User Manual

PCE-LDC 15 Leak Detector

Last change: 8 June 2022
v1.0

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Contents

1 Safety notes

1.1 About this document

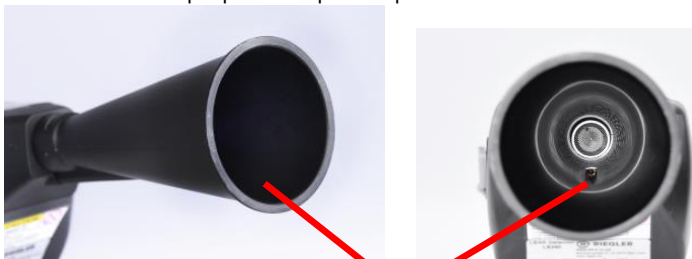|	- Read this documentation carefully and familiarize yourself with the product before using it. Pay particular attention to the safety and warning instructions to prevent injury and product damage. - Keep this documentation handy for future reference. - Share this documentation with future users of the product.

1.2 General safety instructions

⚠	- The product is to be used only in accordance with the intended purpose and within the parameters specified in the technical data. Do not use force for operation. - Never measure with the device at or near live/energized parts! - During leak detection on electrical systems, please maintain a sufficient safety distance to avoid dangerous electric shocks! - Avoid any direct contact with hot and/or rotating parts. - Always switch on the device before putting on the headphones! At high signal levels (bar graph headphones in the red area), the volume can be correspondingly large. The sensitivity setting can be used to reduce the volume. - Observe the prescribed storage and operating temperatures. - In case of improper handling or violence, the warranty claims are lost. - Interventions on the device of any kind, unless they correspond to the intended and described procedures, lead to the expiration of warranty and to the disclaimer. - The device is intended solely for the described purpose.

1.3 Use of class 2 laser

⚠️ (laser warning symbol)	• Never point the laser directly towards persons! • Absolutely avoid a direct irradiation of the eyes of humans and animals! • If a person's eyes are exposed to class 2 laser radiation, they should shut their eyes and immediately move away from the beam • Do not stare into the beam • Laser module: corresponds to DIN EN 60825-1: 2014 Class 2 (<1mW / 635nm) • Laser output point trumpet and parabolic mirror: **Laseraustrittstelle** **Laser output point**

2 Service and maintenance

Service and maintenance work must only be carried out by authorized personnel.

3 Environmental protection

• Disposal of defective batteries / dead batteries according to the valid legal regulations.
• After the end of the useful life, take the product to the separate collection for electrical and electronic equipment (observe local regulations) or return the product to the manufacturer for disposal.

The manufacturer makes no warranty as to its suitability for any particular purpose and assumes no liability for any errors contained in this manual. Nor for consequential damages in connection with the delivery, performance or use of this device.

The following accumulator is contained in this electrical appliance

Battery type	Chemical system
Accumulator	LiIon 2S1P

<u>Information on the safe removal of the batteries or accumulators</u>

- Warning: Make sure that the battery is completely empty.

Removing the battery cover

Disconnecting the connector

Carefully pull out the battery

- Carefully remove the accumulator
- The accumulator and the appliance can now be disposed of separately

4 Intended use

The PCE-LDC 15 is a leak detector for quick and reliable leak detection in/on compressed air systems.

It is solely designed and constructed for the intended use described here and may only be used for this purpose.

The user must verify that the device is suitable for the intended use. The technical data listed in this datasheet are binding.

Improper handling or operation outside the technical specifications is not permitted. Claims of any kind for damages arising from improper use are excluded.

5 Technical specifications

Dimensions hand-held housing	263 x 96 x 280 mm (with preamp module and acoustic trumpet)
Weight	0.55 kg with preamp module and acoustic trumpet, complete set in case approx. 3.0 kg
Operating frequency	40 kHz (+/-2 kHz)
Power supply	Internal 7.4 V lithium-ion battery
Operating time	> 10 h (continuous operation)
Charging	ext. battery charger (included in scope of delivery)
Charging time	max.4 h
Laser	Wavelength 630–660nm, output power < 1mW (laser class 2)
Connections	3.5 mm stereo jack for headset, Power supply socket for connecting an external charger USB connection
Colour screen	3.5" touch panel TFT transmissive
Interface	USB for SW update.
Application Area	Indoor use
Operating temperaturer	-5 °C bis +50 °C
Storage temperature	-20 °C to +60 °C
Altitude	Up to 4000m above sea level
Max. Humidity	<95% RH without condensation
Pollution degree	2
Protection class	IP20

