Dansensor®
Lippke® VC1400
User Guide EN

Dansensor® / AMETEK®

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Dansensor® Lippke® VC1400

User Guide

EN

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1. Introduction

Important!

Safety and Use

WARNING! Personnel operating and maintaining the device must be familiar with all aspects of its operation and be proficient in maintenance.
Such personnel should review the information in *"Safety and Handling Instructions" on page 99* to promote safety awareness.
Failure to follow the safety instructions could result in fire, electric shock, injury, or damage to the device or other property.

- Prior to using the equipment it is assumed that it has been properly installed and configured as described in this manual.
- Always refer to this manual before operating or maintaining the device.
- Observe all NOTES, CAUTIONS and WARNINGS - see *page 8* for details.

About this Manual

Intended Use of this Manual

- This manual describes the common use and maintenance procedures of the Dansensor® **Lippke®** VC1400 device.
  It is intended for the daily users and should be kept with the equipment for reference at all times.

Reservations

- This manual was written and illustrated using the best possible information available at the time of publication.
- Any differences between this manual and the equipment reflect improvements introduced after the publication of the manual.
- Changes, technical inaccuracies and typographic errors will be corrected in subsequent editions.
- As a part of our policy of continuous improvement, we reserve the right to alter design and specifications without further notice.

Notes, cautions, warnings and tips!

Throughout the manual notes, cautions, and warnings are indicated with various icons and written in bold like the example below:

CAUTION! Never use hard tools or abrasive materials when cleaning any part of the device.

Explanation

NOTE! The operator should observe and/or act according to the information in order to obtain the best possible function of the equipment.

CAUTION! The operator must observe and/or act according to the information in order to avoid any mechanical or electrical damage to the equipment.

WARNING! The operator must observe and/or act according to the information in order to avoid any personnel injury.

Tips and recommendations

Tips, recommendations and “best practice” advises are indicated as shown in the example below:

TIP! Try using a screwdriver to release the cover.

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General description

The Dansensor® **Lippke®** VC1400 is an integrated package test system which can determine leaks in blister packages, glass vials and other flexible, semi-rigid or rigid packages by means of vacuum.

The test system can be setup as a combination of the **VC1400** device itself and one or more of the available accessories - see *"Accessories" on page 13* for details.

The **VC1400** is available in two versions depending on how you want to create the necessary vacuum.
The "Vacuum Ejector" model has a built-in vacuum ejector which uses compressed air to create the vacuum, while the "External Vacuum" model either requires connection to the separate pump unit Dansensor® **Lippke®** PU1400 or to another external vacuum system.

Fig. 1. Dansensor® Lippke® VC1400 Test System

Setting up and testing is done using the display on the instrument.
The entry, selection and management of all test parameters is easily and quickly accomplished and multiple test configurations can easily be created and recalled.

Test Capabilities

The system automates the classic methylene blue dye test and bubble emission test and is compliant with ASTM standard D3078.
See *"2. Tests" on page 19* for detailed descriptions of the test procedures.

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Overview

1. **5.7" colour touch display**
   For intuitive operation of the device by use of explanatory icons and easy understandable text messages and buttons.

2. **Device name plate**
   Holds device information such as device model, voltage, manufacturing date and serial number.

3. **"CHAMBER VACUUM" connector**
   Connector for the device's vacuum outlet.

4. **"SENSE" connector**
   Inlet connector for the vacuum chamber pressure measurement.

5. **"VENTILATION" inlet connector** *("External Vacuum" models)*
   Ventilation inlet for the vacuum chamber. The inlet is fitted with a combined silencer and air filter.

   "EXHAUST/VENTILATION" connector *("Vacuum Ejector" models)*
   Exhaust outlet for the vacuum ejector and ventilation inlet for the vacuum chamber. The connector must be fitted with a combined silencer and air filter (see *"Connecting hoses and cables" on page 26* for details).

6. **"I/O CONTROL" connector**
   This connector is only used on "External Vacuum" models for connection of the Dansensor® **Lippke**® PU1400 pump unit control cable.

7. **"VACUUM IN" connector** *("External Vacuum" models)*
   Connector for vacuum from the Dansensor® **Lippke**® PU1400 pump unit or other external vacuum system.

   "AIR PRESSURE" connector *("Vacuum Ejector" models)*
   Connector for compressed air used by the integrated vacuum ejector.

   CAUTION! The supply pressure must not exceed the max. pressure as specified in *"Compressed air supply" on page 94*.

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8 **"POWER SUPPLY"**
For connection of the power supply delivered with the device.

9 **LAN/Ethernet port**
For connection to local computer network for external data collection (LAN Data dump). The port has 2 built-in status indicator LED's.

10 **USB (2.0 - Type A) connector**
For connection of a USB memory stick for exporting/importing of files and updating of firmware or for auxiliary equipment such as a bar-code scanner, an external keyboard and/or a printer.

11 **USB (2.0 - Type B) connector**
For service purposes only.

12 **On/Off switch**

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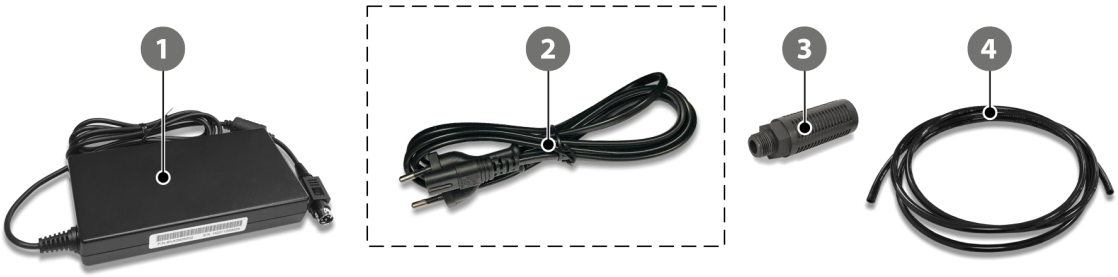
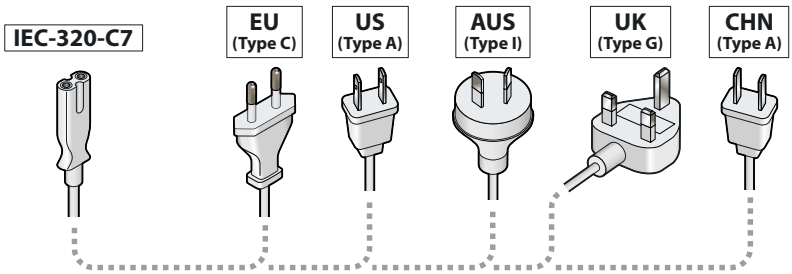
Supplied Parts

The following items are included with the device:



1 Power Supply
Supplies the appropriate supply voltage to the device. Use the cable 2 to connect the power supply to the main power outlet.

2 Power cable
The cable to be used to connect the power supply 1 to the main power outlet is not supplied with the instrument, but can be ordered as an accessory - see *"Accessories" on page 97* for details.
The cable must have an **IEC-320-C7 (female)** connector at the end that connects to the power supply.
The type of plug at the other end depends on which country/area the device is to be used in*:



EU (Type C): Europe
US (Type A): North America, Thailand, Taiwan
AUS (Type I): Australia, New Zealand
UK (Type G): United Kingdom, Singapore, Malaysia
CHN (Type A): China

* Compatibility is not limited to the indicated countries/areas.

3 Silencer/filter *("Vacuum Ejector" models only)*
For vacuum ejector exhaust and vacuum chamber ventilation.

4 Plastic hose Ø6/4 mm
For connection of compressed air on "Vacuum Ejector" models or for connection to the optional Dansensor® **Lippke**® PU1400 pump unit on "External Vacuum" models.

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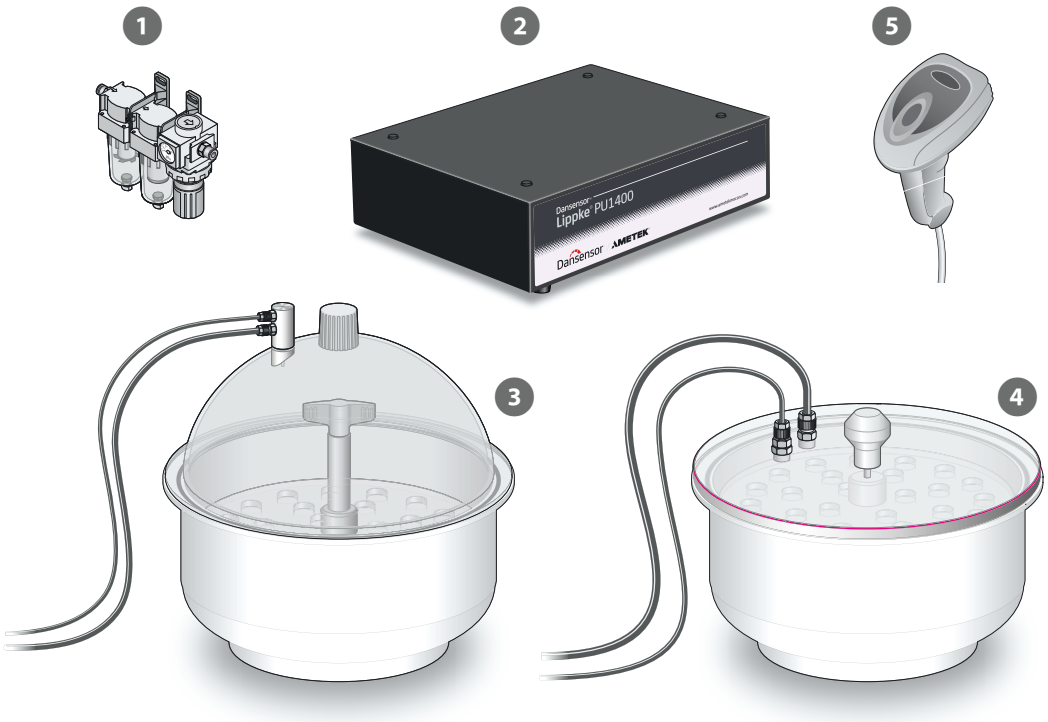
Accessories

A variety of accessory kits are available for the Dansensor® **Lippke®** VC1400 test system.

See *"8. Consumables and Accessories" on page 97* for details.

In addition to the selection of measurement accessory kits specially designed for testing of the most commonly used package types, the accessory list also includes other accessories that can be used separately or together with one or more of the measurement accessory kits.

1. **Pressure Regulator with filters** (see *page 17* for details)
2. **Dansensor® Lippke® PU1400 pump unit** (see *page 16* for details)
3. **Desiccator Ø250 mm** (see *page 14* for details)
4. **Desiccator Ø250 mm, flat lid** (see *page 14* for details)
5. **Bar-code scanner** (see *page 38* for details)



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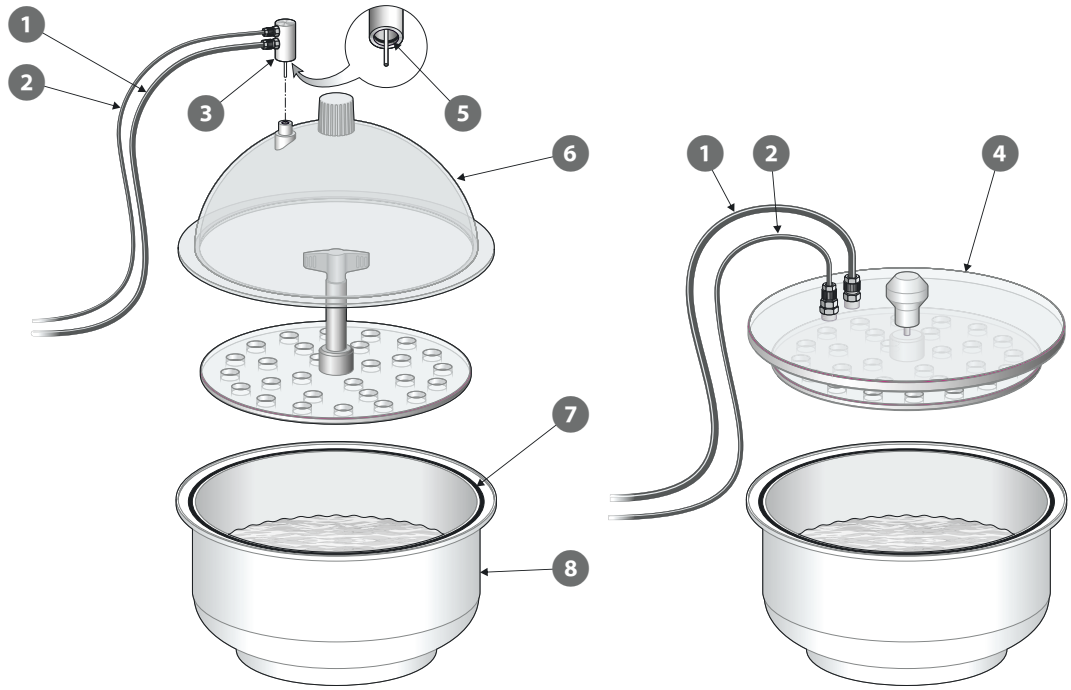
Desiccator

The desiccator is basically a vacuum chamber, which is filled with a liquid, either methylene blue dye for blister pack tests or water for bubble tests. During a test, the test items are kept submerged in the liquid.
The desiccator is available in 2 designs, one with a domed lid and one with a flat lid. Both types are quite versatile, but basically the domed lid version is best for **Blue Dye** testing of blister packs while the flat lid version is best for **Bubble** tests.

Setting Up

NOTE! The equipment must be placed on an even, steady, and horizontal surface.

1. Connect the 6 mm vacuum hose ❶ and the 4 mm pressure sense hose ❷ between the connectors on the adapter ❸ or the flat lid ❹ and the appropriate connectors on the VC1400 - see *"Connecting hoses and cables" on page 26* for details.
2. On domed lid versions, check that the O-ring ❺ is fitted properly in the adapter ❸, then connect it to the connector on the lid ❻.
3. Check that the O-ring ❼ is fitted properly in the groove in the tub ❽ and at the same time apply a small amount of grease to the O-ring if necessary.
4. Fill the appropriate amount of liquid into the tub ❽, either methylene blue dye for blister pack tests or water for bubble tests.



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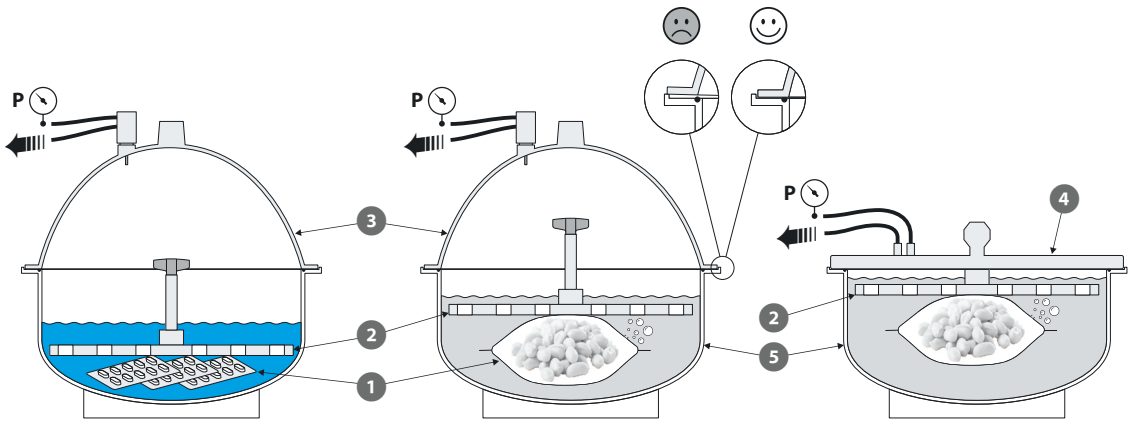
How does it work?

1. Place the test item(s) 1 into the liquid and then place the disc 2 on top of them to submerge them fully into the liquid.
   On flat lid versions the disc is mounted underneath the lid 4.
2. Place the lid 3 or 4 on the tub 5. Make sure that the lid is placed inside the edge of the tub all the way around (see detail).
3. Start the test.
   The VC1400 automatically performs the predefined test sequence as described in *"Performing a workflow/test" on page 44*.
4. After testing, remove the lid 3 or 4 and the disc 2, and then removed the test item(s) 1 from the desiccator.

