



Scan QR-Code for  
other languages.

# OPERATING INSTRUCTIONS

EN

Translation of the Original

## TPG 202 NEO

Piezo/Pirani handheld measurement instrument

**PFEIFFER**  **VACUUM**

---

## Dear Customer,

Thank you for choosing a Pfeiffer Vacuum product. Your new handheld measurement instrument is designed to support you in your individual application with full performance and without malfunctions. The name Pfeiffer Vacuum represents high-quality vacuum technology, a comprehensive and complete range of top-quality products and first-class service. From this extensive, practical experience we have gained a large volume of information that can contribute to efficient deployment and to your personal safety.

In the knowledge that our product must avoid consuming work output, we trust that our product can offer you a solution that supports you in the effective and trouble-free implementation of your individual application.

Please read these operating instructions before putting your product into operation for the first time. If you have any questions or suggestions, please feel free to contact [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de).

Further operating instructions from Pfeiffer Vacuum can be found in the [Download Center](#) on our website.

## Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

## Copyright

This document is the intellectual property of Pfeiffer Vacuum and all contents of this document are protected by copyright. They may not be copied, altered, reproduced or published without the prior written permission of Pfeiffer Vacuum.

We reserve the right to make changes to the technical data and information in this document.

# Table of contents

<b>1</b>	<b>About this manual</b>	<b>7</b>
1.1	Validity	7
	1.1.1 Applicable documents	7
	1.1.2 Variants	7
1.2	Target group	7
1.3	Conventions	7
	1.3.1 Instructions in the text	7
	1.3.2 Pictographs	8
	1.3.3 Labels on product	8
	1.3.4 Abbreviations	8
	1.3.5 Trademark proof	8
<b>2</b>	<b>Safety</b>	<b>9</b>
2.1	General safety information	9
2.2	Safety instructions	9
2.3	Safety precautions	11
2.4	Limits of use of product	11
2.5	Proper use	12
2.6	Foreseeable improper use	12
<b>3</b>	<b>Product description</b>	<b>13</b>
3.1	Identifying the product	13
3.2	Function and design	13
	3.2.1 Display layout	13
	3.2.2 Keyboard layout	14
	3.2.3 Measuring principle	14
	3.2.4 USB connector	14
3.3	Scope of delivery	14
<b>4</b>	<b>Transport and storage</b>	<b>16</b>
4.1	Transporting product	16
4.2	Storing product	16
<b>5</b>	<b>Installation</b>	<b>17</b>
5.1	Establishing vacuum connection	17
5.2	Connecting USB cable	17
<b>6</b>	<b>Interfaces</b>	<b>19</b>
6.1	USB interface	19
6.2	Pfeiffer Vacuum protocol for USB interface	19
	6.2.1 Telegram frame	19
	6.2.2 Telegram description	19
	6.2.3 Telegram example 1	20
	6.2.4 Telegram example 2	20
	6.2.5 Data types	20
<b>7</b>	<b>Parameter set</b>	<b>22</b>
7.1	General	22
7.2	Control commands	22
7.3	Status requests	22
7.4	Set value settings and pressure value query	23
<b>8</b>	<b>Operation</b>	<b>24</b>
8.1	Charging the rechargeable battery	24
8.2	Switching on handheld measurement instrument	24
8.3	Switching off handheld measurement instrument	25
8.4	Operating unit with keyboard	25

8.5	Switching keyboard lock on and off	25
8.6	Selecting operating mode	25
8.7	Calling up additional information	26
8.8	Opening and quitting main menu	27
8.9	Logging data with data logger	27
8.10	Displaying pressure curve graphically	28
8.11	Calculating leakage rate	28
<b>9</b>	<b>Settings</b>	<b>30</b>
9.1	Setting data logger	30
9.2	Setting graphical display mode	31
9.3	Adjusting sensors	32
9.3.1	Handheld measurement instrument calibration	33
9.3.2	Setting gas type correction factor	33
9.3.3	Setting transition type between sensors	33
9.4	Configuring device settings	34
9.4.1	Adjusting visual and acoustic warning signal	34
9.4.2	Setting maximum operating time	36
9.4.3	Setting date and time	36
9.4.4	Setting language and display units	37
9.4.5	Adjusting interfaces	37
9.5	Formatting data storage device file system	38
9.6	Resetting unit to the factory settings	38
<b>10</b>	<b>Device information</b>	<b>39</b>
<b>11</b>	<b>Dismantling</b>	<b>40</b>
<b>12</b>	<b>Maintenance</b>	<b>41</b>
12.1	Cleaning components	41
12.2	Handheld measurement instrument calibration	42
12.2.1	Zero point calibration	43
12.2.2	Calibrating atmospheric pressure	43
12.2.3	Calibrating zero point of relative pressure display	44
12.3	Updating firmware	44
12.4	Replacing sensor	44
12.5	Replacing rechargeable battery	45
12.6	Replacing housing cover	45
<b>13</b>	<b>Malfunctions</b>	<b>46</b>
<b>14</b>	<b>Shipping</b>	<b>47</b>
<b>15</b>	<b>Recycling and disposal</b>	<b>48</b>
15.1	General disposal information	48
15.2	Disposing of handheld measurement instrument	48
<b>16</b>	<b>Spare parts</b>	<b>50</b>
<b>17</b>	<b>Accessories</b>	<b>51</b>
17.1	Accessory information	51
17.2	Ordering accessories	51
<b>18</b>	<b>Technical data and dimensions</b>	<b>52</b>
18.1	General	52
18.2	Technical data	52
18.3	Dimensions	53
	<b>EC Declaration of Conformity</b>	<b>54</b>
	<b>UK Declaration of Conformity</b>	<b>55</b>

## List of tables

Tbl. 1:	Abbreviations used	8
Tbl. 2:	Permissible ambient conditions	11
Tbl. 3:	Characteristics of the USB interface	19
Tbl. 4:	Explanation and meaning of the parameters	22
Tbl. 5:	Parameter set   Control commands	22
Tbl. 6:	Parameter set   Status requests	22
Tbl. 7:	Parameter set   Set value settings and pressure value query	23
Tbl. 8:	Keyboard functions	25
Tbl. 9:	Malfunctions	46
Tbl. 10:	Spare parts	50
Tbl. 11:	Conversion table: Pressure units	52
Tbl. 12:	Conversion table: Units for gas throughput	52
Tbl. 13:	Technical data	53

## List of figures

Fig. 1:	Design of the handheld measurement instrument	13
Fig. 2:	Display layout (measured value display)	14
Fig. 3:	Keyboard with arrow keys and "OK" button	14
Fig. 4:	Measured value display menu with the current measured pressure	24
Fig. 5:	Symbol for keyboard lock in the top line	25
Fig. 6:	Auto-Off and Continuous operating modes	26
Fig. 7:	Additional information	26
Fig. 8:	Main menu	27
Fig. 9:	Start/stop data logger	27
Fig. 10:	Pressure/time diagram	28
Fig. 11:	Using measurement of pressure rise to calculate leakage rate	28
Fig. 12:	Example of displayed values for measurement of pressure rise	28
Fig. 13:	Opening Settings menu	30
Fig. 14:	Set the logging interval	30
Fig. 15:	Set the logging period (Auto Stop)	30
Fig. 16:	Select the data source (Datasource)	31
Fig. 17:	Set the measured value display mode (Graph Mode)	31
Fig. 18:	Set the time window for a rolling display (Graph Window)	32
Fig. 19:	Set the Y axis (Graph Axis)	32
Fig. 20:	Select the data source (Graph Datasource)	32
Fig. 21:	Setting gas type correction factor	33
Fig. 22:	Setting your own gas type correction factor	33
Fig. 23:	Setting transition type	34
Fig. 24:	Setting transition pressure or pressure range	34
Fig. 25:	Select the measurement signal for the alarm	34
Fig. 26:	Adjust the alarm volume	35
Fig. 27:	Select the switching mode for the alarm	35
Fig. 28:	Set the switching values for the alarm	35
Fig. 29:	Setting maximum operating time	36
Fig. 30:	Setting date and time	36
Fig. 31:	Setting language and display units	37
Fig. 32:	Adjusting USB interface	38
Fig. 33:	Calling up unit information	39
Fig. 34:	Calling up sensor information	39
Fig. 35:	Selecting calibration	42
Fig. 36:	Zero point calibration	43
Fig. 37:	Calibrating atmospheric pressure	43
Fig. 38:	Calibrating zero point of relative pressure display	44
Fig. 39:	Dimensions	53

# 1 About this manual



## IMPORTANT

Read carefully before use.  
Keep the manual for future consultation.

## 1.1 Validity

This document describes the function of the products listed in the following and provides the most important information for safe use. The description is written in accordance with the valid directives. The information in this document refers to the current development status of the products. The document retains its validity assuming that the customer does not make any changes to the product.

### 1.1.1 Applicable documents

Designation	Document
Declaration of conformity	A component of these operating instructions

### 1.1.2 Variants

This document applies to the TPG 202 Neo Piezo/Pirani handheld measurement instrument.

- Article number: **PT G28 212**

You can find the part number on the rating plate of the product.

Pfeiffer Vacuum reserves the right to make technical changes without prior notification.

The figures in this document are not to scale.

Dimensions are in mm unless stated otherwise.

## 1.2 Target group

These operating instructions are aimed at all persons performing the following activities on the product:

- Transportation
- Setup (Installation)
- Usage and operation
- Decommissioning
- Maintenance and cleaning
- Storage or disposal

The work described in this document is only permitted to be performed by persons with the appropriate technical qualifications (expert personnel) or who have received the relevant training from Pfeiffer Vacuum.

## 1.3 Conventions

### 1.3.1 Instructions in the text

Usage instructions in the document follow a general structure that is complete in itself. The required action is indicated by an individual step or multi-part action steps.

#### Individual action step

A horizontal, solid triangle indicates the only step in an action.

- ▶ This is an individual action step.

#### Sequence of multi-part action steps

The numerical list indicates an action with multiple necessary steps.

1. Step 1
2. Step 2
3. ...

### 1.3.2 Pictographs

The pictographs used in the document indicate useful information.



Note



Tip



Arrow keys and "OK" button

### 1.3.3 Labels on product

This section describes all the labels on the product along with their meanings.

	<p><b>Rating plate</b></p> <p>The rating plate is located on the back of the device.</p>
--	--

### 1.3.4 Abbreviations

Abbreviation	Explanation
ATM	Atmosphere
FKM	Fluorinated rubber
HV	High vacuum
MSD	Mass storage device
MSL	Mean sea level
p	Pressure
TPG	Total pressure gauge
TSV	Text file format (tab separated values)
USB	Universal Serial Bus

Tbl. 1: Abbreviations used

### 1.3.5 Trademark proof

- EXCEL® is a trademark of Microsoft Corporation.



## 2 Safety

### 2.1 General safety information

The following 4 risk levels and 1 information level are taken into account in this document.

#### **DANGER**

##### **Immediately pending danger**

Indicates an immediately pending danger that will result in death or serious injury if not observed.

- ▶ Instructions to avoid the danger situation

#### **WARNING**

##### **Potential pending danger**

Indicates a pending danger that could result in death or serious injury if not observed.

- ▶ Instructions to avoid the danger situation

#### **CAUTION**

##### **Potential pending danger**

Indicates a pending danger that could result in minor injuries if not observed.

- ▶ Instructions to avoid the danger situation

#### **NOTICE**

##### **Danger of damage to property**

Is used to highlight actions that are not associated with personal injury.

- ▶ Instructions to avoid damage to property



Notes, tips or examples indicate important information about the product or about this document.

### 2.2 Safety instructions



#### **Safety instructions according to product life stages**

All safety instructions in this document are based on the results of a risk assessment. Pfeiffer Vacuum has taken into account all the relevant life stages of the product.

#### **Risks during installation**

#### **WARNING**

##### **Risk of injury resulting from overpressure in the vacuum system**

Opening tensioning pieces with an overpressure > **1000 hPa** in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > **2500 hPa**. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-clip).
- ▶ Use sealing rings with an outer centering ring.

**Risks during operation**

**⚠ WARNING**

**Risk of injury resulting from overpressure in the vacuum system**

Opening tensioning pieces with an overpressure > 1000 hPa in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > 2500 hPa. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-clip).
- ▶ Use sealing rings with an outer centering ring.

**Risks during maintenance**

**⚠ WARNING**

**Health hazard through poisoning from toxic contaminated components or devices**

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ▶ Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ▶ Decontaminate affected parts before carrying out maintenance work.
- ▶ Wear protective equipment.

**⚠ WARNING**

**Risk of injury resulting from overpressure in the vacuum system**

Opening tensioning pieces with an overpressure > 1000 hPa in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > 2500 hPa. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-clip).
- ▶ Use sealing rings with an outer centering ring.

