Air Release Valve

for raw and potable water, for communal and industrial sewerage

Technical information for project planners and technicians

hawle

Content

1. The purpose of aerating and air release

(see also DVGW Worksheet W 334 [1])

A water transport system is to be kept in an operating condition that is as stable as possible. This is done by taking appropriate and suitable measures.

- **Most of all, the inclusion of air in water can have a very considerable negative effect on the functioning of a pipeline system, such as:**

  – reduction of flow
  – pressure fluctuations
  – water hammer
  – dry running of pumps

  The possibility of air entering into a pipeline system can´t be eliminated entirely. Already the air dissolved in water itself can turn gaseous under certain pressure and temperatue conditions. Even larger quantities of air enter the network of pipes most of all during maintenance work.

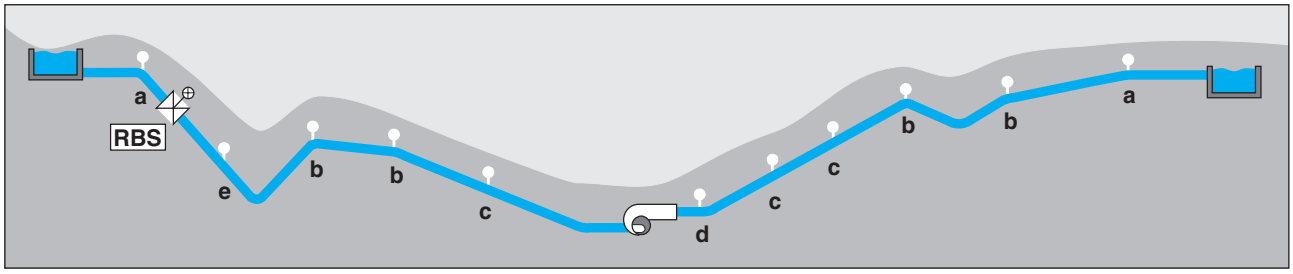
Those quantities of air accumulate at certain spots and have to be released through a proper valve (see illustration below).

- **Nevertheless, the lack of air can also lead to disturbances.** Negative pressure arises from water flowing off too fast. This is mostly the case when pipes get drained or when pipe fractures occur. The same symptoms occur when pumps get turned off and after rapid closing of valves, or for example behind a pipe fracture safety valve. There the flow of water stops abruptly and therefore a difference in negative pressure arises between the valve and the water being discharged. In this case sufficient air has to be brought into the pipe line through the aeration valve so that the negative pressure stays within limits and the pipe line therefore doesn‘t suffer damage.

- **Therefore the following technical requirements arise for aeration and air release valves:**

  – releasing of small quantities of air
  – releasing of large quantities of air
  – intake of large quantities of air

2. Where does aerating and air release occur ?



- **The Aeration and Air Release Valve releases air from the pipe line:** Accumulations of air are generally to be expected there, where operating pressures expected to be lower than those prevailing in the neighboring sections of the pipeline system. That is:

  a) at every maximum high point
  b) at every temporary high point
  c) in long rising or falling sections of pipe. Here it is recommended to install a valve at regular distances of 800 m)
  d) after pumps and ahead of locations where the flow gets throttled.

- **The Aeration and Air Release Valve supplies the required quantity of air** at every section of the pipe line which is in danger of coming under negative pressure, such as for instance.

  e) after fast closing valves (pipe rupture safety -RBS- valve).

3. How to do aeration and air release?

3.1 Versions

3.1.1 VAA Order no. 9876 Air release valve (single orifice / double orifice)

Technical details:	**DN 2"**	**DN 1"**
Test pressure (body)	24 bar	24 bar
Working pressure	**standard: 1 - 16 bar** **alternative: 0,1 - 6 bar**	**standard: 0,8 - 16 bar** **alternative: 0,1 - 6 bar**
Size of the opening	900 mm² / 2,0 mm²	1,8 mm²
Max. air release capacity	190 m³/h	7,8 m³/h
Connection	female thread 2" or flange DN 50 (drilled according to DIN 2501, PN 16)	female thread 1"
Insect protective grid	yes	no
Application	Potable water up to 30°C	Potable water up to 30°C

On request: Valve with ventilate-function only

Material:	
Body	POM
gasket seat	CuZn35Pb3As
Float	POM
Valve seal	elastomer
UV-Shield	PE
Insect protective grid	St 1.4301

DN 2": for large quantity of air

double orifice

DN 1": for small quantity of air

single orifice

3.1.2 VAA Order no. 9863/9864 Air release valve (with diaphragm)

Technical details:	
Test pressure (body)	24 bar
Working pressure	**0 - 16 bar**
Size of the opening	480 mm²
Max. air release capacity	230 m³ / h
Connection	Female thread 2" or flange DN 50 - 200 (drilled according to DIN 2501 = BS 4504, PN 10) other flanges on request
Application	for raw and potable water for communal and industrial sewerage

Characteristics:

- Smooth operation
- Operation starts at 0 bar
- Sealing face is not in contact with the medium
- Suitable for parallel-operation
- Big orifice = safeness against contamination

On request: Valve with ventilate-function only

Material:	
Body	No. 9863 St 37 - epoxy powder coated No. 9864 St 1.4571
Body nut with sieve	POM / St 1.4301
Float	POM
Valve body-bonnet	POM
O ring 160 x 6	elastomer
Outlet elbow with dirt sieve	PE 100 / St 1.4301

Order no. 9863

Order no. 9864

Due to the direct operation the release of maximum air is possible, even under full working pressure

3.1.3 **VAA Order no. 9835** **Air Release Valve** double orifice, with travelling valve, DN 80-200
VAA Order no. 9836 double orifice, with travelling valve, PE pipe and insect protective grid, DN 80-DN100
VAA Order no. 9837 **Air Release Valve** single orifice, without travelling valve, DN 80-200
VAA Order no. 9838 single orifice, without travelling valve, with PE pipe and insect protective grid, DN 80-DN100

Technical details :

Test pressure (Body)	24 bar			
Working pressure	No. 9835/9836 0,2 - 6 bar or 0,8 - 16 bar No. 9837/9838 0,2 -16 bar			
Dimensions	DN 80 1810/1,77 mm²	DN 100 3320/1,77 mm²	DN 150 17670/1,77 mm²	DN 200 17670/1,77 mm²
max. air release capacity	1562 m³/h	3250 m³/h	16900 m³/h	27800 m³/h
Connection	Flange DN 80 - 200, (drilled according to DIN 2501, = BS 4504, PN 10) other flanges on request on request PE-pipe DN 80 d 63, DN 100 d 75			
Application	Potable water up to 30°C			

Material:

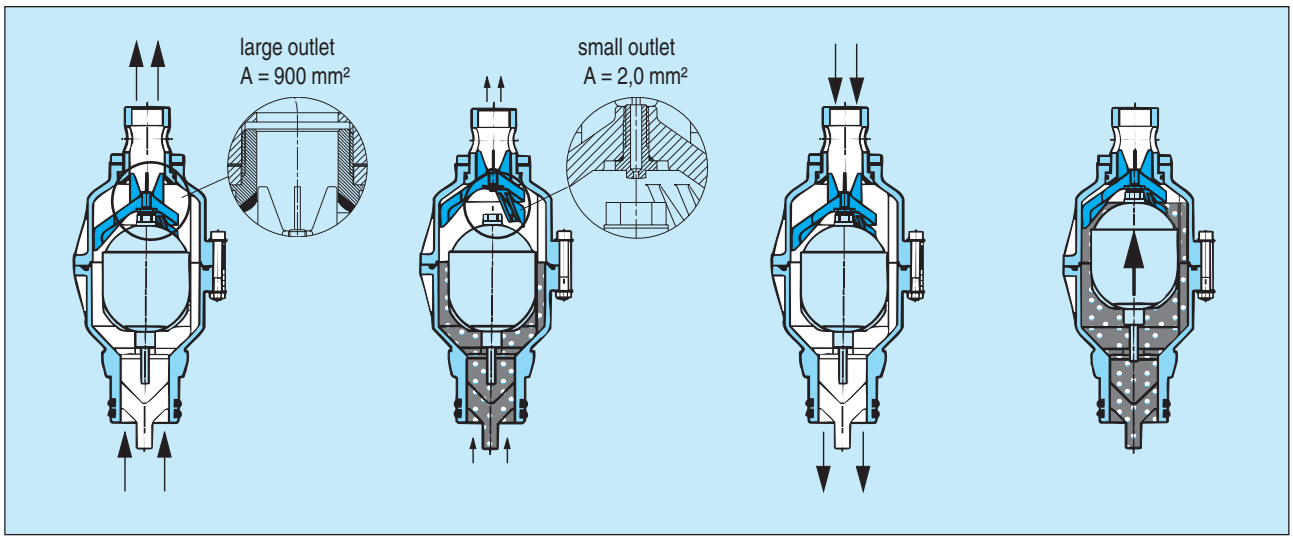
Body and bonnet:	grey iron, epoxy powder coated
Seat:	Ms58/elastomer, suitable for potable water
Float:	DN 80-100 polycarbonat DN 150-200 A2 passivated
Nipple:	POM / stainless steel A2
Bolts and nuts:	stainless steel A2

3.2 How does aeration and air release function ?

3.2.1 The function of the HAWLE Combination Aeration and Air Release Valve no. 9876 (shown is type DN 2"):

(this Air Release Valve is also available in the Automatic Air Valve Order no. 9822/9823)

Application: Potable water



Releasing large quantities of air:
When filling the pipeline air is released at the **large outlet**.

