

# MAINTENANCE INSTRUCTIONS

EN

Translation of the original instructions

## ASM 340

Leak detector



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# 1 About this manual

## 1.1 Validity

This maintenance manual is intended for the customers of the Pfeiffer Vacuum Company. It describes the product maintenance operations which can be performed by the user on the product concerned. **This documentation must be used with the operating manual of the product of the same name.**

The current maintenance manuals are also available on the Internet at [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com).

This manual covers products with the following part numbers:

Part number	Description
JSVA00AxMx9x	ASM 340 Wet (all models)
KSBA00AxMM9A	ASM 340 Dry (all models)
MSXA00AxMM9A	ASM 340 Integrable (all models)

### 1.1.1 Applicable documents

The document to be used in reference to this maintenance manual is:

ASM 340	Operating Instructions
ASM 340 Operating Instructions	P/n 121762 *

\*also available at [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)

## 1.2 Conventions

### 1.2.1 Safety instructions

Operating manual safety instructions Pfeiffer Vacuum are based on the UL, CSA, ANSI Z-535, SEMI S2, ISO 3864 and DIN 4844 certification standards. This document describes the following information and danger levels:

<b>DANGER</b>
<b>Imminent danger</b> Indicates an imminent hazardous situation that will result in death or serious injury.
<b>WARNING</b>
<b>Possibly imminent danger</b> Indicates an imminent hazardous situation that can result in death or serious injury.
<b>CAUTION</b>
<b>Possibly imminent danger</b> Indicates an imminent hazardous situation that can result in minor or moderate injury.
<b>NOTICE</b>
<b>Command or note</b> Command to perform an action or information about properties, the disregarding of which may result in damage to the product.

### 1.2.2 Pictographs



Prohibition of an action to avoid any risk of accidents, the disregarding of which may result in serious accidents



Warning of a displayed source of danger in connection with operation of the unit or equipment



Command to perform an action or task associated with a source of danger, the disregarding of which may result in serious accidents



Important information about the product or this document

### 1.2.3 Instructions/Abbreviations used

⇒ or →	Work instruction: you must perform an operation here.
[XXXX]	You must press the <b>XXXX</b> key on the control panel.
I/O	Inputs/Outputs
<sup>4</sup> He	Helium 4
<sup>3</sup> He	Helium 3
H <sub>2</sub>	Hydrogen

### 1.2.4 Labels



Indicates an electrical shock hazard in case of contact:  
⇒ disconnect the electrical power supply before removing the cover and working on the product.



Indicates that the operator must:  
⇒ handle the product using the devices shown on this label,  
⇒ comply with the rules for moving the equipment, taking weight and dimensions into account.



Locate a grounding point on the product.



Product subject to the treatment of waste electronic and electrical equipment in accordance with directive 2002/95/EC.

Other labels: see Operating Instructions.

## 2 Safety and maintenance information

### 2.1 Safety precautions



#### Duty to inform

Every person who is involved in maintenance and servicing work on the pump must read and follow the safety-relevant parts of all associated documents.



#### NOTICE

#### Exclusion of liability

Pfeiffer Vacuum accepts no responsibility concerning equipment damage, disrupted service or physical injury resulting from maintenance carried out by technicians who have not been trained in safety rules (EMC, electrical hazards, chemical pollution). Liability and warranty claims shall be inadmissible in this case.



#### WARNING

#### Risk of electric shock

Voltage and current can cause electric shock. Only skilled, authorized people may carry out maintenance work.

- Isolate and lock the power supply circuit by positioning the circuit breaker on **O**.
- Disconnect the power cable from all power sources before doing any work on the product and/or removing the covers.



#### WARNING

#### Other localized hazardous energies

Electrical circuit and other pressurized circuits as nitrogen are potential hazards:

- Always lock out these energy sources before working on the product.



#### NOTICE

#### Work/Handling the detector

The operator must not work on the product to move it or carry out maintenance until it has come to a complete shutdown! When the circuit breaker is set at **O**, you must:

- Unplug the power cable.
- Wait for the control panel screen to turn off completely before working on the product and/or removing the covers.

- Wait 5 minutes after switch-off before working on the product.
- When you order spare parts, you must mention everything featured on the product nameplate.
- Comply with all safety and risk prevention instructions in accordance with local safety standards.
- Regularly check compliance with all precautionary measures.
- Do not switch on the product if the covers are not in place.
- To return the product to one of our Pfeiffer Vacuum service centers, read the after-sales Service procedure and complete the declaration of contamination available on our website.
- Use the original packaging to return the product to a Pfeiffer Vacuum service center: the manufacturer shall not be held liable for any damage resulting from transport in unsuitable packaging.

## 2.2 Protective equipment

In some situations, personal protective equipment must be worn when handling the detector and its components. Customers must provide operators with the necessary equipment. This equipment must be checked regularly and used in accordance with the supplier's recommendations.



<b>DANGER</b>
<p><b>Health hazard in case of contact with the operating fluid</b></p> <p>Contact with or inhaling products such as oil from the pump can cause irritation.</p> <p>→ Wear appropriate protective equipment when carrying out maintenance or adding/draining oil.</p>



<b>WARNING</b>
<p><b>Risk of injury due to falling objects</b></p> <p>When transporting parts/components and during maintenance there is a danger of loads slipping and falling down.</p> <p>→ Carry small and medium-size parts/components with both hands.</p> <p>→ Carry parts/components &gt; 20 kg with a suitable lifting device.</p> <p>→ Wear safety shoes with a steel toe in accordance with directive EN 347.</p>



<b>WARNING</b>
<p><b>Risk of injury through hot surfaces</b></p> <p>The products are designed so as not to present a thermal risk for the operator's safety. However, specific operating conditions may exist that require extra caution from users due to the high temperatures (surfaces &gt; 70 °C for parts inside the covers).</p> <p>→ Leave the part to cool before working on the product.</p> <p>→ If necessary wear protective gloves according to directive EN 420.</p>



<b>CAUTION</b>
<p><b>Risk of pinching</b></p> <p>When handling the storage tank cover, there is a risk of fingers becoming pinched.</p>

## 2.3 Maintenance preparation



<b>NOTICE</b>
<p><b>Work/Handling the detector</b></p> <p>The operator must not work on the product to move it or carry out maintenance until it has come to a complete shutdown! When the circuit breaker is set at <b>O</b>, you must:</p> <p>→ Unplug the power cable.</p> <p>→ Wait for the control panel screen to turn off completely before working on the product and/or removing the covers.</p>

- Disconnect the detector from the part/installation to be tested: install the blanked-off flange on the detector's inlet (accessory supplied with the product or available upon request (see **Accessories** chapter of the Operating instructions).
- Handle the detector so it can be moved in the maintenance area (see **Handling** chapter of the Operating instructions).
  - clean, dust-free and ventilated room,
  - appropriate protective equipment.

## 2.4 Tools and spare parts

The tools necessary for the maintenance of the detector are available in the maintenance kit supplied with the product. Depending on the maintenance operation, other tools may be needed, at the customer's expense.



### Spare parts

Replacing defective components with parts that are not genuine jeopardizes the product's initial safety conditions.

- Use only spare parts available for order from Pfeiffer Vacuum Service.
- Parts numbers are available in the **Spare Parts** chapter.
- To identify the product and communicate with Pfeiffer Vacuum look at the product's nameplate.

### 3 Maintenance intervals and responsibilities

Level 1 and 2 maintenance operations of the service frequency table are described in this manual.

Level 3 overhaul operations require the intervention of a technician from the Pfeiffer Vacuum Service network.

Component Operation	Number of hours in use				Level <sup>(4)</sup>	Site <sup>(5)</sup>
	Routine main-tenance <sup>(3)</sup>	8,600	17,200	Others		
<b>Primary pump RVP 1015 (Model Wet)</b>						
Oil level and appearance check	x				II	OS
Oil change		x		4,300 hours <sup>(1)</sup>	II	OS
Pump replacement				In case of failure	III	OS
<b>2 AMD1 Primary pumps (Dry Model)</b>						
Replacement of the diaphragms and valves			x		III	OS
Pump replacement				In case of failure	III	OS
<b>Primary pump (Integrable Model)</b>						
Refer to the maintenance intervals of the primary pump connected to the detector						
<b>Oil mist eliminator (Wet Model)</b>						
Oil mist eliminator replacement		x		4,300 hours <sup>(1)</sup>	II	OS
<b>Splitflow 50 turbomolecular pump</b>						
Operating fluid reservoir replacement		x		or 4 years	II	OS
Bearings replacement				or 4 years	III	OS
Replacement of the TC 110 frequency converter				In case of failure	III	OS
Pump replacement				In case of failure	III	OS
<b>Analyzer cell</b>						
Filament replacement				In case of failure	I	OS
Replacing the extraction electrode				In case of failure	III	OS
<b>Valves</b>						
Replacement of all valves				Every 500,000 tests	III	OS
<b>Air filter</b>						
Cleaning or replacement of the air inlet filter	x				I	OS
<b>Air inlet filter</b>						
Cleaning or replacement of the air inlet filter	x				II	OS
<b>Pirani gauge</b>						
Setting	x			Every 4,300 hours (recommended)	I	OS
Replacement				In case of failure	II	OS
<b>Smart sniffer probe</b>						
Capillary filter replacement	x			<sup>(2)</sup>	I	OS
Sintered filter replacement	x			<sup>(2)</sup>	I	OS
<b>Standard sniffer probe</b>						
Sintered filter replacement	x			<sup>(2)</sup>	I	OS
<b>Fans</b>						
Fan replacement				In case of failure	II	OS
Cleaning or replacement of the fan air filter	x				I	OS
<b>Calibrated leak</b>						
Recalibration				Every 2 years	II	WS
<b>Leak detector</b>						
Service	x			Every 4 years (recommended)	III	OS/WS

(1) In case of severe application (with significant flow or contamination)

(4) Level:

I = Operator

II = Technical or trained operator

III = Service center

(2) 160 h In case of severe application (with significant flow or contamination)

(5) Site:

OS = On site

WS = In Pfeiffer Vacuum service center.

(3) Routine maintenance: according to usage conditions

### 3.1 Maintenance time monitoring

The cycle counters of the primary pump (Wet and Dry Models) and turbomolecular pump alert the operator that a maintenance operation must be performed (see **Maintenance Menu** of the *Operating Instructions*).

## 4 Calibration

### 4.1 Purpose

Calibration helps ensure that the leak detector is correctly adjusted to detect the tracer gas selected and display the correct leak rate. A calibrated leak is used to calibrate the leak detector.

Depending on the test method, different types of calibration can be performed.

	Test method	
	Hard Vacuum	Sniffing
With the internal calibrated leak	yes	yes (*)
With an external calibrated leak	yes	yes
With the ambient air (ambient air not contaminated by the tracer gas)	no	yes

(\*) in this case, the flow of the sniffer probe is not included in the leak detector calibration process.

### 4.2 Calibration with the internal calibrated leak

#### 4.2.1 Internal calibrated leak

The internal calibrated leak is specifically designed for the leak detector. It is composed of:

- a Helium 4 reservoir (no internal calibration with the other tracer gases),
- a temperature sensor (to take into account the effect of temperature on the leak rate),
- an integrated diaphragm (to calibrate the leak rate),
- an identification label (identical to the identification label of an external calibrated leak).

The calibrated leak is supplied with a calibration certificate.

Use a calibrated leak in the range  $\approx 10^{-8}$  Pa.m<sup>3</sup>/s ( $\approx 10^{-7}$  mbar.l/s).

#### 4.2.2 Procedure

When switching the leak detector on, calibration with the internal calibrated leak is automatically initiated if the calibration parameter is set on 'Start-up' and if the type of calibrated leak is set on 'Internal'.

The calibration can begin when the detector is:

- in test mode for the hard vacuum test
- in test mode or Stand-by for the sniffer test.

→ Check the leak settings (corrected leak rate to take temperature and time into account if necessary) (see **Spectro Menu of the Operating Instructions**).

→ Press **[Auto cal]** key to launch a calibration.

In the case of intensive use of the detector, a spare internal calibrated leak is recommended. If this is not possible, the detector can still be used and calibrated using an external calibrated leak.



### NOTICE

#### Detector calibration

When switched on, the detector suggests that the operator carry out an auto-calibration (if calibration parameter = 'operator'). For the optimal use of the detector, **this auto-calibration must be performed**. In all situations, a manual or automatic calibration must be performed:

- at least once a day
- to optimise the measurement reliability for high sensitivity tests
- if it is uncertain whether the detector is working properly
- during intense and continuous operation: start an internal calibration at the beginning of each work session (e.g. work in teams, every 8 hours).

## 4.3 Calibration with an external calibrated leak

### 4.3.1 External calibrated leak

The operator must use a calibrated leak containing the tracer gas selected ( $^4\text{He}$ ,  $^3\text{He}$  or  $\text{H}_2$ ). There are several types of external calibrated leaks, with or without reservoir, with or without valve, covering several leak ranges. Use calibrated leaks from the ranges indicated below.

Gas	Minimum Value	Maximum Value
$^4\text{He}$	$\approx 1.10^{-9}$ mbar·l/s $\approx 1.10^{-10}$ Pa·m <sup>3</sup> /s	$1 \cdot 10^{-4}$ mbar·l/s $1 \cdot 10^{-5}$ Pa·m <sup>3</sup> /s
$^3\text{He}$	$\approx 3 \cdot 10^{-7}$ mbar·l/s $\approx 3 \cdot 10^{-8}$ Pa·m <sup>3</sup> /s	$1 \cdot 10^{-4}$ mbar·l/s $1 \cdot 10^{-5}$ Pa·m <sup>3</sup> /s
$\text{H}_2$	$\approx 5 \cdot 10^{-6}$ mbar·l/s $\approx 5 \cdot 10^{-7}$ Pa·m <sup>3</sup> /s	$1 \cdot 10^{-4}$ mbar·l/s $1 \cdot 10^{-5}$ Pa·m <sup>3</sup> /s



**The choice of external calibrated leak depends on the needs of the application: use a calibrated leak from the same leak rate range as the leak to be measured.**

The manufacturer does not provide calibrated leaks in  $^3\text{He}$  and  $\text{H}_2$ .

### 4.3.2 Adaptor for external calibrated leaks

A DN 16 ISO-KF or DN 25 ISO-KF adaptor helps calibrate the detector with an external calibrated leak in sniffing test mode (with Standard probe only).

Adaptor part numbers (see 9).

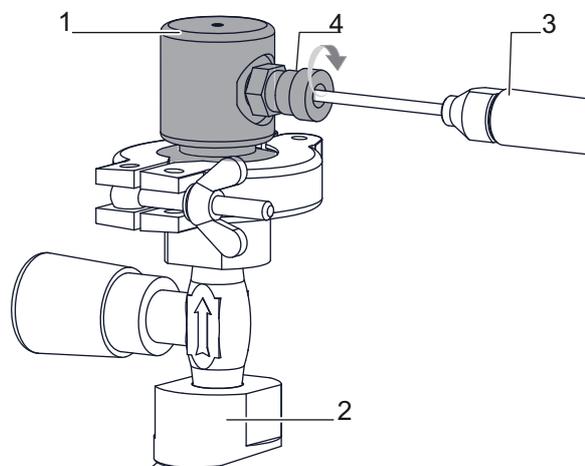


Fig. 1: Adaptor installation

→ Attach the adaptor (1) to the external calibrated leak (2) used for the calibration with centering ring and a clamp.

