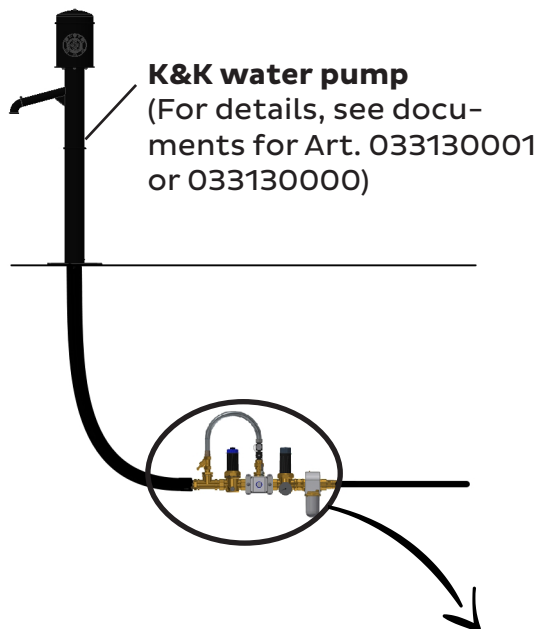


K&K Valve Combination with Hygienic Flushing Art. 033195000-A

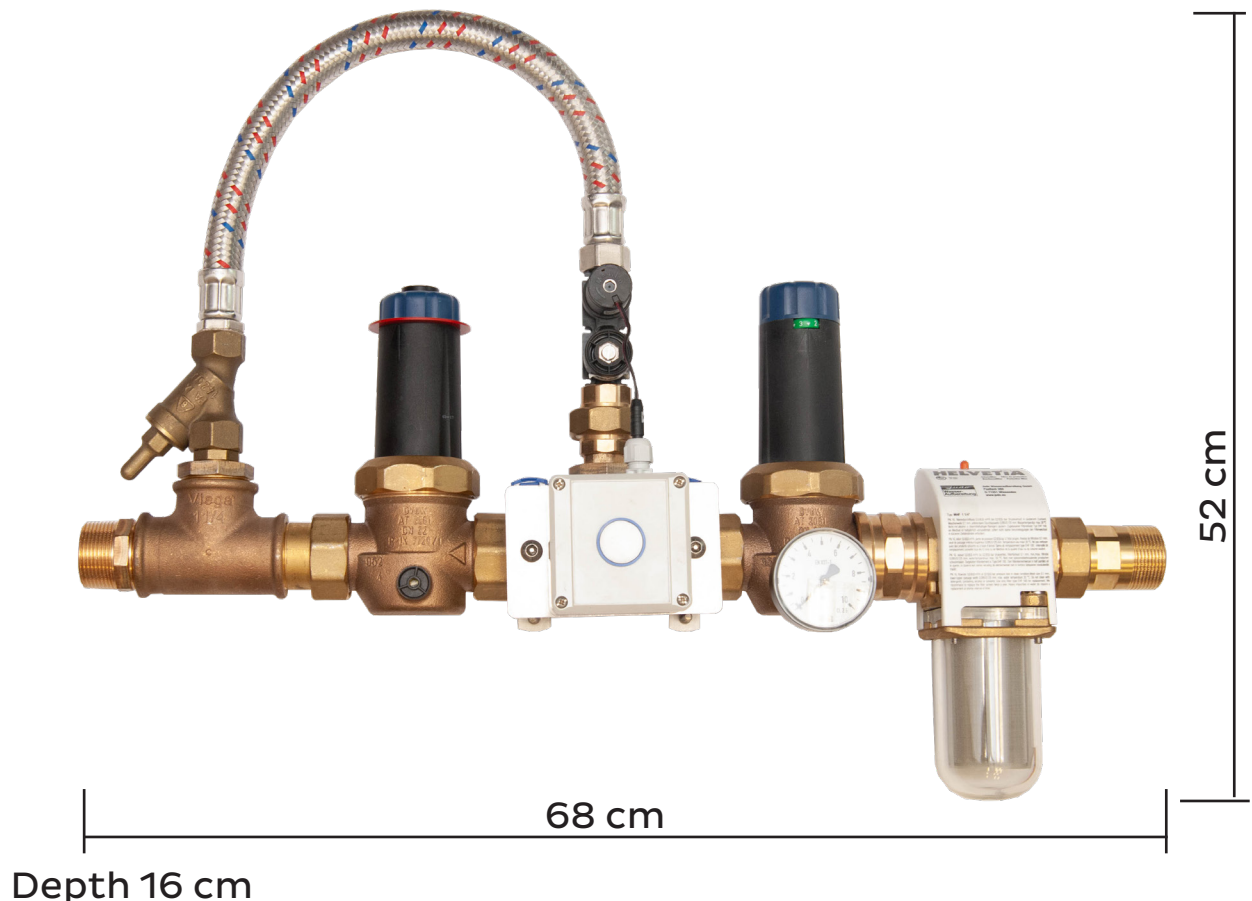
for operating a K&K water pump (Art. 033130000, Art. 033130001, Art. 033131000) on a pressurised water pipe and with automatic flushing function for the pipe run between the valve combination and the K&K water pump.



Scope of delivery:

1x valve combination, cpl. pre-assembled

Weight 7 kg



Content

K&K Valve Combination with Hygienic Flushing Art. 033195000-A

Please note the following details:	4
1. Function:	5
1.1 Function of the valve combination	5
1.2 Function of the hygiene flushing	6
2. Components of the valve combination with hygienic flushing:	7
3. Assembly:	9
3.1 Installation position of the valve combination:	9
3.2 Suitable installation locations:	9
3.3 Installation of the valve combination with hygienic flushing:	10
3.4 Explanations:	10
4. Test run / commissioning:	12
4.1 Check or adjust internal pressure:	12
4.2 Check water flow to the pump:	12
4.3 Test pump operation:	13
4.4 Adjustment of vacuum valve / regulation of water supply	13
4.5 Fine adjustment flow rate / displacement in the pump head	14
4.6 Test run / manual operation of the hygiene flushing:	16
5. Explanation of the K&K valve combination with hygienic flushing	17
5.1 Task of the K&K valve combination	17
5.2 Task of the K&K hygiene flushing	17
5.3 Tasks of the individual components of the K&K valve combination with hygienic flushing	18
6. Fault-free operation	20
7. Avoidance of frost damage	21
7.1 Avoidance of frost damage to the K&K water pump	21
7.2 Avoidance of frost damage to the K&K valve combination with hygienic flushing	21
7.3 Winter preparation of the K&K water pump and the K&K valve combination with hygienic flushing	22
7.4 Restarting the K&K water pump and the K&K valve combination after a period of frost	24
8. Fault analysis	25
9. Replacing the leather sleeve on the piston of the K&K water pump	31
10. Expansion vessel in the event of pressure surges in the pipeline network	32
11. Replacement parts list	33
12. Maintenance information	36
12.1 Regular maintenance work:	36
12.2 Annual main inspection:	37
13. Battery assembly / replacement:	38

14. Change the factory setting: Setting the waterrunning time_____	39
14.1 Power supply interruption:_____	39
14.2 NOW: Running Time – Determining the settings (within the next 15 minutes)_____	40
15. Changing the factory setting: _____	41
Set time intervals between flushings _____	41
(Flushing rhythm)_____	41
15.1 Time interval between flushes – Determining the settings_____	41
15.2 Hygiene flush “OFF” _____	41
15.3 Hygienic flushing “12 h” _____	43
15.4 Hygienic flushing “24 h” _____	44
15.5 Hygienic flushing “72 h” _____	45

Please note the following details:



- Only suitable for K&K water pump.
- Installation and connection by a specialist installation company only!
- Preparation of the drinking water connection in accordance with DIN 1988 "Technical Rules for Drinking Water Installations", in particular, with regard to the use of appropriate backflow protection.
- Forward all special tools supplied with the unit, as well as all unit-specific documents that are (or could be) important for safety management in accordance with DIN EN 1176-7 – such as invoice, delivery note or order confirmation, assembly instructions and maintenance instructions – either in the original or as a copy, to the responsible offices

During winter periods:

Danger of frost damage!



Valve combination in the winter months:

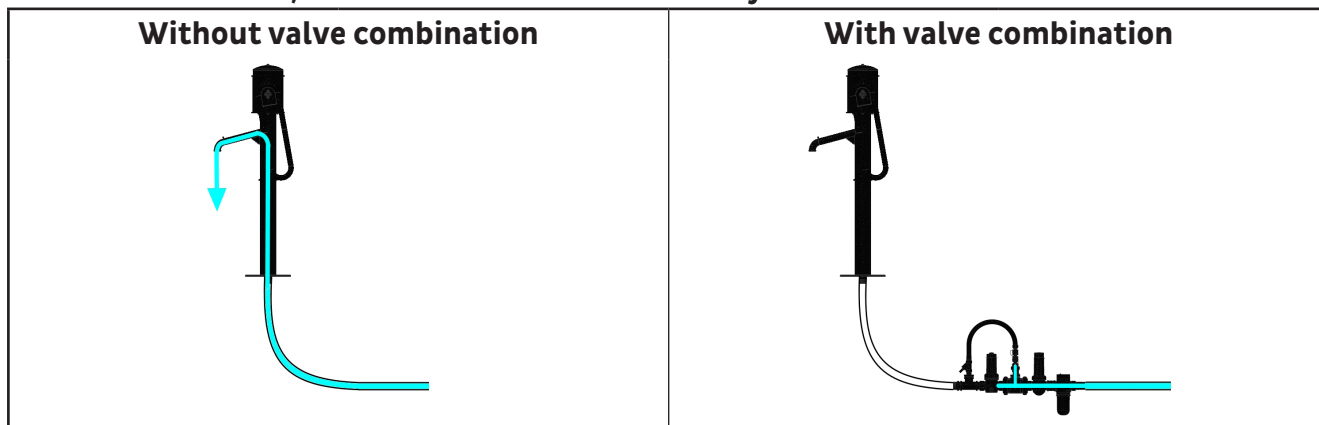
- Dismantle and store frost-free!
OR
- Ensure frost-free conditions!
- Simple draining is not enough!
- See notes under section 7 "Avoiding frost damage"
- Safe operation is only possible down to +5°C.
- Lower temperatures lead to the destruction of the electric valve.
- No warranty for damage caused by frost.



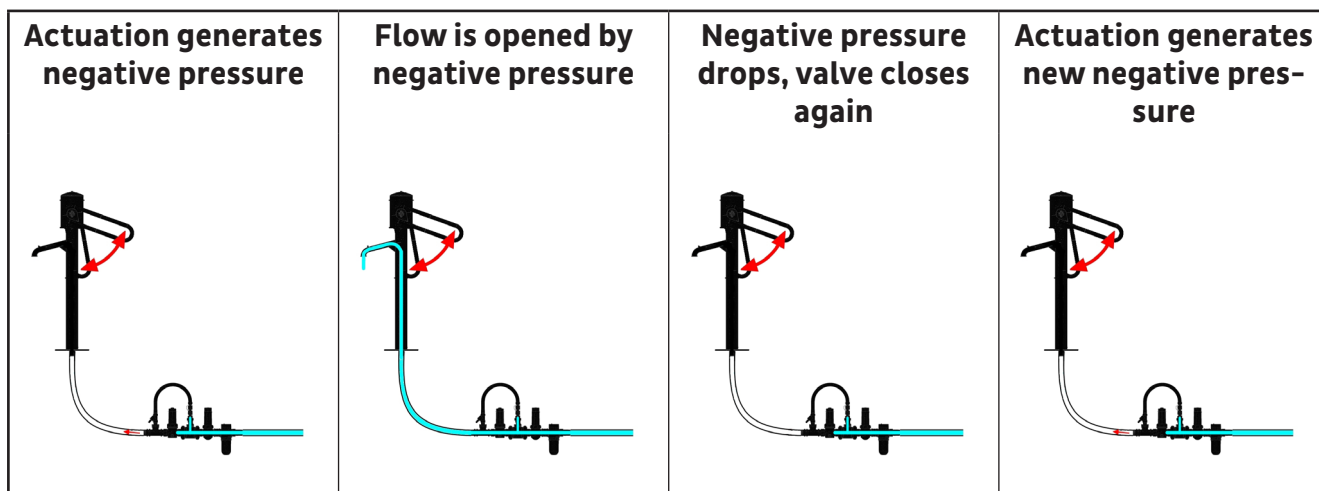
1. Function:

1.1 Function of the valve combination

The valve combination prevents the unhindered continuous flow of pressurised water through the pump. The pressurised water is shut off by the valve combination. Without a valve combination, water would flow continuously:



If negative pressure is generated at the outlet side of the valve combination, the valve combination opens the flow and releases until atmospheric pressure is again present at the outlet side:



If the K&K water pump and K&K valve combination are connected correctly in accordance with the K&K installation instructions and the specified maximum distances are observed, negative pressure is created between the pump piston and the valve combination when the pump drive

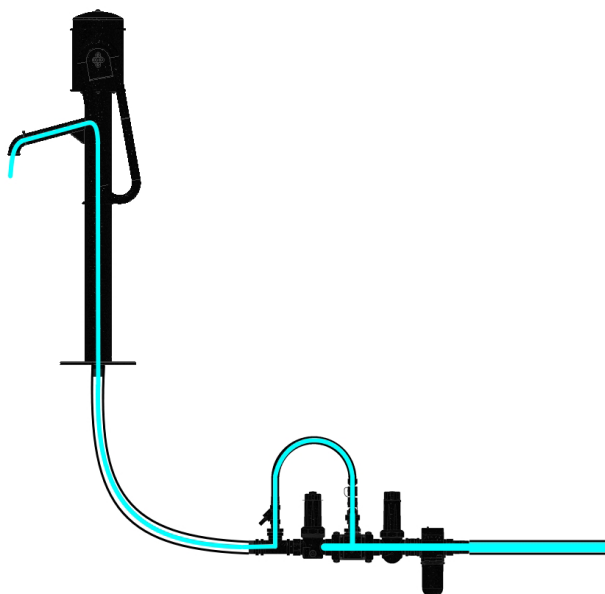
- is actuated (handle or hand wheel).
- This negative pressure causes the vacuum valve to open as soon as the valve closing force is exceeded. Now water is let through to the pump.
- As soon as the negative pressure has decreased, the valve closes again so that the water flow is interrupted.

When operating a K&K water pump on a pressurised water line, the valve combination prevents the flow of water when not actuated, but releases the amount of water corresponding to the displacement volume when the drive is actuated.

1.2 Function of the hygiene flushing

The hygienic flushing is an addition to the K&K valve combination for the automatic flushing of the pipe line of the K&K water pump (according to the Drinking Water Ordinance [TrinkwV] 2001/2016).

The flushing is equipped with a timer and a non-return valve. Via a bypass, this control supplies the entire pipe run with water via an electric valve, independently of the pump's operation. The water is discharged via the pump outlet into the flushing system or the surrounding area, respectively. There is no need for an extra drain.



The hygiene flush is set to a 12-hour rhythm and 30 s runtime in the factory. This will flush 6m of DN 40 pipe.

When changing the factory setting, the hygiene flushing can be set to a maximum pipe length of 36 m (pipe cross-section DN 40).

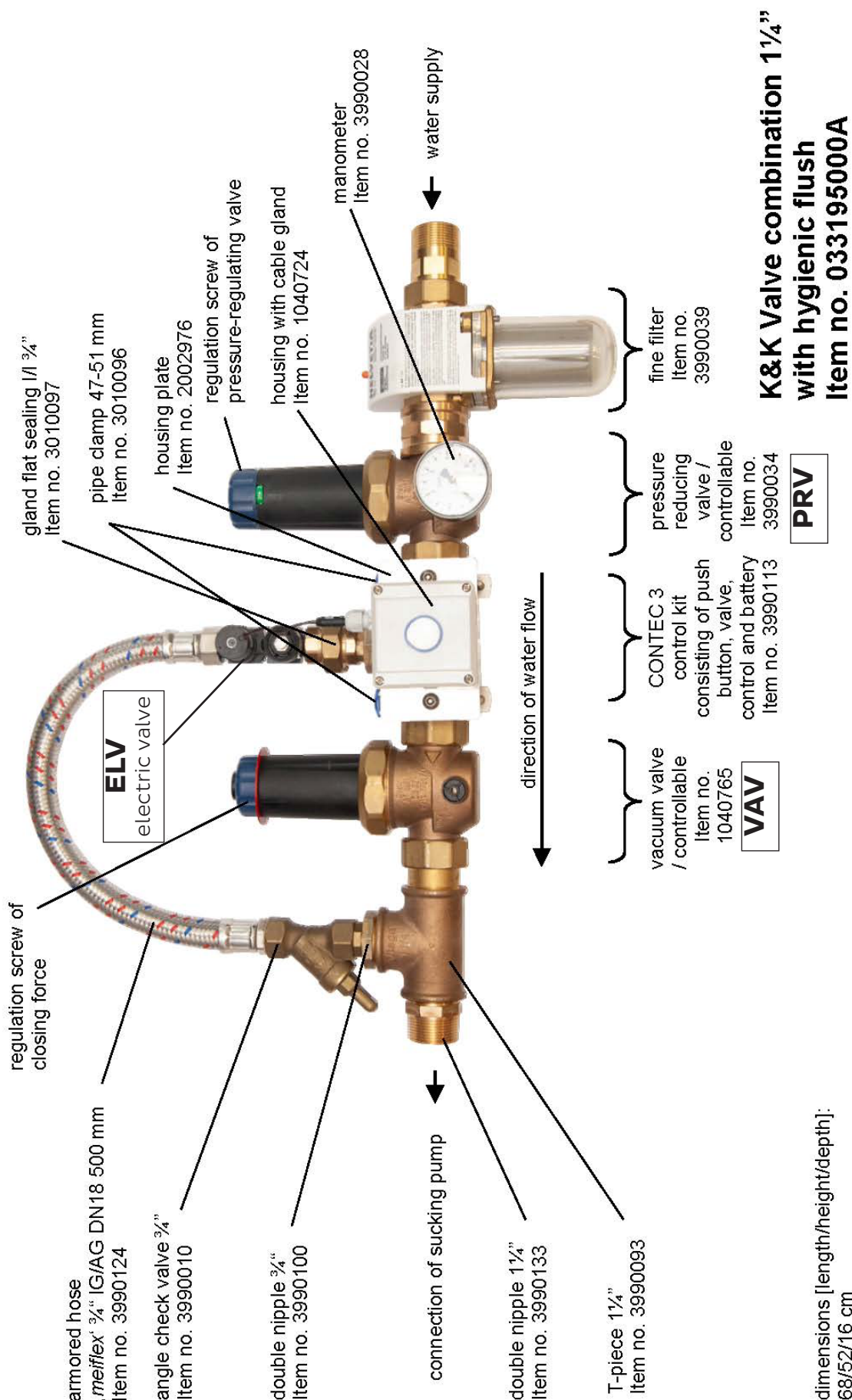
Settings			Time intervals between flushes
Volumes in l	Run-ning time in sec	Max. Flush-ing length at DN 40 and 3 bar	
Factory setting			
7.5	30	6 m	12 h
Other possible settings:			
15	60	12 m	“OFF” / 12h / 24h / 72h
22.5	90	18 m	
30	120	24 m	
37.5	150	30 m	
45	180	36 m	

2. Components of the valve combination with hygienic flushing:

The K&K valve combination with hygienic flushing essentially consists of the following commercially available components:

- a fine filter to keep contamination in the lines away from the following valves;
- an adjustable pressure reducing valve 1¼" (PRV), unchanged in its function, incl. a manometer to indicate the pressure prevailing in the valve combination;
- a 1¼" adjustable pressure reducing valve modified by K&K in its function, which functions as a vacuum valve after its modification;
- a bypass line made of flexible armoured hose to bypass the aforementioned vacuum valve;
- a electric valve with control module and 6V battery for automatic flushing of the line pressure between the valve combination and the pump;
- and a button for test operation or for manually triggering the flush.

See illustration on the following page



3. Assembly:

Location of the water pump:

- Take space requirements for pump and valve combination into account!
- Take the specifications of higher-level installation instructions (e.g. water feature) into account!

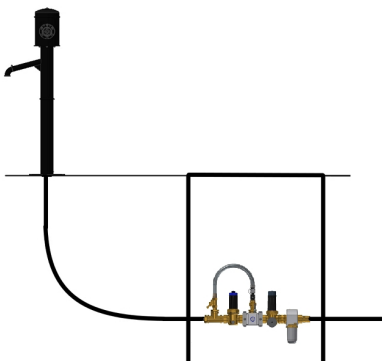
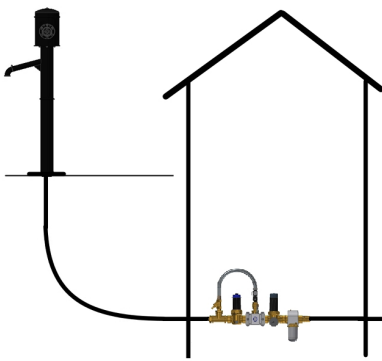
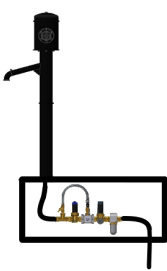
Suitable mounting of the water pump:

- Dowel assembly
- Mounting on K&K flange tube
- Mounting on K&K ring foundation
- Mounting on K&K pedestal (or other pedestals)

The pump is always fixed through 4 holes in the foot flange. For further details on above fixing options a. to d., please see separate instructions for the water pump.

3.1 Installation position of the valve combination:

- Installing the valve combination horizontally
- Observe flow direction, see arrow markings on the valves!
- Valve combination must always be positioned at the level below the pump outlet!

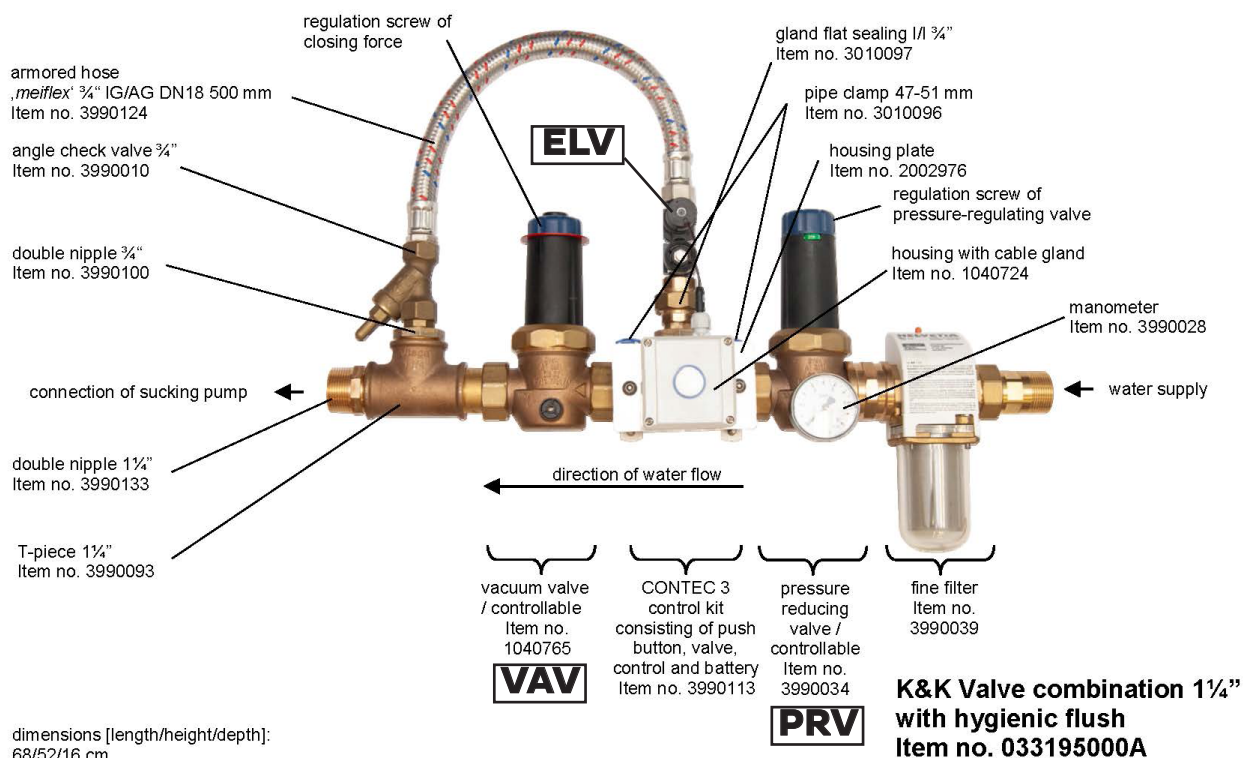
3.2 Suitable installation locations:		
<p>a. Shaft:</p> <ul style="list-style-type: none"> • Close to the pump (max. horizontal distance 30 m) • Minimum inner diameter Ø 1.00 m • Shaft depth: for frost-proof installation of the valve combination • with drained bottom • Level below pump outlet! 	<p>b. Connection room / building:</p> <ul style="list-style-type: none"> • Close to the pump (max. horizontal distance 30 m) • for frost-proof installation • Level below pump outlet! 	<p>c. Platform:</p> <ul style="list-style-type: none"> • Pump pedestal manufactured at K&K with integrated valve combination • Remove valve combination if there is a risk of frost or drain carefully • Level below pump outlet! 

