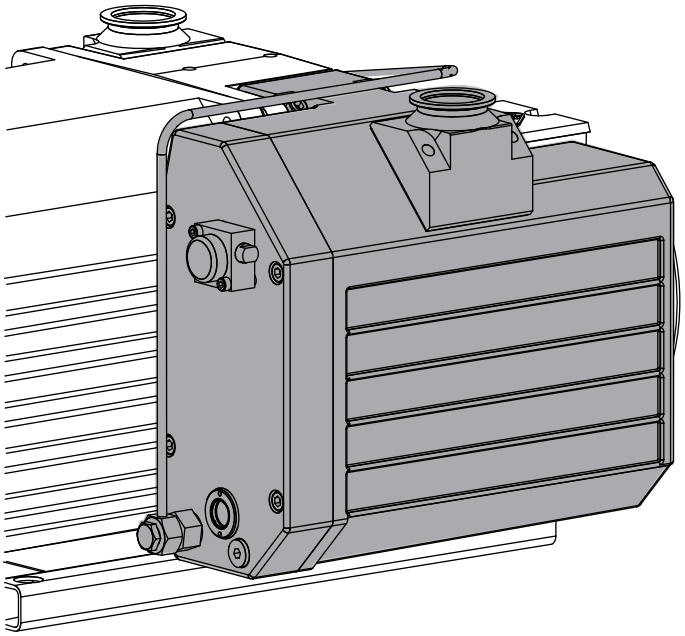
A PASSION FOR PERFECTION

PFEIFFER VACUUM



ONF/R 035/065, ONF/R 035/065 C

Oil mist filter

Operating Instructions

EN

Translation of the original instructions

PD 0053 BEN/A (1101)

1.855.882.2886

AJVS

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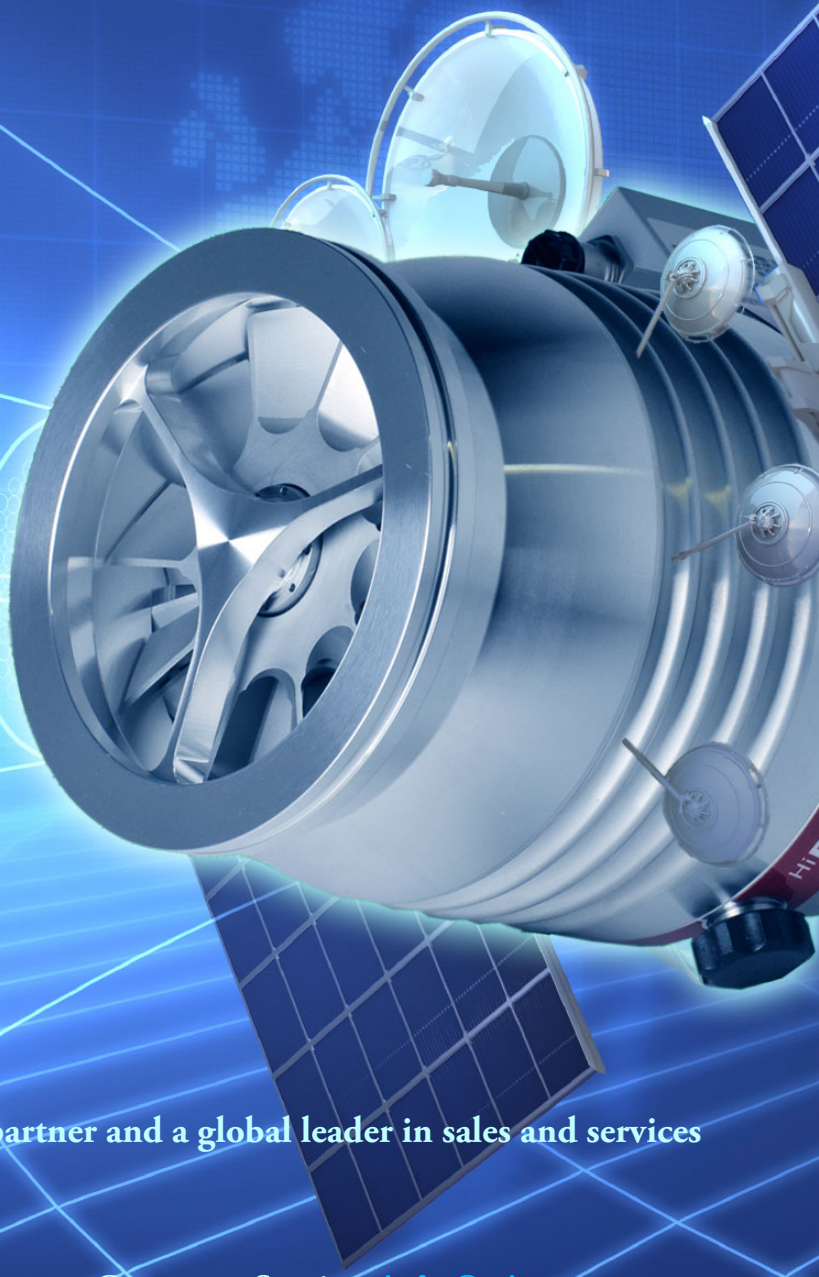