Releasing small quantities of air:
During normal operation of the pipeline air is released from the **small outlet**.

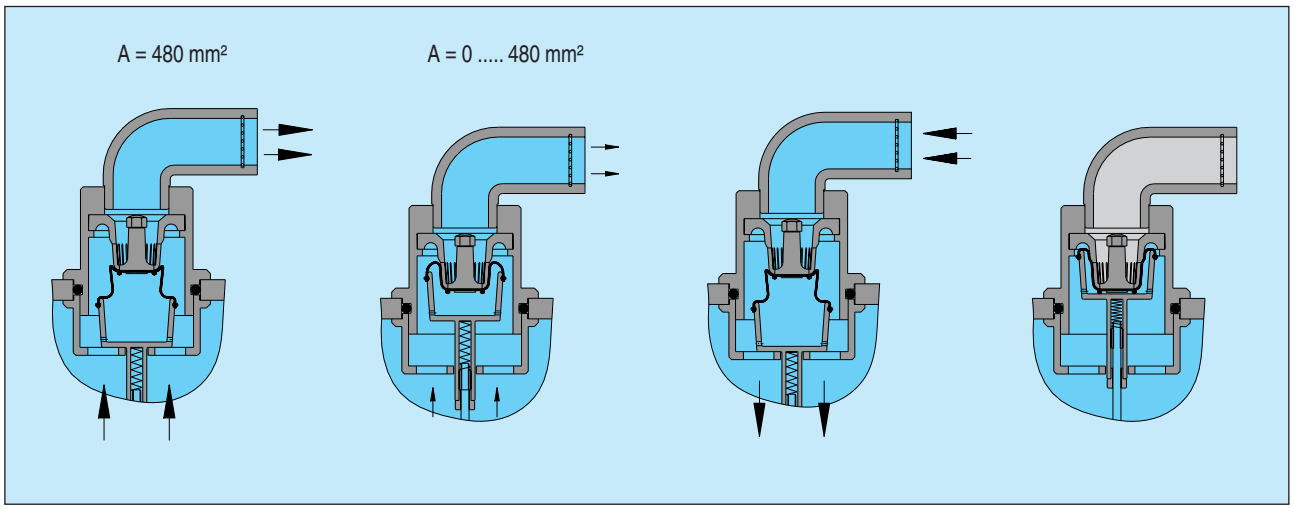
Air admission:
When emptying the pipeline air is admitted at the **large outlet**.

Closing:
After air admission the valve closes automatically.

3.2.2 The function of the HAWLE Automatic Air Valve Order no. 9863/9864:

(this valve is also assembled in the Automatic Air Valve Order no. 9827/9828)

Application: potable and wastewater



Release of large amount of air:

During the filling of the pipe the air is released via the **max. size of the opening**.

Release of small amount of air:

During operation the valve opens as broad **as necessary**.

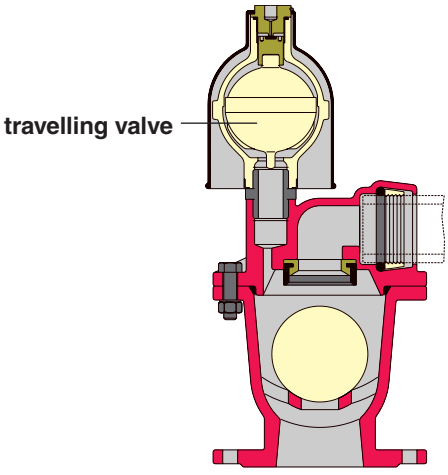
Air inflow:

While draining the pipe air flows in via the **max. size of the opening**.

Closing:

After the air release the valve closes automatically.

3.2.3 The function of the HAWLE Automatic Air Valve Order no. 9835, 9836, 9837, 9838:



Release of large amount of air:

During the filling of the pipe the air is released via the **max. size of the opening**.

Release of small amount of air:

During operation the air is released through the **travelling valve** (small outlet) only No. 9835/9836

Air inflow:

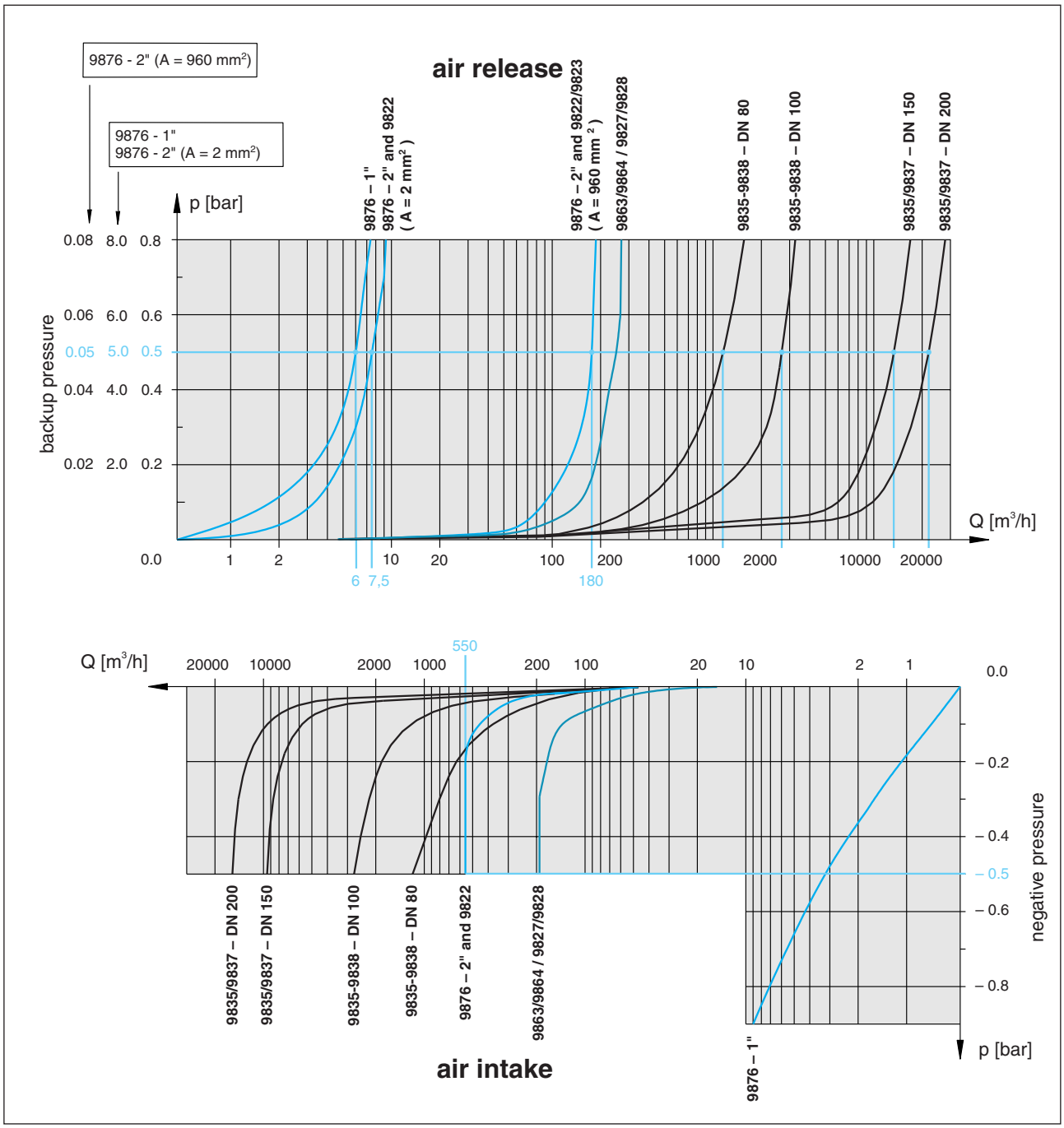
While draining the pipe air flows in via the **max. size of the opening**.

Closing:

After the air release the valve closes automatically.

3.3 Flow performance diagram:

The following conditions to W334 are basic assumptions for the diagrams and calculations of the valve sizes required and their diameter of free flow.



