Instruction Manual

Vacuum Leak Tester
VDT/S
Version table

<table>
<thead>
<tr>
<th>Date</th>
<th>Document version*</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.05.2014</td>
<td>1.0</td>
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</tr>
<tr>
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<td>1.1</td>
<td>Editorial revision</td>
</tr>
<tr>
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<td>New firmware</td>
</tr>
<tr>
<td>07.03.2016</td>
<td>2.1</td>
<td>Editorial revision</td>
</tr>
<tr>
<td>07.12.2016</td>
<td>2.2</td>
<td>Editorial revision</td>
</tr>
<tr>
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<td>2.3</td>
<td>Editorial revision, new format (11/15)</td>
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<tr>
<td>15.05.2017</td>
<td>3.0</td>
<td>New firmware</td>
</tr>
<tr>
<td>08.06.2017</td>
<td>4.0</td>
<td>New firmware</td>
</tr>
</tbody>
</table>

* When the document version X.Y is increased, X means a technical change and Y – a document amendment only.
# Table of Contents

1 – Introduction 5  
1.1 – About this instruction manual 5  
1.2 – Service 5  
1.3 – Hints and symbols 6  
1.4 – Protection of the environment 6  

2 – Safety 7  
2.1 – Safety instructions 7  
2.2 – Intended use 7  

3 – Overview 8  
3.1 – Description 8  
3.2 – Construction 9  
3.3 – Type label 9  
3.4 – Operation elements and connections 10  
3.4.1 – Display 10  
3.4.2 – Keypad 10  
3.4.3 – Connections and main switch 11  
3.5 – Technical data 12  

4 – Installation 13  
4.1 – Storage and transport conditions 13  
4.2 – Unpacking and checking 13  
4.3 – Installation 13  
4.3.1 – Positioning 13  
4.3.2 – Acclimatization 13  
4.3.3 – Required installation environment 13  
4.4 – Connecting and switching the device on 14  

5 – Menu Structure 15  

6 – Configuration 16  
6.1 – Settings (SETT) 16  
6.2 – Input mode for the test time (TMOD) 16  
6.3 – Penetration time (PENE) 17  
6.4 – Inverted penetration (PINV) 17  
6.5 – Language of the user interface (LANG) 18  
6.6 – Identification number (ID) 18  
6.7 – Time and date 18  
6.8 – Firmware version of the device (VERS) 19  
6.9 – Exsiccator’s diameter (EXSI) 20  
6.10 – Serial number (DEV) 20  

7 – Device Check 21  
7.1 – Leak test (CONT) 21  
7.2 – Calibration (CALI) 22  
7.2.1 – Calibrating the VDT/S device 22  

8 – Entering the Test Parameters 24  
8.1 – Test time 24  
8.2 – Vacuum value 24  

9 – Tests 24  
9.1 – Preparation 24  
9.2 – Performance 24  
9.3 – Sample test 25  

10 – Printing the Protocols 26  

11 – Maintenance 28  
11.1 – Cleaning 28  
11.2 – Inspection and maintenance 28  
11.3 – Spare parts 29
1 – Introduction

Thank you for purchasing the ERWEKA vacuum leak tester type VDT/S.

1.1 – About this instruction manual

This instruction manual supports you in work with your ERWEKA device. It describes the device, its operation and gives you useful tips on its handling. Furthermore, read descriptions of installation and setting as well as detailed step-by-step work operations in the present manual. Pictures facilitate the understanding of processes described here.

The instruction manual is a part of the product. Read this manual completely and make sure you understand its content. Keep this manual in a safe place so that it will be available for any questions at a later date. This is important for warranty of permanent and accurate operation of the corresponding device.

The editorial team of ERWEKA appreciates your feedback regarding the present manual. Just send an e-mail to quality@erweka.com with your topic and “technical documentation” as a subject. Your reply contributes to our high quality level.

1.2 – Service

Contact ERWEKA at support@erweka.com to order spare parts, in case of technical questions or possible repairs. Please supply the following information:

- Type of the device (on the type label)
- Serial number of the device (on the type label)
- Short description of the case
1.3 – Hints and symbols

**WARNING** indicates a possible hazardous situation which, if not avoided, could result in death or serious injury.

**HAZARD** of electric shock! Indicates a possible hazardous situation which, if not avoided, can lead to injuries caused by electric shock.

