



Bypass for ASM 340

Leak detector

Operating Instructions

Table of contents

1	About this manual	3
	1.1 Validity	3
	1.2 Conventions	4
2	Safety	5
	2.1 Safety precautions	5
	2.2 Proper use	5
	2.3 Improper use	6
3	Product description	6
	3.1 Product identification	6
	3.2 Function	7
4	Installation	8
	4.1 Assembly	8
	4.2 Connections	9
5	Operation	10
	5.1 Mode 1 "Quick pump"	10
	5.2 Mode 2 "Partial-flow"	10
	5.3 Evacuation delay	11
	5.4 Modes on the ASM 340	11
6	Maintenance	12
7	Service	13
8	Accessories	13
9	Technical data and dimensions	14
	9.1 Units of measurement	14

1 About this manual

1.1 Validity

This operating manual is for customers of Pfeiffer Vacuum. It describes the functioning of the designated product and provides the most important information for safe use of the unit. The description follows applicable EU guidelines. All information provided in this operating manual refers to the current state of the product's development. The documentation remains valid as long as the customer does not make any changes to the product.

Up-to-date operating instructions can also be downloaded from www.pfeiffer-vacuum.com.

These operating instructions relates to the products with the following order numbers:

Order no.	Description	Design
PT 445 411 -T	ASM 340 bypass option	Mains cable with Euro-style safety plug
PT 445 413 -T	ASM 340 bypass option	Mains cable with US plug

Applicable documents

The following documents contain useful information about using options and/or accessories and about the maintenance of the product:

ASM 340	Operating instructions No.
Operating instructions for ASM 340 leak detectors	121762ODE/OEN/ON/
Operating instructions for the angle valve AVC 025 MA	BP 5272 BN

*also available from www.pfeiffer-vacuum.com

1.2 Conventions

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:

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

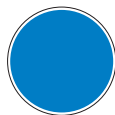
Pictographs



Prohibition of an action or activity in connection with a source of danger, 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

Instructions in the text

→ Work instruction: here you have to do something.

2 Safety

2.1 Safety precautions



Obligation to inform

Any person responsible for installing, using or maintaining the product must first read the security instructions in this operating manual and comply with them.

→ It is the operating customer's responsibility to protect all operators against the dangers associated with the product, with the media pumped and with the entire installation.



Installation and use of the accessories

The products can be fitted with special accessories. The installation, use and refurbishment of the connected accessories are described in detail in the respective manuals.

→ Only use original accessories.

→ Accessory part numbers: see **Accessories**.



WARNING

Hazard associated with non-compliant electrical installation

Safe operation after installation is the operator's responsibility.

→ Connect the product to an installation that is compliant with local safety standards.

→ Do not carry out any alterations or modifications to the product on your own initiative.

→ For specific questions, contact your service center.

- Only qualified personnel trained in safety rules (EMC, electrical safety, chemical pollution) may carry out the installation and maintenance described in this manual. Our service centers can provide the necessary training.
- Local safety regulations and precautions must be complied with.
- Regular checks should be carried out to ensure that all precautions are complied with.

2.2 Proper use



NOTICE

EC conformity

The manufacturer's declaration of conformity becomes invalid if the operator modifies the original product or installs additional components.

→ Following installation into a plant and before commissioning, the operator must check the entire system for compliance with the valid EU directives and reassess it accordingly.

- The bypass option may be used only in combination with an ASM 340 Leak Detector featuring for leak detection on large test objects or objects with high outgassing rates.

2.3 Improper use

Improper use will cause all claims for liability and warranties to be forfeited. Improper use is defined as usage for purposes deviating from those mentioned above, especially:

- pumping aggressive, corrosive, chemical, flammable, reactive, toxic or explosive substances,
- pumping condensable liquids or vapors,
- pumping dust or solid matter,
- operation in potentially explosive areas,
- testing gas with a hydrogen concentration in excess of 5 %,
- testing parts which are soiled or which exhibit traces of water, steam, dyes, detergents or flushing products,
- using accessories or spare parts which are not listed in these operating instructions.

