



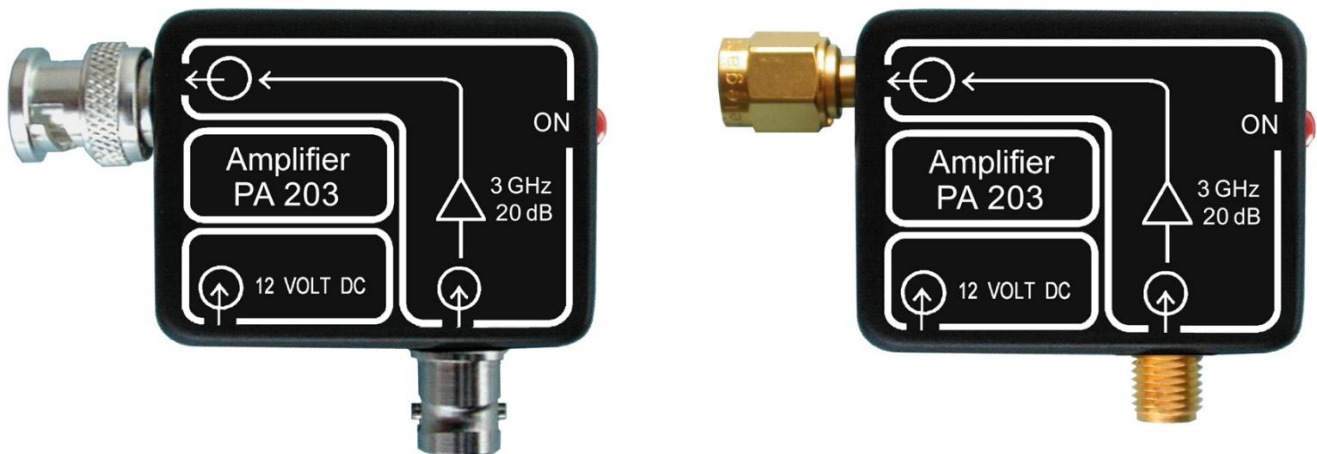
**LANGER**  
EMV-Technik

## User Manual

- Translation of the original -

### PA 203 BNC/SMA set

Preamplifier 20 dB from 100 kHz to 3 GHz





## Contents

|                                                            |           |
|------------------------------------------------------------|-----------|
| <i>1 Declaration of Conformity .....</i>                   | <i>3</i>  |
| <i>2 General Information .....</i>                         | <i>4</i>  |
| 2.1 Storage of the User Manual .....                       | 4         |
| 2.2 Reading and Understanding the User Manual .....        | 4         |
| 2.3 Local Safety and Accident Prevention Regulations ..... | 4         |
| 2.4 Images and Illustrations .....                         | 4         |
| 2.5 Limitation of Liability .....                          | 4         |
| 2.6 Errors and Omissions .....                             | 4         |
| 2.7 Copyright .....                                        | 4         |
| <i>2 Scope of Delivery .....</i>                           | <i>5</i>  |
| <i>4 Technical Parameters .....</i>                        | <i>5</i>  |
| <i>5 Safety .....</i>                                      | <i>7</i>  |
| 5.1 Intended Use .....                                     | 7         |
| 5.2 Reasonably Foreseeable Improper Use .....              | 7         |
| 5.3 Personnel Requirements .....                           | 8         |
| 5.4 Safety Instructions .....                              | 8         |
| <i>6 Application .....</i>                                 | <i>8</i>  |
| 6.1 Operating Instructions .....                           | 8         |
| 6.2 Standard Measurement Setup .....                       | 8         |
| <i>7 Information on Recycling and Disposal .....</i>       | <i>9</i>  |
| <i>8 Customer service .....</i>                            | <i>10</i> |
| <i>9 Warranty .....</i>                                    | <i>10</i> |



## 1 Declaration of Conformity

Manufacturer:  
Langer EMV-Technik GmbH

Nöthnitzer Hang 31  
01728 Bannewitz  
Germany



Langer EMV-Technik GmbH herewith declares that the

**PA 203 BNC set**, Preamplifier 100 kHz up to 3 GHz including  
**PA 203 BNC**, Preamplifier and **NT FRI EU** power supply

