

Operating instructions

Underground fire hydrants

Type 304/305

- based on EN 1074-6, EN 14339
- completely enamelled inside and outside
- one-piece body, made of ductile cast iron
- DVGW registered

Type 304 with single obturator
Type 305 with double obturator

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1. Intended Use



After the installation into a pipe system, shut-off valves are only intended for stopping or allowing media to pass within the range of the permitted operating conditions (temperature and pressure limit "PN" labeling on the valve, unless stated otherwise).

These valves are preferably intended for liquid media, such as drinking water, process water, raw and waste water. Any deviating operating conditions or areas of application are subject to manufacturer approval.

We will not assume any responsibility for consequential damage caused by

- unauthorized modification of the valve and the accessories supplied
 - improper operating or operating conditions
 - acts of God



Continuous operation of the valve in an intermediate position will lead to increased wear of the valve or the subsequent pipe system up to total destruction and should therefore be avoided.

Cavitation can be identified among other things by:

- Increased noise level
- Crackling noise
- Severe vibrations

Cavitation can be avoided by operating the valve only in fully OPENED or fully CLOSED position.

2. Safety Precautions

2.1. General safety instructions

The same safety regulations apply for valves as for the pipe system in which they are installed. The following instructions only include additional safety instructions to be observed for valves.

2.2. User safety instructions

The operator of the valve must ensure that the valve is only used in accordance with the intended use. This is not the responsibility of the manufacturer. The valve may only be operated by properly qualified

and trained staff. The operating manual and the corresponding safety instructions must be read and understood.



It is prohibited to use any valves with a nominal pressure ("PN") and maximum admissible operating temperature insufficient for the operating conditions.

The approved range is indicated on the valve.

Warning: Temperatures below 10°C and above 40°C during work on the pipeline parts involve the risk of injury. Protective measures must be taken accordingly.

Operating media must correspond to the specification of the valve. The manufacturer does not

assume any liability for damage resulting from corrosion caused by aggressive media. Neglect of these regulations may result in imminent danger to life and health, and may cause damage to the pipeline.

- The valve must be professionally installed into the pipeline.
- Following EN 1074-1, the maximum flow velocity may not surpass 4 m/s in continuous operation.
- Operating conditions such as vibrations, water impact, erosion, cavitation and major proportions of solid matter in the medium - especially of an abrasive nature – must be clarified with the manufacturer prior to commissioning.

2.3. Special risks

Be sure to free the pipeline from any pressure and risk prior to disassembly, maintenance and repair of the valve. During disassembly the medium may leak, therefore the pipeline and the valve must be completely emptied.

The energy supply must be switched off.



For valves that are used as end valves, the free connection must be shut off or the valve locked securely in the position "shut". Danger of Crushing!



3. Transport and storage

All valves must be carefully transported and stored.

The valves are fully enamelled or powder-coated. The coatings are shock-sensitive and must be protected against impact stress.



The gaskets are sensitive to light: Unpackaged valves may only be exposed to bright daylight or ultraviolet light for a very short time. This is why the openings are sealed with protective caps. Valves must be stored in darkened rooms, in their original packaging with the protective caps.



In the event of storage over an extended period of time, the storage location should be frost-protected, cool, dry, dark and free of dust. Alternatively, the valves may also be packed in order to fulfill these conditions.



The valve should be stored on a pallet or similar support and only transported with suitable tools such as wide straps to its designated point of installation. Do not use chains!

4. Installation into the pipeline

For installation and operation of the hydrants consider the DVGW Leaflet W 331!

When installing the hydrant with the factory-provided flange gasket, the flange bolts should be tightening with a max. torque of 70 Nm.

5. Description

5.1. Protection against pressurised water

Düker hydrants series 304/305 are equipped with the proven, automatic working protection against pressurised water.

When opening the hydrant (main obturator), the pressurised water will flow into the hydrant only after the draining outlet of the hydrant is safely closed.

When closing the hydrant, the drainage outlet will only be re-opened after the main obturator is safely closed.

This construction avoids the flow of pressurised water through the drainage outlet, and residual water remaining in the hydrant can be drained without problems into the surrounding soil. In order to ensure a permanently safe and unhindered drainage, we recommend the use of drainage packages.