CAUTION! Special care should be taken when removing the disc and test pieces after a "Blue Dye" test, as the blue liquid may be difficult to clean off some surfaces.



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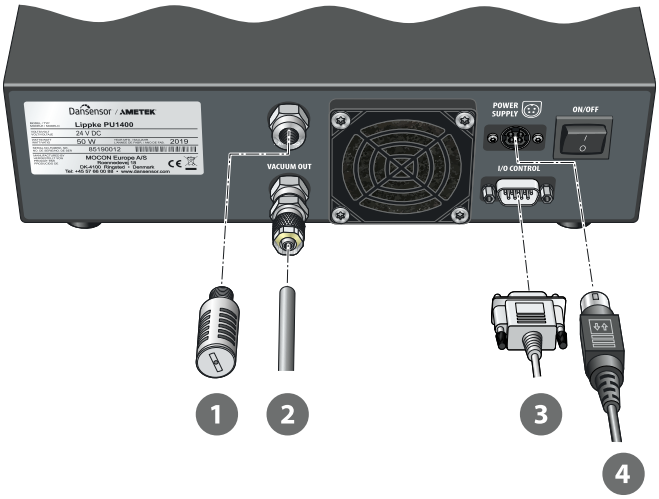
Dansensor® Lippke® PU1400 pump unit

The Dansensor® **Lippke**® PU1400 is a stand-alone pump unit that makes the VC1400 independent of compressed air or an external vacuum system and can therefore be placed anywhere in the production environment. The unit is designed so that the VC1400 can be placed on top of it.
The unit's pump function is controlled from the VC1400.

Setting Up



1. Connect the noise filter (1) to the "EXHAUST" outlet connector.

   CAUTION! The filter should only be hand tightened - do not use any tools.

2. Connect the Ø6/4 mm hose (2) from the "VACUUM OUT" connector to the "VACUUM IN" connector on the VC1400.

   CAUTION! When connecting the hose, make sure that it can not be squeezed or blocked in any way.

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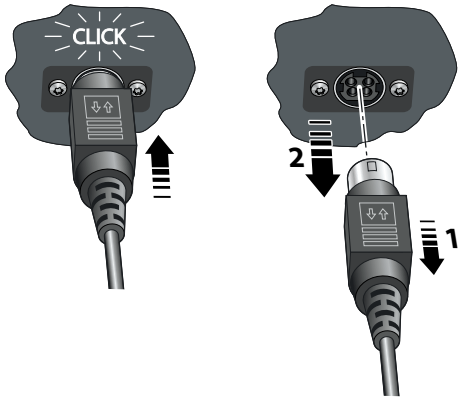
3. Connect the control cable 3 between the "I/O CONTROL" connectors on the pump unit and the VC1400.
4. Connect the power cable 5 with the provided power supply between a suitable power outlet and the device's "POWER SUPPLY" connector.

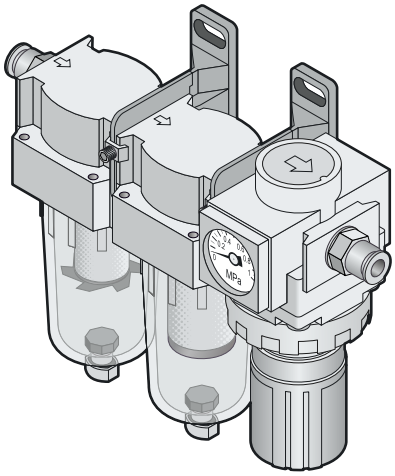
CAUTION! Always use the power supply that comes with the device.

Make sure that the connector clicks into the socket. When disconnecting the cable, pull the collar backwards to unlock the plug, then disconnect it.



Pressure Regulator with filters

The optional pressure regulator/filter unit ensures that the supplied compressed air quality is compliant with DIN ISO 8573-1:2010 [4:4:3].



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2. Tests

Test types

Blue Dye test

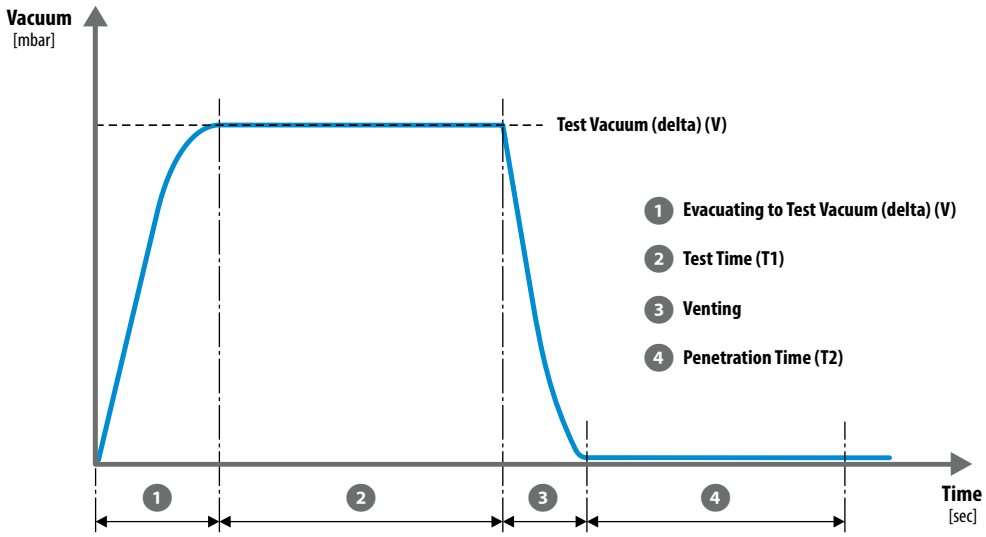
The **Blue Dye** test is used mainly in the pharmaceutical industry to leak test tablet blister packages.

The tablet blister packages are submerged into a colored liquid (in most cases methylene blue) in the desiccator, and then exposed to vacuum. Any defective blister will be evacuated as well, and when the desiccator is vented, the pressure difference will cause the colored liquid to enter these blisters, thus revealing the leaks.

We recommend using the dome lid desiccator for this type of test - see *"Desiccator" on page 14* for details.

A **Blue Dye** test is divided into 4 phases:

1. **Evacuation**
   The desiccator is evacuated to the test vacuum.
2. **Testing**
   The test vacuum is maintained for a fixed period of time.
3. **Venting**
   Venting of the desiccator to ambient pressure.
4. **Penetration**
   Period where the pressure difference causes the colored liquid to penetrate into any defective blisters.



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Blue Dye test settings

A **Blue Dye** test is defined using the following parameters:

Parameters marked with an asterisk (*) are the only parameters that can be changed, when test definition has already been used for testing and if the parameter ***Settings -> Device -> Lock Test*** *has been enabled.*

Name	A unique test definition name (up to 30 characters).	
Product ID	Unique test definition identification code (up to 20 characters).	
Standard Test *	If set to **No**, the test definition is not available for the **Standard Test Operator**. Test definition will still be available for an **Operator** and **Supervisor**.	
State	Only used if **Use State Mark** is enabled in **Settings -> Device.** Can be used by a **Supervisor** to categorize the various test definitions in the test definition list:	
	New	Automatically assigned to new test definitions. Can for example be used for test definitions where settings are still being considered/ tested.
	Current	Typically used for test definitions that have been approved for use. This category of test definitions are the only test definitions available to the **Standard Test Operator** (provided that the **Standard Test** option is set to **Yes**).
	Old	Can for example be used for discontinued test definitions or test definitions that should not be used for a period.
Use ASTM increase vacuum rate limit	**Yes**	The build-up of vacuum in the desiccator is limited to 30 mbar/sec.
	No	The build-up of vacuum in the desiccator is limited to 90 mbar/sec.
	Regardless of the setting, the build-up of vacuum may happen slower. This depends on the capacity of e.g. the vacuum pump or the external vacuum system and how large a volume is to be evacuated.	
Test Vacuum (delta) (V)	The vacuum level to which the desiccator is evacuated.	
Test Time (T1)	The period of time for which the test vacuum is maintained in the desiccator.	
Penetration Time (T2)	The period of time for which the coloured liquid can penetrate into any defective test item blisters.	

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Custom Fields *	Select if one or more of the 4 custom fields are required for the current workflow - see *"Custom Fields" on page 62* for details.

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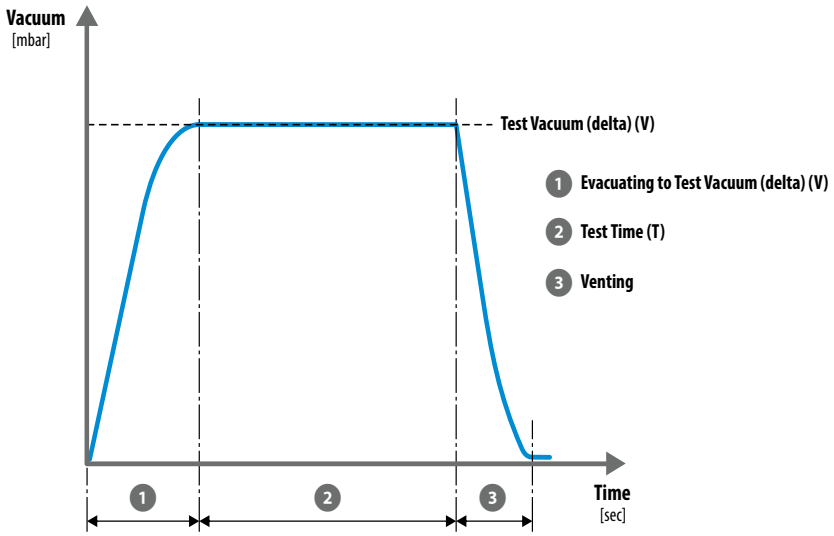
Bubble test

In a **Bubble** test, the test package is submerged into a liquid (in most cases clear water) in the desiccator, and then exposed to vacuum.
The package should be monitored permanently throughout the test, and air bubbles coming out of the package will reveal if there is a leak in the package, as well as where this leak is located. This test is especially suitable for large-volume packages, e.g. bags.

We recommend using the flat lid desiccator for this type of test - see *"Desiccator" on page 14* for details.

A **Bubble** test is divided into 3 phases:

1. **Evacuation**
   The desiccator is evacuated to the test vacuum.
2. **Testing**
   The test vacuum is maintained for a fixed period of time.
3. **Venting**
   Venting of the desiccator to ambient pressure.



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Bubble test settings

A **Bubble** test is defined using the following parameters:

Parameters marked with an asterisk (*) are the only parameters that can be changed, when test definition has already been used for testing and if the parameter ***Settings -> Device -> Lock Test*** *has been enabled.*

Name	A unique test definition name (up to 30 characters).
Product ID	Unique test definition identification code (up to 20 characters).
Standard Test *	If set to **No**, the test definition is not available for the **Standard Test Operator**. Test definition will still be available for an **Operator** and **Supervisor**.
State	Only used if **Use State Mark** is enabled in **Settings -> Device.** Can be used by a **Supervisor** to categorize the various test definitions in the test definition list: **New** — Automatically assigned to new test definitions. Can for example be used for test definitions where settings are still being considered/ tested. **Current** — Typically used for test definitions that have been approved for use. This category of test definitions are the only test definitions available to the **Standard Test Operator** (provided that the **Standard Test** option is set to **Yes**). **Old** — Can for example be used for discontinued test definitions or test definitions that should not be used for a period.
Use ASTM increase vacuum rate limit	If set to **Yes** the build-up of vacuum in the desiccator is limited to 30 mbar/sec. If set to **No** the build-up of vacuum may happen faster, but it will depend on the capacity of e.g. the pump or the external vacuum system and how large a volume is to be evacuated.
Test Vacuum (delta) (V)	The vacuum level to which the desiccator is evacuated.
Test Time (T)	The period of time for which the test vacuum is maintained in the desiccator.
Custom Fields *	Select if one or more of the 4 custom fields are required for the current workflow - see *"Custom Fields" on page 62* for details.

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3. Setting Up

NOTE! The device and the various accessories must be placed on an even, steady, and horizontal surface.

Compressed air connections

("Vacuum Ejector" models only)

Compressed air supply requirements

The compressed air supply must be dry, clean and free from oil - see specifications in *"Compressed air supply" on page 94*.

We recommend to use our optional pressure regulator/filter unit which ensures that the air quality fulfills the required specifications - see *"Pressure Regulator with filters" on page 17* for details.

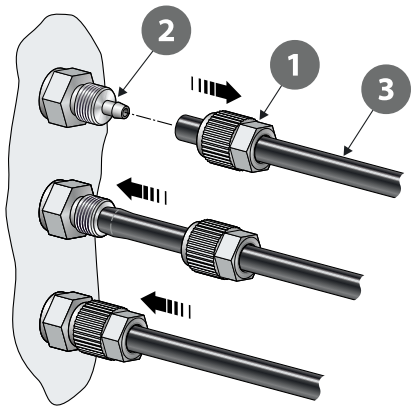
NOTE! The above regulator/filter unit does not ensure that the air is dry and therefore it is recommended to install a type of air-drying unit as well.

NOTE! If the air supply pressure is below or above the specified input pressure, the system may not function as intended.

CAUTION! If the specified maximum pressure is exceeded, there is a danger of bursting of tubing and other components.

Correct use of hose connectors

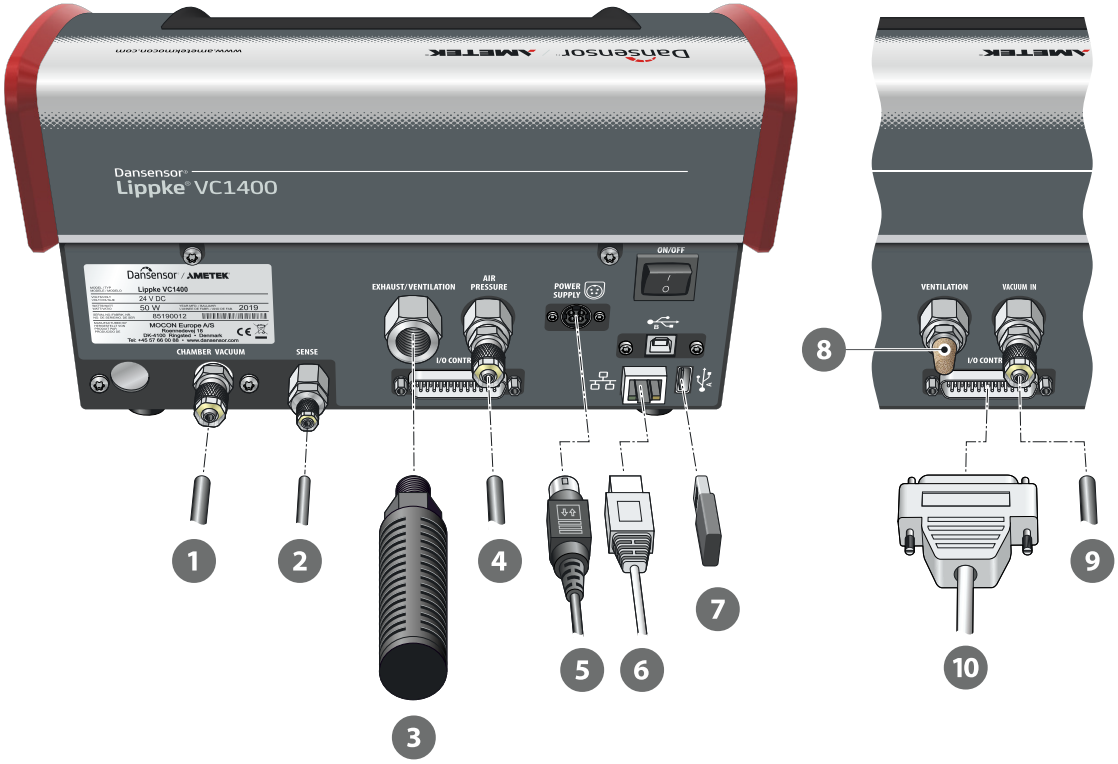
Follow procedure below to ensure correct and tight hose connections:



1. Unscrew the union nut ❶ from the hose connector ❷ and slide it onto the hose ❸.
2. Press the hose ❸ onto the hose connector ❷ as far as it goes.
3. Finally slide the union nut ❶ onto the hose connector ❷ and tighten properly.