3 Product description

3.1 Product identification

You can find information about the unique identification of the product and on getting in contact with Pfeiffer Vacuum on the product rating plate.

Scope of delivery

Item	Designation	Order no.	Pieces
4	Bypass valve AVC 025 MA, electromagnetic	PF A44 506	
4.2	Control cable for bypass option	PT 110 138	
4.3	Mains cable		
3	Bypass pipework (complete)		
3.1	Circlip, DN 20-25 ISO-KF	PF 100 325 -T	
3.2	Centering ring, Al/elastomer	PF 110 125 -T	
3.3	Intermediate piece, Al/DN 25 ISO-KF	PF 123 025	
3.4	90° bend, Al/DN 25 ISO-KF	PF 124 025	
3.5	T-piece Al/DN 25 ISO-KF	PF 126 025	
3.6	Metallic hose, 750 mm, DN 25 ISO-KF	PF 131 375 -X	

3.2 Function

The bypass option is an additional device that fits the ASM 340 leak detector. Using the bypass option reduces the pump-down time during leak detection on large test objects or objects with high outgassing rates. With this installation, a second backing pump with a greater throughput is connected to the test object in addition to the leak detector backing pump (internal). This enables the required vacuum to be reached faster and the measuring mode can be activated earlier.

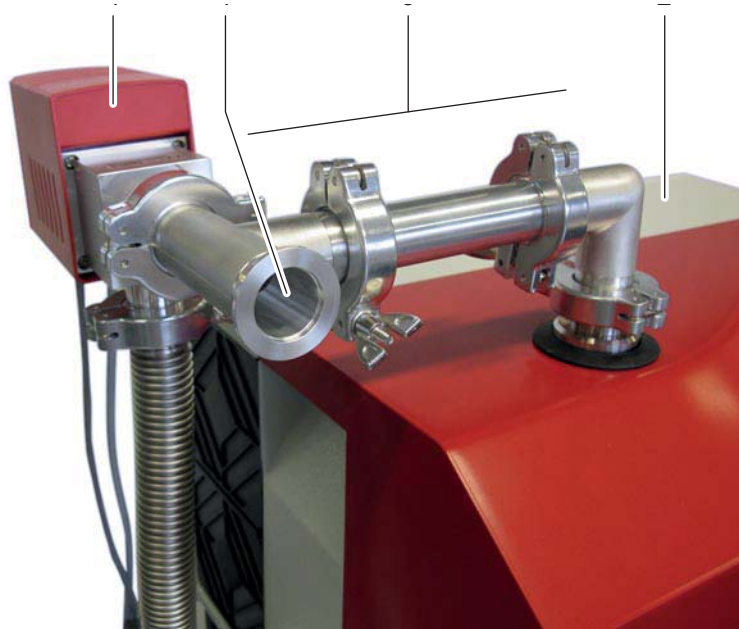


Fig. 1: Bypass for ASM 340 leak detector