This symbol indicates a possible hazardous situation which, if not avoided, can lead to equipment damage.

This symbol emphasizes the information to ensure a smooth work process.

This symbol provides you with additional useful information.

1.4 – Protection of the environment

Note that product residues must be properly disposed of in accordance with the respective valid environmental legislation. According to the valid EC directives all the electrical parts (electrical scrap) must be disposed of appropriately.
2 – Safety

2.1 – Safety instructions

To guarantee the health and safety, read the following safety instructions before using the device.

**WARNING**
Wear the personal protective outfit and, if needed, the glasses!

**HAZARD** of electric shock! Electric devices are to be plugged into safety sockets only. Use the delivered power cable. The voltage of the existing power supply has to meet the requirements of the type label. Before installation works always switch the corresponding device off and disconnect it from the rear panel.

**NOTICE**
ERWEKA devices should be operated by qualified and trained personnel only.

Pay attention to the on-site safety instructions for work in the laboratory and with the laboratory equipment.

2.2 – Intended use

The ERWEKA vacuum leak tester type VDT/S should be used only for performing leak tests of tablet blister packs, associated verification and quality control. The requirements for installation environment defined by ERWEKA shall be met.

ERWEKA devices should **not** be used for processing:

- Products that are easily flammable or explosive
- Products that develop vapours which may create flammable or explosive mixtures in combination with air
- Products that release harmful or poisonous substances

The device should be operated and maintained only as it is foreseen and due to the instructions presented in this manual.
3 – Overview

3.1 – Description

The ERWEKA VDT/S serves for checking the integrity of tablet blister packs. With the pack integrity check the quality during the packing and filling process is ensured.

For a check the blister packs are immersed in the methylene blue solution inside the exsiccator. The blister packs must be fully covered with the liquid. For this purpose the porcelain plate delivered together with the exsiccator is placed onto the blister packs.

The exsiccator is connected to the VDT/S by means of a quick coupling. A vacuum pump is then used to evacuate the test chamber (exsiccator) to a predefined vacuum value. Once the vacuum value set previously has been reached, the test timer starts automatically and the vacuum is held for a predetermined interval, prior to being released and then allowed to equilibrate.

All leaking cells of the blister pack are evacuated when the vacuum is applied. When the vacuum is released, this process is reversed. The methylene blue solution is drawn into all faulty cells of the blister pack so that they can be identified immediately during a visual inspection.

The VDT/S contains the following components as a standard:

- Vacuum pump
- Vacuum filter with an exchange insert (positioned outside the housing)
- Solenoid valve to release the vacuum and equilibrate the system
- Quick coupling for connection of the exsiccator
- Control electronics with pressure sensor for control of the pump and valve
- Membrane keypad and two LED displays (user interface)

The operator should enter the vacuum value during the test and the test duration.
3.2 – Construction

The vacuum filter is attached externally on the device rear panel.

3.3 – Type label

The type label is placed on the rear panel of the device and contains following data:

- **Typ**: Device type
- **Serial No**: Serial number
- **P_n**: Rated output in volt-ampere [VA]
- **I_n**: Nominal current in ampere [A]
- **U**: Voltage in volt [V]
- **F**: Frequency in hertz [Hz]
3.4 – Operation elements and connections

The main switch for switching the device on and off as well as power connection and vacuum filter are located on the device rear panel. The operation happens through the control panel with display and keypad on the device front side. USB and RS 232 interfaces are located on the device right side.

3.4.1 – Display

The display surface consists of two LED displays.

![Left display](left display) ![Right display](right display)

3.4.2 – Keypad

<table>
<thead>
<tr>
<th>Key symbol</th>
<th>Description/Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲</td>
<td>Arrow keys; to scroll through the menus and submenus and select the values</td>
</tr>
<tr>
<td>▼</td>
<td>The Stop key; to pause and stop a test and exit the current menu</td>
</tr>
<tr>
<td>□</td>
<td>The Start key; to start a test and enter a selected menu</td>
</tr>
</tbody>
</table>

All data inputs are supported by a beep tone. The beep tone confirms that the command has been accepted and carried out.
3.4.3 – Connections and main switch

The main connections such as the power and vacuum connections are located on the device rear panel:

1) Main switch
2) Fuses
3) Power connection
4) Type label
5) Vacuum filter
6) Vacuum connection

