OPERATING INSTRUCTIONS

EN

Translation of the Original

SAS 16 – 160

Dust separators

PFEIFFER VACUUM

Dear customer,

Thank you for choosing a Pfeiffer Vacuum product. Your new Pfeiffer Vacuum accessory should support you in your individual application with full performance and without malfunctions. The name Pfeiffer Vacuum stands for high-quality vacuum technology, a comprehensive and complete range of top-quality products and first-class service. With this expertise, we have acquired a multitude of skills contributing to an efficient and secure implementation of our product.

Knowing that our product must not interfere with your actual work, we are convinced that our product offers you the solution that supports you in the effective and trouble-free execution of your individual application.

Please read these operating instructions before putting your product into operation for the first time. If you have any questions or suggestions, please feel free to contact info@pfeiffer-vacuum.de.

Further operating instructions from Pfeiffer Vacuum can be found in the Download Center on our website.

Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

Copyright

Table of contents

1 About this manual

IMPORTANT

Read carefully before use.

Keep the manual for future consultation.

1.1 Validity

These operating instructions are a customer document of Pfeiffer Vacuum. The operating instructions describe the functions of the named product and provide the most important information for the safe use of the device. The description is written in accordance with the valid directives. The information in these operating instructions refers to the product's current development status. The document shall remain valid provided that the customer does not make any changes to the product.

1.2 Variants

- SAS 16
- SAS 25
- SAS 25 S
- SAS 25 SB
- SAS 40
- SAS 63
- SAS 100
- SAS 160

1.3 Target group

These operating instructions are aimed at all persons performing the following activities on the product:

- Transportation
- Setup (Installation)
- Usage and operation
- Decommissioning
- Maintenance and cleaning
- Storage or disposal

The work described in this document is only permitted to be performed by persons with the appropriate technical qualifications (expert personnel) or who have received the relevant training from Pfeiffer Vacuum.

1.4 Conventions

1.4.1 Instructions in the text

Usage instructions in the document follow a general structure that is complete in itself. The required action is indicated by an individual step or multi-part action steps.

Individual action step

A horizontal, solid triangle indicates the only step in an action.

► This is an individual action step.

Sequence of multi-part action steps

The numerical list indicates an action with multiple necessary steps.

1. Step 1
2. Step 2
3. ...

1.4.2 Pictographs

Pictographs used in the document indicate useful information.

Note

Tip

1.4.3 Stickers on the product

This section describes all the stickers on the product along with their meanings.

PFEIFFER VACUUM D-35641 Asslar Mod. Dust Separator SAS Mod.-Nr.: PK Z60 508 Made in Germany 2020/02	**Rating plate** The rating plate is located on the cylinder surface of the housing.

Tbl. 1: Stickers on the product

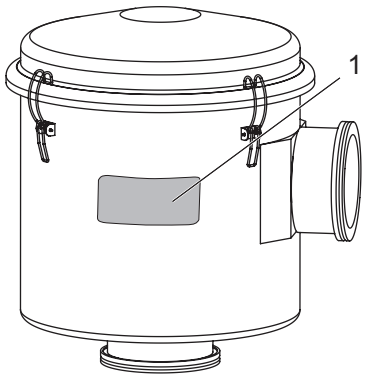

Fig. 1: Position of the stickers on the product

1 Rating plate

1.4.4 Abbreviations

Abbreviation	Meaning in this document
SAS	Dust separators

Tbl. 2: Abbreviations used in this document

2 Safety

2.1 General safety information

The following 4 risk levels and 1 information level are taken into account in this document.

⚠ DANGER

Immediately pending danger

Indicates an immediately pending danger that will result in death or serious injury if not observed.

► Instructions to avoid the danger situation

⚠ WARNING

Potential pending danger

Indicates a pending danger that could result in death or serious injury if not observed.

► Instructions to avoid the danger situation

⚠ CAUTION

Potential pending danger

Indicates a pending danger that could result in minor injuries if not observed.

► Instructions to avoid the danger situation

NOTICE

Danger of damage to property

Is used to highlight actions that are not associated with personal injury.

► Instructions to avoid damage to property

Notes, tips or examples indicate important information about the product or about this document.

2.2 Safety instructions

All safety instructions in this document are based on the results of the risk assessment. Where applicable, all life cycle phases of the product were taken into account.

Risks during installation

⚠ CAUTION

Risk of poisoning from toxic process gases escaping in the event of overpressure

There is risk of exhaust gases and vapors escaping freely into the open air, if the interior pressure exceeds the permissible value of the SAS. In processes involving toxic media, there is a risk of injury and danger to life from poisoning by escaping gas.

► Install the exhaust duct in such a way that no overpressure develops in the line.
► Install the exhaust line without additional shut-off units.

Risks during maintenance

⚠ WARNING

Health hazard through poisoning from toxic contaminated components or devices

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ► Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ► Decontaminate affected parts before carrying out maintenance work.
- ► Wear protective equipment.

⚠ CAUTION

Health hazard from increased dust emission

Cleaning with compressed air causes increased dust emission. There is risk of injuring your respiratory organs.

- ► Clean the dust separator outdoors, if possible.
- ► Wear a respiratory mask.

2.3 Safety precautions

Duty to provide information on potential dangers

The product holder or user is obliged to make all operating personnel aware of dangers posed by this product.

Every person who is involved in the installation, operation or maintenance of the product must read, understand and adhere to the safety-related parts of this document.

Infringement of conformity due to modifications to the product

The Declaration of Conformity from the manufacturer is no longer valid if the operator changes the original product or installs additional equipment.

- Following the installation into a system, the operator is required to check and re-evaluate the conformity of the overall system in the context of the relevant European Directives, before commissioning that system.

General safety precautions when handling the product

- ► Observe all applicable safety and accident prevention regulations.
- ► Check that all safety measures are observed at regular intervals.
- ► Never fill or operate the unit with cleaning agents or cleaning agent residues.
- ► Do not carry out your own conversions or modifications on the unit.

2.4 Limits of use of product

Parameter	SAS
Installation location	• Indoors, protected against: — dust deposits — falling objects — fire-fighting water • Outdoors, protected against: — falling objects — direct influence of weather such as rain, splash water, strong drafts and sunlight — fire-fighting water — lightning strike
Inlet pressure, max.	Atmosphere
Separable particle size, paper filter	2 µm

Parameter	SAS
Separable particle size, polyester	5 µm 3 µm with SAS 25 SB
Exhaust pressure, max.	Atmosphere, exhaust line unpressurized
Gas inlet temperature	-26 °C to +104 °C -26 °C to +90 °C with SAS 25 SB
Mounting orientation	Vertical or horizontal, according to the permissible mounting orientations

Tbl. 3: Permissible ambient and operating conditions

2.5 Proper use

- ► Use the SAS only for the separation of dust and particles from the gas flow of vacuum pumps, as follows:
  - – in intake lines of vacuum pumps
  - – at a suitable position in the system's intake line, at a distance from the vacuum pump
  - – in the exhaust lines of oil-free vacuum pumps
  - – at a suitable position in the system's exhaust line, at a distance from the vacuum pump
- ► Select the SAS that is suitable for the respective pumping speed of the vacuum pump.
- ► Adhere to the installation, commissioning, operating, and maintenance instructions.
- ► Do not use any accessory parts other than those recommended by Pfeiffer Vacuum.

