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ARS 16-25

ARS 40-65

Exhaust Filter with Lubricant Feedback

Operating Instructions GA01297_002_A1

Part Nos.

189 56 /57 /57V3



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Original installation and operating instructions.

Safety Information

Obligation to Provide Information

Before installing and commissioning the equipment, carefully read these Operating Instructions and follow the information so as to ensure optimum and safe working right from the start.

The Oerlikon Leybold Vacuum **Exhaust Filters with Lubricant Feedback ARS** have been designed for safe and efficient operation when used properly and in accordance with these Operating Instructions. It is the responsibility of the user to carefully read and strictly observe all safety precautions described in this section and throughout the Operating Instructions. The equipment must only be operated in the proper condition and under the conditions described in the Operating Instructions. It must be operated and maintained by trained personnel only. Consult local, state, and national agencies regarding specific requirements and regulations. Address any further safety, operation and/or maintenance questions to our nearest office.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to notify users of installation, operation, programming or maintenance information that is important, but not hazard related.

We reserve the right to alter the design or any data given in these Operating Instructions. The illustrations are not binding.

Retain the Operating Instructions for further use.

Figures

The references to figures, e.g. (4/2) consist of the consecutive Fig. No. and the Item No. in that order.

NOTICE



DANGER



WARNING



CAUTION



NOTICE



Safety Information



DANGER



0 Important Safety Information

0.1 Hazards caused by materials and substances

- 1 Hazardous substances may escape from the filter, condensate or the oil. Take suitable precautions (e. g. gloves, goggles or gas mask). Observe all safety regulations.
- 2 When toxic gases or vapors are pumped, an exhaust line must be fitted in accordance with the safety regulations relating to protection against poisonous vapors.
- 3 Contaminated parts can be detrimental to health and environment. Before beginning with any work, first find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts; For example wear gloves, face protection or breathing protection. If there exists a potential hazard, the filter or the separator must be decontaminated before starting with any maintenance work. The filter pot may be as hot as 90 °C. There is the danger of receiving burns. Wear suitable protective clothing. For professional decontamination we recommend our service.
- 4 The equipment must be packed in such a way, that it will not be damaged during shipping and so that any contaminants are not released from the package.
- 5 When disposing of used oil and spent filter and filter elements, please observe the relevant environmental protection regulations.
- 6 The ARS can be operated with perfluoropolyether (**PFPE**) as lubricant. When handling PFPE you should observe the following: During thermal decomposition at temperatures over 290 °C toxic and corrosive gases are released. When handling PFPE keep it away from open fires. Do not smoke with PFPE on your fingers. Touch the inner sections of the pumps only while wearing clean gloves, and use clean tools; do the necessary work in clean and dry rooms; after having removed the pump from its packaging, start it up as quickly as possible; as cleaning agents solvents based on hydrofluorether compounds may be used..

NOTICE



0.2 Risk of damaging the device

- 1 The filter element should be changed regularly, depending on the operating conditions. Clogged filters will increase the pump's temperature.
- 2 Only original filter elements guarantee the function of the pressure relief

1 Description

1.1 Design and Function

The ARS is part of the TRIVAC SYSTEM. It is an exhaust filter with oil feedback controlled by a float-actuated valve. It is connected to the exhaust port of a TRIVAC B/BCS pump.

Connection of the ARS does not affect the easy modification of the pump inlet port (vertical or horizontal installation) or the functioning of the pump's anti-suckback valve.

Oil mist and aerosols are trapped by the filter element, while volatile and aromatic substances pass through.

The oil trapped in the ARS housing is allowed to collect. When it exceeds a certain level, the built-in float valve opens and releases the inlet aperture.

The oil is drawn out of the collector of the ARS and returned to the lubricating circuit via the feedback pipe (2/12) and the adapter (2/6) beneath the inlet port (2/9), because when the pump is running the pressure in the collector is higher than that beneath the inlet port. The float then drops and closes the exhaust aperture. The oil level now gradually rising again leads to the foregoing procedure being repeated.