Printer and PC can be connected through the corresponding ports on the device right side:

7) USB A for printer connection
8) USB B for PC connection
9) Diode for USB B
10) RS 232 for PC connection
3.5 – Technical data

**Dimensions (without exsiccator)**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height [mm]</td>
<td>166</td>
</tr>
<tr>
<td>Width [mm]</td>
<td>300</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>340</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>7</td>
</tr>
<tr>
<td>Exsiccator’s diameter [mm]</td>
<td>150 (PC and PP)</td>
</tr>
<tr>
<td></td>
<td>200 (PC and PP)</td>
</tr>
<tr>
<td></td>
<td>250 (PC and PP)</td>
</tr>
<tr>
<td></td>
<td>300 (glass)</td>
</tr>
</tbody>
</table>

**Power supply**

- 220 – 240 VAC / 50 – 60 Hz
- 100 VA

**Vacuum**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustable reduced pressure range</td>
<td>–100 to –700 mbar (exsiccator: Ø 300 mm)</td>
</tr>
<tr>
<td></td>
<td>–100 to –900 mbar (exsiccator: Ø ≤ 250 mm)</td>
</tr>
<tr>
<td>Absolute pressure range (related to atmospheric pressure)*</td>
<td>≥ 120 mbar</td>
</tr>
</tbody>
</table>

**Test run timer**

- Adjustable range: 99 hrs. 59 min. +/-0.1%
- 99 min. 59 sec. +/-0.1%

**Safety**

<table>
<thead>
<tr>
<th>Protection class</th>
<th>Protection type</th>
</tr>
</thead>
<tbody>
<tr>
<td>I / EN 61140</td>
<td>IP 21 / IEC 529</td>
</tr>
</tbody>
</table>

* The absolute pressure is the difference between the actual atmospheric pressure and the reduced pressure.

### Absolute pressure

The absolute pressure for the accurate function of the device must constitute at least 120 mbar.

**Calculation example:**

If you have the atmospheric pressure of 1008 mbar, to calculate the maximum reduced pressure for the device, you should do the following calculations: 1008 – 120 = 888 mbar. So, when entering the reduced pressure for the device, you must specify values equal to or less than 888 mbar.

### Time for producing a vacuum

The time for producing a preset vacuum value differs. It depends on the diameter of the used exsiccator. The different times for producing a vacuum with a value of 800 mbar depending on exsiccators of different diameters are listed in the table below.

<table>
<thead>
<tr>
<th>Exsiccator Ø</th>
<th>150 mm</th>
<th>200 mm</th>
<th>250 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time for producing 800 mbar</td>
<td>0:57 min.</td>
<td>1:58 min.</td>
<td>3:49 min.</td>
</tr>
</tbody>
</table>
4 – Installation

4.1 – Storage and transport conditions

The device should not be exposed to punches and vibrations.

Temperature and humidity should not exceed or fall below the values defined by ERWEKA (see 4.3.3 – Required installation environment).

4.2 – Unpacking and checking

After receipt of the delivery, check the packaging and the device for transport damage.

On some packages you can see indicator labels, which change their colors in case of improper transporting. Check these labels for discoloration.

If undue transporting or any damage is evident, take a photo of this and send it to our ERWEKA Service immediately.

4.3 – Installation

4.3.1 – Positioning

Position the device on a horizontal, plane, stable surface, e.g. on a laboratory table, and pay attention not to displace it during the operation.

For ease-of-use and accessibility, when positioning the device ensure that there is sufficient distance towards walls, cabinets or other fixed components of the facility.

Besides sticking to the requirements for installation environment defined by ERWEKA, avoid the following:

- Heat (heating, insolation)
- Direct draft through open windows, doors or air conditioning and ventilating systems
- Vibrations
- Dampness

4.3.2 – Acclimatization

If a cold device is moved to a warm environment, condensation may occur. Therefore you should allow the device to acclimatize for approximately two hours at room temperature, leaving it unplugged.

4.3.3 – Required installation environment

- Ambient temperature in operation: +10°C up to +30°C
- Storage and transport temperature: -10°C up to +55°C
- Relative humidity: 25-80% / no condensation
4.4 – Connecting and switching the device on

Make the required device connections (see 3.4.3 – Connections and main switch).

The device is connected with the exsiccator through a quick coupling.

Plug the device into a safety socket. Use the delivered power cable.

