Flush valve universal

Instructions for Use

for automated water exchange in DN 12-80 pipelines

Model
2243.10

Year built:
from 03/2016

en_INT

viega

Table of contents

1 About these instructions for use

1.1 Target groups

The information in this instruction manual is directed at the following groups of people:

- Heating and sanitary professionals and trained personnel
- Trained electricians
- Operators
- Consumers

It is not permitted for individuals without the abovementioned training or qualification to mount, install and, if required, service this product. This restriction does not extend to possible operating instructions.

The installation of Viega products must take place in accordance with the general rules of engineering and the Viega instructions for use.

1.2 Labelling of notes

Warning and advisory texts are set aside from the remainder of the text and are labelled with the relevant pictographs.

DANGER!
This symbol warns against possible life-threatening injury.

WARNING!
This symbol warns against possible serious injury.

CAUTION!
This symbol warns against possible injury.

NOTICE!
This symbol warns against possible damage to property.

Notes give you additional helpful tips.

1.3 About this translated version

This instruction for use contains important information about the choice of product or system, assembly and commissioning as well as intended use and, if required, maintenance measures. The information about the products, their properties and application technology are based on the current standards in Europe (e. g. EN) and/or in Germany (e. g. DIN/DVGW).

Some passages in the text may refer to technical codes in Europe/ Germany. These should serve as recommendations in the absence of corresponding national regulations. The pertinent national laws, standards, regulations and guidelines, as well as other technical guidelines, have priority over German/European guidelines in this manual: The information is not binding for other countries and territories and should, as mentioned, be considered as support.

1.4 Acronyms and notes on the text

Acronyms

WM	wall-mounted
BCS	building control system
CC	concealed

Notes on the text

In these instructions for use, the purpose-oriented term "water exchange" is used instead of the term "flushing".

2 Product information

2.1 Safety advice

DANGER!
Danger due to electrical current
An electric shock can lead to burns and serious injury and even death.

- Work on the electrics may only be carried out by trained electricians.
- Switch off the mains voltage before carrying out work on electrical parts.

2.2 Intended use

2.2.1 Areas of use

The flush valve is intended for use in drinking water installations with manifold or uptake conduits of dimension 12-80.

While an external flush command is applied, the control of the flush valve automatically performs a water exchange, helping the user to keep their water quality at drinking water level.

The control does not perform a water exchange independently or automatically. Water exchange must be triggered by enabling the binary input referred to a potential, or the analog voltage input (6-48 V AC/DC). This opens the integrated magnet valve for as long as the signal is applied.

The flush valve must either be connected to a higher-level control, such as building control system (= BCS) which centrally monitors the fault and alarm message outputs and evaluates the signals, or a once-per-week visual inspection of the alarms indicated at the control must be ensured.

2.3 Product description

2.3.1 Overview and description of component

Scope of delivery

- Flush valve, mounted to the base support, with interior wiring
- fixing material
- Seals for inlet and drain

- Protective plug at water connection
- Instructions for use

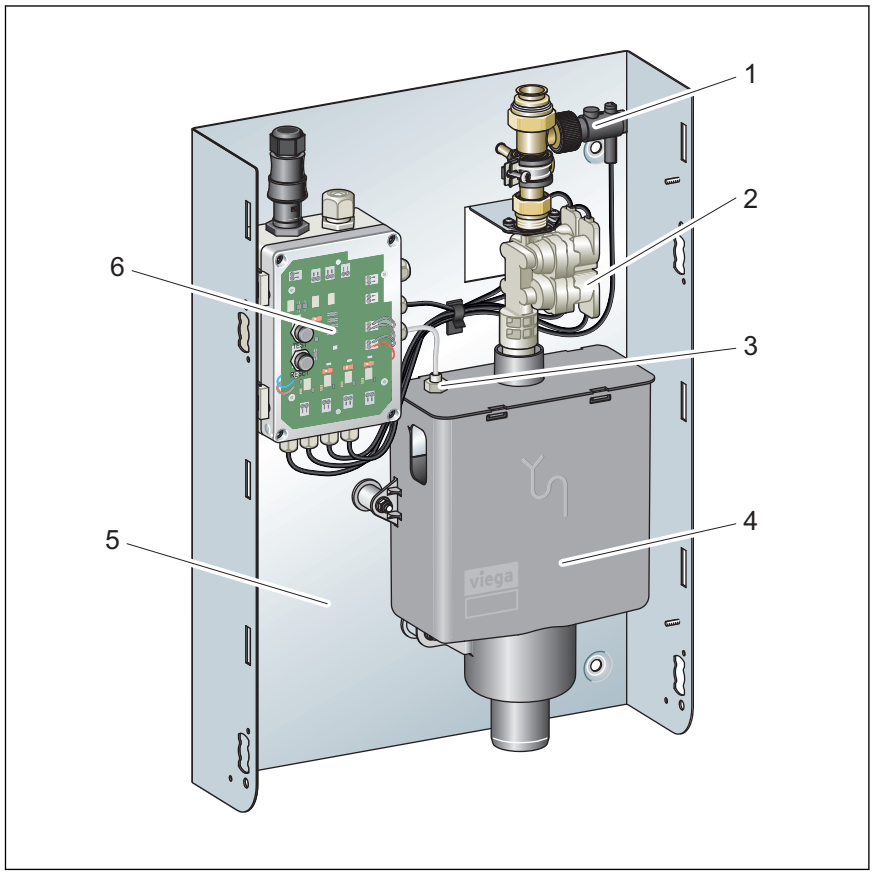


Fig. 1: Overview of flush valve

1 - Flow switch
2 - Magnet valve
3 - floating switch
4 - siphon with integrated overflow monitoring (floating switch)
5 - base support
6 - control

Control

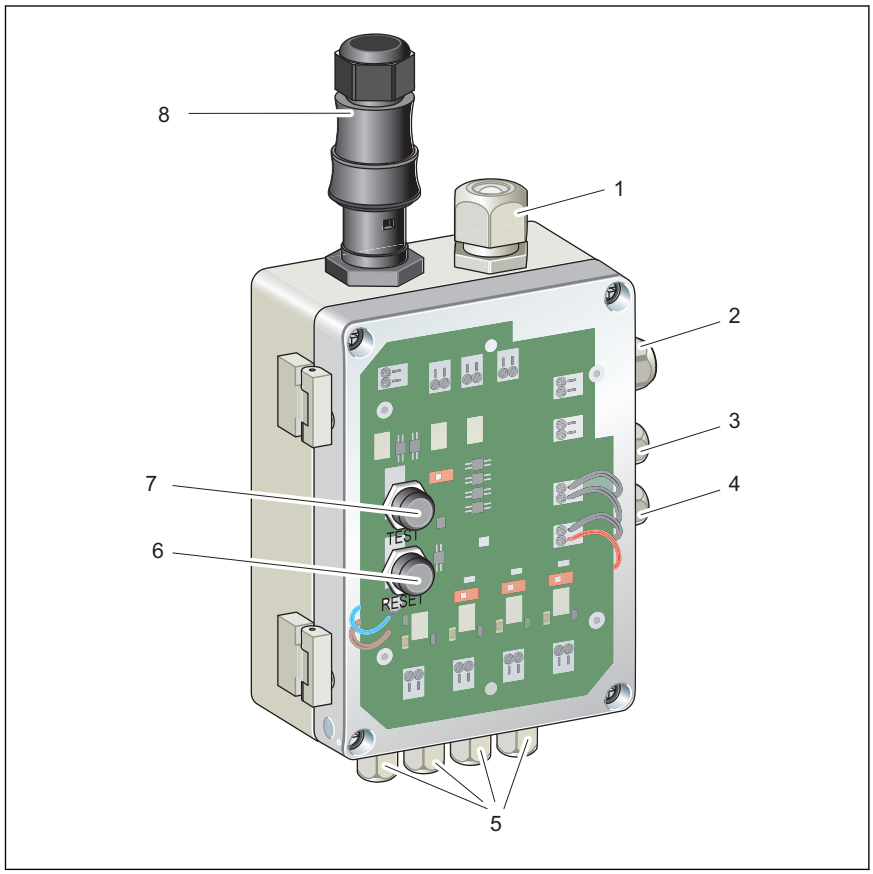


Fig. 2: Overview of control

1 - Bush (flush command input and event signaling outputs)
2 - Bush (flush command voltage and event signaling output 4-20 mA)
3 - flow switch bush
4 - backflow sensor bush
5 - magnet valves bushes
6 - reset button backflow
7 - test button test flushing
8 - connection for 230 V power supply

Magnet valve

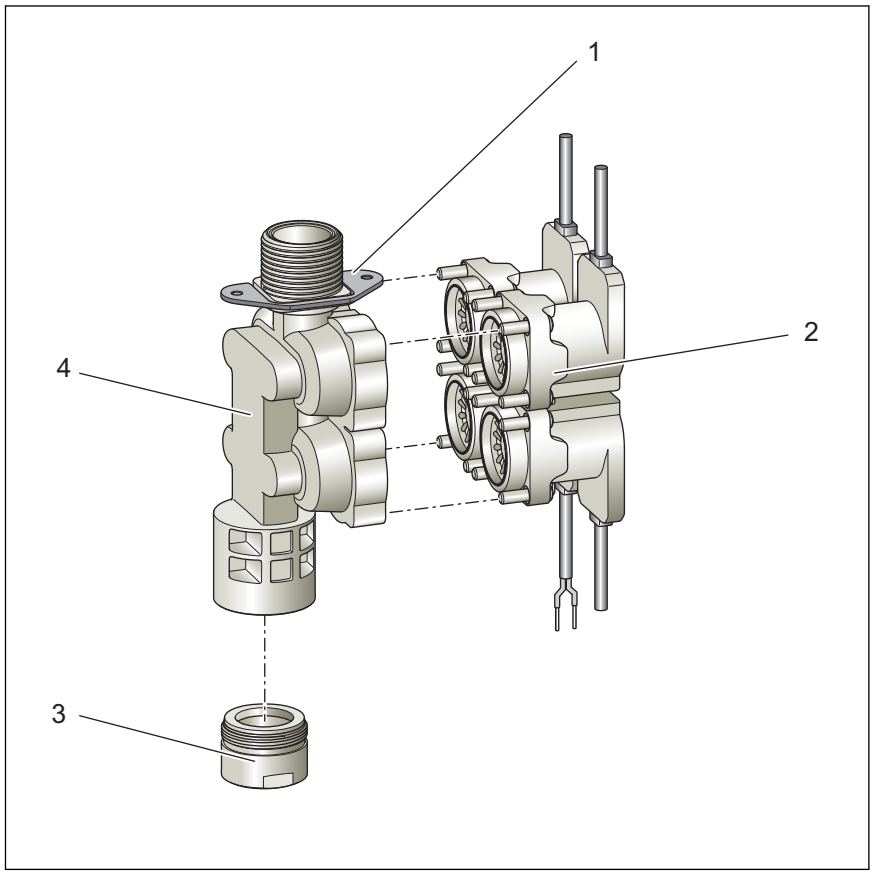


Fig. 3: Magnet valve overview

1 - fixing flange
2 - magnetic coils
3 - flow control
4 - valve body

Flow switch

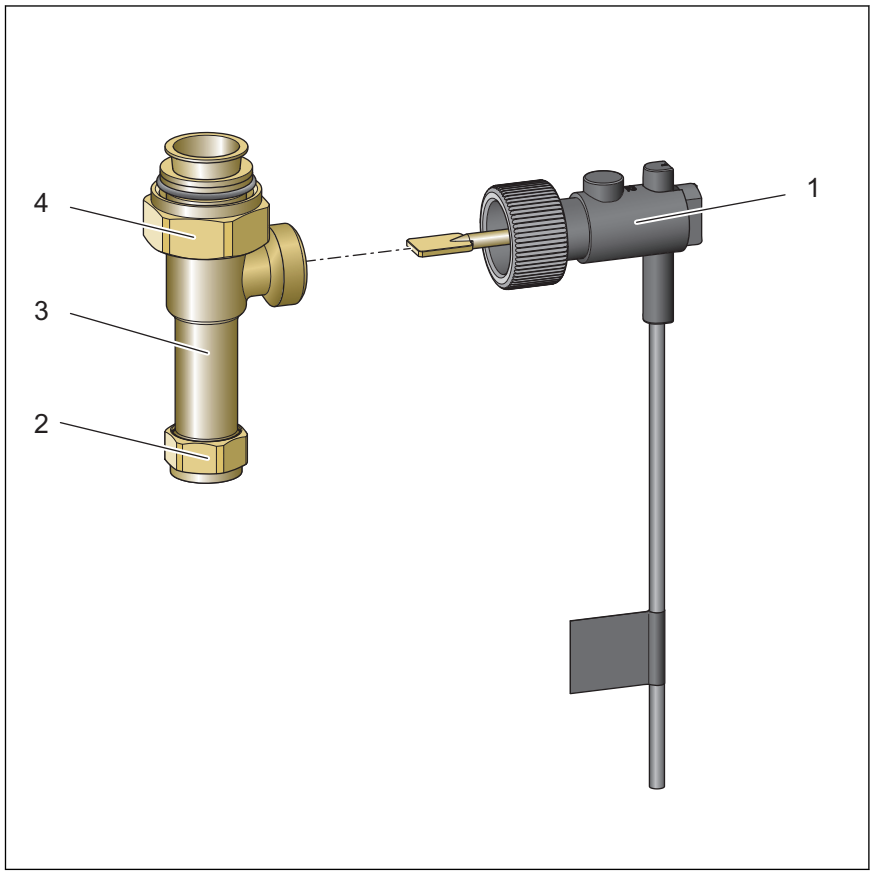


Fig. 4: Flush switch, overview

1 - Flow switch
2 - union nut
3 - T-piece
4 - union nut

Siphon

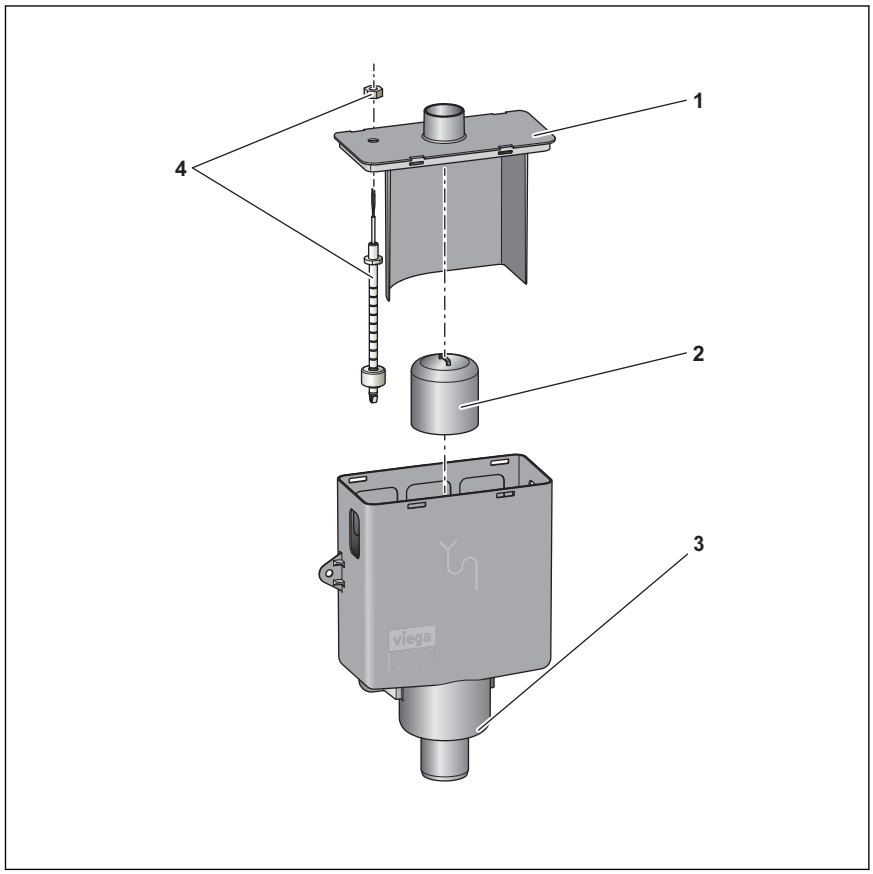


Fig. 5: Overview siphon

1 - lid
2 - socket
3 - drain with free discharge AB
4 - floating switch

2.3.2 Operating mode

The flush valve is intended for automated water exchange (flushing) in the connected drinking water pipelines. The flush valve is suitable for connection to DN 12-80 manifold or riser pipes.