Impurities and cracking products of the oil may clog the filter elements during operation, thus causing an overpressure in the pump.

To prevent the pressure from exceeding a specific value (approx. 1.5 bar, 7 psig), a pressure relief valve is incorporated in each exhaust filter element.

If the filter becomes clogged, the built-in pressure relief valve opens and the filter is bypassed, thus avoiding damage caused by overpressures.

The ARS has a differential pressure indicator (2/3) to allow easy checking of the condition of the filter elements (green: filter OK; red: change filter) .

All ARS parts that come into contact with the pumped medium are surface-protected.

1.2 Supplied Equipment

The ARS exhaust filter with oil feedback is supplied complete with a pump inlet adapter, connection piping with banjo bolts and all required O-ring gaskets as well as long fastening screws for the pump inlet port.

The ARS is pre-cleaned so that it can be used with either mineral oil (e.g. LVO 100) or perfluoropolyether (PFPE, e.g. LVO 400).

For shipping it is sealed airtight in foil, together with silica gel.

Description

1.3 Technical Data

ARS		16-25	40-65
TRIVAC pump model		S/D 16 B/BCS S/D 25 B/BCS	S/D 40 B/BCS S/D 65 B/BCS
Connecting flange	DN	25 KF	40 KF
Weight	kg (lbs)	4.7 (10.4)	8.5 (16.7)
Oil quantity needed to actuate float			
Mineral oil	cm ³ (qt)	510 (0.54)	760 (0.80)
PFPE	cm ³ (qt)	340 (0.36)	420 (0.44)
Remaining oil capacity			
Mineral oil	cm ³ (qt)	430 (0.45)	700 (0.74)
PFPE	cm ³ (qt)	300 (0.31)	390 (0.41)

1.4 Ordering Data

ARS	16-25	40-65
	Part No.	
ARS	189 56	189 57
ARS, FPM sealed	–	189 57V3
Replacement filter element	189 72	189 73 (2x)
Connection fittings (needed for connection other components)	Part No.	
Centering ring	183 27	183 28
Clamping ring	183 42	183 43