**HAZARD** of electric shock! Electric devices are to be plugged into safety sockets only. The voltage of the existing current supply has to meet the requirements of the type label.

**NOTICE** ERWEKA accepts no liability in case of wrong connection. Defective devices are to be opened by the ERWEKA authorized staff only!

**Switching on/off**

Switch the device on/off using the main switch on the rear panel.

For switching on set the main switch to I (on).

For switching off set the main switch to 0 (off).

The device is ready for operation as soon as the welcome message ERWEKA VDTS is shown on the display.

Immediately after switching the device on the **TIME** menu is shown.

More information on configuration and test performance you will find in the corresponding chapters of this instruction manual.
5 – Menu Structure

The main menu of the VDT/S device contains the following submenus:

<table>
<thead>
<tr>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME (test time)</td>
<td>To specify the test duration.</td>
</tr>
<tr>
<td>VAC (vacuum value for a test)</td>
<td>To specify the vacuum value applicable for this test.</td>
</tr>
<tr>
<td>PRT (printout settings)</td>
<td>To specify the settings for the report printout.</td>
</tr>
<tr>
<td>CALI (device calibration)</td>
<td>To calibrate the device and check the calibration results.</td>
</tr>
<tr>
<td>CONT (test control)</td>
<td>To check if the device functions correctly and there are no leakages.</td>
</tr>
<tr>
<td>SETT (general settings)</td>
<td>To configure the general settings for the device.</td>
</tr>
</tbody>
</table>

To enter the main menu:

1. Switch the device on using the main switch.

2. Press **Start** on the keypad.

The left display shows the TIME menu item. It is the first item of the main menu and therefore is shown at the start.

Using the **left arrow keys** you can scroll the menu items.

The right display shows the last set values of the corresponding menu items.

Using the **right arrow keys** you can specify the required values.

The specified values are automatically accepted and saved.

All settings for the VDT/S device are carried out in the SET menu (settings).
6 – Configuration

6.1 – Settings (SETT)

Here you can see the general device parameters and set them according to your own demands.

To enter the SETT menu:

1. Switch the device on.

2. Using the left arrow keys find the SETT menu (Settings).

3. Press Start during 8 seconds.

The SETT menu contains the following items:

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMOD (Time mode)</td>
<td>Input mode for the test time (in minutes or hours)</td>
</tr>
<tr>
<td>PENE (Penetration)</td>
<td>Penetration duration - time after test end</td>
</tr>
<tr>
<td>LANG (Language)</td>
<td>Language of the user interface</td>
</tr>
<tr>
<td>ID</td>
<td>Identification number of the device</td>
</tr>
<tr>
<td>HOUR</td>
<td>Current time (hour)</td>
</tr>
<tr>
<td>MINU</td>
<td>Current time (minute)</td>
</tr>
<tr>
<td>DAY</td>
<td>Current date (day)</td>
</tr>
<tr>
<td>MONT</td>
<td>Current date (month)</td>
</tr>
<tr>
<td>YEAR</td>
<td>Current date (year)</td>
</tr>
<tr>
<td>VERS</td>
<td>Firmware version of the device</td>
</tr>
<tr>
<td>EXSI</td>
<td>Exsiccator’s diameter</td>
</tr>
</tbody>
</table>

6.2 – Input mode for the test time (TMOD)

The TMOD menu supports two modes: MINU (test time in minutes) and HOUR (test time in hours).

The maximal set-up times of the modes are shown in the following table:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Maximal set-up time</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUR (hours)</td>
<td>99 hours and 59 minutes</td>
</tr>
<tr>
<td>MINU (minutes)</td>
<td>99 minutes and 59 seconds</td>
</tr>
</tbody>
</table>

To change the test time mode:

1. Enter the SETT menu.

2. Using the left arrow keys find the TMOD menu.

3. Using the right arrow keys select the required option.

See 8.1 – Test time for more information on the test time setting.
6.3 – Penetration time (PENE)

To set the penetration time:

1. Enter the SETT menu.

2. Using the **left arrow keys** find the PENE menu.

The right display shows the currently set penetration duration.

3. Using the **right arrow keys** specify the required penetration duration (0 to 10 minutes).

6.4 – Inverted penetration (PINV)

To set the inverted penetration:

1. Enter the SETT menu.

2. Using the **left arrow keys** find the PINV menu.

The right display shows the currently set option for inverted penetration. By default it is switched off.