One flush valve each regulates the water exchange in the cold water and hot water pipes.

Placement

The flush valve can be placed in the following spots:

- at the end of the pipeline run
- at the end of the manifold lines
- in the supply line to the fire extinguishing systems
- In the supply line to rarely used sections of the installation.

Water exchange actuation

The following additional or customer-provided components can actuate water exchange (flushing):

- Timer
- Building control system (BCS)

Furthermore, the flush valve flushes all valves for 10 seconds every 72 hours (time-delayed cycle: 1.5 s open, 1.5 s closed) to prevent blocking of valves and stagnation of the water within the valve.

Every water exchange is switched off automatically after 30 minutes.

Water exchange is actuated by:

- application of a floating contact (closing the contact = flush command); or
- application of 6-48 V AC/DC analog voltage, see *Fig. 6*.

Volume flow

Volume flow can be set depending on the length and nominal width of the line. It remains constant also with pressure fluctuations. The necessary flow rates pursuant to DIN 1988-600 can be set at the control unit in increments of approx. 12 l/min. (setting range 12 l/min to 45 l/min), see *„Flowthrough volumes at flow pressure 0.3 MPa (3 bar)“ on page 45*.

The flowthrough volumes are reliably provided at a flow pressure of 0.3 MPa (3 bars) and up, see *„Flowthrough (±10%)“ on page 18*.

Recommended setting

Number of active valves	Dimensions (DN)
1	12–25
2	32–40
3	50–65
4	80

Drain system

The drain system works as follows:

- A free drain of type AB ensures safe separation of drinking water from wastewater pursuant to the requirements of DIN EN 1717 and DIN 1988 -100.
- In case of a backflow in the wastewater system, overflow monitoring by means of an integrated floating switch (level sensor) in the siphon prevents the actuation of a water exchange, or aborts the water exchange in case of resulting overflowing.

The flush valve comprises a siphon / odour trap. No additional siphon is required outside of the flush valve.

NOTICE!
The dimension of the wastewater conduits must comply with the specifications of DIN 1986-100.

Flowthrough monitoring

During a water exchange, a flow switch checks whether water is discharged in the proper manner. The flow switch also signals improper flowthrough without flushing command, e.g. in case of a defective magnet valve etc.

Terminals for external sensor

The following functions can be set by means of floating contacts, see *Fig. 6*:

- Message: Operating / fault
- Message: Water exchange ongoing
- Message: Backflow
- Message: Active valve runs / setting of flowthrough volumes

mA	Connections
4	Standby
8	1 valve
12	2 valves
16	3 valves
20	4 valves

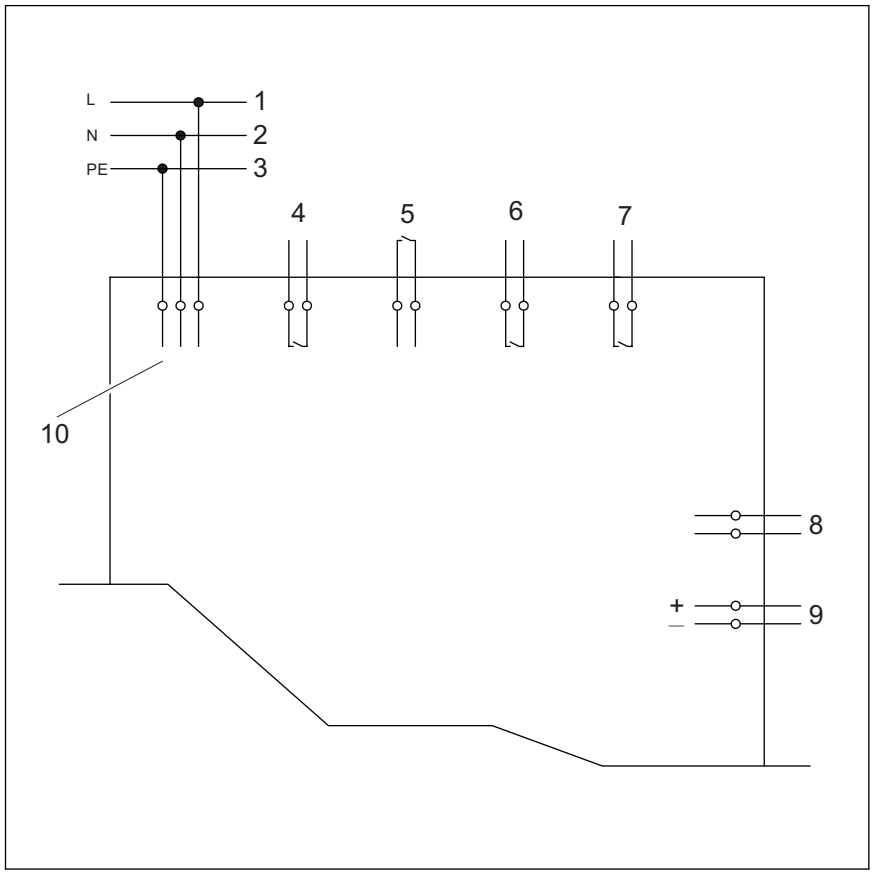


Fig. 6: Connection diagram

1 - line L
2 - line N
3 - PE line
4 - fault (alarm)
5 - flush command (flushing)
6 - water exchange ongoing (flushing ongoing)
7 - backflow (fault backflow)
8 - flush command (6–48 V AC/DC)
9 - flowthrough volume (4–20 mA)
10 - 100–240 V AC

Switching the signal outputs

The outputs are digital outputs (potencial-free N.O. contacts).

The connectors 4, 6 and 7 are binary outputs which can be evaluated in an isolated circuit.

Connector 5 is a binary input which can be actuated in an isolated circuit to carry out a water exchange.

When evaluating the switching contact 6 - water exchange ongoing (flushing ongoing) -, note the switch-on delay of 2-3 seconds at the beginning.

NOTICE!
The maximum load on the binary outputs is 24 V and 1 A (max. 24 W). Do not switch loads directly via the signal outputs!

An analog voltage of 6–48 V AC/DC can be applied at connector 8 to initiate a water exchange.

NOTICE!
Load the analog voltage input with minimum voltage, e.g. 100 mA at 24 V (max. 3 W).
Example: 12 V and 250 mA

Connector 9 is an analog current output 4–20 mA.

Number in the wiring diagram	Output message	Contact closed	Contact open
- 4 -	Fault or operating	Normal operation	Control current-less, magnet valve short-circuited or defective
- 6 -	Water exchange ongoing, or leaks	Flowthrough > 6 l/min	No flowthrough, or flowthrough < 6 l/min
- 7 -	Backflow	Backflow sensor is triggered or is defective	Normal operation

2.3.3 Sound protection

All components are mounted to the mounting bracket with acoustic insulation.

We recommend to use acoustic insulation also when mounting the base. Place for example a rubber mat or insulation material between the brickwork and the base.

2.3.4 Technical data

Ambient conditions

Operating temperature of the control unit	0 °C up to 50 °C
Relative humidity	5 to 95 % (non-condensing)
Storage temperature	-20 °C up to 80 °C
Protection class	IP54

Power supply / control

Mains voltage	100–240 V ±10 % AC
Mains frequency	50 / 60 Hz
Supply voltage internal	24 V DC SELV
Supply current	Max. 1.25 A
Standby	< 0.75 W
Power consumption power pack	30 W
Operating temperature	5–50 °C

Backflow sensor

Protection class	IP 67
Ambient temperature	-30 °C up to 80 °C

Magnet valve

Operating pressure	0.8 MPa (8 bar)
Temperature range	10–90 °C
Output state	Closed in de-energized state
Protection class	IP 54
Voltage	24 V DC

Flowthrough (±10%)

Flow pressure	Valve 1 (l/min)	Valve 2 (l/min)	Valve 3 (l/min)	Valve 4 (l/min)
0.1 MPa (1 bar)	10	19	25	30
0.2 MPa (2 bar)	12	22	32	40
0.3 – 0.8 MPa (3–8 bar)	12	24	35	45

2.4 Information for use

2.4.1 Installation variations

Viega front-wall installations

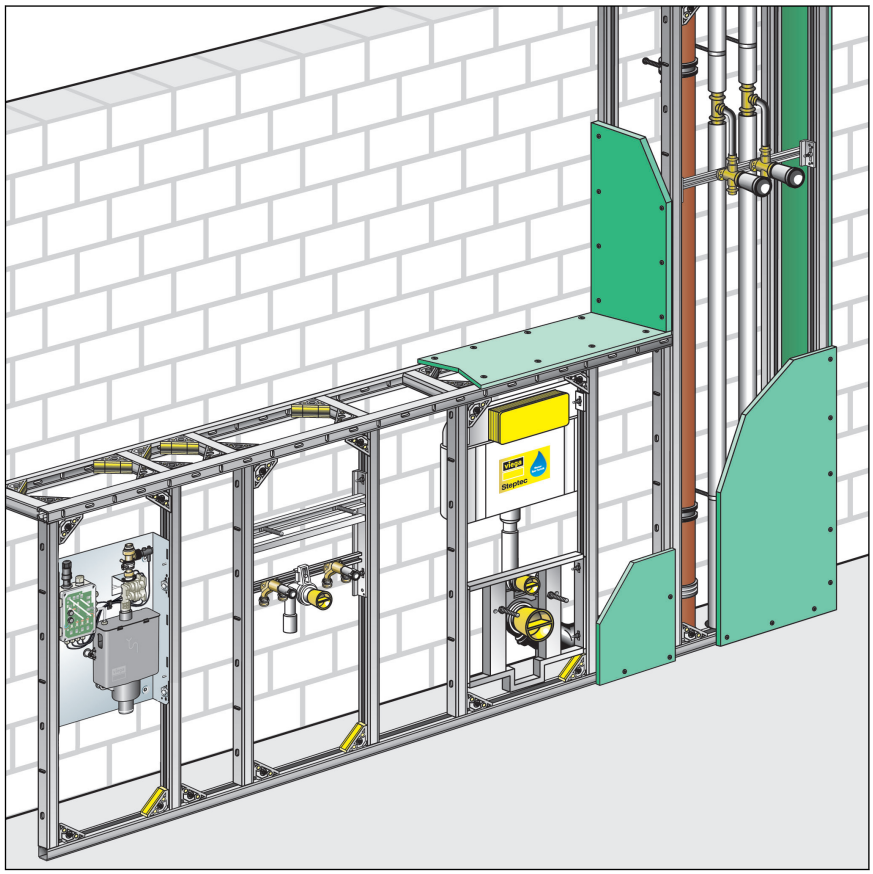


Fig. 7: Viega Steptec installation diagram

For mounting, see „*Viega Steptec*“ *on page 30*.

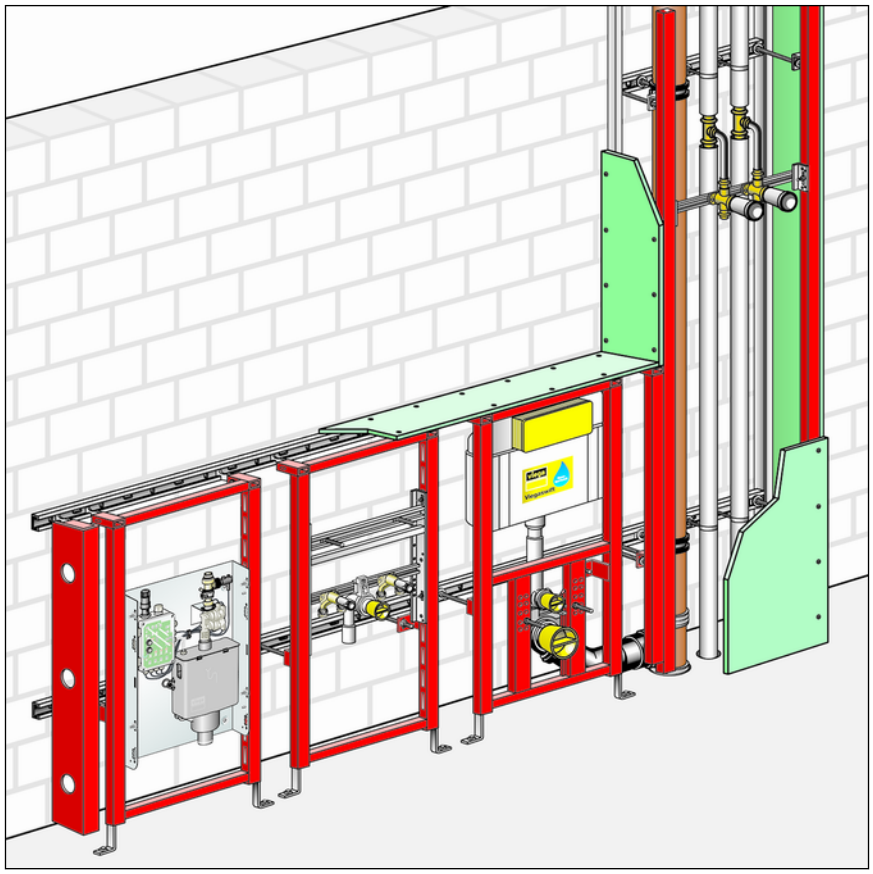


Fig. 8: Viegaswift installation diagram

For mounting, see „*Viegaswift / Viega Eco Plus*“ *on page 31*.

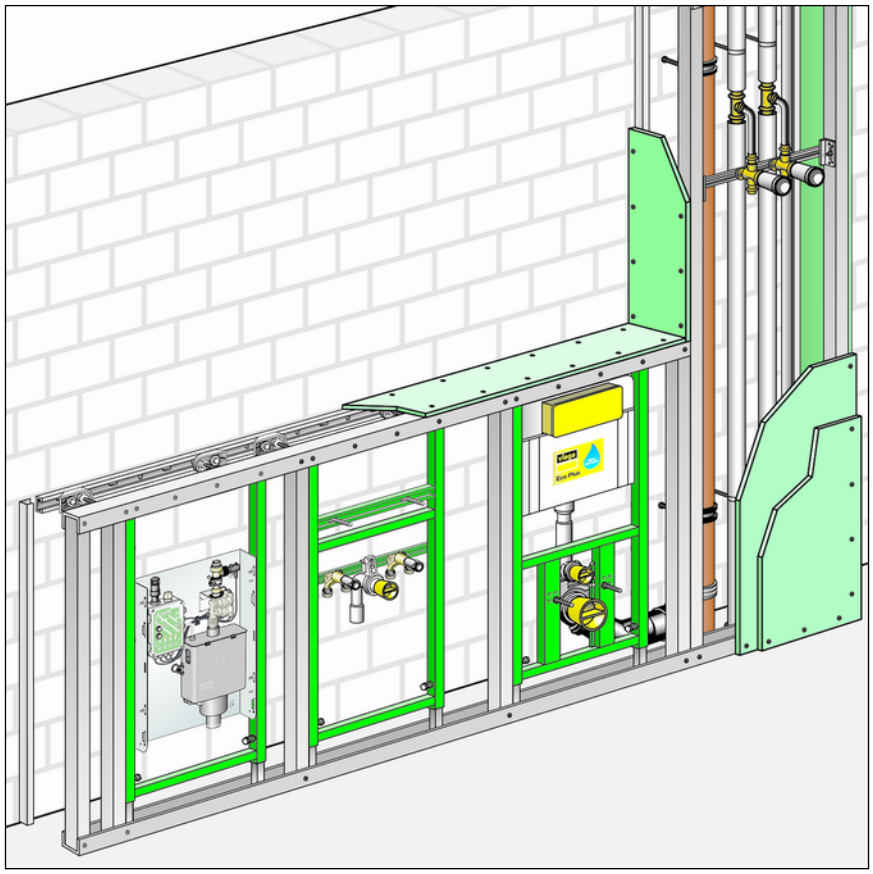


Fig. 9: Viega Eco Plus installation diagram

For mounting, see *„Viegaswift / Viega Eco Plus“ on page 31*.

