

AQA therm HFB-1717 BA

Art.-Nr./Item no. 51955 (DE)

Art.-Nr./Item no. 820425 (AT)

AQA therm HES

Art.-Nr./Item no. 51094 (DE)

Art.-Nr./Item no. 820423 (AT)

AQA therm HWG

Art.-Nr./Item no. 820454 (AT)

bestehend aus 820425 und 820423

Important notice: Always keep the fitting and operating instructions close at hand to avoid any mistakes and before carrying out any work on the device you should read the fitting and operating instructions carefully and follow them. While our data sheets and brochures should provide advice to the best of our knowledge, the content thereof is not legally binding. In addition to this, our general terms and conditions of trade apply.

Subject to alterations!

For You and Planet Blue.

 **BWT**
BEST WATER TECHNOLOGY

Thank you very much for the confidence that you have shown in us by purchasing a BWT appliance.



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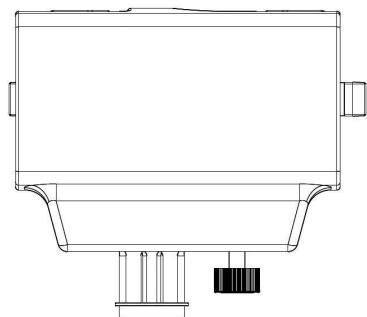
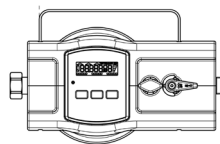


Fig. 1 AQA therm HFB-1717 BA



Optional:
AQA therm HRC
(softening)
or
AQA therm SRC
(desalination)

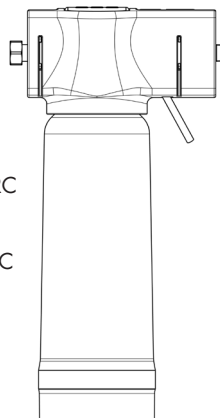
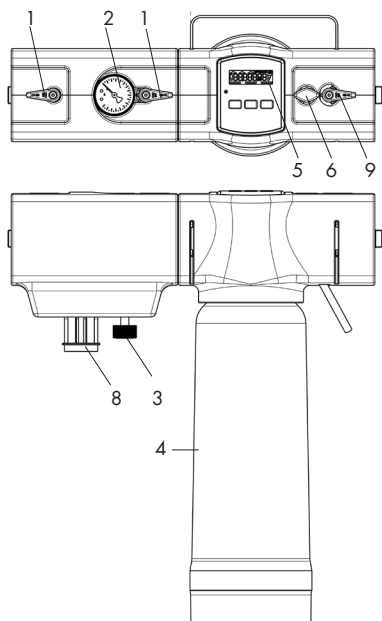


Fig. 2 AQA therm HES

Abb. 3 AQA therm HFB-1717 BA &
AQA therm HES

- 1 Ball valve
- 2 Pressure gauge
- 3 Pressure reducer with removable adjustment handle
- 4 Optional: AQA therm HRC or SRC
- 5 Water meter with smart operation display
- 6 Bleed valve / distilled water-filling point
- 8 Drain valve with pipe connection
- 9 Shut-off ball valve

These installation and operating instructions are for the AQA therm HFB-1717 BA and the AQA therm HES. Both units are available separately. This modular system guarantees optimum flexibility for all installation situations. With both systems your heating system can be installed with the following cartridges in accordance with the relevant standards and can be filled and refilled. The AQA therm HRC/hardness-reducing cartridge only reduces the calcifying substances in the water. The AQA therm SRC/desalination cartridge reduces both calcifying and corrosive substances in the water. In addition to these water treatment procedures, installers must ensure that the heating system is correctly planned, installed, commissioned and operated in accordance with the relevant standards and BWT specifications.