**PA 203 SMA set**, Preamplifier 100 kHz up to 3 GHz including  
**PA 203 SMA**, Preamplifier and **NT FRI EU** power supply

conforms with the following relevant regulations:

EMC Directive 2014/30/EU  
Low-Voltage Directive 2014/35/EU  
Restriction of certain Hazardous Substances 2011/65/EU

The following applicable standards were used to implement the requirements specified by the a  
forementioned directives:

DIN EN IEC 61000-6-1:2019-11 (EMC immunity)  
DIN EN IEC 61000-6-3:2022-06 (EMC emission)  
DIN EN 61010-1:2020-03 (Safety)  
DIN EN IEC 63000:2019-05 (Restriction of hazardous substances)

Name of the person authorized to compile the technical

Katja Langer

Bannewitz, 2025-09-08

Signature:

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K. Langer, CEO



## **2 General Information**

### **2.1 Storage of the User Manual**

This user manual enables the safe and efficient use of the PA 203 BNC/SMA sets. It must be kept close at hand and accessible to the user.

### **2.2 Reading and Understanding the User Manual**

Before using the PA 203 BNC/SMA Set, the user must read and understand this user manual. If you have any questions or comments, please contact Langer EMV-Technik GmbH.

### **2.3 Local Safety and Accident Prevention Regulations**

All applicable local safety and accident prevention regulations must be observed.

### **2.4 Images and Illustrations**

The images and illustrations in this manual are intended to facilitate understanding. They may differ from the actual design of the product.

### **2.5 Limitation of Liability**

Langer EMV-Technik GmbH shall not be liable for personal injury or property damage if:

- the instructions contained in this user manual have not been followed,
- the PA 203 BNC/SMA Set has been used by persons who are not qualified in the field of EMC or who are not suited to work in the presence of interference voltages and electromagnetic fields,
- the PA 203 BNC/SMA Set has not been used for its intended purpose,
- the PA 203 BNC/SMA Set has been modified or technically altered without authorization,
- spare parts or accessories have been used that were not approved in advance by Langer EMV-Technik GmbH.

### **2.6 Errors and Omissions**

The information contained in this user manual has been carefully reviewed and is believed to be accurate. However, Langer EMV-Technik GmbH assumes no responsibility for typographical errors, printing errors, or proofreading mistakes.

### **2.7 Copyright**

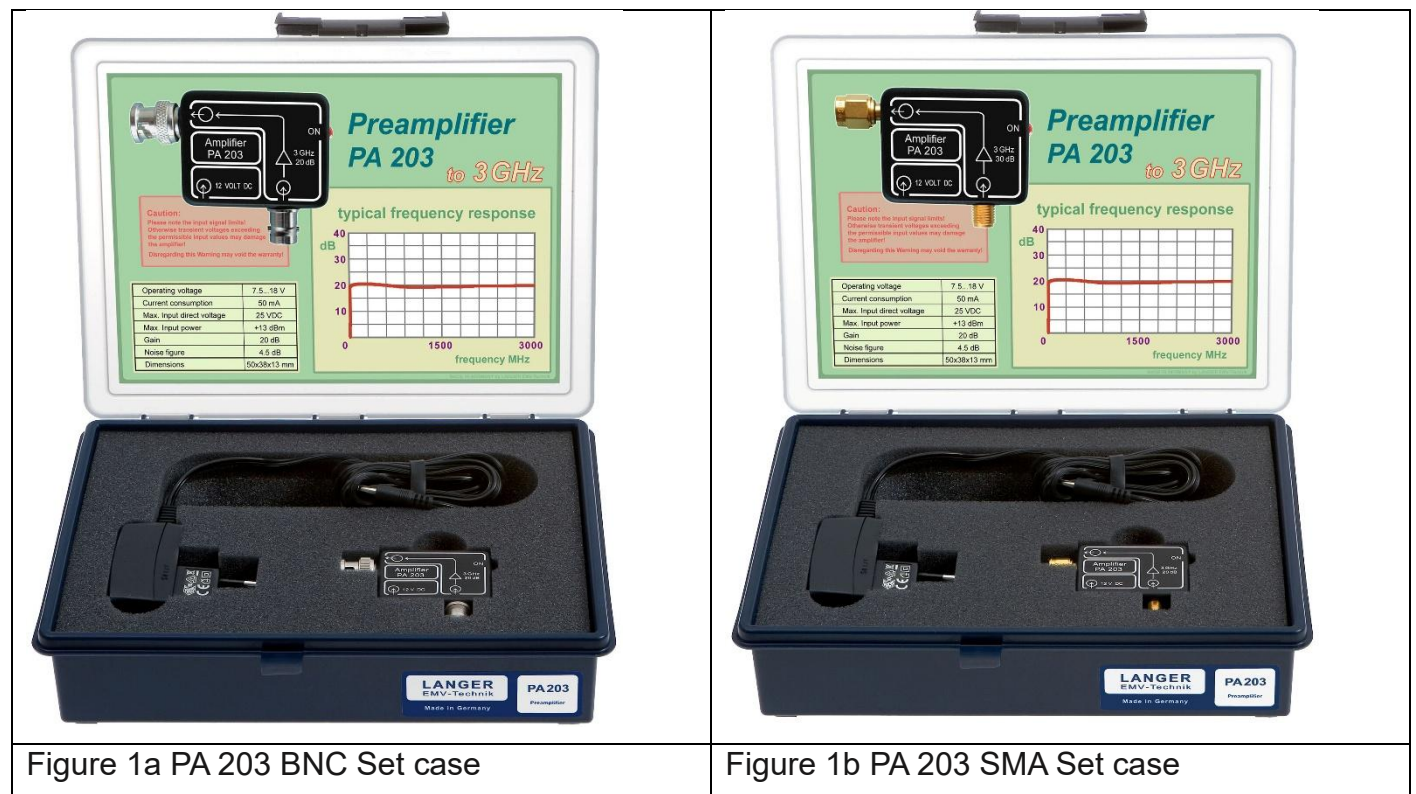
The contents of this user manual are protected by copyright and may only be used in conjunction with the PA 203 BNC/SMA Set. This user manual may not be used for any other purpose without the prior written permission of Langer EMV-Technik GmbH.