Connecting hoses and cables

CAUTION! Make sure to place the device so that it is possible to easily switch off the power to the unit, either by means of the ON/OFF switch or by disconnecting the power supply from the device.



1. Connect the Ø6/4 mm vacuum hose (1) from the desiccator to the “CHAMBER VACUUM” connector.
2. Connect the Ø4/2.7 mm pressure sense hose (2) from the desiccator to the “SENSE” connector.

Items 3 and 4 only apply to “Vacuum Ejector” models:

3. Connect the combined silencer and air filter (3) to the “EXHAUST/VENTILATION” connector.

CAUTION! Filter should only be hand tightened - do not use any tools.

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4. Connect the compressed air supply hose (4) to the “AIR PRESSURE” inlet connector - see *"Compressed air supply" on page 94* for details.

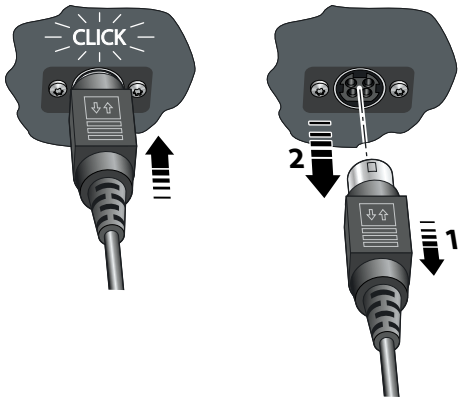
   NOTE! Make sure that the hose between the device and the pressure regulator is max. 1m, otherwise you must compensate for the pressure drop in the hose.

   CAUTION! When connecting the hose, make sure that it can not be squeezed or blocked in any way.

5. Connect the power cable (5) with the provided power supply between a suitable power outlet and the device’s “POWER SUPPLY” connector.

   CAUTION! Always use the power supply that comes with the device.

   Make sure that the connector clicks into the socket. When disconnecting the cable, pull the collar backwards to unlock the plug, then disconnect it.



6. If you plan on using network data logging, you should connect a LAN/Ethernet cable (6) from the LAN connector (labelled) to a connector on your local area network. This cable is not delivered with the device.

   NOTE! Use shielded cables for optimal noise immunity.

   NOTE! Always consult your network administrator before making network settings, as incorrect settings can result in reduced or no network activity.

7. The USB connector (labelled) can be used for connecting a USB memory stick (7) for exporting/importing log data, device settings etc. and for connection of a bar-code scanner, a printer or a keyboard - see also *"Connecting multiple USB devices" on page 39*.

Items 8 to 10 only apply to "External Vacuum" models:

8. The noise filter (8) is already fitted. Check that it is sufficiently tightened.
9. Connect the Ø6/4 mm vacuum hose (9) from the external vacuum system or from the "VACUUM OUT" connector on the Dansensor® **Lippke®** PU1400 pump unit to the "VACUUM IN" inlet connector.

NOTE! If you are using the pump unit, the vacuum hose can be cut to a length of approx. 30 cm.

CAUTION! When connecting the hose, make sure that it can not be squeezed or blocked in any way.

10. Connect the pump unit control cable (10) to the "I/O CONTROL" connector.

NOTE! Check to ensure that all hoses are firmly and tightly connected. Please use the union nuts provided with the system. This will help ensure that all the connections are safe and leak free - see *"Correct use of hose connectors" on page 25*.

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4. Operating

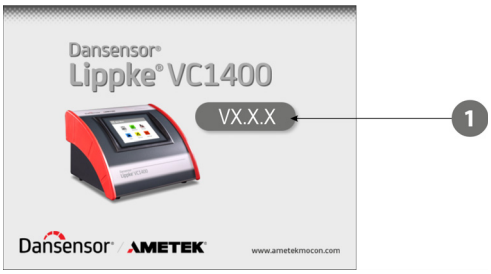
Basics

CAUTION! If the device has been stored in a cold location and then moved to a warmer location then at least one hour of acclimatization is required before switching on the unit.
If operated in a cold and high humidity environment it is advisable to let the device heat up for 30 minutes after is has been switched on.

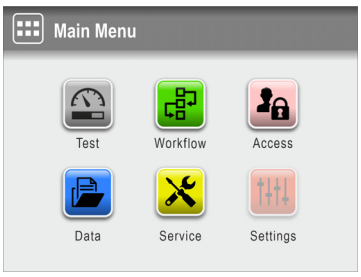
NOTE! Up to 10 minutes of heating time after power on is required before measurements can be performed.

Switching on/off

1. Use the "ON/OFF" button on the back of the device to switch the device on and off.
2. When the device is switched on, the display will show the start-up screen, indicating the device model and the currently installed firmware version 1.

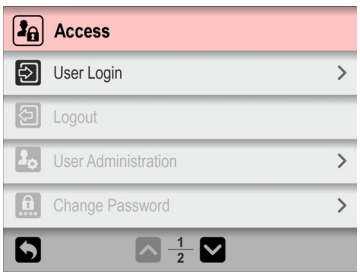


3. When the device is ready and if no login is required, the display will show the **Main Menu**:



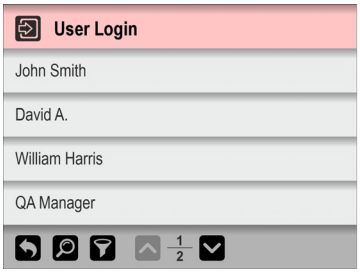
Current user is the default **Operator**.

4. If, however, login is required the **Access** menu appears.



Select **User Login**.

5. From the **User Login** screen...



...either select a user from the **User Login** list or enter a valid **User ID** depending on which method is required.

6. If login with password is required (see *page 88*), enter the **Password** for the selected user or the user associated with the **User ID**.

NOTE! By toggling the and symbols in the top right corner of the screen, you can show and hide the entered passwords respectively.

NOTE! It is only for users with Operator or Standard Test Operator access level that you can choose not to log in with a password. All other types of users must always log in with a password.

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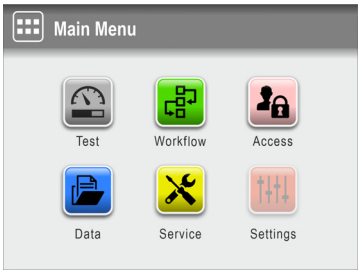
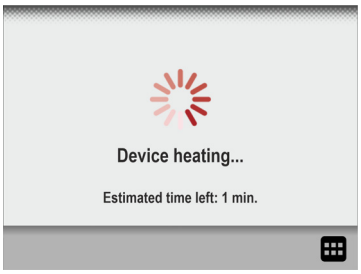
7. When you are properly logged in, the display will show the **Main Menu**:

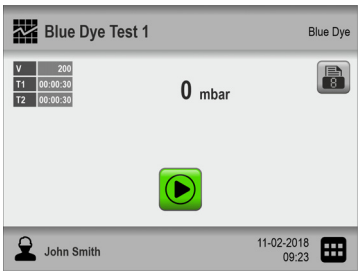


Current user is as selected during login with the access level as specified for this user.

8. To go to the test screen to start a test press **Test** button.
9. The device will start a warm-up cycle...



... and when finished the display changes to show the test screen.



10. Now the device is ready to start a test.

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Touch screen

Except for the ON/OFF button on the back of the device, all the buttons you use are virtual ones on the touch screen.

CAUTION! The touch screen should only be finger touch operated. Pencils or metal tools can damage the touch sensitive film.

Login and access levels

Different levels of login can be selected, and all users can be assigned different levels of access, some of which only allow access to a limited number of the device's functions and menus - see *"Login" on page 88* and *"Access" on page 64* for details.

Restarting/resetting

If device freezes or something is not working right, try switching the device off and then on again using the "ON/OFF" button on the back of the device.

Screen-shots

The device offers the ability to take screen-shots of current screens. This can be useful for example in connection with remote support. The screen-shots can be exported to a USB-stick - see *"Export" on page 74* for details.

To make a screen-shot, tap 5 times in quick succession on the top part of the screen.

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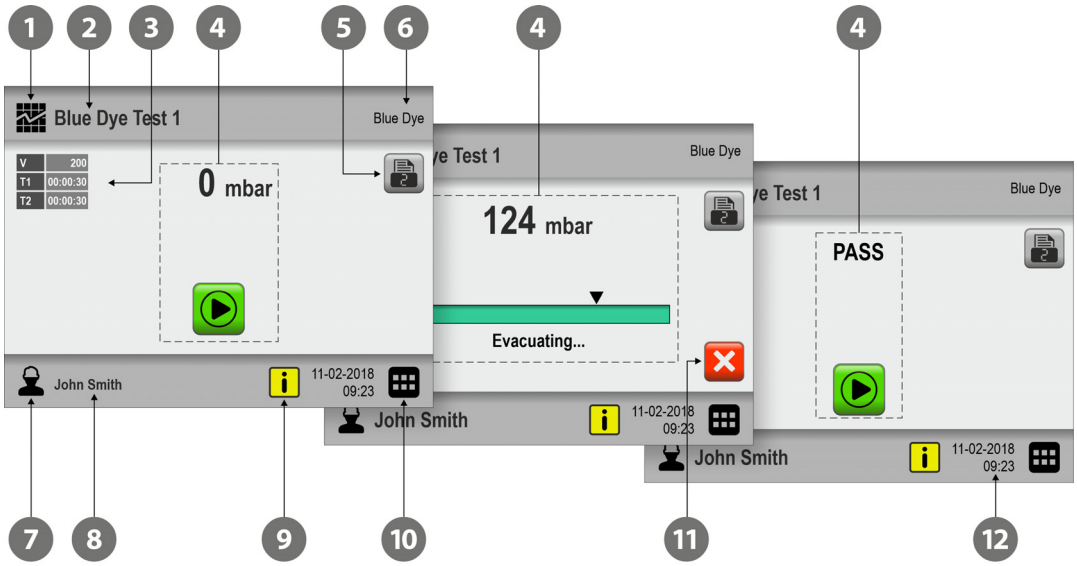
The Test screen



1	**Test Definitions icon**	Pressing this icon will take you to the **Test Definitions** menu for quick selection of a test definition. See *"Selecting a Test definition" on page 42* for details.
2	**Active Test Definition**	Currently selected test definition. To select another test definition, tap **Test Definitions** icon 1.
3	**Test definition settings**	Primary settings for the currently selected test definition.
4	**Status area**	In the status area the workflow status/progress is displayed.
5	**Print**	All measurement data can be printed continuously on a connected USB-printer - see *"Printer" on page 39* for details. Press the button to edit the required number of print-outs (0-9). The button shows the currently selected number of print-outs.
6	**Test Definition type**	The test definition type for the currently selected test definition.

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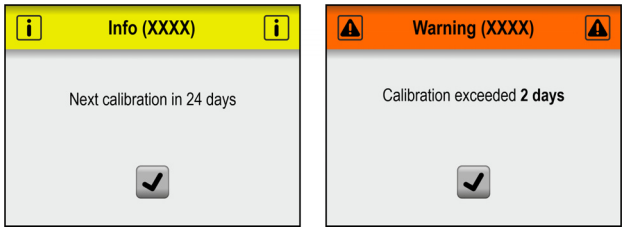
7	**User icon**	This icon shows the access level of the current user: **Standard Test Operator** **Operator** **Supervisor** **Administrator** **Service** See *"Access" on page 64* for details about users and access levels. Pressing this icon will log out the current user and take you to the **Access** screen from where you can select another user or login as **Administrator**.
8	**Current user**	Currently selected user. To select another user, press **User** icon 7.
9	**Calibration alert**	Next calibration in 1 - 30 days Calibration period expired/exceeded Pressing the icon displays a pop-up window with information about the calibration alert: 
10	**Menu icon**	Pressing this icon will take you to the **Main Menu**. See *"Main menu" on page 55* for details.
11	**Abort**	A test can be aborted anytime by pressing this button.
12	**Date & Time**	Current date and time.

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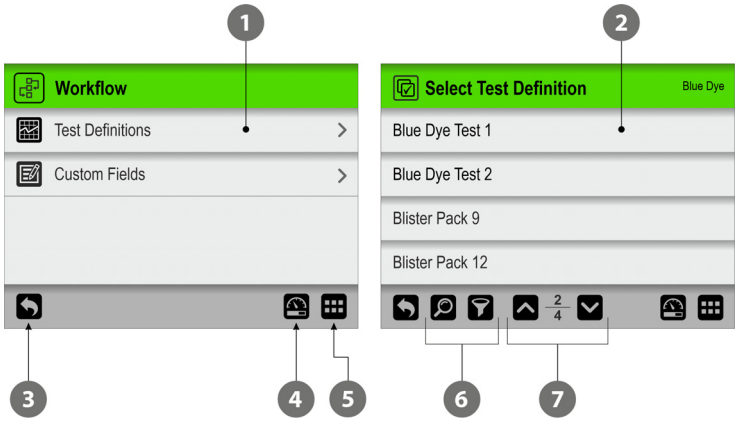
Menu navigation

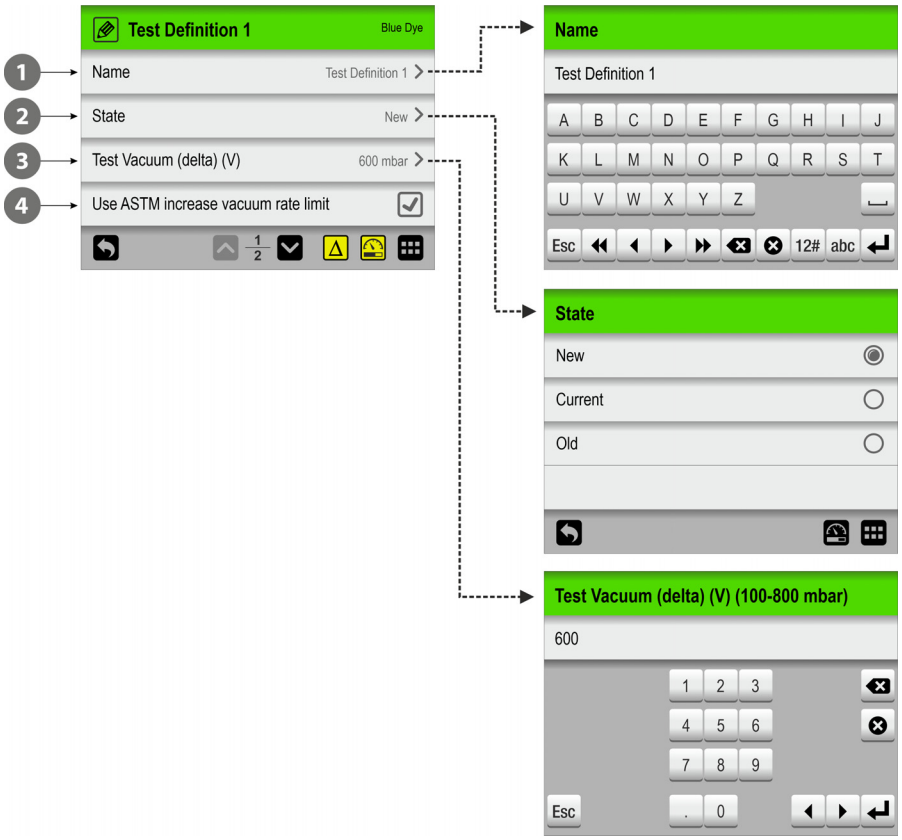
The graphic interface offers various elements for navigating through the menu structure:



1	**Sub-menu**	Open the associated sub-menu.
2	**Open Test Definition**	Select and open a test definition record.
3	**Return icon**	■ Return to the previous menu level. ■ Save editing and return to previous window. ■ When editing test definitions and users, tapping the button will save the edited test definition or user when confirmed.
4	**Test screen icon**	Pressing this icon will take you to the **Test** screen. See *"The Test screen" on page 33* for details.
5	**Main Menu icon**	Pressing this icon will take you to the **Main Menu**. See *"Main menu" on page 55* for details.
6	**Find/Filter icons**	Opens the **Find** and/or **Filter** function - see *"Find and Filter" on page 60* for details.
7	**Scroll/Current page**	Tap icons to scroll through pages in current window. Page indicator shows current page of pages in total.