- Start a calibration: press the **[Auto cal]** function key.
- Fit the sniffer probe (3) in the calibration opening.
- Tighten the fixing screw (4). Follow the calibration process indicated on the control panel.
- Loosen the fixing screw (4).
- Remove the sniffer probe from the calibration opening.
- Continue the calibration process indicated on the control panel.
- Wait 10 s (at least) before reading the leak rate.

Notes

- The displayed leak rate takes  $^4\text{He}$  into account (if  $^4\text{He}$  used as tracer gas).

Example:

- calibration with a leak of  $2 \cdot 10^{-6} \text{ Pa} \cdot \text{m}^3/\text{s}$  ( $2 \cdot 10^{-5} \text{ mbar} \cdot \text{l/s}$ )
- the displayed leak rate is:  $2 \cdot 10^{-6} + 5 \cdot 10^{-7} = 2.5 \cdot 10^{-6} \text{ Pa} \cdot \text{m}^3/\text{s}$  ( $2 \cdot 10^{-5} + 5 \cdot 10^{-6} = 2.5 \cdot 10^{-5} \text{ mbar} \cdot \text{l/s}$ )

### 4.3.3 Calibration procedure with external leak in Hard Vacuum test

- Allocate a function key to **[Auto.Cal]** (see **Configuration Menu** in the *Operating Instructions*).
- Configure the following settings:
  - test method = hard Vacuum (see **Test Menu**)
  - type of calibrated leak = external (see **Spectro Menu**)
  - calibration = operator (see **Advanced Menu**)
- Check the settings and value of the external calibrated leak used (see **Spectro Menu**). Correct the temperature, month and year if necessary.
- Select the tracer gas of the external calibrated leak (see **Spectro Menu**).
- Place the external calibrated leak on the detector inlet port.
- Verify that the detector is on Stand-by mode.
- Press the **[Auto.Cal]** function key to start the calibration.
- Follow the instructions provided by the leak detector: press **[Next]** to move to the next stage.

At the end of the calibration, the detector returns to Stand-by mode.



**Recommended procedure when the measuring range differs from the value of the internal calibrated leak.**

### 4.3.4 Calibration procedure with external leak in sniffing test

- Allocate a function key to **[Auto.Cal]** (see **Configuration Menu** in the *Operating Instructions*).
- Configure the following settings:
  - test method = sniffing (see **Test Menu**)
  - type of calibrated leak = external (see **Spectro Menu**)
  - calibration = operator (see **Advanced Menu**)
- Check the settings and value of the external calibrated leak used (see **Spectro Menu**). Correct the temperature, month and year if necessary.
- Select the tracer gas of the external calibrated leak (see **Spectro Menu**).
- Select the tracer gas of the concentration (see **Spectro Menu**).
- Verify that the detector is on Stand-by mode.
- Press the **[Auto.Cal]** function key to start the calibration.
- Follow the instructions provided by the leak detector: press **[Next]** to move to the next stage.

At the end of the calibration, the detector returns to Stand-by mode.

## 4.4 Calibration on concentration

Concentration = container at atmospheric pressure with a gas mixture of a known tracer gas concentration.



### NOTICE

**Before launching this function, make sure that the leak detector is in an environment free of tracer gas pollution.**

### 4.4.1 Procedure

The calibration on concentration can be made only in sniffing test, detector in Stand-by or in test.

- Allocate a function key to **[Auto.Cal]** (see **Configuration Menu** in the *Operating Instructions*).
- Configure the following settings:
  - test method = sniffing (see **Test Menu**)
  - type of calibrated leak = concentration (see **Spectro Menu**)
  - calibration = operator (see **Advanced Menu**)
- Select the tracer gas of the concentration (see **Spectro Menu**).

The detector can be in Stand-by or in sniffing test.

- Press the **[Auto.Cal]** function key to start the calibration.
- Follow the instructions provided by the leak detector: press **[Next]** to move to the next stage.

At the end of the calibration, the detector returns to Stand-by mode.

## 4.5 Calibration with a pumping system in parallel

### 4.5.1 Purpose

When the leak detector is connected to an installation equipped with its own pumping system, only part of the leak will be measured by the leak detector. Calibration gives a direct reading of the leak rate by taking into account the loss of tracer gas of the leak pumped by the pumping unit.

Calibration is performed via the Correction function.

### 4.5.2 Target value

2 possible target values:

Target value =	Hard Vacuum	Sniffing
External calibrated leak value <sup>(1)</sup>	X	X
Known tracer gas concentration		X

(1) When an external calibrated leak is used, it is recommended to take into account the calibration date and temperature effect for calculating the target value from the calibrated leak value featured on its identification label.

- Corrected leak rate = target value = measured leak value x correction factor.

### 4.5.3 Procedure

Correction must be performed when the leak detector is already calibrated with its internal calibrated leak.

**Note** The correction must be made using the same test method as that used by the operator. If the operator works using both test methods (hard vacuum and sniffing), operator must make a correction for each method.

- Allocate a **[Correction]** function key (see **Configuration Menu** in the *Operating Manual*).
- Select the 'hard vacuum' or 'sniffing' test mode.
  - If 'Sniffing test', connect the sniffer probe to the detector: connect it to an external calibrated leak or place it in a container with a known concentration.
- Press  to start a test.
- Press the **[Correction]** function key.
  - if the value of the correction factor to be applied is known:
    - Press **[Value]** and configure the correction factor to be applied. The correction factor is the coefficient to be applied to the measured leak rate.
    - Press **[Return]** to exit the function.
  - if the value of the target leak rate is known (value of the external calibrated leak or concentration):
    - Press **[AutoCal] [Target]** and configure the target leak rate.
    - Press **[Start]** to make the correction.
    - Press **[Return]** to exit the function.
- Press **[RAZ]** to reset the correction factor to 1.

The 'COR' indicator light (see **Standard screen** of the *Operating Manual, Rep 9*) is illuminated on the control panel as soon as the value of the correction factor is not 1.

The digital display takes into account the correction factor applied.

The bargraph display does not take into account the correction factor applied.

## 5 Maintenance / replacement

### 5.1 Cleaning

- Clean the cover(s) with a soft, lint-free cloth and a product that will not damage the painted surfaces or the labels.

### 5.2 Covers disassembly

- Tools
- 5 mm Allen key supplied in the maintenance kit

#### 5.2.1 Dismantling the front cover

- Shut down the detector (Position the circuit breaker **MS** on **O**, control panel switched off and mains power cable disconnected).
- Install the blanked-off flange on the detector's inlet port.
- Remove the black flange around the inlet port.
- Lift the lid of the storage tank: loosen and remove the 2 upper fixing screws.
- Loosen and remove the 2 side fixing screws.

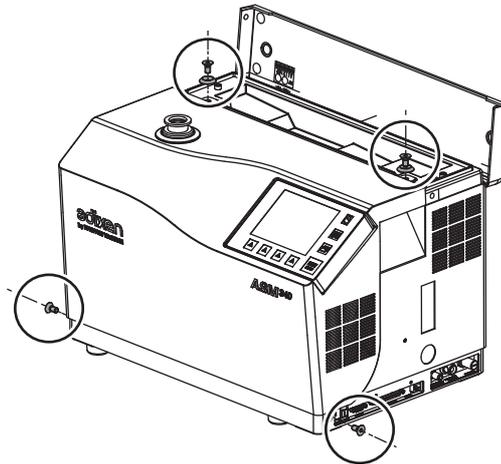


Fig. 2: Location of the front cover dismantling screw

- Remove the front cover and extricate it from the detector (1.5 mm max) (see 5.2.1).
- On the supervisor board, disconnect the connector from the control panel to fully release the cover.

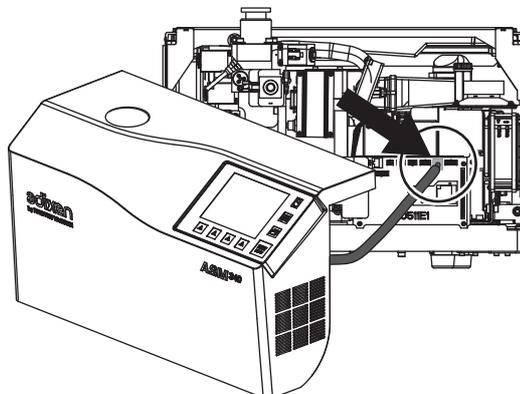
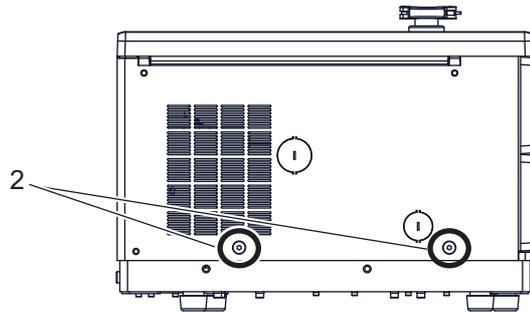


Fig. 3: Disassembly of the front cover

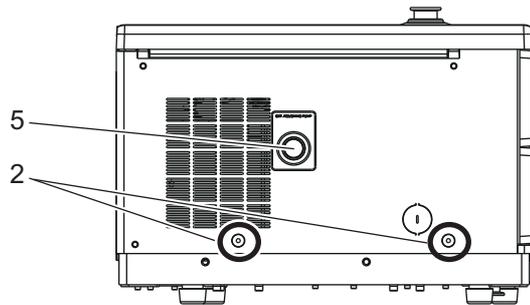
## 5.2.2 Dismantling the rear cover

- Remove the front cover (see 5.2.1).
- Disconnect the primary external pump if it is connected to the back of the detector. Do not leave the clamp on the pipe connection (5).
- Loosen and remove the 5 fixing screws (1), (2) and their washers.
- Disconnect the harness (3) and the ground point (4).
- Remove the rear cover.

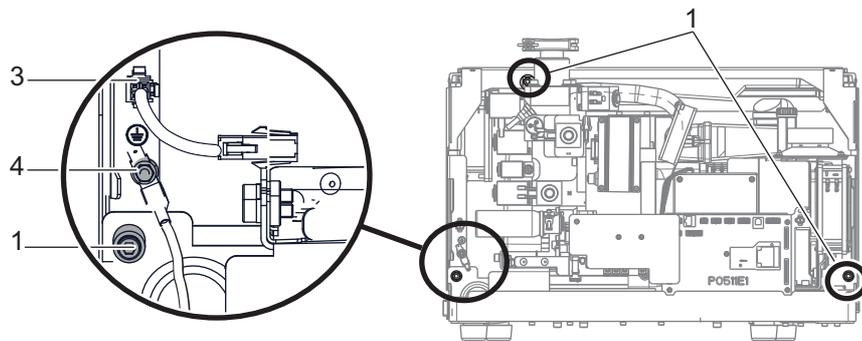
### Wet and Dry Models



### Integrable Model



### All Models



- Before reassembling the front cover, make sure that the 5 fixing screws for the rear cover on the frame are in place and properly screwed.

## 5.3 Maintenance of the internal calibrated leak

### 5.3.1 Replacement

- |                    |  |
|--------------------|--|
| <b>Tools/</b>      | • 2.5 mm Allen key supplied in the maintenance kit |
| <b>Spare parts</b> | • Internal calibrated leak (see 9)                 |

### NOTICE

Change the internal calibrated leak if it has significant impact marks.

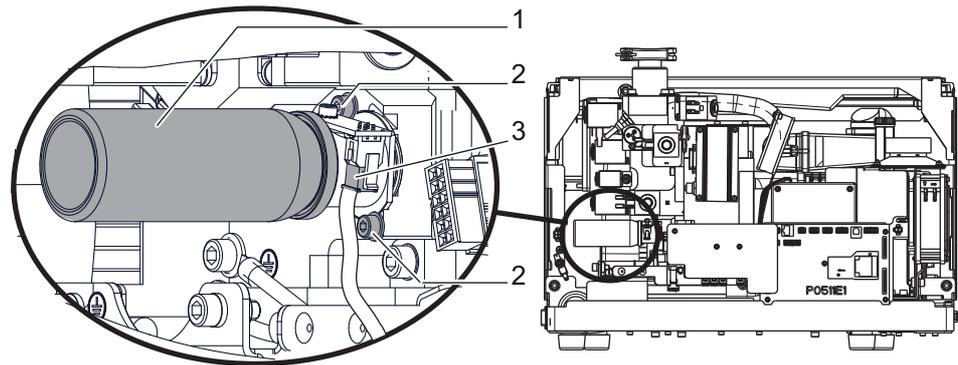


Fig. 4: Calibrated leak maintenance

- Remove the front cover (see 9).
- Disconnect the temperature sensor (3) from the calibrated leak. **Never separate the temperature sensor from the calibrated leak.**
- Loosen the 2 fixing screws (2) without removing them.
- Rotate the internal calibrated leak by 90°.
- Replace the leak (1).
- Rotate the calibrated leak by 90° so that the temperature sensor is positioned underneath the valve.
- Connect the temperature sensor (3).
- Update the settings of the internal calibrated leak (see **Spectro Menu of the Operating Instructions**).

### 5.3.2 Recalibration

Most calibrated leaks can be used for many years ( $\approx 6$  years) even though the tracer gas is permanently escaping (the leak rate is very low compared with the amount of tracer gas contained in the reservoir: annual loss is indicated on the calibrated leak identification label).

However, to guarantee the reliability of the test, we recommend that you regularly recalibrate (2 years maximum) every leak with reservoir to check its leak rate: this applies to both internal and external calibrated leaks.

Return the leak to your Pfeiffer Vacuum service center for recalibration purposes.

### 5.3.3 Setting

- The setting of the calibrated leak must be updated every time a calibrated leak (internal or external) is replaced or after a recalibration (see **Spectro Menu in the Operating Instructions**).

This operation can be carried out with the information featured on the calibrated leak identification label or the certificate supplied with the calibrated leak.

- If type = 'internal' is set for the calibrated leak, the internal calibrated leak parameters are displayed in the menu.
- If type = 'external' is set for the calibrated leak, the external calibrated leak parameters are displayed in the menu.