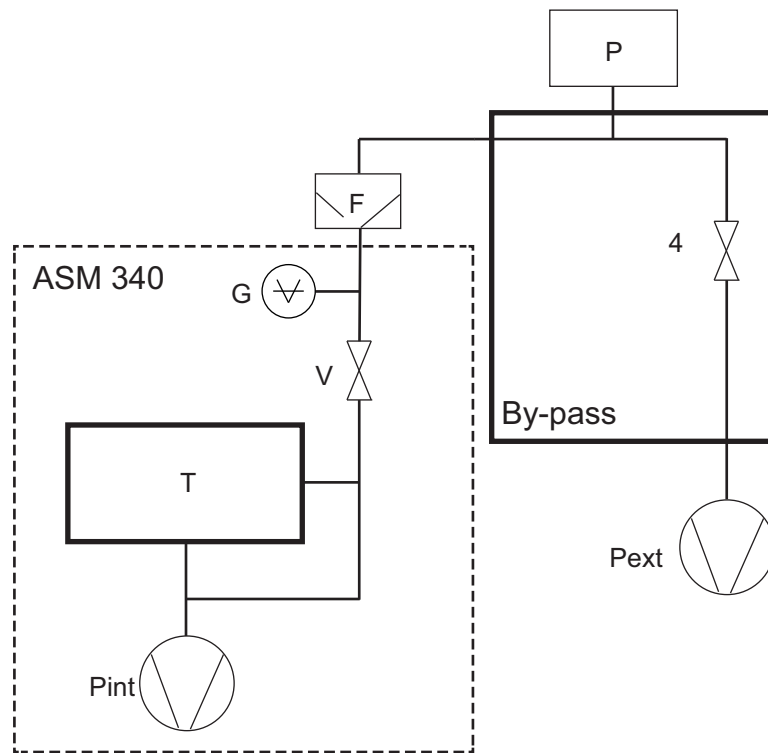


Fig. 2:

- | | | | | | | | |
|---|------------------------|---|--------------|------|------------------------|---|------------|
| 1 | Test object connection | 4 | Bypass valve | Pext | Backing pump, external | T | Turbo pump |
| 2 | Leak detector | F | Filter | Pint | Backing pump, internal | V | Valve |
| 3 | Bypass pipework | O | Test object | | | | |

4 Installation

4.1 Assembly

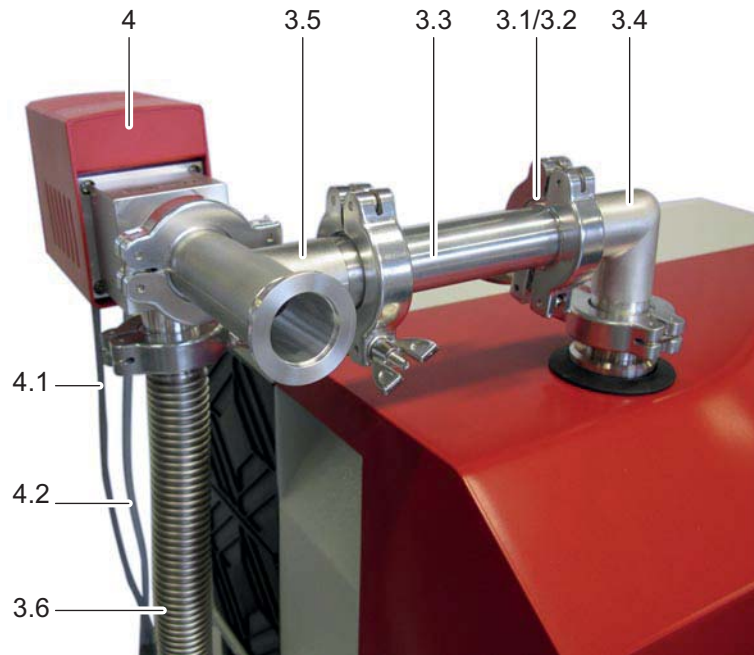


Fig. 3: ASM 340 with a bypass option

1	Connection for the test object	3.4	90° bend, DN 25 ISO-KF	4.1	Valve connection, control cable
3.1	Circlip	3.5	T-piece, DN 25 ISO-KF	4.2	Mains cable, valve connection
3.2	Centering ring	3.6	Metallic hose		
3.3	Intermediate piece, DN 25 ISO-KF	4	Bypass valve AVC		



Depending on the application, Pfeiffer Vacuum recommends that PORAL filters be used.

It is advisable to fit a centering ring with PORAL filter 3.2a between bend 3.4 and intermediate piece 3.3 when using contaminated objects.

- Fit the bypass pipework, ensuring that the circlip 3.1 and centering ring 3.2 are correctly seated.
- Fit the bypass valve 4.
- Metallic hose for connecting the external vacuum pump (backing pump)
- Connect the vacuum chambers or test objects to vacuum connection 1 of the bypass pipework.

