



OPERATING INSTRUCTIONS

EN

Translation of the Original

ASM 2000

Leak testing equipment

PFEIFFER  **VACUUM**

Disclaimer of liability

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

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

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1 About this manual



IMPORTANT

Read carefully before use.

Keep the manual for future consultation.

1.1 Validity

This operating instructions is a customer document of Pfeiffer Vacuum. The operating instructions describe the functions of the named product and provide the most important information for the safe use of the device. The description is written in accordance with the valid directives. The information in this operating instructions refers to the product's current development status. The document shall remain valid provided that the customer does not make any changes to the product.

1.1.1 Applicable documents

ASM 2000	Operating Instructions
Roughing pump operating instructions (pump model varies according to the ASM 2000 part number).	-
ASI 35 Operating instructions	127801
EC Declaration of conformity	Included with this manual
Specification: Data migration from the equipment computer to another SOP computer	3880
Specification: Recovery in the event of SOP failure (Backup and restore Windows 10)	4296
Specification: Selection of 'open - close' test mode in He SOP mode (Test sequences Open and He Prefilled UUT)	4495
Specification: SOP hard drive change	3881

1.1.2 Products concerned

This document applies to products with the following part numbers:

Part Number	Description
200314 - 200320 - 200321 - 200322 - 200384 - 200385 - 200386 - 200387	ASM 2000

1.2 Target group

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

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

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

1.3 Conventions

1.3.1 Instructions in the text

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

Individual action step

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

- This is an individual action step.

Sequence of multi-part action steps

The numerical list indicates an action with multiple necessary steps.

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

1.3.2 Pictographs

Pictographs used in the document indicate useful information.



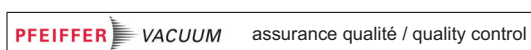
Note



Tip

1.3.3 Labels

I/O	Switch (Start/Stop)
HDMI	HDMI connector
CDA	Compressed dry air supply connector
P1/P3	Pumps 1 to 3
He	⁴ He supply connector
N₂	N ₂ supply connector
EXHAUST	Roughing pump exhaust connector
SNIFFER	Sniffer probe connector
UPS	Uninterruptible power supply



Safety label: guarantee that the packing has not been opened since leaving the factory.

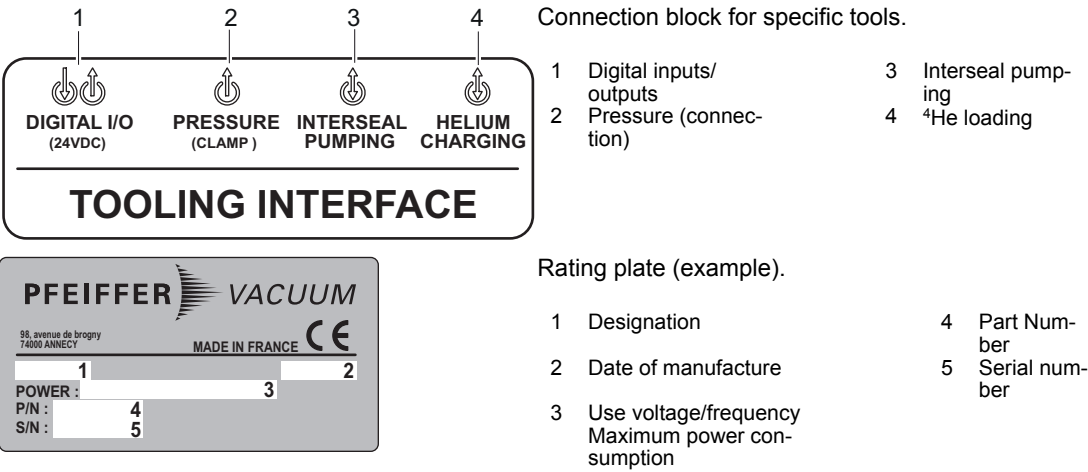


Indicates an electrical shock hazard in the event of contact.



Heavy object: 2 people are required to lift the product.

Electrical hazard: disconnect the power supply to the product before opening it.



PFEIFFER VACUUM

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74000 ANNECY

MADE IN FRANCE

CE

1

2

POWER : 3

P/N : 4

S/N : 5

1

2

3

4

5

1 Designation

2 Date of manufacture

3 Use voltage/frequency
Maximum power con-
sumption

4 Part Num-
ber

5 Serial num-
ber

Tbl. 1: Labels

1.3.4 Abbreviations

[XXXX]	The control panel menus and parameters are shown in bold between square brackets. Example: [TEST] to access the TEST menu.
CDA	Compressed Dry Air
N ₂	Nitrogen
⁴ He	Helium 4
UUT	Unit Under Test
HDMI	High-Definition Multimedia Interface
USB	Universal Serial Bus
SOP	Standard Operating Procedure

2 Safety

2.1 General safety information

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

DANGER

Immediately pending danger

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

- Instructions to avoid the danger situation

WARNING

Potential pending danger

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

- Instructions to avoid the danger situation

CAUTION

Potential pending danger

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

- Instructions to avoid the danger situation

NOTICE

Danger of damage to property

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

- Instructions to avoid damage to property



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

2.1.1 Safety instructions

All safety instructions in this document are based on the results of the risk assessment carried out in accordance with Machinery Directive 2006/42/EC Annex I and EN ISO 12100 Section 5. Where applicable, all life cycle phases of the product were taken into account.

WARNING

Risk of fatal injury due to electric shock on account of incorrect installation

The device's power supply uses life-threatening voltages. Unsafe or improper installation can lead to life-threatening situations from electric shocks obtained from working with or on the unit.

- Ensure safe integration into an emergency off safety circuit.
- Do not carry out your own conversions or modifications on the unit.

WARNING

Risk of electric shock due to non-compliant electrical installations

This product uses mains voltage for its electrical supply. Non-compliant electrical installations or installations not done to professional standards may endanger the user's life.

- Only qualified technicians trained in the relevant electrical safety and EMC regulations are authorized to work on the electrical installation.
- This product must not be modified or converted arbitrarily.

WARNING

Danger of electrocution by contact during maintenance or overhaul

There is an electric shock hazard in case of contact with a powered product and not electrically isolated.

- ▶ Before carrying out any work, set the main switch to **O**.
- ▶ Take care to ensure that the mains connection is always visible and accessible so that the equipment can be disconnected at any time.
- ▶ Disconnect the mains power cable from the mains.

WARNING

Risk of poisoning when process gases are present in the atmosphere

The manufacturer has no control over the types of gases used with this equipment. Process gases are often toxic, flammable, corrosive, explosive or reactive. There is a risk of serious or fatal injury if these gases are allowed to escape freely into the atmosphere.

- ▶ Follow the relevant safety instructions in accordance with local regulations. This information is available from the operator's safety department.
- ▶ Check that the equipment is correctly connected to the customer's installation.
- ▶ Regularly check that there are no leaks where the equipment connects to the venting pipework.

WARNING

Risk of burns in case of contact with hot surfaces

For the operator's safety, the products are designed to avoid thermal risk. Depending on the application, the conditions of use generate high temperatures which require extra caution from users (surfaces > 65 °C).

- ▶ Pay attention to the marking of hot surfaces indicated by safety labels.
- ▶ Wait for the part to cool completely before working on the product.
- ▶ If necessary, wear protective gloves in accordance with standard EN 420.

WARNING

Risk in the case of power maintained by UPS

After power has been disconnected, the UPS maintains the power supply of the PC.

After the main switch is switched off, the following elements remain live: mains filter and mains cable connecting the equipment's power socket to the main switch.

- ▶ Disconnect the mains cable from all power sources before working on the equipment.

2.1.2 Precautions



Duty to provide information on potential dangers

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

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



Obligation to provide personal protective equipment

The operators or employers are obliged to provide the user of the product with the necessary personal protective equipment (PPE).

Persons responsible for installing, operating and repairing the product must wear PPE for safety.



Infringement of conformity due to modifications to the product

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

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

Installation and maintenance procedures described in this manual must be performed by qualified technicians trained in the relevant health and safety aspects (EMC, electrical safety, chemical pollution). Our service centers can provide the necessary training.

- ▶ Do not expose any part of the human body to the vacuum.
- ▶ Comply with all safety and risk prevention instructions in accordance with local safety standards.
- ▶ Regularly check compliance with all precautionary measures.
- ▶ Do not remove the blanking plates sealing the inlet and exhaust ports if the product is not connected to the pumping line.
- ▶ Do not operate the product unless the inlet and exhaust are not connected to the pumping line.

2.2 Intended use

The ASM 2000 is specially designed for leak testing.

2.3 Foreseeable misuse

Misuse of the product will render the warranty and any claims void. Any use, whether intended or not, that diverges from the uses already mentioned will be treated as non-compliant; this includes but is not limited to:

- analysis of gas with a hydrogen concentration higher than 5%
- testing parts that are soiled or that have traces of water, vapors, paint, adhesive, detergent or rinsing products
- pumping liquids
- pumping dust or solids
- pumping corrosive, explosive, aggressive or flammable fluids
- pumping reactive, chemical or toxic fluids
- pumping condensable vapors
- use in potentially explosive areas
- use of accessories or spare parts, which are not named in this manual

The product is not designed to carry people or loads and is not for use as a seat, stepladder or any other similar purpose.

3 Transportation and Storage

3.1 Receipt of the product



Condition of the delivery

- Check that the product has not been damaged during transport.
- If the product is damaged, take the necessary measures with the carrier **and** notify the manufacturer.

- Keep the product in its original packaging so it stays as clean as it was when dispatched by us. Only unpack the product once it has arrived at the location where it will be used.
- Keep the blanking plates in place on the inlet, exhaust and purge ports while the product is not connected to the pumping line.



Keep the packaging (recyclable materials) in case the product needs to be transported or stored.

3.2 Handling

WARNING

Risk of crushing related to product tilting

Although the product fully complies with the EEC safety regulations, there is a risk of tilting when it is moved over the floor or is not properly secured.

- Do not place the product on an inclined plane.
- Place it on a flat, hard floor.
- Do not push the product sideways.

CAUTION

Risk of injury due to heavy loads

The weight of the equipment may injure the user if it is handled incorrectly and is therefore hazardous to health.

The detector must be immobilized when it is being used or maintained.

- Engage the brakes to immobilize it.
- Use the equipment handle to move it.
- The manufacturer cannot be held liable for the consequences of using other handling equipment.

3.3 Storage



Pfeiffer Vacuum recommends storing the products in their original transport packaging.

- Store the product in a clean, dry environment for a maximum of 3 months, in accordance with the specified temperature conditions (see chapter "Environmental conditions").

Beyond 3 months, factors such as temperature, humidity, salt in the air, etc. could damage some components (elastomers, lubricants, etc.). If this happens, contact our service center.

4 Product description

4.1 Product identification

To correctly identify the product when communicating with our service center, always have the information from the product rating plate available (see chapter "Labels").

4.2 Scope of delivery

- 1 ASM 2000
- 1 operating instructions
- 1 mains supply cable: length of cable and type of socket customized according to the product part number
- 2 gauge certificates (1 certificate per gauge)
- 1 DN 25 ISO-KF blanking plate
- 1 DN 25 ISO-KF clamp
- 1 conditioning tool
- 1 pen-type sniffer probe
- 1 calibration certificate for the internal calibrated leak
- Additional supplies depending on the selected options.

4.3 Options

To enhance product suitability for specific applications, the manufacturer has made several options available that can be configured when ordering. How these options operate and how to use them are described where necessary in the chapters of this manual.

- Roughing pumps: models vary according to the ASM 2000 part number
- Test tools: quantity varies according to the ASM 2000 part number
- ⁴He calibrated leaks: quantity varies according to the ASM 2000 part number

4.4 Environmental conditions

Use	Indoors, clean, dust-free room
Installation altitude	Up to 1000 m
Protection rating	IP20
Ambient operating temperature	15–25 °C (stabilized temperature)
Storage temperature	10–45 °C
Hygrometry	30–80 % (relative humidity without condensation)
Transient overvoltage protection	Category II
Pollution degree	Level 2

Tbl. 2: Environmental conditions

The materials

Our products contain different materials which must be recycled:

- Steel
- Stainless steel
- Aluminum
- Copper (cable)
- Iron (magnet)
- Electronic boards
- Molybden
- Plastic
- FPM O-ring
- Ceramic
- Nickel
- Glass

4.5 Human/machine interface

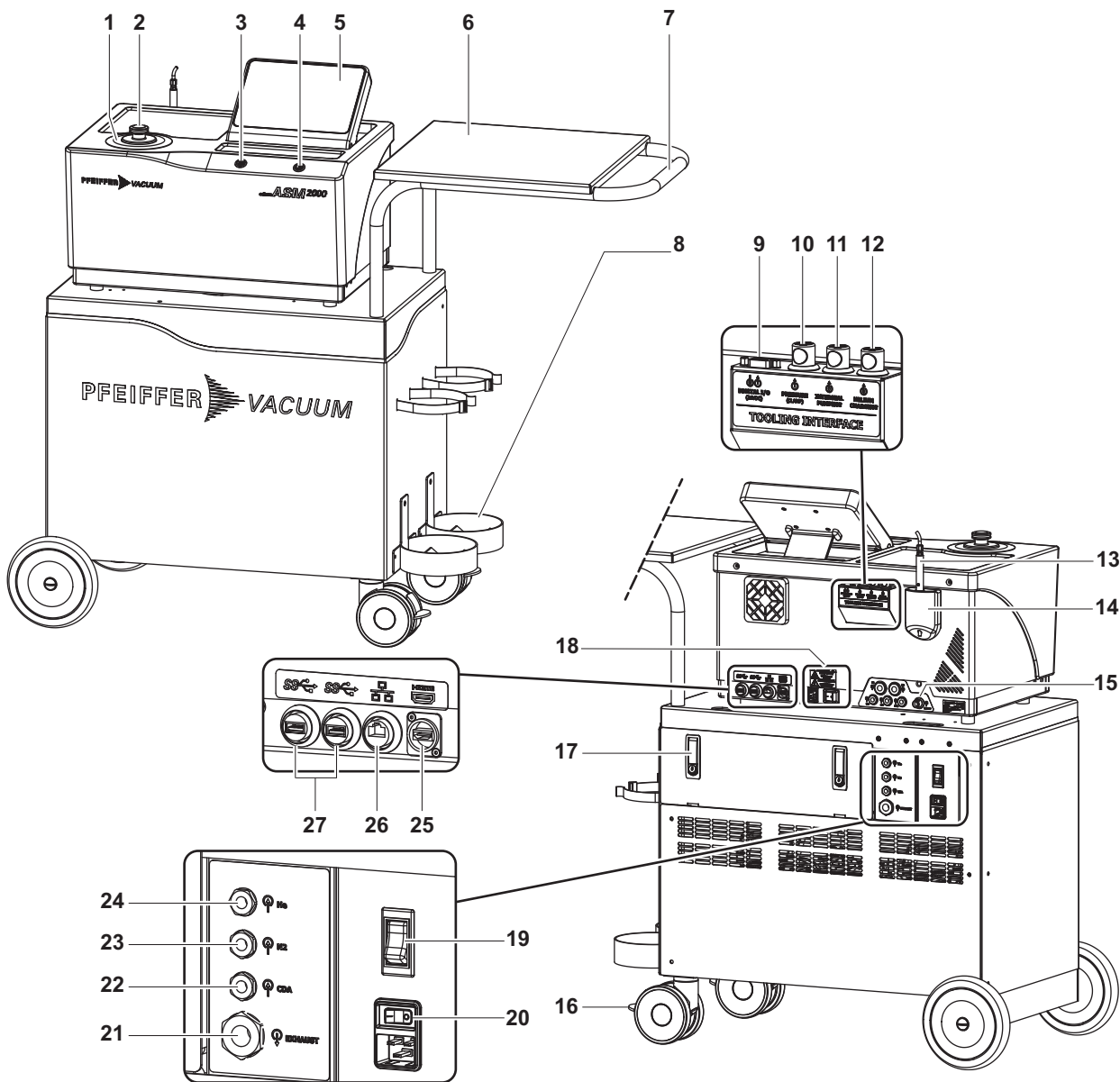


Fig. 1: Human/machine interface

- | | | | |
|----|--|----|---|
| 1 | Light ring | 15 | Sniffer probe connector - Quick connector |
| 2 | Test port - DN 25 ISO-KF | 16 | Brakes |
| 3 | ABORT/ACKNOWLEDGE button | 17 | Storage compartment access door with lock |
| 4 | START button | 18 | ASM 2000 switch |
| 5 | Touchscreen | 19 | Main switch/Circuit breaker of trolley |
| 6 | Laptop table | 20 | Equipment mains power supply |
| 7 | Handling handle | 21 | Roughing pump gas exhaust connector - G1/4' interface |
| 8 | Gas bottle holder (x2) | 22 | CDA supply connector - G1/8' interface |
| 9 | DIGITAL I/O: Digital Input/Output connector (24 V DC) - 9-pin D-Sub | 23 | Venting gas supply connector - G1/8' interface |
| 10 | PRESSURE: Pressure connector - Quick connector | 24 | ⁴ He tracer gas supply connector - G1/8' interface |
| 11 | INTERSEAL PUMPING: Interseal pumping connector - Quick connector | 25 | HDMI connector |
| 12 | HELIUM CHARGING: ⁴ He supply connector - N.O. quick connector | 26 | Ethernet connector |
| 13 | Sniffer probe (optional) | 27 | USB3 connector (x2) |
| 14 | Sniffer probe storage holder (optional) | | |

5 Installation

5.1 Installation

⚠ CAUTION

Risk of injury due to heavy loads

The weight of the equipment may injure the user if it is handled incorrectly and is therefore hazardous to health.

The detector must be immobilized when it is being used or maintained.

- ▶ Engage the brakes to immobilize it.
- ▶ Use the equipment handle to move it.
- ▶ The manufacturer cannot be held liable for the consequences of using other handling equipment.

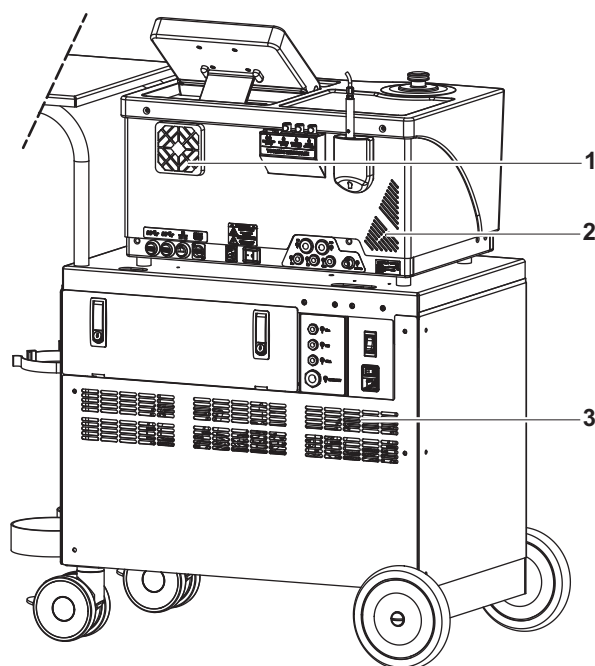
The equipment must be used in horizontal position, standing on its 4 wheels, with the brakes on.

- The equipment must be stored for at least 12 hours under normal use conditions (see chapter "Environmental conditions") before switching on.
- The equipment must be correctly lighted to allow a clear view of its indicator lights and its touchscreen, with no shadows or reflections.
- The equipment should be installed in an area with controlled humidity levels.

Ventilation

To guarantee the characteristics and performances of the equipment within the boundaries of the operating conditions:

- Do not obstruct the ventilation grids.
- Ensure the rear of the equipment with the air circulation grids is at least 110 mm away from fixed walls.



1 Air extraction
2 Air inlet

3 Air inlet/extraction

5.2 Compressed dry air (CDA) connection

The compressed air allows to operate the valves.

The compressed dry air supply is to be supplied by the customer.

- Connection (see chapter "Human/Machine Interface")

A compressed dry air supply with the given characteristics is required (see chapter “Compressed dry air characteristics”).

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

- ▶ When installing the compressed dry air circuit, provide accessories to isolate the equipment in the installation and facilitate its maintenance (isolation valve, etc.).
- ▶ Fit flexible hoses in the circuit to reduce the transmission of vibrations, and hoses of the same diameter as the connector.

5.3 Venting gas circuit connection

Nitrogen is the only permitted venting gas. All other gases must be submitted to the manufacturer for approval.

The venting gas supply is to be supplied by the customer.

WARNING

Risk of asphyxia in the event of a burst hose

The equipment uses a specific gas (^4He , N_2) which may cause a lack of oxygen in the atmosphere or inside the equipment in the event of a leaking hose.

- ▶ Install the equipment in an environment with sufficient ventilation to absorb any N_2 which may escape in the event of a leaking hose
- ▶ Install (recommendation) a flow limiter to prevent a risk of asphyxia in the event of a burst hose. The maximum authorized flow is 25 slm.

- Connection (see chapter “Man/Machine Interface”)

A venting gas supply with the given characteristics is required for optimum performance (see chapter “Venting gas characteristics”).

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety guidelines, in accordance with local regulations.

- ▶ Fit flexible hoses in the circuit to reduce the transmission of vibrations, and hoses of the same diameter as the connector.

5.4 Tracer gas circuit connection

Tracer gas is the gas the equipment looks for to detect a leak.

Helium 4 is the only permitted tracer gas. All other gases are prohibited.

The tracer gas supply is to be supplied by the customer.

- Connection (see chapter “Human/Machine Interface”)

A compressed tracer gas supply with the given characteristics is required (see chapter “Tracer gas characteristics”).