- Installation and connection of the valve combination by a **specialist installation company** only
- Before installation, the water pipes must be carefully flushed to remove any contamination.
- All pipes and connections must be suitable for drinking water and must be installed in an airtight and watertight manner.
- The pump must have a **separate connection** to the main line; no other consumers should be connected to this connection, as, otherwise, there may be interactions between the pump and the consumers, such as pressure surges; also, during the pumping process, the line is depressurised for a short time, so that this may also result in problems for other consumers!

- **TRWI:**
 - When connecting the K&K valve combination to the public network of a water supply company, the **1988 Technical Rules for Drinking Water Installations (TRWI)**, must be complied with, in particular, by using the prescribed **backflow protection**.
 - Resting pressure of the connected water pipe: **3 – 6 bar**
- **M1:**
 - K&K water pump connection piece: **Male thread 1 1/4 inch**
 - K&K valve combination Connecting piece: on both sides **Male thread 1 1/4 inch**
- **M2:**
 - Pipe material on site: negative pressure-stable pipe (e.g. PE pipe)
 - Water supply: Pipe cross-section **at least 3/4 inch DN 20**
 - A larger cross-section allows a greater flow rate of the connected K&K water pump.
- **M3:**
 - Pipe material on site: negative pressure-stable pipe (e.g. PE pipe)
 - Supply line **from** the valve combination **to** the pump: Pipe cross-section **at least 1 1/2 inch DN 40**
 - Supply line must be laid underneath the pump **FLEXIBLY**, in order to ensure a **air- and watertight connection**
- **M4:**
 - Recommendation for **FLEXIBLE** supply path: Installation in empty pipe between valve combination and pump
 - Empty pipe material on site: e.g. plastic KG pipe DN 150, 2x bends 45° with straight pipe 0.50 m long between the bends.
- **A:**
 - At least 15 cm straight run in front of and behind the valve combination
- The **vertical distance** between valve combination and pump outlet must not exceed **4 m**.
- The **horizontal distance** between the valve combination and the pump outlet must not exceed **30 m**.
- Installation location of the valve combination: see section 2.2
- If possible, ensure frost resistance or drainage of the valve combination and pipes, see section 7 "Prevention of frost damage".

Please note: If the water supply to the pump is interrupted (by a timer or similar), the pump handle must be secured against operation (e.g. by the K&K locking device Art. No. 1040639 (the so called "pump lock")). This prevents the pump handle from kicking back due to the negative pressure that builds up.

4. Test run / commissioning:

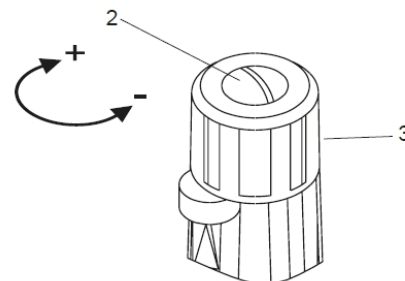


• Factory setting:

- The vacuum valve (**VAV**, left in the image) is factory-set to an internal water pressure of 3 bar. Please ensure the use of the required pipe cross-sections (see sections „3.3“ auf Seite <?> and „3.4“ auf Seite <?>)!

4.1 Check or adjust internal pressure:

- Check on the pressure gauge: Internal pressure should be 3 bar.
- When the water pressure is at least 3 bar, set an internal pressure of 3 bar at the pressure reducing valve (**PRV**, in the picture on the right).
- For pressure adjustment: On the **PRV** Loosen the locking screw (2) in the adjustment handle (3). Adjustment handle towards minus (-) to reduce internal pressure, towards plus (+) to increase.



4.2 Check water flow to the pump:

- On the vacuum valve (**VAV**): Push in the black plastic cap until water comes out of the pump by itself.

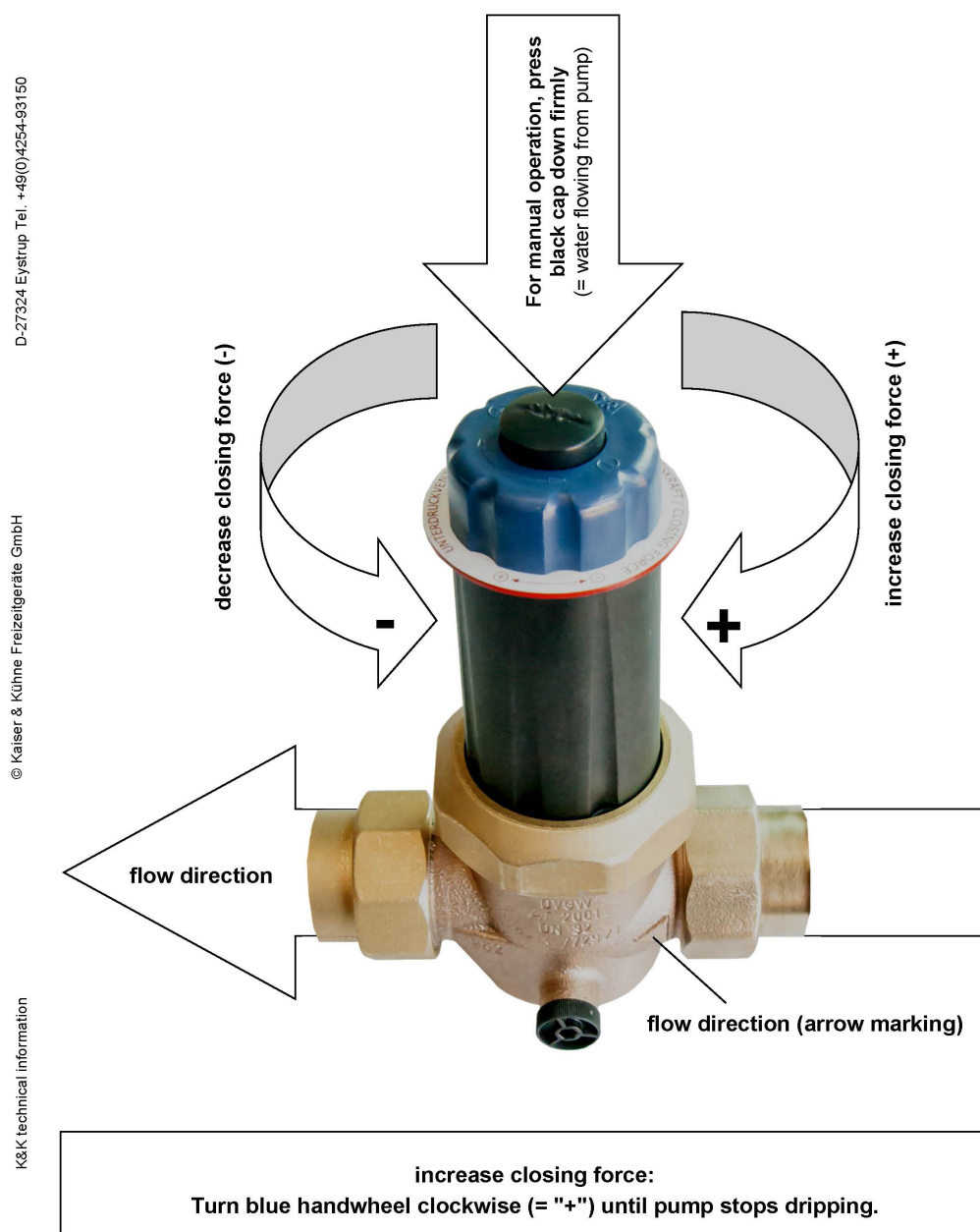
4.3 Test pump operation:

- Operate the pump: Move the pump handle or hand wheel until water comes out of the pump. A quantity of water of about 0.15 litres (equivalent to about 1 glass of water) is pumped per lever pull or rotation.

4.4 Adjustment of vacuum valve / regulation of water supply

- **Case A: In an idle state, water flows out of the pump:**
- The closing force on the vacuum valve (**VAV**) is too small.
- The closing force on the vacuum valve (**VAV**) must be increased (+).
- If the pump is dripping, the pre-set spring force on the vacuum valve (**VAV**) must be adjusted by turning the blue knob. The direction of rotation (+/-) can be seen on the valve.

