HFK
CAPACITIVE COUPLING CLAMP AND CALIBRATION SET CA HFK

The HFK is used to couple EFT/burst pulses to I/O lines as required in different European and international standards for immunity testing. The coupling of the Electrical Fast Transients EFT/burst to signal lines can usually not be achieved by discrete capacitive coupling without interfering with the signal flow. It is often impossible to contact the required circuit (direct), e. g. coaxial or shielded cables. In this case the coupling is realized by the capacitive coupling clamp. The interference simulator can be connected on both sides of the coupling clamp.

The IEC 61000-4-4 Ed 3.0 published 2012 recomends the calibration of the capacitive coupling clamp into a 50ohm coaxial load with the normative calibration kit CA HFK.

FOR TESTS ACCORDING TO ...
› EN 61000-4-18
› EN 61000-4-4
› IEC 61000-4-18
› IEC 61000-4-4

CALIBRATION SET FOR CAPACITIVE COUPLING CLAMP VERIFICATION

HIGHLIGHTS
› Construction as per IEC 61000-4-4 Ed.3
› EFT/Burst testing of signal- and datalines
› Active coupling length 1m
› Permissible burst voltage 7 kV
› For cable diameter up to 40 mm

APPLICATION AREAS

INDUSTRY
MEDICAL
BROADCAST
TELECOM
RESIDENTIAL

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TECHNICAL DETAILS

### CA HFK CALIBRATION SE-TUP

**CALIBRATION OF THE CAPACITIVE COUPLING CLAMP**

The standard IEC 61000-4-4 Ed 3.0 recommends a new calibration of the capacitive coupling clamp. EM test developed for the calibration, the CA HFK set.

Components required for carry out the calibration:
- **CA HFK**: Consisting of transducer-plate and support
- **KW 50**: Load resistor 50ohm
- **AD-CA EFT**: Adapter 4 mm/6 mm for connect the transducer-plate to the coaxial F103 connector of KW 50

**Calibration set-up**

The transducer plate shall be placed into the capacitive coupling clamp such that the end with the connection is aligned with the end of the coupling plate. The connecting adapter AD-CA EFT is bond with a low impedance connection band to ground reference plane for grounding of the 50ohm coaxial measurement terminator/attenuator. The load resistor KW 50 is connected to the AD-CA EFT adapter. An acrylic support places the KW 50 to the same 100mm height as the coupling clamp is distant from the reference ground. The distance between the transducer plate and the KW 50 measurement terminator/attenuator shall not exceed 0,1m. A setup example is given in figures on this datasheet.

### COUPLING CLAMP CALIBRATION

The calibration of the capacitive coupling plane is performed with the open circuit voltage setting at the EFT/burst generator (50 ohm output): 2,000 V

Resulting output voltage across the KW 50 (50ohm matching resistor): 1,000 V.

Measuring voltage Vm: 10 V

Measured voltage considering the 50 ohm input impedance of the oscilloscope: 5 V

Resulting attenuation (theoretical): 400:1
## Technical Details

### HFK Capacitive Coupling Clamp

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Voltage</td>
<td>7.0 kV</td>
</tr>
<tr>
<td>Dimension Coupling plate</td>
<td>140 mm x 1000 mm</td>
</tr>
<tr>
<td>Height</td>
<td>GND - Coupling plate, 100 mm</td>
</tr>
<tr>
<td>Connector</td>
<td>High voltage connector, coaxial</td>
</tr>
<tr>
<td>GND connection</td>
<td>4 mm plug, banana</td>
</tr>
<tr>
<td>EUT cable</td>
<td>up to 40 mm diameter</td>
</tr>
<tr>
<td>Weight</td>
<td>5.6 kg</td>
</tr>
</tbody>
</table>

### CA HFK (Calibration)

#### Technical Data for Transducer Plate

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Transducer plate with 4 mm connection plug</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>Max. 5,000 V</td>
</tr>
<tr>
<td>Dimension</td>
<td></td>
</tr>
<tr>
<td>Insulation</td>
<td>1,100 +/- 5 mm x 130 +/- 1 mm</td>
</tr>
<tr>
<td>Copper foil</td>
<td>1,050 +/- 5 mm x 120 +/- 1 mm thickness foil &lt;0.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>300 g</td>
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</tbody>
</table>

#### Technical Data for Insulated Support

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Support for measuring adapter KW 50 on 100mm level for capacitive coupling clamp verification</td>
</tr>
<tr>
<td>Height KW 50</td>
<td>100 mm +/- 1 mm</td>
</tr>
<tr>
<td>Material</td>
<td>Acrylic</td>
</tr>
<tr>
<td>Dimension</td>
<td>70 mm x 49 mm x 95 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>400 g</td>
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</tbody>
</table>

## General Data

### General Data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>10°C to 40°C</td>
</tr>
<tr>
<td>Rel. humidity</td>
<td>Max. 85 %, non condensing</td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>86 kPa (860 mbar) to 106 kPa (1,060 mbar)</td>
</tr>
</tbody>
</table>

## Options

### Optional Accessories

- **CA EFT Kit**: Calibration Kit for EFT Burst calibration includes:
  - KW 50, 50ohm load resistor
  - KW 1000, 1,000 ohm load resistor
  - AD-CA EFT, Adapter 4mm/6mm to coaxial F103 connector, (connection Load resistor to transducer plate)
- **AD-CA EFT**: Adapter to match the transducer plate to the KW 50 load resistor, (connection Load resistor to transducer plate)
- **KW 50**: Coaxial 50 ohm load resistor for EFT/Burst transient calibration
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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.