

Warning



The use of a call device does not release supervisors from the obligation to supervise the persons supported by such a device. The call device provides for supporting comfort and allows for checking supervised persons less frequently. The system must be subjected to regular functional checks. Please note that the reach of radio links can be subject to substantial variations especially in buildings and that the product will not work in case of power failure. In the case of error and malfunction the system must not be used until it has been checked by an authorised technician. Carefully read all attached instructions before operating this device and keep them for further reference.

Important: This device must not be used for monitoring purposes if life-threatening conditions are foreseeable. In addition, control measures for checking the quality of the radio link are to be observed if the device uses a radio link.

Package Contents

Product	Material Number	Additional Information
VarioSwitch breath sensor device	210.216.00	
Call device connecting cable (approx. 3 m) with open cable ends.	210.216.01	(Ready-for-use connecting cables on request)
VarioSwitch instruction manual	LE218	For cable connection to call systems

Note: While unpacking, each shipment should be inspected for completeness and damage.

Note: In this manual the VarioSwitch breath sensor system device is referred to as "breath sensor".

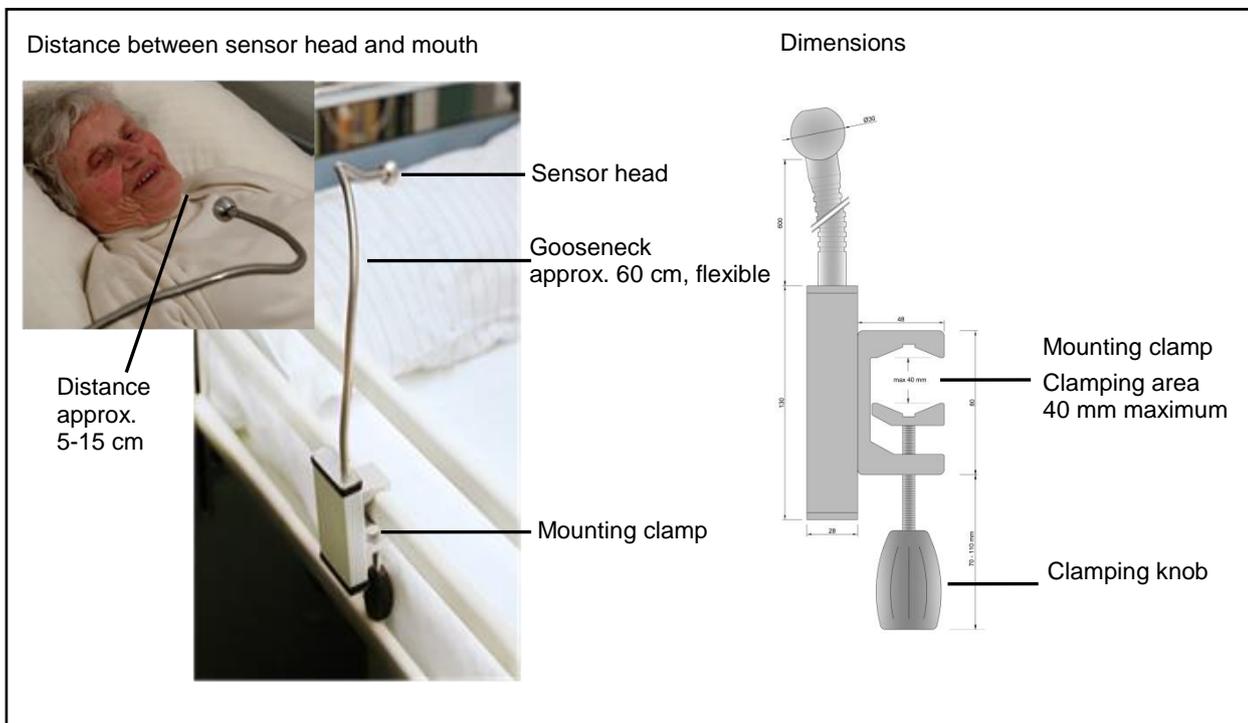
Use and Functions

The gooseneck sensor head of the respiratory sensor (Figure 1) captures blowing noises intended as calls by the patient and triggers a patient call. A microphone at the bottom side detects ambient sound. As long as loud ambient sound is present, triggering of calls is blocked in order to avoid faulty activations by loud background noise. Three operating indicators indicate the device status.

