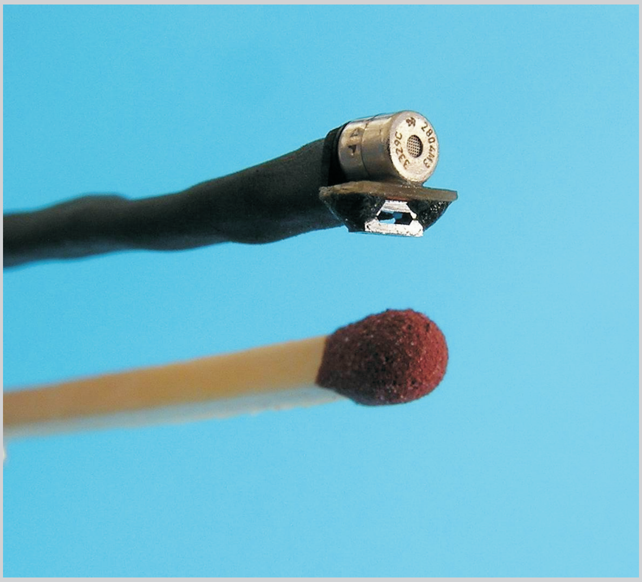
Datasheet

PU match

The one dimensional PU match probe consists of a Microflown acoustical particle velocity sensor and a miniature sound pressure transducer (Knowles FG series) placed without packaging. Making it the worlds smallest available intesity probe.

The PU match probe can be used for a variety of purposes, such as in broad banded sound intensity measurements. Due to its very small size the probe makes its possible to measure with extreme high spatial resolution wich never could be met before.



Typical applications

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

Specification - PU match

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

Physical characteristics:
Diameter : 3,5mm
Length : 45mm
Weight : 5g

Electrical properties:
Powering : power is supplied by the MFSC-2, 2channel signal conditioner. The input is provided by the USB 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 : 135dB
Polar pattern : figure of eight
Directivity : directive

