

ONF 16 S / ONF 25 S

Oil Mist Filter

Operating Instructions

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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 refer 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.

1.2 Conventions

Safety instructions

The safety instructions in Pfeiffer Vacuum operating instructions are the result of risk evaluations and hazard analyses and are oriented on international certification standards as specified by UL, CSA, ANSI Z-535, SEMI S1, ISO 3864 and DIN 4844. In this document, the following hazard levels and information are considered:

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.

Pictogram definitions



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



Important information about the product or this document

Instructions in the text

→ Work instruction: here you have to do something.

Abbreviations used

ONF: Oil mist filter

ORF: Oil return device

Symbols used

The following symbols are used consistently throughout in all illustrations:

- Ⓥ Vacuum flange
- Ⓛ Exhaust flange
- ⓧ Connection flange ONF

2 Safety

2.1 Safety precautions



Duty to inform

Each person involved in the installation or use of the component must read and observe the safety-related parts of these instructions.

→ The operator is obligated to make operating personnel aware of dangers originating from the component or the entire system.



Installation and operation of accessories

Pfeiffer Vacuum pumps can be equipped with a series of adapted accessories. The installation, operation and maintenance of connected devices are described in detail in the operating instructions of the individual components.

→ For information on order numbers of components, see "Accessories".

→ Use original accessory parts only.



CAUTION

High pressure in the exhaust chamber of the pump!

Danger of damage to the seals and danger of the pump bursting.

→ Monitor saturation level of the filter elements; if necessary connect a suitable manometer at the operating fluid intake port of the pump and measure the exhaust pressure (max. 150 kPa abs.).

→ Monitor thermal overload of the pump.

→ Before carrying out any work read and observe the operating and safety instructions of the pumping station and the individual components.

→ Observe the safety and accident prevention regulations.

→ Check regularly that all safety precautions are being complied with.

→ When returning the components to us please note the instructions in the Service section.

→ use of accessories or spare parts, which are not named in this manual

2.2 Proper use

- Only use the oil mist filter to filter oil mist from the gas flow of rotary vane pumps.
- Simply mount the ONF onto the exhaust port of rotary vane pumps.
- Use the ONF in accordance with the corresponding approved pumping speed.
- Operate ONF preferably with oil return to avoid operating fluid discharge.

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 of corrosive gases
- connection to pumps or units which are not suitable for this purpose according to their operating instructions
- connection to units which have exposed voltage-carrying parts
- use of accessories or spare parts, which are not named in this manual
- pumping-off of gases and vapors that may be prone to polymerization or may resinify the filter inserts

3 Transport and storage

3.1 Storage

The ONF 16 S / ONF 25 S should be stored dry and protected from moisture. The filter insert can absorb moisture, and the lubrication properties of the oil and hence the ultimate pressure can be negatively influenced in pumps with an oil return unit.

4 Product description

4.1 Product identification

To correctly identify the product when communicating with Pfeiffer Vacuum, always have the information from the rating plate available.

- Date of manufacture
- Model and model number

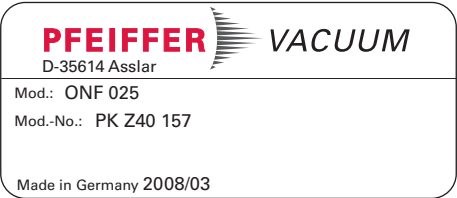


Fig. 1: Product identification on the rating plate (example)

Scope of delivery

- Filter housing with filter element
- Allen key 3/16"
- Operating instructions

Variants

Type	Versions	intended for
ONF 16 S	DN 16 ISO-KF	UNO 2.5, UNO 5, DUO 1.3/2.5/5 M
ONF 25 S	DN 25 ISO-KF	DUO 10 M

4.2 Function

The oil mist filter is mounted on the exhaust port of rotary vane pumps. It filters oil mist particles from the conveyed gas flow and thus reduces the escape of operating fluid mist. The filter element made of glass polyester fleece is integrated in a cylindrical sheet metal casing. The collected operating fluid can be observed through an opening at the top of the filter cover and discharged with a drain screw.