2.6 Foreseeable improper use

Improper use of the product invalidates all warranty and liability claims. Any use that is counter to the purpose of the product, whether intentional or unintentional, is regarded as improper use; in particular:

- Filtering media that attack or decompose materials making contact with media
- Filtering media that contain fluids or condensate
- Filtering condensable vapors with paper filter as filter insert
- Filtering corrosive or explosive gases
- Use in potentially explosive areas
- Use of accessories or spare parts that are not listed in these instructions
- Painting of accessories

2.7 Personnel qualification

The work described in this document may only be carried out by persons who have appropriate professional qualifications and the necessary experience or who have completed the necessary training as provided by Pfeiffer Vacuum.

Training people

1. Train the technical personnel on the product.
2. Only let personnel to be trained work with and on the product when under the supervision of trained personnel.
3. Only allow trained technical personnel to work with the product.
4. Before starting work, make sure that the commissioned personnel have read and understood these operating instructions and all applicable documents, in particular the safety, maintenance and repair information.

3 Product description

3.1 Function

The dust separator protects the vacuum pump from dust particles from the process. Mounted on the intake side of the vacuum pump, it separates dust particles from the pumped gas flow. The filter insert is made of polyester. The media flows through it from the outside to the inside. Alternatively, a filter insert made of paper is available.

In the case of oil-free vacuum pumps, mounting the dust separator on the exhaust protects the environment by filtering dust and particles from the pumped gas flow.

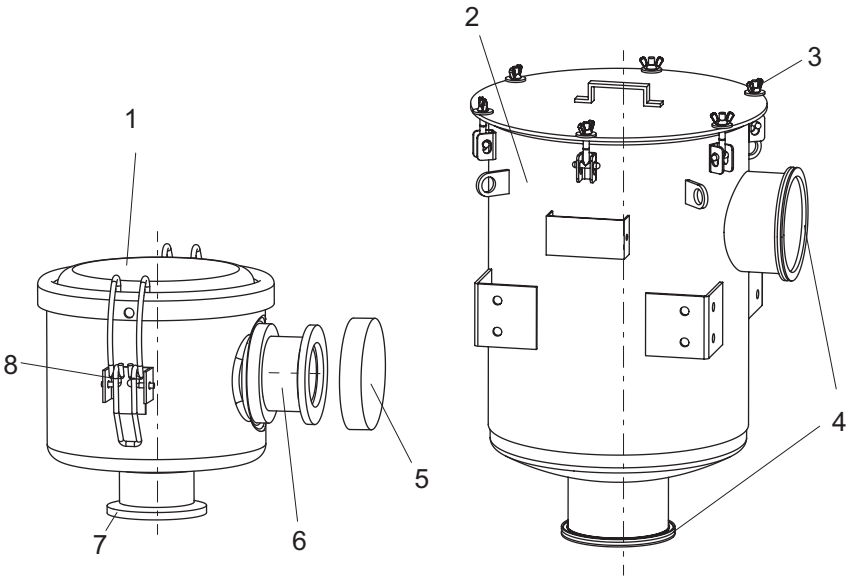

Fig. 2: Design of the dust separator

1 Filter housing with flanges, ISO-KF
2 Filter housing with flanges, ISO-K
3 Cover fasteners with wing nuts
4 Connection flanges, ISO-K
5 Protective cap for gas inlet flange
6 Gas inlet flange
7 Gas exhaust flange
8 Locking clasp

3.2 Identifying the product

► To ensure clear identification of the product when communicating with Pfeiffer Vacuum, always keep all of the information on the rating plate to hand.

3.3 Product features

SAS type	Connection flange	suitable for vacuum pump speed
SAS 16	DN 16 ISO-KF	42 m^3/h
SAS 25	DN 25 ISO-KF	93 m^3/h
SAS 25 S	DN 25 ISO-KF	42 m^3/h
SAS 25 SB	DN 25 ISO-KF	36 m^3/h
SAS 40	DN 40 ISO-KF	195 m^3/h
SAS 63	DN 63 ISO-K	493 m^3/h
SAS 100	DN 100 ISO-K	968 m^3/h
SAS 160	DN 160 ISO-K	1870 m^3/h

Tbl. 4: Characteristics of the dust separators

3.4 Scope of delivery

- Dust separator with integrated filter insert
- Protective cover for the connection flange (mounted)
- Operating instructions

4 Storage

Recommendation
Pfeiffer Vacuum recommends storing the products in their original transport packaging.

The filter inserts can absorb moisture, which can negatively influence the filtering effect and service life.

Store SAS

1. Store the SAS only in dry, dust-free rooms, within the specified ambient conditions.
2. In rooms with humid or aggressive atmospheres: Hermetically seal the dust separator, together with a drying agent, in a plastic bag.

5 Installation

5.1 Determine mounting orientations on vacuum side

The direction of flow inside the SAS is from the outside of the filter insert to the inside.

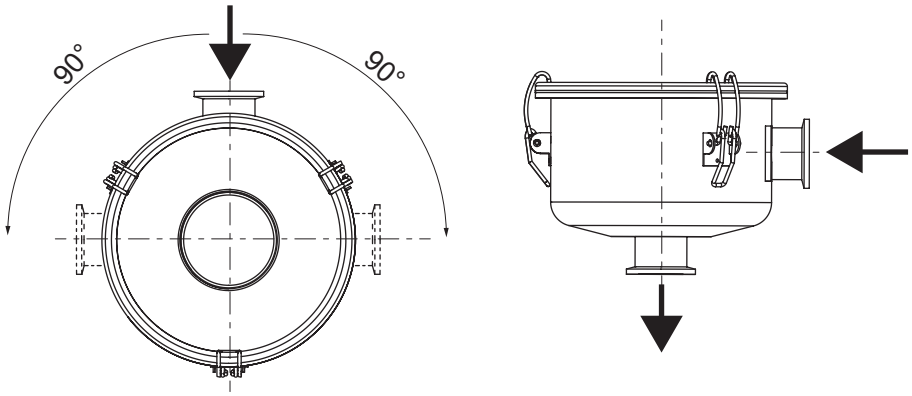

Fig. 3: Permissible mounting orientations

Procedure

1. Make sure that the connections to the piping has been sealed sufficiently to prevent leaks.
2. Install the SAS vertically or horizontally, taking the permissible mounting orientations into account.
3. Make sure that the SAS is easily accessible for maintenance work.

5.1.1 Install SAS on vacuum pump

Prerequisite

- Vacuum pump switched off

Required aids

- Circlip
- Centering ring and O-ring

Installing SAS

If necessary, install the dust separator at any position in the intake line.

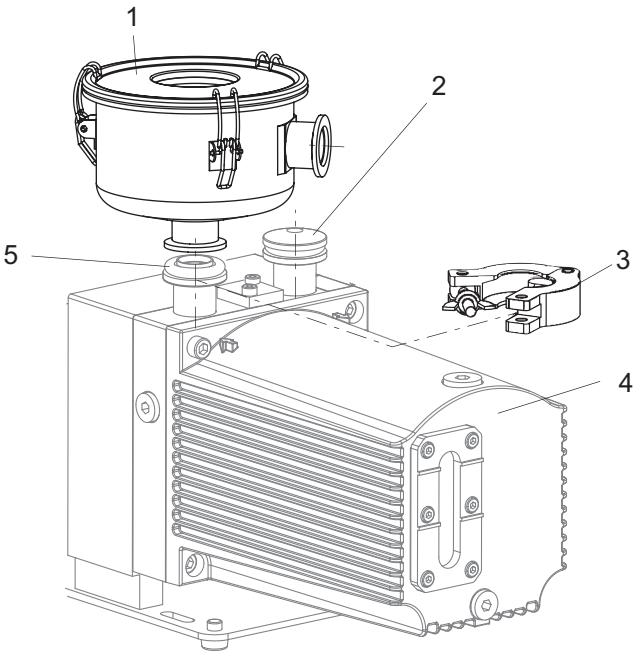

Fig. 4: Install SAS on vacuum flange

1 SAS
2 Exhaust flange with blank flange
3 Circlip
4 Vacuum pump
5 Centering ring with O-ring

Procedure

1. Make sure that the centering ring with O-ring and cone strainer are fitted in the vacuum flange.
2. Place the SAS vertically on the centering ring.
3. Connect both flanges with a circlip.
   – Ensure correct seating of the centering ring.