5.2. Technical characteristics

The underground fire hydrants Type 304 / 305 are designed to supply a minimum flow of 110 m³ per hour, at an internal pressure loss of 1 bar.

The maximum allowable water flow velocity is 4 m/ s.

The residual rest water is lower than 80 cm³.

Connecting flange: DN 80 according to EN 1092-2

Soil covers: 0.80 m – 1.00 m – 1.25 m – 1.50 m

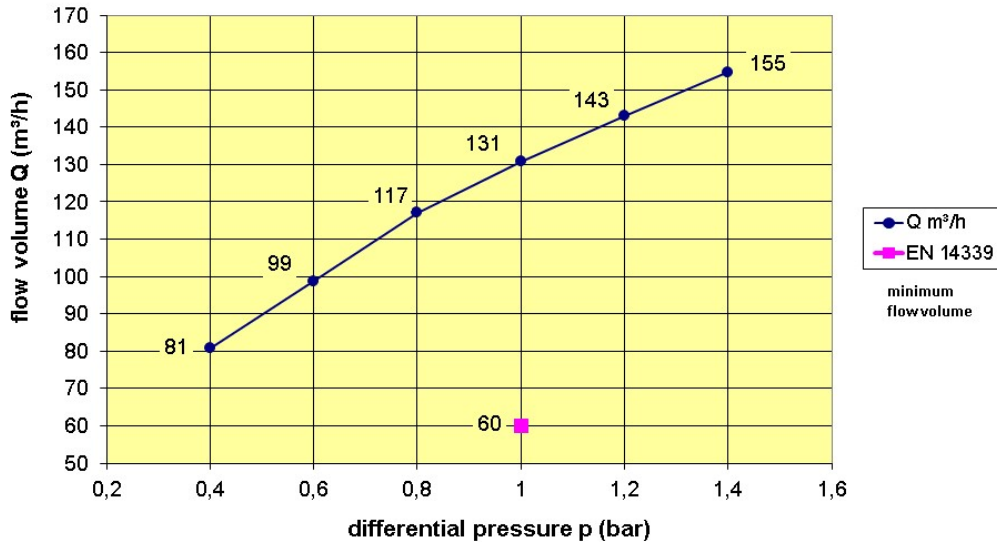
Factory test pressure: 24 bar

If the hydrant Type 305 (with double obturator) is used for supplying water in the pipeline, the maximum flow velocity should not surpass 0.5 m/s (150 l/min.)

