

## FEATURES

- Pressure chamber with clamping platform
- Sealed outlet for ¼” microphone
- Pneumatic excitation of small diaphragms

## APPLICATION

- Passive excitation of micro-speaker, headphone, tweeter and microphone suspension parts
- Determine linear and nonlinear membrane parameters using the MSPM Lite/Pro
- Perform 3D scans of a bare membrane without motor, using SCN



## DESCRIPTION

The MSPM-Bench (Micro Suspension Part Measurement) is designed for the measurement of the suspension parameters of small suspension parts (micro-speakers, headphones, tweeters, micro-phones).

The MSPM Bench is a small pressure chamber designed to produce high sound pressures. It is used to pneumatically excite a clamped small diaphragm passively to monitor its vibration behavior. A sealed outlet is used for a microphone to measure the sound pressure in the chamber directly.

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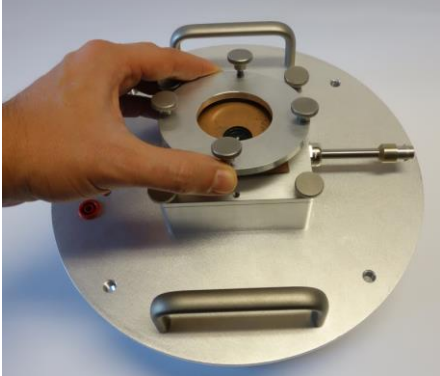
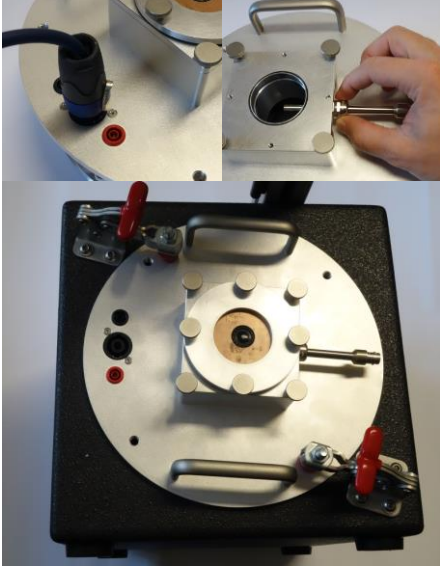
## 1 Components of MSPM Bench

<b>1.1 MSPM Bench Set</b>	
MSPM Bench	Hardware for the measurement of small suspension parts (micro-speakers, headphones, tweeters and microphones).
MSPM Bench Inlay	Inlay for the pressure chamber to reduce the air volume and to increase the possible sound pressure
Loudspeaker	Loudspeaker to actively drive the pressure chamber
<b>1.2 Additional Components required</b>	
Microphone	A 1/4" microphone is required for sound pressure measurement in the pressure chamber. Recommended Product: <ul style="list-style-type: none"> <li>• MIC 40PP-S1</li> </ul>
Laser Stands	The MSPM Bench is designed to work with one of the following laser positioning devices <ul style="list-style-type: none"> <li>• 3D Scanner (Scanning Vibrometer System SCN) (Art. #:2510-001)</li> <li>• LST Bench (Art. #: 2500-310) + Translation Stage</li> <li>• Pro Driver Stand (Art. #:2211-002) + Translation Stage</li> </ul>
<b>1.3 Measurement DUTs</b>	
DUTS	<p>The size of the supported diaphragms depends on the clamping adapter.</p> <p>Using the standard clamping, diaphragms with a diameter up to 45mm; using the extended clamping, diaphragms up to 70mm can be mounted on the MSPM Bench.</p> <p>The Diaphragm should be clamped or glued sealed into a stiff panel. Any material (plastic, metal, epoxy, etc. may be used) Panel may be up to 3mm thick.</p>