5.1.2 Connect vacuum side

Prerequisite

- Vacuum pump switched off

Required aids

- Circlip
- Centering ring and O-ring

Connect vacuum side to the SAS

1. Remove the protective cap from the gas inlet flange.
2. Establish the shortest possible connection between the SAS and the vacuum chamber. Use at least the nominal flange diameter.
3. Support or suspend the piping to the SAS so that no forces from the piping system are applied to the vacuum pump.
4. Connect both flanges with a circlip.

5.2 Determine mounting orientations on exhaust side

The direction of flow inside the SAS is from the outside of the filter insert to the inside.

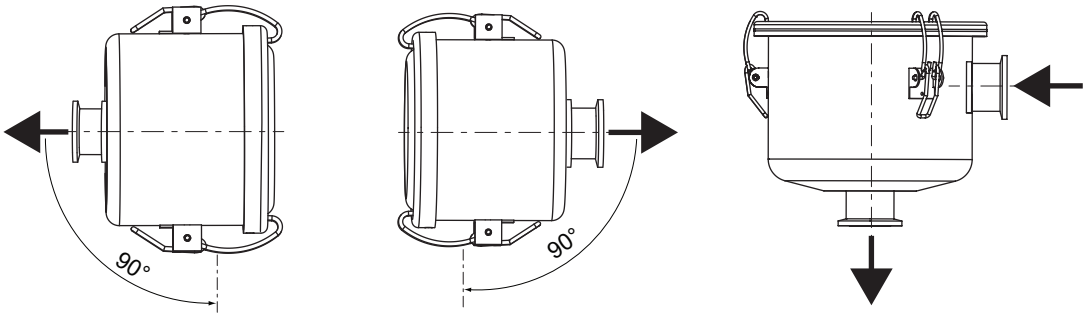

Fig. 5: Permissible mounting orientations

Procedure

1. Make sure that the connections to the piping has been sealed sufficiently to prevent leaks.
2. Install the SAS vertically or horizontally, taking the permissible mounting orientations into account.
3. Make sure that the SAS is easily accessible for maintenance work.

5.2.1 Install SAS on vacuum pump

Prerequisite

- Vacuum pump switched off

Required aids

- Circlip
- Centering ring and O-ring

Installation of the SAS

Keep in mind that installation at the exhaust side is only permitted at dry compressing vacuum pumps.

If necessary, install the dust separator at any position in the exhaust line.

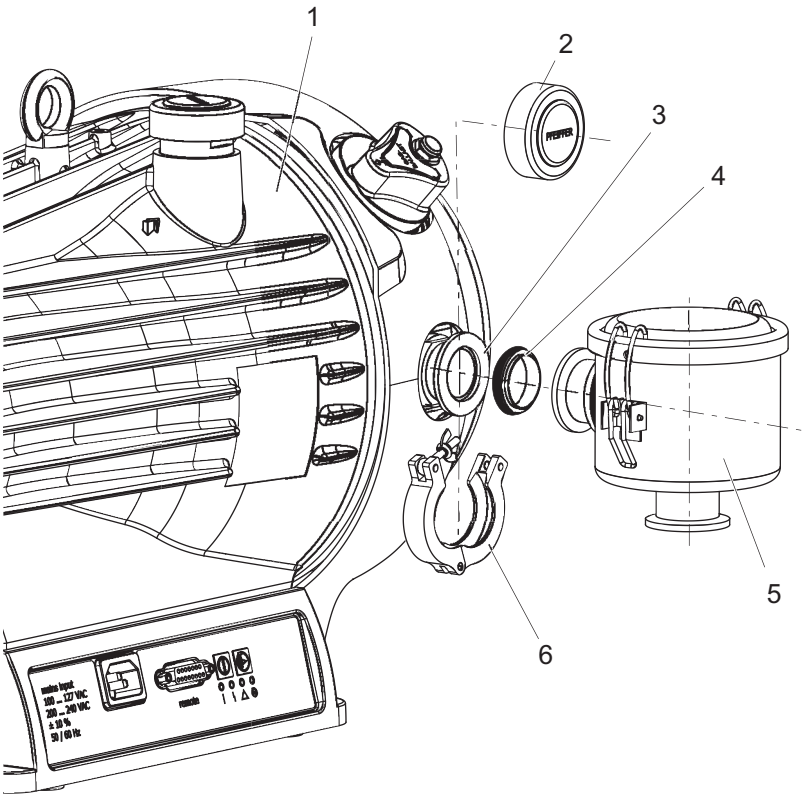

Fig. 6: Install SAS on exhaust flange

1 Scroll pump, here shown as an example
2 Protective cap
3 Gas exhaust flange
4 Centering ring with O-ring
5 Dust separator SAS 25 S
6 Circlip

Procedure

1. Remove protective caps.
2. Place the SAS on the exhaust flange of the vacuum pump.
   – Make sure that the centering ring with O-ring are fitted in the flange.
3. Connect both flanges with a circlip.
   – Ensure correct seating of the centering ring.

5.2.2 Connect exhaust side

⚠ CAUTION

Risk of poisoning from toxic process gases escaping in the event of overpressure

There is risk of exhaust gases and vapors escaping freely into the open air, if the interior pressure exceeds the permissible value of the SAS. In processes involving toxic media, there is a risk of injury and danger to life from poisoning by escaping gas.

► Install the exhaust duct in such a way that no overpressure develops in the line.
► Install the exhaust line without additional shut-off units.

Required aids

- Circlip
- Centering ring and O-ring

Procedure

1. Remove the protective cap from the gas exhaust flange.
2. Connect the exhaust duct. Use at least the nominal diameter of the flange.
3. Support or suspend the piping to the SAS so that no forces from the piping system are applied to the vacuum pump.
4. Connect both flanges with a circlip.

6 Operation

NOTICE

Damage to dust separator due to excess temperature

Temperatures higher than the max. permissible gas inlet temperature lead to damage on the filter insert and the seals.

- ► Operate the dust separator only when the seals are in proper condition.
- ► Observe the max. permissible inlet temperature.

Check differential pressure of the SAS

- If the differential pressure exceeds the initial value by 25 – 40 hPa, ensure that a replacement filter insert is available.
- Clean or replace the filter insert at the latest when the differential pressure exceeds the initial value by 40 – 50 hPa.

Notes on before and during operation, for use on vacuum side

1. Regularly check the condition of all seals.
   – The seals always have to lie evenly on the end cover.
2. Regularly check the differential pressure of the SAS.
   – Measure and note the pressure loss at the beginning of the evacuation phase with a clean filter insert.
3. Compare the pressure loss with the values that occur during operation.
4. Clean or replace the filter insert at the latest when the differential pressure exceeds the initial value by 40 – 50 hPa.

Notes on before and during operation, for use on exhaust side

1. Regularly check the condition of all seals.
   – The seals always have to lie evenly on the end cover.
2. Regularly check the filter insert for soiling.
   – When the through-flow matches the specified direction, the cover acts as safety valve.