Parameters

Setting up of test definitions and various device settings involves the following parameter types:



1	**Alphanumeric**	E.g. PIN-codes, Test Definition- and user names. Tap item to open an alphanumeric keyboard to edit/enter text. See *"Typing" on page 37* for details.
2	**Predefined options**	E.g. selection of menu language or temperature/pressure units. Tap item to show list of predefined options.
3	**Numeric**	E.g. pressure- and time settings. Parameter value is numeric and often it can only be set within a predetermined range. Tap item to open a numeric keyboard to edit/enter value.
4	**With check box**	Tap item to enable/disable function (Check/Uncheck)

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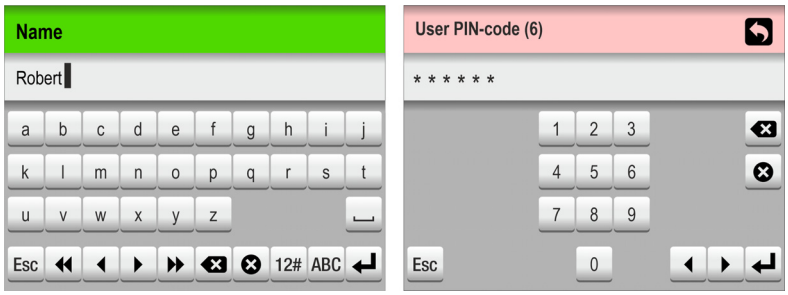
Typing

An on-screen keyboard appears automatically anytime you need to type. An alphanumeric keyboard appears when you must enter text, such as test definition- or user names while a numeric keyboard appears when typing numerical values only, such as PIN-codes.



In the alphanumeric keyboard you can switch between upper- and lowercase characters, special characters, numbers or symbols, by tapping the appropriate keyboard selection key to the left of the ↵ key.

The ⊗ key deletes all the text whereas the ⌫ key deletes the character to left of the cursor.

The ◀ and ▶ keys move the cursor one character to the left or right respectively, and the ⏮ and ⏭ keys make the cursor jump to the beginning or end of the text respectively.

Tapping the ↵ key confirms the input and closes the keyboard, while tapping the Esc key will discard the entered text and exit the keyboard.

Entering accented letters or other alternate characters is done by touching and holding the related key...

...and then selecting the appropriate character from the pop-up list.
Pressing the ⊠ icon will close the pop-up list without typing any character.

It is also possible to use an external keyboard - see *"Keyboard" on page 38* for details.

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Keyboard

It is possible to connect an external keyboard, which makes it easier to enter text.
USB keyboards with cable or wireless transmitter can be used.

MOCON Europe A/S does not offer keyboards.

NOTE! To ensure correct functioning of the keyboard, it is recommended that the parameter Settings -> Units -> External Keyboard Layout is set to the correct language - see *"Units" on page 91*.

Bar-code scanner

If a bar-code scanner is connected to the device, it can be used to scan bar-codes for test definition and user creation.
The scanner can also be used to scan predefined text strings converted to bar-codes, e.g. for custom field inputs or invalid measurement notes.

NOTE! To ensure correct functioning of the bar-code scanner, it is recommended that the parameter Settings -> Units -> External Keyboard Layout is set to the correct language - see *"Units" on page 91*.

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Printer

If a printer is connected to the device, it is possible to print a number of copies of the test results.
The print-outs show:

- Test date and current user
- Test Definition name and parameters
- Test result and custom fields (if any)
- Device serial no. and current Firmware version.

See *"Printer" on page 97* for details about compatible printers.

Connecting multiple USB devices

Even if the device has only one USB connection, it is still possible to connect several USB devices at the same time. However, this requires the use of a USB hub, which is available with different numbers of USB connections.

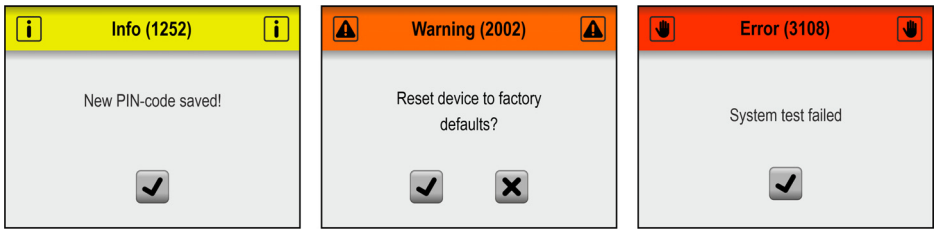
MOCON Europe A/S does not offer USB hubs.

NOTE! Some USB devices (f.ex. bar-code scanners) have a larger power consumption than others, so to ensure that the USB hub can provide the required power supply to all the connected devices, we recommend using a USB hub with a separate power supply.

Pop-up messages

Three types of messages may occur:

- **Info**
- **Warning**
- **Error**



Generally the **Info** and **Warning** messages are self explanatory and relates to user interface interaction. They must be acknowledged by tapping ✓ or by tapping ✓ or ✗ to decide how to proceed.

Error messages are mainly related to the device itself. The **Error** message screen describes the problem and must be acknowledged by tapping ✓.

See *"Error messages" on page 47* for details.

If one or more errors persist you should contact your service provider (see *"Service" on page 75*).
In these cases be sure to inform of the error no. as indicated in the header of the **Error** message screen.
A list of the most recent errors is available in the **Error/Event log** from the **Data** menu - see *"Data" on page 71* for details.

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Get started

When you start the device for the first time and before you start making measurements, it is recommended that you perform some basic device settings.

NOTE! To be able to change device settings you must change the device to "Administrator" access level.
To do so select "Access" from the "Main Menu" - see *"Access" on page 64* for details.

- **Device Settings**
  Go through the parameters available in the **Settings** menu and make appropriate settings - see *"Settings" on page 83* for details.
- **Set up Users**
  From the factory default **Operator**, **Administrator** and **Service** users have been created, but we highly recommend that you create specific users, so that you can separate measurements performed by different users later on for use in statistics etc. - see *"Access" on page 64* and *"Login" on page 88* for details.
- **Set up Test Definitions and Workflows**
  From the factory no default Test Definitions have been created, but we highly recommend that you create specific Test Definitions, so that you can separate the different tests later on for use in statistics etc. - see *"Workflow" on page 56* for details.

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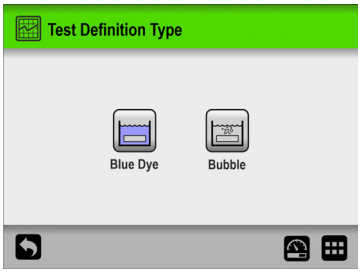
08/2024

Testing

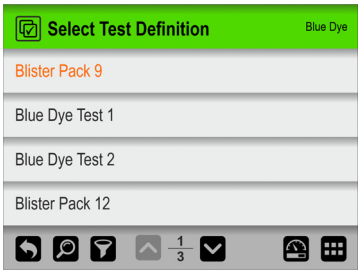
Selecting a Test definition

1. In the test screen....

... tap the icon in the top left corner. This will bring up the **Test Definition Type** screen. This screen can also be reached by tapping the icon in the bottom right corner to go to the **Main Menu**, and then selecting **Workflow -> Test Definitions -> Select (as active)**.



2. Select the appropriate type of test ex. **Blue Dye**.



3. The **Select Test Definition** screen lists all the **Blue Dye** test definitions in last used order.
   Orange text indicates the currently selected test definition.
4. Use and keys to scroll through the list to find the appropriate test definition.

NOTE! If you have a large number of test definitions, scrolling through the list may be quite time consuming. In this case you can use the "Find" and "Filter" functions - see *"Find and Filter" on page 60* for details.

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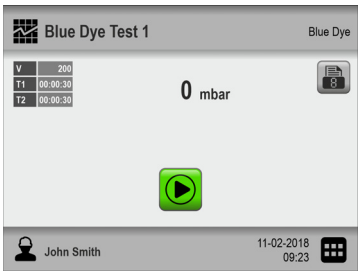
5. Once you have found the required test definition, tap it to select it and return to the test screen.



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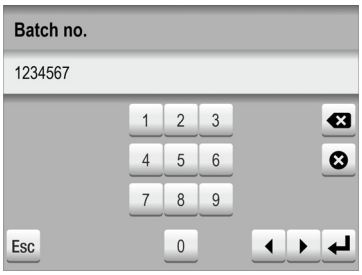
Performing a workflow/test

1. Prepare the test item using the appropriate test setup.
2. Connect printer if required.

3. Select appropriate test definition - see *"Selecting a Test definition" on page 42*.
4. When the device is ready, the display will show one of the screens below.

5. Press button to select required number of print-outs if required.
6. The button appears if the selected test definition requires entering of data in one or more predefined custom fields before test starts.
   If this is the case, proceed from item 7, otherwise go to item 10.
7. Press button to start the workflow.
8. If the first custom field requires entering of, for example, **Batch no.**, a keyboard will appear.



Enter appropriate information and press ↵ key.

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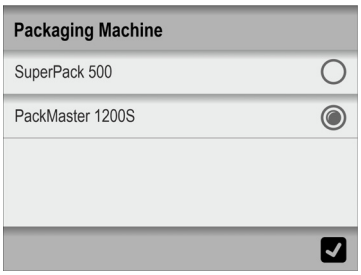
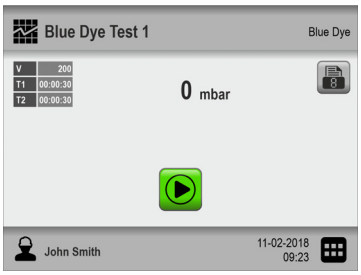
9. If another custom field is required, this could, for example, be selection between 2 predefined options, e.g. packaging machines.



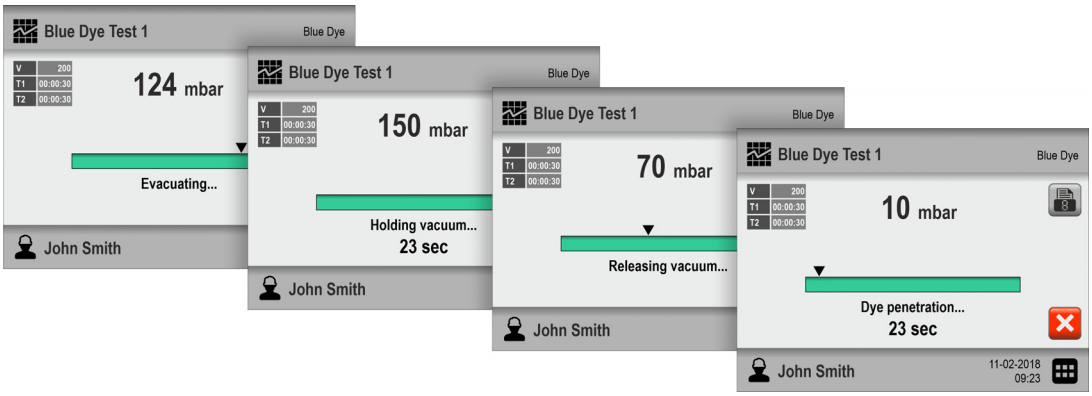
Make your selection and press ☑.

10. When display changes to...



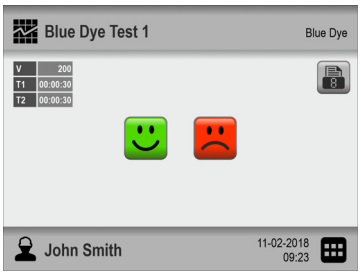
... press the ▶ button to start the test.

11. The device now automatically performs all the steps of the selected test, displaying each step as it is executed (vacuum increase, hold and release, penetration etc.) together with a read-out of the current package vacuum.

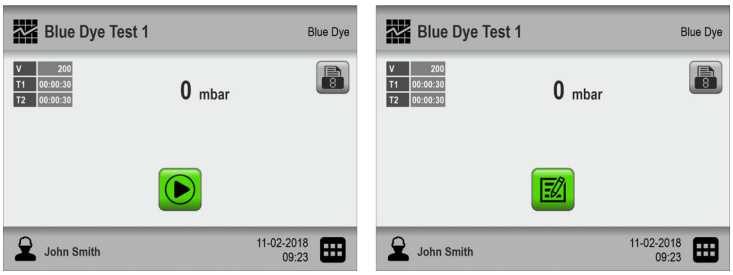


NOTE! A test can be aborted anytime by pressing the ✖ button.

12. When the test is completed, the result of the test must be determined.
    For **Blue Dye** tests, it must be examined whether the coloured liquid has penetrated into any defective blisters of the test subject.
    The result of a **Bubble** test is basically determined by seeing if bubbles came out of the package or not.
    If you want to save the test results in the **Test Log**, this can be achieved by having enabled the parameter **Enter Test Result** in **Settings -> Device**.
    Two buttons will now appear on the test screen with which you can select whether the test is approved or not.



    Thus, if you press the button, the test result will subsequently be indicated and registered as **OK**, whereas pressing the button will indicate and register the result as **Error**.
13. If print-outs are selected, the selected number is now printed on the connected printer.



14. The device is now ready for a new test/workflow.

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Error messages

NOTE! The error message list below is not complete but describes the possible errors that the daily user has an opportunity to respond to and correct. Other error messages may occur, but these will most often require a greater technical insight into the device or that you contact your assigned service provider (see *"Service" on page 75*).

NOTE! If problems or errors occur, that are not described in this section or if one or more errors persist, you should contact your assigned service provider (see *"Service" on page 75*).

No.	Message	Problem	Solution
3004	Name exists: XX	This name is already used.	Use another name.
3005	ID already exist: XX	This ID is already used.	Use another ID.
3009	Binary file version not supported	The binary file is not compatible with the device.	Check that it was the correct file. Files from other Dansensor equipment can not be imported.
3010	Printing failed	The printer was not connected or not turned on. Non-compatible printer is used.	Connect and turn on the printer. Change to recommended printer.
3111	Initial desiccator vacuum too high	A test can not be done if the vacuum in the desiccator is lower or the same as the test vacuum.	De-pressurize the desiccator and retry.
3112	Target vacuum not achieved	The vacuum was not achieved within the time limits, probably because a leakage or a defective pump.	Run a System Test to trouble shoot. Check whether pump is functional and able to create a vacuum. Is inlet pressure high enough? (Ejector version). Check that sealings are clean and intact.

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No.	Message	Problem	Solution
3113	Overshoot more than XXX	The pressure in the package became higher that the set point.	Ensure that the package is restrained, if needed. Do not touch the package when the device is inflating the package. If it still overshoots, reduce the test speed.
3203	Flash memory full	Not enough space on the connected USB-stick.	Use an empty USB-stick.
3205	User login not allowed	Service access not enabled.	Enable service access. (Requires Administrator access).
3206	Unsupported users database	You are trying to import an incompatible user database	Select a compatible user database.
3207	Users database corrupted	Internal SW error.	Try to restart.
3208	Users list import failure		Try another USB-stick.
3209	Users list export failure		Try another USB-stick.
3215	Unable to edit Test definition. Test definition has been used	You are trying to edit a test definition that has been used.	Either create a new test definition or change the “Lock Test” setting so that a used test definition can be edited.
3216	Test definition value(s) out of range		Change the value to an acceptable value.
3236	Test definition exists		Save test definition with another name.
3301	USB stick not inserted	No USB-stick connected.	Connect USB-stick.
3302	Failed to copy a file to USB		Try another USB-stick.
3303	Couldn’t find a file from USB		Try another USB-stick. The file must be placed in the correct folder on the USB-stick and it must have the correct name.
3305	File export failed		Try another USB-stick.
3306	File import failed		Try another USB-stick.

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No.	Message	Problem	Solution
3308	Failed to communicate with data logging server	No LAN connection when the device tried to send data.	If you do not want to use Network Logging: Disable Network Logging. If you want to use Network logging: Ensure that the device and PC is connected to the same network. Ensure that the IP-address set on the device is the one used by the PC.
3312	File exists in USB		Use an empty USB-stick.

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5. Cleaning and Maintenance

General

NOTE! Performing cleaning and maintenance regularly reduces the chances of equipment failure.

CAUTION! Personnel performing any maintenance or cleaning must familiarize themselves with the *"Safety and Handling Instructions" on page 99* before attempting any of these procedures.