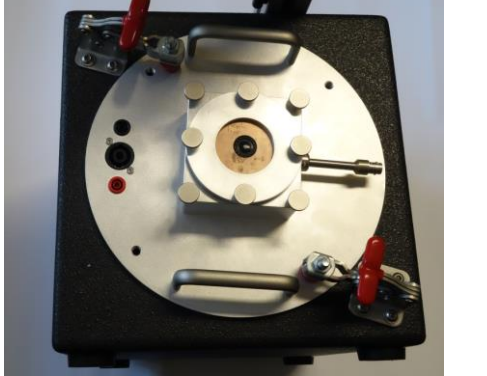
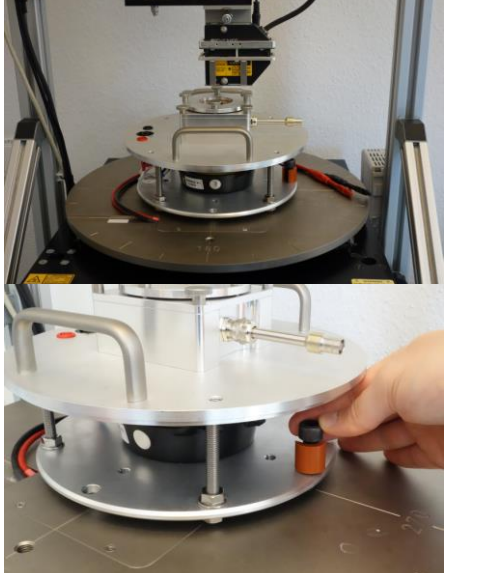


<p>The outer dimension of the panel should be between 50mm and 70mm. A ring with inner diameter of 45mm is used to press the panel on a sealing ring.</p>	<p>Technical drawing showing a square panel with a central circular hole. The outer square dimension is 60mm (+10/-10). The inner circular hole has a diameter of 45mm (+0/-40).</p>
<p>The outer dimension of the panel should be between 75mm and 80mm. A ring with inner diameter of 70mm is used to press the panel on a sealing ring.</p>	<p>Technical drawing showing a square panel with a central circular hole and four mounting holes. The outer square dimension is 90mm (+0/-10). The inner circular hole has a diameter of 70mm (+0/-2.5). The four mounting holes have a diameter of 5mm (+0.5/-0.5). The distance between the center of the hole and the center of a mounting hole is 40mm (+2.5/-2.5).</p>

## 2 Preparing a Measurement

<p>Unscrew the clamping ring</p>	<p>Unscrew the clamping ring from the enclosure. Place the DUT on the platform.</p>	
<p>Fix the DUT</p>	<p>Fix the DUT between the two mounting parts using the 4 screws.</p>	
<p>Prepare the Sensors</p>	<p>Insert and connect the microphone. Close the outlet. Connect the driving speaker.</p> <p>Place the MSPM bench on one of the Laser positioning devices.</p> <p>Direct the laser beam to the center of the membrane. Potentially a white dot is needed on the membrane for proper reflection. Adjust the laser position so that the laser is in its center position.</p>	

### 3 Using different laser stands

Pro Driver Stand	Clamp the MSPM Bench on the screws between the platforms or on the lower platform into the Pro Driver Stand.	
LST Bench	Place the MSPM Bench on the LST Box and close the fast clamps of the MSPM-Bench	
Laser Scanner	Place the MSPM Bench on the Laser Platform and connect the driving speaker with the speaker clamps. Adjust the laser using the motor controller. Mount the MSPM bench to the turntable, using the included M10 screws.	

## 4 Limits

Parameter	Conditions	Min	Typ	Max	Unit
<b>DUT</b>					
<b>Mounting plate</b>					
Dimensions		50	60	80	mm
Thickness				3	mm
<b>Diaphragm</b>					
Diameter				70	mm
Resonance frequency		100		2500	Hz
<b>MSPM CLAMPING SET</b>					
<b>Operation</b>					
Maximum Sound Pressure in Chamber	continuous (<40s) Short term (<5s)			156 160	dB <sub>SPL</sub> dB <sub>SPL</sub>
Input voltage	continuous (<40s) Short term (<5s)			12 19	V V
<b>Dimensions</b>					
width			250		mm
height			150		mm
weight			4,5		Kg

Find explanations for symbols at:

<http://www.klippel.de/know-how/literature.html>

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