### 3 Scope of Delivery

| Item | Name of article   | Type                   | Qty. |
|------|-------------------|------------------------|------|
| 01   | Preamplifier      | PA 203 BNC/SMA         | 1    |
| 02   | Power supply unit | NT FRI EU or NT FRI US | 1    |
| 03   | System case       | Case A5                | 1    |
| 04   | Quick guide       |                        | 1    |
| 05   | User manual       |                        | 1    |

The scope of delivery may deviate depending on the respective order.



### 4 Technical Parameters

|                                                  |                        |
|--------------------------------------------------|------------------------|
| Preamplifier PA 203 BNC/SMA (25°C, 12 V, 170 mA) |                        |
| Frequency range                                  | 100 kHz - 3 GHz        |
| Gain                                             | typ. 20 dB             |
| -1 dB compression point (output)                 | typ. 0 dBm at 1,5 GHz  |
| Noise figure                                     | typ. 4,5 dB at 1,5 GHz |
| Supply voltage                                   | 12 V DC                |



|                                             |                   |
|---------------------------------------------|-------------------|
| Impedance                                   | 50 $\Omega$       |
| Current consumption                         | 50 mA             |
| Max. input power (destruction threshold)    | +13 dBm           |
| Max. DC component at RF input/output        | 15 V              |
| Amplitude flatness                          | $\pm 3$ dB        |
| Housing dimensions (height x width x depth) | (50 x 38 x 13) mm |
| Weight                                      | 40 g              |
| Connector - input                           | BNC/SMA, female   |
| Connector - output                          | BNC/SMA, male     |
| Ambient temperature (in operation)          | (0 - 40) °C       |