**⚠ WARNING**

**Health hazards due to cleaning agent**

The cleaning agent being used causes health hazards which could include, for example, poisoning, allergies, skin irritations, chemical burns or damage to the airways.

- ▶ When handling cleaning agents, observe the applicable regulations.
- ▶ Adhere to safety measures regarding handling and disposal of cleaning agents.
- ▶ Be aware of potential reactions with product materials.

**Risks when shipping**

**⚠ WARNING**

**Risk of poisoning from contaminated products**

Where products that contain harmful substances are shipped for maintenance or repair purposes, the health and safety of service personnel is at risk.

- ▶ Comply with the notices for safe shipment.

## Risks during disposal

**⚠ WARNING****Health hazard through poisoning from toxic contaminated components or devices**

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ▶ Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ▶ Decontaminate affected parts before carrying out maintenance work.
- ▶ Wear protective equipment.

## 2.3 Safety precautions

The product is designed according to the latest technology and recognized safety engineering rules. Nevertheless, improper use can result in danger to operator all third party life and limb, and product damage and additional property damage.

**Duty to provide information on potential dangers**

The product holder or user is obliged to make all operating personnel aware of dangers posed by this product.

Every person who is involved in the installation, operation or maintenance of the product must read, understand and adhere to the safety-related parts of this document.

**Infringement of conformity due to modifications to the product**

The Declaration of Conformity from the manufacturer is no longer valid if the operator changes the original product or installs additional equipment.

- Following the installation into a system, the operator is required to check and re-evaluate the conformity of the overall system in the context of the relevant European Directives, before commissioning that system.

**General safety precautions when handling the product**

- ▶ Observe all applicable safety and accident prevention regulations.
- ▶ Check that all safety measures are observed at regular intervals.
- ▶ Pass on safety instructions to all other users.
- ▶ Do not expose body parts to the vacuum.
- ▶ Always ensure a secure connection to the earthed conductor (PE).
- ▶ Never disconnect plug connections during operation.
- ▶ Observe the above shutdown procedures.
- ▶ Keep lines and cables away from hot surfaces (> 70 °C).
- ▶ Do not carry out your own conversions or modifications on the device.
- ▶ Observe the unit protection degree prior to installation or operation in other environments.
- ▶ Provide suitable touch protection, if the surface temperature exceeds 70 °C.
- ▶ Inform yourself about any contamination before starting work.

## 2.4 Limits of use of product

Installation location	Weatherproof (internal space)
Protection degree	IP40
Installation altitude	max. 2000 m
Ambient temperature	5°C to 50°C
Rel. air humidity	max. 80% up to 30°C, max. 50% at 40°C, non-condensing
Degree of pollution	2
Storage temperature	-20°C to 60°C

Tbl. 2: Permissible ambient conditions

## 2.5 Proper use

The handheld measurement instrument provides vacuum measurement of gases within the range of  $5 \times 10^{-5}$  to 1200 hPa.

### Use the product according to its intended purpose

- ▶ Install, operate and maintain the handheld measurement instrument only in accordance with these operating instructions.
- ▶ Observe the limits of use prescribed in the technical data.
- ▶ Observe the technical data.

## 2.6 Foreseeable improper use

Improper use of the product invalidates all warranty and liability claims. Any use that is counter to the purpose of the product, whether intentional or unintentional, is regarded as improper use; in particular:

- Use outside the mechanical and electrical limits of use
- Use with corrosive or explosive media, if this is not explicitly permitted
- Use for the measurement of highly flammable or combustible gases mixed with an oxidizing agent (e.g. atmospheric oxygen) within the explosion limits
- Use outdoors
- Use after technical changes (inside or outside on the product)
- Use with replacement or accessory parts that are not suitable or not approved

## 3 Product description

### 3.1 Identifying the product

You will need all the data from the rating plate to safely identify the product when communicating with Pfeiffer Vacuum.

- ▶ To ensure clear identification of the product when communicating with Pfeiffer Vacuum, always keep all of the information on the rating plate to hand.

### 3.2 Function and design

The handheld measurement instrument has a combined Piezo/Pirani sensor and is temperature-compensated. A further piezoresistive sensor is used to record the ambient pressure. The use of two physical measuring methods makes a high resolution possible over the entire measuring range. You can connect the handheld measurement instrument to suitable flange connections and operate it directly in the vacuum. The pressure is continuously displayed over the entire measuring range. The integrated data logger function makes it possible to store measurements in the handheld measurement instrument.



**Fig. 1: Design of the handheld measurement instrument**

- |                 |                             |
|-----------------|-----------------------------|
| 1 USB connector | 3 Keyboard                  |
| 2 Display       | 4 Small flange DN 16 ISO-KF |

#### 3.2.1 Display layout



##### English displays

This document describes the functions by reference to the English displays.

The monochrome display has a resolution of 400 × 240 pixels.

##### Available languages

- English (factory setting)
- German
- French
- Chinese

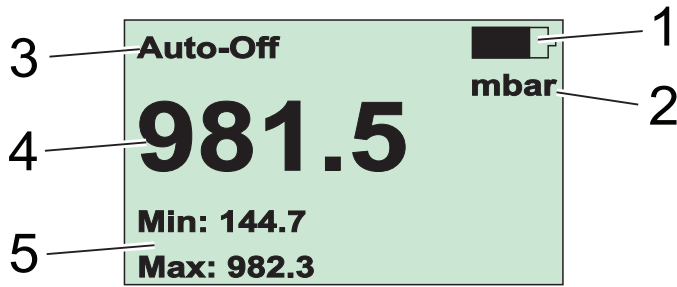


Fig. 2: Display layout (measured value display)

- |                    |                          |
|--------------------|--------------------------|
| 1 Battery charge   | 4 Measured value         |
| 2 Unit of pressure | 5 Additional information |
| 3 Operating mode   |                          |

### 3.2.2 Keyboard layout

The keyboard of the unit consists of 4 arrow keys and the "OK" button.



Fig. 3: Keyboard with arrow keys and "OK" button

### 3.2.3 Measuring principle

The handheld measurement instrument operates in the low vacuum range with an internal piezo-resistive silicon sensor. The influence of pressure causes deformation of a thin diaphragm that has a resistance bridge mounted on its rear side. The resulting unbalance of the measuring bridge is a measure of the absolute pressure acting on the diaphragm. For the medium vacuum range, the handheld measurement instrument uses an internal Pirani sensor that uses the heat conductivity of gases for vacuum measurement. Here, the handheld measurement instrument heats a filament in a measuring bridge to a constant temperature. The necessary bridge voltage is a measure of the absolute pressure.

### 3.2.4 USB connector

The USB connector is used to connect a PC for storing data and configuring the unit. The required USB driver can be found in the [Pfeiffer Vacuum Download Center](#).

#### Functions of the USB connector

- Configure unit parameters (Pfeiffer Vacuum protocol)
- Record and read out measured values
- Retrieve data or edit parameters with customer's own program using the LabView driver
- Utilize unit as a USB mass storage device <sup>1)</sup>
- Charging unit's internal rechargeable battery

## 3.3 Scope of delivery

- Handheld measurement instrument
- Silicone protective sleeve (black, fitted ex factory)
- Protective cap (red) for flange connection
- Operating instructions

#### Unpacking the product and checking completeness of the shipment

1. Unpack the product.
2. Remove the transport fasteners, transport protection etc.
3. Store the transport fasteners, transport protection etc. in a safe place.

1) Visible as a removable medium in file explorer with read and write authorizations

4. Check that the shipment is complete.
5. Ensure that no parts are damaged.

## 4 Transport and storage

### 4.1 Transporting product

#### NOTICE

##### Damage caused by incorrect transport

Transport in unsuitable packaging or failure to install all transport locks can result in damage to the product.

- ▶ Comply with the instructions for safe transport.



##### Packing

We recommend keeping the transport packaging and original protective cover.

##### Safe transport of the product

- ▶ Observe the weight specified on the transport packaging.
- ▶ Where possible, always transport or ship the product in the original transport packaging.
- ▶ Always use dense and impact-proof transport packaging for the product.
- ▶ Remove the existing protective cap and transport protections only immediately prior to installation.
- ▶ Reattach transport locks and transport protections prior to each transport.

### 4.2 Storing product

#### NOTICE

##### Damage caused by improper storage

Improper storage will lead to damage to the product.

Static charging, moisture, etc. will lead to defects on the electronic components.

- ▶ Comply with the instructions for safe storage.



##### Packing

We recommend storing the product in its original packaging.

##### Safe storage of the product

- ▶ Store the product in a cool, dry, dust-free place, where it is protected against impacts and mechanical vibration.
- ▶ Always use dense and impact-proof packaging for the product.
- ▶ Where possible, store the product in its original packaging.
- ▶ Store electronic components in antistatic packaging.
- ▶ Maintain the permissible storage temperature.
- ▶ Avoid extreme fluctuations of the ambient temperature.
- ▶ Avoid high air humidity.
- ▶ Seal connections with the original protective caps.
- ▶ Protect the product with the original transport protection (where available).



## 5 Installation

### 5.1 Establishing vacuum connection

#### **WARNING**

##### **Risk of injury resulting from overpressure in the vacuum system**

Opening tensioning pieces with an overpressure > **1000 hPa** in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > **2500 hPa**. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-circlip).
- ▶ Use sealing rings with an outer centering ring.

#### **NOTICE**

##### **Impairment from contamination and damage**

Touching the devices or components with bare hands increases the desorption rate and leads to incorrect measurements. Dirt (e.g. dust, fingerprints, etc.) and damage impair the function.

- ▶ When working on high or ultra high vacuum systems, always wear clean, lint-free and powder-free laboratory gloves.
- ▶ Only use clean tools.
- ▶ Make sure that the connection flanges are free of grease.
- ▶ Remove protective caps and protective covers from flanges and connections only when necessary.
- ▶ Carry out all work in a well lit area.

#### **Prerequisites**

- Appropriate ambient conditions
- Operating temperature within permissible range
- Adequate room available for electrical connection (e.g. permissible bending radii for cables)

#### **Recommendations**

- ▶ Where possible, ensure that the handheld measurement instrument is not exposed to any vibrations during operation, as vibrations in general will lead to deviations in the measured values.
- ▶ Install the handheld measurement instrument in a horizontal to upright position (flange facing downwards).
  - This prevents condensate and particles from accumulating in the measurement chamber.
- ▶ Fit a seal with centering ring and filter for applications susceptible to pollution and to protect the measuring system against contamination.
- ▶ Electrically connect the vacuum flange to the earthed conductor, e.g., by contacting the earthed vacuum chamber through a metal tensioning piece.

#### **Procedure**

1. Remove the protective cap and store in a safe place.
2. Install the handheld measurement instrument on the vacuum system, with vacuum components from the [Pfeiffer Vacuum Components Shop](#).

### 5.2 Connecting USB cable

#### **Required material**

- Commercially available USB-C cable (not included in scope of delivery)

### Connecting USB cable

- ▶ Connect the USB cable to the handheld measurement instrument and the PC.
  - When switched on, the handheld measurement instrument is ready for bidirectional data transfer and ends the current measured value display and any data recording currently running.

