SCHLÖDER
EMV-Systeme & Komponenten

# CDN EMCL-20
# CDN EMCL-35

## EM Clamp for immunity tests

**IEC / EN 61000-4-6 Ed. 4.0**

CDN EMCL-20 for cable diameter up to 20 mm

CDN EMCL-35 for cable diameter up to 35 mm

- EM Clamp for immunity testing of cables with up to 20 (35) mm diameter
- High coupling factor: less than 15 watts amplifier output power is required to obtain a test level of 10 V
- Calibration unit and calibration data are supplied with each unit.

The preferred coupling and decoupling devices are the CDNs, for reasons of test reproducibility and protection of the AE. However, if they are not suitable or available, clamp injection can be used.

Often, clamp injection needs to be applied to multi-pair balanced cables because suitable CDNs might not be available.

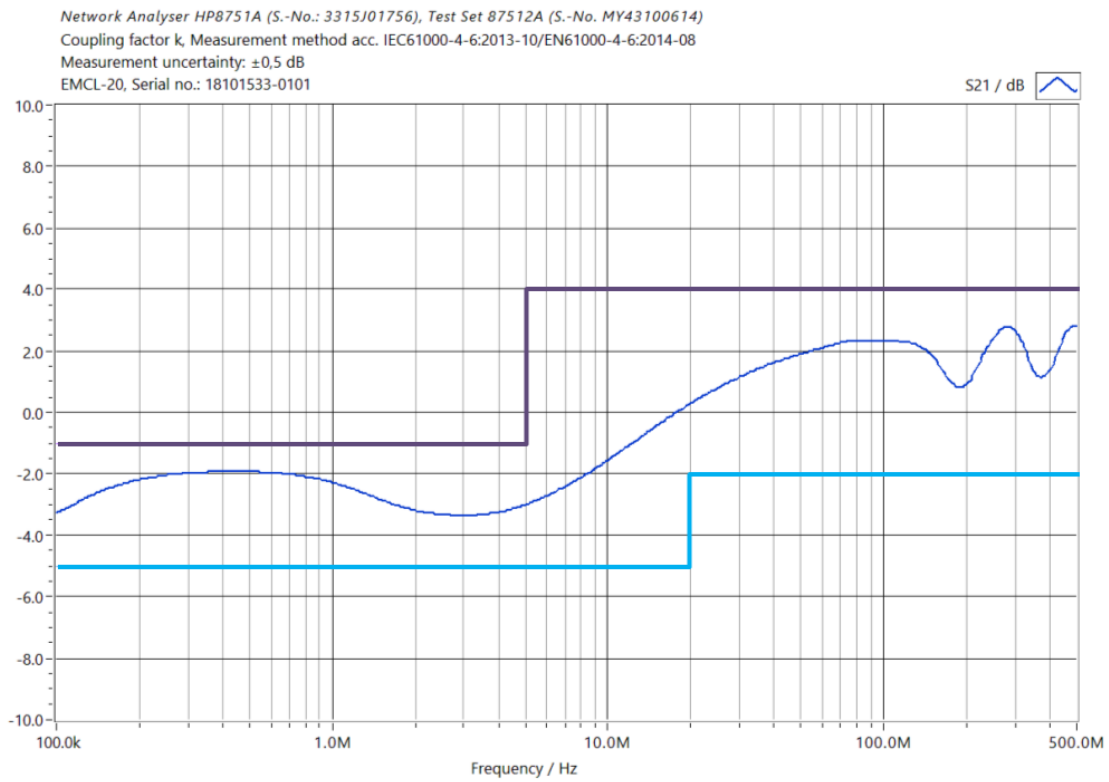
The EM Clamp establishes both capacitive and inductive coupling to the cable connected to the EUT.

The EM-Clamp (in contrast to the conventional current injection clamp) has a directivity ≥ 10 dB, above 10 MHz, so that defined impedance between the common-mode point of the AE and the ground reference plane is no longer required. Above 10 MHz, the behavior of the EM Clamp is similar to that of a CDN.