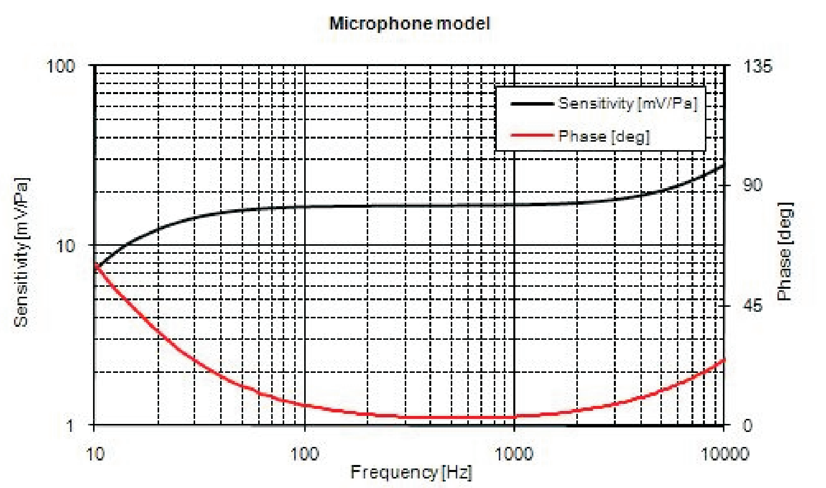
Model sound pressure microphone

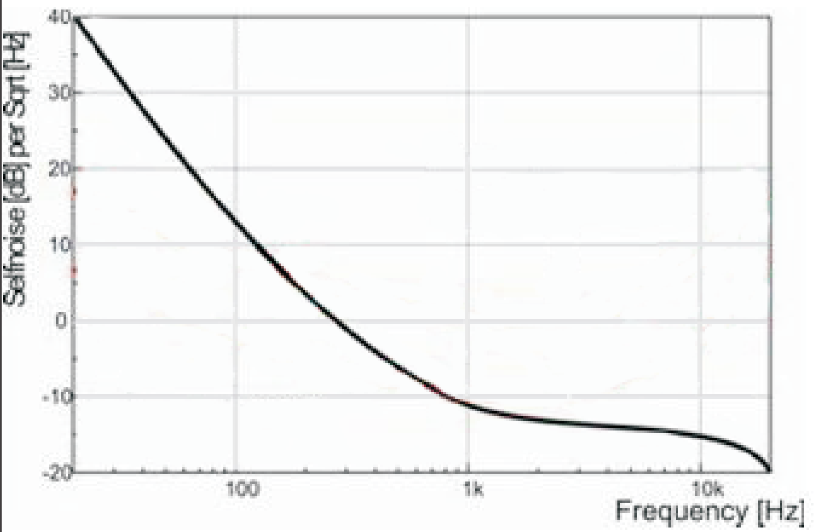
The sensitivity of the pressure microphone (independent of high/low gain or corrected/uncorrectede mode):

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

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:

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

The phase in uncorrected mode:

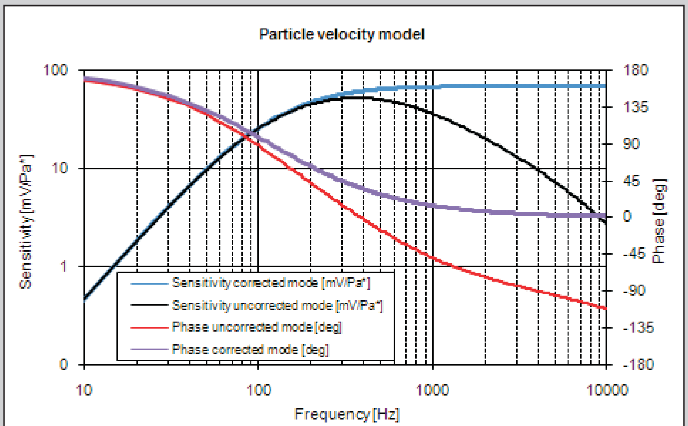
$$\varphi_u\left[\deg\right]=\arctan\frac{C_{1u}}{f}-\arctan\frac{f}{C_{2u}}-\arctan\frac{f}{C_{3u}}-\arctan\frac{C_{4u}}{f}+\arctan\frac{C_{5u}}{f}$$

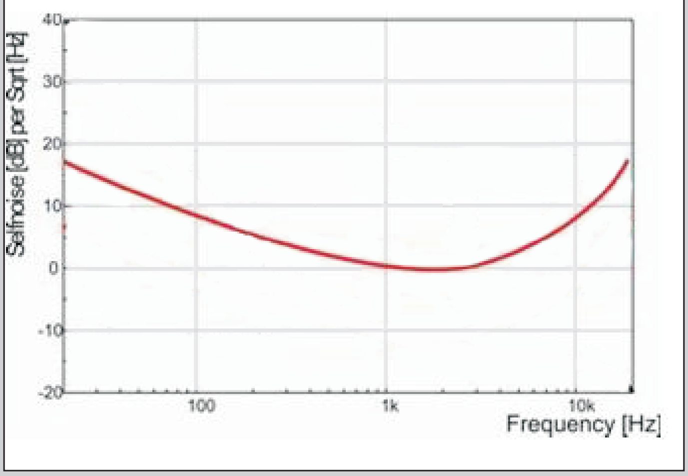
The sensitivity in corrected mode:

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

The phase in corrected mode:

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





Parameters velocity equations		
Sensititivity in high gain:		
Su @250Hz=	25	[mV/Pa*]
Su @250Hz=	10	[V/(m/s)]
Sensititivity in low gain:		
Su @250Hz=	0,25	[mV/Pa*]
Su @250Hz=	0,1	[V/(m/s)]
Sensitivity cornerfrequencies		
fc1u=	150	[Hz]
fc2u=	600	[Hz]
fc3u=	10000	[Hz]
fc4u=	77	[Hz]
Phase cornerfrequencies		
C1u=	180	[Hz]
C2u=	700	[Hz]
C3u=	20000	[Hz]
C4u	77	[Hz]

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