## 6 Interfaces



### 6.1 USB interface


Designation	Value
Serial interface	USB-C
Baud rate	9600 Baud
Data word length	8 bit
Parity	none (no parity)

Tbl. 3: Characteristics of the USB interface

### 6.2 Pfeiffer Vacuum protocol for USB interface

#### 6.2.1 Telegram frame

The telegram frame of the Pfeiffer Vacuum protocol contains only ASCII code characters [32; 127], the exception being the end character of the telegram  $C_R$ . Basically, a host  (e.g. a PC) sends a telegram, which a device  (e.g. electronic drive unit or gauge) responds to.

a2	a1	a0	*	0	n2	n1	n0	l1	l0	dn	...	d0	c2	c1	c0	$C_R$
a2 – a0				Unit address for device 												
				<ul style="list-style-type: none"> <li>Individual address of the unit ["001"]</li> </ul>												
*				Action according to telegram description												
n2 – n0				Pfeiffer Vacuum parameter numbers												
l1 – l0				Data length dn to d0												
dn – d0				Data in the respective data type .												
c2 – c0				Checksum (sum of ASCII values of cells a2 to d0) modulo 256												
$C_R$				carriage return (ASCII 13)												

#### 6.2.2 Telegram description

Data query  -->  ?

a2	a1	a0	0	0	n2	n1	n0	0	2	=	?	c2	c1	c0	$C_R$
----	----	----	---	---	----	----	----	---	---	---	---	----	----	----	-------

Control command  -->  !

a2	a1	a0	1	0	n2	n1	n0	l1	l0	dn	...	d0	c2	c1	c0	$C_R$
----	----	----	---	---	----	----	----	----	----	----	-----	----	----	----	----	-------

Data response / Control command understood  --> 

a2	a1	a0	1	0	n2	n1	n0	l1	l0	dn	...	d0	c2	c1	c0	$C_R$
----	----	----	---	---	----	----	----	----	----	----	-----	----	----	----	----	-------

Error message  --> 

a2	a1	a0	1	0	n2	n1	n0	0	6	N	O	_	D	E	F	c2	c1	c0	$C_R$
										_	R	A	N	G	E				
										_	L	O	G	I	C				

NO\_DEF            Parameter number n2–n0 no longer exists  
 \_RANGE           Data dn–d0 outside the permissible range  
 \_LOGIC           Logical access error

### 6.2.3 Telegram example 1

**Query pressure value**

Current measured pressure (parameter **[P:740]**, device address: "001")

☞ --> ○ ?	0	0	1	0	0	7	4	0	0	2	=	?	1	0	6	c <sub>R</sub>
ASCII	48	48	49	48	48	55	52	48	48	50	61	63	49	48	54	13

**Data response: measured pressure 1 × 10<sup>+3</sup> hPa as exponent 1E+3**

Current measured pressure (parameter **[P:740]**, device address: "001")

○ --> ☞	0	0	1	1	0	7	4	0	0	6	1	0	0	2	3	0	2	5	c <sub>R</sub>	
ASCII	48	48	49	49	48	55	52	48	48	54	49	48	48	48	50	51	48	50	53	13

### 6.2.4 Telegram example 2

**Incorrect command**

Incorrect command (parameter **[P:888]**, device address: "001")

☞ --> ○ !	0	0	1	1	0	8	8	8	0	3	1	3	0	c2	c1	c0	c <sub>R</sub>
ASCII	48	48	49	49	48	56	56	56	48	51	49	51	48				13

**Unknown command**

Incorrect command (parameter **[P:888]**, device address: "001")

○ --> ☞	0	0	1	1	0	8	8	8	0	6	N	O	_	D	E	F	c2	c1	c0	c <sub>R</sub>
ASCII	48	48	49	49	48	56	56	56	48	54	78	79	95	68	69	70				13

### 6.2.5 Data types

No.	Data type	Description	Length I1 – I0	Example
0	boolean_old	Logical value (false/true)	06	000000 is equivalent to false 111111 is equivalent to true
1	u_integer	Positive whole number	06	000000 to 999999
2	u_real	Fixed point number (unsigned)	06	001571 corresponds with 15.71
4	string	Any character string with 6 characters. ASCII codes between 32 and 127	06	TC_110, TM_700
6	boolean_new	Logical value (false/true)	01	0 is equivalent to false 1 is equivalent to true
7	u_short_int	Positive whole number	03	000 to 999
10	u_expo_new	Exponential value ±[1,000 · 10 <sup>-20</sup> ; 9,999 · 10 <sup>29</sup> ]  The first 4 digits contain the mantissa, the last two contain the exponent. If the exponent is [0; 49], then the mantissa is positive and the exponent has an offset of 20. If the exponent is [50; 99], then the mantissa is negative and the exponent has an offset of 70. "000000"/"999999" are used for values below/above the measuring range.	06	123423 is equivalent to 1,234 · 10 <sup>3</sup> 100063 is equivalent to -1,0 · 10 <sup>-7</sup> 243017 is equivalent to 2,430 · 10 <sup>-3</sup> 000000 = underrange 999999 = overrange (100000 is equivalent to 1,000 · 10 <sup>-20</sup> is equivalent to 0

---

No.	Data type	Description	Length 11 – 10	Example
11	string16	Any character string with 16 characters. ASCII codes between 32 and 127	16	PrezelBeer&Sausage
12	string8	Any character string with 8 characters. ASCII codes between 32 and 127	08	Example


## 7 Parameter set

### 7.1 General

All variables related to the function are stored as parameters in the handheld measurement instrument. Each parameter has a three-digit number and a description. Via the USB interface, parameters can be used with the Pfeiffer Vacuum protocol.



#### Factory settings

The handheld measurement instrument is pre-programmed at the factory. The handheld measurement instrument is ready for safe operation without additional configuration.

#	Three digit number of the parameter
Description	Brief description of the parameters
Functions	Function description of the parameters
Data type	Type of formatting of the parameter for the use with the Pfeiffer Vacuum protocol
Access type	R (read): Read access; W (write): Write access
Unit	Physical unit of the described variable
min. / max.	Permissible limit values for the entry of a value
default	Factory default setting (partially unit-specific)
	The parameter can be stored to the non-volatile memory of the handheld measurement instrument


Tbl. 4: Explanation and meaning of the parameters

### 7.2 Control commands

#	Indicator	Description	Functions	Data type	Access type	Unit	min.	max.	de-fault	
049	SensSw-Mode	Switching ranges	0 = direct 1 = continuous 3 = user-defined pressure threshold values	7	RW RW R		0	2	1	





Tbl. 5: Parameter set | Control commands

### 7.3 Status requests

#	Indicator	Description	Functions	Data type	Access type	Unit	min.	max.	de-fault	
303	Error code	Error code	000000 = No error Err001 = Sensor defective	4	R					
312	Fw version	Firmware version of handheld measurement instrument		4	R					
314	Operat.Hrs	Operating hours		1	R	h	00000	99999		
349	DeviceName	Device name		4	R					
354	HW Version	Hardware version		4	R					
355	Serial No	Serial number		11	R					
388	Order Code	Order number		11	R					

Tbl. 6: Parameter set | Status requests

## 7.4 Set value settings and pressure value query

#	Indicator	Description	Functions	Data type	Access type	Unit	min.	max.	default	
643	PhysUnits	Physical unit	0 = mbar 1 = Pa 2 = mTorr 3 = Torr 4 = hPa	7	RW		0	4	4	
740	Pressure 1	Absolute pressure	Pressure value in format aaaabb <sup>2)</sup> aaaa = mantissa bb = exponent	10	R	hPa				
742	PresCorrPI	Pirani correction factor		2	RW		0.2	8.0	-	
750	Pressure 2	Relative pressure	Pressure value in format aaaabb <sup>3)</sup> aaaa = mantissa bb = exponent	10	R	hPa				
797	RS485Adr	RS-485 address		1	RW		1	16	1	

**Tbl. 7: Parameter set | Set value settings and pressure value query**

- 2) The first 4 digits contain the mantissa, the last two contain the exponent. If the exponent is [0; 49], then the mantissa is positive and the exponent has an offset of 20. If the exponent is [50; 99], then the mantissa is negative and the exponent has an offset of 70. "000000"/"999999" are used for values below/above the measuring range.
- 3) The first 4 digits contain the mantissa, the last two contain the exponent. If the exponent is [0; 49], then the mantissa is positive and the exponent has an offset of 20. If the exponent is [50; 99], then the mantissa is negative and the exponent has an offset of 70. "000000"/"999999" are used for values below/above the measuring range.

## 8 Operation

**⚠ WARNING**

**Risk of injury resulting from overpressure in the vacuum system**

Opening tensioning pieces with an overpressure > **1000 hPa** in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > **2500 hPa**. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-circlip).
- ▶ Use sealing rings with an outer centering ring.

The handheld measurement instrument displays the measured value approximately 2 seconds after it is switched on.

**Recommendation**

- ▶ Observe a minimum stabilization period of at least 5 minutes to ensure full accuracy in the medium vacuum, e.g., after extreme pressure changes.

### 8.1 Charging the rechargeable battery

**NOTICE**

**Damage to the unit due to an unsuitable power source**

An unsuitable power source will cause damage to the unit.

- ▶ Make sure that the connected power source supports the value set for the permissible charging current.

**Required aids**

- USB-C cable for connecting to a PC
- Alternatively: commercially available USB-C charging power supply

**Procedure**

- ▶ Connect the unit to the charging power supply or the PC.
  - Charging starts.

### 8.2 Switching on handheld measurement instrument

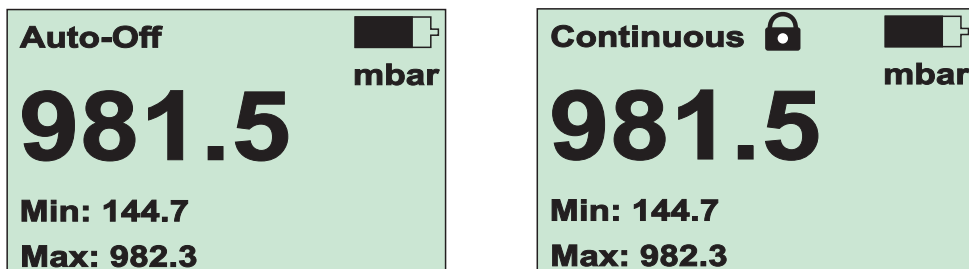


Fig. 4: Measured value display menu with the current measured pressure

**Procedure**

- ▶ Press the "OK" button.
  - After about 2 seconds, the Measured value display menu appears in the display with the current measured pressure.



## 8.3 Switching off handheld measurement instrument

### Procedure

- ▶ Press the "OK" button for 3 seconds.

## 8.4 Operating unit with keyboard

Key	In the measured value display	In the menu
"up"	<ul style="list-style-type: none"> <li>• Switch operating mode</li> <li>• Keypad lock</li> </ul>	<ul style="list-style-type: none"> <li>• Move up</li> <li>• Increase input value</li> </ul>
"down"	<ul style="list-style-type: none"> <li>• Switch additional info</li> <li>• Reset Min/Max</li> </ul>	<ul style="list-style-type: none"> <li>• Move down</li> <li>• Reduce input value</li> </ul>
"left"	<ul style="list-style-type: none"> <li>• Switch between absolute and relative pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Move left</li> <li>• Go back</li> <li>• Previous menu</li> </ul>
"right"	<ul style="list-style-type: none"> <li>• Switch between absolute and relative pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Move right</li> <li>• Next submenu</li> </ul>
"OK"	<ul style="list-style-type: none"> <li>• Switching on and off.</li> <li>• Call up main menu</li> </ul>	<ul style="list-style-type: none"> <li>• Acknowledge</li> </ul>

Tbl. 8: Keyboard functions

## 8.5 Switching keyboard lock on and off

The keyboard lock prevents unintentional input and changes.

### Prerequisite

- Unit in default Measured value display menu
- Alternatively: unit showing a graphical view of pressure curve
- Alternatively: unit measuring the leakage rate

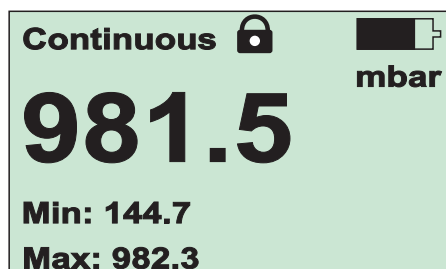


Fig. 5: Symbol for keyboard lock in the top line

### Procedure

- ▶ Press the "up" button for 3 seconds.
  - The keyboard lock is switched on.
- ▶ Press the "up" button twice within 5 seconds.
  - The keyboard lock is switched off.

## 8.6 Selecting operating mode

### Prerequisite

- Unit in default Measured value display menu

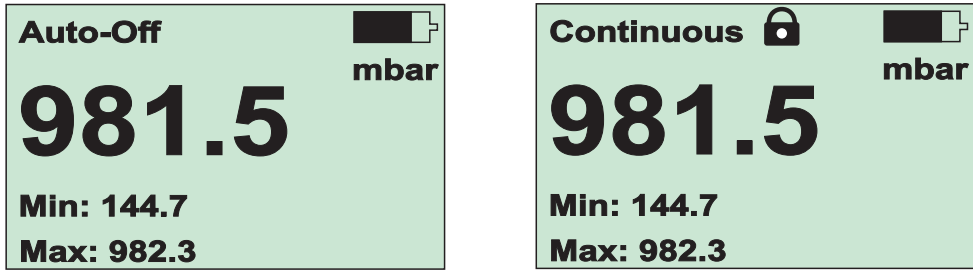


Fig. 6: Auto-Off and Continuous operating modes

**Procedure**

- ▶ Press the "up" button and set "Continuous operation" (Continuous) operating mode.
- ▶ Press the "up" button and set "Automatic cutoff" (Auto-Off) operating mode.

In continuous operation, the unit remains switched on for an unlimited period or until a set maximum operating period (see page 34) expires depending on the setting. "Auto-Off" means that the unit is automatically switched off after about 20 seconds to save the battery.

