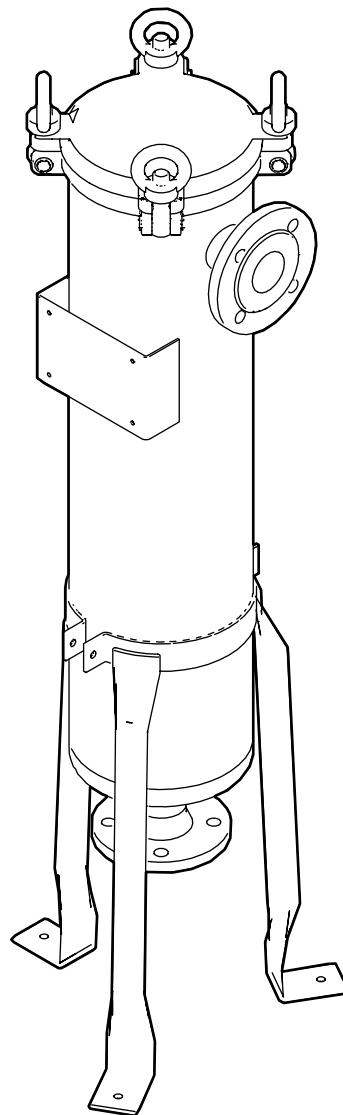
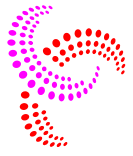


INSTALLATION AND OPERATION MANUAL

Bag Filter Housing

Type AFB/AFE/AFH/AFN & AFZ

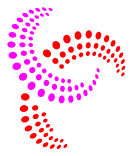




Filtration Group[®]
Filtering The World

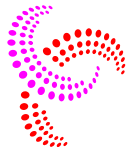
CONTENTS

Chapter 1. Introduction	1
1.1 Scope	1
1.2 Use according to purpose	1
1.3 Nameplate	3
Chapter 2. Safety	5
2.1 General	5
2.2 Warning icons	5
2.3 Warning instructions	6
2.4 Pressure	7
Chapter 3. General description	9
3.1 Main items	9
3.2 Filter size identification	10
3.3 Filter types	11
AFB:	11
AFE:	11
AFZ:	11
AFH	12
AFN	12
Dual/multiple bag filters	12
3.4 Filter bag	13
AFB, AFE and AFZ	13
AFH	13
AFN	13
3.5 Secondary components	14
Cover O-ring(s)	14
Pressure gauge	14



Chapter 4. Transport and storage	15
4.1 When accepting the equipment	15
4.2 Storage	15
4.3 Lifting during storage	15
Chapter 5. Installation	17
5.1 Pre-installation checklist	17
Piping	17
Valves	17
5.2 Put the vessel in position	18
5.3 Open the filter cover	18
5.4 Install the filter bag	19
5.5 Examine the cover O-ring	20
5.6 Close the filter cover	20
5.7 Ground the system	20
5.8 Connect the piping	20
Rp thread connectors	20
Flange connectors	21
5.9 Install the pressure gauge	21
5.10 Ground the system	22
Chapter 6. Commissioning	23
6.1 Pre-commissioning	23
6.2 Start the filter	23
Chapter 7. Operation	25
7.1 About filter cleaning	25
7.2 Open the filter cover	25
7.3 Clean the filter	25
7.4 Examine the cover O-ring	26
7.5 Close the filter cover	27
7.6 Start the filter	27
7.7 Process control	28
7.8 Process interruptions	28

Chapter 8. Maintenance and inspection	29
8.1 Monthly:	29
Chapter 9. Disposal	31



CHAPTER 1. INTRODUCTION

1.1 Scope

This MAHLE filter system guide gives you information about:

- Hardware
- Safety instructions
- Start-up and operation
- Maintenance
- Disposal.

of a Filtration Group filter housing.

Obey these instructions to make sure that the product functions safely and without problems.

Read this manual before you start to do work with the filter system. Know the product function and operation, and obey all instructions.



Note:

Illustrations can be different from your situation.

Filtration Group B.V. will not accept any liability for possible damage or injury, caused by users who do not obey the instructions in this manual and in all related documentation.

If you have any questions or if you need more information about the filter system please contact Filtration Group B.V. or your local representative.

1.2 Use according to purpose

This filter is for liquid filtration with product and process parameters given in the order confirmation and on the lay-out drawing. Different use is not permitted. Filtration Group B.V. does not accept any liability for incorrect use.



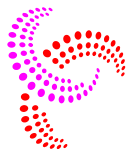
Note:

The filter and seal materials are compatible with the filter liquid which is specified during the design phase.

Contact Filtration Group B.V. before you change the filter liquid.

The use according to purpose means that the instructions in this manual are obeyed.

The warranty on the equipment is void if these instructions are not obeyed.



The customer shall make sure that the pressure in the filter can not become higher than the design pressure of the pressure vessel.



Danger

Do not weld on the pressure vessel.

The installation is designed and built according to Annex VII of the pressure equipment directive 2014/68/EU.

With the design approval of this filter, the influence of the fluids on the inner surface of the filter and gaskets is not considered. In some cases a corrosion allowance is included. This is recorded in the General Arrangement.

Make an inspection plan, record the number of pressure changes during the pressure vessels life.


Inspect the pressure vessel when it gets to the maximum number of pressure changes.

Make sure that:

- there are no cracks in the pressure vessel.
- the wall thickness of the pressure vessel is larger than the minimum permitted.
- there is no corrosion on the pressure vessel.

