



OPERATING INSTRUCTIONS

EN

Translation of the original instructions

ES 25S

External silencer

PFEIFFER  **VACUUM**

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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 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.

This manual covers products with the following part numbers:

Part number	Description
109873	ES 25S External silencer

1.1.1 Applicable documents

Operating Instructions	Part Number
Dry compact Multi-stage Roots pump ACP 28-40	112369*
Dry compact Multi-stage Roots pump ACP 15	123884*

*also available at www.pfeiffer-vacuum.com

1.2 Conventions

1.2.1 Safety instructions

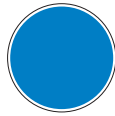
Operating manual safety instructions Pfeiffer Vacuum are based on the UL, CSA, ANSI Z-535, SEMI S2, ISO 3864 and DIN 4844 certification standards. This document describes the following information and danger levels:

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.

1.2.2 Pictographs



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

→ Work instruction: here you have to do something.

ES : External silencer

⓪ Aspiration

Ⓛ Refoulement

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.

→ Comply with all safety and risk prevention instructions in accordance with local safety standards.

→ Regularly check compliance with all precautionary measures.

2.2 Protective equipment

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



DANGER

Health risk due to contact with toxic materials

The vacuum pump, pumping line components, and operating media may be contaminated with toxic, corrosive, reactive, or radioactive materials, depending on the process.

→ Wear appropriate safety equipment when pump is disconnected for maintenance, while it is being re-installed, and during filling and draining of operating media.

2.3 Proper use

The ES is used only to reduce noise at the exhaust of multi-stage roots pumps.

→ The ES is used only with Air cooled multi-stage Roots pumps, ACP type for which it is compatible (see 1.1.1).

- The ES is installed at the exhaust of multi-stage Roots pumps, type ACP standards, models SD, G.

2.4 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:

- connection to multi-stage Roots pumps, ACP type, models CV.
- connection to pumps and devices for which it is not intended,
- connection to devices uninsulated electrically,
- use of accessories or spare parts, which are not named in this manual
- use of the ES on corrosive pumping applications
- the applications of the microelectronics, LPCVD, LTO because non compatibility with the filter elements,
- use of the ES 25S on pumping applications with flammable products such as oxygen, silane,
- use for applications:
 - drying,
 - freeze drying,
 - pumping condensable vapors,
 - impregnation with polymeric resins,
 - debubbling monomers.

3 Transport and storage

3.1 Storage

The filter element inserted in the ES can absorb moisture.

If the new product must be stored:

- Store the product in a dry place in its original packaging.
- Store the product at storage temperatures (+5 / +65°C).
- Make sure that the filter element is not crushed during storage.

Before using the ES, make sure that the valve is not stuck on the filter element.

If the product was unpacked, used, or stored for a long period (> 1 year):

- Proceed to its maintenance by replacing the filter element (see 7).

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.

4.1.1 Scope of delivery

Supplied with	Reference	Part Number
1 centering ring DN 25 ISO-KF	C	
1 O-Ring DN25 ISO-KF Nitrile	D	
1 quick connect clamp DN 25 ISO-KF	E	
1 centering ring DN 16 ISO-KF	F	
1 O-Ring DN 16 ISO-KF Nitrile	G	
1 quick connect clamp DN 16 ISO-KF	H	
1 elbow fitting	A (see 5.2)	104113
1 straight reducer DN 25 ISO-KF / DN 16 ISO-KF	B (see 5.2)	068510
1 operating manual		

4.2 Function

The ES, mounted on the exhaust of an ACP pump, significantly reduces the noise level of the pump during high-pressure pumping phases on clean applications. Noise reduction (-12 dBA) when pump is at atmospheric pressure.

The ES includes a safety valve calibrated at 500 hPa relative which avoids any overpressure in the tank of the pump when the filter element is saturated

5 Installation

5.1 General



WARNING

Poisonous substances exit from the exhaust!