Concealing mounting

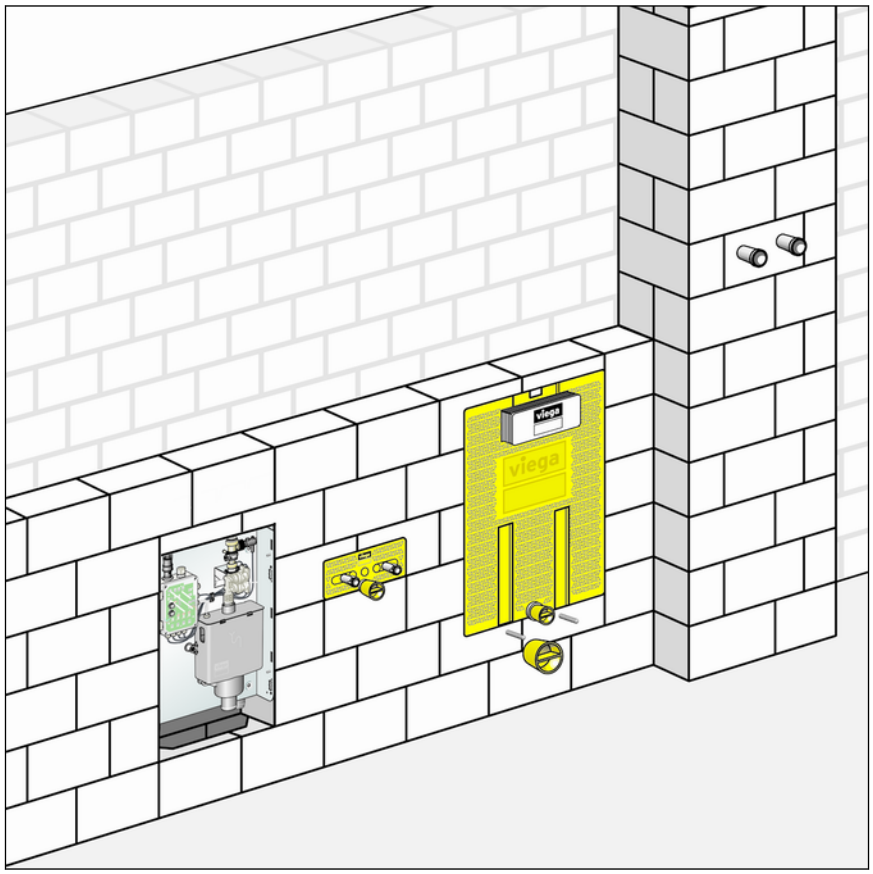


Fig. 10: Installation diagram concealed mounting

For mounting, see „*Concealing mounting*“ *on page 32*.

Wall mounting

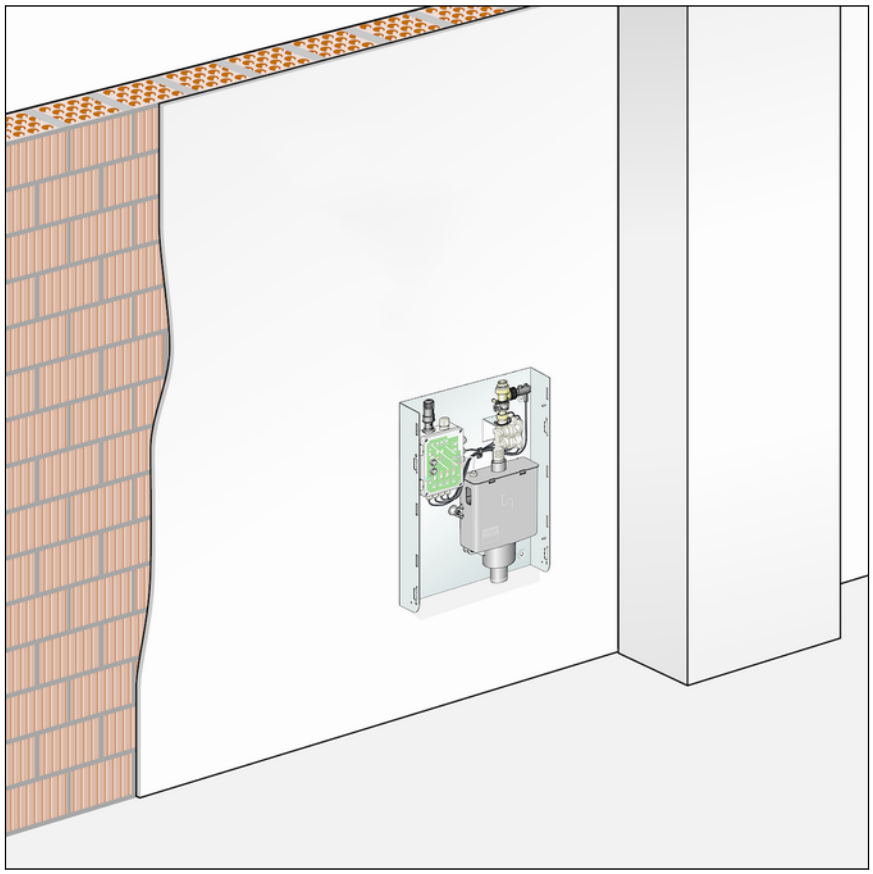


Fig. 11: Installation diagram wall mounting

For mounting, see „*Wall mounting*“ *on page 32*.

Dry construction

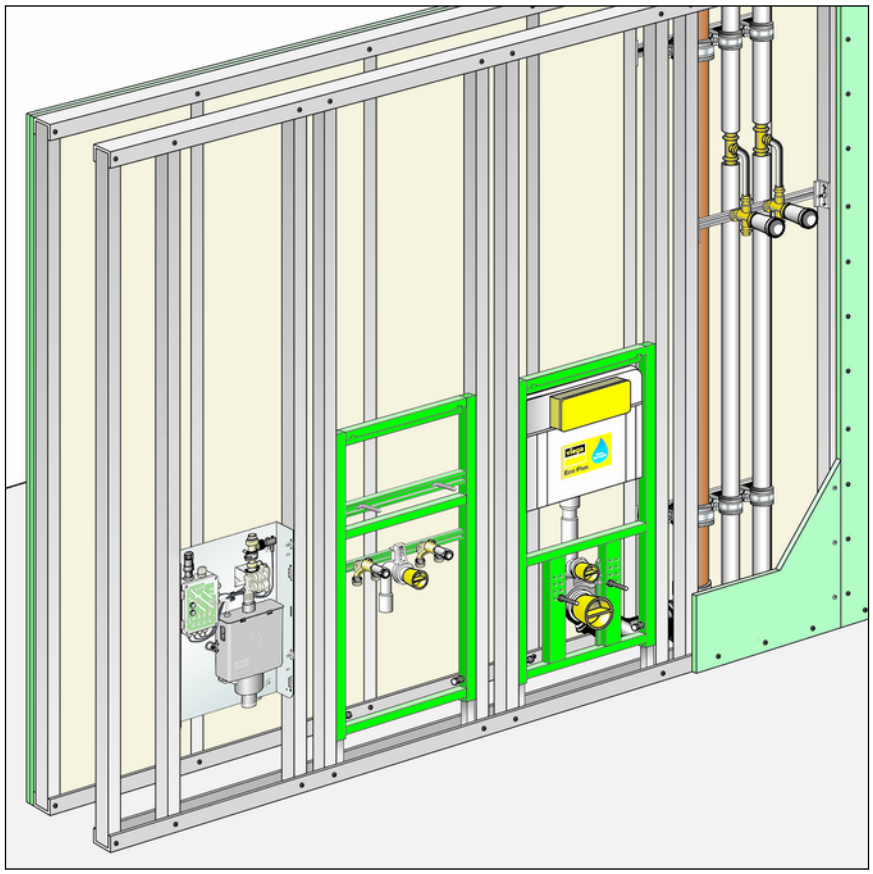


Fig. 12: Installation diagram dry construction

For mounting, see *„Dry construction“ on page 33*.

2.5 Accessories and spare parts

Accessories

Product	Model	Article
Cover set wall mounting	2243.11	735 197
Cover set for concealed mounting	2243.12	735 203
Maintenance set	2243.14	735 227
Shut-off for wall mounting: ball valve DN 25	2270.1	587 048
Shut-off for wall mounting: connection screw fitting	3335	320 256

Product	Model	Article
Shut-off for concealed mounting: Easytop slanted seat valve DN 20	2237.1	457 143
Shut-off for concealed mounting, as an alternative: Easytop Basic valve DN 20	2137.09	624 217
Viega Steptec fasteners	8437.90, min. 4 pc.	494 179
Viega Swift/Eco-Plus fastener	8013.23, min. 4 pc., 6 pc. recommended	308 278

Spare parts

Product	Model	Article
Control unit	2243.15	735 234
Flow switch	2243.16	735 241
Level sensor	2243.19	735 272
Odour trap	2243.18	735 265
Magnet valve	2243.20	735 289

3 Handling

3.1 Transport and storage

Note the following for transport and storage:

- Avoid hard impacts and heavy vibrations.
- Store the parts in a clean and dry environment.
- Do not remove the components from the packaging until immediately before use.
- Use the transport lock as site protection.

3.2 Assembly information

3.2.1 Mounting conditions

Mounting the device is permissible only if the following conditions are met:

- Install the flush valve in drinking water installations only.
- In ring and series pipelines for hot drinking water (PWH), comply with the output times pursuant to VDI 6003.
- Only use sealants approved by the DVGW pursuant to DIN 30660 and DIN EN 751-2.

The flush valve must either be connected to a higher-level control, such as building control system (= BCS) which centrally monitors the fault and alarm message outputs and evaluates the signals, or a once-per-week visual inspection of the alarms indicated at the control must be ensured.

The BCS signals:

- *Faults*
- *Backflow*
- *Accidental flushing (leakage)*
- *Correctly performed flushing.*

Requirements in the installation site

- The installation site must have a smooth wall surface or a suitable support profile.
- The accessories required must be available at the installation site.
- All appurtenant pipelines, valves and fittings must be accessible.
- The device must not be exposed to direct solar radiation.

3.2.2 Potential equalisation

DANGER!
Danger due to electrical current

An electric shock can lead to burns and serious injury and even death.

Because all metallic piping systems conduct electricity, unintentional contact with a live part can lead to the whole piping system and components connected to it (e. g. radiators) becoming energised.

- Only allow electrical work to be carried out by qualified electricians.
- Integrate the basic holder system into the potential equalisation.

It is the fitter of the electrical system who is responsible for ensuring that the potential equalisation is tested and secured.

