

Isolation by
galvanic Isolation



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Baaske network isolators
 for galvanic network isolation
 of electrical medical devices.



Baaske network isolators are designed to protect devices and people from high voltages and currents from the data network. Stray currents, which are often undetected, can cause enormous damage to people and equipment. Increasingly complex networks mean that such currents are rarely noticed in time and can lead to unpredictable interactions. By simply installing a Baaske network isolator, users, inventory and third parties are protected from dangerous currents and voltages within 5 seconds. The Baaske network isolators reliably prevent potential equalization currents that can occur due to installation errors, environmental influences, inrush currents or electrostatic discharges.

All Baaske network isolators offer protection against D and AC voltages of 5kV and operate in the data network with almost no loss due to its excellent damping. This means that several Baaske network isolators can be used in a network without any noticeable impairment of data performance. The passive, electronic components do not require their own power source and behave completely transparently in the data network. In addition, significantly higher normative requirements are met than with other commercially available network isolators. This enables easy use of the Baaske isolators in the patient environment.



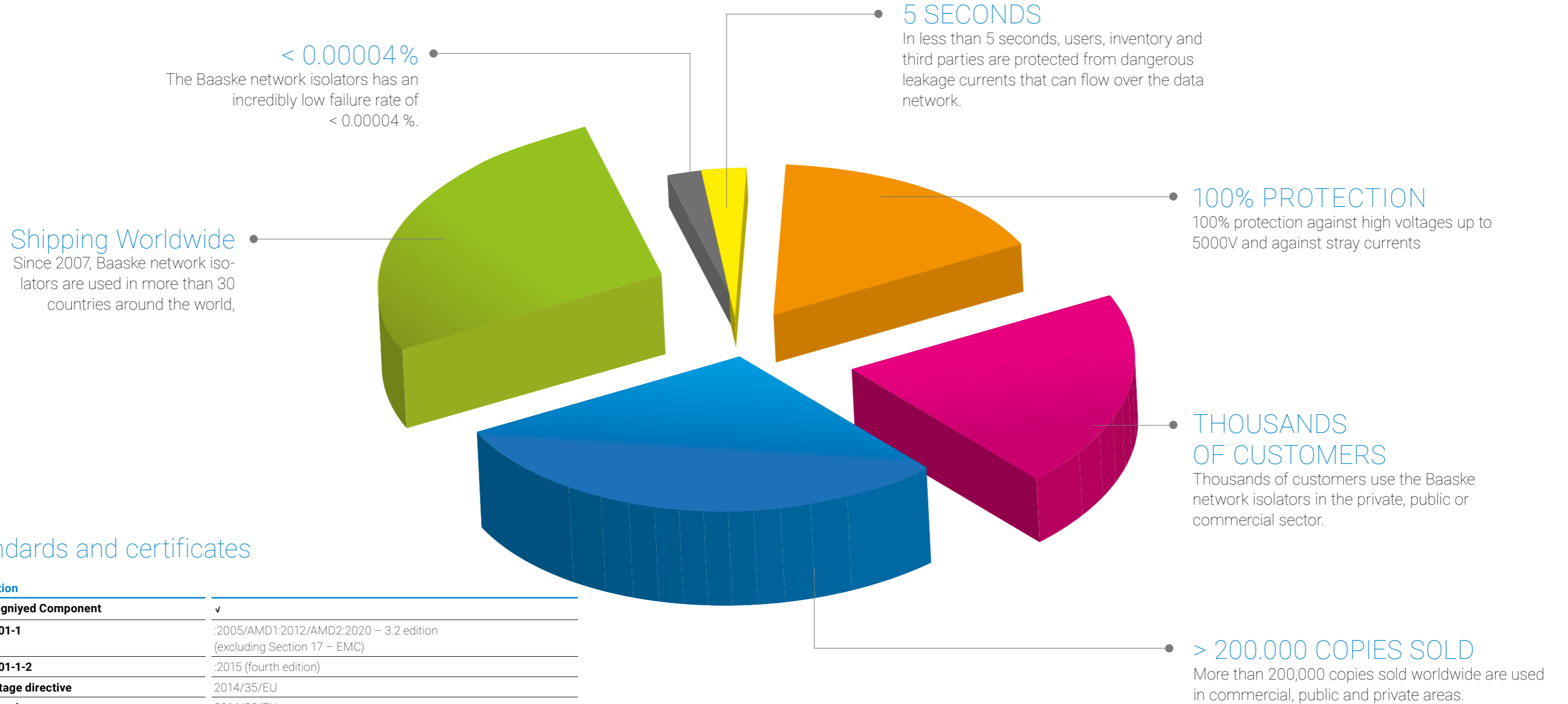
Baaske network isolators:
Compact and universally
applicable.