## 8.7 Calling up additional information

**Prerequisite**

- Unit in default Measured value display menu

**Available additional information**

- Current stored values for minimum and maximum pressure
- Current stored values for relative or absolute pressure
- Date and time

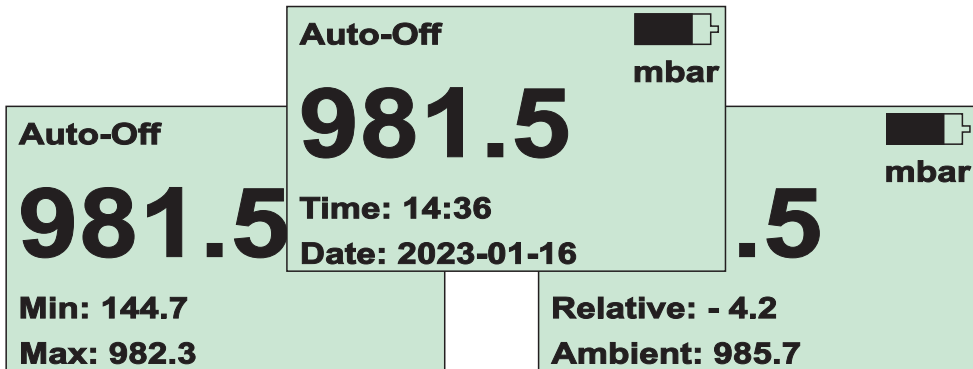


Fig. 7: Additional information

**Calling up additional information**

- ▶ Press the "down" button until the desired additional information is displayed.

**Resetting values for minimum and maximum pressure**

1. Press the "down" button until the minimum and maximum pressure display appears.
2. Press the "down" button for at least 3 seconds.

## 8.8 Opening and quitting main menu

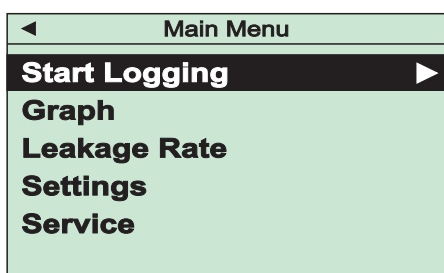


Fig. 8: Main menu

### Procedure

- ▶ Press the "OK" button in the measured value display.
  - The main menu is displayed.
- ▶ Press the "left" button until the measured value display appears.

## 8.9 Logging data with data logger

The unit stores multiple measurements in separate files in its internal data memory. The memory can hold several million individual measured data sets. The unit saves the measurements in TSV format. You can import the data with Excel.



### Storing in multiple files

If one measurement exceeds 1 million measured data records, the unit stores the measurement in multiple files to avoid exceeding the max. number of lines supported by Excel.

### Prerequisite

- Unit in main menu

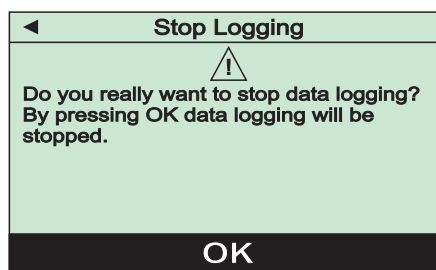
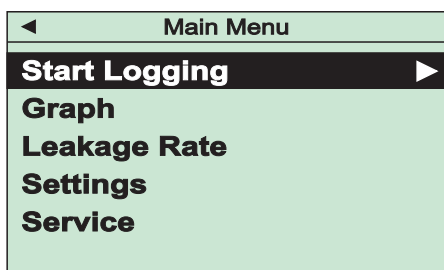


Fig. 9: Start/stop data logger



### Logging period

When the data logger is running, the unit does not switch off automatically after 20 seconds or when the maximum operating time expires. You can use the unit settings to configure the logging period (see chapter "Setting data logger", page 30).

### Starting data logger

1. Select the "Start Logging" item in the main menu.
2. Press "OK".
  - A message appears showing the name automatically assigned to the measured data file and the logging interval defined in the configuration.
3. Press "OK".
  - Data logging starts. The measured value display shows "Logging" as the operating mode.

### Stopping data logger

1. Select the "Stop Logging" item in the main menu.
  - A confirm window appears.
2. Click "OK" to confirm.
  - The measured value display appears.

## 8.10 Displaying pressure curve graphically

The unit can display the measured pressure curve graphically as a pressure/time diagram. (see chapter "Setting graphical display mode", page 31)

**Prerequisite**

- Unit in main menu

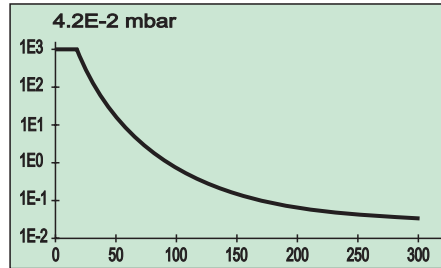
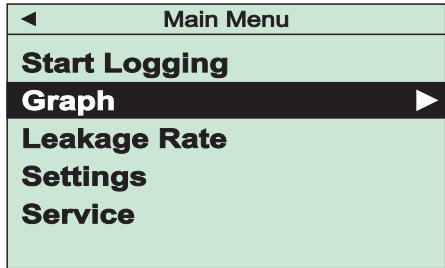


Fig. 10: Pressure/time diagram

**Procedure**

1. Select the "Graph" item in the main menu.
  - The unit displays the pressure/time diagram. The current numeric measured value is displayed above the pressure/time diagram.
2. Press the "left" button to close the view.
  - The measured value display appears.

## 8.11 Calculating leakage rate

The unit can perform a measurement of pressure rise to determine the leakage rate of a vacuum system.

**Prerequisite**

- Unit in main menu

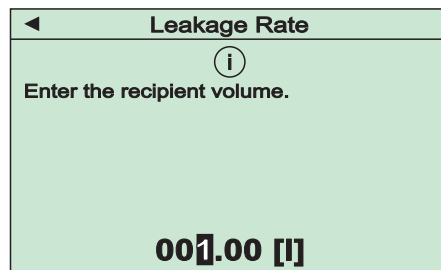
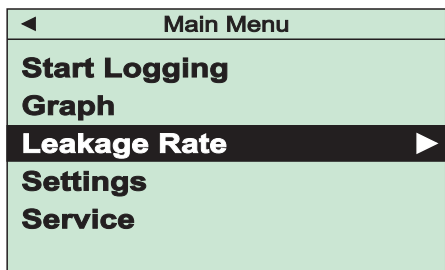


Fig. 11: Using measurement of pressure rise to calculate leakage rate

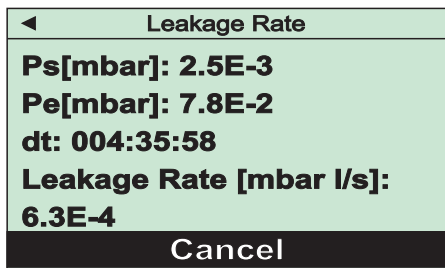


Fig. 12: Example of displayed values for measurement of pressure rise

P <sub>s</sub> [mbar]	Starting pressure	Leakage Rate [mbar l/s]	Calculated leakage rate
P <sub>e</sub> [mbar]	Current final pressure in mbar	PumpingSpeed [l/s]	Calculated pumping speed
dt	Expired rise time		

**Procedure**

1. Select the "Leakage Rate" item in the main menu.
2. Enter the volume of the vacuum chamber or the vacuum system in use.

3. Confirm your entries with "OK".
  - The measurement of pressure rise starts with continuous calculation of the leakage rate. The unit displays the leakage rate and the pumping speed alternately.
4. Press "OK" to stop the measurement of pressure rise.
  - The main menu is displayed.

# 9 Settings

**Prerequisite**

- Unit in main menu

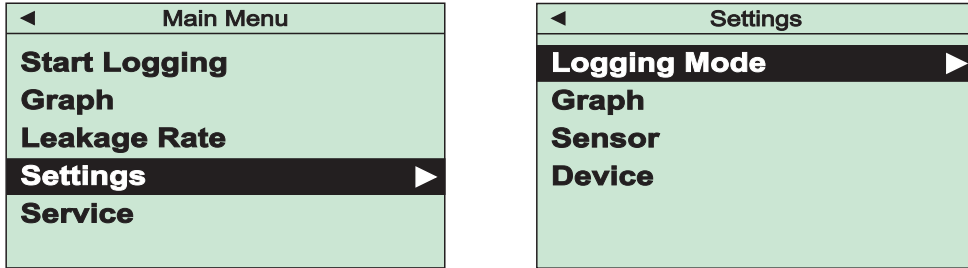


Fig. 13: Opening Settings menu

**Procedure**

1. Select the "Settings" item in the main menu.
2. Press "OK".
  - The Settings menu is displayed.

## 9.1 Setting data logger



**Avoiding high data volume**  
Tune the logging interval to match the logging period to avoid an unnecessarily high data volume.

**Prerequisite**

- Unit in Settings - Logging Mode menu

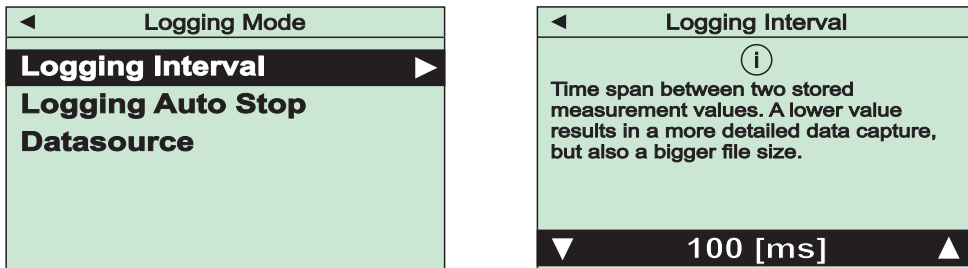


Fig. 14: Set the logging interval

**Setting logging interval**

1. Select the "Logging Interval" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired logging interval.
  - The supported logging intervals are 20 ms, 100 ms, 1 s, 5 s, 10 s, 30 s, and 1 min.
4. Confirm your entries with "OK".

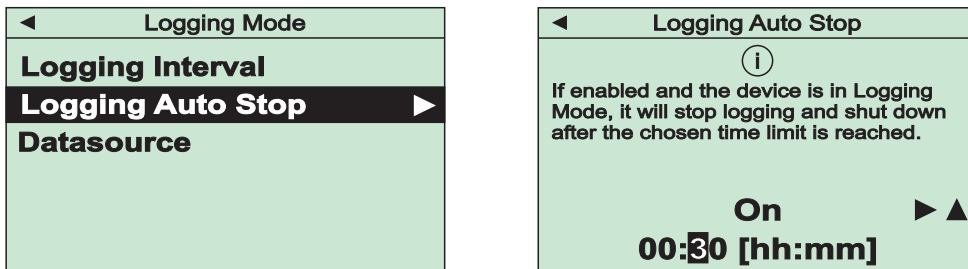


Fig. 15: Set the logging period (Auto Stop)

### Setting logging period

1. Select the "Logging Auto Stop" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to switch the Auto Stop functions ON or OFF.
  - When the Auto Stop function is switched off, the unit logs data without a time limit.
4. When the Auto Stop function is switched ON: Press the "right" button.
  - The cursor jumps to the time setting.
5. Use the "up", "down", "left", and "right" buttons to set the desired logging period.
  - Data logging stops automatically when the configured logging period expires. You can also stop logging manually. (see chapter "Logging data with data logger", page 27)
6. Confirm your entries with "OK".

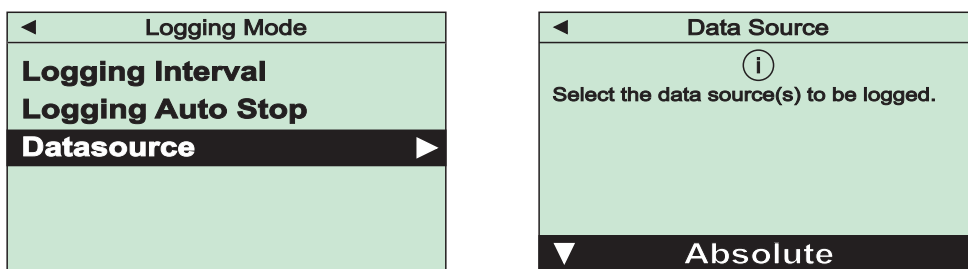


Fig. 16: Select the data source (Datasource)

### Selecting data source

1. Select the "Datasource" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired data source for data logging.
  - The options are absolute pressure, relative pressure, and both together.
4. Confirm your entries with "OK".