6 Delivery contents

1 x PCE-LDC 15, 1 x carrying case, 1 x mains adaptor, 1 x focus tube with focus tip, 1 x acoustic trumpet, 1 x headphones, 1 x user manual

7 Identification

7.1 Name plate

PCE-LDC 15

Part number: 0560.0106
Serial number: 41208495

Supply Voltage: === 12 V /1A ⚠ ☒ CE

7.2 Laser warning label

⚠ CAUTION
Laser 2

Acccording IEC 60825-1:2014
Max. output power: <1mW @ 630-660nm

Complies with 21 CFR 1040.10 and 1040.11except for
conformance with IEC 60825-1 Ed.3., as described in
Laser Notice No. 56, dated May 8,2019
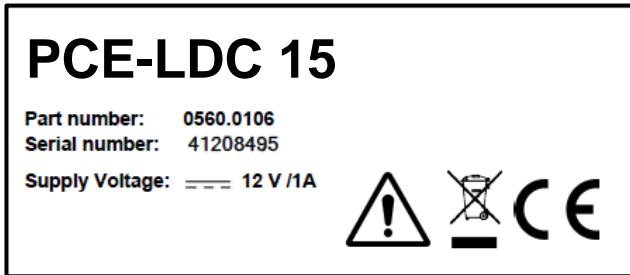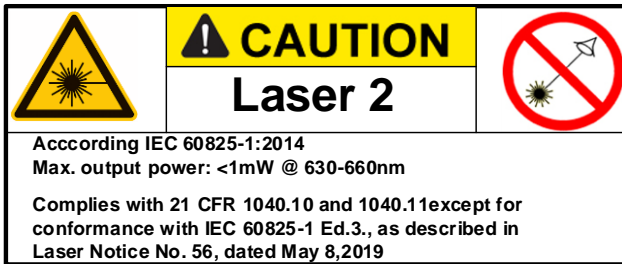
8 Device description

8.1 The PCE-LDC 15

3.5" TFT colour display with touch panel	Acoustic trumpet
On/Off button	USB connection
Volume (+/-)	USB connection
	Laser On/Off button

35 mm jack for the headphones

9 Overview and application description of the different sensor types

Acoustic trumpet (standard tool)	Straightening tube
The acoustic trumpet bundles incident ultrasonic waves, thereby extending the range of the device. This behaviour makes it ideal for medium distances. The leakage can be heard from large distances, for precise detection, the user must approach the leakage and consistently follow the "loudest" point. Individual compressed air components are then checked for precise detection. Quantification distance (distance) ☐ 1 – 6 m	The straightening tube permits only very few ultrasonic waves to pass in the direction of the ultrasonic transducer, allowing leakages to be located very precisely. For this reason, the use of the straightening tube is recommended for small distances, for the precise detection of the corresponding leakage. **Quantification distance:** 0…0.2 m
Use of acoustic trumpet: - Average distance to pipe/component 0.2 - 6 m - Low interfering noise - Leakage freely accessible	**Use of focus tube:** - Short distance to pipe/component 0.05 m - Pipe/component freely accessible - Pipes and components to be inspected are very close together

10 Start-up / Application of the PCE-LDC 15

10.1 Switch on

Hold down the power button for about 1 second, the power will turn on, and a start-up sequence will appear on the display. Pressing the button again switches the device off again.

10.2 Headphone Volume Up / Volume Down

The volume up and volume down buttons in the headset can be increased or decreased in 16 steps. Continuously pressing the button automatically increases / decreases the value.

⚠️ **Please make sure the headphone level is <50% before putting on the headphones.**

10.3   Sensitivity level

Ultrasound levels can be understood as a "loudness" of the leakage.

With the "Sensitivity" button, the sensitivity of the PCE-LDC 15 can be adjusted to the environment, which strongly influences the acoustic behaviour of the device and increases or decreases the valid value range. A reduction in sensitivity reduces the range of the leakage.