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1 About this manual

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.net.

1.2 Conventions

Safety instructions

The safety instructions in Pfeiffer Vacuum operating manuals 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:

WARNING
Possible danger Injuries or severe property damages can occur.

CAUTION
Possible danger Injuries or property damages can occur.

NOTE
Command or note Command to perform an action or information about properties, the disregarding of which may result in damage to the product.

Pictograph definitions

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.

Abbreviations used

ONF: Oil mist filter

ONFR: Oil mist filter with return unit

C version: Corrosive gas version

2 Safety

2.1 Safety precautions

NOTE

Duty to inform

Each person involved in the installation, operation or maintenance of the vacuum pump must read and observe the safety-related parts of these operating instructions.

➔ The operator is obligated to make operating personnel aware of dangers originating from the vacuum pump, the pumped medium and the entire system.

➔ 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.

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 suction capacity.

2.3 Improper use

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

➔ 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.

➔ The use of accessories, which are not named in this manual.

3 Transport and storage

3.1 Storage

The ONF should be stored dry and protected from moisture. The filter inserts can absorb moisture, and the lubrication properties of the oil and hence the end 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.

- Model and model number
- Date of manufacture

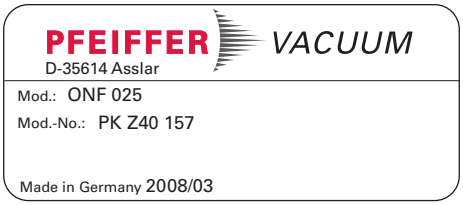

Fig. 1: Product identification on the rating plate

Variants

In addition to the standard version the oil mist filters are also supplied in a helium-tight version and a corrosive gas version.

The oil mist filters are supplied with a relief pressure valve standard.

Type	Versions	Characteristics
ONF 35/65	Standard model	
ONF 35/65	Helium-tight model	• Leak tested: < 1 • 10^{-5} mbar l/s
ONFR 35/65	Version with operating fluid return line	
ONF 35/65 C	Corrosive gas model	Differences from the standard model: – Sight glass of PCTFE – Filter elements of sintered carbon – Leak tested: < 1 • 10^{-5} mbar l/s
ONFR 35/65 C	Corrosive gas model with operating fluid return line; applicable for pump model MC	Differences from the standard model: – Sight glass of PCTFE – Filter elements of sintered carbon – Leak tested: < 1 • 10^{-5} mbar l/s

Range of application

The oil return unit operates without auxiliary power and is capable of operating in the final vacuum range of 800 mbar intake pressure (at 1000 mbar air pressure). Moreover, its operation is not affected by rotational speed, gas ballast application or built-up exhaust-side pressure. During dynamic pump-down cycles such as load lock applications involving small volumes extended pump-down times are to be expected for intake pressures < 5 • 10^{-2}.

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 elements are installed in a corrosion-resistant aluminum casing and consist of a cylindrical filter made from glass/polyester fleece in the standard and helium-tight versions, or from sintered carbon in the corrosive gas version. A baffle is also fitted over the filter insert. An integrated pressure relief valve opens when the filter elements are excessively contaminated. The volume of filtered operating fluid can be viewed through a sight glass and drained via 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.