7 Maintenance

7.1 Remove filter insert

⚠ WARNING

Health hazard through poisoning from toxic contaminated components or devices

Toxic process media result in contamination of devices or parts of them. During maintenance work, there is a risk to health from contact with these poisonous substances. Illegal disposal of toxic substances causes environmental damage.

- ► Take suitable safety precautions and prevent health hazards or environmental pollution by toxic process media.
- ► Decontaminate affected parts before carrying out maintenance work.
- ► Wear protective equipment.

NOTICE

Damage to the vacuum pump due to damaged filter inserts

Using unsuitable aids and cleaning agents for disassembly and cleaning can potentially result in damage to the filter inserts. Unfiltered particles enter the vacuum pump and cause damage.

- ► Never use sharp-edged, metallic tools.
- ► Observe the specified cleaning procedure.
- ► Use approved cleaning agents only to clean filter inserts.

NOTICE

Damage to sealing surfaces from unsuitable tools

The use of unsuitable tools for removal or insertion of sealing rings damages the sealing surfaces, causing vacuum pump leakage.

- ► Never use sharp, metallic tools (e.g. tweezers).
- ► Only remove sealing rings with an O-ring picker.

Signs that indicate saturation of the filter insert:

- Pressure loss exceeds the initial value by 40 – 50 hPa
- Vacuum pump does not achieve the initial throughput

Prerequisites

- Vacuum pump switched off
- Vacuum line or exhaust line vented to atmospheric pressure
- SAS has cooled sufficiently to be touched

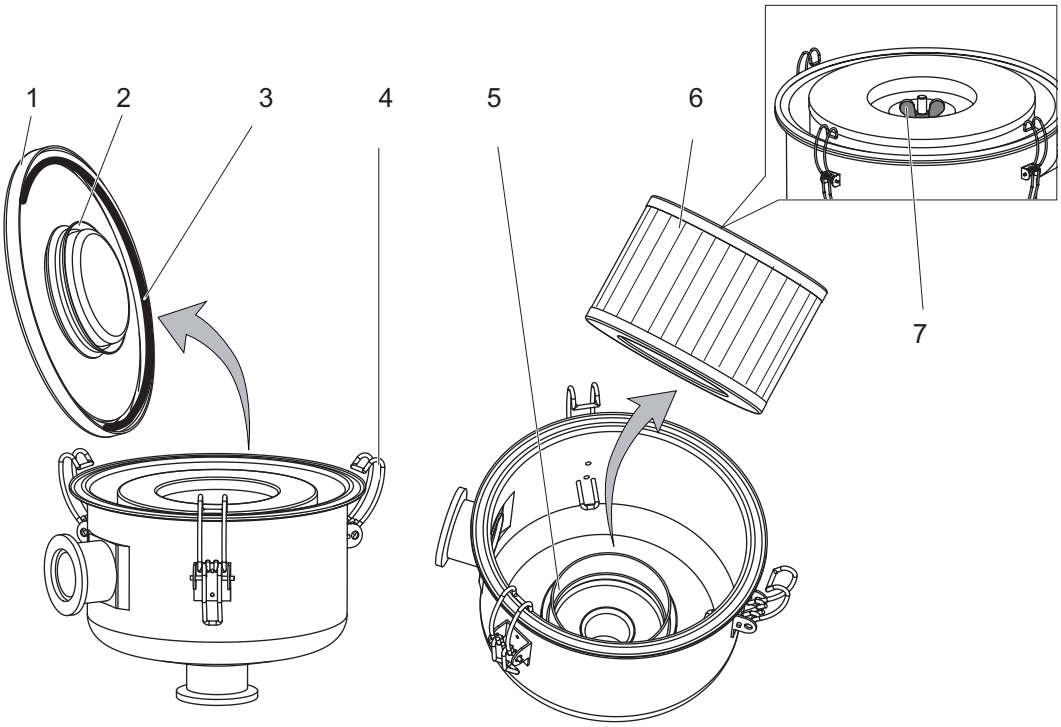

Fig. 7: Remove filter insert

1 Filter cover
2 Cover seal
3 O-ring
4 Locking clasp
5 Housing seal
6 Filter insert
7 Wing nut (on SAS 100 and SAS 160)

Remove filter cover

1. Remove the SAS from the vacuum pump.
2. Protect the sealing surfaces of the connection flanges with the original protective covers.
3. Loosen the locking clasps or wing nuts, depending on the design of the dust separator.
4. Remove the filter cover.
5. If necessary, loosen the wing nut.
   – On SAS 100 and SAS 160.
6. Remove the filter insert from the filter housing.
7. Tip out any dust particles that are in the filter insert, or vacuum-clean the housing.
8. Clean the seals and sealing surfaces of the housing.

7.2 Cleaning filter insert

⚠ CAUTION

Health hazard from increased dust emission

Cleaning with compressed air causes increased dust emission. There is risk of injuring your respiratory organs.

► Clean the dust separator outdoors, if possible.
► Wear a respiratory mask.

Prerequisites

- Filter insert has been removed

Required aids

- Cleaning agent
- Compressed air
- Vacuum cleaner

Clean polyester filter insert

1. Clean the filter insert by carefully blowing off its surface with dry, oil-free compressed air or by vacuum-cleaning the surface.
2. Wash the filter insert in lukewarm soapy water.
3. Dry the filter insert completely.
4. Replace the filter insert after it has been cleaned three times, at the latest.

Information on cleaning the filter insert made of paper

Only clean the paper filter insert when it is dry. Replace the filter insert in case of doubt.

Cleaning paper filter insert

► Clean the filter insert by carefully blowing off its surface with dry, oil-free compressed air or by vacuum-cleaning the surface.

7.3 Install filter insert

Prerequisites

- Filter housing has been cleaned
- Filter insert has been cleaned, or replacement filter is available

Required consumables

- Filter insert
- Set of seals, if necessary

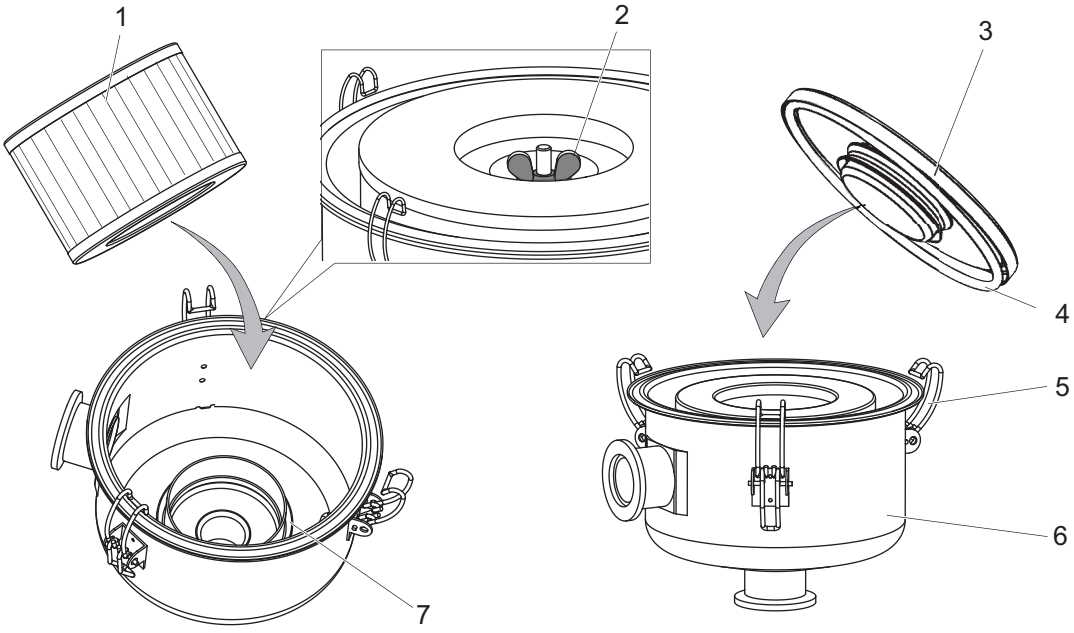

Fig. 8: Install filter insert

1 Filter insert
2 Wing nut (on SAS 100 and SAS 160)
3 Filter cover
4 O-ring
5 Locking clasp
6 Filter housing
7 Seal

Install filter insert

1. Position the filter housing with the opening facing upwards.
2. Check that all sealing surfaces are clean.
3. Replace the seals, if required.
4. Put the clean or new filter insert in place.
5. When fitting the cover, make sure the seals are in the right position.
6. Fasten the filter insert with the wing nut, if applicable.
   – On SAS 100 and SAS 160.
7. Place the filter cover on the housing.