Examples for calculating an Aeration and Air release Valve:

a) Air release capacity of VAA 1" at 5 bar: ≈ 6 m³/h

b) Air release capacity of VAA 9876 - 2" at 0,05 bar: ≈ 180 m³/h

c) Air release capacity of VAA 9876 - 2" at 5 bar: ≈ 7,5 m³/h
(large orifice is closed because of the air flow)

d) Aeration capacity of VAA 9876 - 2": ≈ 550 m³/h

3.4 Determine the valve size:

(according to the draft of the DVGW Worksheet from Nov. 93 W 334 [1])

● **The following conditions are basic assumptions for the diagrams and calculation for the valve sizes required and their diameters of free flow.**

a) Air release during the filling of a pipeline:

- The maximum pressure shock during the closing of the aeration and air release valve is limited to 3 bar = max. ..... 0,25 m/s in the pipeline)
- The velocity by which pressure waves advance in the pipe line is being assumed with: a = 1200 m/s
- The maximum flow velocity in the diameter of clear flow through the aeration and air release valve is limited to: V_E = 20 m/s. This is because a too high flow velocity of the air would drag along the float body of the aeration and air release valve. Then the valve would be closed even before the actual process of aeration has begun.

b) aerating during drainage of a pipe line:

- The absolute pressure in the pipe line is limited to: p_R = 0,95 bar (= a negative pressure deficite of 0,05 bar)
- The contraction value and fricton value of the aeration and air release valve is: μ = 0,52

Diagram 1: Filling the pipeline

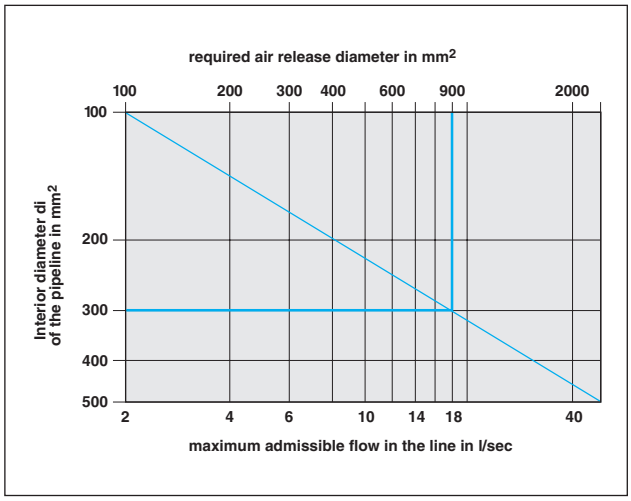
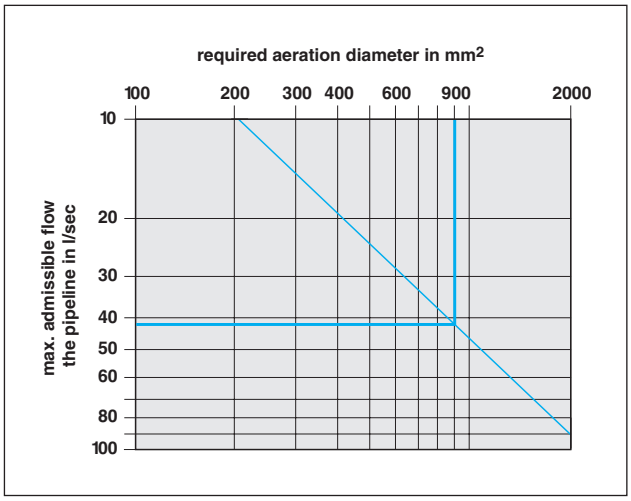


Diagramm 2: Draining the pipeline



● **Example for calculating an Aeration and Air release Valve:**

The required size of the combined aeration and air release valve is to be determined for a pipe line with an internal diameter of 300 mm.

– Filling of a pipeline:
according to diagram 1, the clear flow clearance diameter in the combined aeration and air release valve for a pipe line with Ø = 300 mm, has to be at least 900 mm². The flow through the pipe line may reach maximally 18 l/sec.

– Draining the pipeline:
according to the diagram 2 and with a given clear flow through diameter of 900 mm² in the valve, a maximum admissible flow rate of 42 l/sec results during the draining of the pipe.

This means that one Hawle VAA Order no. 9876 DN 2" (A = 960 mm²) or two Hawle VAAs Order no. 9864 arranged in parallel (A = 2 x 480 = 960 mm²) are able to manage the arising air quantity under the assumed conditions as specified for aeration and/or air release of a DN 300 line.

As the above calculation is not adapted to a possibly complicated pressure situation within a pipe, we would recommend a comprehensive hydraulic calculation* be carried out when having a complicated pressure situation in a pipe. If there are even higher air quantities arising when filling pipelines, mechanical air release is also possible, in this case a flushing and water drainage set will be inserted into the Hawle aeration and air release set. Other air release fittings such as hydrants can also be used.

(* see also DVGW Worksheet W 303 „Dynamic Pressure Variations in Water Supply Facilities“)

4. The installation

The location for the installation should be easily accessible for purposes of regular checks. Easy access is important and locations with heavy traffic should be avoided. However, the priority must be given to the proper site, that is, for example a high point of elevation.

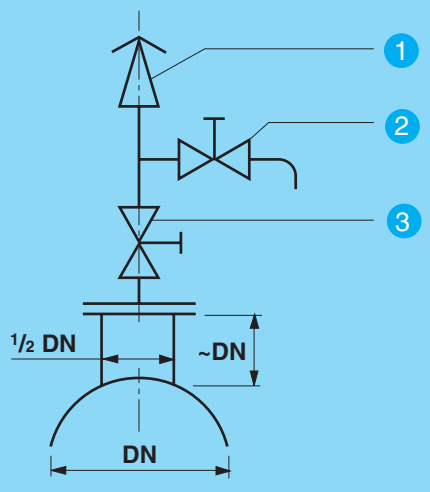
4.1 Fitting the connection

The DN size of the supply pipe line should at least correspond to the valve size. That means, for a combination valve DN 1" the supplying line should also be at least of the size DN 1". The same rule applies for a DN 2" supply line for DN 2" combination valves. Also the dimension of the shut-off valve located ahead has to correspond at least to the valve size or the combination air valve. This supply pipeline, planned in size to fit to the air valve has the purpose of collecting the air that is carried along with the water in the water main and then the air can then be discharged by the valve.

Extract from the draft of a DVGW Worksheet W 334

A sufficient aeration chamber is necessary for pipelines < DN 600. If not determined more precisely, the aeration chamber can be considered of a sufficient dimension, as long as its constructional heights corresponds to the diameter is approximately ½ of the diameter of the pipeline.

Also required is a central shut-off valve, a T-piece with an air control valve and a side exit for manual aeration and air release. The central shut-off valve allows the installation and removal of the combined air valves and the manual aeration valve without interrupting the operation. The testing of the functioning of the aeration valve or the float bodies and the manual aeration is possible also with the central shut-off valve being closed (see page 15).



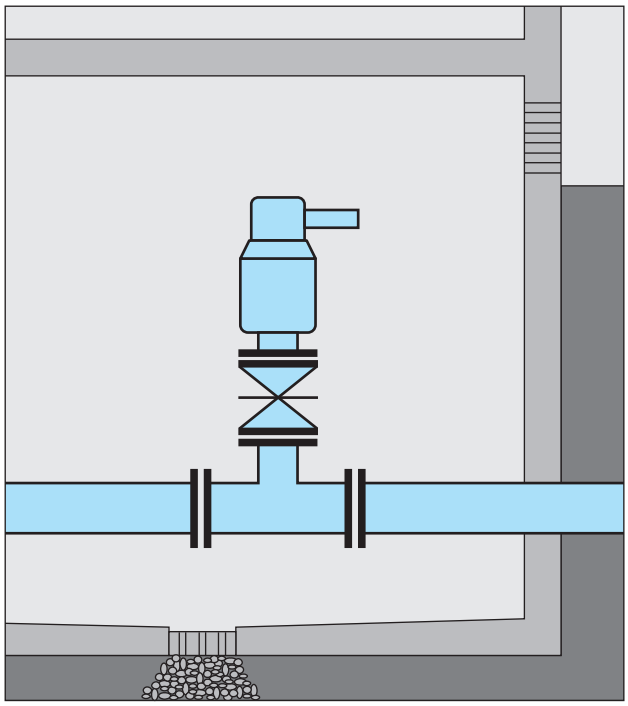
1 Aeration and Release Valve
2 Manual Aeration and Air Release
3 Shut-off valve

Attention:
Prior to the installation of the aeration and Air Release Valve the line has to be flushed, since debris and drilling swarf inhibit the proper sealing of the valve.
(See also Hawle Flushing and Water Drainage Set)

4.2 Aeration and Release Valves (VAA) in systems and shafts

Combined air valves are installed in dry rooms or chambers. Within buildings care has to be taken that a sufficient opening exists to allow the passage of air both in and out. If in a location were dirt or vermin can enter the building, the openings are to be covered with proper meshwire. When the building is being constructed, the installation of a drain off point with packed gravel should be provided in the base. This will allow any water that has been expelled during the air release process to drain away.

Attention:
Before entering into a chamber, ensure that enough fresh air is present !