3.2.3 Installation dimensions

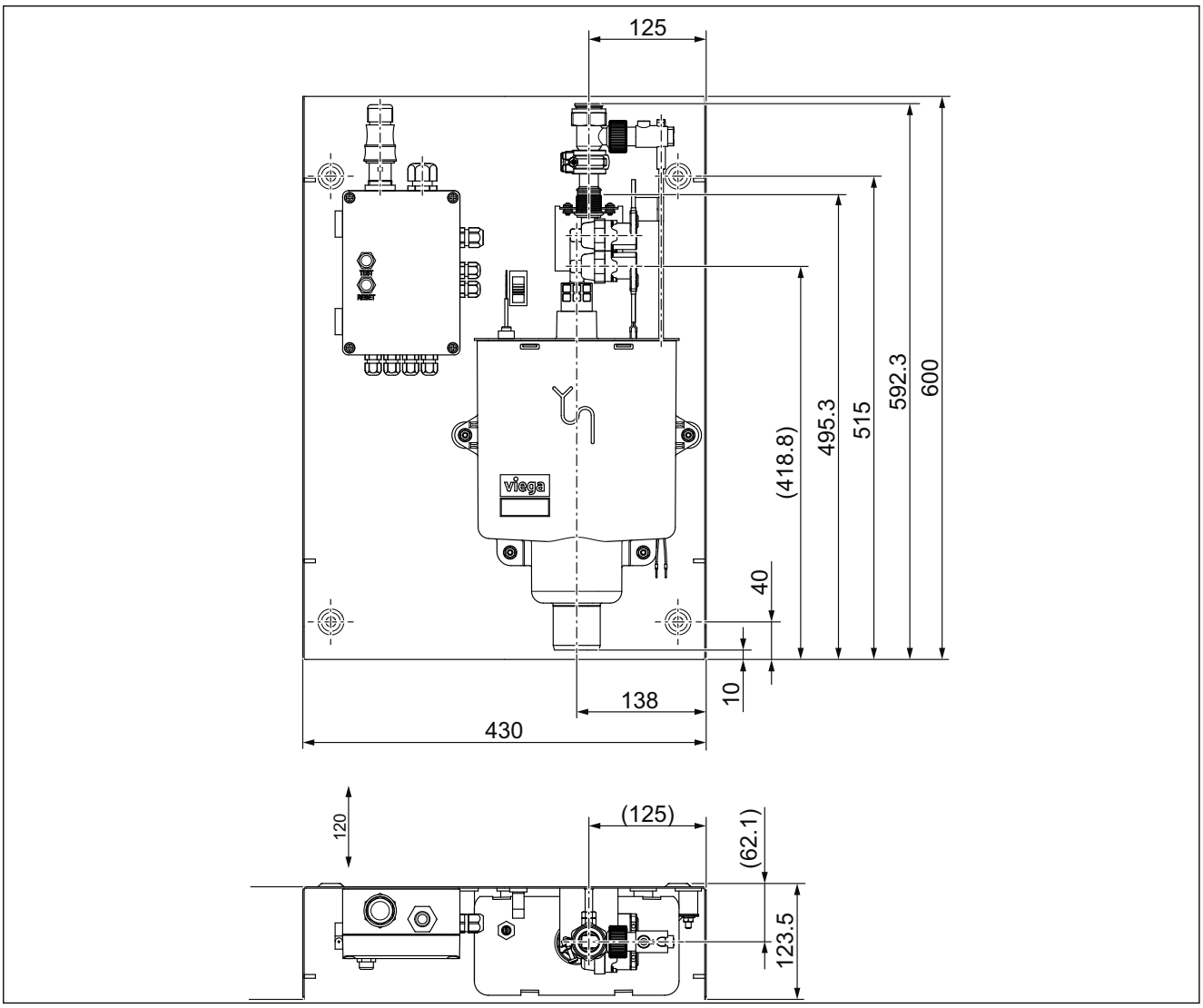


Fig. 13: Flush valve dimensions

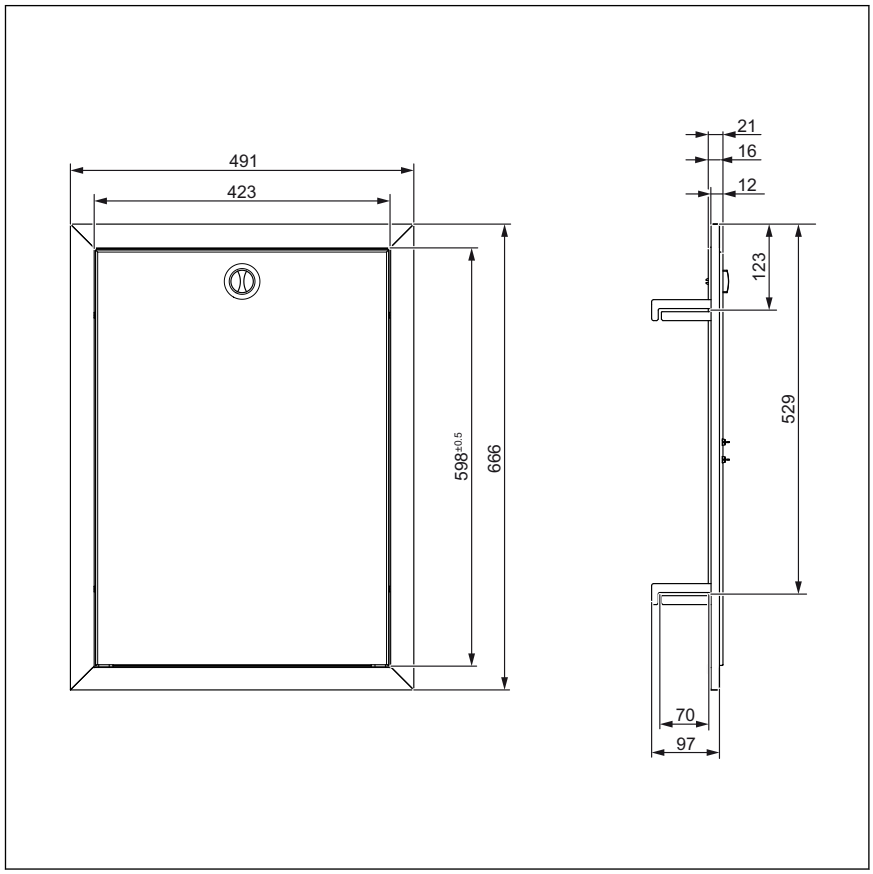


Fig. 14: Dimensions concealed-mounting cover

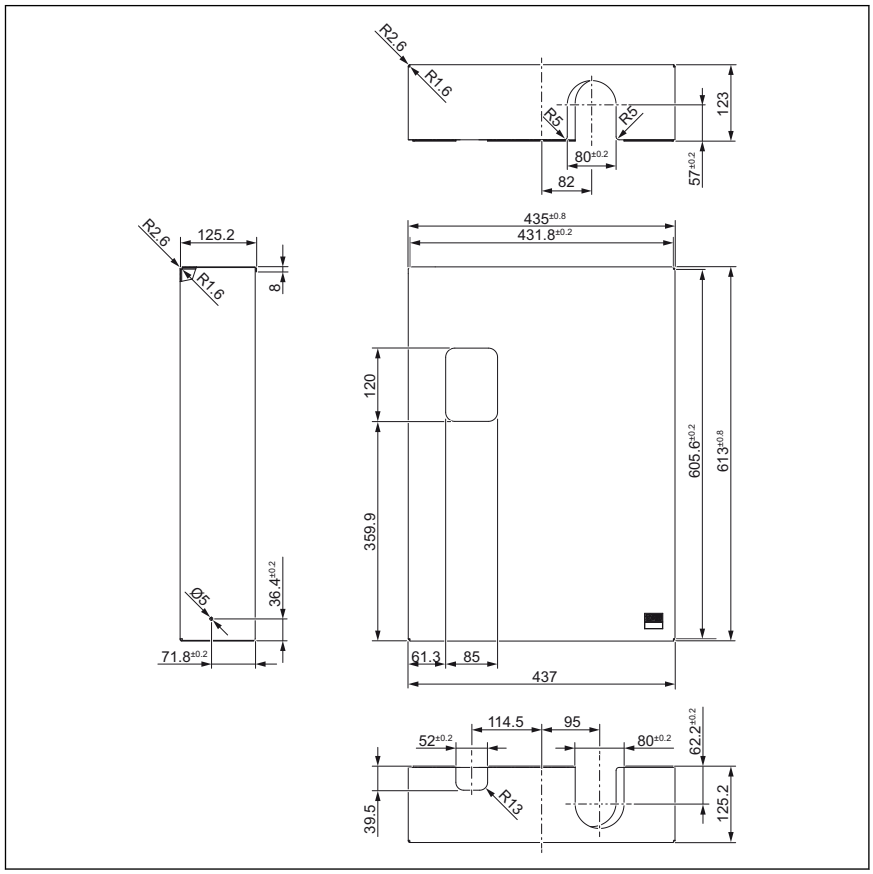


Fig. 15: Dimensions of the wall-mounting cover

3.3 Mounting

3.3.1 Mounting the base

Site protection

The flush valve is delivered pre-assembled and ready for connection. All components are mounted to the base and have been tested for leak tightness and proper function.

The flush valve is delivered packaged in a cardboard box. This box will later be used for protection during the construction phase.

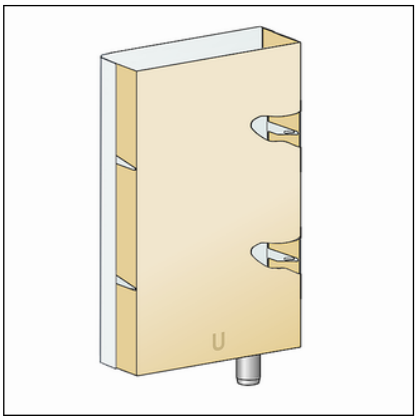


Fig. 16: Protective cardboard box, delivery condition

- Do not remove the cardboard box until you are ready to mount the device.

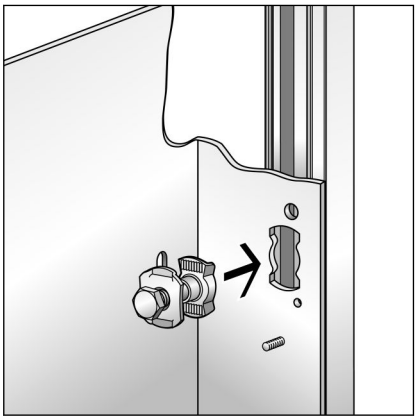
  INFO! Do not damage the cardboard box!

- Put it in a dry and clean space for interim storage. It will be required later.

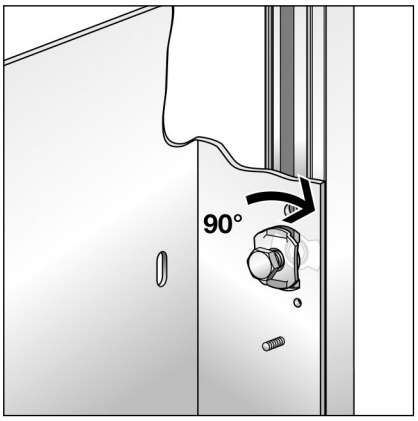
To give you a better view, the base is shown as empty for the following assembly steps.

Viega Steptec

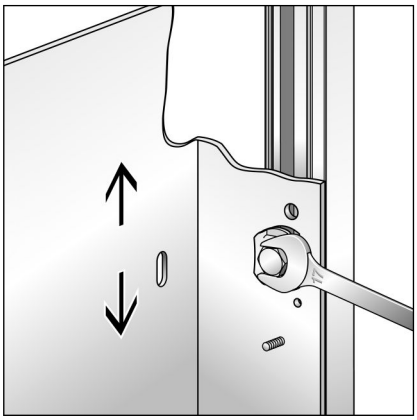
Use Steptec slot nuts model 8437.90 for assembly.



- Push the slot nuts through the cuttings of the base into the open sides of the mounting rail.



- Turn the screws with the slot nuts bei 90° and hand-tighten them.



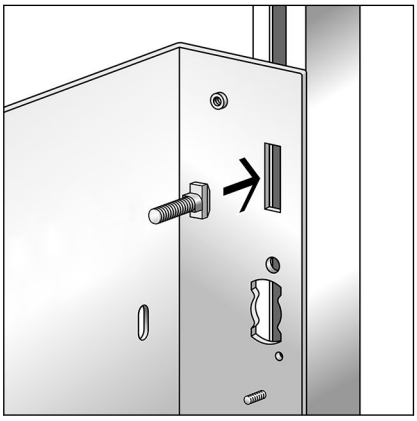
- Align the base using a spirit level, and tighten the screws.

Further see *Chapter 3.3.2 „Connecting the flush valve to the pipeline“ on page 34*.

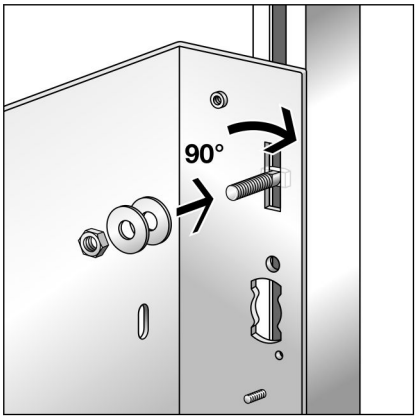
Viegaswift / Viega Eco Plus

The base fits exactly on the Viegaswift and the Viega Eco Plus.

Use hammer head screws model 8013.23 for assembly.

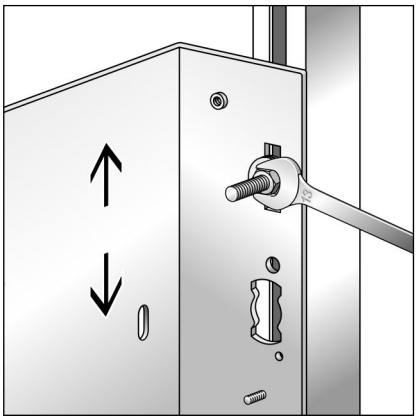


- Push the screws through the cuttings of the base into the rail of the basic element.



- Turn the screws by 90°.
- Place two washers on each screw and use a nut to hand-tighten them.

  INFO! Be sure to use the second washer so that the nut can be tightened properly.



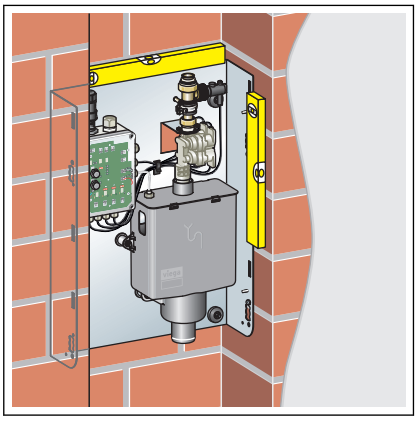
- Align the base using a spirit level.
- Tighten the nut.

Repeat the process for fastening the base at the other side.

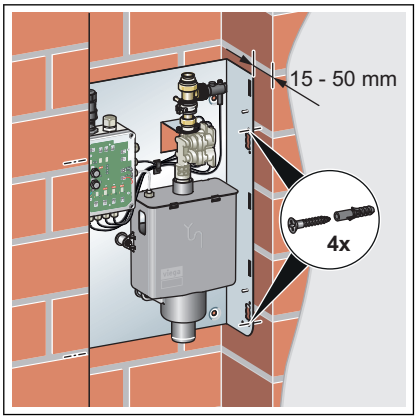
Further see *Chapter 3.3.2 „Connecting the flush valve to the pipeline“ on page 34*.

Concealing mounting

Select the fixing material in accordance with the underground.



- Align the base using a spirit level.



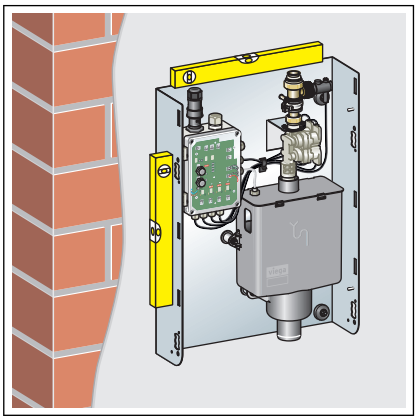
- Mark the positions for the dowel holes.
- Drill holes and insert dowels.
- Put the base on the dowels and hand-tighten the screws.
- Align the base once more using a spirit level, and tighten the screws.

  The distance between the base and the front edge of the finished wall must be 15 to 50 mm. This ensures that the cover can be professionally mounted later.

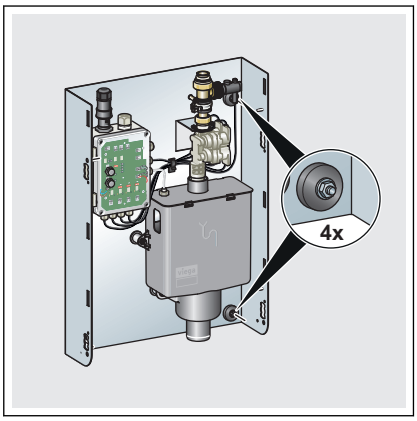
Further see *Chapter 3.3.2 „Connecting the flush valve to the pipeline“ on page 34*.

Wall mounting

Select the fixing material in accordance with the underground.



- Align the base using a spirit level.



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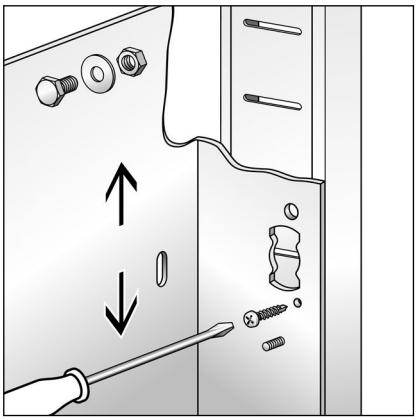
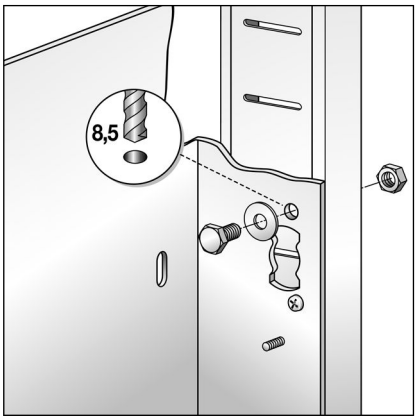
Further see *Chapter 3.3.2 „Connecting the flush valve to the pipeline“ on page 34*.

Dry construction



- Align the base using a spirit level.



- Use suitable fixing material to fastened the base to the support profile.

Further see *Chapter 3.3.2 „Connecting the flush valve to the pipeline“ on page 34*.

3.3.2 Connecting the flush valve to the pipeline

Installation variants

- For mounting in a ring installation, mount the flush valve with a maintenance shut-off directly at the T-piece with the water flow.
- For mounting in a series inistallation, mount and connect the flush valve as the last consumer.

Maintenance shut-off

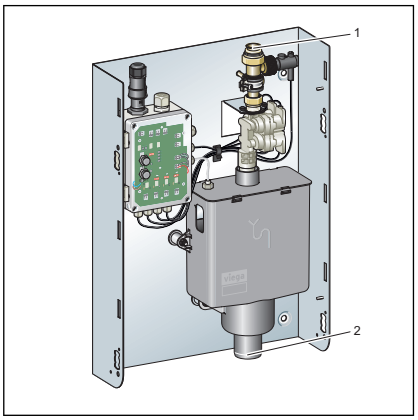
For maintenance purposes, use the following shut-off elements:

- Wall-mounted assembly: Easytop ball valve model 2270.1, DN 25 - EAN 587048 and screw fitting model 2263 - EAN 320256
- Concealed mounting: Easytop slanted seat valve model 2237.1, DN 20 - EAN 457143
- Alternative for concealed mounting: Easytop basic valve model 2137.09, DN 20 - EAN 624217

Connecting the supply and disposal lines

For connecting the siphon to the drainage system, for example the following rules and standards are applicable:

- *DIN EN 12056:2001*
- *DIN 1986-100:2008:05*



- Connect the supply line (1).
- Connect the drainage line (2).
- Up to the next branch into the sewer line, use DN 50 as a minimum.
- Downstream of the branch, extend width to DN 70 as a minimum, depending on the consumer.

There is no need to install another siphon.

Backflow

The device is equipped with an overflow detection sensor. In case of a backflow, ongoing flushing operations are aborted, pending flushing operations are not started. After a backflow, it is mandatory that you reset the control; without a reset, there will be no more water exchange. To reset, press the „Reset“ button.

NOTICE!

In case of an external backflow, wastewater leakage over the free discharge area cannot be avoided. Take appropriate measures.