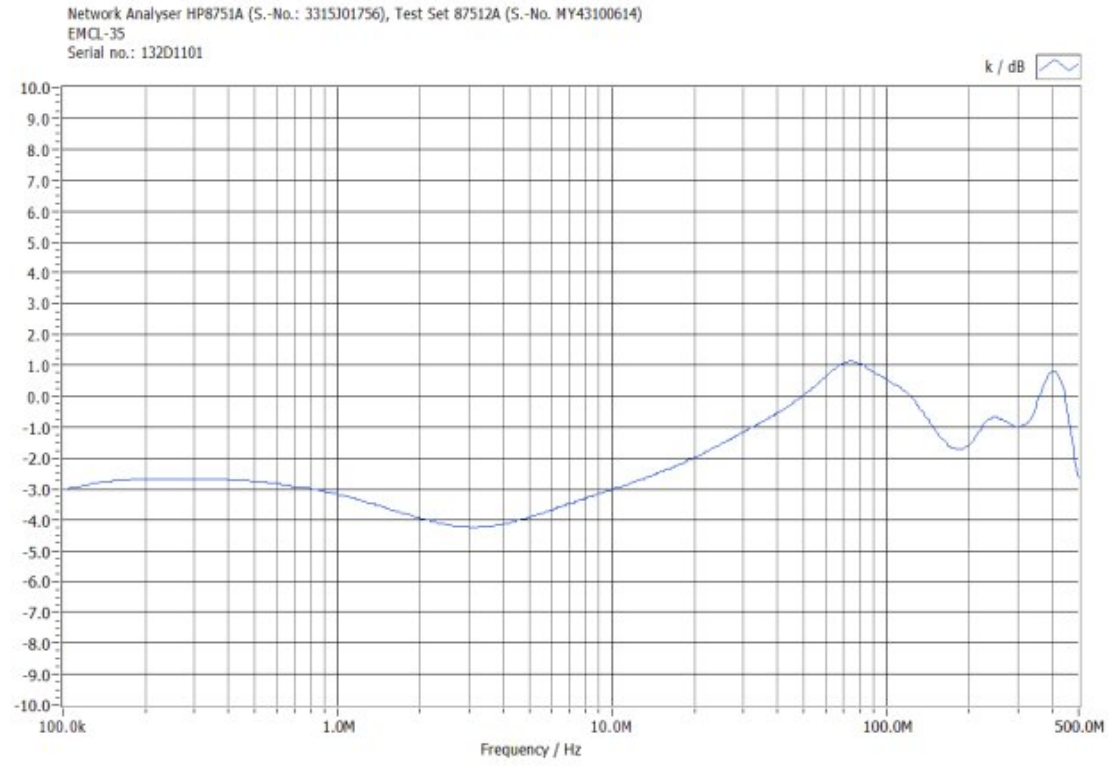
Subject to changes without prior information