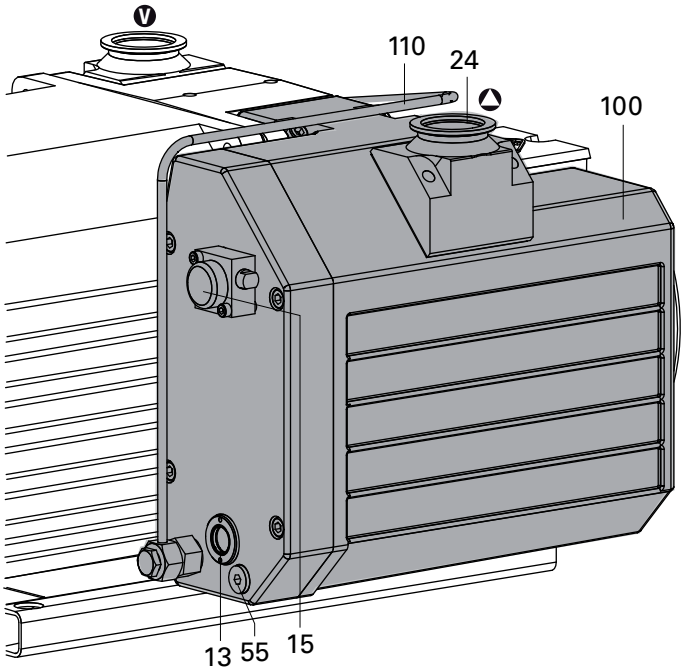

Fig. 2: DUO 35/65 with oil mist filter ONFR

13	Sight glass	24	Interchangeable flange	100	Oil mist filter
15	Filter element saturation indicator	55	Operating fluid drain screw	110	Operating fluid return line

Operating fluid return line

If the operating fluid accumulated in the ONF reaches a specified level, a float valve opens and the operating fluid is channeled via intake pressure back into the rotary vane pump´s intake side. Condensate concentrates underneath the oilpan and has to be drained when necessary so as not to impair the operation of the pump.

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

5 Installation

5.1 Assembly

To install the ONF in a vacuum system, flange connections are provided on the input side and output side. The flanges are provided with protective caps when delivered to protect the seals.

WARNING

Poisonous substances exit from the exhaust!

There is a poisoning hazard from discharged gases or vapours that can be hazardous and/or polluting during use.

➔ Install and run the exhaust line so that overpressure cannot build up inside it.

➔ Follow the vacuum pump installation instructions in the respective operating instructions.

NOTE

Risk of the filter elements becoming blocked with resin!

When pumping gases and vapors with a tendency towards polymerization, the ONF filter elements can become resinified.

➔ Observe the corresponding safety devices such as the saturation indicator or pressure relief valve.

➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.

➔ Unscrew screws 46 and dismantle the interchangeable flange 24 on the exhaust side of the rotary vane pump.

➔ Fit interchangeable flange 24 to the exhaust side of the ONFR, being careful with O-ring 60 and spring washers 57.

➔ Mount the ONF on the pump in place of the interchangeable flange 24.

➔ Lay exhaust line from the ONF sloping downward so that no condensate can flow back.

– If an air trap is created in the system, then a device for draining condensation water must be provided at the lowest point.

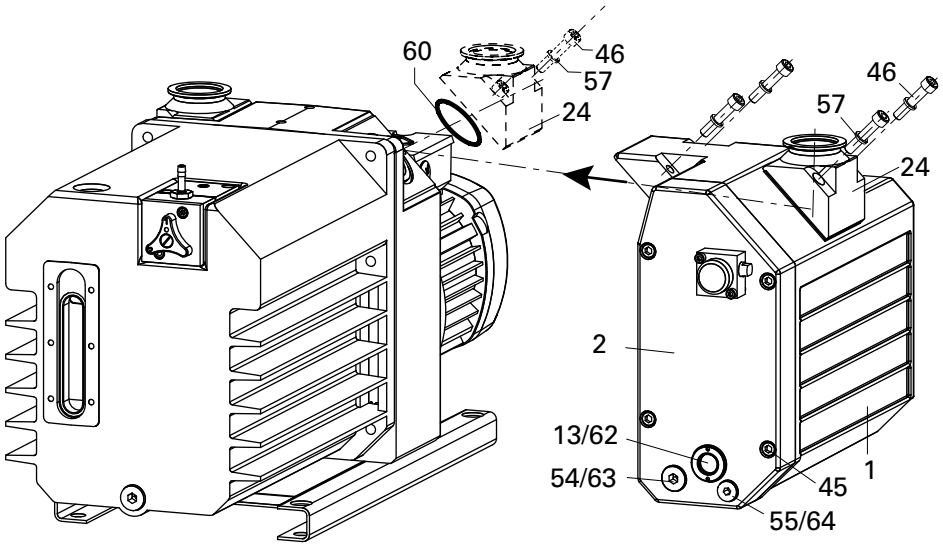

Fig. 3: Assembling the ONF

1	Casing	45	Screws	57	Spring washer
2	Cover	46	Screws	60	O-ring
13	Sight glass	54	Screw plug	63	O-ring
24	Interchangeable flange	55	Operating fluid drain screw	64	O-ring

5.2 Installing the operating fluid return line

Retrovit kit: PK 005 950 -T

Prior to conversion work check the pump's final pressure to get a reference value. For this purpose, measure the final pressure at the intake side with a vacuum gauge (e.g. Pirani).

