

VAG HYDRUS® G Underground Hydrant DN 100 - PN 16



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1 General

1.1 Safety



These Operation and Maintenance Instructions must be observed and applied at all times along with the general "VAG Installation and Operation Instructions for Valves" (see www.vag-group.com / Category: Installation and Operation Instructions).

Arbitrary alterations of this product and the parts supplied with it are not allowed. VAG will not assume any liability for consequential damage due to non-compliance with these instructions.

When using this valve, the generally acknowledged rules of technology have to be observed (e.g. national standards, EN 1074-6 hydrants, fitness for purpose requirements and appropriate verification tests, etc.). The installation must only be carried out by qualified staff (see also Section 6.1 General safety instructions). For further technical information such as dimensions, materials or applications, please refer to the respective documentation (KAT 1622-A).

VAG valves are designed and manufactured to the highest standard and their safety of operation is generally ensured. However, valves may be potentially dangerous if they are operated improperly or are not installed for their intended use.

Everyone dealing with the assembly, disassembly, operation, maintenance and repair of the valves must have read and understood the complete Operating and Maintenance Instructions (Accident Prevention Regulations, VBG 1 §§ 14 [Regulations issued by the Trade Associations], ANSI Z535).

Before removing any protective devices and/or performing any work on the valves, depressurise the pipeline section and ensure it is free of hazards. Unauthorised, unintentional and unexpected actuation as well as any hazardous movements caused by stored energy (pressurised air, water under pressure) must be prevented.

In case of equipment that must be monitored and inspected, all relevant laws and regulations, such as the Industrial Code, the Accident Prevention Regulations, the Ordinance of Steam Boilers and instructional pamphlets issued by the Pressure Vessels Study Group must be complied with. In addition, the local accident prevention regulations must be observed.

When a valve needs to be dismantled from a pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be emptied completely before the valve is dismantled. Special care needs to be taken in case of residues which may continue flowing.

1.2 Proper use

The VAG HYDRUS® G Underground Hydrant is a valve for installation in drinking water pipeline networks.

Refer to DVGW technical standard W331 for deployment and correct installation.

For the respective technical application ranges (e.g. operating pressure, medium, temperature) please refer to the product-related documentation (KAT 1622-A).

For any alternative operating conditions and applications, the manufacturer's written approval must be obtained!

These Operation and Maintenance Operation Instructions contain important information on the safe and reliable operation of the

VAG HYDRUS® G Underground Hydrant.

Observing these Operation and Maintenance Instructions helps you to:

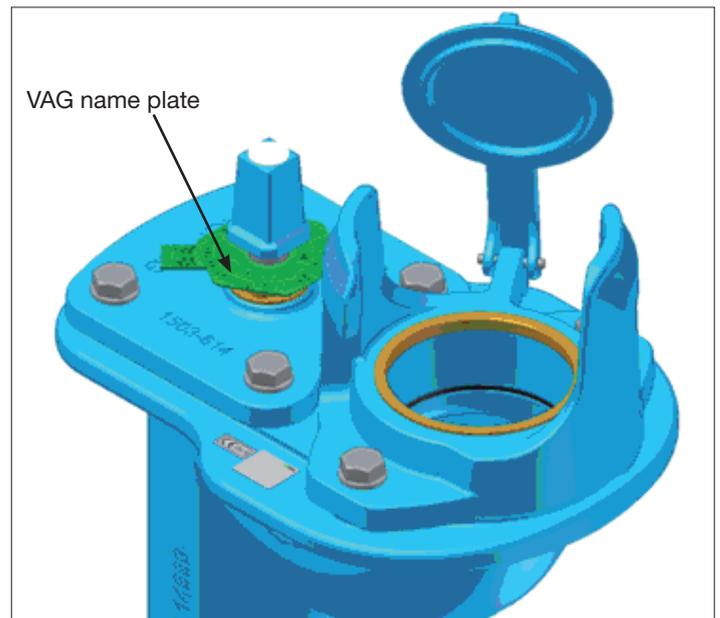
- Prevent hazards
- Reduce repair costs and down-times of the valve and/or the entire equipment
- Improve the operational safety and useful life of the equipment.

1.3 Identification

According to DIN EN 19 all valves bear an identification label specifying the nominal diameter (DN), nominal pressure (PN), body material and the manufacturer's logo.