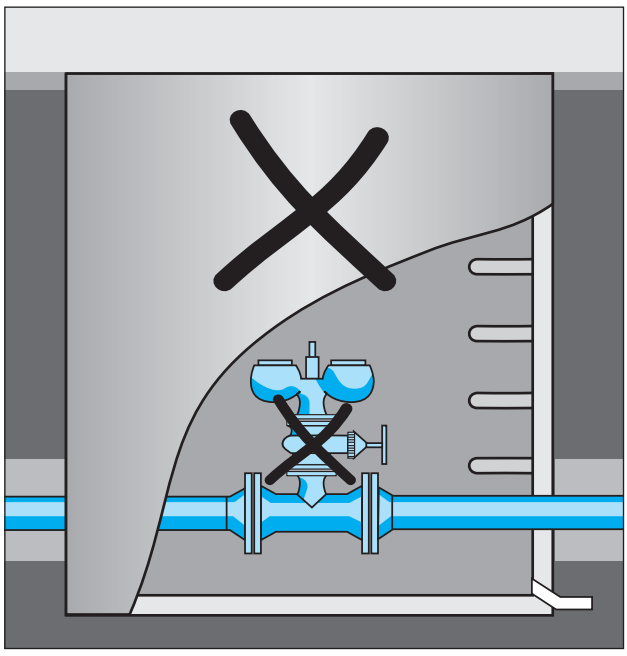


4.3 The HAWLE Aeration and Air Release Set (SAA) as a further logical development based on the Aeration and Air Release Valve (VAA)

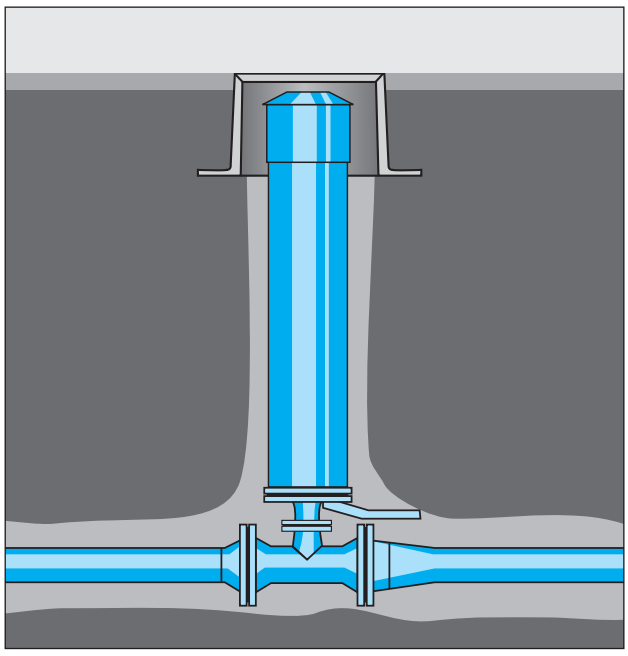
● **Advantages of the Hawle Air Release Set**

- Low costs
- Integrated shut-off
- No chamber required
- Easy and time saving maintenance

No danger, as no need to enter chamber !



CONVENTIONAL SHAFT



HAWLE AERATION AND AIR RELEASE SET

4.3.1 Description of SAA Order no. 9822/9823

Application: Potable water

Available with flange connection in DN 50, 80 or BAIO® Spigot End DN 80. When using BAIO® - please use the dirt cover and locking ring.

Description of SAA Order no. 9827/9828

Application: Potable water and wastewater

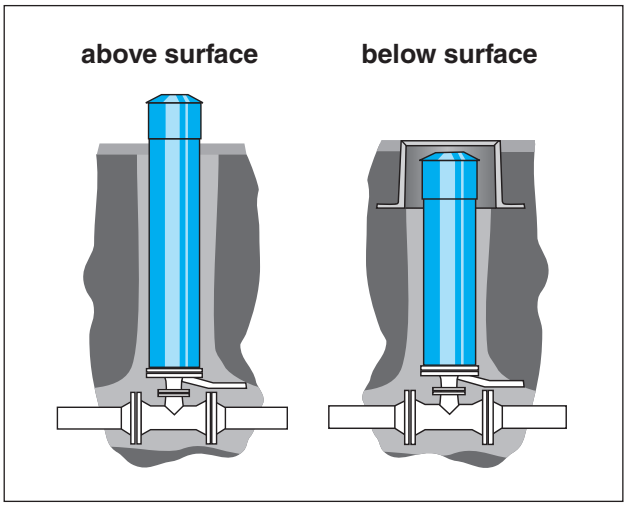
Available with flange connection in DN 80 or BAIO® Spigot End DN 80. When using BAIO® - please use the dirt cover and locking ring.

4.3.2 Above ground and below ground installation

The SAA can be installed above ground and below ground. The above ground construction will be applicable whenever the valve shall be installed in open terrain.

TABLE FOR PIPE COVERAGE

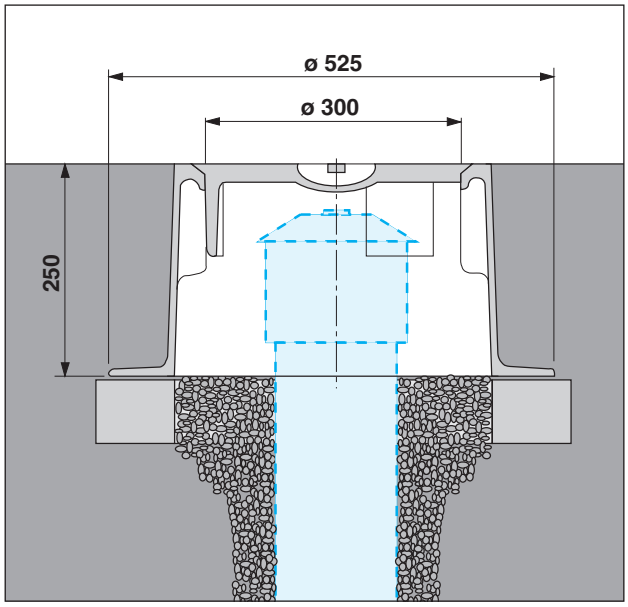
above ground (RD)	below ground (RD)	L (mm) Flange	L (mm) Baio® spigot end
—	1.00	755	815
1.00	1.25	1055	1115
1.25	1.50	1305	1365
1.50	—	1555	1615



4.3.3 Surface box for below surface installation for SAA Order no. 9822/9823

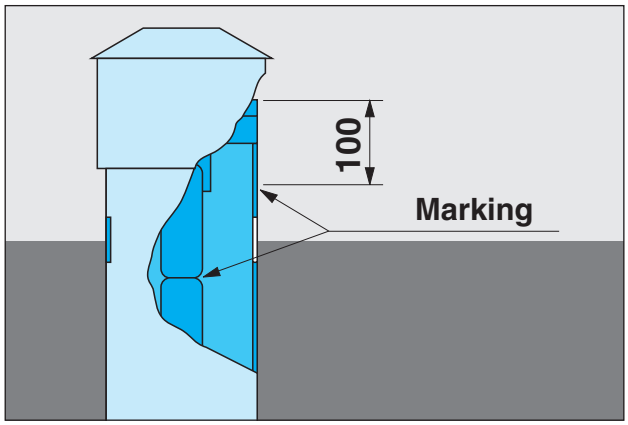
The underground installation requires a surface box. For this purpose Hawle developed its own surface box bearing the markings „Hawle Aeration and Air release Valve“. Eliminating the possibility of mistaking them for other surface boxes or valve installation.

During filling or draining the pipe line it is recommended to open the lid of the surface box. For the operational air release the volume of the SAA stand tube and the surface box or the gaps of the manhole cover are sufficient.



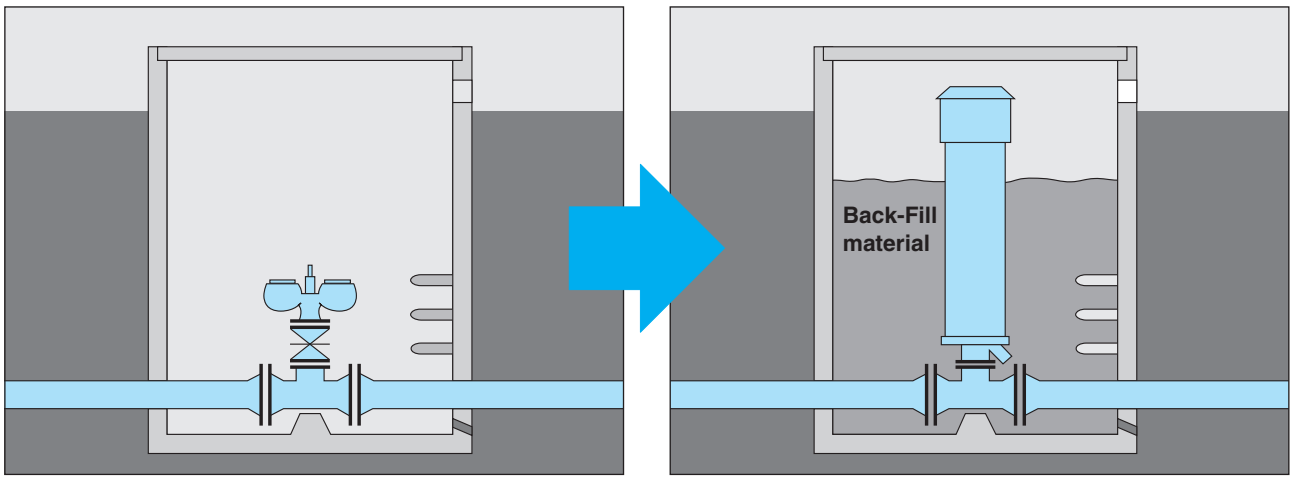
4.3.4 Shortening the SAA-set Order no. 9822/9823 on the construction site

In both, the above surface and the below surface version a shortening of the SAA-set may become necessary on site due to changes in pipe coverage. The sketch indicates the activating tube (with marking) and the high grade steel stand tube can be cut down by 100 mm.
In doing so take care that cut areas are straight.



