



BSI Standards Publication

Specifications for installations inside buildings conveying water for human consumption

Part 5: Operation and maintenance

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National foreword

This British Standard is the UK implementation of EN 806-5:2012. Together with BS EN 806-1:2000, BS EN 806-2:2005, BS EN 806-3:2006 and BS EN 806-4:2010, it supersedes BS 6700:2006+A1:2009, which will be withdrawn on 01 August 2012.

The UK participation in its preparation was entrusted to Technical Committee B/504/2, Water Supply - Internal systems and components.

A list of organizations represented on this committee can be obtained on request to its secretary.

Users of this standard should note that there will be a short period of co-existence between BS 6700:2006+A1:2009 and the BS EN 806 series, to assist UK industry with the transition from BS 6700 to the BS EN 806 series of standards. In addition, BS 8558:2011 has been published to be read in conjunction with the BS EN 806 series.

BS 8558:2011, *Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Complementary guidance to BS EN 806*, incorporates parts of BS 6700:2006+A1:2009, *Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Specification*, as they are not detailed in the BS EN 806 series of standards.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Specifications for installations inside buildings conveying water for human consumption - Part 5: Operation and maintenance

Spécifications techniques relatives aux installations d'eau
destinée à la consommation humaine à l'intérieur des
bâtiments - Partie 5: Exploitation et maintenance

Technische Regeln für Trinkwasser-Installationen - Teil 5:
Betrieb und Wartung

This European Standard was approved by CEN on 19 November 2011.

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Foreword

This document (EN 806-5:2012) has been prepared by Technical Committee CEN/TC "Water supply", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document is intended for the use of engineers, architects, surveyors, contractors, installers, water suppliers, consumers and regulatory inspectors.

This standard has been written in the form of a practice specification. It is the fifth part of the European Standard "Specifications for installations inside buildings concerning water for human consumption" consisting of five parts as follows:

- *Part 1: General;*
- *Part 2: Design;*
- *Part 3: Pipe sizing — Simplified method;*
- *Part 4: Installation;*
- *Part 5: Operation and maintenance.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies requirements and gives recommendations for the operation and maintenance of potable water installations within buildings and for pipework outside buildings but within the premises in accordance with EN 806-1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references the latest edition of the referenced document (including any amendments) applies.

EN 806-1:2000, *Specifications for installations inside buildings conveying water for human consumption — Part 1: General*

EN 806-2, *Specifications for installations inside buildings conveying water for human consumption — Part 2: Design*

EN 806-4:2010, *Specifications for installations inside buildings conveying water for human consumption — Part 4: Installation*

EN 1487, *Building valves — Hydraulic safety groups — Tests and requirements*

EN 1488, *Building valves — Expansion groups — Tests and requirements*

EN 1489, *Building valves — Pressure safety valves — Tests and requirements*

EN 1490, *Building valves — Combined temperature and pressure relief valves — Tests and requirements*

EN 1491, *Building valves — Expansion valves — Tests and requirements*

EN 1567, *Building valves — Water pressure reducing valves and combination water pressure reducing valves — Requirements and tests*

EN 1717:2000, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 12729, *Devices to prevent pollution by backflow of potable water — Controllable backflow preventer with reduced pressure zone — Family B - Type A*

EN 12897, *Water supply — Specification for indirectly heated unvented (closed) storage water heaters*

EN 13076, *Devices to prevent pollution by backflow of potable water — Unrestricted air gap — Family A - Type A*

EN 13077, *Devices to prevent pollution by backflow of potable water — Air gap with non-circular overflow (unrestricted) — Family A - Type B*

EN 13078, *Devices to prevent pollution by backflow of potable water — Air gap with submerged feed incorporating air inlet plus overflow — Family A, type C*

EN 13079, *Devices to prevent pollution by backflow of potable water — Air gap with injector — Family A - Type D*

EN 13433, *Devices to prevent pollution by backflow of potable water — Mechanical disconnect, direct actuated — Family G, type A*

EN 13434, *Devices to prevent pollution by backflow of potable water — Mechanical disconnecter, hydraulic actuated — Family G, type B*

EN 13443-1, *Water conditioning equipment inside buildings — Mechanical filters — Part 1: Particle rating 80 µm to 150 µm — Requirements for performances, safety and testing*

EN 13443-2, *Water conditioning equipment inside buildings — Mechanical filters — Part 2: Particle rating 1 µm to less than 80 µm — Requirements for performance, safety and testing*

EN 13959, *Anti-pollution check valves — DN 6 to DN 250 inclusive family E, type A, B, C and D*

EN 14095, *Water conditioning equipment inside buildings — Electrolytic treatment systems with aluminium anodes — Requirements for performance, safety and testing*

EN 14367, *Non-controllable backflow preventer with different pressure zones — Family C, type A*

EN 14451, *Devices to prevent pollution by backflow of potable water — In-line anti-vacuum valves DN 8 to DN 80 — Family D, type A*

EN 14452, *Devices to prevent pollution by backflow of potable water — Pipe interrupter with atmospheric vent and moving element DN 10 to DN 20 — Family D, type B*

EN 14453, *Devices to prevent pollution by backflow of potable water — Pipe interrupter with permanent atmospheric vent DN 10 to DN 20 — Family D, type C*

EN 14454, *Devices to prevent pollution by backflow of potable water — Hose union backflow preventer DN 15 to DN 32 — Family H, type A*

EN 14455, *Devices to prevent pollution by backflow of potable water — Pressurised air inlet valves DN 15 to DN 50 — Family L, type A and type B*

EN 14506, *Devices to prevent pollution by backflow of potable water — Automatic diverter — Family H, type C*

EN 14622, *Devices to prevent pollution by backflow of potable water — Air gap with circular overflow (restricted) — Family A, type F*

EN 14623, *Devices to prevent pollution by backflow of potable water — Air gaps with minimum circular overflow (verified by test or measurement) — Family A, type G*

EN 14652, *Water conditioning equipment inside buildings — Membrane separation devices — Requirements for performance, safety and testing*

EN 14743, *Water conditioning equipment inside buildings — Softeners — Requirements for performance, safety and testing*