Assembly

NOTE

Make sure that the return for the operating fluid works.

Operating fluid is only sucked in and returned from an operating pressure of < 800 mbar and starting from a minimum quantity of operating fluid in the ONF.

➔ Fill in additional operating fluid in order to ensure the return of operating fluid.

NOTE

Escaping operating fluid!

Slip hazard and workplace contamination from spilled operating fluid.

➔ Place suitable container underneath and collect escaping operating fluid.

➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.

➔ Screw out the operating fluid drain screw 55; pay attention to the O-ring 64.

➔ Drain off operating fluid if so and fill in the pump.

➔ Screw in operating fluid drain screw 55; pay attention to O-ring.

➔ Unscrew screws 45 and remove cover 2 with the filter elements from casing 1, then take up any remaining operating fluid and clean the cover if necessary.

➔ Unscrew screw plug 54 .

➔ Screw reducing piece 25 with O-ring 63 into cover 2 from the outside.

➔ Lightly lubricate sealing nipple 37 and manually press into the hole in cover 2.

➔ Push cylinder bolt 38 into floating support 35.1.

➔ Insert the floating support and cylinder bolt 38 into the groove in cover 2 and mount terminal board 36 using screw 48.

– Floating support 35 should be able to move slightly.

➔ Replace cover 2, being careful with flat seal 3.

➔ Unscrew and remove locking screw 142 on the support.

➔ Screw reducing piece 25 wtih O-ring 63 into connection 4 on the pump support while ensuring that the sealing surfaces are clean.

➔ Fit oil return system pipe 27 onto the two reducing pieces using hollow screws 28, being careful with O-rings 67.

➔ Check the pump's final pressure to ensure a leakproof assembly;

– compare the measurement result with the previously determined final pressure.