Functions and benefits of the Baaske network isolators at a glance:

- Protection against incalculable currents in the patient environment
- no fixed cables - easy to replace
- long-term availability
- years of acceptance on the global market
- long-lasting: 1 error in 21 000 000 hrs
- isolation up to 5 kV AC; up to 10 kV DC (10 sec.) under stress conditions
- fulfills the statutory specification for 4 kV as per 60601-1
- additional suppression of short-term excess voltage in the signal cables
- outstanding Ethernet performance, 1 dB attenuation
- virtually loss-free – behaves like a 1 m network cable
- lowest possible insertion loss, no resistors or capacitors
- tested and standardized in accordance with IEC 60601-1 (3.1 Edition)
- UL production monitoring for consistent quality
- reinforced isolation in accordance with IEC 60601-1
- can be combined with Cat5 / Cat6 patch cables
- suitable for use in medical sectors
- 24-hour reliable and maintenance-free continuous operation
- low failure rates – 5-year guarantee



Datas and facts.

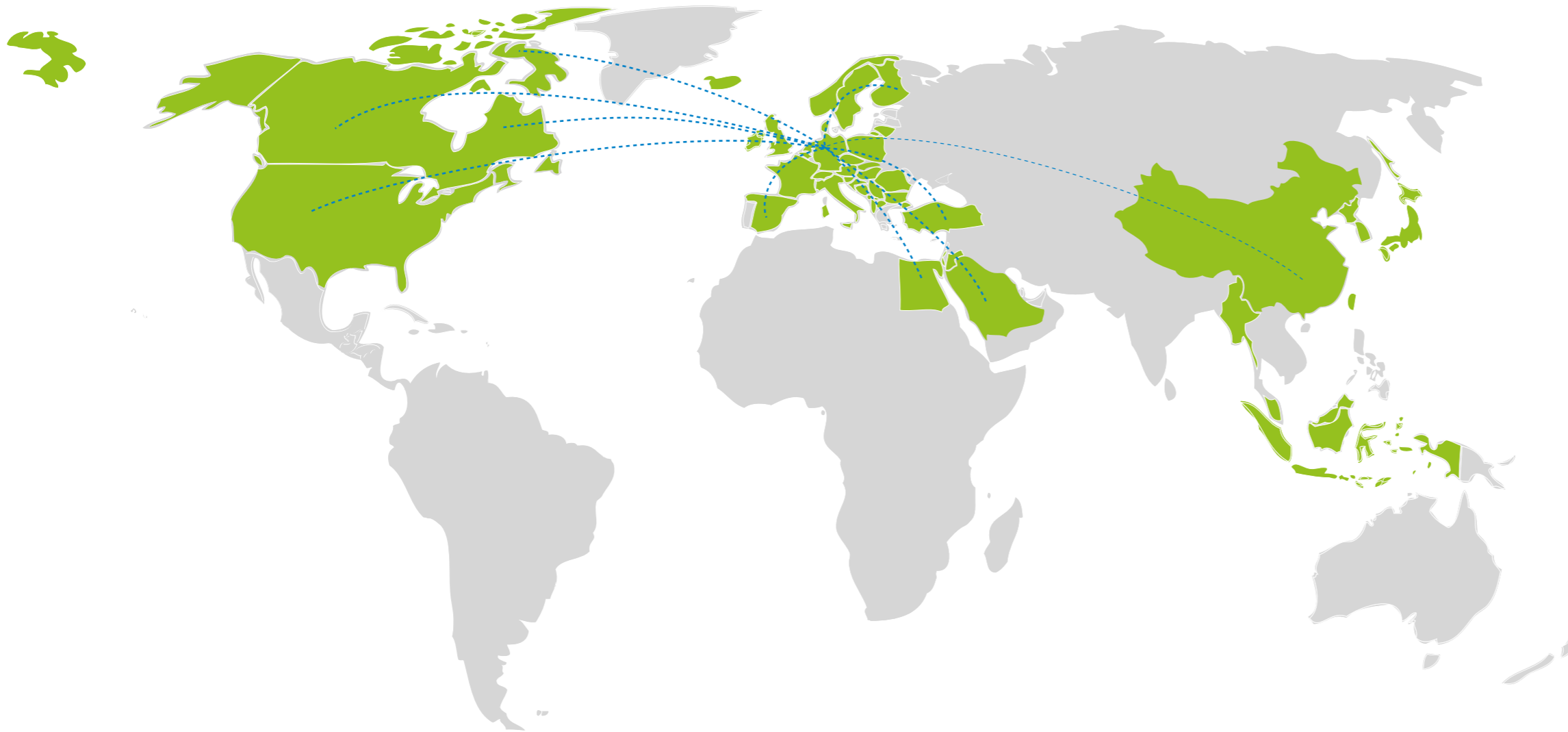


Standards and certificates

Description	
UL Recogniyed Component	✓
IEC 60601-1	:2005/AMD1:2012/AMD2:2020 – 3.2 edition (excluding Section 17 – EMC)
IEC 60601-1-2	:2015 (fourth edition)
Low-voltage directive	2014/35/EU
EMC directive	2014/30/EU
RoHS	✓
Reach	✓
Lead free	✓

Areas of application

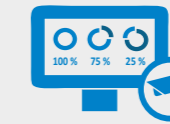
Baaske network isolators are used in more than 30 countries around the world, in both the private and public sector. They reliably protect electrical devices from excessive voltages, ground loops and signal noise from the network line. Our network isolators meet the high requirements of the IEC EN 60601-1 standard for medical electrical devices and systems and can therefore be integrated into almost any network.



Fields of application



In medicine: The network isolators protect patients, medical devices and users from excessive leakage currents that can flow through the data network in accordance with standards.