1. Safety instructions

- I. Refer to the installation instructions.
- II. Use the device
 - in accordance with the specifications
 - in perfect operational conditions
 - in full awareness of the safety procedures and potential risks.
- III. Please note that the device is intended for filling and refilling heating systems. Any use outside the scope of the manual shall be considered non-compliance with the specifications.
- IV. Note that all installation, commissioning, maintenance and adjustment work must only be carried out by qualified personnel.
- V. Immediately remedy any faults that may compromise safety.
- VI. Treated water has different corrosive chemical parameters. In addition to these water treatment procedures, installers must ensure that the heating system is correctly planned, installed, commissioned and operated in accordance with the relevant standards and BWT specifications.
- VII. If the drinking water is heated via the heating system and category 4 or 5 liquids are present, any components that come into contact with such must be double-walled. Demineralised water (AQA therm SRC) corresponds to category 2 pursuant to EN 1717 Annex B.

2. Description of functions AQA therm HFB 1717 BA

The AQA therm HFB-1717 BA comprises a backflow preventer, pressure reducer and shut-off ball valves and is designed to provide a secure, standardised

connection between the heating system and the drinking water supply. The integrated backflow preventer and pressure reducer must be used to connect the heating system permanently to the drinking water system, allowing the heating system to be refilled at any time.

The BA-installed AQA therm HES, which is installed immediately after the AQA therm HFB-1717, comprises a water meter, a docking point for optional softening cartridges (AQA therm HRC) or desalination cartridges (SRC), an integrated shut-off ball valve and a distilled water filling point (warning: non-potable water!). This is used for softening/desalination and to register the flushing, filling and refilling volumes.

Function of the backflow preventer (AQA therm HFB-1717 BA)

The backflow preventer is a back-up valve compliant with DIN EN 1717 and prevents the back pressure, backflow and return of polluted water into the supply line, into external systems or other system components. The backflow preventer is divided into three chambers (inlet, intermediate and outlet pressure chamber). If no water is drawn, the backflow preventer remains in idle mode under operating pressure. The inlet- and outlet-side backflow preventers and the drain valve are closed. When water is drawn, the backflow preventer is in the flow rate setting. The inlet- and outlet-side backflow preventers are opened and the drain valve is closed. If the differential pressure between the inlet pressure and intermediate pressure chamber falls below 0.14 bar, the backflow preventer moves into the isolated position (return). The backflow preventer on the inlet side closes and the drain valve opens.

Function of the pressure reducer (AQA therm HFB-1717 BA)

The pressure reducer reduces the inlet-side pressure (inlet pressure) at the required pressure on the outlet side (outlet pressure). The pressure reducer operates on the force-balance principle. The diaphragm force pushes against the spring force of the control valve. If the outlet pressure decreases when water is drawn, and with it the diaphragm force, a stronger spring force, then opens the valve. The outlet pressure continues to rise until a state of equilibrium is reached between the diaphragm and spring force. Inlet pressure has no effect on the control valve in the pressure reducer. Pressure fluctuations on the inlet side do not affect the outlet pressure (inlet pressure compensation). The AQA therm HFB-1717 BA can be permanently

connected to the drinking water supply by a hose or pipe in accordance with DIN EN 1717 (plastics and drinking water (German: KTW)) approval required for the hose).

After filling, the shut-off device must be activated to prevent uncontrolled refilling of the heating system.

Function of the AQA therm HES

The BA-installed AQA therm HES, which is installed immediately after the AQA therm HFB-1717, comprises a water meter, a docking point for an optional softening cartridge (AQA therm HRC) or desalination cartridge (SRC), an integrated shut-off ball valve and a distilled water filling point (warning: non-potable water!). This is used for softening/desalination and to register the flushing, filling and refilling volumes. AQA therm HES works either with the AQA therm HRC/hardness-reducing cartridge, using the ion exchange principle (whereby alkaline earth metals found in the water, like calcium and magnesium, are replaced with sodium ions), or with the SRC/desalination cartridge (reduces both calcifying and corrosive substances in the water).