EN 14812, *Water conditioning equipment inside buildings — Chemical dosing systems — Pre-set dosing systems — Requirements for performance, safety and testing*

EN 14897, *Water conditioning equipment inside buildings — Devices using mercury low-pressure ultraviolet radiators — Requirements for performances, safety and testing*

EN 14898, *Water conditioning equipment inside buildings — Active media filters — Requirements for performances, safety and testing*

EN 15092, *Building valves — Inline hot water supply tempering valves — Tests and requirements*

EN 15096, *Devices to prevent pollution by backflow of potable water — Hose union anti-vacuum valves — DN 15 to DN 25 inclusive Family H, type B and type D — General technical specification*

EN 15161, *Water conditioning equipment inside buildings — Installation, operation, maintenance and repair*

EN 15219, *Water conditioning equipment inside buildings — Nitrate removal devices — Requirements for performance, safety and testing*

EN 15848, *Water conditioning equipment inside buildings — Adjustable chemical dosing systems — Requirements for performance, safety and testing*

EN ISO 3822-1, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 1: Method of measurement (ISO 3822-1:1999)*

EN ISO 3822-2, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 2: Mounting and operating conditions for draw-off taps and mixing valves (ISO 3822-2:1995)*

EN ISO 3822-3, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3:1997)*

EN ISO 3822-4, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 4: Mounting and operating conditions for special appliances (ISO 3822-4:1997)*

3 Terms and definitions

For the purposes of this document, the terms, definitions and graphical symbols given in EN 806-1:2000 and EN 1717:2000 apply.

4 General

Installations shall be operated and maintained in such a manner as to avoid adversely affecting the quality of potable water, the supply to consumers and the equipment of the water supplier.

Installations shall be checked at regular intervals for safety and performance. Appropriate procedures shall be adopted to maintain the performance of the system at the level specified in EN 806-2, EN 1717 and the individual product standards referenced in Annex A.

The system shall be operated in accordance with the original design conditions, e.g. temperature, pressure.

Responsibility for operation, inspection and maintenance is subject to local and national requirements (e.g. qualified personnel).

5 Documentation

In order to enable the correct operation and maintenance, all information relevant to the installation shall be readily available.

Manufacturer's documentation (e.g. Technical Product Information (TPI)) related to the operation and maintenance of appliances shall be available, retained and followed.

The commissioning report shall be part of the documentation.

The maintenance shall be recorded and stored in such a way that the data is auditable.

6 Operation

Installations and appliances shall be operated in such a manner as to ensure their reliable performance. Unless otherwise specified in the relevant operating instructions, the following shall apply:

- Stop valves and servicing valves shall always be in their fully open or closed position and actuated at regular intervals to ensure they remain operational.
- All spare parts shall be readily available and fit for purpose. Original manufacturers' spare parts are preferred.
- Valves and parts, which are subject to noise control requirements, shall only be replaced by valves and parts that are at least acoustically equivalent.
- Draw-off fittings shall not be used to connect hoses, unless suitable backflow protection is provided (see EN 1717).
- The connection of appliances can influence water quality. It is recommended that any connection and modifications are undertaken by suitably qualified personnel.
- The connection of appliances and apparatus (e.g. washing machines and dishwashers) shall be suitably protected against backflow in accordance with EN 1717.
- Hoses (e.g. garden hoses) shall only be connected to draw-off points provided for this purpose which are specifically designed for hose connection and are fitted with suitable backflow protection.
- The air inlet openings of valves (e.g. anti vacuum valves, air gaps) shall not be closed or obstructed and shall be protected against possible flooding or contamination.
- The water contained in parts of the installation that are seldom used (e.g. pipes serving guest rooms, garages or cellar connections) shall be flushed at regular intervals, preferably once a week.
- Water pipes shall not bear external loads.
- Checks shall be made on the temperature of water in pipes, cold water cisterns, hot water storage vessels and the discharge from taps to ensure that they are within the limits as listed in EN 806-2.
- Particular attention shall be given to the function and servicing of safety and protection devices and to the location of stop valves. Local and national regulations shall apply.
- Hygienic aspects shall be observed especially where water conditioning equipment is installed.

7 Interruptions to operation and disconnection

Installations, which will not be operated within 7 days of their completion or are out of service for more than 7 days, shall either be shut off at the supply stop valve and drained or the water shall be flushed regularly.

Service pipes that are not commissioned immediately after completion or are to be disconnected temporarily, shall be shut off at the water main and those not used for a period of one year or more, should be disconnected from the water main.

Water installations located in areas where frost damage is likely and frost protection measures are not in place and operational, shall be drained in time to prevent such damage.

To avoid potential damage by water and water loss in the event of prolonged absence, it is recommended that the system is isolated at the supply stop valve in residential units and in the case of apartments, at the stop valve in the pipe entering the apartment.

8 Resumption of supply

After interruptions to the operation, it is usually sufficient for the individual draw-off fittings to be fully opened for a short period (approximately 5 min) to allow stagnant water to run off.

Systems which have been temporarily shut off and drained shall be thoroughly flushed before operation is resumed by the following procedure:

- The stop valves shall be partially opened, starting with the service stop valve. To prevent pressure surges and damage to the system, the pipes shall then be completely vented by slowly opening the taps. Following this, the stop valves shall be fully opened and the pipes shall be flushed (for flushing see EN 806-4:2010, 6.2).
- Once the system has been filled, flushed or cleaned and, if necessary, disinfected and the draw-off fittings are closed, all accessible pipes, connections and appliances shall be inspected for signs of leakage.
- Any water conditioning equipment with a regeneration process shall be restarted manually and other water conditioning equipment in accordance with the manufacturer's instructions.

Systems that have been out of service for a prolonged period, not commissioned or disconnected from the service pipe shall only be reconnected and/or operation restarted by the water supplier or a suitably qualified installer.

Any necessary disinfection shall be in accordance with EN 806-4:2010, 6.3.1.

9 Damage and faults

9.1 Change in water quality

Where damage or malfunctions involve the risk of water pollution or produce changes in odour, taste or colour of the water, necessary corrective actions shall be taken.

