

Operating Manual

# leakguardPRO



**Ultrasonic-Leakage Detector  
for Compressed air plants**

## Contents

- 1 Manufacturer's information.....2**
- 2 Scope of supply.....2**
- 3 General dangers and precautions.....3**
  - 3.1 Safety instructions .....3
  - 3.2 Safety instructions for compressed air systems.....4
  - 3.3 Product specific safety instructions.....4
  - 3.4 Intended applications.....4
- 4 General description.....6**
  - 4.1 Characteristic features.....7
  - 4.2 Results.....7
  - 4.3 Usage and areas of application.....7
- 5 Start up and operation.....8**
  - 5.1 Illustrations and operating elements.....8
  - 5.2 Charging the batteries.....9
  - 5.3 Operation .....9
  - 5.4 Laser beam adjustment.....9
- 6 Notes for application.....10**
- 7 Maintenance and cleaning.....11**
  - 7.1 Cleaning.....11
  - 7.2 Battery change.....11
  - 7.3 Deactivation and disposal.....11
- 8 Technical data.....12**
- 9 Guarantee.....13**
- 10 Repair and Calibration services.....13**
- 11 Product overview and accessories.....14**

**Many thanks that you have decided for this high quality product!**

With your new Ultrasonic Leakage detector, you are now in the possession of an innovative quality product as per latest technology, which makes it possible for you to get accurate working results, even in stringent industrial applications. And of course, the device also corresponds to the current safety and environment protection requirements and is RoHS conforming.

The present operating manual is to help you with the adjustment and operation of the device. The information is important, in order to obtain optimum results and eliminate safety risks. Hence, please always keep this manual with the device.

**We wish you a very happy going with your new measuring instrument!**

## 1 Manufacturers' information

Manufacturer Information	
Pro air GmbH	
Peter-Müller Strasse 29a	
80997 München	
Telephone:	089 / 818 8823 - 4
Fax:	089 / 818 8823 – 6
Internet:	<a href="http://www.pro-air.eu">www.pro-air.eu</a>
Email:	<a href="mailto:info@pro-air.eu">info@pro-air.eu</a>

Service and Ordering	
Service and Ordering	
Telephone:	089 / 818 8823 - 4
Fax:	089 / 818 8823 – 6
Internet:	<a href="http://www.pro-air.eu">www.pro-air.eu</a>
Email:	<a href="mailto:kotzock@pro-air.eu">kotzock@pro-air.eu</a>
Technical support and Calibration service	
Telephone:	089 / 818 8823 - 4
Fax:	089 / 818 8823 – 6
Internet:	<a href="http://www.pro-air.eu">www.pro-air.eu</a>
Email:	<a href="mailto:kotzock@pro-air.eu">kotzock@pro-air.eu</a>

## 2 Scope of supply

The Ultrasonic Leakage detector is delivered in ready-to-use condition. In the scope of supply, there is a battery charging unit, head phone, carry case and operating manual.

Additionally you may require, if necessary (special accessories):

- ▶ The external microphone with goose neck for working in an inaccessible location
- ▶ The external microphone with round characteristics
- ▶ The external body sound microphone for hydraulic applications or for measurement of drive shafts and ball bearings
- ▶ The telescopic stand for measurement in running lines on the ceiling
- ▶ An ultrasonic generator if sealing checks are to be carried out in the cabins or windows.



**Before start up, the operating manual of this device should be read properly. Besides operating instructions, you will also find important information about mounting, start up and trouble shooting.**

## 3 General dangers and precautions



Please carefully read the following precautions before putting into operation! The symbols used in the operating manual are to make you careful, before hand, regarding safety considerations and dangers. But all these symbols used cannot substitute the text of the associated safety instructions in any way. Therefore, the instructions should also be always read completely!



This symbol indicates likely danger for persons, material or environment. The information provided in the associated text should be duly followed to avoid any kind of risk.

This symbol refers to important application notes and tips, which are necessary for successful working and should be absolutely followed to ensure good results.