VAV adjustment vacuum valve



D-27324 Eystrup Tel. +49(0)4254-93150

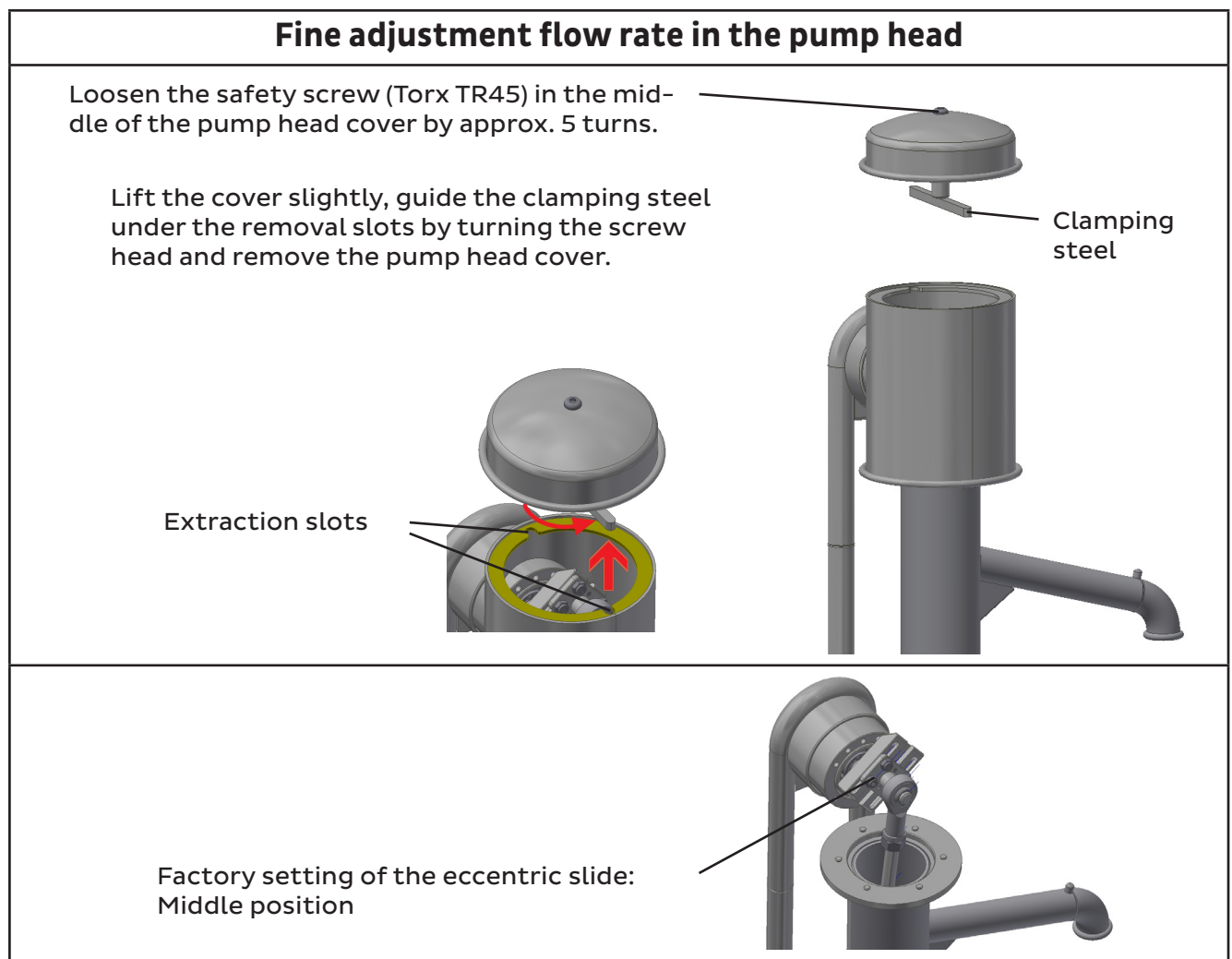
© Kaiser & Kühne Freizeitgeräte GmbH

K&K technical information

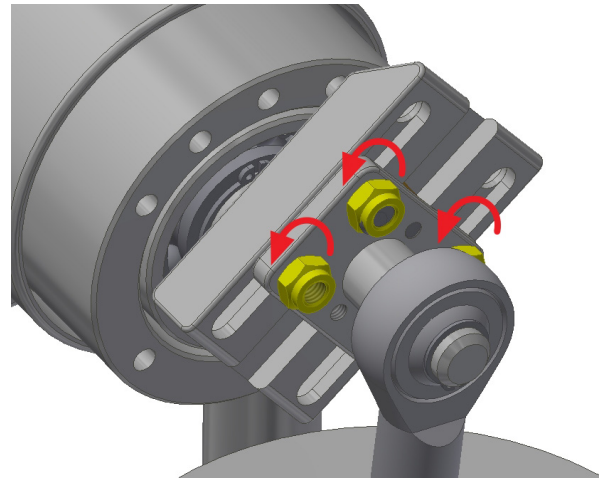
- **Case B: When actuated, the pump handle or handwheel strikes back:**
- The closing force on the vacuum valve (**VAV**) is too great.
- The closing force on the vacuum valve (**VAV**) must be decreased (-).
- The pre-set spring force on the vacuum valve (**VAV**) must be adjusted by turning the blue knob. The direction of rotation (+/-) can be seen on the valve.

4.5 Fine adjustment flow rate / displacement in the pump head

- The pre-set delivery rate can be changed to a certain extent
- The change also alters the pump resistance:
 - » High flow rate (approx. 0.2 litres) = large displacement = large pump-
ing resistance
 - » Low flow rate (approx. 0.05 litres) = small displacement = small
pumping resistance
- Factory setting: medium flow rate (approx. 0.15 litres)



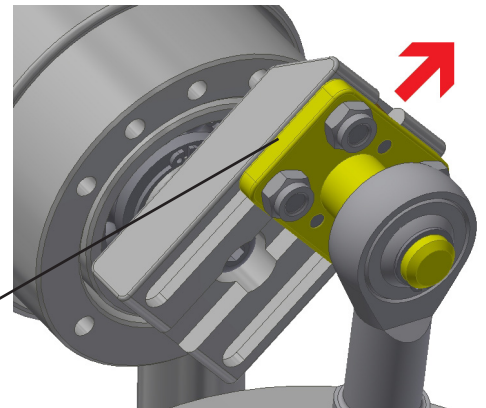
Loosen the 4 clamping nuts
(M8 – spanner size 13 mm)
on the eccentric slide by 1–2
turns.
Do not unscrew completely!



Move eccentric slide to desired position

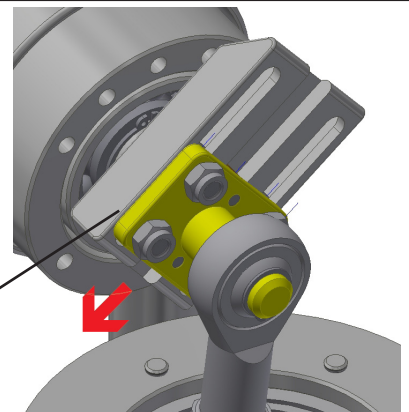
Large displacement = large flow rate = large pumping
resistance

Large dis-
placement

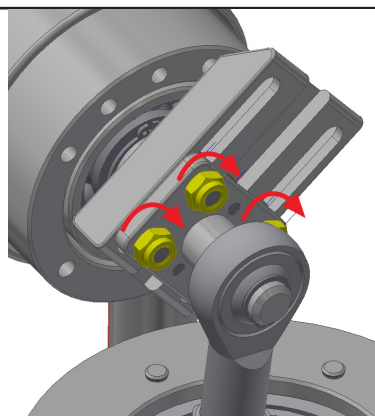


Small displacement = small flow rate = small pumping
resistance

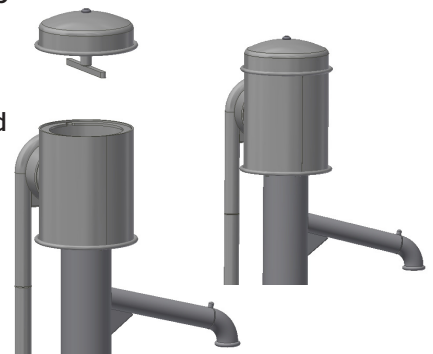
Small dis-
placement



Tighten the 4
clamping nuts
again



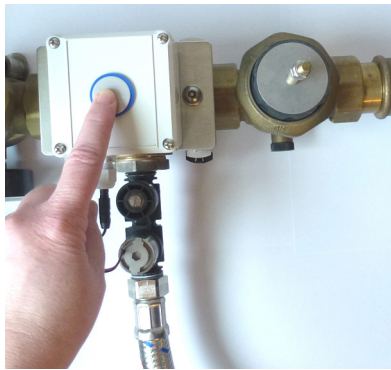
Place the pump
head cover
and clamping
steel on the
pump head and
screw tightly
again with the
safety screw.



4.6 Test run / manual operation of the hygiene flushing:

Water "On" + AUTO Stop:

- Press the piezo button 1x
- Water flows
- Water flow stops automatically at the end of the running time
- (Factory setting: Running time = 30sec)



OR:

Water "On" + Water "Off" manually

- Press the piezo button 1x = On
- Water flows
- Press the piezo button 1x = Off
- Water flow stops immediately

Modification of hygienic flushing: see section „14. Change the factory setting: Set water running time“ on page 40

Modification of hygienic flushing: see section „15. Change the factory setting: Set time intervals between flushes (flushing rhythm)“ on page 42

5. Explanation of the K&K valve combination with hygienic flushing

5.1 Task of the K&K valve combination

The K&K water pump is basically a manually operated, mechanical pump. It is designed as a suction pump, i.e. it is able to pump water from a pressure-less water supply (well, stream, cistern, reservoir, groundwater or similar) Draw in water and also hold the water column.

The term suction pump also means that, during normal operation, there are only negative pressures, i.e. pressures below atmospheric pressure within the water-bearing vessels involved, between the water level of the water supply and the pump piston. **Operation as a suction pump is not the subject of these instructions (see separate instructions).**

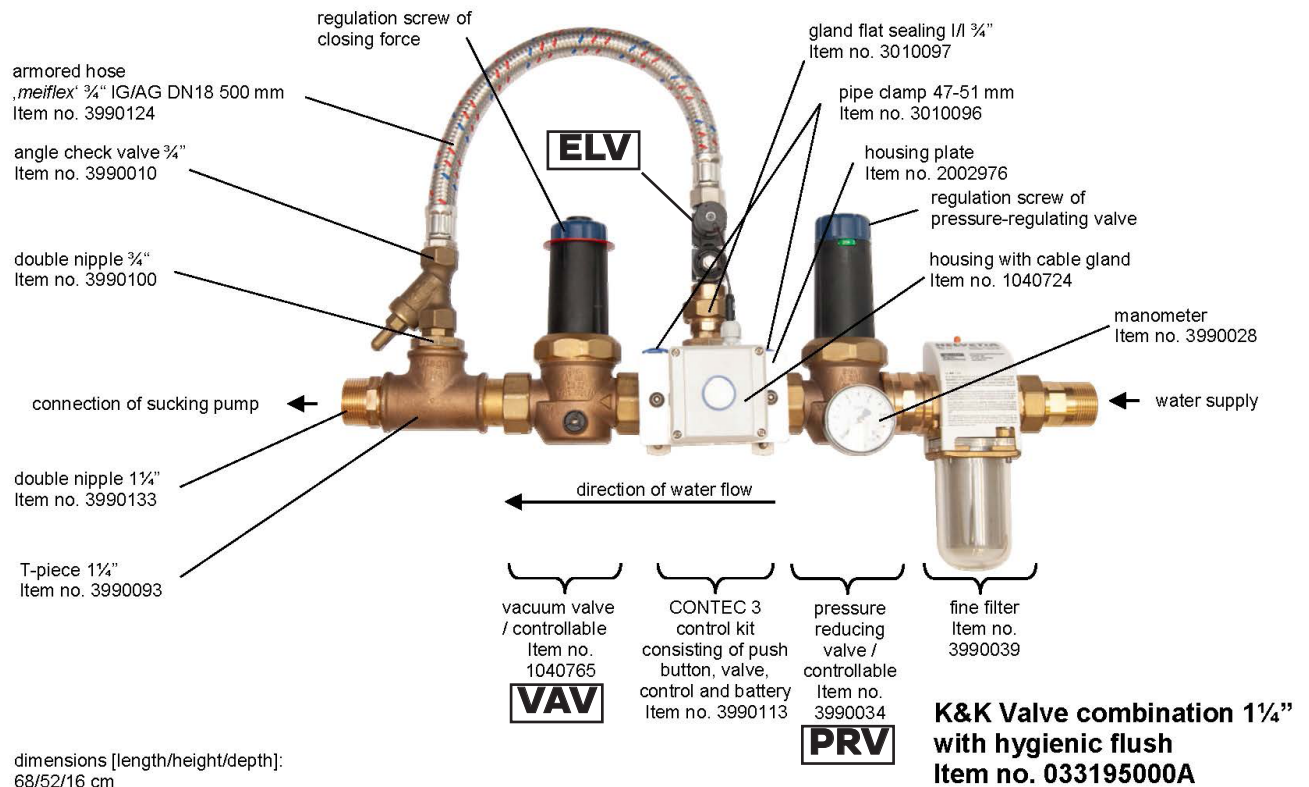
In the event that the **pump is to be connected to a pressurised water pipe**, the problem arises that, if the K&K water pump were to be operated directly on a pressurised water pipe, the water would flow through the pump unhindered (i.e. continuously and uncontrolled) and the actual pumping process would no longer have any function. The pump would then be comparable to an open water tap: water would flow continuously.

When operating a K&K water pump on a pressurised water line, the K&K valve combination is, therefore, absolutely essential as a necessary technical link. It prevents the flow of water when the handle is not moving, but releases the amount of water corresponding to the displacement volume when it is actuated.

5.2 Task of the K&K hygiene flushing

K&K Hygienic Flushing is a device for the automatic flushing of the pipe run between valve combination and K&K water pump with time control and non-return valve, designed for the flushing of a max. 30 m DN 40. The control unit consists of a control module with watertight welded-in 6V battery in a housing. The hygiene flushing is set to a 12-hour rhythm at the factory. For a manual flushing process, a button is attached to the housing.

5.3 Tasks of the individual components of the K&K valve combination with hygienic flushing



After the fine filter, a pressure reducing valve (**PRV**) is arranged first in the direction of flow, which serves to reduce the water of a supply line, which is present at an undefined pressure (but at least 3.0 bar), to a constant pressure of 3.0 bar, which is necessary for the correct functioning of the system.

The pressure gauge located on the same component serves as an aid for setting the operating pressure. It shows the water pressure between the pressure reducing valve and the downstream vacuum valve – i.e. not the pressure upstream of the pressure reducing valve in the supply line!

The next component in the direction of flow is a vacuum valve (**VAV**). It takes over the actual task of the valve combination. In its original state, this is the same pressure reducing valve as described above. Due to the changes made by K&K, it now acts as a vacuum valve. The visible machining marks on the valve (modified plastic parts), therefore, originate from the reworking of the valve at K&K; it is, therefore, a component that has been deliberately modified to achieve a different function.

The preset spring force may need to be adjusted by turning the blue knob if the pump drips. The direction of rotation (+/-) can be seen on the valve.

