AFRISO

Technik für Umweltschutz

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EN

Operating instructions

Automatic fuel oil de-aerator with integrated filter

FloCo-Top-1K

GREEN FUELS up to 100 % carbon neutral READY

PROOFED BARRIER®

in conjunction with a PA hose 4 x 1 mm

AFRISO

MVV TB
C 2.15.23
EN 12514-2

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1 About these operating instructions

These operating instructions describe the automatic fuel oil de-aerator with integrated filter "FloCo-Top-1K" (also referred to as "product" in these operating instructions). These operating instructions are part of the product.

- You may only use the product if you have fully read and understood these operating instructions.
- Verify that these operating instructions are always accessible for any type of work performed on or with the product.
- Pass these operating instructions as well as all other product-related documents on to all owners of the product.
- If you feel that these operating instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these operating instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

2 Information on safety

2.1 Safety messages and hazard categories

These operating instructions contain safety messages to alert you to potential hazards and risks. In addition to the instructions provided in these operating instructions, you must comply with all directives, standards and safety regulations applicable at the installation site of the product. Verify that you are familiar with all directives, standards and safety regulations and ensure compliance with them prior to using the product.

Safety messages in these operating instructions are highlighted with warning symbols and warning words. Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.

NOTICE

NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

2.2 Intended use

This product may only be used in single-line systems with return pipe connection for continuous de-aeration of the following fuels in fuel oil consuming systems:

- Fuel oil EL as per DIN 51603-1 and as per DIN SPEC 51603-6 with 0 - 30 % fatty acid methyl ester (FAME) as per EN 14214
- Diesel fuel as per EN 590 with up to 7 % fatty acid methyl ester (FAME) as per EN 14214
- Biofuel and biodiesel with up to 30 % fatty acid methyl ester (FAME) as per EN 14214
- Paraffinic fuels (HVO/GTL as per DIN/TS 51603-8) proportionally with 0 - 100 %

Any use other than the application explicitly permitted in these operating instructions is not permitted and causes hazards.

Verify that the product is suitab le for the application planned by you prior to using the product. In doing so, take into account at least the following:

- All directives, standards and safety regulations applicable at the installation site of the product
- All conditions and data specified for the product
- The conditions of the planned application

In addition, perform a risk assessment in view of the planned application, according to an approved risk assessment method, and implement the appropriate safety measures, based on the results of the risk assessment. Take into account the consequences of installing or integrating the product into a system or a plant.

When using the product, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the operating instructions and on the nameplate, as well as with all directives, standards and safety regulations applicable at the installation site of the product.

2.3 Predictable incorrect application

The product must never be used in the following cases and for the following purposes:

- Use with undiluted additives, alcohols and acids
- Pressure operation with fuel pumping system

2.4 Qualification of personnel

This product may only be mounted, commissioned, maintained and decommissioned by a qualified, specialised company which has all required certifications and which meets the following requirements:

- Compliance with all directives, standards and safety regulations concerning handling of water-polluting substances as applicable at the installation site of the product.
- In Germany: Certification as per § 62 "Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen" (AwSV) (Ordinance on Installations for Handling Water-Polluting Substances).

Only appropriately trained persons who are familiar with and understand the contents of these operating instructions and all other pertinent product documentation are authorized to work on and with this product.

These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product.

All persons working on and with the product must be fully familiar with all directives, standards and safety regulations that must be observed for performing such work.

2.5 Personal protective equipment

Always wear the required personal protective equipment. When performing work on and with the product, take into account that hazards may be present at the installation site which do not directly result from the product itself.

2.6 Modifications to the product

Only perform work on and with the product which is explicitly described in these operating instructions. Do not make any modifications to the product which are not described in these operating instructions.

3 Transport and storage

The product may be damaged as a result of improper transport or storage.