To return the filtered operating fluid from the ONF into the pump without interrupting the pump operation, an operating fluid return (optional) can be used.

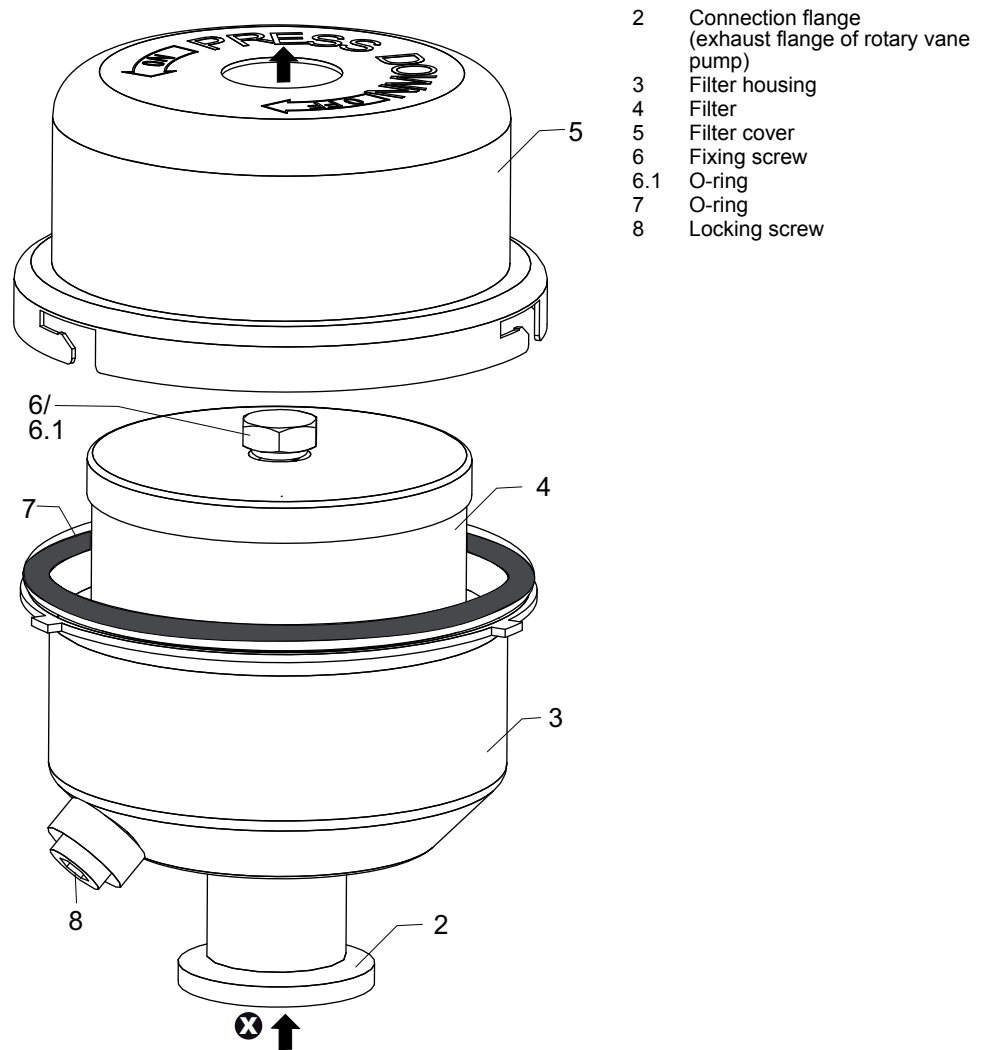


Fig. 2: ONF 16 S

Operating fluid return line

The use of the operating fluid return increases the operational safety of the pump and reduces the maintenance requirements.

Range of application

The ONF is suitable for rotary vane pumps with low gas throughput up to a pumping speed of 9 m³/h for ONF 16 S and 12 m³/h for ONF 25 S.

