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Translation of the
original operating instructions

Pressure Test Kit
PMS3000

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Dimensions

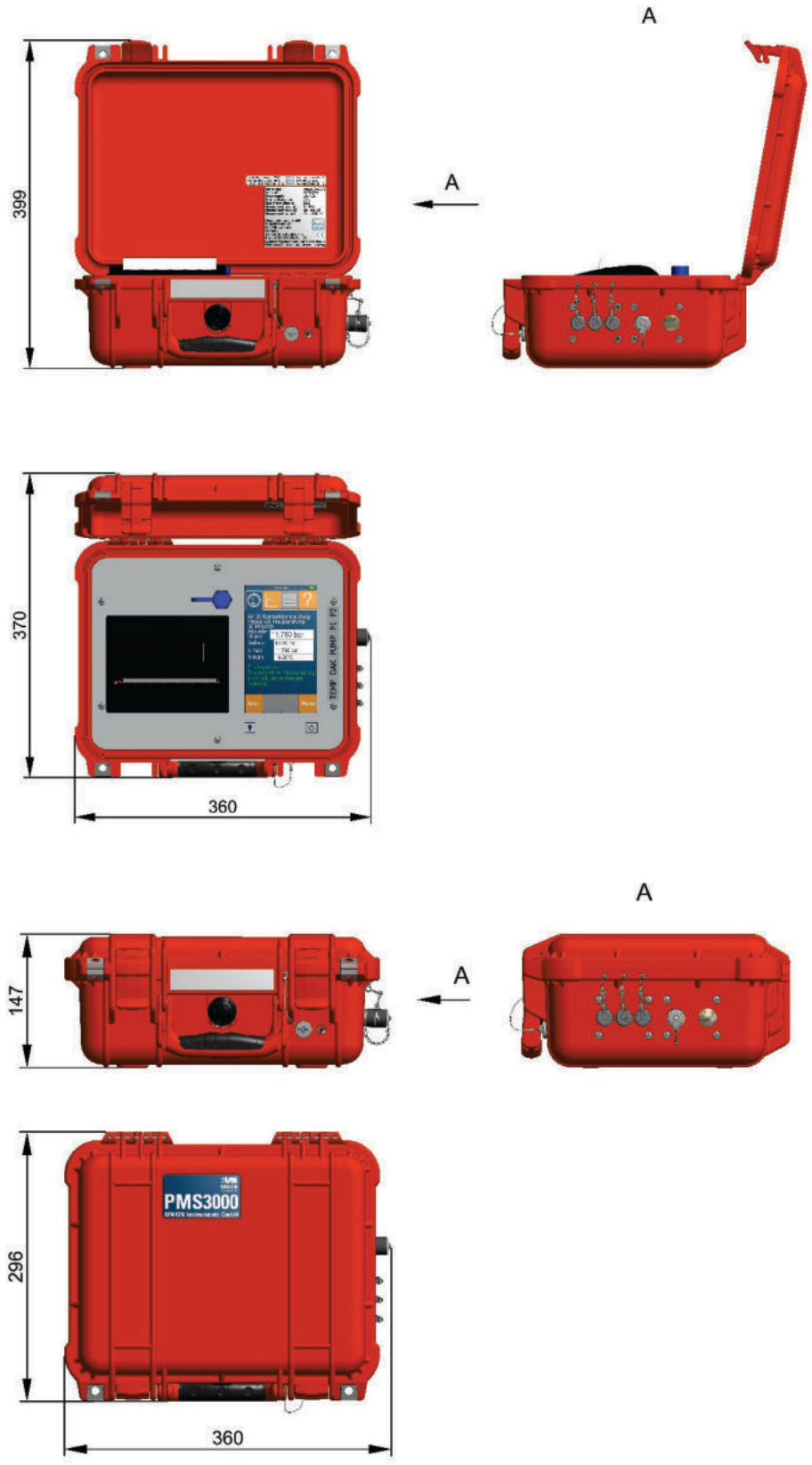

Fig. 1.1: Pressure test kit dimensions

PMS3000 versions and product code

The PMS3000 pressure test kit is available in the following versions:

- PMS3170
  The device is equipped with a 7” display and a printer.

- PMS3150
  The device is equipped with a 4.3” display and a printer.

- PMS3050
  The device is equipped with a 4.3” display; no printer present.

Operation of the devices is identical. With the PMS3050, logs cannot be printed out directly; printing must be performed with a Windows PC.

The product code – key for device and first pressure sensor – consists of two groups. The first four digits describe the device (display, printer), the next four describe the measurement range. See table of pressure sensor measurement ranges

Measurement ranges and measuring accuracy

The PMS3000 can support up to two separate pressure sensors. The second pressure sensor can be retrofitted. Various measurement ranges are available depending on equipment.

Pressure sensor measurement ranges

Pressure sensors Measurement range	Suitable for Application	Standard	Product code
0–300 mbar absolute	Sewers	EN 1610	PMS3XX0-0003S
0–1 bar absolute	Interior gas installation	Problem analysis of the gas supply	PMS3XX0-0010S
-1–1 bar absolute	Vacuum tests	EN 1610	PMS3XX0-0020S
0–7 bar absolute	Gas supply + building gas connection	G469 (A) B3	PMS3XX0-0070S
0–35 bar absolute	Gas supply lines MOP ≤ 5 bar Drinking water supply lines	G469 (A) B3 W400-2	PMS3XX0-0350S
0–150 bar absolute	Gas supply lines > MOP 5 bar	G469 (A) A2/B2	PMS3XX0-1500S
0–500 bar absolute	Industry	Expert	PMS3XX0-5000S

It also has an internal temperature sensor; a second external sensor can be connected as an option.

Temperature sensor measurement ranges

Temperature sensor Measurement range	Suitable for Application
-10–40 °C	For all applications, typically underground cable and pipeline temperatures

Technical data

Measuring inputs

No. of measuring points:	2 pressure connections; 1 temperature sensor
Pressure input:	Lead 1620
Max. input pressure:	Based on sensor type; max. 1.3x measuring range [1)]
Max. medium temperature	40 °C
Temperature input:	-10–40 °C

Voltage supply

Internal battery:	12 V 9000 mAh rechargeable NiMH
Operating time:	Approx. 150 hours, measuring mode, display off Approx. 55 hours, PMS3150 (4.3” display) measuring mode with display, display brightness 50% Approx. 40 hours, PMS3170 (7” display) measuring mode with display, display brightness 50%
IP rating:	IP66 when kit closed
External power supply:	100–240 V, max. 36 W power consumption, 3 A output current, 12 V output voltage, protection class II, incl. US/UK/Australia adapter

External ports

Dig. interface:	Micro-USB 2.0
Pump controller	8-pin plug connector
Pressure relief kit, calibration ESS3	7-pin plug

Environmental conditions

Operating temperature:	-10 - +40 °C[*)]
Humidity:	0–95% relative humidity
Storage temperature:	-20 – +60°C[*)]
	[*)] with liquid test media >0°C

Weight and dimensions

Weight:	Approx. 4.5 kg without accessories
Kit length:	35 cm
Kit width:	30 cm
Kit height:	15 cm

[1] Overview of max. input pressure

Pressure sensor measurement range	Product code	Max. input pressure
0–300 mbar absolute	PMS3XX0-0003S	390 mbar
0–1 bar absolute	PMS3XX0-0010S	1.3 bar
-1–1 bar absolute	PMS3XX0-0020S	1.3 bar
0–7 bar absolute	PMS3XX0-0070S	9.1 bar
0–35 bar absolute	PMS3XX0-0350S	39 bar
0–150 bar absolute	PMS3XX0-1500S	195 bar
0–500 bar absolute	PMS3XX0-5000S	650 bar

Back-up battery

The back-up battery for date and time has a service life of 10 years.

