beurer Pulsoximeter AFTER 45

Beurer GmbH • Söflinger Str. 218 • 89077 Ulm • Germany
www.beurer.com • www.beurer-healthguide.com
www.beurer-gesundheitsratgeber.com

CE 0483

GERMAN

Dear Customer,

We are pleased that you have chosen a product from our range. Our name stands for high quality and thoroughly tested quality products in the areas of heat, weight, blood pressure, body temperature, pulse, gentle therapy, massage, beauty, baby and air. Please read these instructions for use carefully, keep them for later use, make them accessible to other users and follow the instructions.

With kind regards
Your Beurer team

1. Scope of delivery

1x POÿ45 Pulsoximeter, 2x 1,5 V AAA Batterien sung 1x lanyard, 1x belt pouch, 1x this instruction manual

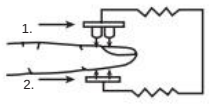
2. Intended use

The PO 45 finger pulse oximeter is a non-invasive compact device for checking arterial oxygen saturation (SpO2) and heart rate in adults, adolescents and children in hospitals, clinic-like facilities and in home care.

3. To get to know each other

The Beurer PO 45 pulse oximeter is used for non-invasive measurement of arterial oxygen saturation (SpO2), heart rate (PRbpm) and the perfusion index (PI). Oxygen saturation indicates the percentage of hemoglobin in arterial blood that is loaded with oxygen. It is therefore an important parameter for assessing respiratory function.

When oxygen flows through the lungs, it is bound by hemoglobin in red blood cells. A pulse oximeter uses two frequencies of light (red and infrared) to determine the percentage (%) of hemoglobin in the blood that is saturated with oxygen. This percentage is called oxygen saturation (SpO2) . In addition to the SpO2 level, a pulse oximeter also measures and displays the pulse rate.



1. Red and infrared light source
2. Red and infrared detector

A low oxygen saturation value is mainly due to diseases (respiratory diseases, asthma, cardiac insufficiency, etc.).

The following symptoms occur more frequently in people with a low oxygen saturation value: shortness of breath, heart rate increase, loss of performance, nervousness and sweating. A chronic and known reduced oxygen saturation requires monitoring by your pulse oximeter under medical supervision.
An acutely reduced oxygen saturation, with or without accompanying symptoms, must be clarified immediately by a doctor, it can be a life-threatening situation. The pulse oximeter is therefore particularly suitable for high-risk patients such as people with heart disease and asthmatics, but also for athletes and healthy people who move at high altitudes (e.g. mountaineers, skiers or sports pilots).

Features of the pulse oximeter

• Easy to use and easy to transport (also ideal for on the go)
• Compact and lightweight design
• Two-color OLED display showing oxygen saturation (SpO2), pulse rate (PRbpm) and des Infusion Index (PI)
• Adjustable display brightness (1 to 10)
• 7 display formats / low battery indicator / auto power off after 8 seconds if no signal received will

4. Explanation of symbols

The following symbols are used in the instructions for use, on the packaging and on the type plate of the device:

⚠	**WARNING** Warning on the risk of injury or danger to your health		Manufacturer
⚠	**DANGER** Security notice on possible Damage to device/accessories		Applied part type BF
ⓘ	**a notice** Note on important information	Pb Cd Hg	Batteries containing harmful substances are not included dispose of household waste
	Follow the instructions	CE 0483	This product meets the requirements ments of the applicable European and national directives.
%SpOÿ	Arterial oxygen saturation Hemoglobin (in percent)	SN	serial number
PR bpm	Pulse rate (beats per Minute)	SpO2	alarm suppression
PI%	Infusions Index		
Storage	Permissible storage temperature and humidity	**IP22**	Protected against foreign objects ÿ12.5 mm and against slanting Tropfwasser
Operating	Permissible operating temperature and humidity		Disposal according to electrical and Waste electronic devices EC Directive WEEE (Waste Electrical and Electro nic Equipment)
	Low battery indicator	21 PAP	Dispose of packaging in an environmentally friendly manner

5. Warnings and Precautions

Failure to observe the following instructions can cause personal injury or damage to property. Keep the instructions for use and make them accessible to other users. Pass on these operating instructions if the device is passed on.

⚠ WARNING

• Check that all parts specified in the scope of delivery are included.
• Check the pulse oximeter regularly to ensure that the device is not used before use shows visible damage and the batteries are still sufficiently charged. If in doubt, do not use it and contact Beurer customer service or an authorized dealer.
• Do not use any additional parts that are not recommended by the manufacturer or offered as accessories.
• Under no circumstances may you open or repair the device, as otherwise it cannot be guaranteed that it will function properly. Failure to do so will void the warranty. For repairs, contact Beurer Customer Service or an authorized dealer.

Use the pulse oximeter

ÿ NOT if you are allergic to rubber products.
ÿ NOT if the device or the application finger is wet.
ÿ NOT on small children or infants.
ÿ NOT during an MRI or CT scan.
ÿ NOT during patient transport outside of a medical facility.
ÿ NOT during a blood pressure measurement on the arm side with cuff application.
ÿ NOT on fingers with nail polish, dirt or plaster bandages.
ÿ NOT on thick fingers that cannot be easily inserted into the device (fingertip: width approx. > 20 mm, thickness approx. >15 mm)
ÿ NOT on fingers with anatomical changes, edema, scars or burns.
ÿ NOT on fingers that are too thin and too small, such as those found in small children (width approx. < 10 mm, thickness approx. < 5 mm).
ÿ NOT on patients who are restless at the application site (eg tremors).
ÿ NOT in the vicinity of flammable or explosive gas mixtures.