191806

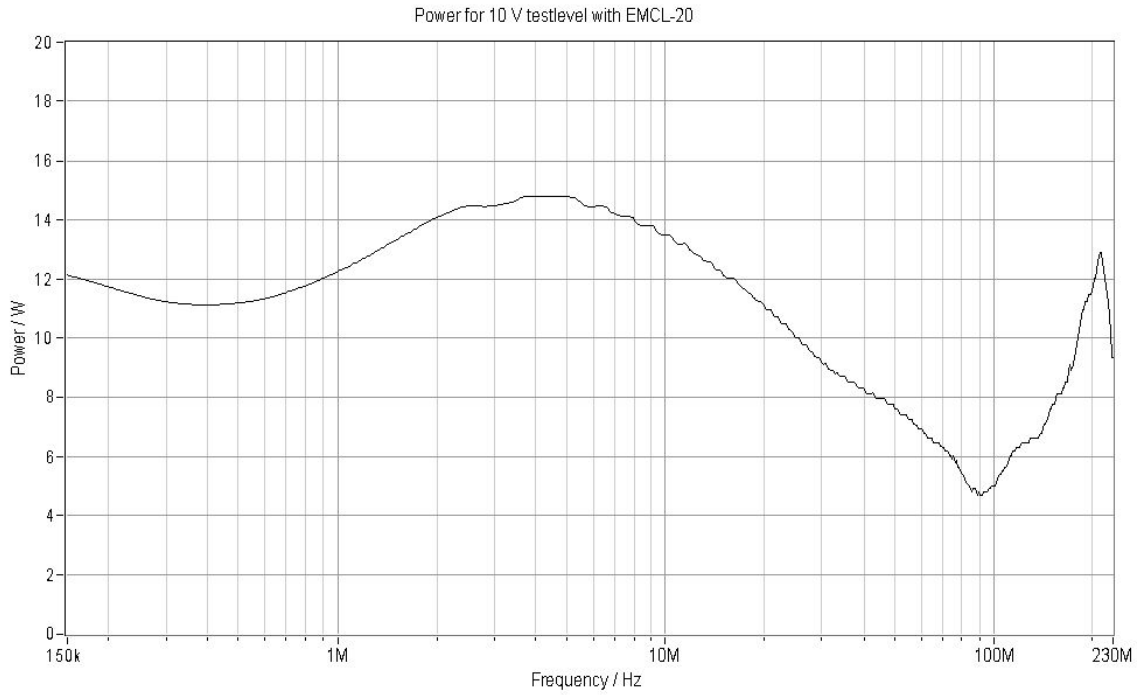
**Coupling factor of the EMCL-20**




**Typical coupling factor of the EMCL-35**



**Measured amplifier power to achieve the highest level required in EN 61000-4-6 of 10 V.
Measurement was carried out with 6 dB attenuator and 80% amplitude modulation. (EMCL-20)**