Replace the pressure vessel if it is unserviceable.

1.3 Nameplate

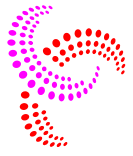
amafilter LFC Lochem		 Filtration Group® Filtering The World Filtration Group BV - THE NETHERLANDS www.filtrationgroup.com Tel: +31 (0)573-297777	
MODEL MODELL MODÈLE		<input type="text"/> <input type="text" value="CE"/>	
MANUFACTURER HERSTELLER FABRICANT			
<input type="text" value="Filtration Group B.V. - NETHERLANDS"/>			
SERIAL NO. FABRIK NR. NO. DE FABR.	<input type="text"/>	YEAR BUILT BAUJAHR ANNÉE DE FABR.	<input type="text"/>
CHAMBER RAUM ENCEINTE	<input type="text"/>	<input type="text"/>	<input type="text"/>
MAX. ALLOWABLE PRESSURE MAX. ZULÄSSIGER DRUCK PRESSION MAX. ADMISSIBLE	PS bar	<input type="text"/>	<input type="text"/>
MAX./MIN. ALLOWABLE TEMPERATURE MAX./MIN.ZULÄSSIGER TERATUR TEMPERATURE MAX.MIN.ADMISSIBLE	TS °C	<input type="text"/>	<input type="text"/>
VOLUME VOLUMEN	V L	<input type="text"/>	<input type="text"/>
TEST PRESSURE PRÜFDRUCK PRESSION D'ESSAI	PT bar	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	



Note:

Only AFZ housings have a name plate, the other housing types are identified by means of a sticker.

This is due to certification requirements.



CHAPTER 2. SAFETY

2.1 General

Always obey local safety regulations (or higher) when you work on an installation.

Always make sure that all safety devices function correctly.



Warning

Do not make changes to a safety device.

Open the vent valve and release the pressure before you start to do work.



Warning

Parts of the filter can become very hot. Do not go near hot parts.

Make sure that the vessel opening is clear when you open or close the filter.

2.2 Warning icons

Special warnings and cautions are found, where necessary, in this guide. Alert labels with the applicable symbol are attached to the equipment where necessary.

Obey all instructions and warning texts on the labels which are attached to the different parts of the equipment.

Text in this document which is related to the safety of personnel and/or equipment is shown as follows:



Danger

Identifies a very dangerous situation which, if not prevented, can result in death or very bad injury.



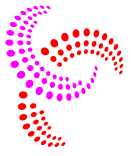
Warning

Identifies a dangerous situation where there is a risk of bad injury.



Caution

Identifies a situation where equipment or property can be damaged; or if there is a risk of injury.