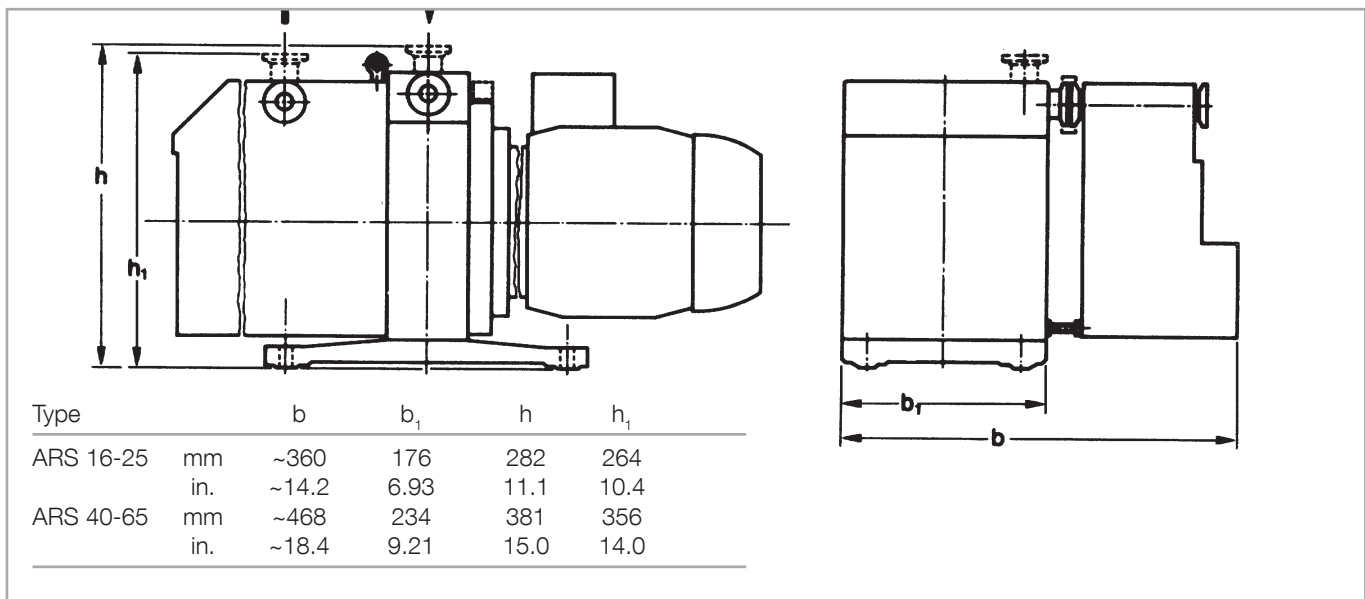


Fig. 1 Dimensional drawing of ARS mounted on a TRIVAC BCS

Transport and Storing / Installation

2 Transport and Storing

The equipment must be packed in such a way, that it will not be damaged during shipping and so that any contaminants are not released.

WARNING



3 Installation

Before installing disconnect all electrical connections. You must reliably prevent the pump from running up.

CAUTION



The ARS is freed of any oil and grease so that it can be used with either mineral oil or perfluoropolyether (PFPE). It is shipped in an airtight bag to prevent corrosion.

Touch the interior of the ARS only with clean gloves or tools.

NOTICE



Work in rooms that are as clean and dry as possible.

Do not open the packaging of the ARS until immediately before use; after opening, install the ARS as quickly as possible and start up the pump.

When using PFPE, employ only Freon^{®1}-113 or Frigen^{®2}-113 as cleaning agent.

Since mineral oil and PFPE emulsify on coming into contact with one another, the ARS has to be completely cleaned and equipped with new gaskets and filter elements when changing the type of oil. It is recommended to let Leybold do this work.

Observe Safety Information 0.1.5.

WARNING



If a CFS and ARS are both connected to a TRIVAC B pump, it is advisable to replace the pump's rubber feet with antivibration elements. The TRIVAC BCS already has antivibration elements.

©1) Registered trademark of DuPont de Nemours

©2) Registered trademark of Farbwerke Hoechst AG

Tools needed

Allen key 6 mm, 8 mm open-jaw or ring wrench 13 mm, 19 mm

Remove the inlet port (2/9) of the TRIVAC B/BCS pump.

Check that the O-ring in the inlet port is in perfect condition; if not, replace it by the new ring supplied.

In the inlet port of the TRIVAC 16/25 B/BCS there is a plate acting as sealing surface for the anti-suckback valve. Remove this plate.

Clean the sealing surface of the pump and then install the adapter (2/6) with a clean O-ring (2/5).

Mount the inlet port (2/9) with an O-ring (2/7) that is in perfect condition and fasten it using the long screws supplied (2/8).