NOTICE

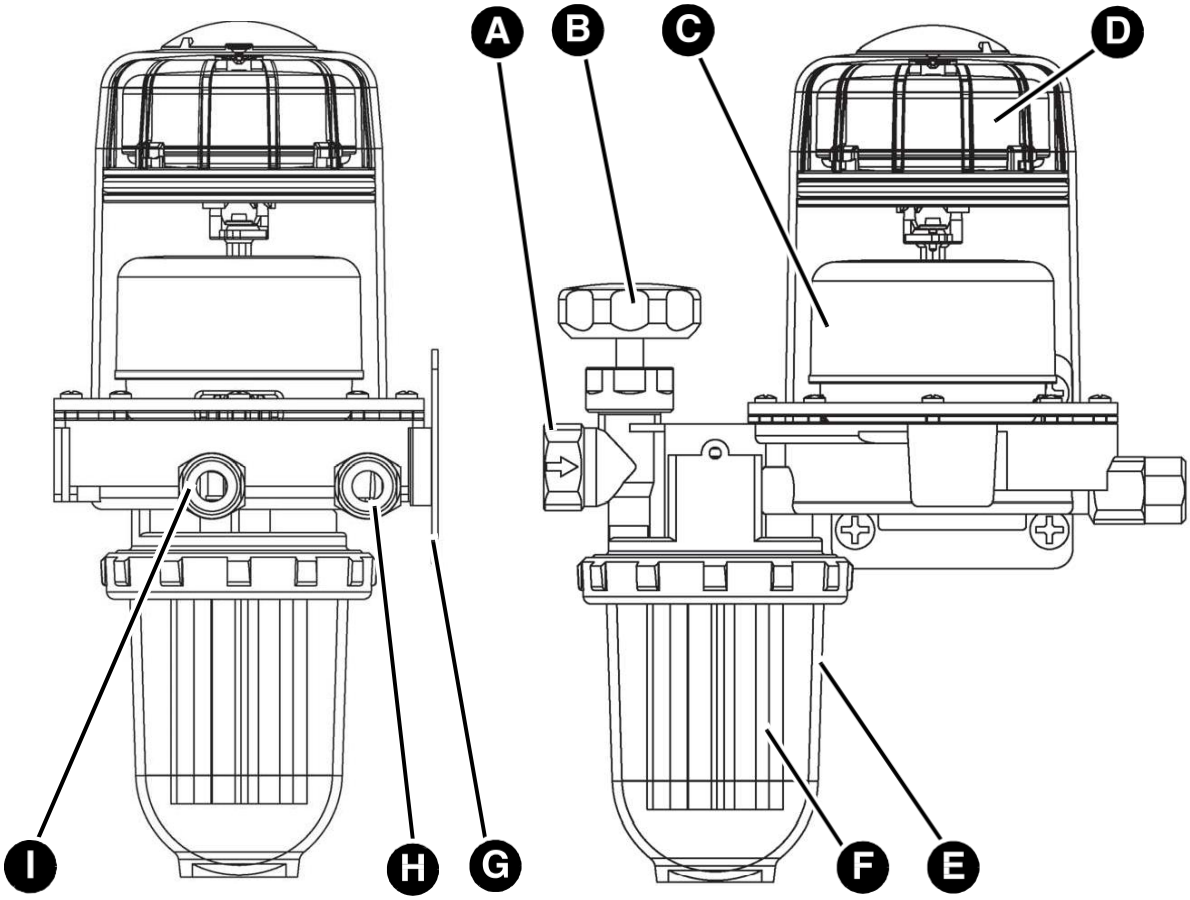
INCORRECT HANDLING

- Verify compliance with the specified ambient conditions during transport or storage of the product.
- Use the original packaging when transporting the product.
- Store the product in a clean and dry environment.
- Verify that the product is protected against shocks and impact during transport and storage.

Failure to follow these instructions can result in equipment damage.

4 Product description

Overview



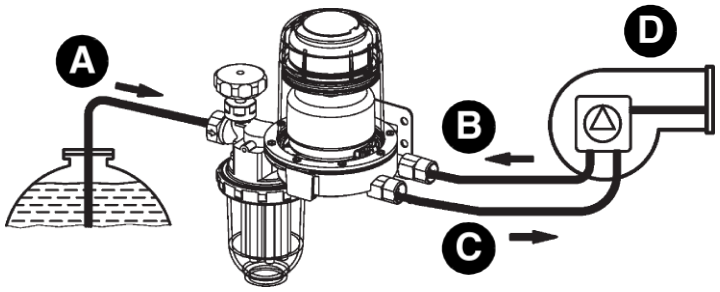
A. Connection suction line
B. Shut-off valve
C. Lower float chamber (operating float)
D. Upper float chamber (safety float)
E. Filter cup
F. Filter insert
G. Wall bracket
H. Return connection (from burner)
I. Flow connection (to burner)

The upper float chamber (D) keeps foam from escaping through the vent opening.

Fig. 1: Overview FloCo-Top 1K

4.1 Function

The burner pump sucks the liquid fuel from the tank via the filter insert. The fuel not burnt by the burner nozzle is returned to the vent via the return line and then resupplied to the burner via the flow line. Only the amount of fuel actually burnt is taken from the tank and added to the de-aerated fuel.



A. $Q_{Tank} = Q_{Nozzle}$
B. Q_{Return}
C. Q_{Flow}
D. Q_{Nozzle}

4.2 Approvals, conformities, certifications

The product is TÜV-tested (report number 968/FSP 2170.01/21).

4.3 Technical data

Parameter	Value
General specifications	
Dimensions (W x H x D) with short filter cup	165 x 221 x 98 mm
Connection burner Flow and return	G3/8 male with 60° cone for burner hose
Connection tank	G3/8 female at shut-off valve
Nozzle capacity	Max. 100 l/h
Return flow	Max. 120 l/h
Separating capacity air/gas, depending on air content of fuel	> 4 l/h (de-aeration unit only) > 6 l/h (as per EN 12514-3)
Mounting position	Float housing vertical to the top
Operating overpressure	Max. 0.7 bar (corresponds to a static liquid column of approximately 8 m)
Suction pressure	Max. -0.5 bar
Test pressure	6 bar

Parameter	Value
Filter insert	50-70 µm sintered plastic (part no. 69960), see packaging label for other articles
Housing material	Zinc die cast
Ambient conditions	
Ambient temperature operation	Max. 60 °C
Temperature of the medium	Max. 60 °C

5 Mounting

Install the product upstream of the burner.

