

**- FULL VERSION -**



Flanged end connection



Spigot end connection

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## 1. Intended use / product description

**Medium:** potable water

**Working range:** 0 - 16 bar

**Material:** see parts list

**Possible connections:** flange DN50, DN80  
BAIO® spigot end DN80

**Pipe cover depths:** 1,0 m, 1,25 m, 1,5 m, 1,75 m ( can be shortened on site by 100mm, see item 2.3 )

The air valve set (AVS) consists of a shaft with a shut-off facility and an air valve (AV). Due to its compact design, the AVS replaces costly and high-maintenance manhole constructions. All maintenance and repair work can be carried out from the road surface, thus avoiding the dangers possibly related with the access of manholes.

The HaVent® air valve featuring the roll-on diaphragm technology is perfectly suitable for taking in and releasing high amounts of air during filling or draining of pipelines and for releasing major amounts of air during operation within operating range. The AV operates continuously from 0 to 16 bar, perfectly sealing even in unpressurized condition. No minimum response pressure is needed. The sealing principle with a roll-on diaphragm helps to absorb pressure surges.

Due to the high air intake capacity, the AV is additionally provided with effective vacuum protection.

Max. air release capacity: 770 m³/h (on filling the pipeline)

Max. release cross section: 1,500 mm²

Max. cross section for in-service venting: 200 mm²

During installation and maintenance operations, the applicable standards and guidelines, accident prevention regulations and the regulations of professional associations are to be observed and complied with.

Installation and maintenance operations may be performed by qualified personnel only.

### Product labelling AV inside:



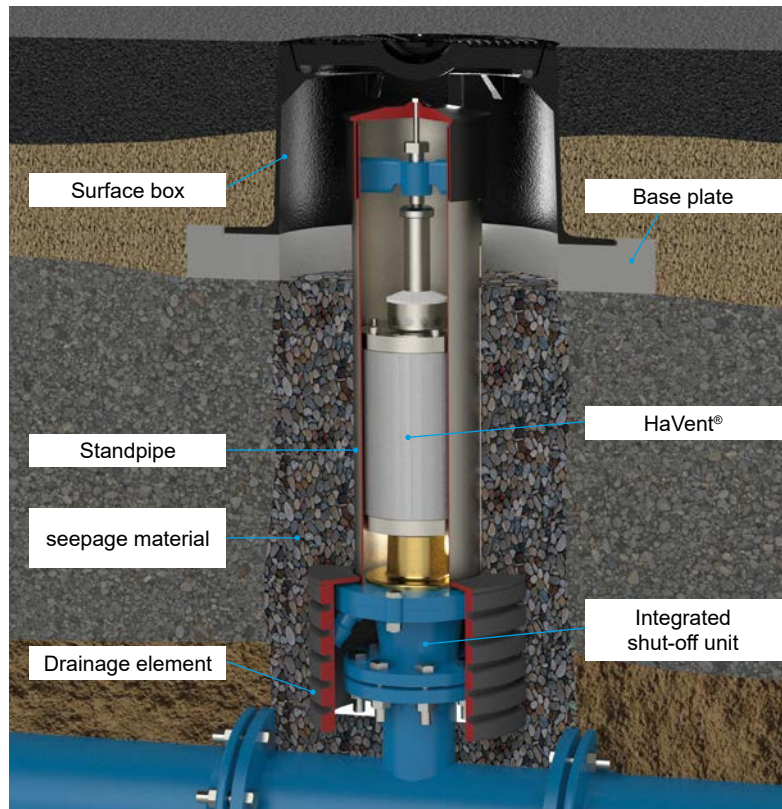
### Product labelling AVS outside:



**Product Complements:**

		
<p> <b>211-00</b> Surface box and base plate</p>	<p> <b>211-04</b> Surface box for rolling in</p>	<p> <b>204-04</b> Base plate for 211-00 and 211-04</p>
		
<p> <b>986-02</b> Indicator plate</p>	<p> <b>992-03</b> Drainage element for air valve set for potable water</p>	<p> <b>992-04</b> Seepage hose</p>
		
<p> <b>992-05   992-06</b> Flushing and water tapping set <b>992-07</b> Clamping yoke, extended</p>	<p><b>Cleaning brush AVS</b> Art.No. 992 200 1200 with extension rod ( Art.No. 992 200 1215 )</p>	<p> <b>490-05</b> Dirt cover and locking ring for BAIO® spigot ends</p>

## 2. Assembly



2x open-ended wrench A/F 24 (version with flange), socket wrench A/F 13

### 2.1 General

Air valves and air valve sets are installed at high points, at points of change in pipe inclination, in descending line sections, in case of slightly descending or horizontal pipe runs, upstream and downstream of control valves, as well as downstream of pumps.

For detailed planning specifications for new construction and retrofitting, please refer to the technical information for planners regarding air valves and air valve sets, as well as the current DVGW sheet W334.