Installation

Place the device such that the gooseneck sensor head can be positioned about 5-15 cm from the mouth of the patient. Bend the gooseneck accordingly. Use the mounting clamp to attach the device. Please note that the clamp may cause scratches and/or pressure marks when tightening the knob. These can be reduced by applying a suitable material (e.g., plaster, fabric) on the inner surface of the clamp and tightening carefully without slipping. The device must not be mounted in positions where scratches and/or pressure marks are not tolerable.

Figure 1: Placement and Installation



Connection to the call system

The breath sensor is connected to a call signalling device with the supplied connecting cable. A cable with open cable ends is included in the delivery. Please refer to the documents on the call signalling device for the correct connection of the cable ends.

Ready-for-use connecting cables for common nurse call systems are available on request. The request must include information on the nurse call system used.

Time behaviour: The device emits a call in the form of a pulse for the duration of the blowing noise. However, the minimum duration of the pulse is 2 seconds. If the break function is used for the connection, the connection is monitored at the same time. This option should always be preferred.

Terminal assignment of the 9-pin SUB-D connector (female cable connector at cable)

PIN	Function	Additional Information
1	Power supply + 24 V DC	max. allowable current 2 A
2	Power supply GND	
Voltage of call signalling outputs		
3	+ 10 V DC during call	max. 20 mA
4	+ 24 V DC during call	max. 20 mA (make contact, to +24 V)
5	+ 24 V DC in rest position	max. 20 mA (break contact, to +24 V), preferred
Potential-free relay contact signalling outputs		
6	(m) relay centre contact	Common relay contact (internally connected to Pin 7)
7	(m) relay centre contact	Common relay contact (internally connected to Pin 6)
8	(r) closed in rest position	Relay contact, (break contact) quiescent current loop
9	(a) open in rest position	Relay contact, (make contact) NO contact

Power supply

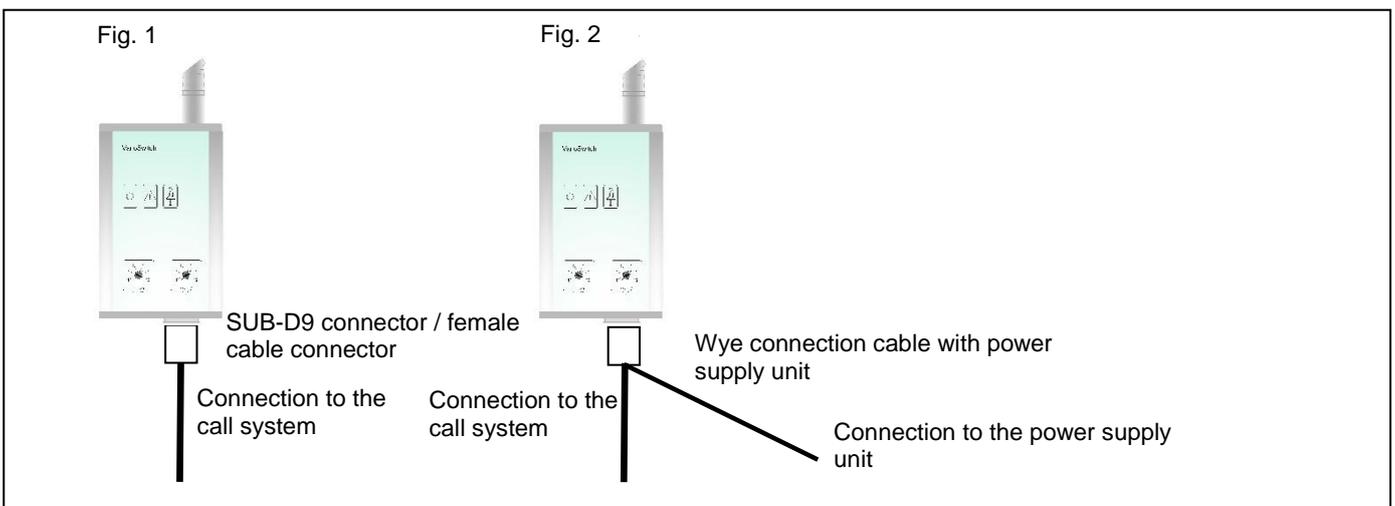
Normally the call system supplies the breath sensor with a voltage of 24 V DC (Fig. 1). If this is not possible power can alternatively be provided by a 24 V DC power supply unit (approx. 200 mA). In this case a wye-connection cable is required to feed the current (Fig. 2). Power supply units with wye cables are available on request.