Installation

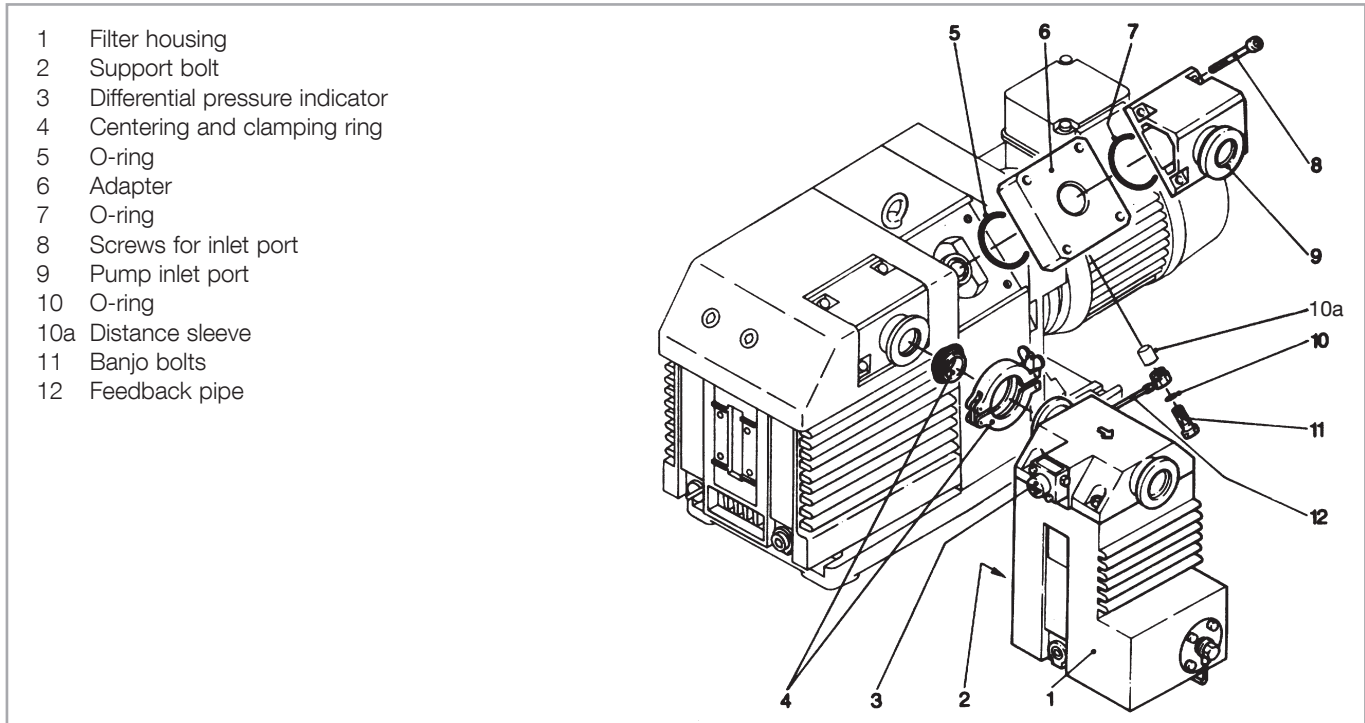


Fig. 2 Installation of ARS 40-65 (ARS 16-25 similar)

Connect the ARS to the pump's exhaust port using the centering and clamping ring (2/4).

Loosen the lock nut (2/2) on the support bolt of the filter housing and adjust the bolt by hand so that it rests firmly against the pump housing, thus supporting the housing of the exhaust filter. Tighten the lock nut.

The surfaces of the connecting flanges must be parallel to each other and not at an angle!

Mount the feedback pipe (2/12) with two banjo bolts (2/11) each having two O-rings (2/10). The feedback pipe with screwed elbow joints fits precisely and has been checked for vacuum tightness.

The quality of the couplings can be checked by measuring the pump's ultimate pressure. The latter must not be higher with installed feedback pipe than without.

Also fill in at (3/10) the remaining amount of oil specified in the Technical Data.

WARNING



Even when connecting the ARS, an exhaust line in accordance with safety regulations is indispensable if toxic or other hazardous gases or vapours are pumped.

Operation and Maintenance

4 Operation and Maintenance

By connecting the ARS, the pump's oil consumption becomes negligible.

This does not affect the service life of the oil. It thus remains necessary to check the condition of the oil and change it.

PFPE does not have to be changed under normal operating conditions.

Since the ARS has a lower operating temperature than that of the pump, condensate may gather in the ARS when pumping vapours.

Feedback of condensate (e.g. water) into the pump causes a deterioration in the oil quality.

Please consult us in cases of doubt.

Whenever changing the pump's oil, change the oil in the ARS as well.

To do so, remove the oil drain plug (3/2) after the pump has been shut down and drain the used oil into a suitable container.