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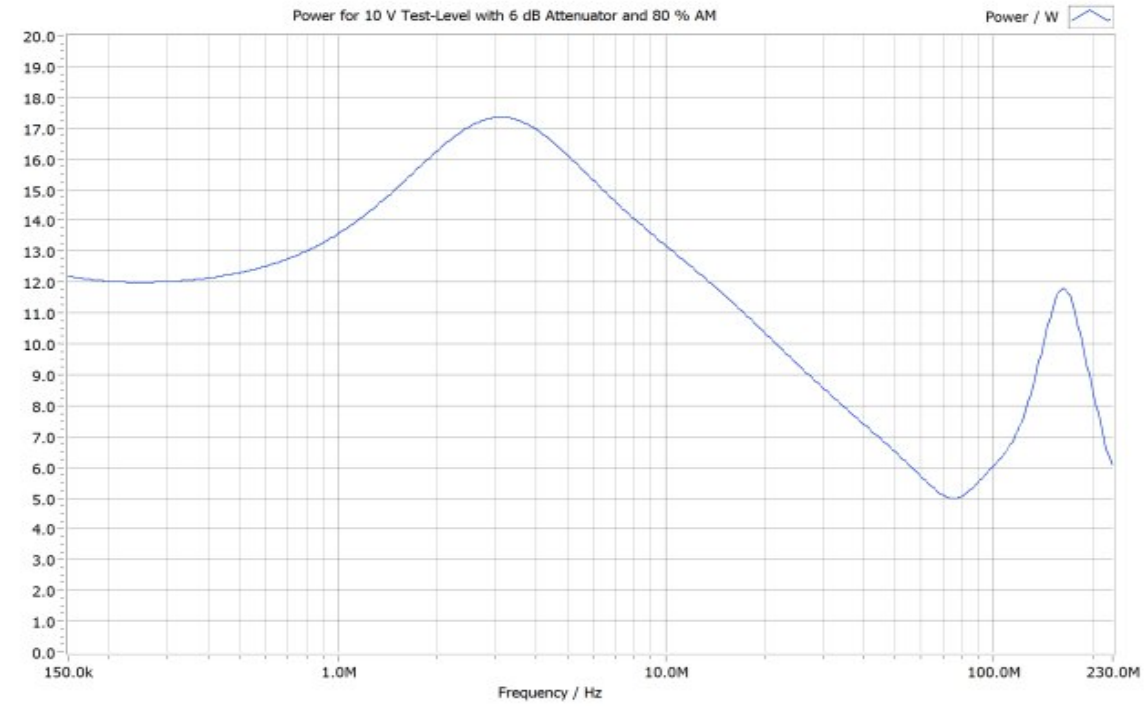
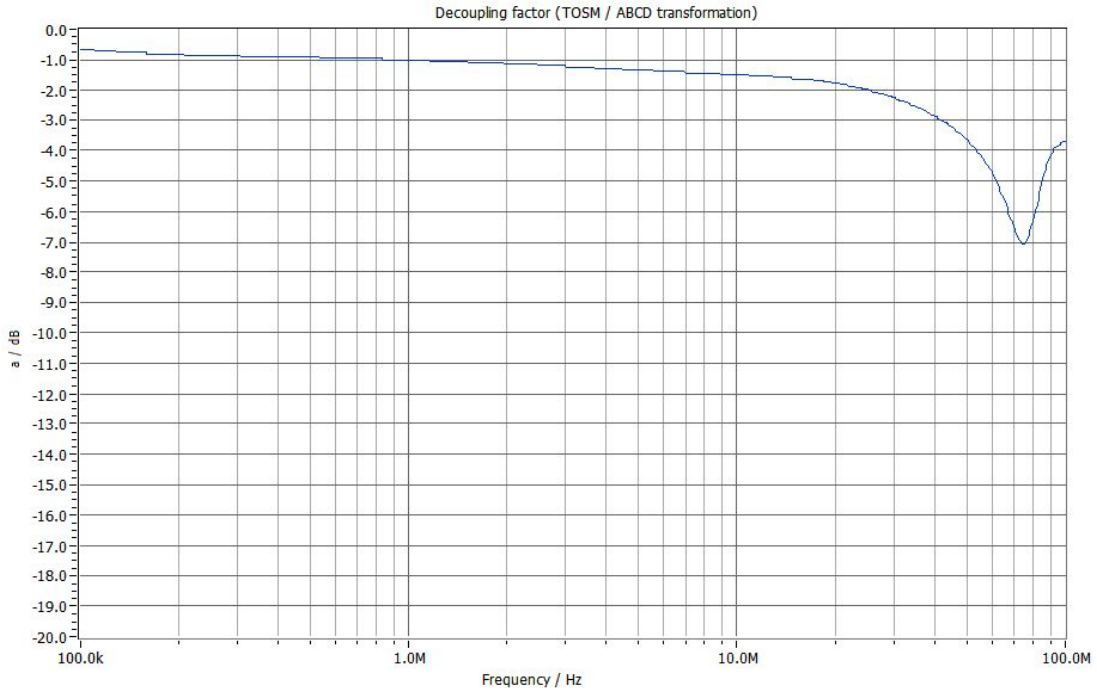