In cases, where immediate action is necessary to prevent serious damage or contamination, the system shall be shut off at the service stop valve; the water supplier shall be informed.

In case of stagnation and when the water temperature does not comply with EN 806-2, there is an increased risk of bacteria growth, e.g. *Legionella*. Then necessary corrective actions shall be taken.

9.2 Insufficient water supply

In the case of insufficient supply of water, at least the following shall be checked:

- stop valves not fully opened;
- blocked filters;
- blocked spray outlets (e.g. by dirt or scale);
- defective pressure reducing valves;

- too much water being drawn off at the same time from a number of discharge points;
- scaling of system components, in particular of those carrying hot water;
- change in supply pressure;
- pipe burst or frozen pipes.

9.3 Noise emission

In the case of noise emission, higher than expected, at least the following shall be checked:

- installation of valves not classified in accordance with EN ISO 3822 series;
- stop valves that are defective or not fully opened;
- water hammer, caused by rapid-closing or defective draw-off fittings, unsuitable valves, incorrect operation or installation or inadequate fixing;
- too high velocities due to high pressure or incorrect pipe sizing.

10 Alterations, extensions and refurbishment

Major alterations to and extensions of the installation, in particular extensions of the pipework servicing appliances, connection of systems and appliances, can be a potential source of potable water pollution. Therefore, prior to this work being undertaken notification shall be given to the relevant authority in accordance with local and national regulations. This work together with maintenance and replacement of safety devices and backflow prevention devices shall be carried out by the water supplier or a suitably qualified installer and shall be documented (see Clause 5).

Where pipework, fittings or appliances are to be replaced, continuity of earthing and equipotential bonding shall be maintained. Where pipework has been used for earthing, alternative earthing arrangements shall be made in consultation with the electricity supplier and in accordance with national or local regulations.

Colour or marking to aid tracing of the pipe system shall be maintained and protected.

11 Accessibility of installation components

Installation components which require regular inspection and servicing (e.g. water meters, check valves, filters, anti-vacuum valves, air gaps) or are installed for inspection and servicing purposes (e.g. pressure gauges), and all controls (e.g. on stop valves) shall be readily accessible for inspection, maintenance and operation. Access to these components shall not be obstructed by stored goods, furniture, cladding, floor coverings, etc.

12 Maintenance

Routine maintenance work on pipes and draw-off fittings, stop valves and appliances shall be in accordance with the manufacturer's instructions. Particular care shall be taken to ensure reliable operation of safety and backflow prevention devices. Where water conditioning equipment is installed, specific attention shall be paid to the hygienic aspects to prevent excessive bacterial growth.

Types of maintenance include:

- Inspection: The system shall be visually checked on a regular basis.

- Routine maintenance: work on pipes and draw-off fittings, stop valves and appliances shall be carried out in accordance with the manufacturer's instructions. To ensure reliable operation, safety devices and backflow protection devices shall be checked at regular intervals and maintained in fully operational condition by replacing, where necessary, any worn part (e.g. seals, valve seats, springs, diaphragms), taking into account the requirements and recommendations given in Annex A, Annex B and Annex C.

Annex A, Annex B and Annex C describe the inspection, maintenance and repair work to be carried out for the common types of valves, appliances and installation components and give recommendations for the minimum frequency of such work. Procedures and frequencies for operation and routine maintenance shall be followed in accordance with the manufacturer's instructions.

Frequencies for inspection and routine maintenance are given in Annex A. Any deviation shall be justified and recorded; these may depend on:

- size and complexity of the network;
- type of water use (cooking, beverage, shower, medical care, etc.);
- users (vulnerability);
- operation of the installation (permanent, intermittent, seasonal, etc.).

Cisterns shall be inspected at regular intervals to ensure they are clean, that overflow and warning pipes are clear, that covers are adequate and securely fixed and that there are no signs of leakage or deterioration likely to result in leakage. Cisterns storing potable water shall be inspected at least annually, and the water shall be tested, if contamination is suspected.

Annex A (normative)

Frequencies for inspection and maintenance of components for potable water installations

Table A.1 contains information on frequencies for inspection and maintenance of various components for potable water installations.

Different requirements on inspection and maintenance may exist in the Member States. If national requirements exist, they shall be followed.

This table is not exhaustive. Other components will also require inspection and maintenance.

Table A.1 — Frequencies for inspection and maintenance

No.	Installation component and unit	Reference document	Inspection	Routine maintenance
1	Unrestricted air gap (AA)	EN 13076	Every 6 months	
2	Air gap with overflow non-circular (unrestricted) (AB)	EN 13077	Every 6 months	
3	Air gap with submerged feed incorporating air inlet plus overflow (AC)	EN 13078	Once a year	
4	Air gap with injector (AD)	EN 13079	Every 6 months	
5	Air gap with overflow circular (restricted) (AF)	EN 14622	Once a year	
6	Air gap with overflow tested by vacuum measurement (AG)	EN 14623	Once a year	
7	Backflow preventer with controllable reduced pressure zone (BA)	EN 12729	Every 6 months	Once a year
8	Backflow preventer with different non controllable pressure zones (CA)	EN 14367	Every 6 months	Once a year
9	In line anti-vacuum valve (DA)	EN 14451	Once a year	Once a year
10	Pipe interrupter with atmospheric vent and moving element (DB)	EN 14452	Once a year	
11	Pipe interrupter with permanent atmospheric vent (DC)	EN 14453	Every 6 months	
12	Controllable antipollution check-valve (EA)	EN 13959	Once a year	Once a year
13	Non controllable antipollution check-valve (EB)		Once a year	Replacement every 10 years
14	Controllable antipollution double check-valve (EC)		Once a year	Once a year
15	Non controllable antipollution double check-valve (ED)		Once a year	Replacement every 10 years
16	Mechanical disconnecter direct actuated (GA)	EN 13433	Every 6 months	Once a year
17	Mechanical disconnecter hydraulic actuated (GB)	EN 13434	Every 6 months	Once a year
18	Hose union backflow preventer (HA)	EN 14454	Once a year	Once a year
19	Shower hose union anti-vacuum valve (HB)	EN 15096	Once a year	Once a year
20	Automatic diverter (HC)	EN 14506	Once a year	
21	Hose union anti-vacuum valve combined with a check-valve (HD)	EN 15096	Once a year	Once a year
22	Pressurised air inlet valve (LA)	EN 14455	Once a year	Once a year