Reinsert the oil-drain plug (check the gasket and replace it, if necessary).

Also fill the remaining amount of fresh oil specified in the Technical Data into the pump at (3/10).

4.1 Replacing the Filter Elements

The filter element(s) (3/5) has/have to be replaced from time to time, depending on their conditions of use and the pump's operating mode.

The dirtier the operating conditions and the hotter the pump gets, the more often they have to be replaced.

The filter elements have to be replaced when the differential pressure indicator (3/8) moves from green to red.

Under normal operating conditions, the filter becomes clogged by cracking products of the oil (not PFPE). A clogged oil filter is thus a sign of a deterioration of oil quality. Whenever replacing the filter elements, the oil and any chemical filters should also be changed.

(Description below for ARS 40-65; ARS 16-25 similar, but only one filter element).

Tools needed

Allen key 6 mm, 8 mm open jaw or ring wrench 10 mm

Shut down the pump.

Operation and Maintenance

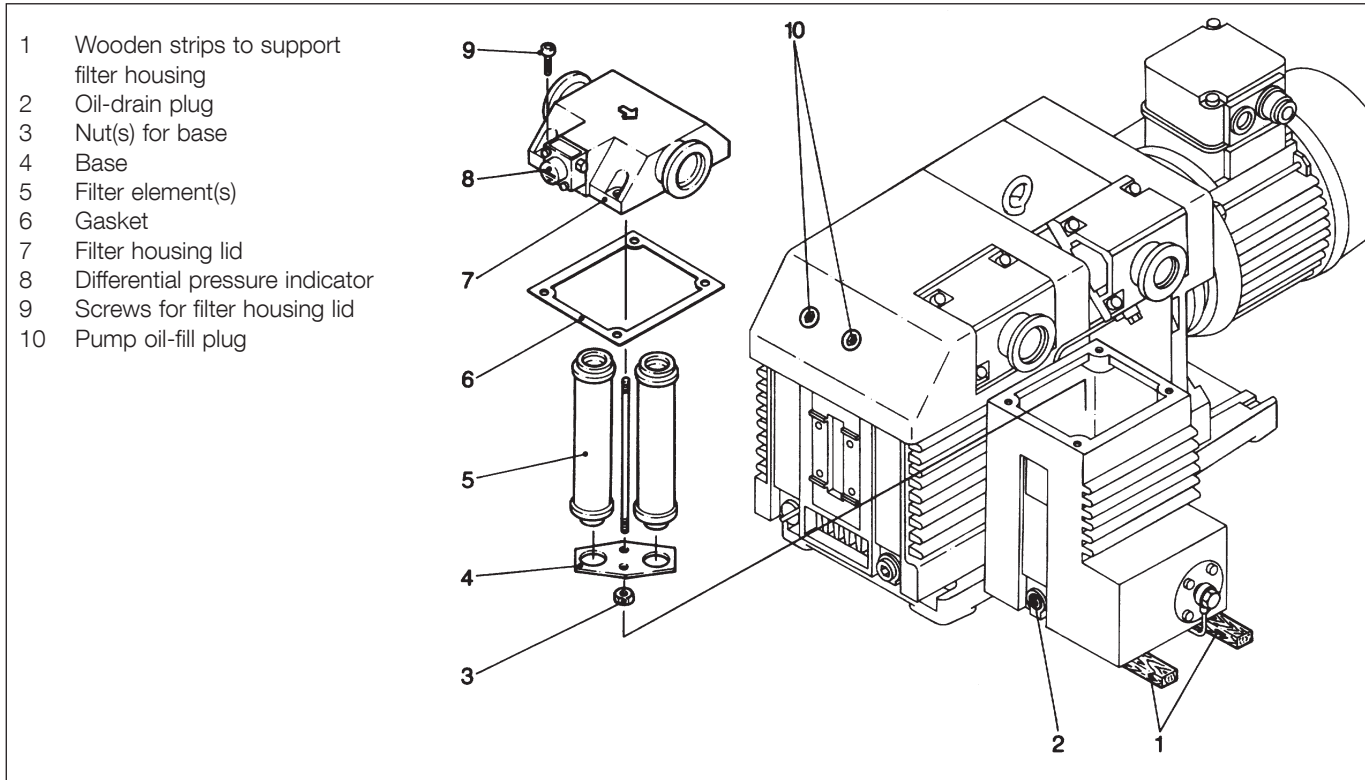


Fig. 3 Filter change on ARS 40-65 (ARS 16-25 similar)



Hazardous substances may escape from the filter and the oil. Take suitable precautions (e.g. gloves, goggles or gas mask). Observe all safety regulations.

Drain the oil (3/2) and reinsert the oil-drain plug.

Support the filter housing by placing, say, two wooden strips (3/1) underneath.

Remove the 4 screws (3/9) and put down the filter housing.

Loosen the small-flange connections to the pump's exhaust port and exhaust line and remove the lid (3/7).

Loosen 2 nuts (3/3) on the base (3/4) and remove the base.

Replace the used filter elements with new ones. Make sure that the vulcanised seal of the filter elements is seated in the centering groove in the housing cover.

When disposing of used oil and spent filter elements, please observe the relevant environmental protection regulations.

Fasten the base again with the aid of the nuts, making sure that the filter elements fit properly into the apertures in the base and the lid.

Fill oil into the filter housing (for quantity, see Technical Data).

Operation and Maintenance

Connect the filter housing lid (3/7) to the pump's exhaust port and exhaust line.

Mount the lid (3/7) with a gasket (3/6) that is in perfect condition.

Torque for the screws (3/9) is

5 ± 0.5 Nm for Part Nos. 18956 and 18957 and

12.5 Nm for Part No. 18957V3 (FPM sealed).