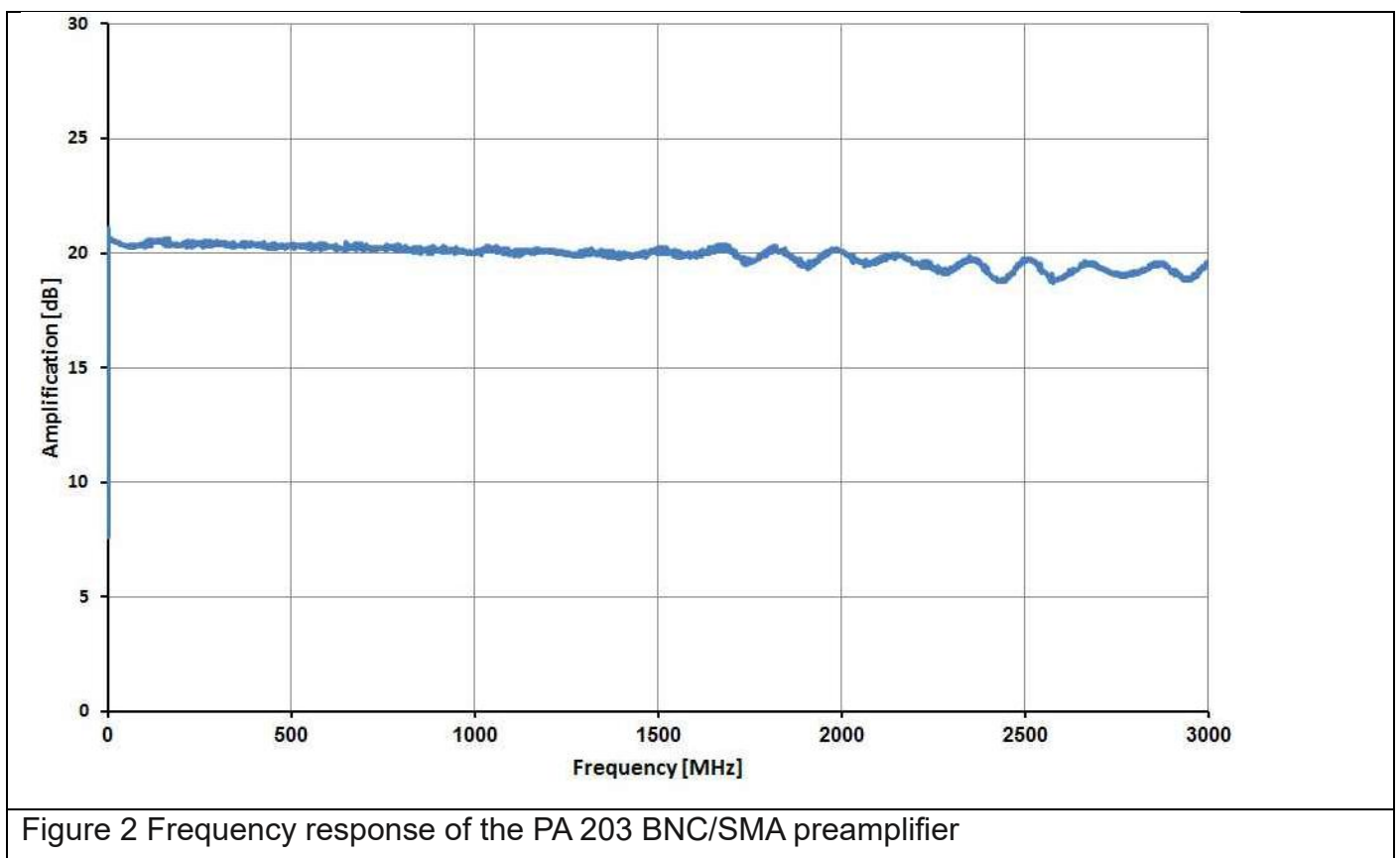
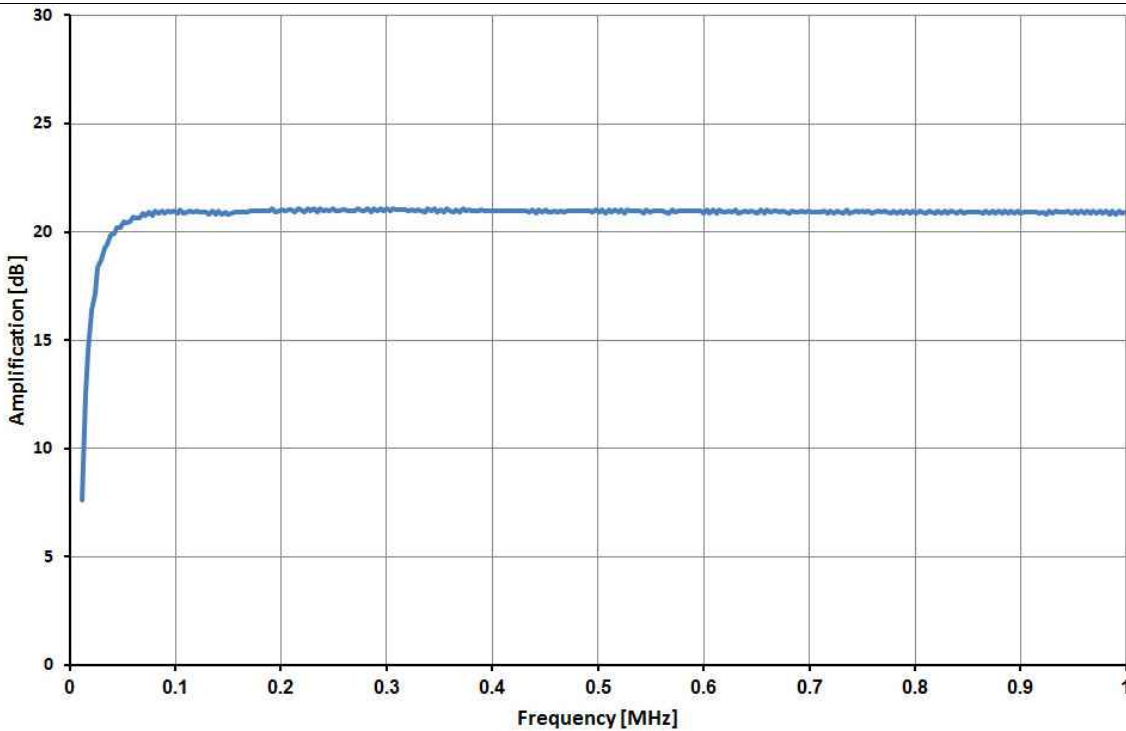