In summary, the function of this combination can be described as follows:

If the K&K water pump is connected behind the vacuum valve (**VAV**), negative pressure is generated in the space between the pump piston and the vacuum valve when the pump is actuated, and the water pump and valve combination are connected correctly in accordance with the K&K installation instructions and the maximum distances specified in the installation instructions are observed. This causes the vacuum valve to open as soon as the generated negative pressure has exceeded the closing force; as soon as the negative pressure decreases, the valve closes again, so that the water flow is interrupted once more.

The bypass of the hygiene flushing (consisting of armoured hose and non-return valve) is blocked by the electric valve (**ELV**). The electric valve opens in adjustable hygiene flush cycles for the duration of programmable flow times. This bypasses the vacuum valve (**VAV**). The unpressurised water in the line between the K&K valve combination and the K&K water pump is flushed out via the outlet of the K&K water pump.

The electric valve (**ELV**) is operated by a programmable controller, which is supplied with voltage by a waterproof-welded-in 6V battery (running time approx. 4 years – depending on the conditions of use).

The flushing volume that can be achieved with a static pressure of 3.0 bar and a DN 40 pipe is 7.5 l in the factory setting (30 sec.) and can thus flush a pipe length of approx. 6 m. The maximum flushing time (180 sec.) allows a flow of 45 l, which corresponds to a flushed pipe length of approx. 36 m (or a horizontal distance between valve combination and pump of max. 30 m).

6. Fault-free operation

Proper functioning is only guaranteed if the basic principles in the field of water installations are observed during installation, operation and maintenance:

- Tightness of the connecting parts
- Ensuring the cleanliness of the water (fine filter!)
- Compliance with the required supply water pressure (at least 3.0 bar)
- Compliance with the maximum level difference between valve combination and water pump and the horizontal distance
- Sufficient pipe cross-sections. Especially in the area of the supply line to the valve combination, DN 40 must be ensured throughout; any reduction in the cross-sections can lead to impairments in the pump's function!
- Correct installation of the valve combination in the direction of flow
- Precisely set water pressure at the pressure reducing valve before the vacuum valve
- Adjusting or re-adjusting the closing force of the vacuum valve in case the pump "drips"
- Frost precaution to avoid frost damage has been carried out

7. Avoidance of frost damage

During winter periods:

Danger of frost damage!

Valve combination in the winter months:

- Dismantle and store frost-free!
- OR
- Ensure frost-free conditions!
- Simple draining is not enough!
- See notes under section 7 "Avoiding frost damage"
- Safe operation is only possible down to +5°C.
- Lower temperatures lead to the destruction of the electric valve.
- No warranty for damage caused by frost.



7.1 Avoidance of frost damage to the K&K water pump

Due to the risk of destruction by frost, the upper part of the K&K water pump must be dismantled and stored during the winter months or before temperatures below 4° C occur.

If this is not done, or if it is done by other means (e.g. chaining the pump handle or similar), Kaiser & Kühne Freizeitgeräte GmbH shall not accept any liability for the damage caused by this.

7.2 Avoidance of frost damage to the K&K valve combination with hygienic flushing

Due to the risk of destruction by frost, measures must be taken to prevent frost damage during the winter months or before temperatures below 5° C occur.

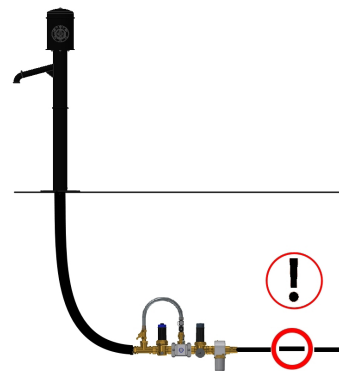
If the **K&K valve combination with hygienic flushing** is installed in an area that is not frost-proof, then the valve combination must also be dismantled, drained and stored. Otherwise, damage to the electric valve may occur due to freezing moisture.

7.3 Winter preparation of the K&K water pump and the K&K valve combination with hygienic flushing

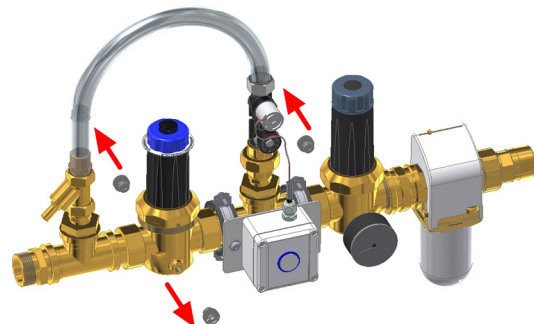
- Have the pump winter preparation kit ready.



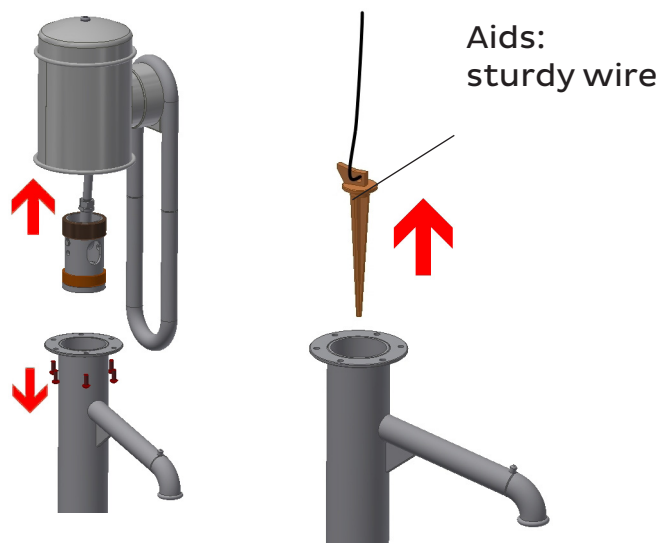
- Shut off the water supply to the valve combination.

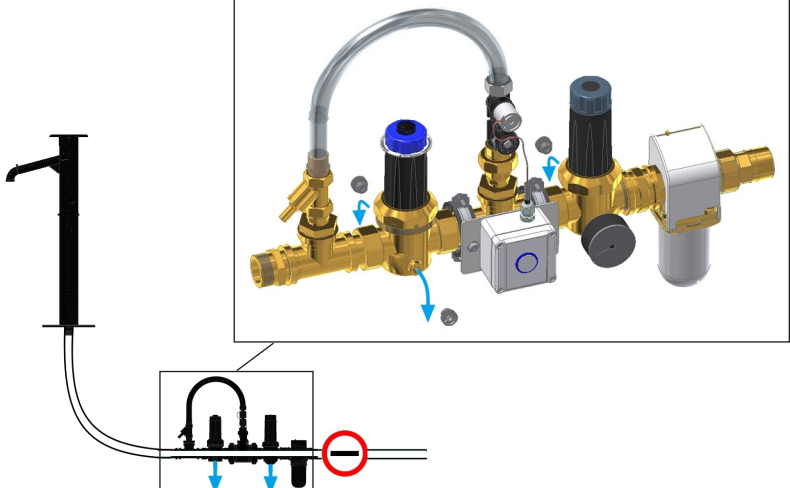
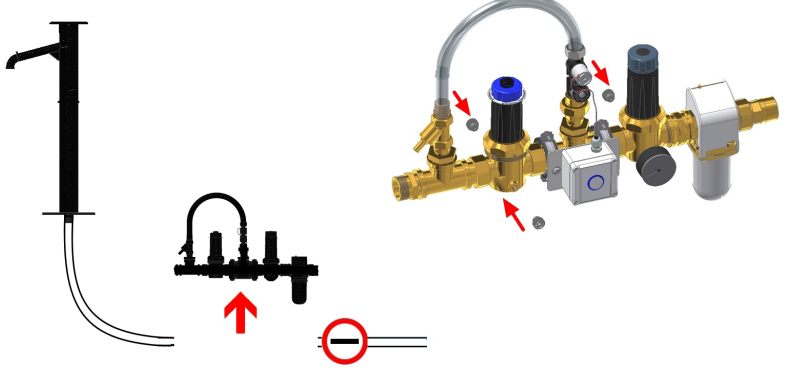
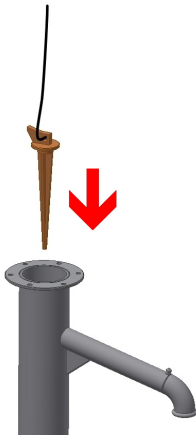
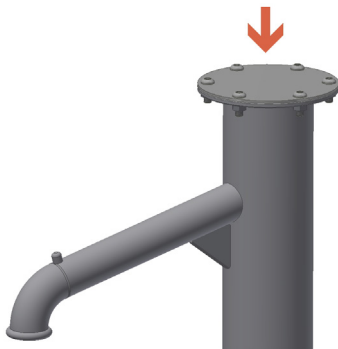


- Unscrew the black plugs on the K&K valve combination (= 3 pieces in total).



- Unscrew the pump head and remove it.
- The piercing valve in the pump column is visible after removing the pump head.
- Remove the piercing valve from the sealing seat in the pump column. If necessary, use a wire as an aid.



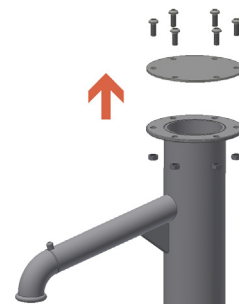
<ul style="list-style-type: none"> The water standing in the pipe between the pump and the valve combination now runs out of the previously opened drain openings of its own accord. 	
<ul style="list-style-type: none"> Completely remove the K&K valve combination with hygienic flushing if frost-free conditions cannot be guaranteed. Screw the black plugs back into the drain holes 	
<ul style="list-style-type: none"> Replace the piercing valve in the sealing seat. 	
<ul style="list-style-type: none"> Mount the supplied winter preparation plate on the remaining pump column Store the pump head and, if necessary, the K&K valve combination with hygienic flushing. 	

7.4 Restarting the K&K water pump and the K&K valve combination after a period of frost

- If the leather sleeve on the pump piston has hardened due to storage, soak it in water for 24 hours before putting it back into operation.

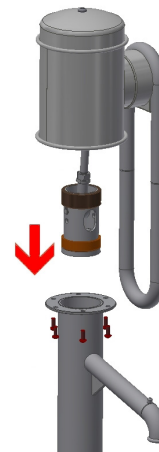


- Dismantle the winter preparation plate from the pump column.

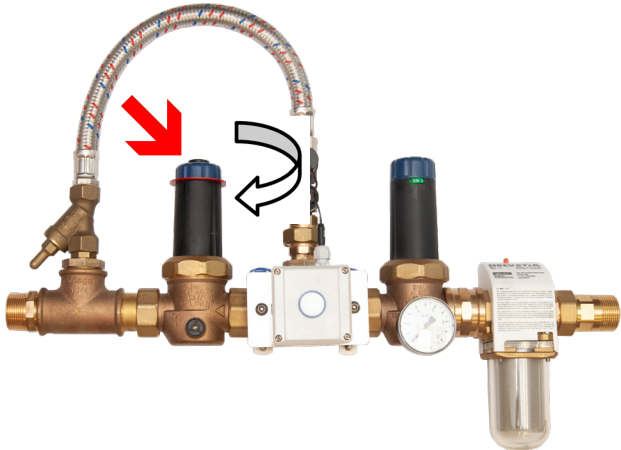

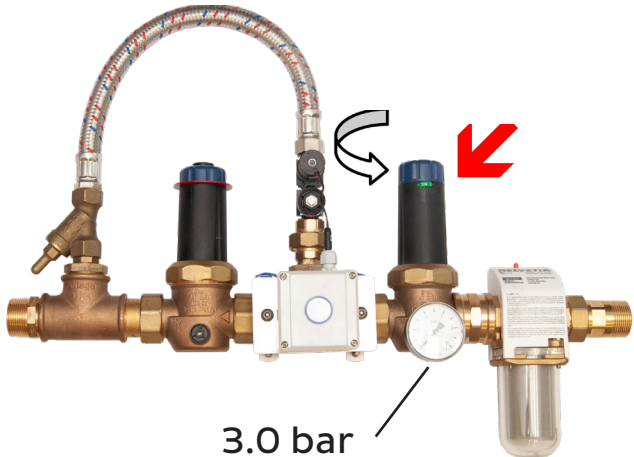


- Reinstall the K&K valve combination with hygienic flushing if necessary.