5 Installation

5.1 Assembly

An ISO small flange is provided on the input side for installing the ONF in a vacuum system. The flange is provided with a protective cap when delivered to protect the seals.

- ➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.
- ➔ Remove the protective cap from the connection flange.
- ➔ Place ONF on the discharge side of the pump with flange pointing downwards and fit with clamping ring (accessories), pay attention to centering ring (accessories).

5.2 Installing the operating fluid return line

ONF 16 S at gas ballast valve

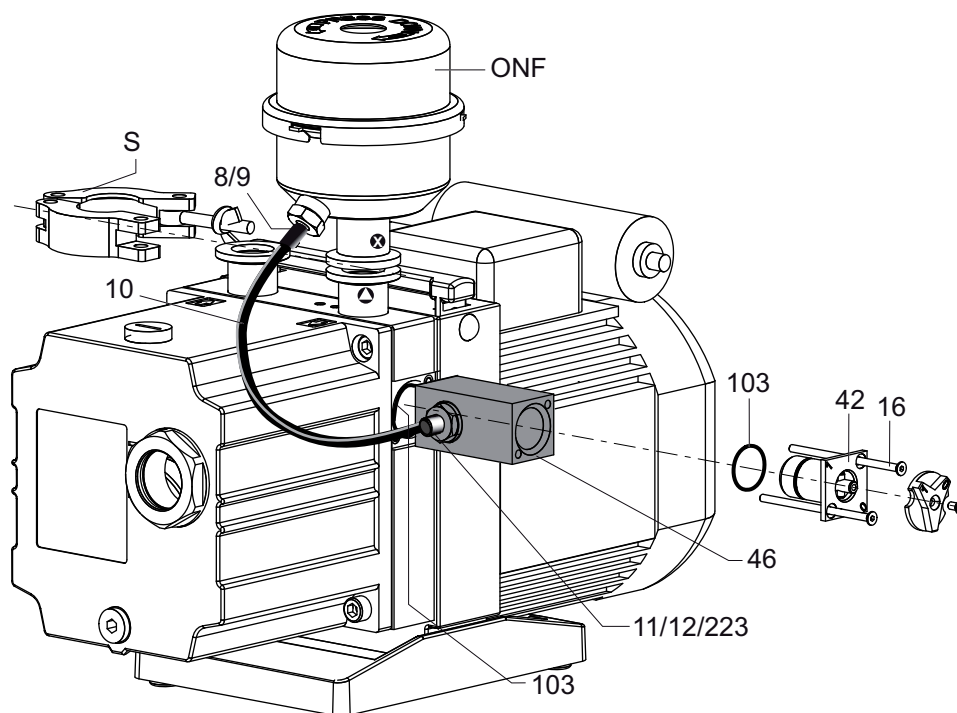


Fig. 3: DUO 2.5 Rotary Vane Pump with ONF and operating fluid return

8	Locking screw	11	Sealing ring	46	Intermediate flange
9	Fitting	12	Hose nipple	103	O-ring
10	Operating fluid return hose	16	Screws	223	Hose clip
		42	Gas ballast valve	S	Clamping ring

Note: As the hexagon socket of the **locking screw** is not metric, a **special spanner (3/16")** (provided as part of the scope of supply) is required.

- ➔ Unscrew locking screw 8.
- ➔ Drain off operating fluid if so and fill in the pump.
- ➔ Screw in fitting 9 in place of the locking screw; take care with seal ring.
- ➔ Remove gas ballast valve 42 from the pump.
- ➔ Re-fit the gas ballast valve with intermediate flange 46 and screw tight with longer screws 16; take care with O-ring 103.
- ➔ Screw in hose nipple 12; pay attention to sealing ring 11.
- ➔ Fit operating fluid return hose 10 at both sides.
- ➔ Fasten hose clip 223.
- ➔ Tighten the union nut of the screw fitting 9.