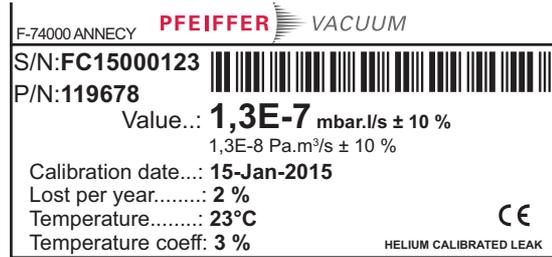


Fig. 5: Example of identification label

## 5.4 Analyzer cell maintenance



### NOTICE

#### Cleanliness guarantee

During vacuum component maintenance operations, avoid any contamination which could subsequently result in the degassing of the parts. To avoid this:

- perform the maintenance in an appropriate area (clear, dust-free and ventilated)
- use non-woven materials
- dust the parts with filtered dry air
- wear unpowdered vinyl gloves (clean room gloves)

### 5.4.1 Dismantling

#### Tools

- Torx® screwdriver supplied in the maintenance kit

#### Procedure



### WARNING

#### Risk of burning associated with hot surfaces

When in operation, certain mechanical parts can reach high temperatures. If the detector was used recently:

- Let it cool down for at least 15 minutes before working on the analyzer cell.
- When relevant, use protective gloves in accordance with the EN 420 standard.
- Create an air inlet in the cell via the Maintenance Menu (see Operating Instructions).
- Shut down the detector (Position the circuit breaker  on **O**, control panel switched off and mains power cable disconnected).
- Loosen the fixing screws (3) from the protective cover (4) of the harness (1).
- Remove the front cover (see 5.2.1).
- Disconnect the harness (1) from the cell.
- Loosen the 6 fixing screws (2) of the cell.
- Free the analyzer cell manually and vertically.

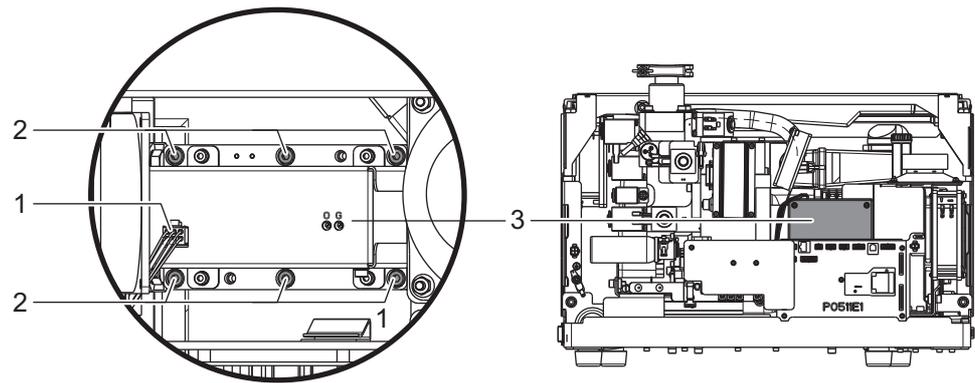


Fig. 6: Dismantling the analyzer cell

### 5.4.2 Seals replacement

Check the condition of the seals every time you work on the analyzer cell (filament replacement for example): change them if necessary.

**Spare parts** • 2 seals (see 9)

Seal is consumables. As such, it is not covered by the warranty.

#### Procedure

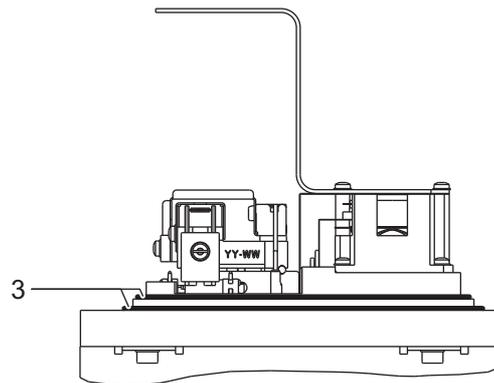


Fig. 7: Replacement of the seals

→ Remove the analyzer cell from the detector (see 5.4.1).

→ Replace the 2 seals (3). **Never lubricate the seals.**

### 5.4.3 Filament replacement

**Tools/Consumables**

- Torx screwdriver<sup>®</sup> supplied in the maintenance kit
- Flat pliers
- Filament (see 9)

Filament is consumables. As such, it is not covered by the warranty.

#### Procedure



**The oxidation of the iridium filament is normal: do not touch the filament with your fingers.**

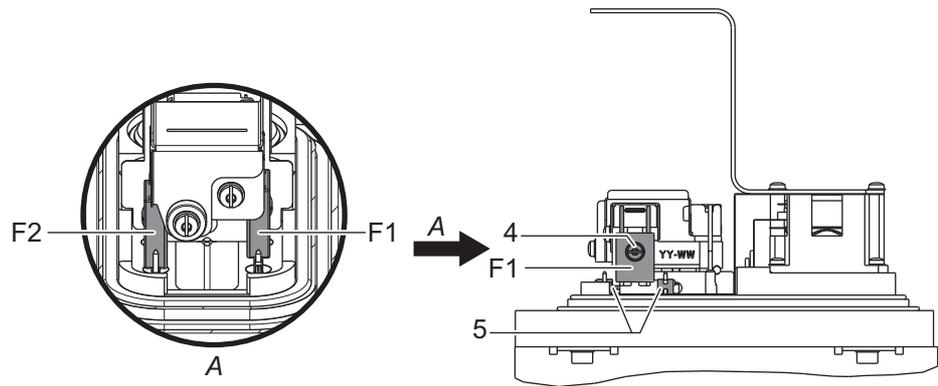
→ Remove the analyzer cell from the detector (see 5.4.1).

→ Remove the fixing screw (4) and the washer of the defective filament.

→ Remove the 2 fastening clips (5) using flat pliers (2 new clips are supplied with the spare filament).

→ Replace the filament.

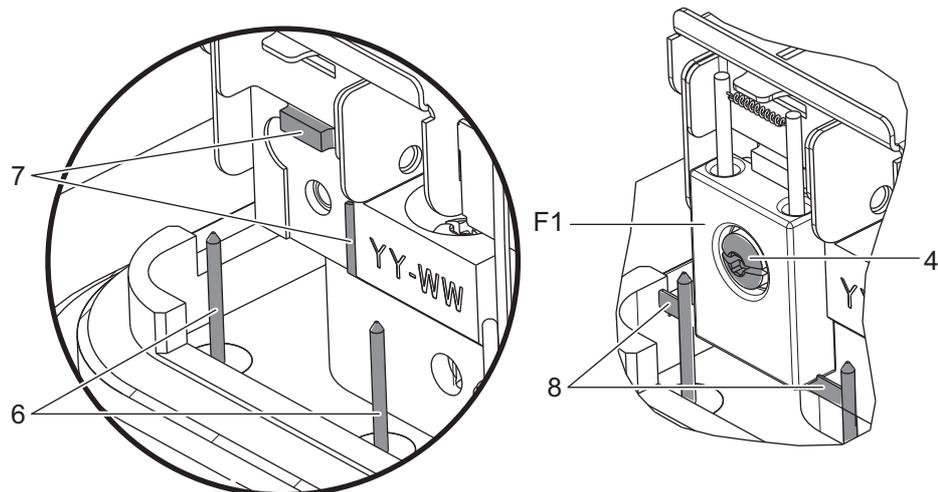
→ Reset the counter of the new filament (see **Maintenance Menu** in the *Operating instructions*).



**Fig. 8: Dismantling the filament**

F1	Filament 1 in the menu
F2	Filament 2 in the menu

→ Make sure that the filament connectors (6) are perpendicular to the supporting surface and parallel to each other.



**Fig. 9: Positioning the filament**

- Fit the new filament in its housing against the 2 centring stops (7). Attach it with the screw (4) and washer supplied with the filament, using the Torx® screwdriver.
- Take a fastening clip (5) with the flat pliers: this clip will ensure electrical contact between the filament and the cell (see figure: Fitting the fastening clip, index A).
- Fit the clip on the connector (6) and the strip of the filament (8) (see figure: Fitting the fastening clip, index B).
- Push in the clip (5) with the pliers until it stops (see figure: Fitting the fastening clip, index C).
- Repeat the last 3 operations for the second connector.
- Reset the counter of the new filament (see **Maintenance Menu** in the *Operating instructions*).

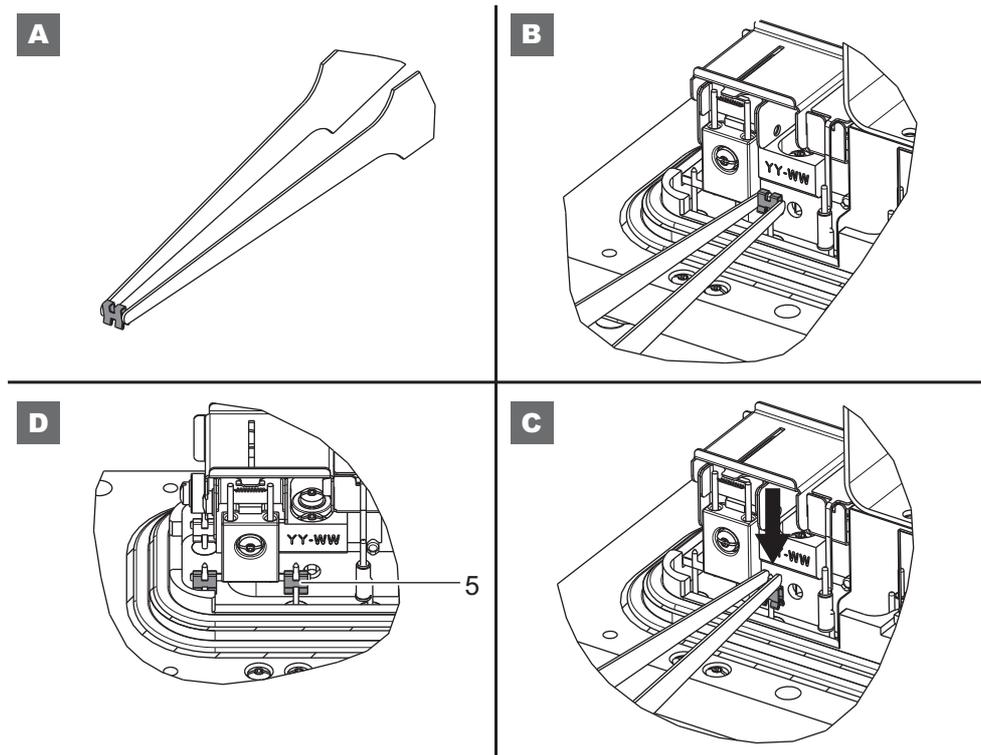


Fig. 10: Fitting of the fastening clip

## 5.5 Primary pump maintenance (Wet Model)

### 5.5.1 Localization

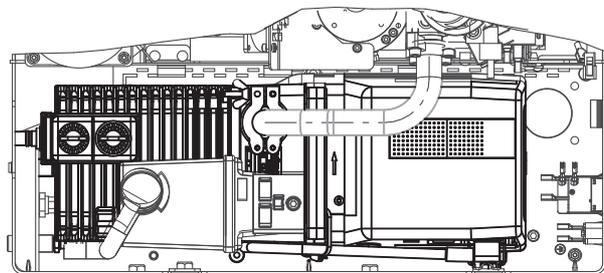


Fig. 11: Primary pump location

### 5.5.2 Oil level check

For the pump to function in optimal conditions, the oil level must be checked regularly.

→ If the oil level is not between the Min. and Max. marks, adjust it (see 5.5.6).

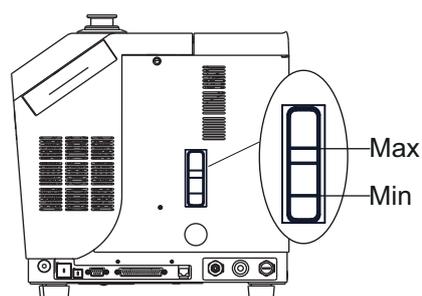


Fig. 12: Oil level check

### 5.5.3 Oil quality inspection

For the pump to function in optimal conditions, oil quality must be checked regularly. Thickening and darkening of the oil, combined with a burning smell, are signs of lubricant deterioration.

- Drain the pump (see 5.5.4).
- Flush it using fresh oil (see 5.5.5).
- Fill the pump with fresh oil (see 5.5.6).

### 5.5.4 Draining the pump



<b>NOTICE</b>
<b>Drain the primary pump before removing it from the detector and before any product shipment.</b>

<b>DANGER</b>
<b>Health hazard in case of contact with the operating fluid</b> Contact with or inhaling products such as oil from the pump can cause irritation. → Wear appropriate protective equipment when carrying out maintenance or adding/draining oil.

<b>WARNING</b>
<b>Risk of intoxication in case of contact with substances hazardous to health.</b> Appropriate precautions should always be taken when handling waste oil: → Wear appropriate protective equipment when draining and flushing the pump. → Do not pour waste oil down the drain. Have it destroyed by a qualified company if necessary. → Take the necessary safety precautions to avoid generating health risks or polluting the environment in case of contamination. → Decontaminate the parts affected before performing maintenance work.

**Tools/  
Consumables**

- 1 oil recovery container (capacity = 1.5 l)
- 1 funnel supplied with the product
- 1 drain connector supplied with the product
- 1 oil can (1 liter) (see 9).

**Procedure**

**The pump must be drained when it is hot.**

- Position the circuit breaker **MS** on **I**.
- Wait 5 minutes.
- Position the circuit breaker **MS** on **O**: wait for the control panel to switch off
- Disconnect the mains power cable
- Install a container (4) underneath the drain plug.
- Connect the drain connector (5).

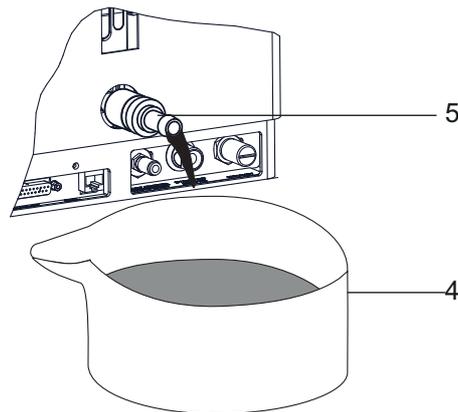


Fig. 13: Fitting of the drain connector

- Recover waste oil.
- When all the oil has been drained, remove the drain connector.
- Fill with fresh oil (see 5.5.6).

### 5.5.5 Flushing the pump



#### NOTICE

##### Only use approved operating fluids

The pumps are factory tested using Pfeiffer Vacuum oil.

- The same oil **must be used** during operation. The oil safety data sheet is available on the website.

#### Tools /Consumables

- 1 oil recovery container (capacity = 1.5 l)
- 1 funnel supplied with the product
- 1 drain connector supplied with the product
- 1 oil can (1 liter) (see 9)

#### Procedure

- Drain the pump (see 5.5.4).
- Leave the drain connector on the detector and the waste oil recovery container in place.
- Remove the oil fill cap (1) from the rotary vane pump (2).
- Put the funnel (included with the detector) in the oil fill opening (3).