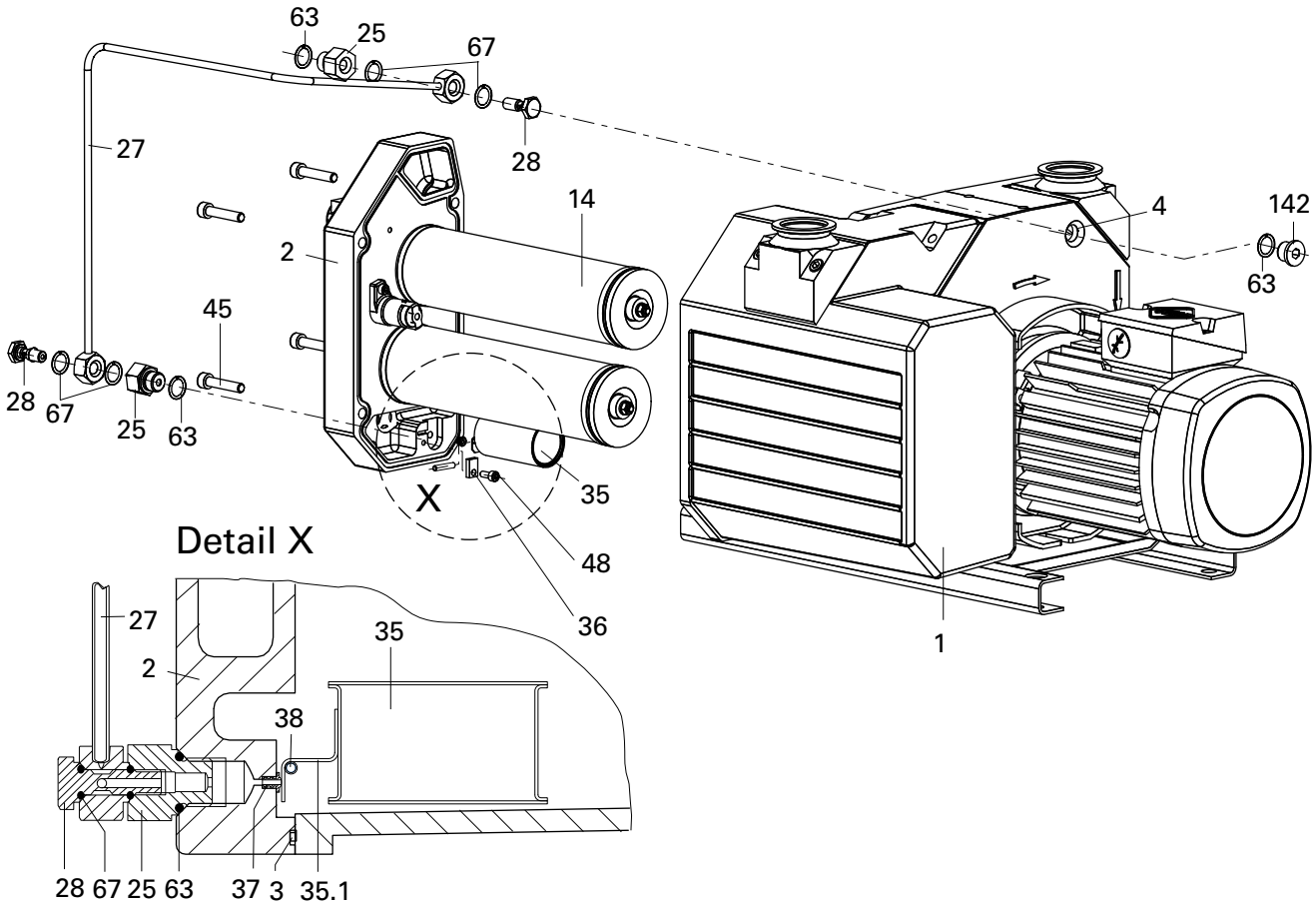

Fig. 4: Installing the operating fluid return line

1	Casing	27	Operating fluid return line	38	Cylinder bolt
2	Cover	28	Hollow screw	45	Screws
3	Flat seal	35	Floater	48	Screw
4	Connection operating fluid return line	35.1	Floater holder	63	O-ring
		36	Clamping plate	67	O-ring
14	Filter element	37	Sealing nipple	142	Locking screw
25	Reducing piece				

6 Operation

NOTE

The very smallest of oil particles can only be filtered to a limited degree!

The level of filtering by the filter elements depends on the gas throughput and the particle distribution in the gas flow.

➔ Use the visual saturation indicator as an guide to the degree of saturation of the filter elements.

➔ Replace the filter elements when the exhaust pressure increases to the point that the indicator enters the red area of visual saturation indicator 15.

NOTE

Pay attention to the back pressure in the C version!

There is a greater back pressure in the C version than with the standard version.

➔ The saturation indicator only displays the correct saturation level of the filter elements at pressures <600 mbar.

NOTE

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

If the accumulated operating fluid in the ONF is above the top edge of the sightglass 13, the operating fluid must be drained.

The intervals at which the operating fluid is drained depends on the 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

WARNING

Toxic vapours!

Danger of poisoning when igniting and heating synthetic operating fluids (e.g. F4/F5) above 300°C.

➔ Observe the application instructions.

➔ Do not allow operating fluid to make contact with tobacco products; observe safety precautions when handling chemicals.

➔ Check the operating fluid level in the sightglass.

➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.

➔ Ensure that the exhaust line is depressurized.
➔ Screw out the operating fluid drain screw 55; pay attention to the O-ring 64.
➔ 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.
➔ Screw in operating fluid drain screw 55; pay attention to O-ring.
➔ Dispose of condensate according to the respectively valid legal requirements.

Operating fluid return line

Due to the automatic operating fluid return, it is not necessary to drain the operating fluid manually.

However, depending on the process, filtered condensate in the oil sump should occasionally be drained in the ONF, since it could enter the operating fluid return to the pump.

7.2 Changing the filter element

WARNING

Contamination of parts and operating fluid by pumped media is possible.

Poisoning hazard through contact with materials that damage health.

➔ In the case of contamination, carry out appropriate safety precautions in order to prevent danger to health through dangerous substances.

➔ Decontaminate affected parts before carrying out maintenance work.