## 9.2 Setting graphical display mode

### Prerequisite

- Unit in Settings - Graph menu

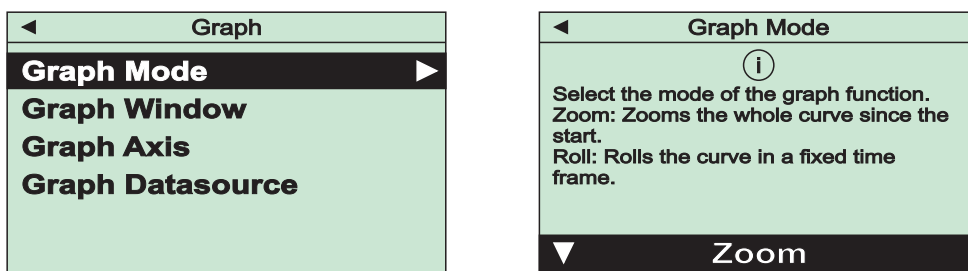


Fig. 17: Set the measured value display mode (Graph Mode)

### Setting measured value display mode

1. Select the "Graph Mode" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired display mode.
  - Roll = rolling display in a configured time window up to the current measured value
  - Zoom = display all measured values from the start of the plot
4. Confirm your entries with "OK".

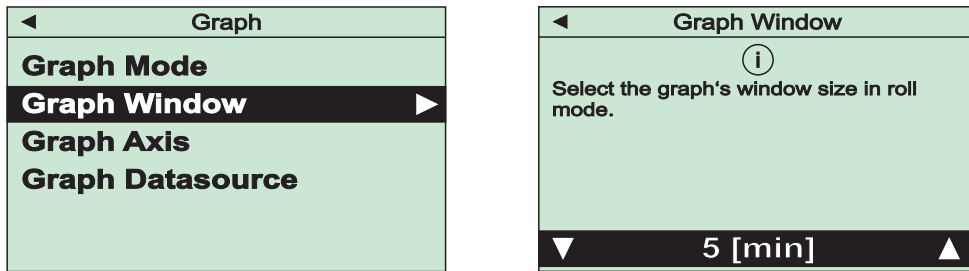


Fig. 18: Set the time window for a rolling display (Graph Window)

**Setting time window for rolling display**

1. Select the "Graph Window" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired time window.
  - The supported time windows are 30 s, 60 s, 6 min, 12 min, and 18 min.
4. Confirm your entries with "OK".

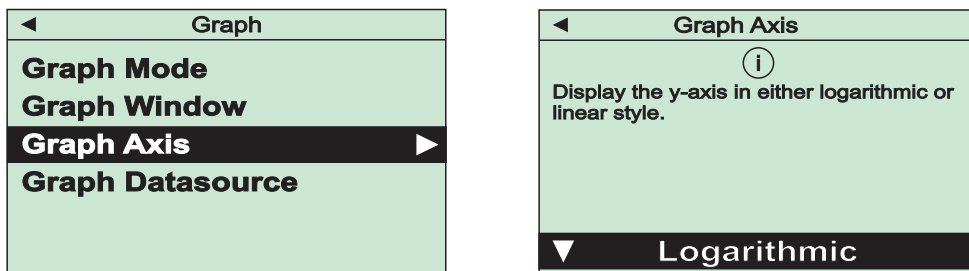


Fig. 19: Set the Y axis (Graph Axis)

**Setting Y axis**

1. Select the "Graph Axis" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired Y axis view.
  - The options are linear and logarithmic.
4. Confirm your entries with "OK".

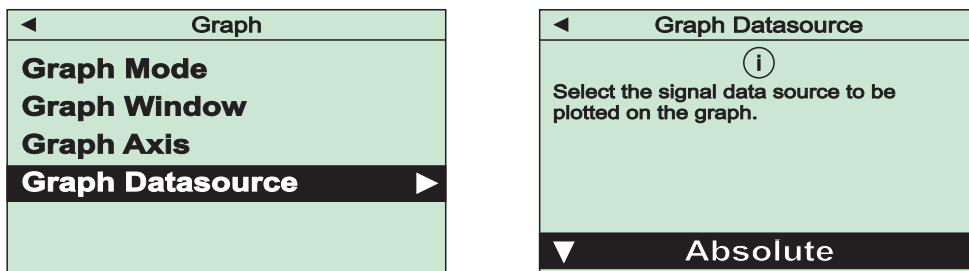


Fig. 20: Select the data source (Graph Datasource)

**Selecting data source**

1. Select the "Graph Datasource" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired data source for the view.
  - The options are absolute pressure and relative pressure.
4. Confirm your entries with "OK".

## 9.3 Adjusting sensors

**Prerequisite**

- Unit in Settings - Sensor menu



### 9.3.1 Handheld measurement instrument calibration

#### Prerequisite

- Unit in Settings - Sensor - Adjust menu

(see chapter "Handheld measurement instrument calibration", page 42)

### 9.3.2 Setting gas type correction factor

The pressure display of Pirani sensors depends on the type and composition of the gas being measured. Ex factory, the unit is calibrated for N<sub>2</sub> (nitrogen) or dry air. For other gases, you can multiply the value measured by the Pirani sensor in the device with the appropriate factor to ensure a correct pressure display below 0.5 hPa.

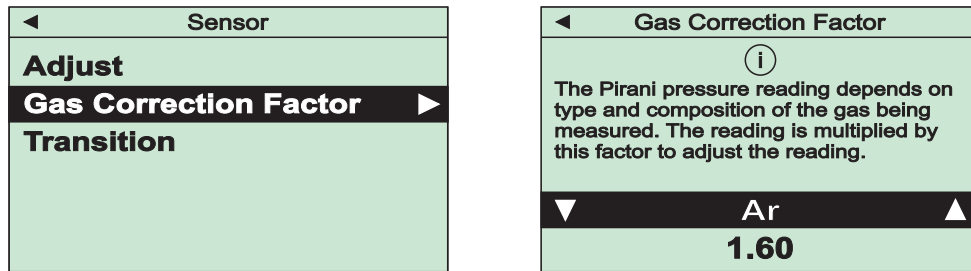


Fig. 21: Setting gas type correction factor

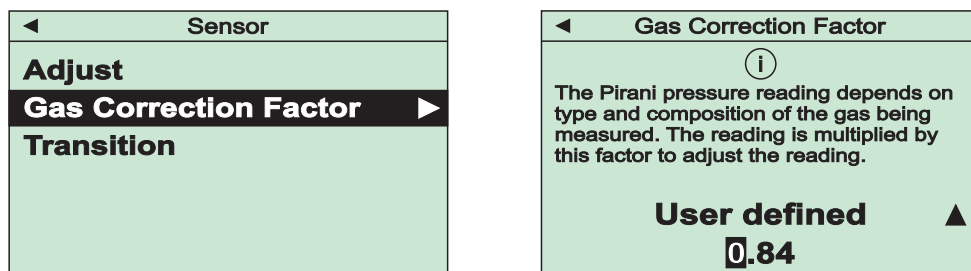


Fig. 22: Setting your own gas type correction factor

#### Procedure

1. Select the "Gas Correction Factor" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired gas type and gas correction factor.
  - Air = 1.00
  - Ar (Argon) = 1.60
  - CO<sub>2</sub> (Carbon Dioxide) = 0.89
  - CF<sub>4</sub> (Tetrafluoromethane) = 0.95
  - Ne (Neon) = 1.40
  - H<sub>2</sub> (Hydrogen) = 0.57
  - Kr (Krypton) = 2.40
  - User defined = x.xx
4. For "User defined", use the "left", "right", "up", and "down" buttons to set the desired gas correction factor.
5. Confirm your entries with "OK".

### 9.3.3 Setting transition type between sensors

#### Prerequisite

- Unit in Settings - Sensor - Transition menu

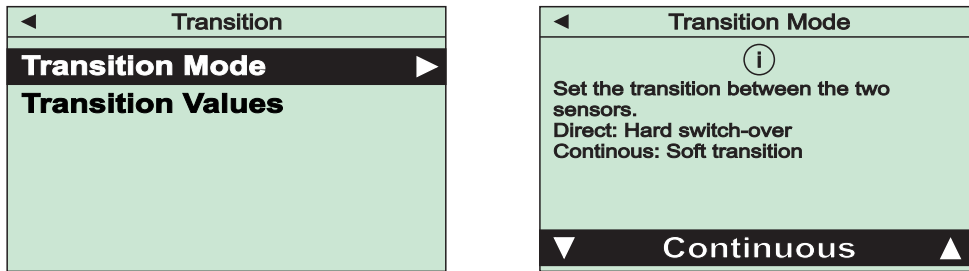


Fig. 23: Setting transition type

**Setting transition type**

1. Select the "Transition Mode" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired transition mode.
  - Direct = hard switchover at a configurable pressure (default =1 hPa)
  - Continuous = continuous value adjustment in a configurable pressure range (default: lower = 5 hPa, upper = 15 hPa)
4. Confirm your entries with "OK".

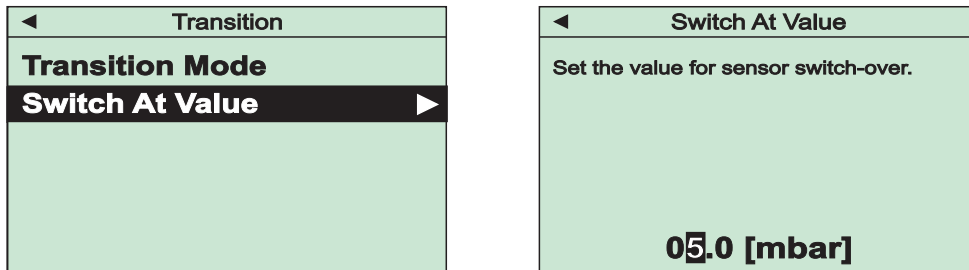


Fig. 24: Setting transition pressure or pressure range

**Setting transition pressure or pressure range**

1. Select the "Switch At Value" item in the menu.
2. Press "OK".
3. Use the "up", "down", "left", and "right" buttons to set the desired switching pressure and/or pressure range (lower/upper value).
4. Confirm your entries with "OK".
  - If you change the default values, parameter P:049 assumes a value of 3.

## 9.4 Configuring device settings

**Prerequisite**

- Unit in Settings - Device menu

### 9.4.1 Adjusting visual and acoustic warning signal

**Prerequisite**

- Unit in Settings - Device - Alarm Buzzer menu

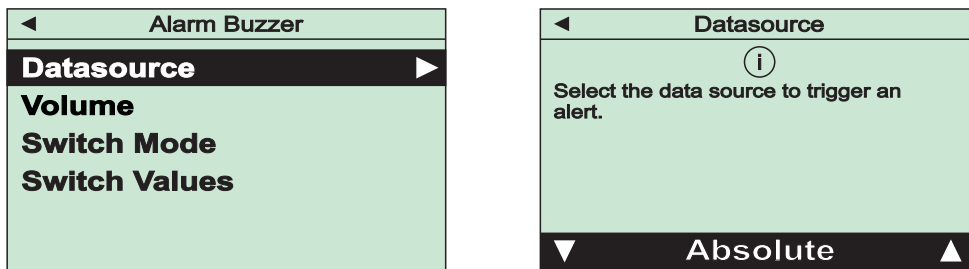


Fig. 25: Select the measurement signal for the alarm

### Selecting measurement signal for the alarm

1. Select the "Datasource" item in the menu.
2. Press "OK".
3. Select the desired measuring signal.
  - Off = Alarm switched off
  - Absolute = Absolute pressure
  - Relative = Relative pressure
  - Leakage Rate = Leakage rate
  - Pumping Speed = Pumping speed
4. Confirm the selection with "OK".

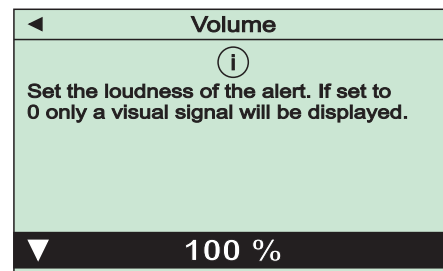
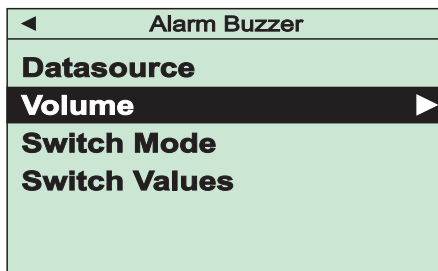


Fig. 26: Adjust the alarm volume

### Adjusting alarm volume

1. Select the "Volume" item in the menu.
2. Press "OK".
3. Set the desired volume.
  - The options are 0%, 50%, and 100%.
4. Confirm the selection with "OK".