See (Fig. 15)

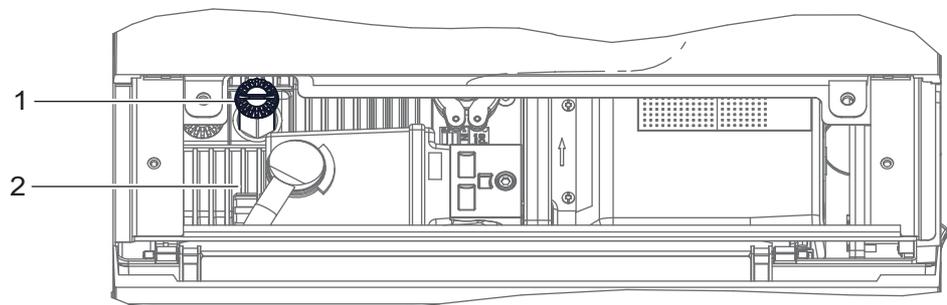


Fig. 14: Oil fill opening

- Pour the flushing oil very slowly (full 1 liter can) into the filling opening.
- When all the flushing oil has been emptied into the container, remove the drain connector.
- Fill the pump with fresh oil (see 5.5.6).
- Tighten the filling plug on the pump.

### 5.5.6 Filling the pump



**Tools/  
Consumables**

**Procedure**

**NOTICE**

**Only use approved operating fluids**  
The pumps are factory tested using Pfeiffer Vacuum oil.  
→ The same oil **must be used** during operation. The oil safety data sheet is available on the website.

**DANGER**

**Health risk in case of oil contact**  
The pumps are delivered empty of oil: the oil is delivered in separate containers.  
→ Wear mask, gloves, protective glasses to fill the pumps with oil.

- 1 funnel supplied with the product
- 1 oil can (1 liter) (see 9)

- Make sure that the detector is off (circuit breaker **MS** at **O**, the control panel screen is off) and in a horizontal position.
- Make sure that the detector is off (circuit breaker **MS** at **O**, control panel switched off and power cable disconnected) and in a horizontal position.
- Make sure the drain connector is not connected.
- Loosen the filling plug (1) (Fig. 14).
- Install the funnel in the filling opening (3).
- Put the funnel (included with the detector) in the oil fill opening (3).

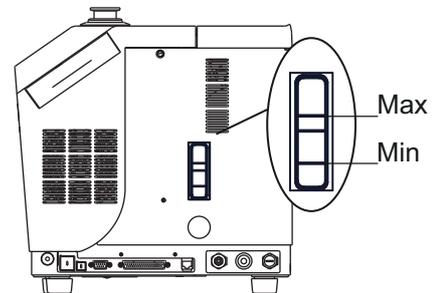
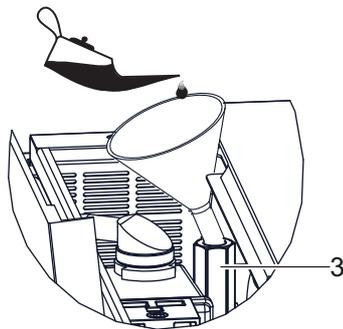


Fig. 15: Oil filling and oil level check

- Fill with oil to the highest level.
- Tighten the filling plug (1).
- Replace the oil fill cap tightly (1).

### 5.5.7 Primary pump replacement



**Tools/Spare  
parts**

**Procedure**

**NOTICE**

**Drain the primary pump before removing it from the detector and before any product shipment.**

- 5 mm Allen key supplied in the maintenance kit
- Pair of scissors
- Primary pump (see 9)

- Make sure that the detector is off (circuit breaker **MS** at **O**, the control panel screen is off) and in a horizontal position.
- Remove the front and rear covers (see 5.2).

- Remove the tightening clamp (1).
- Disconnect the pump power cable (2).
- Cut the plastic fixing clamp (4) of the pump power cable.

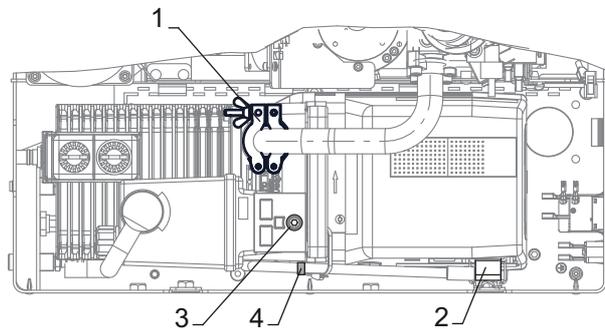
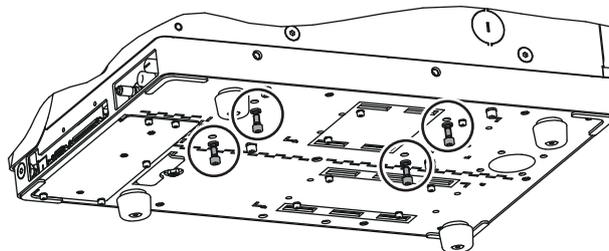


Fig. 16: Dismantling the primary pump

- Loosen the screw (+ washer) of the mist eliminator's mounting bracket (3), then remove the mist eliminator.
- Loosen the 4 fixing screws (+ washers) of the pump underneath the detector frame.



When dismantling the primary pump to send it to the service center, keep the tightening clamp, power cable and entire mist eliminator unit (mist eliminator + bracket + screws). **Never send accessories with the pump.**

After pump service or replacement:

- Put the pump back into the frame in reverse dismantling order.
- Reset the timer of the primary pump (see **Maintenance Menu** in the *Operating instructions*).

### 5.5.8 Replacement of the internal oil mist eliminator

- |                          |   |
|--------------------------|---|
| <b>Tools/ Spare part</b> | <ul style="list-style-type: none"> <li>• 5 mm Allen key supplied in the maintenance kit</li> <li>• Oil mist eliminator (see 9)</li> </ul>   |
| <b>Procedure</b>         | <ul style="list-style-type: none"> <li>→ Make sure that the detector is off (circuit breaker  at <b>O</b>, the control panel screen is off) and in a horizontal position.</li> <li>→ Remove the storage tank (2 screws + washers).</li> <li>→ Loosen the screw (2) of the oil mist eliminator's mounting bracket.</li> <li>→ Remove the fixing clamp of the hose (3) and then the hose.</li> <li>→ Replace the oil mist eliminator.</li> </ul> |

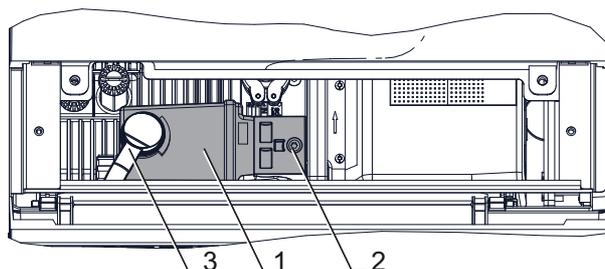


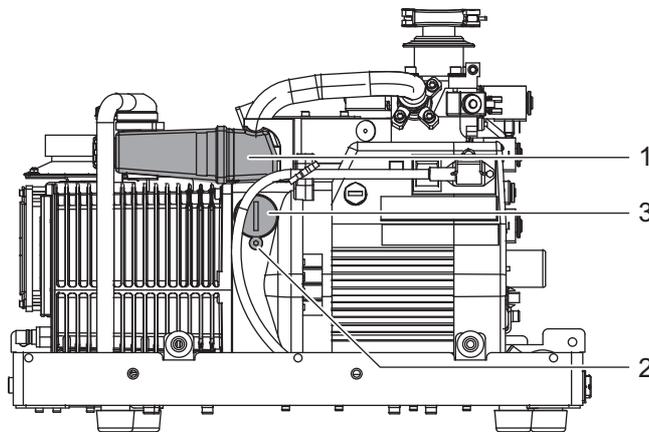
Fig. 17: Internal oil mist eliminator disassembly

### 5.5.9 Installation of an external mist eliminator

The operator can use an external oil mist eliminator to replace the internal oil mist eliminator installed on the detector: this modification requires connecting an accessory: an exhaust connector for the pump.

- Tools**
- 5 mm Allen key supplied in the maintenance kit
  - Wide, flat-head screwdriver
  - Exhaust connector (see 9)
  - O-ring (see 9)
  - External oil mist eliminator, DN 25 ISO-KF connection supplied by the customer.

- Procedure**
- ➔ Remove the rear cover (see 5.2.2).
  - ➔ Dismantle the internal mist eliminator (1).
  - ➔ Loosen the locking screw (2) of the side blanked-off flange (3).
  - ➔ Unscrew and remove the blanked-off flange (3) and the O-ring (4).



- ➔ Install a replacement O-ring (5), tighten the exhaust connector (6) and the locking screw (2).
- ➔ Install the O-ring (4) and the blanked-off flange (3) to replace the internal mist eliminator, on top of the pump.
- ➔ On the rear cover, using a screwdriver, remove the cap (7) to allow the passage of the exhaust connector.

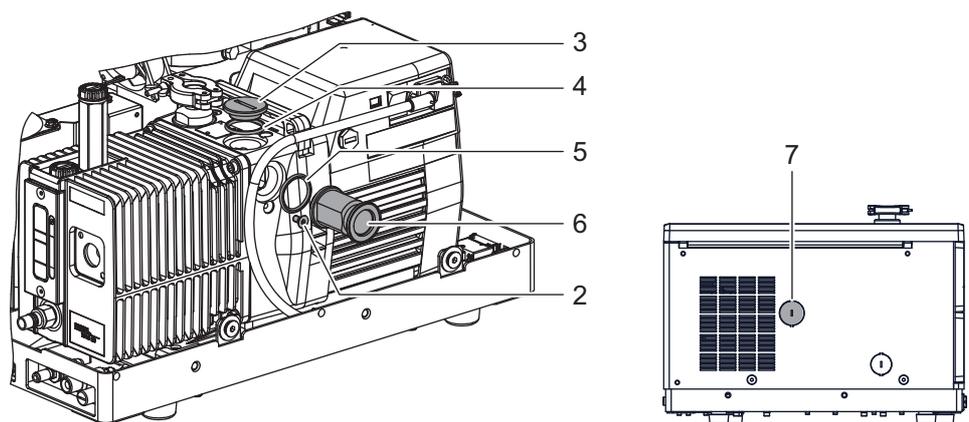


Fig. 18: Installation of the exhaust connector

## 5.6 Maintenance of the turbomolecular pump



### WARNING

#### Risk of burning associated with hot surfaces

When in operation, certain mechanical parts can reach high temperatures. If the detector was used recently:

- Let it cool down for at least 10 minutes before working on the turbomolecular pump.
- If necessary wear protective gloves according to directive EN 420.

### 5.6.1 Localization

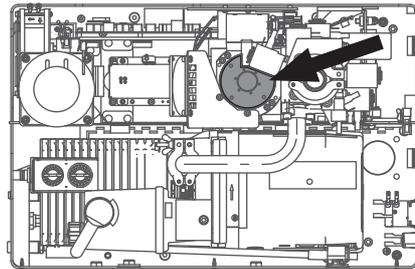


Fig. 19: Turbomolecular pump location

### 5.6.2 Access to the fluid reservoir

- |                    |                            |
|--------------------|----------------------------|
| <b>Tools/</b>      | • Flat pliers              |
| <b>Spare parts</b> | • 2 flat-head screwdrivers |
|                    | • Special tool (see 9)     |
|                    | • Torque wrench (13 N·m)   |
|                    | • Clean, lint-free cloth   |
|                    | • Oil reservoir (see 9)    |

- Procedure**
- Create an air inlet in the cell (see **Maintenance Menu** in the *Operating Instructions*).
  - Make sure that the detector is off (circuit breaker  at **O**, the control panel screen is off) and in a horizontal position.
  - Let it cool down for 10 mn if necessary.
  - Remove the front cover (see 5.2.1).
  - Loosen the fixing screw (1) and remove the coil (2). **Do not dismantle the operator (3).**

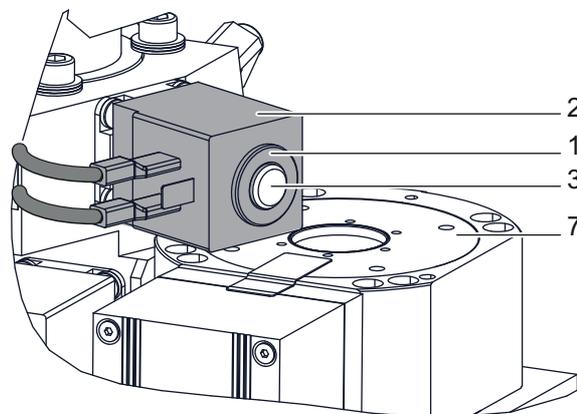


Fig. 20: Dismantling the coil

### 5.6.3 Replacing the operating fluid reservoir



#### WARNING

**Risk of intoxication in case of contact with substances hazardous to health.**

Always take appropriate precautions when handling the operating fluid reservoir:

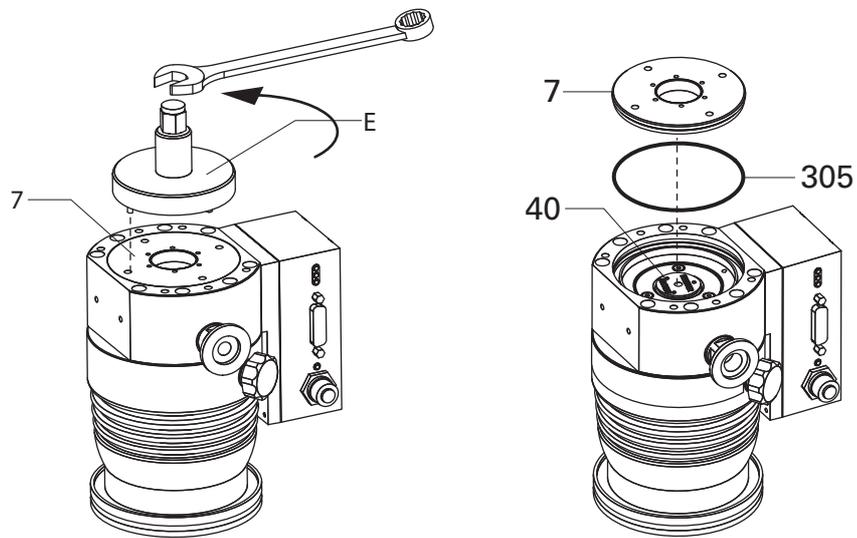
- Dispose of operating fluid reservoirs in accordance with the applicable legislation. Safety data sheet available upon request or at [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)
- Take the required safety precautions to avoid creating health risks or polluting the environment in case of contamination.
- Decontaminate the parts affected before performing maintenance work.



#### Operating fluid filling

The operating fluid reservoir is sufficiently filled with operating fluid.