The sensitivity levels or the automatic function are selected via the "Sensitivity" button.
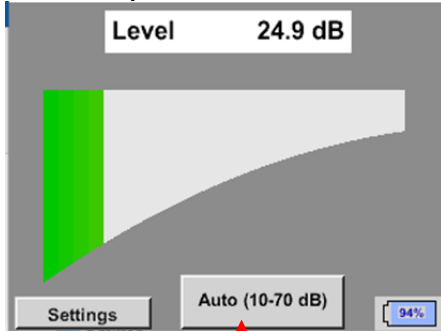
The PCE-LDC 15 offers a manual selection as well as an automatic function *"Auto"* for setting the sensitivity.
Selection is made by pressing the *"Sensitivity"* setting button.
When *"Auto"* is selected, the PCE-LDC 15 selects the best possible sensitivity level.

Sensitivity button

Sensitivity levels
0–60 dB = Highest sensitivity level of the device (use with small leaks and no noise), selection with the "*Sensitivity*" button
10 –70 dB = Leakages and noises get "less noisy", the range is reduced.
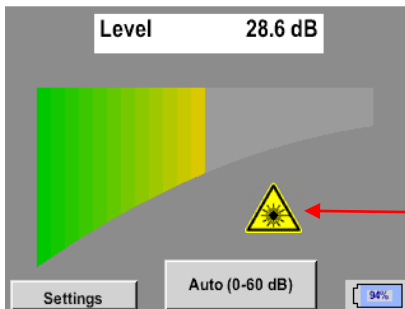**20–80 dB** = Leakages and noises get "less noisy", the range is reduced.
30–90 dB = Leakages and noises get "less noisy", the range is reduced.
40–100 dB = Most insensitive stage (large leaks, many noises → for heavy-duty application)

10.4   Laser On/Off

The laser pointer can only be switched on by pressing the laser on / off button.
When switched on, the display shows a laser warning symbol.

Please note the warnings for laser operation!
*Avoid direct / indirect (via reflexion) irradiation of the eyes in humans and animals!*

Laser „On"
Icon

11 Operation

The operation is largely self-explanatory and menu-driven via the touch panel.
The selection of the respective menu items is done via short "tapping" with the finger or a soft round pen.

Attention: Please use no pens or other objects with sharp edges! The foil can be damaged!

11.1 Initialization

Initialize Channel 1

Pegel   15.5 dB

Einstellungen   Auto (10-70 dB)   10.12.2021 10:28:17
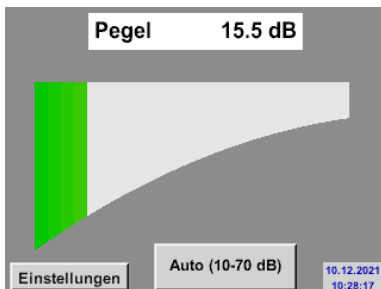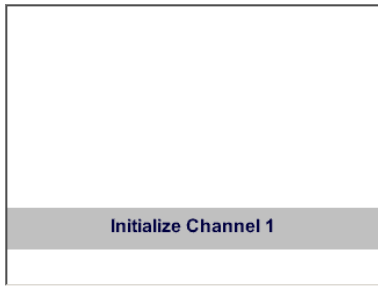
After switching on the PCE-LDC 15, the initialization takes place and then switch to leakage display.

11.2 Screen

The following picture shows and describes the display elements.

Signal level in dB

Level   28.6 dB

Bar graph of signal level

Laser „On"

Settings menu — Settings

Auto (0-60 dB)   94%

Date/ Time and battery condition indicator

Sensivity level button

Date / Time:

Battery condtion indicator

Battery condtion:

Power supply connected and battery is charging:

11.3 Settings menu

The operation is largely self-explanatory and menu-driven via the touch panel.
The selection of the respective menu items occurs via short "tapping" with the finger or a soft round pen.