Dismantling

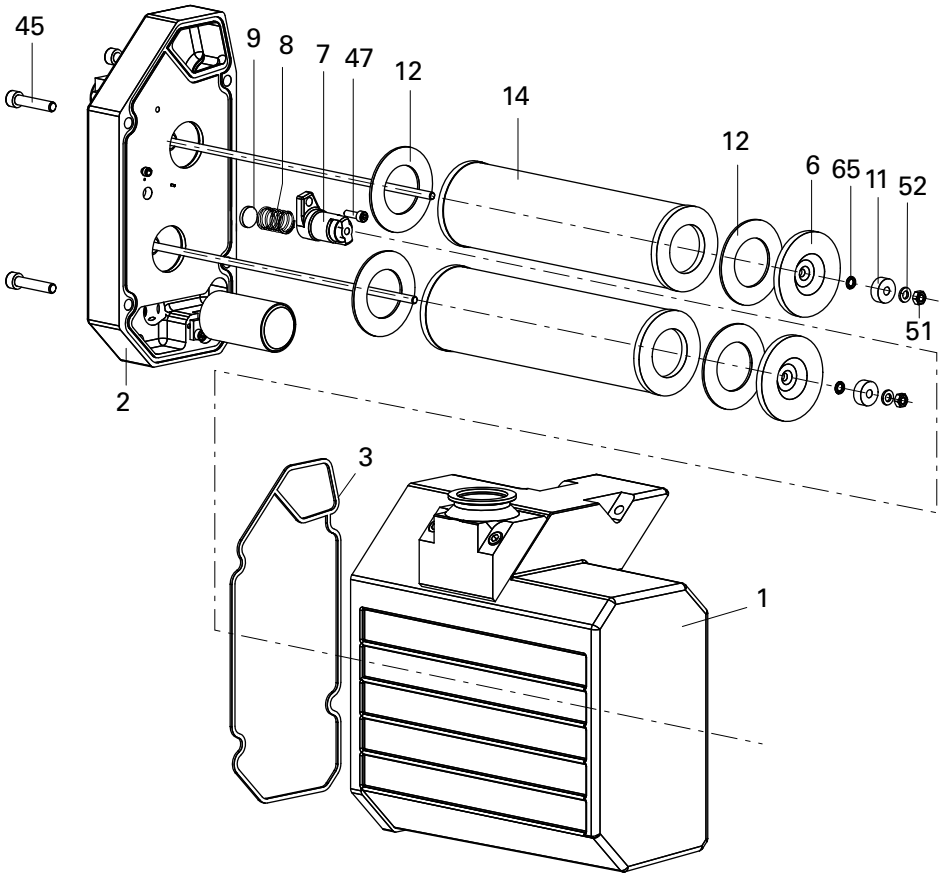

Fig. 5: Changing the filter elements

1	Casing	8	Compression spring	45	Screws
2	Cover	9	Valve plate	47	Screws
3	Flat seal	11	Pressure piece	51	Nut
6	Filter cover	12	Seal	52	Washer
7	Valve casing	14	Filter element	65	O-ring

➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool, if necessary.

➔ Screw out the operating fluid drain screw 55; pay attention to the O-ring 64.

➔ 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 the oil return system pipe, if installed.

➔ Remove ONF from the system and pour out the remaining operating fluid.

➔ Unscrew screws 45 and remove cover 2 with the filter elements from casing 1, then take up any remaining operating fluid and clean the cover if necessary.

➔ Unfasten nuts 51, remove washer 52, pressure piece 11, O-ring 65 and filter cover 6being careful with seal 12.

➔ Replace filter elements 14; cleaning is not recommended in most cases.

Dismantling the pressure relief valve

➔ Remove screw 47, dismantle valve casing 7 with the valve buffer 9 and pressure spring 8.

➔ Clean all parts and inspect for wear.

➔ Check the sealed surface of valve buffer 9; replace if necessary.

– When assembling lightly oil valve buffer and ensure the correct seating in the valve housing 7.

Cleaning

Only in the C version can the filter elements be cleaned; the elements in the standard version must be replaced. The success of the cleaning process depends on the process medium being used, and should be tested by the user for the specific situation.

WARNING

Explosion hazard

The use of volatile or combustible cleaning agents in vacuum systems can lead to explosive vapour-air mixtures.

➔ After cleaning ventilate and dry components adequately and let dry completely.

➔ Clean the filter insert in a solvent bath.

➔ Use blasts of compressed air to expel the cleaning agent from the filter element, and then dry them.

Assembling

➔ **Assembling** is carried out in reverse order.

➔ Tighten the filter elements at a torque of 3 ... 5 Nm.

– Ensure the correct seating of the seal 12.

➔ Fill in additional operating fluid in order to ensure the return of operating fluid.

➔ Check the pump's final pressure to ensure a leakproof assembly;

– compare the measurement result with the previously determined final pressure.

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.net (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.