Table A.1 (continued)

No.	Installation component and unit	Reference document	Inspection	Routine maintenance
23	Pressurised air inlet valve combined with a check valve located downstream (LB)		Once a year	Once a year
24	Hydraulic safety group	EN 1487	Every 6 months	Once a year
25	Expansion group	EN 1488	Every 6 months	Once a year
26	Pressure safety valve	EN 1489	Every 6 months	
27	Combined temperature and pressure relief valve	EN 1490	Every 6 months	
28	Expansion valve	EN 1491	Every 6 months	
29	Pressure reducing valve	EN 1567	Once a year	Once a year
30	Inline hot water supply tempering valve	EN 15092	Every 6 months	Once a year
31	Pressure booster pump	EN 806-2 EN 806-4	Once a year	
32	Filter, back washable (80 µm to 150 µm)	EN 13443-1	Every 6 months	
33	Filter, not back washable (80 µm to 150 µm)	EN 13443-1	Every 6 months	
34	Filter (< 80 µm)	EN 13443-2	Every 6 months	
35	Chemical dosing system	EN 14812 EN 15848	Every 2 months	Every 6 months
36	Water softener	EN 14743	Every 2 months	Every 6 months
37	Electrolytic treatment system with aluminium anodes	EN 14095	Every 2 months	Every 6 months
38	Active media filter	EN 14898	Every 2 months	Every 6 months
39	Membrane separation device	EN 14652	Every 2 months	Every 6 months
40	UV device	EN 14897	Every 2 months	Every 6 months
41	Nitrate removal device	EN 15219	Every 2 months	Every 6 months
42	Water heater	EN 12897	Every 2 months	Once a year
43	Pipework	EN 806-2 EN 806-4	Once a year	
44	Water meter, cold	MID [1]	Once a year	Every 6 years
45	Water meter, hot	MID [1]	Once a year	Every 5 years
46	Fire fighting devices	EN 806-2 EN 806-4	National regulations	

Annex B (normative)

Inspection and maintenance procedures

B.1 Air gaps (protection device family A)

Inspection and maintenance:

Check there is no change in the use of the water downstream and therefore the device is still suitable to protect the supply.

Check conformity with the installation requirements.

Check the spill-over level visually.

Check the distance of the air gap.

Verify that overflow outlets are clean and unobstructed. If necessary, clean them.

Check the point of discharge of the inlet device is clear (dirt, corrosion). Clean, if necessary.

Check the air inlet is not blocked.

Check the leaktightness of the inlet device.

B.2 Pipe interrupters (protection unit family D type C)

Inspection and maintenance:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.1) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the unit is clean.

Check that there is no corrosion or deterioration.

Check that air inlet is free and unobstructed.

Check that no water escapes through the air inlet apertures when water flows through the valve.

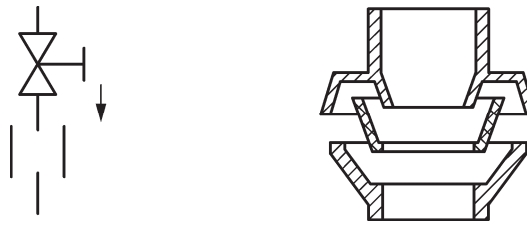


Figure B.1 — Protection unit family D type C and design principle

B.3 Backflow preventer with controllable reduced pressure zone (protection unit BA)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.2) is still suitable to protect the network and any potential backflow should not exceed the discharge capacity of the device.

Check conformity with the installation requirements.

Check:

- accessibility of the protection unit;
- ventilation;
- location not liable to flooding;
- protection against frost or excessive temperature;
- easy operation of the parts of the protection unit (valves, strainer, pressure test outlet);
- that the position of the discharge outlet is 90° to the vertical and the distance of the air brake to drain is correct;
- surface of the device (corrosion or deterioration);
- capacity of the drainage network to collect the discharge water;
- there is fluid in the trap, if present.

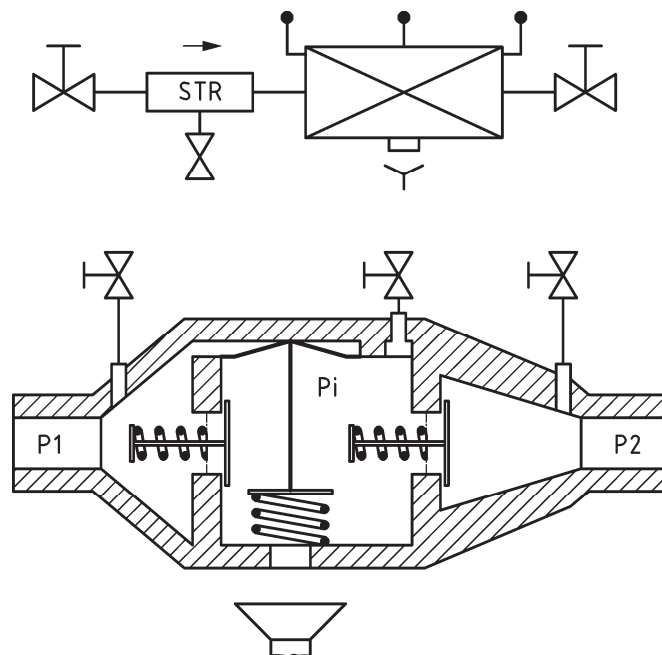


Figure B.2 — Protection unit family B type A and design principle

Maintenance:

Dismantle and clean the strainer.

Test the tightness of valves and seals.

Test opening and closing of the discharge port.

Clean the air break to drain and the air inlet.

Test the pressures by suitable measuring equipment (static, dynamic, differential).

Check the functioning of the backflow preventer according to the manufacturer's instructions.

Record data:

- date of tests;
- results of tests;
- name of the inspector / tester;
- identification of the measurement devices;
- useful remarks;
- details of repairs.