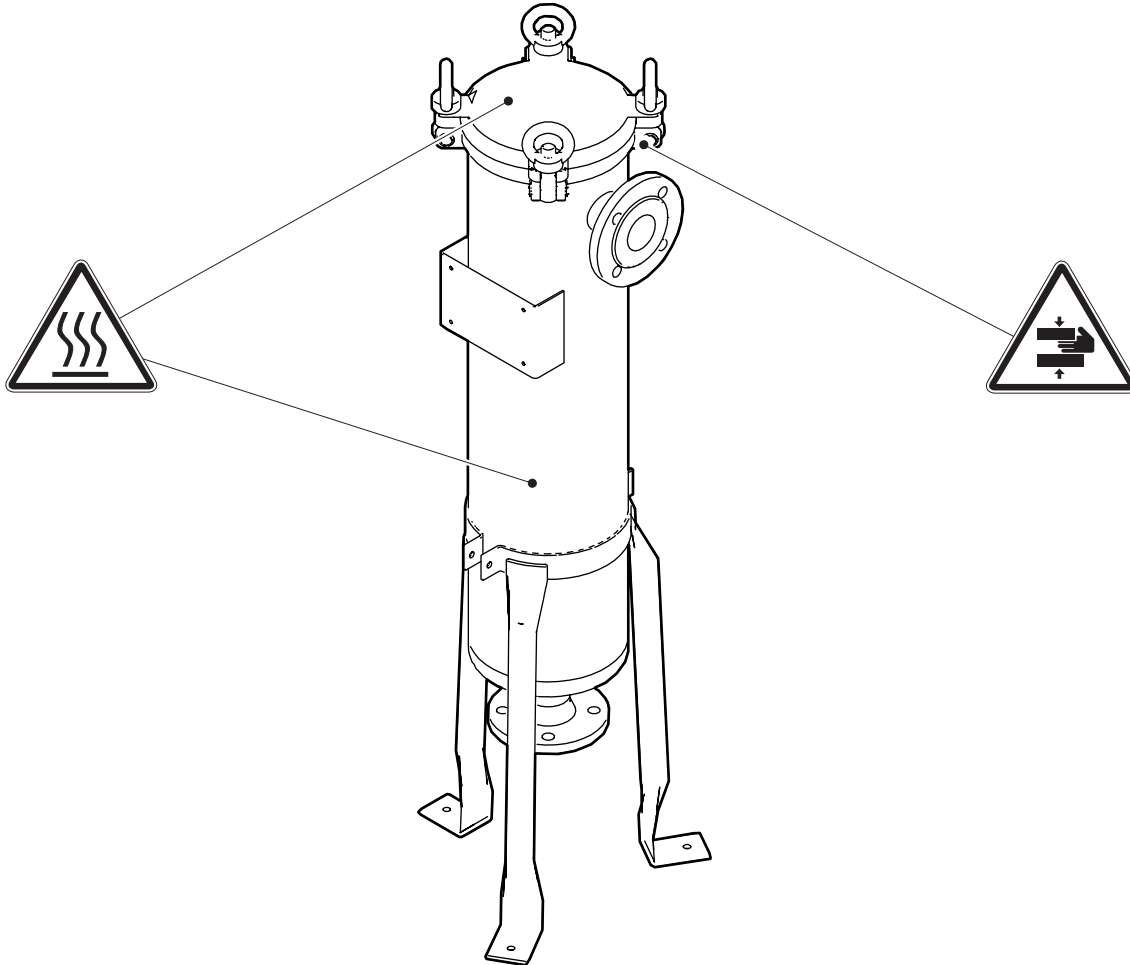


Note:

Identifies important information to help you understand or adjust the equipment.

2.3 Warning instructions

The warning instructions identify areas of possible danger and the type of danger or injury.



The icons are warnings for the risks that follow.



Hot surface Hand injury

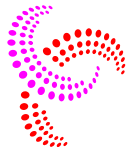
2.4 Pressure

Do not let the pressure in the pressure vessel become higher than the design pressure.

Do not let the pressure in the pressure vessel become lower than the ambient pressure, unless the pressure vessel is approved for this.

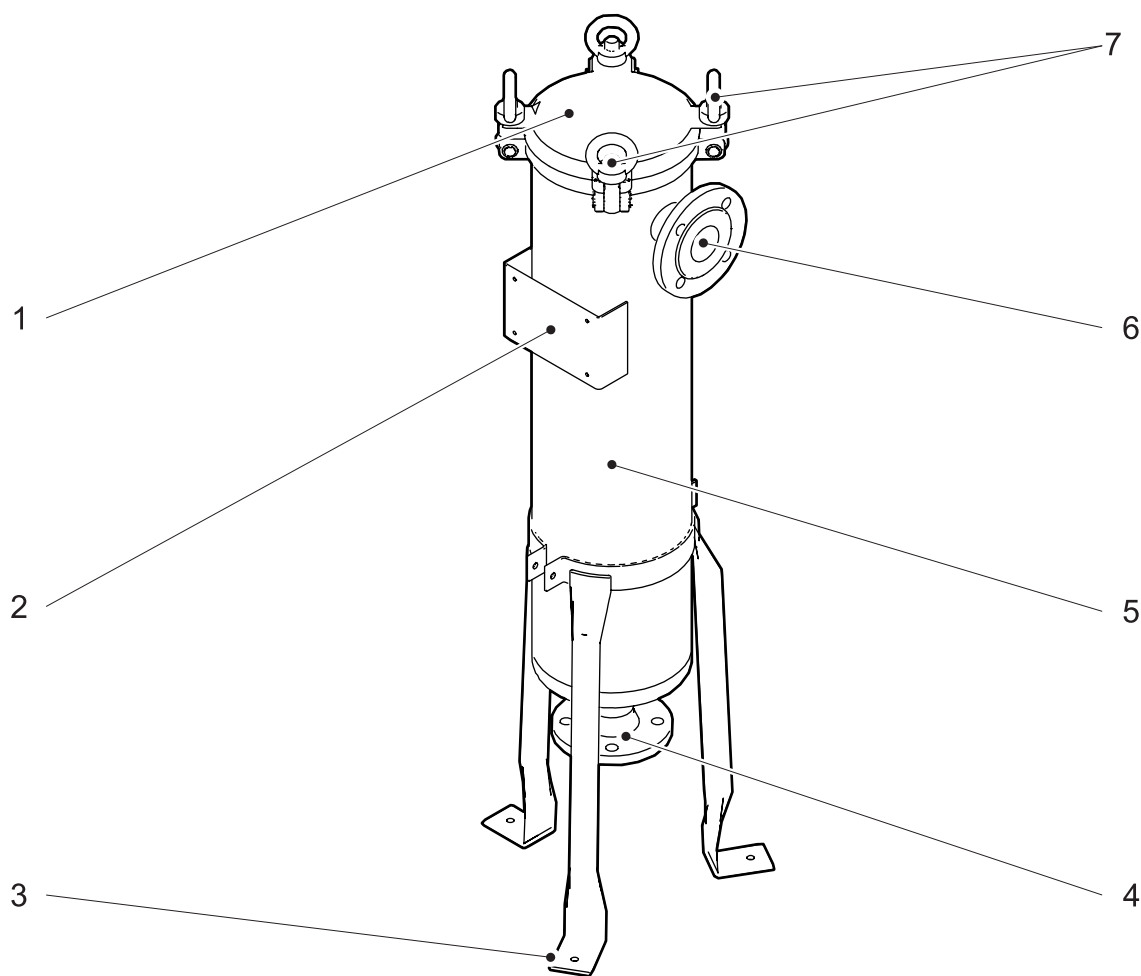
Before starting work on the filter system:

- Make sure all pressure vessels and pipelines are empty.
- Make sure that the pressure in all pressure vessels, pipelines and air buffers is released.



CHAPTER 3. GENERAL DESCRIPTION

3.1 Main items



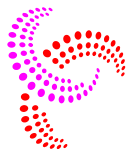
- | | | |
|-----------------|--------------------|-----------------|
| 1. Filter cover | 4. Outlet | 6. Inlet |
| 2. Nameplate | 5. Pressure vessel | 7. Cover clamps |
| 3. Support | | |



Note:

Only AFZ housings have a name plate (2), the other housing types are identified by means of a sticker.