The AV and/or AVS has to be installed on a vertical outlet directly on the pressure pipe. The need for an air release dome as specified in DVGW sheet W334 has to be checked. A laterally displaced arrangement of air valves / air valve sets must be avoided.

Installation shall be performed in unpressurized condition.

For installing the AVS on the pipeline, the respective DVGW provisions for establishing a flanged connection and/or the BAIO® installation instructions shall be observed.



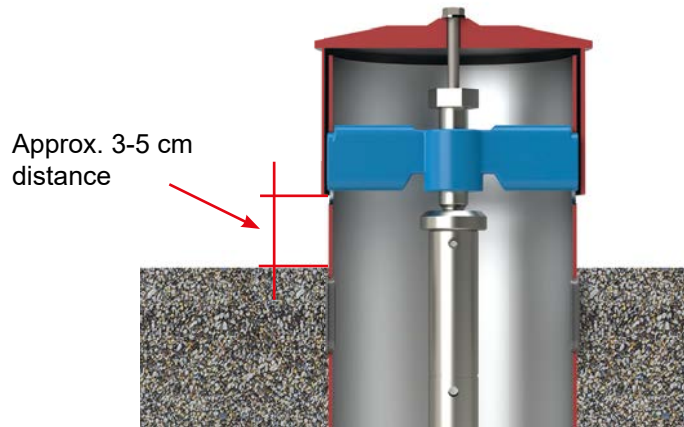
**Important:** For the connection variant with BAIO® spigot end, the dirt cover and locking ring Ord. No. 490-05 shall be used.

If there is a risk of frost, the AVS must be provided on site with frost-proof insulation (see also item 5.4).

## 2.2 Seeping water drain packing

To prevent surface water from running in, the shaft pipe must be surrounded with permeable backfilling (grain size > 5 mm).

Maximum filling height see image.



We recommend installing a drainage element Ord. No. 992-03, or alternatively a seepage hose Ord. No. 992-04 in connection with permeable backfilling.

## 2.3 Drainage element Ord. No. 992-03

The drainage element for AVSs serves the purpose of receiving and slowly draining off the splash water accumulating inside the AVS (originating during air release) and the residual water accumulating on dismantling the valve. Additionally, a possible penetration of roots is prevented.

### Use in:

- Normal soils
- Installation situations where no mud is expected to be washed into the housing (no groundwater).

### Assembly:

1. Remove the hood (10) from the AVS. To this end, loosen hexagon head screw M8 (8) and washer (10).
2. Put the drainage element (stop ring on top) over the shaft pipe from above and push it downward as far as it will go.
3. Reinstall the hood (10) with hexagon head screw M8 (8) and washer (10).
4. Surround the drainage element with permeable backfilling.

## 2.4 Seepage hose Ord. No. 992-04

The seepage hose for AVSs serves the purpose of receiving and slowly draining off the splash water accumulating inside the AVS (originating during air release) and the residual water accumulating on dismantling the valve. Additionally, a possible penetration of roots is prevented.

The seepage hose consists of a flexible drainage pipe d 50 mm wrapped in filter fleece. Via the big surface area, the accumulated splash water / residual water is released evenly.

The filter fleece reduces the penetration of fine soil material into the interior of the AVS via the seepage hose.

### Use in:

- "Fine-textured" soils
- Installation situations where mud is expected to be washed into the housing (groundwater).

### Assembly:

See operating instructions "Seepage Hose for Air Valve Set".

## 2.5 Drainage hose PE d20

If the drainage element Ord. No. 992-03 or seepage hose Ord. No. 992-04 is not used, the supplied drainage hose PE d20 can be used for draining off the accumulating splash water into an additional seeping water drain packing. To this end, push the hose into the drain-off fitting (2) as far as it will go. For installation, moisten the pipe end with water.

## 2.6 Shortening



Socket wrench A/F 13, A/F 30, fitting grease, e.g. Art. No. 600 000 0015  
Angle grinder with cutting disc for stainless steel, pin punch

Prior to installation, the AVS can be shortened on site by 100 mm to adapt it to changed height conditions.



**Important:** In case of the version with pipe cover depth 1.0 m **with** special function “Air release only” or “Air intake only”, shortening is not possible!

Sequence:

1. Take off the hood (10). To this end, loosen hexagon head screw M8 (8) and washer (9).
2. Loosen the centring screw (11) and take out the clamping yoke / spindle holder (12).
3. Take out the whole replacement set and put it aside protected from dirt.

### 4. Shortening the shaft pipe: ( see Figure 1 )

Put the hood (10) loosely onto the shaft pipe. Mark a line for shortening along the lower hood edge (corresponding to max. shortening by 100 mm). Shorten the shaft pipe using an angle grinder and cutting disc for stainless steel. Deburr the cut surface.