Name plate

Data, information on name plate

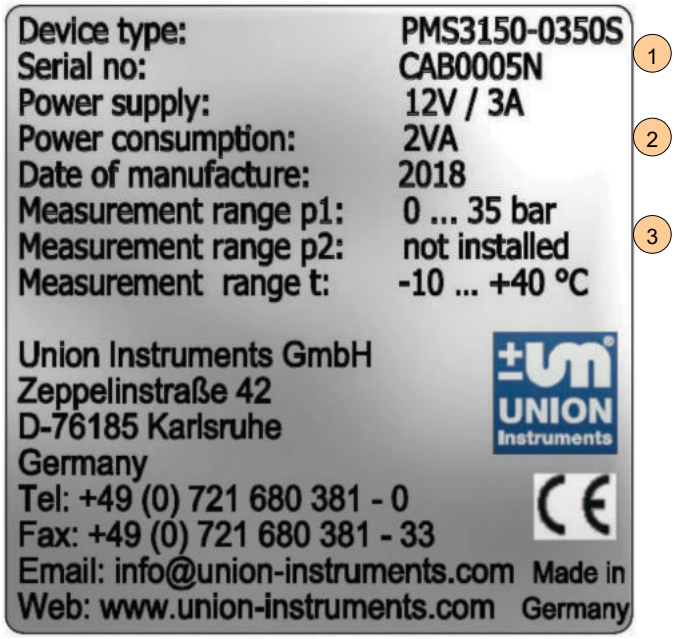

Fig. 1.2: Name plate (example)

1. Device type/product code
2. Technical information
3. Sensor measurement ranges

⚠ NOTICE

Using the PMS3000 outside of the specified ambient conditions will negatively affect the measurement results. The device can be seriously damaged. Risk of injury from exploding parts.

Liquids may freeze.

⚠ NOTICE

Use of the PMS3000 requires accessories which are under pressure. Improperly handled accessories may be ejected.

Risk of injury from ejecting parts.

Do not disconnect lines/connections that are under pressure. Release pressure completely before removal.

Max. pressure is 1.3x the measurement range depending on the sensor used; see technical data.

Table of contents

1 EU Declaration of Conformity

2 Safety instructions

2.1 Warning information and symbols

These operating instructions use the following nomenclature and symbols for especially important information:

DANGER

For an immediate danger that can lead to serious physical injury or death!

WARNING

For a potentially dangerous situation that can lead to serious injury or death.

NOTICE

For a potentially dangerous situation that will result in slight injury. This may also be used for warnings of property damage.

NOTE

For information that can improve the operation of the pressure test kit or contribute to the prevention of property damage.

2.2 Principle, intended use

The PMS system is designed to test for leakage and measure pressure in pipes and plants.

It is intended for use with gas and water supplies, pipelines (long-distance heating, plant construction) and process technology (chemical industry, process engineering).

The PMS3000 pressure test kit tests for leaks in gas and water supplies in accordance with DVGW G469 (A) and W400-2.

The PMS3000 pressure test kit is portable and designed for mobile use outside of enclosed areas. When closed, the kit meets protection class IP67.

When connecting to pressure lines, observe applicable on-site conduct and safety regulations.

The PMS3000 is not designed or suitable for use in explosive atmospheres. Tests may be performed with natural gas.

Observe applicable on-site safety regulations when working with toxic gases.

Any use beyond the above is not considered intended use. The manufacturer is not liable for damage resulting from unintended use; the owner/operator assumes all risk.

⚠ WARNING

Intended use also includes observance of these operating instructions! In addition to the following safety instructions, always observe the safety instructions for connected accessories.

Additional equipment or accessory parts not installed, supplied, or made by UNION Instruments GmbH require manufacturer's approval by UNION Instruments GmbH! Any warranty is otherwise voided!

The operating instructions are also found as a PDF file in the “manual” folder on the SD card in the PMS3000.

2.3 Personnel and qualification

Only skilled personnel observing safety regulations may work on the electrical system and mechanical connections of the pressure test kit.

2.4 Safety instructions

2.4.1 General safety instructions

⚠ WARNING

Compatibility of media to be tested – material compatibility

The user must determine whether the medium to be tested is compatible with the pressure test kit material! Incompatibility may result in damage that could lead to injury.

Parts made of the following material will come into contact with the tested medium:

Stainless steel 1.4301

NBR 70 rubber

⚠ WARNING

Only operate the PMS3000 pressure test kit

- **if all mechanical connections and accessories are in perfect working order!**

Additional safety instructions:

☞ Preceding the corresponding sections!

2.4.2 Information on specific hazards

⚠ WARNING

- **Any type of repair that requires opening the device should only be performed by instructed personnel.**
- **Always make sure accessories that connect to pressure lines are intact and functioning properly before use.**

2.5 Recurring operator training

NOTE

The owner must observe any country-specific regulations on recurring operator training, especially in regard to handling pressurized lines and accessories.

2.6 Performing a workplace risk assessment

NOTE

Regardless of the CE marking on the pressure test kit, national regulations may require that the owner prepare a risk assessment!

Further technical developments may result in deviations from these operating instructions. If you would like more information or if you encounter problems that are not covered in detail in this manual, contact us at the following address:

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3 Label

Fig. 3.1: Designation Name plate

1. Name plate

4 Connections

Fig. 4.1: Product description

1. Pressure input, 2 Measuring port, optional
2. Pressure input, 1 Measuring port, standard
3. Pump controller input, (optional)
4. DAK2060 pressure relief kit control, ESS calibration
5. Temperature sensor input/measuring port
6. Status LED
7. Power supply charging socket
8. On/off switch
9. Display light, on/off – brightness levels
10. Thermal printer
11. USB port (slave)

NOTE

Up to 3 sensors can be connected:

2 internal pressure sensors and 1 external temperature sensor.