After installation in the pipeline cap, the following information can be seen on the name plate when viewed from above.

VAG	Manufacturer's name
DN	Nominal diameter of the valve
PN	Nominal pressure of the valve
	Installation depth (important for spare part definition)
	Date of manufacture



Picture 1: VAG name plate

2 Transport and Storage

2.1 Transport

For transportation to its installation site, the valve must be packed in stable packaging material suitable for the size of the valve. It must be ensured that the valve is protected against atmospheric influences and external damage. When the valve is shipped under specific climatic conditions (e.g. overseas transport), it must be specially protected and wrapped in plastic film and a desiccant must be added.

The factory-applied corrosion protection and any assemblies must be protected against damage by external influences during transport and storage.

2.2 Storage

The VAG HYDRUS® G Underground Hydrant must be stored with the opened stopper in the horizontal position.

The elastomeric parts (seals) must be protected against direct sunlight and/or UV light otherwise their long-term sealing function cannot be guaranteed. Store the valve in a dry and well-aerated place and avoid direct radiator heat. The protective cover protects functionally important components from dust and other external impurities.

Do not remove the protective caps of the connections / flanges and the packaging materials until immediately prior to assembly.

The valve can be stored in ambient temperatures ranging from -20 °C to + 50 °C (protected by adequate covers). If the valve is stored at temperatures below 0 °C, it should be warmed up to at least +5° C before installation and before it is put into operation.

3 Product features

3.1 Features and function description

In its dimensions, function and hygienic characteristics the VAG HYDRUS® G Underground Hydrant meets current standards.

- VP 325 Hydrants, requirements and tests
- EN 1074-6 Hydrants, requirements, fitness for purpose and verification tests

3.2 Applications

Due to the EPDM gasket materials used the standard version of the VAG HYDRUS® G Underground Hydrant is suitable for the following media:

- Water, at a maximum temperature of 50°C

The use of media containing oil and gas may damage the lining and gaskets and is thus not permissible.

For information about the corresponding temperature limits, please refer to the product-related technical documentation (KAT 1622-A).

In case of deviating operating conditions and applications, please consult the manufacturer.

3.3 Permissible and impermissible modes of operation

The maximum operating temperatures and operating pressures specified in the technical documentation (KAT 1622-A) must not be exceeded.

The pressure applied to the closed valve must not exceed its rated pressure.

For reasons of cavitation safety the maximum flow rate should not exceed 1.5 times the Kv-value according to applicable technical standards.

The valve may only be operated in fully opened position. Regulation of the flow may only take place via the extraction valves located on the standpipe.



Caution!! Extracting water while the shut-off cone is in a partially open position can cause cavitation effect in the seat area, resulting in leakiness.

For correct operation of the valve DVGW standard W 331 must be complied with.

The metallic limit stops when the hydrant is in open and closed position are clearly noticeable. The design of the installed sealing system guarantees tightness in this position. It is thus not necessary to exert extra force to close the valve into an end position. This may cause an overload of the limit stops, or result in the valve being stuck in an end position or damaged.

3.3.1 Claw dimensions

The VAG HYDRUS® G DN 100 is available with two claw sizes (DN 100 and DN 80) from the factory.



Caution!! The hydrant with claw size DN 100 cannot be used in public supply networks for the public fire brigade as only standpipes with a claw connection size DN 80 are available there. It is essential to consider this fact for planning and ordering. Should you have ordered the wrong claw size, the claw can be replaced afterwards even with the hydrant installed.



Claw DN 100



Claw DN 80 with intermediate flange adapter

Picture 2: Claw varieties

3.3.2 Suitable surface box



To install the VAG HYDRUS® G Underground Hydrant DN 100 the large surface box DN 100 to DIN 4055 is required.

4 Installation into the pipeline

4.1 Conditions required on site

Observe the provisions of the DVGW standard W 331 when installing the VAG HYDRUS® G Underground Hydrant.

The flange version of the VAG HYDRUS® G is delivered with a multifunction seal integrated in the flange. An additional flat seal for the flange connection to the pipeline should not be used. The multifunction seal should not be removed, because doing so will impair the function of the hydrant during operation.

To reliably drain the underground hydrant we recommend the additional installation of the VAG seepage stone. (Fig. 4).