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

- ▶ Fit flexible hoses in the circuit to reduce the transmission of vibrations, and hoses of the same diameter as the connector.

5.5 Gas extraction circuit connection

The exhaust gases are the gases from the dry air circuit, the venting gas (N_2) and the tracer gas (^4He).

The connection to the gas extraction circuit is to be supplied by the customer.

WARNING

Risk of asphyxia in the event of a burst hose

The equipment uses a specific gas (^4He , N_2) which may cause a lack of oxygen in the atmosphere or inside the equipment in the event of a leaking hose.

- ▶ Install the equipment in an environment with sufficient ventilation to absorb any N_2 which may escape in the event of a leaking hose
- ▶ Install (recommendation) a flow limiter to prevent a risk of asphyxia in the event of a burst hose. The maximum authorized flow is 25 slm.

- Connection (see chapter "Human/Machine Interface")

The gas extraction circuit must have an exhaust flow rate of at least 1.5 m³/h.

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

- ▶ Fit flexible hoses in the circuit to reduce the transmission of vibrations, and hoses of the same diameter as the connector.

5.6 Conditioning tool connection

The conditioning tool allows to pressurize a part to be tested with tracer gas.

- Connection (see chapter "Human/Machine Interface")

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

- ▶ Fit flexible hoses in the circuit to reduce the transmission of vibrations, and hoses of the same diameter as the connector.

5.7 Test tool connection

The test tool allows to perform the leak test.

It is connected to the DN 25 ISO-KF test port (see chapter "Human/Machine Interface").

The test tools, defined by the manufacturer with the customer, are to be supplied by the customer.

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

5.8 Specific tool connections

The specific tools are connected to the "TOOLING INTERFACE" block (see chapter "Human/Machine Interface").

They are required when using the equipment.

Interseal pumping tool

The interseal pumping is used for pumping and venting the interseal space of the test tools.

The "INTERSEAL PUMPING" connector is a quick connector to connect the interseal space of the test tools to the equipment.

The specific tool is to be supplied by the customer.

- Connection (see chapter "Human/Machine Interface")

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

^4He tracer gas charging tool

The "HELIUM CHARGING" connector is a quick connector (N.O.) that is used to charge the test tool with tracer gas (^4He).

The specific tool is to be supplied by the customer.

- Connection (see chapter "Human/Machine Interface")

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

Pressure tool

The "PRESSURE" connector is a quick connector that is used to supply the test tool with CDA.

The specific tool is to be supplied by the customer.

- Connection (see chapter "Human/Machine Interface")

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

Digital input/output tool

The 'DIGITAL I/O' connector is a 9-pin D-Sub connector to communicate with the test tool.

The specific tool is to be supplied by the customer.

- Connection (see chapter "Human/Machine Interface")

The user and/or equipment integrator are ultimately responsible for the installation and must apply the specific safety instructions, in accordance with local regulations.

5.9 Mains connection

WARNING

Risk of electric shock due to non-compliant electrical installations

This product uses mains voltage for its electrical supply. Non-compliant electrical installations or installations not done to professional standards may endanger the user's life.

- ▶ Only qualified technicians trained in the relevant electrical safety and EMC regulations are authorized to work on the electrical installation.
- ▶ This product must not be modified or converted arbitrarily.

WARNING

Danger of electrocution by contact during maintenance or overhaul

There is an electric shock hazard in case of contact with a powered product and not electrically isolated.

- ▶ Before carrying out any work, set the main switch to **O**.
- ▶ Take care to ensure that the mains connection is always visible and accessible so that the equipment can be disconnected at any time.
- ▶ Disconnect the mains power cable from the mains.

WARNING

Risk in the case of power maintained by UPS

After power has been disconnected, the UPS maintains the power supply of the PC.

After the main switch is switched off, the following elements remain live: mains filter and mains cable connecting the equipment's power socket to the main switch.

- ▶ Disconnect the mains cable from all power sources before working on the equipment.

NOTICE

Risk of loss of performance due to electromagnetic disturbance

The products' EMC behavior is guaranteed only if the relevant EMC standards are followed during installation.

- ▶ Use shielded cables and connections for the interfaces in interference-prone environments.

NOTICE

Risk of electrical overload

The equipment is protected against overload via electromechanical-component circuit breakers.

- ▶ Never override these interlocks during installation, use, or maintenance.

- The equipment is connected to the mains using the mains supply cable provided: type E mains power cable.
- Characteristics (see chapter “Technical characteristics”).
- ▶ Connect the mains power cable to the mains (see chapter “Human/Machine interface”).

6 Commissioning

6.1 Commissioning

- Connection (see chapter "Human/Machine Interface")

The displays of the light ring and buttons provide information about the equipment status (see chapter "Equipment status display").

1. Connect the facilities: electricity supply, CDA, venting gas, tracer gas, gas extraction system (see chapter "Installation").
2. Switch on the equipment (power supply switch, trolley main switch/circuit breaker and ASM 2000 switch in position I).
 - The UPS loads up (duration: 20 to 30 seconds) (see chapter "UPS functioning").
 - The PLC integrated into the equipment starts up.
 - The computer integrated into the equipment starts up.
3. Wait until the connection screen is displayed.
4. Log in to the interface.

6.2 Preliminary precautions for use

- The equipment must be stored for at least 12 hours under normal use conditions (see chapter "Environmental conditions") before switching on.
- After switching on, log into the interface and make sure that there are no alarms (acknowledge them if necessary) and wait at least 1 hour before using the equipment.

6.3 Shutting down the equipment

6.3.1 Standard shutdown procedure

1. Disconnect all products (test tool, conditioning tool, calibrated leak) from the test port.
2. Disconnect all specific tools from the TOOLING INTERFACE block.
3. Install the DN 25 ISO-KF blanking plate with its O-ring and clamp on the test port.
4. Put the sniffer probe in its holder (if equipment has sniffer option).
5. Log in to the interface.
6. Close any calibration verifications or tests which are running.
7. Press the **[User]** tab on the home page (see chapter "User Tab").
8. Press the **[Shutdown]** function key.
 - A confirmation window appears. Once confirmed, the shutdown procedure commences.
 - Wait for the indicator light showing that the shutdown procedure has finished (see chapter "Equipment status display").
9. Press the 3 switches/circuit breakers to stop the equipment:
 - ASM 2000 switch in position **O**,
 - Reminder: the UPS keeps the computer switched on for 3 minutes.
 - main switch/circuit breaker of trolley in position **O**,
 - mains power supply switch in position **O**.

6.3.2 Emergency stop

In case of an emergency stop:

1. Disconnect the trolley mains supply cable from the equipment (see chapter "Human/Machine interface").
2. Correct the problem.
3. Restart the equipment according to the commissioning procedure.

6.4 Equipment status display

Status		Display		
		Variable depending on the status (see below)	Orange	Green
		Light ring	Button	Button
			 ABORT/ ACKNOWLEDGE	 START
Start-up in progress	Awaiting RS-232 communication between PLC and ASI 35	 White/red		
	ASI 35 (turbomolecular pump) starting up	 White/violet		
	ASI 35 warming up	 White/yellow		
	ASI 35 not ready	 White/blue		
Conditioning required		 White	-	-
Standby in progress		-		
Test in progress		 Blue	-	
Stop the test in progress		 Red	-	-
Awaiting removal of UUT for depollution		 Blue/red	-	-
Test result	PASS	 Green	-	-
	FAIL	 Red	-	-
	INVALID	 Violet	-	-
Computer stopped		 White		
Caption (e.g. START button):				
Steady permanent light: 				
Slowly flashing light: 				
Quickly flashing light: 				

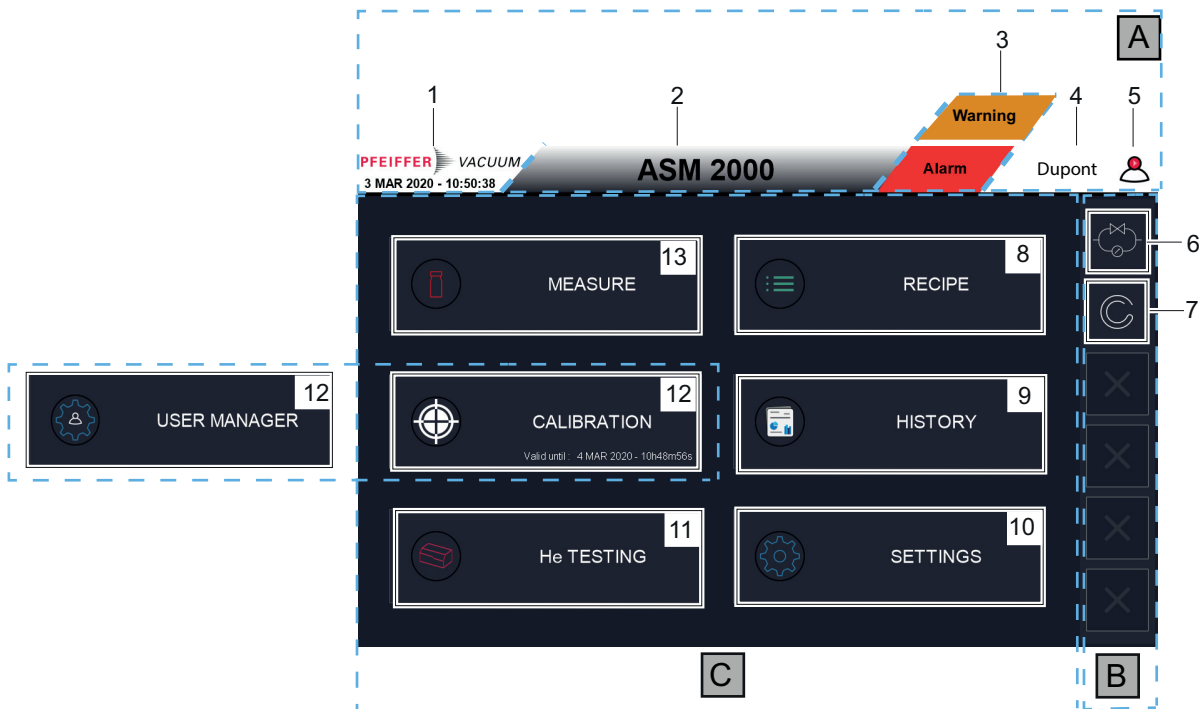
Tbl. 3: Equipment status display

7 Operation

7.1 Home page description

The home page is a touchscreen that is interfaced with the equipment, and it:

- displays information about the test,
- enables access to the function keys, menus and available tabs,
- sets the equipment's parameters.



Zone A Tab banner (always present)

Zone C Customized zone (content varies depending on the menu and functions in progress)

Zone B Function keys (content varies depending on the menu and functions in progress)

Zone A - Tabs

Item	Description	Designation in the operating instructions
1	Date - Time	-
2	Name of the current display (menu, function)	-
3	Access to alarm/warning faults in progress The tab is visible only if a fault is in progress.	[Alarm]/[Warning]
4	Username logged on	[Username logged on] (Example: Dupont)
5	Access to the user profile	[User]

Zone B - Function keys

Item	Description	Designation in the operating instructions	Pictogram
6	Access to Synoptic	[Synoptic]	
7	Access to conditioning	[Conditioning]	

Zone C - Menus		
Item	Description	Designation in the operating instructions
8	Access to the 'RECIPE' menu: recipe management.	[RECIPE]
9	Access to 'HISTORY' menu: faults and events history, test report and calibration history.	[HISTORY]
10	Access to 'SETTINGS' menu: general parameters management.	[SETTINGS]
11	Access to 'He TESTING' menu: ASI 35 leak detector integrated into the equipment management	[He TESTING]
12	Access to 'CALIBRATION' menu: calibration management.	[CALIBRATION]
	Access to the 'USER MANAGER' menu: user Management	[USER MANAGER]
13	Access to 'MEASURE' menu: leak test management.	[MEASURE]

7.2 Navigation

Main navigation buttons		
Description	Pictogram	In the operating instructions
Available on the control panel Return to the main screen from any menu		[Home]
Creation is aborted Return to previous menu		[Return]
Return to home page		[Exit]
Return to home page		[Cancel]
Switch off the equipment and the computer		[Shutdown]
Shut down the current operation		[Stop]
Validate a recipe Validate a modification		[✓]

7.3 Access authorization

Authorization to access tabs, function keys and menus depends on the user level of the connected user.

- The tabs, function keys and menus that an user is permitted to access are highlighted.
- The tabs, function keys and menus that an user is not permitted to access are greyed out.

Menu/Function	User level			
	Operator	Service	Advanced	Administrator
'MEASURE' menu	✓	✓	✓	-
'RECIPE' menu	-	✓	✓	-
'CALIBRATION' menu	✓	✓	✓	-

1) Access can be granted by an 'Administrator' level user.

2) Access can be granted by a 'Maintenance' or 'Advanced' level user.

3) Access is for consultation only.

Menu/Function	User level			
	Operator	Service	Advanced	Administrator
'USER MANAGER' menu	-	-	-	✓
'HISTORY' menu	✓	✓	✓	✓
'He TESTING' menu	- 2)	✓	✓	-
'SETTINGS' menu	-	✓	✓	✓
'Alarm' / 'Warning' tab	✓ 3)	✓	✓	-
'Synoptic' function	- 2)	✓	✓	-
'Conditioning' function	✓	✓	✓	-
'Sniffer' function	- 2)1)	✓ 1)	✓ 1)	-

1) Access can be granted by an 'Administrator' level user.

2) Access can be granted by a 'Maintenance' or 'Advanced' level user.

3) Access is for consultation only.

7.4 'CALIBRATION' menu

Calibration enables:

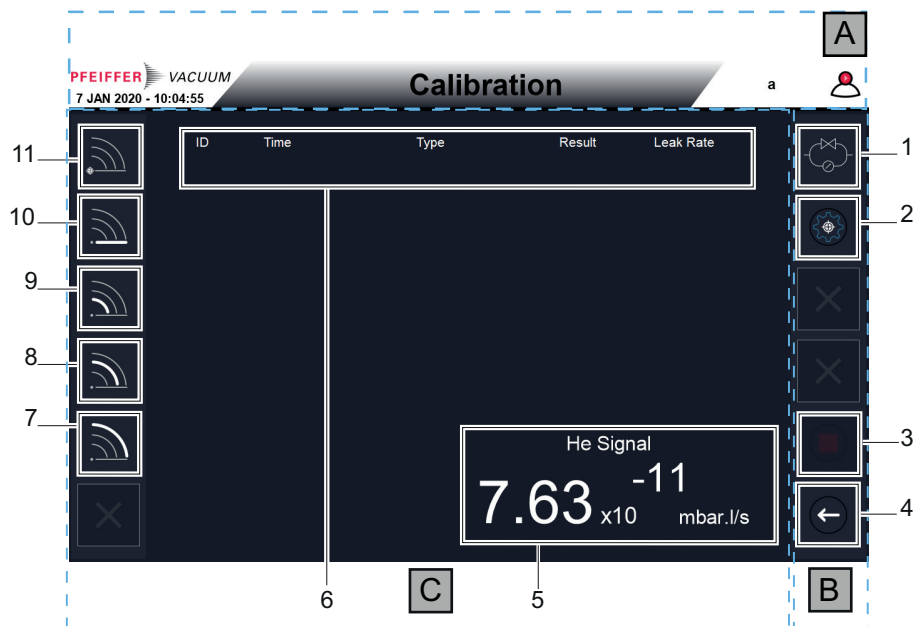
- the equipment to be calibrated,
- verification that the helium background of the equipment has reached the desired sensitivity,
- verification that the calibration has been correctly carried out.

Access authorization

(See chapter "Access authorization")

Access

- Press the [CALIBRATION] menu on the home page. The 'Calibration' menu is displayed.



Zone B - Function keys - 'Calibration' menu

Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Access to the calibration general parameters	[Calibration Settings]	

Zone B - Function keys - 'Calibration' menu			
Item	Description	Designation in the operating instructions	Pictogram
3	Calibration closure	[Stop]	
4	Return to previous screen	[Return]	

Zone C - Calibration data zone				
Item	Designation	Description	Designation in the operating instructions	Pictogram
5	He Signal	Display Leak rate value measured	-	-
6	List of steps carried out			
	ID	Chronological number The first step carried out is number 1, the second number 2, etc.	-	-
	Time	Time	-	-
	Type	Name	-	-
	Result	Result	-	-
	Leak rate	Leak rate value measured	-	-
7	Calibration function key	Verification of the upper point	[Upper Point Verification] ¹⁾	
8	Calibration function key	Verification of the reject point	[Reject Point Verification] ¹⁾	
9	Calibration function key	Verification of the lower point	[Lower Point Verification] ¹⁾	
10	Calibration function key	Verification of the helium background level of the equipment	[Background Verification] ¹⁾	
11	Calibration function key	Launch of the internal calibration of the leak detector	[Autocalibration]	

1) Setting: see chapter "Calibration' function"

7.4.1 Validity of a calibration

- A validated calibration is valid for 24 hours (configurable duration (see chapter "Calibration' Function")).
 - Beyond that, the calibration is invalid.
 - A new calibration is required before a new test run can be initiated.
- A calibration becomes invalid if one of the calibration parameters is modified.
 - A new calibration is required before a new test run can be initiated.
- The calibration becomes invalid if the equipment is switched off.
 - A new calibration is required before a new test run can be initiated.

7.4.2 Equipment calibration

- All the steps of the calibration must be followed and completed for the calibration to be valid.
- The calibration steps to be followed to validate the calibration are configurable (see chapter "Calibration' function").

Calibrated leaks

3 calibrated leaks are required:

- 1 to verification the reject point
- 1 to verification the lower point
- 1 to verification the upper point

The value of each leak must be in the same value range as the configured verification point value.

An 'Operator' level user can change the calibrated leak information subject to the access authorization granted by an 'Advanced' level user (see chapter "Calibration' Function").

External calibrated leak $1 \cdot 10^{-8}$ to $1 \cdot 10^{-4}$ mbar.l/s.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[CALIBRATION]** menu on the home page.

Prerequisite to the calibration

- Carry out equipment conditioning if conditioning was not successful after starting the equipment.

Presence of a fault

If a fault is in progress, no calibration steps can be launched.

- Acknowledge the fault and proceed with the calibration.

Abort a calibration in progress

A calibration can always be aborted provided that a step has not been launched.

To exit a calibration in progress, wait for the end of the current step.

1. Press the **[Stop]** function key to stop the step in progress. The function key is available when a calibration step is launched.
2. Press the **[Cancel]** function key on the new 'Calibration Report' menu displayed to abort the calibration.
 - The calibration is aborted.

Procedure for 'Operator' level user

The calibration procedure and each step to be followed is highlighted for the user.

Unavailable functions are greyed out. Those that are not part of the calibration procedure are not displayed.

It is not possible to select a step when another is in progress.

The number of steps varies depending on the calibration setting. It is possible to disable one or more of the stages of calibration verification (see chapter "Calibration' function").

- Step 1: Calibration launch (obligatory)
 - Step 2: Background verification (obligatory)
 - Step 3: Upper point verification (optional)
 - Step 4: Reject point verification (optional)
 - Step 5: Lower point verification (optional)
1. **Step 1:** Press the **[Autocalibration]** function key.
 - The procedure starts automatically.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps (see table 'Result of calibration steps' at the end of the chapter).
 - Step 2 becomes available for selection when step 1 is validated.
 2. Hermetically seal the Test port with a cap.
 3. **Step 2:** Press the **[Background Verification]** function key.
 - The procedure starts automatically.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps (see table 'Result of calibration steps' at the end of the chapter).
 - The next step becomes available for selection when step 2 is validated.
 4. Remove the cap from the test port.

5. **Steps 3/4/5:** To be carried out for each verification point.
 - Press the function key corresponding to the verification point.
 - Place the requested helium calibrated leak on the test port for each verification point.

Correct the values if they do not correspond to the calibrated leak used.

The ambient operating temperature field must be filled out.

 - Enter the information for the calibrated leak placed on the test port.
 - Test the ambient operating temperature of the part.
 - Validate the information entered to start the step.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps.
 - The next step becomes available for selection when the step is validated.
 6. After the last step, press the **[Stop]** function key. The 'Calibration Report' menu is displayed.
 - A comment can be entered at the end of calibration.
 7. Close the calibration.
 - Restart the step if one of the verifications is not satisfactory.

Do not validate the calibration and restart a new calibration if necessary.

If after several calibrations, the results are still not satisfactory, consult the manufacturer.

Press the **[Cancel]** function key.

 - The calibration is aborted and the calibration is not validated.
 - Press the **[Return]** function key to return to the 'Calibration' menu.
 - The current calibration is not closed.
 - Close and validate the calibration when all the steps are satisfactory.

Press the **[✓]** function key.

 - The calibration is closed and the result of the calibration is validated.
 - Press the **[Home]** function key to return to the home page.
 8. Press the **[HISTORY]** menu on the home page, then the **[Report]** function key to view the calibration report (see chapter "Report' Function").
- A calibration report is automatically generated at the calibration closure (see chapter "Creation of a report").

Procedure for an 'Advanced'/'Maintenance' level user

The calibration procedure is not guided.

All of the steps can be selected. The steps do not have to be carried out in any particular order. The user does not have to complete all the steps to validate the calibration.

It is not possible to select a step when another is in progress.

1. **Step 1:** Press the **[Autocalibration]** function key.
 - The procedure starts automatically.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps (see table 'Result of calibration steps' at the end of the chapter).
2. Hermetically seal the Test port with a cap.
3. **Step 2:** Press the **[Background Verification]** function key.

The calibration starts automatically.

 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps (see below 'Result of calibration steps').
4. Remove the cap from the test port.
5. **Steps 3/4/5:** To be carried out for each verification point.
 - Press the function key corresponding to the verification point.
 - Place the requested helium calibrated leak on the test port for each verification point.