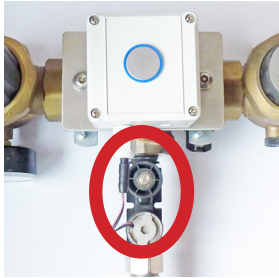
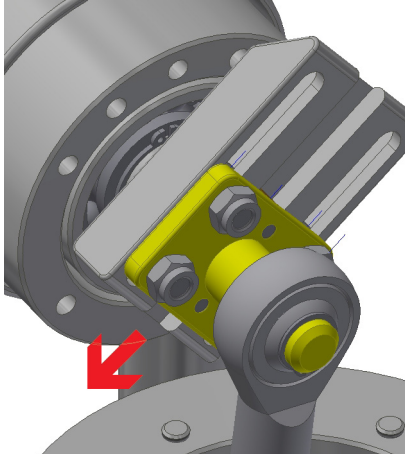
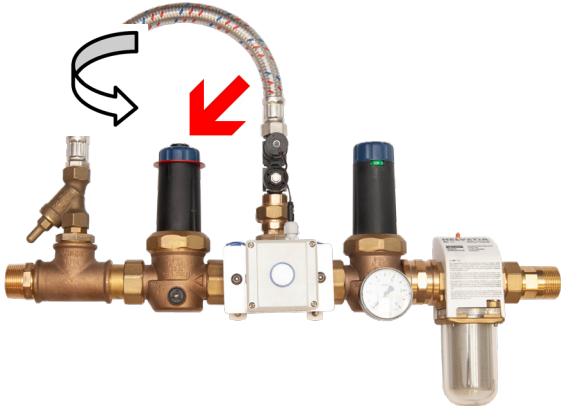
- Insert the pump head and screw it tight.
- Put the pump back into operation, see section „4. Test run / commissioning:“ on page 12.



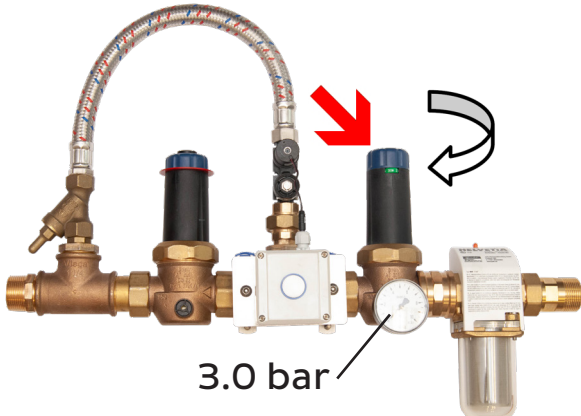

8. Fault analysis

Fault	Cause	Remedy
The pump is dripping or there is a constant flow of water from the pump	<ul style="list-style-type: none"> Closing force setting on vacuum valve too weak 	Increase the closing force of the vacuum valve by turning it in direction “+”
	<ul style="list-style-type: none"> Valve combination is dirty 	Clean the fine filter; if necessary, disassemble and clean the valve combination
	<ul style="list-style-type: none"> The pressure at the valve combination is excessively high  <p>3.0 bar</p>	Reduce pressure: 3 bar is required

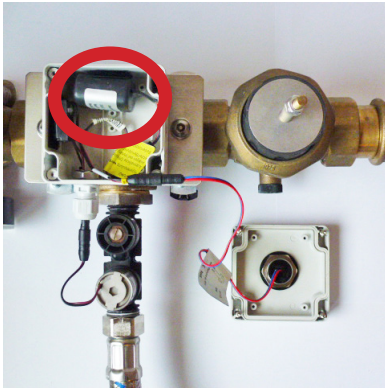
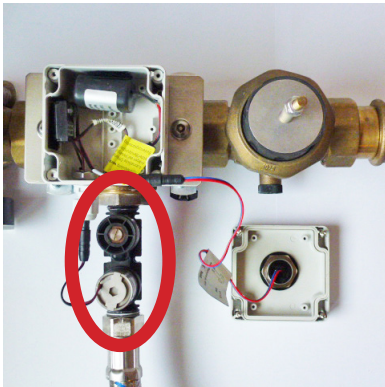
8. Fault analysis

Fault	Cause	Remedy
The pump is dripping or there is a constant flow of water from the pump	<ul style="list-style-type: none"> Dirt in the electric valve is preventing the valve from closing 	Clean the electric valve; Install fine filter (K&K Art. No. 3990039); or clean existing filter
	<ul style="list-style-type: none"> Pump displacement/flow rate too high 	Adjustment of the pump displacement/ reduction of the volume flow (see section „4.5 Fine adjustment flow rate / displacement in the pump head“ on page 14)
	<ul style="list-style-type: none"> Closing force setting on the vacuum valve too high 	Reduce the closing force of the vacuum valve by turning it in direction “-”
	<ul style="list-style-type: none"> Air in the supply lines 	Vent the supply lines

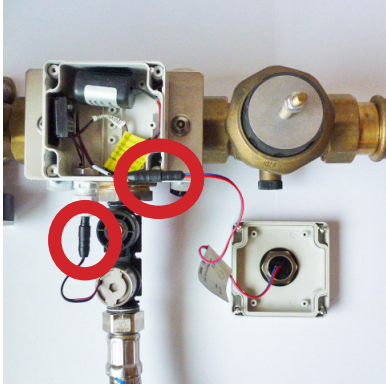
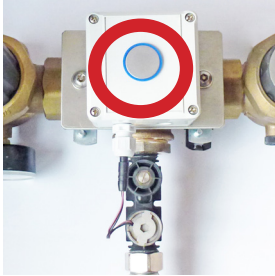
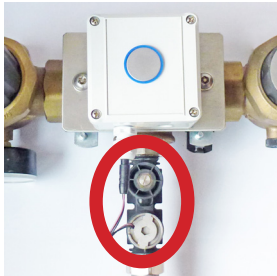
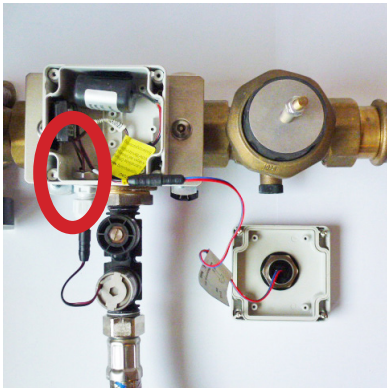
8. Fault analysis

Fault	Cause	Remedy
Pump handle strikes back	<ul style="list-style-type: none"> Installation dimensions (maximum distances) not complied with 	Correct the distances according to the illustration in section 3.3 "Installation of the valve combination"
	<ul style="list-style-type: none"> Supply lines blocked, compressed or pinched (e.g. due to vehicles driving over them) 	Check lines for free flow
	<ul style="list-style-type: none"> System with timer – Pump operation in the switch-off period 	Adjust switching times
No water comes out of the pump, and there is virtually no effort to operate the system	<ul style="list-style-type: none"> No water in the system 	Connect pressurised water
	<ul style="list-style-type: none"> Pump draws air; leaks in the piping system. 	Check the pipe system for leaks
	<ul style="list-style-type: none"> Water pressure too low 	Increase pressure, 3 bar is required
	<ul style="list-style-type: none"> Leather sleeve on the piston of the pump is hardened or worn out 	Soak leather sleeve in water for 24 h or replace.

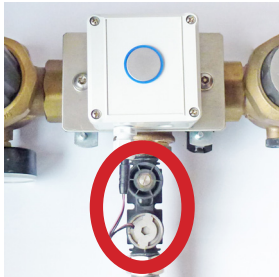
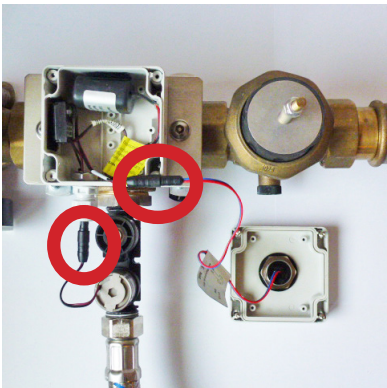
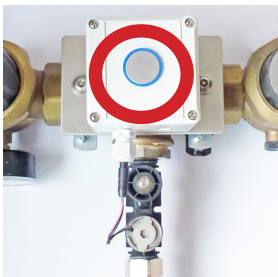
8. Fault analysis

Fault	Cause	Remedy
Pressure shocks in the pipeline network	<ul style="list-style-type: none"> No separate water connection 	Establish a separate water connection.
Hygiene flushing is not carried out No water flows when the piezo button is pressed	<ul style="list-style-type: none"> Water supply is not guaranteed 	Check water supply line and connections; Open shut-offs
	<ul style="list-style-type: none"> The battery is empty 	Change battery (K&K Art. No. 3990119)
	<ul style="list-style-type: none"> Dirt in the electric valve prevents the electric valve from opening 	Clean the electric valve; Install fine filter (K&K Art. No. 3990039); or clean existing filter

8. Fault analysis

Fault	Cause	Remedy
Hygiene flushing is not carried out No water flows when the piezo button is pressed	<ul style="list-style-type: none"> Pipes or plug connections damaged or loosened 	<p>Check and plug together correctly, pay attention to colour markings; Plug contacts must not be bent; Dry the connector before plugging it together</p>
	<ul style="list-style-type: none"> Piezo push-button defective 	<p>Renew piezo push button (K&K Art. No. 3990117)</p>
	<ul style="list-style-type: none"> Electric valve defective 	<p>Renew electric valve (K&K Art. No. 3990118)</p>
Electric valve does not close or does not close fast enough after actuation	<ul style="list-style-type: none"> Control module defective 	<p>If all the above points are in order, replace the control module (K&K Art. No. 3990120)</p>

8. Fault analysis

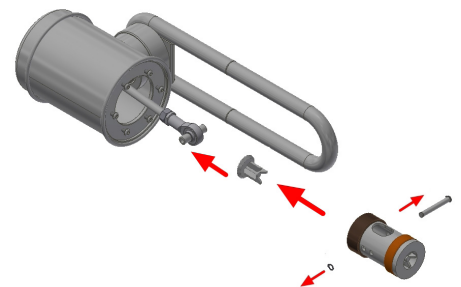
Fault	Cause	Remedy
Water pump triggers of its own accord	<ul style="list-style-type: none"> Hygiene flush runs for the programmed duration: NO FAULT! 	<ul style="list-style-type: none"> NO FAULT!
	<ul style="list-style-type: none"> Electric valve contaminated or defective 	Clean the electric valve; install the fine filter; replace the electric valve if necessary
	<ul style="list-style-type: none"> Moisture in the piezo button connector 	Dry the connector before plugging it together
	<ul style="list-style-type: none"> Piezo push-button defective 	Renew piezo push button

9. Replacing the leather sleeve on the piston of the K&K water pump

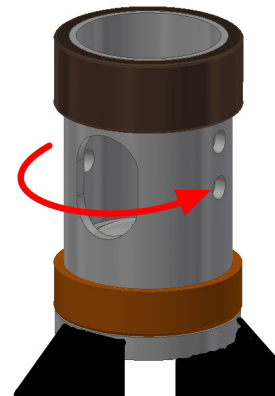
1. Dismantle the pump head including rods and piston from the pump column.



2. For easier handling, the pump piston is dismantled from the connecting rod. To do this, remove one of the retaining rings that fix the pump shaft in the pump piston using suitable pliers. Then the axle can be removed and the piston is loose.

