Microflown Technologies

Charting sound fields **V1.0 2009-10**

Datasheet

PU mini

The one dimensional PU mini probe consists of a Microflown acoustical particle velocity sensor and a miniature sound pressure transducer (Knowles FG series) placed in one single spot in a ½” packaging.

The PU mini probe can be used for a variety of purposes, such as in broad banded sound intensity measurements. The ½" package is robust so this way of packaging is the best for "non laboratory" use. The wind caps and mountings etc. of a regular ½" pressure microphone probe can be used.

Typical applications

- ✓ Array applications
- ✓ Particle velocity measurements
- ✓ Sound intensity measurments
- ✓ Impedance measurements

Specification - PU mini

Sensor configuration:
- 1x Microflown Titan sensor element
- 1x miniature pressure microphone

Physical characteristics:
Diameter : ½ inch / 12,7mm
Length : 41mm
Weight : 18g

Electrical properties:
Powering : power is supplied by the MFSC-2, 2channel signal conditioner. The input is provided by the 4 to 7pins lemo cable

Environment
Max. temperature: 60 Degrees Celcius

Acoustical properties microphone element
Frequency range : 20Hz - 20kHz
Upper sound level : 110dB
Polar pattern : omnidirectional
Directivity : omnidirectional

Acoustical properties Microflown element
Frequency range : 0.1Hz - 20kHz ± 1dB
Upper sound level : 125dB
Polar pattern : figure of eight
Directivity : directive

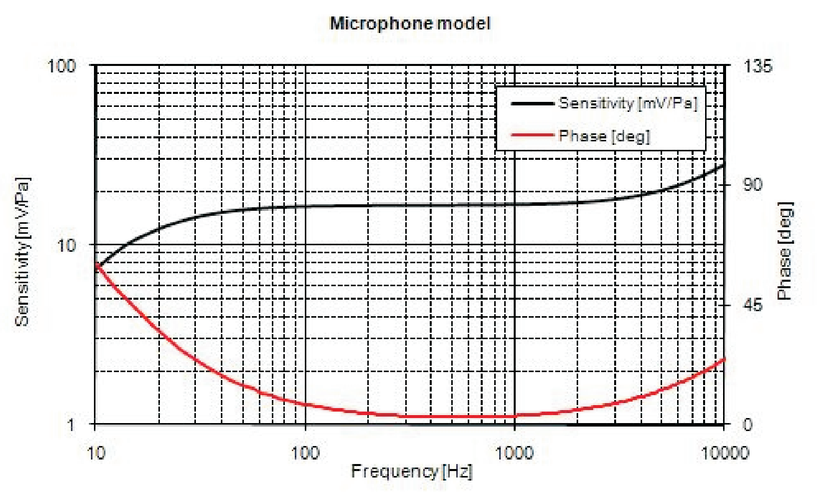
Model sound pressure microphone

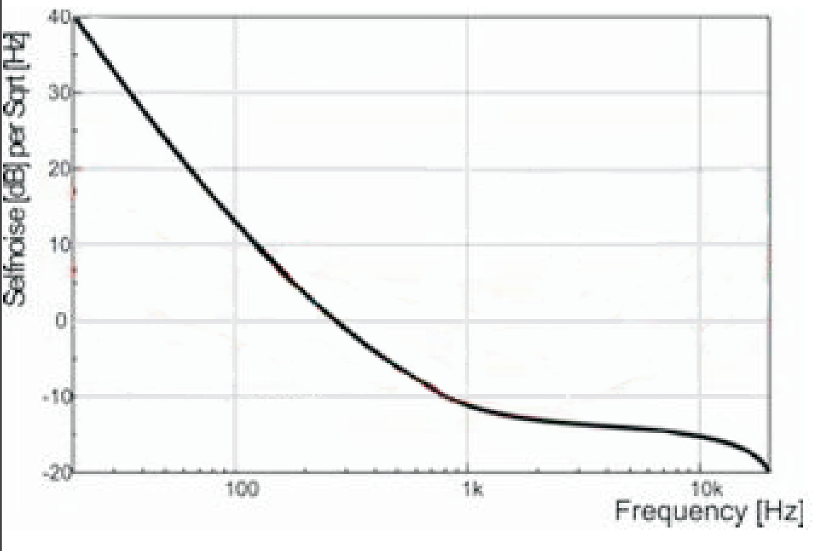
The sensitivity of the pressure microphone (independent of high/low gain or corrected/uncorrectede mode):

$$S_p[mV/Pa] = S_p@1kHz \frac{\sqrt{1+\frac{f^2}{f_{c3p}^2}}}{\sqrt{1+\frac{f_{c1p}^2}{f^2}}\sqrt{1+\frac{f_{c2p}^2}{f^2}}}$$