**Typical decoupling factors (transformed): EMCL-20**

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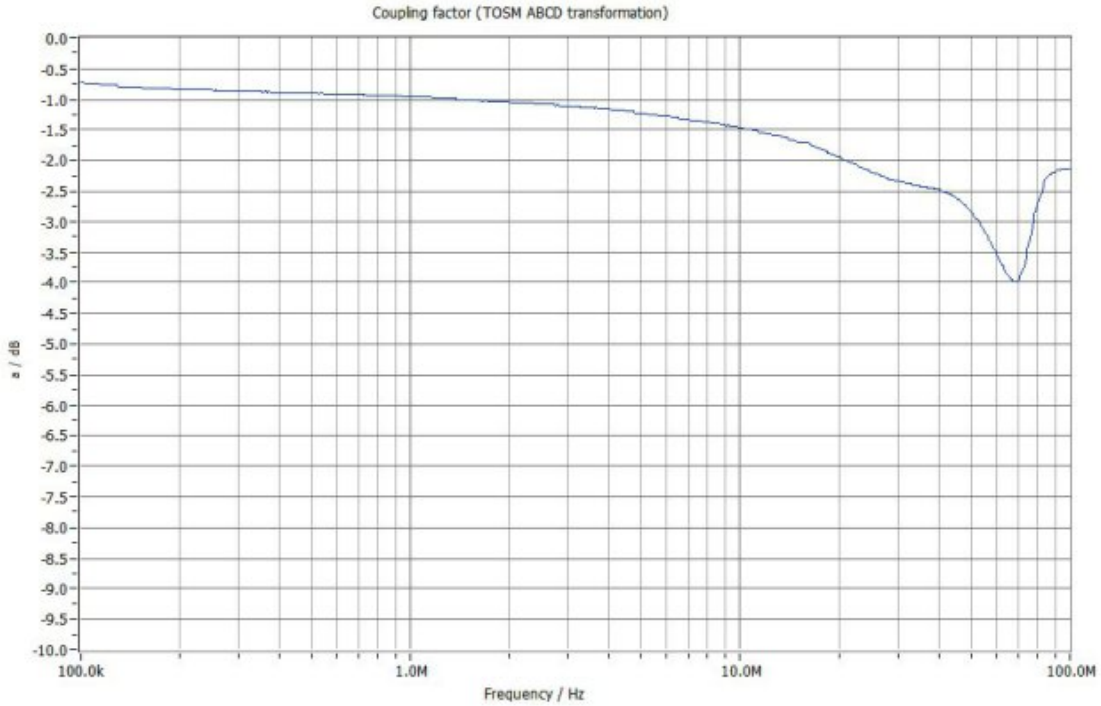
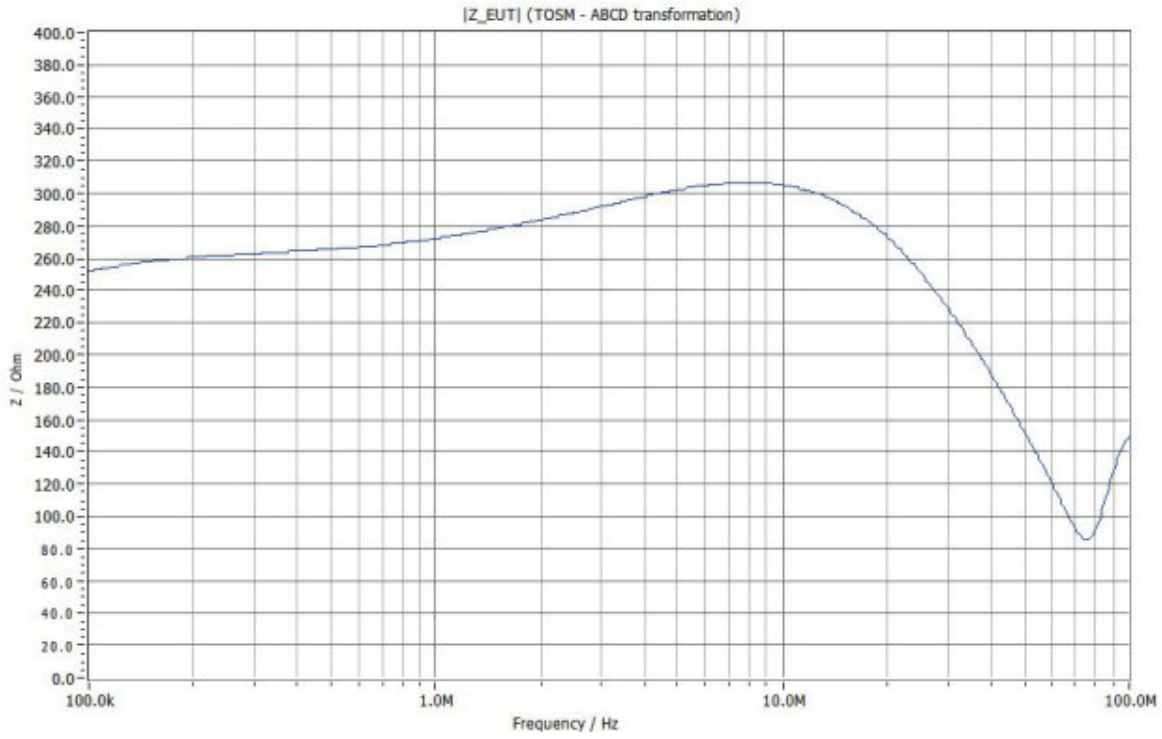
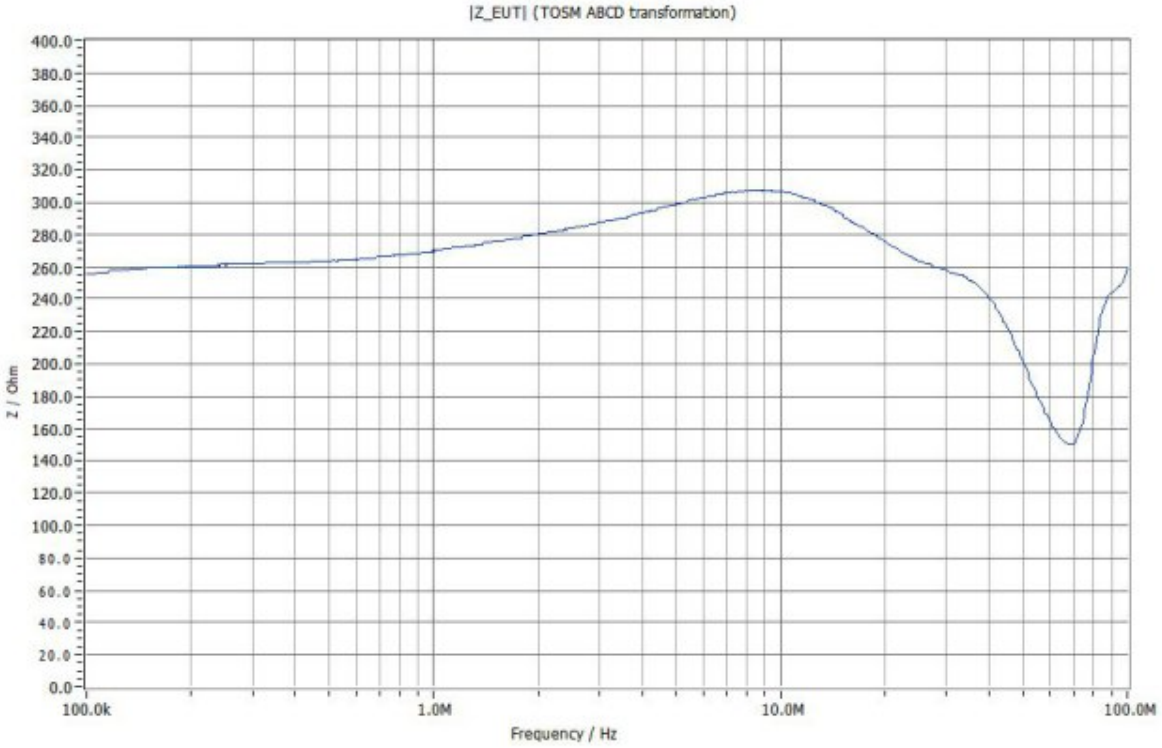