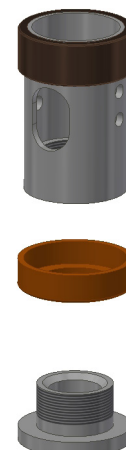


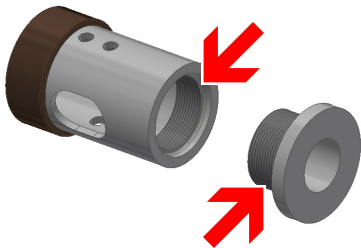
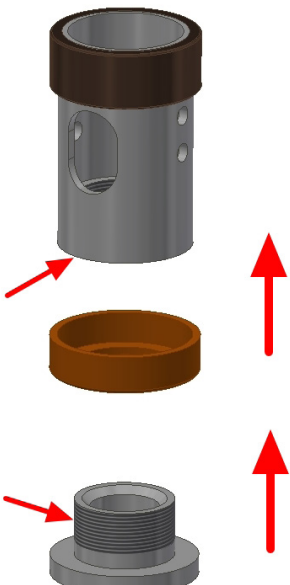
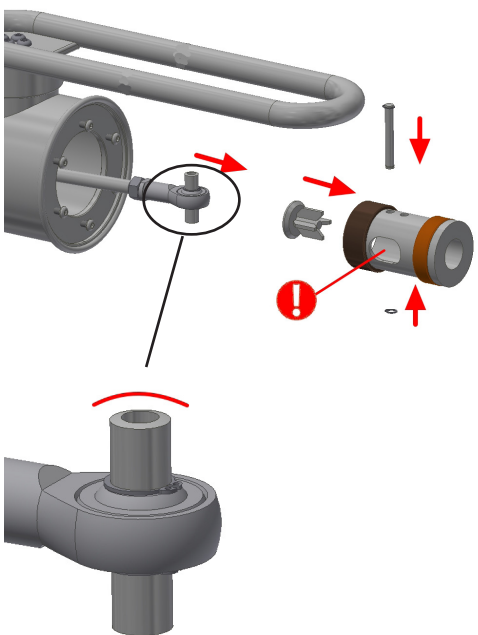
3. Then the pump piston is to be clamped vertically – as in the installed position – in a vice in such a way that the clamping jaws only grip the narrow area below the leather sleeve. Tighten the vice very firmly!



4. Insert a suitable tube or round material as a lever into the oval outlet hole of the upper piston section. By turning the upper part of the piston anticlockwise (right-hand thread), the upper part of the piston and the lower part are released from each other.

Please note: The thread is provided with a locking adhesive against unintentional loosening, which makes a screwing motion more difficult.



<p>5. After removing the old leather sleeve, the internal and external threads of the piston parts should be cleaned.</p>	
<p>6. Before assembling the piston parts with the new leather sleeve, the threads must be provided with a thread locking adhesive (Loctite or similar), in order to prevent unintentional loosening during operation.</p> <p>(The leather sleeve changes its volume due to the influence of moisture and, therefore, does not ensure a permanent tightening torque)</p>	
<p>7. When assembling the pump piston with the connecting rod and the axle, the installation directions of the spacer sleeves in the pump piston (radius in the direction of the piston skirt) and the orientation of the outlet bore must be observed.</p> <p>Please ensure that the valve body has been reinserted in the piston before mounting the connecting rod axle!</p>	

10. OPTIONALLY:

Expansion vessel K&K #3990096

in the event of pressure surges in the pipeline network

Pressure expansion vessel for use with pressure surge problems in adjacent buildings of water playgrounds where K&K water pumps in combination with the K&K valve combination cause noise.

Recommended pre-pressure: Static pressure of water supply minus 0,2 bar.
(Factory setting pressure 4,0 bar.)

Any installation position is possible. Connection preferably at the prepared 3/4" connection between pressure reducer and vacuum valve of the K&K valve combination. If the accommodation is not possible due to lack of space, other installation locations are also possible but less effective.


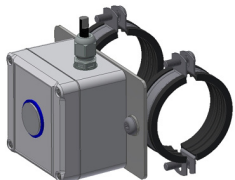
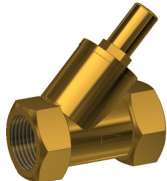
Maintenance: At least annually. Pressure can be built up using a compressor in combination with a tyre inflator (it is best to note the ideal pressure with a waterproof pen on the vessel).

Please follow the instructions supplied with the expansion vessel.







11. Replacement parts list		
Article No.	Designation	Image
3990039	Fine filter for water pump and water tap	
3990055	Brass sleeve	
3990034	Pressure reducer	
3990028	Manometer	
3990093	T-piece	
3990138	Crosspiece	
3990095	Threaded plug	
3990094	Reducer	

11. Replacement parts list

Article No.	Designation	Image
1040765	Vacuum valve 1 1/4"	
1040551	Leather sleeve - Pump piston	
1040729	Housing incl. piezo push-button pre-assembled on pipe clamps	
3990131	6-KT double nipple 3/4"	
3010097	Screw connection - flat sealing	
3990124	Flexible armoured hose with stainless steel braiding	
3990010	Check valve	
3990133	6-KT double nipple 1 1/4"	

11. Replacement parts list

Article No.	Designation	Image
3990117	Replacement piezo button	
3990118	Spare electric valve 6 Volt	
3990119	Spare battery 6 Volt	
3990120	Replacement control module 6 Volt	

12. Maintenance information

12.1 Regular maintenance work:

1x a week (or divergent, dependent on local factors)	<ul style="list-style-type: none"> • Check components for tightness and cleanliness. • Check components for vandalism, e.g. missing or damaged components. • Check components for the effects of weather, e.g. rain, storm or frost. • Check battery, replace if necessary („4.6 Test run / manual operation of the hygiene flushing:“ on page 16; „13. Battery assembly / replacement:“ on page 39)
1x monthly (or divergent, dependent on local factors)	<p>in addition to all the aforementioned maintenance work:</p> <ul style="list-style-type: none"> • Check components for wear, replace if necessary • Check connections and screw connections for tightness, tighten if necessary. • Replace defective components if necessary. • Check the sieve in the fine filter for impurities. If contaminated, clean or replace the sieve. • Check plug connections and screw connections for tightness, tighten if necessary • Check the functions of the electronic components (battery, piezo button, control module, electric valve), also open the housing to check the condition of the components inside („4.6 Test run / manual operation of the hygiene flushing:“ on page 16; „13. Battery assembly / replacement:“ on page 39). • Replace defective components if necessary

12. Maintenance information

12.2 Annual main inspection:

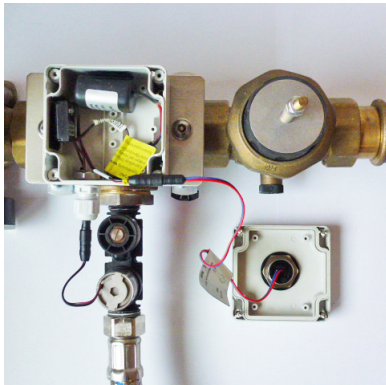
1x per year <small>(or divergent, dependent on local factors)</small>	in addition to all the aforementioned maintenance work:
	At the beginning of the frost period: <ul style="list-style-type: none"> • Safe operation is only possible down to +5°C • Dismantle pump head with linkage and with piston and store in a frost-free place . • Dismantle valve combination with hygienic flushing in the winter months and store frost-free OR ensure frost-free storage! • Simple draining is not enough! • Temperatures lower than 4°C lead to destruction of the electric valve • Before recommissioning: Clean or replace the sieve in the fine filter.

13. Battery assembly / replacement:

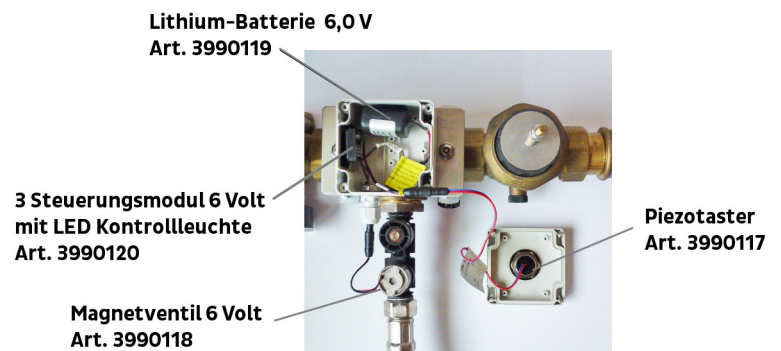
Lithium primary battery:

- Art. 3990119 (replacement only available from Kaiser & Kühne Freizeitgeräte GmbH)
- 6V / 1.4Ah / 7.8Wh
- Service life of approx. 4 years, depending on frequency of use and ambient temperature, among other things.

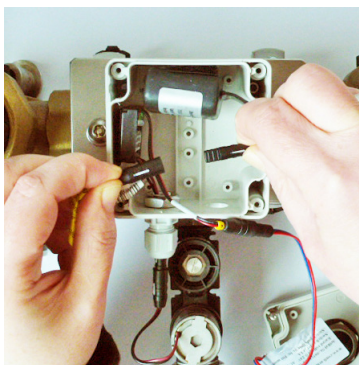
- **Open the housing: 4x Loosen cover screw**



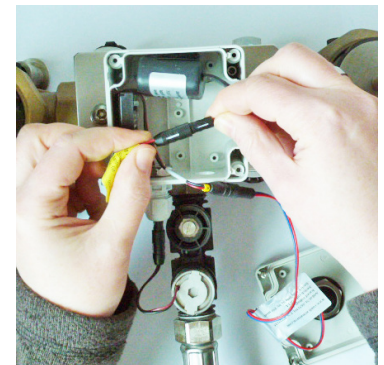
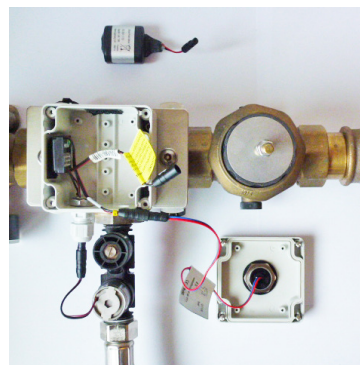
- **Components in the housing:**



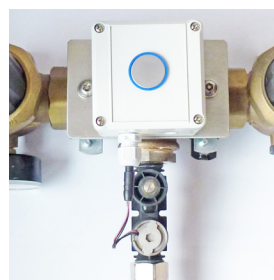
- **Disconnect the cable plug connection between battery and control module**



- **Reconnect the cable between the battery and the control module**
- **Keep plugs dry! Observe the line markings on the plugs!**



- **Close the housing again with the lid**

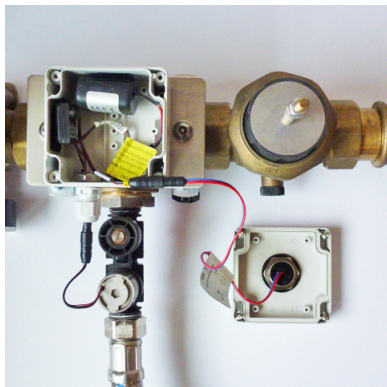


14. Change the factory setting: Set water running time

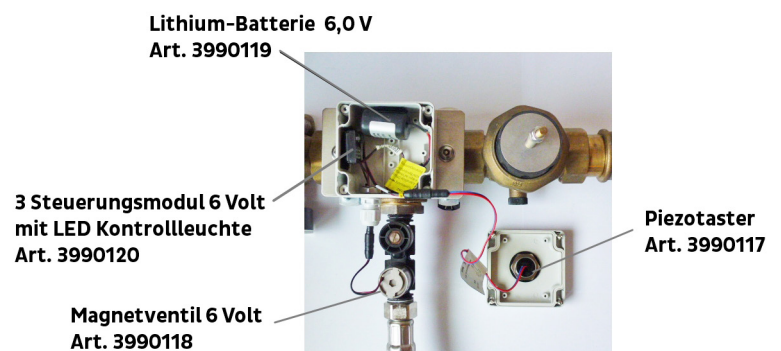
- The settings for the runtime of the hygiene flushing are made exclusively via the piezo button.
- Settings are only possible within 15 minutes after interruption and restoration of the power supply (battery).
- This means: The battery cable connection must be disconnected and reconnected before adjustments are made!