4.3.5 SAA-set installation into existing shafts

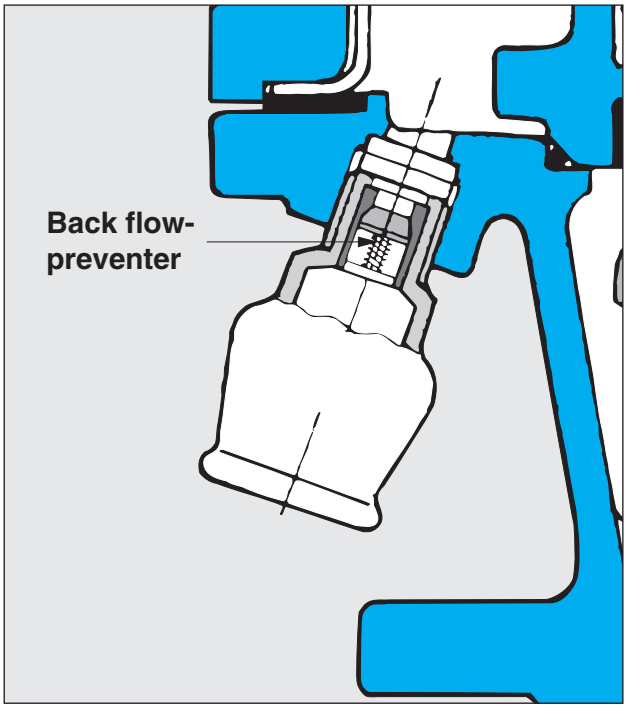
Hawle SAA-sets can also be installed into existing shafts. That means that the SAA is mounted onto the pipe line instead of the old aeration and air release valve. The shaft is then back filled with gravel. This eliminates any maintenance of the shaft and, the valve can be installed and removed from above for service purposes.



4.3.6 SAA installation near ground water

When groundwater rises and seeps in through the drainage fitting, the danger exists that during the aeration process dirty water might enter into the pipe net work.
This can be prevented by installing a Back flow preventer. This feature, however, is not included in the standard delivery and has to be ordered specially. In both cases, whether back flow preventer is fitted or not, please check for water in the base of unit prior to removal of SAA.

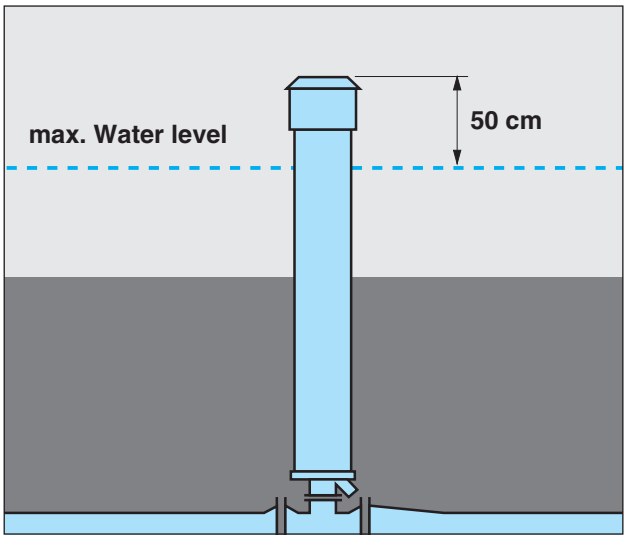
Attention:
In the case of a vacuum and if the Back flow preventer is not installed, ground water or rain water could back syphon into chamber causing bacteriological contamination.



4.3.7 Installation of the SAA-set in areas endangered by flood water

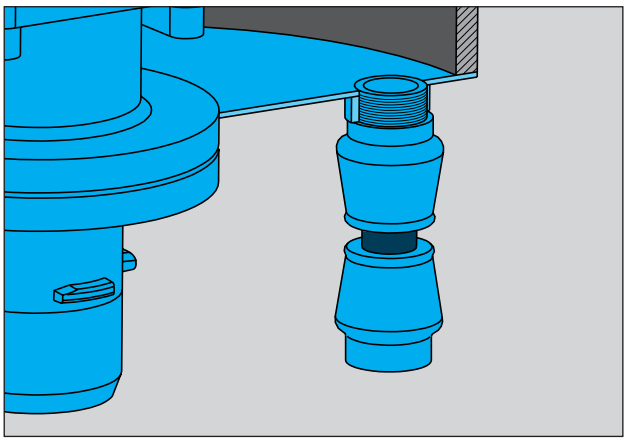
In flood water areas the length of the SAA is to be sized so that the hood with the air slots is approximately 50 cm above the maximum expected water level. This way no dirty water can enter the SAA set. The drainage fitting must be closed. (Not included in the standard scope of supply – to be prepared on site).

Attention:
In the case of a vacuum and if the Back flow preventer is not installed, ground water or rain water could back syphon into chamber causing bacteriological contamination.



4.3.8 SAA for wastewater

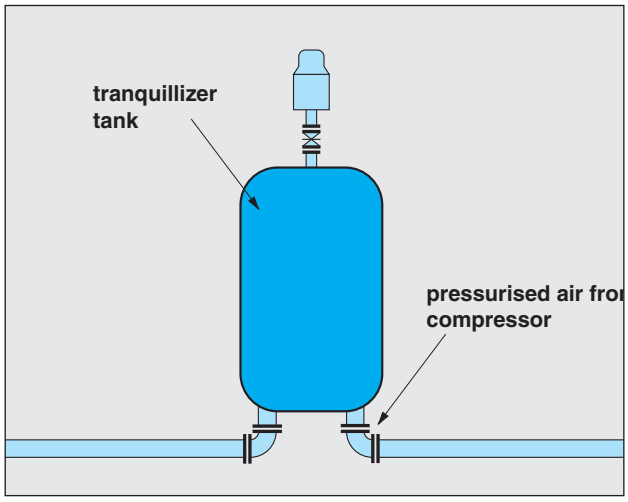
The drain from this chamber should not go directly into the ground, but should be either sealed with an end fitting or via a pipe into a container.



4.4 VAA Applications

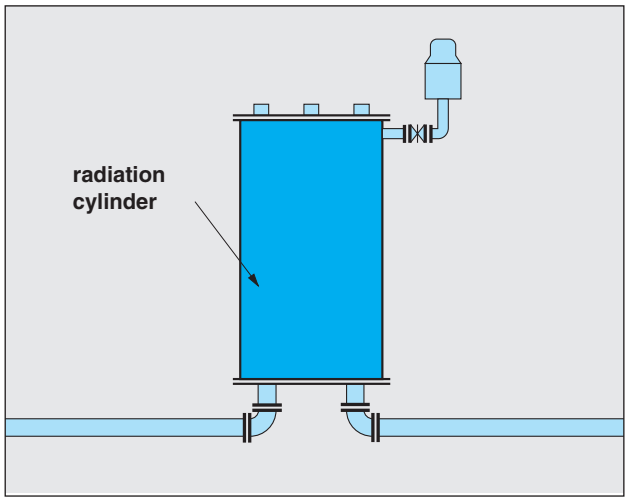
4.4.1 VAA for water treatment plants

Automatic air release at the tranquillizer tank after a water treatment with air / oxygen. The function is guaranteed only up to the maximum possible air release quantity of the VAA (see diagram).
The VAA Order no. 9864 and the SAA Order no. 9827/9828 suitable best for such an application, due to the large ventilation capacity under pressure.



4.4.2 VAA for sterilization systems

In water sterilizing plants the water is exposed to radiation with UV-rays. During this process air is released. This air has to be discharged at the highest point of the radiaton system.

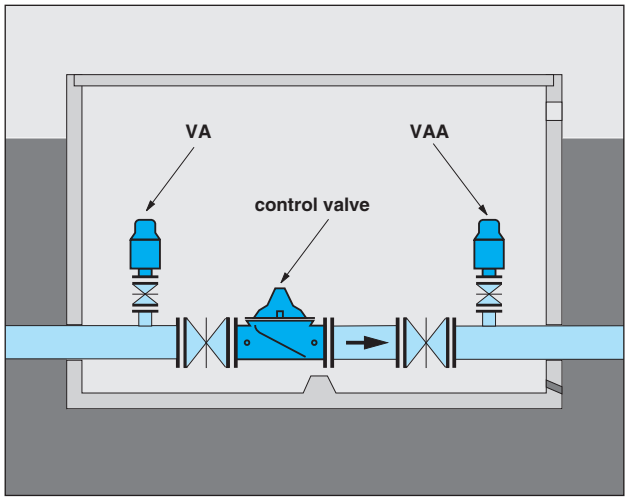


4.4.3 VA upstream of and VAA downstream of control fittings

Control fittings are very sensitive to airlocks in water. Therefore it may be necessary, depending on the operating conditions, to install a VA upstream of the control fitting to ensure troublefree operation.