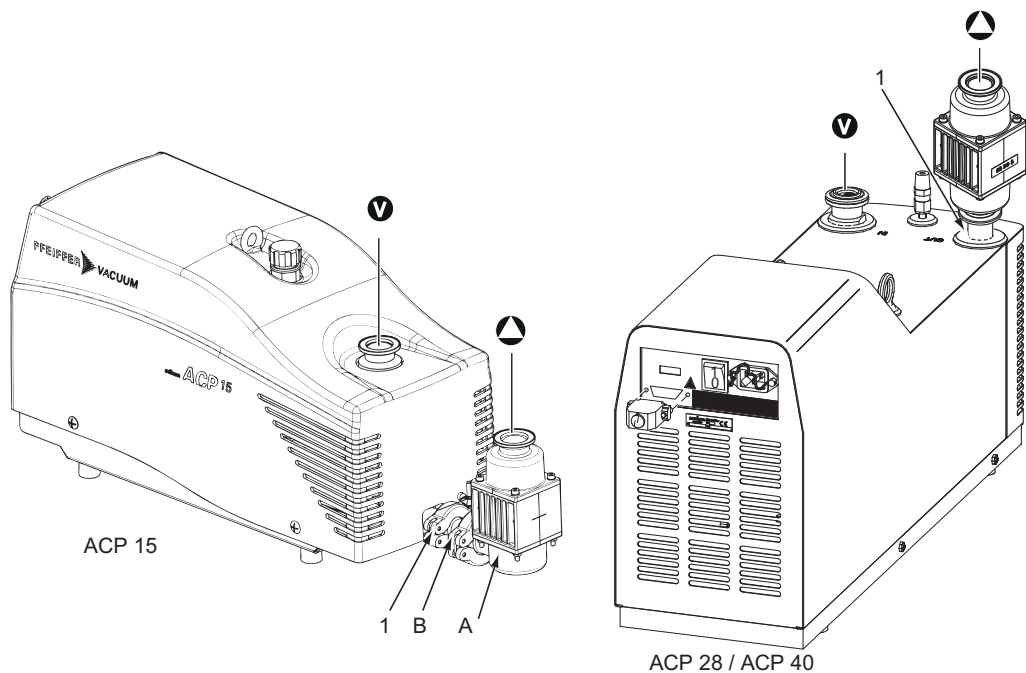
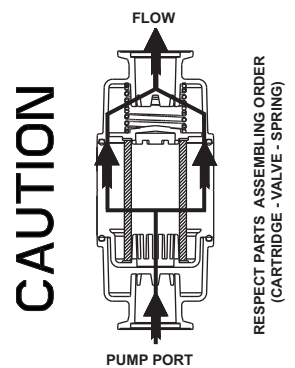
There is a poisoning hazard from discharged gases or vapors that can be hazardous and/or polluting during use.

- 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.
- Perform the installation on the pump stopped and off.
- Use connection accessories provided with the ES.
- Use accessories on the inlet and exhaust lines whose materials and sealing properties are compatible with gases being used.
- Provide in the pumping line, accessories to isolate the pump from the vacuum and exhaust line, to make the maintenance easier (inlet and exhaust isolation valves, purges,...).
- Remove the blanking plates blocking the inlet and exhaust ports.

5.2 Assembly

- Install the ES to the pump's exhaust respecting the assembling direction (see label).
- Use the ES with the elbow fitting (A) for the ACP 15 model.

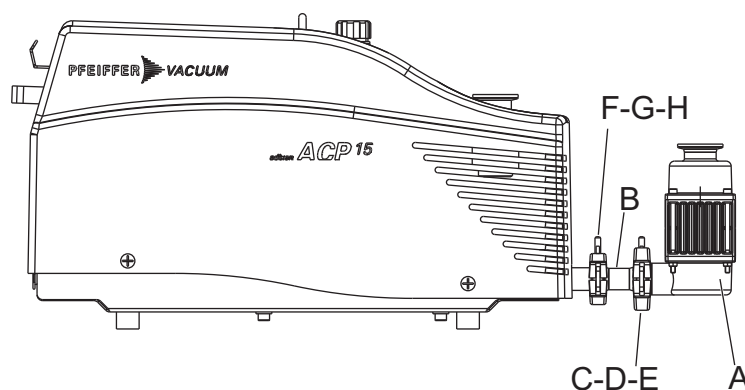
If the ES 25S silencer is connected to a chimney or to an exhaust duct, care should be taken to ensure that the head loss of these equipment does not exceed 500 hPa.