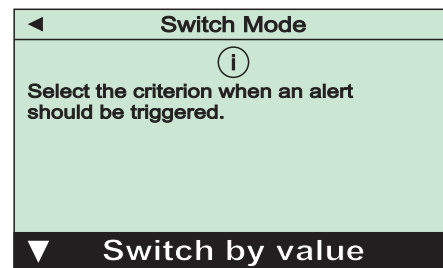
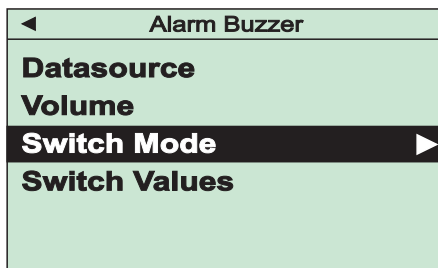


Fig. 27: Select the switching mode for the alarm

### Selecting switching mode for the alarm

1. Select the "Switch Mode" item in the menu.
2. Press "OK".
3. Select the desired switching mode.
  - Switch by value = Switching by pressure value
  - On/Off if Error = Switch on/off in case of error
  - On/Off if Underrange = Switch on/off in case of underrange
  - On/Off if Overrange = Switch on/off in case of overrange
4. Confirm the selection with "OK".

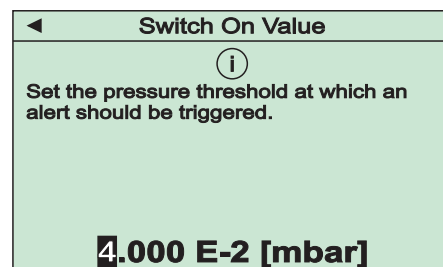
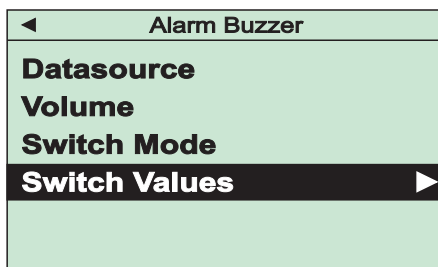


Fig. 28: Set the switching values for the alarm

**Setting switching values for the alarm**

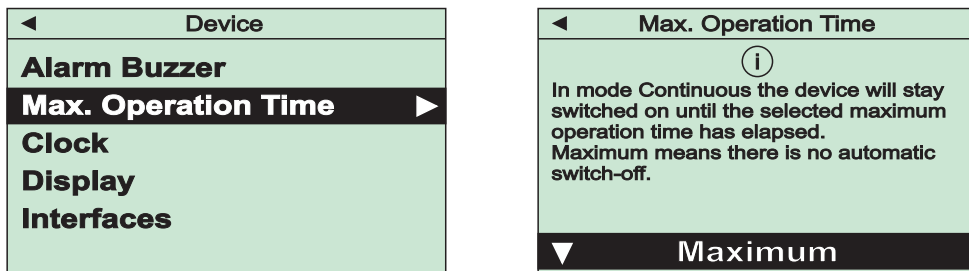
1. Select the "Switch Values" item in the menu.
2. Press "OK".
3. Use the "left", "right", "up", and "down" buttons to set the desired switch-on value.
4. Confirm the setting with "OK".
5. Use the "left", "right", "up", and "down" buttons to set the desired switch-off value.
6. Confirm the setting with "OK".

**9.4.2 Setting maximum operating time**

This function automatically switches the unit off, also in "Continuous" operation, following a configurable maximum operating time.

**Prerequisite**

- Unit in Settings - Device menu



**Fig. 29: Setting maximum operating time**

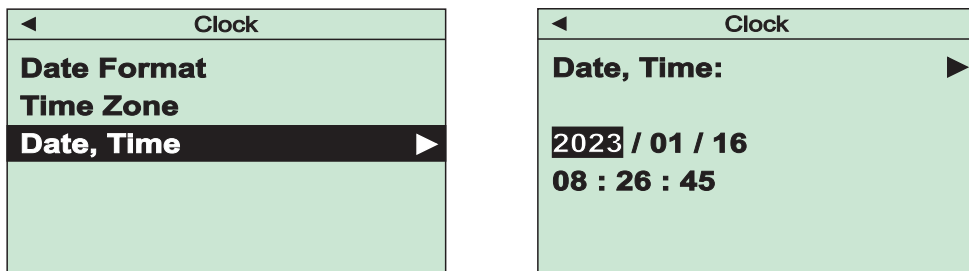
**Procedure**

1. Select the "Max. Operation Time" item in the menu.
2. Press "OK".
3. Select the desired maximum operation time.
  - The options are 30 min, 1 h, 2 h, 5 h, and maximum (no switch off).
4. Confirm the selection with "OK".

**9.4.3 Setting date and time**

**Prerequisite**

- Unit in Settings - Device - Clock menu



**Fig. 30: Setting date and time**

**Setting date and time**

1. Select the "Date, Time" item in the menu.
2. Press "OK".
3. Use the "left", "right", "up", and "down" buttons to set the date and time.
4. Confirm the setting with "OK".

**Setting data format**

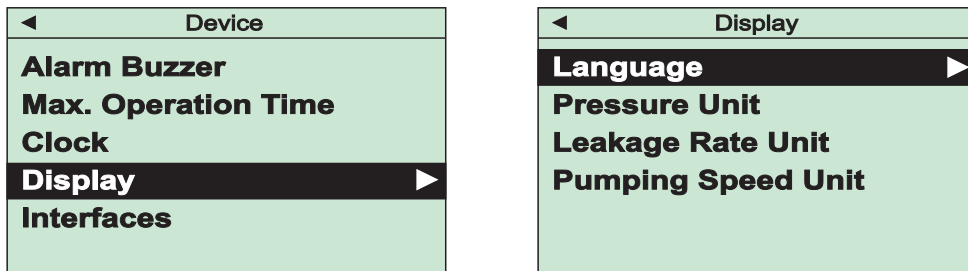
1. Select the "Date Format" item in the menu.
2. Press "OK".
3. Select the desired date format.
  - The options are YYYY-MM-DD, DD.MM.YYYY, and MM/DD/YYYY.
4. Confirm the selection with "OK".

**Setting time zone**

1. Select the "Time Zone" item in the menu.
2. Press "OK".
3. Use the "left", "right", "up", and "down" buttons to set the time zone.
4. Confirm the setting with "OK".

**9.4.4 Setting language and display units****Prerequisite**

- Unit in Settings - Device - Display menu

**Fig. 31: Setting language and display units****Setting language**

1. Select the "Language" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired language.
  - The options are English (factory default), German, French, and Chinese.
4. Confirm the selection with "OK".

**Setting unit of pressure**

1. Select the "Pressure Unit" item in the main menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired unit of pressure.
  - The options are mbar, Torr, hPa, Pa, and mTorr.
4. Confirm the selection with "OK".

**Setting leakage rate unit**

1. Select the "Leakage Rate Unit" item in the main menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired leakage rate unit.
  - The options are mbar l/s, mTorr l/s, Torr l/s, Pa l/s, hPa l/s mbar m<sup>3</sup>/s, Torr m<sup>3</sup>/s, Pa m<sup>3</sup>/s, hPa m<sup>3</sup>/s, psi m<sup>3</sup>/s, sccm, and slm.
4. Confirm the selection with "OK".

**Setting pumping speed unit**

1. Select the "Pumping Speed Unit" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired pumping speed unit.
  - The options are l/s, l/min, m<sup>3</sup>/min, m<sup>3</sup>/h, and ft<sup>3</sup>/min.
4. Confirm the selection with "OK".

**9.4.5 Adjusting interfaces****NOTICE****Damage to the unit due to an unsuitable power source**

An unsuitable power source will cause damage to the unit.

- ▶ Make sure that the connected power source supports the value set for the permissible charging current.

**Prerequisite**

- Unit in Settings - Device - Interfaces menu

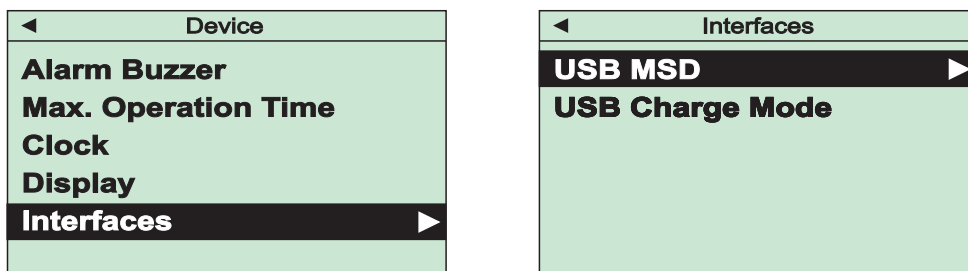


Fig. 32: Adjusting USB interface

#### Configuring unit as mass storage device

1. Select the "USB MSD" item in the menu.
2. Use the "up" and "down" buttons to select "MSD Enabled" to switch the function on, or "MSD Disabled" to switch the function off.
3. Confirm the selection with "OK".

When the USB MSD function is enabled, the measurement files are visible in the file explorer on a PC when the unit is connected.

#### Setting limit of permissible charging current

1. Select the "USB Charge Mode" item in the menu.
2. Use the "up" and "down" buttons to select the desired charging current.
  - The options are Off (no limit), 100 mA, 500 mA, and 900 mA.
3. Confirm the selection with "OK".

## 9.5 Formatting data storage device file system

#### Prerequisite

- Unit in Service menu

#### Procedure

1. Select the "File System" item in the menu.
2. Use the "up" and "down" buttons to select "Execute" and format the file system or "Cancel" to cancel the action.
3. Confirm the selection with "OK".

## 9.6 Resetting unit to the factory settings

#### Prerequisite

- Unit in Service menu

#### Procedure

1. Select the "Factory Defaults" item in the menu.
2. Use the "up" and "down" buttons to select "Execute" to reset the unit to the factory settings or "Cancel" to cancel the action.
3. Confirm the selection with "OK".

## 10 Device information

### Prerequisite

- Unit in Service menu

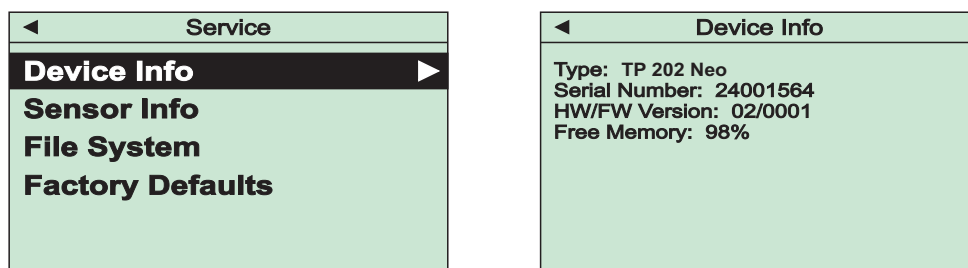


Fig. 33: Calling up unit information

### Calling up unit information

1. Select the "Device Info" item in the menu.
2. Press "OK".

You will find information on the unit's sensor in Sensor information. This also includes parameters relevant to assessing the degree of wear. The unit displays an operating hours counter and the number of operating hours since the last zero point calibration.

The device calculates the Pirani sensor's current degree of wear on each zero point calibration. This is an estimated value in percent. A positive value indicates contamination of the sensor, while a negative sign indicates possible corrosion. Values above 100% mean that the sensor's measured value deviation is likely to exceed the specified measurement uncertainty.



#### Assessing degree of wear

Always assess the degree of wear in the context of the concrete use case.

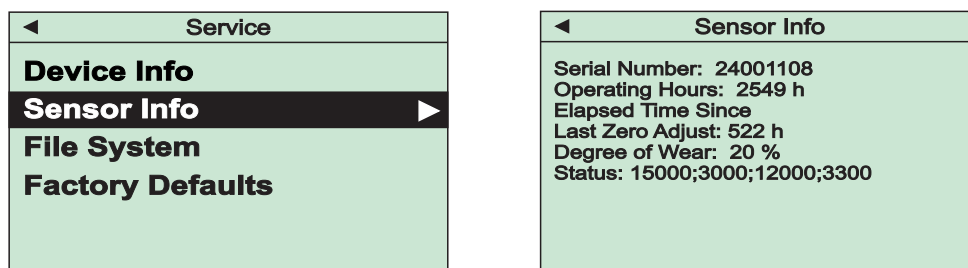


Fig. 34: Calling up sensor information

### Calling up sensor information

1. Select the "Sensor Info" item in the menu.
2. Press "OK".

# 11 Dismantling

## ⚠ WARNING

### Health hazard through poisoning from toxic contaminated components or devices

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ▶ Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ▶ Decontaminate affected parts before carrying out maintenance work.
- ▶ Wear protective equipment.