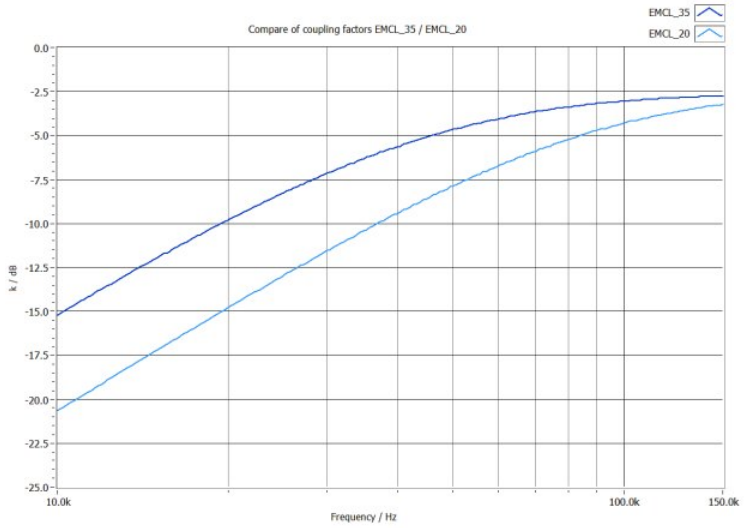
**Typical clamp impedance (transformed): EMCL-20**