4.2 Connections

Interface connection

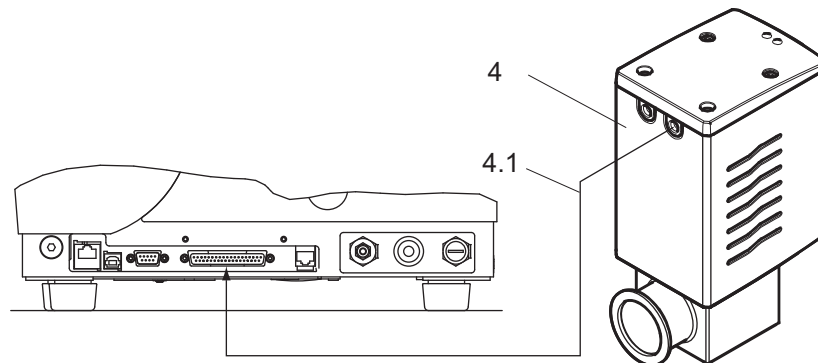


Fig. 4: Connection of the control pipe on ASM 340

4	Bypass valve AVC 025 MA	4.1	37-pin port connection – I/O D-SUB (INPUTS/OUTPUTS) ¹⁾
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→ Connection control cable 4.1 of the bypass valve 4 to the appropriate D-SUB port (37-pin, Input/Output) on the leak detector.

Connection to the mains power supply



WARNING

Hazard associated with non-compliant electrical installation

Safe operation after installation is the operator's responsibility.

- Connect the product to an installation that is compliant with local safety standards.
- Do not carry out any alterations or modifications to the product on your own initiative.
- For specific questions, contact your service center.



WARNING

Danger of unsafe electrical installation

Safe operation after installation is the responsibility of the operator.

- Do not independently modify or change the pump and electrical equipment.
- Make sure that the system is integrated in an emergency off safety circuit.
- Consult Pfeiffer Vacuum for special requirements.



DANGER

Voltage-bearing elements

Danger to life from electric shock as a result of improper installation.

- Electrical connection may be carried out only by trained and authorised electricians.
- Ensure the system is adequately earthed.
- Establish an adequate fuse protection on customer side (depending on the model).

→ Connect the mains cable 4.2 of the bypass valve 4 and of the additional backing pump.

5 Operation

To activate the operating modes with bypass option, the control cable must be connected to the 37-pin D-SUB "INPUT/OUTPUT" port on the leak detector. The "Quick pump" or "Partial-flow" modes can then be activated, each with or without "Evacuation delay", in the ASM 340 menu.

- Consider the following manual for the operation of this accessory:
 - Operating instructions "Leak Detector ASM 340"
- Define the settings in the "**Leak test / Bypass option**" menu.

5.1 Mode 1 "Quick pump"

Large test objects:

The test objects is large and its outgassing rate only just high enough to maintain the leak detector's intake capacity to remain in measuring mode. In this case, the additional backing pump remains on only until the ASM 340 switches over to leak rate mode. During the measurement, the entire gas flow passes through the leak detector.

Function description (quick pump without evacuation delay)

- Where necessary, define the settings in the "**Leak test / Bypass option**" menu.
- Press the start button on the control unit of the ASM 340.
 - The bypass valve 4 opens. The test objects is evacuated by the ASM 340 and the external backing pump.
 - The bypass valve closes once the pressure in the test object has fallen to below the set pressure threshold value for the reverse flow.
 - The entire gas flow passes through the ASM 340.
 - The actual leak rate is displayed.



Increased outgassing rate from the test object!
 If the test object has an increased outgassing rate, the pressure may rise above the set threshold value when the external backing pump is switched off or an alternative measuring mode is activated.
 → Adapt this value accordingly in the ASM 340 menu.

5.2 Mode 2 "Partial-flow"

The object is large or its outgassing rate not high enough to maintain the intake capacity of the leak detector to stabilize the measuring mode. In this case, the external backing pump must remain switched on throughout the measurement. During the measurement, the ASM 340 is in partial-flow mode.

Function description (partial-flow without evacuation delay)

- Press the start button on the control unit of the ASM 340.
 - The bypass valve 4 opens. The test object is evacuated by the external backing pump and the ASM 340. The corresponding measuring mode is controlled depending on the set threshold value for P.
- Pressing the stop button closes the bypass valve again.



Inaccurate leak rates displayed in partial-flow mode!
 In partial-flow mode, only a proportion of the pumped gas passes through the ASM 340. Therefore, the leak rate indicated on the control unit does not reflect the test object's true leak rate.