9 Accessories

Optoelektronische Sättigungsanzeige für die Filterelemente: P 0991 684

1) Forms under www.pfeiffer-vacuum.net

10 Technical data

Parameter	ONF 35/65	ONFR 35/65	ONF 35/65 C
Degree of separation	98 %	98 %	98 %
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Pressure max. (absolute)	1.5 bar	1.5 bar	1.5 bar
For pumping speed	35-65 m^3/h	35-65 m^3/h	35-65 m^3/h
Capacity	0.7 l	0.7 l	0.7 l
Weight	11 kg	11 kg	11 kg

10.1 Dimensions

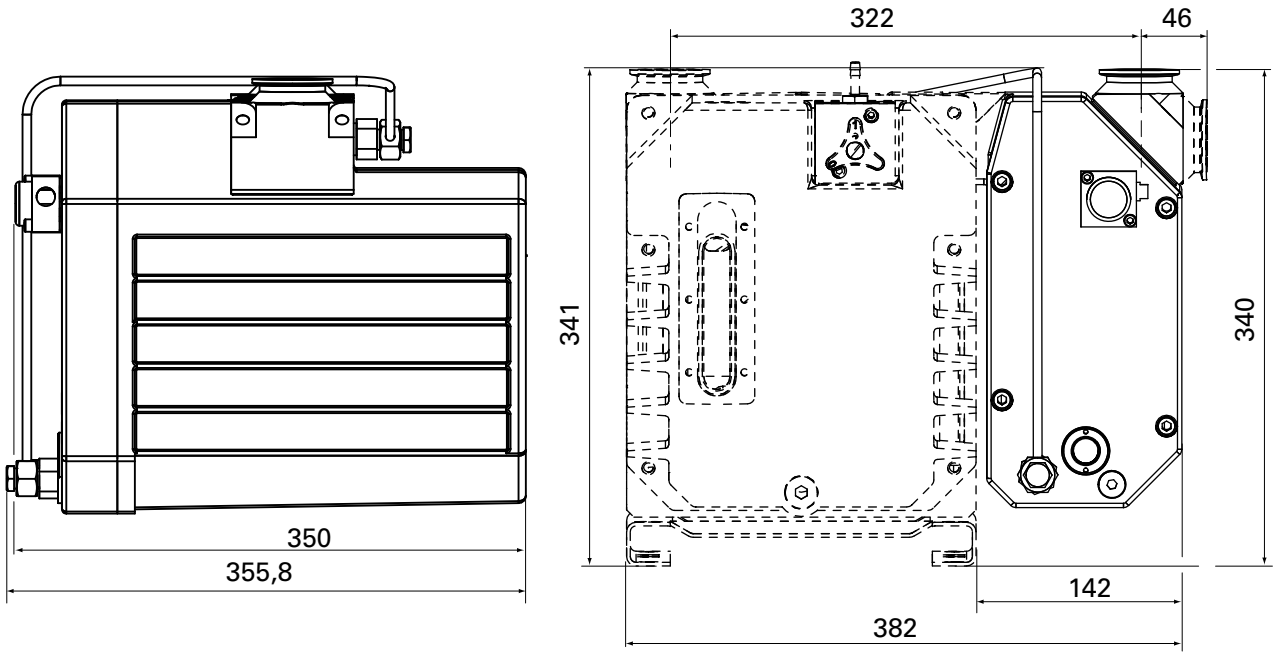

Fig. 6: ONFR 35/65

11 Spare parts

Please also specify model number of the the rating plate when ordering accessories or spare parts.

11.1 Spare parts packages

Spare parts package	No.	Model	Procedure	Consisting of
Maintenance kit	PK E27 001 -T	ONF standard	Replacing the filter elements	3, 14, 65, 12, 67
	PK E27 002 -T	ONF C version	Replacing the filter elements	3, 14, 65, 12, 67
Overhaul kit	PK E27 003 -T	ONF standard	Replacing the filter elements and seals	3, 9, 13, 14, 60, 62, 63, 64, 65, 66, 67
	PK E27 004 -T	ONFR standard	Replacing the filter elements and seals	3, 9, 13, 14, 37, 60, 61, 62, 63, 64, 65, 66, 67
	PK E27 005 -T	ONF C version	Replacing the filter elements and seals	3, 9, 13, 14, 60, 62, 63, 64, 65, 66, 67
	PK E27 006 -T	ONFR C version	Replacing the filter elements and seals	3, 9, 13, 14, 37, 60, 61, 62, 63, 64, 65, 66, 67
Retrofit kit for operating fluid return line to suction side	PK 005 950 -T	ONF standard and C version		
Conversion kit for converting the operating fluid return line from gas ballast valve to suction side	PK 005 951 -T	ONF standard and C version		