The product may be installed above or below the maximum tank level.

The suction line can be implemented with a steady gradient to the tank if the conditions on site permit this.

5.1 Determining the cross section of the suction line

When dual-pipe systems are converted to single-pipe operation, the flow rate of the fuel in the suction line is reduced.

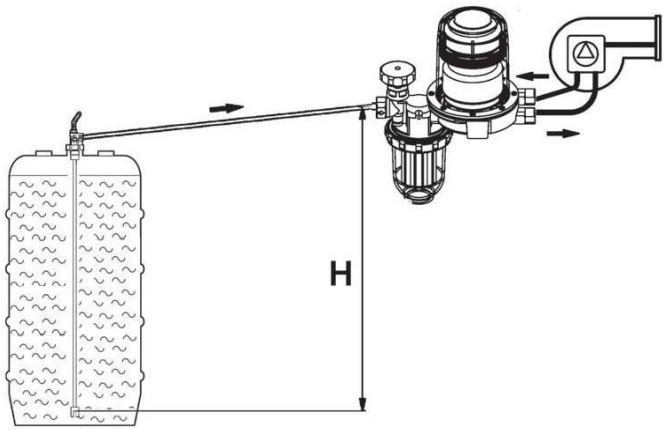
⇨ Verify that the cross section of the suction line complies with DIN 4755-2 (flow rate 0.2 to 0.5 m/s) in order to help avoid air cushions in higher pipe sections and pipes with gradients (shutdowns due to error conditions).

Consider the specifications and instructions of the system manufacturer.

5.2 Determining the suction line length

For the determination of the maximum possible suction line length, the maximum suction vacuum must not exceed -0.4 bar. An additional pressure loss of 0.05 bar is considered for the resulting filter pollution.