Figure 1

### 5. Shortening the replacement (see Figure 2)::

Dismantle the centring cap (6.16) from the operating tube (6.18). To this end, remove the roll pin (6.17) by means of the pin punch. Shorten the operating tube at the specified marking (see figure) using an angle grinder and cutting disc for stainless steel. Deburr the cut surface.

6. Reinstall the centring cap (6.16) and roll pin (6.17) on the shortened operating tube.

7. Reinsert the replacement set through the shaft pipe (7) into the sealing flange (3). To this end, press the replacement set into the sealing flange (3) applying manual force until you feel high resistance.

8. Subsequently, insert the clamping yoke / spindle holder (12) into the shaft pipe (7), and brace the replacement set again by turning in the centring screw (8) 2-3 revolutions.

9. Reinstall the hood (10) with the hexagon head screw (8) and washer (9).



Figure 2




**Important:** If a flushing and water tapping set Ord.No.992-05 und 992-06 is used for a shortened AVS, the extended clamping yoke Ord. No. 992-07 is needed (Figure 3).




Figure 3

### 3. Commissioning and pressure testing

	Socket wrench A/F 13, A/F 30
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#### 3.1 Commissioning

For commissioning, the unpressurized line shall be filled and pressurized.

 **Important:** Acc. to DVGW W334, the maximum filling rate must be limited to 0.25 m/s to avoid pressure surges.

**Note:** During start-up ventilation, a minor quantity of splash water is blown off via the valve.

Prior to commissioning, we recommend flushing to remove possible dirt accumulations at the high point of the pipeline (right column).

Alternatively, commissioning can be performed without flushing (left column).

Commissioning with automatic venting Important: Malfunction caused by dirt ingress is possible!	Commissioning with flushing and water tapping set
1. Take off the hood (10). To this end, loosen hexagon head screw M8 (8) and washer (9).	1. Take off the hood (10). To this end, loosen hexagon head screw M8 (8) and washer (9).
	2. Loosen the centring screw (11) and take out the clamping yoke / spindle holder (12).
	3. Take out the whole replacement set (6) and put it aside protected from dirt.
	4. Install the flushing and water tapping set Ord. No. 992-05, 992-06. See operating instr. "Flushing and Water Tapping Set".
	5. Fix it by means of the clamping yoke / spindle holder (12) and centring screw (11).
	6. Slowly open the ball valve at the flushing and water tapping set.
2. Fill the pipeline (filling rate acc. to DVGW W334, see above).	7. Fill the pipeline (filling rate acc. to DVGW W334, see above).
3. Air and/or air/water mixture escapes. Dirt possibly present in the line accumulates in the AV. Consequence: AV does not close any more. Perform maintenance as described in item 4.	8. Air and/or air/water mixture escapes together with any possible dirt. Continue flushing until only clear water escapes.
4. After filling is finished, the AV closes automatically.	9. Close the ball valve at the flushing and water tapping set very slowly (danger of water hammers).
5. To be able to perform the subsequent pressure test described in item 3.2, the following sequence must be observed:	10. Perform pressure test described in item 3.2.
6. Loosen the centring screw (11) until the clamping yoke / spindle holder (12) is loosened. Consequently, the complete replacement set is also loosened as well as unpressurized, since the sealing tappet (4) closes automatically.	
7. Perform pressure test described in item 3.2.	

## 3.2 Pressure testing

### 3.2.1 Pressure testing of the pipeline

The pressure test of the pipeline with the installed AVS in the open trench shall be performed considering the maximum operating pressures as specified in the DVGW regulations.



**IMPORTANT:** The pressure test must be carried out with the replacement set put out of service and/or the flushing and water tapping set installed!

After the successful pressure test, repressurize the replacement set previously put out of service by turning in the centring screw (8) until a distinctive momentary “venting splash” appears.

Then turn in the centring screw (11) by only approx. 1/2 additional turn!

Reinstall the hood (10) with the hexagon head screw (8) and washer (9).



**IMPORTANT:** If a permanent water splash instead of a momentary venting splash appears, maintenance acc. to item 4 must be performed.

### 3.2.2 Pressure testing of the installed AV

After subjecting the pipeline to a pressure test acc. to item 3.2.1 or after successful maintenance, an additional pressure test of the AV considering the maximum operating pressures specified in the DVGW regulations has to be carried out.

Before pressure testing, any flushing and water tapping set used during commissioning must be removed, and the replacement set has to be reinstalled (see item 3.1 / 3. Commissioning with flushing and water tapping set).

## 4. Servicing and maintenance



Allen key A/F 6, open-ended wrench A/F 6, socket wrench A/F 13, A/F 30  
Flat-tip screwdriver blade width e.g. 3 mm, fitting grease e.g. Art. No. 600 000 0015  
Cordless screwdriver, cleaning brush and extension rod  
Suction device for residual water

As specified in the DVGW regulations W400-3, AVSs must be maintained at least once a year. Depending on the composition of the water, it may be necessary to reduce the maintenance intervals. Regular inspection will increase the functional reliability of the AVSs.