### 3.1 Safety instructions



Caution laser radiation - Do not look into the beam ! The device is equipped with a Laser Class 2 (as per VDE 0837 and BGV B2/VBG 93) which is used for the indication of leakage point. It must be manually switched on with the key. For human accessible beam, the Laser intensity is lower than 1 mW and is in the visible spectral range (680 Nm). Short time radiation exposure up to 0.25 s is harmless for eyes. An Irradiation beyond that is normally prevented by the blink reflex of the eyes.

Never point the laser beam directly or indirectly (e.g. through reflecting surfaces) towards the eyes of human beings or animals. Laser radiation can cause irreparable damage to the eyes. During measurements, the laser beam should not be activated in the proximity of living beings.

Batteries have been put inside the device. Due to improper usage, overcharging, short circuit, excessive heating or dropping down, these can cause fire or may explode. Remove the battery charger after completion of the charging process.



The equipment may not be used in close proximity to high voltage parts. This is to be specially considered while working with the external microphone. Similarly, while using the telescopic stand, always keep a sufficient safety margin with respect to voltage carrying parts or bus bars, so that any danger to the user or environment is always ruled out.

The device does not have EX-permission and should not be used within EX-protected zones. It is also not intended for measurement in plants with inflammable or explosive gases.



It is to be noted that in the surrounding area of measuring points, there is often increased danger potential for the user and any third person. For this, specially sensible behaviour and increased caution is necessary. The applicable safety regulations must be absolutely taken care of.

The work to be entrusted only to those persons who have been trained for the said job requirements. Specially while working with the telescopic stand, attention to be paid regarding the persons and articles in the vicinity. The work must be carried out carefully and attentively. The applicable safety and accident prevention rules are to be absolutely followed.

This device is CE-conforming and hence fulfils the necessary guidelines. On the grounds of safety and certifications (CE), arbitrary changes and/or modifying the device is not permitted.

# leakguardPRO

## 3.2 Safety instructions for compressed air systems



The energy stored in the compressed gas can lead to unforeseen events causing damage to objects or injury to persons. The risk increases with the operating pressure in the plant. Therefore, all activities are to be executed by only suitably trained personnel. For all activities in the compressed air system, a commensurate alertness is necessary in order to avoid damages! Carrying a goggle is recommended. The loud air release noise, in case of uncontrolled opening of lines under pressure, can damage the hearing or create panic to other persons in the vicinity. At high flow velocities, the swept along foreign bodies can act like projectiles and cause injury to skin or eyes.

## 3.3 Intended application



The leakage detector is meant to find out leakage points in the compressed air systems. In combination with goose neck microphone, measurements are also possible in potential free switched off control panels. In combination with the ultrasound generator, leaky points can also be localised in cubicle doors and door gaskets.

Measuring instruments are sensitive and must be handled carefully: Avoid impact, shocks and vibration. The microphone of the device should not come into contact with liquids or aggressive gases. The device should never be opened. In case of external interference, the warranty claim expires.

A measurement under critical environment-conditions (dust and inflammable gases, steam or solvents, high humidity, strong electrostatic fields etc.) is not allowed.



Any other use, other than described above, can lead to damage of the device. In addition, this is also prone to dangers like for example, short circuit, fire etc. The product should not be opened, modified or converted!

Please consider the following points during application:

- ▶ Avoid operation of the device in close proximity of electrical welding sets, induction heaters, transmitters, static frequency converters, fluorescent lamps and other strong electromagnetic fields.
- ▶ After abrupt temperature change, the device must be left out for approx. 15 minutes to adapt to the new ambient temperature for stabilisation.
- ▶ Do not expose the device for a long time to high temperatures. Avoid dusty and humid site conditions. Keep the equipment in the carry case after use, in order to avoid any damage.
- ▶ Consider the technical background of the measuring procedure, specially the dependence of measuring field parameter on distance and the information regarding use of lasers, in order to ensure safe handling and to obtain accurate results.

General principle: If you have questions, you should first contact the manufacturer, before making mistakes through own experiments and causing a risk of damaging the device!

## 4 General Description

Compressed air is a very expensive form of energy. Leakages in compressed air plants cause considerable operating cost, which can be easily avoided by regular examination and maintenance of the plant. However, leakages can not be just determined by only human hearing and in the loud atmosphere of production or engine rooms, it is practically not possible to acoustically locate the flow noises.