This is due to certification requirements.



3.2 Filter size identification

The model number as follows gives the filter size:

AF B/E/H/N/Z 90/180 TY - 2/3/4/F/B

in which:

AFB/AFE/AFH/AFN/AFZ	Indication of the type of Filter housing See section 3.3 "Filter types" for a brief description of each filter.
90/180	Size 90 = Size 1 filter bag. 180 = Size 2 filter bag.
T/TY	Material T = Stainless steel vessel 316Ti (1.4571). TY = Stainless steel vessel with stainless steel closing nuts and bolts (default = galvanized closing nuts and bolts).
2/3/4	Connector size 2 = DN50 connector. 3 = DN80 connector (Size 180 only). 4 = DN100 connector (Size 180 only).
F/FA/B	Connector type F = DIN flange connector. FA = ASME 150 lbs RF. B = Smooth pipe (weld connection). - = Rp Thread (AFB only).

3.3 Filter types

AFB:



- Filter medium = Water or non hazardous liquids
- Design Temperature = 90 °C
- Design Pressure = 10 bar
- PED 97/23/EC cat. : article 3 paragraph 3

AFE:

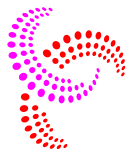


- Filter medium = (Edible) oil
- Design Temperature = 120 °C
- Design Pressure = 10 bar
- PED 97/23/EC cat. : article 3 paragraph 3

AFZ:



- Filter medium = All
- Design Temperature = 150 °C
- Design Pressure = 10 bar
- PED 97/23/EC category II/III



AFH



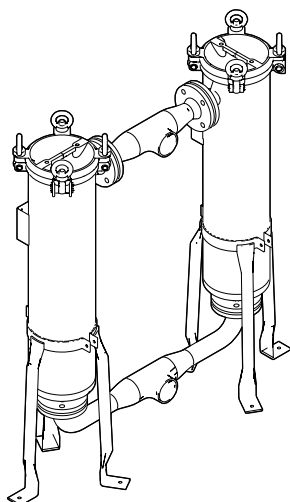
- Filter medium = Water
- Design Temperature = 90 °C
- Design Pressure = 10 bar
- PED 97/23/EC cat. : article 3 paragraph 3
- Stainless steel only
- Electro polished finish

AFN



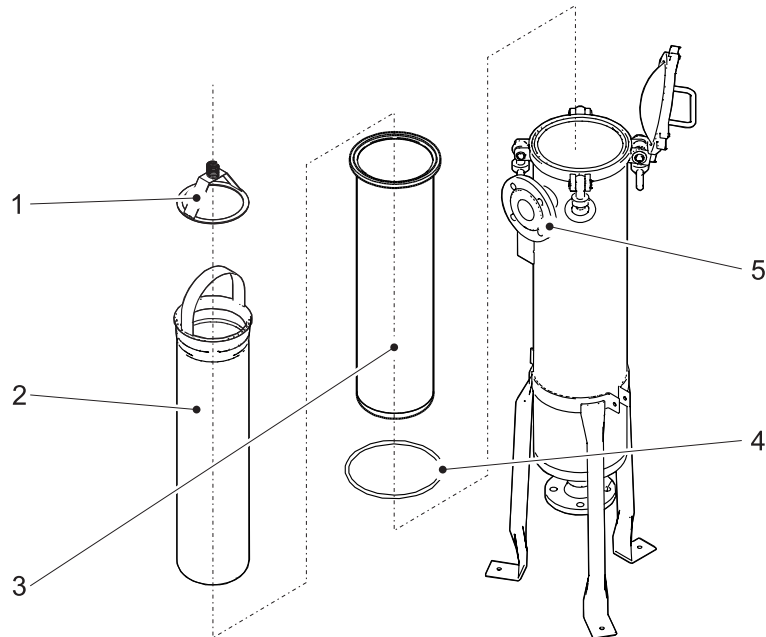
- Filter medium = Water or non hazardous liquids
- Design Temperature = 90 °C
- Design Pressure = 10 bar
- PED 97/23/EC cat. : article 3 paragraph 3
- Top feed housing
- Stainless steel only
- Electro polished finish

Dual/multiple bag filters



- Two (or more) bag filter housings connected with a manifold.

3.4 Filter bag

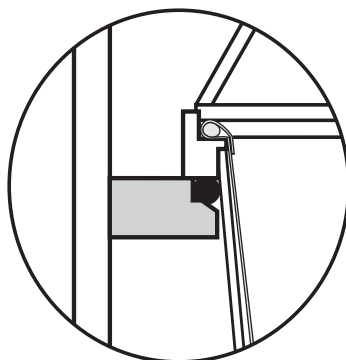


The filter bag (2) is made of needled felt or mesh filter media. The basket (3) supports the filter bag. The basket is made of stainless steel.

- The basket of the AFB, AFE and AFZ is a coarse mesh.
- The basket of the AFH and AFN is perforated.