For cleaning, we recommend using lukewarm water. Before reinstallation, all components shall be disinfected by means of disinfectants approved for potable water applications observing the manufacturer's instructions.

Foreign matter washed into the valve body (e.g. PE chips left over from drilling, wood, polystyrene, ...) as well as deposits in case of ferrous or manganiferous water qualities may impair the proper sealing function.



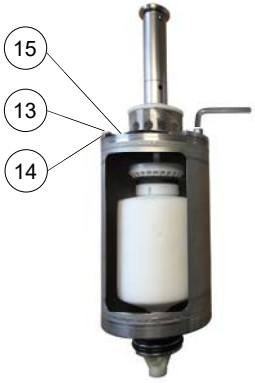
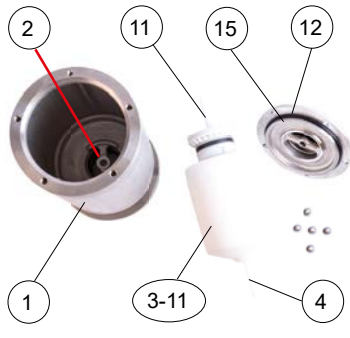

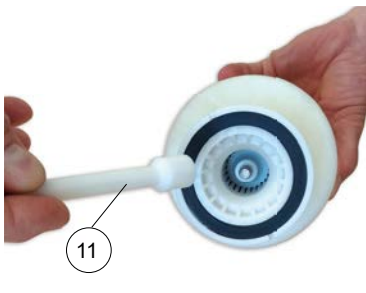
**IMPORTANT:** Before maintenance, AVSs shall be put out of service. Maintenance shall be performed in unpressurized condition.


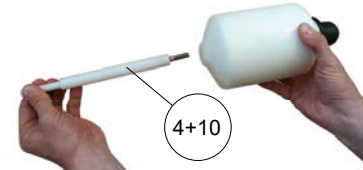



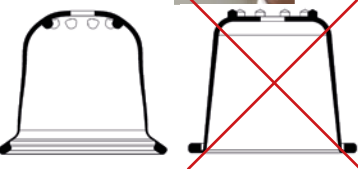
**Always** take the complete replacement set out of the AVS housing for maintenance and service work.

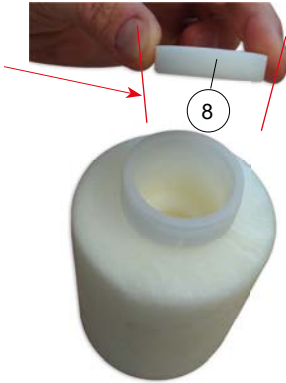

**IMPORTANT:** For the sequence of dismantling and reinstallation, observe the arrow direction!

1	Open the cover of the surface box.
2	Take off the hood (10). To this end, loosen hexagon head screw M8 (8) and washer (9).
3	Remove any residual water left inside the set by means of a suitable suction device.
4	Loosen the centring screw (11) and take out the clamping yoke / spindle holder (12).
5	Take out the entire replacement set.