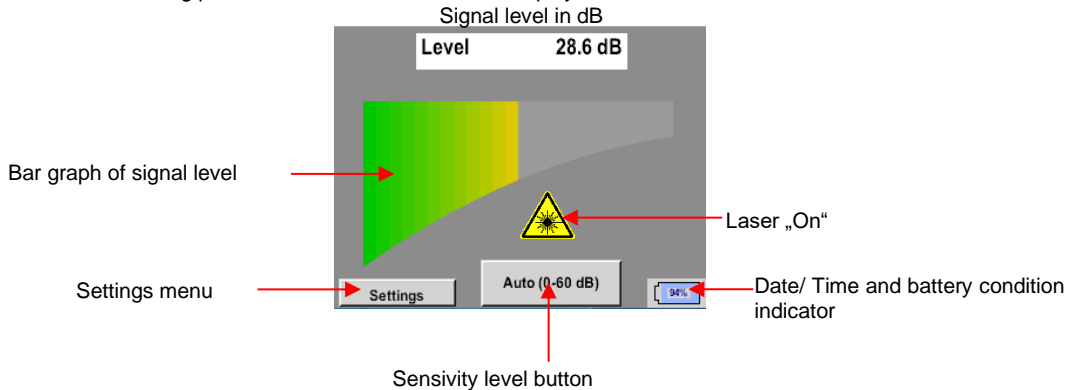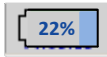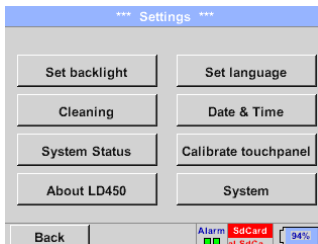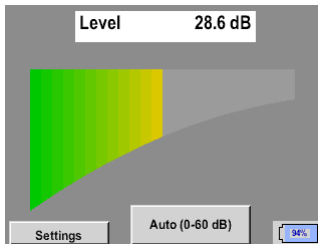**Attention: Please use no pens or other objects with sharp edges! The foil can be damaged!**

Before the leakage search is started, the device must be configured. The user can access the menu by clicking the "Settings" button. The following figure shows the "Settings"-Menu.

Settings:

With the button *„Settings"* you access the basic menu of the PCE-LDC 15.

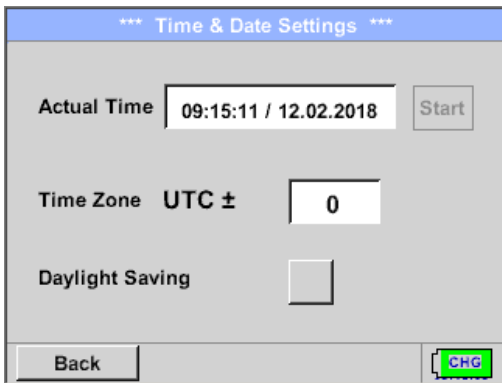Return to measurement by pressing *„Back"* –button.

11.3.1 Language

*** Choose language ***

Can you read this text?

English	Deutsch
Spanish	Italian
Danish	Русский
Polski	French

Back	🔳 Page

Here you can select one of 13 languages for the PCE-LDC 15.
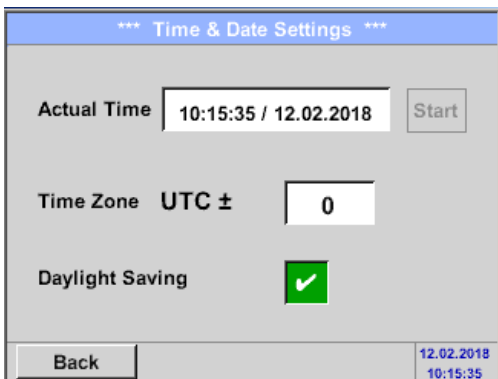
For languages on page 2 please press 🔳 Page

11.3.2 Time & Date

*** Time & Date Settings ***

Actual Time | 09:15:11 / 12.02.2018 | Start

Time Zone UTC ±   0

Daylight Saving ☐

Back	CHG

By pushing the *Time Zone* description field and enter the correct *UTC*, you can set the correct time all over the world.

*** Time & Date Settings ***

Actual Time | 10:15:35 / 12.02.2018 | Start

Time Zone UTC ±   0

Daylight Saving ✔

| Back	12.02.2018 10:15:35

The summer and wintertime switchover is realized by pushing the *Daylight Saving* button.