Measuring and monitoring equipment: Protect sensitive measuring and monitoring equipment connected to a control station via Ethernet interfaces reliably against interference voltages and potential differences.



Server Systems/Building Services: To prevent failures or potential equalization currents, MI 1005 and MI 2005 network isolators protect server systems that are connected over long distances using copper cabling.



Audio applications: Baaske network isolators reliably protect against voltage surges and low-frequency AC voltages (mains hum) and thus improve the sound.

Safe & Easy to use

The MI 1005/MI 2005 network isolators provide a flexible and simple way to immediately galvanically isolate the network interface between devices. In less than 5 seconds, users, inventory and third parties are protected from dangerous leakage currents that can flow through the data network. These network isolators reliably stop potential equalization currents and protect against surges that can occur due to installation errors, environmental influences such as lightning or moisture, inrush currents or electrostatic discharges. In addition, the 5 kV RJ-45 network insulators provide outstanding attenuation and act with virtually no loss in the data network. This allows the use of multiple Baaske network isolators in a network without a noticeable degradation of data performance. Used in medical technology: In accordance with the IEC EN 60601-1 standard for medical electrical devices and systems, the Baaske network isolators protect the network interface by two independent protective measures (2 MOPP) to the patient and the network connection is safely galvanically isolated.

Benefits:

- Easy handling
- Compact and universally applicable
- In less than 5 seconds, patient, user and equipment are protected from leakage currents
- No fixed cables - defective network cables do not require a new isolator
- Lightweight and durable housing - for any system with a network connection
- Inexpensive to purchase and efficient to operate operation - does not require its own power supply



Baaske Network Isolators MI 1005 und MI 2005:

The flexible and easy way
to isolate medical devices immediately

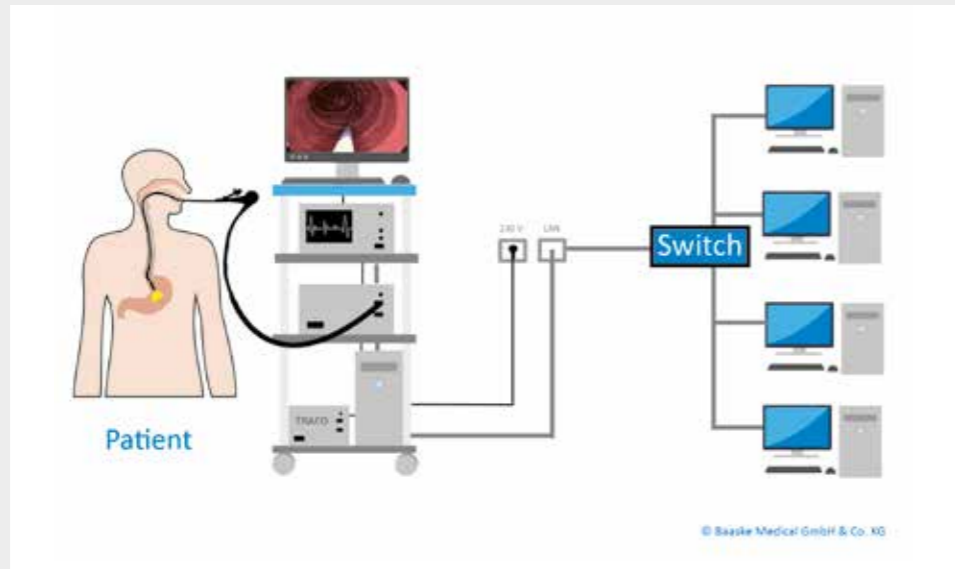


How to use a network isolator correctly and why the use of an isolating transformer is not sufficient.

With increasing digitalization, active medical devices are more and more often combined with network components and PCs. This creates a growing risk factor in almost all medical facilities, hospitals and clinics: high leakage currents via the Ethernet data network and possibly also via the patient. As soon as an electrical device within the patient environment is connected to the server via an electrical (data) line, the standards for electrical safety in

medical technology IEC 60601-1 require electrical isolation of the signal line. Our MI 1005 network isolators solve this problem by isolating currents and voltages up to a maximum of 5000V on the data network line, preventing them from reaching the patient. Even when the data processing device is outside the patient environment.

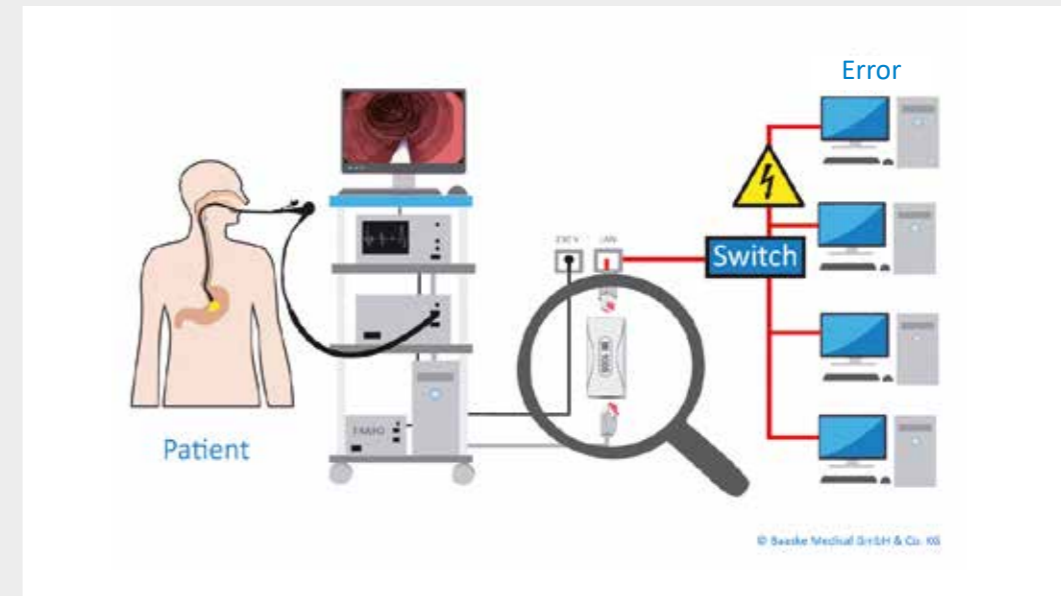
Not electrically secured despite the use of a isolating transformer