5.2.1 Maximum suction line length in the case of rising line

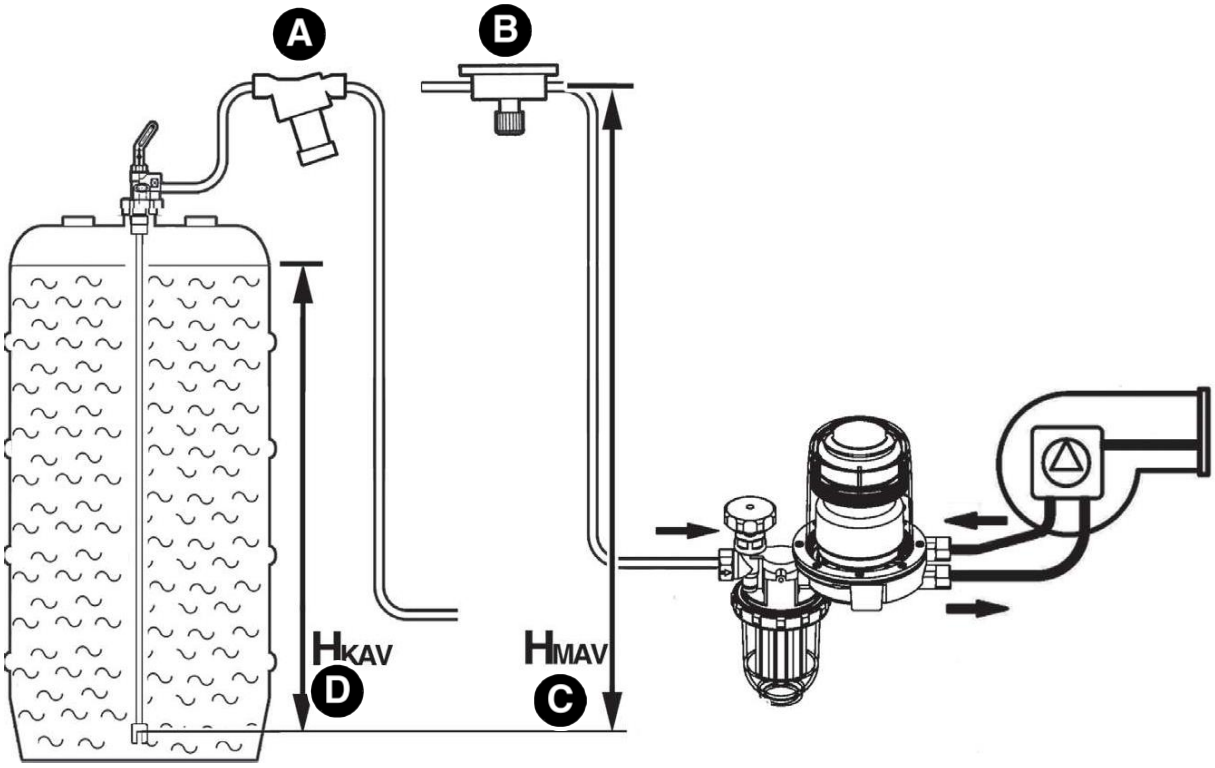


1. Remove all check valves at the tank and in the area of a self-securing suction line.

Nozzle capacity	Inner pipe Ø	Suction height H [m]						
		1.5	2.0	2.5	3.0	3.5	4.0	
< 2.5 kg/h (3 l/h)	Ø 4 mm	32	26	19	13	7	1	Maximum possible suction line length [m]
	Ø 6 mm	> 100	> 100	> 100	68	36	4	
	Ø 8 mm	> 100	> 100	> 100	> 100	> 100	14	
5 kg/h (6 l/h)	Ø 4 mm	10	8	6	4	2	1	
	Ø 6 mm	81	65	49	34	18	2	
	Ø 8 mm	> 100	> 100	> 100	> 100	57	7	
7.5 kg/h (9 l/h)	Ø 4 mm	10	8	6	4	2	0	
	Ø 6 mm	54	43	33	22	12	1	
	Ø 8 mm	> 100	> 100	> 100	71	38	4	
10 kg/h (12 l/h)	Ø 4 mm	8	6	4	3	1	0	
	Ø 6 mm	40	32	25	17	9	1	
	Ø 8 mm	> 100	> 100	78	53	28	3	
	Ø 10 mm	> 100	> 100	> 100	> 100	69	8	
15 kg/h (18 l/h)	Ø 6 mm	27	21	16	11	6	0	
	Ø 8 mm	86	69	52	35	19	2	
	Ø 10 mm	> 100	> 100	> 100	87	46	5	
20 kg/h (24 l/h)	Ø 6 mm	20	16	12	8	4	0	
	Ø 8 mm	64	52	39	26	14	1	
	Ø 10 mm	> 100	> 100	96	65	35	4	

5.2.2 Maximum suction line length in the case of a lower lying line

1. Install an anti-siphon valve to keep liquid fuel from escaping (siphoning) in the case of an untight suction line and a higher level in the tank.



A. Piston type anti-siphon valve "KAV"

B. Diaphragm type anti-siphon valve "MAV"

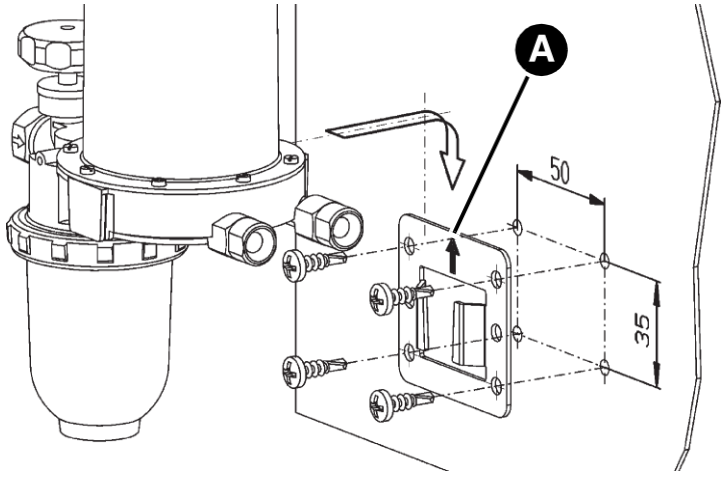
C. $\mathbf{H_{MAV}}$ = Safe height "MAV"

D. $\mathbf{H_{KAV}}$ = Safe height "KAV"

5.3 Mounting the product

⇨ Verify that the product is not mounted the product on top of or next to a non-insulated boiler part, above opening dampers at furnaces or to the flue gas pipe.

⇨ Verify that the float housing points vertically to the top.



1. Mount the product to the boiler casing using the enclosed bracket and the four self-tapping screws.
2. Use the bracket as a template when screwing in the self-tapping screws. The arrow (A) must point upwards.

NOTICE

LEAKING PRODUCT

- Verify that you use a screwed pipe connection as per DIN 2353 with cylindrical thread (G thread) and seal the screwed pipe connection with a flat gasket or with suitable glue. Do not use Teflon tape or hemp.

Failure to follow these instructions can result in equipment damage.

3. Mount the suction line into the female thread G$^{3}/_{8}$ of the housing with a cylindrical screwed pipe connection G$^{3}/_{8}$ as per DIN 2353. The tightening torque is 40 ±10 Nm.
4. Use a stiffener in the case of soft or semi-soft copper pipes.
5. Lock with an open ended spanner (spanner size 24) and tighten the screwed connection at the connection piece.
6. Mount the burner hoses. Before mounting, make sure the sealing surfaces are clean and not damaged. The tightening torque is 20 ±5 Nm.

NOTICE

INOPERABLE PRODUCT

- Verify that you do not interchange the burner hoses for the flow and return lines.

Failure to follow these instructions can result in equipment damage.