Without a seepage stone the lower draining point must be surrounded by packed gravel or crushed rock that permits draining.

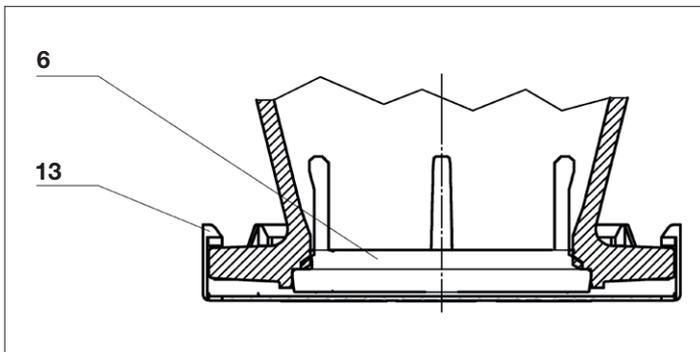
The draining area (immediately above the flange connection) must never be blocked by the external application of sealants!

4.2 Assembly instructions and fitting

Check the valve for possible damage that it may have occurred during transport and storage. Until installation the valve is protected from dirt accumulating during construction site operations via a factory mounted cover (13).

4.3 Assembly of the VAG HYDRUS® G Underground Hydrant

Remove the protective flange cover (13) prior to attachment to the pipeline.



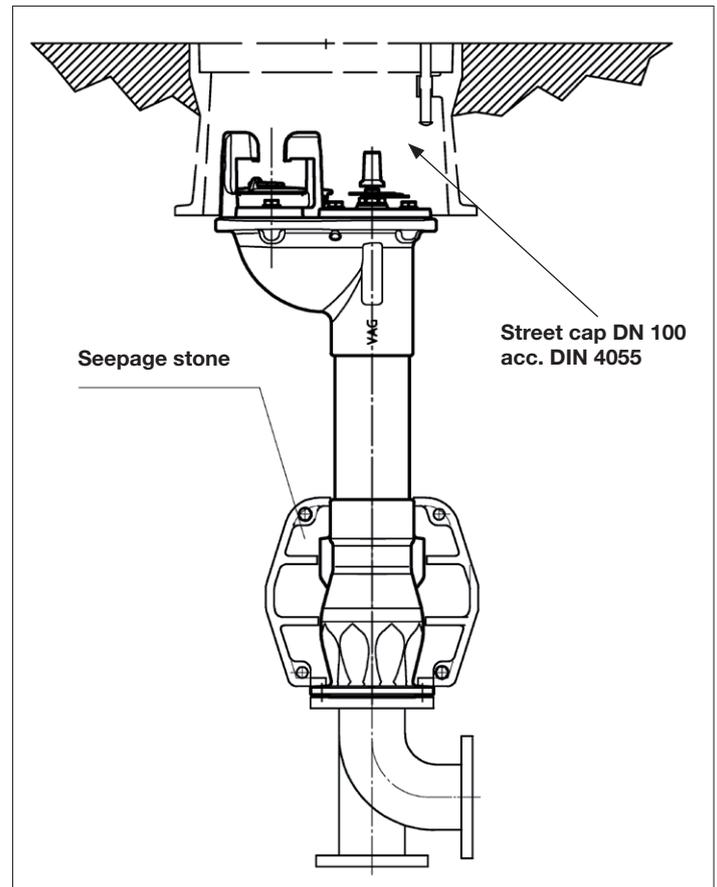
Picture 3: Detailed view flange version

4.4 VAG HYDRUS® G flange version

Multifunction sealing ring (6) is pressed in at the factory and is used as a sealing for the pipeline flange. An additional flat seal should not be used.

After attaching the underground hydrant tighten the flange bolting crosswise.

Before filling in the pipe trench install the appropriate VAG seepage stone for the safe draining of the underground hydrant.



Picture 4: Installation into the pipeline

In addition, observe the installation guidelines set out in DVGW worksheet W 331 to install the HYDRUS® G.

5 Set-up and operation of the valve

5.1 Visual inspection and preparation

Before putting the valve and the equipment into operation, perform a visual inspection of all functional parts.

The fittings are sufficiently lubricated at the factory for purposes of assembly, storage and transport. For maintenance work specified in accordance with DVGW W392 the lubricant for drinking water lines approved for foodstuffs or drinking water, must be used.