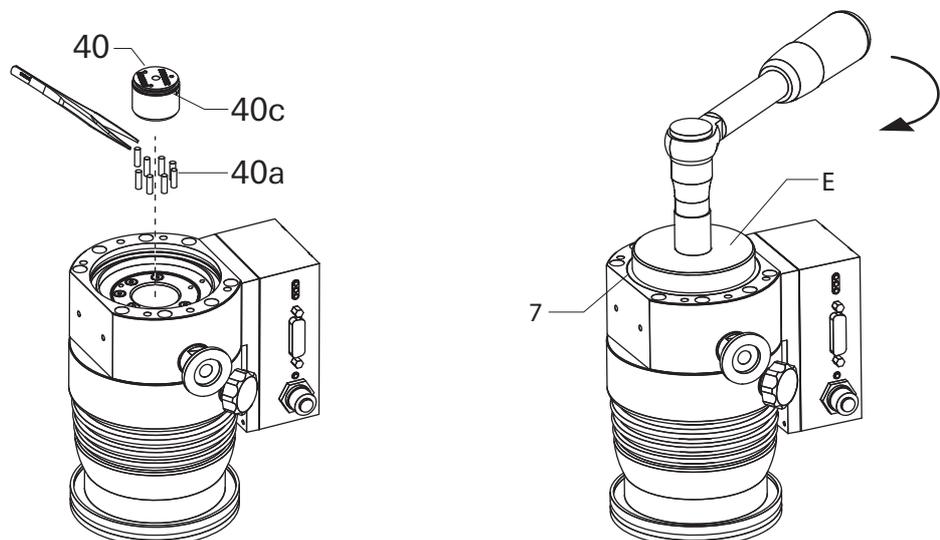
- Do not add additional operating fluid.



**Fig. 21: Assembly / Disassembly of the operating fluid reservoir**

- |    |                           |     |           |     |                   |
|----|---------------------------|-----|-----------|-----|-------------------|
| 7  | End cover                 | 40a | Porex rod | 305 | O-ring            |
| 40 | Operating fluid reservoir | 40c | O-ring    | E   | Key for end cover |

- Screw out the end cover 7 on the bottom of the turbopump with special tool E. Pay attention to O-ring 305.



- Lift out the operating fluid reservoir using two screwdrivers.

- Using tweezers, pull out the Poroplast rods (8x).
- Remove impurities from the turbopump and the end cover with a clean, lint-free cloth.  
**Do not use any cleaning fluids!**
- Using tweezers, insert the new Poroplast rods (8x).
- Push the new operating fluid reservoir up to the O-ring 40c into the pump.
  - **Do not** perform any pressure upon the operating fluid reservoir!
- Screw in the end cover with the new O-ring 305. The operating fluid reservoir is brought into the correct axial position by the end cover.
- Observe the end cover's tightening torque **13 Nm ± 10 %**.
- Reinstall the coil (2) and tighten the fixation screw (1).

## 5.7 Pirani gauge maintenance

### 5.7.1 Replacement

- |                               |  |
|-------------------------------|--|
| <b>Tools/<br/>Spare parts</b> | <ul style="list-style-type: none"> <li>• CHc M4 x 80 screw supplied in the maintenance kit</li> <li>• 3 mm Allen key supplied in the maintenance kit</li> <li>• Gauge (see 9)</li> </ul> |
|-------------------------------|--|

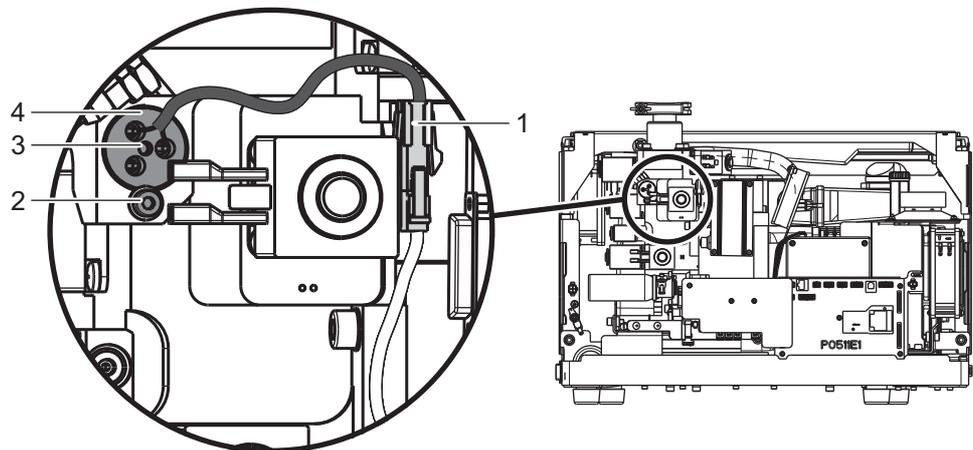


Fig. 22: Gauge maintenance

- Remove the front cover (see 5.2.1).
- Disconnect the gauge harness (1).
- Loosen the retainer screw (2).
- Tighten the CHc screw (3) in the center of the gauge.
- Pull on the CHc screw (3) to free the gauge.
- Position the new gauge (4).
- Tighten the retainer screw (2).
- Connect the gauge harness (1).
- Adjust the gauge: see chapter **Internal Pirani gauge calibration** in the *Operating Instructions*.

## 5.8 Maintenance fans

### 5.8.1 Localization

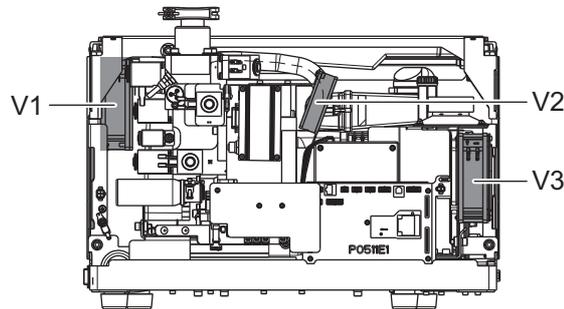


Fig. 23: Fan location

V1	Air inlet fan
V2	Turbomolecular pump fan
V3	Air Exhaust fan

- |                               |  |
|-------------------------------|--|
| <b>Tools/<br/>Spare parts</b> | <ul style="list-style-type: none"> <li>• Philips screwdriver</li> <li>• Fan + grill (see 9)</li> </ul> |
|-------------------------------|--|

### 5.8.2 Replacement of the air inlet fan

- Remove the front cover (see 5.2.1).
- Remove the rear cover (see 5.2.2).
- Remove the air filter of the rear cover.

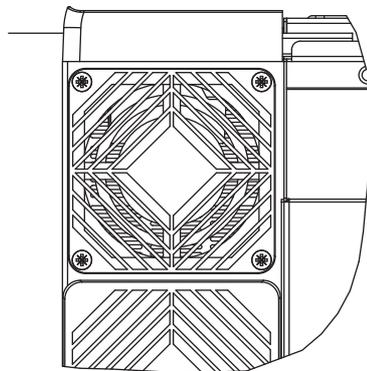


Fig. 24: Maintenance of the air inlet fan

- Disconnect the harness (1) of the fan (V1)
- Loosen the 4 fixing screws (2). Keep the 4 metal hooks (4) of the old fan.
- Attach the grill (3) to the unprotected side of the new fan. Fit the 4 metal hooks (4) onto each angle of the fan.
- Position the fan, respecting the direction arrows.
- Fit the fan and attach the unit using the 4 fixing screws.
- Connect the fan harness (1), respecting the (+) and (-) polarities.

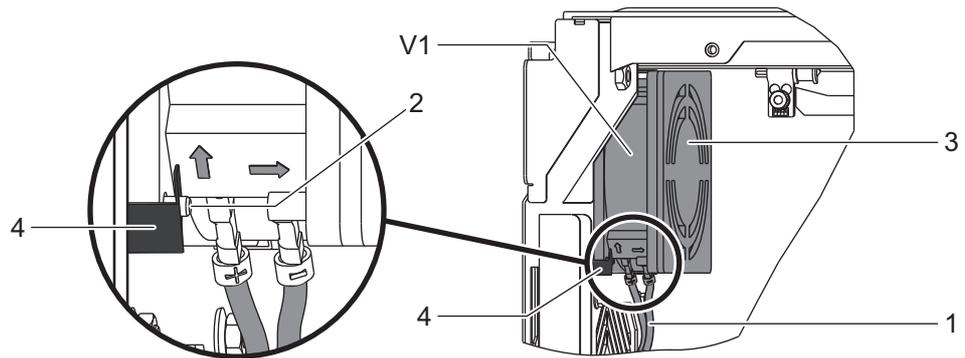


Fig. 25: Placing of fan and harness

### 5.8.3 Replacement of the turbomolecular pump fan

- Remove the front cover (see 5.2.1).
- Disconnect the fan harness (1) of fan (V2) from the 24V distribution board (2).
- Loosen the 2 fixing screws (3).
- Replace the fan, respecting the correct direction.

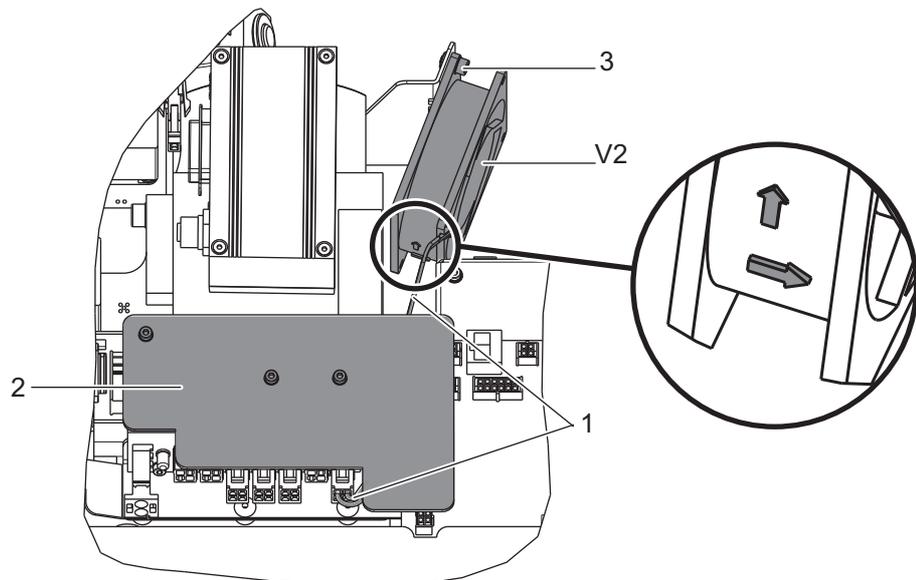


Fig. 26: Maintenance of the turbomolecular pump fan

### 5.8.4 Replacement of the exhaust fan

- Remove the front cover (see 5.2.1).
- Disconnect the fan harness (1) of the fan (V3).
- Loosen the 4 fixing screws (+ 2 washers per screw).
- Replace the fan, respecting the direction arrows.
- Position the protective grill (2) and attach the unit using the 4 fixing screws (+ 2 washers per screw).
- Connect the fan harness (1), respecting the (+) and (-) polarities.

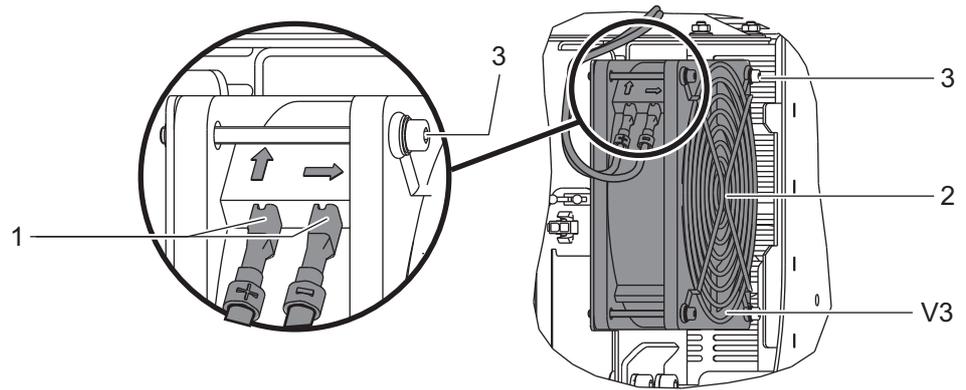


Fig. 27: Maintenance of the exhaust fan

## 5.9 Air filters maintenance

### 5.9.1 Air filters location

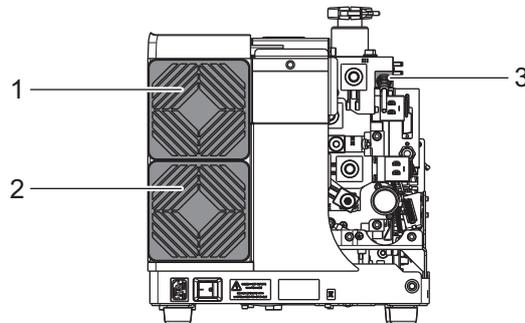


Fig. 28: Air filters location

1	Air filter no. 1
2	Air filter no. 2
3	Air filter of the vacuum block

**Tools/Spare parts**

- 13 mm and 17 mm spanners (for the air filter of the vacuum block)
- Air filters (see 9)

### 5.9.2 Replacement of air filters no. 1 and no. 2

- ➔ Unclipping the air filter.
- ➔ Replacing the used filter: follow the assembly order indicated below (1 + 2 + 3: **do not forget the grill**).

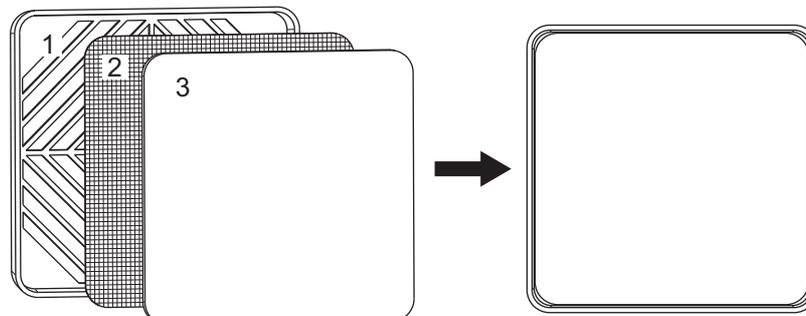


Fig. 29: Air filter assembly

- ➔ Clipping the entire air filter.

### 5.9.3 Replacement of the vacuum block air filter

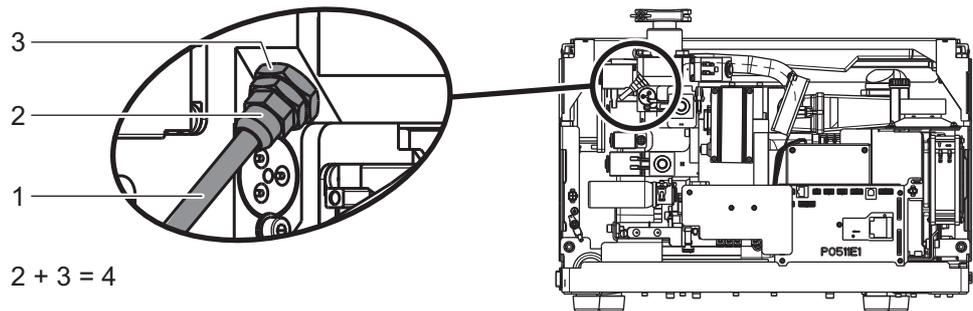


Fig. 30: Maintenance of the vacuum block air filter

- Remove the front cover (see 5.2.1).
- Loosen the filter connector (2) with the 13 mm spanner to free the tube (1).
- Loosen the connector (3) with the 17 mm spanner.
- Loosen the connector (2) of the new filter (4).
- Install the new filter in reverse dismantling order and tighten the connectors.