In the case of any malfunctions of a backflow protection, the owner shall be immediately informed and the water supply upstream of the device shall be isolated until such time the device is repaired or replaced.

Bypassing a backflow protection device, even for a short time, is prohibited. Therefore, where the water supply is critical, it is recommended that a replacement valve be retained on site for use in an emergency.

B.4 Backflow preventer with different non-controllable pressure zones (protection unit CA)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.3) is still appropriate to protect the supply and any potential backflow should not exceed the discharge capacity of the device.

Check conformity with the installation requirements.

Check there is no change in the use of the water and that the protection unit is still adapted to protect the network.

Check:

- accessibility of the protection unit;
- ventilation;
- locations not liable to flooding;
- protection against frost or excessive temperature;
- easy operation of the parts of the protection unit (valves, strainer, pressure test outlet);
- clearance around the protection unit;
- the position of the discharge outlet is 90° to the vertical and the distance of the air break to drain is correct;
- surface of the device (corrosion or deterioration);
- capacity of the drainage network to collect the discharge water;
- whether there is fluid in the trap.

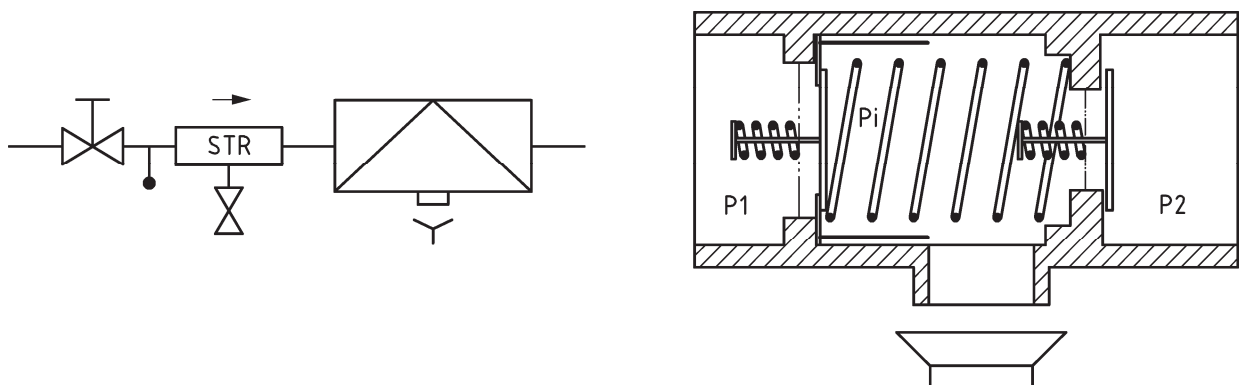


Figure B.3 — Protection unit family C type A and design principle

Maintenance:

Close the upstream stop valve and observe that no discharge occurs.

Open the upstream drain and observe that only a few drops are discharged.

If either of these conditions is not met, then the device is to be replaced or repaired according to the manufacturer's instructions.

B.5 Controllable antipollution check valves (protection units EA and EC)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.4) is still suitable to protect the supply.

Check that the environment is clean.

Check there is no leakage, corrosion or deterioration.

Check conformity with the installation requirements.

Check the accessibility of the check valve.

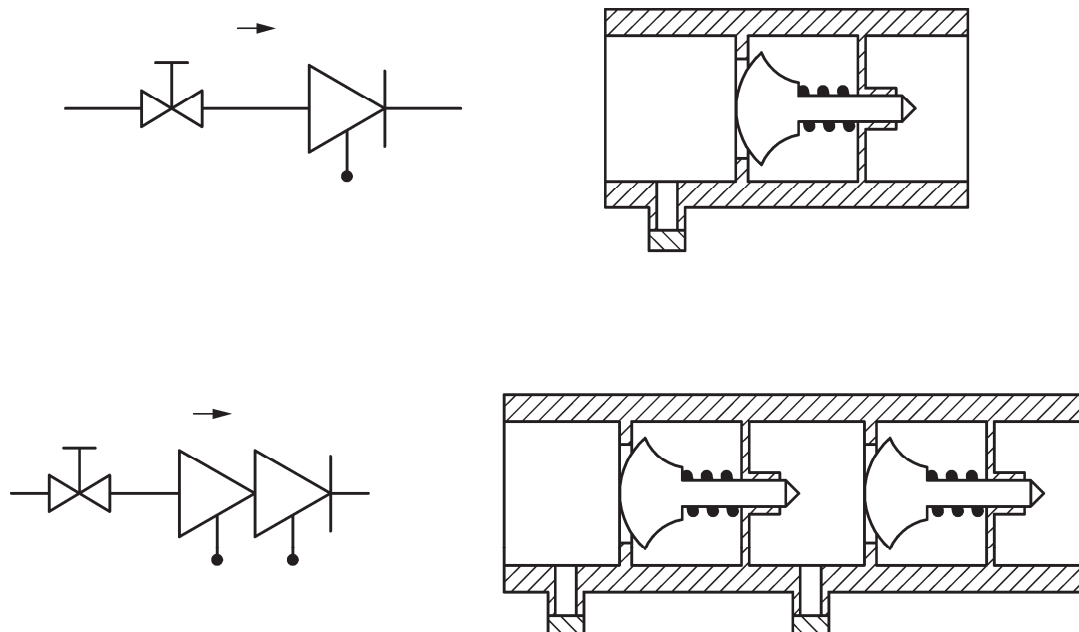


Figure B.4 — Protection units family E types A and C and design principles

Maintenance:

Ensure that the downstream pipe is under pressure and there is no flow (all draw off points closed). This can be done by closing a valve downstream of the check valve.

Close the upstream valve and open the upstream pressure test outlet. The flow shall stop after emptying. If not, check the tightness of the valve upstream of the device, repair if necessary. If the flow continues, replace the check valve.

B.6 Non-controllable antipollution check valves (protection units EB and ED)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.5) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the environment is clean.

Check there is no leakage, corrosion or deterioration.