Correct the values if they do not correspond to the calibrated leak used.

The ambient operating temperature field must be filled out.

 - Enter the information for the calibrated leak placed on the test port.
 - Test the ambient operating temperature of the part.
 - Validate the information entered to start the step.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps.
 - The next step becomes available for selection when the step is validated.

6. Validate the information entered to start the step.
 - The light ring flashes blue during the step.
 - When the step is finished, it is displayed with its result in the list of completed steps.
7. Close the calibration.
 - Restart the step if one of the verifications is not satisfactory.

If a fault appears during calibration, the [✓] function key is not available. Abort the calibration.

If after several calibrations, the results are still not satisfactory, consult the manufacturer.

Press the [Cancel] function key.

 - The calibration is aborted and the calibration is not validated.
 - Press the [Return] function key.
 - The current calibration is not closed. Return to the 'Calibration' menu.
 - Close and validate the calibration when all the steps are satisfactory.

Press the [✓] function key.

 - The calibration is closed and the result of the calibration is validated
 - Press the [Home] function key to return to the home page.
 - Press the [HISTORY] menu, then the [Report] function key to view the calibration report (see chapter "Report Function").

A calibration report is automatically generated at the calibration closure (see chapter "Creation of a report").

Result of the calibration steps

Display of the result of each step in the list of completed steps.

Result	Description
PASS: step validated	• The light ring briefly lights up green. – The next step is available. – Close the calibration after the last step.
FAIL: step rejected	• The light ring briefly lights up red. – Restart the step
INVALID: step invalid (step incomplete)	• Aborted before the end by the user. • Problem with the equipment. • Problem during the step. The light ring briefly lights up red. – Restart the step. – After several invalid results, contact the manufacturer.

7.5 'MEASURE' menu

7.5.1 Prerequisites for carrying out a test run

A test run allows to test each sample of a batch.

The test chamber or tool used must be compatible with the recipe selected to carry out the test run.

A test run can be carried out on 2 types of samples:

- closed sample: samples are charged with helium beforehand then sealed before the test is launched.
- open sample: samples are charged with helium during the test.

(see chapter "Characteristics of the sample to be used")

(see chapter "Test sequences")

Cleanliness conditions

- ▶ Check the cleanliness of the seals, the inside of the test chamber and the tool: no particles or dust.
 - If necessary, clean it with alcohol and a soft lint-free cloth.
- ▶ Check the cleanliness of the sample before placing it in the test chamber or in the tool.
 - If necessary, clean it with alcohol and a soft lint-free cloth.

7.5.2 Opening/Closing the test chamber

- The test chamber can be opened/closed manually by the user.
- The test chamber can be opened by the user when it returns to atmospheric pressure.
- The test chamber can be opened between two ongoing tests or at the end of a test: follow the instructions provided.

7.5.3 Conditions for the sample to be tested

Condition	Type of sample	
	Closed ¹⁾	Open ²⁾
Change the sample for each test. • Prevents the internal helium pollution of the sample from distorting the next test.	-	X
Wait between 2 uses of the same sample for optimal results. • Enables the sample to degas (removal of helium from the sample).	-	X
The surface of the sample in contact with the detector should not be polluted with helium. • It could distort the test.	X	X
The sample used must be adapted to the test chamber or tool. • Allows to ensure the tightness.	X	X
The tested samples must be perforated if required. • Enables helium charging.	-	X
It is important to seal charged samples immediately prior to testing. • This allows helium to always be present in a known concentration in the sample and to minimize the impact of permeation on the test.	X	-
1) Sample previously charged with helium then sealed before launching the test.		
2) Sample charged with helium during the test.		

7.5.4 Creating a test run

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the **[MEASURE]** menu on the home page. The 'Select Recipe' menu opens.
 - Select the recipe to be used for the test run.
 - Only the activated recipes are in the list (see chapter "Details of a recipe").
 - If the recipe to be selected is not in the list, contact an user authorized to manage the recipes (see chapter "Access authorization").
 - Press the **[✓]** function key to create the test run.
 - Press the **[Return]** function key to cancel the current creation and return to the home page.

7.5.5 'Testing' menu

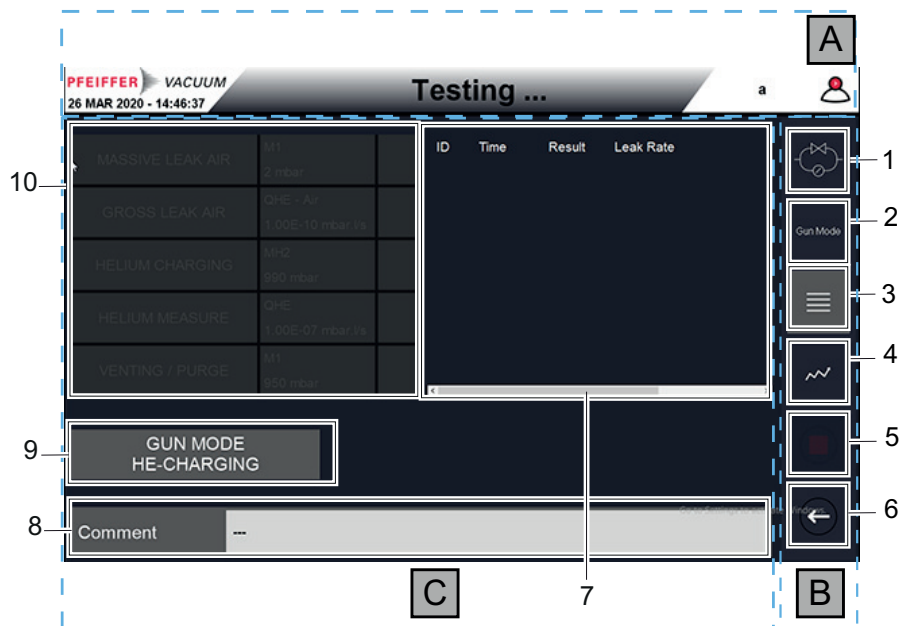
The user creates a test run whatever the number of samples to be tested (even if there is only one). A leak test is carried out on each sample. A test report is automatically generated when the test run is closed summarizing the parameters used for the test run and the result of each sample tested.

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the **[MEASURE]** menu on the home page. The 'Testing' menu is displayed.

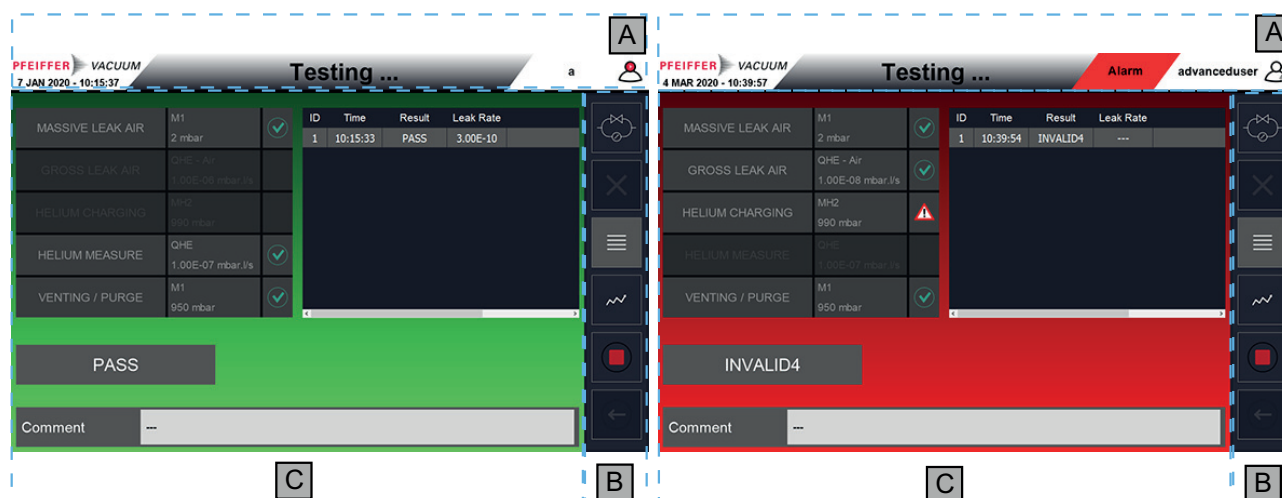

Zone B - Function keys - 'Testing' menu

Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Start/stop the helium loading with a spray gun	[Gun Mode]	
3	Access to the test and to the test overview	[Test]	
4	Access to the graphic of the test in progress	[Graphic]	
5	Test run closure	[Stop]	
6	Return to previous screen	[Return]	

Zone C - Test data zone

Item	Designation	Description of the sample	Designation in the operating instructions
7	List of tests carried out		
	ID	Sample number The first sample is number 1, the second number 2, etc.	-
	Time	Time of test	-
	Result	Test result	-
	Leak rate	Leak rate value measured	-
8	Comment	Comment entry box	[Comment]
9	-	Status of the test in progress	[Status]
10	-	List of steps for the recipe of the test in progress	-

7.5.6 Testing a batch of samples



- The test is considered to be invalid if an alarm occurs (see chapter "Test Result").
- A fault during a step is annotated with a danger pictogram .
- During a test, the step in progress is highlighted.
Future steps or steps not carried out are greyed out.
- At the end of the step, the result of the test is displayed in the **[Status]** box and on the list of tests carried out (see column 'Result') and the value of the measured leak flow (see column 'Leak Rate') are displayed on the graph above on the left.
- The test and its result are displayed in the summary table of tests carried out.
- The result of a validated step is annotated with ✓, otherwise it is annotated with ✗.
- The comment associated with the test is displayed in the comment box **[Comment]**.
- It is possible to graphically view the steps in real time during the test in the 'Graphic' menu (see chapter "'Graphic' function").
 - The M1 and MH2 pressures, as well as the helium leak rate value measured, are displayed during the test.

Test procedure for a batch of samples, to be carried out in several steps.

- Step 1: Carry out the 4 prerequisite steps.
- Step 2: Start a test run.
- Step 3: View the sample test result.
- Step 4: Close the test run.
- Step 5: Edit the test report.

Step 1: Carry out the 4 prerequisite steps.

1. Carry out equipment conditioning.
(see chapter "'Conditioning' function")
 - Conditioning must be successful to continue.
2. Calibrate the equipment.
(see chapter "'Calibration' menu")
 - The calibration must be valid to continue.
3. Create the associated recipe for the test run.
(see chapter "Creation of a recipe")
 - The recipe must be activated to continue.
4. Create a test run.
(see chapter "Creation of a test run")

Step 2: Start a test run.

1. Press the **START** button (flashing green).
 - The test starts automatically.
 - At the end of the step, the result of the test is displayed in the **[Status]** box and on the list of tests carried out (see column 'Result') and the value of the measured leak flow (see column 'Leak Rate') are displayed on the graph above on the left.
 - The recipe step and its result are displayed in the summary table of steps carried out.
 - The result of a validated step is annotated with ✓, otherwise it is annotated with ✗.
 - The comment associated with the step is displayed in the comment box **[Comment]**.
 - It is possible to graphically view the steps in real time during the test in the 'Graphic' menu (see chapter "'Graphic' function").
 - The M1 and MH2 pressures, as well as the helium leak rate value measured, are displayed during the test.
2. Add a comment (optional) before and/or during the sample test.
This comment is included in the comment box **[Comment]** of the summary table of tests in the test run and in the test report.
3. Repeat the operations above for each sample to be tested.

Step 3: View the sample test result

The result for each sample is displayed at the end of the test.

► See chapter "Test result".

Step 4: Close the test run

1. Press the **[Stop]** function key after the test on the last sample.
 - The details of the test run are displayed.
2. Press the **[Return]** function key to return to the 'Testing' menu.
 - The test run is not closed.
Testing of new samples can continue.
3. Press the **[✓]** function key to close the test run.
 - No more tests can be run in this test run.
Testing of new samples cannot continue.
A new test run must be created to test other samples.

Step 5: Edit a test report

The automatically generated test report can be completed by the user using the available fields (see chapter "Creation of a report").

7.5.7 Test result

Refer to the specification reference 4495 (Test sequences Open and He Prefilled UUT).

If an alarm is triggered during a test, the test result is invalid.

If the alarm occurs at the end of the test during depollution, the test carried out is not affected by the alarm: the test result is displayed.

Result	Back-ground color of the 'Testing' menu screen	Light ring status	Description	Action
In progress	Grey	flashing blue	Test in progress.	-
PASS	Green	Green	Test accepted, part correct. Sample leak rate below the reject point set. All the test steps are validated.	-

Result	Back-ground color of the 'Testing' menu screen	Light ring status	Description	Action
INVALID 1	Red	Violet	Roughing pump pressure thresholds were not achieved before the end of the maximum timeout for the ML-Air (Massive Leak Air) step. Test aborted before finishing. Test invalid due to a problem with the equipment during the test.	- Check that the tool or test chamber are tightened and connected correctly. - Check that the setting for the target pressures and maximum timeout are correct. - Press the START button to restart the test on the same sample.
INVALID 3	Red	Violet	Test interrupted by the user.	Press the START button to restart the test on the same sample.
INVALID 4	Red	Violet	A fault was triggered during the test, before depollution.	- Press the ABORT/ACKNOWLEDGE button to acknowledge the fault. - Correct the fault. - Acknowledge the active alarm. - Press the [Return] function key to return to the previous screen.
FAIL	Red	Red	Test rejected, bad part. Sample leak rate above the reject point set.	Press the START button to restart the test on the same sample.
FAIL ML-Air	Red	Red	Test rejected during the ML-Air (Massive Leak Air) step.	- Press the ABORT/ACKNOWLEDGE button to read the test result. - Press the START button to restart the test on the same sample.
FAIL GL-Air	Red	Red	Test rejected during the GL-Air (Gross Leak Air) step.	- Press the ABORT/ACKNOWLEDGE button to read the test result. - Press the START button to restart the test on the same sample.
FAIL GL-He	Red	Red	Test rejected during the 'Helium Measure' step. Leak rate measured above the GL-He (Gross Leak Helium) reject point.	- Press the ABORT/ACKNOWLEDGE button to read the test result. - Press the START button to restart the test on the same sample.
FAIL FL-He	Red	Red	Test rejected during the 'Helium Measure' step. Measured leak rate above the FL-He (Fine Leak Helium) reject point.	- Press the ABORT/ACKNOWLEDGE button to read the test result. - Press the START button to restart the test on the same sample.

7.5.8 'Gun Mode' function

The 'Gun Mode' function allows to load a helium sample before its test.

The 'Gun Mode' function only applies to the closed sample test.

Loading can only take place if no other tests are in progress.

A test run using a recipe for closed samples must be selected.

The loading gun, equipped with a needle on its tip, is suitable for samples with a rubber sealing, which can be pierced then re-sealed.

Loading is broken down into 2 steps triggered by the user.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[MEASURE]** menu on the home page. The 'Testing' menu is displayed.

Procedure

1. Connect the loading gun to the back of the equipment to the ^4He supply connector (see chapter "Human/Machine Interface").
2. Insert the needle of the loading gun into the sample (pierce the rubber sealing).
3. Hold the trigger of the loading gun to open the gun's internal valve.
4. Select the recipe, the **[Gun Mode]** function key is displayed.
5. Press the **[Gun Mode]** function key.

Step 1 of loading starts: pumping of the gun in the charge chamber then loading of the helium sample.

- Wait until the equipment status "Gun Mode – He Charging" appears.
- Release the trigger of the loading gun and withdraw the needle from the rubber sealing of the sample.
- Seal the sample again.

6. Press the **[Gun Mode]** function key again.

Step 2 of loading starts: sample loading stopped, pumping in the gun charge chamber then ventilation of the chamber with nitrogen.

- Wait until the equipment status "Gun Mode – Venting" disappears.

7.5.9 'Graphic' function

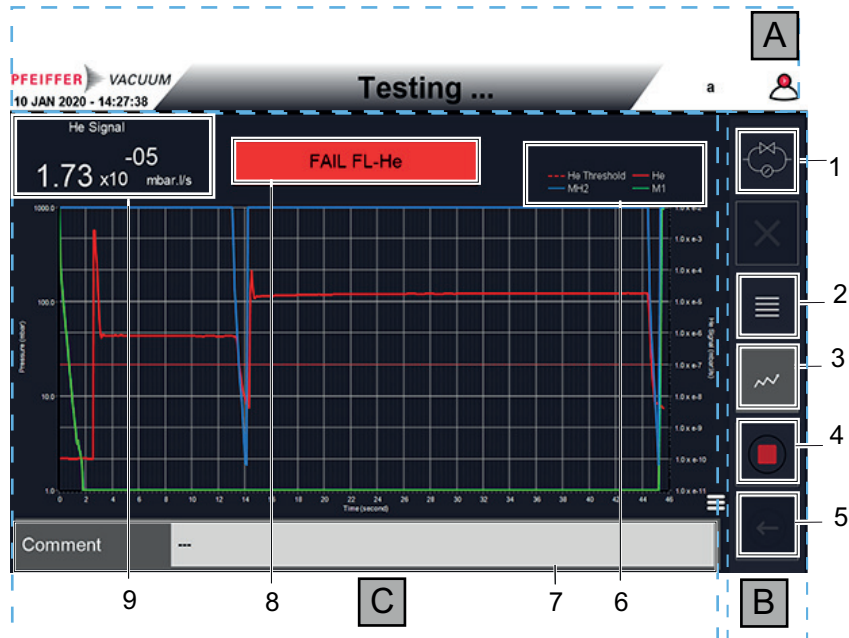
The 'Graphic' function displays the different parameters measured in real time during the test.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[MEASURE]** menu on the home page. The 'Testing' menu is displayed.



Zone B - Function keys - 'Graphic' function			
Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Access to the test and to the test overview	[Test]	
3	Access to the graphic of the test in progress	[Graphic]	
4	Test run closure	[Stop]	
5	Return to previous screen	[Return]	

Zone C - Graphic zone data		
Item	Designation	Description
6	M1 (mbar)	Graph of the pressure in the test chamber (green)
	MH2 (mbar)	Graph of the pressure in the charge chamber (blue)
	He (mbar.l/s)	Graph of the leak rate measured in real time (red)
	He Threshold	SHe-FL reject point set in the recipe used (see chapter "Creation of a recipe")
7	Comment	Comment entry box
8	Test result	Test result
9	He Signal (mbar.l/s)	Leak rate value measured

1. Start a test run (see chapter "Sample batch test").
2. Press the **[Graphic]** function key.
 - The graphs of the test in progress are displayed.

7.6 Data management

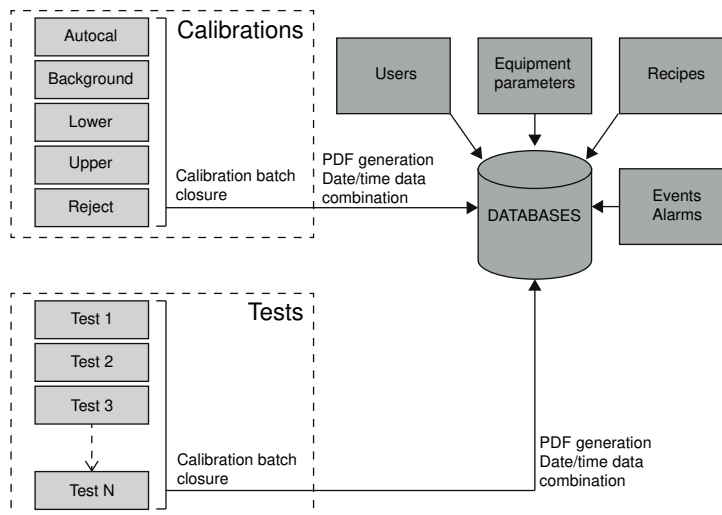
The computer installed in the equipment is an industrial computer equipped with Windows 10 (64 bit). It is equipped with two hard drives used in mirror mode (RAID 1) allowing data to be saved if one of the hard drives fails.

Refer to the hard drive change technical specification described in the specification reference 3881.

The 'ASM2000' software generates different data:

- Equipment parameters
- Recipe parameters
- User parameters
- Events and alarms
- Date/time test data
- Test and calibration report

The software includes a database engine. All the data above are stored in this database.



7.7 Reports

Access authorization

(See chapter "Access authorization")

Access

- Press the **[HISTORY]** menu on the home page, then the **[Report]** function key.
 - The list of reports is displayed.

7.7.1 Creation of a report

The closure of a test run or a calibration automatically generates the creation of a report (pdf format).

- Name of a test run report: TestReport_YYYY_MM_DD_hhHmmmss.pdf
- Name of the calibration report: CalibReport_YYYY_MM_DD_hhHmmmss.pdf

Calibration report

- Fill out the information at the end of calibration if required.

Designation	Description
End Comment	Blank field to be filled out. Final comment added by the user after the report is created.

Test run report

- Fill out the information at the end of the test run if required.

Designation	Description
Test	Blank field to be filled out (example: name of the test run).
UUT	Blank field to be filled out (example: name of the sample tested during the test run).
End Comment	Blank field to be filled out (example: final user comment).

7.7.2 Report history

The reports are displayed in two different columns depending on the type of report, in chronological order of creation.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[HISTORY]** menu on the home page, then the **[Report]** function key.

Displaying a report

The information in the report varies according to the type of report (see chapter "Creation of a report").

1. Select the report to display.
2. Press the **[PDF]** function key.

Filters

A date filter is available to facilitate report searches.

By default, the reports displayed correspond to the reports generated in a 1-month period.

- ▶ Press the scroll-down menu  to access the filters.
- ▶ Press the key  to hide the filters.