1	Pump exhaust
A	Elbow fitting
B	Straight reducer DN 25 ISO-KF / DN 16 ISO-KF (for adaptation on ACP 15)
☯	Silencer exhaust
V	Pump inlet

5.2.1 Mounting the elbow fitting for ACP 15 use

For use on the ACP 15, it is necessary to adapt the elbow fitting to the ES 25S and the straight reducer DN25 ISO-KF / DN 16 ISO-KF.



- Unscrew the 4 nuts (15) (see 10), by manually pressing on each end of the ES 25S (to avoid sudden release of the spring), and remove the 4 screws (13).
- Remove the lower end (2b) opposite side to the spring.
- Replace the lower straight nipple by the elbow fitting (A).
- Assemble using the mounting screws (13), washers (14) and the nuts (15) and apply a torque of 2 N·m.
- Assemble the straight reducer DN 25 ISO-KF /DN 16 ISO-KF, using the connection accessories provided with the ES 25S or ordered separately (see Pfeiffer Vacuum products catalogue) (see 4.1.1), (see 10).
- Insure sealing's assembling.

6 Operation

CAUTION

Do not reuse an ES 25S that has been stored for a long period (> 1 year) without first performing maintenance on it and replacing its filter element.

WARNING

Risk of overpressure
 At the pump exhaust, the discharge circuit must be such that the resulting overpressure in the oil case is as low as possible. The maximum overpressure recommended for correct pump operation is 500 hPa. A slight negative pressure in the oil case (100 to 200 hPa), at the exhaust, will prevent gases from accumulating and reduce pump corrosion and pollution.
 When the ES is installed to a pump exhaust, check periodically that:

- the exhaust valve is not clogged and does not prevent the operation of the ES's valve,
- the exhaust valve operates to avoid overpressure in the oil case.



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.

Commissioning

- Turn the pump on.

Filter element saturation

Increase of the noise level over time may mean that the filter element is saturated. When the filter element is saturated, proceed to its replacement (see 7).

Decommissioning

- Stop the pump.
- Bring the pump back to the atmospheric pressure and let the pump cool down.
- Make sure the exhaust pipe is not under pressure.

7 Maintenance / replacement

7.1 Precautions



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.

DANGER

Risk to the health in the event of contact with toxic substances

During pump disconnection, operator could be in contact with process residues on the exhaust that could cause severe injury or death.

→ Take the appropriate safety measures to prevent injury. Consult the department manager for instructions and safety information.

- Wear gloves, goggles, a respirator or other appropriate safety equipment.
- Ventilate well the premises or work under an extract hood.
- Do not dispose of residues in the usual network. Call on a qualified agency for their destruction.
- Spray the system with dry nitrogen before working on it.
- Do not discard the used filter element in the usual network; seek a competent agency for its destruction.
- Set up the blanking plates at the inlet and exhaust of the pump (supplied with the product).

7.2 Dismantling

When the filter element is saturated, proceed to its change as follows : (see 10)

- Remove the ES from the pump, and disassemble it on a workbench.
- Loosen the 4 nuts (15), by pressing manually on each end of the ES (**to avoid sudden release of the spring**), and remove the 4 screws (13) and washers (14).
 - Remove the reducer (B) if installed.
- Remove successively and in the following order, the straight nipple (2) and its O-ring (7), the spring (5), the valve (4), the filter element (8) the lower body (2b) (or elbow fitting (A) if ACP 15) and its O-ring (7).

7.3 Cleaning

WARNING

A used filter element must not be cleaned. It must be systematically replaced with a new one.

→ Elastomer seals must always be replaced by new seals.