In this case just an Air Release Valve is recommended, which is realized by installing a non - return valve in the outgoing line of the VAA (please inquire separately).

Attention: This non - return valve reduces the air release capacity!

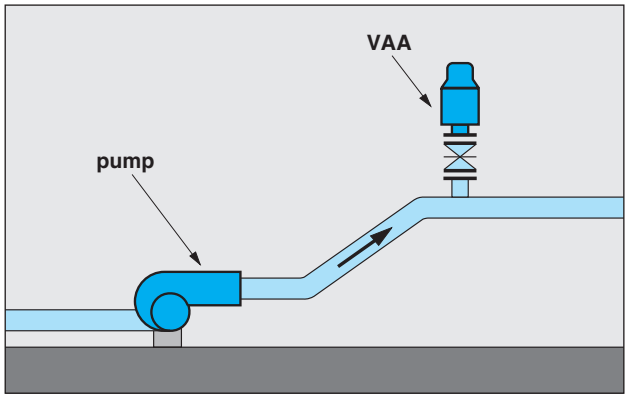


Air is released while flowing through the control fitting, as is the case with all throttle points in the pipeline system. This air should be best removed from the line while it is still in the shaft or the building, in which the control fitting is installed. Downstream of pipe-break valves, in particular, an aeration fitting must be installed to prevent negative pressure and consequential damage to the pipelines.

4.4.4 VAA for fire extinguishing systems

In large fire extinguishing systems there are pumps in action which guarantee sufficient delivery of water in case of an emergency. These pumps drag air into the pipe line which has to be released at the next highest point of elevation again.

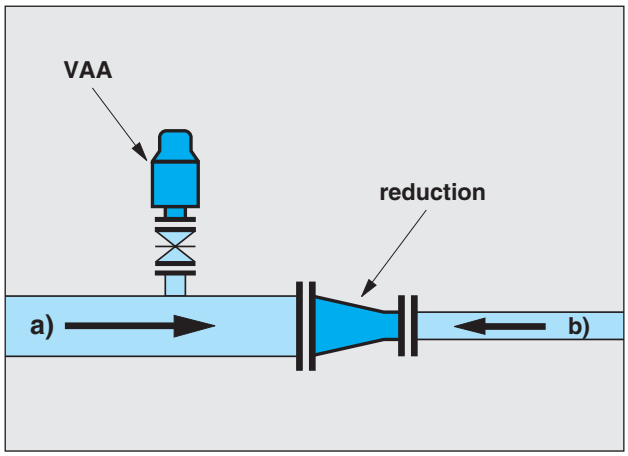
Please note the relevant applicable national regulations such as VDS guidelines [3] prior to installation.



4.4.5 VAA ahead of reductions

a) Ahead of reductions in the pipe network, that is, before large reduced sections, air bubbles are created in the water (see curve for automatic air release of pipelines, enclosure to W 334 [1]). The VAA automatically releases the collected air.

b) Even in case that the flow goes from the smaller to the larger pipe air release may be necessary, for example if the pipe is installed descending and the speed for automatic air release is not reached.



4.4.6 VAA in waste water head pipes with automatic aeration

In some waste water head pipes air is blown in regularly, which is usually fully removed again from the pipeline at the next VAA.

This is not always desired. In such cases the installation of solenoid valves on the valve outlet side will help (the solenoid valves are closed while air is blown in and for some time thereafter) or the installation of an apertured diaphragm reducing the blow-off capacity in such a way that a certain share of air is always carried on. For design and dimensioning please contact our application engineers.

4.4.7 VA in waste water vacuum pipes

In waste water vacuum pipes only air release valves may be used. To this end a nonreturn valve is to be installed on the valve outlet side.

Attention: This nonreturn valve reduces the air release capacity!

4.5 Pressure testing of pipelines

Prior to delivery Hawle SAAs and VAAs are tested at maximum operating pressure for proper function and at 1.5 times the operating pressure for leakage of the chamber.

Before pressure testing of pipelines with SAAs and/or VAAs the shut-off valve must be closed, otherwise there is a danger of air release during pressure testing, thus invalidating the results of the pressure test.

VAA:	close shut-off unit upstream of the valve
SAA 9822/9823:	take VAA out of SAA – integrated shut-off device of set closes automatically
SAA 9827/9828:	close shut-off unit by applying half a turn

5. Insulation

Very little danger of frost exist for valves that are mounted directly onto water main lines. This is because the water inside the valve is being „warmed up“ from the water flowing in the main pipe. However, if an offset installaton is necessary, that is an installation beside the main line, because the location is problematic and the situation unfavourable, the danger of frost exists. It also exists if the distance between valve and ground is less than 1,5 m.

In these cases the supply line and the valve have to be insulated. The valve in the SAA is protected from frost by inserting a properly sized disk into the stand pipe at half height. This disk is made of approximately 4 - 6 mm thick styrofoam with a hole in the middle. See illustration a.

This disk however must not be tight, so that aeration and air release are not inhibited or prevented. Drill approximately 10 holes with a diameter of 10 mm. The VAA in shaft is insulated against frost by lining the shaft walls and the shaft lid with styrofoam material. See illustration b.

In the case of waste water insulation may be sensible as, although there is usually no danger of freezing, the depositing of grease at the VAA chamber walls is intensified by the differences in temperature.

illustration a

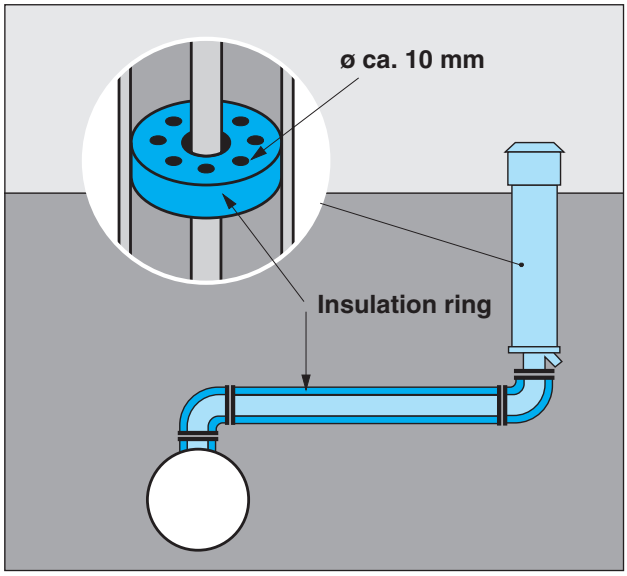
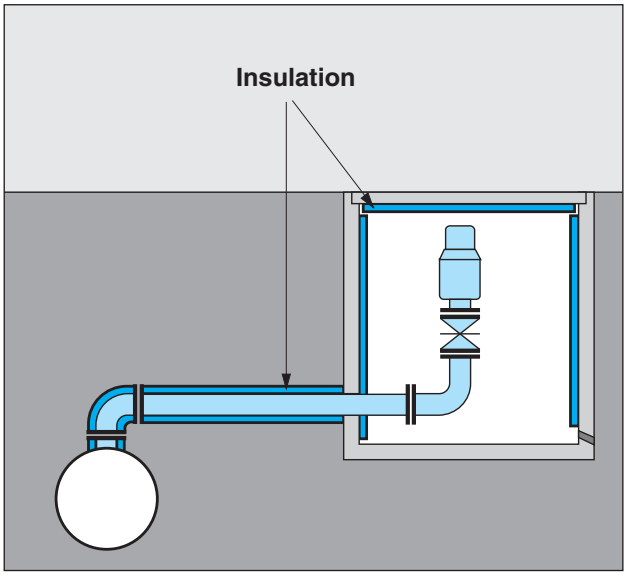
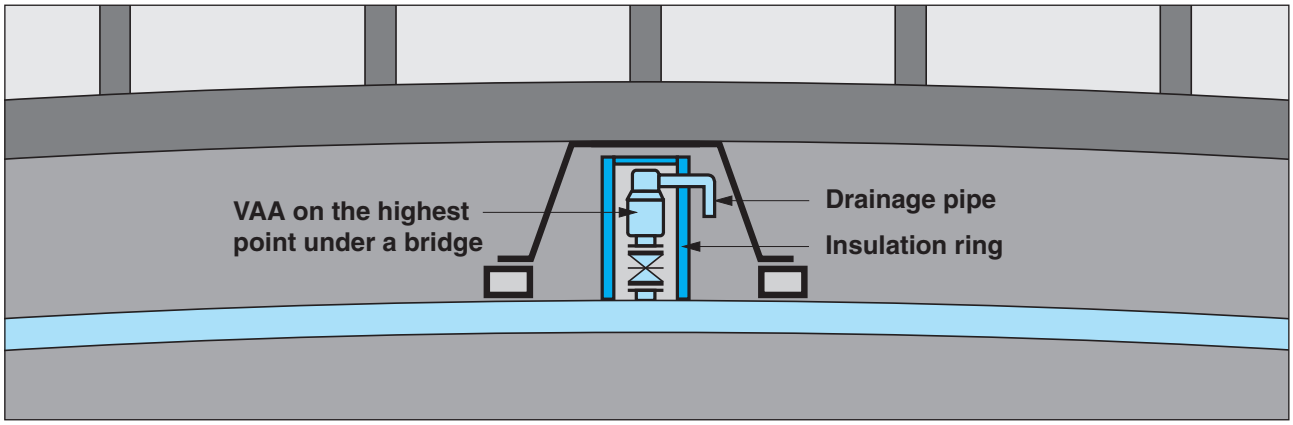


illustration b



If a VAA stands in the open, for example under a bridge, it has also got to be frost protected. Also a drainage pipe has to be set up that leads from the VAA into the open for draining away the discharge water.