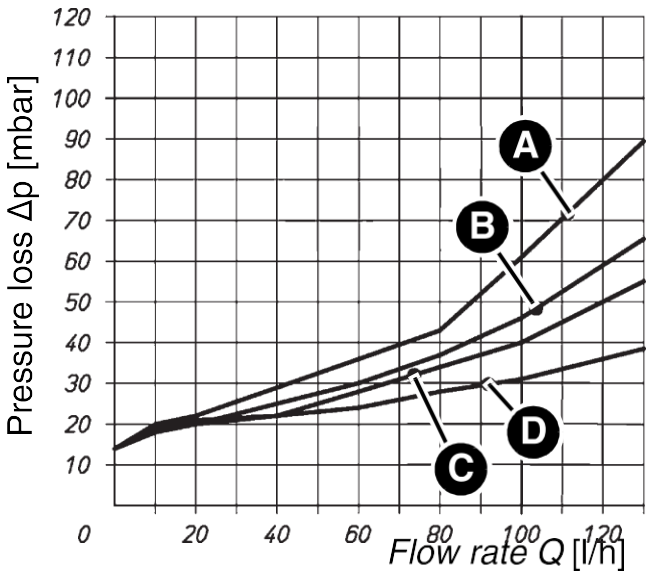
5.4 Pressure test

⇨ Verify that the product is not included in the pressure test.

5.5 Pressure loss

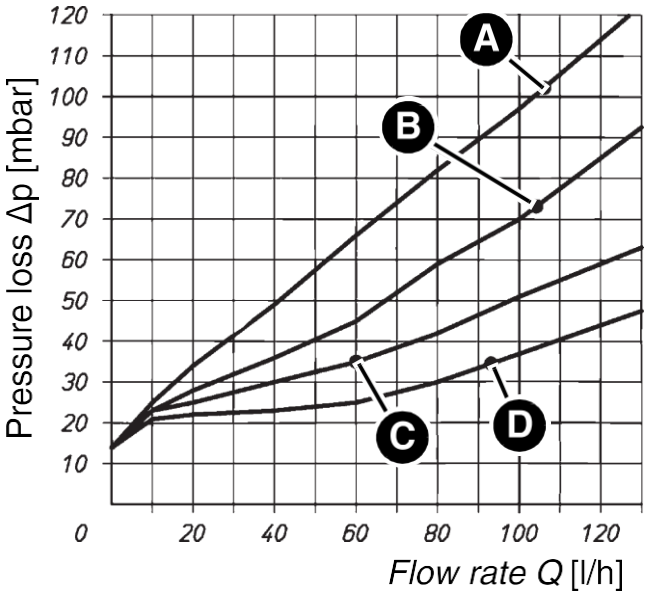
The product allows you to use a great variety of filter inserts. See the diagram for the resulting pressure losses.

5.5.1 In suction mode with clean filter insert



A. Sintered plastic insert 35 µm
B. Sintered plastic insert 50 µm
C. Sintered plastic insert 70 µm
D. Felt
E. Steel sieve

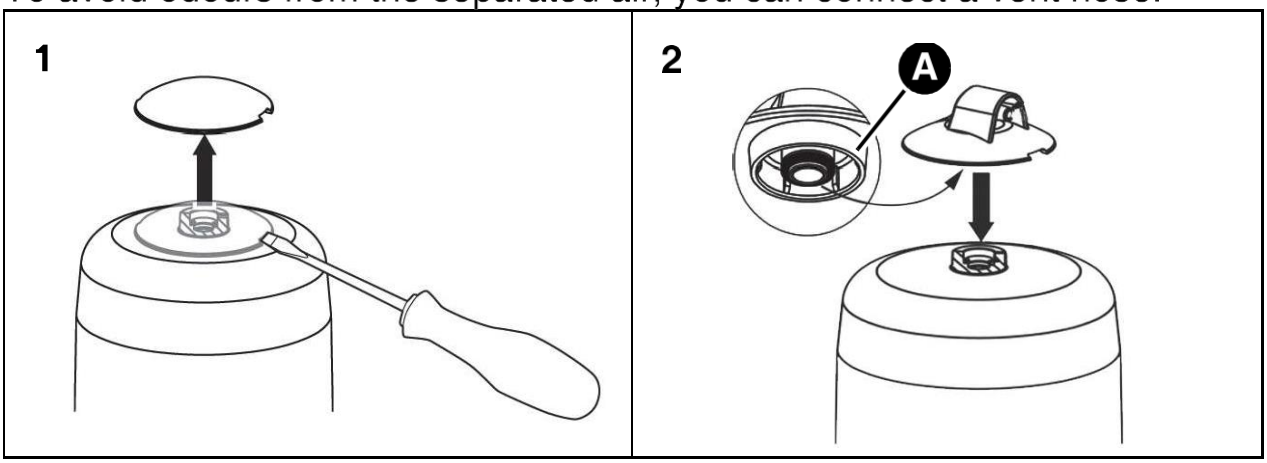
5.5.2 In suction mode with filter insert polluted by 50 %