Proceed as follows:

For model pumps
V6SHxxxxxx and
V8SHxxxxxx

After using mineral or synthetic oil, clean the parts with a solvent, mineral-based in accordance with the legislation in force, for example, the type **AXAREL**¹⁾, **CARE-CLEAN**²⁾, **PREMACLEAN**³⁾, **NAPHTESOL**⁴⁾.

- 1) Registered trademark DUPONT DE NEMOURS
- 2) Registered trademark CASTROL
- 3) Registered trademark DOW
- 4) Registered trademark NIPPON OIL CORPORATION

For model pumps
V6xxxxxxx and
V8xxxxxxx

- Clean when cold or hot (max. 45°C) by dipping or using a lintfree cloth.
- Vacuum dry in a ventilated heating chamber then,.

After use in (perfluorinate) synthetic oil, clean the components in a solvent such as **GALDEN S 90¹⁾** and proceed as follows:

- Clean when cold by dipping or using a lintfree cloth.
- Dry the components in the open air or using compressed air.

7.4 Reassembly

- Install the flat ring (6) in the base of the body (1).
- Position the filter element (8) so that it rests on the flat ring (6) in the body (1).
- Mount the new O-ring (7) on the lower and upper nipples.
- Mount the flat ring (6) on the valve (4) and install the unit on the filter element, with the flat ring resting on the filter element.
- Install the spring (5) on the valve (4): for mounting see direction on the label (see 5.2)
- Position the body thus assembled (1) on the lower nipple (2b) (or elbow fitting (A) if ACP 15).
- Assemble the upper nipple (2) on the spring (5) and assemble using the mounting screws (13), (14), (15).
- Tighten in cross and apply 2 N·m of torque.
- Connect the ES to the pump exhaust port (by means of the supplied accessories) (see 5.2).

8 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.

Our products contain various materials which must be recycled (see 10).

Take special care for:

- fluoroelastomers which may breakdown if they are subjected to high temperatures.
- components in contact with the products resulting from the processes which may have been contaminated.

9 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 (Service).

¹⁾ Registered trademark MONTEDISON

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.