3. Using the **right arrow keys** select the **ON** option.

**Options for inverted penetration:**

OFF - the vacuum is released before the beginning of the penetration time.
ON - the vacuum is released after the expiration of the penetration time.
6.5 – Language of the user interface (LANG)

The LANG menu supports two options: ENGL (English) and DEUT (German).

To change the user interface language:

1. Enter the SETT menu.
2. Using the left arrow keys find the LANG menu.
3. Using the right arrow keys select the required option.

6.6 – Identification number (ID)

To display the identification number of the device:

1. Enter the SETT menu.
2. Using the left arrow keys find the ID menu.
3. Press the right arrow key during ca. 8 seconds.

The identification number will be shown step by step. It contains up to 14 digits and cannot be changed.

6.7 – Time and date

To change the time and date on the device:

1. Enter the SETT menu.

To set the hours:

2. Using the left arrow keys find the HOUR menu.
3. Using the right arrow keys set the required value.

To set the minutes:

4. Using the left arrow keys find the MINU menu.
5. Using the right arrow keys set the required value.
To set the day:

6. Using the **left arrow keys** find the DAY menu.

The right display shows the currently activated day setting.

7. Using the **right arrow keys** set the required value.

To set the month:

8. Using the **left arrow keys** find the MONT menu.

The right display shows the currently activated month setting.

9. Using the **right arrow keys** set the required value.

To set the year:

10. Using the **left arrow keys** find the YEAR menu.

The right display shows the currently activated year setting.

11. Using the **right arrow keys** set the required value.

6.8 – Firmware version of the device (VERS)

To display the firmware version of the device:

1. Enter the SETT menu.
2. Using the **left arrow keys** find the VERS menu.

The right display shows the installed firmware version of the device.

You cannot change the firmware version since it is assigned by the manufacturer when the device is produced.
6.9 – Exsiccator’s diameter (EXSI)

The EXSI menu supports the options: 150, 200, 250 and 300.

To select the option of the exsiccator’s diameter:

1. Enter the SETT menu.
2. Using the left arrow keys find the EXSI menu.
3. Using the right arrow keys select the required option.

6.10 – Serial number (DEV)

To display the device serial number:

1. Enter the SETT menu.
2. Using the left arrow keys find the DEV menu.
3. Press Start.

The right display shows the serial number of the device. It contains 6 digits and cannot be changed.
7 – Device Check

The device check includes the leak test and calibration. The both procedures are described below.

Before you start a device check procedure ensure that you have a validation vacuum gauge at hand. We recommend using the corresponding validation tool from ERWEKA.

7.1 – Leak test (CONT)

For the effective usage of VDT/S, first check that there are no leakages in the device (vacuum exsiccator). Use the CONT (test control) function to apply the maximum adjustable reduced pressure to the device and make sure that it works as appropriate.

To apply the test control function (CONT):

1. Using the left arrow keys find the CONT menu.

2. Put the validation vacuum gauge into the exsiccator.

3. Press Start to begin the check.

The vacuum applied to the device will be shown on the right LED display.

4. Wait until the vacuum pressure reaches the required value. In this way you make sure that the device is ready for operation.

5. To stop the process, press any key.

In case the required value is not reached, refer to the ERWEKA Service.
7.2 – Calibration (CALI)

Before the device is taken into operation, you must calibrate it and then check the accuracy of the performed calibration.

To calibrate the device:

1. Using the left arrow keys find the CALI menu.

2. Switch the validation vacuum gauge on and note the displayed air pressure value (atmospheric air pressure).

Example: 1008 mbar.

3. Put the validation vacuum gauge into the exsiccator.

For better results of the calibration we recommend to use the exsiccator with the 250 mm diameter.

4. Press Start and then simultaneously the lower left arrow key and upper right arrow key to start the calibration.

In this step of the procedure the device introduces 200 mbar into the exsiccator.

5. As soon as the value 200 is reached in the right display, read the value from the gauge in the exsiccator.

6. Now calculate the first offset value by deducting this value from the air pressure value that you noted in step 2.

Example: If the noted air pressure value is 1008 mbar and the value of the gauge in the exsiccator is 812 mbar, the first offset value is 196 mbar.

Calculation: 1008 mbar - 812 mbar = 196 mbar

7. Press Start.

The right display shows a dot near the value now.