- KLÜBERSYNTH VR 69-252 N (with KTW approval for drinking water) manufactured by Klüber Lubrication München AG,

5.2 Function check and pressure test

Prior to installation the working parts of the valve must be opened up completely and closed at least once and the movement checked. Caution! During a pressure test of the pipeline the closed valve may only be put under a load up to its nominal pressure (see technical data sheet KAT 1622-A).



According to the technical standard a leakage rate of only E in accordance with DIN EN 1226-1 is guaranteed for the draining seal that is active when the cone is open. This means that there is no tightness guarantee

on the part of the manufacturer for a pressure test in this position.

For test pressures higher than the approved nominal pressure the hydrant must be disassembled and the flange blanked using a blind flange.

Newly installed pipeline systems should first be carefully flushed to remove all foreign matter. Should any residue or impurities exist in the pipeline they may clog the internals during the flushing process. This may impact the tightness function of the fitting or damage the lining of the shut-off cone.

In particular, after repairs are carried out, but before putting new systems into operation, the pipeline system must be flushed again with a fully opened valve. Any cleaning or disinfecting agents used may not corrode the fitting materials. The fitting is normally closed by being turned in clockwise direction.

5.3 Initial operation

VAG HYDRUS® G Underground Hydrants are delivered in the following versions:

- Claw DN 100 with self-closing claw cover (2)
- Claw DN 80 with self-closing claw cover (2)

Select the standpipe according to the claw version.

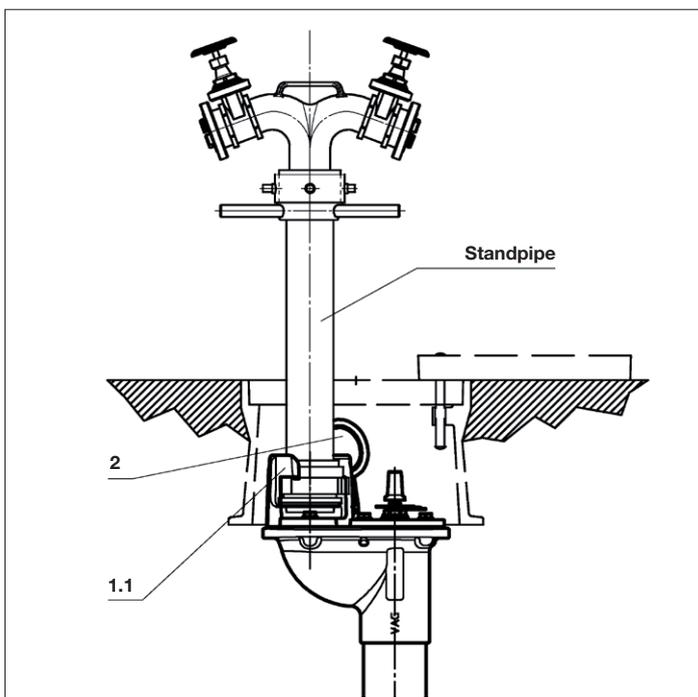
- Lift up self-closing outlet claw cover (2) (Wire with bent hook),
- Attach and tighten standpipe. Check that the base pins are properly seated in the claw (1.1) by shaking the standpipe.
- Fill the piping section. In doing so the underground hydrant can be used to release air and be flushed afterwards.



Caution!! The hydrant shut-off valve must always be completely open. Throttling of the flow may only take place via the valves on the standpipe.

Throttling the hydrant shut-off valve may result in high flow velocities occurring within the valve.