• Prolonged use of the pulse oximeter can cause pain in persons with circulatory disorders to lead. Therefore, do not use the pulse oximeter on one finger for more than 30 minutes. This is the only way to ensure correct sensor alignment and skin integrity.
• The pulse oximeter always shows an instantaneous reading, but cannot be used for continuous monitoring. • The pulse oximeter does not have an alarm function and is therefore not suitable for medical evaluation

shear results.
• Do not carry out any self-diagnosis or treatment based on the measurement results without consulting your doctor. In particular, do not start a new medication on your own and do not make any changes to the type and/or dosage of an existing medication.
• Do not look directly into the inside of the housing during the measurement process. The red light and the invisible Infrared light from the pulse oximeter is harmful to the eyes.
• The operation of portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be maintained at least a 30 cm (12") separation distance from all parts of the PO 45. Otherwise, the performance of this device may be affected.
• The pulse oximeter device is calibrated to display functional oxygen saturation.
• This device is not intended to be used by people (including children) with restricted physical, sensory or mental abilities or lack of experience and/or knowledge, unless they are supervised by a person responsible for their safety or received instructions from her on how to use the device. Children should be supervised to ensure they do not play with the device.

• The display of the pulse wave and the pulse column do not allow an estimation of the pulse or blood flow strength at the measuring point, but only serve to display the current optical signal variation at the measuring point, but they do not enable reliable pulse diagnostics.

Failure to follow the instructions below can result in erroneous measurements or measurement failure:

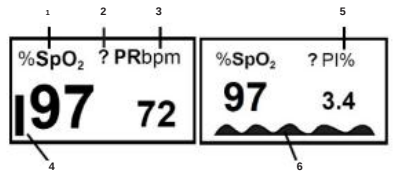
• There should be no nail polish, artificial nails or other cosmetics on the measuring finger. •
When using the measuring finger, ensure that the fingernail is short enough for the fingertip to touch the sensor elements covered in the case.
• If people move during the measurement process. Hold hand, fingers and body during measurement process calmly.
• In people with cardiac arrhythmias, readings of oxygen saturation (SpOÿ) and heart frequency (PRbpm) may be incorrect or the measurement is not possible at all.
• The functionality of the pulse oximeter may be impaired when using electrosurgical equipment or defibrillators.

• Pulse oximeter readings are too high in case of carbon monoxide poisoning.
• In order not to falsify the measurement result, there should be no strong light sources (eg fluorescent lamps or direct sunlight) in the immediate vicinity of the pulse oximeter.
• People who have low blood pressure, suffer from jaundice, are taking drugs that cause vasoconstriction, or have low blood pressure may experience erroneous or false readings.
• In patients who have received clinical dyes in the past and in patients with an abnormal hemoglobin occurrence is to be expected with a false measurement. This applies in particular to carbon monoxide poisoning and methaemoglobin poisoning, which result, for example, from the administration of local anesthetics or if there is a methaemoglobin reductase deficiency.
• In patients with an arterial catheter, hypotension, severe vasoconstriction, anemia or hypothermia measurement failure can occur.
• Protect the pulse oximeter from dust, shock, moisture, extreme temperatures and explosives Substances.

6. Device Description

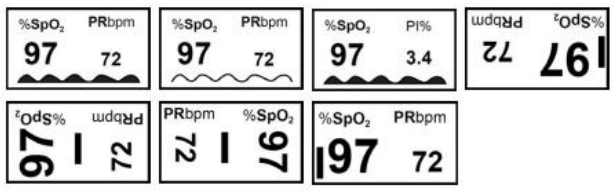
device

Display



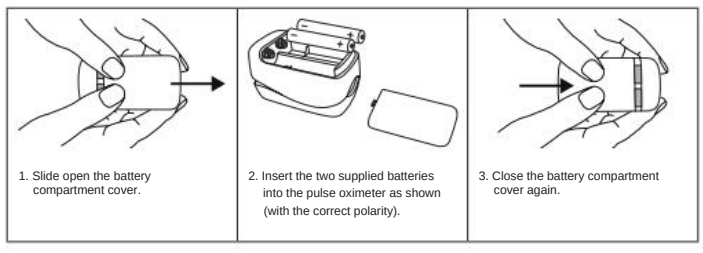
1. Oxygen saturation (value in percent)
2. Unsteady measurement
3. Pulse rate (value in beats per minute)
4. Pulses
5. Perfusion Index (value in percent)
6. Pulswelle

Display format (7 different)



7. Commissioning

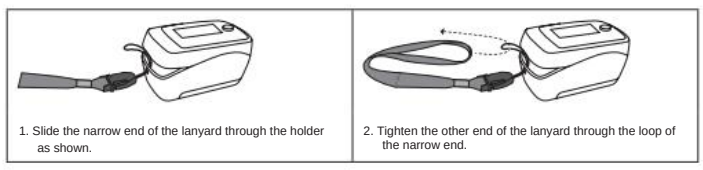
7.1 Insert batteries



1. Slide open the battery compartment cover.
2. Insert the two supplied batteries into the pulse oximeter as shown (with the correct polarity).
3. Close the battery compartment cover again.