8. Using the right arrow keys specify the offset value calculated in step 6.
9. To confirm the specified value and continue the calibration, press **Start**.

In this step of the procedure the device introduces 700 mbar into the exsiccator.

![Device Display](image)

During the procedure you will hear the specific sound of the device in operation.

10. As soon as the value 700 is reached in the right display, read the value from the gauge in the exsiccator.

11. Now calculate the second offset value by deducting this value from the air pressure value that you noted in step 2.

   Example: If the noted air pressure value is 1008 mbar and the value of the gauge in the exsiccator is 271 mbar, the second offset value is 737 mbar.

   Calculation: 1008 mbar - 271 mbar = 737 mbar

12. Press **Start** again.

   The right display shows a dot near the value again now.

13. Using the **right arrow keys** specify the second offset value calculated in step 11.

14. To confirm the entered value, press **Start** again.

   The vacuum is released. This finishes the calibration and returns you to the CALI menu.

15. Perform a calibration check as it is described further.

**To check the calibration:**

1. Place the validation vacuum gauge inside the exsiccator.

2. Start a test with any time and vacuum settings (e.g. 2 min. and 500 mbar).

3. Now compare the values shown on the gauge and on the device display. If the difference between these values lies within the range of ±10 mbar, the calibration was performed successfully.

   Otherwise, you must repeat the calibration.
8 – Entering the Test Parameters

8.1 – Test time

Before performing a test on the VDT/S device, you must specify the corresponding values for the test time.

To set the test time:

1. Switch the device on. The TIME menu is shown.
2. Using the right arrow keys specify the required test time in the hh:mm or mm:ss format corresponding to the selected time mode.

(See 6.2 – Input mode for the test time (TMOD).)

See the following table for the maximal test time that can be specified in the set mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Maximal set-up time</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUR (hours)</td>
<td>99 hours and 59 minutes</td>
</tr>
<tr>
<td>MINU (minutes)</td>
<td>99 minutes and 59 seconds</td>
</tr>
</tbody>
</table>

The minimal test time that can be specified constitutes 10 seconds. In case of this entry the device will start an automatic sequence of 10 tests for each 1 second.

8.2 – Vacuum value

Before performing a test with the VDT/S device, you must specify the corresponding vacuum values for the test.

To set the vacuum value:

1. Switch the device on.
2. Using the left arrow keys find the VAC menu.
3. Using the right arrow keys specify the required vacuum value.

The vacuum value for tests must be in the range of 100-900 mbar.

9 – Performing the Test

9.1 – Preparation

To perform a test on the VDT/S device, do the following preparations:

1. Connect the main device and exsiccatior through a vacuum hose by means of quick coupling.
2. Fill the exsiccatior with the methylene blue solution.
3. Insert the blisters to be checked into the methylene blue solution.
4. Cover them with a porcelain plate.

9.2 – Performance

1. Switch the device on.
2. Using the right arrow keys specify the required test time (see 8.1 – Test time).
3. Using the left arrow keys specify the required vacuum value (see 8.2 – Vacuum value).
4. Press Start.

On the following pages the test performance is described on the basis of an example.

Vacuum tolerance limit

The produced vacuum is being kept during the test. The vacuum value fluctuates minimally. The tolerance limit is -5 mbar. If the value decreases for more than 5 mbar, the vacuum pump is applied. Then the vacuum value can be a little bit higher than the nominal value. The actual values are displayed and logged.

Example:

A produced nominal vacuum of 500 mbar is shown on the display at the test start. The value decreases to 494 mbar. This is also displayed. The pump is applied and produces the required vacuum. The vacuum is 503 mbar now. This is also shown on the display. After the pumping it can be also 506 mbar or similar for a short time. The value decreases again slowly to 500 mbar and lower, what can be seen on the display. This continues until the test ends. Always when the value decreases for more than 5 mbar from the nominal value, the pump is applied.
9.3 – Sample test

The parameters for this test are as follows:

- Test duration: 2 min.
- Vacuum value: 700 mbar

To perform this test:

1. Switch the device on.

2. Ensure that the MINU (minutes) entry mode is selected in the TMOD menu (see 6.2 - Input mode for the test time (TMOD)).