In case of leaking out compressed air, the sound spectrum goes quite high up to the ultrasonic range, which can no more be captured within the human hearing range. However, in this range, normally there is almost no interference from the production processes and loud environment. Moreover, ultrasound is very specifically directed and hence, its point can be exactly localised from larger distances.

The **leakguardPRO** is an electronic ultrasonic leakage detecting device and is used for systematic, acoustic detection of leaky points. Even smallest leakages within the range of small  $\mu\text{m}$  can be confidently detected with the device.

**leakguardPRO** captures the ultrasonic noise of leaking out air with the help of a Piezo direction microphone and converts the signal into a frequency spectrum audible for the human ear. The optical, 10-stage LED bar line display additionally helps in accurate evaluation of the signal level. Hence, application without headphones is also possible. However, the headphone significantly simplifies the leakage detection through acoustic control.

The applied procedure very selectively evaluates only the ultrasound and hence it is almost insensitive against interferences in the audible sound spectrum. Because of high sensitivity and distinctive directional characteristic of the built-in microphone, detections from a large distance are also possible without direct visual contact. The laser pointer built-in in the device indicates the centre of evaluation range, and hence, makes the exact point detection of the leakage location.

Because of the closed headphones and the high selectivity of ultrasound technique, the device is suitable for application in running production. Even loud background noises within the hearing range do not disturb the leakage detection. To restrict the loud signal points, for example, flowing out air from switching valves, an electronic amplitude attenuator has been introduced to protect the hearing.

Both sensitivity and the headphone sound volume are separately adjustable. Moreover, the ultrasound middle frequency can be adjusted, such that the user can adapt the subjective sound intensity as per his feelings. The device is provided with a connection for external microphone, headphones and battery charger.

The device is compact and very light of only 270g weight. The ergonomically shaped housing can be held well in the hands and enables fatigue free working for hours together.

The built-in battery can support continuous operation for over 15 hours in fully charged condition. Within the scope of supply, there is a quick charging unit with which re-charging is possible in only 2 hours.

With the use of a telescopic stand, the external microphone can be extended and enables measurement in supply lines in halls up to a height of 6 m.

Different microphones are available as accessories for measurement in plants or body sound measurements for liquid plants. The optional ultrasonic transmitter serves as signal source for measurement of door seals in cubicles or cooling cells.

# leakguardPRO

## 4.1 Characteristics features

The **leakguardPRO** is unique in its size and arrangement and offers the following product advantages:

- ▶ Built-in Ultrasonic direction microphone with narrow recording angle
- ▶ Extremely high sensitivity, adjustable up to 30 m reach width
- ▶ High selectivity, narrow direction characteristics, hence no background noises
- ▶ Different microphone for different applications
- ▶ Finds each leakage, even without visual contact
- ▶ Laser for pin pointed detection
- ▶ Application also possible from large distances or at badly accessible points
- ▶ Adjustable sound intensity with amplitude delimitation (Hearing protection)
- ▶ Enclosed Headphones
- ▶ Light weight, fatigue free working
- ▶ Long operation time, 15 h for each battery charge
- ▶ Battery and charging unit within the package without extra price
- ▶ Carry case within the package without extra price

4 Optimum price performance ratio

## 4.2 Results

The device generally amortises itself through cost saving within a very short time:

- ▶ Significant reduction in operation and energy costs
- ▶ Reduction in maintenance costs

4 Decrease in required compressor capacity

## 4.3 Usages and areas of application

Although the **leakguardPRO** has been specially developed for the compressed air industry, the device can also be used for a variety of other applications to come:

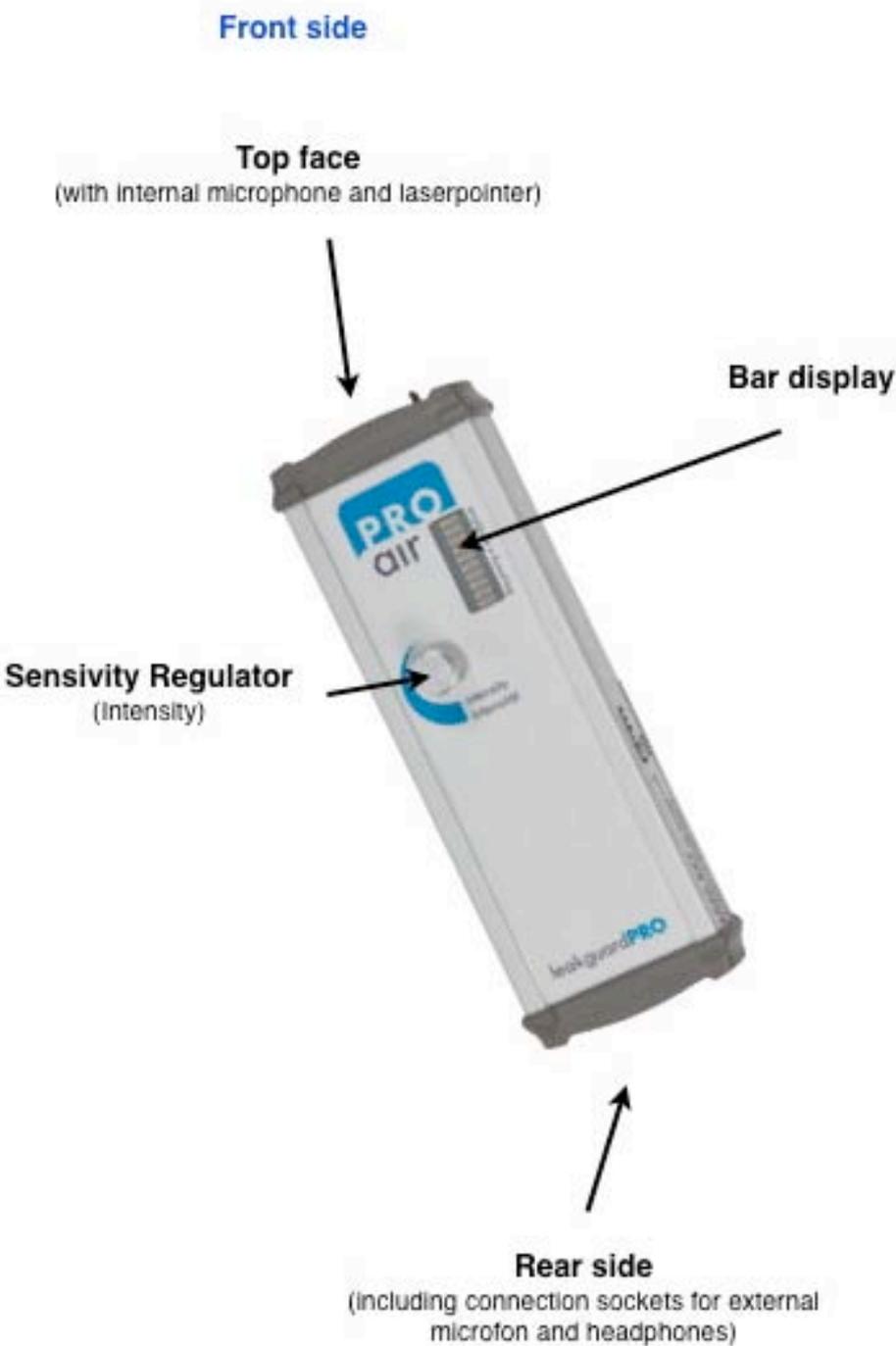
- ▶ Leakage search in compressed air or gas plants, vacuum systems
- ▶ Medical technology, checking of oxygen junctions
- ▶ Pneumatic plants, valves, air regulators, fittings
- ▶ Refrigeration plants, refrigeration compressors
- ▶ For ultrasonic transmitter: checking of interiors for sealing
- ▶ Door and window sealing, cabinet doors, refrigerating cabinet doors
- ▶ For body sound microphone: Monitoring of axles, shafts, ball bearings