5.4 Operation



Picture 5: Assembly of standpipe and self-closing claw cover

5.4.1 Opening the hydrant

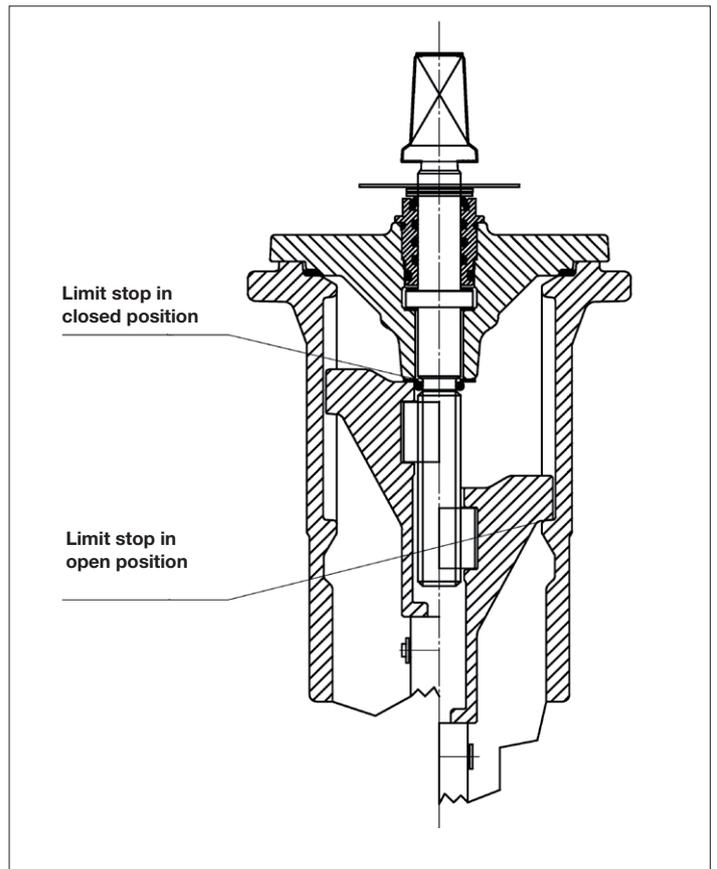
Lift street cap cover at lifting support and turn sideways until the street cap is freely accessible.

Clean claw (1.1) and claw cover (2) in street cap. Lift up self-closing outlet claw cover (2.) (Wire with bent hook). From above insert standpipe with claw nuts bolted downwards into the claw (1.1.) and turn clockwise until the claw (1.1) is firmly seated. Check that the base pins are properly seated in the claw (1.1) by shaking the standpipe.



Caution!! Make sure the standpipe valve is wide open, allowing air to escape when opening the hydrant shut-off valve. !!!

Open by slowly and completely turning the hydrant shut-off handling key anti-clockwise (approx. 12 turns) until the clearly noticeable metallic limit stop.



Picture 6: Hydrant operation, metallic limit stop

The metallic limit stops when the hydrant is in open and closed position are clearly noticeable. The design of the installed sealing system guarantees tightness in this position.

It is thus not necessary to exert extra force to close the valve into an end position. This may cause an overload of the limit stops, or result in the valve being stuck in an end position.

Flush underground hydrant and standpipe with the water flowing out. In new condition the underground hydrant requires torque of approx. 60 Nm to open. This can increase significantly during operation depending on maintenance condition.



Caution! Before opening the underground hydrant the operator must make sure that no initial gate valve immediately upstream from the underground hydrant is closed. Because the underground hydrant closure device opens down into the pipeline, a strong rise in operating torque would occur due to the incompressibility of the water, perhaps causing damage to internal parts.



Caution !! The hydrant shut-off valve must always be completely open. Regulation of the quantity dispensed may only take place via the valves on the standpipe. When throttling the hydrant shut-off valve high flow velocities occur in interim position that may result in cavitation effects.

6.2 Inspection and operation intervals

Tightness, movement and corrosion protection of the VAG HYDRUS® G Underground Hydrant should be checked at least once every 4 years (DVGW worksheet W 392).

Depending on operating experience this maintenance schedule can be shortened or prolonged.

5.4.2 Closing the hydrant

Do not close the standpipe completely. With the standpipe valve open slightly close it by evenly turning the handling key for the hydrant shut-off slowly and completely (approx. 12 turns) in clockwise direction towards the metal limit stop.



Caution !! By not opening the standpipe valve strong overpressure can build up when closing the hydrant shut-off.

Make sure to drain the hydrant.

After approx. 5 minutes loosen the standpipe from the claw (1.1) by turning anti-clockwise. Then remove the standpipe, the self-closing claw cover (2) closes automatically, and close the surface box so that it is safe for traffic.

6 Maintenance and repair

6.1 General safety instructions

Prior to the performance of inspection and maintenance work on the valve or its assemblies, shut-off the pressurised pipeline, depressurise it and secure it against inadvertent activation.

After completing the maintenance works and before resuming operation, check all connections for proper fastening and tightness. Perform the steps described for initial set-up as described under Section 5 "Set-up and operation".