4.1 Accessories

WARNING

Risk of injury/damage!

Using non-approved accessories may cause damage and put persons at risk. Such use voids the warranty. The owner is then liable for any resulting damage!

Only use genuine accessories or accessories approved by UNION Instruments GmbH.

5 Transport, setup and acceptance

NOTE

The PMS3000 pressure test kit comes ready to use. Make sure it is complete, intact and functioning properly before initial use!

Notify UNION Instruments GmbH or your distributor/retailer of any irregularities.

Charge the battery with the included power supply for at least 6 hours before initial use (see Chapter 6).

5.1 Transport

⚠ NOTICE

Avoiding damage

Always close the PMS3000 pressure test kit when transporting. Disconnect external sensors, accessories and cables.

Avoid dropping the kit – minor injury may occur.

NOTE

If there is transport damage indicative of improper handling, have the carrier (rail, post, shipping company) conduct a damage assessment immediately.

5.2 Environmental conditions

NOTICE

Observe environmental conditions for storage and setup.

Make sure environmental conditions are met. Residual liquids may freeze at temperatures below 0 °C and cause damage.

5.2.1 Storage conditions

Frozen water in the pressure test kit may cause damage. Completely drain the pressure test kit before storing and protect against frost.

Ambient temperature:	-20–60 °C
Air humidity:	0–95% relative humidity

5.3 Usage site and setup

5.4 Usage site

The usage site of the pressure test kit must meet the following conditions:

- No exposure to splash water or rain when open

WARNING

Outgoing media (air, water) may be under pressure and pose a risk.

Before removing or connecting accessories, it is necessary to release all pressure!

5.4.1 Pressure testing

NOTE

- **Accessories must be clean and free of residue. Contaminants may enter the pressure test kit and cause faulty measurements and/or damage.**
- **Do not allow the input pressure for the measuring ports to exceed 1.3x the measurement range in bar.**
- **Check each connection carefully for leaks. Leaks can cause pressure loss and faulty measurements.**
- **Lead must be free of contamination/particles.**

DANGER

Risk of injury!

Improper use may damage pressurized parts. Risk of injury from exploding or ejected parts.

Follow owner rules and safety measures.

Interfaces

Fig. 5.1: Interfaces

Item No.	Designation
1	USB (slave): access internal memory, transfer test sequences, read out test results (PDF, CSV)
2	Electrical connections: communication with pump control, pressure relief kit, calibration ESS
3	Power supply charging socket Battery charging

5.4.2 Owner safety precautions

⚠ WARNING

- **Discharge pressurized media in controlled fashion.**
- **Leads and connected accessories may be under pressure. Risk of injury from uncontrolled opening of connections.**
- **Tripping hazard from improperly placed leads.**
- **Determine the measurement range of the sensor being used at test pressure; exceeding max. pressure may damage the sensor/PMS3000!**

Set up an organized work area.

6 Startup/turning on

NOTICE

Charge the battery for min. 6 hours before initial startup.

We recommend taking the following steps before beginning a test to ensure safe use and a complete test sequence:

Steps	
Check whether the materials (stainless steel 1.4301, NBR) used in the kit are compatible with the test medium.	
Check whether the battery is sufficiently charged; for further information, see 6.1.	
Check whether the proper test sequence is on hand/loaded.	
Check whether there is sufficient printer paper.	
Check whether the proper sensors (measurement range) are installed.	
Check whether the proper accessories are available.	
Check whether the pressure connections are correct and sealed.	
Accessories	
Ports and connections in proper working order; no visible damage, deformation, cracks, unacceptable soiling	

6.1 Battery status

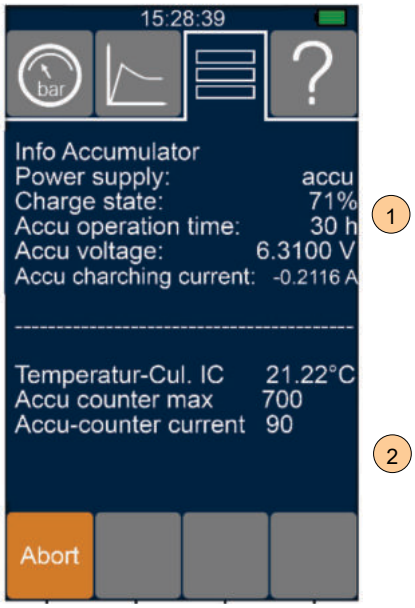


Fig. 6.1: Battery status display

Item No.	Designation
1	Current information on battery, charge state, possible operating time (estimate depending on use, environment, accuracy ±20%), voltage
2	Current data on battery use (battery counter), used for the internal calculation

NOTE

The status data of the battery provides an overview to allow estimates on the service life and capacity to be made.

The actual runtime during a test is also dependent on the ambient conditions.

7 Description of the interfaces/operator control elements

NOTE

This chapter only contains the elements for controlling the PMS3000 pressure test kit in measuring mode (normal mode).

7.1 Controls/features

Fig. 7.1: Controls/features

Item No.	Designation	Function/Activity
1	Display	Show status, operate device, monitor test sequence
2	Measuring ports	Connection to test leads
3	Accessory control	Connection for pump controller, controller for DAK2060 pressure relief kit and calibration ESS
4	Measuring port	Connection for temperature sensor
5	Charging port	Connection for power supply, charging battery Status - display LED
6	Printer	Output of measurement logs
7	USB port	Communication with PC

8 Operation

WARNING

Risk of injury!

Test pressure only if all connections and accessories are in proper working order and connected properly.

Do not disconnect lines/connections that are under pressure.

Release pressure completely before removal.

Observe owner instructions and training.

8.1 Description of display

8.1.1 Turning on membrane keyboard

Fig. 8.1: Switching on

Turn on the pressure test kit by pressing key 3 “On/Off."

Item No.	Designation	Function/Activity
1	Display	Display and operate the kit with on-screen buttons
2	Display button	Turn display on/off, set brightness in levels (35%, 50%, 75%, 100%)
3	On/off button	Turn the device on/off, long-press (3 seconds) to re-start/reset
4	LED	Device status using flashing/color-coded signals

8.1.2 Operating the display

The software controller is operated using a touch-sensitive display. The on-screen buttons shown can be selected by touching the display. The menu structures are deliberately kept flat so that functions can be accessed quickly.

⚠ NOTICE

Damage to keypad.

Using objects other than fingers to operate the keypad may cause damage.

NOTE

The display is resistive and can be operated with a stylus. Coarse soiling may scratch the display.

We recommend touching the display directly with your fingers or a stylus for precise, simple operation.