3. Using the left arrow keys find the TIME menu.

4. Using the right arrow keys set the time value to 2 minutes.

5. Using the left arrow keys find the VAC menu.

6. Using the right arrow keys set the vacuum value to 700 mbar.

7. To start the test, press Start.

The device produces the vacuum now.

During the procedure the device releases an operating noise.

Now the left display shows the test time, the right display – the applied vacuum value.

The device finishes the procedure as soon as the test time of 2 minutes runs out.

In case the penetration time has been set and the test has finished automatically, the PENE menu with the descending time will be displayed. When the penetration time runs out, the device will start beeping. According to the option set in the PINV menu the vacuum will be released before the beginning or after the expiration of the penetration time automatically. See „6.4 – Inverted penetration (PINV)“.

The left display shows the time value set previously again. The device is ready for a new test.

Printout option

In case the printout option is enabled, the protocol will be printed out as soon as the test and the penetration time end. To know more about the the printout option, see the next chapter.
10 – Printing the Protocols

Test protocols can be printed out automatically after the test is completed or aborted.

To select the printout option:

1. Switch the device on.

2. Using the left arrow keys find the PRT menu.

The right display shows the currently enabled printout option.

3. Using the right arrow keys select the required option.

The protocol contains the following information about the performed test:

- name of the device and its firmware version
- name of the protocol (TEST PROTOCOL)
- page numbering (conventional printer)
- device ID
- date and time of performing the test
- serial number of the device
- exsiccator’s diameter (Exsiccator)
- vacuum value for the test (Nominal)
- time of the test (Test time)
- vacuum measurements in 10 test points
- signature
Example of the protocols from the portable printer:

<table>
<thead>
<tr>
<th>No</th>
<th>Pressure Time</th>
<th>Penetration Time: 1 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.56</td>
<td>116</td>
</tr>
<tr>
<td>2</td>
<td>0.49</td>
<td>124</td>
</tr>
<tr>
<td>3</td>
<td>0.43</td>
<td>171</td>
</tr>
<tr>
<td>4</td>
<td>0.37</td>
<td>119</td>
</tr>
<tr>
<td>5</td>
<td>0.31</td>
<td>118</td>
</tr>
<tr>
<td>6</td>
<td>0.28</td>
<td>118</td>
</tr>
<tr>
<td>7</td>
<td>0.19</td>
<td>117</td>
</tr>
<tr>
<td>8</td>
<td>0.13</td>
<td>117</td>
</tr>
<tr>
<td>9</td>
<td>0.07</td>
<td>117</td>
</tr>
<tr>
<td>10</td>
<td>0.01</td>
<td>124</td>
</tr>
</tbody>
</table>

If the printout option is enabled but the protocol is not printed out after the test is finished, check if the printer is connected appropriately to the VDT/S device.
Example of the protocols from the conventional printer:

### ERWEKA VDT 2.06.0 TEST PROTOCOL

<table>
<thead>
<tr>
<th>Measure Value No</th>
<th>Pressure</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>118</td>
<td>0:56</td>
</tr>
<tr>
<td>2</td>
<td>123</td>
<td>0:50</td>
</tr>
<tr>
<td>3</td>
<td>121</td>
<td>0:44</td>
</tr>
<tr>
<td>4</td>
<td>120</td>
<td>0:38</td>
</tr>
<tr>
<td>5</td>
<td>119</td>
<td>0:32</td>
</tr>
<tr>
<td>6</td>
<td>119</td>
<td>0:26</td>
</tr>
<tr>
<td>7</td>
<td>118</td>
<td>0:20</td>
</tr>
<tr>
<td>8</td>
<td>118</td>
<td>0:14</td>
</tr>
<tr>
<td>9</td>
<td>118</td>
<td>0:08</td>
</tr>
<tr>
<td>10</td>
<td>118</td>
<td>0:02</td>
</tr>
</tbody>
</table>

**Signature:** ..........................................

This protocol is printed out if no penetration time was specified.
Example of the protocols from the conventional printer:

This protocol is printed out if no penetration time was specified.

This protocol is printed out if the penetration time was set to 2 minutes and the inverted penetration was turned off.