**Typical clamp impedance (transformed): EMCL-35**



**Comparison of the coupling factors EMCL-35 / EMCL-20**




**The high coupling factor of the EMCL-35 allows a test according to level 3 (10V) of IEC 61000-4-6 already at 10 kHz with the test generator CDG 6000-75_10 or amplifier PA1020-75-250.**

## EMCL-20 clamp for frequency range 10 kHz - 150 kHz

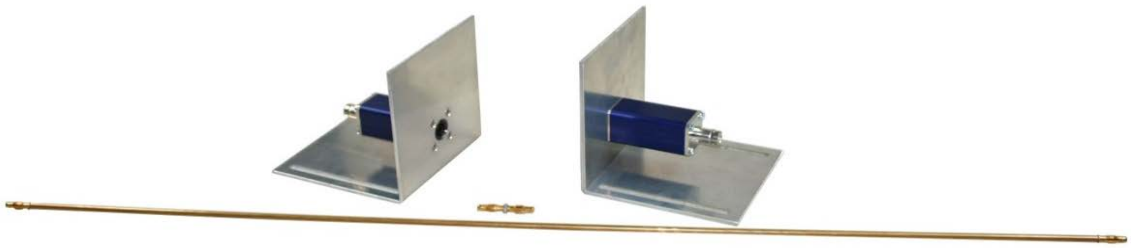
**CDN EMCL-NW_10 / MN-1**

The EM clamp is developed for test frequencies above 150 kHz. For product standards with testing requirements in the frequency range of 10 kHz – 150 kHz the EMCL-20 clamp cannot operate like normal with a 6dB attenuator. The insertion loss for an effective coupling is too high. Therefore, a matching network **CDN EMCL-NW_10** should be used. This network transforms the low impedance of the EM clamp to an acceptable impedance for the amplifier. With this matching network reproducible tests are feasible till 10V at 80% AM – without the 6 dB attenuator.

**The matching network CDN EMCL-NW_10 is not required for the EMCL-35.**

| Specifications | EMCL-20 | EMCL-35 |
|---|---|---|
| Frequency range | 10 kHz - 1000 MHz | |
| Nominal impedance | 50 Ohm | |
| Connector | N-type, female weiblich | |
| Max. input level<br><br>0,15 – 100 MHz<br>100 – 230 MHz<br>230 – 1000 MHz | <br><br>100 W, 15 min<br>100 W, 5 min<br>50 W, 3 min | |
| Cable diameter | < 20 mm | < 35 mm |
| Dimensions(L x W x H) in mm | 632 x 120 x 80 | 666 x 135 x 120 |
| Weight | 7 kg | 14 kg |

**Calibration unit of the CDN-EMCL-20 (included in scope of delivery of the EMCL -20 and EMCL-35)**



| Accessories (Calibration unit) | |
|---|---|
| Mounting bracket incl. 50/150 Ohm adapter (2 pieces) | |
| BNC termination, 50 Ohm, 1 W | |
| Adapter with 2 banana-plugs, length 34 mm | For calibration of the network-analyser |
| Brass rod 4 mm with banana-plugs, length 672 mm | For setting of test level |

| Bestell-Informationen | |
|---|---|
| CDN-EMCL-20 | EM-Clamp, acc. IEC/EN 61000-4-6 for cables up to 20 mm diameter, incl. calibration unit and calibration data. |
| CDN EMCL-NW_10 | Matching network 10 kHz – 150 kHz, for using EMCL-20 from 10 kHz to 150 kHz |
| CDN-EMCL-35 | EM-Clamp, acc. IEC/EN 61000-4-6 for cables up to 35 mm diameter, incl. calibration unit and calibration data. |
| CDN ABCL-20 | Decoupling clamp for additional decoupling at immunity testing according to IEC / EN 61000-4-6, 100 kHz – 1000 MHz, cable diameter max. 20mm. |