Statutory and local provisions as well as the safety and accident prevention regulations must be observed and complied with at all times.

Servicing, maintenance and inspection work as well as the replacement of spare parts must only be done qualified staff. The plant operator is responsible for determining the suitability of the staff or for ensuring that they have the relevant qualifications.

If the operator's employees do not have the qualifications required, they need to attend a training course. This training course can e.g. be held by VAG Service employees.

In addition to this, the plant operator needs to ensure that all employees have understood these Operation and Maintenance Instructions as well as all further instructions referred to in them.

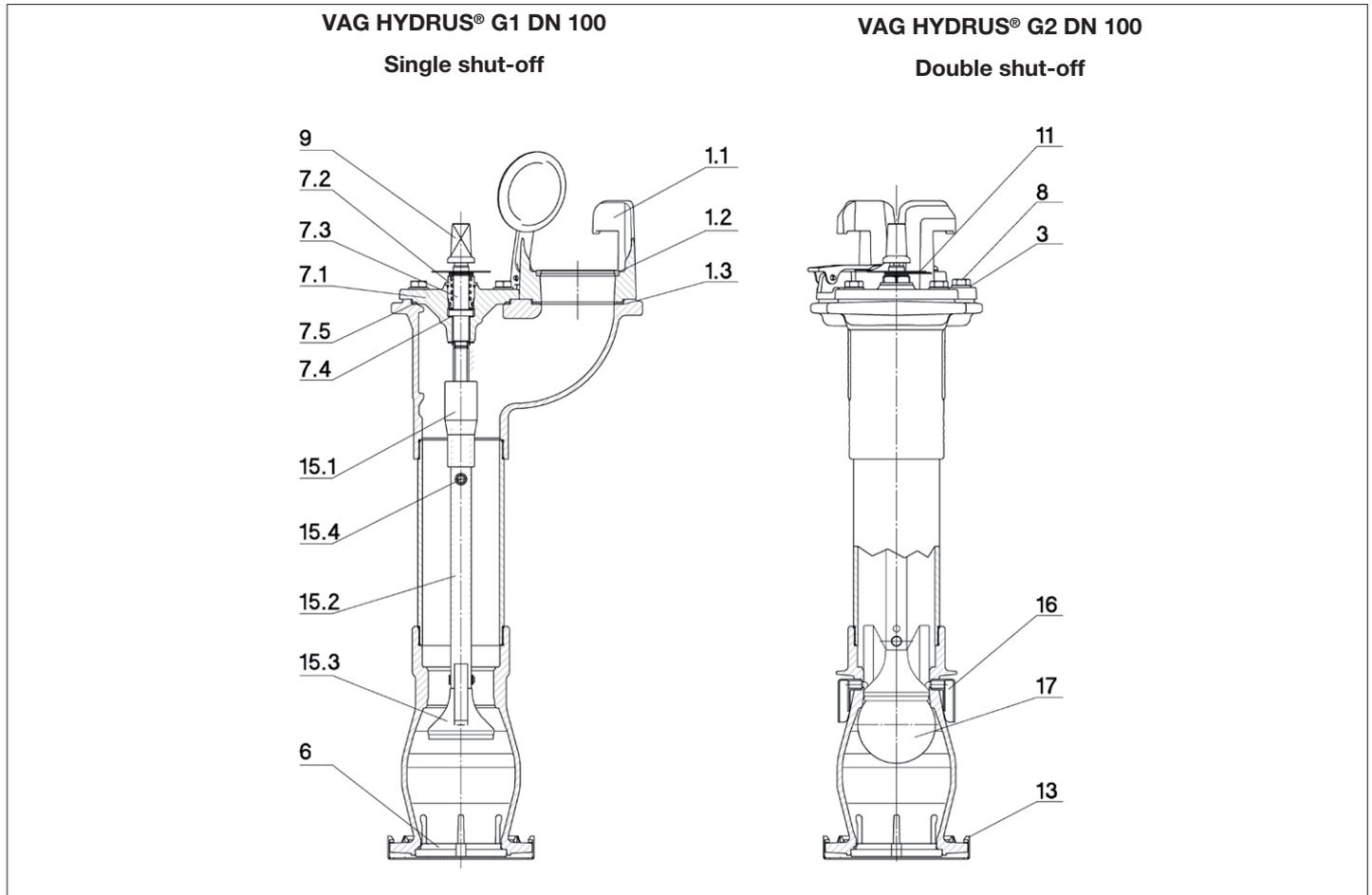
Protective equipment such as safety boots, safety helmets, goggles, protective gloves etc. must be worn during all work requiring such protective equipment or for which such protective equipment is prescribed.