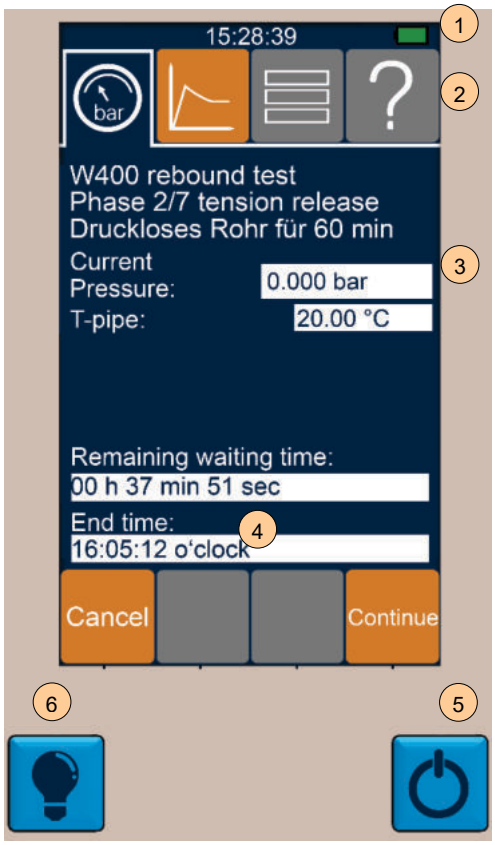


Fig. 8.2: Operator control elements

Item No.	Designation	Function
1	Status indicator	Displays current status, information and fault notifications
2	Function buttons	Go directly to views: 1 Test sequence; 2 Graph display; 3 Test sequences and system menu; 4 Information
3	Display	Displays values, measurement results and settings, preselects
4	Control buttons	Operates the menus and test sequence
5	On/off switch	Turns the device on/off
6	Display	Switches display on/off, sets brightness in levels (35%, 50%, 75%, 100%)

The brightness can be set with the Display button to levels 35%, 50%, 75%, 100%. Press the button in quick succession – two times within one second – to change to the next brightness level.

8.2 Icons and buttons

Buttons and icons are displayed in various colors depending on status and availability.

Dark blue	Active button
Orange	Enabled buttons and functions
Gray	Disabled buttons and functions
Green (text)	Values in normal range (values, text in green font)
Red (text)	Indicates exceeded tolerances, action prompt (text in red font)

8.3 Status display

8.3.1 Status bar

Fig. 8.3: Status bar

The top line of the display shows the following status information:

Display	Meaning
T	Temperature sensor connected and detected
P	Controllable pump is switched on by PMS sequence
Green	Battery fully charged
Yellow	Battery partially discharged
Red	Battery low, charge required
Flashing	Battery charging
Time	Current time
	Printing

Fig. 8.3: Status indicators

8.3.2 Status LED

The status LED next to the charging port indicates the following status information:

Display	Meaning
Flashing green	Device is turned on, normal operation
Flashing red quickly	Internal memory not detected
Flashing orange	Battery charging

8.4 Available displays

NOTE

The available displays and their function are described below. The displays are accessed using the menu and function keys shown in the chapter headings.

The controller operates based on the following structure. (Version 2.1.0)

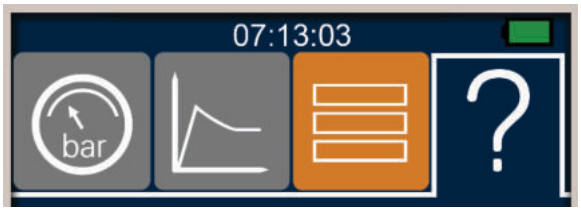
DVGW test sequences are based on applicable DVGW rules and regulations as of August 2018. The test sequence is described in detail in the rules and regulations.

8.4.1 Menu structure

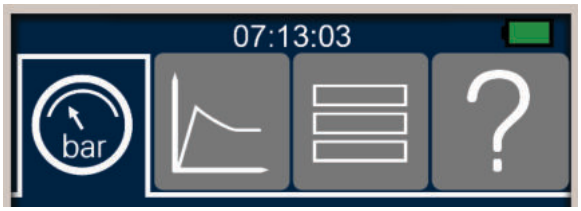
Main menu
- **Conduct test**
  - General test
  - Gas
  - Water
  - Sewage
  - Conduit
  - Problem analysis
- **System**
  - Version no.
  - Company address
  - Set system time
  - Measurement data
  - Display switch-off time
  - System switch-off time
  - Battery info
- **USB**
- **Language**

The menu structure refers to firmware version 2.1.0.

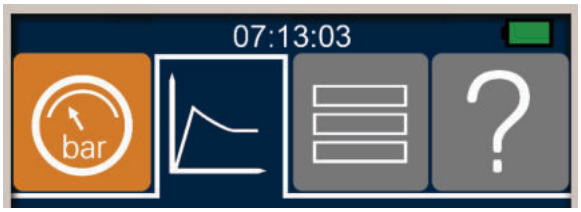
8.4.2 Navigating via function buttons



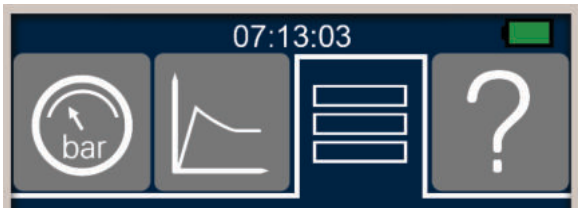
- Four function buttons for selecting various display options
- Disabled displays gray
- Enabled displays orange
- Active display blue



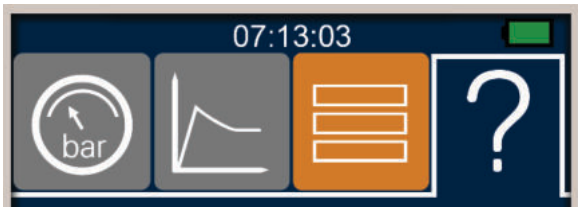
- Test sequence displays current phase of the test sequence
- Active once test sequence is selected from menu



- Graph display shows a progressive graph of the ongoing test
- Active once pressure test is started