The phase of the pressure microphone (independent of high/low gain or corrected/uncorrectede mode):

$$\varphi_p[\deg] = \arctan\frac{C_{1p}}{f} + \arctan\frac{C_{2p}}{f} + \arctan\frac{f}{C_{3p}}$$





Parameters pressure equations		
Sensititivity:		
S_p @1kHz=	55,0	[mV/Pa]
Sensitivity cornerfrequencies		
fc1p=	30	[Hz]
fc2p=	15	[Hz]
fc3p=	10000	[Hz]
Phase cornerfrequencies		
C1p=	30	[Hz]
C2p=	15	[Hz]
C3p=	10000	[Hz]

Model Microflown sensor

The sensitivity in uncorrected mode:

$$S_u[mV/Pa^*] = \frac{S_u @ 250Hz}{\sqrt{1+\frac{f_{c1u}^2}{f^2}}\sqrt{1+\frac{f^2}{f_{c2u}^2}}\sqrt{1+\frac{f^2}{f_{c3u}^2}}\sqrt{1+\frac{f_{c4u}^2}{f^2}}\sqrt{1+\frac{f_{c5u}^2}{f^2}}}$$

The phase in uncorrected mode:

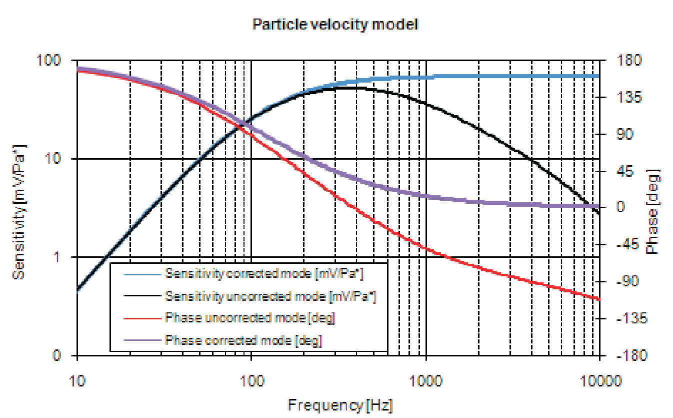
$$\varphi_u[\deg] = \arctan\frac{C_{1u}}{f} - \arctan\frac{f}{C_{2u}} - \arctan\frac{f}{C_{3u}} - \arctan\frac{C_{4u}}{f} + \arctan\frac{C_{5u}}{f}$$

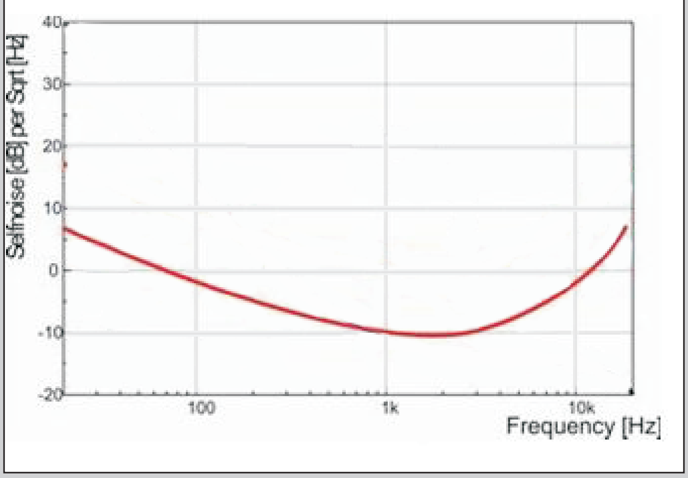
The sensitivity in corrected mode:

$$S_u[mV/Pa^*] = \frac{S_u @ 250Hz}{\sqrt{1+\frac{f_{c1u}^2}{f^2}}\sqrt{1+\frac{f_{c4u}^2}{f^2}}\sqrt{1+\frac{f_{c5u}^2}{f^2}}}$$

The phase in corrected mode:

$$\varphi_u[\deg] = \arctan\frac{C_{1u}}{f} + \arctan\frac{C_{4u}}{f} + \arctan\frac{C_{5u}}{f}$$





Parameters velocity equations		
Sensititivity in high gain:		
Su @250Hz=	69	[mV/Pa*]
Su @250Hz=	28	[V/(m/s)]
Sensititivity in low gain:		
Su @250Hz=	0,544	[mV/Pa*]
Su @250Hz=	0,224	[V/(m/s)]
Sensitivity cornerfrequencies		
fc1u=	187	[Hz]
fc2u=	636	[Hz]
fc3u=	7868	[Hz]
fc4u=	77	[Hz]
Phase cornerfrequencies		
C1u=	176	[Hz]
C2u=	559	[Hz]
C3u=	19974	[Hz]
C4u	77	[Hz]

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