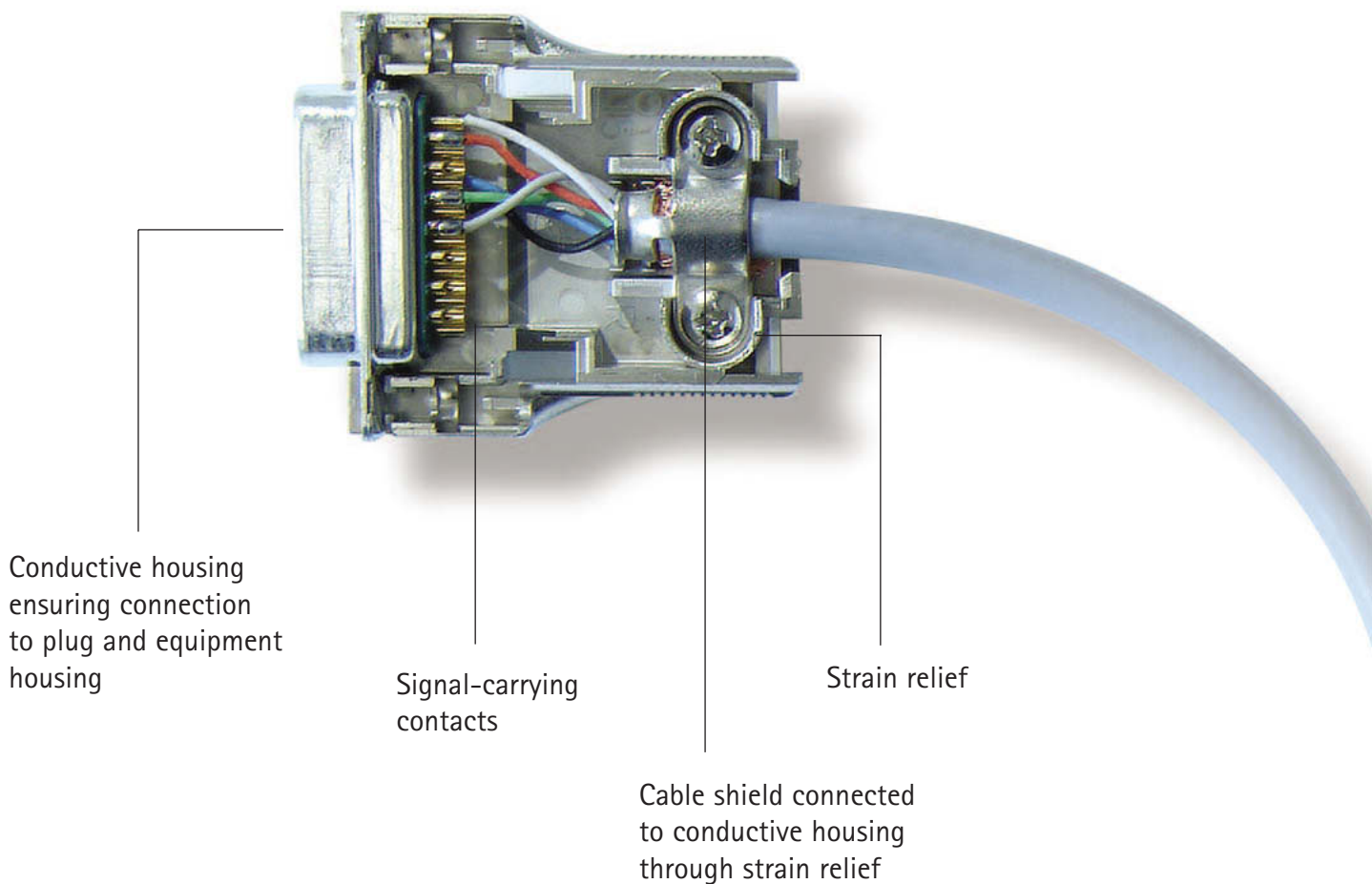


Greenline shielding design

EMC-compliant measuring cable...
...minimizing the effect of electromagnetic disturbances