- Menu displays the current menu level



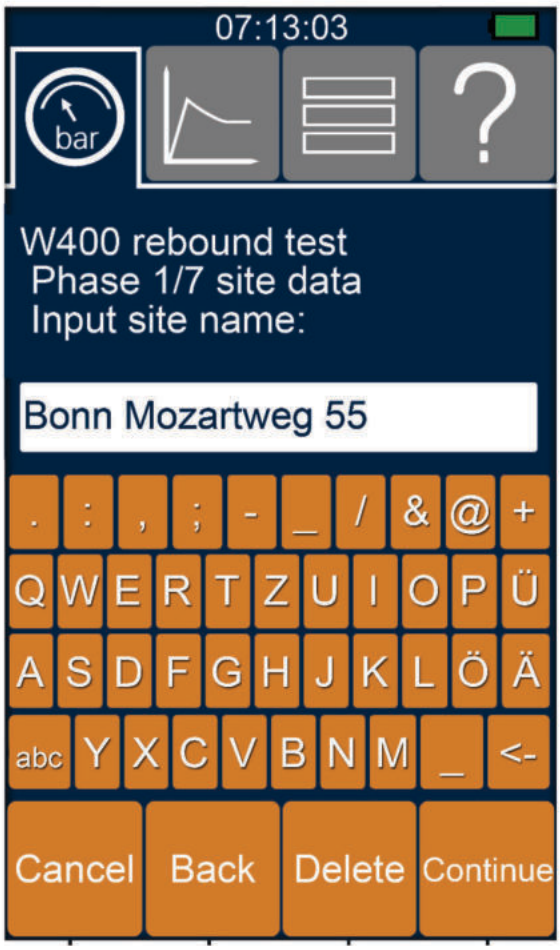
- ? Info displays help text for the current selection

8.4.3 Navigating via control buttons

- Buttons at the bottom of the screen for navigating menus and test sequences
- Button functions are contextual
- Possible functions: Next, Back, Up, Down, Yes, No, Cancel.

Entries made while navigating through the menu levels using NEXT are retained. If the Back button is used to navigate, new entries are not applied. Use Cancel to delete all entries and measurement values of the current test sequence; the display returns to the menu.

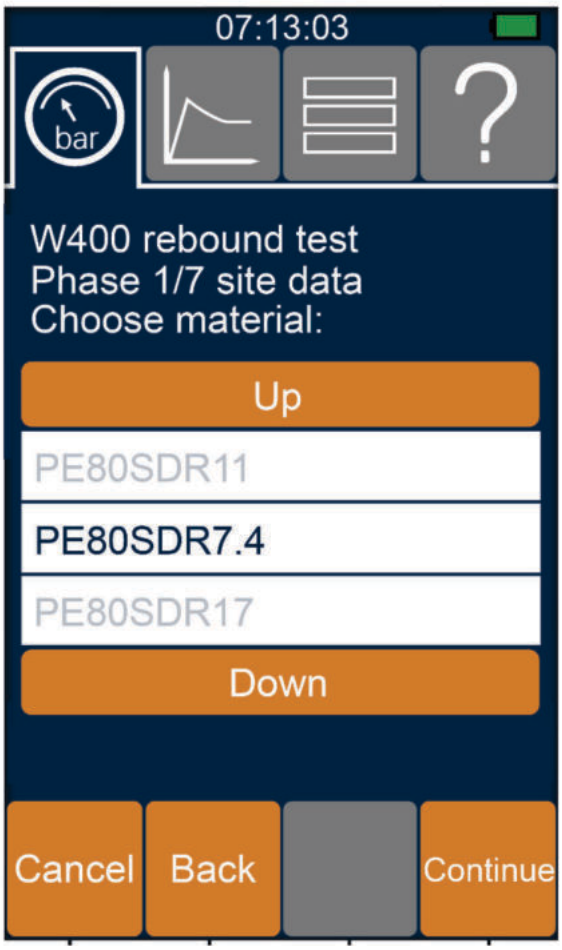
8.4.4 Input via virtual keyboard



- Virtual keyboard for entering information (site info shown here)
- Delete input with delete button <-
- Cancel, interrupts entry and returns to the menu
- Back, pages back to the last entry, new entries are not applied
- Delete, deletes current entry
- Next saves entry and goes to next screen

Display contents are an example – content and display are based on the test program used.

8.4.5 Input with list selection



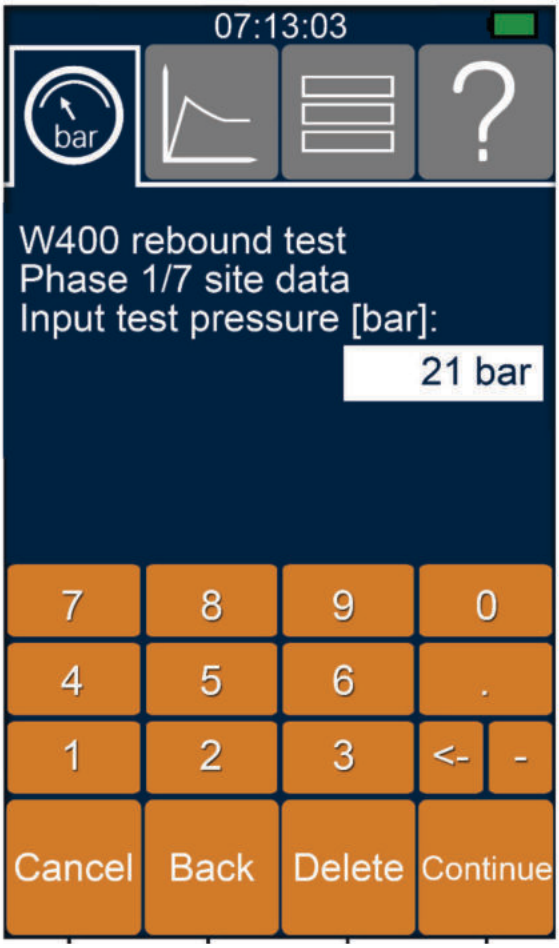
- Current selection dark at center
- Navigate list using Up button to go up and Down to go down
- Cancel, interrupts entry and returns to the menu
- Back, pages back to the last entry, new entries are not applied
- Next saves entry and goes to next screen

Display contents are an example – content and display are based on the test program used.

8.4.6 Input via numeric keypad

NOTE

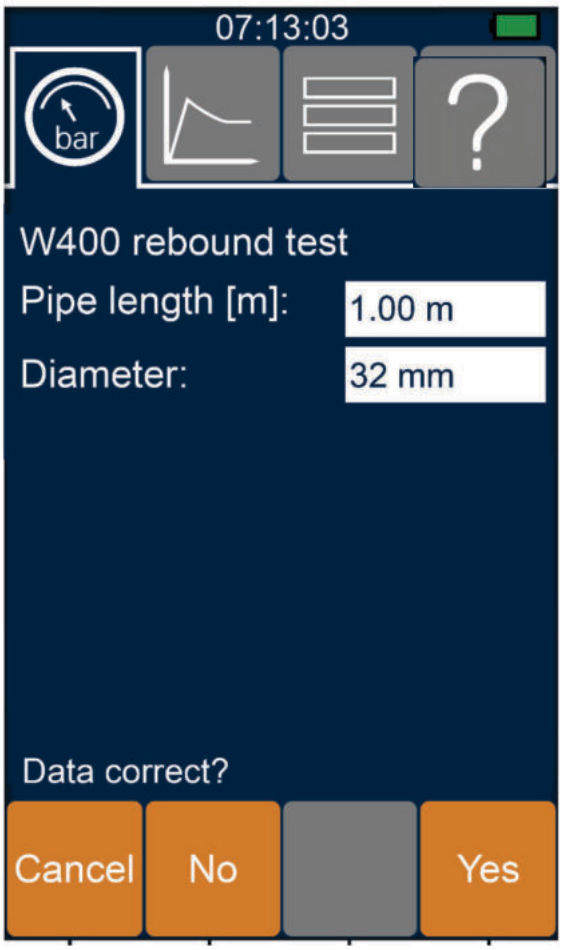
Depending on the test sequence, the unit of measure used for numerical input is bar or mbar!