Improper or wrong use of the valve should be avoided. Prior to the performance of any work on the valve and equipment it must be ensured that the relevant pipeline section has been depressurised and/or de-energised.

6.3 Maintenance work and replacement of parts

6.3.1 Design

The design view in picture 7 is a partial overview of the following descriptions of work procedures.



Picture 7: Design and assemblies

Item	Assembly	Single part	Material	Spare part
1	Complete self-closing claw	1.1 Self-closing claw	EN-JS 1050	•
		1.2 Sealing ring	Brass	
		1.3 O-ring	NBR	
3	Disk DIN 125-17		A2-70	
6	Sealing ring DN 100		NBR / Polyamide	•
7	Complete bonnet	7.1 Bonnet	EN-JS 1050	•
		7.2 Packing sleeve	Brass	
		7.3 Stem	1.4021	
		7.4 Sliding disk	Polyamide	
		7.5 O-ring	NBR	
8	Hexagonal bolt M16		A2-70	
9	SET Stem square cap		EN-JS 1050	•
11	Name plate		Plastic	•
13	Protective cap		Plastic PP	
15	Complete main valve assembly	15.1 Stem nut retainer with stem nut	EN-JS 1050 Brass	•
		15.2 Pressure tube	1.4301	
		15.3 Valve cone	EN-JS 1050/ EPDM	
		15.4 Bolt rivets	1.4305	
16	Draining protection		Polyethylene	•
17	Hollow ball		Aluminium / EPDM	•

6.3.2 Cleaning and lubrication

For maintenance work specified in accordance with DVGW W392 the lubricant for drinking water lines approved for foodstuffs or drinking water must be used.

- KLÜBERSYNTH VR 69-252 N (with KTW approval for drinking water) manufactured by Klüber Lubrication München AG

6.3.3 Visual and function check

- Easy movement of hydrant shut-off
- Check whether the claw (1.1) and the self-closing cover for standpost application are undamaged.
- Drain function of the hydrant. Complete draining should be completed within 5 minutes. Should draining not take place within this period it is highly probable that the drain hole is clogged.

The following may resolve the problem:

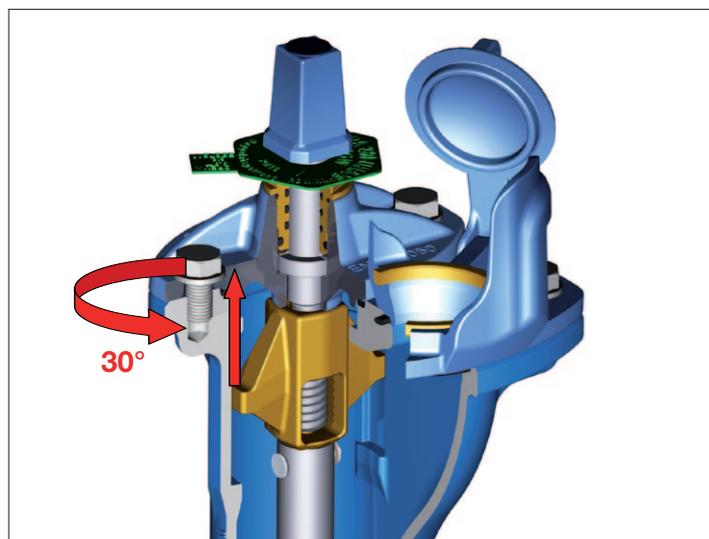
- a) Create internal pressure (max. 24 bar) using a manual pump with the shut-off closed
 - b) Disassemble main valve assembly and mechanically clean (e.g. slat with nails) drain hole (see 7.1)
 - c) If a) and b) are unsuccessful, the fitting will have to be excavated and replaced
- Function and cleanliness of internal parts of hydrant, cleaning by flushing a short time, water always leads away from standpipe and hose without any problem.
 - Tightness of the hydrant shut-off. The frequent cause of leaks is foreign matter (e.g. plastic shavings, etc.) These can be removed by flushing or by extraction using auxiliary tools.