3.3.3 Connecting electrical components

The device has the following electrical components:

- Mains plug for power supply
- Control unit for the flush valve
- Terminals for connection to external sensors for operating / alarm messages

DANGER!
Risk of electric shock

An electric shock can lead to burns and serious injury and even death. Only allow electrical work to be carried out by qualified electricians.

- Work on the electrics may only be carried out by trained electricians.
- De-energise the connection line before connecting the mains plug.

For safety reasons, pull the mains plug before you open the cover.

Control connections

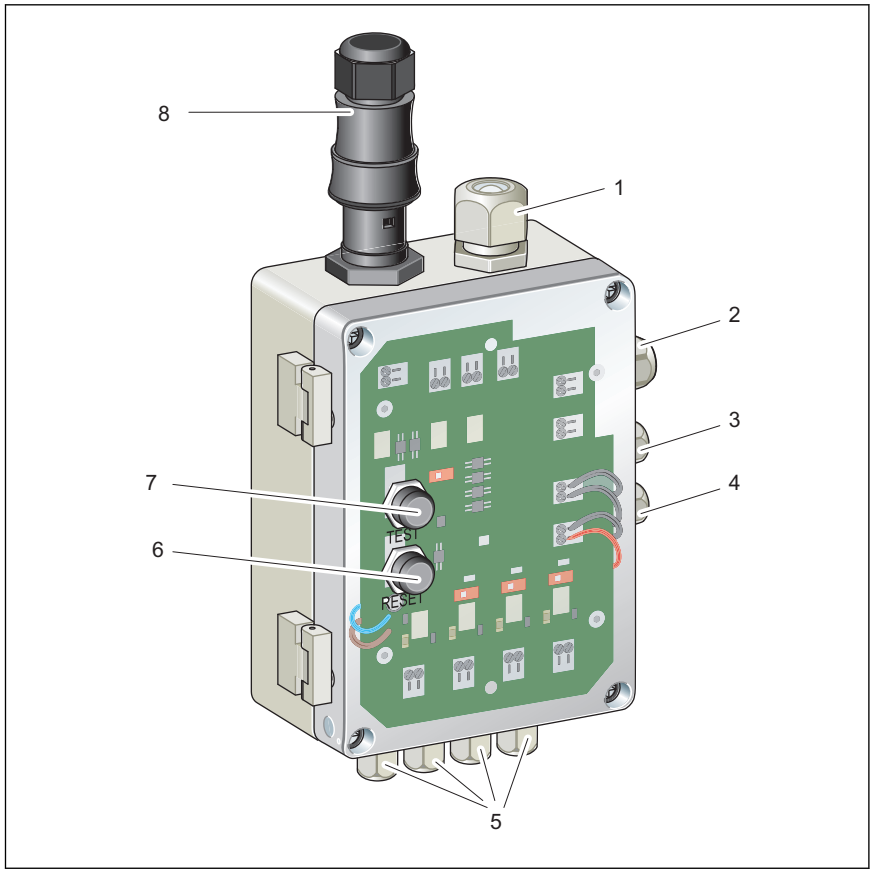


Fig. 17: Overview of control

1 - Bush (flush command input and event signaling outputs)
2 - Bush (flush command voltage and signalling output 4–20 mA)
3 - flow switch bush
4 - backflow sensor bush
5 - magnet valves bushes
9 - reset button backflow
10 - test button test flushing
11 - connection for 230 V power supply

The device is delivered with all components connected.

Connecting the mains plug

DANGER!
Risk of electric shock

- Work on the electrics may only be carried out by trained electricians.
- De-energise the connection line before connecting the mains plug.

NOTICE!
The power pack is intended exclusively for use in closed rooms with the flush valve model 2243.10.

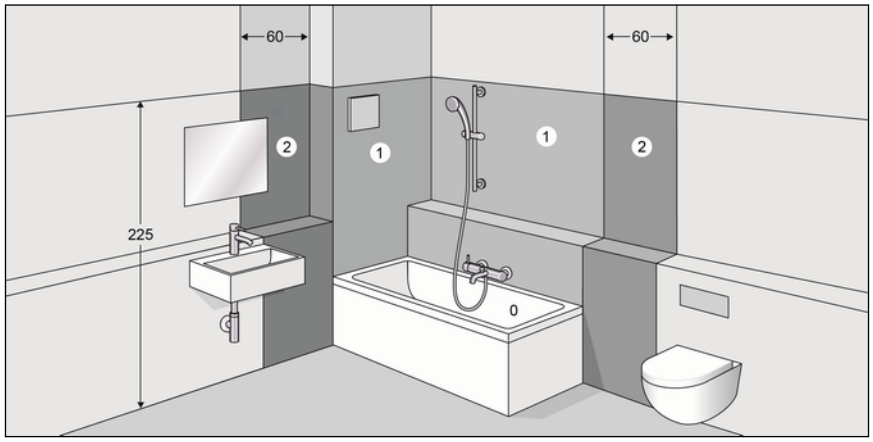
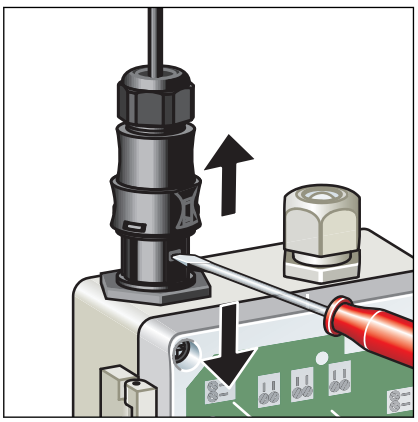


Fig. 18: Protected zones according to VDE 0100 part 701

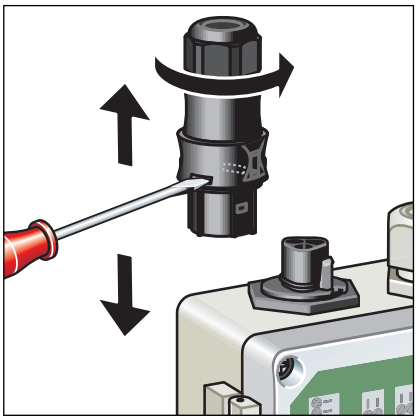
Requirements:

- A 230 V mains connection is available on site.
- According to VDE 0100 part 701, installation in the protected zones 0 and 1 of shower rooms and bathrooms is not permitted.
- According to VDE 0100-520, connection to the 230 V mains plug is permissible only with flexible line.

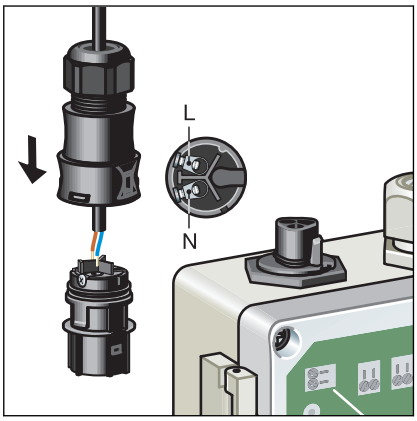
On delivery, the mains plug is at the control.



➥ Use a small screwdriver to press down the lock in the middle, and remove the plug.

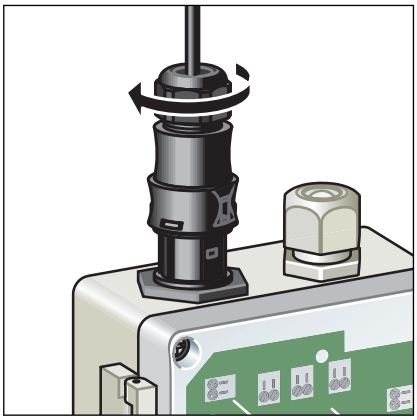


- Press down the locks at the side one after the other, and push up.
- Pull the top apart.



- Unscrew the strain clamp and push on the connection pipeline.
- Push the top into the connection pipeline.
- Connect the leads to the terminals.
  - N = blue
  - L = brown or black

  You do not need a PE conductor.



- Combine the halves of the connector.
- Hand-tighten the strain clamp.
- Return the connector to the power pack.
  - ⇨ You have connected the mains plug.

Connecting the external sensor

See *Fig. 6* - Connecting the external sensor to position 8.

For connecting the sensor outputs and inputs, use lines with an external diameter of max. 13 mm (cable inlet 1) or max. 10 mm (cable inlet 2). We recommend to use shielded lines for signal transmission.

Recommended line types:

- Cable inlet 1: 4 x 2 x 0.5 mm^2
- Cable inlet 2: 2 x 2 x 0.5 mm^2

The maximum length of the line is 50 m for 2 x 0.5 mm^2.

The following functions can be set by means of potencial-free contacts:

- Message: Operating / fault
- Message: Water exchange ongoing
- Message: Backflow
- Message: Active valve runs / setting of flowthrough volumes

The maximum length of line is 50 m with 2 x 0.5 mm^2.

3.3.4 Flushing the valve

Before commissioning, the system must be flushed according to the ZVSHK Data sheet.

Fill the installation with drinking water immediately before startup.

Perform a leakage test with compressed air or inert gases.

Flushing

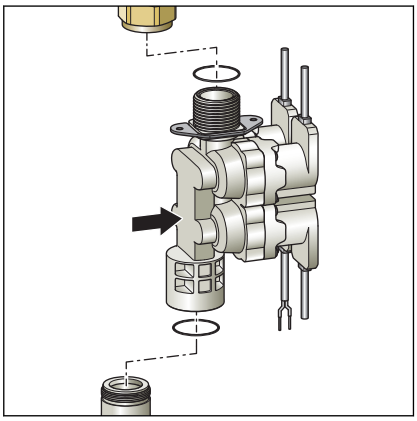
- Open the maintenance shut-off.
- Flush the water pipe section.

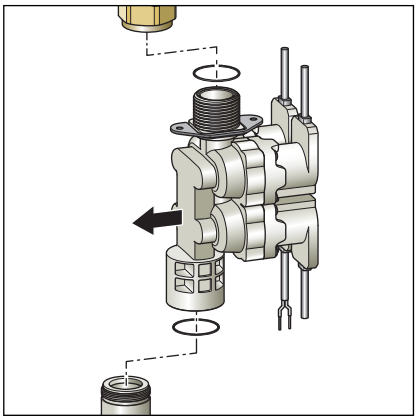
  For information on proper flushing in drinking water installations, see the ZVSHK Data sheet *"Flushing, disinfecting and commissioning of drinking water installations"*.
- Close the maintenance shut-off again.

Cleaning the sieve (if required)

CAUTION! Risk of burning due to hot magnetic coils! After prolonged water exchange, the magnet coils get hot. Do not touch them.

- Close the maintenance shut-off.
- Remove the magnet valve and the seals (SW 30).
- Clean the sieve and put the seal aside.





- Re-install the magnet valve with the old seal (SW 30). Note the tightening torque of the union nuts: max. 8 Nm.

  NOTICE! Risk of damage to magnet valve! Do not forget to put the sieve back in again to avoid damage to the valve due to dirt particles!

- Fill and flush the system.

3.3.5 Manual functional test

Description

We recommend to do a manual functional test after completion of installation or in case of fault.

At the start of the functional test, only the central LED emits light (*„Function“*). The following components are queried:

- Magnet valve
- Flow switch
- Backflow sensor

Execution

Flushing with all four sections must take place correctly, without backflow and with indication that flowthrough is present.

- Enable all four valves (= delivery state).
- Check the proper connection of drinking water and wastewater.
- Press the Test button and keep pressed until all four valve sections are open (LED indication).
  - ⇨ The flowthrough indicator emits light, the backflow indicator does not light up.
- Release the Test button.
  - ⇨ The valves close automatically with a time delay.
- Next, set the valves / flowthrough volume to the correct values.

  In case of malfunction, see *Chapter 3.5.2 „Troubleshooting“ on page 53*.

LED indications

During the test flushing, the LEDs emit light as follows:

- LED *„Function“* emits light permanently
- LED valve 1 lights up.
- LED valve 2 lights up.
- LED valve 3 lights up.
- etc.

- LED *„Throughflow“* lights up.
- The light of the LEDs goes out in the same sequence.

LED "Function"

The LED "Function" emits light:

- red - Malfunction is pending, e.g. magnet defective, see *Chapter 3.5.2 „Troubleshooting“ on page 53*.
- green – Normal operation

3.3.6 Notes on wall installation

After mounting, be sure to place the protective cardboard box back over the device.

It fulfills the following functions during the construction phase:

- It protects the flush valve from damage and dirt.
- The next technical crews (e.g. dry construction, tilers) must work up to the outer edges of the protective cardboard box.

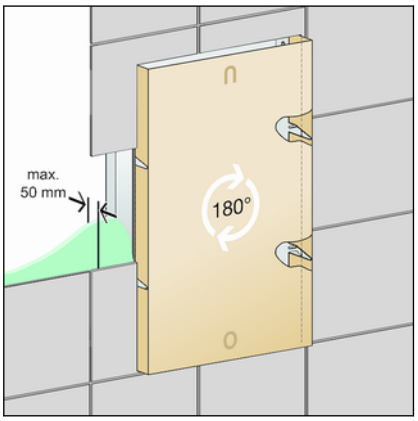


Fig. 19: Protective cardboard box

▶ Rotate the protective cardboard box by 180° (sits tighter this way) and place it over the device.

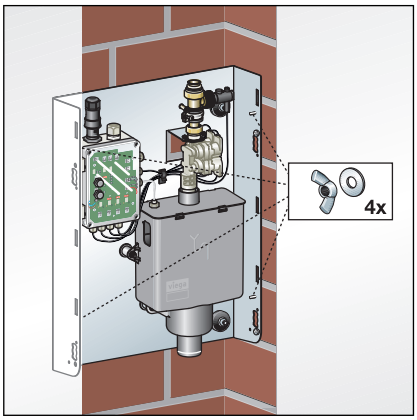
⇨ The protective box ensures that the internal area of the base will not be obstructed and that there will be no problems with the subsequent installation of the concealed-mounting cover.

Make sure the next technical crews are aware of the following conditions:

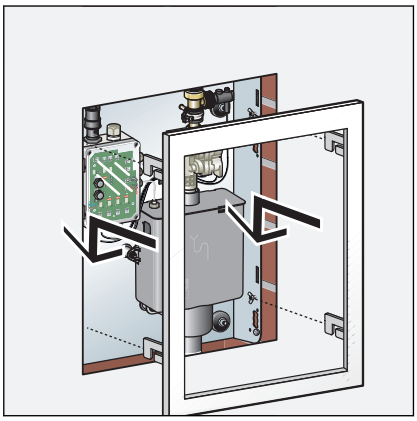
- *The next wall installations (dry construction, plastering and tiling work) must not proceed beyond the protective cardboard box.*
- *The wall installation from the front edge of the base until the top edge of the finished wall must have a maximum thickness of 50 mm. Otherwise, professional mounting of the concealed-mounting will be impossible.*

3.3.7 Mounting the cover

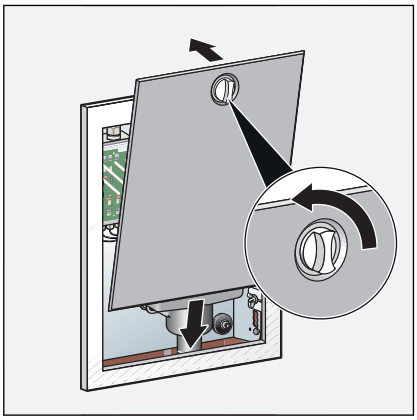
Concealed-mounting cover



- Place the washers on the screw and screw on the wing nuts.

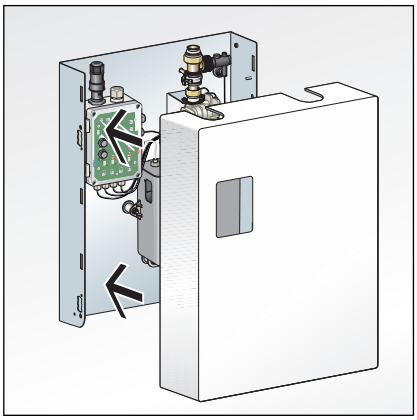


- Insert the frame between the washer and the base.
- Tighten the wing nuts.