Desalination without additives is preferred. The integrated 'smart' electrical water meter enables users to register the flushing, filling and refilling volumes at all times.

3. Application

AQA therm HFB-1717 BA

Medium	Water
Inlet pressure	max. 10.0 bar
Outlet pressure	adjustable from 1.5–4 bar preset to 1.5 bar
Liquid category back-flow preventer BA	4 (toxic, extremely toxic, carcinogenic, radioactive materials)

AQA therm HES

Medium	Water
Inlet pressure	max. 4 bar

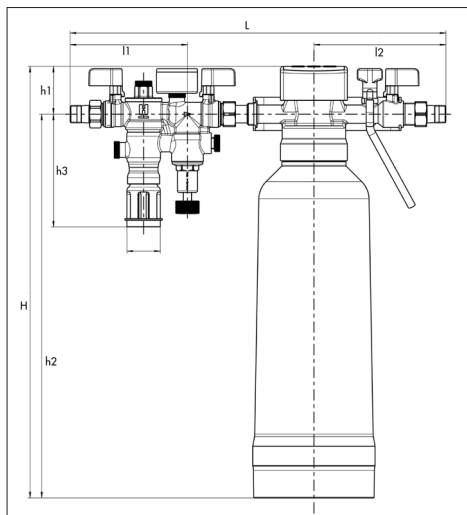
4. Technical data

AQA therm HFB-1717 BA

Mounting position	Horizontal with drainage connection directed downwards
Operating temperature	max. 65 °C
Pressure reducer Ball valve connection Backflow preventer	G 1/4"
Drainage connection	HT 40
Connection size	1/2" external thread

AQA therm HES

Mounting position	horizontal with cartridge directed downwards, cartridge optional
Operating temperature	Feed water max. 30 °; device temperature max. 50 °C with shut-off ball valve (closed) using the heating system's temperature transfer; ambient temperature max. 40 °C
Connection size	1/2"



Connection size	R	1/2"
Dimensions	H	518,4 mm
	h1	57,4 mm
	h2	461 mm
	h3	135,5 mm
	L	450,1 mm
	l1	140,5 mm
	l2	158,1 mm
Kvs value	m³/h	0,45

Ensure that there is a minimum 610 mm installation height from the ground to the middle of the pipe for safe and secure cartridge replacement.

5. Scope of delivery

The AQA therm HFB-1717 BA comprises:

- Integrated shut-off ball valve on both the inlet and outlet sides.
- BA type backflow preventer with drainage connection, backflow preventer core, integrated filter on the inlet side, backflow preventer on the outlet side and three metering points with sealing plugs.
- Pressure reducer with pressure gauge
- Insulating shell

The AQA therm HES comprises:

- Water meter on the inlet side with digital display and electronics for configuring the water data and controlling the cartridge capacity.
- Vent or release valve: distilled water filling point (non-potable water!)
- Shut-off ball valve on the outlet side
- Insulating shell
- Dummy plug/flushing plug

6. Model variants

AQA therm HFB-1717 BA = standard model: with 600 µm filter (variant in Germany) or 25 µm filter (variant in Austria).

AQA therm HES = standard model: HRC or SRC cartridges must be ordered separately.

7. Installation

Please consult the installation manual when installing the system to comply with the applicable regulations and general guidelines.

7.1 Installation instructions

- When installing in the feeder to the heating system, mount the AQA therm HES on the wall.
- When installing in horizontal pipelines, the drainage connection should be directed downwards.
- Installation must not take place in rooms or ducts where toxic gases or vapours occur, and where there is a risk of inundation (flood water).
- The installation location must be well ventilated.
- The installation location must be frost-resistant and easily accessible for easy maintenance and cleaning.

- The pressure gauge on the pressure reducer must be highly visible for easy monitoring.
- First, install the AQA therm HFB-1717 BA in the flow rate direction and then install the AQA therm HES immediately after it.
- During installation, please comply with national installation regulations.