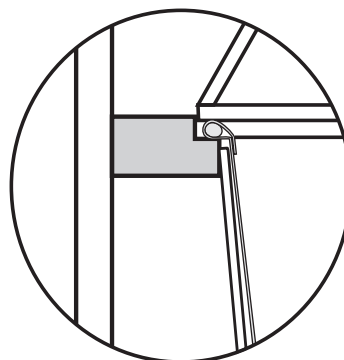
The liquid goes into the filter through the inlet (5). The liquid is pressurized and the liquid is pushed through the filter bag. The solids stay in the filter cake and the filter bag. The liquid goes out of the filter through the outlet pipe in the bottom of the filter housing.

AFB, AFE and AFZ



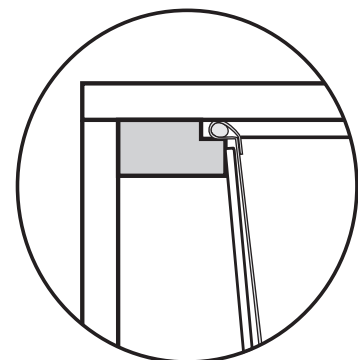
The bag seals against the support basket, which is sealed against the housing.
The bag is kept in place and sealed by the bag retainer.

AFH

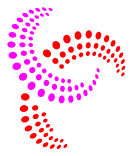


The bag seals directly against the housing.
The bag is kept in place and sealed by the bag retainer.
The only function of the support basket is to support the filter bag.

AFN



The bag seals directly against the housing.
The bag is kept in place and sealed by the filter cover.
The only function of the support basket is to support the filter bag.



3.5 Secondary components

Cover O-ring(s)

The cover O-ring gives a good seal between the cover and the filter tank.

The O-ring material is selected by the operating conditions such as temperature and chemical composition of the filtered liquid.

The cover O-ring is installed in the O-ring groove.

AFB, AFE, AFH and AFZ bag filters have one cover O-ring, AFN bag filters have two cover O-rings.

Pressure gauge



Note:

Install a pressure gauge on the top of the pressure vessel.

Use the pressure gauge:

- to make sure that the pressure in the vessel is not higher than the maximum allowable pressure,
- before opening to make sure that the pressure in the pressure vessel is equal to the pressure on the outside.

CHAPTER 4. TRANSPORT AND STORAGE

4.1 When accepting the equipment

- Make sure that the delivery is complete. Refer to the packing list.
- Do an inspection of the filter and all parts. Make sure that nothing is damaged.

Tell the transport company immediately if there are problems.

4.2 Storage

- Keep all parts in their original containers.
- Keep in a dry and dust free area with good airflow.
- Make sure that all flanges, nozzles, openings, etc. are sealed with a cover to prevent unwanted material to go into the vessel.

4.3 Lifting during storage



Caution

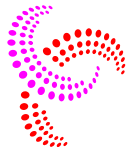
- Do not wind slings around the pressure vessel when lifting the filter. The slings will damage the pressure vessel.
- Connect slings to the lifting lugs on top of the vessel only .



Caution

Do not wind slings for lifting around:

- nozzles.
 - piping.
 - flanges.
-
- Keep the filter in its original container when moving.
 - Make sure that the filter is empty before lifting.
 - Make sure the filter coverbottom is closed before lifting.
 - Make sure the filter is de-energized before lifting.
 - Remove all loose parts from the filter.
 - Lock all moving parts.



CHAPTER 5. INSTALLATION

5.1 Pre-installation checklist

Piping

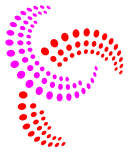
Make sure that:

- All general rules for good process piping have been followed.
- The connections agree with the information on the general assembly drawing.
- Sufficiently sized lines and fittings have been used.
- The flange loads are not larger than indicated on the general assembly drawing.
- All valves and other fittings have easy access for operation and maintenance.
- All valves are installed as close as possible to the flange connections of the filter.
- There are no places where solids can collect.

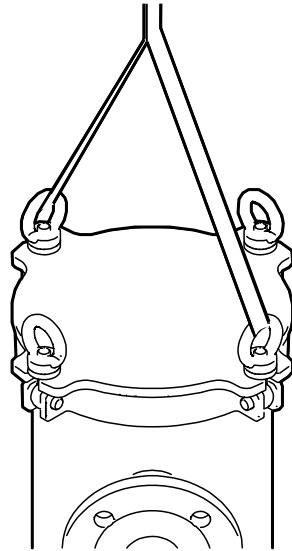
Valves

Make sure that:

- All fittings are tight.
- All valves are protected from opening and closing suddenly.
- liquid leakage from the vent line of the filter is contained.

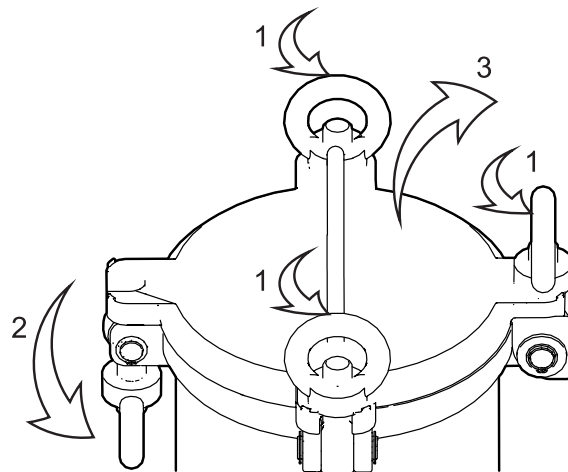


5.2 Put the vessel in position



1. Attach slings to the eye-nuts and lift the vessel.
2. Move the vessel to its final position.
 - Make sure that the piping aligns correctly.
 - Use shims to align the pressure vessel vertically.
3. Attach the vessel to its foundation.
4. Remove the slings.

