Microflown Technologies

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

Datasheet

High dB PU probe

When the standard available PU probes maximum dB level is not sufficient this probe could be the solution. The High dB PU probe is designed to measure dB levels for both sound pressure and particle veloctity up to 130dB. The cap with protective metal mesh is not removable.

Typical applications

- ✓ Sound pressure measurements
- ✓ Particle velocity measurements
- ✓ Sound intensity measurments
- ✓ Impedance measurements

Specification - High dB PU probe

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

Physical characteristics:
Diameter : ½ inch / 12,7mm
Length : 128mm
Weight : 39g

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

Environment
Max. temperature: 50 Degrees Celcius

Acoustical properties microphone element
Frequency range : 20Hz - 20kHz ± 3dB
Upper sound level : 130dB
Polar pattern : omnidirectional
Directivity : omnidirectional

Acoustical properties Microflown element
Frequency range : 0.1Hz - 20kHz ± 1dB
Upper sound level : 130dB
Polar pattern : figure of eight
Directivity : directive

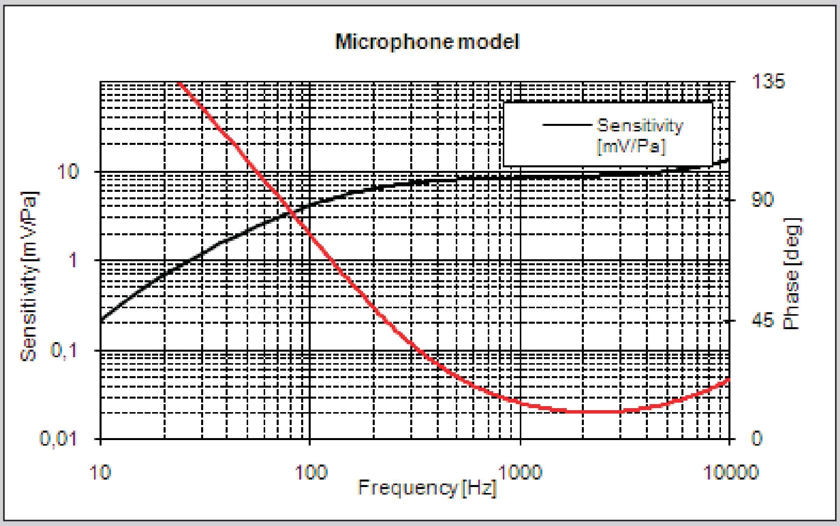
Model sound pressure microphone

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

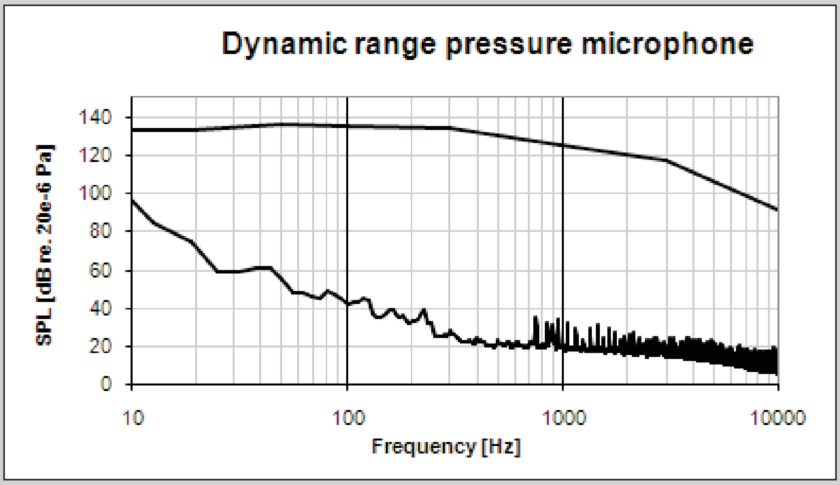
$$S_p[mV/Pa] = S_p@1kHz \frac{\sqrt{1+\frac{f^2}{f_{c3p}^2}}}{\sqrt{1+\frac{f_{c1p}^2}{f^2}}\sqrt{1+\frac{f_{c2p}^2}{f^2}}}$$

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=	10,0	[mV/Pa]
Sensitivity cornerfrequencies		
fc1p=	20	[Hz]
fc2p=	180	[Hz]
fc3p=	1000	[Hz]
Phase cornerfrequencies		
C1p=	20	[Hz]
C2p=	180	[Hz]
C3p=	20000	[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:

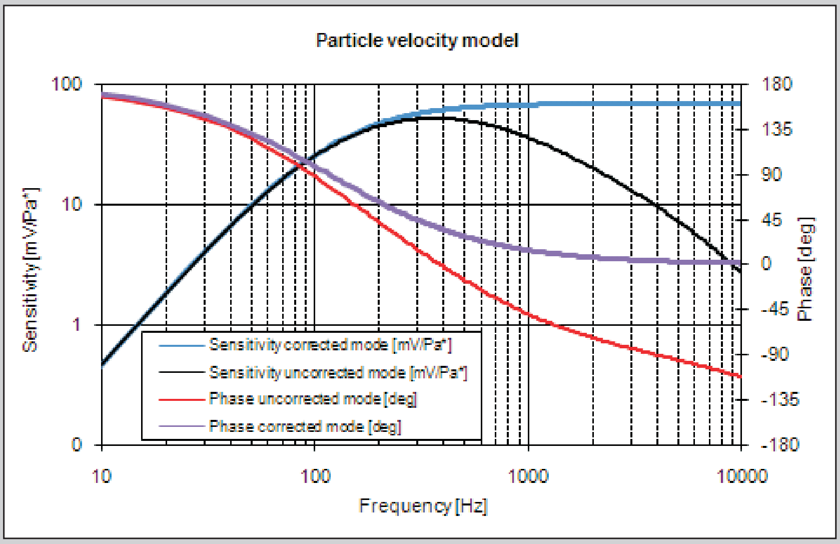
$$\varphi_u[\deg] = \arctan\frac{C_{1u}}{f} - \arctan\frac{f}{C_{2u}} - \arctan\frac{f}{C_{3u}} - \arctan\frac{C_{4u}}{f} + \arctan\frac{C_{5u}}{f}$$

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]