6. Service and maintenance

6.1 Why perform maintenance ?

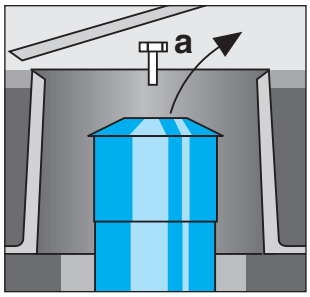
Almost all types of water tend to carry deposits and suspended particles along with them. To avoid possible functional disturbances owing to dirt, the combined air valves have to be checked periodically and if needed they have to be serviced.

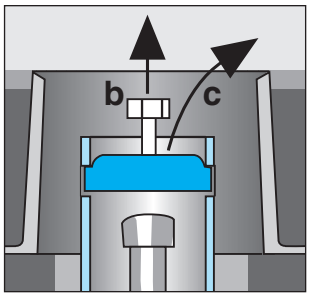
6.2 Service intervals

Due to proper work materials and properly treated surfaces the operating life of the VAA can be prolonged when serviced regularly. The Hawle VAA float body and the housing is made of polyacetal thus, deposits can largely be avoided. In spite of this fact, we recommend regular maintenance to be performed at least once annually. The exact maintenance interval chiefly depends on the make up of the water in question. For this reason, maintenance should commerce a little earlier so that experience can be gathered for the next service. Nevertheless we recommend regular maintenance: for drinking water see also **Worksheet DVGW W 390 [2]**. For waste water the maintenance intervals must be adapted to the conditions of the pipeline. In most cases the first VAAs of a series of several valves are soiled most. There are no generally applicable rules for maintenance intervals.

6.3 Important service tasks

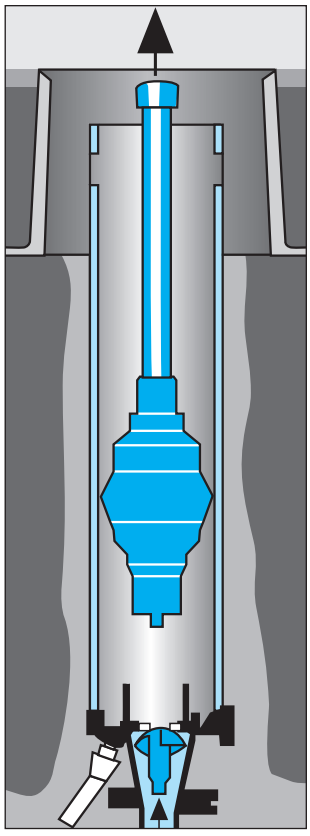
6.3.1 Removal of the DN 2" Order no. 9822/9823





- open the surface box
- loosen screw **a**
- remove the hood

- loosen screw **b**
- remove spindle retainer **c**



- pull the valve with the activating tube
- at the same time, the sealing plug down below shuts down the system.

dismantling and servicing the 2" VAA:

- cleaning the housing and the gasket seats
- air blowing the drilled valve hole with compressed air (see also the cross section illustration 3.1.1)

dismantling and servicing the 1" VAA:

- remove the gasket seats and air blow them
- clean the valve gasket (see also the cross section illustration 3.1.1)

The above steps are to be carried out in reverse for the installation process. A loud hissing sound can be heard when the spindle retainer is screwed in. This is an air release process. If this does not happen the procedure has to be repeated.

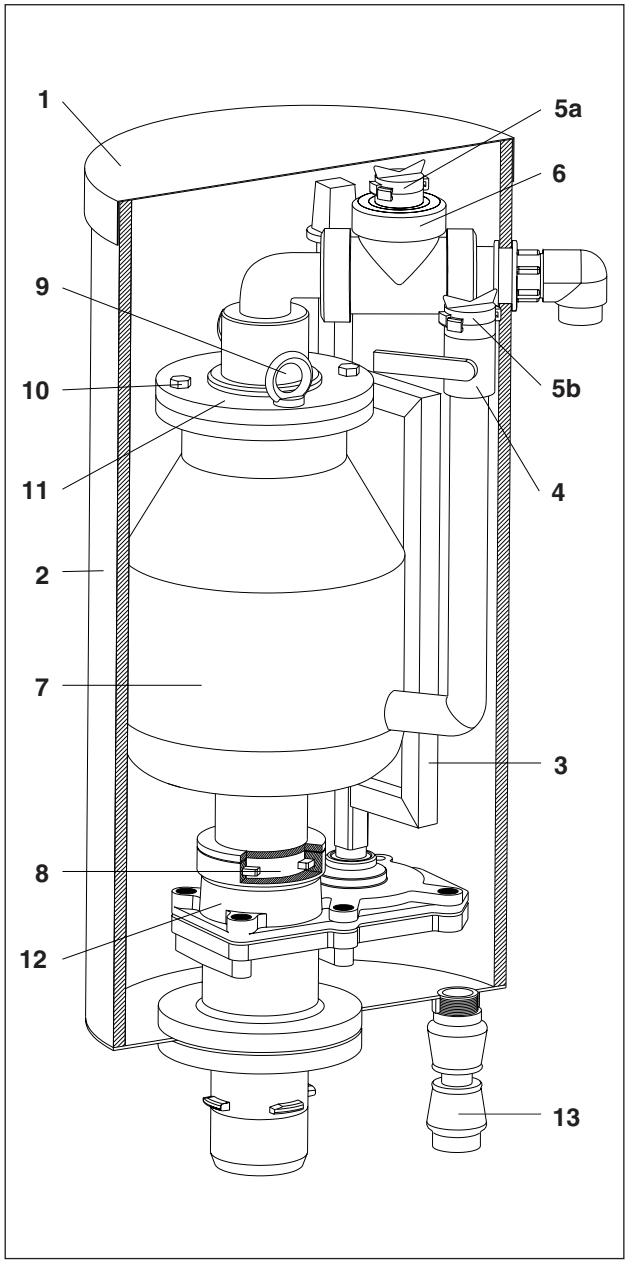
6.3.2 Maintenance of SAA Order no. 9827/9828

All maintenance and service work can be done from the road surface, thus avoiding the dangers arising with shafts.

The aeration and air release valve can be flushed via the two flushing ports (5a / 5b) without dismantling. To this end hoses must be connected to the two flushing ports (5a / 5b) in such a way that the inside pressure is released safely after opening the ball valves (4 / 6). Flushing is carried out by passing water (and possibly adding cleaning agents) from 5a towards 5b.

If there are any foreign bodies in the valve that cannot be flushed out via the lower flushing orifice the valve should be dismantled, opened and the foreign body be removed. To this end please proceed as follows:

1. Take off cover (1) from shaft pipe (2). Close shut-off valve via offset flushing tube (3) by applying half a turn (clockwise). Attention: The aeration and air release valve is still under pressure even after closing of shut-off valve, therefore open ball valve (4) on lateral flushing tube carefully and only after mounting a hose at the flushing port provided for this purpose (5b) and take away safely any emerging waste water. Dismantle 3/2-way ball valve (6). To this end loosen the screwed union.



2. Pull operating tube (3) upward and out of the aeration and air release set. Turn the valve (7) counter-clockwise until the bayonet coupling (8) gets loose. Pull the valve upward and out of the shaft pipe (2) at the two eye bolts (9) by means of an appropriate lifting tool. The residual water is drained off via the drainage. If this is not desired, insert an end fitting (13) and empty the shaft.

3. Open the chamber screws (10). Clean the valve inside (use cleaning agent, if necessary, let it take effect for some time in case of persistent dirt before cleaning it with a brush). Screw valve cover (11) back on, making sure that the toroidal sealing ring is fitting properly. Before re-installation clean all sealing surfaces of the aeration and air release valve.

4. Put the valve (7) from the top onto the bayonet coupling and lock it clockwise. Reinsert the 3/2-way ball valve (6) and fasten the screwed unions manually until the connections are tight. Put on the operating tube (3). Close the ball valve of the lower flushing orifice (4). Open shut-off valve (12) below the aeration and air release valve slowly (counter-clockwise). Visual inspection of all connections and flushing orifices.