8. Press the filter cover down and simultaneously fasten the locking clasps at the cover.
9. Fasten the filter cover with the wing nuts, if applicable.
   – On SAS 160.

8 Spare parts

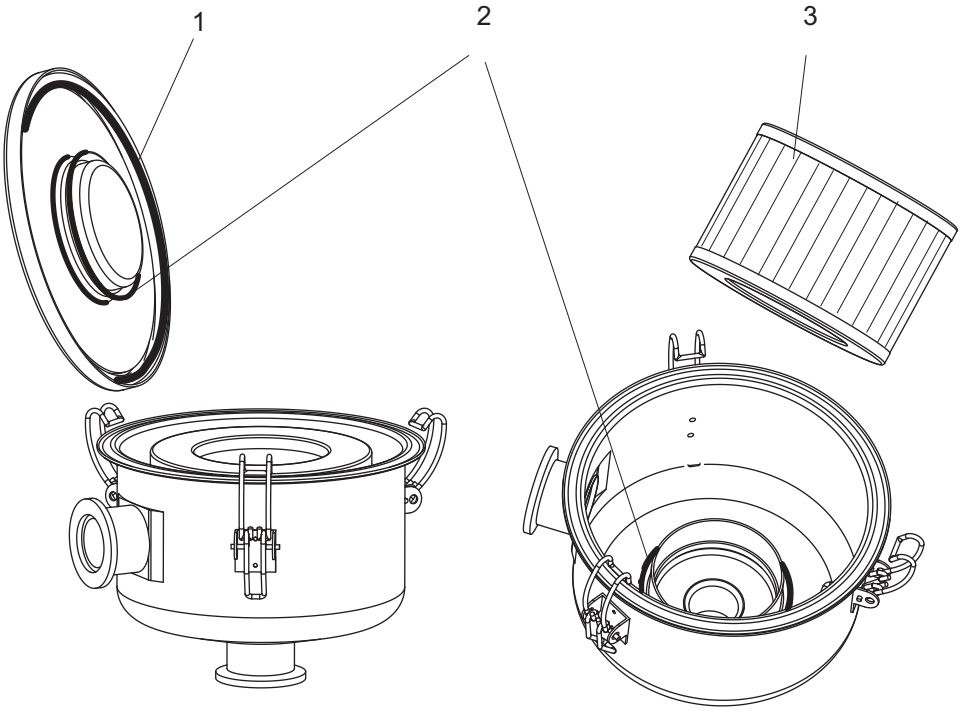

Fig. 9: SAS spare parts

1 O-ring
2 Profile seal
3 Filter insert

SAS	Filter insert, standard: Polyester	Filter insert, optional: Paper	Set of seals	Set of seals consisting of
SAS 16	PK E57 009 -T	PK E57 005 -T	PK E57 001 -T	Pos. 1 and 2
SAS 25	PK E57 010 -T	PK E57 006 -T	PK E57 002 -T	Pos. 1 and 2
SAS 25 S	PK E57 009 -T	PK E57 005 -T	PK E57 001 -T	Pos. 1 and 2
SAS 25 SB	PK E57 030 -T	-	-	-
SAS 40	PK E57 013 -T	PK E57 020 -T	PK E57 014 -T	Pos. 1 and 2
SAS 63	PK E57 011 -T	PK E57 007 -T	PK E57 003 -T	Pos. 1 and 2
SAS 100	PK E57 012 -T	PK E57 008 -T	PK E57 004 -T	Pos. 1 and 2
SAS 160	PK E57 016 -T	-	PK E57 015 -T	Pos. 1 and 2

Tbl. 5: SAS spare parts packs

9 Technical data and dimensions

9.1 Technical data

Type designation	SAS 16	SAS 25	SAS 25 S	SAS 25 SB
Part number	PK Z60 506	PK Z60 508	PK Z60 507	PK Z60 527
Connection flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Connection flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
For pumping speed up to	42 m³/h	93 m³/h	42 m³/h	36 m³/h
Inlet pressure max.	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure
Integral leak rate	< 1 · 10^{-5} Pa m³/s	< 1 · 10^{-5} Pa m³/s	≤ 1 · 10^{-5} Pa m³/s	< 1 · 10^{-5} Pa m³/s
Conductance at 1 hPa	27 l/s	50 l/s	27 l/s	–
Conductance at 100 hPa	70 l/s	150 l/s	70 l/s	–
Grain size limit (separable)	5 µm	5 µm	5 µm	3 µm
Degree of separation	99.7 %	99.7 %	99.7 %	99.7 %
Temperature range (vacuum side)	-26 – 104 °C	-26 – 104 °C	-26 – 104 °C	-26 – 90 °C
Temperature: Shipping	-25 – 55 °C	-25 – 55 °C	-25 – 55 °C	-25 – 55 °C
Weight	0.6 kg	1.1 kg	0.6 kg	0.7 kg

Tbl. 6: Technical data for SAS 16 | SAS 25 | SAS 25 S for polyester filter inserts

Type designation	SAS 40	SAS 63	SAS 100	SAS 160
Part number	PK Z60 510	PK Z60 511	PK Z60 512	PK Z60 514
Connection flange (in)	DN 40 ISO-KF	DN 63 ISO-F	DN 100 ISO-K	DN 160 ISO-K
Connection flange (out)	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
For pumping speed up to	195 m³/h	493 m³/h	968 m³/h	1870 m³/h
Inlet pressure max.	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure
Integral leak rate	< 1 · 10^{-5} Pa m³/s	< 1 · 10^{-5} Pa m³/s	< 1 · 10^{-5} Pa m³/s	< 1 · 10^{-5} Pa m³/s
Conductance at 1 hPa	180 l/s	660 l/s	2000 l/s	2500 l/s
Conductance at 100 hPa	680 l/s	3100 l/s	13000 l/s	20000 l/s
Grain size limit (separable)	5 µm	5 µm	5 µm	5 µm
Degree of separation	99.7 %	99.7 %	99.7 %	99.7 %
Temperature range (vacuum side)	-26 – 104 °C	-26 – 104 °C	-26 – 104 °C	-26 – 104 °C

Type designation	SAS 40	SAS 63	SAS 100	SAS 160
Temperature: Shipping	-25 – 55 °C	-25 – 55 °C	-25 – 55 °C	-25 – 55 °C
Weight	2.1 kg	5.9 kg	12.8 kg	50 kg

Tbl. 7: Technical data for SAS 40 | SAS 63 | SAS 100 | SAS 160 for polyester filter inserts