The technology

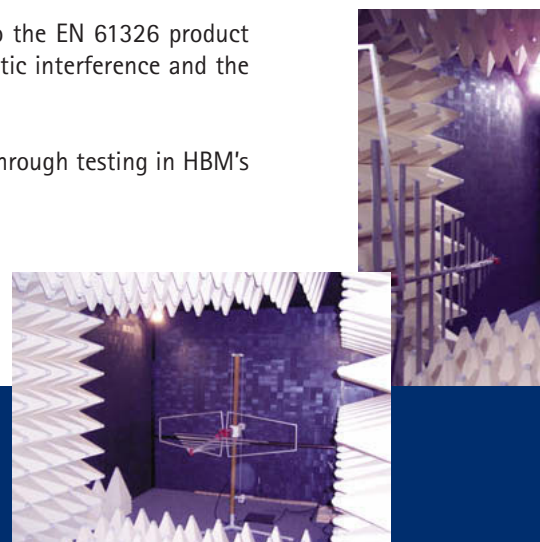


Harmonization of national regulations

Since 1996, all electric and electronic equipment for sale on the European domestic market have to comply with EMC Directive 2004/108/EC and carry the CE marking.

HBM ensures conformity of all HBM equipment by adhering to the EN 61326 product family standard which defines both the limits for electromagnetic interference and the test levels for electromagnetic immunity.

Compliance with the requirements of this standard is ensured through testing in HBM's accredited in-house EMC laboratory.



Electric protection measures

Electromagnetic environmental pollution, which has grown steadily over the past years, places ever increasing demands on the immunity to electromagnetic disturbances of measuring equipment. Potential sources of interference are: Radio equipment, mobile phones, solenoid valves, contactors, relays, welding equipment, power lines, etc. These sources of interference may cause electromagnetic fields which couple interference voltages into the respective measuring circuits inductively or capacitively through connecting cables and equipment housings and thus affect the way the equipment works.

It is essential to ensure that the equipment used in the system itself does not emit electromagnetic disturbances. Electromagnetic compatibility (EMC) which combines the concepts of required electromagnetic immunity or susceptibility (EMS) and permitted electromagnetic interference (EMI) has become increasingly more important over the past years.

The electromagnetic interference and immunity of all electrical/electrotechnical components of the complete measuring chain are tested and technical safety issues are analyzed in HBM's accredited in-house laboratory, thus ensuring that all normative requirements are satisfied. These tests have resulted in a shielding design which ensures that HBM equipment operates safely and failure-free, and that it does not emit any disturbances into the environment nor excessively load the mains power supply.

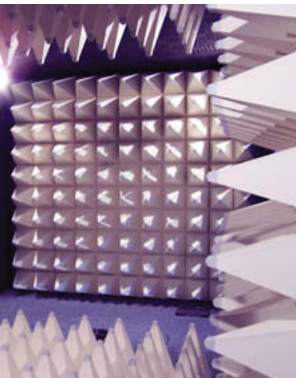
HBM's solution: The Greenline shielding design

The complete measuring chain is fully enclosed in a Faraday cage through the unique design of the cable shield. The cable shield is flattened, connected to the transducer housing, and routed to the amplifier housing through conductive connectors. These measures substantially reduce the effects of electromagnetic disturbances.



Practical hints on how to ensure the shielding design:

All components of the measuring chain (including all cable joints such as connectors and couplings) have to be surrounded by a closed, EMC-tested shield. Shield transitions must be realized in the form of flattened, closed and low-impedance joints. This is ensured when original HBM connectors are used.



Grounding and earthing

EMC-compliant wiring requires that signal ground and shield are separate, therefore the shielding can be connected to earth at several points, for example, through the transducers (metal housing) and the amplifier (housing connected to protective earth conductor).

In the case of potential differences in the measuring system, a potential equalization conductor has to be laid (recommended: very flexible stranded wire, 10 mm² line diameter). Ensure that signal and data lines are run separately from current-carrying power lines. Ideally use metal cable ducts with internal separating plate. Signal ground, earth and shield should be separate from one another.

To minimize the effect of electromagnetic disturbances and potential differences, the signal ground and earth (or shield) are separated in HBM equipment. The mains protective earth conductor or a separate earth potential line should be used as connection to earth. This is common practice, for instance, for potential equalization in buildings. Avoid connecting the earth lead to a radiator, water pipe or similar.



D-Sub plug
9/15/25/37-pin
IP 20 protection
Including metal housing
and mounting parts



MS connector
7-pin cable socket/plug
IP 65 protection



FGG Lemo connector
6-pin, IP 67 protection
for cable diameters
from 3.1...6 mm



Series 423 circular connector
Circular connector, socket/plug,
4/7/8-pin, IP 67 protection

The consistent HBM Greenline design helps you to

- ▶ comply with legal requirements, e. g. European EMC directives,
- ▶ ensure machine/plant conformity,
- ▶ increase plant/system operating safety.



Metal, EMC-tested screwed cable gland



measurement with confidence

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