In Fig. 1, a gastroscopy is being performed on a patient. The patient is directly connected to the equipment cart via the gastroscopy. The patient data obtained is forwarded via a network cable to a PC, which in turn is connected to the hospital network via the network interface. An isolation transformer was used to ensure electrical safety. Connecting the medical device or system (PC, measuring station, ...) to a network (LAN) overrides this electrical safety. The reason for this is that the LAN connection via

the network cable was not electrically protected (isolated). The occurred error in the network, is passed on to the device trolley. An error can also occur in the connected devices or they can be destroyed. In the worst case, the error reaches the patient, which can lead to an electric shock.

Electrically secured

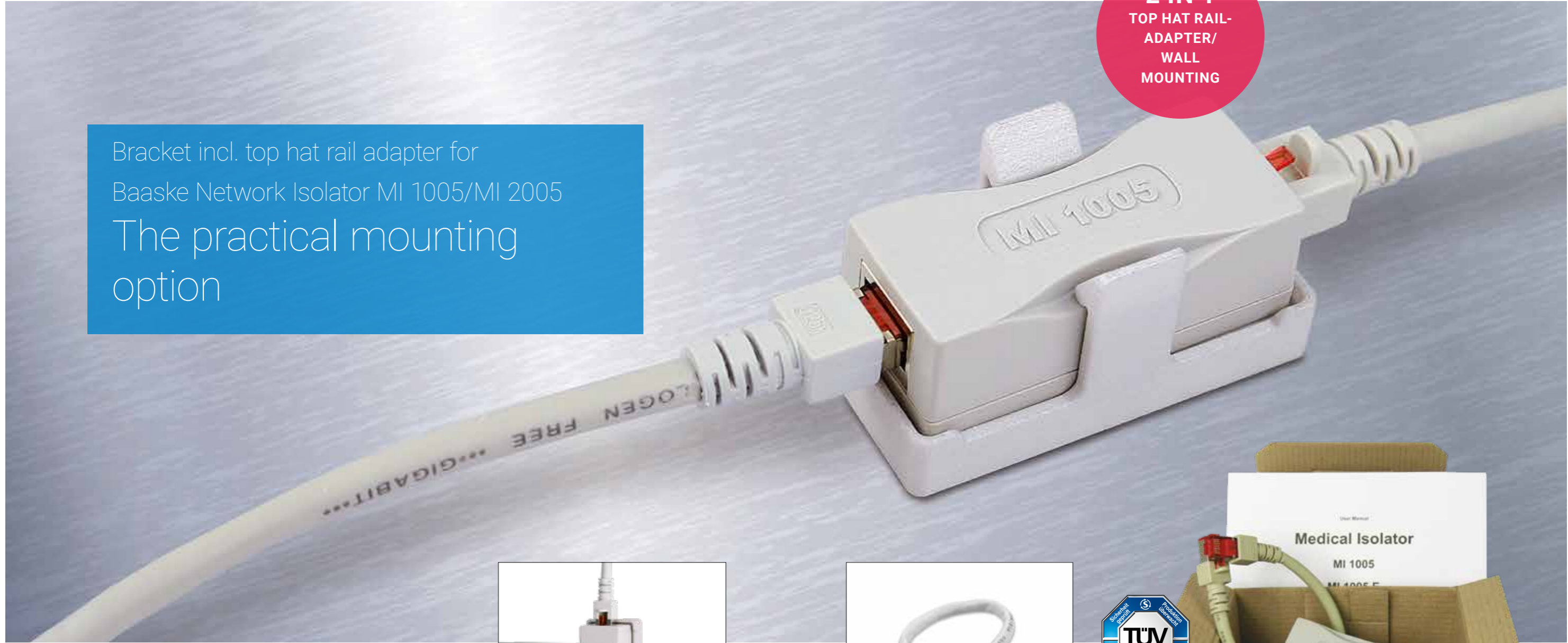


In Fig. 2, the MI 1005 network isolator or MI 2005 network isolator was inserted between the LAN output socket and the medical device or system (e.g. a PC or measuring station, etc.) and the entire system was thus electrically

isolated from the LAN. The error that has occurred in the network can no longer be passed on to the patient.