- Virtual keyboard for entering information (test pressure shown here)
- Enter decimal values with .
- Delete entries with backspace button <-
- –, entry of negative data
- Cancel, interrupts entry and returns to the menu
- Back, pages back to the last entry, new entries are not applied
- Delete, deletes current entry
- Next saves input and goes to next input/screen

Display contents are an example – content and display are based on the test program used.

8.4.7 Starting test sequence



- Test sequence begins after confirming the pipe data
- Cancel, interrupts entry and test sequence and returns to the menu
- No, pages to the start of the data entry; previously entered data is retained and can be edited
- Next, confirms entries and starts test sequence

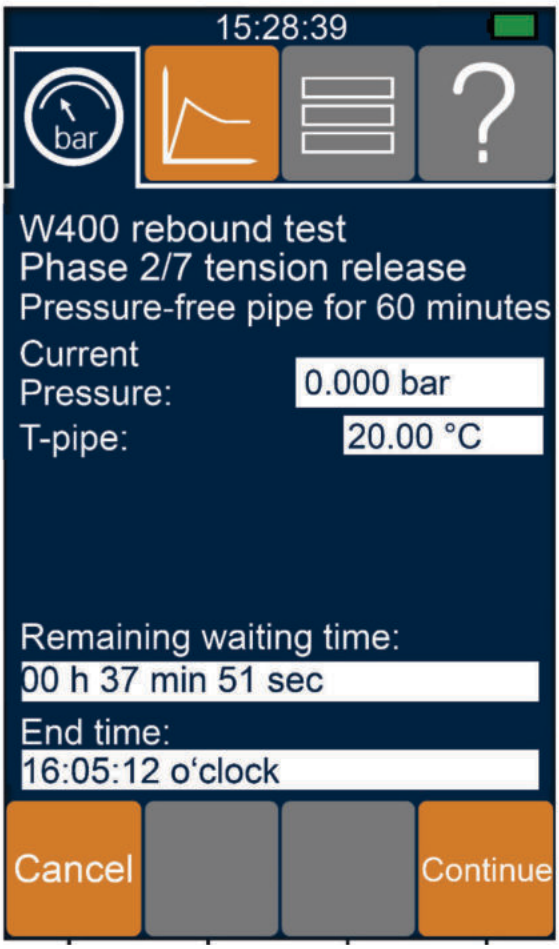
Display contents are an example – content and display are based on the test program used.

8.4.8 Test sequence display

NOTE

Test sequence starts, display shows progress and status.

Green text indicates action required.



- Displays progress, no input possible
- Test sequence phase
- Current test data
- Current parameters
- Waiting time and end time
- Cancel, cancels test sequence, deletes current entries and measurement values, returns to the menu
- Next ends the current test procedure phase early

Display contents are an example – content and display are based on the test program used.

Ending a phase early by pressing Next requires additional confirmation by pressing Yes in order to proceed to the next phase.

If the specified durations are not observed, the test procedure is no longer to standard.

8.5 Data

The PMS3000 saves data and information. The data can be downloaded via the USB port.

Tests are saved as logs in PDF format; the data is saved as a CSV file. The test sequences with all entered data and any faults are saved as log files.

Test sequences are stored in the internal memory as apps (applications).

NOTE

Additional test sequences can be uploaded.

Apps for test sequences are device-dependent and cannot be transferred to other devices.

⚠ NOTICE

Malfunction

The pressure test kit memory contains system data. Any change can result in malfunctions or loss of function.

Only access data in the "log", "pdf" and "csv" folders. Only save test sequences in the "script" folder; do not open or edit files.

8.5.1 Test data

Logs are saved in the PDF folder of the internal memory as PDF files. Test data is saved in CSV format in the "csv" folder.

Faults in the test sequences are stored in the log folder as text files.

Files are named using the following convention: timestamp_location of measurement. For example: 2016-06-16-121500_New York Broadway

Names recorded with the test, such as tester, site manager, are stored.

8.5.2 Operating instructions

The operating instructions are also found as a PDF file in the “manual” folder on the SD card in the PMS3000.

8.5.3 Logs

The pressure test kit can be used to generate logs of completed tests.

8.5.4 Printing with the log printer

NOTE

Printout is sensitive to light and may fade!

Printouts are thermal. Keep printout out of direct sunlight. Duration of storage also depends on storage temperature and humidity.

The printer cannot be operated while the battery is charging.

The PMS3050 does not have an integrated printer.

The log can be printed immediately after the test sequence has ended.

There are three options available:

- Text printout
- Complete graph
- Partial graph

8.5.5 Operating the log printer

The printer is controlled and turned on/off by the PMS3000 software. The printer status LED lights green once the printer is turned on.

Press and hold down button (1) on the printer to manually advance the paper.

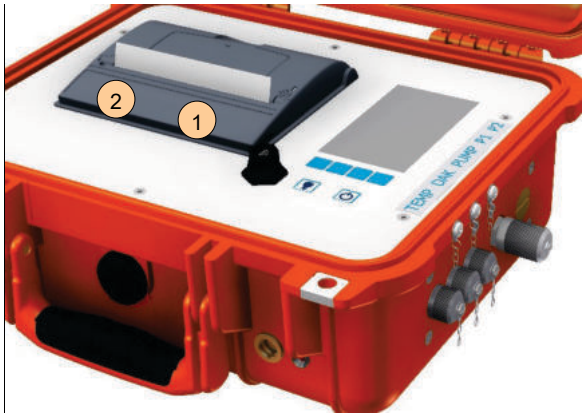


Fig. 8.4: Printer status LED and paper advance button

The printer status LED (2) flashes when a printer fault occurs, e.g., no paper.

8.5.6 PDF log file

PDF log files can be accessed via USB interface.

To do this, the PMS3000 is to be connected to the USB interface of a PC using a USB connection cable and the USB menu item then selected in the main menu. The PMS3000 data is available in Windows Explorer after approx. 20 seconds.

All created leak logs are available in the pdf folder. These can be copied to the PC for archiving and further processing.

NOTE

Data loss, damage to internal memory!

First safely remove and eject the “PMS3000” USB device and then disconnect the connection cable between computer and PMS3000.

For information on safely removing and ejecting the USB device, see description of computer operating system.

8.5.6.1 User-defined logo

A user-defined logo can be added to PDF log files.