## ⚠ WARNING

### Risk of injury resulting from overpressure in the vacuum system

Opening tensioning pieces with an overpressure > **1000 hPa** in the vacuum system can lead to injuries as a result of flying parts, and escaping process medium could prove harmful to health.

Elastomer seals in KF connections (e.g. O-rings) are not resistant to pressures > **2500 hPa**. This could prove harmful to health due to escaping process medium.

- ▶ Do not open any tensioning pieces when overpressure is prevalent in the vacuum system.
- ▶ Use suitable tensioning pieces for overpressure.
- ▶ Use tensioning pieces which can only be opened and closed using a tool (e.g. tightening strap-circlip).
- ▶ Use sealing rings with an outer centering ring.

## NOTICE

### Impairment from contamination and damage

Touching the devices or components with bare hands increases the desorption rate and leads to incorrect measurements. Dirt (e.g. dust, fingerprints, etc.) and damage impair the function.

- ▶ When working on high or ultra high vacuum systems, always wear clean, lint-free and powder-free laboratory gloves.
- ▶ Only use clean tools.
- ▶ Make sure that the connection flanges are free of grease.
- ▶ Remove protective caps and protective covers from flanges and connections only when necessary.
- ▶ Carry out all work in a well lit area.

### Prerequisites

- Vacuum system vented to atmospheric pressure

### Removing handheld measurement instrument

1. If necessary, disconnect the USB cable from the handheld measurement instrument.
2. Remove the handheld measurement instrument from the vacuum system.
3. Fit the protective cap on the connection flange.



## 12 Maintenance

### WARNING

#### Health hazard through poisoning from toxic contaminated components or devices

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ▶ Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ▶ Decontaminate affected parts before carrying out maintenance work.
- ▶ Wear protective equipment.



#### Maintenance in the Pfeiffer Vacuum Service Center

Pfeiffer Vacuum offers a complete maintenance service for all products.

Pfeiffer Vacuum recommends: Contact your Pfeiffer Vacuum Service Center to arrange the maintenance of defective products and components.



#### Cleaning in the Pfeiffer Vacuum Service Center

Pfeiffer Vacuum recommends: Contact your nearest Pfeiffer Vacuum Service Center to arrange the cleaning of heavily-soiled products and components.



#### Warranty claim

Opening the device during the warranty period or damaging/removing the warranty seal will void the warranty.

Contact the Pfeiffer Vacuum Service Center in the event of process-related shorter maintenance intervals.



#### Warranty

Malfunctioning of the equipment as a direct result of contamination or wear, as well as wear parts, is not covered by the warranty.



#### First read through the sections completely

Read the section with the work instructions through completely first before you commence with work.

The handheld measurement instrument is maintenance-free in clean operating conditions. Aging, long-term operation, contamination, or extreme climatic conditions can cause a zero point shift and thus reduced accuracy of measurement at a pressure of  $< 10^{-2}$  hPa. A zero point shift necessitates readjustment.

### 12.1 Cleaning components

### WARNING

#### Health hazards due to cleaning agent

The cleaning agent being used causes health hazards which could include, for example, poisoning, allergies, skin irritations, chemical burns or damage to the airways.

- ▶ When handling cleaning agents, observe the applicable regulations.
- ▶ Adhere to safety measures regarding handling and disposal of cleaning agents.
- ▶ Be aware of potential reactions with product materials.

**NOTICE**

**Damage caused by penetrating moisture**  
 Penetrating moisture, e.g. through condensation or dripping water, damages the unit.

- ▶ Protect the unit against penetration of moisture.
- ▶ Only operate the unit in a clean and dry environment.
- ▶ Operate the unit away from fluids and sources of moisture.
- ▶ Take special precautions if there is a risk of dripping water.
- ▶ Do not switch on the unit if fluid has penetrated into it, instead contact the Pfeiffer Vacuum Service Center.

**NOTICE**

**Damage caused by unsuitable cleaning agents**  
 Unsuitable cleaning agents damage the product.

- ▶ Do not use solvents as they attack the surface.
- ▶ Do not use any aggressive or abrasive cleaning agents.

**Required consumables**

- Industrial alcohol
- Cloth (soft, lint-free)

**External cleaning of the device**

1. Always use a cloth soaked in industrial alcohol for external cleaning.
2. Allow the surfaces to dry thoroughly after cleaning.

## 12.2 Handheld measurement instrument calibration

Pfeiffer Vacuum calibrated the handheld measurement instrument to default values in upright position at the factory.

**Prerequisites**

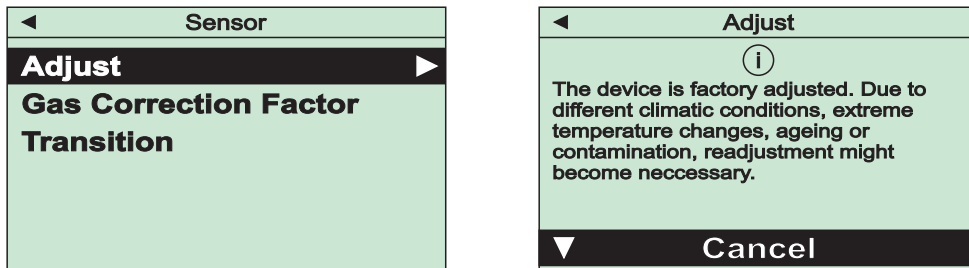
- Handheld measurement instrument installed on vacuum system
- Unit in Settings - Sensor menu
- Actual pressure value determined for atmospheric pressure calibration or reference zero point calibration

**Required aids**

- Suitable reference unit for determining the actual pressure value

**Preparing for adjustment**

- ▶ Ensure the same installation and ambient conditions as those applicable for normal use.
- ▶ Check the filter for contamination as required.
- ▶ Replace the filter wherever the filter becomes contaminated or damaged.



**Fig. 35: Selecting calibration**

**Selecting calibration**

1. Select the "Adjust" item in the menu.
2. Press "OK".
3. Use the "up" and "down" buttons to select the desired calibration.
  - Adjust Zero = zero point calibration
  - Adjust Zero [p] = reference zero point calibration

- Adjust ATM = atmospheric pressure calibration
  - Adjust Relative = relative pressure display zero point calibration
  - Cancel = cancel calibration
4. Confirm your entries with "OK".

## 12.2.1 Zero point calibration

### Prerequisites

- Handheld measurement instrument installed on vacuum system
- Zero point calibration: actual pressure in sensor  $< 1 \times 10^{-4}$  hPa and displayed pressure  $< 4 \times 10^{-2}$  hPa
- Unit in Settings - Sensor - Adjust menu

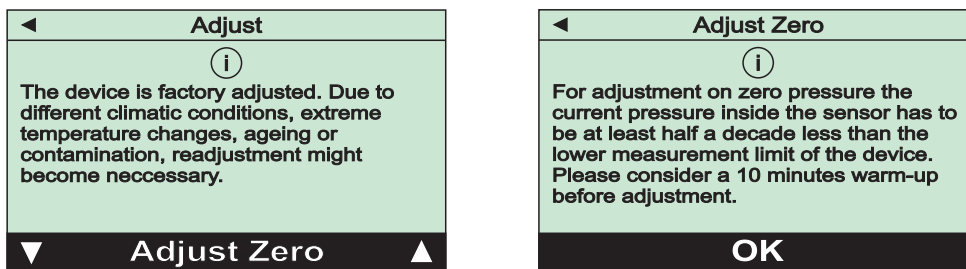


Fig. 36: Zero point calibration

### Zero point calibration

1. Use the "up" and "down" buttons to select "Adjust Zero" and calibrate or "Cancel" to cancel the action.
2. Confirm the selection with "OK".
3. Use the "up" and "down" buttons to select "Execute" and calibrate or "Cancel" to cancel the action.
4. Confirm the selection with "OK".
5. Confirm the message with "OK".

### Calibrating zero point with reference pressure

1. Use the "up" and "down" buttons to select "Adjust Zero [p]" and calibrate or "Cancel" to cancel the action.
2. Confirm the selection with "OK".
3. Use the "left", "right", "up", and "down" buttons to set the reference pressure.
4. Confirm your entries with "OK".
5. Use the "up" and "down" buttons to select "Execute" and calibrate or "Cancel" to cancel the action.
6. Confirm the selection with "OK".
7. Confirm the message with "OK".

## 12.2.2 Calibrating atmospheric pressure

### Prerequisites

- Handheld measurement instrument installed on vacuum system
- Pressure in vacuum system:  $> 800$  hPa
- Unit in Settings - Sensor - Adjust menu

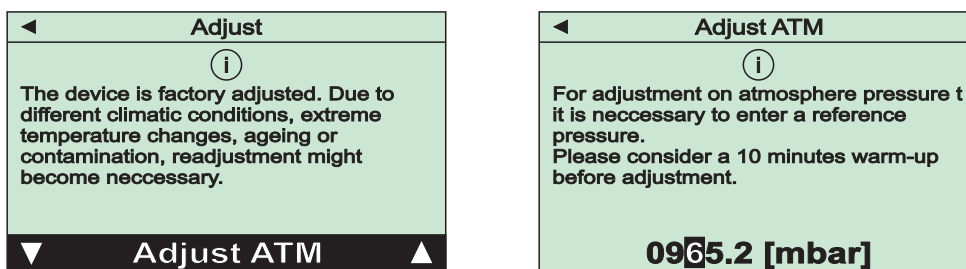


Fig. 37: Calibrating atmospheric pressure

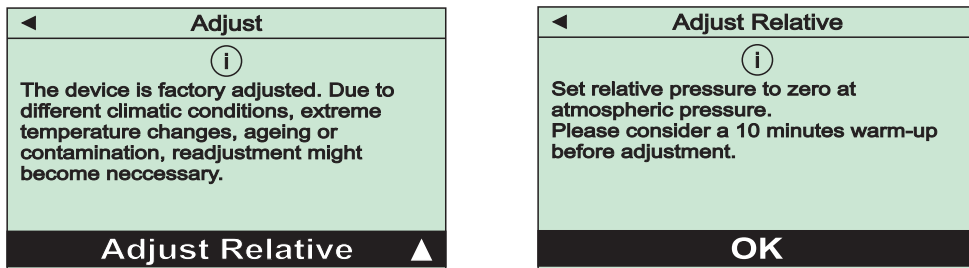
**Procedure**

1. Use the "up" and "down" buttons to select "Adjust ATM" and calibrate or "Cancel" to cancel the action.
2. Confirm the selection with "OK".
3. Use the "left", "right", "up", and "down" buttons to set the determined reference pressure.
4. Confirm your entries with "OK".
5. Confirm the message with "OK".

### 12.2.3 Calibrating zero point of relative pressure display

**Prerequisites**

- Handheld measurement instrument installed on vacuum system
- Zero point calibration: actual pressure in sensor  $< 1 \times 10^{-4}$  hPa and displayed pressure  $< 4 \times 10^{-2}$  hPa
- Unit in Settings - Sensor - Adjust menu



**Fig. 38: Calibrating zero point of relative pressure display**

**Procedure**

1. Use the "up" and "down" buttons to select "Adjust Relative" and calibrate or "Cancel" to cancel the action.
2. Confirm the selection with "OK".
3. Use the "up" and "down" buttons to select "Execute" and calibrate or "Cancel" to cancel the action.
4. Confirm the selection with "OK".
5. Confirm the message with "OK".

## 12.3 Updating firmware

**Prerequisites**

- Update tool and latest firmware downloaded from the [Download Center](#) or product page as a ZIP folder
- TPG 202 Neo connected to the PC

**Procedure**

1. Start the update tool (FirmwareUpdater.exe).
2. Search for the unit in the Update tool in "Select the interfaces to search for devices".
3. Select the device in "Select the device for a firmware upgrade".
4. Select the firmware version.
5. Click on "Next".
  - Further information is displayed (Upgrade Notes).
6. Click on "Next" to start the update.
  - A bar appears as a progress indicator (Please wait while flashing firmware).
7. After the update completes successfully click on "Finish" to confirm.
8. Check the settings of the unit.

## 12.4 Replacing sensor

Pfeiffer Vacuum Service handles the replacement.

- ▶ Contact [Pfeiffer Vacuum Service](#).

## 12.5 Replacing rechargeable battery

Pfeiffer Vacuum Service handles the replacement.

- ▶ Contact [Pfeiffer Vacuum Service](#).

## 12.6 Replacing housing cover

Pfeiffer Vacuum Service handles the replacement.