5.3. Flow values

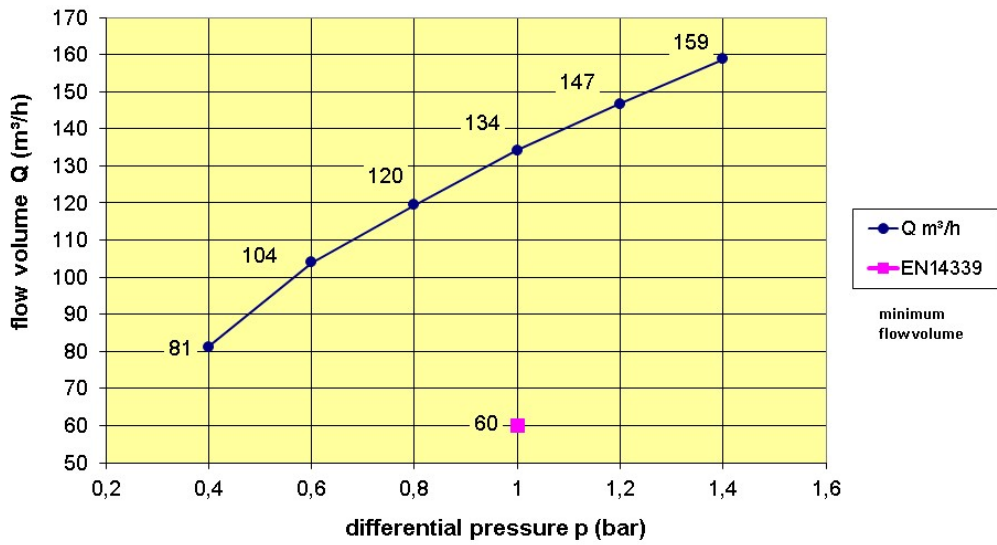
Düker

**underground hydrant type 304
EN 14339 RD 1,50 m**



Düker

**underground hydrant type 305
EN 14339 RD 1,50 m**



5.4. Performances

- Robust, one-piece obturator, completely covered with high grade Polyurethane elastomer.
- Obturator designed in flow-optimized shape.
- Automatic draining and protection against pressurised water safely guaranteed by inside enamelling
- Stem bearing maintenance-free by use of 2 O-Rings.
- Stem thread produced by rolling process, therefore highest protection against wear and tear.
- Protection during replacement of the obturator linkage by integral linkage locking device.

5.5. Operation

The hydrant will be closed by turning the stem in clockwise direction, actuation anti-clockwise opens the hydrant. To open the hydrant fully, approx. 9 turns are necessary. Due to the fact that the obturator acts radially, absolutely tight sealing can be achieved with low effort.



When open or closing the hydrant, always turn the stem to the perceptible contact of the mechanical end stops. The maximum operation torque MOT up to 105 Nm is valid for both directions of rotation. If the max. torques are reached without satisfying closing or opening, the application of higher torques will not achieve a better tightness of the obturator and can lead to a destruction of the coating of the end stops or the stem drive.

=> Throttling or intermediate positions of the obturator during water flow are not allowed!

To avoid to high pressure in the upper column, the hydrant should not be closed as long the valves of the standpipe are closed.

Automatical draining:

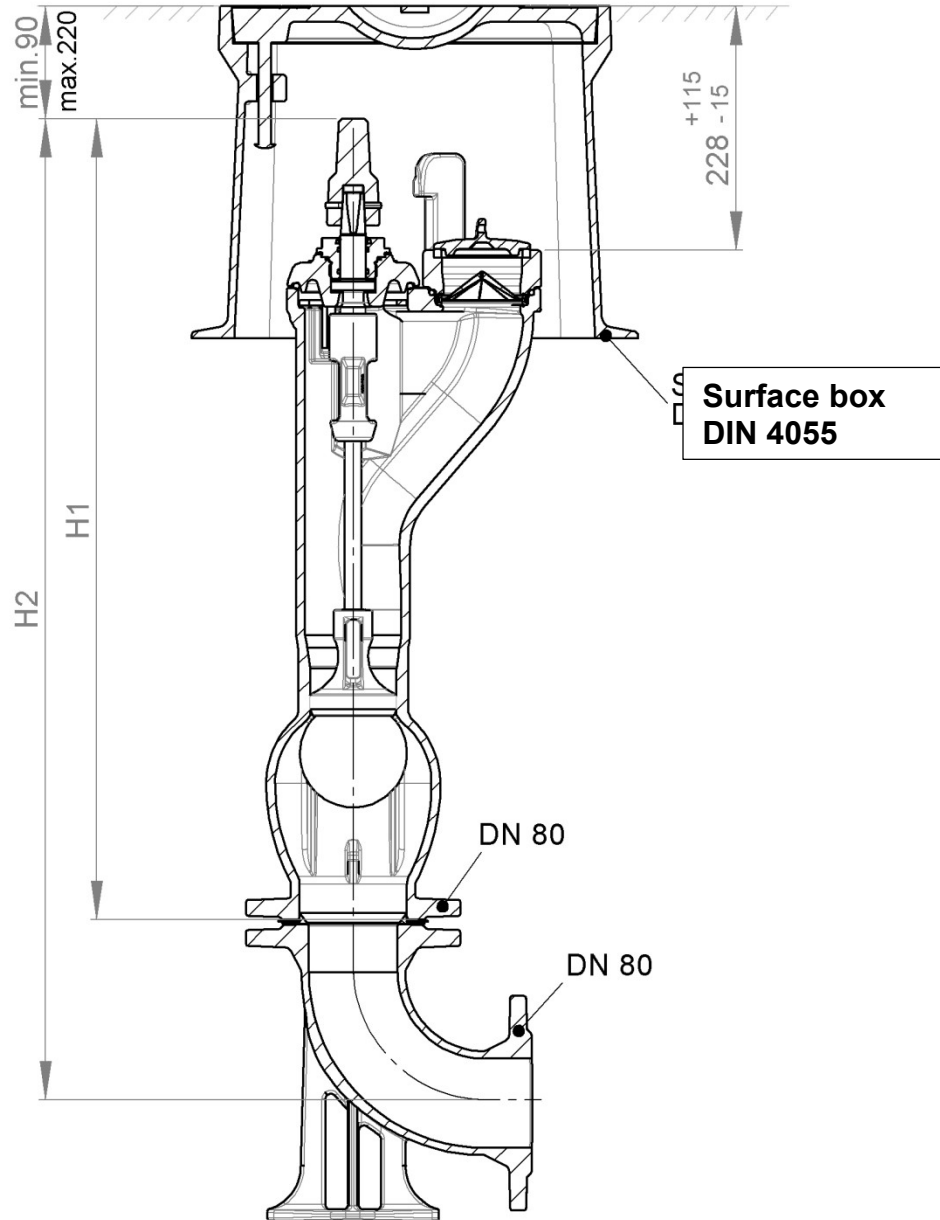
The outlet of the automatical draining is opened, when the hydrant is closed. The complete draining of the hydrant will be carried out within a drainage time of 2 – 3 minutes, depending on the column length (soil cover) and the water absorbing capacity of the surrounding soil. (EN 1074-6: max. 10 minutes)