## 5.10 Connection the primary pump (Integrable Model)



### NOTICE

#### Connecting the primary pump

- The external primary pump must be connected and powered up before the detector is switched on.

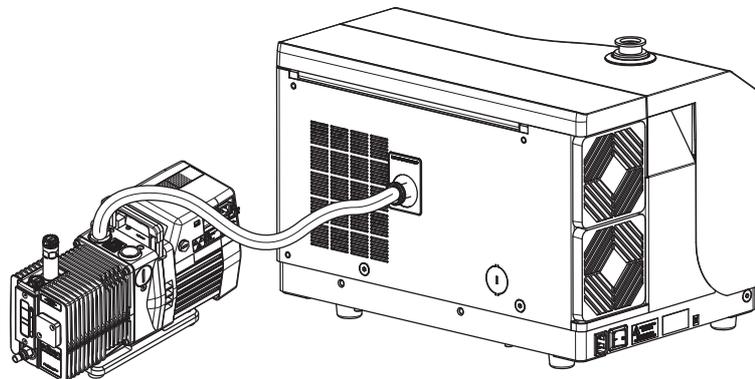


Fig. 31: Example: Primary pump connected to the back of the detector

### 5.10.1 Characteristics of the primary pump

- Wet or Dry pump in DN 25 ISO-KF
- Empty limit < 1 mbar ( $5 \cdot 10^{-2}$  mbar recommended)
- Minimum throughput = 1 m<sup>3</sup>/h  
If used as a sniffer with a Smart probe, minimum throughput = 3 m<sup>3</sup>/h
- Maximum throughput = 100 m<sup>3</sup>/h  
A greater throughput does not improve the performance of the leak detector/primary pump combination.
- Maximum 2 m-long flexible tube between the detector and primary pump

### 5.10.2 Connection of the primary pump

Two possible DN 25 ISO-KF connections: on the rear or under the detector frame. The leak detector is delivered with the connection at the rear.

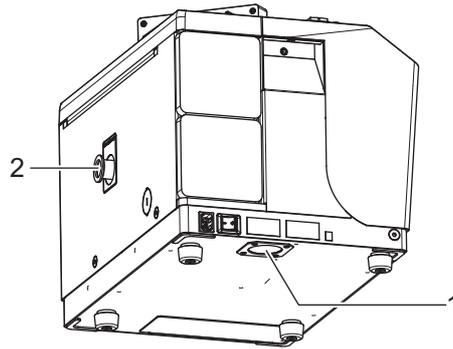


Fig. 32: Rear connection

1	Stopgap plug
2	DN 25 ISO-KF pipe connection

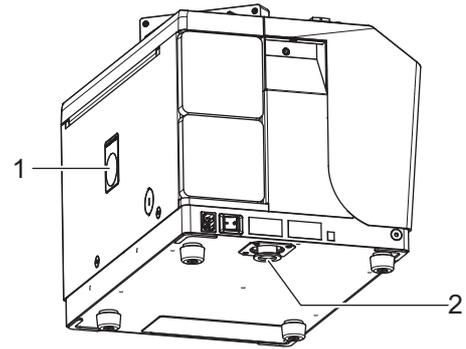


Fig. 33: Connection under the detector frame

### 5.10.3 Connection of the primary pump under the frame

- Tools**
- 5 mm Allen key supplied in the maintenance kit
  - 1 plastic DN 25 ISO-KF blank-off flange delivered with the detector

**Procedure**



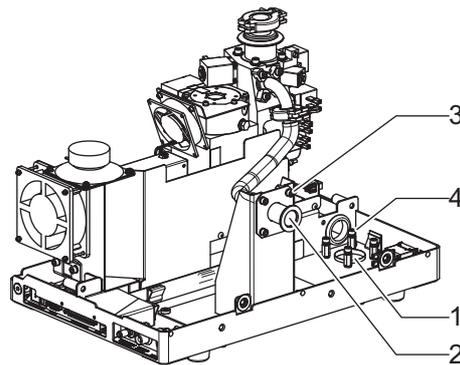
**NOTICE**

**Warranty terms**

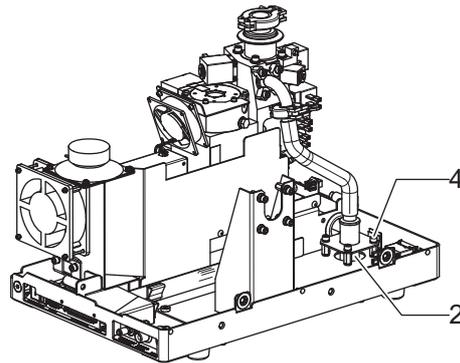
It is the user's responsibility to protect detectors from any contamination which may be produced by the primary external pump (particles or backscattering of oil on the detector, for example).

Any contamination or deterioration of the detector due to the connected primary pump will not be considered by the manufacturer under this warranty.

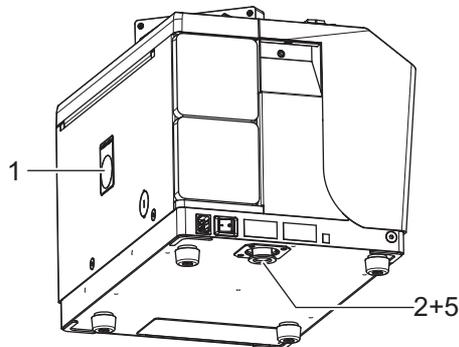
- ➔ Remove the pump covers (see 5.2.1) (see 5.2.2).
- ➔ Remove the stopgap plug (1) from the frame, which is simply clipped on.
- ➔ Remove the 4 M6 x 16 screws (3) and their pipe connection washers (2).



- ➔ Release the pipe connection (2) and put the 4 screws (3) and their washers back.
- ➔ Remove the 4 M6 x 12 screws (4) and their washers.
- ➔ Place the pipe connection (2) in its casing on the frame and secure it with the 4 screws (4) and their washers.



- Put the covers back on.
- Clip the stopgap plug (1) in the opening of the rear cover.
- Put the plastic DN 25 ISO-KF blank-off flange (4) delivered with the detector onto the pipe connection (2):
  - as long as the detector is not connected to an external primary pump
  - for any detector transmission.



#### NOTICE

##### Connection pipe under the frame

For any transmission of the detector in this configuration, never use a metal blank-off flange and clamp: only use a plastic blank-off flange.

Do not turn on the product if the covers are not in place.

## 6 Decommissioning

### 6.1 Shutting down for longer periods

If the detector must be shut down for an extended period of time, after use it is recommended that you:

- apply the prolonged downtime procedure described *in the **Prolonged storage** chapter of the Operating Instructions.*
- keep the detector in its original packaging or under its protective cover in a dust-free environment.
- for the start-up procedure, see **Operation** of the Operating Instructions. If a problem occurs, contact your Pfeiffer Vacuum service center.

### 6.2 Disposal



#### WARNING

##### **Environmental protection**

The product or 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 waste and preventing pollution.

**Directive 2011/65/EC establishes the regulations on the restriction of the use of hazardous substances in electrical and electronic equipment (EEE) to contribute to the protection of human health and the environment, including the environmentally sound recovery and disposal of EEE waste.**

The manufacturer shall ensure that the EEE placed on the market (including cables and spare parts intended for repair, reuse, updating or capacity enhancement) that contain hazardous substances are subject to restriction within the authorised limits.

Our products contain different materials which must be recycled: iron, steel, stainless steel, cast iron, brass, aluminium, nickel, copper, PTFE, FEP.

Special precautions must be taken for components in contact with the products resulting from potentially contaminated processes.

Before you return a product, please familiarise yourself with the after-sales service procedure, and complete the declaration of contamination available on our website.

For any question, contact the Support Customer service: [support.service@pfeiffer-vacuum.fr](mailto:support.service@pfeiffer-vacuum.fr).

#### 6.2.1 Restriction of Hazardous Substances (R.O.H.S.)

**Directive 2011/65/EC establishes the regulations on the restriction of the use of hazardous substances in electrical and electronic equipment (EEE) to contribute to the protection of human health and the environment, including the environmentally sound recovery and disposal of EEE waste.**

The manufacturer shall ensure that the EEE placed on the market (including cables and spare parts intended for repair, reuse, updating or capacity enhancement) that contain hazardous substances are subject to restriction within the authorised limits.

#### 6.2.2 Electric and electronic equipments (EEE)

Decontamination and recycling of Electrical and Electronic Equipment (EEE) containing polluting materials (electronic cards, battery cells, batteries, screens, capacitors, mercury, etc.) enables the preservation of natural resources, particularly strategic raw materials.



This product carries the identification logo, as it is subject to regulations regarding the management of waste from EEE.

The manufacturer's obligation to recover EEE applies only to "Adixen" or "Pfeiffer Vacuum" branded products sold by Pfeiffer Vacuum:

- EEE is subject to the regulations in force as regards the recycling of end-of-life products
- complete EEE that has been neither modified nor retrofitted, and has used only spare parts from Pfeiffer Vacuum, including their assemblies and sub-assemblies, but excluding the batteries.

**Product sold outside  
French territory**

**In the absence of any specific contract, and according to the Directive 2012/19/UE concerning the waste treatment stemming from EEE, in the case of a sale by Pfeiffer Vacuum outside France (European Union and third country) of EEE subject to applicable regulations, the owner of EEE will undertake full responsibility of organizing and financing the pickup and treatment of waste of EEE sold by Pfeiffer Vacuum.**

The owner will undertake full responsibility namely the collection (gathering, sorting and storage of wastes for the purpose of transportation to a processing installation), recycling, recovery and/or disposal, except in the case of contrary overriding legislative provisions in the country where the owner is located, which must be brought to the attention of Pfeiffer Vacuum by the owner.

# 7 Malfunions

## 7.1 What happens in the event of a defect

The leak detector can display warnings or faults on screen at any time

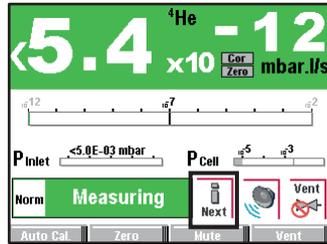


Fig. 34: Standard screen with warning [i Next]

### 7.1.1 Warning fault display

Press the key to display the fault.

1	Level 1: Warning Press the [i Next] key to display the maintenance information		
2	Level 2: Major fault: erroneous measurement Press the [i Next] or [!] key to display the fault.		
3	Level 3: Critical fault: test impossible Press the [i Next] or [!] key to display the fault.		
4	Level 4: Service fault: temporary fault Fault only registered in the fault history: no display on the screen		
5	Level 5: Warning The detector is not in normal operating condition. Press the [i Next] or [i] key to display the fault.		

### 7.1.2 Warning / fault window

Description

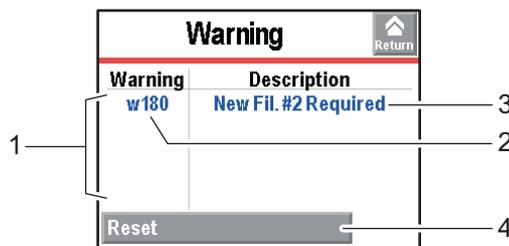


Fig. 35: Warning/fault window

1	Fault list: 5 maxi.
2	RS-232 fault code.
3	Fault description.
4	Warning and faults deletion: faults requiring the operator's intervention remain displayed as long as the cause of the fault has not been corrected.

### 7.1.3 List of warnings / faults

Description of the levels 1 to 5 (see 7.1.1)

Level	RS command	RS-232 Code	Information
1	?ER	e59	loss of cal test mode
	?ER	e93	Dynamic calib. failure
	?WA	w60	Sensor Type/Connector
	?WA	w145	maintenance requested
	?WA	w150	primary pump service
	?WA	w160	secondary pump service
	?WA	w180	2A wire change
	?WA	w181	1A wire change
	?WA	w182	No output on wire 2
	?WA	w183	No output on wire 1
	?WA	w211	Select manual calib.
	?WA	w235	Autocal request
	?WA	w240	Autocal Request
2	?WA	w242	Internal Pirani to set
	?WA	w245	Temp. too high
	?ER	e50	zero cell. unstable
	?ER	e56	residual problem
	?ER	e57	sensitivity low
	?ER	e58	sensitivity too high
	?ER	e65	residual too high
	?ER	e70	poor PIC
	?ER	e80	calibrated leak year Er.
	?ER	e85	Temp. too high
	?ER	e89	loss of power
	?ER	e95	cell zero limits
	?ER	e96	Fault in Autocal +2 <sup>nd</sup> code
?ER	e97	temperature too high	
?ER	e98	temperature too low	
?ER	e160	LDS probe clogged	
?WA	w220	Filament not active	
3	?WA	w215	Background too high for test
	?WA	w241	Autocal requested
	?WA	w244	VHS not calibrated
	?ER	e188	speed cell pump
	?ER	e192	power fault wire
	?ER	e194	short-circuit wire 2
	?ER	e195	short-circuit wire 1
	?ER	e205	fault primary pump
	?ER	e206	ACP temp. too high
	?ER	e210	primary pump fault
	?ER	e220	no V AC power
	?ER	e224	- 15V cell problems
	?ER	e230	HS filaments
	?ER	e231	No output on wire 1 and 2
	?ER	e235	cell pressure > 1e-03 Mbar
	?ER	e238	No cell com.
	?ER	e239	no pump cell com.
	?ER	e241	cell own speed
	?ER	e243	EEPROM fault
	?ER	e245	cell pump fault
?ER	e247	Check ATH connection	
?ER	e248	Check MDP connection	
?ER	e251	+15V cell problems	
?ER	e252	24V cell problems	
?ER	e253	ram timekeeper hs	
?ER	e255	Critical fault +2 <sup>nd</sup> code	
4	?ER	e180	no electrical current;
	?ER	e185	triode SECU active
	?ER	e248	Check MDP connection
	?ER	e75	PIC not found
	?ER	e99	24 V DC problems
	?WA	w203	calibrated leak External
	?WA	w205	shutdown of Autocal
5	?WA	W97	temperature too high
	?WA	W98	temperature too low
	?WA	W230	Autocal request
	?WA	W255	Outside start-up conditions

## 7.2 Troubleshooting guide

The troubleshooting guide helps correct the malfunctions reported on the detector's control panel or affecting the detector.

It can be consulted from an interactive application specifically developed for the technical documentation.

### 7.2.1 Installation of the application

- Insert the Operating manual CDRom into the CD/DVD player of the computer.
- Launch the "ASMxxx" or "ASlxx" application.
- Select the language.
- Select the interactive application "**Troubleshooting**".
- Install the application on your computer.