The Dansensor® **Lippke**® VC1400 device is maintenance-free. This particularly applies to the pneumatics and electronic control systems.

Cleaning and maintenance of measurement accessories is described in the following.

Parts required for maintenance purposes are listed in *"Consumables and Accessories" on page 97*.

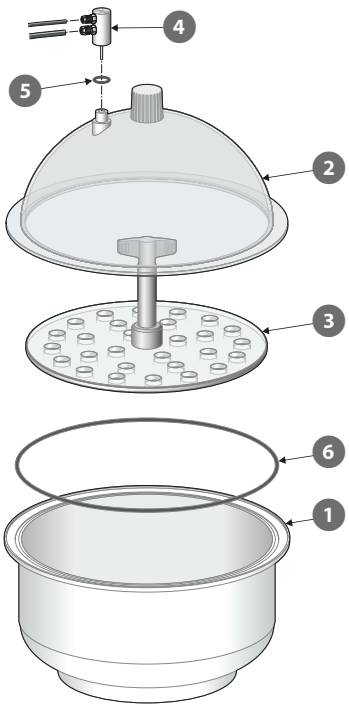
Cleaning

Device

All device surfaces should be cleaned using a mild soap solution and a wrung cloth.

Desiccator

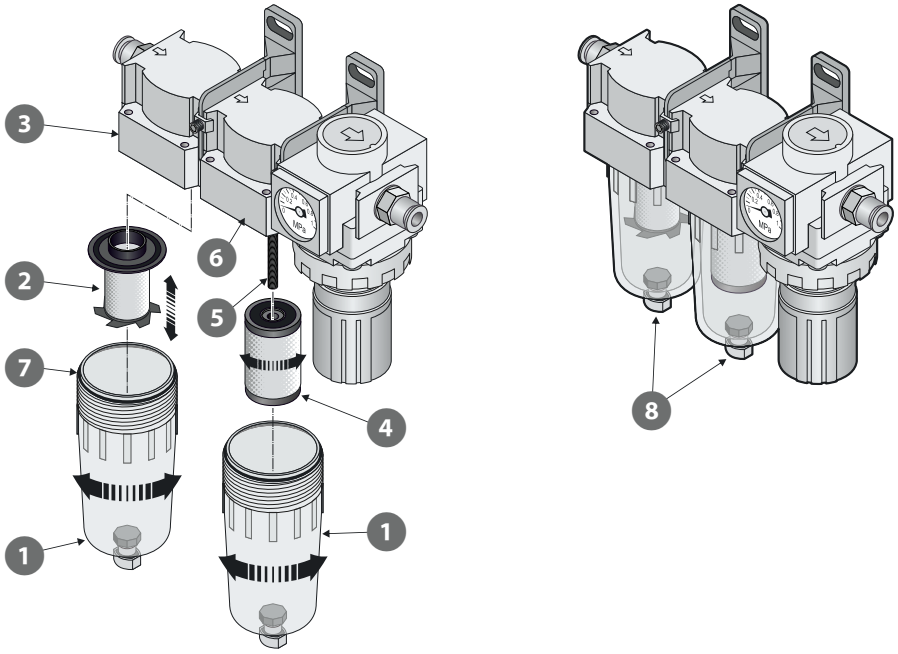
- All surfaces of the tub 1, lid 2 and disc 3 should be cleaned using a mild soap solution and a wrung cloth.
- Please make sure that the suction tube adapter 4 is clean. Disconnect it from time to time from the lid 2 and check if the needle and the orifice around the needle is completely clean.
  Solid residues can be removed cautiously by a needle-shaped tool.
  It is recommended to blow out liquid residues with compressed air.
- The O-ring 5 on the suction tube adapter and the O-ring 6 on the desiccator tub guarantee the tightness and reliable functioning of the system. Therefore, they have to be replaced regularly.



Pressure regulator with filters

("Vacuum Ejector" models only)

The filters in the optional pressure regulator unit should be replaced at regular intervals or if they are soiled.



1. Unscrew the filter bowl 1.
2. Replace filter:
   - The new oil filter element 2 should be clicked into the bowl 1 before assembling it with the filter housing 3.
   - The new dust filter element 4 must be screwed onto the threaded rod 5 and tightened before assembling the bowl 1 with the filter housing 6.

CAUTION! All parts should only be hand tightened - do not use any tools.

CAUTION! When assembling the bowls 1 with the filter housings 3 and 6, make sure that the O-rings 7 are fitted properly on the bowls.

Draining the filters

If necessary, use the drain valves 8 at the bottom of the bowls 1 to empty them of dirt and oil residues.

CAUTION! This should be done when the unit is under pressure.

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Hoses

All hoses should be disconnected regularly and blown through using compressed air.

NOTE! When using compressed air for cleaning, make sure that air is clean, dry and oil free.

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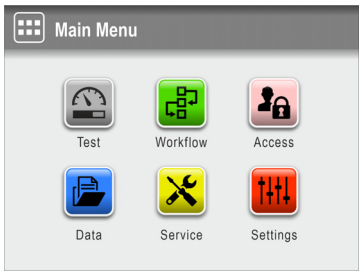
6. Menus and Settings

Main menu

Tapping the icon in the lower right corner of the test screen takes you to the **Main Menu**.



Please note that the access level of the current user determines which features and menus are available - see *"NOTE! For best safety and correct operation of the device, we recommend logging "Administrator" and "Service" users out when their use is not required." on page 65* for details about the various access levels and the associated rights.

Test	Takes you to the Test screen. See *"Performing a workflow/test" on page 44* for details.
Workflow	Definition of workflows and set-up of test definitions. See *"Workflow" on page 56* for details.
Access	Selection and administration of user access levels. See*"Access" on page 64* for details.
Data	View logged data for a test definition. See *"Data" on page 71* for details.
Service	Perform test measurements and view device serial nos., SW version and counters etc. See *"Service" on page 75* for details.
Settings	Setting of various device parameters. See *"Settings" on page 83* for details.

IMPORTANT!

When changes are made to device settings, workflows and users etc., most of these are not saved until you return to the previous menu level.

To make sure changes are saved, you should go to the main menu and wait at least 30 sec. before switching the device off.

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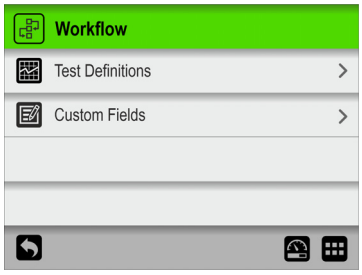
Workflow

A workflow is set up as a combination of a test definition, the actual testing and a number of predefined custom fields. During the workflow the custom fields allow the user to enter optional texts or numbers and/or to select from a list of predefined text strings.
All data entries are saved together with the test result in **Test Log** in the **Data** menu - see *"Data" on page 71* for details.

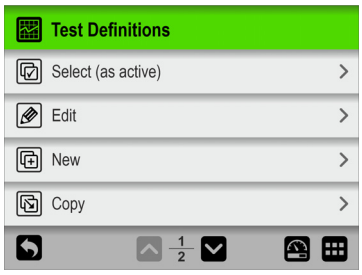


Parameters marked with an asterisk (*) are only available when logged in as "Administrator".

Test Definitions	Select, create, edit and delete test definitions. See *"Test Definitions"* below for details.
Custom Fields *	Setting up of the various custom fields. See *"Custom Fields" on page 62* for details.

Test Definitions

Selecting **Test Definitions** from the **Workflow** menu will display a menu with the available test definition options. The total number of test definitions that can be created is 999.



Select (as active)	Select the test definition, you wish to use for the test. See *"Select (as active)" on page 58* for details.

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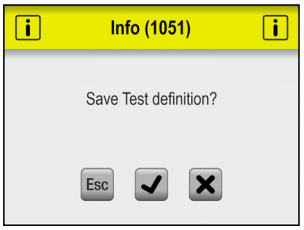
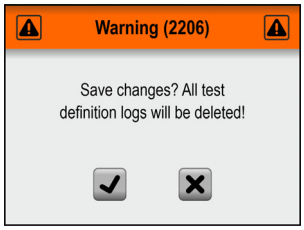
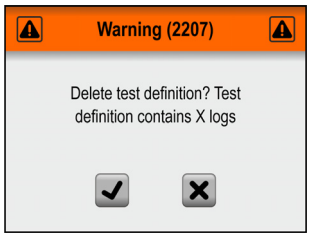
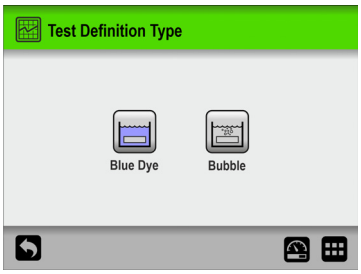
Edit	Edit an existing test definition. Test definition settings are described in *"New" on page 59*. Most of the test definition parameters can only be edited if no tests have been performed using the test definition or if the parameter **Settings -> Device -> Lock Test** has been disabled. Depending on whether the current change requires any existing log data to be deleted or not, one of these messages will appear when you exit the function:   Press ✓ to save the changes and at the same time delete any existing log data if required.
New	Creates a new, blank test definition. See *"New" on page 59* for details.
Copy	Use this function to create a new test definition that is similar to an existing test definition. Test definition settings are described in *"New" on page 59*.
Delete	When deleting a test definition, both the test definition and its logged data are deleted. The action must be confirmed before the test definition is deleted. 

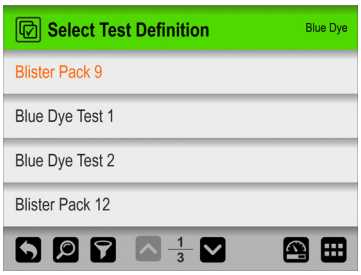
Select (as active)

This function allows you to select the test definition, you wish to use to perform a test.

1. Selecting **Select (as active)** brings up the **Test Definition Type** screen.



2. Select the appropriate type of test ex. **Blue Dye**.



3. The **Select Test Definition** screen lists all the **Blue Dye** test definitions in last used order.
   Orange text indicates the currently selected test definition.

NOTE! If you have a large number of test definitions, scrolling through the list may be quite time consuming. In this case you can use the "Find" and "Filter" functions - see *"Find and Filter" on page 60* for details.

4. Use and keys to scroll through the list to find the appropriate test definition, then tap it to select it and return to the test screen.

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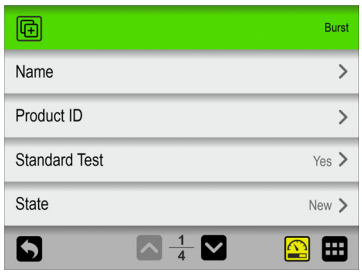
New

Creates a new test definition with default settings.



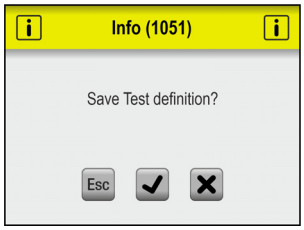
TIP! If a new test definition will be very similar to an existing test definition, you might want to use the "Copy" function.

An explanation of the parameters for the test definition types can be found here:

Blue Dye - see *"Blue Dye test settings" on page 20*

Bubble - see *"Bubble test settings" on page 23*

When you have finished setting the test definition parameters, a message appears when exiting the function:

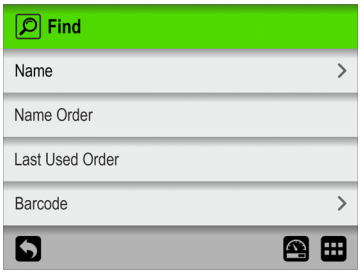


Tap ✓ to save the new test definition and return to the **Test Definitions** menu.

Find and Filter

The **Find** and **Filter** functions can be helpful if you have a large number of test definitions thus making scrolling through the list quite time consuming.
The functions can be used separately, or combined as described below:

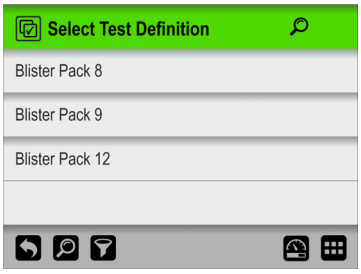
1. Tap the icon to bring up the **Find** screen.



2. Select the appropriate search method. Selecting either the **Name** or **Barcode** methods brings up a touch screen keyboard for keying in the search text.

NOTE! The "Name" or "Barcode" search methods will not find all test definitions, with the search text appearing somewhere in the name or Product ID, but only test definitions where the name or Product ID starts with the entered search text.

3. Key in the test definition name (e.g. **Blister** and confirm by tapping the key.
4. The **Select Test Definition** screen will appear showing a list of found test definitions with names starting with **Blister**.



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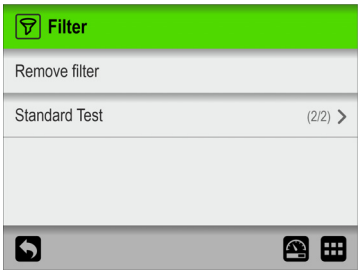
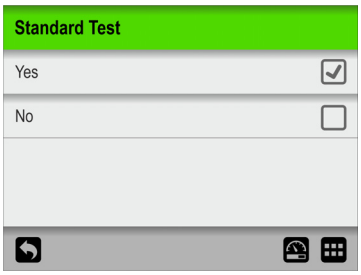
5. Now tap the icon to bring up the **Filter** screen.

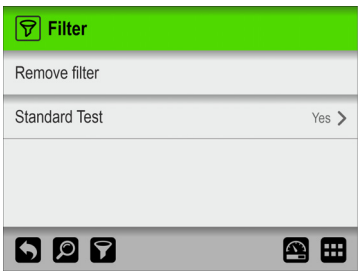


6. If required select the **Standard Test** filtering parameter.

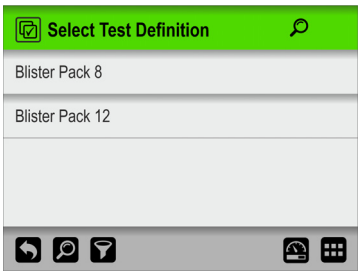


Make required setting, then press the key.

7. Now you can see the selected **Standard Test** filter setting.



Press the key to return to the list of test definitions that meet the search- and filter criteria.

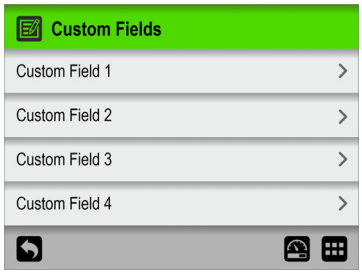


8. Tap the appropriate test definition to select it and return to the test screen.

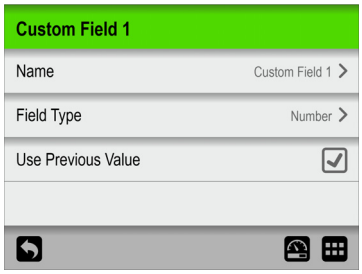
Custom Fields

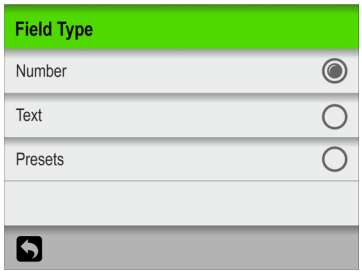
Use the custom fields to add various information about a specific measurement during a measurement workflow. The data entries are saved together with the measurement result.

4 custom fields are available, each of which can be individually defined with a name and an input type. Whether or not a field entry is required, is set up for each test definition individually.



Custom Field settings



Name	A unique custom field name (up to 32 characters).
Field Type	Select the type of required input:  When type is set to either **Text** or **Number,** the appropriate type of keyboard appears when an entry is required.

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	When type is set to **Presets** you have the possibility to define up to 4 different text fields. When prompted during the measuring workflow, you must select either of the preset text fields from the list.
Use Previous Value	If enabled, the previous entered value will already be filled in, when the appropriate entry keyboard appears. Only applies when **Field Type** is set to either **Text** or **Number**.