5.3 Open the filter cover



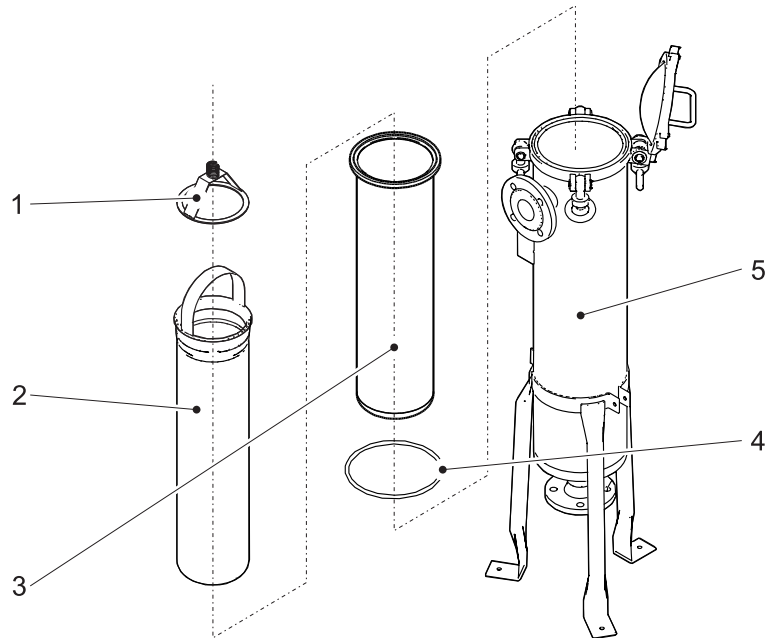
1. Loosen the bolts which hold down the cover.
2. Turn the bolts out of the way.
3. Turn the cover out of the way.

5.4 Install the filter bag



Note:

Only the AFB, AFE and AFZ bag filters have a basket O-ring (4). Do not use a basket O-ring with AFH and AFN type bag filters..



1. Put the O-ring (4) on the mesh basket (3).
2. Put the basket in the housing (5).
3. Put the filter bag (2) in the basket.



Note:

Make sure that the top of the filter bag is not creased or folded.



Note:

Make sure that the bottom of the filter bag is pushed to the bottom of the basket.

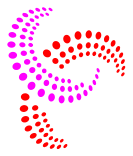
Make sure that the basket supports the tip of the filter bag.

4. Put the bag retainer (1) on the filter bag.



Note:

AFN type filters do not have a bag retainer. The filter cover holds the filter bag in place.



5.5 Examine the cover O-ring

Make sure that the cover O-ring is:

- Placed correctly.
- Not damaged.
- Clean.

Make sure that the O-ring contact areas are clean.

5.6 Close the filter cover

1. Close the filter cover.
2. Turn the cover clamping bolts into position.
3. Crosswise tighten the clamping bolts .



Note:

Hand tighten the filter cover bolts only. Do not use mechanical aid.

5.7 Ground the system

1. Connect all ground connections of the filter and components.



Note:

Make sure that the filter system is grounded sufficiently.

5.8 Connect the piping

Rp thread connectors



Warning

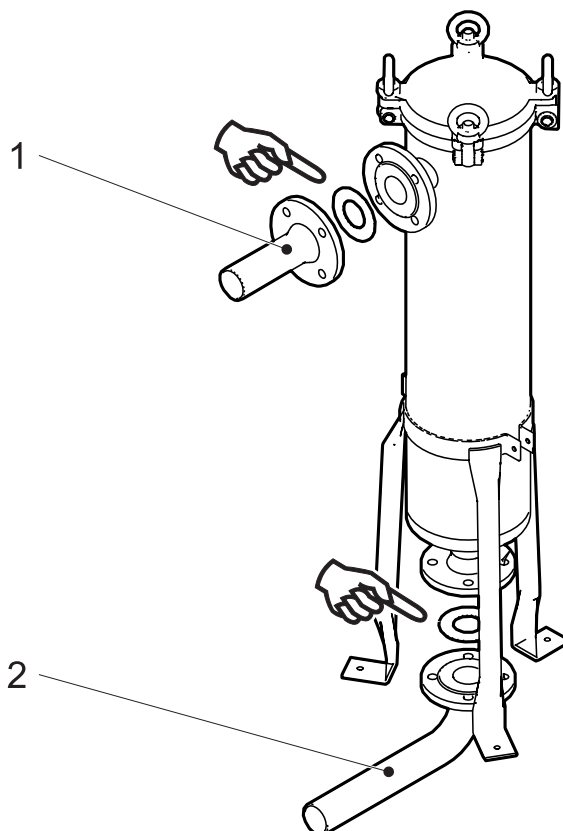
Apply Teflon tape to all metal parts that engage together.



Note:

Connect all piping so that the flange loads are not larger than indicated on the general assembly drawing.

Flange connectors



1. Put the gasket on the inlet flange.
2. Connect the inlet pipe (1) to the vessel.

Note:



Connect all piping so that the flange loads are not larger than indicated on the general assembly drawing.

3. Insert and torque the bolts.
4. Do steps 1 thru 3 for the outlet pipe (2).

5.9 Install the pressure gauge



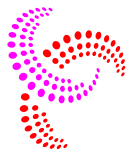
Warning

Apply Teflon tape to all metal parts that engage together.