The logo is inserted in the upper right edge of the PDF log.

Copy the logo as JPG file into the “logo” folder on the SD card of the PMS3000. Several JPG files can be stored in the “logo” folder.

Only the file with the name logo.jpg will be displayed on the PDF log file.

The logo will be scaled automatically. The width on the PDF log file is specified, the logo will be scaled to this width.

In case of unfavorable proportions, the top of the logo may be cut off.

8.6 UNION Bluetooth App

If the PMS3000 is equipped with Bluetooth functionality, the UNION Connect App can be used to operate the PMS3000 and tests downloaded as a PDF file.

So that the UNION Connect app can be coupled to a PMS3000, the PMS3000 must be equipped with a license.

8.6.1 Installation

Select the UNION Connect app in the Google Play Store and start the installation.

8.6.2 Starting and connecting to the PMS3000

After the initial start come the commands to connect to a PMS3000 – PMS3000 SEARCH as well as a notice that the app is calling up the device location.

NOTE

Calling up the device location

This authorization is required so that older versions of the Android operating system enable operation of the app. Device location is not used and forwarded by the app.

After starting the app, the smartphone must be coupled to the PMS3000; to do this, when the PMS3000 is switched on, press the Search PMS3000 button of the app.

The app displays the PMS3000 with its serial number; with a press of the button for the serial number, the app connects to the PMS3000.

After initial coupling and successful connection, it is possible to establish a connection with the PMS3000 directly by pressing the button. Different PMS3000s can be connected with the app.

8.6.3 Start page of the UNION Connect app

Start the app without a connection to a PMS.

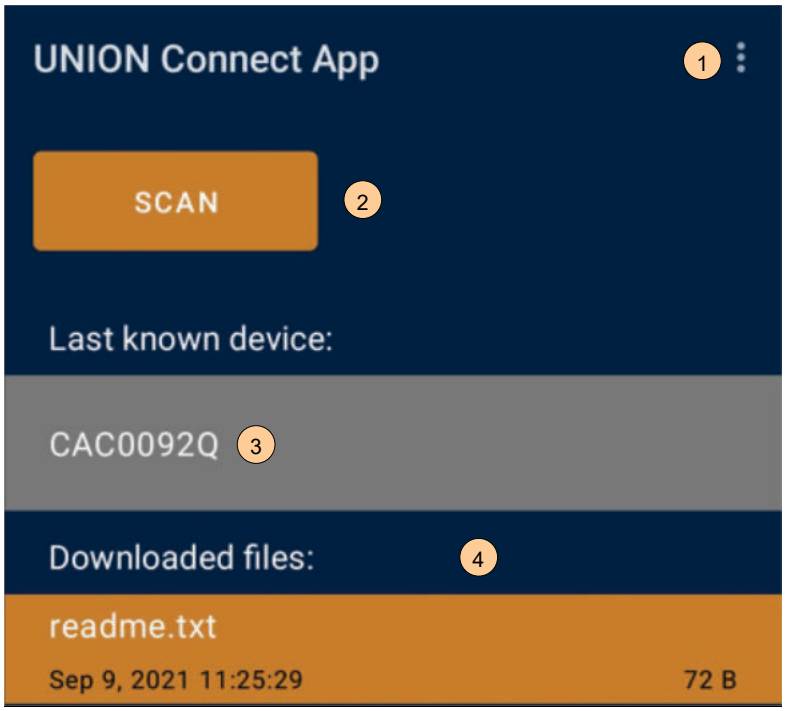


Fig. 8.5: Start page of the UNION Connect app (example)

Options menu (1) opens operating instructions or settings such as Edit Signature for PDF test logs.

Search for additional PMS3000 (2) or connect to last known device (3).

Files already downloaded from the PMS3000 (4) can be opened or deleted. A PDF viewer is required to display the PDF test logs on the smartphone and if needed, it must be installed separately. With the functions of the PDF viewer, it is possible to insert a created signature or to share or forward the log.

8.6.4 Connected to the PMS3000

App connected to a PMS3000.

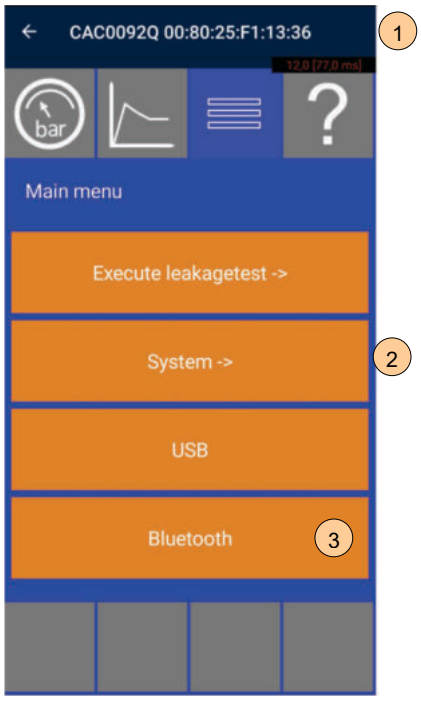


Fig. 8.6: UNION Connect app screen without connection to PMS (example)

The display of the PMS3000 (2) is displayed; operation of the PMS3000 with the smartphone is possible.

PDF test logs are loaded onto the smartphone with the button (3).

The status line (1) displays information about the connected PMS3000. The back arrow takes you to the app's start page and ends the connection to the PMS3000. The settings on the status line lead to the license management; it is possible to upload a logo.

NOTE

PMS3000 screen

If the display of the PMS3000 is switched off (8.1), a connection can be established with the PMS3000, and the device controlled with the app.

8.6.5 Usage agreement and data privacy

With the installation and use of the UNION Bluetooth File Manager app, you agree to the license conditions.

The trademarks named in this section are the property of their respective owners.

With use of the app, data about the use of the app can be collected and made available to UNION for evaluation. Via the settings on the start screen, you can activate/deactivate the Send Analytics option of the app.

Notices about the UNION Connect app's data privacy are in the appendix.

8.6.6 System requirements for the UNION Connect app

The UNION Connect app is available for mobile devices with the Android operating system in the Google Playstore.

The app is intended for smartphones with the Android operating system. The smartphone must have a Bluetooth interface.

Android operating system Version 5.0 or higher
Bluetooth Version 4.0 or higher
Display at least 480x320 pixels (HVGA), at least 3.2”/8.13 cm diagonal screen

9 Decommissioning/turning off

⚠ NOTICE

To decommission the pressure test kit, first decommission connected system components according to their operating instructions.

Risk of injury from pressurized lines and accessories!

NOTE

The following table contains steps for decommissioning for extended periods.

Some steps can be skipped if only turning the pressure test kit off for a short time:

☞ Switching off column!