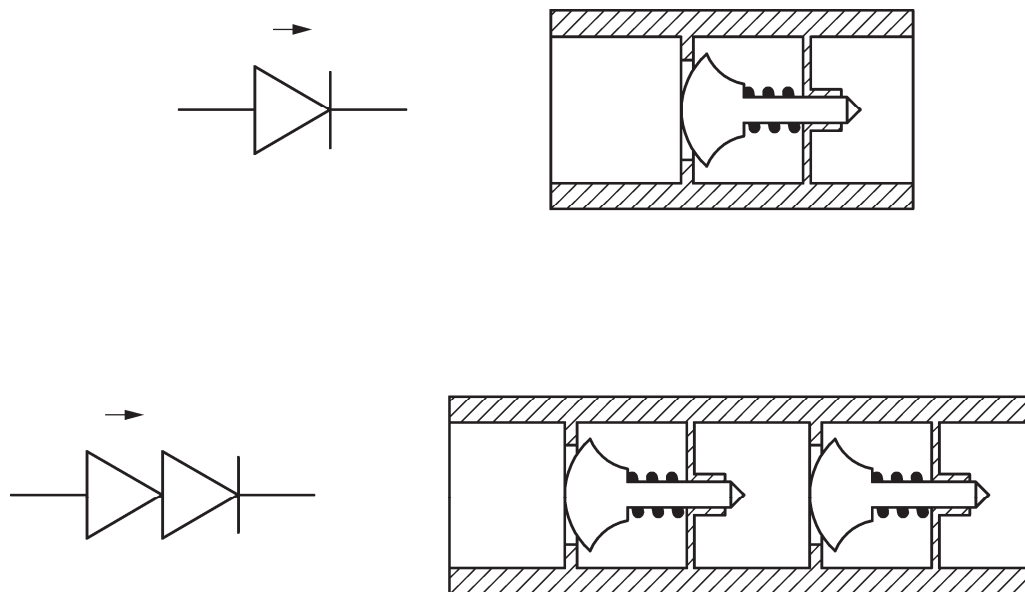


Figure B.5 — Protection units family E type B and D and design principles

Maintenance:

Replace the check valve every 10 years.

B.7 Inline anti vacuum valve (protection units DA)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.6) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the device is clean.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check there is no leakage, corrosion or deterioration.

Check that the air inlets are free and unobstructed.

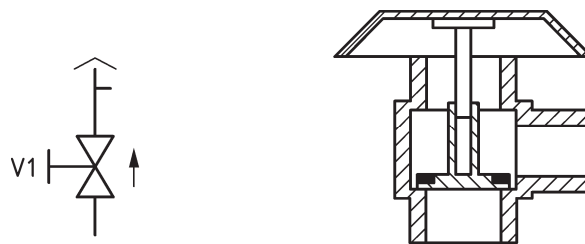


Figure B.6 — Protection unit family D type A and design principle

Maintenance:

Remove the protection cap.

Open valve V1.

Close valve V1, the floating disk shall fall down in low position and the downstream pipe shall discharge.

If the floating disk does not fall down, dismantle, clean and reassemble or replace in accordance with the manufacturer's instruction.

B.8 Pipe interrupter with atmospheric vent and moving elements (protection unit DB)

Inspection:

Check there is no change in the use of the water downstream and that the device (see Figure B.7) is therefore still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the device is clean.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check there is no leakage, corrosion or deterioration and the moving element is not damaged or blocked.

Check that the air inlets are free and unobstructed.

Maintenance:

Check there is no leakage, corrosion or deterioration and the moving element is not damaged or blocked, e.g. by opening the upstream stop valve no water shall discharge and there shall be a sufficient flow. After closing the valve, the downstream pipe shall discharge. In case of any damage or malfunction the device shall be replaced.

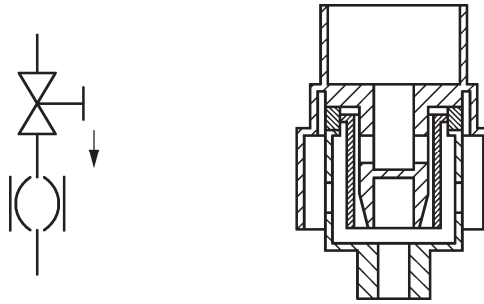


Figure B.7 — Protection unit family D type B and design principle

B.9 Hose union backflow preventer (protection unit HA)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.8) is still suitable to protect the supply.

Check conformity with the installation requirements

Check that the device is clean.

Check there is no leakage, corrosion or deterioration.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check that the air inlets are free and unobstructed.

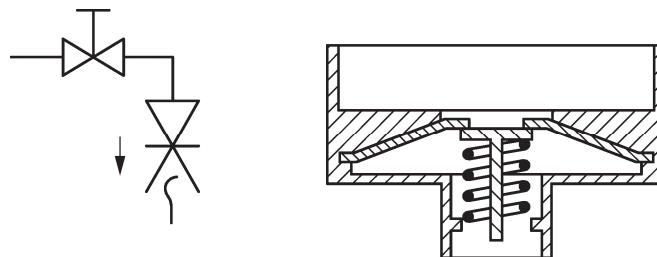


Figure B.8 — Protection unit family H type A and design principle

Maintenance:

Connect a flexible hose to the draw-off tap to examine the flow.

Open the tap to fill the hose with water and close it again.

The flexible hose shall discharge. If not, replace the backflow preventer, it is often also necessary to replace the tap.

B.10 Hose union anti-vacuum valve (protection unit type HB)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.9) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the device is clean.

Check there is no leakage, corrosion or deterioration.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check that the air inlets are free and unobstructed.

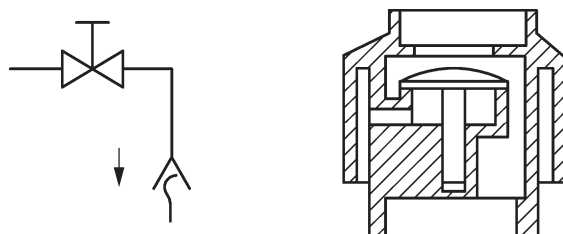


Figure B.9 — Protection unit family H type B and design principle

Maintenance:

A hose approximately 1 m in length shall be connected to the downstream outlet and the upstream stop valve opened to allow a small amount of water to escape from the hose. The hose end shall then be raised above the anti-vacuum valve, the stop valve closed and the hose lowered again. The water in the hose shall drain off and there shall be an intake of air through the air inlet apertures. If not, replace the device.