<table>
<thead>
<tr>
<th>Measure Value No</th>
<th>Pressure</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>116</td>
<td>0:55</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>0:49</td>
</tr>
<tr>
<td>3</td>
<td>119</td>
<td>0:43</td>
</tr>
<tr>
<td>4</td>
<td>118</td>
<td>0:37</td>
</tr>
<tr>
<td>5</td>
<td>117</td>
<td>0:31</td>
</tr>
<tr>
<td>6</td>
<td>117</td>
<td>0:25</td>
</tr>
<tr>
<td>7</td>
<td>117</td>
<td>0:19</td>
</tr>
<tr>
<td>8</td>
<td>118</td>
<td>0:13</td>
</tr>
<tr>
<td>9</td>
<td>118</td>
<td>0:07</td>
</tr>
<tr>
<td>10</td>
<td>118</td>
<td>0:01</td>
</tr>
</tbody>
</table>

Penetration time: 2 minutes
This protocol is printed out if the penetration time was set to 2 minutes and the inverted penetration was turned on.
11 – Maintenance

11.1 – Cleaning

Ensure that the device is cleaned regularly.

Read the following instructions carefully before starting the cleaning.

**HAZARD** of electric shock when cleaning the electric devices!
Disconnect the mains supply for cleaning the electric devices. Switch the device off and unplug it for cleaning. Clean the electric devices without liquids.

Note that product residues must be properly disposed of in accordance with the respective valid environmental legislation.

**Cleaning procedure**

1. Disconnect the mains supply.
2. Disconnect the device.
3. Empty the exsiccator. For disposal pay attention to 1.4 – Protection of the environment.
4. Clean the exsiccator, porcelain plate and vacuum hose with warm water.
5. Wipe the device with a soft and slightly damped cloth.

**NOTICE**
Do not use a wet cloth but slightly damped one.
Do not add any chemical cleansing agents to the cleaning water.
For the lacquered housing parts use no cleansing agents which attack this material.
11.2 – Inspection and maintenance

Ensure that the device is regularly inspected and each time is clean.

**To ensure a long lifetime of your devices and systems we recommend regular maintenance performed by our specialized staff.**

**Check regularly:**

Check regularly the vacuum filter for contamination. The vacuum filter on the device rear side should be checked for contamination at regular intervals. The filter insert can be checked during visual inspection of the glass.

Check regularly the hose connections for leakages and fixed position. The joints are tightened manually. It is enough to achieve a tight connection.

**NOTICE** Never seal with sealant or PTFE band.

**Filter change**

The filter insert must be replaced at least once a year.

**To change the filter:**

1. Turn the inspection glass 1/8 revolution to the left and pull it down.
2. Remove the filter insert and replace it with a new one.
3. Fix the inspection glass to the device and turn it 1/8 revolution to the right.

**You can order the new filter inserts at ERWEKA.**
In longer standstills:

- Switch off the device.
- Disconnect the device from the mains.
- Empty and rinse all containers and hoses.
- Clean the device thoroughly.
- Store the device, its components and instruction manual. See the storage conditions defined by ERWEKA in 4.3.3 – Required installation environment.

**NOTICE**  Non-compliance with the instructions given above can lead to damages.

11.3 – Spare parts

**NOTICE**  Electronic and mechanical replacements are to be made by the ERWEKA personnel or approved by ERWEKA.

Only original spare parts or components released by ERWEKA should be used. Only repairs or changes on the device performed by the ERWEKA technicians or approved explicitly by ERWEKA are to be made.
Certificate of Compliance for
Konformitätserklärung für
Vacuum Leak Tester,
Type VDT/S

We, ERWEKA GmbH, declare under our sole responsibility that the product to which this declaration relates is in conformity with the following EU-Directives and harmonized standards:

- Low Voltage Directive (LVD) 2014 / 35 / EU
- Safety requirements for electrical equipment for measurement, control and laboratory use; EN 61010-1
- Electromagnetic Compatibility, (EMC) Directive 2014 / 30 / EU
- Electrical equipment for measurement, control and laboratory use; EN 61326-1

Wir, die ERWEKA GmbH, erklären in alleiniger Verantwortung, dass das Produkt, auf das sich diese Erklärung bezieht, mit folgenden EU-Richtlinien und harmonisierten Normen übereinstimmt:

- Niederspannungsrichtlinie 2014 / 35 / EU
- Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte; EN 61010-1
- Elektromagnetische Verträglichkeit, EMV-Richtlinie 2014 / 30 / EU
- Mess-, Steuer-, Regel- und Laborgeräte, EN 61326-1

Heusenstamm, 13.03.2017

Claudia Müller
-Managing partner-