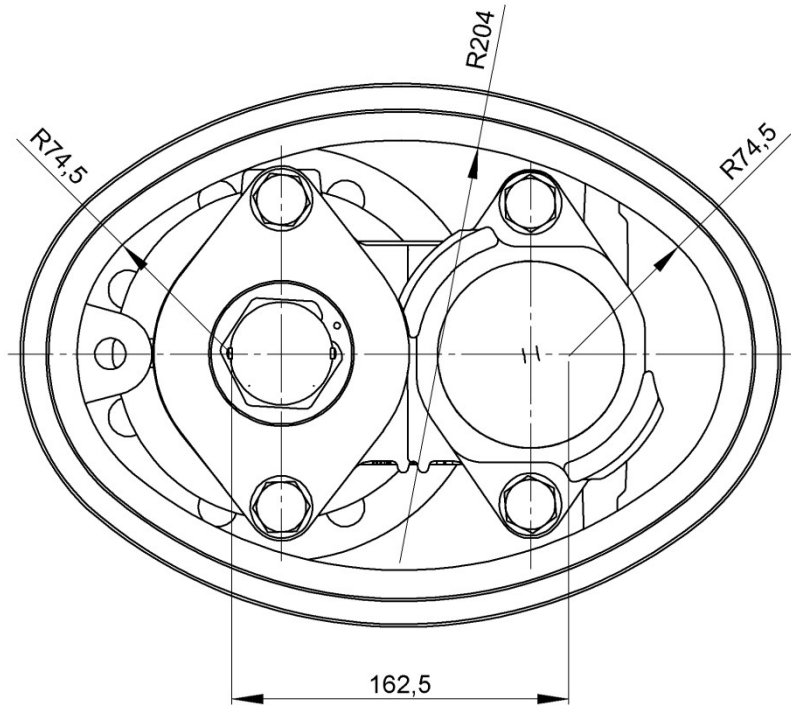
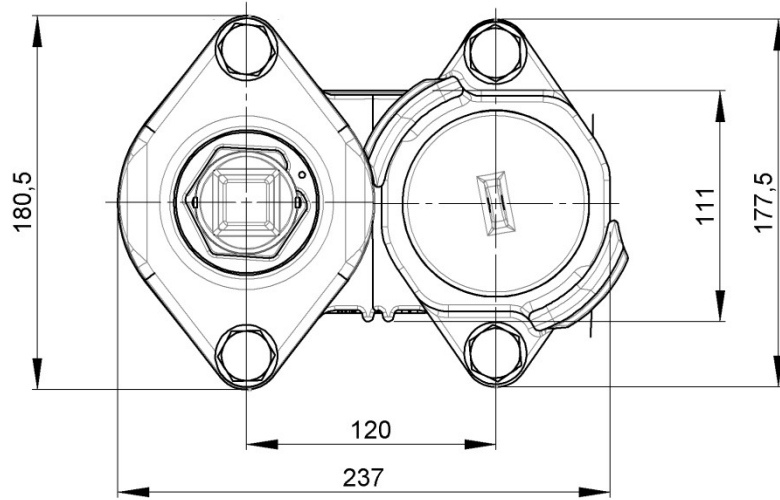
Protection against pressurised water:

When opening the hydrant (approx. 2 turns), at first the drainage outlet will be closed against the pressurised water, due to the design of the obturator.