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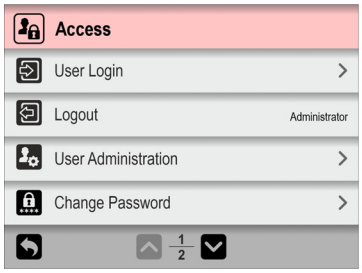
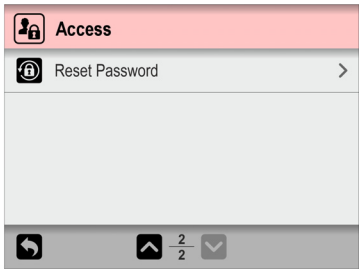
Access

From the **Access** menu the various users and their access levels are created and managed. See *"Access levels" on page 66* for details about the various access levels and the associated rights.

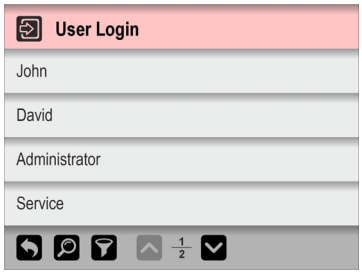




User Login

Which screen appears when you select **User Login** depends on which type of user login is selected in **Settings -> Login -> User Login**:

If **User Login** is set to either **Not required** or **User Name**, the user list screen appears. From this list you can select the user, you want to log in as. The user list always contains the default **Administrator** and **Service** users.



If **User Login** is set to **User ID**, an input screen appears, where you must enter the **User ID** of the user, you want to log in as.

NOTE! User ID for the default Administrator is "Administrator" (cannot be changed).

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	In both cases **Supervisor, Administrator** and **Service** level users must then always enter a password. In case **Settings -> Login -> Password -> Enable Operator Password** is enabled, **Standard Test Operator** and **Operator** level users must enter password as well.
Logout	Logout the current user.
User Administration	Maintain user database. See *"User Administration" on page 67* for details.
Change Password	See *"Change Password" on page 69* for details.
Reset Password	***(Only available if logged in as an "Administrator" or "Service" level user)*** See *"Reset Password" on page 70* for details.

NOTE! For best safety and correct operation of the device, we recommend logging "Administrator" and "Service" users out when their use is not required.

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Access levels

The various access levels and the associated rights are described below:

NOTE! A higher level of access always has all rights from lower access levels.

Standard Test Operator	Basic user. ■ Can only perform tests on workflows/test definitions marked as **Standard Test**. If **Use State Mark** is enabled in **Settings -> Device** the access is limited to **Standard Test** test definitions/workflows marked with **State = Current**. ■ Cannot change any settings.
Operator	Normal user. ■ Can perform tests using all test definitions/workflows with **State = Current**. ■ Cannot change any settings.
Supervisor	Daily administrator of test definitions/workflows and standard users. ■ Has access to all test definitions/workflows. ■ Can create test definitions/workflows and edit custom fields. ■ Can create **Standard Test Operator** and **Operator** users, but not other **Supervisor** users. ■ Can access the **System Test** and **Vacuum Test** functions from the **Service -> Test & Adjustment** menu. ■ Can export measurement logs and error/event logs. ■ Cannot change settings in the **Settings** menu.
Administrator	Device administrator. ■ Can change settings in the **Settings** menu (except for the **Service** menu). ■ Can create/delete **Supervisor** users and other **Administrator** users. Please note that default **Administrator** cannot be deleted. ■ Can reset passwords. ■ Can remove access to **Service** login. ■ Can export and import all data.
Service	Service Technician. ■ Can access all settings in the **Settings -> Service** menu. ■ Can access all functions in the **Service -> Test & Adjustment** menu.

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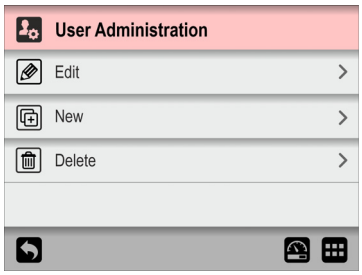
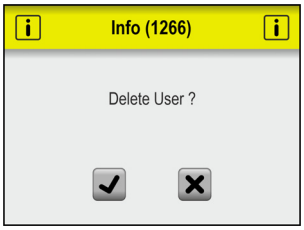
User Administration

From here the user database is maintained. You can edit the settings for an existing user, create new users or delete users.

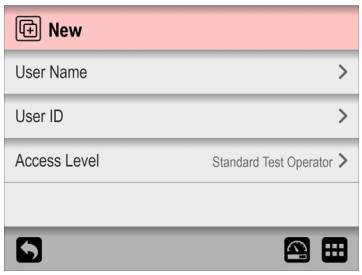
See *"Access levels" on page 66* for details on what access rights you must have to create/ modify/delete the different types of users.



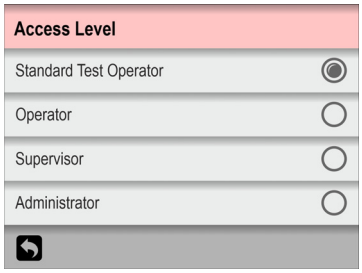
Edit	Edit an existing user. User settings are described in *"New" on page 68*.
New	Creates a new, blank user. See *"New" on page 68* for details.
Delete	Delete user. The action must be confirmed before the user is deleted. 

New

Creates a new, blank user. The total number of users that can be created is 100.



The following parameters can be set for a user:

User Name	A unique user name (up to 25 characters).
User ID	Unique user identification code (up to 25 characters). Both numbers and letters can be used. Use ID to login when login with **User ID** is required. **NOTE! If you forget your User ID, you should create a new (requires Supervisor or Administrator access).**
Access Level	Select access level.  The access level determines how much you have access to in relation to creating, modifying and deleting data. See *"Access levels" on page 66* for details.

NOTE! The first time you try to log in as a new user you will be prompted to create a password for this user. For Operator users this only applies if Enable Operator Password is enabled.

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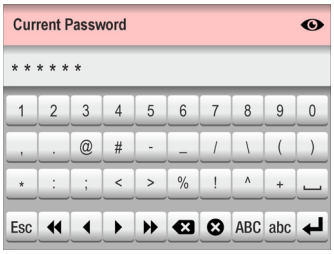
Change Password

Use this function to change the password for the user you are logged in as.

To change the password do the following:

NOTE! By toggling the and symbols in the top right corner of the screen, you can show and hide the entered passwords respectively.

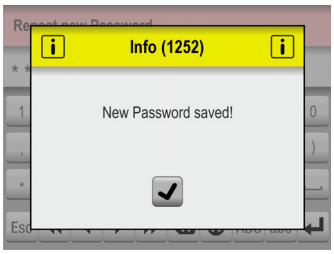
1. From the **Access** menu select **Change Password**.
   This screen appears:



2. Enter current password and tap the ↵ key.

3. Enter new password and tap the ↵ key.

4. Enter new password again and tap the ↵ key.



5. Tap ✓ to confirm. Password has now been changed.

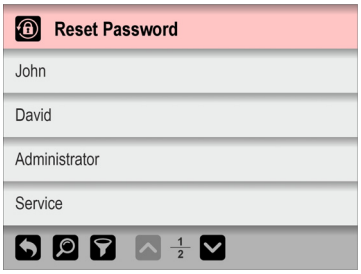
Reset Password

Applies to "Administrator" or "Service" level users only!

Use this function to reset a password for a user.

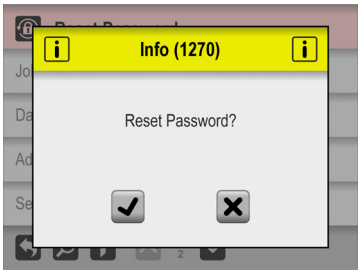
NOTE! The reset functionality cannot be used to reset the password for the Service user profile.

1. From the **Access** menu select **Reset Password**.
2. From the appearing list of users...



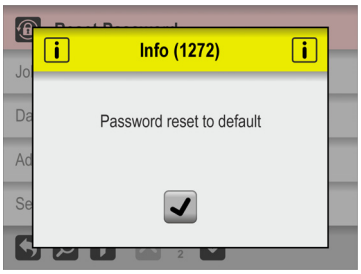
...select the user whose password should be reset.

3. When this message appears...



...confirm that you wish to reset the password for the selected user.

4. If action is confirmed, the password for the selected user will be reset.



5. Tap ✓ to confirm.

NOTE! The next time you try to log in as the user whose password has been reset, you will be asked to create a new password for this user.

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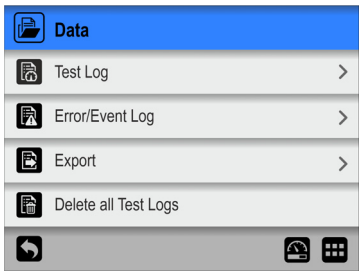
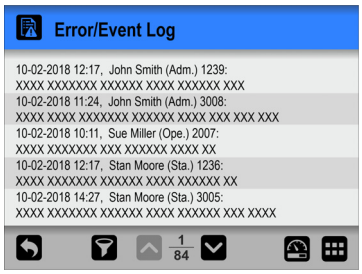
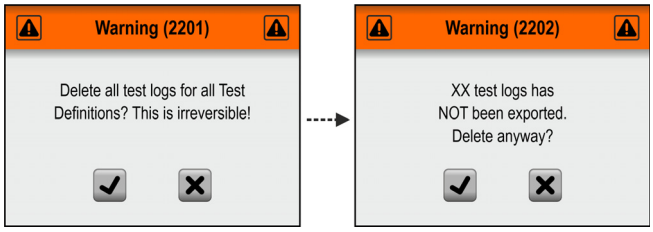
Data

From the **Data** menu you can read out and manage measurement data for selected test definitions and error and event log data.
The device can store log data for more than 1,000,000 tests.



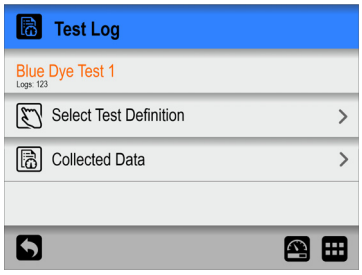
The **Data** menu holds the following items:

Parameters marked with an asterisk (*) are only available when logged in as "Administrator".

Test Log	Opens the **Test Log** screen See *"Test Log" on page 72* for details.
Error/Event log	Displays an internal log file listing the last 99 pages of errors and events. To see the complete list of errors and events you should export the logs - see *"Export" on page 74* for details.  Tap the icon to select the type of logs to be displayed (**Errors**, **Events**, **Warnings** or **All**) if required.
Export *	Opens the **Export** screen See *"Export" on page 74* for details.
Delete all Test Logs *	Use function to delete log data for all test definitions. The action must be confirmed before the data is deleted. 

Test Log

From the **Test Log** screen you can read out and manage the test log data for selected test definitions.



The **Test Log** menu holds the following items:

Active test definition	The test definition currently selected for data management. The field also shows the current number of data logs for the test definition. The default selected test definition is always the active test definition (test definition text is orange) but any other test definition can be selected using the **Select Test Definition** function.
Select Test Definition	Select test definition for data management. The procedure of locating and selecting test definitions is the same as described in *"Select (as active)" on page 58* and *"Find and Filter" on page 60*.
Collected data	Displays the logged data (if any) for the currently selected test definition. See *"Collected data" on page 73* for details.

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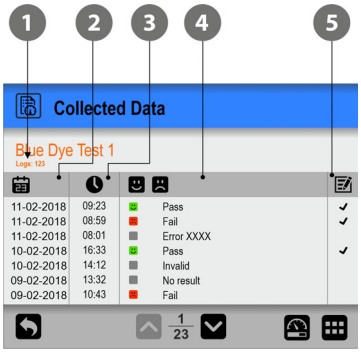
Collected data

Selecting **Collected data** from the **Test Log** menu will display a list of the logged measurement data for the selected test definition.



The list shows the following information about each log:

1. **Number of log entries for the selected test definition**
2. **Log date**
3. **Log time**
4. **Test result**
   There are the following possible test results:

Pass	The test has been marked as passed. Test is a valid test.
Fail	The test has been marked as failed. Test is a valid test.
No result	No test result has been applied to test. Test is a valid test.
Invalid	The test has been marked as invalid.
Error (No.)	An error occurred during the test.

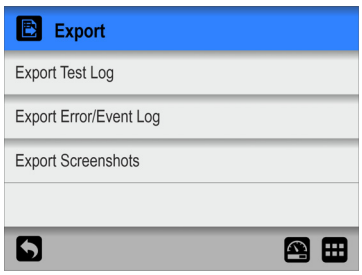
5. **Comments**
   Shows if there are comments to the test (from Custom Fields).
   All custom field entries are exported together with the log data.

The logged data can be exported - see *"Export" on page 84* for details.

Data logging via a local network is also possible - see *"Network Logging" on page 87* for details.

Export

Selecting **Export** from the **Data** menu will display a screen showing the available export functions.



NOTE! The export functions require that you insert a USB-stick in the device's USB-port (labelled).

Export Test Log	Exports all test data logs (as text file).
Export Error/Event Log	Exports error/event logs (as text file).
Export Screenshots	Exports all screen-shots from the device's memory to a USB-stick. At the same time the screen-shots are deleted from the device. See *page 32* for details about making screen-shots.

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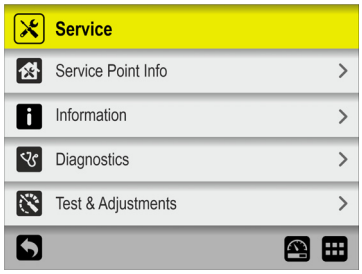
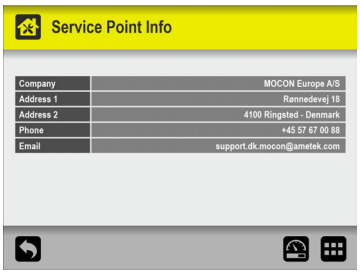
Service

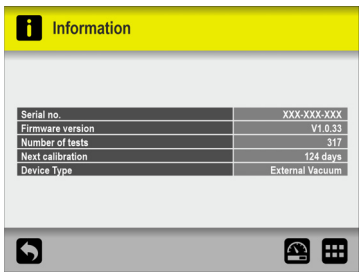


The **Service** menu holds the following items:

Service Point Info	Displays the company information for your appointed service provider.  (Can be changed by a Service Technician).
Information	Opens the **Information** screen. See *"Information" on page 76* for details.
Diagnostics	Opens the **Diagnostics** screen. See *"Diagnostics" on page 77* for details.
Test & Adjustments	Opens the **Test & Adjustments** screen. See *"Test & Adjustments" on page 78* for details.

Information

The **Information** screen holds general information about the device.



Serial no.	Shows the device's serial number.
Firmware Version	Shows the firmware version currently installed on the device.
Number of tests	Shows the total number of tests performed.
Next calibration	Shows the number of days left until the device should be calibrated.
Device Type	Shows the device type.

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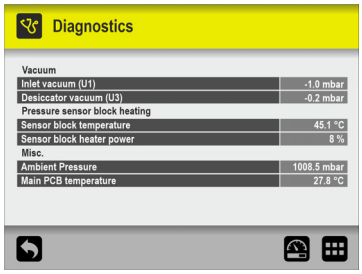
Diagnostics

The **Diagnostics** screen holds various internal device parameters.

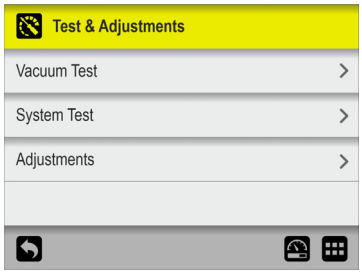


The parameters can only be read and not changed.

Vacuum	**Inlet vacuum (U1)**	Currently measured inlet pressure.
	Desiccator vacuum (U3)	Currently measured vacuum in the desiccator.
Pressure sensor block heating	**Sensor block temperature**	Shows the temperature measured on the sensor block.
	Sensor block heater power	Sensor block heater power percentage.
Misc.	**Ambient Pressure**	Shows the currently measured atmospheric pressure.
	Main PCB Temperature	Shows the temperature measured on the PCB in the device. This will always be slightly higher than the surrounding temperature.

Test & Adjustments

The **Test & Adjustments** functions can be used to perform various tests.