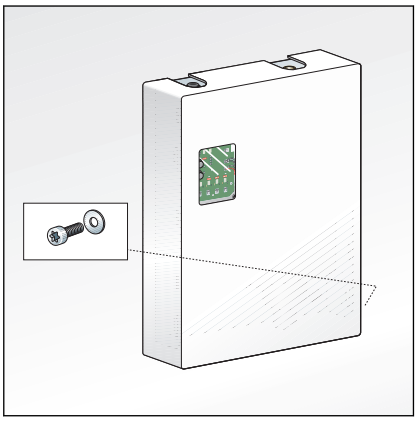


- Insert the lid and close it.

Wall mounting cover



Put the wall mounting cover on.



Fasten the wall mounting cover.

3.4 Commissioning

3.4.1 Leakage test

The qualified craftsman must perform a leakage test (load and leakage test) before commissioning.

For example the following regulations apply:

- DIN EN 806–4
- ZVSHK Data sheet *"Leakage tests of drinking water installations with compressed air, inert gas or water"*

Carry out this test on a unit that is finished but not yet covered.

We recommend to use compressed air or inert gas for the leakage test.

The result must be documented.

3.4.2 Configuring the control

Valve flushing is the only function which can be switched on and off at the flush valve (factory setting is *„On“*, i.e. all valves are opened once for 10 s every 72 hours (time-delayed cycle: 1.5 s for open, 1.5 s for closed). This provides for a complete exchange of the water contained in the valve; blocking of the magnet valve or its four valve sections is prevented.

Switching valve flushing on and off

- To switch on, set the switch *„3d / 10s“* in the control to position "On".
- To switch off, return the switch to its original position.

Setting the flush volume

Specify the flush volume by setting the number of valves which open during flushing, and by the period of time for which the flush command is applied (e.g. via BCS).

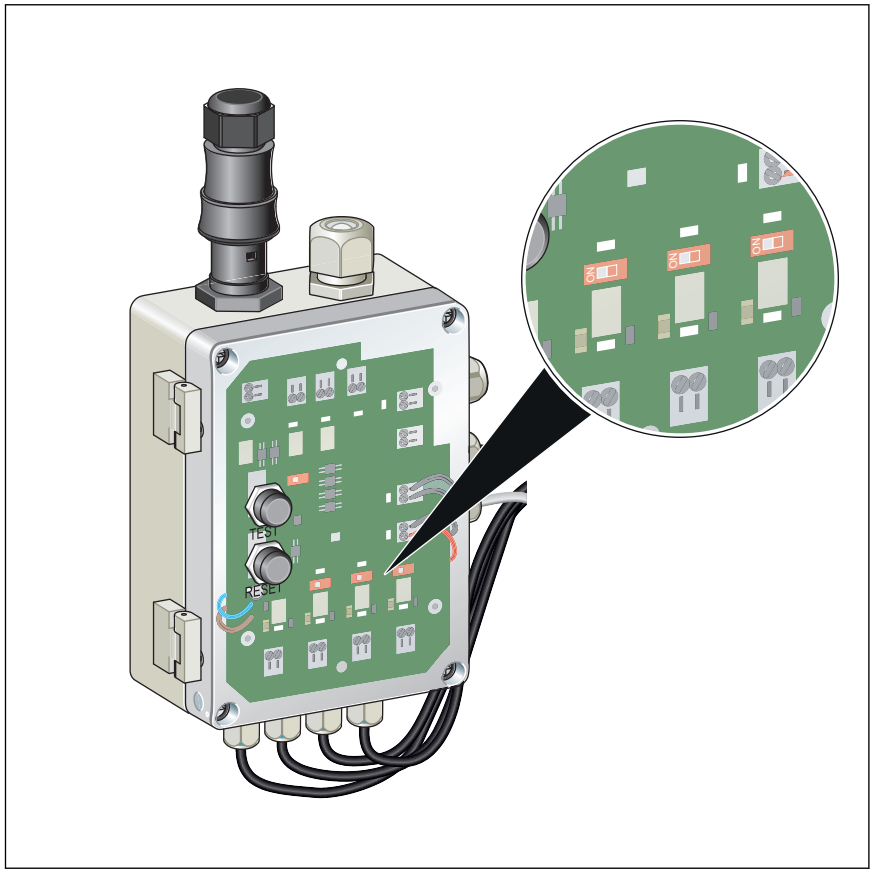


Fig. 20: Control - switch position ON

Recommended setting

Volume flow l/min	Dimensions (DN)
12	12–25
24	32–40
35	50–65
45	80

Flowthrough volumes at flow pressure 0.3 MPa (3 bar)

Period of time in minutes	Period of time in seconds	Valve 1 litre	Valve 1+2 litres	Valve 1-3 litres	Valve 1-4 litres
-	5	1	2	3	4
-	10	2	4	6	8
-	15	3	6	9	11
-	20	4	8	12	15
-	25	5	10	15	19
0.5	30	6	12	18	23
-	35	7	14	20	26
-	40	8	16	23	30
0.75	45	9	18	26	34
-	50	10	20	29	38
-	55	11	22	32	41
1	60	12	24	35	45
-	70	14	28	41	53
-	80	16	32	47	60
1.5	90	18	36	53	68
-	105	21	42	61	79
2	120	24	48	70	90
-	135	27	54	79	101
-	150	30	60	88	113
3	180	36	72	105	135
-	210	42	84	123	158
4	240	48	96	140	180
5	300	60	120	175	225
6	360	72	144	210	270
7	420	84	168	245	315
8	480	96	192	280	360
9	540	108	216	315	405
10	600	120	240	350	450

The flowthrough volumes are defined by the period of time for which the flush command or floating contact is applied, or by analog voltage from the external control.

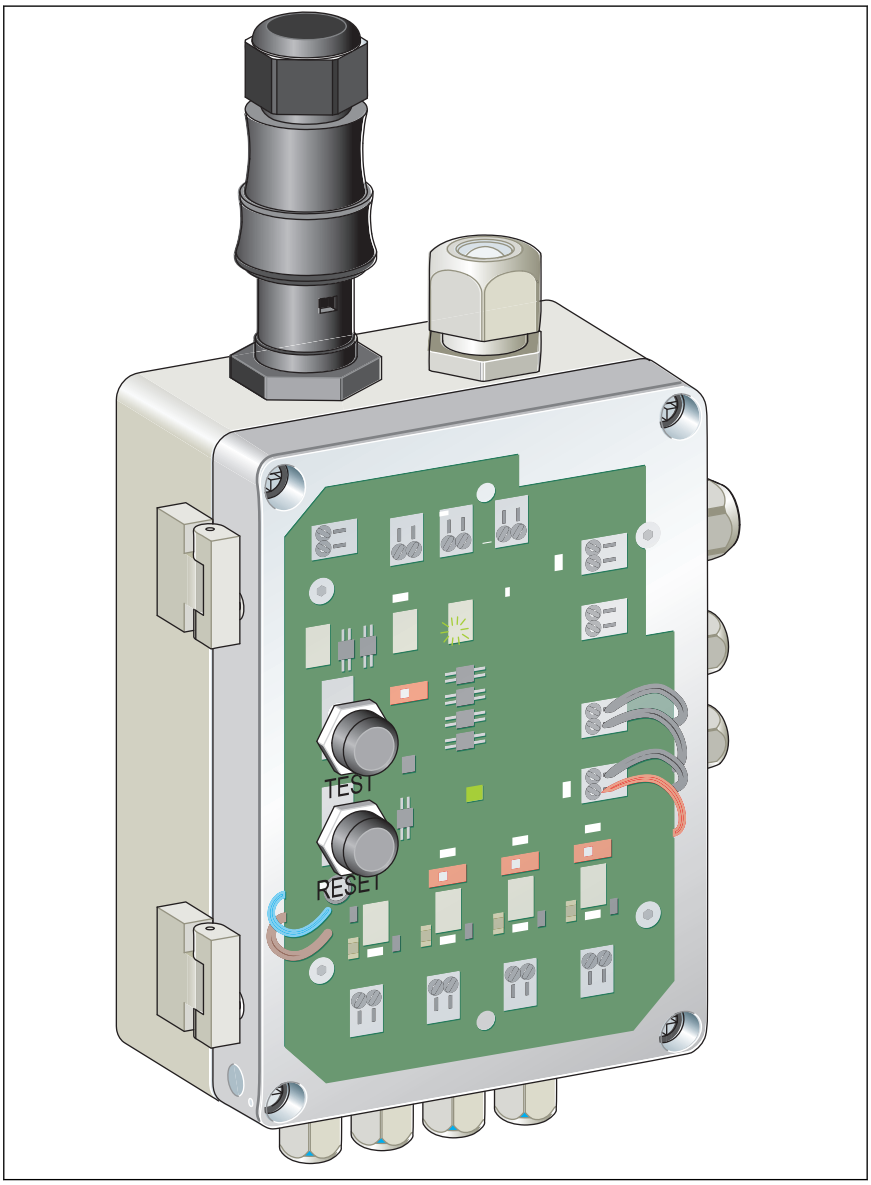
3.5 Faults, faults and remedy

3.5.1 Visible faults and LED Indications

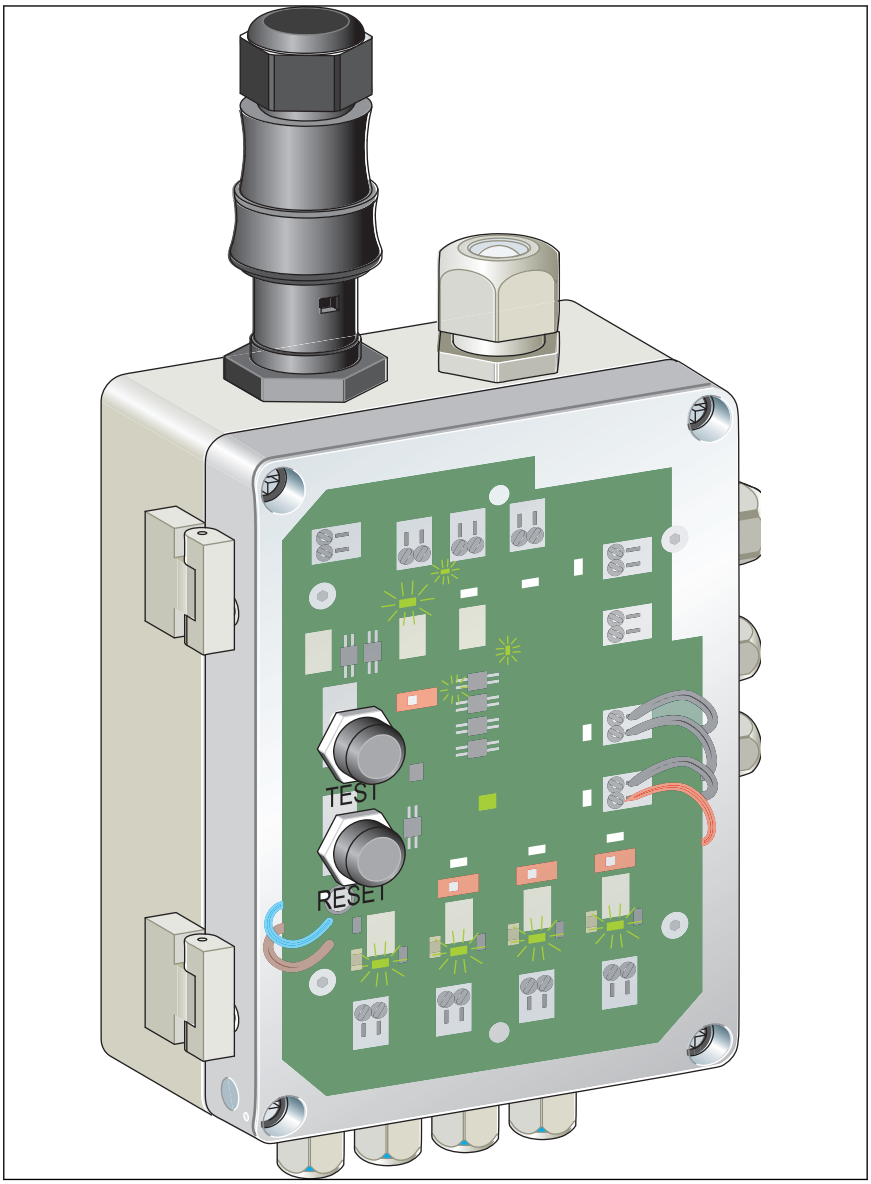
Faults can be visible in the form of:

- Leaking water
- Reactions from connected external sensors
- Evaluation of the signal outputs in the BCS
- LED indications at the control