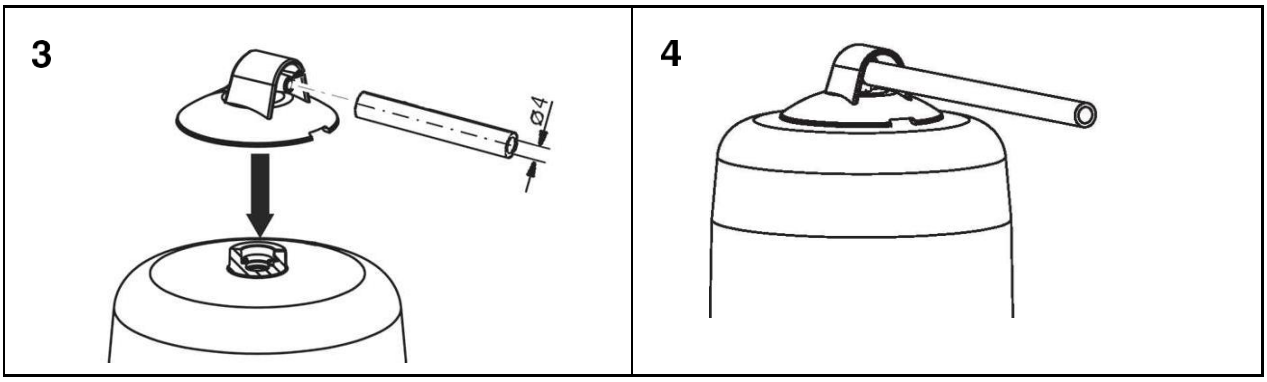
A. Sintered plastic insert 35 µm
B. Sintered plastic insert 70 µm
C. Felt
D. Steel sieve

5.6 Connecting the vent hose

To avoid odours from the separated air, you can connect a vent hose.



A. Hose connection with O ring



1. Route the vent hose back to the tank next to the suction line.
2. Fixate the vent hose with cable ties.
3. Mount the other end of the vent hose to the de-aeration line or the return connection of the withdrawal fitting at the tank to avoid clogging.

6 Operation

6.1 Liquid level in the float housing

The liquid level depends on the operating conditions of the system and amounts to approximately 20-50 mm in suction mode. If the liquid level is higher, the float housing may be completely filled with fuel if the suction line is tight. When the operating conditions change, for example, decreasing liquid level in the tank, the air cushion is formed again in the float housing.

6.2 Accumulations of air in the filter cup

Depending on the filter insert and the suction vacuum of the system, an air cushion may form in the filter cup. If the filter insert is new, there may be only a little amount of fuel in the filter cup. This does not affect the operation of the system (as long as the inside of the filter is wetted with fuel).

With increasing pollution of the filter, the suction pressure increases and the filter cup gradually fills up completely with fuel.

6.3 Use in flood hazard areas

NOTICE

INOPERABLE PRODUCT

- Verify that the product (without vent hose) is replaced after a flood event.

Failure to follow these instructions can result in equipment damage.

With a connected vent hose, the product is suitable for use in flood hazard areas; it is watertight up to 10 mH_2O (1 bar pressure).

The product with vent hose continues to be operative after a flood.

⇨ Verify that the end of the vent hose is located at the return connection of the tank or ends above the maximum possible water level.

7 Maintenance

7.1 Maintenance intervals

NOTICE

UNSUITABLE CLEANING AGENTS

- Verify that you use only cleaning agents which do not contain solvents for cleaning the plastic parts.

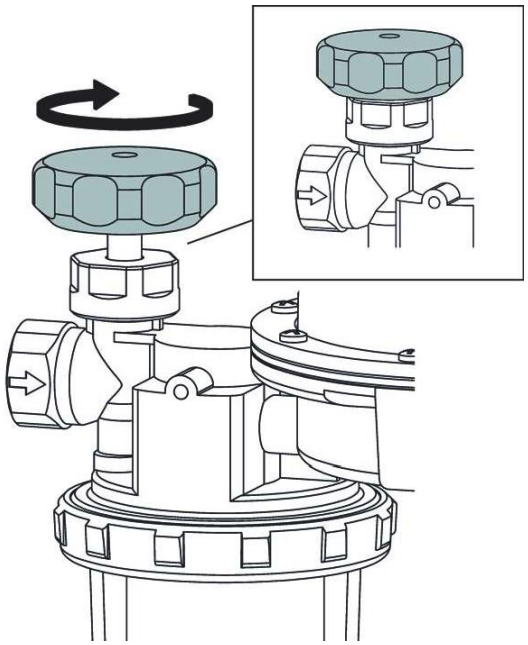
Failure to follow these instructions can result in equipment damage.