Note:

Make sure that an operator can see the gauge face.



5.10 Ground the system

1. Connect all ground connections of the filter and components.



Note:

Make sure that the filter system is grounded sufficiently.

CHAPTER 6. COMMISSIONING

6.1 Pre-commissioning

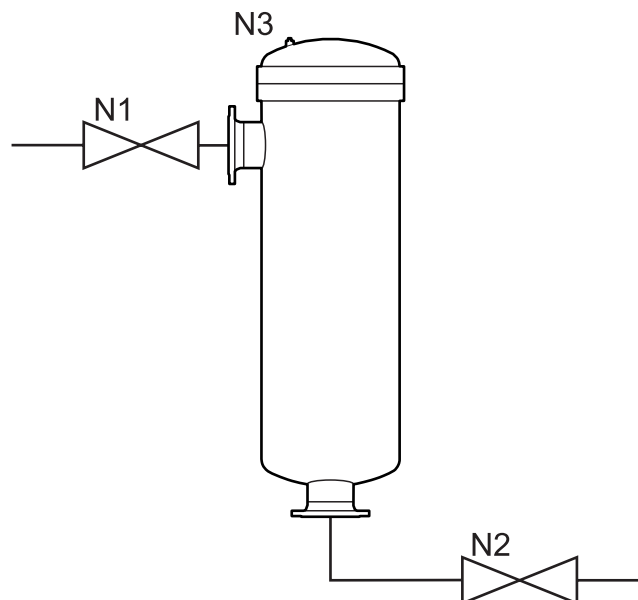


Caution

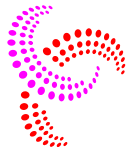
Make sure that there are no bolts, welding debris or other unwanted items in the system.

1. Before commissioning:
 - clean the connecting piping and tanks.
 - do a pressure test on the connecting piping and tanks.
2. Pressurize the pressure vessel and pipelines.
3. Do a visual inspection on the piping and fittings. Make sure there are no leaks.
4. Do a first test run. This lets the operator(s) know how the filter works and how to use the valves, etc.

6.2 Start the filter



1. Open the vent (N3) to bleed the air.
2. Open the inlet valve (N1) slowly.
3. Close the vent (N3) when liquid starts flowing out. The filter is now full with liquid.



Note:

Make sure that the cover seal does not leak.

If there is a leak: Remove the contents of the filter and place a new seal.

4. Fully open the inlet valve (N1) and slowly open the outlet valve (N2).
5. Flush the filter liquid for \pm 5 minutes. All contaminates from the installation will be filtered out of the medium.
6. Start filtration.

CHAPTER 7. OPERATION

7.1 About filter cleaning

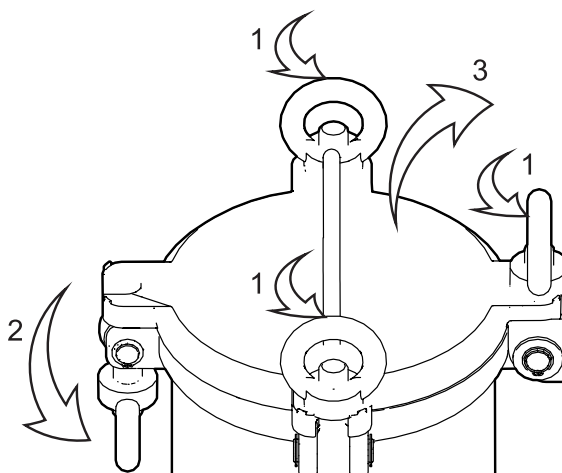


Warning

Clean or replace the filter elements when the the maximum pressure difference between the inlet and the outlet of the filter has reached 2,5 bar.

7.2 Open the filter cover

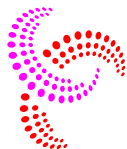
1. Stop the flow to the filter.
2. Remove the liquid in the filter.



3. Loosen the bolts which hold down the cover.
4. Turn the bolts out of the way.
5. Turn the cover out of the way.

7.3 Clean the filter

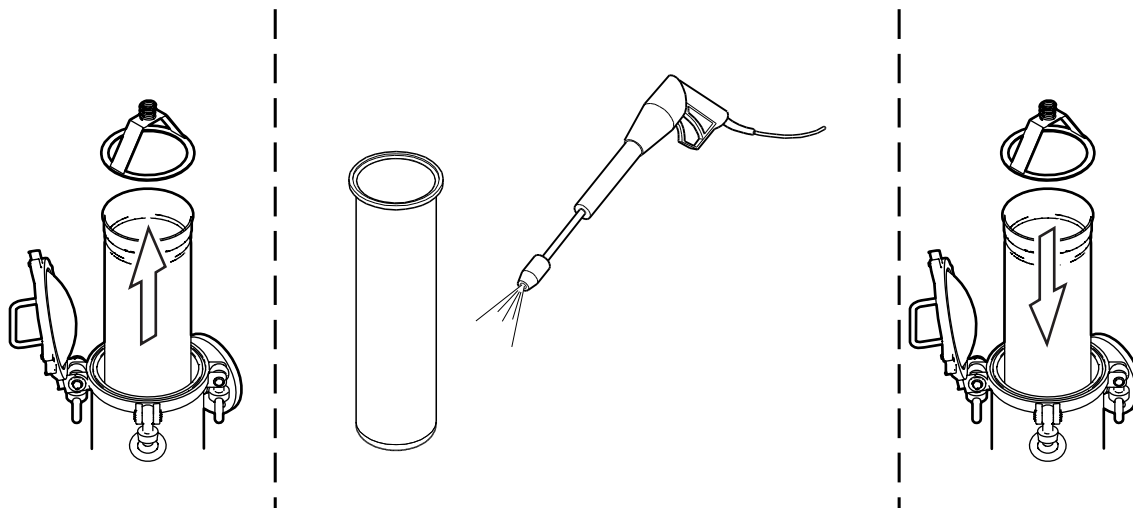
1. Stop the flow to the filter.
2. Remove the liquid in the filter.
3. Allow the filter to dry.
4. Open the filter cover.
5. Remove the bag retainers.
6. Lift out the filter bags and discard them.



