# MSPM Bench A12

Accessory of the KLIPPEL ANALYZER SYSTEM (Document Revision 1.4)

## 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 module
- 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, microphones).

The bench is designed as a small pressure chamber, enabling the production of high sound pressures. A clamped, small diaphragm is excited pneumatically. Using a displacement sensor, the vibration behavior is monitored. The sealed outlet allows the measurement of the sound pressure in the chamber directly, by using a microphone.

| | |
|---|---|
| Article number | #2500-601 |

## CONTENT



# 1 Components of MSPM Bench

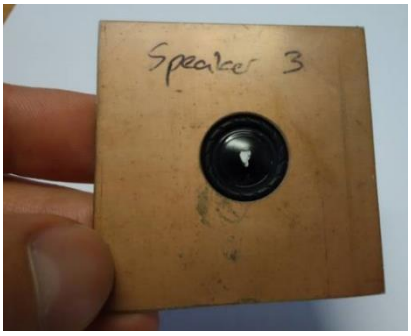
## 1.1 MSPM Bench Set

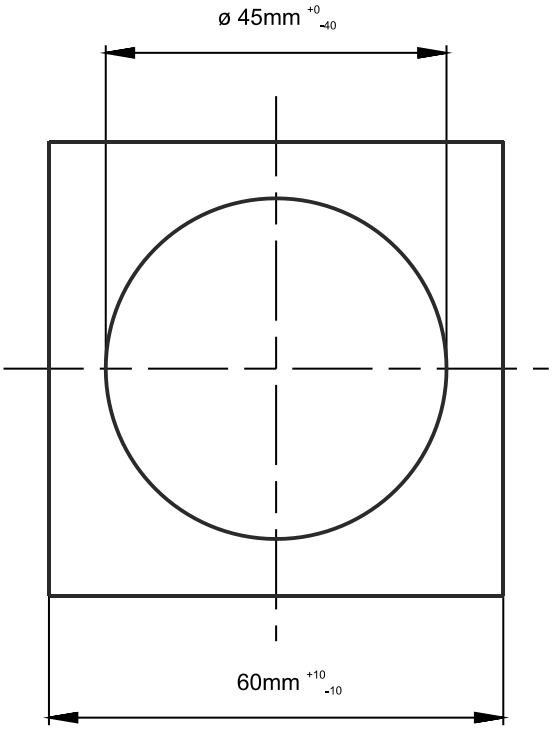
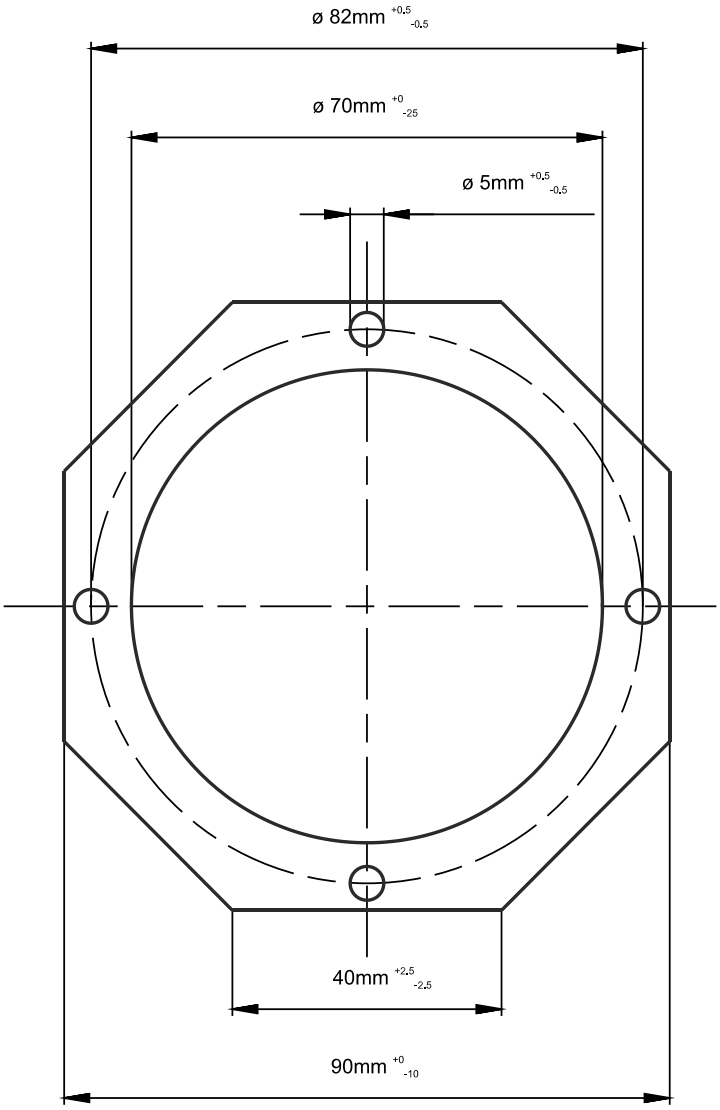
| | |
|---|---|
| **MSPM Bench** | Hardware for the measurement of small suspension parts (micro-speakers, headphones, tweeters and microphones). |
| **MSPM Bench Inlay** | Inlay for the pressure chamber to reduce the air volume and to increase the possible sound pressure. |
| **Loudspeaker** | Loudspeaker to actively drive the pressure chamber. |