9.2 Dimensions

Dimensions in mm

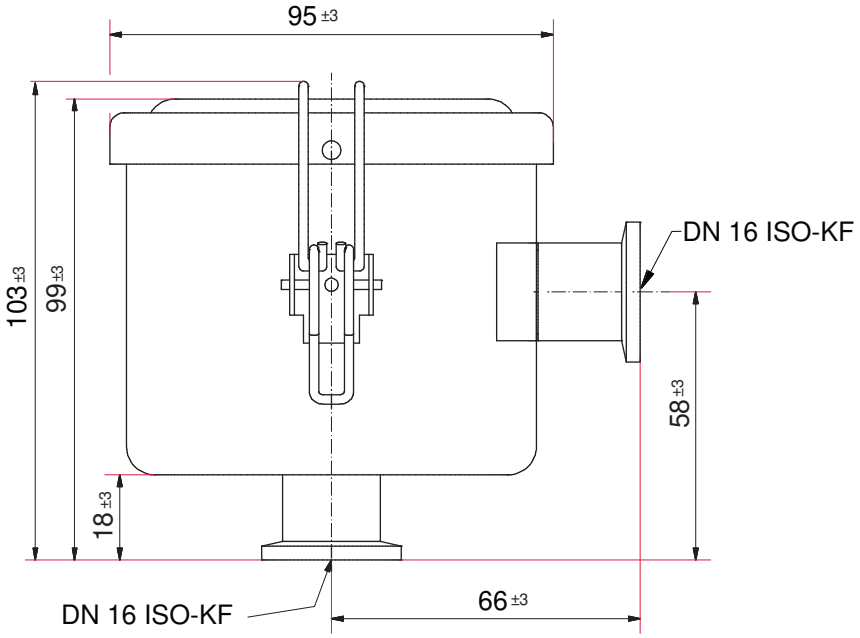

Fig. 10: Dimensions SAS 16

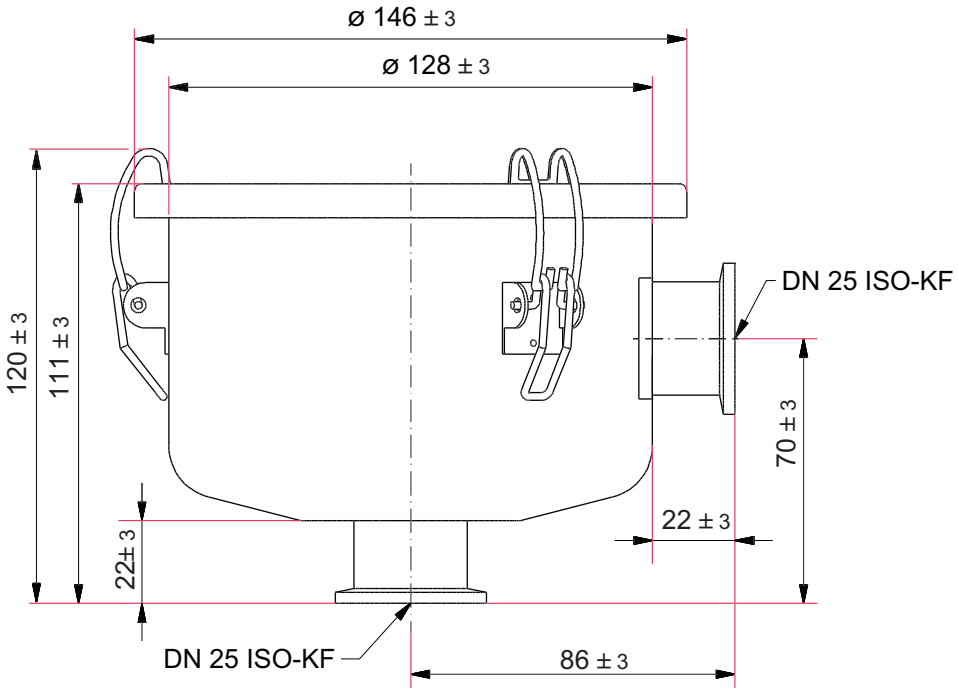

Fig. 11: Dimensions SAS 25

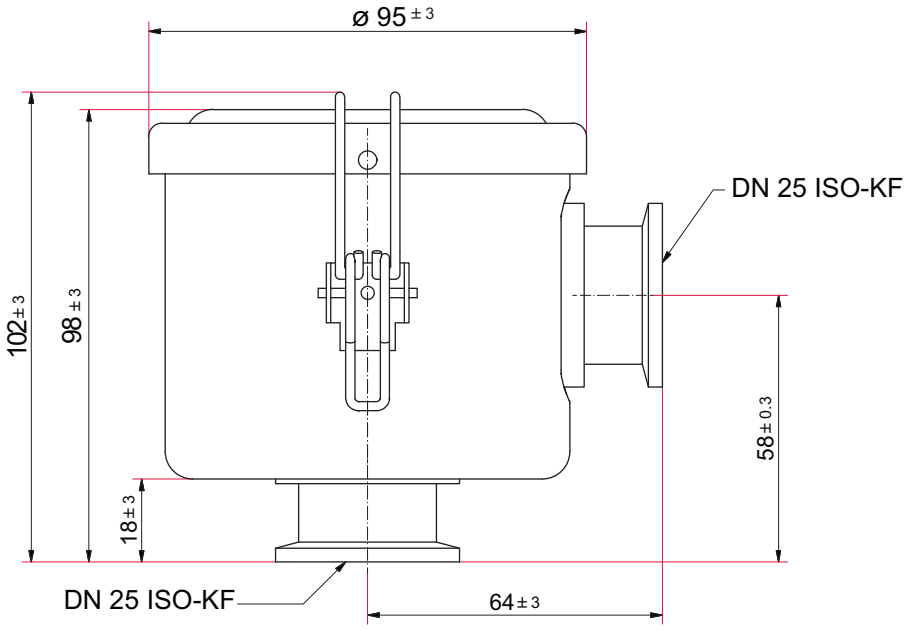