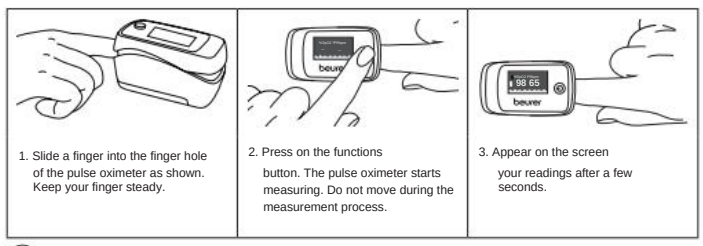
7.2 Fasten the neck strap

You can attach a lanyard to the device to make it easier to transport the pulse oximeter (e.g. on the go).



1. Slide the narrow end of the lanyard through the holder as shown.
2. Tighten the other end of the lanyard through the loop of the narrow end.

8. Service



1. Slide a finger into the finger hole of the pulse oximeter as shown. Keep your finger steady.
2. Press on the functions button. The pulse oximeter starts measuring. Do not move during the measurement process.
3. Appear on the screen your readings after a few seconds.

ⓘ a notice

• If this symbol ? appears on the display , it means that the measurement signal is unstable. The readings displayed are invalid.
• If you remove your finger from the pulse oximeter, the device switches off after approx. 8 seconds off automatically.
• To set your desired display format, briefly press the functions during operation taste.
• To set your desired display brightness, hold the function button longer during operation pressed.

9. Assess measurement results

⚠ WARNING

The following table for evaluating your measurement results does NOT apply to people with certain previous illnesses (e.g. asthma, cardiac insufficiency, respiratory diseases) and for stays at altitudes over 1500 meters. If you have any pre-existing conditions, always consult your doctor to evaluate your readings.

Measurement result SpOÿ (oxygen saturation) in %	Classification / Measures to be taken
99–94	normal range
93–90	Depressed area: doctor's consultation recommended
< 90	Critical area: Consult a doctor urgently

Source: Based on “Windisch W et al. S2k guideline: Non-invasive and invasive ventilation as therapy for chronic respiratory insufficiency Revision 2017; Pneumology 2017; 71: 722795"

Assess perfusion index

The Perfusion Index (PI) can range from 0.3% to 20%. It varies depending on the patient, measurement site and physical condition. A very low PI value can affect the measurement.

Altitude dependent decrease in oxygen saturation

ⓘ a notice

The table below informs you about the effects of different altitudes on the oxygen saturation value and their consequences for the human organism. The following table does NOT apply to people with certain pre-existing conditions (e.g. asthma, heart failure, respiratory diseases, etc.). Symptoms (e.g. hypoxia) can already occur at lower altitudes in persons with pre-existing conditions.

altitude	Expected SpOÿ value (oxygen saturation) in %	consequences for humans
1500–2500 m	> 90	No altitude sickness (usually)
2500-3500 m	~90	Altitude sickness, adaptation recommended
3500–5800 m	<ÿ90	Very common occurrence of altitude sickness, Adaptation mandatory
5800-7500 m	<ÿ80	Severe hypoxia, only temporary stay possible
7500–8850 m	<ÿ70	Immediate acute danger to life

Quelle: Hackett PH, Roach RC: High-Altitude Medicine. In: Auerbach PS (ed): Wilderness Medicine, 3rd edition; Mosby, St.Louis, MO 1995; 1-37.

10. Cleaning / Maintenance

⚠ DANGER:

Do not use high pressure or ethylene oxide sterilization on the pulse oximeter! The device is not suitable for sterilization.
Never hold the pulse oximeter under water, otherwise liquid can penetrate and damage the pulse oximeter.
• After each use, clean the housing and the rubberized inner surface of the pulse oximeter with a soft cloth dampened with medicinal alcohol.
• If the pulse oximeter display shows a low battery condition, replace the batteries out of.
• If you will not be using the pulse oximeter for more than a month, remove both batteries from the device, to prevent possible battery leakage.

11. Retention

⚠ DANGER:

Store the pulse oximeter in a dry environment (relative humidity ÿ 93%). Excessive humidity can shorten the life of the pulse oximeter or damage it. Store the pulse oximeter in a place where the ambient temperature is between -25°C and 70°C.

12. Disposal

Please dispose of the device in accordance with the WEEE (Waste Electrical and Electronic Equipment) directive. If you have any questions, please contact the local authority responsible for disposal.

The used, completely discharged batteries are to be disposed of via the specially marked collection containers, the hazardous waste collection points or via the electronics retailer. You are legally obliged to dispose of the batteries.

Note: You will find these symbols on batteries containing harmful substances:
Pb = battery contains lead,
Cd = battery contains cadmium,
Hg = battery contains mercury.

Pb Cd Hg

13. What to do in case of problems?

Problem	Possible Cause	fix
"Finger out" is shown on the display	The measuring finger is not inserted correctly in the pulse oximeter	Place the measuring finger back into the pulse oximeter.
Readings will not displayed correctly	The measured SpOÿ is too low (< 70%)	Carry out the measurement again. If problem occurs several times and that The device must be in perfect condition, it is essential to consult a doctor.
	strong light source (e.g. fluorescent lamp or direct sunlight) is nearby	Keep the pulse oximeter away from strong light sources.
Pulse oximeter shows Measurement interruptions or high reading jumps	Insufficient blood flow to the Messfingers	Warning and safety notices in Note Chapter 5
	Measuring finger is too big or too small.	Fingertip must have the following dimensions: Width between 10-20mm Thickness between 5-15mm
	Finger, hand or body is in motion	Keep your fingers, hand and body still during the measurement.
	cardiac arrhythmias	Consult a doctor.
Pulse oximeter does not turn on	Batteries are empty	Replace the batteries
	Batteries are not inserted correctly	Reinsert the batteries
	The pulse oximeter is defective	Contact your dealer or customer service
Indicator lights are suddenly off	The pulse oximeter will automatically turn off after 8 seconds if no signal is received.	Turn the pulse oximeter back on with the ON/OFF button.
	Batteries are empty	Replace the batteries
"Error 3" will appear on the displayed	The red light receiving LED is defective	Contact your dealer or the customer service
"Error 4" will be on the displayed	The infrared light receiving LED is defective	Contact your dealer or customer service
"Error 6" will appear on the displayed	The display is defective	Contact your dealer or customer service
"Error 7" will appear on the displayed	The reception LEDs are defective	Contact your dealer or customer service