B.11 Automatic diverter (protection unit type HC)

Inspection and maintenance:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.10) is still suitable to protect the supply.

Check conformity with the installation requirements.

Open the tap and observe the shower outlet, there shall be no discharge. Divert to the shower position and observe the outlet to the bath, there shall be no discharge. Close the tap gently and check, if the device goes into bath position before water flow stops.

If not, the device shall be replaced or repaired and retested.

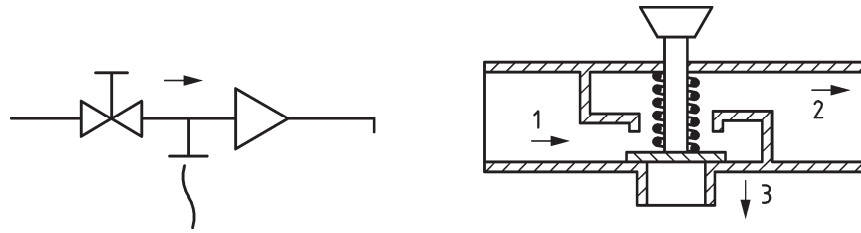


Figure B.10 — Protection unit family H type C and design principle

B.12 Hose union anti vacuum valve combined with check valve (protection unit family H type D)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.11) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the equipment is clean.

Check there is no leakage, corrosion or deterioration.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check that the air inlets are free and unobstructed.

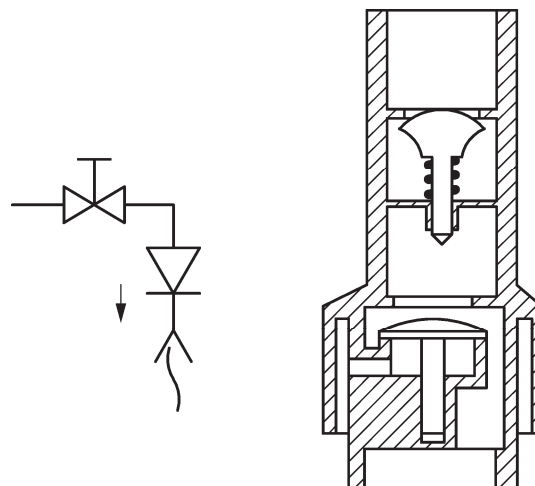


Figure B.11 — Protection unit family H type D and design principle

Maintenance:

A hose approximately 1 m in length shall be connected to the downstream outlet and the upstream stop valve opened to allow a small amount of water to escape from the hose. The hose end shall then be raised above the anti-vacuum valve, the stop valve closed and the hose lowered again. The water in the hose shall drain off and there shall be an intake of air through the air inlet apertures. If not, replace the device.

B.13 Pressurised air inlet valve (protection unit family L type A)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.12) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the equipment is clean.

Check there is no leakage, corrosion or deterioration.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check that the air inlets are free and unobstructed.

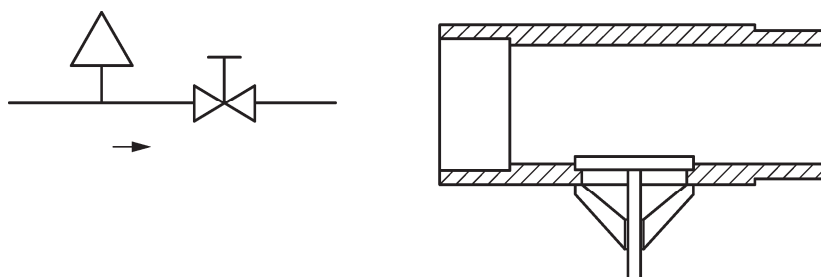


Figure B.12 — Protection unit family L type A and design principle

Maintenance:

The valve immediately upstream of the pressurised air inlet valve to be checked shall be closed and a downstream outlet valve opened (with spray outlet removed, if any). As a result, air shall be taken in through the air inlet apertures, with the water discharging rapidly from the draw-off point.

Make sure that no water escapes through the air inlet openings when water flows through the valve and the water discharges rapidly from the draw-off point.

B.14 Pressurised air inlet valve combined with a check valve located downstream (protection unit family L type B)

Inspection:

Check there is no change in the use of the water downstream and therefore the device (see Figure B.13) is still suitable to protect the supply.

Check conformity with the installation requirements.

Check that the equipment is clean.

Check there is no leakage, corrosion or deterioration.

Check locations not liable to flooding.

Check protection against frost or excessive temperature.

Check that the air inlets are free and unobstructed.

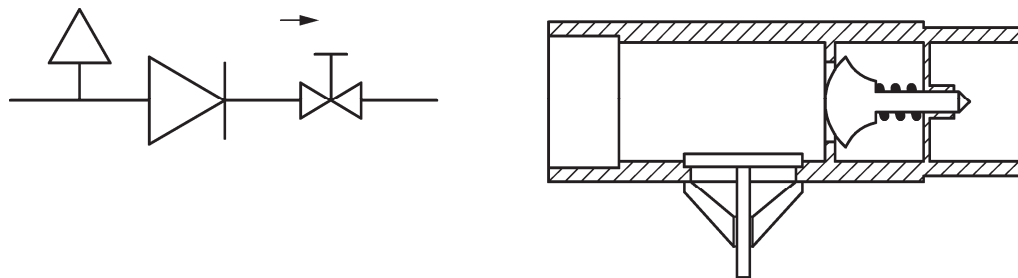


Figure B.13 — Protection unit family L type B and design principle

Maintenance:

The valve immediately upstream of the anti-vacuum valve to be checked shall be closed and a downstream outlet valve without check valve opened (with spray outlet removed, if any). As a result, air shall be taken in through the air inlet apertures, with the water discharging rapidly from the draw-off point.