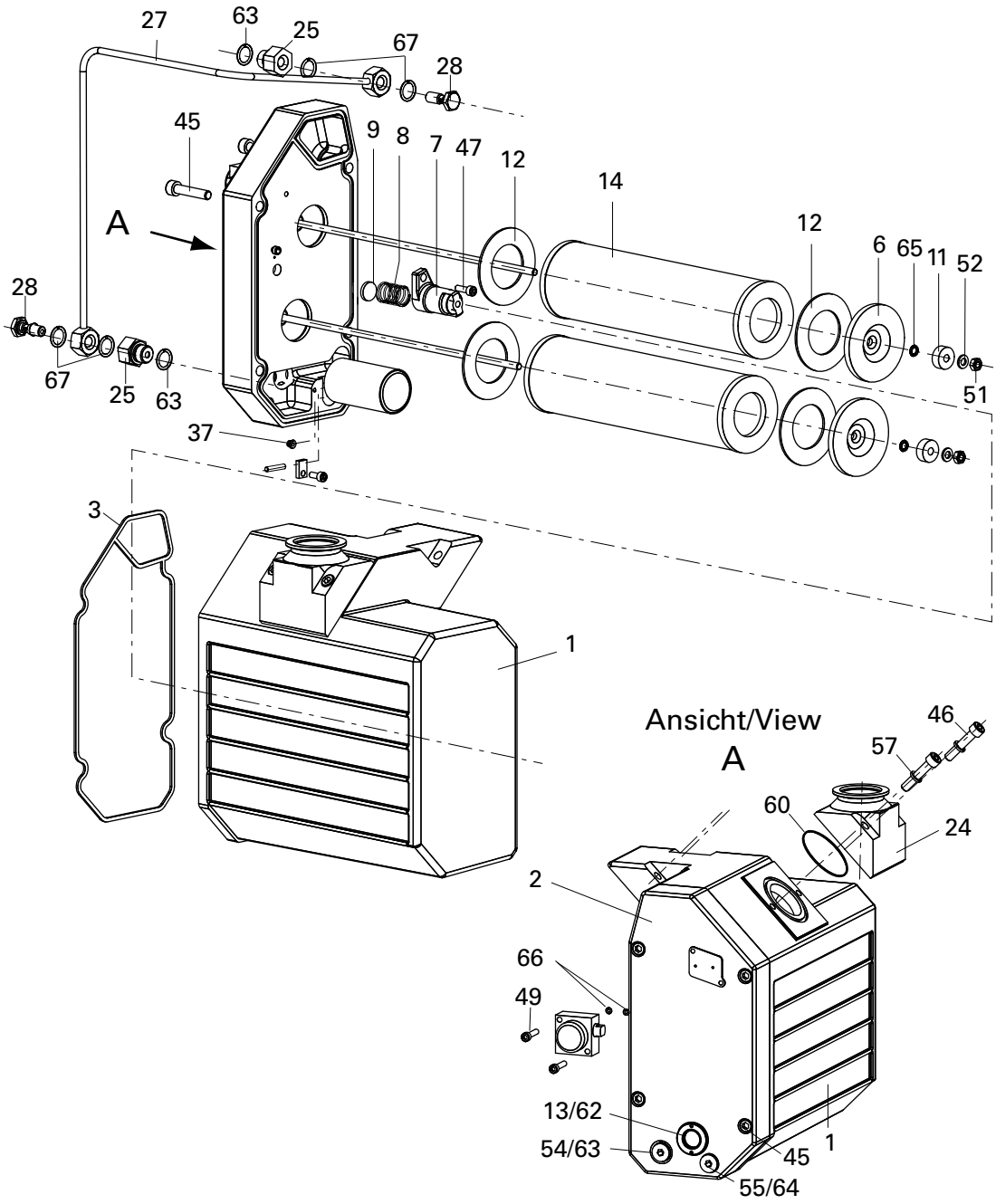

Fig. 7: ONFR 35/65

1	Casing	24	Interchangeable flange	54	Screw plug
2	Cover	25	Reducing piece	55	Operating fluid drain screw
3	Flat seal	27	Operating fluid return line	57	Spring washer
6	Filter cover	28	Hollow screw	60	O-ring
7	Valve casing	37	Sealing nipple	62	O-ring
8	Compression spring	45	Screws	63	O-ring
		46	Screw	64	O-ring
9	Valve plate	47	Screws	65	O-ring
11	Pressure piece	49	Screw	66	O-ring
12	Seal	51	Nut	67	O-ring
13	Sight glass	52	Washer		
14	Filter element				

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.