- ▶ Contact [Pfeiffer Vacuum Service](#).

## 13 Malfunctions



### Warranty

Malfunctioning of the equipment as a direct result of contamination or wear, as well as wear parts, is not covered by the warranty.

The unit outputs error messages in plain text on the display.

Malfunction	Possible cause	Remedy
Measured value deviation too large	<ul style="list-style-type: none"> <li>• Aging</li> <li>• Pollution</li> <li>• Extreme temperatures</li> <li>• Incorrect calibration</li> </ul>	<ul style="list-style-type: none"> <li>• Perform a calibration to atmospheric pressure at &gt; 800 hPa.</li> <li>• Perform a zero point calibration at &lt;math&gt;4 \times 10^{-2}&lt;/math&gt; hPa.</li> <li>• Replace the sensor.</li> <li>• Contact <a href="#">Pfeiffer Vacuum Service</a>.</li> </ul>
Zero point deviation not possible	Measured value deviation exceeds setting range	<ul style="list-style-type: none"> <li>• Replace the sensor.</li> <li>• Contact <a href="#">Pfeiffer Vacuum Service</a>.</li> </ul>
“or” is displayed	Measuring range exceeded (pressure > 1200 hPa)	Reduce the pressure to < 1200 hPa.
“ur” is displayed	Measuring range undershot (pressure <math>5 \times 10^{-5}</math> hPa)	Increase the pressure to >math>5 \times 10^{-5}</math> hPa.

**Tbl. 9: Malfunctions**

## 14 Shipping

### **WARNING**

#### **Risk of poisoning from contaminated products**

Where products that contain harmful substances are shipped for maintenance or repair purposes, the health and safety of service personnel is at risk.

- ▶ Comply with the notices for safe shipment.



#### **Decontamination subject to charge**

Pfeiffer Vacuum decontaminates products not clearly declared "Free of contamination" at your expense.

#### **Safe shipping of the product**

- ▶ Do not ship microbiological, explosive or radioactively contaminated products.
- ▶ Observe the shipping guidelines for the participating countries and transport companies.
- ▶ Highlight any potential dangers on the outside of the packaging.
- ▶ Download the explanation for contamination at [Pfeiffer Vacuum Service](#).
- ▶ Always enclose a completed declaration of contamination.

## 15 Recycling and disposal

### **WARNING**

#### **Health hazard through poisoning from toxic contaminated components or devices**

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ▶ Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ▶ Decontaminate affected parts before carrying out maintenance work.
- ▶ Wear protective equipment.



#### **Environmental protection**

You **must** dispose of the product and its components in accordance with all applicable regulations for protecting people, the environment and nature.

- Help to reduce the wastage of natural resources.
- Prevent contamination.

### 15.1 General disposal information

Pfeiffer Vacuum products contain materials that you must recycle.

- ▶ Dispose of our products according to the following:
  - Iron
  - Aluminium
  - Copper
  - Synthetic
  - Electronic components
  - Oil and fat, solvent-free
- ▶ Observe the special precautionary measures when disposing of:
  - Fluoroelastomers (FKM)
  - Potentially contaminated components that come into contact with media

### 15.2 Disposing of handheld measurement instrument

Pfeiffer Vacuum handheld measurement instruments contain materials that must be recycled.

1. Decontaminate the components that come into contact with process gases.
2. Separate the components into recyclable materials.
3. Recycle the non-contaminated components.
4. Dispose of the product or components safely according to locally applicable regulations.
5. Do **not** dispose of the rechargeable battery as domestic waste.



**Information relating to the supply of energy storage devices**

- The end user is legally obliged to return used energy storage devices (batteries and rechargeable batteries).
- Pfeiffer Vacuum disposes of energy storage devices in returned units professionally and free of charge.
- The symbols shown on the energy storage devices have the following meanings:
  - Pb - the energy storage device contains more than 0.004 percent by mass of lead
  - Cd - the energy storage device contains more than 0.002 percent by mass of cadmium
  - Hg - the energy storage device contains more than 0.0005 percent by mass of mercury

## 16 Spare parts

### Ordering spare parts

- ▶ Have the part number to hand, along with other details from the rating plate as required.
- ▶ Install original spare parts only.

Description	Order number
Silicone protective sleeve (black)	PT 350 113 -T
Lithium-ion battery	PT 350 114 -T
Sensor	PT 350 115 -T
Housing cover (red)	PT 350 116 -T

**Tbl. 10: Spare parts**

## 17 Accessories

### 17.1 Accessory information

**Transport case**

Transport case for TPG 202 Neo and customer's own accessories

**Centering ring and filter**

Filter available in different pore sizes to protect the measuring system against contamination in the event of potential contaminating applications

### 17.2 Ordering accessories

Description	Order number
Transport case (with foam liner)	PT 350 112 -T
Centering ring with sintered metal filter, 0.02 mm pore size, stainless steel, FKM, DN 16 ISO-KF	PF 117 216 -T
Centering ring with sintered metal filter, stainless steel size, FKM, DN 16 ISO-KF	122ZRS016

## 18 Technical data and dimensions

### 18.1 General

	mbar	bar	Pa	hPa	kPa	Torr   mm Hg
mbar	1	$1 \cdot 10^{-3}$	100	1	0.1	0.75
bar	1000	1	$1 \cdot 10^5$	1000	100	750
Pa	0.01	$1 \cdot 10^{-5}$	1	0.01	$1 \cdot 10^{-3}$	$7.5 \cdot 10^{-3}$
hPa	1	$1 \cdot 10^{-3}$	100	1	0.1	0.75
kPa	10	0.01	1000	10	1	7.5
Torr   mm Hg	1.33	$1.33 \cdot 10^{-3}$	133.32	1.33	0.133	1

$$1 \text{ Pa} = 1 \text{ N/m}^2$$

**Tbl. 11: Conversion table: Pressure units**

	mbar l/s	Pa m <sup>3</sup> /s	sccm	Torr l/s	atm cm <sup>3</sup> /s
mbar l/s	1	0.1	59.2	0.75	0.987
Pa m <sup>3</sup> /s	10	1	592	7.5	9.87
sccm	$1.69 \cdot 10^{-2}$	$1.69 \cdot 10^{-3}$	1	$1.27 \cdot 10^{-2}$	$1.67 \cdot 10^{-2}$
Torr l/s	1.33	0.133	78.9	1	1.32
atm cm <sup>3</sup> /s	1.01	0.101	59.8	0.76	1

**Tbl. 12: Conversion table: Units for gas throughput**

### 18.2 Technical data

Part number	PT G28 212
Part_no_SAP	2000219991
Connection flange	DN 16 ISO-KF
Measuring method	Piezo, Pirani
Measuring range	5E-5 – 1.2E3 hPa
Measurement range P-Relative	-1.06E3 – 3.4E2 hPa
Pressure max.	10000 hPa
Memory rate	20 ms - 60 s
Accuracy of measurement in range 1	10 % (of measured value) (1E-3 hPa – 4E1 hPa)
Repeatability in range 1	0.1 % (full scale) (4E1 hPa – 1.2E3 hPa)
Accuracy of measurement in range 2	0.3 % (full scale) (4E1 hPa – 1.2E3 hPa)
Repeatability in range 2	2 % (of measured value) (1E-3 hPa – 40 hPa)
Measuring accuracy in range P-Relative	0.25 % (full scale) (-1.06E3 hPa – 3.4E2 hPa)
Display	LCD graphic display, resolution 400 x 240
Battery type	Integrated Li-Ion battery (3500mAh)
Charging voltage	5 VDC via USB-C connection
Battery runtime	≥ 100 h
Protection degree	IP40
Electrical connection	USB-C
Interface: Type	USB-C
Ambient temperature	5 – 50 °C
Temperature: Storage	-20 – 60 °C

<b>Part number</b>	<b>PT G28 212</b>
Materials in contact with media	Stainless steel 1.4307 (AISI 304L), Tungsten, Nickel, Silicon oxide, Glass, SnAg solder, Polyamide, Epoxy
Weight	0.25 kg

Tbl. 13: Technical data

### 18.3 Dimensions

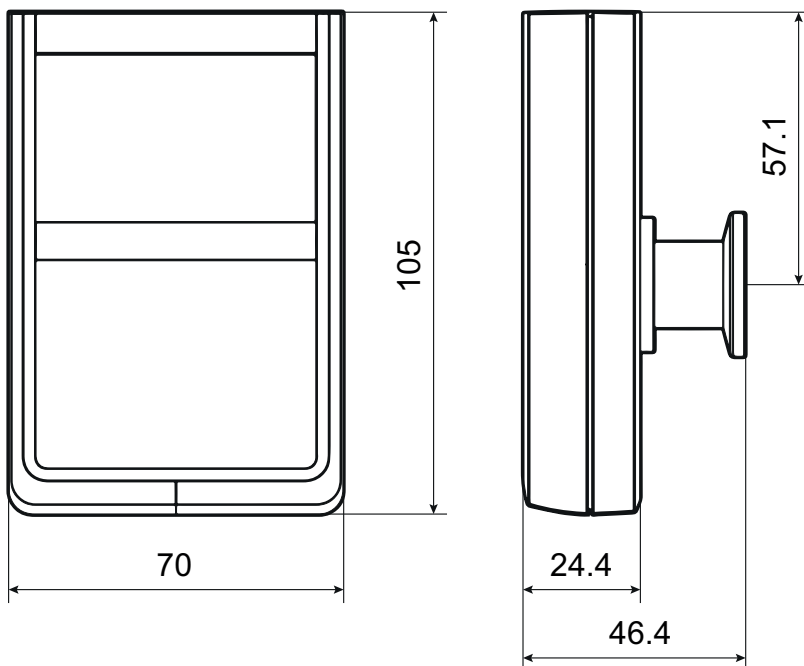


Fig. 39: Dimensions  
Dimensions in mm

# EC Declaration of Conformity

Declaration for product(s) of the type:

**Handheld measurement instrument**

TPG 202 Neo

We hereby declare that the listed product satisfies all relevant provisions of the following **European Directives**.

**Low voltage 2014/35/EU**

**Electromagnetic compatibility 2014/30/EU**

**Radio systems 2014/53/EU**

**Restriction of the use of certain hazardous substances 2011/65/EU**

**Restriction of the use of certain hazardous substances, delegated directive 2015/863/EU**

**Harmonized standards and applied national standards and specifications:**

EN 61326-1:2013, group 1, class B

EN 301 489-1 V2.2.3

EN IEC 63000:2018

EN 301 489-17 V3.2.4

EN 300 328 V 2.2.2

EN 62311: 2008

EN 61010-1: 2010

---

Signature:



Pfeiffer Vacuum GmbH  
Berliner Straße 43  
35614 Asslar  
Germany

---

(Daniel Sälzer)  
Managing Director

---

Asslar, 2024-08-01



# UK Declaration of Conformity

This declaration of conformity has been issued under the sole responsibility of the manufacturer.

Declaration for product(s) of the type:

**Handheld measurement instrument**

TPG 202 Neo

We hereby declare that the listed product satisfies all relevant provisions of the following **British Directives**.

**Supply of Machinery (Safety) Regulations 2008**

**Electrical Equipment (Safety) Regulations 2016**

**Electromagnetic Compatibility Regulations 2016**

**The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012**

**Applied standards and specifications:**

EN 61326-1:2013, group 1, class B

EN 301 489-1 V2.2.3

EN IEC 63000:2018

EN 301 489-17 V3.2.4

EN 300 328 V 2.2.2

EN 62311: 2008

EN 61010-1: 2010

The manufacturer's authorized representative in the United Kingdom and the authorized agent for compiling the technical documentation is Pfeiffer Vacuum Ltd, 16 Plover Close, Interchange Park, MK169PS Newport Pagnell.

Signature:



Pfeiffer Vacuum GmbH  
Berliner Straße 43  
35614 Asslar  
Germany

(Daniel Sälzer)  
Managing Director

Asslar, 2024-09-11

**UK  
CA**

## VACUUM SOLUTIONS FROM A SINGLE SOURCE

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

## COMPLETE RANGE OF PRODUCTS

From a single component to complex systems:

We are the only supplier of vacuum technology that provides a complete product portfolio.

## COMPETENCE IN THEORY AND PRACTICE

Benefit from our know-how and our portfolio of training opportunities!

We support you with your plant layout and provide first-class on-site service worldwide.

ed. A - Date 2409 - P/N:PG0031BEN



Are you looking for a  
perfect vacuum solution?  
Please contact us

Pfeiffer Vacuum GmbH  
Headquarters • Germany  
T +49 6441 802-0  
info@pfeiffer-vacuum.de

[www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)

**PFEIFFER**  **VACUUM**