7.2 Installation

The AQA therm HFB-1717 BA should be connected as close as possible to the supply line to prevent water from stagnating!

During installation, please comply with national installation regulations. Tighten plastic sealing plugs manually only (do not use tools).

1. Flush the pipeline thoroughly.
2. Installing the AQA therm HFB-1717 BA:
 - When installing in horizontal pipelines, the drainage connection should be directed downwards
 - Observe the flow rate direction (direction of arrow)
 - Avoid tensing and twisting during installation
3. Connect the drainage pipe to the drainage connection (plastic pipe HT 40).
4. Install the AQA therm HES immediately after the AQA therm HFB-1717 BA and mount using the wall bracket.
 - When installing in horizontal pipelines:
 - Observe the flow rate direction (direction of arrow)
 - Avoid tensing and twisting during installation
5. Please allow a 'damping zone' of at least 50 cm between the AQA therm HES and the connection to the heating system.
6. Screw the AQA therm hardness-reducing cartridge (HRC) or desalination cartridge (SRC) (both are available optionally) into the AQA therm HES and tighten manually.

7.3 Application

The AQA therm HFB-1717 BA is used to fill and refill closed heating systems in accordance with DIN EN 12828:2003 and, with the relevant BA backflow preventer, stops heating water of category 4 liquids (with inhibitors) flowing back into the drinking water system. If the drinking water is heated via the heating system and category 4 or 5 liquids are present, any components that come into contact with such must be double-walled. Demineralised water corresponds to category 2 pursuant to EN 1717 Annex B.

The AQA therm HES ensures that the heating system is filled and refilled with softened or demineralised water, as stipulated by VDI 2035 sheet 1 or Austrian standard ÖNORM H 5195-1.

8. Commissioning

8.1 Setting outlet pressure (AQA therm HFB-1717 BA)

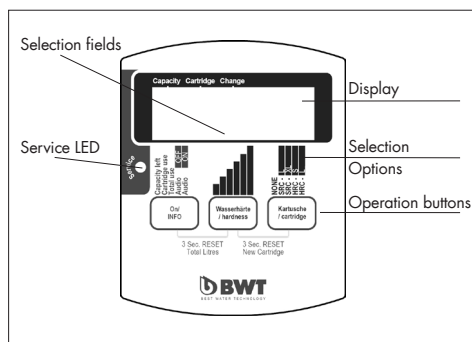
The factory setting of the pressure reducer is 1.5 bar. The system pressure should be at least 2 bar higher than the outlet pressure setting.

1. Close the shut-off ball valve on the inlet side of the AQA therm HFB-1717 BA and on the outlet side of the AQA therm HES.
 - The outlet-side shut-off ball valve on the AQA therm HFB-1717 BA must remain open.
2. Depressurise the outlet side by opening the sampling valve (bleed valve on AQA therm HES).
3. Slacken the compression spring
 - Use the adapter to get to the compression spring. Turn the adapter to the left (-) as far as it will go.
4. Slowly open the shut-off ball valve on the inlet side.
5. Turn the adapter until the pressure gauge reaches the required value.
6. Re-tighten the slotted screw.
7. Slowly open the shut-off ball valve on the outlet side.

8.2 Flushing the system

Some national standards stipulate flushing the heating system, so a dummy plug is supplied with the AQA therm HES. This can be installed instead of the AQA therm hardness-reducing cartridge (HRC) or desalination cartridge (SRC). After flushing, re-connect the cartridge to fill the system.

8.3 AQA therm HES electronic with 'smart' set-up and 'smart' operation



- a) Remove the electronics housing, insert the battery and replace the housing.
- b) 'Smart' set-up:

The custom electronics of the AQA therm HES, with just 3 clicks, enable easy, quick and intelligent setting of the operating parameters, majoring on the preferred low-salt process for natural, perfect heating water without additives.