When	Activity
If required	Clean the plastic parts with soap suds
Annually or if required	Replace the filter insert
Every 5 years	Replace the burner hoses
No later than after 20 years	Replace the product
After a flood	Replace the product if no vent hose is connected

7.2 Replacing the filter insert

7.2.1 Dismounting the filter insert

1



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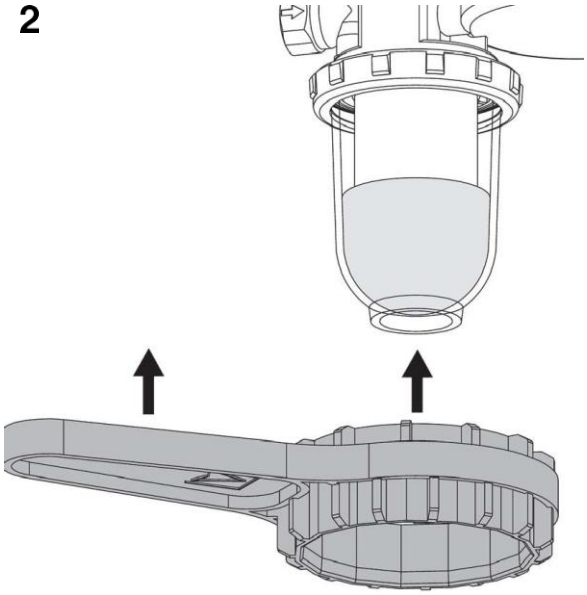

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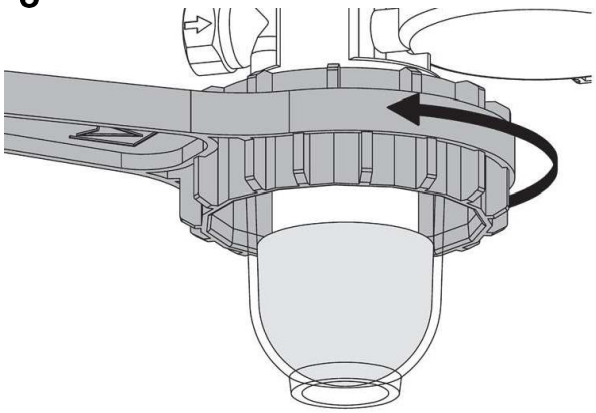

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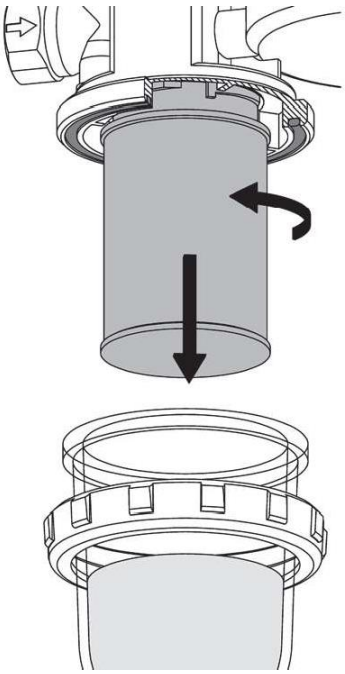
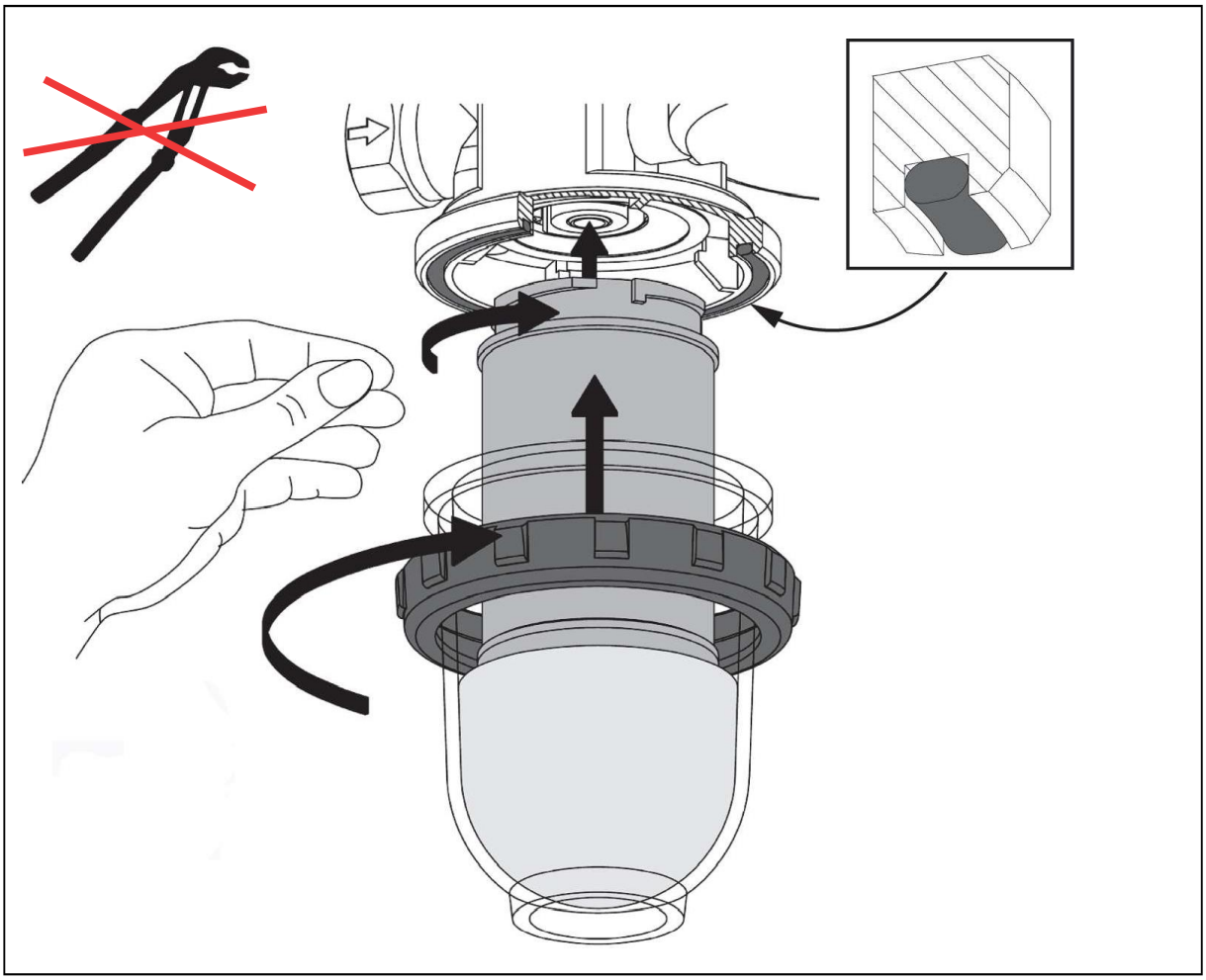