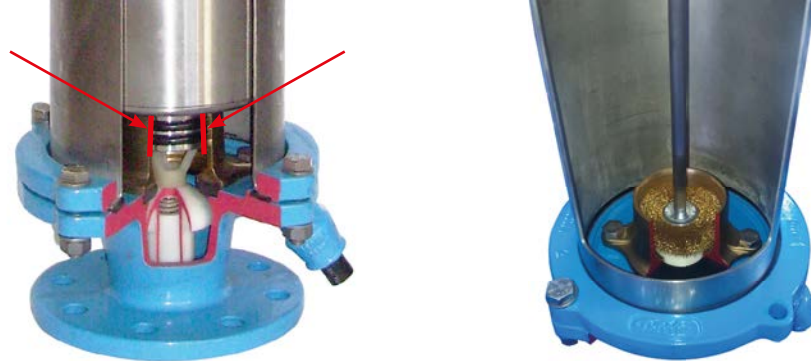


Dismantling		Reinstallation	
<p><b>6</b> Dismantle the housing upper part (6.15) by loosening the five hexagon socket screws (6.13) using an Allen key 6 mm.</p>	<p><b>25</b></p>	<p>Tighten the hexagon socket screws (6.13) with shim rings (6.14) clockwise and handtight on the block. Then proceed with item 26!</p>	
<p><b>7</b> Take off the housing upper part. Remove the float with integrated valve mechanism / function unit (3-11).</p>	<p><b>24</b></p>	<p>Insert the function unit (3-11) into the housing (6.1). Take care to insert the guide rod (6.4) into the closing sleeve (6.2) via the housing bottom side.</p> <p>Put the housing upper part with O-ring (6.15-6.12) onto the housing (6.1). Take care to insert the guide of the valve basket (6.11) into the central bore of the housing upper part (6.15).</p>	
<p><b>8</b> Remove any foreign matter that may be present!</p> <p>If required, clean the following parts with lukewarm water:</p> <ul style="list-style-type: none"> <li>• Housing parts</li> <li>• Roll-on diaphragm (6.9)</li> <li>• Slots of valve basket (6.3)</li> <li>• Flat gasket of valve basket (6.7)</li> <li>• Cover bead (red marking)</li> </ul> <p>Check the roll-on diaphragm (6.9), flat gasket (6.7), and O-ring (6.12) for wear and/or damage.</p> <p>If required, replace sealing elements. (For dismantling, see items 9-16).</p> <p>Otherwise proceed with item 23!</p>	<p><b>23</b></p>	<p>Grease the O-ring (6.12) with suitable fitting grease.</p>	
<p><b>9</b> Dismantle the valve basket guide (6.11) using an open-ended wrench A/F 6 by turning it counter-clockwise.</p>	<p><b>22</b></p>	<p>Turn the valve basket guide (6.11) clockwise onto the guide rod by hand and tighten it as far as it will go. When using an open-ended wrench A/F 6 make sure to prevent overtightening.</p>	

10	Dismantle the valve basket (6.3) manually by turning it counter-clockwise.	21	Install the valve basket (6.3) manually by turning it clockwise. Important: Plastic female thread. Prevent overtightening.	
11	Remove the guide rod (6.4) with the grub screw (6.10) from the float as a unit.	20	Push the guide rod (6.4) with the grub screw (10) through the float and the roll-on diaphragm. Make sure not to damage the roll-on diaphragm.	
12	Lever the flat gasket (6.7) out of the valve basket (6.3) using a flat-tip screwdriver.	19	Press the tapered flat gasket into the valve basket. Due to the tapered form, some more force will be needed for pressing in. Make sure not to damage the flat gasket	
13	Pull the roll-on diaphragm (6.9) off the float. The roll-on diaphragm adaptor (6.6) remains installed on the float.	18	<p>Fit the bead of the roll-on diaphragm into the groove of the roll-on diaphragm adaptor.</p> <p>- make sure it fits evenly.</p> <p>- Make sure the bead is positioned properly.</p>	  

14	Remove the shim (6.8) and keep it ready for reinstallation.	17 Reinsert the shim. Important: Observe the tapered form (see indicative lines)	
15	Figure of float with integrated valve mechanism (individual components)		
16	Reassemble the valve in reverse order (see blue instructions items 17-25)		



26	Clean both O-rings 60x6 (6.21) or replace the O-rings if required. Subsequently apply fitting grease.		
27	Before reinstalling the replacement set, we recommend cleaning the sealing flange (see red marking) using the cleaning brush for AVS Art. No. 992 200 1200 and extension rod 1500 mm Art. No. 992 200 1215..		
			
28	Subsequently, we recommend flushing by means of the flushing and water tapping set Ord. No. 992-05, 992-06. See operating instr. "Flushing and Water Tapping Set".		
29	<p>After successful maintenance, reinsert the replacement set through the shaft pipe (7) into the sealing flange (3). To this end, press the replacement set into the sealing flange (3) applying manual force until you feel high resistance.</p> <p>Subsequently, insert the clamping yoke / spindle holder (12) into the shaft pipe (7) and repressurize the replacement set by turning in the centring screw (8) until a distinctive momentary "venting splash" appears. Then turn in the centring screw (11) by only approx. 1/2 additional turn! Reinstall the hood (10) with the hexagon head screw (8) and washer (9).</p>		
30	<p><b>After maintenance, a visual inspection for leak tightness and function must be performed. Important:</b> If the valve does not seal reliably and tightly, maintenance must be repeated. Commissioning and pressure testing see item 3.</p>		
31	Close the cover of the surface box.		

#### 4.1 Spare parts

		
<p>Roll-on diaphragm for AV HaVent® 987-00, 992-00) Art. No. 009 878 1605 Ord. No. 009E00</p>	<p>O-ring 60x6 Art.No. 992 299 0023 O-ring 116x4 Art.No. 992 299 0033 Ord.No. 009E01</p>	<p>Function unit PN16 Art.No. 987 800 0017 Best.No. 987E00</p>
		
<p>Replacement set HaVent® AVS Ord.No. 992E00</p>	<p>Centring screw with ball (operating screw) for AVS HaVent®  992-00 and 992-01 Art.No. 992 299 0018 Ord.No. 992E02</p>	<p>Spare part: clamping yoke (spindle holder) for AVS  992-00 and 992-01 Art.No. 992 299 0015 Ord.No. 992E06</p>

Other spare parts on request.