14. Specifications

Type	AFTER 45
measurement method	Non-invasive measurement of arterial oxygen saturation of hemoglobin, pulse rate and perfusion index on the finger.
measuring range	SpOÿ (oxygen saturation): 70-100%, Pulse : 30-250 bpm, PI: 0.3-20%
accuracy	SpOÿ (oxygen saturation): 70-100%, ±2%, Pulse: 30-250 bpm, ±2 bpm PI: 0,3ÿ% – 1ÿ%; ±0.2 digits; >1,1ÿ% ±20ÿ%
Dimensions	L 59 mm x B 33 mm x H 33 mm
Weight	Approx. 57 g (including batteries)
Sensor technology for measuring SpOÿ	Red light (wavelength 660 nm ±3 nm, 3.2 mW); Infrared (wavelength 905nm ±10nm, 2.4mW); Silicon receiver diode
Permissible operating conditions	+5 °C to +40 °C, 15-93% relative humidity, 70-106 kPa ambient pressure
Permissible storage conditions	-25 °C to +70 °C, ÿ93% relative humidity, 70-106 kPa ambient pressure
power supply	2x 1,5 V ⎓ AAA batteries
battery life	2 AAA alkaline batteries enable approx. 2 years of operation with 1 measurement per day (each 60 seconds).
classification	IP22, type BF applied part
Response time of the device	The time to calculate new measured values is 8 seconds.

The serial number can be found on the device or in the battery compartment.

Specifications are subject to change without notice for update reasons.

• This device conforms to European standards EN60601-1 and ENEN60601-1-2 (compliance with CISPR, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-8) and is subject to special precautions regarding electromagnetic compatibility . Please note that portable and mobile HF communications equipment can affect this device. You can request more detailed information from the customer service address provided.

• The device complies with the EU directive for medical products 93/42/EEC, the Medical Devices Act and the standard DIN EN ISO 80601-2-61 (medical electrical devices - special specifications for the basic safety and the essential performance features of pulse oximeters for medical Use).

Notes on Electromagnetic Compatibility

⚠ WARNING

• The device is suitable for use in all environments specified in this user manual, including the domestic environment.
• The device may only function to a limited extent in the presence of electromagnetic disturbances. As a result, error messages or a failure of the display/device may occur.
• The use of this device adjacent to other devices or stacked with other devices should be avoided as it may result in improper operation. If use of the prescribed type is nevertheless necessary, this device and the other devices should be observed to ensure that they are working properly.
• The use of accessories other than those specified by the manufacturer of this device or provided, can result in increased electromagnetic interference emissions or reduced electromagnetic interference immunity of the device and lead to incorrect operation.
• Keep portable RF communications equipment (including peripherals such as antenna cables or external antennas) at least 30cm away from all parts of the device, including all cables included in the scope of delivery. Non-observance can lead to a reduction in the performance characteristics of the device.
• Non-observance can lead to a reduction in the performance characteristics of the device.

15. Warranty/Service

Beurer GmbH, Söflinger Straße 218, D-89077 Ulm (hereinafter referred to as "Beurer") grants a guarantee for this product under the following conditions and to the extent described below.

The following warranty conditions do not affect the statutory warranty obligations of the seller from the purchase contract with the buyer.
The guarantee also applies without prejudice to mandatory statutory liability regulations.

Beurer guarantees the flawless functionality and completeness of this product.

The worldwide guarantee period is 5 years from the start of the purchase of the new, unused product by the buyer.

This guarantee only applies to products that the buyer has purchased as a consumer and uses exclusively for personal purposes within the framework of domestic use.

German law applies.

If, during the guarantee period, this product proves to be incomplete or defective in terms of functionality in accordance with the following provisions, Beurer will carry out a replacement delivery or repair free of charge in accordance with these guarantee conditions.

If the buyer would like to report a warranty claim, they should first contact Beurer Customer Service: Beurer GmbH, Service Center Tel: +49 731 3989-144

For speedy processing, please use our contact form on the website www.beurer.com under the heading 'Service'.

The buyer then receives more detailed information on how to process the guarantee case, eg where to send the product free of charge and which documents are required.

A claim under the guarantee can only be considered if the buyer can present - a copy of the invoice/purchase receipt and - the original product to Beurer or an authorized Beurer partner.

Specifically excluded from this warranty are - wear and tear resulting from normal use or consumption of the product;
- accessories supplied with this product which wear out or become exhausted with normal use (e.g. batteries, rechargeable batteries, cuffs, seals, electrodes, lamps, attachments, inhaler accessories); - Products that have been used, cleaned, stored or serviced improperly and/or contrary to the provisions of the operating instructions, as well as products that have been opened, repaired or modified by the buyer or a service center not authorized by Beurer;

- Damage occurring on the transport route between the manufacturer and the customer or between the service center and the customer develop
- Products purchased as 2nd choice or used items;
- Consequential damage based on a defect in this product (in this case, however, there may be claims based on product liability or other mandatory statutory liability provisions).