Vacuum Test	Opens the **Vacuum Test** screen. See *"Vacuum Test" on page 79* for details.
System Test	Opens the **System Test** screen. See *"System Test" on page 81* for details.
Adjustments	*Only available for Service Technicians.*

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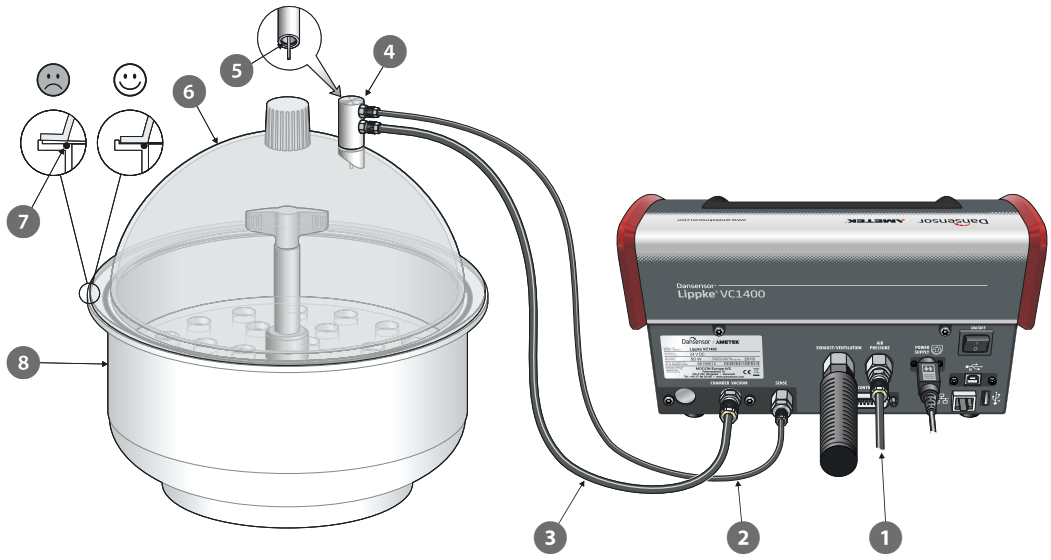
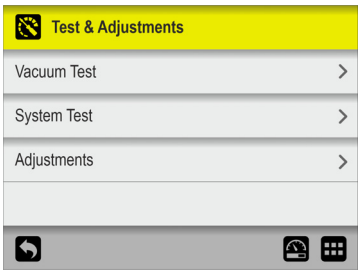
Vacuum Test

The **Vacuum Test** function is primarily to be used for checking the tightness of the assembled system.

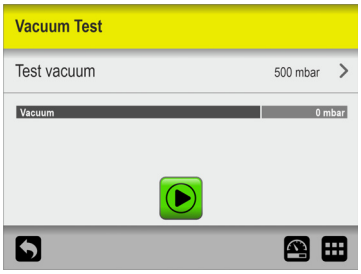


1. Make sure that the vacuum/air pressure hose 1 is properly connected between the device and the air pressure or vacuum source and that the sense hose 2, and the vacuum chamber hose 3 are properly connected between the device and the appropriate connectors on the desiccator adapter 4.
2. Check that the O-ring 5 is fitted properly in the adapter 4, then connect it to the connector on the desiccator lid 6.
3. Check that the O-ring 7 is fitted properly in the groove in the tub 8 and at the same time apply a small amount of grease to the O-ring if necessary.
4. Place the lid 6 on the tub 8. Make sure that the lid is placed inside the edge of the tub all the way around (see detail).
5. In the **Test & Adjustments** menu....

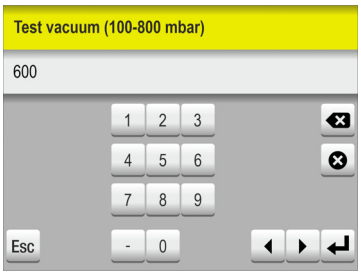


...select **Vacuum Test**.

6. The **Vacuum Test** screen shows the currently set test vacuum.

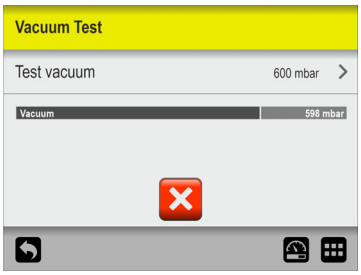


To set another test pressure, press **Test vacuum**...



...then enter the required test vacuum (ex. 600 mbar) and press ↵.

7. Press the ▶ button to start the test.
8. The test starts by evacuating the system until the set vacuum is reached.
   Then the valves are closed and in the following period the pressure should be observed until it can be decided whether the system is tight or not.



The test can then be stopped by pressing the ✖ button.

9. When a test fails, it will be necessary to investigate where there are leaks in the system and have these repaired.

NOTE! We recommend to perform additional tests afterwards.

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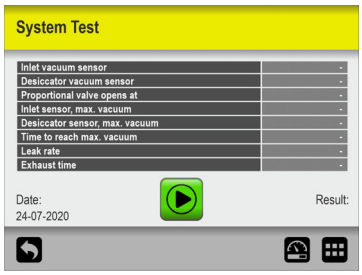
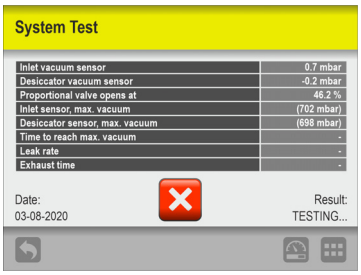
System Test

The **System Test** function can be used to test the main functions of the device.



NOTE! The function should typically be used to check the current values for a fully installed test system, ready to perform tests.

1. Press the button to start the test.

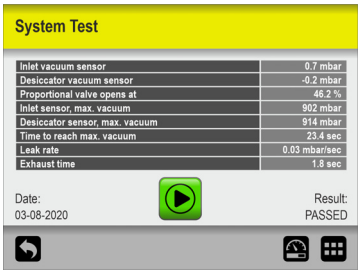


The test checks the following:

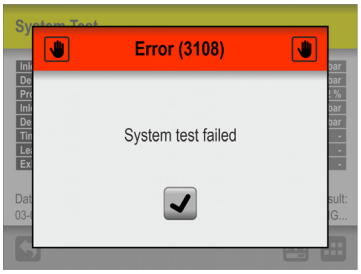
- **Inlet vacuum sensor:**
  Shows the applied vacuum on the inlet port. With PU1400 or Vacuum Ejector this value is typically close to 0 mbar ±6 mbar, (e.g. pump is not started).
  In case of connection to External vacuum this pressure will show the applied vacuum supply by the source.
- **Desiccator vacuum sensor:**
  Shows the pressure in the desiccator before the test is started. This value is typically close to 0 mbar ±4 mbar. Otherwise the pressure sensor is malfunctioning or chamber is not vented to atmospheric pressure.
- **Proportional valve opens at:**
  The proportional valve regulates the vacuum.
  This value indicates at which level (%) a vacuum in the chamber starts to build up.
  A higher value could indicate a leaking chamber. A hand on the lid can ensure an airtight seal.
- **Inlet sensor max vacuum:**
  This is how much vacuum the vacuum system is capable to supply.
- **Desiccator sensor max vacuum:**
  This shows the vacuum level which the VC1400 system is capable to obtain.
- **Time to reach max vacuum:**
  This value shows how long time it takes to reach max. vacuum in desiccator.
  Too long time could indicate a defective or misplaced O-ring.

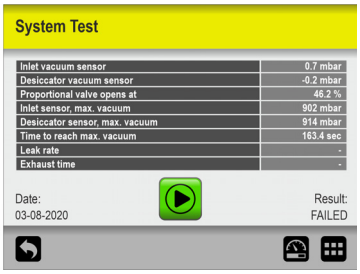
- **Leak rate:**
  On a countdown from 20 sec, this value is calculated and shows how the system is leaking.
  Too high leakage could indicate a defective or misplaced O-ring.
- **Exhaust time:**
  At vacuum release this value shows the time to reach atmospheric pressure again.
  Too long time could indicate a blocked exhaust line.

2. If all tests are performed without errors, the screen will show:



3. If one of the tests fails, the entire test procedure stops and an error message appears.





Press the ✓ button to close the error message.
On the screen you can see which test has failed and the measured value for it.

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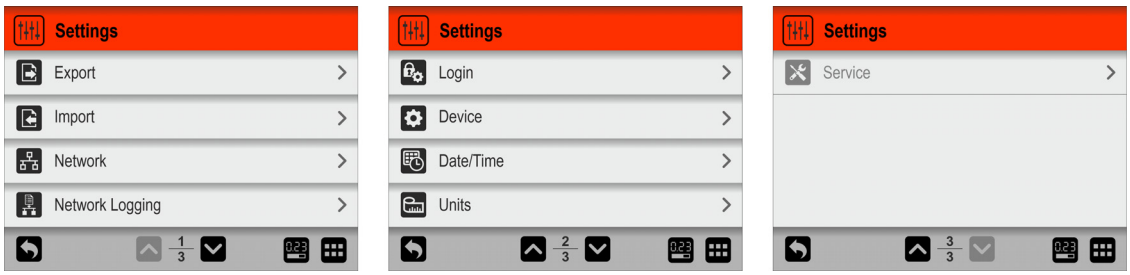
Settings

Selecting **Settings** from the **Main Menu** will display a menu with available set-up parameters.

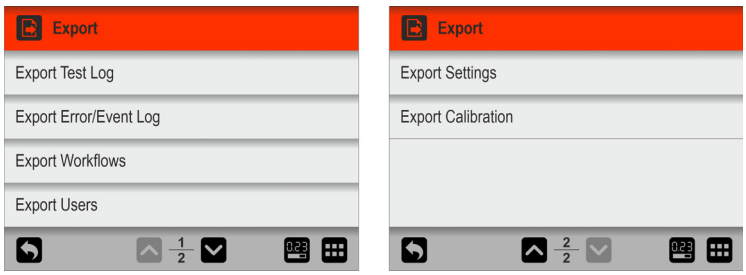


The menu holds the following items:

Export	Opens the **Export** screen See *"Export" on page 84* for details.
Import	Opens the **Import** screen See *"Import" on page 85* for details.
Network	Opens the **Network** setup screen See *"Network" on page 86* for details.
Network Logging	Opens the **Network Logging** setup screen See *"Network Logging" on page 87* for details.
Login	Opens the **Login** setup screen See *"Login" on page 88* for details.
Device	Opens the **Device** setup screen See *"Device" on page 90* for details.
Date/Time	Opens the **Date/Time** setup screen See *"Date/Time" on page 91* for details.
Units	Opens the **Units** setup screen See *"Units" on page 91* for details.
Service	Opens the **Service** setup screen *Only available for Service Technicians.*

Export

Selecting **Export** from the **Settings** menu will display a screen showing the various export functions.



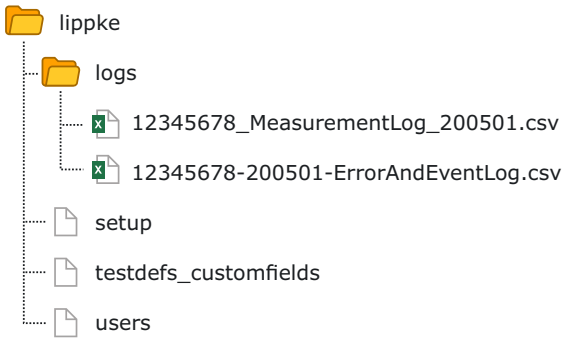
NOTE! The export functions require that you insert a USB-stick in the device's USB-port (labelled).

NOTE! We recommend to use the various export functions to make backups regularly so that files can be restored in case of a PCB breakdown.

The functions marked with an asterisk (*) can for example be used to clone another device.

Export Test Log	Exports all test data logs
Export Error/Event Log	Exports error/event logs
Export Workflows *	Exports the workflow database
Export Users *	Exports the user database
Export Settings *	Exports all settings from the **Settings** menu

The export function creates the following folders/files on the USB-stick:



The file export format for the log files is *.csv (Comma Separated Values). This format can be imported into a spreadsheet. The actual used separator is ";" (semicolon).
Measurement log files are named **<serial no.>_MeasurementLog_<date>.csv** and Error and Event log files are named **<serial no.>-<date>-ErrorAndEventLog.csv**.

Other files are exported as binary files and named **setup, testdefs_customfields**, and **users** respectively. These files can not be edited.

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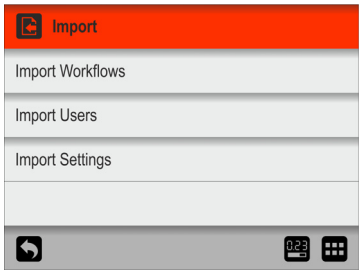
Import

Selecting **Import** from the **Settings** menu will display a screen showing the various import functions.



NOTE! The import functions require that you insert a USB-stick with the required files in the device's USB-port (labelled).

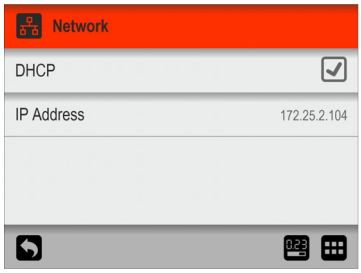
The functions can for example be used to clone your device with exported data from another device.

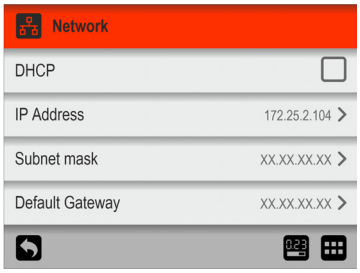
Import Workflows	Imports a workflow database. Only new test definitions will be imported, unless you choose to delete the existing test definitions before importing. **NOTE! Custom Fields will be deleted from the imported test definitions.**
Import Users	Imports a user database. Only new users will be imported.
Import Settings	Imports all settings. Current settings will be overwritten. Test definitions, users and log files are not affected.

The import functions requires that the files are located in a folder named **lippke** and named as described in *"Export" on page 84*.

Network

The **Network** screen holds the parameters for the Ethernet/LAN connection.





DHCP It is possible to choose between a fixed (static) IP-address or a DHCP (dynamic) IP-address, where the device's network settings are assigned from a DHCP server on the network.

DHCP is enabled as default.

Disabling **DHCP** brings up following parameters for setting up a static IP-address:

IP-address
Subnet mask
Default gateway

These parameters have to be set up to the existing network.

NOTE! Always consult your network administrator before making network settings, as incorrect settings can result in reduced or no network activity.

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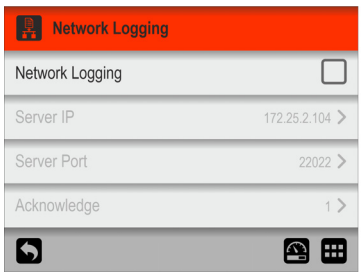
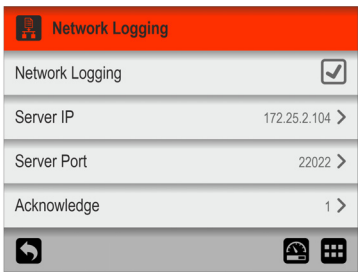
Network Logging

The **Network Logging** screen holds the parameters for the network logging function. If enabled, the function sends a data string through a LAN connection for each measurement.

The data format is an array of semicolon separated values. The format differs slightly from one test type to another in terms of test specific fields.

NOTE! Always consult your network administrator before making network settings, as incorrect settings can result in reduced or no network activity.





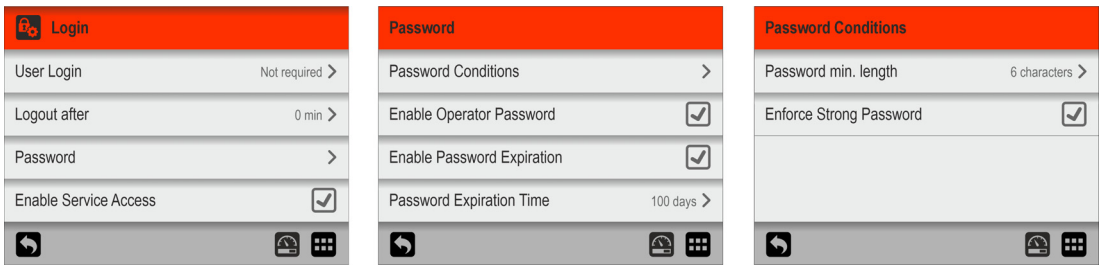
Network Logging	Select whether or not network logging is required. Disabled = No network logging Enabling **Network Logging** also enables the following parameters:	
	Server IP	Set up an IP-address to be used for collecting log data for each measurement via LAN. This requires for setting up of a **Server Port** number as well.
	Server Port	See above.
	Acknowledge	Byte sent by the server to the device after each received log entry. Setting value to 0 will disable the function.