4 Hydraulics, sanitary systems, under floor heating

# leakguardPRO

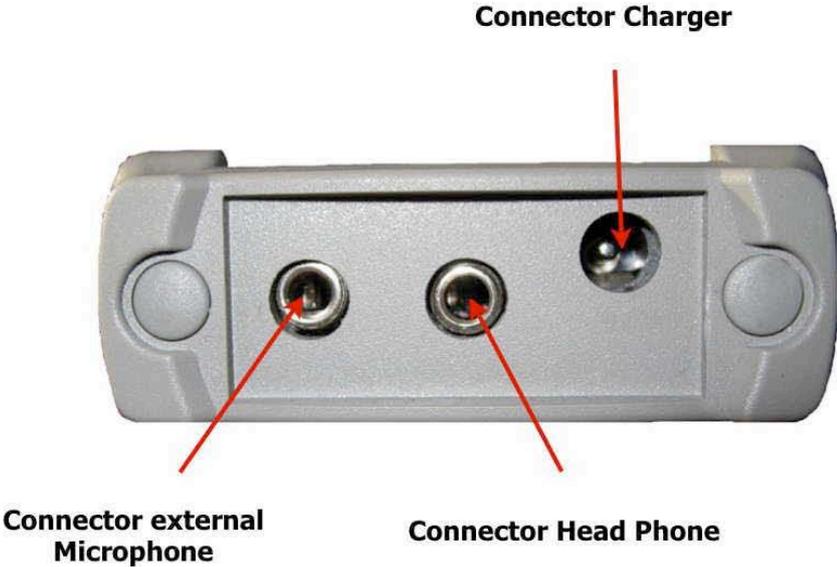
## 5 Start up and operation

### 5.1 Illustration and control elements

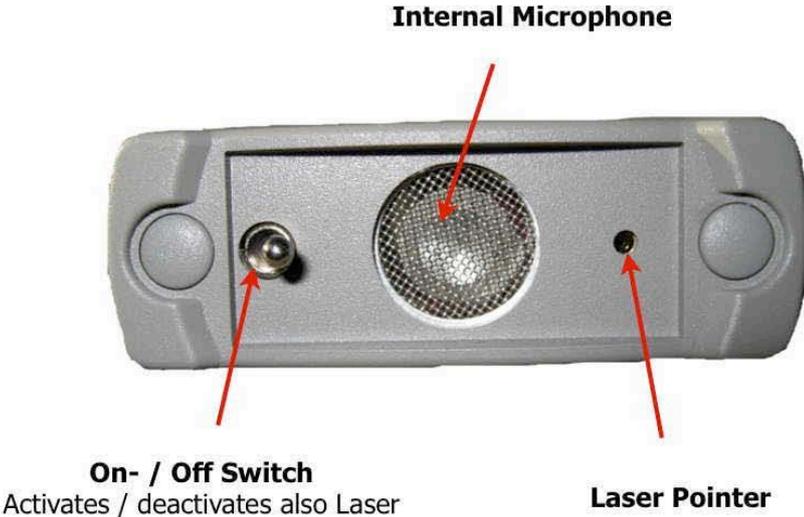


# leakguardPRO

## Rear side



## Top face



## Gerät von hinten



**The enclosed control is insertable and fits for the left notch to adjust the tone pitch, as well as the right notch to adjust the volume.**

## 5.2 Charging the batteries

Before taking up the device into operation for first time, the batteries inside the device must be charged. For this purpose, connect the battery charger at the connection socket.

The device uses a fast charging process, which fully charges the battery in approx. 2 hours. Hence, a light heating up is normal. After full charging, the battery charger automatically gets switched off and should be removed. Recharging to be done only after using for the respective utilisation time.

With fully charged batteries, approx. 15 hours of uninterrupted operation is possible.

## 5.3 Operation

Connect the headphone at the middle socket if you want to work with acoustic support using headphones. You can also work with only visual indication with the LED bar line display.

If an external microphone is to be used, then connect it at the microphone socket leftside below. Do not get confused between the sockets and take care on the labels on the upper side.

Keep the headphone volume to minimum, for this purpose, rotate the knob in the anti- clockwise direction up to the left end position. Then switch ON the device with the ON key.

Now slowly increase the sensitivity, until the lower LEDs of the bar line display indicate presence of signal and you can hear a quiet background noise from the headphones. If necessary, adjust the headphone volume as per your requirement.

Caution: Keeping a too loud setting can damage your hearing! Take care during adjustment that because of direct proximity to switching valves, sudden loud noises are likely to occur. Hence, carefully set the volume considering such unusual arising events, particularly while doing measurements in pneumatic plants.