Repairs or a complete replacement do not extend the warranty period under any circumstances.

Subject to errors and changes

beurer Pulse oximeter AFTER 45

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CE 0483

ENGLISH

Dear customer,

Thank you for choosing one of our products. Our name stands for high-quality, thoroughly tested products for applications in the areas of heat, weight, blood pressure, body temperature, pulse, gentle therapy, massage, beauty, baby and air. Please read these instructions for use carefully and keep them for later use, be sure to make them accessible to other users and observe the information they contain.

With kind regards,
Your Beurer team

1. Included in delivery

1x POÿ45 pulse oximeter, 2x 1,5 V AAA batteries, 1x lanyard, 1x belt bag, 1x these instructions for use

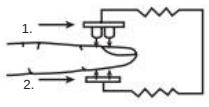
2. Intended use

The Fingertip Pulse Oximeter PO 45 is a handheld non-invasive device intended for spot-checking of oxygen saturation of arterial hemoglobin (SpO2) and Pulse Rate of adult, adolescent and child patients in hospitals, hospital-type facilities and homecare.

3. Getting to know your instrument

The Beurer POÿ45 pulse oximeter provides a non-invasive measurement of the arterial oxygen saturation (SpO2), the heart rate (pulse rate) (PRbpm) and the perfusion index (PI). Oxygen saturation indicates the percentage of haemoglobin in arterial blood that is loaded with oxygen. Therefore it is an important parameter for assessing the respiratory function.

Oxygen binds to hemoglobin in red blood cells when moving through the lungs.
It is transported throughout the body as arterial blood. Aÿpulse oximeter uses two frequencies of light (red and infrared) to determine the percentage (%) of hemoglobin in the blood that is saturated with oxygen. The percentage is called blood oxygen saturation, or SpO2. A pulse oximeter also measures and displays the pulse rate at the same time it measures the SpO2 level.



1. Red and Infrared-ray Emission Tube 2. Red
and Infrared-ray Receipt Tube
A low oxygen saturation value generally indicates underlying illnesses (respiratory diseases, asthma, heart failure etc.).

People with a low oxygen saturation value are more likely to experience the following symptoms: shortness of breath, increased heart rate, weakness, nervousness and outbreaks of sweating. If oxygen saturation is known to be chronically diminished, it requires monitoring using the pulse oximeter under medical supervision. If you have acutely diminished oxygen saturation, with or without the accompanying symptoms, you must consult a doctor immediately as it could lead to a life-threatening situation. The pulse oximeter is particularly suitable for patients at risk such as people with heart disease or asthma, but also for athletes and healthy people who exercise at high altitude (e.g. mountaineers, skiers or amateur pilots).

Features of the pulse oximeter

- Easy to use and to take with you (ideal for on the go)
- Compact, lightweight design
- Two-colour OLED display, readings for oxygen saturation (SpO2), pulse rate (PRbpm) and perfusion index (PI) are shown
- Adjustable display brightness (1 to 10)
- 7 display formats/low battery indicator/automatic switch-off after 8 seconds if no signal is received

4. Signs and symbols

The following symbols are used in these instructions for use, on the packaging and on the type plate for the device:

⚠	**WARNING** Warning instruction indicating a risk of injury or damage to health		Manufacturer
⚠	**IMPORTANT** Safety note regarding potential for damage to the device/accessories		Application part, type BF
ⓘ	**Note** Note on important information	Pb Cd Hg	Do not dispose of batteries con taining hazardous substances with household waste.
	Observe the instructions for use	CE 0483	This product satisfies the require ments of the applicable European and national directives.
%SpOÿ	Arterial oxygen saturation of haemoglobin (in percent)	SN	Serial number
PR bpm Pulse rate (beats per minute)		SpO2	Alarm suppression
PI%	Index infusions		
Storage	Permissible storage temperature and humidity	**IP22**	Device protected against foreign objects ÿ12.5 mm and against falling drops of water
Operating	Permissible operating temperature and humidity		Disposal in accordance with the Waste Electrical and Electronic Equipment EC Directive – WEEE
	Low power indication	21 PAP	Dispose of packaging in an environ mentally friendly manner

5. Warnings and safety notes

Non-observance of the following information may result in personal injury or material damage. Store these instruc tions for use and make them accessible to other users. Make sure you include these instructions for use when handing over the device to third parties.

⚠ WARNING

- Check to ensure that the package contains all the parts that should be included in the delivery.
- Check the pulse oximeter regularly before use to ensure that there is no visible damage to the device and the batteries are still sufficiently charged. In case of doubt, do not use the device and contact Beurer customer services or an authorised retailer.

- Do not use any additional parts that are not recommended by the manufacturer or offered as equipment.
- Under no circumstances should you open or repair the device yourself, as faultless functionality could no longer be guaranteed thereafter. Failure to comply will result in voiding of the warranty. For repairs, please contact Beurer customer services or an authorised retailer.

Do NOT use the pulse oximeter
ÿ if you are allergic to rubber products.
ÿ if the device or the finger you are using is damp.
ÿ on small children or babies.
ÿ during an MRI or CT scan.
ÿ while transporting a patient other than within a medical establishment.
ÿ whilst taking a blood pressure measurement on the same arm using a cuff.
ÿ on fingers that have nail varnish on, are dirty or have a plaster or other dressing on them.
ÿ on large fingers that do not fit into the device easily (fingertip: width approx. > 20 mm, thickness approx. >15 mm).
ÿ on fingers with anatomical changes, oedemas, scars or burns.
ÿ on fingers that are too small, as with small children for example (width approx. < 10 mm, thickness < 5 mm).
ÿ on patients who are not steady at the site of application (e.g. trembling).
ÿ near flammable or explosive gas mixtures.