Fig. 12: Dimensions SAS 25 S

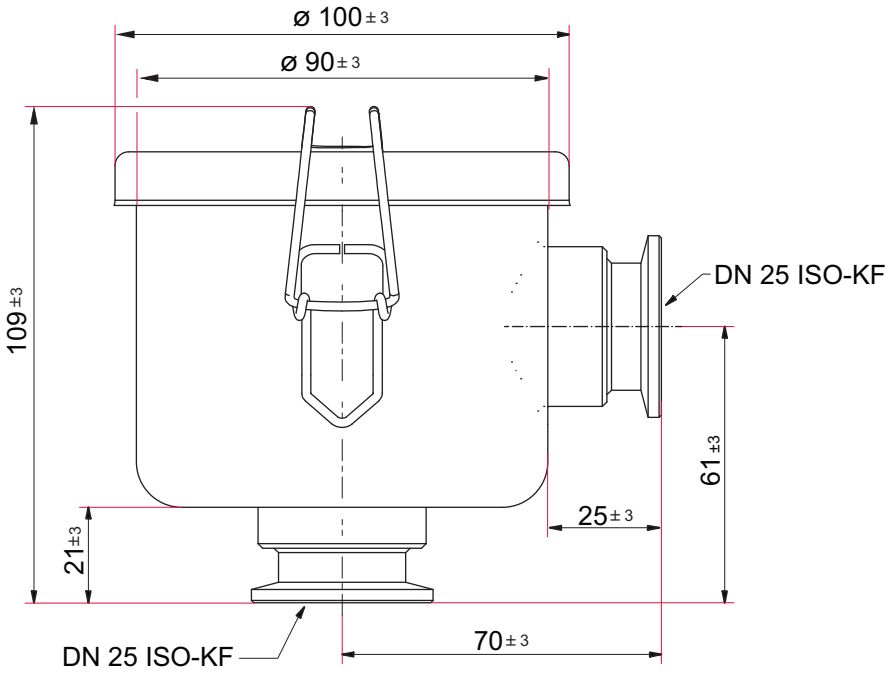

Fig. 13: Dimensions SAS 25 SB

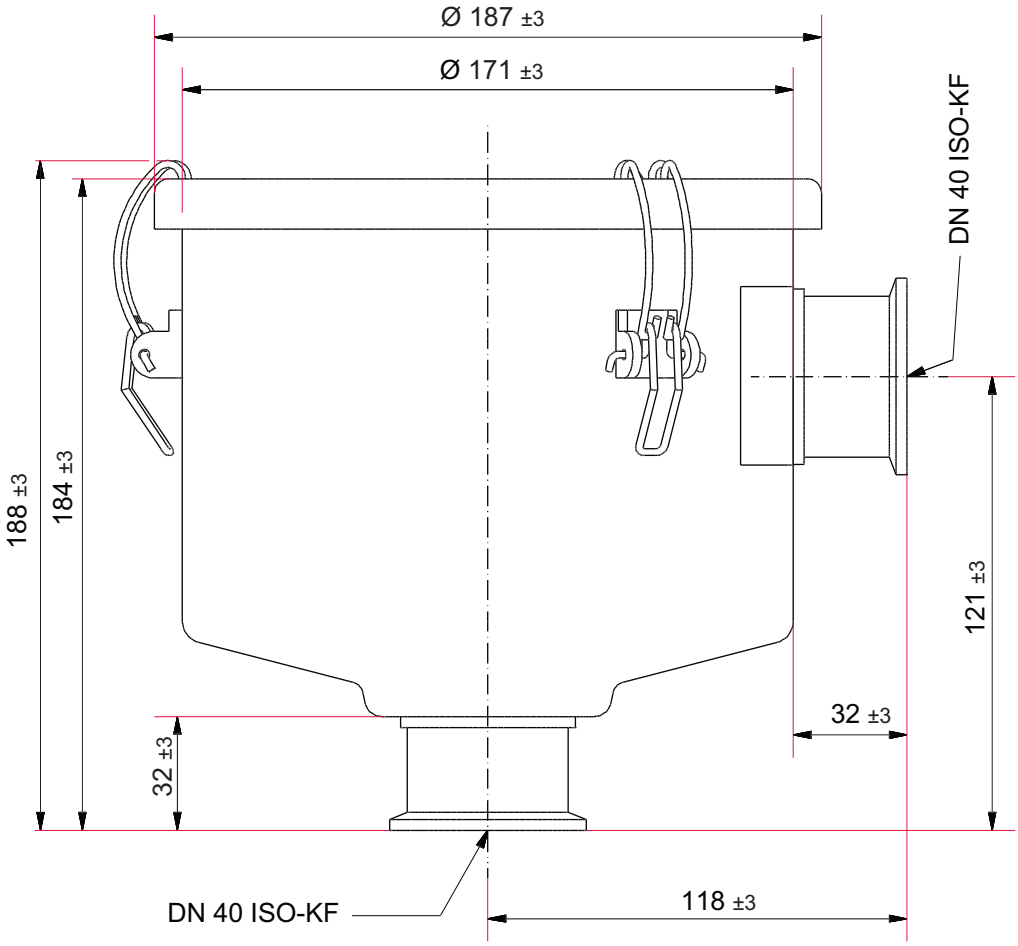

Fig. 14: Dimensions SAS 40

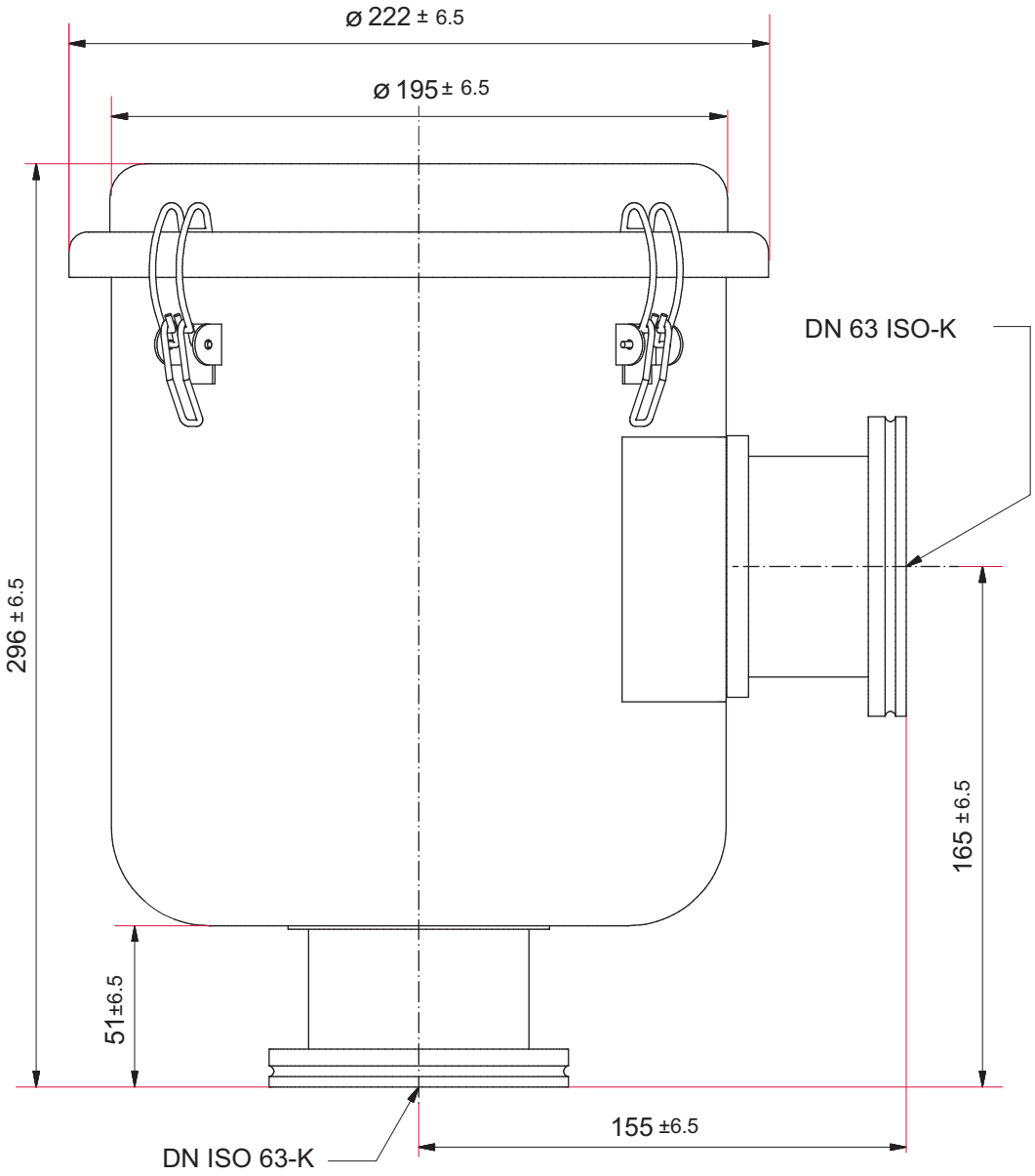