Change the pump's oil and any chemical filters installed (see relevant operating instructions).

4.2 Oerlikon Leybold Vacuum Service

Whenever you send a pump to Oerlikon Leybold Vacuum, indicate whether the pump is contaminated or is free of substances which could pose a health hazard. If it is contaminated, specify exactly which substances are involved. You must use the form we have prepared for this purpose; we will forward the form on request.

A copy of the form is printed at the end of these operating instructions:

„Declaration of contamination of vacuum equipment and components“.

Another suitable form is available from www.oerlikon.com/leyboldvacuum → Documents → Download Documents.

Connect the form at the device or lay it to the device.

This statement detailing the contamination is required to satisfy legal requirements and for the protection of our employees.

Pumps which are not accompanied by a contamination statement will be returned to the sender.

Use secure shipping packaging

Package the equipment such that it will not suffer any damage when being shipped and so that no oil or hazardous materials can escape from the packaging.

CAUTION



Disposal

5 Waste Disposal

The equipment may have been contaminated by the process or by environmental influences. In this case the equipment must be decontaminated in accordance with the relevant regulations. We offer this service at fixed prices. Further details are available on request.

WARNING



Risk of injury and environmental damage

Contaminated parts can be detrimental to health and environment. Before beginning with any work, first find out whether any parts are contaminated.

Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts; For example wear gloves, face protection or breathing protection.

Separate clean components according to their materials, and dispose of these accordingly. We offer this service. Further details are available on request.

When sending us any equipment, observe the regulations given in Section "Oerlikon Leybold Vacuum Service".

Disposal of Waste Oil

Owners of waste oil are entirely self-responsible for proper disposal of this waste.

Waste oil from vacuum pumps must not be mixed with other substances or materials.

Waste oil from vacuum pumps (Oerlikon Leybold Vacuum oils which are based on mineral oils) which are subject to normal wear and which are contaminated due to the influence of oxygen in the air, high temperatures or mechanical wear must be disposed of through the locally available waste oil disposal system.