- Using the device for long periods may cause pain for people with circulatory disorders. Therefore do not use the pulse oximeter for longer than 30 minutes on one finger. This is essential to ensure correct sensor orientation and to safeguard the integrity of the skin.
- The pulse oximeter displays an instantaneous measurement but cannot be used for continuous monitoring. • The pulse oximeter does not have an alarm function and is therefore not suitable for evaluating medical results.
- Do not self-diagnose or self-medicate on the basis of the measurements without consulting your doctor. In particular, do not start taking any new medication or change the type and/or dosage of any existing medication without prior approval.

- Do not look directly inside the housing during the measurement. The red light and the invisible infra-red light in the pulse oximeter are harmful to your eyes.
- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the PO 45. Otherwise, degradation of the performance of this equipment could result.
- The pulse oximeter equipment is calibrated to display functional oxygen saturation.
- This device is not intended for use by people (including children) with restricted physical, sensory or mental skills or a lack of experience and/or a lack of knowledge, unless they are supervised by a person who has responsibility for their safety or they receive instructions from this person on how to use the device. Children should be supervised around the device to ensure they do not play with it. • The displays for the pulse wave and pulse bar allows the strength of the pulse or circulation to be evaluated at the measurement site. Rather, they are exclusively used to display the current visual signal variation at the measurement site and do not enable reliable diagnostics for the pulse.

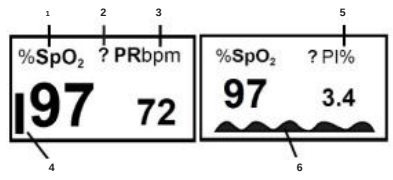
Non-observance of the following instructions can lead to incorrect or failed measurements:

- There must not be any nail varnish, artificial nails or other cosmetics on the finger to be measured. • Ensure that the finger nail on the finger to be measured is short enough that the fingertip covers the sensor element in the housing.
- If the person moves while the measurement is being taken. Keep your hand, finger and body steady during the measurement.
- For people with cardiac arrhythmia, the oxygen saturation level (SpOÿ) readings and the heart rate (PRbpm) may be incorrect or the measurement may not be possible at all.
- If an electronic surgical device or defibrillator is used, the functioning of the pulse oximeter may be impaired.
- In cases of carbon monoxide poisoning, the pulse oximeter displays a measurement value that is too high.
- To avoid falsifying the measuring result, there should not be any strong light sources (e.g. fluorescent lamps or direct sunlight) in the immediate vicinity of the pulse oximeter.
- People with low blood pressure, who suffer from jaundice or take medication for vascular contraction may experience incorrect or falsified measurements.
- Incorrect measurements are likely for patients who have been administered medical dye in the past or for those who have abnormal haemoglobin levels. This applies in particular for cases of carbon monoxide poisoning and methaemoglobin poisoning, which can occur for example from the administration of local anaesthetics or from an existing methaemoglobin reductase deficiency.
- The measurement may be falsified in patients with an arterial catheter, hypotension, severe vascular con striction, anaemia or hypothermia.
- Protect the pulse oximeter from dust, shocks, moisture, extreme temperatures and explosive materials.

6. Unit description

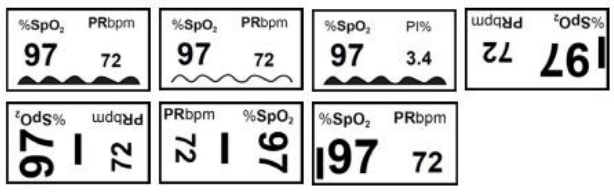
Device

Display



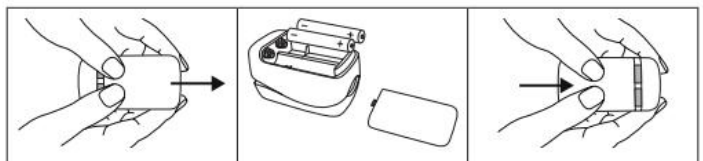
1. Oxygen saturation (value in percent)
2. Inaccurate measurement
3. Pulse rate (value in beats per minute)
4. Pulse bar
5. Perfusion index (value in percent)
6. Pulse wave

Display formats (7 different formats)



7. Initial use

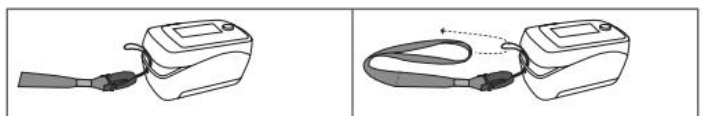
7.1 Inserting the batteries



1. Slide the battery compartment lid open.
2. Insert the two supplied bat teries into the pulse oximeter battery compartment following the correct polarity as shown.
3. Close the battery compartment cover again.

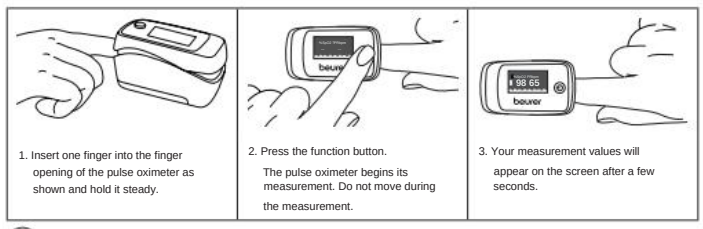
7.2 Attaching the lanyard

To transport the pulse oximeter more easily (e.g. whilst on the move) you can attach a lanyard to the device.