ONF 16 S at DUO 1.6 / DUO 3

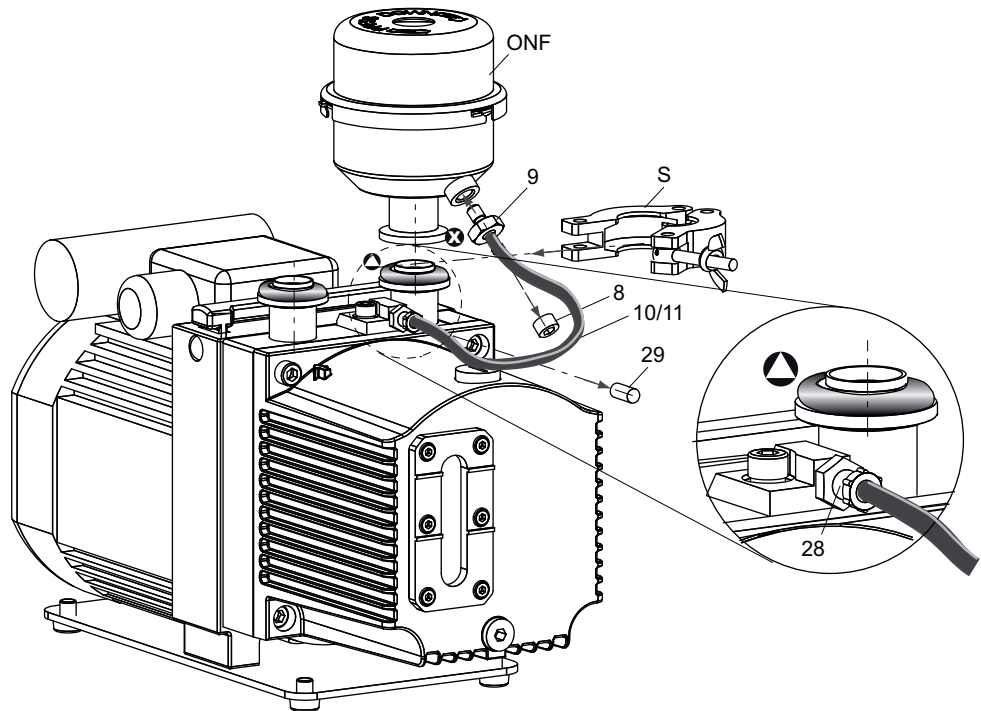


Fig. 4: ONF 16 S with operating fluid return line

8	Locking screw	11	Spring (inside the hose)	29	Locking cap
9	Fitting	28	Fitting	S	Clamping ring
10	Operating fluid return hose				

Note: As the hexagon socket of the **locking screw** is not metric, a **special spanner (3/16")** (provided as part of the scope of supply) is required.

- Unscrew locking screw 8.
- Drain off operating fluid if so and fill in the pump.
- Screw in fitting 9 in place of the locking screw; take care with seal ring.
- Loosen fitting 28 and take off locking cap 29.
- Insert spring 11 into hose 10 (anti-kink device).
- Fit operating fluid return hose 10 at both sides.
- Tighten union nut of both screw fittings.