2 IN 1
TOP HAT RAIL-
ADAPTER/
WALL
MOUNTING

Bracket incl. top hat rail adapter for
Baaske Network Isolator MI 1005/MI 2005
The practical mounting
option



For mounting the MI 1005 / MI 2005 network insulators on any flat surface or on a 35 mm top-hat rail according to DIN EN 50022. The snap lock automatically positions the Baaske network insulator in the optimum holding position and prevents accidental slipping or loosening. The bracket is designed in such a way that it can also be mounted on unearthed metallic surfaces is possible. The protective effect of the network insulator is not impaired by the holder, since the insulation distance to the mounting surface required for 2 MOPP remains ensured.



Bracket incl. top hat rail adapter for Baaske network isolator Mi 1005 and MI 2005



Patch cable CAT6 gray PIMF, RoHs

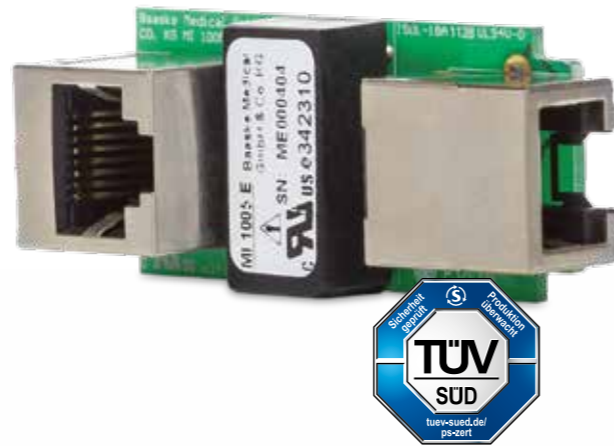


MI 1005 Retail
The network isolator complete set for resellers

Built-in isolator MI 1005 E

For the galvanic network isolation of electrical devices

In addition to network isolators with permanently mounted cables, the MI 1005 E provides a simple and cost-effective option for isolating medical devices from the device housing wall. This isolator is therefore particularly well suited for manufacturers of medical devices. Thanks to Harting's PushPull technology, the MI 1005 E Medical Built In Isolator can be easily and quickly installed in existing devices. Long availability also provides the planning security needed for new product development.



Benefits:

- Ideally suited for manufacturers of medical devices
- **Insulation from the device housing wall**
- **Easy installation** due to Harting PushPull-technology
- Offers planning reliability - long-term availability
- **Small and light** - weighs only approx. 20 g
- No permanently mounted cables - easy exchange
- **Inexpensive** to purchase and efficient in operation - does not require its own power supply



Easy installation with the help of standardized Harting PushPull technology



MI 1005 MB

Medical network isolator for wall mounting

The passive network isolator MI 1005 MB has been specially developed for wall mounting in medical areas. It enables galvanic network isolation for medical electrical devices and systems directly from the wall outlet box. Once permanently mounted in the wall, the isolator is well protected by the housing. Accidental impacts can be compensated and the isolator, as well as the network cable connector, remain undamaged.

The MI 1005 MB network insulator provides insulation resistance up to 5 kV, and up to 10 kV DC for 10 seconds under stress conditions. Together with the Harting PushPull technology an absolutely safe connection. There is no need to install drivers or additional software, as the MI 1005 MB network isolator behaves completely transparently in the data network.



Benefits:

- **Insulation from the wall outlet box**
- Fixed installation - flush mounting
- Protects medical devices and patients from excessive leakage currents in the data network
- **Robust housing** - absorbs minor shocks and thus protects isolator and network
- No installation of drivers or additional software required
- **Inexpensive** to purchase and efficient to operation - does not require its own power supply
- Together with the Harting PushPull technology an absolutely secure connection