1. Insert the narrow end of the lanyard through the holder as shown.
2. Draw the other end of the lanyard through the loop at the narrow end and tighten.

8. Operation



1. Insert one finger into the finger opening of the pulse oximeter as shown and hold it steady.
2. Press the function button. The pulse oximeter begins its measurement. Do not move during the measurement.
3. Your measurement values will appear on the screen after a few seconds.

ⓘ Note

- If the ?, symbol appears on the display this indicates that the measurement signal is unstable, and the readings shown are invalid.
- When you remove your finger from the pulse oximeter, the device will automatically switch off after approx. 8ÿseconds.
- To select your desired display format, hold down the function button briefly during operation.
- To select your desired display brightness, hold down the function button for slightly longer during operation.

9. Evaluating measurement results

⚠ WARNING

The following table for evaluating your measurements does NOT apply to people with certain pre-existing con ditions (e.g. asthma, heart failure, respiratory diseases) or whilst staying at altitudes above 1500 metres. If you have a pre-existing condition, always consult your doctor to evaluate your measurements.

SpOÿ (oxygen saturation) measurement in %	Classification/measures to be taken
99–94	Normal range
93–90	Decreased range: Visit to the doctor recommended
< 90	Critical range: Seek medical attention urgently

Source: Adapted to "Windisch W et al. Guidelines for Non-Invasive and Invasive Home Mechanical Ventilation for Treatment of Chronic Respiratory Failure Update 2017; Pneumologie 2017; 71: 722795"

Evaluating perfusion index

The perfusion index (PI) may lie between 0.3% and 20%, and varies depending on the patient, measurement location and state of health. A very low PI value can impair the measurement.

Decline in oxygen saturation depending on altitude

ⓘ Note

The following table informs you of the effects of various altitudes on oxygen saturation value and its impact on the human body. The following table does NOT apply to people with certain pre-existing conditions (e.g. asthma, heart failure, respiratory diseases etc.). People with pre-existing conditions can show signs of illness (e.g. hypoxia) at lower altitudes.

Altitude	Expected SpOÿ value (oxygen satura tion) in %	Impact on human body
1500–2500 m	> 90	No altitude sickness (normally)
2500–3500 m	~90	Altitude sickness, acclimatisation recommended
3500–5800 m	<ÿ90	Very frequent altitude sickness, acclimati sation absolutely essential
5800–7500 m	<ÿ80	Severe hypoxia, only limited length of stay possible
7500–8850 m	<ÿ70	Immediate, acute danger to life

Source: Hackett PH, Roach RC: High-Altitude Medicine. In: Auerbach PS (ed): Wilderness Medi-cine, 3rd edition; Mosby, St.Louis, MO 1995; 1-37.

10. Maintenance/cleaning

⚠ IMPORTANT:

Do not use high pressure or ethylene oxide sterilisation on the pulse oximeter! The device is not suitable for sterilisation.

Under no circumstances should you hold the pulse oximeter under water, as this can cause liquid to enter and damage the pulse oximeter. • Clean the housing and the interior rubber surface with a soft cloth dampened with medical alcohol after each use.

- If a low battery status appears on the display of the pulse oximeter, change the batteries.
- If you are not going to use the pulse oximeter for more than one month, remove both batteries from the device to avoid possible leaking.

11. Storage

⚠ IMPORTANT:

Store the pulse oximeter in a dry place (relative humidity ÿÿ93ÿ%). If the humidity is too high it may shorten the service life of the pulse oximeter or damage it. Store the pulse oximeter in a place where the ambient temperature is between -25ÿ°C and 70ÿ°C.

12. Disposal

Please dispose of the device in accordance with EC Directive – WEEE (Waste Electrical and Electronic Equipment). If you have any questions, please contact the local authorities responsible for waste disposal.

The empty, completely flat batteries should be disposed of through specially designated collection boxes, recycling points or electronics retailers. You are legally required to dispose of the batteries.
Note: The codes below are printed on batteries containing harmful substances: Pb = Battery contains lead, Cd = Battery contains cadmium, Hg = Battery contains mercury.

Pb Cd Hg

13. What if there are problems?

Problem	Possible cause	Solution
"Finger out" appears on the display	The finger on which the measure ment is being taken has not been inserted properly in the pulse oximeter	Insert the finger in the pulse oximeter again
Measurement values are not correctly displayed	The measured SpOÿ is too low (<ÿ70ÿ%)	Do the measurement again. If the prob lem occurs repeatedly and the device is functioning properly, seek medical advice as a matter of urgency
	There is a strong light source (e.g. fluorescent lamp or direct sunlight) in the vicinity	Remove pulse oximeter from the vicinity of these light sources
The pulse oximeter is displaying measurement interruptions or high meas urement value jumps	Insufficient circulation in the measurement finger	Observe the warnings and safety notes in section 5
	Measurement finger is too large or too small	Fingertip must have the following meas urements: Width between 10 and 20 mm Thickness between 5 and 15 mm
	Finger, hand or body is moving	Keep your finger, hand and body still during the measurement.
	Cardiac arrhythmia	Seek medical attention
Pulse oximeter will not switch on.	Batteries are flat	Replace the batteries
	The batteries have not been inserted correctly	Reinsert the batteries
	The pulse oximeter is faulty.	Contact the retailer or Customer Services
Indicator light goes out suddenly	The pulse oximeter switches off automatically after 8 seconds if it is not receiving a signal	Switch the pulse oximeter on again using the ON/ OFF button.
	Batteries are flat	Replace the batteries
"Error 3" appears on the display	The red light receiving LED is faulty	Contact the retailer or Customer Services
"Error 4" appears on the display	The infrared light receiving LED is faulty	Contact the retailer or Customer Services
"Error 6" appears on the display	The display is faulty.	Contact the retailer or Customer Services
"Error 7" appears on the display	The receiving LEDs are faulty	Contact the retailer or Customer Services