#### 5. Special functions

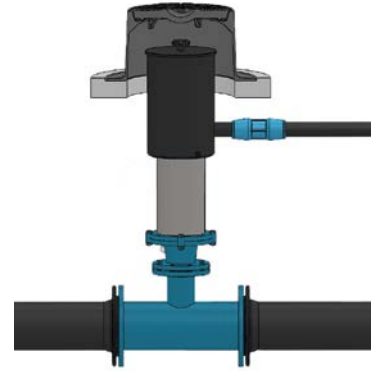
Item	Ord.No./ Art.No.		Ex factory	For retrofitting on site
5.1	992 000 1010 ( 992-08 )	<b>Installation in flood water areas / flood protection</b>	<b>X</b>	
5.2	992 500 1000 - 992 500 1003	Version for groundwater installation	<b>X</b>	
5.3	992 500 0900 - 992 500 0903	Air release only / air intake only	<b>X</b>	
5.4	009 878 1570	Closing aid	<b>X</b>	<b>X</b>
5.5	992 200 1050	Anti-frost disc	<b>X</b>	<b>X</b>
5.6	992 200 1010	Insect and snail protection	<b>X</b>	<b>X</b>
5.7	992 200 1100	Screw lock	<b>X</b>	<b>X</b>

Maintenance of the AVSs with special function is carried out the same way as described for the standard version (see item 4).

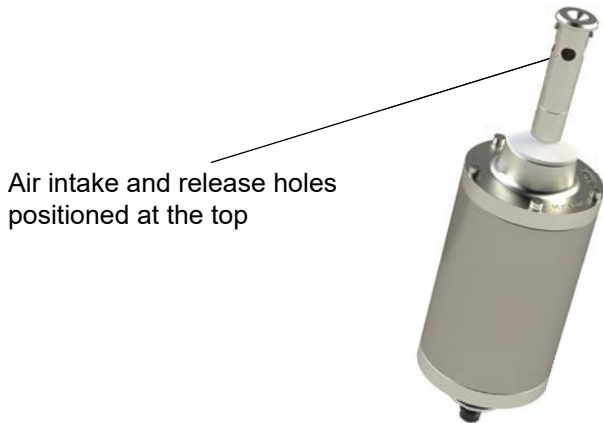
## 5.1 Special function - installation in flood water areas / flood protection

If the air valve set is installed in areas susceptible to flooding, the special flood protection function can prevent dirty water from flowing back into the air valve and subsequently into the potable water system.

See operating instr. "Flood Protection for Air Valve Set".



## 5.2 Special function - installation in groundwater



Air intake and release holes positioned at the top

The special groundwater version is used to prevent dirty water from getting into the AVS in case of rising water.

In this case, the standard drain hole in the base has been sealed at the factory.

Splash water (caused by venting strokes), condensation water, or high groundwater accumulating inside the set shall be controlled and sucked off from the set if required, e.g. by means of a hand pump and suction hose, since it will not be able to drain off via the sealed drain hole.

**Important:** Any splash or condensation water not evacuated may be sucked into the pipeline in case of underpressure conditions. As a result, there is a risk of ingress of dirt or germs!

The standard pipe cover depth is used. The air intake and release holes positioned at the top ensure normal air intake and release in spite of a high groundwater level.

If the groundwater rises above the air intake and release holes positioned at the top, the function of the AVS is no longer ensured.

**Important:** Risk of ingress of dirty water!

Product identification  
AVS (outside):

**Grundwasser-  
ausführung**

Product identification  
AV (inside):

HaVent  
Nennweite / Size  
BEG  
GRUNDWASSER

Druckstufe:  
max. pressure:

PN 16  
250 psi

Gehäuse/Body:  
Edelstahl  
stainless steel

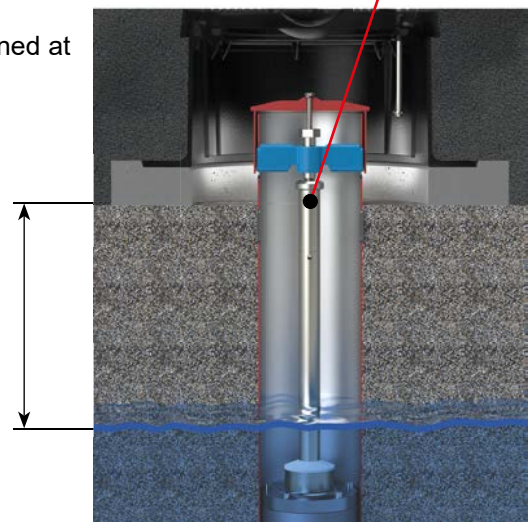
European standard:  
EN1074-4  
DVGW-W

Herstelljahr:  
Year of manufacture:  
xxx

Seriennummer:  
Serial No.:

Made in Germany

Air intake and release holes placed on top



Max. groundwater  
level to be expected

**5.3 Special function - air intake only or air release only Art. No. 992 500 0900 - 992 500 0903**



Product identification:

**Nur Entlüftung!**

-> "Air release only"

**Nur Belüftung!**

-> "Air intake only"

**Special function "Air intake only"**

E.g. to avoid a vacuum when the air release function is inhibited.