Further opening (approx. 1 turn) will open the water flow.

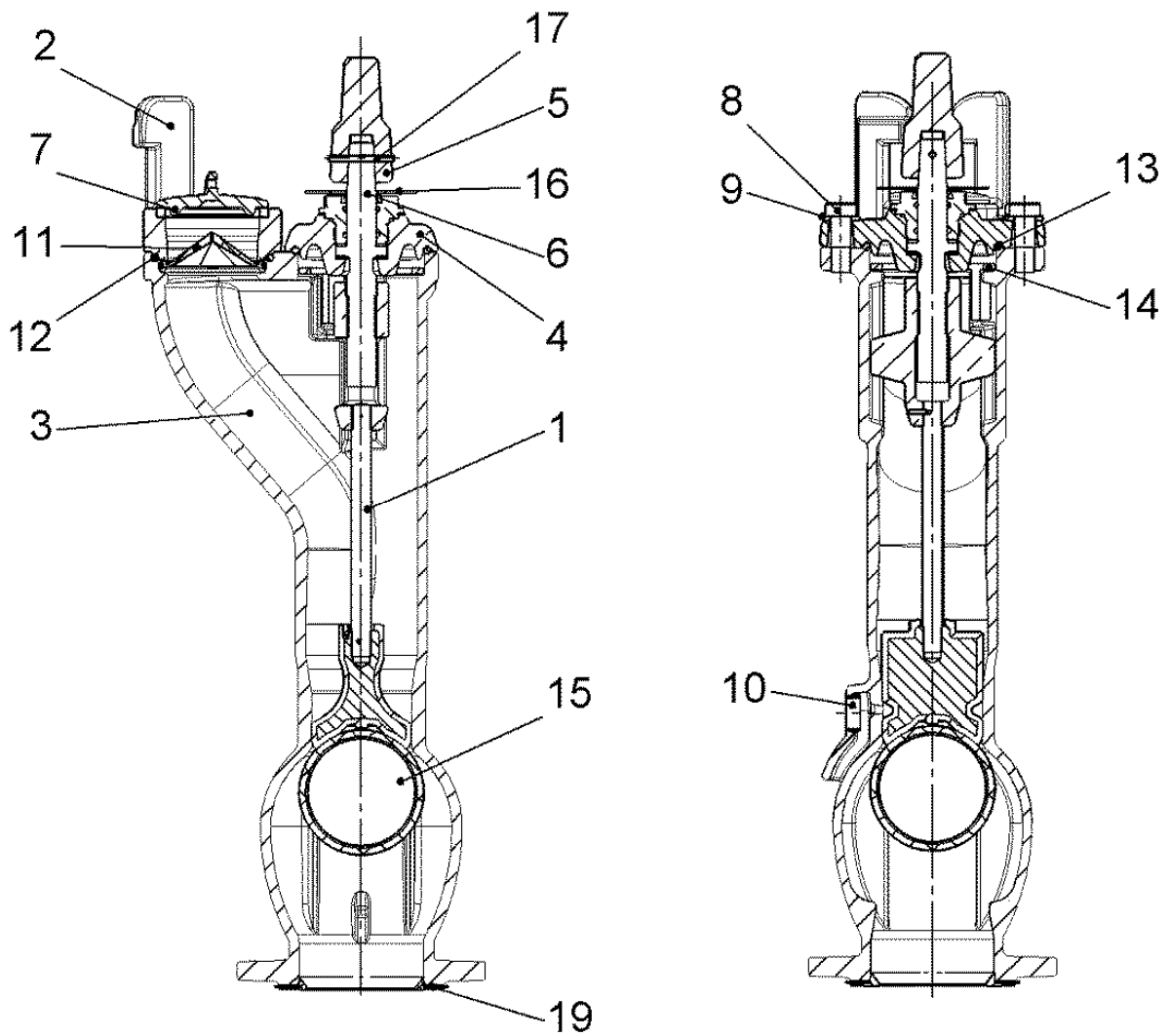
6. Dimensions





7. Drawings and part list

7.1. Drawing



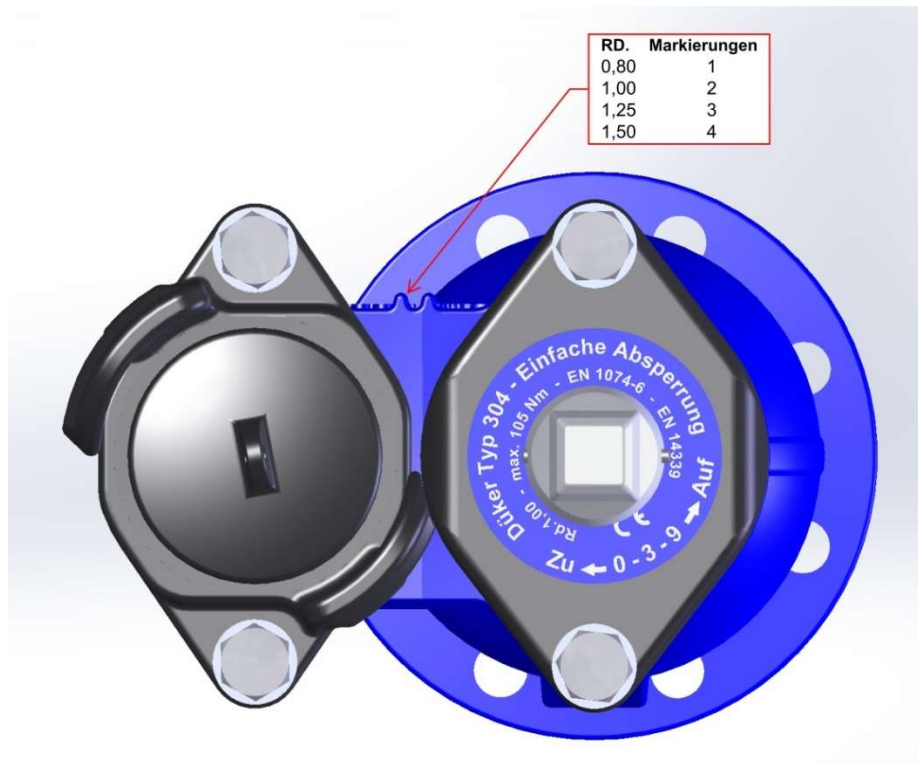
7.2. Part list

Pos.	Part	Material
1	<i>Obturator linkage, consisting of:</i>	
1.1	Obturator	DCI / PUR
1.2	Guide piece	Brass
1.3	Bar	Stainless steel
2	<i>Bayonet claw, consisting of:</i>	
2.1	Bayonet claw	DCI
2.2	Ring	Brass
3	Body	DCI
4	Bonnet	DCI
5	Stem cap	DCI
6	<i>Stem unit, consisting of:</i>	
6.1	Stem	Stainless steel
6.2	Bonnet nut	Brass
6.3	Sliding ring	Brass
6.4	Screening ring	Neoprene
6.5	O-Ring	NBR
6.6	O-Ring	NBR
6.7	O-Ring	NBR
7	Outlet cap with chain	DCI
8	Hexagon screw M16x40	Stainless steel
9	Washer 16	Stainless steel
10	Closing plug	PE-LD
11	Stone protector	Steel / EPDM
12	O-Ring	NBR
13	O-Ring	NBR
14	Safety ring	POM
15	Ball (Double obturator)	Steel / EPDM
16	Marking ring	Plastic
17	Cylindrical pin	Steel
18	Type label	Adhesive foil
19	Flange gasket	Stainl. Steel / EPDM

8. Dismantling of the obturator linkage

Note: For hydrants Type 304 (single obturator) the pipeline has to be unpressurised before working on the obturator linkage!