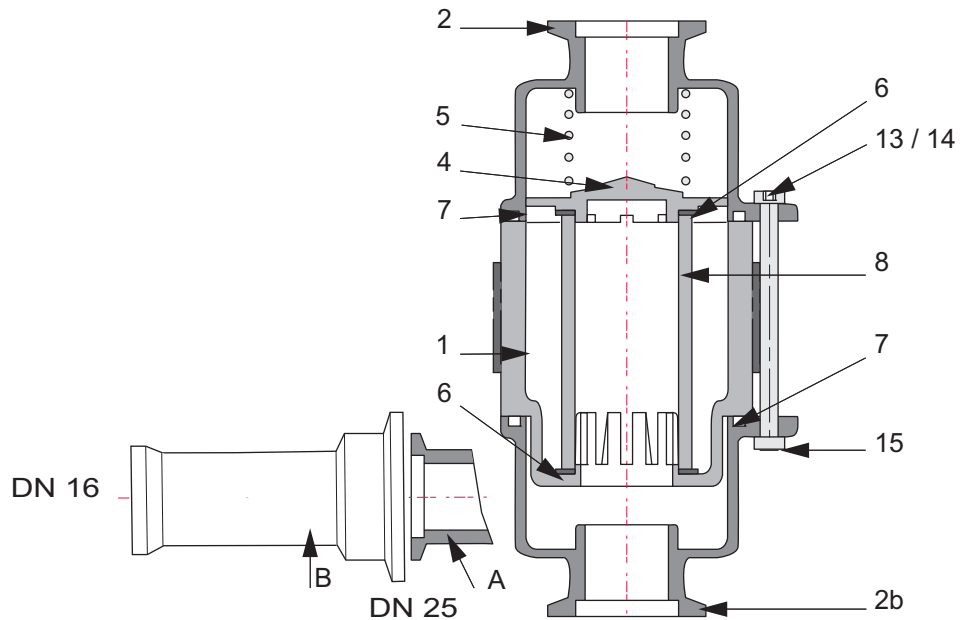
10 Spare parts

Ref.	Designation	Material	Quantity	Part Number
1	Body	Polyamid	1	-
2 & 2b	Upper Nipple	Polyamid	1	-
4	Valve	Polyamid	1	-
5	Spring	Stainless Steel	1	-
13	Screw CHC	Steel	4	-
14	Washer	Steel	8	-
15	Nut	Steel	4	-
A	Elbow fitting	Polyamid	1	-
B	Straight reducer	Steel DN 25 ISO-KF / DN 16 ISO-KF	1	-

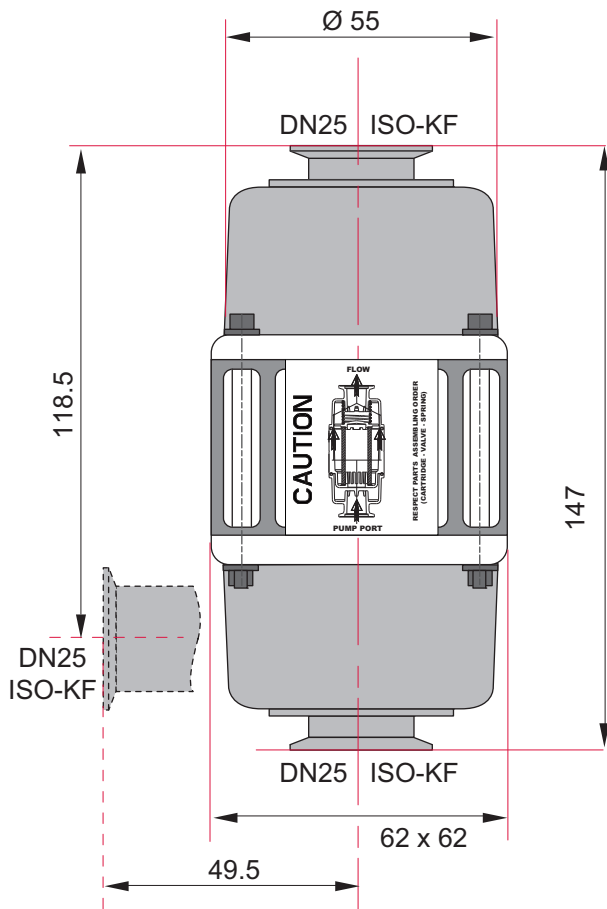
Replacement parts for each maintenance

6	Flat ring	Elastomer NBR*	2	052117
7	O-ring	Elastomer NBR*	2	111197
8	Filter element	Filter element (glass microfibers + epoxy re- sine)	1	109797

(*) Following normalize NFT 40-002



11 Technical data and dimensions



ES 25S	
Weight	0.22 kg
Connection	DN 16 ISO-KF / DN 25 ISO-KF
Tightness	$5 \cdot 10^{-3}$ hPa l/s
Filtration level	Original filter element from manufacturer. Trapping characteristic of the filter element: 99.99% of particles with a diameter greater than 25 microns.
Maximum working pressure	1500 hPa
Maximum flow through the ES	5900 hPa l/s



Declaration of incorporation of partly completed machinery

We hereby declare that the product cited below satisfies all relevant provisions according to the following **EC directives**:

- **Machinery 2006/42/EC (Annex II, no. 1 A)**
- **Restriction of the use of certain Hazardous Substances 2011/65/EU**

This partly completed machinery must not be put into operation until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the **2006/42/EC Directive**.

We, authorized representatives undertake to transmit, in response to a reasoned request by national authorities, relevant information on the partly completed machinery.

The technical file is drawn up by Mr Frédéric ROUVEYRE, Pfeiffer Vacuum SAS, [simplified joint stock company], 98, avenue de Brogny · B.P. 2069, 74009 Annecy cedex.

ES 25S

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24/11/2016

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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.

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perfect vacuum solution?
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