ONF 16 S at DUO 5 M,
ONF 25 S at DUO 10 M

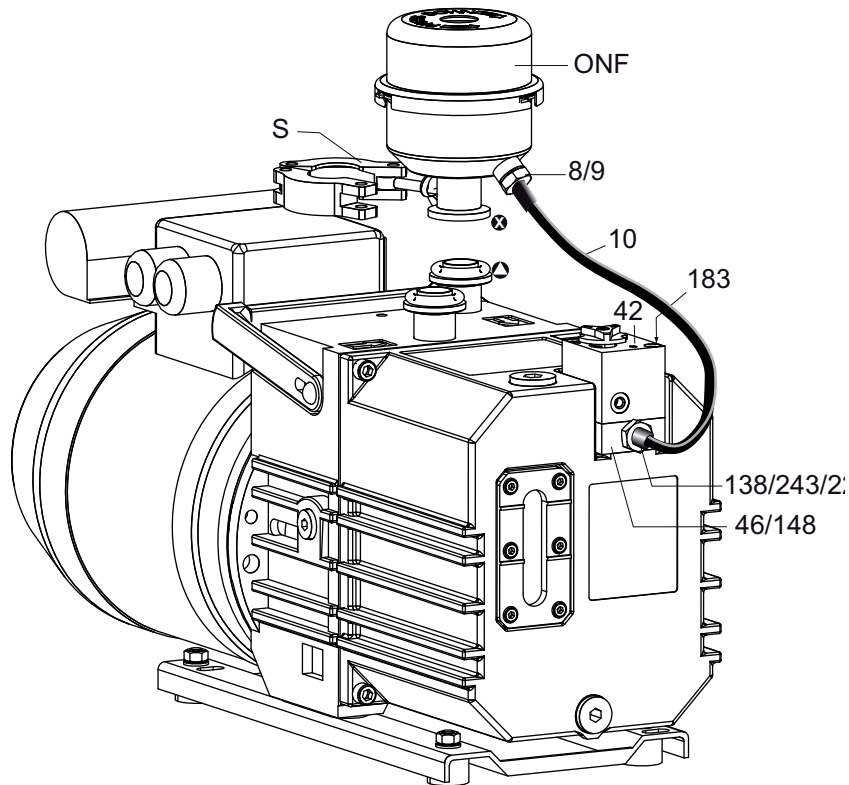


Fig. 5: DUO 5 M with ONF 16 S and operating fluid return

8	Operating fluid drain screw	46	Intermediate flange	223	Hose clip
9	Fitting	138	O-ring	243	Hose nipple
10	Operating fluid return hose	148	O-ring	S	Clamping ring
42	Gas ballast valve	183	Cylinder screw		

Note: As the hexagon socket of the **locking screw** is not metric, a **special spanner (3/16")** (provided as part of the scope of supply) is required.

- Unscrew locking screw 8.
- Drain off operating fluid if so and fill in the pump.
- Screw in fitting 9 in place of the locking screw; take care with seal ring.
- Remove gas ballast valve 42 from the pump and absorb the operating fluid underneath.
- Re-fit the gas ballast valve with intermediate flange 46 and screw tight with longer screws 16; take care with O-ring 103.
- Screw fitting/hose nipple 243 into intermediate flange 46; pay attention to O-ring 138.
- Fit operating fluid return hose 10 at both sides.
- Fasten hose clip 223.
- Tighten the union nut of the screw fitting 9.

6 Operation

When operating without operating fluid return line, the risk increases that with high gas throughput the accumulated operating fluid may flow out from the filter cover of the ONF.

- Check fill level regularly during operation.
- Drain off operating fluid if so and fill in the pump.



WARNING

Emission of toxic substances from the exhaust!

Danger of poisoning from emitted gases or vapours, which can be detrimental to health and/or can pollute the environment, depending on the particular application.

- Comply with the applicable regulations when working with toxic substances.
- Only officially approved filter systems may be used to separate and remove these substances.



NOTICE

Make sure that the return for the operating fluid works.

Operating fluid is only sucked in and returned from an operating pressure of < 100 hPa and starting from a minimum quantity of operating fluid in the ONF.

- Long evacuation phases with a high intake pressure should always be followed by operating phases with a lower operating pressure.



NOTICE

Damage to the pump due to condensate in the operating fluid!

Returned condensate generated by vapors or by temperature differences between the oil mist filter and pump impairs the quality of the operating fluid and negatively impacts the pump's final vacuum.

- Drain operating fluid built up with condensate in a time manner.

7 Maintenance

7.1 Draining the operating fluid

The intervals at which the operating fluid is drained depends on the respective operating conditions.



WARNING

Operating fluid may contain toxic substances from the pumped media!

Danger of poisoning from the emission of harmful substances from the operating fluid.

- Wear suitable protective clothing and respirators.
- Dispose of operating fluid according to the local regulations

- Unscrew locking screw 8.
- Draining the operating fluid
 - If the drained operating fluid is free of foreign material, it can be fed back to the rotary vane pump.
- Screw in locking screw 8; use new sealing tape.
- Seal the thread of the locking screw with sealing tape and screw in.