Waste oil from vacuum pumps which is contaminated with other substances must be marked and stored in such a way that the type of contamination is apparent. This waste must be disposed of as special waste.

European, national and regional regulations concerning waste disposal need to be observed. Waste must only be transported and disposed of by an approved waste disposal vendor.

Safety information on contamination of compressors, vacuum pumps and components.

Scope

Every employer (user) is held responsible for the health and safety of his employees. This also applies to service personnel performing maintenance work either at the premises of the user or the service company in charge.

By means of the declaration attached the contractor is to be informed about any possible contamination of the compressor, vacuum pump or component sent in for servicing. Based on this information the contractor will be able to take the necessary safety precautions.

Preparation before dispatch

Before shipping any parts, the user must complete the following declaration and add it to the dispatch papers. All dispatch instructions laid down in the manual must be followed e.g.:

- Drain all service fluids
- Remove filter elements
- Seal all openings airtight
- Pack / handle appropriately
- Attach the declaration of contamination **outside** of the packaging

Declaration of Contamination of Compressors, Vacuum Pumps and Components

The repair and / or servicing of compressors, vacuum pumps and components will be carried out only if a correctly completed declaration has been submitted. Non-completion will result in delay. The manufacturer can refuse to accept any equipment without a declaration.

A separate declaration has to be completed for each single component.

This declaration may be completed and signed only by authorized and qualified staff.

Customer/Dep./Institute : _____ Address : _____ _____ Person to contact: _____ Phone : _____ Fax: _____ End user : _____	Reason for return: <input checked="" type="checkbox"/> applicable please mark Repair: <input type="checkbox"/> chargeable <input type="checkbox"/> warranty Exchange: <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> Exchange already arranged / received Return only: <input type="checkbox"/> rent <input type="checkbox"/> loan <input type="checkbox"/> for credit Calibration: <input type="checkbox"/> DKD <input type="checkbox"/> Factory-calibr. <input type="checkbox"/> Quality test certificate DIN 55350-18-4.2.1
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A. Description of the product: Material description : _____ Catalog number: _____ Serial number: _____ Type of oil (ForeVacuum-Pumps) : _____	Failure description: _____ Additional parts: _____ Application-Tool: _____ Application- Process: _____
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B. Condition of the equipment	No ¹⁾	Yes	No	Contamination :	No ¹⁾	Yes
1. Has the equipment been used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	toxic	<input type="checkbox"/>	<input type="checkbox"/>
2. Drained (Product/service fluid)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	corrosive	<input type="checkbox"/>	<input type="checkbox"/>
3. All openings sealed airtight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	flammable	<input type="checkbox"/>	<input type="checkbox"/>
4. Purged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	explosive ²⁾	<input type="checkbox"/>	<input type="checkbox"/>
If yes, which cleaning agent				radioactive ²⁾	<input type="checkbox"/>	<input type="checkbox"/>
and which method of cleaning				microbiological ²⁾	<input type="checkbox"/>	<input type="checkbox"/>
¹⁾ If answered with "No", go to D.				other harmful substances	<input type="checkbox"/>	<input type="checkbox"/>

C. Description of processed substances (Please fill in absolutely)

1. **What substances have come into contact with the equipment ?**
 Trade name and / or chemical term of service fluids and substances processed, properties of the substances
 According to safety data sheet (e.g. toxic, inflammable, corrosive, radioactive)

X	Tradename:	Chemical name:
	a)	
	b)	
	c)	
	d)	

2. Are these substances harmful ? No Yes

3. Dangerous decomposition products when heated ? No Yes

If yes, which ? _____

²⁾ Components contaminated by microbiological, explosive or radioactive products/substances will not be accepted without written evidence of decontamination.

D. Legally binding declaration

I / we hereby declare that the information supplied on this form is accurate and sufficient to judge any contamination level.

Name of authorized person (block letters) : _____ _____ Date	_____ signature of authorized person	<div style="border: 1px dashed black; height: 80px; width: 100%;"></div> firm stamp
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