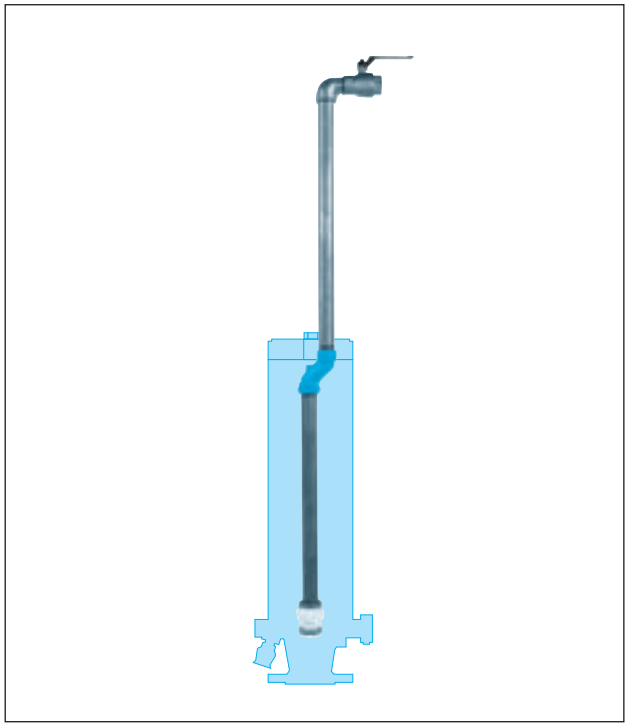
7. Accessories

7.1 Flushing Stand Pipe (for SAA Order no. 9824)

The flushing stand pipe is installed into the SAA instead of the VAA and serves to:

- tap water from the line
- flush the pipe
- mechanically aerate and release air during filling or draining of pipe lines containing great quantities of air
- ideal also for start-up of set

Flushing Stand Pipe with ball valve
(Order no. 9824) for Pipe cover 1,0 / 1,25 / 1,50 / 1,75 m



7.2 Surfaces box for Air Release Valves Order no. 9822/9823

8. Descriptive text for tenders and quotations

Air Release Valve DN 1" Order no. 9876

- totally of corrosion-free materials
- automatic operation
- body and float of POM (PE shield for UV protection)
- seal of elastomer
- max. air release capacity not less than 0,13 m³/min.
- test pressure 24 bar
- working pressure: 0,1 - 6 bar or 0,8 - 16 bar
- female thread inlet reinforced with a stainless steel ring
- for potable water up to 30°C

e.g. HAWLE Automatic Air Valve No. 9876, DN 1"
or equivalent

Air Release Valve DN 2" Order no. 9876

- for small and large air discharge
- totally of corrosion-free materials
- automatic operation
- body and float of POM (PE shield for UV protection)
- seal of elastomer
- max. air release capacity not less than 3,2 m³/min.
- test pressure 24 bar
- working pressure: 0,1 - 6 bar or 1 - 16 bar
- female thread inlet reinforced with a stainless steel ring
- for potable water up to 30°C

e.g. HAWLE Automatic Air Valve No. 9876, DN 2"
or equivalent

on request:
- with flange DN 50 or DN 80 mm

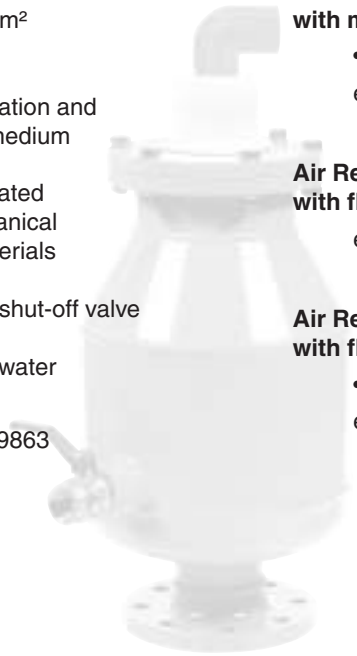
e.g. HAWLE Automatic Air Valve No. 9874
or equivalent

Air Release Valves Order no. 9863/9864 (with diaphragm)

Air Release Valve, with DN 2"

- max. size of the opening 480 mm²
- smooth operating
- automatic operation
- insulating air cushion in the aeration and air release valve between the medium and the sealings
- body of steel, epoxy powder coated
- valve with diaphragm, all mechanical parts of corrosion resistent materials
- float of POM
- with 1 flushing orifice including shut-off valve
- male thread connection 2"
- Application: potable water, raw water wastewater

e.g. HAWLE Automatic Air Valve No. 9863
or equivalent



Air Release Valve of stainless steel, with male thread connection DN 2"

- body of stainless steel

e.g. HAWLE Automatic Air Valve No. 9864
or equivalent

Air Release Valve of stainless steel, with flange DN 50 - 200

e.g. HAWLE Automatic Air Valve No. 9863
or equivalent

Air Release Valve of stainless steel, with flange DN 50 - 200

- body of stainless steel

e.g. HAWLE Automatic Air Valve No. 9864
or equivalent

Air Release Valve Order no. 9835 / 9836 / 9837 / 9838

DN 80, 100, 150, 200

- double orifice design (for small and large air discharge)
- automatic operation
- body and cover of grey iron EN-GJL-250 according to EN 1561 (GG 250 - DIN 1691)
  inside and outside epoxy powder coated according to DIN 30677-T2 in accordance with the quality and test requirements of RAL-Quality Mark 662:
  - coating thickness: min. 250 µm
  - zero porosity: min. 3000 V Spark test
  - adhesion: min. 12 N/mm²
- basic valve: float of polycarbonat (DN 80, DN 100)
  float of A2, passivated (DN 150, DN 200)
  seat of Ms58 / elastomer
- travelling valve: body and float of POM (acetal)
  UV-shield of PE
  seal of elastomer
- Max. air release capacity not less than:
  DN 80 - 26,00 m³/min
  DN 100 - 54,16 m³/min
  DN 150 - 281,66 m³/min
  DN 200 - 463,33 m³/min
- Screws, nuts, washers of corrosion free steel (min. quality grade A2)
- test pressure: 24 bar (corresp. 1,5 times the max. working pressure)
- working pressure: 0,2 – 6 bar or 0,8 – 16 bar
- flange dimensions and drilling to EN 1092-2 PN 10-(PN 16 on request)

e.g. HAWLE Automatic Air Valve No. 9835
or equivalent
on request:

- double orifice Air Valve, with insect protective grid and PE pipe, DN 80, DN 100 Hawle No. 9836
- single orifice Air Valve (without travelling valve), Hawle No. 9837
- single orifice Air Valve (without travelling valve), with insect protective grid and PE pipe DN 80, DN 100 Hawle No. 9838

Combined Air Release Valve Order no. 9822/9823

Air Release Valve
DN 50 (80)

- suitable for installation without construction of a shaft
- Standpipe in stainless steel (minimum quality grade St 1.4301)
- with integral automatic shut-off valve
- the air valve can be removed under pressure
- Air Release Valve DN 2" (see description above)
- all not corrosion-free materials all-round epoxy powder coated to DIN 30677-T2 in accordance with the quality and test requirements of RAL-Quality Mark 662
- with automatic drainage device
- suitable for use with a flushing stand pipe
- with flange EN 1092-2
- for drinking water up to 30°C
- *various installation depths on request*

e.g. HAWLE Combined Air Release Valve No. 9822
or equivalent

Combined Air Release Valve Order no. 9827/9828

Air Release Valve with flange DN 80
(with diaphragm)

- Working pressure: 0 – 16 bar
- max. size of the opening 480 mm²
- max. air release capacity: 230 m³ / h
- smooth operation
- sealing face is not in contact with the wastewater
- PE pipe substituting mainhole
- body of stainless steel
- shut-off devíce: blade of stainless steel; fully free passage when opened
- operating valve with diaphragm, completely made of noncorroding materials
- float made of POM
- 2 maintenance ports with hose coupling
- ball valve for flushing of valve
- lateral outlet for exhaust air
- valve can be taken out of aeration and air release set after closing the shut-off device
- Medium: raw and potable water, communal and industrial sewerage
- Pipe length: PC 1,25 m, PC 1,50 m

e.g. HAWLE Combined Air Release Valve No. 9828 or equivalent

HAWLE Combined Air Release Valve **with BAIO® - Spigot end DN 80**

- however: with BAIO® - Spigot end DN 80

e.g. HAWLE Combined Air Release Valve No. 9827 or equivalent

9. Tests

The Hawle aeration and air release valves are tested according to EN 1074-4. This includes a function test at max. operating pressure and a chamber test at 1.5 times the operating pressure.

10. Safety instructions

Prior to working at aeration and air release valves the valve must be isolated and depressurized via an appropriate fitting. Aeration and air release valves are one of the few automatically operating connecting points between the pipeline system and the environment. Therefore they must be regularly monitored (see also [2]).

11. Lists of references

[1] DVGW Worksheet W 334
[2] DVGW Worksheet W 390 (Note: W 390 shall be replaced by W 392)
[3] National guidlines (e.g. VDS-guideline)
[4] DVGW - Worksheet W 303

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You have some questions ?

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