A TCP/IP LAN server has to be started to receive data. The server will listen to the port as specified above.

Third party solutions may support this functionality as well as the MAP Check 3 PC SW.

Login

Setting up of the login function.



User Login

You can choose between 3 types of user login:

Not required At start-up the device initializes and when finished it changes to show the test screen, ready for measuring.
Current user is the default **Operator**.

User Name During start-up or if changing user, you must select a user from the **User Login** screen to go to the test screen, ready for measuring.

User ID During start-up or if changing user, you must enter a valid **User ID** to go to the test screen, ready for measuring.

NOTE! Service, Administrator and Supervisor users must then also enter a password to log in, regardless of this setting.

Logout After

Set the time after which the device automatically logs out if it is not in use.

Password

Password Conditions The **Password min. length** can be set to 6-15 characters, default is 6.

If **Enforce strong Password** is enabled, a password must always consist of a mixture of letters, numbers, and special characters.

Enable Operator Password Select whether or not an **Operator** user must log in with a password.

NOTE! Service, Administrator and Supervisor users must always log in with a password, regardless of this setting.

Enable Password Expiration Select whether or not user passwords should automatically expire.
If enabled, the desired expiration time can be set with the **Password Expiration Time** parameter.

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	Password Expiration Time	Set password expiration time (1 - 365 days).
Enable Service Access	Select whether or not it should be possible to log in as a user with **Service** access.	

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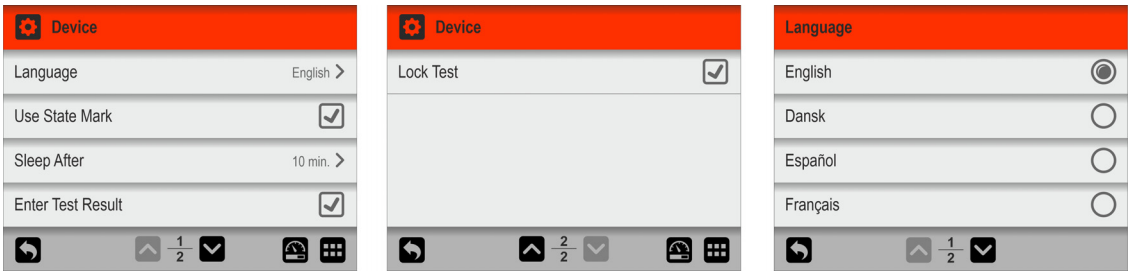
Device

The **Device** screen holds some basic device setup parameters.



Language	When selecting a language all text throughout the menus will be displayed in this language
Use State Mark	Select whether or not the **State** function should be used for test definitions/workflows. If function is disabled all test definitions/workflows are available for users on all access levels.
Sleep After	To save energy and reduce noise, you can make the device switch to a "Sleep" mode when not in use for a period. This will cause e.g. the fan in the chamber and the sample pump to stop and the display will be dimmed. Setting value to 0 will disable the function. To "wake up" the device, simply tap anywhere on the screen.
Enter Test Result	Enable this option if you want to save test results in the **Test Log**. After completing a test, you will be given the opportunity to choose whether the test should be registered as passed or failed.
Lock Test	When enabled, most of a test definition's parameters are locked from editing when tests have been performed using the test definition.

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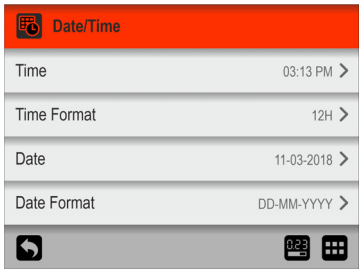
Date/Time

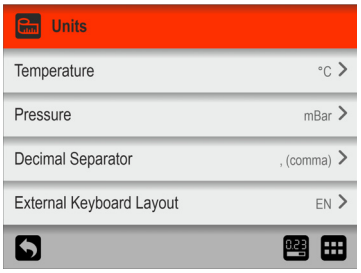
The **Date/Time** screen holds the time and date setup parameters.



Time	Setting of current time (hh:mm)
Time format	Setting of time format (**12h** or **24h**)
Date	Setting of current date (using **Date format**)
Date format	Setting of date format (**DD/MM/YYYY** or **MM/DD/YYYY**) **Time**, **Date** and **Date format** are related to the real time clock setting in the device. The settings will have effect in all displays showing time and date.

Units

The **Units** screen holds the various setup parameters for output formats and units.



Temperature	Setting of temperature read-out unit (**°C** or **°F**)
Pressure	Setting of gas pressure read-out unit (**mBar**, **PSI** or **mmHg**)
Decimal separator	Select whether decimal values should use "**. (dot)**" or "**, (comma)**" as decimal point.
External Keyboard Layout	Select keyboard layout for an external keyboard connected via USB (**English**, **Dansk**, **Español**, **Francais**, **Deutsch**, **Italiano**)

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7. Technical Information

Technical specifications

Mechanical specifications

Dimensions	185 x 284 x 236.5 mm (7.3 x 11.2 x 9.3") (H x W x D)

Weight	Unpacked: 4.3 kg (9.5 lbs) Crated: 6.6 kg (14.6 lbs)
IP Class	IP 20

Electrical specifications

Supply voltage	External PSU, 100-240 VAC, 47-63 Hz
Power consumption	Max. 40 W

Connectivity

Network/LAN	RJ-45 Ethernet 10/100 Mbit/s, DHCP client or fixed IP
USB	1 x Host, USB 2.0 - Type A, max. current 500 mA 1 x Device, USB 2.0 - Type B, max. current 500 mA
I/O control	For "PU1400 pump unit" control

User Interface

Display type	5.7" colour touch display with back-light VGA (640 x 480 pixels) 4096 colours
Functions	Multi language text and icons Supported languages: EN, DA, ES, FR, DE, IT

Compressed air supply

("Vacuum Ejector" models only)

Hose dimensions	Ø6/4 mm [1]
Air supply pressure	4.5 - 6.0 bar [2]
Air consumption	Max. 60 l/min. [3]
Air quality	Dry, clean and free from oil Compliant with DIN ISO 8573-1:2010 [4:4:3] [4]

[1] Ensure that the used hose type is appropriate for the required pressure

[2] Optimal performance at approx. 5 bar

[3] Depending on test settings

[4] See *"Pressure Regulator with filters" on page 17*

Basic specifications

Vacuum chamber volume	400ml – 20L (headspace)	
Pressure range (delta)	Ejector: Ext. vacuum:	100 – 800 mbar 100 – 900mbar
Pressure range (abs)	Ejector: Ext. vacuum:	Down to 100 mbar abs. Down to 50 mbar abs.
Ambient temperature [1]	Operation: Storage:	+2 to +35 °C - 20 to +60 °C
Ambient humidity [1]	Operation: Storage:	10 to 90% RH, non condensing < 95% RH, non condensing
Ambient pressure	Operation:	900 - 1050 mbar
Pressure units	mbar, mmHG or psi	
Test time	Vacuum test time: Penetration time:	Up to 24 hours Up to 24 hours
Calibration interval	12 months	

[1] If the device has been stored in a cold location and then moved to a warmer location then at least one hour of acclimatization is required before switching on the unit.
If operated in a cold and high humidity environment it is advisable to let the device heat up for 30 minutes after is has been switched on.

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Pressure sensors

NOTE! The pressure sensors are temperature controlled to 45°C and up to 10 minutes of heating time after power on is required before measurements can be performed.

Range	0 - 1000 mbar
Resolution	Displayed resolution: 1 mbar Pressure sensors: 0.15 mbar
Accuracy	± 1 mbar or ± 0.5% of reading
Repeatability	± 2 mbar or ± 1% of reading

Data Collection

Number of test definitions	999
Data collection capacity	Test data from more than 1.000.000 tests
Collection type	Export to CSV file via USB Network logging via LAN

Conformity

- CE mark
- China RoHS II

Other standards

- ASTM D3078 (Bubble test)

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8. Consumables and Accessories

Ordering items

When ordering any of the below listed items please state carefully the item number, the item specification and the number of items wanted and send the order to your spare parts dealer.

Consumables

- Filter element, filter Ø6-Ø6, for "Feed" hose, Ser. Cpl. . . . . P/N 390081
- Filter element, water sep., pressure regulator (5 pcs.), Ser. Cpl. . . . . P/N 390250
- Filter element, air, pressure regulator (10 pcs.), Ser. Cpl. . . . . P/N 390251

Accessories

- Barcode Scanner w. USB cable, Ser. Cpl. . . . . P/N 301189
- Desiccator Ø250mm Ser. Cpl. . . . . P/N 390108
- Desiccator Ø250mm flat lid Ser. Cpl. . . . . P/N 390109
- Pressure regulator + air filter Ser. Cpl. . . . . P/N 390208
- Cable, mains IEC 320-C7 to type A, (CHN CCC approved) Ser. Cpl. . . . . P/N 390802
- Cable, mains IEC 320-C7 to type A, (US UL approved) Ser. Cpl. . . . . P/N 310749
- Cable, mains IEC 320-C7 to type C, (EU) Ser. Cpl. . . . . P/N 310747
- Cable, mains IEC 320-C7 to type G (GB) Ser. Cpl. . . . . P/N 310748
- Cable, mains IEC 320-C7 to type I , (AUS) Ser. Cpl. . . . . P/N 390803
- PU1400 (Pump Unit) . . . . . P/N 600635
- Plate for desiccator Ser. Cpl. . . . . P/N 390292
- Block, vacuum tube adapter for desiccator, w/tube Ser. Cpl. . . . . P/N 390293
- O-ring for desiccator 250mm Ser. Cpl. . . . . P/N 390294
- Desiccator Vacuum, Ø250mm Ser. Cpl. . . . . P/N 390295
- O-Ring, NBR 70 13x2mm (5 Pcs.) Ser. Cpl . . . . . P/N 390296

Printer

All measurement data can be printed continuously on a connected USB-printer.
MOCON Europe A/S does not offer printers, but we have tested the following printers and can therefore recommend these:

Epson TM-T20 Series (Thermal, USB-version)
Epson TM-U220B Series (Matrix, USB-version)
Epson TM-m30 Series (Thermal, USB-version)

NOTE! If you want to connect another printer model, it must be compatible with the ESC/POSTM standard.

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Appendix

Safety and Handling Instructions

WARNING! Personnel operating and maintaining the device must be familiar with all aspects of its operation and be proficient in maintenance.
Such personnel should review the following precautions to promote safety awareness.
Failure to follow the safety instructions could result in fire, electric shock, injury, or damage to the Dansensor® Lippke® VC1400 or other property.

NOTE! The manufacturer cannot be held responsible for any damage caused by incorrect installation, operation or maintenance of the device.

Installation

- To ensure the best installation with the least technical problems, please install equipment as described in this manual.
- Only operate the system with the mains voltage indicated on the nameplate.
- Never install the equipment in explosive environments.
- Always use correct fittings when connecting compressed air to the device.
- Provide adequate space around the equipment for proper ventilation.
- The units are Class 2 appliances and thus do not require an earthed mains connection.
- It is the responsibility of the owner and operator(s) of the equipment, that the installation is made in accordance with local rules and regulations.

Handling and maintenance

- Be sure to disconnect compressed air supply hoses and electrical power cables before performing any cleaning or maintenance.
- All panels and protective guards must be in place before operating the equipment.
- When operating or maintaining the equipment always obey the relevant rules and regulations for workers safety.
- Never block gas outlets.
- Handle the device with care. It is made of metal, glass, and plastic and has sensitive electronic components inside.
- The device can be damaged if dropped, burned, or crushed, or if it comes in contact with liquid.
- Do not use a damaged device, such as one with a cracked screen, as it may cause injury.
- Do not cover the device with a cloth or piece of plastic to protect it from dust, as this prevents free air circulation around the device and might lead to overheating.
- Do not expose the device to heavy moisture or heat and keep it away from direct sunlight.

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Repairing

- Don't open the device and do not attempt to repair it yourself, as this may damage it or may cause injury to you.
- If device is damaged, malfunctions, or comes in contact with liquid, contact your authorized MOCON Dansensor service provider.

Cables

- If using other third-party cables and power plugs, make sure that they are compatible with USB 2.0 or later, and that the power supply and plugs are compliant with applicable country regulations.
- Replace damaged cables immediately. Using damaged cables can cause fire, electric shock, injury, or damage to the device or other property.

Explosive atmospheres

- Using the device in any area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapours, or particles, may be hazardous. Obey all signs and instructions.

Cleaning

- Never use hard tools or abrasive materials when cleaning any part of the device.
- Never use cleaning agents containing chlorinated solvents or acetic or phosphoric acid. These constitute a health hazard and could damage the device.
- Avoid getting moisture in openings.
- When using compressed air for cleaning of e.g. hoses or needles, use safety goggles and make sure that items have been disconnected from the device.

Using connectors, ports, and buttons

- Never force a connector into a port or apply excessive pressure to a button, because this may cause damage that is not covered under the warranty.
- If the connector and port don't join with reasonable ease, they probably don't match. Check for obstructions and make sure that the connector matches the port and that you have positioned the connector correctly in relation to the port.

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Operating/storing temperatures

- The device is designed to be operated and stored in the temperatures ranges as specified in *"Basic specifications" on page 94*.
  The device can be damaged if stored or operated outside of these temperature ranges.
- Avoid exposing the device to dramatic changes in temperature or humidity.

NOTE! If the device has been stored in a cold location and then moved to a warmer location then at least one hour of acclimatization is required before switching on the unit.
If operated in a cold and high humidity environment it is advisable to let the device heat up for 30 minutes after is has been switched on.

NOTE! The device must be placed in a temperature controlled environment in order to perform within specifications. Temperature and pressure in a (closed) test volume are proportional i.e. changes in ambient temperature will have an impact on the pressure during a leak test.

Toxic and Hazardous Substances or Elements

(For China RoHS compliance)

See table on the next page.

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Lippke VC1400
Hazardous Substances
有害物质

Component name (组件名称)	Hazardous Substances 有害物质					
	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 镉 (Cd)	Hexavalent Chromium 六价铬 (Cr(Vi))	Polybrominated Biphenyls 多溴联苯 (PPB)	Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDE)
Metal enclosure with foils and labels (带包装箔和标签的金属外壳)	O	O	O	O	O	O
Power supply (PSU) (供电单元 (PSU))	O	O	O	O	O	O
Printed circuit board assembly (Main PCB) (印刷电路板组件（主 PCB))	O	O	O	O	O	O
Printed circuit board with pressure sensors (带压力传感器的印刷电路板)	O	O	O	O	O	O
Block assembly for pressure senor PCB (without PCB) (压力传感器 PCB 的阀块组件（无 PCB))	X	O	O	O	O	O
Proportional valve (比例阀)	X	O	O	O	O	O
On/Off valve (开/关阀)	O	O	O	O	O	O
Valve block assembly (without valves) (阀块组件（无阀))	X	O	O	O	O	O
Internal cables and connections to external cables, on/off rocker switch (内部电缆和外部电缆接头，开/关船型开关)	O	O	O	O	O	O
Mounting hardware (screws, studs, feet) (安装零件（螺钉、螺柱、支脚))	X	O	O	O	O	O
Silencer with fitting (带配件的消音器)	X	O	O	O	O	O
Display panel (LCD) (显示面板 (LCD))	O	O	O	O	O	O
Printed circuit board display PCB (印刷电路板显示屏 PCB)	O	O	O	O	O	O
Bracket and frame for display mounting (用于安装显示屏的支架和框架)	O	O	O	O	O	O
Plastic sides for lid (盖的塑料边)	O	O	O	O	O	O
External power cabels to PSU (PSU 的外部电源线)	O	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364. (此表是按照 SJ/T 11364 的规定而编制的。)

O: It indicates that the content of the hazardous substance contained in all of the homogeneous materials for this part is below the limit requirements of GB/T 26572.
表示该部件所有均质材料中所含有害物质的含量低于 GB/T 26572 的限值要求。

X: It indicates that the content of the hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirements of GB/T 26572.
表示该部件采用的至少一种均质材料中所含有害物质的含量高于 GB/T 26572 的限值要求。

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