Calibration report

Designation	Description
Closed by	The user who closed the calibration (name of the user logged on to the equipment)
Report generated	Date and time that calibration closed and the associated report was created.
File Name	Name of the report
Calibration Status	Calibration status when closed.
Software version PLC version	Software version: • Software: version of the equipment system software. • PLC: version of the PLC software.
Leak Settings	Helium calibrated leak parameters used for detector calibration and for calibration verification.
Measurements	List of measurements performed during calibration (see table below "Details of information for each operation").

Test run report

Designation	Description
Type	Type of recipe (open sample - closed sample).
Recipe	Recipe associated with the test run and version of the recipe.
Report Generated	Date and time of creation of the report
Closed By	The user who closed the test run (name of the user logged on to the equipment).
Last Calibration	Date and time of the last calibration carried out on the equipment.
Software version PLC version	Software version: • Software: version of the equipment system software. • PLC: version of the PLC software.
Test Settings	Recipe parameters used with their values when in use.
Measurements	List of tests performed during the test run (see table below "Details of information for each operation").

Details of information for each operation listed in a report.

An operation can be a measurement in a calibration or a test in a test run.

Designation	Description
User	Name of the user connected to the equipment
Date	Date of the operation
Time	Time of the operation
Type ¹⁾	Name of the step of the calibration
Duration ²⁾	Duration of test
Meas# ²⁾	Name of test
Value (mbar.l/s)	Leak rate measured
Result	Result of the operation

1) Does not appear in a test run report

2) Does not appear in a calibration report

Designation	Description
Target value ¹⁾	Expected calibration result
Comment	The comment entered by the user during the operation (optional)

1) Does not appear in a test run report
2) Does not appear in a calibration report

7.7.3 Export a report

Access authorization

(See chapter "Access authorization")

Access

- Press the **[HISTORY]** menu on the home page.

A report can be exported in pdf format.

During export, the test data from a test run or measurements from a calibration are included in the report.

Only reports selected using the filter are exported.

1. Select a filter.
2. Apply the filter to the report(s) to export (see chapter "Report History").
3. Press the **[Export]** function key.
4. In the 'Windows Explorer' window displayed, select the folder into which the report(s) will be exported.
5. Press the **[Report]** function key.

7.7.4 Printing a report

A report can be printed from the equipment.

A printer must be connected to the equipment USB port.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[HISTORY]** menu on the home page, then the **[Report]** function key.

1. Select the report to print.
2. Press the **[PDF]** function key to display the selected report.
3. Press the **[Print]** function key.
4. In the 'Windows Explorer' window displayed, select the printer connected to the equipment USB port.
5. Press the **[Print]** function key again to print the report.

7.8 'Sniffer' function

The 'Sniffer' function allows to perform a helium leak test using the sniffer probe.

The leak detection limit of a sniffing test is $1 \cdot 10^{-5}$ mbar.l/s.

The test allows to accurately locate a leak or verify the presence of helium in a sample.

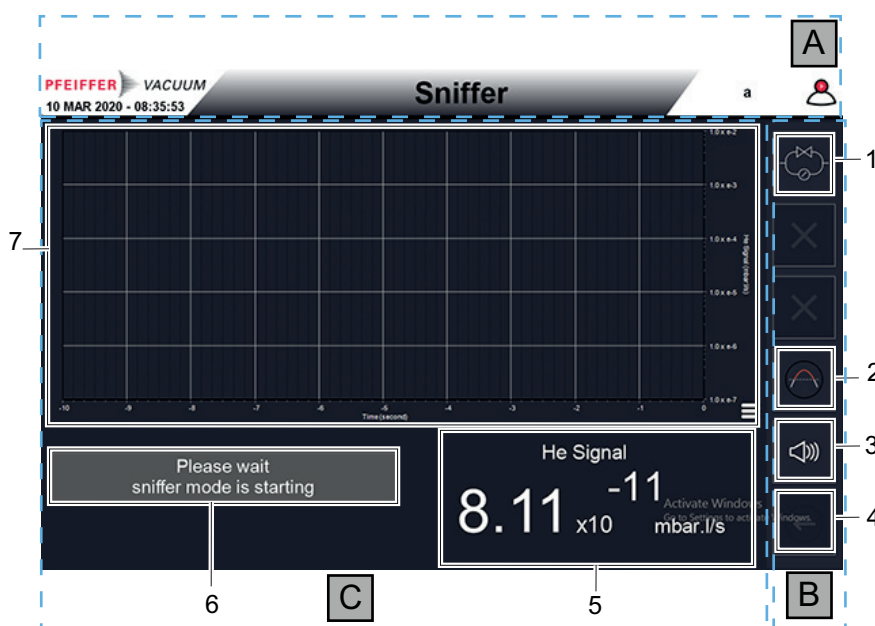
The function is launched automatically when the sniffer probe is removed from the equipment.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[Sniffer]** function key, which becomes available on the screen once the sniffer probe is removed from its holder.



Zone B - Function keys - 'Sniffer' menu

Item	Designation	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Reject point setting	[Reject Point]	
3	Enabling/Disabling the audible warning device When the leak rate measured is greater than the reject point set, the audible warning device is triggered. Press the pictogram to enable or disable the audible warning device.	[Buzzer on]	
		[Buzzer off]	
4	Return to previous screen Pictogram available when the sniffer probe is returned to its holder.	[Return]	

Zone C - Data zone - 'Sniffer' function - Information on the sniffer probe and its graphic

Item	Designation	Description
5	He Signal (mbar.l/s)	Leak rate value measured
6	Sniffer probe status	Information on the sniffer probe status
7	Graphic	Graphic of the test in progress

Connection of the sniffer probe

- Disable the 'Sniffer' function before disconnecting the sniffer probe from the equipment (see chapter "Operator Access' Function").
- Restart the equipment when the 'Sniffer' function is enabled and when the sniffer probe has been disconnected from the equipment.

Prerequisites

- 'Sniffer' function activated in the parameters.
- Sniffer probe connected to the connector located on the back of the equipment (see chapter "Human/Machine Interface").

- No fault activated
 - No other test in progress (test run ('MEASURE' menu), quick test ('He TESTING' menu) or calibration ('CALIBRATION' menu)).
1. Remove the sniffer probe from its holder.
 - The 'Sniffer' function is triggered automatically and the test starts.
 - Do not block the sniffer probe during the test.
 2. Follow the instructions on the screen.
 - Leak rate measured less than the reject point set and displayed in real time = good part.
 - Leak rate measured greater than the reject point set and displayed in real time = bad part.
 3. Return the sniffer probe to its holder to stop the test.
 4. Press the **[Return]** function key to return to the previous screen.

Modify the reject point

1. Press the **[Reject Point]** function key.
2. Modify the value of the reject point.
3. Validate **[✓]**.

7.9 'He TESTING' menu

The 'He TESTING' menu:

- starts a quick global leak test
- runs a test by spray

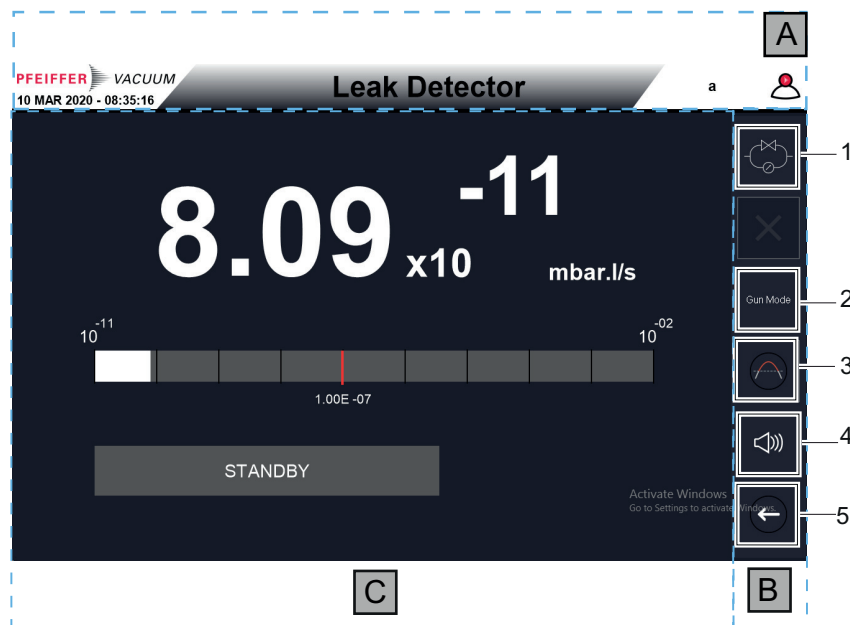
The flow pumped by the equipment into the sample connected to the test port is continuously measured until the user stops the test.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[He TESTING]** menu on the home page. The 'Leak detector' menu is displayed.



Zone B - Function keys - 'He TESTING' menu			
Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Access to the 'Spray Gun' function	[Spray Gun]	
3	Reject point setting	[Reject Point]	
4	Enabling/Disabling the audible warning device When the leak rate measured is greater than the reject point set, the audible warning device is triggered. Press the pictogram to enable or disable the audible warning device.	[Buzzer off]	
		[Buzzer on]	
5	Return to previous screen	[Return]	

Zone C - Data zone - 'He TESTING' menu

Designation	Description
He Signal (mbar.l/s)	Leak rate measured in real time

Prerequisites

No fault activated.

Global test

- ▶ The test chamber or tool used must be compatible with the recipe selected to carry out the test run.
- ▶ Place the sample into the test chamber or tool.
- ▶ Press the **START** button (flashing green) to start the test.
- ▶ Press the **ABORT/ACKNOWLEDGE** button to stop the test and ventilate the test chamber.

Modify the reject point

- ▶ Press the [**He TESTING**] menu on the home page, then on the [**Reject Point**] function key.
- ▶ Modify the value of the reject point.
- ▶ Validate [✓].

Test by spray

A test by spray can be run to locate a leak.

The test by spray is broken down into 2 steps triggered by the user.

1. Connect the spray gun to the equipment to the ⁴He supply connector (see chapter "Human/Machine Interface").
2. Press the [**Spray Gun**] function key to start the test.
 - - **Step 1** starts: the spray gun is loaded with helium.
3. Wait until the equipment status "Spray Gun – He Charging" appears (see illustration).
4. Spray the sample: press briefly on the spray gun trigger to open the internal valve.
5. Release the spray gun trigger when the test by spray is finished.
6. Press the [**Spray Gun**] function key again.
 - - **Step 2** starts: the spray gun is loaded with nitrogen.
7. Wait until the equipment status "Spray Gun – Venting" disappears.

8 Advanced settings



This chapter describes the available functions and how they work. This chapter helps the user to set the product parameters according to the use requirements.

8.1 Onglet 'User'

This tab enables each user to:

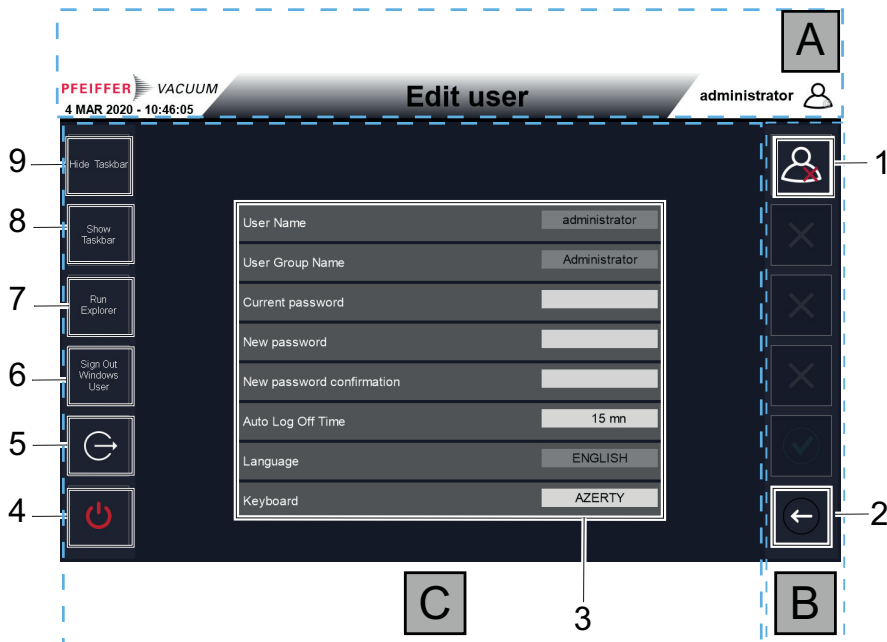
- change his/her own password,
- manage his/her account,
- open/close the 'ASM2000' software,
- open/close his/her Windows session.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[User]** tab on the home page. The 'Edit user' menu is displayed.



Zone B - Function keys - 'User' tab

Item	Description	Designation in the operating instructions	Pictogram
1	User connection/disconnection • No operation can be carried out unless the user is identified.	[User log off]	
2	Return to previous screen	[Return]	

Zone C - Software and user account management				
Item	Designation	Description	Designation in the operating instructions	Pictogram
3	Username	User's login Name saved for all operations.	-	-
	Current Password	Current password	-	-
	New Password	New password	-	-
	New password confirmation	New password confirmation	-	-
	User Group Name	4 user levels: Operator - Advanced - Maintenance - Administrator	-	-
	Auto Log off time	Timeout before automatic disconnection. - Default value: 2 minutes - Maximum value: 15 minutes	-	-
	Language	Choice of display language The functions available for an 'Advanced' - 'Maintenance' - 'Administrator' level user are always displayed in English, regardless of the language set.	-	-
	Keyboard	Virtual keyboard selection Azerty or Qwerty keyboard.	-	-
4	Function key	Computer shutdown	[Shutdown]	
5	Function key	The 'AMI2000' software is closed and return to the Windows session.	[Exit]	
6	Function key	The 'AMI2000' software and the Windows session are closed.	[Sign Out Windows user]	
7	Function key	Opens the Windows session.	[Run Explorer]	
8	Function key	Hides the Windows taskbar.	[Hide Taskbar]	
9	Function key	Displays the Windows taskbar.	[Show Taskbar]	

Information relative to the user account

Users are only permitted to make changes to their own account:

- the password
- the language
- the virtual keyboard
- the timeout before automatic disconnection.

The password management in place asks users to create complex passwords in order to improve security.

- Follow the instructions to save the changes.
 - If there is an error, a message is displayed.

Changing your own password

1. Press the **[User]** tab on the home page then **[Edit User]**.
2. Enter the current password in the 'Current Password' field.
3. Enter the new password in the 'New Password' field.

4. Confirm the new password in the 'New Password Confirm' field.
5. Press the [✓] function key to validate the modification.
6. Press the [Return] function key to cancel the modification.
7. Press the [Quit] function key to abort the modification.

Open/close the 'ASM2000' software

1. Press the [Sign Out Windows User] function key and follow the instructions.

Change Windows session

1. Press the [User] tab.
 2. Press the [Sign Out Windows User] function key.
- Press the [Run Explorer] function key and follow the instructions.

8.2 'USER MANAGER' menu

This menu allows to manage user accounts.

Access authorization

(See chapter "Access authorization")

Access

- Press the [USER MANAGER] menu on the home page.

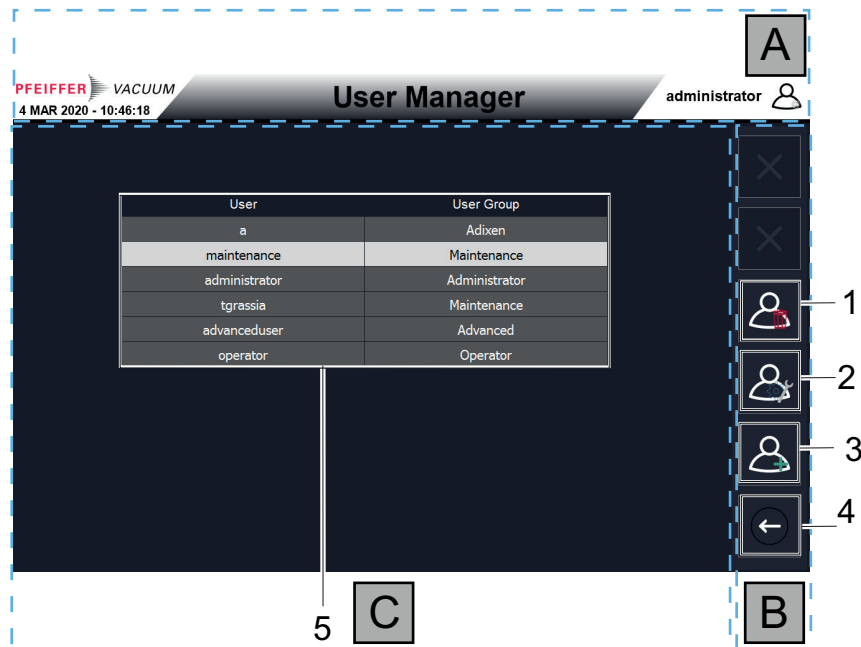
8.2.1 Managing user accounts

Access authorization

(See chapter "Access authorization")

Access

- Press the [USER MANAGER] menu on the home page.
1. Select the user from the list of users created.
 2. Press the [User] tab to edit the user profile selected.



Zone B - Function keys - 'USER MANAGER' menu			
Item	Description	Designation in the operating instructions	Pictogram
1	Creation of a new user (see chapter "Creation of an user account").	[Add User]	
2	Edit an user profile Selection and/or modification (see chapter "Modification of an user account").	[Edit User]	
3	Deleting an user Users who are deleted remain on the list of users but their access permissions are disabled. Their status becomes 'Deleted'.	[Remove User]	
4	Return to previous screen	[Return]	

Zone C - Data zone - List of users created - 'USER MANAGER' menu			
Item	Designation	Description	Description
5	User Log in	Connection name	Details of the user configuration
	User group	Access authorization level	List of users created in order of creation
	Users editor State	Status of permissions to access menus and function keys (Enabled/Disabled)	

8.2.2 Password modification

Modification of an user password is only possible if the user has been created for local use (outside the domain) of the equipment.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[USER MANAGER]** menu on the home page.
- 1. Select the user whose password is to be modified.
- 2. Press **[Edit user]** to display his/her account.
- 3. Enter the current password in the 'Current Password' field.
- 4. Enter the new password in the 'New Password' field.
- 5. Confirm the new password in the 'New Password Confirm' field.
- 6. Press the **[✓]** function key to validate the modification.
- 7. Press the **[Return]** function key to cancel the modification.
- 8. Press the **[Quit]** function key to abort the modification.

8.2.3 Creation of an user account

Creation of an user account is only possible if the equipment is used locally (outside the domain).

Access authorization

(See chapter "Access authorization")

Access

- Press the **[USER MANAGER]** menu on the home page.
- 1. Press the **[Add User]** function key.
- 2. Set the user account (see chapter "User Tab").
- 3. Press the **[✓]** function key to validate the creation.
- 4. Press the **[Return]** function key to exit the creation.
- 5. Press the **[Quit]** function key to abort the creation.

8.2.4 Modification of an user account

Modification of an user account is only possible if the user has been created for local use (outside the domain) of the equipment.

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the **[USER MANAGER]** menu on the home page.
- 1. Select the user of the account to be modified.
- 2. Press **[Edit user]** to display his/her account.
- 3. Modify the account.
- 4. Press the **[✓]** function key to validate the modification.
- 5. Press the **[Return]** function key to cancel the modification.
- 6. Press the **[Quit]** function key to abort the modification.

8.3 'Conditioning' function

The 'Conditioning' function allows to check that the equipment is in an operational state and that the gases needed for the test are correctly connected.

Conditioning must be carried out after starting up the equipment each time and after certain alarms.

The 'MEASURE', 'CALIBRATION' and 'He TESTING' menus, as well as the 'SNIFFER' function, are not available if conditioning has not been successful.

Conditioning setting is through the 'Conditioning' menu.



Modifying the conditioning parameters can have consequences for the correct use of the equipment.