Warning

A power failure results in the failure of the breath sensor. This possibility of failure must be considered when using the device, in particular when using it with a power supply unit.

Fig. 2: Connection Variants

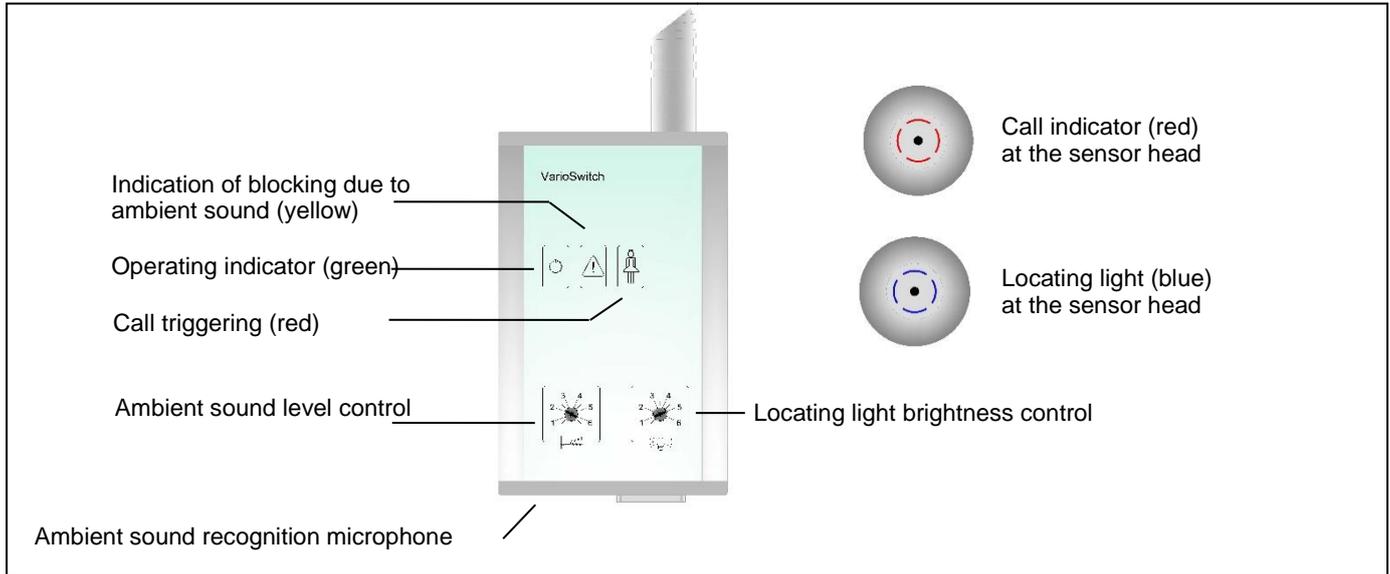


Putting into operation

The device is factory-preset and should be ready to use in normal environments. Hence, the breath sensor can be put into operation after proper positioning, connection of the power supply and programming it to a call receiver. For optimising the settings please refer to the section "Breath sensor adjustment".

Adjustment and Indicator Elements

Figure 3: Controls and Functional Elements



Adjustment Possibilities

Call detection

- The sensor head is positioned near the patient by suitably mounting the device and moving the sensor head to a position at an appropriate distance to the patient by bending the gooseneck.