Now search your plant for leakage points. If the noise in headphones becomes louder and the bar line display indication rises, then try to locate the exact exit point by searching through the line.

If you measure from a larger distance, the attachable laser pointer helps to mark the point, to make it lie at the centre of the identified area. The built-in microphone has an opening angle of approx. +/- 22°, hence the measuring field becomes correspondingly larger with distance.

With the regulator for "Middle frequency", the noise of the converted ultrasonic signal can be adapted as per your feel.

Press the OFF key for switching off the **leakguardPRO**. The device is provided with an automatic switch off after 30 minutes, in order to preserve the battery. Once again pressing the ON key, sets the time counting again.

## 5.4 Laser beam

For simple detection of the leakage point, the **leakguardPRO** is equipped with a red point laser. This laser beam indicates the centre of the identified ultrasonic field.

Please take care of the laser safety guidelines and never direct the beam towards living beings or reflecting surfaces.

## 6 Hints and tips for application

The beats of valves or cylinders result in strong diverting noises, which can make the search of small points in the nearby location more difficult. If necessary, the plants should be switched into silent state, if this is possible.

If you cannot identify the exact exit point, then you can take help of soapy water or leakage detection spray for recognition.

The **leakguardPRO** works completely problem free in most of the applications. Disturbances are rare from the outside. However, difficulties can occur, for example, in the following cases if the working frequency lies at around 40 kHz:

- ▶ In direct proximity of fluorescent lamps with electronic ballasts
- ▶ In direct proximity of frequency converters or induction heating equipment
- ▶ In case of ultrasonic welding sets or ultrasonic cleaning baths operating in the near proximity
- ▶ In direct proximity of transmission or high frequency systems or cell phones
- ▶ In certain operations where there is presence of ultrasound, for example, punching work
- ▶ In direct proximity of electronic appliances and switch mode power supplies

Try to switch off or shield the disturbance source during measurement, if this is possible.

## 7 Maintenance and cleaning

### 7.1 Cleaning

You can clean the surface of the device and the carry case with a light moist cloth. For this purpose, please use only water and no chemicals or abrasives. Take care that the microphone does not become moist.

### 7.2 Battery change

The built-in high capacity NiMH battery of the **leakguardPRO** ensures some few hundred charging cycles. The battery has almost no 'Memory' effect, but still too frequent charging in the already charged condition to be avoided. Similarly, over-discharging should be avoided. If these points are taken care of, then the life span becomes very good and the battery remains efficient for years together.

However, in the course of time, the battery capacity gets reduced by natural ageing and if it not sufficient for normal operation, then the battery must be replaced. For this, please send the device to works. Then only, correct fitments and proper disposal of used cells can be ensured.

### 7.3 Deactivation and waste disposal

Electronic devices should not be disposed off with house waste.

Old devices are disposed off by our company free of charge in the sense of ElectroG. Please feel free to send the device to us.

**Pro air GmbH**  
**Peter-Müller Strasse 29a**  
**80997 München, Germany**

## 8 Technical Data

Procedure	Ultrasonic leakage detection
Measuring range	40 kHz +/- 2 kHz 60 db
Microphone	Built-in, narrow band, Piezo direction microphone Opening angle +/- 22.5° nominal (6db) Socket for external microphone
Display	10- level LED Bar line display
Headphone output	Ultrasound signal spectrum (40 kHz +/- 2 kHz) converted into audible range (0,1 ... 2 kHz)
Visual arrangement	Laser, wavelength 670 nm, < 1 mW Class 2 as per VDE 0837 / BGV B2 / VBG 93
Connection	Charging socket Headphone socket Microphone socket
Adjustments	Signal-sensitivity Middle frequency Headphone-volume 3 Keys: ON / OFF / LASER
Energy supply	Internal NiMH High capacity battery, 2,4 V/1200 mAh approx. 25 h operating time
Weight	250 g with battery
Dimensions	168 x 61 x 25 mm
Housing	Ergonomically shaped plastic housing, ABS with polyester front foil
Automatic switch off	After approx. 20 minutes or at over voltage
Carry case dimensions	400 x 310 x 130 mm
Application conditions	-20 ... +50 °C, relative humidity 0 ... 80% RH
Admissions and standards	CE, RoHS conforming model EMV-Guidelines 89/336/EWG
Scope of supply	Leakage detector with integrated microphone and battery Enclosed Headphone Battery charger Carry case Operating manual
Special accessories	Microphone with goose neck Body sound microphone Microphone with round characteristics Ultrasound transmitter Telescopic stand