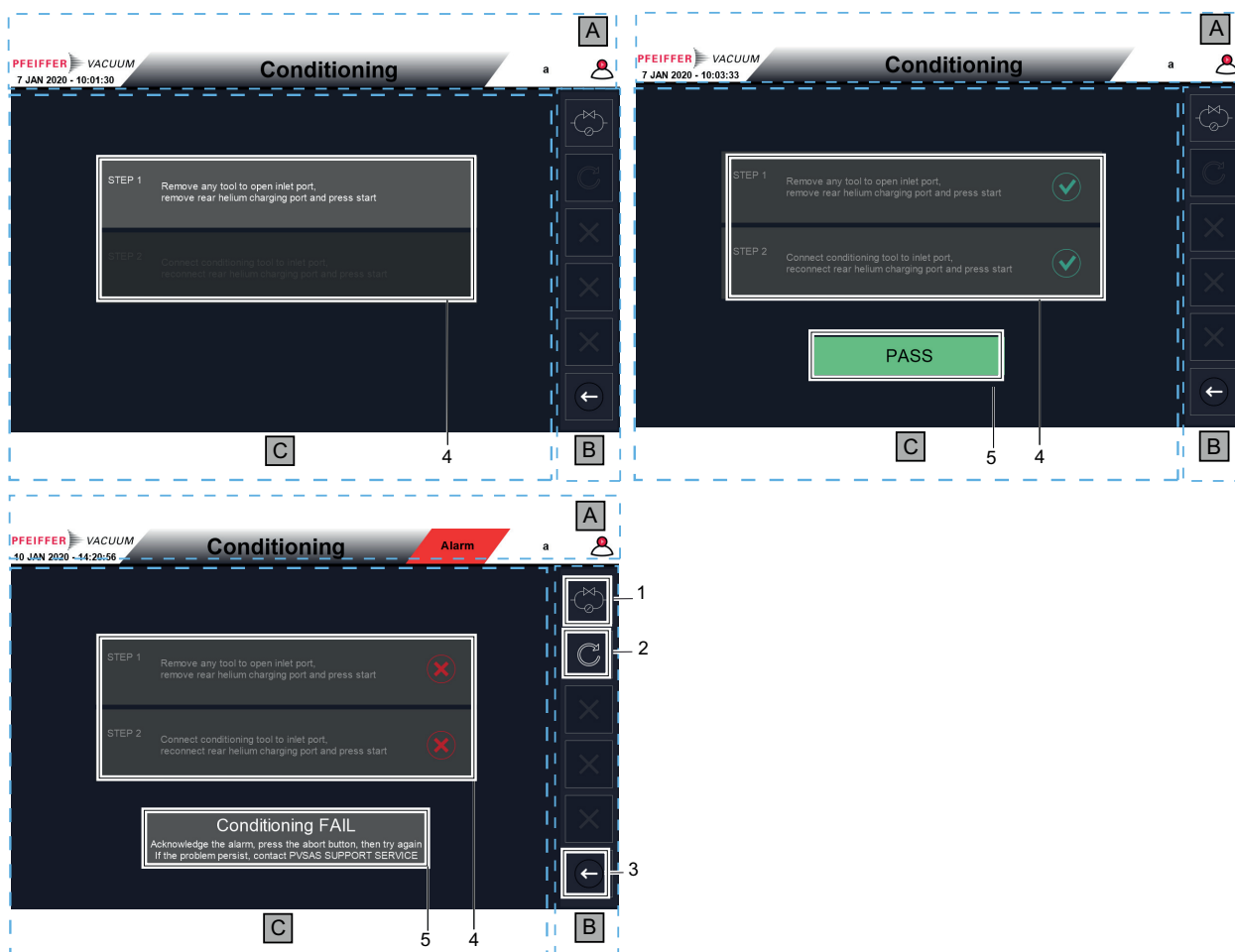
Unless otherwise stated in this manual, never modify these parameters without first consulting the manufacturer.

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the **[Conditioning]** function key on the home page.



Zone B - 'Conditioning' function keys

Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Conditioning restart	[Conditioning restart]	
3	Return to previous screen	[Return]	

Zone C - Data zone - Conditioning monitoring

Item	Details of the conditioning steps	Description
4	Step number and instruction	Step 1, Step 2. Follow the instructions to start the step
5	Conditioning result	- PASS: validated - FAIL: rejected

It is not possible to change the order of the conditioning steps.

A step is not available if:

- the previous step was not successfully carried out,
- an alarm is active,
- the equipment is not ready.

A step that cannot be completed is greyed out. A step that can be completed is highlighted.

When a step is finished, its result is displayed:

- validated step marked with a tick ✓: the next step can then be completed.
- rejected step marked with a cross ✗: conditioning is aborted and must be rerun.

Conditioning is rolled out in 2 steps.

Step 1

Do not connect any tools or test chamber to the test port or to the ⁴He charge port.

1. Follow the instructions.
 - Press the **START** button.
 - When conditioning starts, the light ring flashes blue.
 - When the step is finished, its result is displayed.
 - Step 2 becomes available if step 1 is validated.

Step 2

1. Follow the instructions.
2. Connect the conditioning tool to the test port and to the ⁴He charge port (see chapter “Human/ Machine Interface”).
3. Press the **START** button.
 - When the step is finished, its result is displayed.

Conditioning result

The conditioning result is displayed on the bottom part of the screen:

- PASS: Conditioning validated - Light ring is green
 - FAIL: Conditioning rejected - Light ring is red
- Press the **ABORT/ACKNOWLEDGE** button.
- Restart conditioning.
- Press the **[Return]** function key to return to the home page.

8.4 'HISTORY' menu

The ‘HISTORY’ menu:

- accesses the event history (see chapter “Details of an event”),
- generates reports (see chapter “Report History’ Function”),
- displays active faults and acknowledges them (see chapter “Alarm’/Warning’ Functions”).

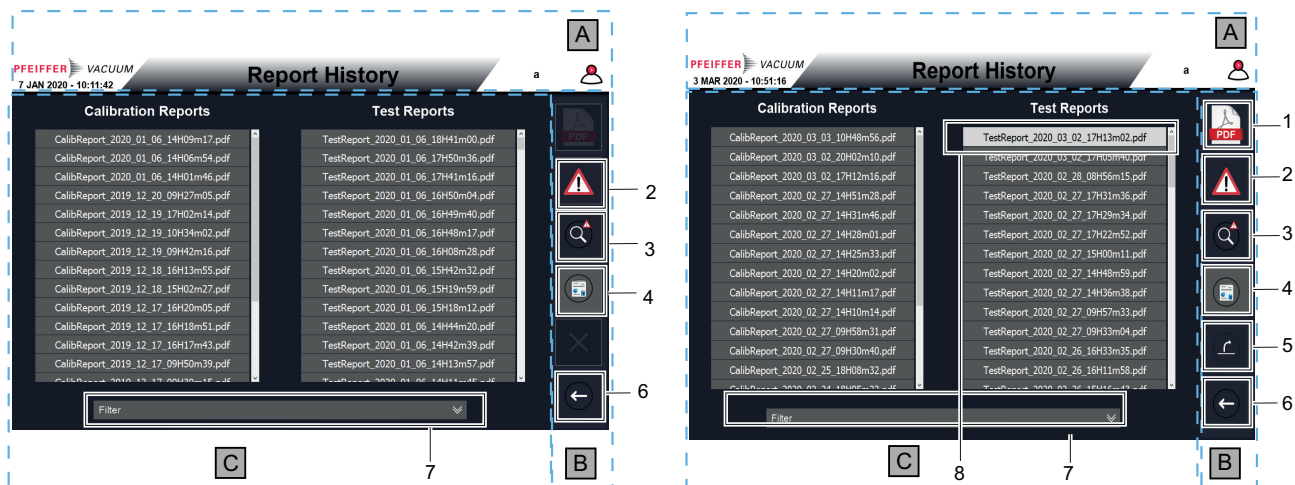
Access authorization

(See chapter "Access authorization")

The first screen displays the last menu viewed.

Access

- Press the **[HISTORY]** menu on the home page. The ‘Report History’ menu is displayed
- Press the **[Alarm]/[Warning]** function key.
- Press the **[Export]** function key to export the list of faults to a PDF file.



Zone B - Function keys - 'HISTORY' menu

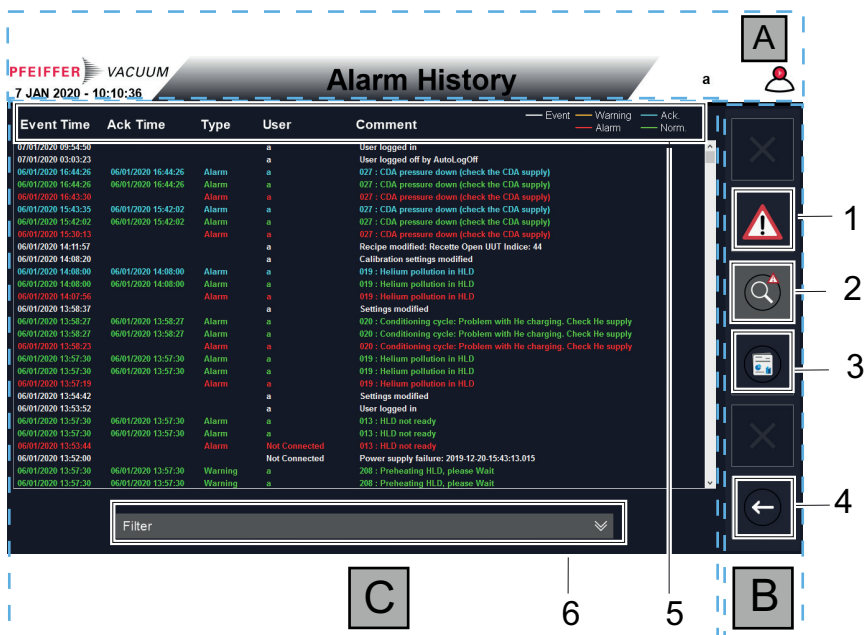
Item	Description	Designation in the operating instructions	Pictogram
1	Displays the selected report (see chapter "Report History") Prints the report displayed	[PDF]	
2	List of active faults to be acknowledged	[Alarm]/[Warning]	
	Acknowledgement of all the current faults (subject to the source of the fault having been processed)	[Acknowledge All]	
3	Events list Display of all events on the equipment (see chapter "Counters' Function").	[Events list]	
4	Access to reports generated on the equipment (see chapter "Report history").	[Report]	
5	Export the list of events in a PDF file (see chapter "Export a report").	[Export]	
6	Return to previous screen	[Return]	

Zone C - Data zone - List of reports and filters

Item	Description	Designation in the operating instructions	
7	Access to filters. Filters are applied to the exported data (see chapter "Filter' scroll-down menu").	[Filter]	
8	Report pdf	-	-

8.4.1 Details of an event

An event is a record of a status change in the equipment.



PFEIFFER VACUUM 7 JAN 2020 - 10:10:36 **Alarm History**

Event Time	Ack Time	Type	User	Comment
07/01/2020 08:54:50			a	User logged in
07/01/2020 09:03:23			a	User logged off by AutoLogOff
06/01/2020 16:44:26	06/01/2020 16:44:26	Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 16:44:26	06/01/2020 16:44:26	Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 16:42:30		Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 15:43:35	06/01/2020 15:42:02	Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 15:42:02	06/01/2020 15:42:02	Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 15:30:13		Alarm	a	027 : CDA pressure down (check the CDA supply)
06/01/2020 14:11:57		Alarm	a	Recipe modified: Racetto Open UUT Index: 44
06/01/2020 14:08:20		Alarm	a	Calibration settings modified
06/01/2020 14:08:00	06/01/2020 14:08:00	Alarm	a	019 : Helium pollution in HLD
06/01/2020 14:08:00	06/01/2020 14:08:00	Alarm	a	019 : Helium pollution in HLD
06/01/2020 14:07:59		Alarm	a	019 : Helium pollution in HLD
06/01/2020 13:58:37		Alarm	a	Settings modified
06/01/2020 13:58:27	06/01/2020 13:58:27	Alarm	a	020 : Conditioning cycle: Problem with the charging. Check He supply
06/01/2020 13:58:27	06/01/2020 13:58:27	Alarm	a	020 : Conditioning cycle: Problem with the charging. Check He supply
06/01/2020 13:58:23		Alarm	a	020 : Conditioning cycle: Problem with the charging. Check He supply
06/01/2020 13:57:30	06/01/2020 13:57:30	Alarm	a	019 : Helium pollution in HLD
06/01/2020 13:57:30	06/01/2020 13:57:30	Alarm	a	019 : Helium pollution in HLD
06/01/2020 13:57:19		Alarm	a	019 : Helium pollution in HLD
06/01/2020 13:54:42		Alarm	a	Settings modified
06/01/2020 13:53:52		Alarm	a	User logged in
06/01/2020 13:57:30	06/01/2020 13:57:30	Alarm	a	013 : HLD not ready
06/01/2020 13:57:30	06/01/2020 13:57:30	Alarm	a	013 : HLD not ready
06/01/2020 13:53:44		Alarm	Not Connected	013 : HLD not ready
06/01/2020 13:52:00		Warning	Not Connected	Power supply failure: 2019-12-20-15:43-13.015
06/01/2020 13:57:30	06/01/2020 13:57:30	Warning	a	208 : Preheating HLD, please Wait
06/01/2020 13:57:30	06/01/2020 13:57:30	Warning	a	208 : Preheating HLD, please Wait

Filter [v]

The following information is saved for each event.

Zone B - Function keys			
Item	Description	Designation in the operating instructions	Pictogram
1	List of active faults to be acknowledged	[Alarm]/[Warning]	
2	Events list Display of all events on the equipment (see chapter "Counters' Function").	[Events list]	
3	Access to reports generated on the equipment (see chapter "Report history").	[Report]	
4	Return to previous screen	[Return]	
Zone C - Data zone - Fault data			
Item	Designation	Description	Pictogram
5	Event Time	Date and time of the event.	-
	Acknowledge Time	Date and time of acknowledgment of the fault by an user	-
	Type	Type of event: • Information — White display • Warning — Orange display: warning to be acknowledged — Blue display: warning acknowledged • Alarm — Red display: alarm to be acknowledged — Blue display: alarm acknowledged — Green display: fault normalized	-
	User	User name connected to the equipment when the event occurred	-
	Comment	Description of the event (event ID number).	-
6	Access to filters.	[Filter]	

8.4.2 'Filter' scroll-down menu

Several filters are available to facilitate event searches.

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the [HISTORY] menu on the home page.
- ▶ Press the [Filter] scroll-down menu in the [Alarm History] or [Report] menu.

Designation	Description
AL/WA/EV ¹⁾	Filter according to the type of message. • EV = EVENT • WA = WARNING • AL = ALARM 1. Select the type of desired message. — Unselected type message is greyed out. 2. Configure the filters 3. Validate to apply the filter.
Start Time	Filter from the date set.
End Time	Filter until the date set.
1) Filters available in [Alarm History] only	

8.4.3 'Alarm'/'Warning' tab

The 'Alarm'/'Warning' tab allows to display faults in progress and to acknowledge them.

Access authorization

(See chapter "Access authorization")

Access

There are 2 possible solutions:

- ▶ Press the **[HISTORY]** menu on the home page.
- ▶ Press the **[Alarm]/[Warning]** tab on the home page header bar.

Designation	Description
Type	Indicates the type of fault • Orange warning: fault to be acknowledged. • Red alarm: fault to be acknowledged.
User	Username connected to the equipment when the fault occurred
Event Time	Fault time and date
Comment	Description of the event (event ID number) Diagnostic and solution (see chapter "Troubleshooting Guide").

Default acknowledgment

- ▶ Press the **[Acknowledge all]** function key.
 - If the faults have been corrected, they disappear from the list of faults in progress.

A fault cannot be acknowledged until it has been corrected.

Acknowledged or current faults can be consulted in events (see chapter "Details of an event").

8.5 'Synoptic' function

The 'Synoptic' function enables:

- dynamic monitoring of the status of the equipment components,
- manual management of the valves (only with 'Maintenance' user level).

The 'Synoptic' function also displays the following information:

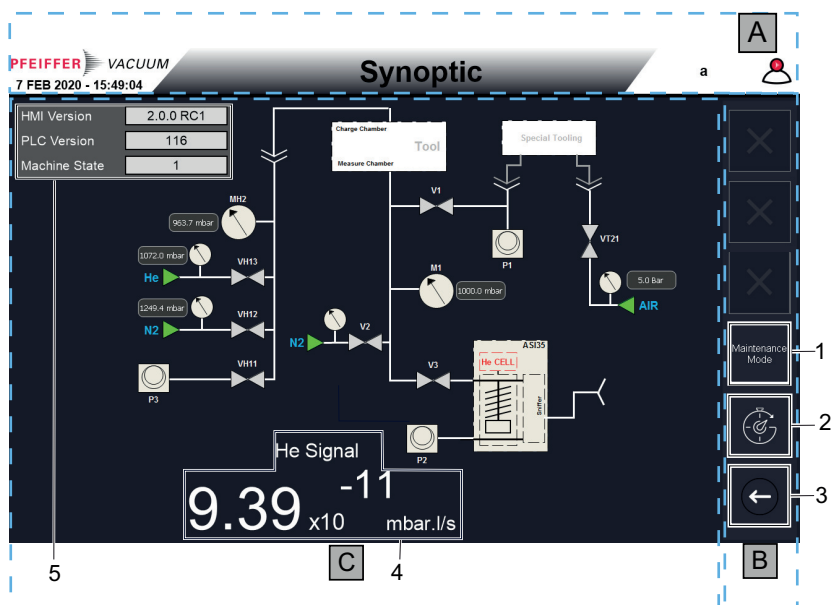
- general information on the equipment,
- use counters,
- leak rate value measured in real time.

Access authorization

(See chapter "Access authorization")

Access

- ▶ Press the **[Synoptic]** function key on the home page.



Zone B - 'Synoptic' function keys

Item	Description	Designation in the operating instructions	Pictogram
1	Access to manual valve management, lighting for the buttons, keys and light ring (see paragraph below: 'Maintenance mode' function).	[Maintenance Mode]	
2	Counters for equipment components (see paragraph below: 'Counters' function).	[Counters]	
3	Return to previous screen	[Return]	

Zone C - Data zone - 'Synoptic' function - Information on equipment

Item	Designation	Description
4	He Signal (mbar.l/s)	Leak rate value measured
5	Machine State	Current status of the equipment
	HMI version	'ASM2000' software version
	PLC Version	Version of the PLC software

'Maintenance mode' function

The user manually manages the equipment valves by pressing the valve pictogram.

- Press the **[Maintenance Mode]** function key.
 - Press the closed valve (grey) to open it.
 - Press the open valve (green) to close it.

'Counters' function

This function allows to display the counters of the equipment components, as well as the internal parameters of the leak detector (detector integrated into the equipment).

- Press the **[Counters]** function key.
- Press the **[Reset]** function key to reset the counter after maintenance or after changing the component.

8.6 'RECIPE' menu

This menu allows to manage and create recipes.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[RECIPE]** menu on the home page. The 'Recipe Manager' menu is displayed.

Recipes are listed in chronological order of creation.

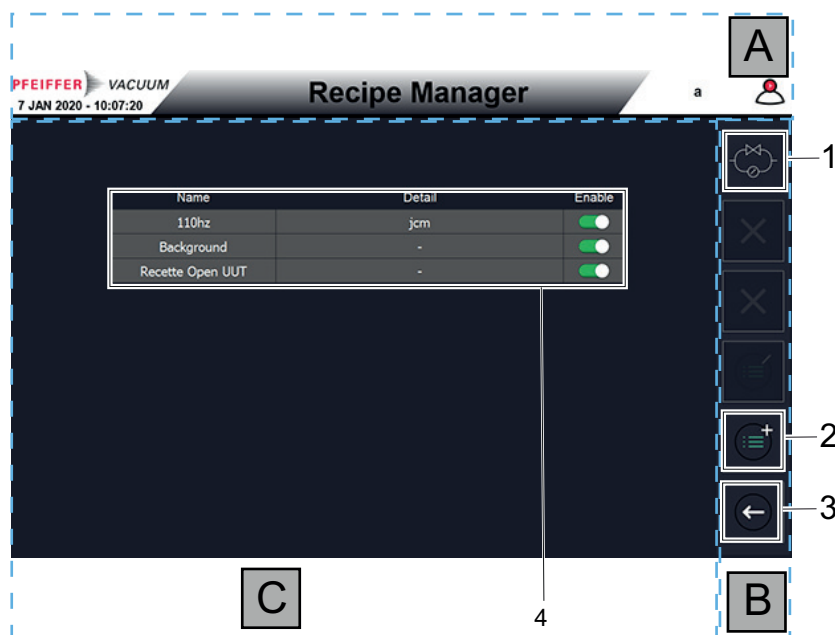
- Press the **[Return]** function key to return to the home page.

8.6.1 Details of a recipe**Access authorization**

(See chapter "Access authorization")

Access

- Press the **[RECIPE]** menu on the home page. The 'Recipe Manager' menu is displayed.

**Zone B - Function keys - 'Recipe' menu**

Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Creation of a recipe	[New Recipe]	
	Editing of a recipe	[Edit Recipe]	
3	Return to previous screen	[Return]	

The following information is saved for each recipe.

Zone C - Data zone - List of recipes created - 'Recipe' menu			
Item	Designation	Description	Pictogram
4	Name	Name of the recipe.	-
	Details	Displays the recipe comment.	-
	Enable	Enable/disable a recipe by sliding the slider. - Green enabling slider = enabled The recipe is available when creating a test run (option of performing a test run with this recipe). The recipe is offered in the list of recipes available when creating a test run (option of performing a test run with this recipe). - Black enabling slider = disabled The recipe is unavailable (the test run cannot be carried out with this recipe). The recipe is no more offered in the list of recipes available when creating a test run (no option of performing a test run with this recipe).	 

8.6.2 Creation of a recipe

A recipe allows to define the parameters of a sample test run.

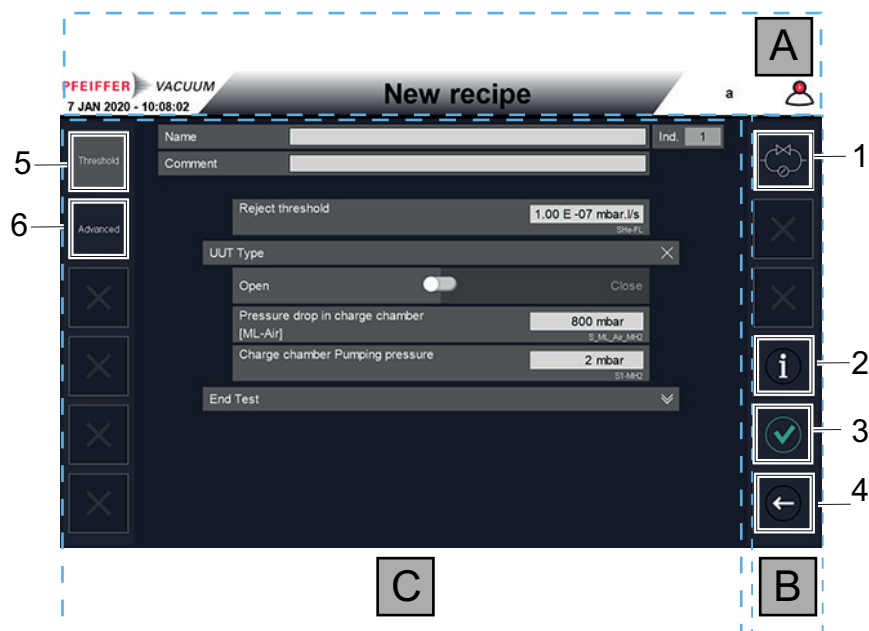
- A recipe can be used for several sample test runs.
- The same sample can be tested using several recipes.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[RECIPE]** menu on the home page. The 'New recipe' menu is displayed.