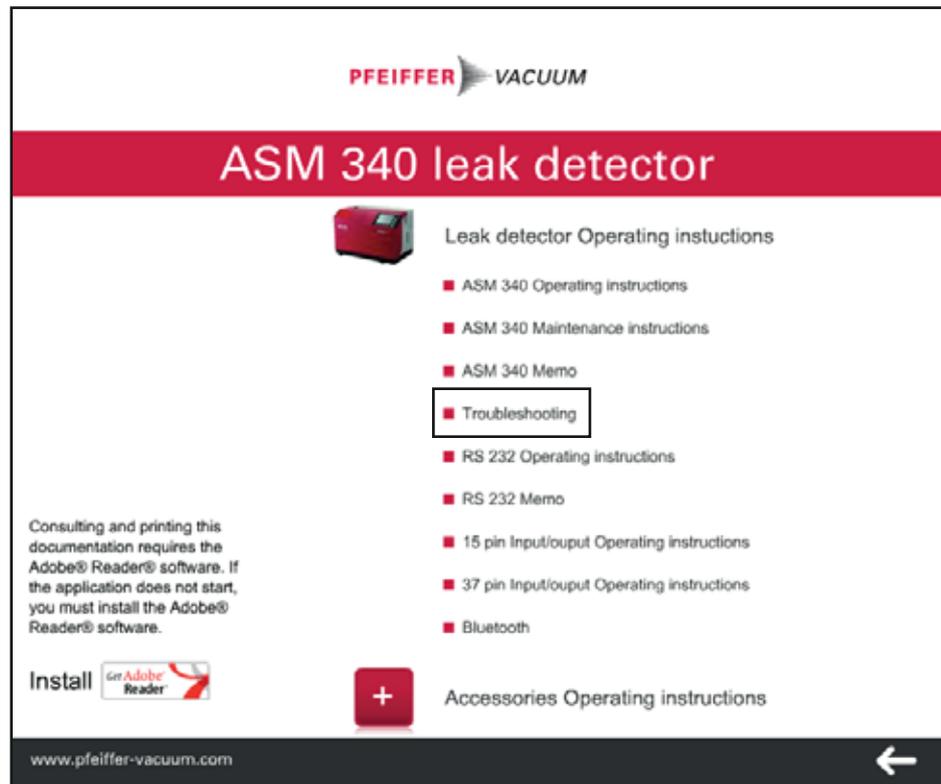


Fig. 36: Example: ASM 340 - Selection of the interactive application

### 7.2.2 Consultation of the application



**Create a shortcut on the computer desktop for direct access to the "Troubleshooting" application.**

- Launch the "**Troubleshooting**" application.
- Select the navigation language (1).
- Select the product and the appropriate key word (2).
- Launch the search (3).
- Select a symptom (4): the origin and diagnosis of this symptom are displayed (5).

**PFEIFFER VACUUM** **Troubleshooting**

**Default searching**

Service center:

**Product**

**Keyword**

1

**Symptoms**

Background increase  
**High background** — 4  
 Low background

2

3

**High background**

Origin / Diagnosis	Solution	Sheet
T1. Dry model Purge valve closed	Open the purge valve.	<a href="#">T.3.3</a>
T2. Integrable model leaks in the twinster evacuation.	Check the evacuation tightness.	
T3. Integrable model switch of the customer primary pump on OFF.	Place switch ON.	

5

© P. Failure recorded in defect's history to the service center: no screen display.

The solutions must be implemented at the isolated area.

**Default not solved? Contact your service center:** [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de)

## 8 Service

### **Pfeiffer Vacuum offers first-class customer service!**

- On-Site maintenance for many products
- Overhaul/repair at the nearby Service Location
- Fast replacement with refurbished exchange products in mint condition
- Advice on the most cost-efficient and quickest solution

Detailed information, addresses and forms at: [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com) (Service).

### **Overhaul and repair at the Pfeiffer Vacuum Service Center**

The following general recommendations will ensure a fast, smooth servicing process:

- ➔ Fill out the "Service Request/Product Return" form and send it to your local Pfeiffer Vacuum Service contact.
- ➔ Include the confirmation on the service request from Pfeiffer Vacuum with your shipment.
- ➔ Fill out the declaration of contamination and include it in the shipment (mandatory!). The Declaration of contamination is valid for any product/device including a part exposed to vacuum.
- ➔ Dismantle all accessories and keep them.
- ➔ Close all the flange opening ports by using the original protective covers or metallic airtight blank flanges for contaminated devices.
- ➔ If possible, send the pump or unit in its original packaging.

### **Sending contaminated pumps or devices**

No devices will be accepted if they are contaminated with micro-biological, explosive, or radioactive substances. "Hazardous substances" are substances and compounds in accordance with the hazardous goods regulations (current version).

- ➔ Neutralize the pump by flushing it with nitrogen or dry air.
- ➔ Close all openings airtight.
- ➔ Seal the pump or device in suitable protective film.
- ➔ Return the pump/device only in a suitable and sturdy transport container and send it in while following applicable transport conditions.

Pump or device returned without declaration of contamination form fully completed and/or not secured in suitable packaging will be decontaminated and/or returned at the shipper's expense.

### **Exchange or repair**

The factory operating parameters are always pre-set with exchange or repaired devices. If you use specific parameters for your application, you have to set these again.

### **Service orders**

All service orders are carried out exclusively according to our general terms and conditions for the repair and maintenance, available on our website.

## 9 Spare parts

### 9.1 Ordering information

Spare parts available for sales, classified by functions are listed in this chapter.

<b>Function</b>	<b>See following pages</b>
Tool	<b>F100</b>
Monitoring and Display	<b>F200</b>
Power and electrical supply	<b>F300</b>
Automatic control system and electronic circuits	<b>F400</b>
Measurement	<b>F500</b>
Pumping	<b>F600</b>
Vacuum block	<b>F700</b>
Pipes - Connections - Seals	<b>F800</b>
Cover	<b>F900</b>
Specific accessories	<b>F1000</b>

## Tools ASM 340

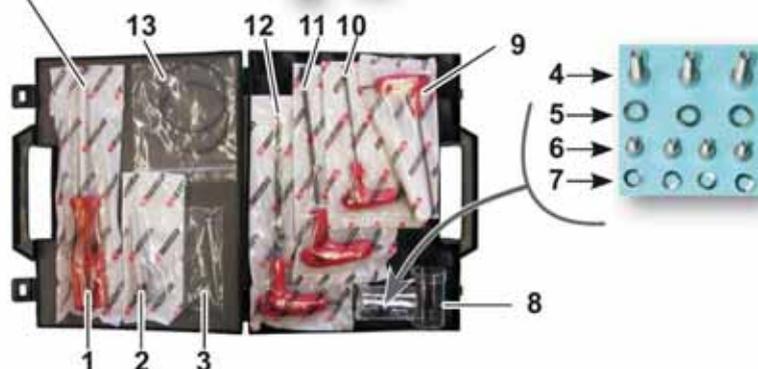


**Accessoires de raccordement**  
Connection accessories  
Verbindungzubehör



**Fuites calibrées Helium**  
Helium calibrated leaks  
Helium Testleck

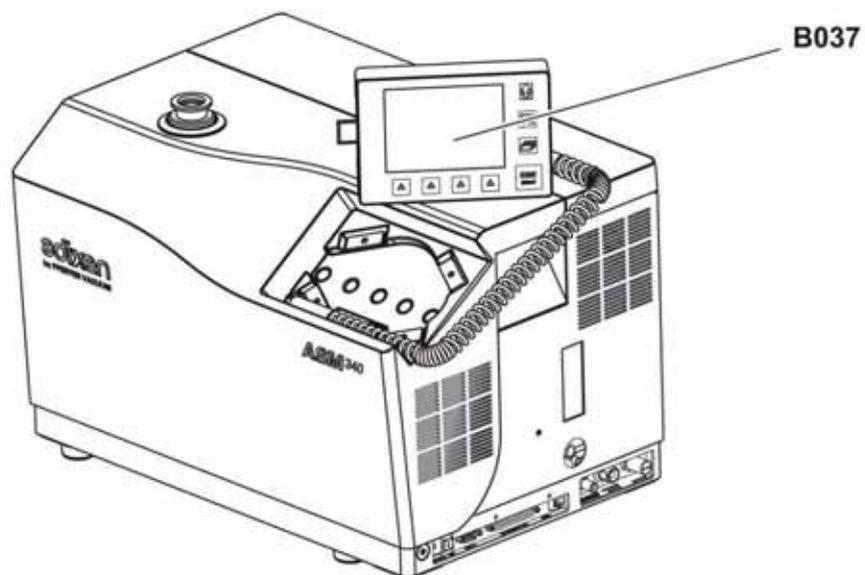
A037



Rep. Ref. Teil	Qté. Qty Menge	Désignation Designation Beschreibung
1	1	<b>Clé emmanchée</b> Box-shank nut spinner Rohrsteckschlüssel mit Heft
2	1	<b>Tournevis pour vis TORX® 6X35</b> Screwdriver for TORX® screw 6x35 Handschrauben für TORX® Schrauben 6x35
3	1	<b>Vis CHc M 4x80</b> Screw CHc M 4x80 Edelstahlschraube CHc M 4x80
4	4	<b>Vis CHc M 4x12</b> Screw CHc M 4x12 Edelstahlschraube CHc M 4x12
5	5	<b>Rondelle</b> Washer Unterlegscheibe
6	3	<b>Vis CHc M 3x6</b> Screw CHc M 3x6 Edelstahlschraube CHc M 3x6
7	3	<b>Rondelle</b> Washer Unterlegscheibe
8	1	<b>Fusible 5 x 20 F1 6,3 A</b> Fuse 5 x 20 F1 6,3 A Sicherung 5 x 20 F1 6,3 A
9	1	<b>Clé six pans mâle de 2,5 mm</b> e 2.5 Allen wrench Innensechskantschlüssel 2,5 mm
10	1	<b>Clé six pans mâle de 3 mm</b> e 3 Allen wrench Innensechskantschlüssel 3 mm
11	1	<b>Clé six pans mâle de 4 mm</b> e 4 Allen wrench Innensechskantschlüssel 4 mm
12	1	<b>Clé six pans mâle de 5 mm</b> e 5 Allen wrench Innensechskantschlüssel 5 mm
13	1	<b>Joint cellule d'analyse 3G</b> 3G Analyser cell O ring 3G Zelle Dichtung

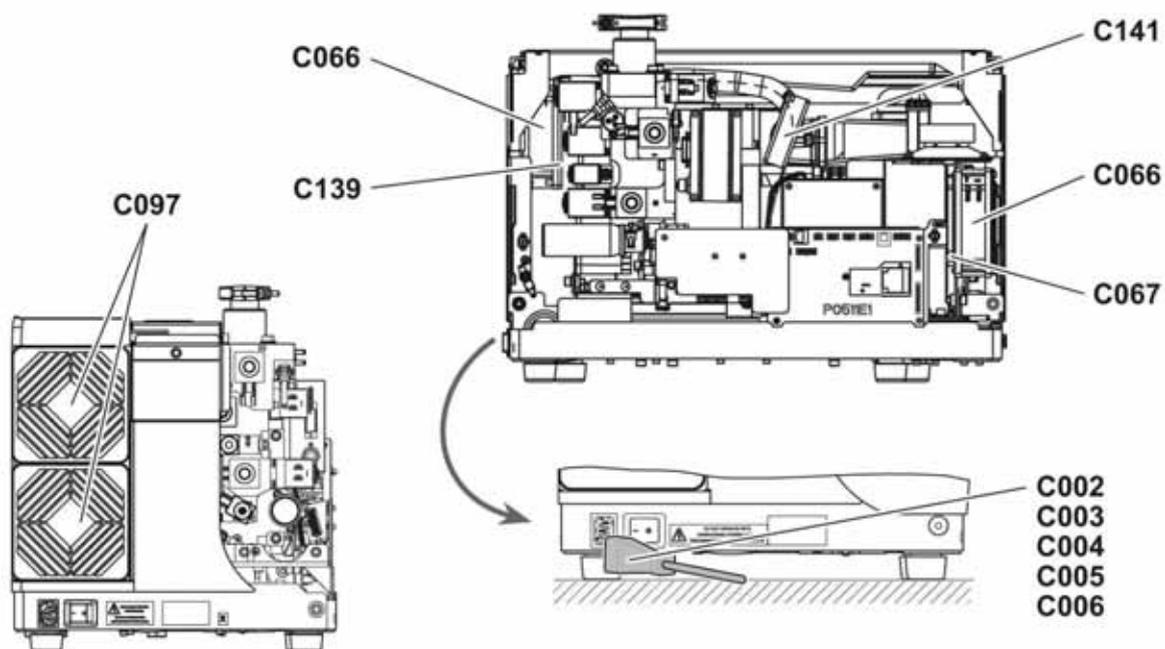
Ref	Description	P/N	Qty	Remarks
A006	DN16KF Calibrated Leak Adaptator Kit	110715	1	
A007	DN25KF Calibrated Leak Adaptator Kit	110716	1	
A013	Tee, Reducing - DN25/25/16KF	068269	1	
A016	Calib. Leak With Valve 1-3.10-6 DN25KF	FV4610	1	
A020	Clamp DN20/25KF	083264	1	
A024	Centering Ring SS/Per DN25KF	068189	1	
A025	Funnel	067592	1	
A027	Vacuum Silicon Grease (100 g Box)	064600	1	
A036	3G Cell, Analyzer Chamber Transport	114386	1	
A037	3G Detection maintenance Kit	114718	1	
A040	"Brucelles" Tweezers	115396	1	

Monitoring and display  
ASM 340



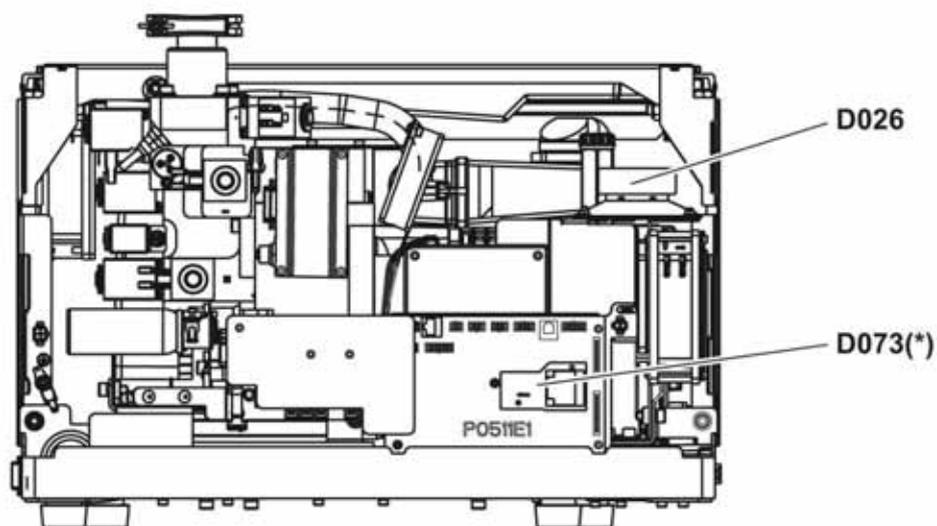
Ref	Description	P/N	Qty	Remarks
B037	Control Panel (Black) - 340	122446S	1	