## 9 Guarantee

The quality of our products is constantly monitored within the framework of our Quality Management systems as per ISO 9001 standards. The devices are carefully tested and adjusted before despatch. Nevertheless, if still there are any reasons for complaint, we are ready to rectify the shortcomings free of charge within the guarantee period of 24 months, if it is evident that the defect is due to some mistake on our part.

Prerequisite for the fulfilment of guarantee service is that the details of defect should be informed to us immediately and within the stipulated guarantee period.

The guarantee turns void if the device has been used for the intended application or damaged by improper handling or tampering with the device. Moreover, defective sensors or sensing units and also calibration service are not covered in the guarantee.

In addition, the guarantee also turns invalid if the device is opened or dismantled. The serial number on the product should not be changed, damaged or removed.

Apart from the guarantee service, if any essential repairs are required to be carried out, the service is free. However, further services and also postage and packing expenses are chargeable.

Compensation demands on the basis of claim for liability or damages during the guarantee period are excluded and these are, in general, not legally covered.

## 10 Repair and calibration service

During the tenure of guarantee period, we are very much at your disposal with our service support. For any malfunctioning, you can simply send back the product to us with a short description of problems observed. Please don't forget to mention your telephone number to enable us contact you for any possible queries.

We shall inform you about the likely amount of repair charges before taking up the repair activity. The cost estimate is provided free. The postage and packing charges for return are to be added over and above the repair costs.

In our calibration laboratory, we can also calibrate your measuring and testing devices of other manufacturers with repeatability of National standards. Please contact us, we would be pleased to send you a non-committal offer!

**Pro air GmbH**  
**Peter-Müller Strasse 29a**  
**80997 München, Germany**

Internet [www.pro-air.eu](http://www.pro-air.eu)

## 11 EG-Conformance declaration

As per EMV-Guidelines 89/336/EWG

We hereby declare that the product

“ULTRASONIC-LEAKAGE DETECTOR “leakguard**PRO** “

conforms to the essential safety requirements, that are specified in the guidelines of the council of legal rules of the member states regarding electromagnetic compatibility (89/336/EWG). This declaration applies to all units, which are manufactured as per the corresponding manufacturing documents.

Following standards were referred for evaluation of the product with respect to electromagnetic compatibility:

- EN 61000-6-3 Electromagnetic compatibility; specialized basic standard for noise emission for residential areas, companies, commercial areas as well as small enterprises
- EN 61000-6-1 Electromagnetic compatibility: noise immunity for residential areas, companies, commercial areas as well as small enterprises

The above mentioned manufacturer has ready records for inspection for verifying the conformance.

München, den 31. März 2011

Ralf Kotzock

## Technology and Innovation –



**Made in Germany**



**Pro air GmbH**  
**Peter-Müller-Strasse 29a**  
**80997 München**

**info@pro-air.eu**  
**www.pro-air.eu**  
**Tel: 089-81888-234**  
**Fax: 089-81888-236**

Die technischen Informationen in dieser Dokumentation wurden von uns mit großer Sorgfalt geprüft und sollen über das Produkt und dessen Anwendungsmöglichkeiten informieren. Die Angaben sind nicht als Zusicherung bestimmter Eigenschaften zu verstehen und sollten vom Anwender auf den beabsichtigten Einsatzzweck hin geprüft werden. Etwaige Schutzrechte Dritter sind zu berücksichtigen.

Stand März 2010 - Diese Dokumentation ersetzt alle früheren Ausgaben.

© Copyright 2010, alle Rechte vorbehalten.

Kein Teil dieser Dokumentation darf ohne vorherige schriftliche Genehmigung in irgendeiner Form gespeichert, reproduziert, verarbeitet, vervielfältigt oder verbreitet werden.