6.4 Maintenance

Make sure to follow 6.1 for all maintenance and servicing work. Refer to VAG spare parts list KAT 1622-E for all required spare parts.

Figure 8 shows a schematic representation of the safety interlock. Depending on the type of hydrant, this may look different in some details.

The VAG HYDRUS® G Underground Hydrant has an integrated safety interlock for the main valve assembly. If after removing the



Picture 8: Maintenance

bonnet (7.1) the main valve assembly is moved upwards it cannot be expelled from the jacket pipe. The integrated internal fixed stop on the front side of the jacket pipe prevents this. After turning approx. 30° clockwise the main valve assembly is unlocked and can be extracted. This makes it impossible for the main valve assembly to be expelled unintentionally due to uncontrolled residual pressure.

6.4.1 Disassembly of the entire bonnet (7.1)

Clean the upper section of the underground hydrant in the area of the bonnet. Remove the two bolts (8) on the bonnet attachment. Turn stem square cap (9) clockwise until stem (7.3) is completely unwound from stem nut (15.3). Remove the bonnet from above.



Caution!!! The stem nut is inserted loosely in the stem nut retainer and may fall into the pipe jacket!

6.4.2 Replacing the stem (7.3); packing sleeve (7.2) or sliding disks (7.4)

Disassemble bonnet as described in 7.5.1. Remove the stem square cap (9) by loosening the cylinder screw on the front side. Pull off the stem square cap and the name plate. Completely undo the screw connection between the packing sleeve (7.2) and the bonnet (7.1). Pull off the stem (7.3) and completely disassemble all individual components. Replace parts as necessary in accordance with Spare parts list KAT 1622-E. Assembly is done in the opposite order.

6.4.3 Replacement of the complete main valve assembly (15) or the valve cone (15.3)

When removing the main valve assembly (15) make sure to observe the general safety instructions in 6.1.

Before beginning disassembly open the hydrant for a short time with opened initial gate valve (approx. 3-4 turns clockwise) to allow any air collected upstream from the hydrant shut-off to escape. The initial gate valve can then be closed with the hydrant shut-off in open position.

Clean the upper section of the underground hydrant in the area of the bonnet. Remove the two bolts (8) on the bonnet attachment. Turn stem square cap (9) clockwise until stem (7.3) is completely unwound from stem nut (15.3). Then turn the stem (7.3) back approx. 3 turns in clockwise direction.

Use both hands to grasp below the bonnet (7) and pull up as far as it goes. You may need to employ additional tools. Then screw off the stem in clockwise direction and pull off the complete bonnet from above.



Caution!!! The stem nut is inserted loosely in the stem nut retainer and may fall into the pipe jacket!!!

Use stem nut (15.1) to turn main valve assembly approx. 30° anti-clockwise and then completely remove from above.

Then grind off the front part of the bottom bolt rivet (15.4) below the valve cone (15.3) and knock out the bolt rivets. From below pull the valve cone out of the pressure pipe (15.2) and insert the pre-drilled replacement valve cone and fasten using the included bolt and the self-securing cap nut.

Installation is done in the opposite order.

Figure 9 shows a schematic representation of the spare parts kit (pre-drilled shut-off cone, bolt and self-locking cap nut made of stainless steel). Depending on the type of hydrant, this may look different in some details.



Picture 9: Spare parts set shut-off cone with bolt and self-securing cap nut

7 Troubleshooting

For all repair and maintenance work, please observe the general safety instructions described in Section 6.1!

Problem	Possible causes	Solutions
Hydrant hard to open	Initial gate valve closed	Open initial gate valve and try again
Hydrant sticky	Wear and tear and bearing	Replace the entire bonnet or sliding disk, as described in 6.4.1/6.4.2.
Tightness on the hydrant shut-off.	Foreign material (e.g. plastic shavings) are stuck between the valve cone (15.3) and valve seating socket	Flush hydrant by opening the hydrant shut-off valve for a short time. Then check tightness again.
Still leaking from hydrant shut-off	Damage to the valve cone (15.3) or the valve seating socket	Remove the main valve assembly (see 6.4.3) and replace the valve cone (15.3). If valve seating socket is damaged the complete hydrant will have to be replaced.

8 How to contact us

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