Make sure that no water escapes through the air inlet openings when water flows through the valve and the water discharges rapidly from the draw-off point.

B.15 Hydraulic safety groups and expansion groups

Inspection:

Check there is no spraying.

Check there is water in the discharge, if available.

Operate the easing gear of the safety valve (lift) to ensure the valve is not sticking or scaled in the closed position.

A check shall be made whether the valve closes automatically when the easing gear is released and the water is completely discharged through the discharge funnel or the relief pipe.

Operate the stop valve (close and open again).

If the hydraulic safety group or expansion group (see Figure B.14) is not leaktight, it shall be replaced.

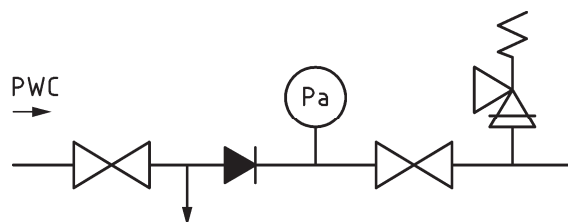


Figure B.14 — Example for an expansion group in accordance with EN 1488

Maintenance:

Close the stop valve upstream of the check valve.

Open the test port for monitoring the check valve.

If hot water flows, check valve is not tight. If cold water flows, stop valve is not tight. In both cases, the hydraulic safety group or expansion group shall be replaced.

B.16 Pressure safety valves, expansion valves and combined temperature and pressure relief valves

Inspection and maintenance:

Check there is no discharge.

Check there is no spraying outside the tundish when operated.

Check there is fluid in the trap, if present.

Operate the easing gear of the safety valve (lift) to ensure the valve is not sticking or scaled in the closed position.

A check shall be made whether the valve closes automatically when the easing gear is released and the water is completely discharged through the discharge funnel or the relief pipe.

If it is not tight, the pressure safety valve or expansion valve (see Figure B.15 and Figure B.16) shall be replaced.



Figure B.15 — Pressure safety valve in accordance with EN 1489 and expansion valve in accordance with EN 1491

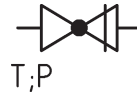


Figure B.16 — Combined temperature and pressure relief valve in accordance with EN 1490

B.17 Inline hot water supply tempering valves

Inspection:

Check that the temperature of the mixed water at the outlet of the tempering valve is within the given limits for correct operation.

Check that the pressures of hot and cold water at the inlets of the tempering valve are within the given limits for correct operation.

Check that there are no leakages from the connections to the tempering valve.

Maintenance:

Check and clean the system filters.

Check that all check valves positioned upstream of the tempering valve are operating correctly.

Perform the thermal shut-off test. Isolate the cold water supply to the thermostatic mixing valve and monitor the mixed water temperature. The outlet flow should quickly stop.

Measure and record the maximum mixed water temperature. The temperature shall not exceed that allowed for the relevant application by the applicable European Standard or local/national regulation.

Restore the cold water supply to the valve and measure and record the outlet temperature after the mixed water temperature has stabilised. The final temperature found during this test should not exceed the permitted values +2 °C.

Where a valve fails these tests, it shall be serviced in accordance with the manufacturer's instructions.

When the components which can be maintained have been checked, commissioning shall be carried out again, in accordance with the manufacturer's instructions.

B.18 Pressure reducing valve

Inspection:

Check the outlet pressure setting of device (see Figure B.17) on the pressure gauge at zero flow and peak flow.

Maintenance:

The strainer shall be cleaned (and replaced if necessary) and the internals removed, inspected and replaced, if necessary.

After completely assembling check the outlet pressure setting as above (see Inspection).



Figure B.17 — Pressure reducing valve in accordance with EN 1567

B.19 Pressure booster pump

Inspection and maintenance:

Servicing and repair shall be in accordance with the manufacturer's instructions.

B.20 Water heaters

Inspection:

Check of set temperature and comparison with the actual temperature of heated water.

Maintenance:

Functional check of pressure-relief valve (see B.15 or B.16).

Testing of tightness of separation walls in accordance with the manufacturer's instructions.

To ensure proper function of the system, all deposits (anode sludge, scale) shall be removed. Any cleaning or descaling agents used for this purpose shall be carefully selected, especially with regard to their composition, so as not to present a health hazard when used in the manner intended or to be anticipated).

It shall be the heater manufacturer's responsibility to specify suitable cleaning and descaling agents as well as adequate cleaning and flushing techniques to be adopted.

B.21 Fire fighting installations

Inspection and maintenance:

In accordance with national or local regulations.

B.22 Pipework

Inspection:

Visual inspection regarding tightness and corrosion or deterioration effects and proper fixing and insulation.

If removable sections are installed, these shall be checked internally for corrosion or deterioration or scale formation.

B.23 Water meters

Inspection and maintenance:

Visual inspection regarding tightness and corrosion or deterioration effects, accessibility and proper fixing.

The calibration of cold and hot water meters shall be deemed to be valid for a certain period in accordance with the MID [1].

Maintenance of the water meters operation as verified is generally the water supplier's responsibility, or the building owner's or operator's responsibility in the case of private water meters.

If a backflow prevention device like EB is integrated, it should be replaced together with the water meter.

Annex C (normative)

Inspection and maintenance procedures for water conditioning devices

Responsibility for operation, inspection and maintenance is subject to local and national requirements, where applicable.

The general requirements for checking the functionality during normal operation and for maintenance and repair to prevent failures of water conditioning devices inside buildings in accordance with EN 15161 shall be followed. For particular water conditioning devices, the further inspection and maintenance procedures stated in the following products specifications shall be followed additionally:

— mechanical filters:	EN 13443-1, EN 13443-2;
— electrolytic treatment systems with aluminium anodes:	EN 14095;
— membrane separation devices:	EN 14652;
— softeners:	EN 14743;
— chemical dosing systems:	EN 14812, EN 15848;
— UV devices:	EN 14897;
— active media filters:	EN 14898;
— nitrate removal devices:	EN 15219.

In addition, specific inspection and maintenance shall be carried out in accordance with the manufacturer's instructions.

Bibliography

- [1] Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments (MID)

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