Network isolators

Model overview



Technical data	Flexible	Flexible	Built-in isolator
Designation	Network isolator MI 1005	Network isolator MI 2005	Built In Network Isolator MI 1005 E
Housing color	light gray	light gray	Without housing
Dimensions (LWH)	65 x 29 x 23 mm	65 x 29 x 23 mm	51x23,4x18.2 mm
Weight approx.	50 g	50 g	20 g
Operating mode	Continuous operation	Continuous operation	Continuous operation
Network-specifications	IEEE 802.3ab 10/100/1000-BaseT, Twisted-Pair, auto-conf (behaves completely transparently in the network)	IEEE 802.3bz 10/100/1000/2500-BaseT, Twisted-Pair, auto-conf (behaves completely transparently in the network)	IEEE 802.3ab 10/100/1000-BaseT, Twisted-Pair, auto-conf (behaves completely transparently in the network)
ESD	---	Luft 15kV / Kontakt 8kV	---
Dielectric strength signal and shielding	5000 V 50/60 Hz over 1 min. / 10000 V 50/60 Hz over 10 s.		
Data throughput	10/100/1000 MBit/s		
Connections	2x RJ45 In/Output		
DC Stress Test (10 Sec)	10 kV		
Material	UL94V-0 / RoHS compliant / REACH		
Product Rating	passive, electronic components, insulation level DI (250 V AC / 300 V DC) tested at 5 kV AC		
Operating time between failures	0,21 x 10 ⁸ (1 Error in 21 000 000 Hrs.)		
Return loss	min. 10 dB		
Insertion loss	max. 1,1 dB		
Temperature	-10 °C up to +85 °C (operation/storage/transport)		
Relative humidity	10 % up to 90 % non condensing (operation/storage/transport)		
Air pressure	700 hPa up to 1060 hPa (operation/storage/transport)		
Standards	IEC 60601-1 (3rd Edition), IEC 60601-1-2, UL 60601 (UL Listed E342310, IEEE 802.3ab	Edition 3.2 (IEC 60601-1:2005/AMD1:2012/AMD2:2020), EN 60601-1-2:2015 (Fourth Edition), IEEE 802.3bz	IEC 60601-1 (3rd Edition), IEC 60601-1-2, UL 60601 (UL Listed E342310, IEEE 802.3ab
Scope of delivery	Network isolator MI 1005	Network isolator MI 2005	MI 1005 E Medical Built In Isolator
Item no.	2005674	2012413	2006633

Technical data	Wall mounted	Complete set
Designation	Network isolator MI 1005 MB	Network isolator MI 1005 Retail
Housing color	cream white	light gray
Dimensions (LWH)	81 x 81 x 57 mm	65 x 29 x 23 mm
Weight approx.	106 g	50 g
Operating mode	Continuous operation	Continuous operation
Network-specifications	IEEE 802.3ab 10/100/1000-BaseT, Twisted-Pair, auto-conf (behaves completely transparent in the network)	IEEE 802.3ab 10/100/1000-BaseT, Twisted-Pair, auto-conf (behaves completely transparent in the network)
ESD	---	---
Dielectric strength signal and shielding	5000 V 50/60 Hz over 1 Min. / 10000 V 50/60 Hz over 10 s.	
Data throughput	10/100/1000 MBit/s	
Connections	2x RJ45 In/Output	
DC Stress Test (10 Sec)	10 kV	
Material	UL94V-0 / RoHS compliant / REACH	
Produkt Rating	passive, electronic components, insulation level DI (250 V AC / 300 V DC) tested at 5 kV AC	
Operating time Between failures	0,21 x 10 ⁸ (1 Error in 21 000 000 Hrs.)	
Return loss	min. 10 dB	
Insertion loss	max. 1,1 dB	
Temperature	-10 °C up to +85 °C (operation/storage/transport)	
Relative humidity	10 % up to 90 % non condensing (operation/storage/transport)	
Air pressure	700 hPa up to 1060 hPa (operation/storage/transport)	
Standards	IEC 60601-1:2005/AMD1:2012/AMD2:2020 Ed. 3.2; EN 60601-1-2:2015 (Fourth Edition); UL60601 (UL Listed E3 42310); IEEE 802.3ab	
Scope of delivery	1x mounting plate, 1x cover, 1x frame, 1x MI 1005 E Medical Built In Isolator, 1x retaining plate, 1x Harting PushPull, 2x screws, 2x nut, 1x mounting instructions, 1x manual	Network isolator MI 1005, patch cable 25 cm, manual, outer packaging and serial number
Item no.	2007704	2006484