Steps	Switching off	Decom-mission-ing
Turn off device	X	X
Relieve all pressure lines to ambient pressure		X
Remove connected lines and cables		X
Seal ports with caps, making sure ports are clean (threads)		X
Close kit		X

10 Maintenance

The quality of pressure test kit measurements can only be guaranteed when the maintenance and calibration intervals are observed. Tests under DVGW G469 (A) and W400-2 Part 16 require annual calibration.

10.1 Calibration intervals

UNION Instruments recommends calibration yearly. UNION offers a calibration service.

10.2 Replacing printer paper

Open the cover by slightly lifting the panel with a finger and pulling upward. Thermal paper is generally only printable on one side. The thermal paper has to be unrolled a few centimeters and inserted so the printable exterior is facing the printing mechanism and the interior is facing the open lid. Close the cover by pressing it down firmly until it clicks into place. The paper should now be firmly clamped between the rollers in the cover and the printing mechanism.

NOTE

When inserting the paper roll, make sure the printable side is facing up when unrolling.

Sand or dirt in the printer can cause the print head to fail or be damaged.

After changing the paper or canceling printing, wait 20 seconds; then printing is possible again.

10.3 Cleaning

10.3.1 Cleaning the printer

Open the cover by slightly lifting the panel with a finger and pulling upward.

Light soiling and dust can be removed with a small brush.

Use a cotton swab soaked in isopropyl alcohol to carefully remove heavier soiling from sensitive surfaces.

Close the cover by pressing it down firmly until it clicks into place.

10.4 Maintenance/Inspection

DVGW rules and regulations require routine calibration.

The PMS3000 displays a notice as soon as the calibration has expired. The notice must be confirmed with the Next button; the PMS3000 remains operational.

A reminder is displayed six weeks prior to expiration of the calibration interval.

The reminder is repeated prior to the start of every test sequence.

NOTE

Calibration date – The calibration date is listed in the test log!

11 Troubleshooting

Press and hold (min. 3 seconds) the "On/off" button to reset the device (restart/reset function).

11.1 Preparations

Disconnect all leads and pressure accessories/connections from the pressure test kit.

WARNING

Risk of serious injury from pressurized parts!

- **Discharge all pressure accessories and connections before starting.**

Risk of injury from live parts!

- **Disconnect the power supply and charging cable.**
- **Short-circuits in the battery and its connectors can result in damage and injury.**

11.2 Notifications/malfunctions on the display

11.2.1 Display of notifications/malfunctions

Notifications/faults are displayed in a separate dialog as a four-digit code; these must be confirmed with the Ok button.

In addition to the fault code, an info text is displayed for interpreting the fault.

Furthermore, all fault messages are also recorded in the log folder in the corresponding log files.

11.3 Display frozen

By pressing the Display/illumination button, the display can be re-initialized if it is frozen.

11.4 Display without function

If the battery of the PMS3000 was deep discharged, the battery must be charged for at least 10 minutes before the PMS3000 can be switched back on again.

11.5 Firmware update

The firmware of the PMS3000 is continually developed further. Should a firmware update be necessary by the user for stability reasons, this can be performed by the user.

UNION provides firmware and information on installation.

The firmware version can be checked via the “System/Version number” menu item.

12 Service

NOTE

UNION Instruments GmbH is available to answer any questions.

For orders or technical questions, please provide your customer number, phone number where you can be reached, pressure test kit type and number (see name plate) and any required spare parts/bills of materials numbers.

The internal memory of the PMS3000 contains all data of the previously performed test sequences, see also 8.5!

UNION Instruments GmbH - Service

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13 Related documents

- Pressure test kit declaration of conformity
- Power supply declaration of conformity
- Accessory operating instructions [1)]

[1)] If available

Related documents

14 Disposal

In case of decommissioning, you can return the device to UNION Instruments GmbH.

Suggestion: Have UNION Instruments GmbH dispose of your pressure test kit.

WARNING

Risk of injury from electricity in the battery!

NOTE

Observe national regulations for disposal of machines and working materials.

Sort parts by groups and have them recycled professionally.

15 Spare parts

WARNING

Use of non-approved spare parts (e.g., parts from other manufacturers, parts with different specifications, imitation consumables and wear parts) may cause damage and endanger people! Such use voids the warranty. The owner is then liable for any resulting damage!

When replacing standard components, use only identical components from the original manufacturer! Use of parts from other manufacturers (due to an original part having been discontinued) requires the approval of UNION Instruments GmbH.

Spare parts can be ordered from UNION Instruments GmbH:
☞ *Chapter 12 Service*.

Note the pressure test kit type and serial number *(☞ Name plate)*.

Identify and note of the order number, if necessary *(☞ Other applicable documents).*

Order part.

15.1 Typical consumables/replacement materials

Paper roll, VPE with 5 pieces/rolls	01401199988
PMS3000 power supply	17302199997
Lead 1620 4 ma	17301199988
DAK2060 pressure relief kit connection cable	17302199994

16 Appendix

Index

Figures

16.1 Notice about the handling of data with the UNION Connect app

We give you notices about the data that is collected by the UNION Connect app and is forwarded to UNION Instruments.

These notices should inform the users of the UNION Connect app about the type, scope, and purpose of the collection and use of the data by UNION Instruments GmbH.

Consider that data transmission on the Internet can essentially be considered with security gaps. Complete protection against access by foreign parties cannot be realized.

When handling the data from the PMS3000 and the data of the UNION Connect app, pay attention to careful, safe handling. Assess the risk of loss, of misuse, and ensure sufficient protection.

16.1.1 Access data

UNION Instruments collects data about the use of the UNION Connect app and stores it. The following data is logged:

- Information about the mobile end user device type, trivial name, operating system, and version of the operating system
- Information about language, region language of the operating system, regional data with country, state, community
- Assignment of the data to a code frequency, duration of use, first and last day of use

16.1.2 Data collection

In the settings of the UNION Connect app, the data transmission can be switched on/off at any time. See settings, Send Analytics option.

16.1.3 Data processing for a purpose, transmission to third parties

The data collected is used only for statistical evaluations and to improve the UNION Connect app. There is no transmission of the data to third parties by UNION Instruments.

16.1.4 Handling of personal data

According to Article 4 No. 1 GDPR, no personal data is collected. The data collected does not allow any link to a person, a mobile phone number or an identification number of the end user device.

16.1.5 Amplitude Analytics

The data is transmitted by the service “Amplitude Analytics,” which is offered by Amplitude, Inc., 631 Howard Street, Floor 5, San Francisco, CA 94105 for analysis of the use. Amplitude, Inc. also processes the above-mentioned data collected via Amplitude Analytics within the scope of its own data privacy declaration, which you can find with the following link: https://amplitude.com/privacy.

16.1.6 Duration of storage

UNION Instruments stores the data as long as is necessary to fulfill the purpose.