Fig. 15: Dimensions SAS 63

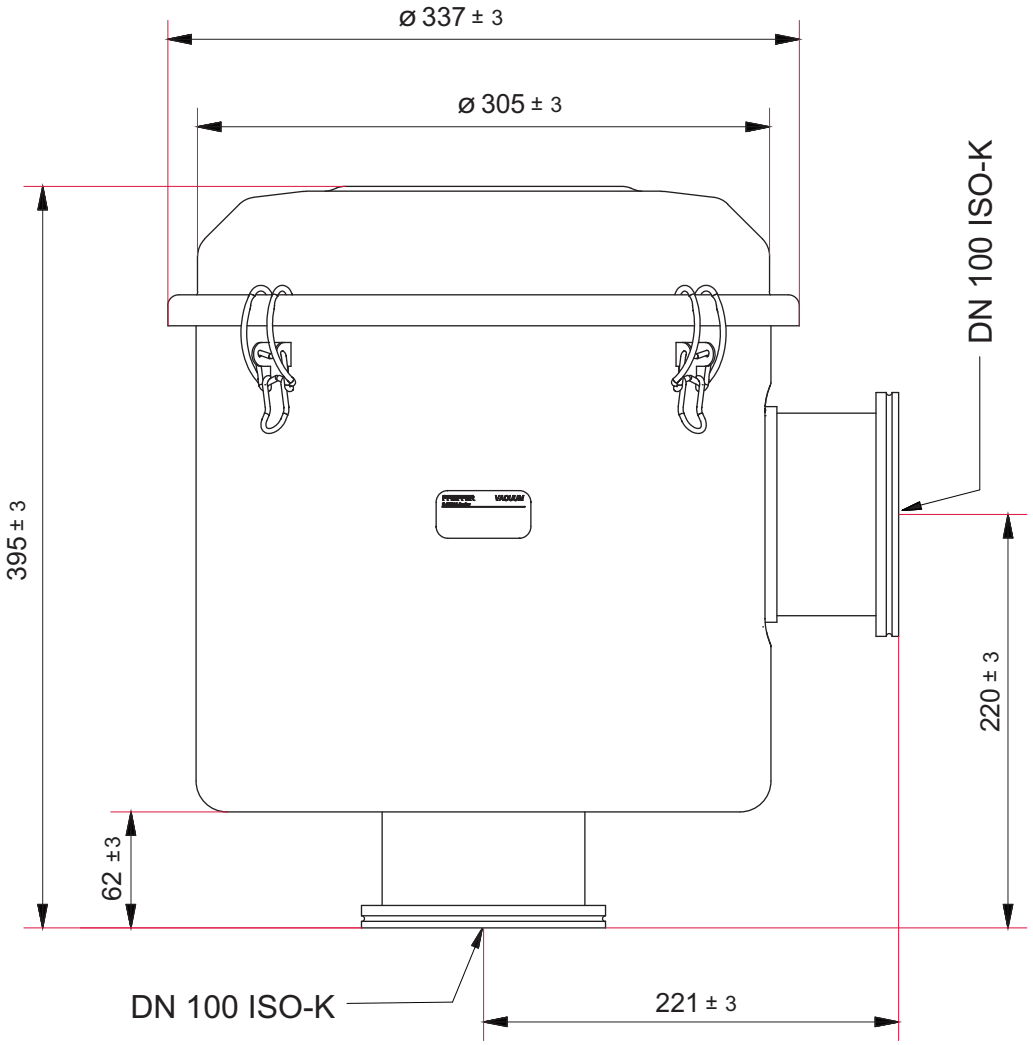

Fig. 16: Dimensions SAS 100

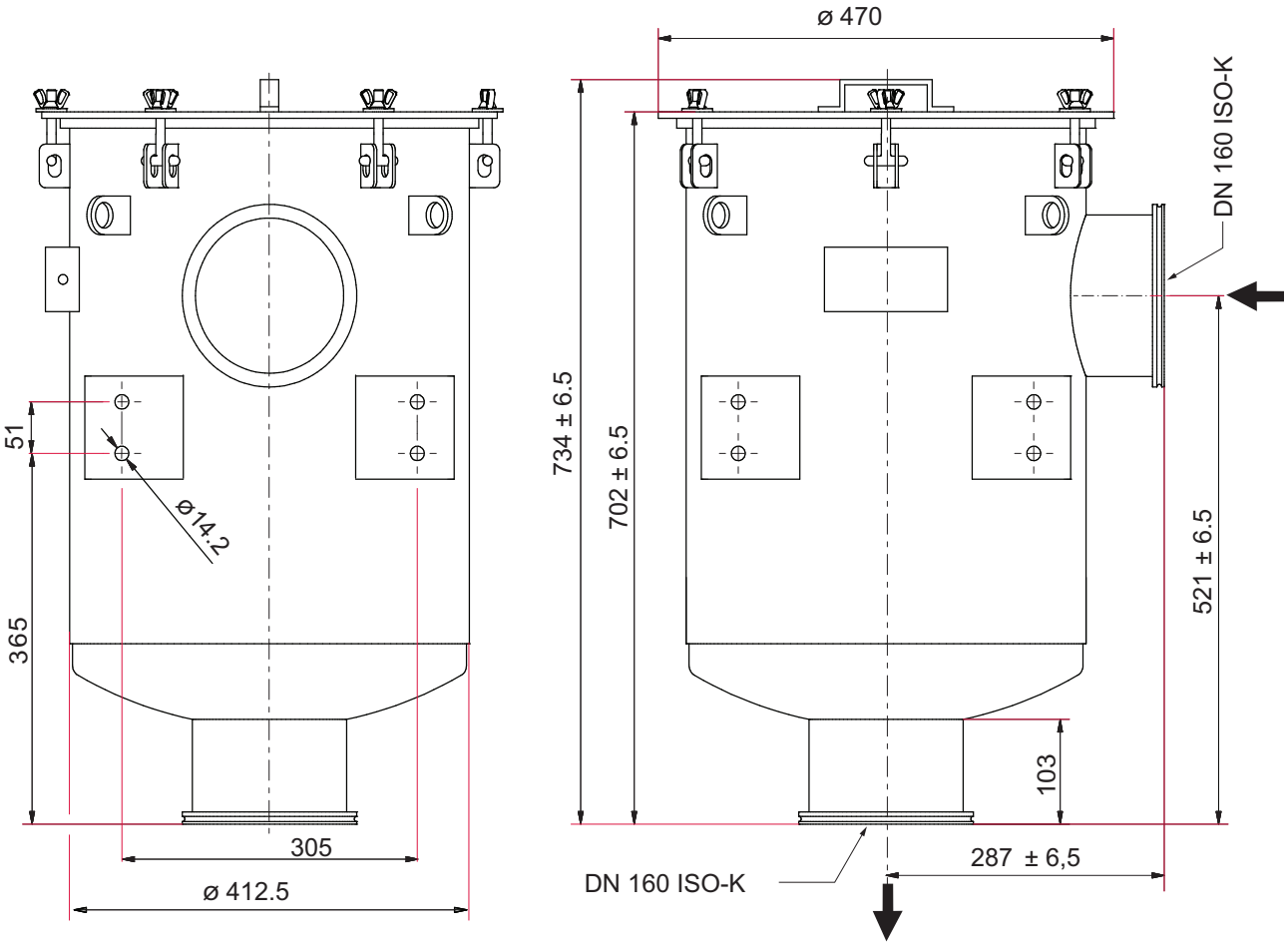

Fig. 17: Dimensions SAS 160

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