Figure 2 Frequency response of the PA 203 BNC/SMA preamplifier



**Figure 3** Detailed frequency response of the PA 203 BNC/SMA preamplifier

## 5 Safety

### 5.1 Intended Use

The PA 203 BNC/SMA is designed to amplify low-level measurement signals from connected near-field probes over a frequency range of 10 MHz to 3 GHz.

A near-field probe is connected to the SMA input of the preamplifier using a suitable coaxial cable with an SMA male connector. The BNC/SMA output (male) of the PA 203 BNC/SMA is connected to either a spectrum analyzer or an oscilloscope.

The PA 203 BNC is powered by the supplied power supply.

### 5.2 Reasonably Foreseeable Improper Use

Improper use of the PA 203 BNC/SMA Set may result in hazards to the user and may cause damage to the product and/or connected equipment.

Examples of improper use that may create hazardous situations include:

- Bypassing or disabling safety devices.
- Operating the preamplifier or connected equipment when they are not in proper working condition.
- Operating the PA 203 BNC/SMA Set outside the specified technical parameters.
- Modifying the design of the product in a way that changes its intended application.

No claims shall arise from improper use of the PA 203 BNC/SMA Set





## 5.3 Personnel Requirements

Only qualified personnel with appropriate training, knowledge, and experience in the field of EMC are permitted to operate the PA 203 BNC/SMA Set.

The PA 203 BNC/SMA Set must not be operated by persons whose ability to react is impaired, for example due to alcohol, medication, or drugs.

## 5.4 Safety Instructions

When using a product from Langer EMV-Technik GmbH, observe the following safety instructions to protect yourself against electric shock and the risk of injury:

- Before each use, inspect all connected equipment for visible signs of damage.
- The PA 203 BNC/SMA Set must only be operated under supervision.
- To prevent excessive heating of the preamplifier, do not cover the unit during operation.
- Do not use damaged or defective equipment.
- Observe the operating and safety instructions for all equipment included in the measurement setup.
- Connect and disconnect all equipment only when the interference source is switched off.

## 6 Application

### 6.1 Operating Instructions

When the PA 203 BNC/SMA is supplied with power, the LED remains continuously illuminated in red.

During normal operation, the PA 203 BNC/SMA will become warm. This is normal and does not indicate a malfunction. The enclosure temperature is approximately 15 °C above ambient temperature.

For reproducible measurement results, it is recommended to allow the preamplifier to warm up for approximately 20 minutes before use.