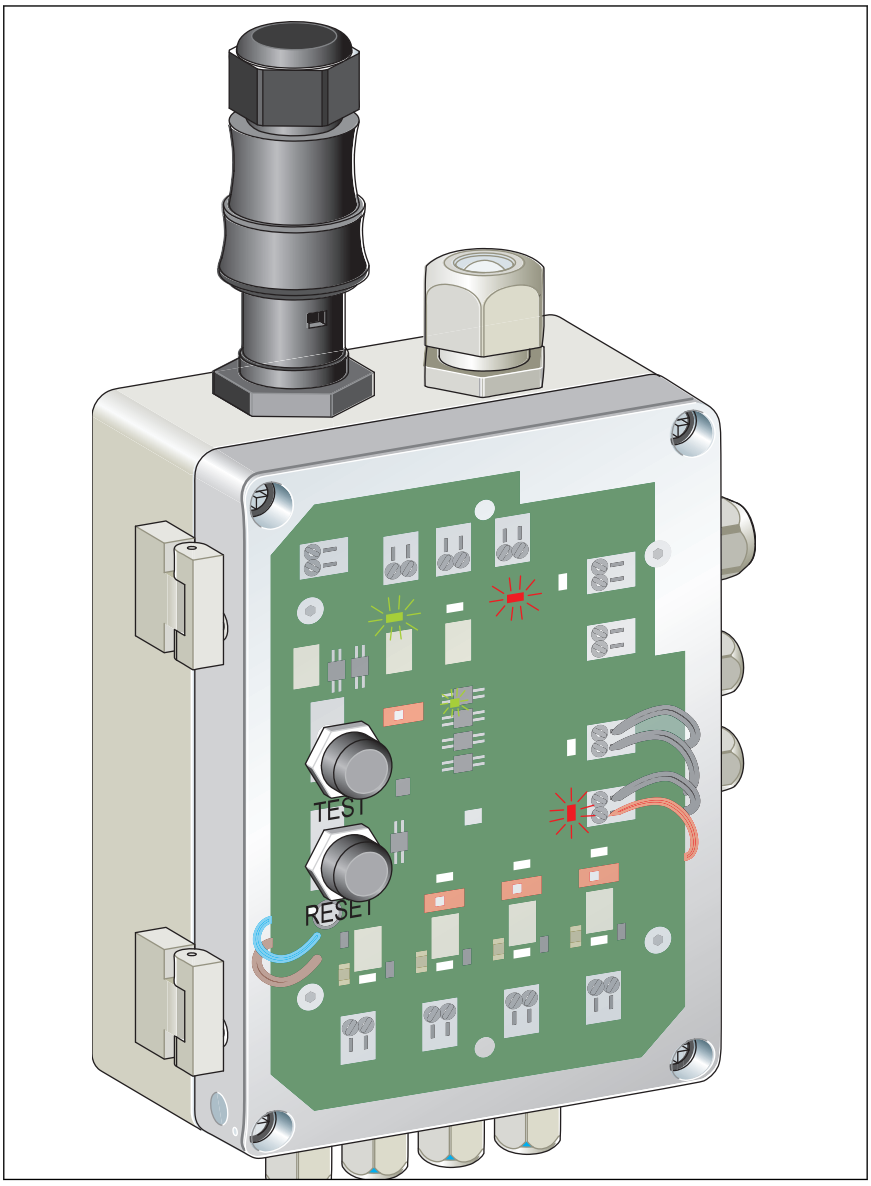
Normal operation – standby



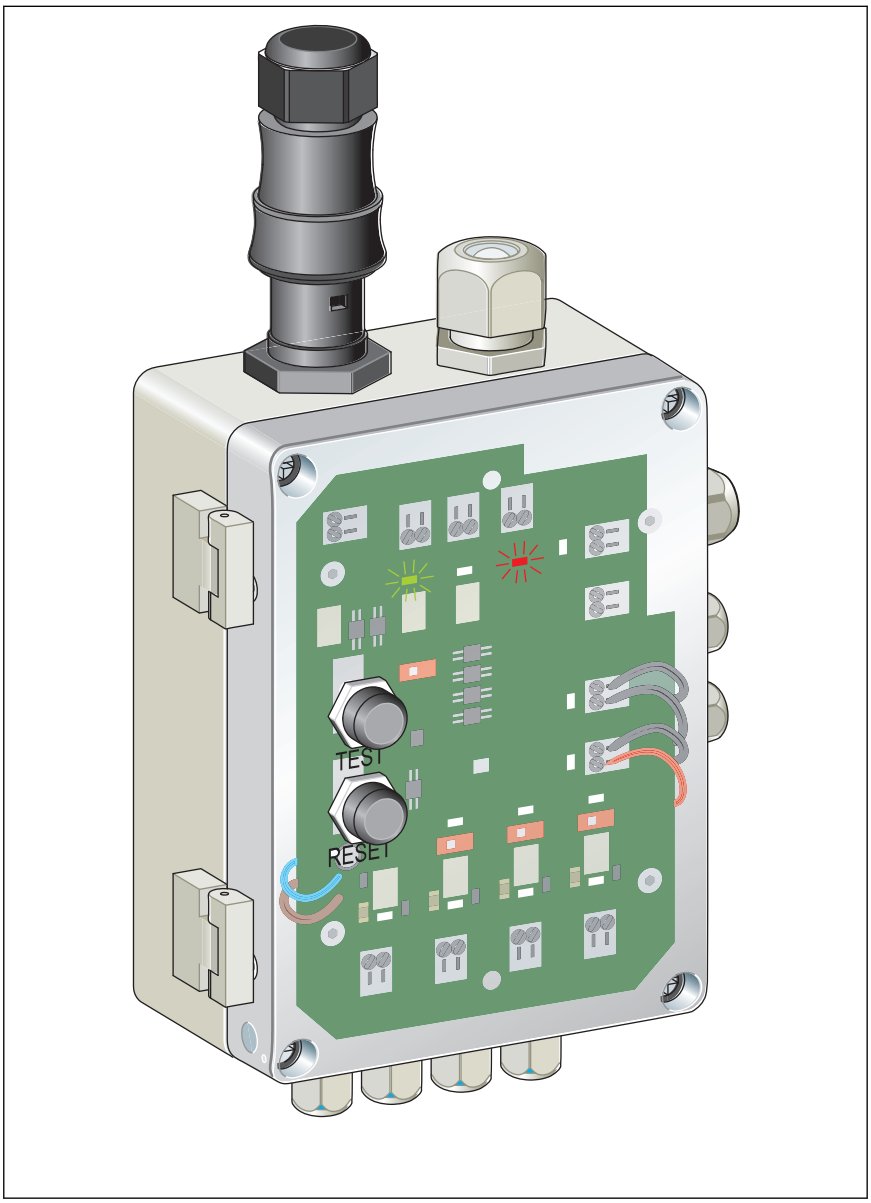
All LEDs emit green light – All functions are operating properly



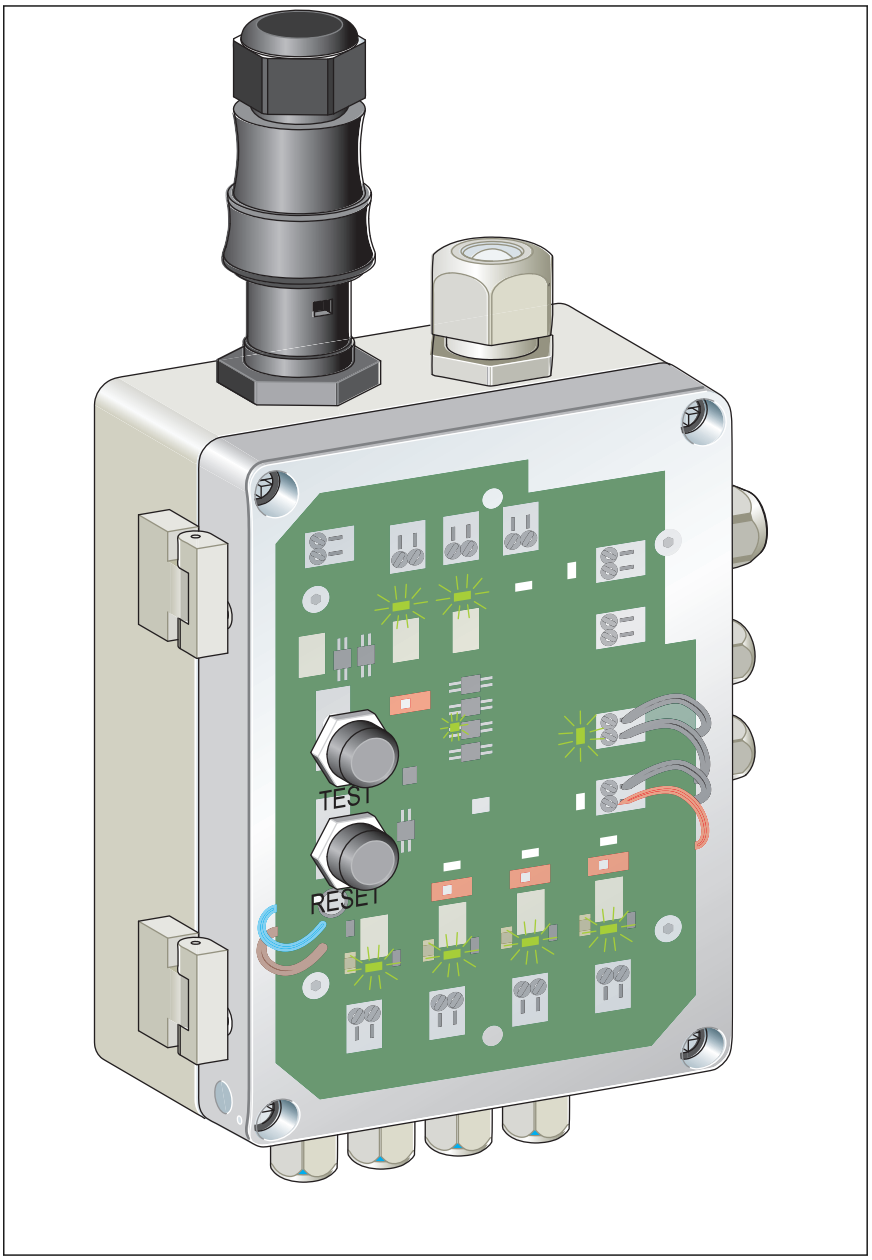
Two red LEDs – backflow



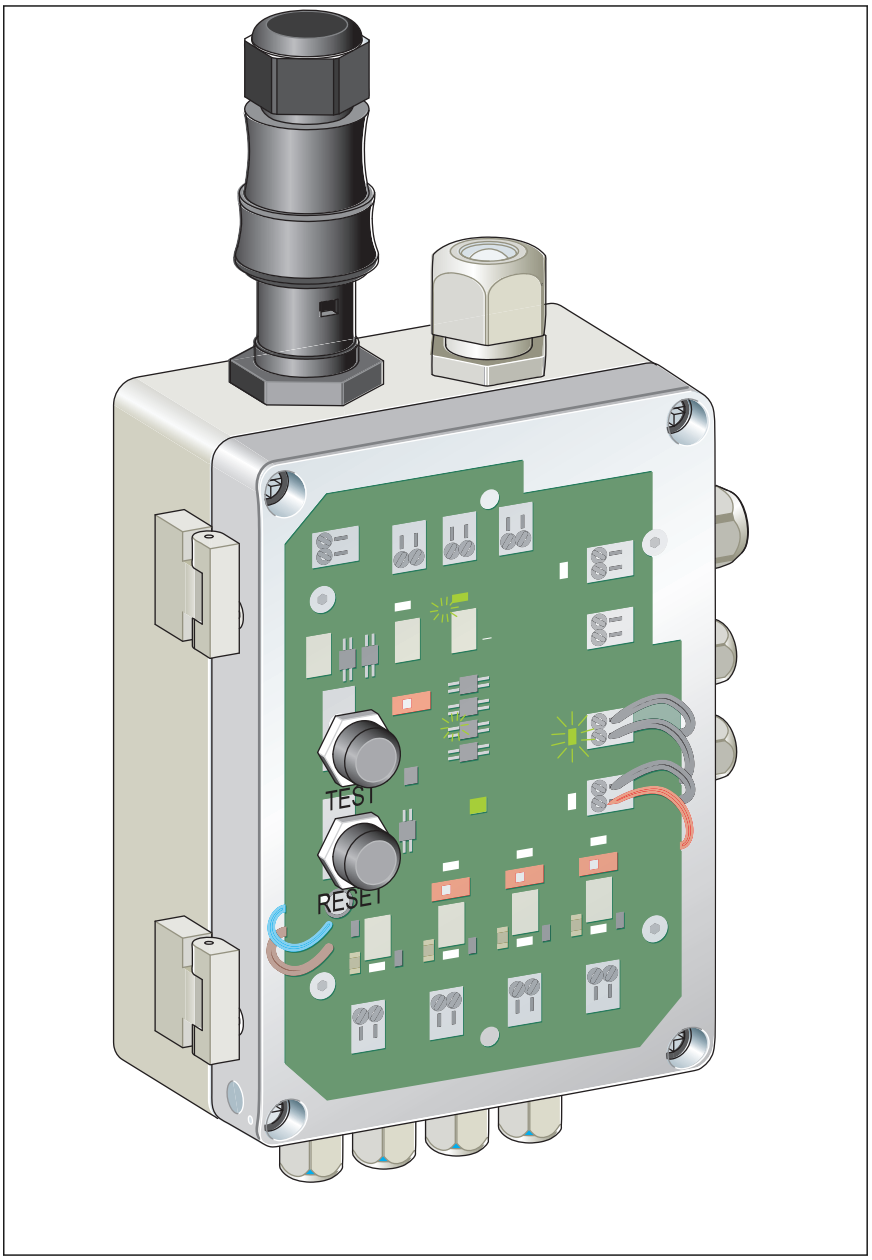
Red light now only from top right LED – backflow remedied but Reset has not been pressed / executed yet



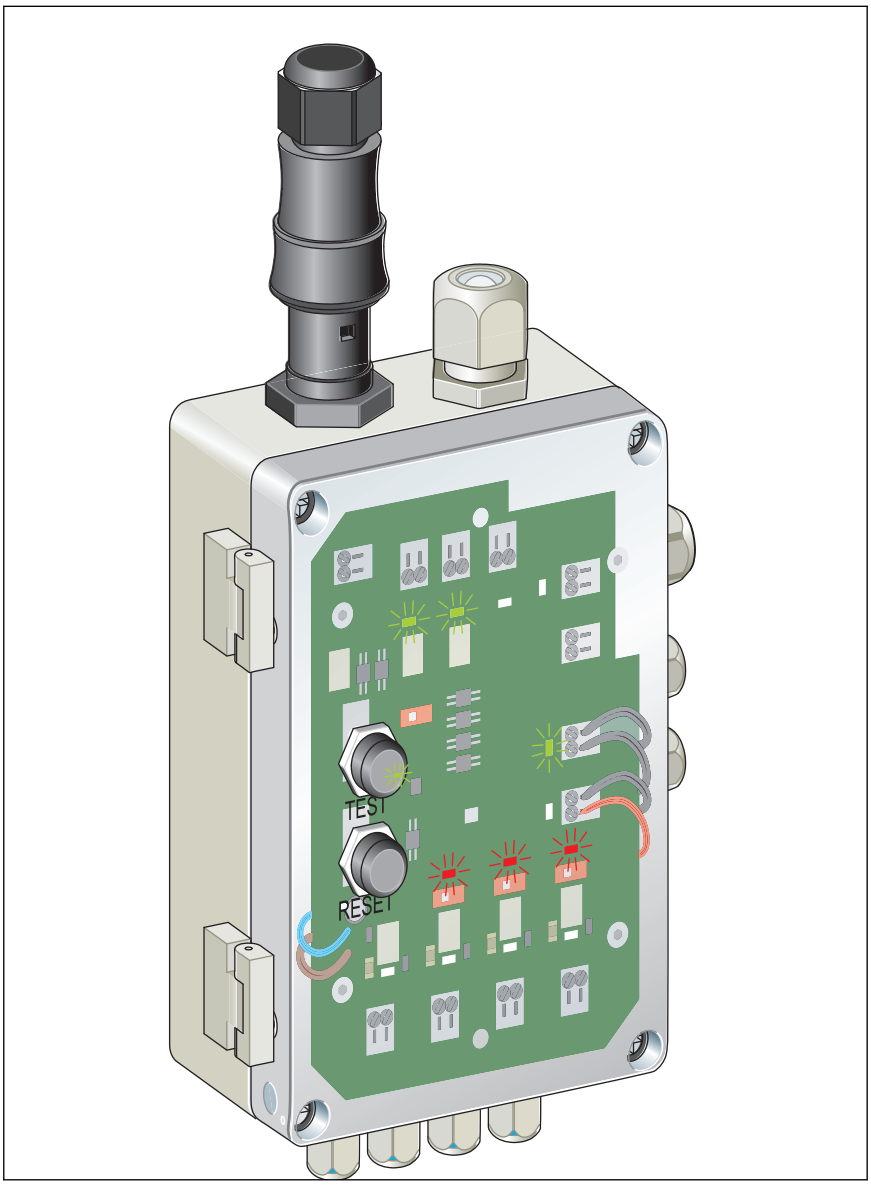
All LEDs emit green light – Flush command has been applied, water is flowing



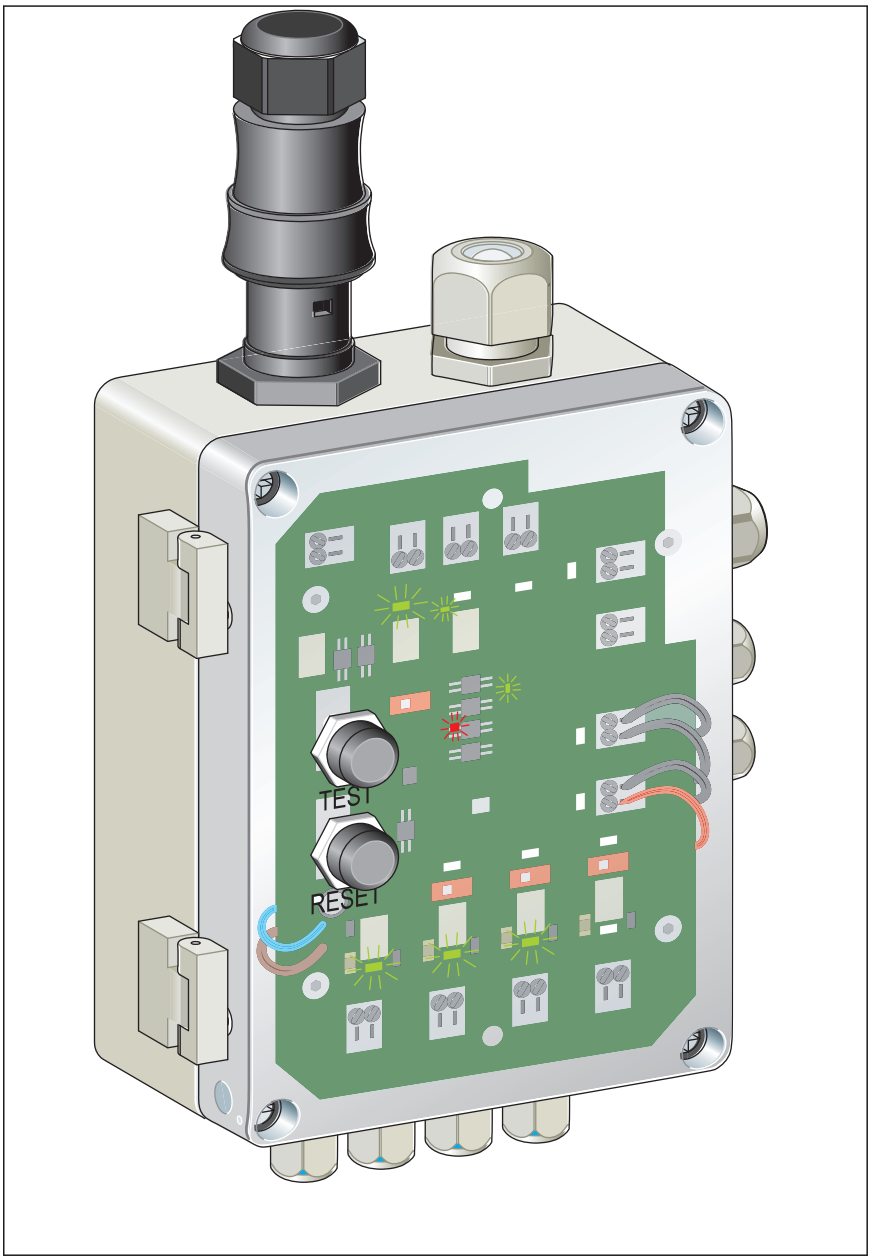
Green light now only from one LED each top, right, centre – No flush command, water is flowing