**Special function "Air release only"**

E.g. upstream of medium-controlled control valves. No dirt can be sucked in.

Additionally, the special function "Air intake only" and/or "Air release only" can be supplemented by the special flood protection function described in item 5.1.

**5.4 Special function - with closing aid Art. No. 009 878 1570**





Closing aid for active closing in case of major air quantities (e.g. for well pipes between the pump and water preparation, high-level tank or pure water container, well mouth, for venting the pressure line).

**Note:** A reduced air release capacity must be considered!

**Description for retrofitting:**

1.	Figure of closing aid.	
2.	Dismantle the unit as described in 4. Maintenance, items 1-7. Put the closing aid (3) into the housing (1) onto the closing sleeve (2) as depicted.	
3.	Install the unit as described in 4. Maintenance, items 24 and 25. Perform commissioning and pressure testing as described in 4. Maintenance, items 29-31.	

## 5.5 Special function - anti-frost disc Art. No. 992 200 1050

1.	Figure of anti-frost disc.	
2.	Dismantle the operating tube (6.18) manually by turning it counterclockwise. Hold the white outlet nipple (6.19) in place by hand.	
3.	Slip the anti-frost disc onto the dismantled operating tube.	
4.	Reinstall the operating tube with the anti-frost disc by turning it clockwise and hand-tighten it. No sealing required.	

**Important:** In case of AVSs with PCD 1.0 and special function “Air intake only” or “Air release only”, the anti-frost disc **cannot** be installed!

## 5.6 Special function - special insect and snail protection Art. No. 992 200 1010

The standard hood can easily be replaced by a special version with insect and snail protection.

An integrated screen and gasket prevent insects and snails from getting in.

For later conversion see operating instr. "Cover Modified for Air Valve Set".



## 5.7 Special function - screw lock Art. No. 992 200 1100

By means of the special screw lock function, an unauthorized opening of the set by removing the hood can be prevented.

The screw lock consists of a cover disc and locking screw M8 with special inside contour. For loosening the special screw, operating key Art. No. 992 200 1110 is needed.



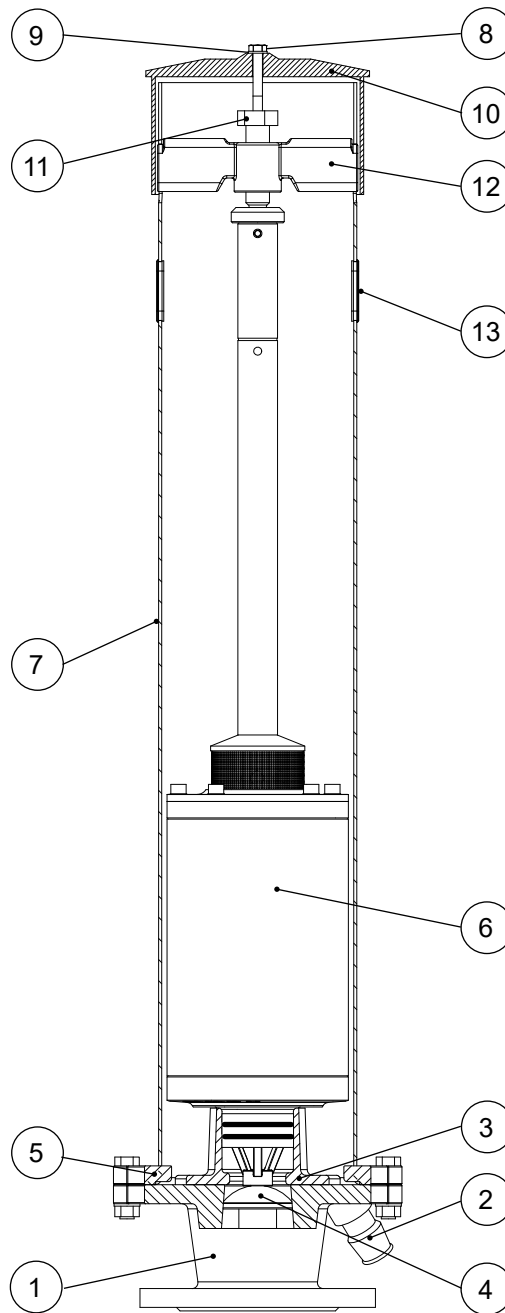
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# Air valve set HaVent® for potable water PN 16