Displaying the true leak rate with external calibration

In partial-flow mode, the leak rate displayed can be corrected by an automatic calibration. The ratio between the true leak rate and the partial current proportion is reflected in the calibration factor.

Displaying the true leak rate with the leak rate factor

→ If necessary, define the settings in the ASM 340 "Leak test / HV connection / Status & settings" menu.

In accordance with the division ratio between the intake capacity of the ASM 340 and that of the external backing pump, a correction factor can be set in the ASM 340 menu for the leak rate display.



The leak rate factor only applies to a measuring mode!

A leak rate factor setting refers to **one measuring mode** only, as the leak detector's two measuring modes have different intake capacities.

5.3 Evacuation delay

The evacuation delay is an option for the ASM 340 leak detector. This can reduce the possible contamination in the internal valve block of the leak detector.

→ If necessary, define the settings in the ASM 340 "Leak test / HV connection / Status & settings" menu.

Once this option has been activated on the leak detector, the internal valve V does not open when the start button is pressed. Initially, therefore, the entire gas flow passes through the external backing pump (partial-flow pump).

The valve V to the internal backing pump does not open until the pressure threshold value for the reverse flow on the leak detector (normally 25 hPa) is reached.

5.4 Modes on the ASM 340

The following table shows an overview of the correlation between the modes on the ASM 340 and the active vacuum pumps.

Mode	Pumping down without evacuation delay	Measuring without evacuation delay	Pumping down with evacuation delay	Measuring with evacuation delay
Without a bypass	with an internal backing pump	with an internal backing pump	with an internal backing pump	with an internal backing pump
"Quick pump" mode	with an internal and external backing pump	with an internal backing pump	with an external backing pump	with an internal backing pump
"Partial-flow" mode	with an internal and external backing pump	with an internal* and an external backing pump	with an external backing pump	with an internal* and an external backing pump

* Depending on the measuring mode on the leak detector, the intake capacity is split between the internal and external backing pumps or the partial intake capacity of the turbo pump.

6 Maintenance



NOTICE

Disclaimer of liability

Pfeiffer Vacuum accepts no liability for personal injury or material damage, losses or operating malfunctions due to improperly performed maintenance. The liability and warranty entitlement expires.

For information on the individual components, please consult the corresponding operating manuals.

To slow down contamination of the leak detector, a centering ring with with PORAL filter 4.2 (pore size 0.02 mm / flow rate 4.2 m³/h air at 20°C and 200 mbar differential pressure) can be used instead of a standard centering ring (see Item 3.2 in the chapter on Installation).

7 Service

Do make use of the Pfeiffer Vacuum service facilities. In the event that repairs are necessary a number of options are available to ensure any system down time is kept to minimum:

- Overhaul / repair in the nearby Service Location
- Send unit and have it replaced with a new unit.

Sending of units (under warranty)

For a quick and smooth handling of the service process, Pfeiffer Vacuum recommends the following steps:

- Download the forms "Service Request" and "Declaration on Contamination".¹⁾
- Fill out the "Service Request" form and send it by fax or e-mail to your local Pfeiffer Vacuum service contact.
- Include the confirmation on the "Service Request" from Pfeiffer Vacuum with your shipment.
- Fill out the "Declaration on Contamination" and include it in the shipment (required!). The "Declaration on Contamination" must be completed separately for each device.
- If possible, send unit in the original packaging.

In the absence or incompleteness of the "Declaration on Contamination" and/or the use of unsuitable transport packaging, Pfeiffer Vacuum reserves the right to make a decontamination and/or to send the product back at the shipper's expense.

Service orders

All service orders are carried out exclusively according to our repair conditions for vacuum units and components.

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

8 Accessories

Designation	Bypass option
Centering ring, with poral filter, FPM/stainless steel, DN 25 ISO-KF	PF 117 225 -T

¹⁾ Forms under www.pfeiffer-vacuum.com

9 Technical data and dimensions

9.1 Units of measurement

Conversion table: pressure units

	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

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

Conversion table: gas throughput 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

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

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Pfeiffer Vacuum GmbH
Headquarters • Germany
T +49 6441 802-0
info@pfeiffer-vacuum.de