7.2 Changing the filter element

The filter element must be exchanged when the exhaust pressure increases, so that

- oil mist escapes from the gas outlet orifice of the ONF or
- the back pressure in the pump exceeds the overpressure of > 1500 hPa with the gas ballast valve open and "0" gas throughput.
 - Close (blank off using flanges) the intake port and use a suitable manometer to measure the exhaust pressure in the operating fluid fill orifice.

Dismantling

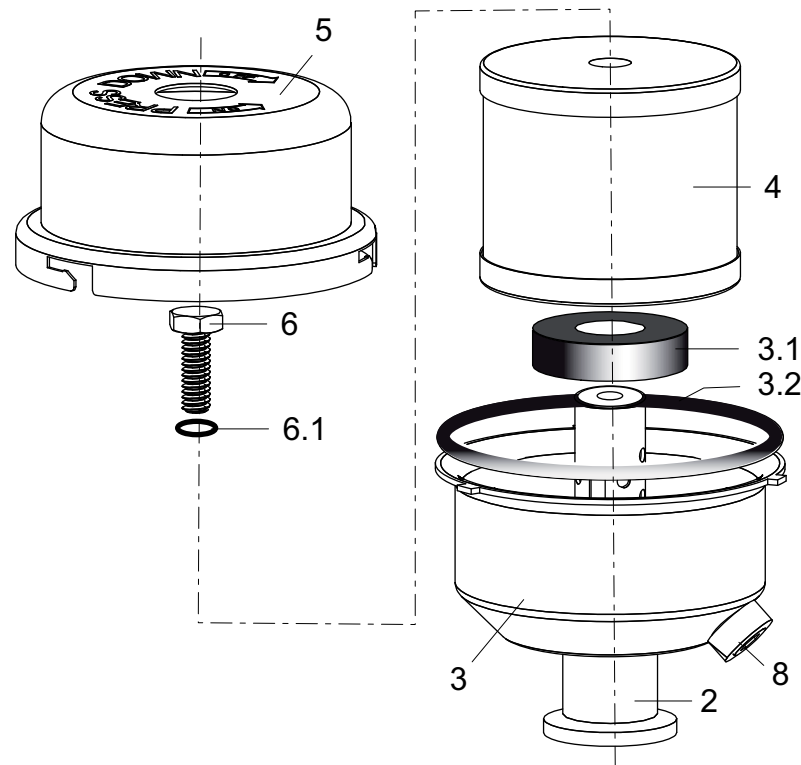


Fig. 6: ONF 16 S / ONF 25 S

2	Connection flange (exhaust flange of rotary vane pump)	3.2	O-ring	6	Fixing screw
3	Filter housing	4	Filter	6.1	O-ring
3.1	Rubber buffer	5	Filter cover	8	Locking screw

- ➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.
- ➔ Unscrew locking screw 8.
- ➔ Drain off operating fluid.
- ➔ Separate the operating fluid from the condensate.
 - If the drained operating fluid is free of contamination, it can be fed back to the rotary vane pump.
- ➔ Remove ONF from the system and pour out the remaining operating fluid.
- ➔ Undo bayonet fastening from filter cover 5 and remove cover.
- ➔ Remove fixing screw 6; pay attention to O-ring 6.1.
- ➔ Replace filter element 4; cleaning is not recommended in most cases.
- ➔ Exchange spare parts according maintenance kit
- ➔ Lightly oil all o-rings with the respective operating fluid before fitting.
- ➔ **Assembling** is carried out in reverse order.

8 Service

Pfeiffer Vacuum offers first-class service!

- Fast replacement with exchange products in mint condition
- Advice on the most cost-efficient and quickest solution

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

Maintenance and repairs in the Pfeiffer Vacuum ServiceCenter

The following steps are necessary to ensure a fast, smooth servicing process:

- 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 Pfeiffer Vacuum service address.
- 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!).
- Drain off operating fluid.
- If possible, send pump or unit in the original packaging.