For ordering the spare linkage, the necessary soil cover length of the column can be detected by the number of the markings.



- Close the gate valve in front of the hydrant (only for Type 304 with single obturator).
- Close the hydrant and turn the stem back for approx. $\frac{1}{4}$ turns till the stem perceptibly strainless.
- Release the bonnet (Pos. 4) by removing both hexagon screws (Pos. 8).
- Lift the bonnet (Pos. 4) approx. 40 mm from the hydrant body, by turning the stem anti-clockwise.
- Fix the bonnet (Pos. 4) in this level by using spacers (for example wooden wedges or similar).
- Turn the stem (Pos. 6.1) in clockwise direction, until the obturator linkage is pulled out of the body seat.
- Drive out the stem-bonnet-unit from the guide piece (Pos. 1.2) by turning the stem in anti-clockwise direction.
- Remove safety ring (Pos. 14) and O-Ring (Pos. 13).
- Turn the obturator linkage (Pos. 3) approx. 30° anti-clockwise and pull it out.

9. Assembling of the obturator linkage

- Insert the new spare linkage (Pos. 1) in the body (Pos. 3). Watch out that the wings of the guide piece (Pos. 1.2), with unequal thickness, fit into the corresponding notches in the body (Pos. 3). This ensures the safe function of the drainage system.
- Turn the guide piece (Pos. 1) for approx. 30° in clockwise direction till the wings of the guide (Pos. 1.2) are positioned directly over the guide notches of the body.
- Place safety ring (Pos. 14) to close the body openings.
- Fix the O-Ring (Pos.13) with some spots of lubricant (for potable water) in the corresponding groove of the bonnet.
- Screw the stem-bonnet-unit clockwise in the guide piece (Pos. 1.2) until the bonnet is in contact with the guide piece. Fix this bonnet position with the help of longer screws M16x75 or similar. Be sure that the screws are well fixed in the thread holes of the body.
- Turn stem (Pos. 6.1) anti-clockwise, to press the obturator in the body seat. Then turn the stem clockwise till the bonnet (Pos.4) contacts either the body (Type 304) or the guide piece (Type 305). During this work please watch out for the correct placement of the O-Ring (Pos. 13).
- Replace the longer helping screws alternately with the original screws (Pos.8). Make sure that during the exchange one screw is always safely in place and holds the bonnet in position. The original screws shall be tightened with 75 Nm.
- Check the proper function and flush the hydrant, to bring out potential dirt, stones or similar.

10. Maintenance and trouble shooting



Consider this chapter always together with chapter 5.5 (Operation)

Regular maintenance intervals on hydrants are not required. We recommend to control the function, drainage and tightness of the hydrant at the latest every 4 years.
We refer to the DVGW Leaflet W 392, Table 2, No. 2.

When flushing the hydrant, in any case the use of a standpipe with connected hose to discharge the flushing water is necessary. Never flush the hydrant free into the surface box. In case of flushing of the hydrant without standpipe, dirt and pollution from the surface box can be sluiced into the hydrant and create problems with the water hygiene or plugging the drainage outlet.

To avoid the generation of too high pressure in the upper part of the column, never close the hydrant while the side valves of the standpipe are closed.

Furthermore please observe the procedure for the operation of underground fire hydrants, which is given in annex "A" of the DVGW Leaflet W 331.

Turning the stemcap anti-clockwise will open, whereas turning clockwise will close the hydrant.

To operate the hydrant the use of operation keys according to DIN 3223 is recommended. The keys are designed to ensure that normal manual force is sufficient for operation.

The additional use of key extensions to increase the operation torque is not allowed as this will damage the valve internally.

Hydrants are open-close valves and not designed to regulate the water flow. To avoid excessively high flow velocities or cavitation, the obturator should always be opened up to the mechanical end stop "Open" even during flushing. As a rule, the side valves of the standpipe or distributor must be used to regulate the flow rate.

=> Throttling or intermediate positions of the obturator during water flow are not allowed!



To guarantee the proper function and the adherence to the hygienic requirements for potable water, the use of Düker genuine spare parts is stipulated.

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