To prevent damage to the PA 203 BNC/SMA preamplifier, any coaxial cable must be discharged immediately before connecting it to the preamplifier. Due to its design, the input of the PA 203 BNC/SMA preamplifier is not protected against electrostatic discharge (ESD). It is therefore recommended to establish a low-resistance connection between the center conductor and the outer conductor (shield) of the coaxial cable before making the connection.

### 6.2 Standard Measurement Setup

Connect the BNC/SMA output (male) of the PA 203 BNC/SMA to the 50  $\Omega$  input of either a spectrum analyzer or an oscilloscope.

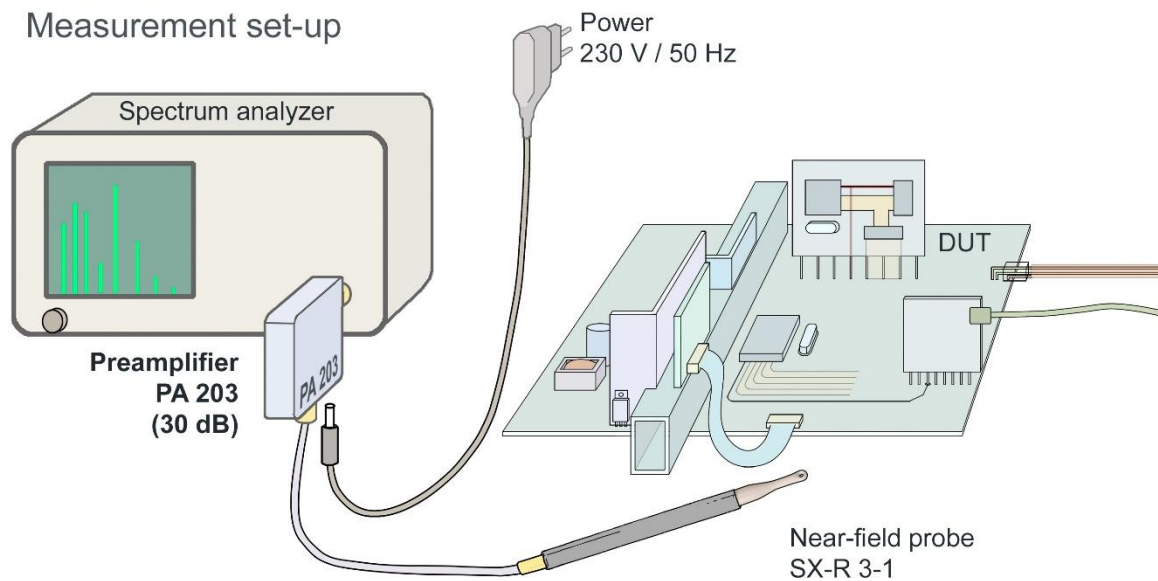
Connect the near-field probe to the BNC/SMA input (female) of the preamplifier using a coaxial cable with a BNC/SMA male connector.

Connect the supplied power supply to the "DC 12 V" power input.





### Schematic Measurement set-up



**Figure 4** Measurement setup with the PA 203 BNC/SMA, spectrum analyzer, near-field probe, and DUT

## 7 Information on Recycling and Disposal



In accordance with the WEEE Directive 2012/19/EU (Waste of Electrical and Electronic Equipment), the following must be observed:

At the end of its service life, this product should be taken to a suitable disposal facility for recycling and disposal. Do not dispose of with household waste.



## 8 Customer service

Please contact us if you have any questions, comments or suggestions.

You can contact us:

Monday – Friday

8:00 a.m. – 3:00 p.m.

Contact us at:

Address: Langer EMV-Technik GmbH  
Nöthnitzer Hang 31  
01728 Bannewitz  
Germany

Web: [www.langer-emv.de](http://www.langer-emv.de)

E-mail: [sales@langer-emv.de](mailto:sales@langer-emv.de)

Phone: +49 (0) 351-430093-0

Fax: +49 (0) 351-430093-22

### Calibration

We recommend having the product calibrated every two years by the manufacturer Langer EMV-Technik GmbH or by a certified service partner.

## 9 Warranty

Langer EMV-Technik GmbH shall remedy all defects attributable to material or manufacturing faults within the statutory warranty period by repairing the product or supplying replacement parts.

This guarantee is only granted on condition that:

- the information and instructions in the operating instructions are observed.

The guarantee expires if:

- an unauthorized repair is carried out on the product
- the product is modified
- the product is not used as intended