- no laborious searching in tables
- no fault-prone sensors
- all the attributes of modern smart metering design and
- practical expansion options

„Smart“-operation:

Monitoring of the flushing, filling and refilling volumes is available via the plain text display. You can also use a 'smart' function to:

- turn the acoustic monitoring signal on/off
- register the relevant data
- send control signals to a solenoid valve (available from 2016)
- connect an SMS box – for sending alarm messages to a mobile phone when cartridges are depleted (available from 2016).

- c) The assigned selection fields in the display move with each keystroke to the selected position. The selection is logged if you pause on the position for more than 3 seconds.
- d) If the AQA therm HES operates without a cartridge in the flushing process, select 'NONE', and connect the flushing/dummy plug supplied with the AQA therm.
- e) If the AQA therm HES is used for filling or refilling, please insert the cartridge (see no. 8.7.). Press the cartridge/cartridge button to toggle between the different cartridges, pausing on the selected cartridge for 3 seconds to log it.
- f) The pre-defined hardness ranges for the 'smart' set-up cover over 90% of the application areas. For water hardness >26 °dH/46.3 °fH/463 ppm, the maximum water hardness should be logged. An estimate to the nearest litre can be seen using the classic comparison method with the capacity table, ditto for the intermediate ranges (see cartridge operation manual or no. 13).
- g) If, according to the 'smart' set-up, cartridge capacity falls below 10%, the service LED will flash yellow. When the cartridge is totally depleted, or if the cartridge has been in use for longer than 5 years, the service display will flash red and emit a beep. (Factory setting is tone on; to turn off, see 8.3 point h.)

- h) Where necessary, use the ON/INFO button to advance to turn the cartridge replacement sound signal on or off, set the position required and pause for 3 seconds to log the selection. Factory setting: signal always on.
- i) To reset the entire filling quantity in litres, please press the ON/INFO button and the water Wasserhärte/hardness button together for 3 seconds.

8.4 Initial system filling

1. Remove the air from the cartridge and rinse it. Place a bucket underneath and open the bleed valve.
2. Open the water supply (shut-off valve) on the inlet side and, with the AQA therm HRC-S, rinse c. 5 litres/HRC/SRC-L c. 15 litres /SRC-XL c. 25 litres of water in the bucket.
3. Close the vent valve, check the cartridge is watertight.
4. Open the shut-off on the AQA therm HES, and fill/refill the heating system in accordance with the standard.
5. Slowly open the shut-off ball valve on the inlet and outlet side of the AQA therm HFB-1717 BA and the outlet side of the AQA therm HES.
6. After filling the system, close all the shut-off ball valves. Occasional fluctuations in pressure may cause water to leak from the drain funnel! This is not a malfunction, and therefore no grounds for complaint!

8.5 System refilling

Proceed in accordance with 8.3 & 8.4. Note the maximum capacity of the AQA therm HRC or AQA therm SRC and replace it when it reaches capacity.

8.6 Replacing depleted cartridges

- a) If, according to the 'smart' set-up cartridge, capacity falls below 10%, the service LED will flash yellow. If, according to the 'smart' set-up, cartridge capacity falls below 10%, the service LED will start flashing yellow. When the cartridge is totally depleted or if the cartridge has been in use for longer than 5 years, the service display will flash red and emit a beep. (Factory setting is tone on; to turn off, see 8.3 point h).
- b. Depressurise the cartridge using the vent valve.
- c. Unscrew the cartridge from left to right (clockwise) from the AQA therm HES.
- d. Dispose of used cartridges in domestic waste/plastic recycling.

8.7 Installing new cartridges

- a) Remove the cartridge from its packaging and check for any damage or defects.

- b) Remove the hygiene cap from the cartridge.
- c) Screw the cartridge into the AQA therm from right to left (anti-clockwise).
- d) If the new cartridge is screwed into the AQA therm HES, it must be logged via the 'smart' function. Press the Kartusche/cartridge button to toggle between the different cartridges, pause on the selected cartridge for 3 seconds to log it. When replacing a depleted cartridge with a new one, please press the water Wasserhärte/hardness and Kartusche/cartridge buttons for 3 seconds to reset the cartridge capacity.