Zone B - Function keys - 'Recipe' menu			
Item	Description	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Setting help (see chapter "Test sequences")	[i]	

Zone B - Function keys - 'Recipe' menu			
Item	Description	Designation in the operating instructions	Pictogram
3	Save the recipe and modifications	[✓]	
4	Return to previous screen	[Return]	

Zone C - Function keys - Recipe setting - 'Recipe' menu			
Item	Description	Designation in the operating instructions	Pictogram
5	Information related to the test run parameters.	[Threshold]	
6	Information related to the test run and depollution advanced parameters.	[Advanced]	

1. From the **[Recipe manager]** page.
2. Press the **[New Recipe]** function key.
Fill out the 'Recipe Name' field: give the recipe a name.
3. Press the **[Threshold]** function key and fill out the parameters (see below: "Threshold" Function").
4. Press the **[Advanced]** function key and fill out the parameters (see below: "Advanced" Function").
5. Press the **[✓]** function key to validate the creation.
 - The new recipe is added to the list of existing recipes: it is activated and available for a test run.
6. Press the **[Return]** function key then **[Quit]** to cancel the creation.

'Threshold' function

Information related to the test run parameters.

- Press the **[Threshold]** function key.

Zone C - Data zone - Setting	
Designation	Description
Name	Name of the recipe.
Comment	Comment associated with the recipe.
Reject Threshold	Reject point setting for the FL-He step for the sample test. The reject point defines the threshold above which the sample is considered to be rejected. • Leak rate measured > reject point: sample rejected • Leak rate measured < reject point: sample accepted The default threshold is $1 \cdot 10^{-7}$ mbar.l/s
UUT type	Scroll-down menu: details in the table below. Type of sample to be tested.
End test	Scroll-down menu: details in the table below. Type of analysis of the leak rate measured.
Ind.	Version 1 of the recipe (creation).

Details: 'UUT Type' scroll-down menu

Designation		Description
Open/Close	-	Type of sample to be tested. Defines the type of test to be carried out. Open/closed sample (see chapter "Testing a batch of samples") - (see chapter "Test sequences") - Open sample: sample charged with helium during the test. - Closed sample: sample already charged with helium and then sealed before the test.
Pressure drop in charge chamber [ML-Air] ¹⁾	S_ML_Air_MH2	Pressure set point setting reached in the charge chamber during the ML-Air step in the event of a very gross leak.
Charge chamber pumping pressure ¹⁾	S1_MH2	Pumping target pressure in the charge chamber.

1) Available for the 'open' sample type only

Details: 'End Test' scroll-down menu

Designation		Description
Timeout / Stability	-	- Timeout: the result of the leak rate measured is saved after a fixed defined time. - Stability: the result of the leak rate measured is saved when the leak rate is stable.
Helium measure duration ¹⁾	To_SHe-FL	Fixed duration of the FL-He step, at the end of which the leak rate measured is retained as the result.
He signal stabilization slope ²⁾	Slope_SHe-FL	Value below which the slope calculated between 2 test points taken at one second interval must be found to meet the stability criteria.
Stability duration ²⁾	T_Slope_SHe-FL	Time during which the criteria must be respected.
Helium measure duration ²⁾	To_Slope_He-FL	Maximum timeout to meet the stability criteria before an alarm is triggered.

1) Available if the 'Timeout' parameter is selected

2) Available if the 'Stability' parameter is selected

'Advanced' function

Information related to the test run and depollution advanced parameters.

- Press the **[Advanced]** function key.

Zone C - Setting

Parameter	Description
Advanced parameters	Scroll-down menu: details below. Advanced parameters
Depollution Management	Scroll-down menu: details below. Depollution management

Details: 'Advanced parameters' scroll-down menu

Parameter		Description
GL-He reject threshold	SHe-GL-He	Reject point of the leak rate for the GL-He step. In the event that the leak rate is above this threshold during the GL-He step, the test is stopped and rejected, and a GL-He result is displayed.
GL-He validation time	Ts_SHe-GL-He	GL-He validation time. Time during which the leak rate must be less than the GL-He (Gross Leak Helium) reject point to be rejected.

1) Available for the 'open' sample type only

Details: 'Advanced parameters' scroll-down menu

Parameter		Description
Primary pumping time-out in test chamber [ML-Air]	To_S1-M1	Maximum timeout to reach the S1-M1 pumping target pressure in the test chamber during the ML-Air step (see chapter "Advanced" function).
GL-Air timeout	To_SHe-GL-Air	Maximum timeout to validate the GL-Air step. If the step is not validated at the end of this timeout, the GL-Air result is displayed.
Decade jump detection [GL-Air]	SHe-open-V3	Minimum height (in decades) of the leak rate increase at the start of the test with the equipment (opening of valve V3).
Pumping timeout in charge chamber [Helium Charging] ¹⁾	To_S1-MH2	Maximum timeout to reach the pumping target pressure (S1-MH2) in the charge chamber (see chapter "Creation of a recipe").
Helium charging pressure ¹⁾	S2-MH2	Helium charge target pressure Crossover pressures

1) Available for the 'open' sample type only

Details: 'Depollution Management' scroll-down menu

Designation		Description
Helium threshold requiring test chamber depollution	SHe_To_Depol_HLD	Leak rate measured beyond which depollution is carried out at the end of the test.
He signal recovery	SHe_End_Depol_HLD	Value of the helium background that must be measured during depollution to end depollution (depollution considered complete).
Nbr depollution cycle in charge chamber ¹⁾	Nb-depol-He	Number of pumping cycles and nitrogen purge cycles carried out in the charge chamber at the end of the test to remove the helium.

1) Available for the 'open' sample type only

8.6.3 Modification of a recipe

It is not possible to modify an existing recipe V_n when a test run or calibration using this recipe is in progress.

Any modification of a recipe in version V_n will generate a new recipe in version V_{n+1} , whilst keeping its name. Version V_n will automatically be invalidated.

1. Press the **[RECIPE]** menu on the home page. The 'Recipe Manager' menu is displayed.
2. Press the **[Edit Recipe]** function key.
3. Modify the desired parameters: (see chapter "Creation of a recipe").
 - The name of the recipe cannot be modified.
 - The version automatically increments.
4. Press the **[✓]** function key to validate the modification.
 - The new recipe V_{n+1} is added to the list of existing recipes.
5. Press the **[Return]** function key then **[Quit]** to cancel the modification.

8.7 'SETTINGS' menu

This menu allows to manage the general parameters of the equipment.



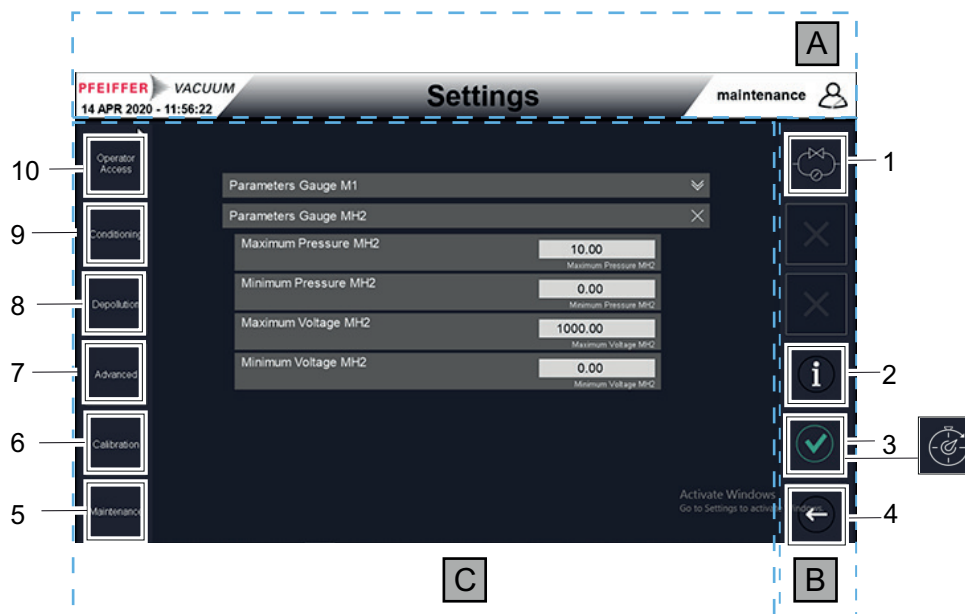
Modifying the general parameters can have consequences for the correct use of the equipment.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page.



Zone C: Displays the last page viewed by default

Zone B - Function keys - 'SETTINGS' menu

Item	Designation	Designation in the operating instructions	Pictogram
1	Access to Synoptic	[Synoptic]	
2	Setting help	[i]	
3	Save/confirm	[✓]	
	Counter management	[Counters]	
4	Return to previous screen	[Return]	

Zone C - Data zone - General parameters - 'SETTINGS' menu

Item	Description	Designation in the operating instructions	Pictogram
5	Management of pressure gauges installed on the equipment (see chapter "Maintenance" function")	[Maintenance]	
6	Calibration management (see chapter "Calibration" function")	[Calibration] tab	
7	Advanced parameters for test run (see chapter "Advanced" function")	[Advanced]	
8	Depollution management (see chapter "Depollution" function")	[Depollution]	

Zone C - Data zone - General parameters - 'SETTINGS' menu			
Item	Description	Designation in the operating instructions	Pictogram
9	Access to equipment conditioning (see chapter "Conditioning" function")	[Conditioning]	
10	Access management for 'Operator' level user (see chapter "Operator Access" function")	[Operator access]	

8.7.1 Enabling/disabling a parameter or slider

Numerical parameter

1. Press the value of the parameter to modify
2. Enter the new value.
3. Validate [✓] to update the parameter.

Enabling slider

- Enabling: slide the parameter enabling slider to the right (the slider turns green).
- Disabling: slide the parameter enabling slider to the left (the slider turns grey).

8.7.2 'Operator Access' function

Access authorization management for an 'Operator' level user and access authorization for the 'Sniffer' function.

Access authorization

(See chapter "Access authorization")

Access

- Press the [SETTINGS] menu on the home page, then on the [Operator Access] function key.

Zone C - Data zone - Rights management - 'Operator Access' function	
Designation	Description
Leak detector access by operator	Authorization to access the 'He TESTING' menu for an 'Operator' level user. • enabled: the 'He TESTING' menu is available (highlighted). • disabled: the 'He TESTING' menu is unavailable (greyed out).
Sniffer access by operator	Authorization to access the 'Sniffer' function for an 'Operator' level user. • enabled: the 'Sniffer' function launches automatically when the sniffer probe is removed from its holder. • disabled: the 'Sniffer' function does not launch automatically when the sniffer probe is removed from its holder.
Sniffer option	Authorization to access the 'Sniffer' function ('Maintenance'/'Advanced' level user). • enabled: the 'Sniffer' function launches automatically when the sniffer probe is removed from its holder. • disabled: the 'Sniffer' function does not launch automatically when the sniffer probe is removed from its holder.
Graphic access by operator	Authorization to access the 'Graphic' function for an 'Operator' level user. • enabled: the 'Graphic' function is available (highlighted). • disabled: the 'Graphic' function is unavailable (greyed out).
Synoptic access by operator	Authorization to access the 'Synoptic' function for an 'Operator' level user. • enabled: the 'Synoptic' function is available (highlighted). • disabled: the 'Synoptic' function is unavailable (greyed out).

8.7.3 'Conditioning' function

Parameters related to conditioning.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, then on the **[Conditioning]** function key.

Zone C - Data zone - Conditioning parameters - 'Conditioning' function		
Designation		Description
'Step 1' scroll-down menu		
Required atmospheric pressure	S_Athmo_M1_MH2_Min	Minimum pressure that must be measured during the first conditioning step
'Step 2' scroll-down menu		
Pumping time in N2 supplies	T_Aspi_N2	Pumping time in the nitrogen line
Helium Charging and venting pressure	S_Cond_M1-High	Helium charge target pressure Nitrogen ventilation target pressure
Pumping pressure	S_Cond_M1_Low	Pumping target pressure in the test chamber and the charge chamber
Measurement offset time	T_After_Pic	Disregarded measurement time at the start of the leak measurement
Maximum background level	She_BG_Cond	Maximum background that can be measured
Minimum leak rate	She_Leak_Cond	Minimum leak rate that must be measured
Pumping time in Helium supply	T_Aspi_He	Pumping time in the helium line
Step Timeout	T_Max_Cond	Maximum time allocated to conditioning
'Conditioning' scroll-down menu		
Additional pumping time	T_Primary_Ultimate_Pumping	Additional time for roughing pump after having reached the pumping target pressure
He signal recovery	She_Depol_Cond	Maximum helium leak rate that must be measured after depollution
Depollution timeout	T_Max_Depol_Cond	Maximum depollution time
Max nbr depollution cycle	Nb_Depol_Cond	Maximum number of nitrogen purges for depollution
Additional depollution time	T_N2_Depol_Cond	Additional pumping time in the nitrogen line if the threshold to be reached after depollution is not achieved

8.7.4 'Depollution' function

Parameters related to depollution.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, then on the **[Depollution]** function key.

Zone C - Data zone - Depollution parameters - 'Depollution' function		
Designation		Description
Test chamber pumping pressure	S3-M1	Target pressure of the roughing pump in the test chamber for depollution
Charging pressure in charge chamber	S3_dep0l-MH2	Target pressure of nitrogen ventilation in the charge chamber for depollution
Pumping timeout in test chamber	T_dep0l-M1	Maximum time to reach the S3-M1 pumping target pressure in the test chamber during depollution
Pumping timeout in charge chamber	T_dep0l-MH2	Maximum time to reach the S1-MH2 pumping target pressure in the charge chamber during depollution

8.7.5 'Advanced' function

Parameters related to test run.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, then on the **[Advanced]** function key.

Zone C – Test run parameters - 'Advanced' function

Designation		Description
Test chamber pumping pressure ML-Air + Calibration	S1-M1	Target pressure of the roughing pumping in the test chamber for the ML-Air step and calibration.
Test chamber venting pressure	S2-M1	Target pressure of the nitrogen ventilation in the test chamber at the end of the test.
GL-Air validation threshold	SHe-GL-Air	Maximum leak rate to validate the GL-Air step. The leak rate must be less than this threshold to validate the GL-Air step and to move on to the next step of the test.
GL-Air validation time	Ts_SHe-GL-Air	GL-Air step validation time. Time during which the leak rate must be less than the validation threshold to validate the step.

8.7.6 'Calibration' function

Parameters related to calibration.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, then on the **[Calibration]** function key.

Zone C – Calibration parameters - 'Calibration' function

Designation		Description
'Access' scroll-down menu		
Lower Point Verification	-	Verification during calibration by an 'Operator' level user. - Enabled: the verification is not carried out during automatic calibration (enabled by default). - Disabled: the verification is not carried out during the automatic calibration. Any disabled verification cannot be launched manually by the user.
Reject Point Verification		
Upper Point Verification		
Leak data modification	-	Modification of helium calibrated leak information used during the verification step of a calibration by an 'Operator' level user. - enabled: information modification is authorized. - disabled: information modification is prohibited.
'Parameters' scroll-down menu		
Validity duration	-	Calibration validity date. Beyond this date, a calibration becomes invalid.
Maximum background level	He-BG	Reject point to verify the equipment's helium background. - Verification validated: background measured < reject point for the helium background verification. - Verification rejected: background measured > reject point for the helium background verification. Minimum leak rate for a test for the FL-He step: - Leak rate < minimum leak rate value: display and record the minimum leak rate value - Leak rate > minimum leak rate value: display and record actual measured value

Zone C – Calibration parameters - 'Calibration' function		
Designation		Description
Background stability criteria	Slope-BG	Stability criteria on the slope calculated between 2 measurement points taken at 1 second intervals. - The leak rate is considered stable if the slope calculated is lower than this criteria. - The leak rate is not considered stable and the verification point measurement continues if the slope is greater than this criteria.
Background stability duration	Ts_Slope_BG	Duration during which the stability criteria must be respected for the helium background verification step.
Background measure time-out	TMax_BG	Duration after which the background measurement stops. An alarm triggers if the stability criteria are not met.
Verification point stability criteria	Slope_SetPoint	Stability criteria on the slope calculated between 2 measurement points taken at 1 second intervals. - The leak rate is considered stable if the slope calculated is lower than this criteria. - The leak rate is not considered stable and the verification point measurement continues if the slope is greater than this criteria.
Verification point stability duration	Ts_Slope_SetPoint	Duration during which the stability criteria must be respected for a verification point step.
Verification point measure timeout	TMax_SetPoint	Duration after which the verification point measurement stops. An alarm triggers if the stability criteria are not met.

8.7.7 'Maintenance' function

Parameters related to the pressure gauges installed on the equipment.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, then on the **[Maintenance]** function key.

Zone C – Gauge parameters - ‘Maintenance’ function	
Designation	Description
‘Parameters Gauge M1’ scroll-down menu	
Maximum Pressure M1 Minimum Pressure M1	M1 gauge pressure range
Maximum Voltage M1 Minimum Voltage M1	
‘Parameters Gauge MH2’ scroll-down menu	
Maximum Pressure MH2 Minimum Pressure MH2	MH2 gauge pressure range
Maximum Voltage MH2 Minimum Voltage MH2	

8.7.8 'Counters' function

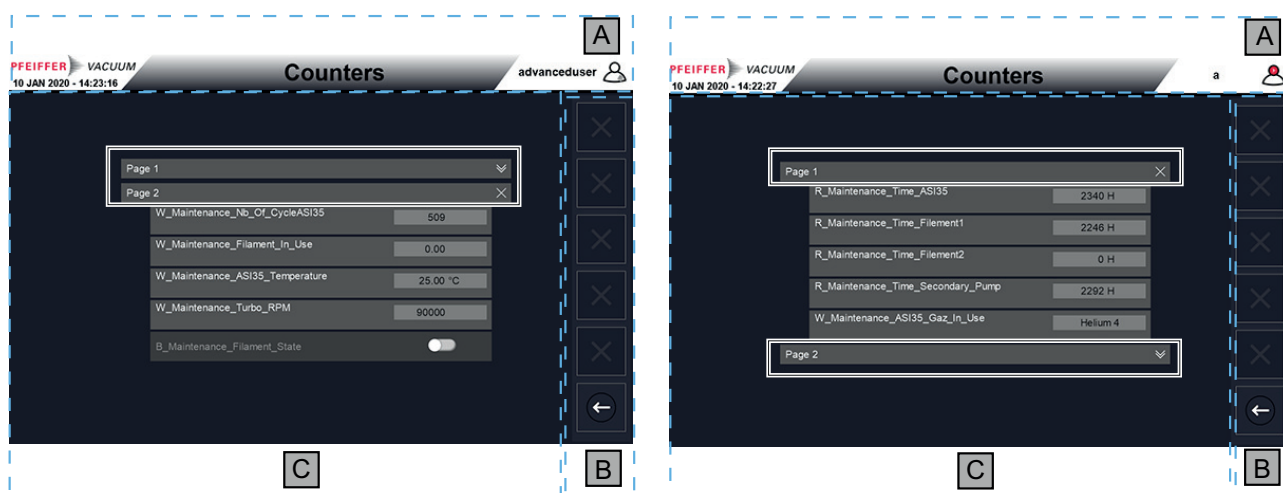
Parameters related to use counter before maintenance.

Access authorization

(See chapter "Access authorization")

Access

- Press the **[SETTINGS]** menu on the home page, or on the **[Synoptic]** function key, and the **[Counters]** function key appears.



1. Press the **[Counters]** function key.
2. Press the **[Reset]** function key to reset the counter after maintenance or after changing the component.
3. Display or hide the scroll-down menus by pressing **[X]** or  (zone C in the illustration).

If one of the counters exceeds the limit set in the parameters below, a warning indicates that maintenance is required.

Zone C – Counter parameters - 'Counters' function

Designation	Description
'Page 1' scroll-down menu	
R_Maintenance_Time_ASI 35	Maximum running time of the ASI 35 leak detector before maintenance.
R_Maintenance_Time_Filament1	Maximum running time of filament no. 1 before maintenance.
R_Maintenance_Time_Filament2	Maximum running time of filament no. 2 before maintenance.
R_Maintenance_Time_Secondary_Pump	Maximum running time of the turbomolecular pump before maintenance. • Turbomolecular pump = HiPace 80
R_Maintenance_ASI 35_Gaz_In_Use	Maximum number of tests run by the ASI 35 before maintenance
'Page 2' scroll-down menu	
Maintenance Time M1 Maintenance Time MH2	Maximum running time of the gauges before maintenance. • Gauge M1 = test chamber gauge • Gauge MH2 = charge chamber gauge
W_Maintenance_Nb_Of_Cycle_ASI 35	Type of gas detected by ASI 35
W_Maintenance_Filament_in_Use	Filament number in use
W_Maintenance_ASI 35_Temperature	ASI 35 use temperature
W_Maintenance_Turbo_RPM	Turbomolecular pump rotation speed set point
B_Maintenance_Filament_State	Status of the filament in use

9 Decommissioning

9.1 Shutting down for longer periods

1. Shut down the equipment as per the standard shutdown procedure.
2. Disconnect the trolley mains power cable from any power sources (see chapter “Storage”).
3. Store the equipment in accordance with storage instructions (see chapter “Technical characteristics”).