## Power and electrical supply ASM 340



Ref	Description	P/N	Qty	Remarks
C002	Cable, Main Power; 2 m - Italy	104758	1	
C003	Cable, Main Power; 2 m - Switzerland	103718	1	
C004	Cable, Main Power; 2 m - UK	104411	1	
C005	Cable, Main Power; 2 m - USA	103567	1	
C006	Cable, Main Power; 2 m - France/Germany	103566	1	
C066	Fan - 20MD/182/192/340	101094	1	
C067	Fan Grill 120x120 mm (101094))	056067	1	
C097	Grille + Filter for Fan - ASI20/22	104754	1	
C139	Protection grill 120x120 mm	104753	1	
C141	Fan 80x80x25 mm - 340	121658	1	

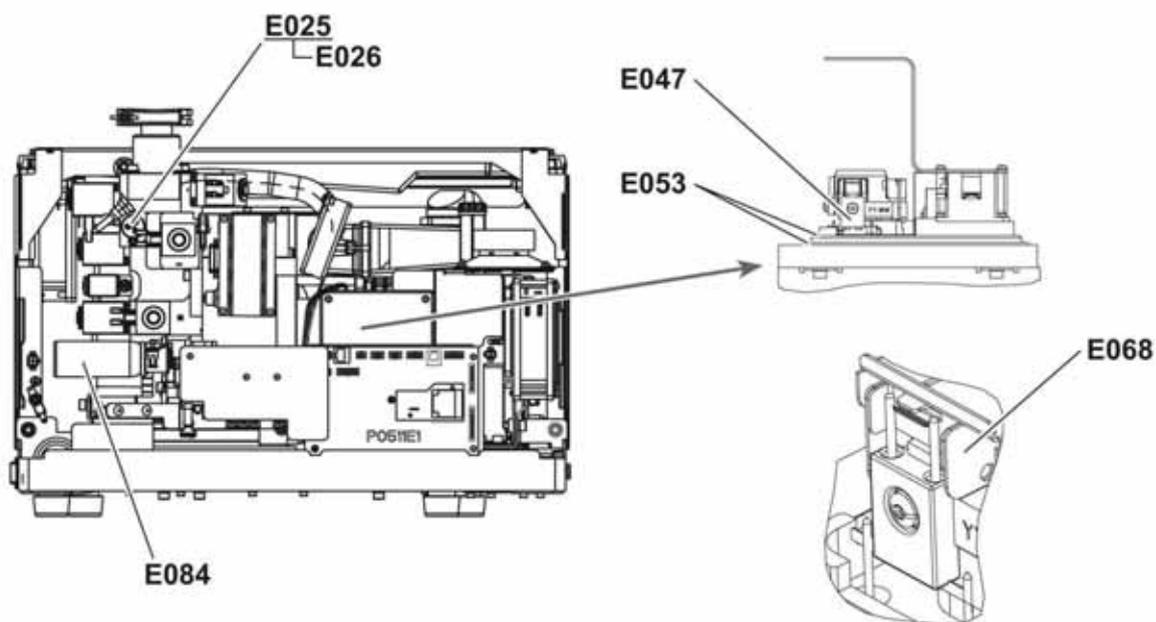
## Automatic control system and electronic circuits ASM 340



(\*) Option/Accessoire - Option/Accessory - Option/Zubehör

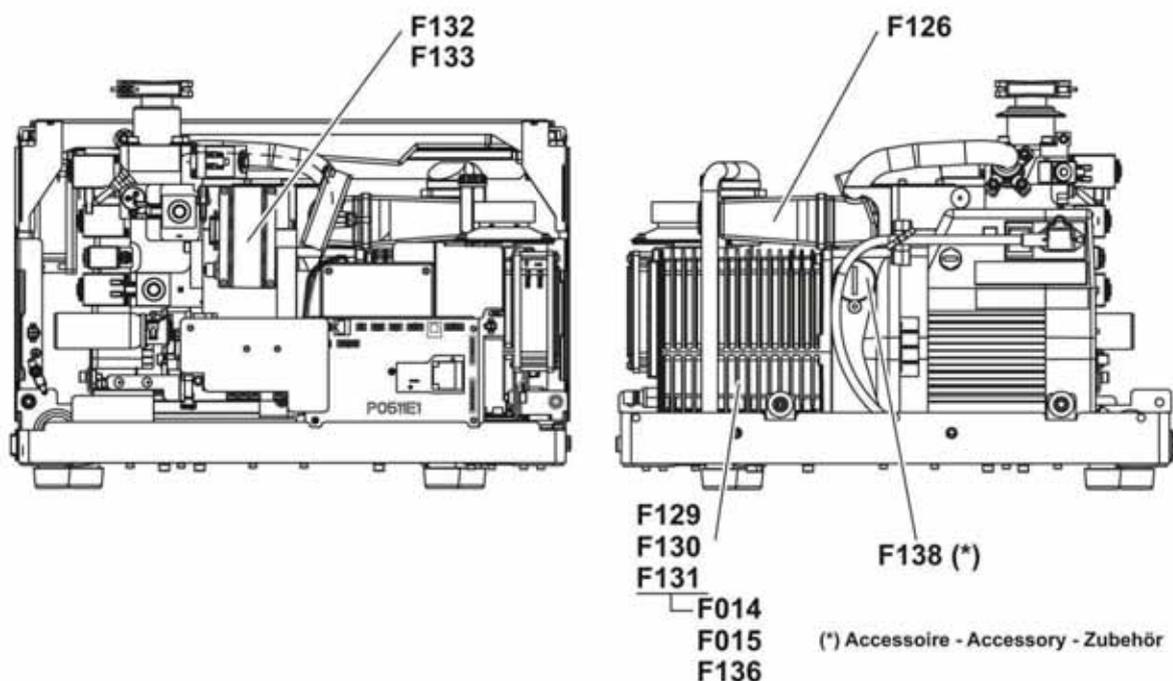
Ref	Description	P/N	Qty	Remarks
D026	Loudspeaker; 90 DB/D 10 cm	060097	1	
D073	P0482E1 Bluetooth Board	P0482E1	1	

Measurement  
ASM 340



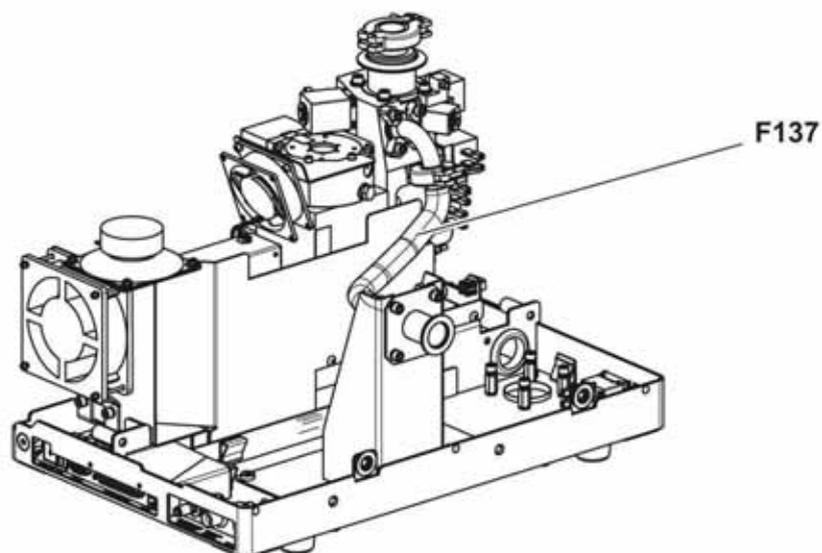
Ref	Description	P/N	Qty	Remarks
E025	Gauge, PI1 (Aluminium)	795706	1	
E026	Filament for PI1 Gauge	057972	1	
E047	Filament for 3G Analyzer Cell	114864S	1	
E053	NBR Seal - 3G Cell	114346	1	
E068	3G.2 Cell ExtrACTION Electrode - Service	119641	1	
E084	Calibrated Leak, Internal - 340	121528S	1	

## Pumping ASM 340



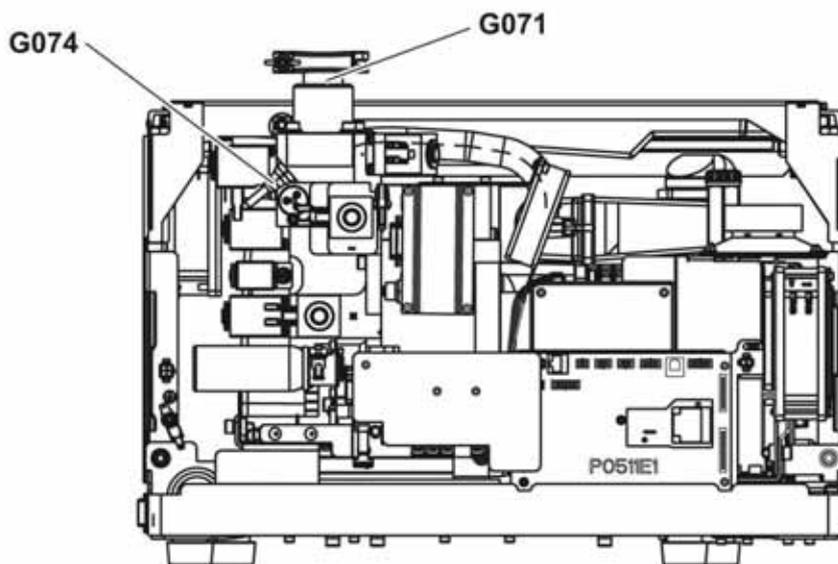
Ref	Description	P/N	Qty	Remarks
F014	Oil, A200 (1L)	068694	1	
F015	Funnel	067592	1	
F126	Oil mist Eliminator 21 m3/h D30 mm - 340	121494	1	
F132	Oil reservoir for Splitflow 50 - 340	PM 143 740 -T	1	
F133	Special wrench for oil reservoir - 340	PV M40 813	1	
F136	Draining connector - 340 Wet	107646	1	
F138	Exhaust connector - 340 Wet	122405	1	

# Pumping ASM 340



Ref	Description	P/N	Qty	Remarks
F137	Ext. pump. connect. bellows 340 Integra.	A334533	1	

Vacuum block  
ASM 340



Ref	Description	P/N	Qty	Remarks
G071	Inlet port filter - 340	103395	1	
G074	Vacuum block filter - 340	122237	1	

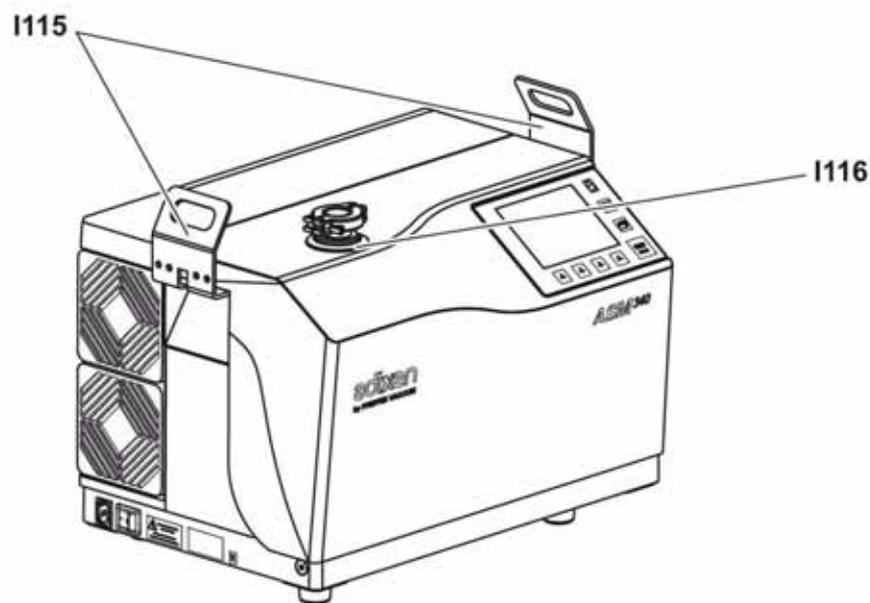
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## Pipes - Connections - Seals ASM 340



Ref	Description	P/N	Qty	Remarks
H008	Bellows, SS; DN16KF L 250 mm	068369	1	
H051	SS mesh filter 70 µm DN40 KF	067636	1	
H165	O'Ring 3.6 x 29.3 FPM	082025	1	
H166	Vacuum block filter - 340	122237	1	
H170	Draining connector - 340 Wet	107646	1	
H171	Ext. pump. connect. bellows 340 Integra.	A334533	1	

Cover  
ASM 340



Ref	Description	P/N	Qty	Remarks
I114	Protection cover - 340	A006733	1	
I115	Lifting handle - 340	A333918	1	
I116	DN25KF Inlet Pipe Frame - 340	A334286	1	

## Options and accessories ASM 340



Ref	Description	P/N	Qty	Remarks
J077	20 µm Poral Filter D 114 mm	105847	1	
J078	5 µm Poral Filter D 114 mm	105848	1	
J174	O'ring Ø 5 mm - D 114 mm	082152	1	
J175	20 µm Poral Filter DN25/25 KF	105841	1	
J176	20 µm Poral Filter DN40/40 KF	105842	1	
J177	20 µm Poral Filter DN40/25 KF	105843	1	
J178	5 µm Poral Filter DN25/25 KF	105844	1	
J179	5 µm Poral Filter DN40/40 KF	105845	1	
J180	5 µm Poral Filter DN40/25 KF	105846	1	
J181	SS mesh filter 70 µm DN16 KF	072721	1	
J182	SS mesh filter 70 µm DN25 KF	072857	1	
J183	SS mesh filter 70 µm DN40 KF	067636	1	

## Options and accessories ASM 340

**Accessoires divers**  
Miscellaneous accessories  
Verschiedenes-Zubehören



Ref	Description	P/N	Qty	Remarks
J185	RC 500 WL remote control -340	PT 445 432 -T	1	
J186	Cable transmitter/ASM340 - RC500WL	A466613	1	
J187	Cable remote/ASM340 - RC500WL	A465975	1	
J188	Bypass Kit Europe - 340	PT 445 411 -T	1	
J189	Bypass Kit US - 340	PT 445 413 -T	1	
J190	Bypass kit cable - 340	A465982	1	
J191	Gauge cable 3 m - 340	A333746	1	
J192	Gauge cable 10 m - 340	A333747	1	
J193	Gauge cable 20 m - 340	A333748	1	
J194	Cart, Transport - ASM340	122570	1	

## **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.

Ed05- Date 2017/06 - P/N: 121762MEN



Are you looking for a  
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