Warning: If the new cartridge is different to the old one, e.g. size (L/XL), the new cartridge must be selected and logged using the Kartusche/cartridge button.

9. Servicing

Backflow preventers must only be serviced by authorised, qualified personnel!

9.1 Inspection

Frequency: every 6 months (depending on local conditions), carried out by an installation company or BWT's service team.

9.1.1 Operating the control pressure reducer

1. Close the shut-off ball valve on the outlet side on the AQA therm HFB-1717 BA.
2. Monitor the outlet pressure on the pressure gauge at zero flow
 - If the pressure increases slowly, the valve may be dirty or faulty. If this is the case, carry out maintenance and cleaning.
3. Slowly open the shut-off ball valve on the outlet side on the AQA therm HFB-1717 BA.

9.2 Maintenance

We recommend that you take out a maintenance contract with an installation company or with BWT's service team.

Regular maintenance must be carried out in accordance with DIN EN 1717.

Frequency: 1-3 years (depending on local conditions), carried out by an installation company or BWT's service team.

9.2.1 Valve core and filter

1. Close the shut-off ball valve on the inlet side of the AQA therm HFB-1717 BA and on the outlet side of the AQA therm HES.

2. Depressurise the outlet side by opening the sampling valve (vent valve on the AQA therm HES).
3. Slacken the compression spring
 - Turn the adapter to the left (-) until it can go no further.
 - The spring cap contains a compression spring. Injuries may occur if the compression spring jumps out of the cap.
 - Make sure the compression spring is slackened!
4. Unscrew the spring cap (double-ring spanner optionally available).
5. Remove the sliding ring.
6. Use pliers to remove the valve core.
7. Check that the gasket, nozzle edge and ring groove are in perfect condition; if necessary, replace the entire valve core.
8. Install in reverse order.
9. Set outlet pressure.

9.2.2 Maintaining and cleaning the backflow preventer core

Do not use solvents and/or cleaning agents containing alcohol to clean the plastic components, as this can lead to water contamination!

Do not allow any cleaning agents to enter the environment or the sewage system!

1. Close the shut-off ball valve on the inlet side of the AQA therm HFB-1717 BA and the outlet side of the AQA therm HES.
2. Depressurise the outlet side by opening the sampling valve (bleed valve on the AQA therm HES).
3. Unscrew the cover of the backflow preventer core.
4. Remove the backflow preventer core and filter.
5. Remove the filter from the backflow preventer core.
6. Clean the filter and backflow preventer core or, where appropriate, replace it. The backflow preventer core should not be taken apart!
7. Install in reverse order
 - Press the cartridge until it clicks.
8. Check that it is operating correctly.

9.2.3 Backflow preventer

1. Close the shut-off ball valve on the inlet side of the AQA therm HFB-1717BA and the outlet side of the mixing unit.
2. Depressurise the outlet side by opening the sampling valve (bleed valve on the AQA therm HES).
3. The backflow preventer is defunct once it has been dismantled.
4. Check that it is operating correctly.

10. Waste disposal

- Housing: zinc-resistant brass.
- Drainage connection, backflow preventer core, valve core, mechanical parts of the mixing unit and spring cap: high-grade plastic.
- Diaphragm: EPDM, reinforced fabric.
- Seals: NBR and EPDM.
- Setpoint spring: spring steel.
- Fine filter: stainless steel.
- Cartridge (HRC, SRC): polypropylene (can be disposed of in normal waste).
- Batteries, electronic