14. Technical data

Type	AFTER 45
Measurement method	Non-invasive measurement of arterial oxygen saturation of haemoglobin, pulse rate and perfusion index in finger.
Measurement range	SpOÿ (oxygen saturation): 70–100ÿ%, pulse: 30–250 beats/minute PI: 0.3–20ÿ%
Accuracy	SpOÿ (oxygen saturation): 70–100ÿ%, ±2ÿ%, pulse: 30–250 bpm, ±2 beats/minute PI: 0.3% – 1ÿ%; ±0.2 digits; >1.1ÿ% ±20ÿ%
Dimensions	L 59 mm x W 33 mm x H 33 mm
Weight	Approx. 57 g (including batteries)
Sensor to measure SpOÿ	Red light (wave length 660 nm ±3nm, 3.2 mW); infra-red (wave length 905 nm ±10 nm, 2.4 mW); silicon receiver diode
Permissible operating conditions +5ÿ°C to +40ÿ°C, ÿ15–93ÿ% relative humidity, 70–106 kPa ambient pressure	
Permissible storage conditions	-25ÿ°C to +70ÿ°C, ÿ93ÿ% relative humidity, 70–106 kPa ambient pressure
Power supply	2 x 1.5V ⎓ AAA batteries
Battery life	2 AAA alkaline batteries last for approx. 2 years of operation at 1 measure ments per day (each of 60 seconds).
Classification	IP22, application part, type BF
Equipment response time	Response time of changing value is 8 seconds.

The serial number is located on the device or in the battery compartment.

Technical information is subject to change without notification to allow for updates.

- This device conforms with the European standards EN60601-1 and EN60601-1-2 (In accordance with CISPR, IEC 61000-4-2, IEC 61000-4-3 and IEC 61000-4-8) and is subject to particular precautions with regard to electromagnetic compatibility. Please note that portable and mobile HF communication systems may interfere with this device. For more details, please contact our Customer Services at the address indicated.
- This device complies with EU Directive 93/42/EEC concerning medical devices, the Medizinproduktegesetz (German Medical Devices Act) and the DIN EN ISO 80601-2-61 standard (Medical electrical equipment – Particular requirements for the basic safety and essential performance of pulse oximeter equipment for medical use).

Notes on electromagnetic compatibility

⚠ WARNING

- The device is suitable for use in all environments listed in these instructions for use, including domestic envi ronments.
- The use of the device may be limited in the presence of electromagnetic disturbances. This could result in issues such as error messages or the failure of the display/device.
- Avoid using this device directly next to other devices or stacked on top of other devices, as this could lead to faulty operation. If, however, it is necessary to use the device in the manner stated, this device as well as the other devices must be monitored to ensure they are working properly.
- The use of accessories other than those specifed or provided by the manufacturer of this device can lead to an increase in electromagnetic emissions or a decrease in the device's electromagnetic immunity; this can result in faulty operation.

- Keep portable RF communication devices (including peripheral equipment, such as antenna cables or external antennas) at least 30 cm away from all device parts, including all cables included in delivery. Failure to comply with the above can impair the performance of the device.
- Failure to comply with the above can impair the performance of the device.

15. Warranty/service

Beurer GmbH, Söflinger Straße 218, 89077 Ulm, Germany (hereinafter referred to as "Beurer") provides a warranty for this product, subject to the requirements below and to the extent described as follows.

The warranty conditions below shall not affect the seller's statutory warranty obligations which ensue from the sales agreement with the buyer.
The warranty shall apply without prejudice to any mandatory statutory provisions on liability.

Beurer guarantees the perfect functionality and completeness of this product.

The worldwide warranty period is 5 years, commencing from the purchase of the new, unused product from the seller.

The warranty only applies to products purchased by the buyer as a consumer and used exclusively for personal purposes in the context of domestic use.
German law shall apply.

During the warranty period, should this product prove to be incomplete or defective in functionality in accordance with the following provisions, Beurer shall carry out a repair or a replacement delivery free of charge, in accord ance with these warranty conditions.

If the buyer wishes to make a warranty claim, they should approach their local retailer in the first instance: see the attached "International Service" list of service addresses.

The buyer will then receive further information about the processing of the warranty claim, e.g. where they can send the product and what documentation is required.

A warranty claim shall only be considered if the buyer can provide Beurer, or an authorised Beurer partner, with - a copy of the invoice/ purchase receipt, and - the original product.

The following are explicitly excluded from this warranty: -
deterioration due to normal use or consumption of the product;
- accessories supplied with this product which are worn out or used up through proper use (e.g. batteries, rechargeable batteries, cuffs, seals, electrodes, light sources, attachments and nebuliser accessories); - products that are used, cleaned, stored or maintained improperly and/or contrary to the provisions of the in structions for use, as well as products that have been opened, repaired or modified by the buyer or by a service centre not authorised by Beurer; - damage that arises during transport between manufacturer and customer, or between service centre and customer;
- products purchased as seconds or as used goods;
- consequential damage arising from a fault in this product (however, in this case, claims may exist arising from product liability or other compulsory statutory liability provisions).

Repairs or an exchange in full do not extend the warranty period under any circumstances.

Subject to errors and changes