Green light only from one bottom LED, red light from 3 LEDs – only one valve / flush section enabled, water is flowing



LED "Function" red LED – Fault



3.5.2 Troubleshooting

Error	Cause	Result
"Alarm" message	No power supply to control	Check or establish power supply
	Magnet valve defective	Check magnet valve, replace if applicable
	Short-circuit at magnet valve	Check magnet valve, replace if applicable Check the connection

Error	Cause	Result
	Magnet valve not or not properly connected	Check or establish connection
Message / indication "Backflow"	Water does not run off, drain is clogged	Clean the sewer line, remove the cause
	Sewer line dimensioned too small	Adjust the dimension
	Mount an additional siphon in the drain downstream of the flush valve	Remove the siphon
(Test) flushing process is not carried out	Backflow	Remove the cause (see above)
	Floating switch defective or not properly connected	Check the floating switch, replace if necessary (see Maintenance / repair)
	No power supply	Check or establish power supply
	Control defect	Check and if applicable replace control
	Magnet valve defective	Check magnet valve, replace if applicable
	Output "Flushing ongoing" not properly connected	Check the output "Flushing ongoing"
	External flushing command (floating or voltage) not properly connected	Check the connection and the terminal -> jumper the terminal at the control
	Test button for actuation defective	Check and if applicable replace control
	No Reset done after backflow	Check for backflow, press Reset
	External flushing command not parameterized	Set up or check the flushing command at the external (customer-provided) control
	Voltage too high or too low (6–48 V AC/DC)	Check the control voltage, adjust if applicable
Sewer smell at installation site	Siphon leaks	Check the drain Check the seat of the drain socket, replace if necessary
No message "Flushing ongoing" though flowthrough is present	Flow switch defective	Check the flow switch, replace if necessary
	Flow switch set to wrong flow direction	Check the flow switch -> observe flow direction
	Flow switch not properly connected (control)	Check or establish connection
	Insufficient flowthrough	Sieve in magnet valve is clogged. Clean sieve

Error	Cause	Result
		Insufficient pressure (min. 0.1 MPa (1 bar) flow pressure). Increase pressure
	Air in the line	Vent the line
	Control defect	Check and if applicable replace control
Message "Flowthrough (4–20 mA)" no signal	Terminal not properly connected	Check or establish the connection
	Connection pipeline too long	Length of connection pipeline max. 50 m with 0.5 mm^2; or choose larger cross section
Message "Flushing ongoing" without flush command	Magnet valve leaks or does not close	Check magnet valve, clean or replace if necessary
	Magnet valve does not close, pressure too high	Lower the pressure; install pressure reducer if necessary. Operating pressure: max 0.8 MPa (8 bar)
	Flow switch blocked	Check the flow switch, clean or replace if necessary
	Flow switch defective / short-circuit	Replace the flow switch
	Hygiene flushing interval every 3 days for 10 s – no malfunction	Consider the safety function of the control in the evaluation done by an external control
Leaking water	Backflow with water leaks	Remedy the backflow

3.6 Care and maintenance

3.6.1 General notes

To ensure proper functionality, the flush valve must be inspected once per month and maintained once per year, see *Chapter 3.6.3 „Perform maintenance“ on page 56*.

If it is connected to a building control system, set the BCS in such a way to provide for checks of the regular water exchange in the respective pipeline section, see *„Connecting the external sensor“ on page 38*.

This guarantees the smooth operation and proper functionality of the flush valve. In this way, you prevent stagnation of the water in the connected pipeline sections and any resulting deterioration of the drinking water.

If the flush valve is not connected to a building control system or another higher-level control, you need to carry out an additional inspection once per week.

3.6.2 Carrying out inspections

Weekly inspection

The weekly inspection is required if the flush valve is not connected to a building control system or another higher-level control.

Interval	once per week
Carried out by	Skilled technician / instructed user

- Visually check the control indications.
- If faults are indicated: see *Chapter 3.5.2 „Troubleshooting“ on page 53*.
- Carry out a manual functional check: see *Chapter 3.3.5 „Manual functional test“ on page 40*.

Monthly inspection

Interval	once per month
Carried out by	Skilled technician / instructed user

- Carry out a valve check to ensure that flowthrough takes place if the flush command is applied:
  - Check that the valve flushing has been switched off for all three valves, see *Chapter 3.4.2 „Configuring the control“ on page 43*.
  - Switch the flushing process for the individual valves on and off subsequently; check whether you can hear the flow sounds of the individual valve sections.
  - If the test flushing was successful, set the valve flushing back to the original settings. If not successful, see *Chapter 3.5.2 „Troubleshooting“ on page 53*.
- Visually check the flush valve, the supply and drain line, and the cable connections for leaks and damage.

3.6.3 Perform maintenance

Once per year, carry out a full maintenance and replace defective or seemingly critical components.

Carry out a test flushing as described in *Chapter 3.3.4 „Flushing the valve“ on page 39*.

Use the maintenance set model 2243.14. It comprises all required components.

Replacing the sieve

Possibly, thorough cleaning of the sieve will be sufficient.

CAUTION!
Risk of burning due to hot magnetic coils! After prolonged water exchange, the magnet coils get hot. Do not touch them.

- Shut the water off.
- De-energise the flush valve.
- Disconnect the plug from the control.
- Remove the magnet valve (SW 30).
- Replace the sieve.
- Dispose of the old seal.
- If necessary, replace the flow control.
- Re-install the magnet valve with a new seal. Note the tightening torque of the union nuts: max. 8 Nm.
- Carry out a test flushing.

Replacing the flow control

CAUTION!
Risk of burning due to hot magnetic coils! After prolonged water exchange, the magnet coils get hot. Do not touch them.

- Remove the magnet valve (SW 30).
- Unscrew the flow control.
- Replace the flow control, seal and nut. Screw down the nut of the flow control not more than hand-tight.
- Re-install the magnet valve with the new seal. Note the tightening torque of the union nuts: max. 8 Nm.
- Carry out a test flushing.

Check or release the floating switch

See also *„Replacing the floating switch“ on page 58*.

- Remove the lid, see "Replacing the floating switch".
- Raise the floating switch and check the indication at the control.
- Re-install the lid.
- Carry out a test flushing.
- Press the Reset button in the lid of the control.

Checking the flow switch

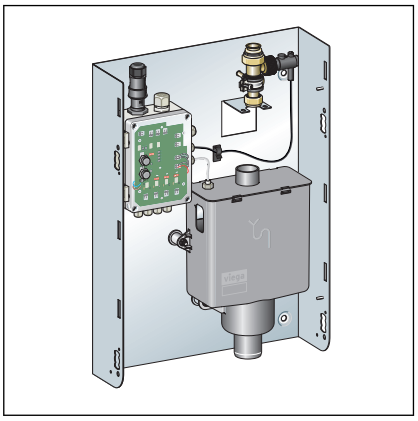
- Press the Test button and keep pressed until the indication "Flow switch" emits light (already with 1 valve).
- Release the Test button.
- Carry out a test flushing.

3.6.4 Repairing

In case of a malfunction, several components may require repairs. In this case, proceed as described in the following:

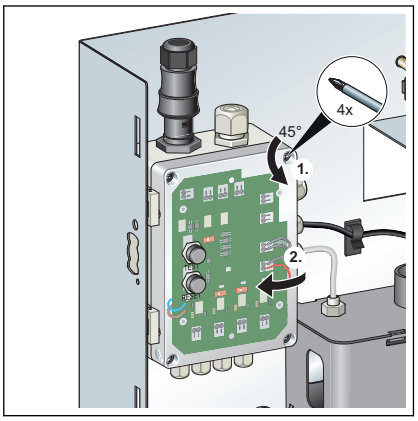
Replacing the floating switch

- Shut the water off.
- De-energise the flush valve.
- Disconnect the mains plug from the control.

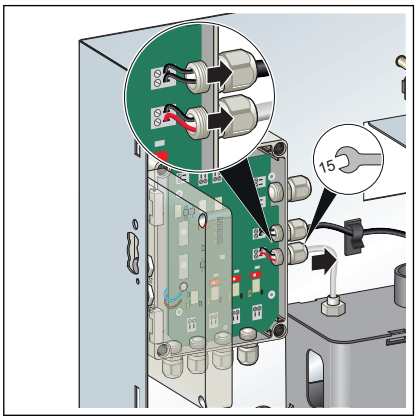


CAUTION! Risk of burning due to hot magnetic coils! After prolonged water exchange, the magnet coils get hot. Do not touch them.

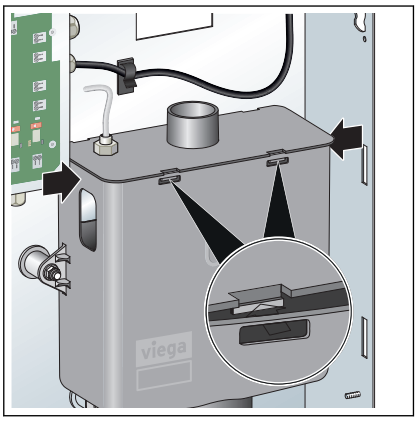
- Remove the magnet valve (SW 30).



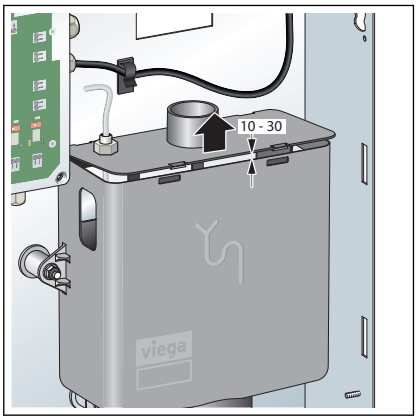
- Use a Phillips-tip screwdriver to remove the lid from the control.



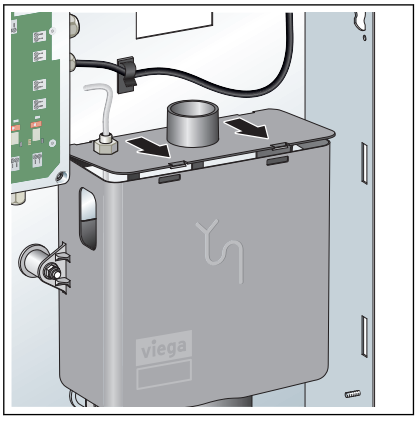
- Disconnect and pull off the connection lines of the floating switch (SW 15).



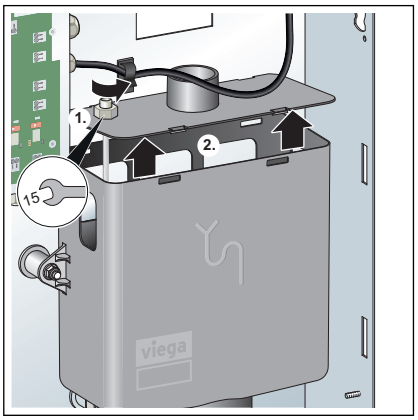
- Compress the top of the siphon lid on both sides with your hands.
  - ⇨ The front lock comes off.



- With your thumb and forefinger, lift the siphon lid by 10–30 mm.



- Slightly pull the lifted siphon lid forward.
  - ⇨ The siphon lid is released from the rear lock.



- Lift the siphon lid and disconnect the cables of the floating switch at the lid (1).
- Check the floating switch (note the indicators) and replace if necessary (2).

- Re-assemble the components in reverse order.

  Screw down the nut of the floating switch not more than hand-tight.
- Carry out a test flushing.

Replacing the control

Before you start, snap a photo or make a drawing of the existing connections or note their arrangement for proper re-installation later on.

- De-energise the flush valve.
- Disconnect the mains plug from the control.
- Open the lid of the control.

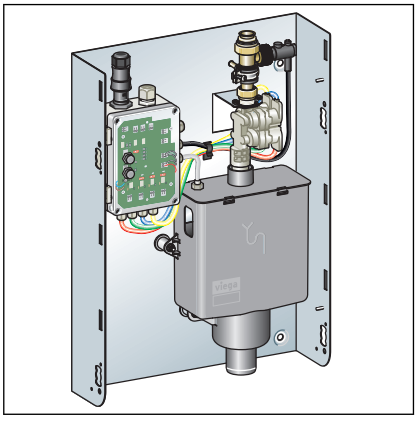


Fig. 21: Kabelverbindungen

- Snap a photo or make a drawing of the existing connections or note their arrangement for proper re-installation later on.

  INFO! Though the connection cables are black in reality, they are shown coloured in the illustration so that you can easily identify the respective connections.

- Disconnect and remove the cables (screw fitting SW 15).
- Unscrew the four fixing screw of the control (Allen key 3 mm) and remove the control.
- Insert and fasten the new control.
- Re-assemble the components in reverse order.

Connections

- Magnet valve coils at the bottom, depending on length
- Floating switch bottom right side
- Flow switch centre right side

Replacing the flow switch

- Shut the water off.
- De-energise the flush valve.
- Disconnect the plug from the control.
- Disconnect and remove the connection line of the flow switch.
- Unscrew the union nut of the flow switch (at the side of the T-piece).
- Replace the flow switch.
- Re-assemble the components in reverse order. Note the tightening torque of the union nut of the flow switch (plastic): max. 8 Nm.

Replacing the siphon

- Shut the water off.
- De-energise the flush valve.
- Disconnect the plug from the control.
- Disconnect and pull off the connection line of the floating switch.
- Use a 10 mm fork spanner to unscrew the four nuts.
- Replace the siphon.
- Re-assemble the components in reverse order.

Replacing the magnet valve

- Shut the water off.
- De-energise the flush valve.
- Disconnect the plug from the control.
- Disconnect and pull off the connection lines of the magnet valve coils (4 pcs.).

  CAUTION! Risk of burning due to hot magnetic coils! After prolonged water exchange, the magnet coils get hot. Do not touch them.
- Unscrew the union nut of the magnet valve (SW 30).
- Unscrew the 2 Allen screws (3 mm).
- Replace the magnet valve.
- Use a new seal.
- Re-assemble the components in reverse order. Note the tightening torque of the union nut: max. 8 Nm.

3.6.5 Care

Clean the components if necessary. Only use a damp cloth.

Never use chemicals to clean the device!

3.7 Disposal

Separate the product and packaging materials (e. g. paper, metal, plastic or non-ferrous metals) and dispose of in accordance with valid national legal requirements.