7.2.2 Mounting the filter insert



8 Troubleshooting

Any malfunctions that cannot be removed by means of the measures described in this chapter may only be repaired by the manufacturer or by qualified persons.

Problem	Possible reason	Repair
Heavy fuel foam in the float chamber due to excessive amounts of air sucked in (in excess of the possible separation capacity > 4 l/h)	Suction line not tight	Perform a tightness test of the suction line (vacuum test or pressure test)
	Screw connections not tight	Seal the screw connections
	Initial commissioning without separate suction pump	Use a suction pump
	Suction line dimensions too great (DIN 4755)	Observe the flow rate 0.2 - 0.5 m/s (DIN 4755-2)
Burner switches off at irregular intervals due to malfunctions	Air accumulations in the suction line because pipe cross section is too great. When the anti-siphon valve opens, a greater air bubble may pass through which can cause a switch-off	Properly rate the suction line (see chapter "Determining the suction line length")

Problem	Possible reason	Repair
Liquid column cannot be sucked in or steady flow keeps being interrupted	Small leaks (for example, at the screw connections between the withdrawal fitting) allow air to get into the suction line, even when the system is idle.	Seal the cylindrical screwed pipe connections at the housing with flat copper gaskets (airtight) Use a stiffener in the case of soft or semi-soft copper pipes Check all sealing surfaces for damage Close the shut-off valve at the withdrawal fitting. Perform a vacuum test (at least -0.6 bar) at the flow connection of the de-aerator
	Burner pump does not generate sufficient vacuum	Perform a suction test at the pump. The pump must generate a vacuum of at least -0.4 bar
Other malfunctions	-	Contact the AFRISO service hotline

9 Decommissioning, disposal

Dispose of the product in compliance with all applicable directives, standards and safety regulations.

Filters and filter inserts must not be disposed of together with the normal household waste.

1. Dismount the product (see chapter "Mounting", reverse sequence of steps).
2. Dispose of the product.

10 Returning the device

Get in touch with us before returning your product (service@afriso.de).

11 Warranty

See our terms and conditions at www.afriso.com or your purchase contract for information on warranty.

12 Spare parts and accessories

NOTICE

UNSUITABLE PARTS

- Only use genuine spare parts and accessories provided by the manufacturer.

Failure to follow these instructions can result in equipment damage.

Product

Product designation	Part no.	Figure
Automatic fuel oil de-aerator with integrated filter "FloCo-Top-1K"	69960	

Spare parts and accessories

Product designation	Part no.	Figure
Filter cup short (standard)	20254	-
Filter cup short (with drain system)	20257	-
O ring for filter cup (packing unit: 10)	20422	-
Oil filter spanner for loosening the union nut of the filter cup and the replaceable filter cartridge	70061	

Spare parts and accessories

Product designation	Part no.	Figure
Screwed pipe connection as per DIN 2353 with flat copper gasket: Pipe Ø 6 mm Pipe Ø 8 mm Pipe Ø 10 mm Pipe Ø 12 mm	 20509 20508 20510 20512	-
Piston type anti-siphon valve "KAV"	20240	-
Diaphragm type anti-siphon valve "MAV"	20139	-
Vent hose, PVC, Ø 4 x 1 mm, 20 m reel	20696	-