.

- Related user settings: Distance measured object- measurement point, which is defined by the size of the 3D shape.

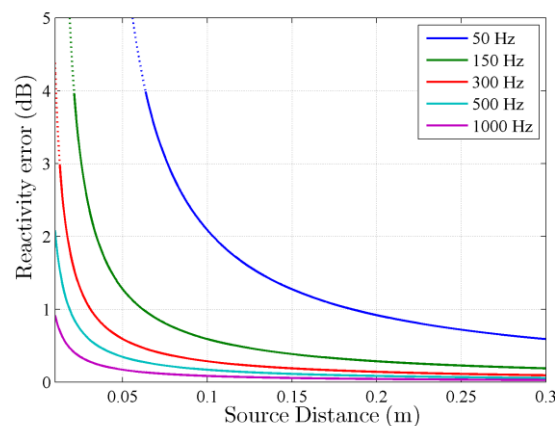


Figure 1 Indication of the reactivity error at different frequencies in relation to the distance measurement point- measured object

EVALUATION OF THE MEASUREMENT PROCEDURE:

Software performs a check on the intensity sign after each measured point is acquired. If the sound intensity value is found to be negative, the user is asked to review the probe orientation, to make sure the sensor is not rotated. Wrong sensor orientation will result in such errors.

PROJECT SETTINGS CHECKS:

BT>400

This quality check depends only on the analysis and recording parameters, established at the beginning of the project definition:

Related user settings:

- B: bandwidth. Selectable between 1/3 octave and octave band.
- T: length of the recording.

GLOBAL CHECKS:

EVALUATION OF THE MEASUREMENT CONDITIONS: FIELD NON-UNIFORMITY INDICATOR, F4

Defined as the normalized variance of the segments intensity values. It provides information as to how much variation there is between the obtained results in all the measured positions.

Related user settings:

- Grade of accuracy
- Number of measured segments: defined in the 3D shape editor.

EVALUATION OF THE MEASUREMENT PROCEDURE: NET POWER (IN/OUT)

Evaluates if the total sound power calculated in each frequency band (octave or third octave), has a positive or a negative sign. It is meant to warn the user of possible interferences from other noise sources or incorrect sensor positioning during the course of data acquisition.

EVALUATION OF THE INSTRUMENTATION: REACTIVITY INDEX INDICATOR: F5





Same criteria as the reactivity index explained in segment checks section, but calculated as a global project indicator.

Related user settings:

- Grade of accuracy
- Bandwidth (B)

Indication	Segment related	Total check	Related user settings	Discarded from Total sound power
Measurement environment	F1<0.6	$N > C * (F4)^2$	• T	
			• Grade • N segments	
Instrumentation	F5	F5<2s	• Grade • Distance to measured object	
Measurement procedure	+/- while measuring	Total +/-	• Probe handling	YES
Project settings		BT>400	• Band Type • T	

II. COMPATIBLE PROBES

Probe type	Diameter	Maximum level range		Temperature range
		Pressure	Velocity	
PU regular	12.7 mm	110 dB	125 dB	-17 to 63
				
PU mini	12.7 mm	110 dB	125 dB	-17 to 63
				
PU match	8.2 mm	131 dB	130 dB	-20 to 85
				
PU match packaged	12.7 mm	110 dB	135 dB	-17 to 63
				

*SPL ref:
20 e-5 Pa

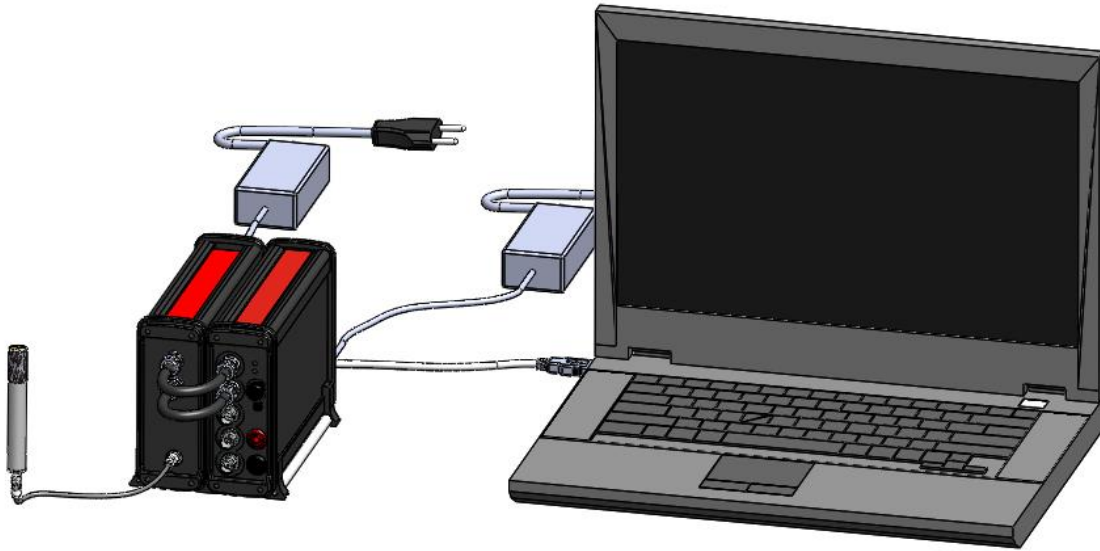
*PVL ref:
50 nm/s

More specifications can be found on the probes datasheets.