9.2 Recommissioning

No special precautions

- Follow the installation procedure (see chapter “First time use”).

9.3 Disposal

In accordance with Directive on the treatment of waste electrical and electronic equipment, and Directive on the restriction of hazardous substances, end-of-life products can be returned to the manufacturer for decontamination and recovery.

Any obligation of the manufacturer to take back such equipment shall apply only to complete, unmodified, equipment, using Pfeiffer Vacuum SAS original spare parts, sold by Pfeiffer Vacuum and including all assemblies and sub-assemblies.

This obligation does not cover the shipping cost to a reclamation facility or services provided, for which the customer will be invoiced.

Familiarize yourself with the service request procedure and fill in the declaration of contamination when returning products to our service centers ([see chapter “Service solutions by Pfeiffer Vacuum”, page 73](#)).



Environmental protection

The product and its components **must be disposed of in accordance with the applicable regulations relating to environmental protection and human health**, with a view to reducing natural resource wastage and preventing pollution.

Our products contain different materials which must be recycled (see chapter “Environmental conditions”).

10 Malfunctions

10.1 What happens in the event of a fault



Management of warnings, alarms

The management of warnings and alarms as defined in this manual must allow the monitoring of the operation of the product according to the following principle:

- a warning indicates a malfunction of the product: the current sequence continues. The user is warned and if necessary, stops the product.
 - an alarm signals a major malfunction that engages the user's safety and / or property damage: the alarm stops the product.
- A tab indicating the type of fault is displayed on the home screen header (warning or alarm).
 - The tab is red for an alarm. An alarm blocks the user.
 - The equipment cannot be used until the origin of the alarm is resolved.
 - The tab is orange for a warning. A warning does not block the user.
 - If the test result is impacted by the triggered alarm, the test result is invalid. On the test screen, a pictogram is displayed on the line of the step during which the fault occurred (see chapter "Test Result").

10.2 Display and acknowledgement of messages.

Display fault messages; acknowledge faults; display the list of active faults (see chapter "Alarm/'Warning' Tab").

10.3 Troubleshooting guide

10.3.1 Warning messages

ID	Message	Diagnostic
201	HLD in start-up phase.	Detector in start-up phase.
202	No background compensation for leak verification.	No background compensation for leak verification.
203	Calibration parameter not valid: reload it.	Calibration parameter not valid: reload it.
204	Global parameters not valid: reloading needed.	General parameters not valid: reloading needed.
205	Recipes parameter not valid or not selected: check recipes.	Recipe parameters not valid or not selected: check recipes.
206	Not possible to start cycle with 'Administrator' user or unlog user.	Not possible to start cycle with 'Administrator' level user or un-log user.
207	Calibration not valid or not finished.	Calibration not valid or not finished.
208	HLD preheating: wait.	Leak detector preheating: wait.
211	Sensitivity fault on HLD filament: contact ASM 2000 supplier.	Sensitivity fault on leak detector filament: contact ASM 2000 manufacturer.
212	Filament 2 in use: less sensitivity of HLD.	Filament 2 in use: less sensitivity of leak detector.
214	Settings for conditioning not valid: reload settings.	Parameters for conditioning not valid: reload parameters.
215	Background threshold must be lower than set point threshold.	Background threshold must be lower than reject point.
216	High pollution on HLD: He signal > 5*10E-2.	Heavy pollution in the detector: Leak rate > 5*10E-2.
251	Warning ASI 35 N° 60: Probe type or connector.	Warning ASI 35 N° 60: Probe type or connector.
252	Warning ASI 35 N° 97: Temperature too high.	Warning ASI 35 N° 97: Temperature too high.
253	Warning ASI 35 N° 98: Temperature too low.	Warning ASI 35 N° 98: Temperature too low.
254	Warning ASI 35 N° 145: Maintenance required.	Warning ASI 35 N° 145: Maintenance required.
255	Warning ASI 35 N° 150: Primary pump maint.	Warning ASI 35 N° 150: Roughing pump maintenance
256	Warning ASI 35 N° 160: High. vac pump maint.	Warning ASI 35 N° 160: High vacuum pump maintenance

ID	Message	Diagnostic
257	Warning ASI 35 N° 180: New Fil. #2 Required.	Warning ASI 35 N° 180: New Filament #2 Required.
258	Warning ASI 35 N° 181: New Fil. #1 Required.	Warning ASI 35 N° 181: New Filament #1 Required.
259	Warning ASI 35 N° 182: No output on wire 2.	Warning ASI 35 N° 182: No output on wire 2.
260	Warning ASI 35 N° 183: No output on wire 1.	Warning ASI 35 N° 183: No output on wire 1.
261	Warning ASI 35 N° 203: External Calib. Leak.	Warning ASI 35 N° 203: External Calibrated Leak
262	Warning ASI 35 N° 205: Auto-cal Aborted.	Warning ASI 35 N° 205: Auto-calibration Aborted.
263	Warning ASI 35 N° 211: Manual calibration.	Warning ASI 35 N° 211: Manual calibration.
264	Warning ASI 35 N° 220: Filament Request Off.	Warning ASI 35 N° 220: Filament Request Off.
265	Warning ASI 35 N° 230: Auto. cal. required.	Warning ASI 35 N° 230: Autocalibration required.
266	Warning ASI 35 N° 235: Auto. cal. required.	Warning ASI 35 N° 235: Autocalibration required.
267	Warning ASI 35 N° 240: Auto. cal. required.	Warning ASI 35 N° 240: Autocalibration required.
268	Warning ASI 35 N° 241: Auto. cal. required.	Warning ASI 35 N° 241: Autocalibration required.
269	Warning ASI 35 N° 242: Int Pirani uncalib.	Warning ASI 35 N° 242: Internal Pirani uncalibrated
270	Warning ASI 35 N° 244: Adjust cell's param.	Warning ASI 35 N° 244: Set cell parameters.
271	Warning ASI 35 N° 245: Temperature too high.	Warning ASI 35 N° 245: Temperature too high.
272	Warning ASI 35 N° 255: Out Start Conditions.	Warning ASI 35 N° 255: Out Start Conditions.

10.3.2 Alarm messages

ID	Message	Diagnostic	Solution
001	No Atmospheric pressure in the Test chamber Check V1 and V3 valve closed, V2 valve open, and check M1 gauge	A measurement was launched when the test chamber was not at atmospheric pressure.	- Ventilate the test chamber using the 'Maintenance Mode' function. - Check that the nitrogen inlet pressure is satisfactory. - Check that the M1 pressure gauge and V2 valve are operational.
002	Invalid initial condition (HLD is not ready or test chamber not at atmospheric pressure)	Invalid initial condition: the detector is not ready or the test chamber is not at atmospheric pressure.	- Return the chamber to atmospheric pressure using the 'Maintenance Mode' function. - Check the nitrogen inlet pressure. - Check that the M1 pressure gauge and V2 and VH12 valves are operational. - Check that the ASI 35 leak rate is consistent and does not increase.
004	No He peak detection (check Settings and V3 Valve)	As the V3 valve was during the measurement, the helium peak was not detected.	- Check that the V3 valve opens using the 'Maintenance Mode' function. - Check that the helium signal from the ASI 35 is consistent. - Check that the SHe_open_V3 recipe parameter is consistent (see chapter "Testing" menu").
006	HV Test mode communication timeout	Communication timeout in 'high vacuum' test mode.	This alarm should normalize on its own after several seconds. - If the fault persists, restart the equipment. - If the fault persists, contact our service center.
007	He charging timeout (waiting for MH2 > S2-MH2)	The helium pressure has not reached the target set during helium charging.	- Check that the charge chamber is closed correctly. - In the 'Synoptic' menu, check that the helium inlet pressure makes it possible to reach the set threshold. - Check that the VH13 valve opens using the 'Maintenance Mode' function.
008	Pumping timeout on charge chamber	The target pressure of the charge chamber is not reached before the maximum timeout during pumping.	- Check that the charge chamber is closed correctly. - Check that the maximum timeout setting is consistent with the volume to be pumped. - Check that the VH11 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.

ID	Message	Diagnostic	Solution
009	Background stability timeout	The 'Background Verification' step measurement could not be taken because the stability criteria were not validated before the maximum timeout.	- Check that the test port is correctly closed with a cap. - Check that the stability criteria and the timeout for the 'Background Verification' step are consistent. - Check that the leak detector or the chamber are not polluted. - Restart the step.
010	N2 charging timeout (waiting for MH2 > S3_Depol_MH2)	The nitrogen pressure has not reached the target set when the charge chamber is ventilated.	- Check that the charge chamber is closed correctly. - In the 'Synoptic' menu, check that the nitrogen inlet pressure makes it possible to reach the set threshold. - Check that the V2 valve opens using the 'Maintenance Mode' function.
012	Sniffer mode communication timeout	Communication timeout in 'Sniffer' test mode.	- Check that the sniffer probe is not clogged. - Connect the sniffer probe and place it in its holder. - Restart the equipment.
013	HLD not ready.	Detector not ready.	- Wait for the leak detector to finish restarting. - Check that the CDA is connected to the equipment and the CDA regulator is open. - Check that the P2 pump is operational.
014	Timeout: Auto-calibration Fail	Problem during the calibration step.	- Restart the step. - Restart the equipment before restarting the step. - If the fault persists, contact our service center.
015	Timeout for RS232 communication. Check the RS232 Cable and restart the machine	Timeout for RS232 communication.	Check the RS232 cable and restart the machine.
016	Helium line pressure down: Check He supply	The helium inlet pressure is too low.	- Check the helium supply. - Check that the helium regulator inside the trolley is open and operational.
017	Unexpected overpressure in test chamber: (V3 safely closed)	The pressure has risen suddenly in the test chamber.	Check that the test chamber is correctly closed and the sample has not been damaged during the test.
018	N2 line pressure down: Check N2 supply	The nitrogen inlet pressure is too low.	- Check the nitrogen supply. - Check that the nitrogen regulator inside the trolley is open and operational.
019	Helium pollution in HLD	The value of the detector background is greater than the maximum background defined during the equipment calibration. The test was interrupted.	If a high leak rate has been measured, the equipment is polluted. - Wait a few seconds for the background to drop below the He-BG reject point. - If the pollution is coming from the test chamber, open the test chamber and leave it in the open air. - Wait for the background to return to a normal level.
020	Conditioning cycle: Problem with He charging. Check He supply	The helium pressure has not reached the target set when charging the helium during conditioning.	- Check the helium supply. - Check that the helium regulator inside the trolley is open and operational.
021	Conditioning cycle: No atmospheric pressure in test chamber and charge chamber	Conditioning was started when one of the chambers was not at atmospheric pressure.	- Return the chamber to atmospheric pressure using the 'Maintenance Mode' function. - Check the nitrogen inlet pressure. - Check that the nitrogen regulator inside the trolley is open and operational.
022	Conditioning cycle: Pumping timeout in test chamber. (Check conditioning tool connection)	The target pressure in the test chamber is not reached when pumping during conditioning.	- Check that the conditioning tool is correctly positioned on the test port. - Check that the V1 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.

ID	Message	Diagnostic	Solution
023	Conditioning cycle: Pumping timeout on charge chamber. (Check conditioning tool connection)	The target pressure is not reached when pumping in the charge chamber during conditioning.	- Check that the charge chamber is closed correctly. - Check that the VH11 valve is enabled using the 'Maintenance Mode' function and that roughing pumping can operate.
024	Conditioning cycle: He charging timeout.	The helium pressure has not reached the target set when charging the helium during conditioning.	- Check that the helium inlet pressure enables the helium charge parameter to be reached for the conditioning step. - Check that the VH13 valve opens using the 'Maintenance Mode' function.
025	Depollution: N2 venting timeout in test chamber.	The nitrogen pressure has not reached the target set when the test chamber is ventilated.	- Check that the nitrogen inlet pressure makes it possible to reach the ventilation target pressure set point. - Check that the V2 valve opens using the 'Maintenance Mode' function and ventilate the test chamber.
026	Primary pumping timeout on test chamber	The target pressure is not reached when pumping in the test chamber.	- Check that the test chamber is closed correctly. - Check that the V1 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.
027	CDA pressure down (check the CDA supply)	The CDA inlet pressure is too low.	- Check the CDA supply. - Check that the regulator for the CDA in the trolley is open and operational.
029	He signal > 5*10E-2; Security to stop HLD pollution; V3 valve has been closed	The leak rate measured reached the ASI 35 safety threshold and the test was stopped.	- Clean the test chamber by leaving it open to the air. - Remove the polluted sample or leaking package. - Wait until the detector reaches a low background.
030	N2 venting error	Nitrogen ventilation error.	- Check that the nitrogen inlet pressure makes it possible to reach the ventilation target pressure set point. - Check that the ventilation timeout is consistent. - Check that the V2 valve opens using the 'Maintenance Mode' function and ventilate the test chamber.
031	Filament fault: (HLD in Refresh mode)	Filament error: leak detector in 'Refresh' mode. Too much gas has entered the detector. The detector goes into safety mode to protect the filament.	- Wait for the leak detector to finish restarting. - Check that the pumping target pressure is low enough before opening V3. - If the fault persists, contact our service center.
033	Conditioning cycle: Pumping timeout. (Check conditioning tool connection)	The target pressure in the test chamber is not reached when pumping during conditioning.	- Check that the conditioning tool is correctly connected to the test port. - Check that the V1 valve opens using the 'Maintenance Mode' function and that the P1 pump is operational.
035	Pumping Timeout on test chamber (During background test)	The target pressure is not reached when pumping in the test chamber during the 'Background Verification' calibration step.	- Check that the test port is correctly closed with a cap. - Check that the V1 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.
036	Pumping timeout on test chamber (during leak verification)	The target pressure is not reached when pumping in the test chamber during the 'Upper/Reject/Lower Point Verification' calibration steps.	- Check that the helium calibrated leak used for the step is correctly connected to the test port. - Check that the V1 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.
037	Helium pollution in HLD Test Chamber	During depollution, the background threshold stopping the SHe_End_Depol_HLD depollution was not reached after 5 background checks.	- Check that the polluted helium sample was removed or that depollution in the charge chamber was sufficient. - Open the test chamber to clean it out.
038	Error: Change the filament	Error: change the filament.	If the fault persists, contact our service center.

ID	Message	Diagnostic	Solution
039	Conditioning cycle: Pressure comparison error between M1 and MH2	The gap measured between the test chamber and the charge chamber pressures is too great during the first stage of conditioning.	- Check that nothing is connected to the helium test port or to the charge port. - In the 'Synoptic' menu, check that the chambers are at atmospheric pressure.
040	Leak detector mode: Invalid initial condition (HLD is not ready or test chamber not at atmospheric pressure)	A He TESTING test is launched when the test chamber is not at atmospheric pressure.	The chambers are not at atmospheric pressure at the start of the test in 'He TESTING' mode. - Check the nitrogen inlet pressure. - Check that the V1 valve opens using the 'Maintenance Mode' function. - Ventilate the chamber before starting the test. - Check that the leak rate measured in real time is consistent.
041	Leak detector mode: Primary pumping timeout on test chamber	The target pressure is not reached during pumping in the test chamber at the start of the He TESTING test.	- Check that the test chamber is correctly connected to the test port. - Check that the V1 valve opens using the 'Maintenance Mode' function and that roughing pumping can operate.
042	Leak verification stability timeout	The 'Background Verification' step measurement could not be taken because the stability criteria were not validated before the maximum timeout was reached.	- Check that the stability criteria and the timeout for the 'Lower/Reject/Upper Point Verification' steps are consistent. - Check that the leak detector or the chamber are not polluted. - Restart the step.
043	Conditioning cycle: He and/or N2 pressure error (check supply)	The helium and nitrogen inlet pressures are too low.	- Check the nitrogen and helium supply. - Check that the regulators inside the trolley are open and operational.

ID	Designation
100	Error ASI 35 No. 50: Cell. Zero stability.
101	Error ASI 35 N° 56: Background trouble.
102	Error ASI 35 N° 57: Lack of sensitivity.
103	Error ASI 35 N° 58: Sensitivity too high.
104	Error ASI 35 N° 59: Calib. test mode lost.
105	Error ASI 35 N° 65: Background too high.
106	Error ASI 35 N° 70: Peak adjust Error.
107	Error ASI 35 N° 75: Peak Search Error.
108	Error ASI 35 N° 80: Cal. leak year Error.
109	Error ASI 35 N° 85: Temperature too high.
110	Error ASI 35 N° 89: Emission lost.
111	Error ASI 35 N° 93: Dynamic Calib. Fail.
112	Error ASI 35 N° 95: Cell. Zero off limits.
113	Error ASI 35 N° 96: Autocal Failure + 2 nd code.
114	Error ASI 35 N° 97: Temperature too high.
115	Error ASI 35 N° 98: Temperature too low.
116	Error ASI 35 N° 99: 24V DC Troubles.
117	Error ASI 35 N° 160: Snif. probe clogged.
118	Error ASI 35 N° 180: Emission Failure.
119	Error ASI 35 N° 188: High. Vac Pump speed.
120	Error ASI 35 N° 185: Triode Safety.
121	Error ASI 35 N° 192: Fil Current Too High.
122	Error ASI 35 N° 194: Fil2-Collector Short.
123	Error ASI 35 N° 195: Fil1-Collector Short.
124	Error ASI 35 N° 205: Primary Pump Failure.
125	Error ASI 35 N° 206: ACP temp. Too high.
126	Error ASI 35 N° 210: Primary Pump Failure.

ID	Designation	
127	Error ASI 35 N° 220: No collector voltage.	Error ASI 35 N° 220: No collector voltage.
128	Error ASI 35 N° 224: -15V cell. Failure.	Error ASI 35 N° 224: -15V cell Failure.
129	Error ASI 35 N° 230: Filaments #1 & #2 bad.	Error ASI 35 N° 230: Filaments #1 & #2 bad.
130	Error ASI 35 N° 231: No output on wire 1&2.	Error ASI 35 N° 231: No output on wire 1&2.
131	Error ASI 35 N° 235: Cell. pres.>1e-03 mbar.	Error ASI 35 N° 235: Cell pressure >1e-03 mbar.
132	Error ASI 35 N° 238: No cell com.	Error ASI 35 N° 238: No cell communication
133	Error ASI 35 N° 239: No high Vac Pump com.	Error ASI 35 N° 239: No high Vacuum Pump communication
134	Error ASI 35 N° 241: High. Vac Pump speed.	Error ASI 35 N° 241: High Vacuum Pump speed.
135	Error ASI 35 N° 243: EEPROM Error.	Error ASI 35 N° 243: EEPROM Error.
136	Error ASI 35 N° 245: High. Vac Pump fail.	Error ASI 35 N° 245: High Vacuum Pump failure
137	Error ASI 35 N° 247: Check ATH connection.	Error ASI 35 N° 247: Check ATH connection.
138	Error ASI 35 N° 248: Check MDP connection.	Error ASI 35 N° 248: Check MDP connection.
139	Error ASI 35 N° 251: +15V cell. Failure.	Error ASI 35 N° 251: +15V cell Failure
140	Error ASI 35 N° 252: 24V cell. Failure.	Error ASI 35 N° 252: 24V cell. Failure.
141	Error ASI 35 N° 253: Timekeeper ram fail.	Error ASI 35 N° 253: Timekeeper ram failure
142	Error ASI 35 N° 255: An Error occurred + 2 nd code.	Error ASI 35 N° 255: An Error occurred + 2 nd code.

10.4 Migration procedure

This procedure allows to migrate the data from the equipment computer to a new computer , to guarantee that the data recovered is compliant with the original data and that the equipment is operational.

- Refer to the migration procedure described in the specification reference 3880.

10.5 Recovery procedure in case of failure

This procedure guarantees that the data recovered is compliant with the original data and that the equipment is operational.

- Refer to the recovery procedure in case of failure described in the specification reference 4296.

11 Service solutions by Pfeiffer Vacuum

We offer first-class service

High vacuum component service life, in combination with low downtime, are clear expectations that you place on us. We meet your needs with efficient products and outstanding service.

We are always focused on perfecting our core competence – servicing of vacuum components. Once you have purchased a product from Pfeiffer Vacuum, our service is far from over. This is often exactly where service begins. Obviously, in proven Pfeiffer Vacuum quality.

Our professional sales and service employees are available to provide you with reliable assistance, worldwide. Pfeiffer Vacuum offers an entire range of services, from original replacement parts to service contracts.

Make use of Pfeiffer Vacuum service

Whether preventive, on-site service carried out by our field service, fast replacement with mint condition replacement products, or repair carried out in a Service Center near you – you have various options for maintaining your equipment availability. You can find more detailed information and addresses on our homepage, in the Pfeiffer Vacuum Service section.

You can obtain advice on the optimal solution for you, from your Pfeiffer Vacuum representative.

For fast and smooth service process handling, we recommend the following:



1. Download the up-to-date form templates.
 - Explanations of service requests
 - Service requests
 - Contamination declaration



- a) Remove and store all accessories (all external parts, such as valves, protective screens, etc.).
- b) If necessary, drain operating fluid/lubricant.
- c) If necessary, drain coolant.
2. Complete the service request and contamination declaration.



3. Send the forms by email, fax, or post to your local Service Center.

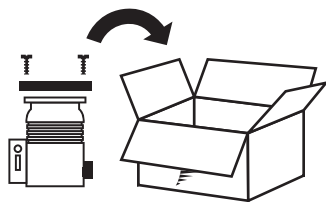


4. You will receive an acknowledgment from Pfeiffer Vacuum.

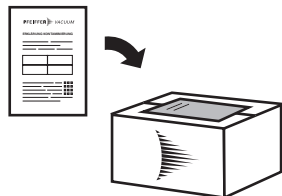
PFEIFFER VACUUM

Submission of contaminated products

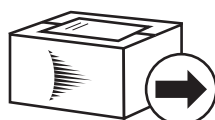
No microbiological, explosive, or radiologically contaminated products will be accepted. Where products are contaminated, or the contamination declaration is missing, Pfeiffer Vacuum will contact you before starting service work. Depending on the product and degree of pollution, **additional decontamination costs** may be incurred.