14.1 Power supply interruption:

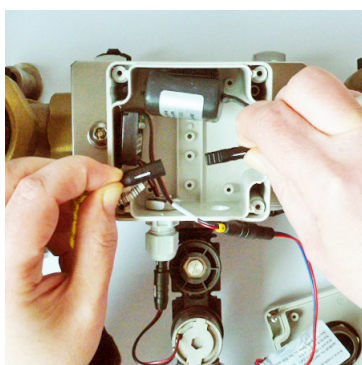
- Open the housing: 4x Loosen cover screw



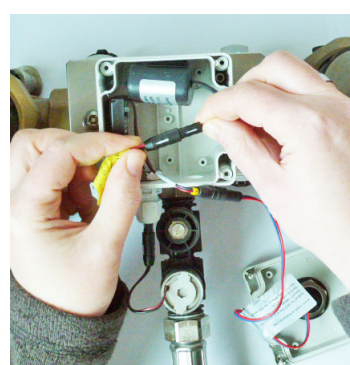
- Components in the housing:



- Disconnect the cable plug connection between battery and control module
- Wait briefly

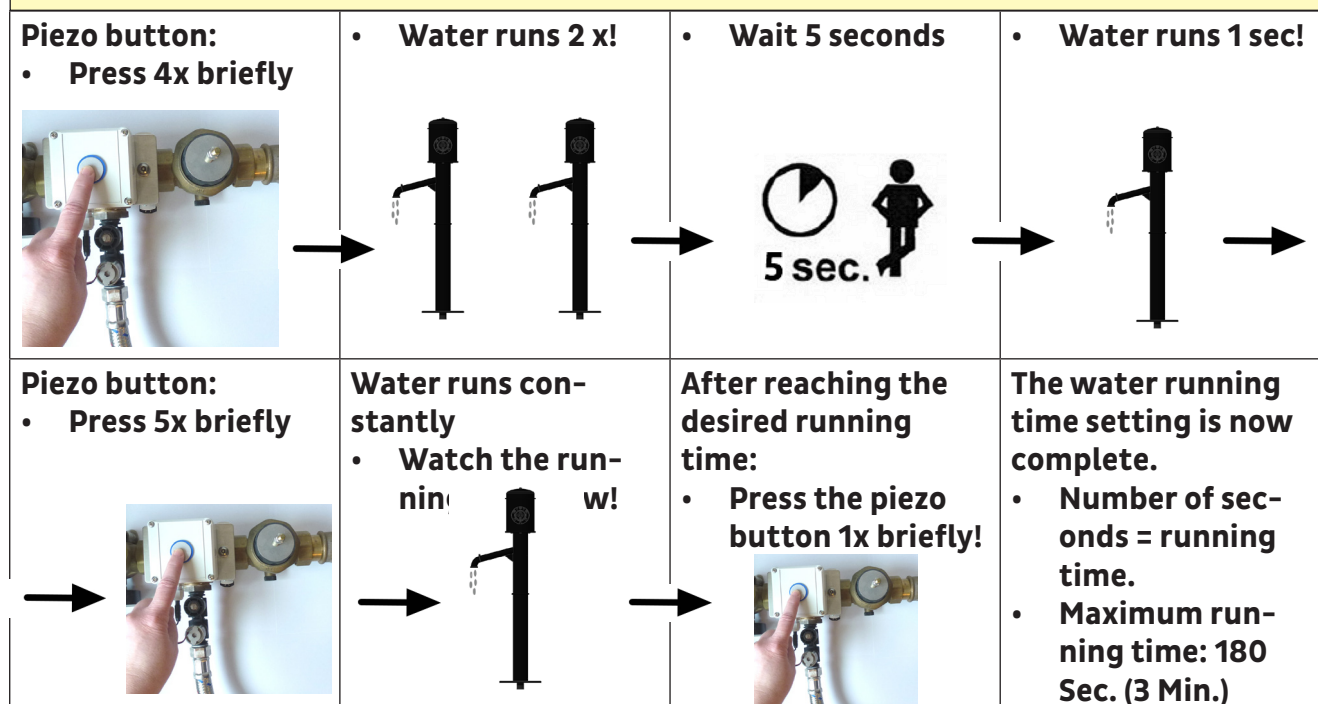


- Reconnect the cable between the battery and the control module
- Keep plugs dry! Observe the line markings on the plugs!



(After finishing the settings: Close the housing again with the lid)

14.2 NOW: Running time – Make settings (within the next 15 minutes)



Alternative representation: Running time – Make settings:

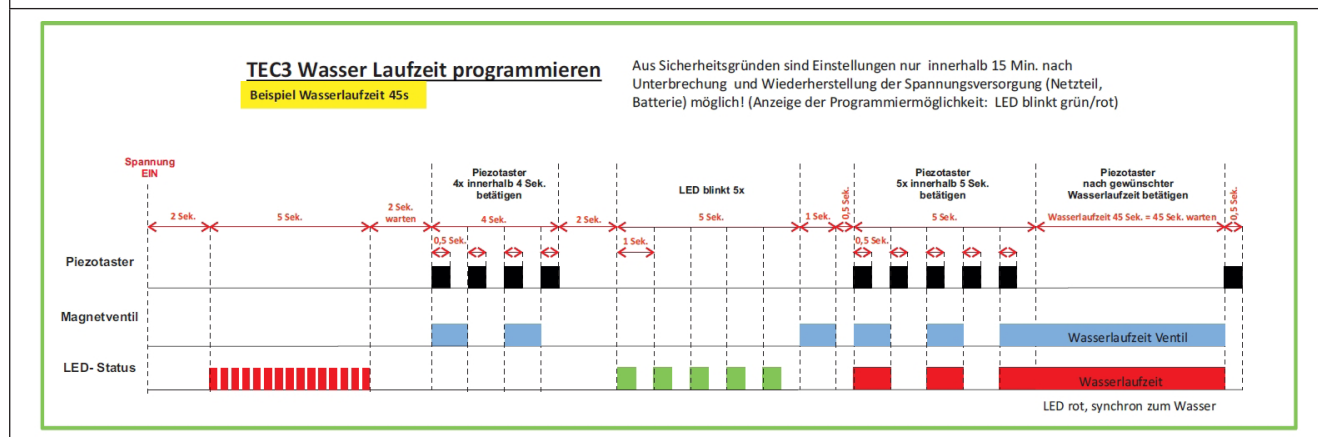


Table:
Flushing volume in litres,
Running time in seconds,
Flushing length in metres for DN40 pipe and 3 bar static pressure,
Time intervals between flushing processes

Settings			
Volumes in l	Running time in sec	Max. Flushing length at DN 40 and 3 bar	Time intervals between flushes
Factory setting			
7.5	30	6 m	12 h
Other possible settings:			
15	60	12 m	"OFF" / 12h / 24h / 72h
22.5	90	18 m	
30	120	24 m	
37.5	150	30 m	
45	180	36 m	

15. Change the factory setting: Set time intervals between flushes (Flushing rhythm)

- The settings for the runtime of the hygiene flushing are made exclusively via the piezo button.
- Settings are only possible within 15 minutes after interruption and restoration of the power supply (battery).
- This means: The battery cable connection must be disconnected and reconnected before adjustments are made!

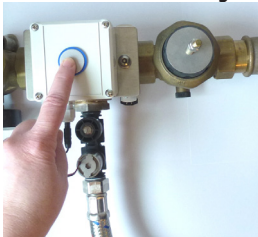




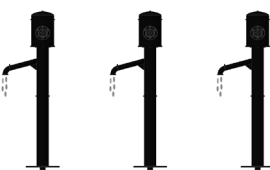



Interruption of the power supply, see section 3.1

15.1 Time interval between flushes – Determining the settings (within the next 15 minutes after interruption of the power supply)

Possible settings: Hygiene flushing

- Hygiene flushing "OFF"
- Flushing rhythm: 12 h (factory setting)
- Flushing rhythm: 24 h
- Flushing rhythm: 72 h

15.2 Hygiene flush "OFF"

Piezo button: <ul style="list-style-type: none"> • Press 6x briefly 	<ul style="list-style-type: none"> • Water runs 3 x! 	<ul style="list-style-type: none"> • Wait 5 seconds 
<ul style="list-style-type: none"> • Water runs independently for 1 sec! 	Piezo button: <ul style="list-style-type: none"> • Press 6x briefly 	<ul style="list-style-type: none"> • Water runs 3 x! 
<ul style="list-style-type: none"> • Water runs without waiting 1 sec! 	Piezo button: <ul style="list-style-type: none"> • Press 1x briefly 	<ul style="list-style-type: none"> • Water runs 1x in confirmation! 



[illegible]

The hygienic flush “Off” setting is now finished.


Piezo button:

-

-

-  
5 sec.

-

- 

-

-
- A diagram showing a black silhouette of a water pump on the right. To its left is a large black arrow pointing towards the pump.

-

-
- A close-up photograph of a hand pressing a blue circular button on a white rectangular electronic control box. The box is mounted on a wall and is connected to a brass water meter and various pipes. The background is a plain, light-colored wall.

-

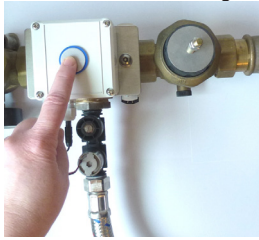
[illegible]

2019/08/22

15.4 Hygienic flushing "24 h"

Piezo button:

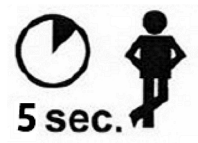
- Press 6x briefly



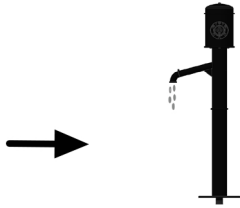
- Water runs 3 x!



- Wait 5 seconds



- Water runs independent-ly for 1 sec!

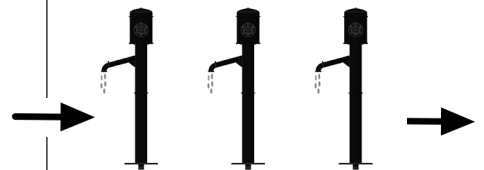


Piezo button:

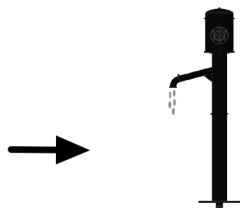
- Press 6x briefly



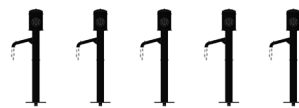
- Water runs 3 x!



- Water runs without waiting 1 sec!



- Wait until water runs 5x

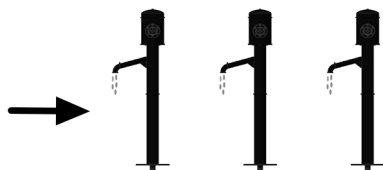


Piezo button:

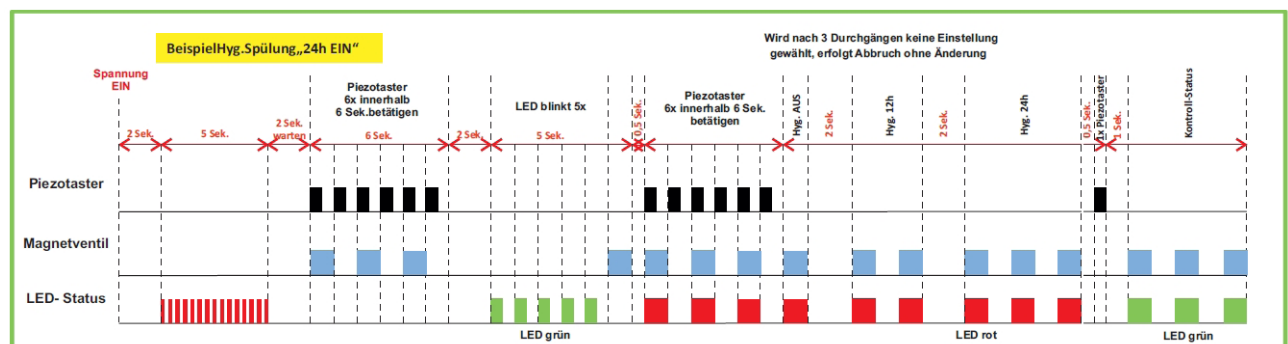
- Press 1x briefly



- Water runs 3x in confir-mation!




Alternative representation: Change to hygiene flushing "24 h":





The "24 h" hygiene flushing setting is now complete.


Piezo button:

- 

-

-  
5 sec.


-

- 

-

-

-

- 

-

Beispiel Hyg. Spülung „72h EIN“

Spannung EIN

2 Sek. 5 Sek. 2 Sek. wartend 6 Sek. 5 Sek. 5 Sek. 5 Sek. 2 Sek. Hyg. 12h 2 Sek. Hyg. 24h 2 Sek. Hyg. 72h 2 Sek. 72h 5 Sek. Kontroll-Status

Piezotaster
6x innerhalb 6 Sek. betätigen

LED blinkt 5x

Piezotaster
6x innerhalb 6 Sek. betätigen

Magnetventil

LED- Status

LED grün LED rot LED grün

Wird nach 3 Durchgängen keine Einstellung gewählt, erfolgt Abbruch ohne Änderung

2019/08/22