III. COMPATIBLE FRONTENDS

Frontend	Nr. Channels		Max Fs (KHz)	Bits	IEPE
	Input	Output			
Scout422 	4 analog inputs 1 tachometer input 1 trigger input	1 amplified output 1 analog output	52	24	Yes
MFDAQ 	2 analog input	1 analog output	48KHz	16 bits	No
DIC24 	24 input, expandable		350 Hz to 50 kHz	24 bits	yes

IV. CONFIGURATIONS & CONNECTIONS



V. SYSTEM COMPONENTS

SENSOR	1x PR/PM/PT/PI
CONDITIONER	1x MFPA-2
FRONTEND	1x Scout V2
ACCESSORIES	
Feet	1x (for Scout and MFPA)
CABLES	
Probe-Conditioner	1x CAB-LEMO-2.5-77
Scout-MFPA	2x BNC
Scout-PC	1x USB cable (white)
POWER SUPPLIES	
MFPA	1x19V
Scout	1x19V
FILES	
Calibration report	1x printed and USB (...\Calibration*Serial.pdf)
Product manual	1x USB (...:\Software\Microflow SW)
PELICAN CASE	1x

VI. ACCESSORIES

- **MICROFLOWN TECHNOLOGIES REMOTE HANDLE (MF-RH):** for easy operation, the Scan & Paint setup measurement process can be managed from the remote handle, not needing the operator to go back to the pc during the data capture.
- **BATTERY PACK:** New PowerGorilla battery pack is made compatible with S&P equipment in order to make it more portable.

Please consult our sales department (info@microflown.com) for suitable accessories and add-ons for your measurement setup.

VII. F.A.Q

MEASUREMENT POINTS ALLOCATION

Defined by the measurement grid designed in the 3D editor. Each grid cell is linked to a measurement point, allocated at the center of the cell.

RECOMMENDED MEASUREMENT TIME

Norm recommends between 8 and 12 s measurement time

FREQUENCY LIMITS OF THE METHOD

No method limitations, frequency limits stated by the probe:

- 20 Hz to 10KHz for intensity and sound power
- 20 Hz to 10 KHz for particle velocity
- 20Hz to 10 KHz for sound pressure

FREQUENCY RESOLUTION OF THE METHOD

It depends on:

- Analyse parameters: FFT points.

Down to few Hertz

SPATIAL RESOLUTION OF THE METHOD

Depends on the defined measurement grid designed in the 3D editor.

WHAT IS THE DEGREE OF ACCURACY?

It is the margin of deviation permitted between the sound power estimation and the actual real value. The lower the degree of accuracy, the smaller the deviation permitted. Grade 1 is the lowest degree, and therefore the most restrictive.

AIRFLOW EFFECT

The velocity sensor response is affected by airflow being able to stand up to 2 m/s. If the probe is overloaded, the results will not be usable.

For wind speeds above this value, special wind caps manufactured by Microflown technologies can be used to protect the sensor.

These wind protections and the automatic overload detection tool, allow removing the time parts where the signal is not properly acquired and discarded from the results.

VIII. USAGE AND PRECAUTIONS



- Do not submerge the electronics in water as this will lead to permanent damage.
- Only use the cables supplied with the kit. Any modifications to these cables or the use of cables of a different brand or type may result in permanent damage to the probes or the rest of the electronics.
- The probes must be powered via a Microflown™ signal conditioner, the new MFPA series or the prior MFSC/ Router. Do not power the sensors with any other device; this might cause permanent damage to the system.
- Access exposure to dust/dirt particles could damage the Microflown™ sensor.

IX. TECHNICAL SUPPORT

For any problem or doubt with your equipment, please contact Microflown™ Technologies Customer service:

- Mail: cs@microflown.com
- Skype: cs.microflown
- Telephone: +31(0) 88 001 08 11 Monday to Friday, from 9:00 to 17:00 (UTC+1).

X. WARRANTY POLICY, REPAIRS AND REPLACEMENTS

WARRANTY AND REPLACEMENT OR SUBSTITUTION

During the first two years (24 months) the seller offers a warranty on all its products, except for trading items and third party manufactured items. The seller warrants that all products will be free from defects in materials and workmanship for this period of two years. During this two year period, the seller will repair or replace defect products free of charge. Products damaged by accident, abuse, misuse, natural disaster or by any unauthorized disassembly, repair or modification are not covered by this warranty. The incurred transportation costs of returning the products to seller will be borne by the buyer. The logistical cost for returning the products back to the buyer will be borne by the seller. Several products come with a “VOID if seal is broken” sticker, the warranty is void at all times when this sticker is broken.

GRACE PERIOD (YEAR 3 AND 4)

During the third and fourth year the seller offers a grace period. In the grace period the products purchased at an earlier date can be replaced by completely new state of the art products of the same scope of the original purchase. This applies only for the products known as standard probes and signal conditioners. In the first year of the grace period, (year 3) customers have an option to replace their products for 25 % of the actual ex works end-user price. The full freight and packaging charges apply.

In the second year of the grace period, (year4) customers have an option to replace their products for 50 % of the actual ex works end-user price. The full freight and packaging charges apply.

The new products are accompanied by a new warranty. Both the two years warranty and grace period become applicable again from the date of invoice.

REPAIRS OUTSIDE WARRANTY POLICY

Replaced/repared parts come with a six month warranty under the same conditions as the two year warranty.