11.3.3 System settings
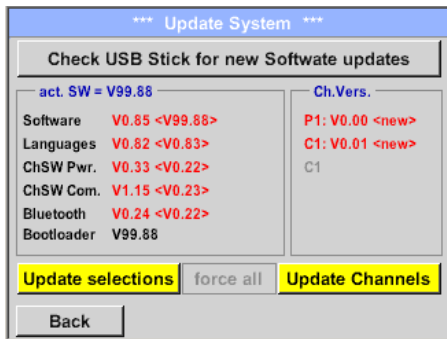
11.3.3.1 System update

If required, there is the possibility for the PCE-LDC 15 to download a firmware update to the device via the USB stick.

The received file must then be stored on the USB stick and transferred to your device as described below.
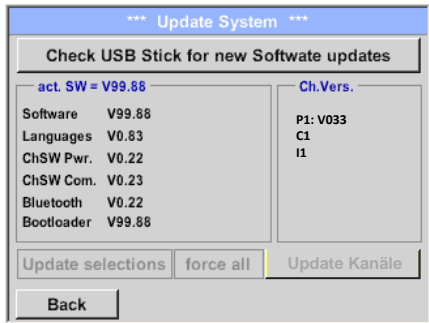
Overview of *System-Update*-Functions.
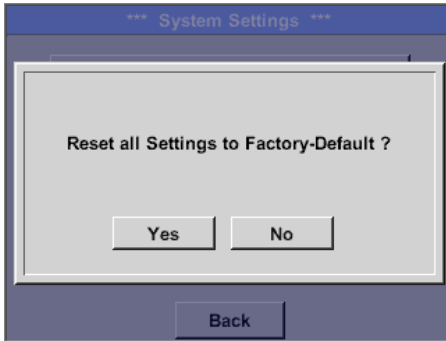
Check for updates

If the PCE-LDC 15 is correctly connected to the USB stick and there are new versions of the individual SW Parts, the new versions are marked in red.

The update is started by pressing the „*Update selections*" button.

If it is required to install an older software version, you have press the button *„Force all".*
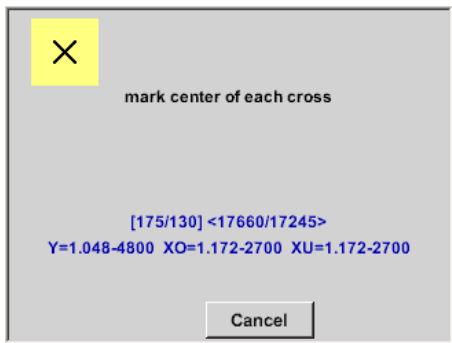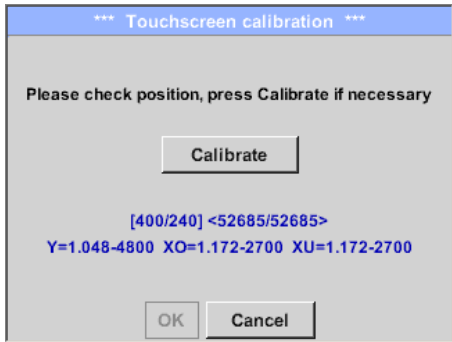
11.3.3.2   Factory reset

Bevor the settings are changed to the production default settings a safety prompt is displayed and must be confirmed by pressing the button "*Yes*".

Note: Saved data are not deleted or overwritten.
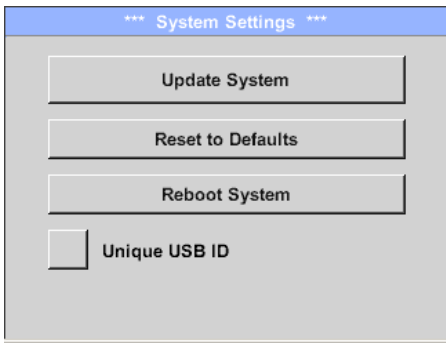
If needed with "Reboot System" the PCE-LDC 15 could be started (*reboot*) here.

11.3.4 Calibration of touchpanel

If necessary, the touch-screen calibration can be changed here.

Push *Calibrate* and it appears, 1. left above, 2. bottom right, 3. bottom left, 4. right above and 5. in the middle, a calibration cross that must be pushed consecutively.

If the calibration finished positive a message *"Calibration successful"* appears and have to be confirmed with *OK*.

Is this not the case, so you can repeat the calibration with the help of the Cancel and *Calibrate* button.