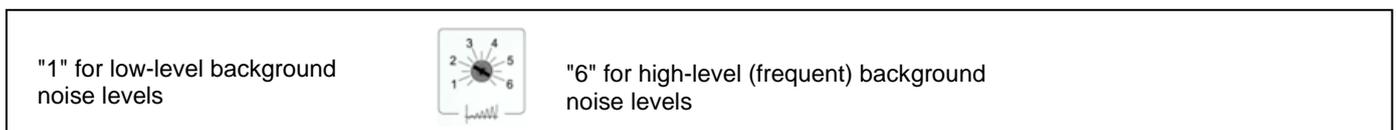
Note: The distance between the sensor head and the patient's mouth should be selected such that normal respiratory sounds do not trigger calls, but blowing is interpreted as a call. The optimum distance for each particular patient is to be determined by trying out. Typical distances between 5 and 15 cm have proven effective.

Background-noise suppression

A microphone at the bottom side detects ambient sound. As long as the ambient sound is too loud, a triggering of calls is blocked in order to avoid faulty activations by background noise.

- The ambient sound level control allows for adjusting the sensitivity of the ambient sound recognition microphone. A typical setting is "2".
- Rotating the control anti-clockwise to smaller numbers has the effect that even low-level background noises will block the triggering of calls. However, this will increase the sensitivity of the device to blowing noises for call triggering.
- Rotating the control clockwise to higher numbers has the effect that only high-level background noises will block the triggering of calls. However, this decreases the sensitivity of the device to blowing noises.

Fig. 4: Ambient Sound Level Control



To achieve the best setting in the immediate vicinity of the patient under normal ambient conditions (considering, e.g., TV or radio noise levels), adjust the control so that the yellow warning indicator flickers as little as possible.



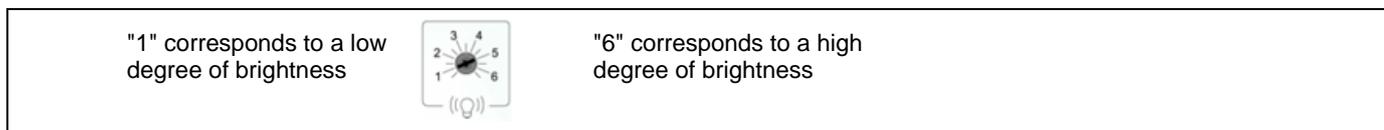
Warning

Background-noise suppression is a compromise between avoidance of incorrect call triggering and temporary blocking of the device and has to be selected depending on the condition and the blowing capability of the patient. In case of doubt a setting for low-level background noise levels should be selected although this will increase the possibility of incorrect call triggering.

Locating light brightness

This control allows for adjusting the brightness of the locating light at the sensor head. The locating light should not disturb the patient at night, but should be bright enough to help the patient to locate the sensor head.

Fig. 5: Locating light brightness control



Operation



Warning

The **VarioSwitch** breath sensor enables persons to trigger calls despite significant motoric restrictions. The detection of blowing noises as calls is limited due to physical laws. Therefore, call triggering cannot be guaranteed. This must be taken into consideration when using the device.

The green operating indicator (Fig. 3) indicates that the device receives the required operating voltage. Therefore, it must be permanently lit.

Table: Functions and Operating Indicators

Indicator element/control	Icon	Operating state
Operating indicator (green)		Must be permanently lit during operation
Call indicators (red)		Light up during a call and go out afterwards.
Ambient sound (yellow)		Lights up in the case of loud ambient noise. Calls cannot be triggered as long as this indicator lights up.
Locating light (at the sensor head) (blue)		Lights up permanently (brightness can be adjusted)

Switch off call message

The VarioSwitch breath sensor sends a call pulse to the call system. The call system saves and transmits this pulse. The saved call message must be switched off at the call device. (Note: usually this is achieved by the presence function).

Regular maintenance

A visual inspection comprising the triggering of a test call as well as a visual inspection of the connection to the call system and a manual test of the tightness of the mounting should be performed at least once a week. Adjustment and positioning of the device must be repeated and checked whenever the patient is repositioned or transferred to an environment with other background noises.