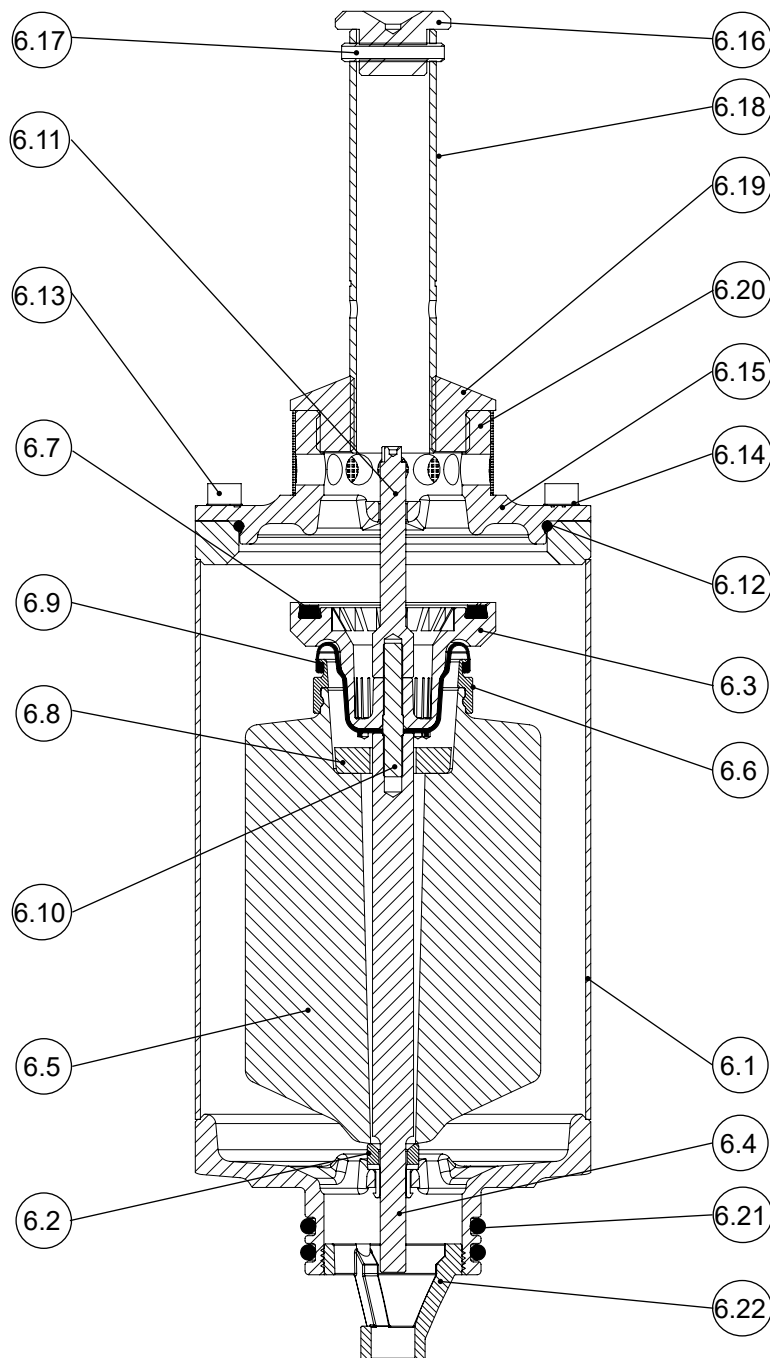
## Parts list



No	Qty	Short description	Material			
1	1	Base	GJS-400 Hawle-epoxy powder coated	7	1	Shaft pipe Stainless steel
2	1	Drain-off fitting	GJS-400 Hawle-epoxy powder coated	8	1	Hexagon head screw M8x60 Stainless steel
3	1	Sealing flange	Brass	9	1	Washer M8 Stainless steel
4	1	Sealing tappet	POM	10	1	Hood PE
5	1	Lock ring	GJS-400 Hawle-epoxy powder coated	11	1	Centring screw with ball Stainless steel
6	1	Replacement set, see separate parts list		12	1	Clamping yoke / spindle holder GJS-400 Hawle-epoxy powder coated
				13	2	AVS rubber plug EPDM

# Replacement set HaVent® for potable water PN 16 for air valve set

## Parts list



No	Qty.	Short description	Material			
				6.12	1	O-ring 116x4 EPDM
6.1	1	Housing	Stainless steel	6.13	5	Allen screw M8x16 Stainless steel
6.2	1	Closing sleeve	POM	6.14	5	Shim ring Stainless steel
6.3	1	Valve basket	POM	6.15	1	Housing upper part Stainless steel
6.4	1	Guide rod	POM	6.16	1	Centring cap Stainless steel
6.5	1	Float	PP	6.17	1	Roll pin Stainless steel
6.6	1	Roll-on diaphragm adaptor	POM	6.18	1	Operating tube Stainless steel
6.7	1	Flat gasket	EPDM	6.19	1	Outlet nipple POM
6.8	1	Shim	POM	6.20	1	Mesh hose Stainless steel
6.9	1	Roll-on diaphragm	EPDM	6.21	2	O-ring 60x6 EPDM
6.10	1	Grub screw M8x30	Stainless steel	6.22	1	Tripod for AVS PA
6.11	1	Guide for valve basket	POM			