Note:

Dispose of the dirty filter bags in an environmentally friendly manner.

7. Lift out the filter baskets.



8. Clean the filter baskets with a high pressure spray.

- Minimum distance = 2,5 cm
- Maximum pressure (water) = 200 barg
- Maximum temperature = 150°C.

9. Install the filter baskets again when they are clean.

10. Install a new filter bag



Note:

Make sure that the top of the filter bag is installed correctly.



Note:

Make sure that the bottom of the filter bag is pushed all the way to the bottom of the basket.

Make sure that the tip of the bag is supported.

11. Put the bag retainers back.

12. Close the filter. See section 7.5 "Close the filter cover" .

7.4 Examine the cover O-ring

Make sure that the cover O-ring is:

- Placed correctly.
- Not damaged.
- Clean.

Make sure that the O-ring contact areas are clean.

7.5 Close the filter cover

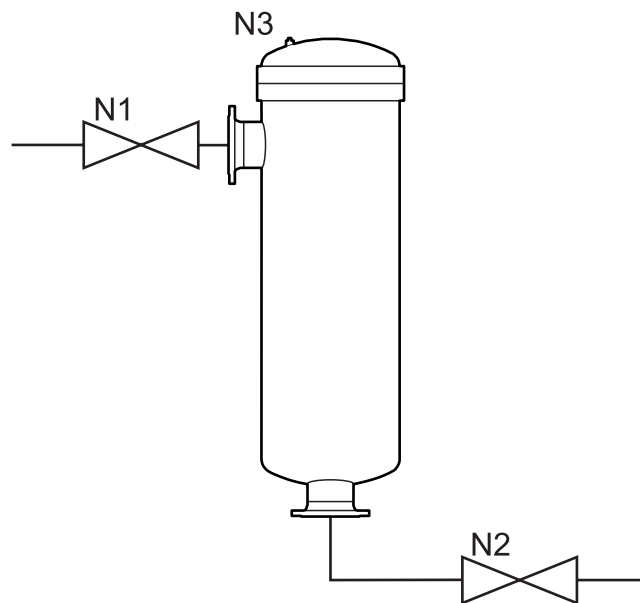
1. Close the filter cover.
2. Turn the cover clamping bolts into position.
3. Crosswise tighten the clamping bolts .



Note:

Hand tighten the filter cover bolts only. Do not use mechanical aid.

7.6 Start the filter



1. Open the vent (N3) to bleed the air.
2. Open the inlet valve (N1) slowly.
3. Close the vent (N3) when liquid starts flowing out. The filter is now full with liquid.

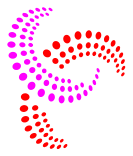


Note:

Make sure that the cover seal does not leak.

If there is a leak: Remove the contents of the filter and place a new seal.

4. Fully open the inlet valve (N1) and slowly open the outlet valve (N2).
5. Flush the filter liquid for ± 5 minutes. All contaminates from the installation will be filtered out of the medium.
6. Start filtration.



7.7 Process control

Adjust the filtration flow as follows:

Type of pump	Filtration flow control
Centrifugal pump	Throttle valve after the filter pump Speed control on the pump motor
Positive displacement pump	Speed control on the pump motor



Caution

Do not use a gate valve for controlling the flow. Use a butterfly or diaphragm valve instead.

7.8 Process interruptions

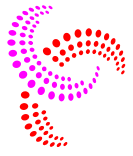
If a process interruption is planned.

1. Remove the liquid in the filter.
2. Clean the filter.

CHAPTER 8. MAINTENANCE AND INSPECTION

8.1 Monthly:

1. Examine all connections. Make sure there are no leaks.
2. Examine all gaskets. Make sure there are no leaks.
3. Replace all parts that are unserviceable.



CHAPTER 9. DISPOSAL

No special, dangerous or environmentally poisonous parts are used in the construction of the installation. Refer to local regulations when you discard waste material.

1. Release the pressure from the installation. Use the pressure gauge on the filter to make sure that there is no pressure in the system.
2. Disconnect the electricity.
3. Disconnect the air supply.



Warning

Make sure that all energy sources are disabled and made safe before you start to disassemble the filter.

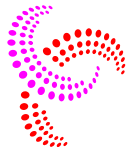
4. Empty and clean the installation.
5. Discard all waste in an environmentally friendly manner.
6. Disassemble all parts that have no structural function.
7. Disassemble the remaining parts of the filter construction.

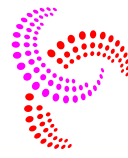


Warning

Make sure that no parts can fall from the installation during disassembly.

8. Discard all components in an environmentally friendly way.





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