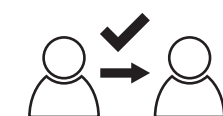
5. Prepare the product for transport in accordance with the provisions in the contamination declaration.
 - a) Neutralize the product with nitrogen or dry air.
 - b) Seal all openings with blind flanges, so that they are airtight.
 - c) Shrink-wrap the product in suitable protective foil.
 - d) Package the product in suitable, stable transport containers only.
 - e) Maintain applicable transport conditions.



6. Attach the contamination declaration to the **outside** of the packaging.



7. Now send your product to your local Service Center.



8. You will receive an acknowledgment/quotation, from Pfeiffer Vacuum.

PFEIFFER VACUUM

Our sales and delivery conditions and repair and maintenance conditions for vacuum devices and components apply to all service orders.

12 Accessories

Refer to the accessory operating instructions to install the accessory.

Accessory	Description	Model	Part Number
⁴ He calibrated leaks	Allows to calibrate the equipment	$5 \cdot 10^{-5} - 8 \cdot 10^{-5}$ mbar.l/s	FV4210
		$1 \cdot 10^{-4} - 3 \cdot 10^{-4}$ mbar.l/s	FV4110
		$1 \cdot 10^{-6} - 3 \cdot 10^{-6}$ mbar.l/s	F04610
		$1 \cdot 10^{-7} - 3 \cdot 10^{-7}$ mbar.l/s	F04710
		$1 \cdot 10^{-8} - 3 \cdot 10^{-8}$ mbar.l/s	F04810
		$1 \cdot 10^{-9} - 3 \cdot 10^{-9}$ mbar.l/s	F04910
		$5 \cdot 10^{-6} - 8 \cdot 10^{-6}$ mbar.l/s	F04510
Conditioning tool	Allows to perform equipment conditioning		A604382
Pen-type sniffer probe	Enables use the 'Sniffer' function		SNC1E1T1

13 Technical data and dimensions

13.1 Technical characteristics

Characteristics		Units	ASM 2000
Sensitivity (hard vacuum mode)	Fine leak mode - ^4He	mbar.l/s	$10^{-8} - 10^{-5}$
	Gross leak mode - ^4He	mbar.l/s	$10^{-5} - 10^{-3}$
	Massive mode - Air	mbar.l/s	10^{-3}
Smallest detectable ^4He leak (sniffer mode)		mbar.l/s	$> 10^{-5}$
Power consumption at ultimate pressure		W	3750
Power supply ¹⁾ (according to ordering guide)		VAC Hz	90-250 50-60
Weight		kg	140
Dimensions		mm	H 1194 x W 1409 x D 575
Sound level		dB(A)	< 53

1) In accordance with EC regulations, the equipment can withstand a voltage variation of $\pm 10\%$.

Tbl. 4: Technical characteristics

Roughing pumps

The ASM 2000 trolley has 3 roughing pumps.

Refer to the pumps operating instructions delivered with the equipment.

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

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

Tbl. 5: Conversion table: Pressure units

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

Tbl. 6: Conversion table: Units for gas throughput

13.1.1 Compressed dry air characteristics

Composition	$\approx 80\% \text{ N} + \approx 20\% \text{ O}_2$
Type	Quality 1.3.1. according to standard ISO 8573-1

Pressure	Minimum = $4.5 \cdot 10^3$ hPa (4.5 bar) relative (65 psig) Maximum = 10^4 hPa (10 bar) relative (145 psig)
Connector	G 1/8" female

Tbl. 7: Compressed dry air characteristics

13.1.2 Venting gas characteristics

Type	Nitrogen
Purity	$\geq$ Alphagaz 1 (Air Liquide) or N50
Residual concentration	< 5 ppm
Pressure	Minimum = $4.5 \cdot 10^3$ hPa (4.5 bar) relative (65 psig) Maximum = 10^4 hPa (10 bar) relative (145 psig)
Connector	G 1/8" female

Tbl. 8: Venting gas characteristics

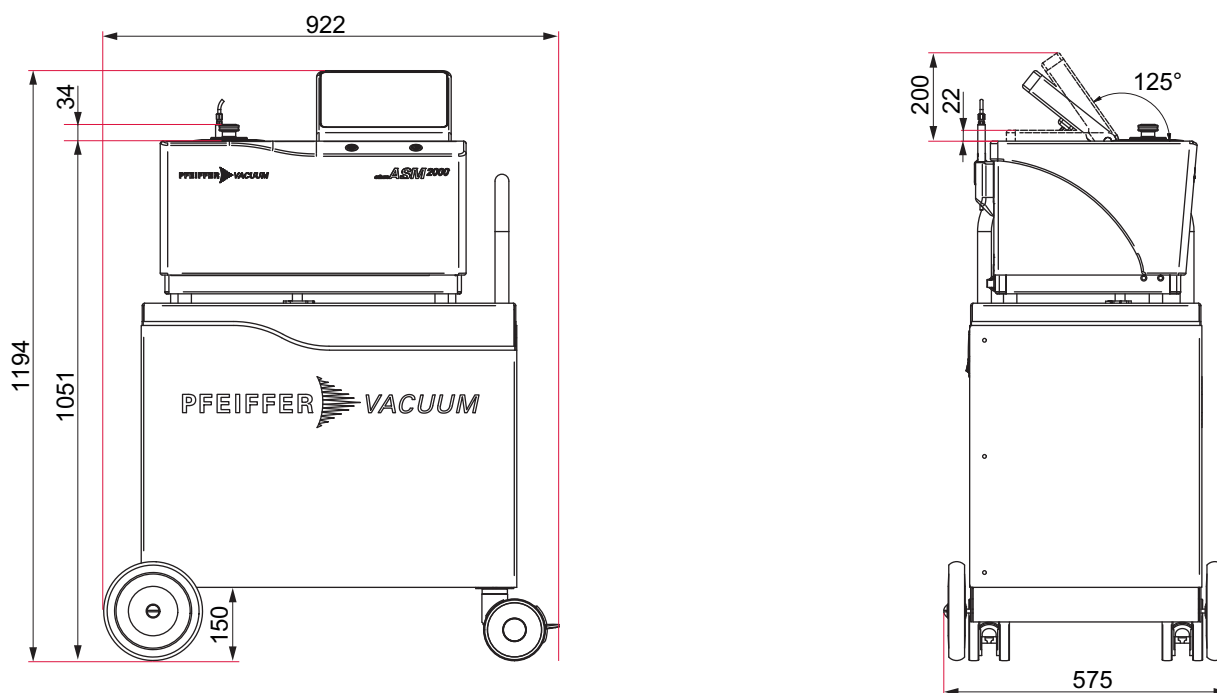
13.1.3 Tracer gas characteristics

Type	^4He
Purity	$\geq$ Alphagaz 1 (Air Liquide) or N50
Residual concentration	< 5 ppm
Pressure	Minimum = $4.5 \cdot 10^3$ hPa (4.5 bar) relative (65 psig) Maximum = 10^4 hPa (10 bar) relative (145 psig)
Connector	G 1/8" female

Tbl. 9: Tracer gas characteristics

13.2 Dimensions

Dimensions in mm


Fig. 2: ASM 2000 dimensions - without laptop table

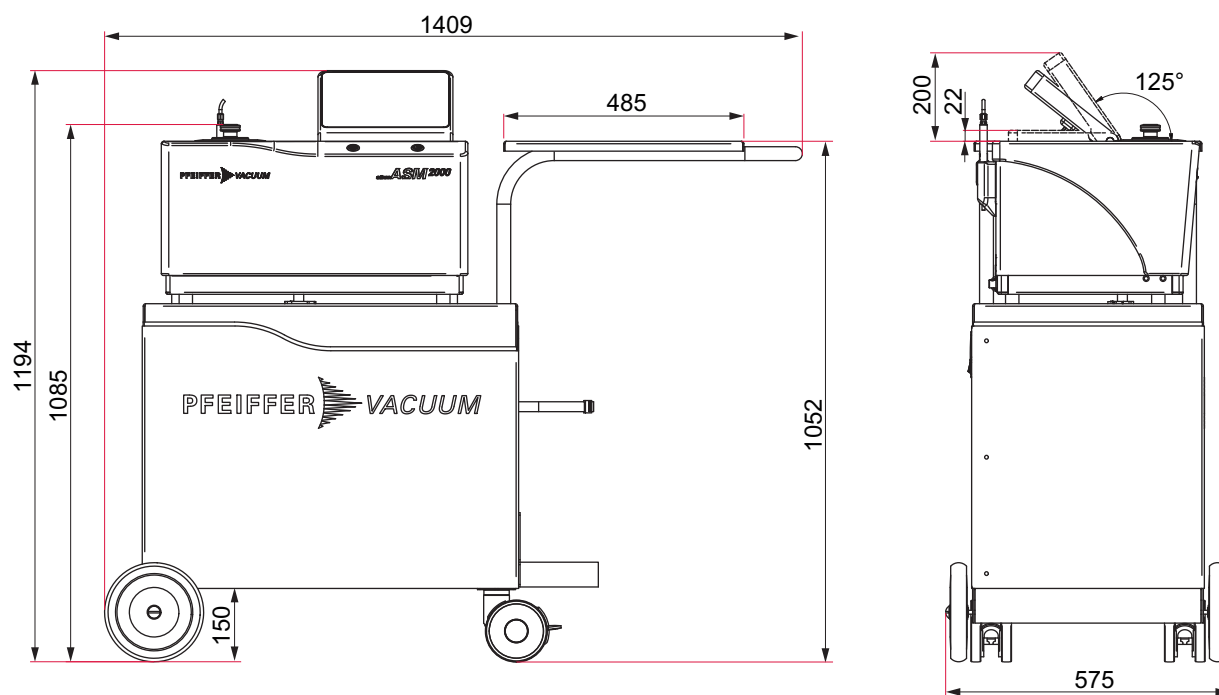


Fig. 3: ASM 2000 dimensions - with laptop table

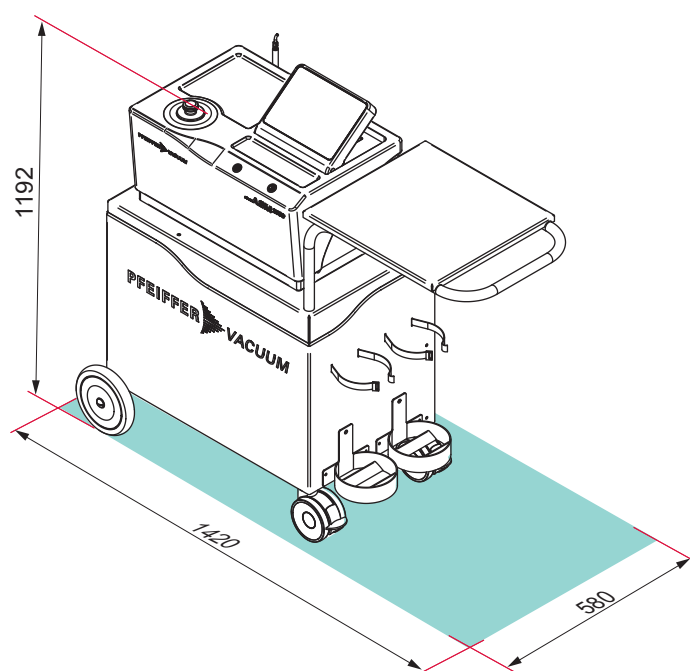


Fig. 4: Maintenance space required

14 Appendix

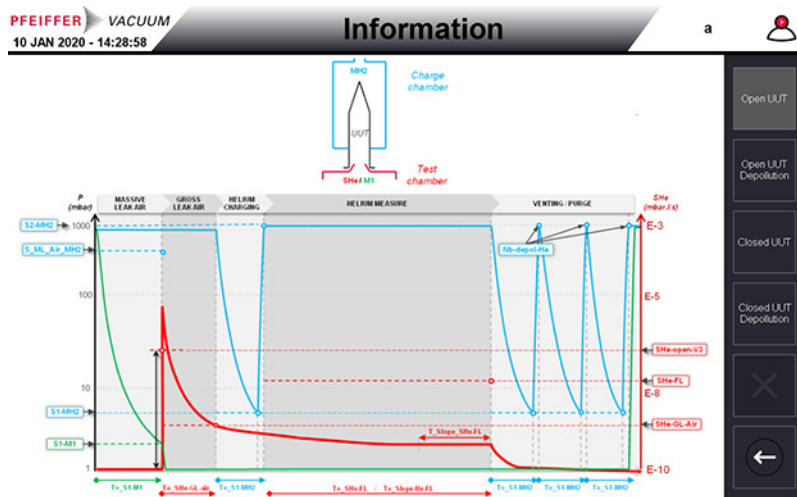
14.1 Test sequences

It is possible to view the progress of a test sequence according to the parameters predefined in the recipe (see chapter "Creation of a recipe").

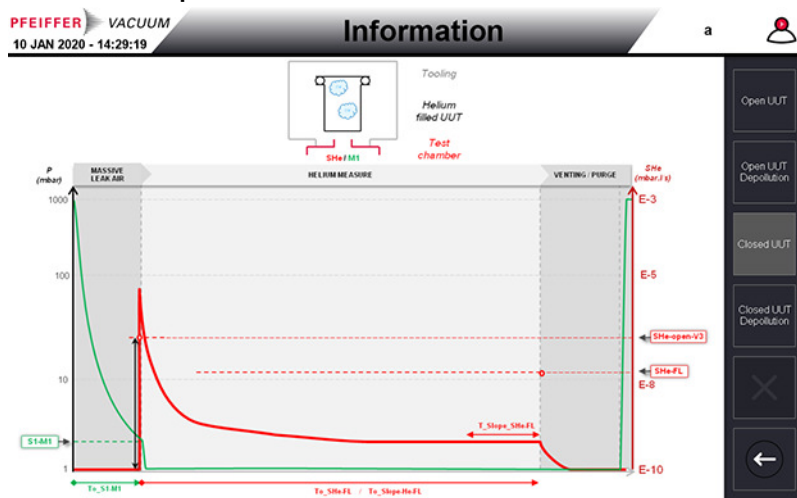
Access

- Press the **[RECIPE]** menu on the home page, then the **[i]** function key.

Open test sequence



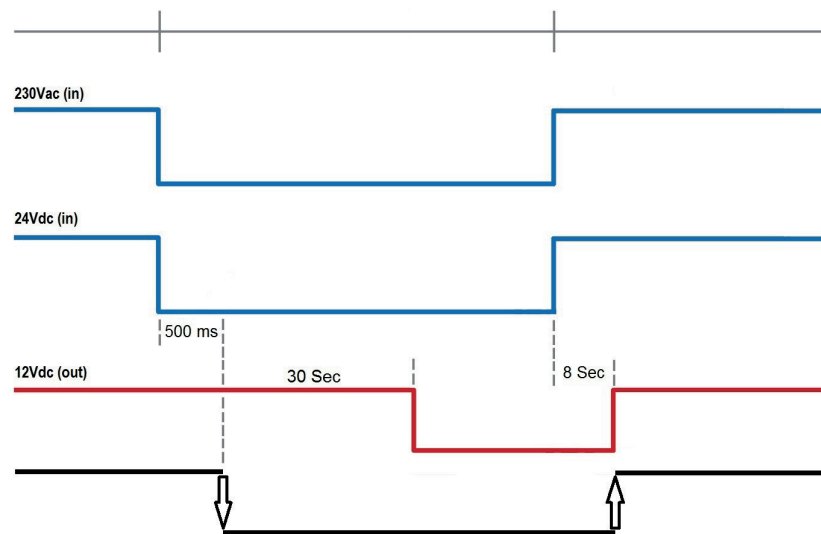
Closed test sequence



14.2 UPS functioning

Case 1: Lengthy power failure (> 30 seconds)

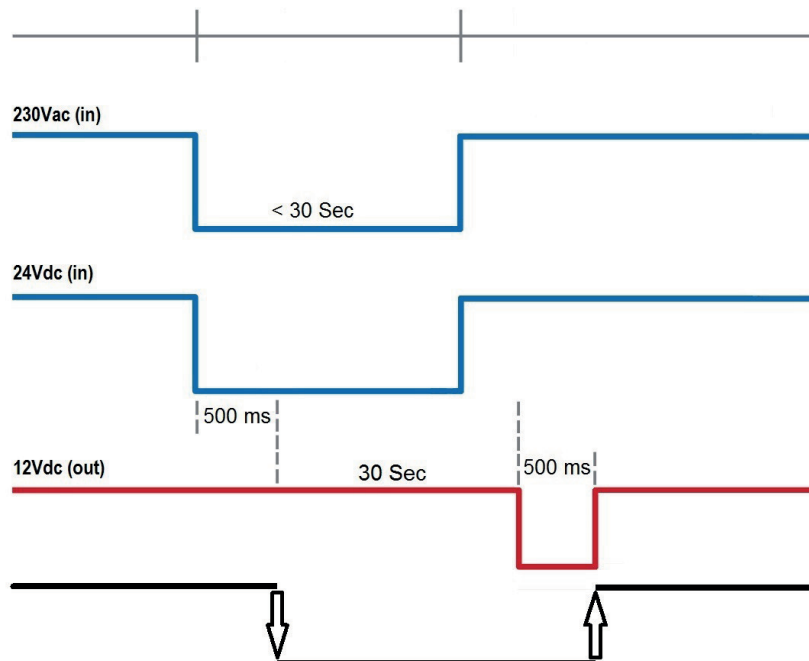
1. The computer switches off automatically when the power fails.
 - Automatic restart when the power returns.
 - No action required by the user.
2. It takes up to 8 seconds to recharge the UPS power inside the equipment.
3. The computer is configured to start at power on (12 V).



Lengthy power failure (> 30 seconds)

Case 2: Power failure > 3 seconds and < 30 seconds

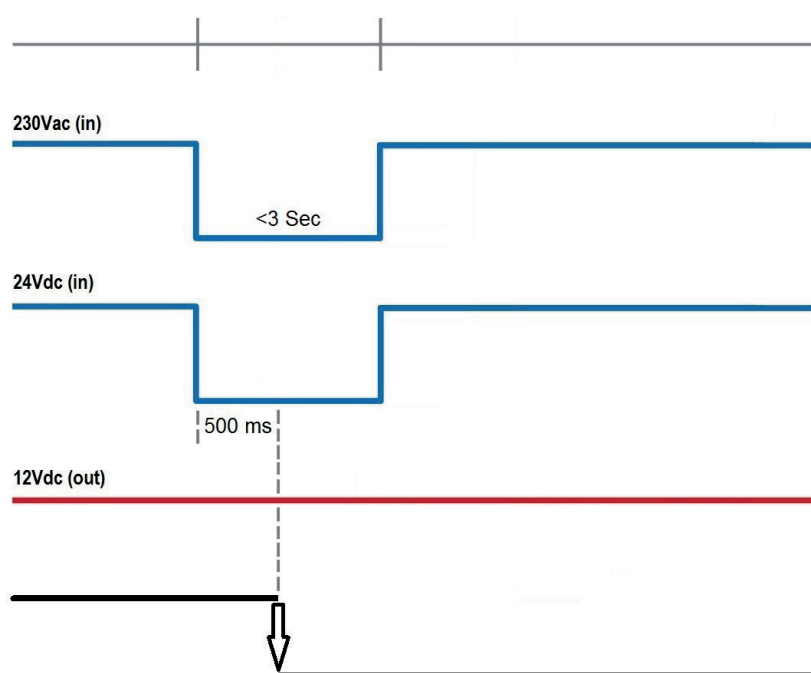
1. Loss of power automatically switches off the computer.
 - Restart within 30 seconds.
 - No action required by the user.
2. The UPS power supply cuts off 12 V DC briefly in order to restart the computer.
 - Reminder: the computer is configured to start at power on.



Power failure > 3 seconds and < 30 seconds

Case 3: Very brief power failure (< 3 seconds)

- If the power failure is very brief, the computer does not restart automatically.
 - The user manually cuts off the power supply to the equipment for more than 3 seconds.



Very brief power failure (< 3 seconds)

Declaration of conformity

We hereby declare that the product mentioned below complies with all the applicable provisions of the following **EU directives**:

- **Machinery 2006/42/EC (Annex II, no. 1 A)**
- **Low voltage 2014/35/EC**
- **Electromagnetic compatibility 2014/30/EU**
- **Restriction of the use of certain hazardous substances 2011/65/EU**

The person responsible for compiling the technical file is Mrs. Cindy Thovex, Pfeiffer Vacuum SAS, 98, avenue de Brogny B.P. 2069, 74009 Annecy cedex, France.

ASM 2000 leak testing equipment

Part numbers:

200314
200320
200321
200322
200384
200385
200386
200387

Harmonized standards and national standards and specifications applied:

French standard NF EN 61010-1: 2010

French standard NF EN 61326-1: 2013

Signature:



Pfeiffer Vacuum SAS
98, avenue de Brogny
74009 Annecy cedex
France
B.P. 2069

Arnaud Favre
Product Group Director
Instrumentation and Systems

02/21/2019





VACUUM SOLUTIONS FROM A SINGLE SOURCE

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

COMPLETE RANGE OF PRODUCTS

From a single component to complex systems:

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

COMPETENCE IN THEORY AND PRACTICE

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

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

Ed. 02 - Date 2021/05 - P/N:127788OEN



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