Sending of contaminated pumps or devices

No units 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 directive (current version). If pumps are contaminated or the declaration on contamination is missing, Pfeiffer Vacuum performs decontamination at the shipper's expense.

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

Service orders

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

¹⁾ Forms under www.pfeiffer-vacuum.com

9 Accessories

Designation	ONF 16 S
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	PK 005 986 -T
Oil return unit from ONF 16 S / ONF 25 S to DUO 5 M / DUO 10 M	PK 005 987 -T
Oil return unit from ONF 16 S to DUO1.6 / DUO 3 / UNO 5	PK 005 990 -T

10 Technical data and dimensions

10.1 General

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	$1 \cdot 10^3$	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 Pa = 1 N/m²

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	$1.69 \cdot 10^{-2}$	$1.69 \cdot 10^{-2}$	1	$1.27 \cdot 10^{-2}$	$1.67 \cdot 10^{-2}$
Torr l/s	1.33	1.33	78.9	1	1.32
atm cm ³ /s	1.01	0.101	59.8	0.76	1

10.2 Technical data

Parameter	ONF 16 S	ONF 25 S
Degree of separation	99.98 %	99.98 %
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF
For pumping speed	max. 9 m ³ /h	max. 12 m ³ /h
Capacity	max. 100 ml	max. 20 ml
Weight	0.35 kg	0.35 kg

10.3 Dimensions

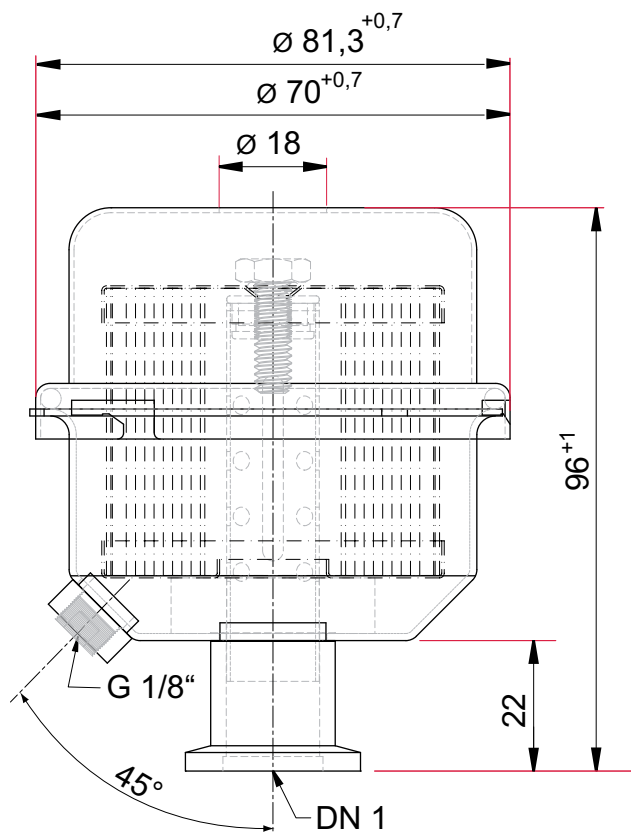


Fig. 7: ONF 16 S / ONF 25 S

Dimensions	ONF 16 S	ONF 25 S
DN1	DN 16 ISO-KF	DN 25 ISO-KF

11 Spare parts

The spare parts packages listed here are only applicable for standard models.

Please state all information on the rating plate when ordering spare parts. Other spare parts than those described in this manual must not be used without the agreement of Pfeiffer Vacuum.

11.1 Spare parts packages

Spare parts package	Model	No.	Consisting of
Maintenance kit	ONF 16 S ONF 25 S	PK E07 025 -T	3.1, 3.2, 4, 6.1

12 Disposal

Products or parts thereof (mechanical and electrical components, operating fluids, etc.) may cause environmental burden.

→ Safely dispose of the materials according to the locally applicable regulations.

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

**Are you looking for a
perfect vacuum solution?
Please contact us**

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