Cleaning

Use of a soft, slightly moist cloth with a small amount of cleaning agent, optionally with disinfecting agents according to EN 16615 (1,000 ppm), is recommended. Do not use abrasive cleaning agents.

Change of Patients / Disinfection

Ball head components can be cleaned / replaced for disinfection or in case of change of patient. A description is given at the end of this manual.

Specifications

Model:	Non-contact blow sensor as call signal detector, microphone for suppressing background noise
Message:	Transmission of calls to a nurse call system
Power supply:	24 V DC / 200 mA by the call system, alternatively by a power supply unit
Controls:	Ambient sound suppression, locating light brightness
Indicators:	At the blow sensor head: call, locating light At the device: operating indicator, call, blocking of calls due to ambient sound
Rating:	IP 30 (do not use in wet areas or under humid conditions)
Dimensions:	130x80x30 mm (WxHxD), Length of the stainless steel positioning arm approx. 600 mm, Blow sensor diameter 25 mm
Weight:	approx. 950 g
Approvals:	CE, RoHS, WEEE

Accessory and Replacement Parts

Product	Order number	Additional Information
Replacement diaphragm set	210.216.900	Three-part set consisting of a highly sensitive replacement diaphragm, an illuminated ring and a protective cover
Replacement ball head	210.216.901	Disinfectable
Floor stand	990.120.12	Stainless steel tube (HxD) 850x20 mm, cast iron bottom plate included

¹Additional accessory and replacement parts can be found on the homepage of Lehmann Electronic.

Warranty

The manufacturer is not liable for any damage resulting from improper or inappropriate use. During the legal warranty period we shall correct, free of charge, all defects of the device attributable to material or manufacturing defects, either by means of repair or replacement. The warranty shall become void in the case of interference by a third party or improper use. The warranty shall not apply to wear and tear of moving parts.

Service address

Please contact the supplier of your call system.

Disposal instructions

Used devices and batteries must not be disposed of together with domestic waste. Dispose of used devices according to local laws and disposal regulations (through a recycling centre or your speciality retailer). Dispose of used batteries according to local laws and disposal regulations (in battery collection containers or through the specialised trade). Dispose of packaging material according to local laws and disposal regulations (in recycling bins for cardboard, paper, and plastic material).



Conformity and Legal Provisions

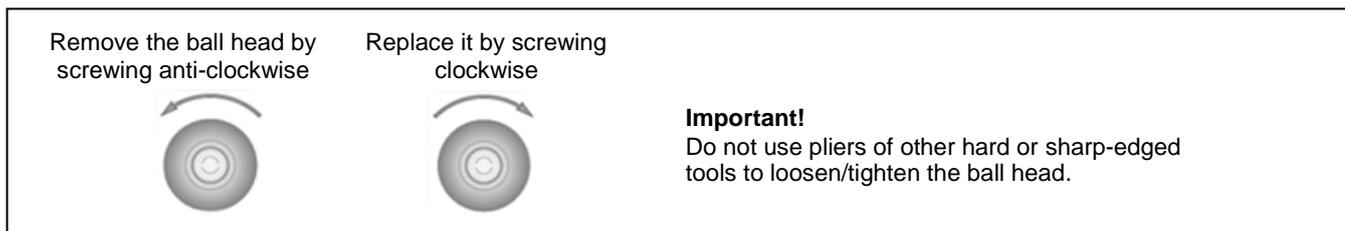
Lehmann Electronic declares that, if applicable, the product complies with the essential requirements and the other relevant provisions of the EMC Directive 2014/30/EU, the RED Directive 2014/53/EU and the RoHS Directive 2011/65/EU. You will find the complete declarations of conformity in the Internet under www.lehmannweb.de.



REACH Regulation Within the meaning of the Regulation we are a downstream user. The product is exempt from the specific labelling requirements of the Regulation. Further information is available on the website.