11. Faults/Troubleshooting

Fault	Cause	Removal
Minimal or no flow rate	AQA therm HFB-1717 BA not mounted in the direction of the flow rate	Mount the AQA therm HFB 1717 BA in the direction of the flow rate (see the arrow direction on the housing)*
	Shut-off ball valve not fully open	Fully open the shut-off ball valve
	Pressure reducer not set at the required outlet pressure	Set outlet pressure
	Integrated filter is dirty	Clean the filter*
Drain valve opens for no reason (no fluctuation in inlet pressure)	Inlet-side backflow preventer or drain valve is dirty	Remove backflow preventer core and clean or replace*
Drain valve does not close	Drain valve is dirty	Remove backflow preventer core and clean or replace*
Water leaking from the spring cap	Diaphragm valve core defective	Insert valve core*
The set outlet pressure does not remain constant	Nozzle or gasket valve dirty or damaged	Replace valve core*
Water not hard enough	Incorrect setting of the hardness range	Set the correct hardness range
	AQA therm hardness-reducing cartridge (HRC) or desalination cartridge (SRC) depleted	Replace (HRC, SRC) cartridge with a new one*
	Impurities have entered the mixing inlets	Flush (HRC, SRC) cartridge

* Note: the corrective measures marked with * must be carried out by an installation company or by BWT's service team. Should the corrective measures listed above fail to achieve the desired result, please contact an installation company or BWT's service team.

12. Ersatzteile/Zubehör

Description		Item no. Austria	Item no. Germany
AQA therm HFB-1717 backflow preventer using BA		810427	1-904115
AQA therm HFB-1717 pressure reducer using BA		081428	1-904792
AQA therm HRC S hardness-reducing cartridge	0,75 l	812523	12523
AQA therm HRC L hardness-reducing cartridge	3,5 l	812524	12524
AQA therm SRC L salt-reducing cartridge	3,5 l	812526	12526
AQA therm SRC XL salt-reducing cartridge	6,5 l	812510	–
HES water meter		810426	1-904793
AQA therm distilled water filling nozzle		084959	1-904794
AQA therm HES filling adapter		084958	11796
Pressure gauge pressure reducer (HFB)		082428	1-904795

13. Cartridge capacity table

Alternative reference total hardness °dH (raw water)	HRC-S	HRC-L	Cartridge conductivity µS/cm	SRC-L	SRC-XL
1	2.600	12.800	30	4.800	9.750
2	1.300	6.400	60	2.400	4.875
3	867	4.267	90	1.600	3.250
4	650	3.200	120	1.200	2.438
5	520	2.560	150	960	1.950
6	433	2.133	180	800	1.625
7	371	1.829	210	686	1.393
8	325	1.600	240	600	1.219
9	289	1.422	270	533	1.083
10	260	1.280	300	480	975
11	236	1.164	330	436	886
12	217	1.067	360	400	813
13	200	985	390	369	750
14	186	914	420	343	696
15	173	853	450	320	650
16	163	800	480	300	609
17	153	753	510	282	574
18	144	711	540	267	542
19	137	674	570	253	513
20	130	640	600	240	488
21	124	610	630	229	464
22	118	582	660	218	443
23	113	557	690	209	424
24	108	533	720	200	406
25	104	512	750	192	390
26	100	492	780	185	375
27	96	474	810	178	361
28	93	457	840	171	348
29	90	441	870	166	336
30	87	427	900	160	325
31	84	413	930	155	315
32	81	400	960	150	305
33	79	388	990	145	295
34	76	376	1020	141	287
35	74	366	1050	137	279
36	72	356	1080	133	271
37	70	346	1110	130	264
38	68	337	1140	126	257
39	67	328	1170	123	250
40	65	320	1200	120	244

Use the values in the table for precise monitoring of cartridge capacity rather than the consumption value on the electronic water meter on the AQA therm HES. The capacity of the HRC cartridges depends on the overall hardness of the water to be treated, and the capacity of the SRC cartridges depends on the conductivity of the water to be treated. The overall water hardness can also be used as a benchmark, but this only applies to untreated water and not to previously (partially) softened water. In this case, the reference value must also be conductivity or, as a guideline, the overall hardness of the original untreated water (i.e. prior to softening).

Further information:

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