## 1.2 Additional Components required

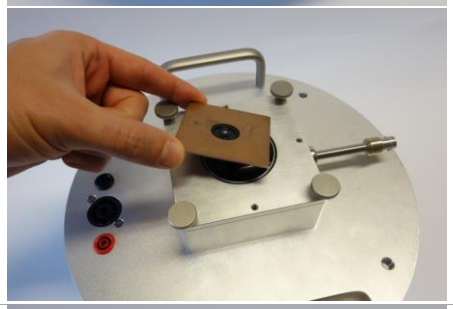
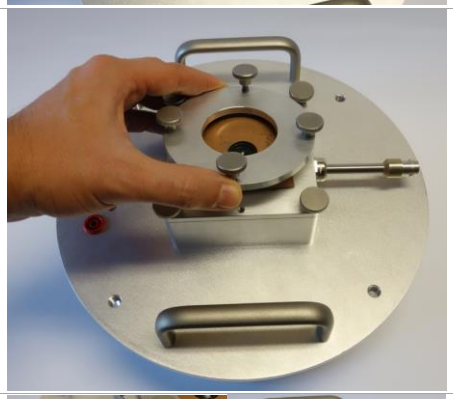
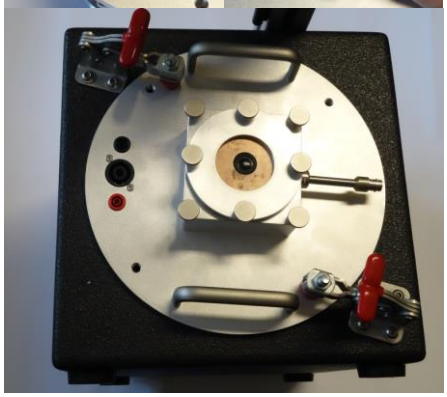
| | |
|---|---|
| **Microphone** | A 1/4" microphone is required for sound pressure measurement in the pressure chamber.<br>**Recommended Product:** MIC 40PP-S1 |
| **Laser Stands** | The MSPM Bench is designed to work with one of the following laser positioning devices<br>• 3D Scanner (Scanning Vibrometer System SCN) (Art. #:2510-001)<br>• LST Bench (Art. #: 2500-310) + Translation Stage<br>• Pro Driver Stand (Art. #:2211-002) + Translation Stage |

## 1.3 Measurement DUTs

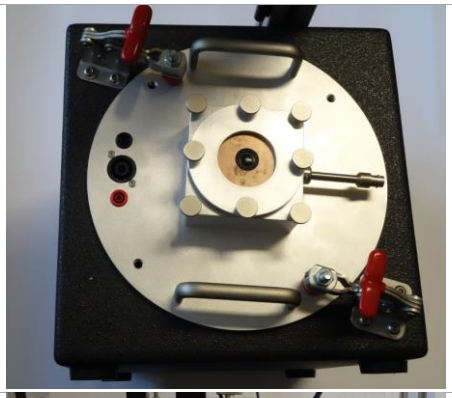
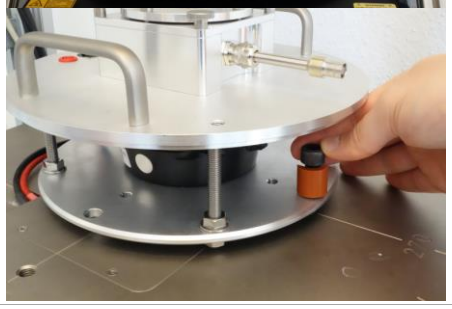
| | | |
|---|---|---|
| **DUTS** | The size of the supported diaphragms depends on the clamping adapter.<br>Using the standard clamping, diaphragms with a diameter up to 45mm; using the extended clamping, diaphragms up to 70mm can be mounted on the MSPM Bench.<br>The Diaphragm should be clamped or glued sealed into a stiff panel. Any material (plastic, metal, epoxy, etc. may be used)<br>Panel may be up to 3mm thick. |  |

| | | |
|---|---|---|
| | 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. |  |
| | 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. |  |

## 2 Preparing a Measurement

| | | |
|---|---|---|
| **Unscrew Clamping Ring** | Unscrew the clamping ring from the enclosure. Place the DUT on the platform. |   |
| **Fix the DUT** | Fix the DUT between the two mounting parts using the 4 screws. |  |
| **Prepare the Sensors** | Insert and connect the microphone. Close the outlet. Connect the driving speaker.<br>Place the MSPM bench on one of the Laser positioning devices.<br>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. |    |

# 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.<br>Mount the MPSM bench to the turntable, using the included M10 screws. |  <br>  |

## 4 Limits

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

Find explanations for symbols at:

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

Last updated: September 30, 2019