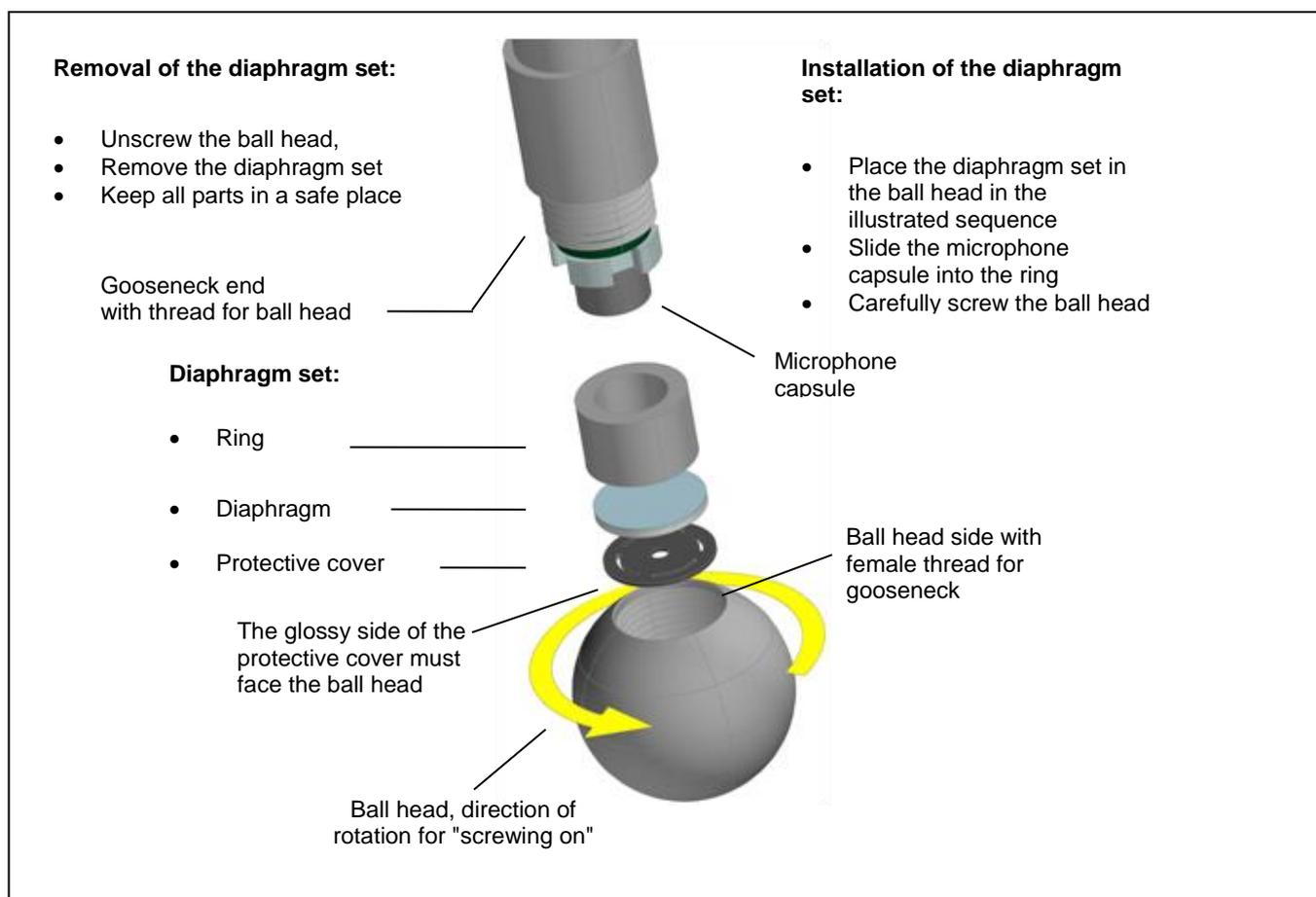
Cleaning / Replacement of Sensor Components

Fig. 6: Removal and Replacement of the Ball Head



Behind the ball head the diaphragm set² is located. This set can be removed and cleaned / replaced. Please follow the correct sequence during re-assembly. The glossy side of the protective cover must face the ball head.

Fig. 7: Replacement of the diaphragm set



²The ball head is not included in the diaphragm set