11.3.5 Backlight brightness
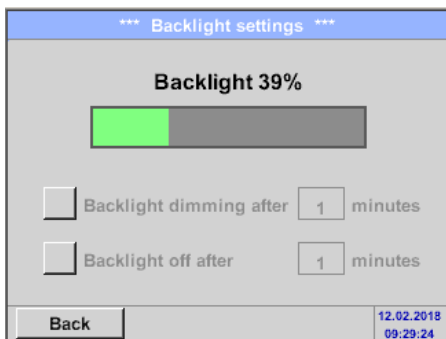
Here you adjust the desired *Backlight* (15-100%) of the display directly.

E. g. *Backlight* to 39 %

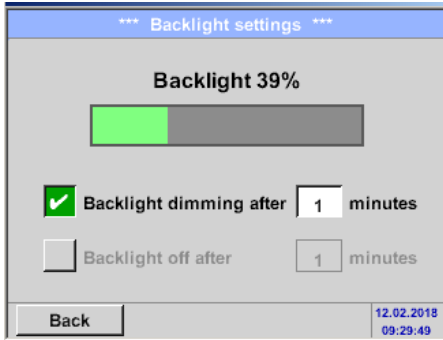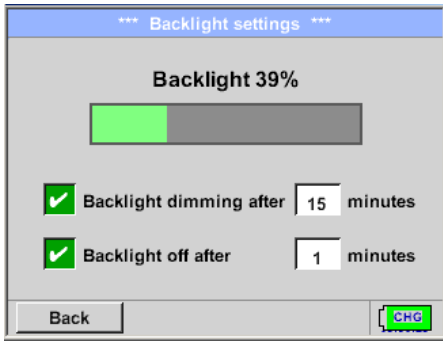With the help of the *Backlight dimming after* button, after a definable time interval (here after 15 minutes), the *Backlight* can be reduced to the minimum.

As soon as the dimmed screen is operated again, the *Backlight* is committed automatically on the last set value before dimming.

To reduce the energy consumption (device runtime), you can switch off the display backlight by setting **"Backlight off after".**

Note: At the first touch, the *Backlight* in our example is reset to 39%, after that a "normal" function operation is possible..

<u>**Important:**</u> **If the *Backlight dimming after* button is not activated, then the *Backlight* stays permanently on, in the currently set brightness.**

11.3.6   Cleaning

This function can be used for cleaning the touch panel during running measurements.

If one minute is not enough time to clean, the process can be repeated at any time.

Is the cleaning faster finished, then you can push the *to abort press long* button (for one or two seconds) to cancel.

12   Charging the battery

Connect external power supply to the charging socket.
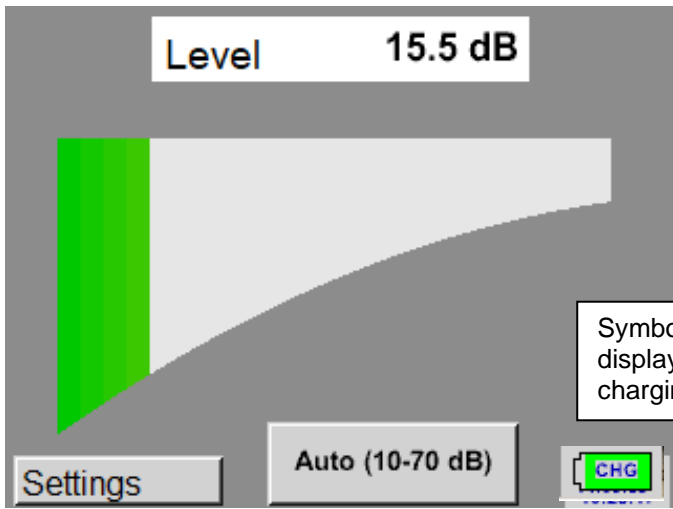
Symbol *„CHG"* is displayed during charging.

The PCE-LDC 15 checks the charging status of the battery and starts the charging process automatically if necessary.

To protect the Li-ION accumulator of exhaustive discharge the device is switching off automatically if a cell voltage of 6.4 V will be reached.

13 Warranty

You can read our warranty terms in our General Business Terms which you can find here: https://www.pce-instruments.com/english/terms.

14 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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