



The intelligent mini-energy domestic hot water pump

**AXW smart**

## Domestic hot water circulation pump AXW smart

### Characteristics

- Developed for One/two family homes, Multi-family blocks, Administration buildings and commercial premises
- Combination of high efficient permanent magnet technology and integrated intelligence in one pump
- Self-learning ability of hot water tapping patterns
- Comfort settings
- Legionella bacteria protection
- No sticking thanks to electronic deblocking program





## Product overview

### AXW 10 smart to AXW 14 smart

#### Type

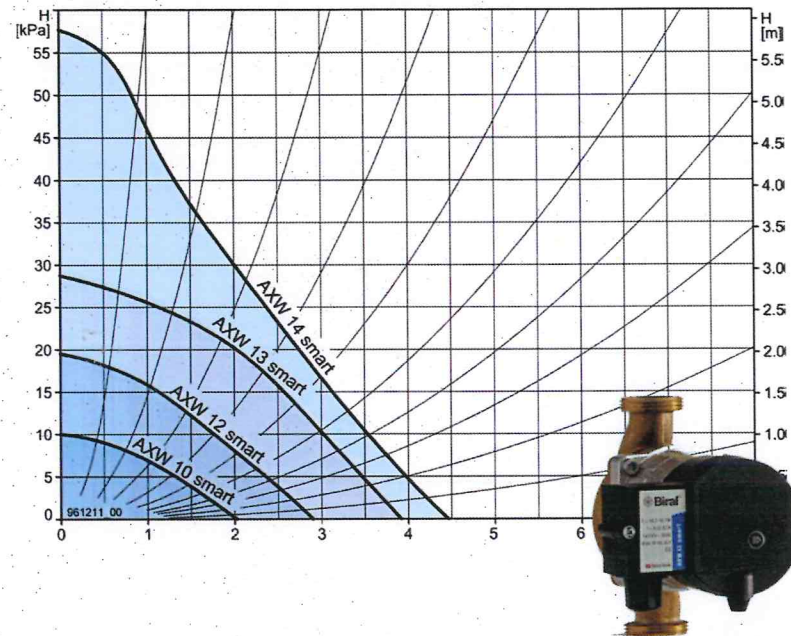
Mini- energy industrial water pump  
 type **AXW smart** 1 x 230V

Mini-Energy circulators for domestic hot water for high convenience, with efficient permanent magnet technology.

#### Applications

- One/two family homes
- Multi-family blocks, administration buildings
- Office buildings, commercial premises

#### Performance curves



#### Technical data

Flow, Q: max 4.5 m<sup>3</sup>/h

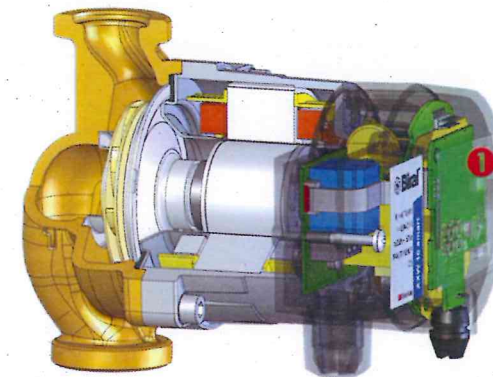
Head, H: max 6 m

Liquid temp: + 15 to + 65 °C

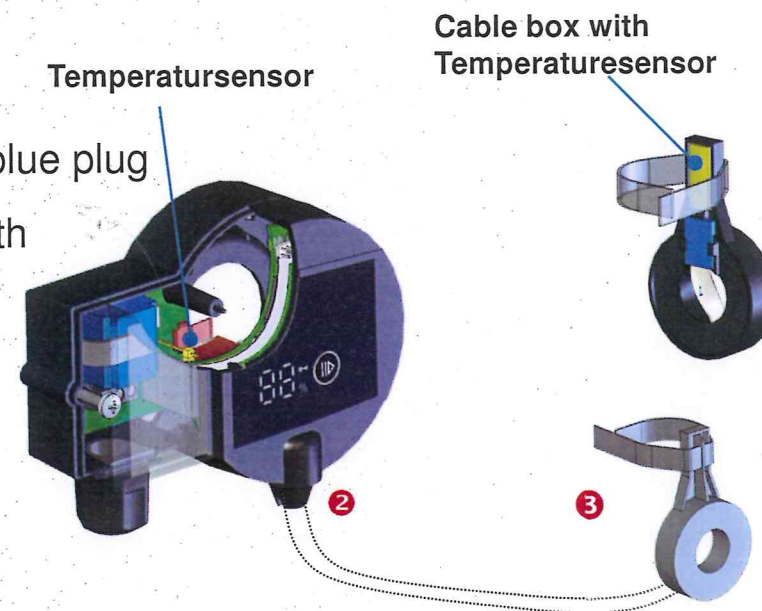
Operating pressure: max 10 bar

## Design and construction AXW smart

Design, construction of AXW smart  
is based on the permanent-magnet  
technology equal to AXW 12 pump



- ❶ Printed board with microprocessor
- ❷ Pluggable connection for sensor cable with blue plug
- ❸ Sensor cable with cable box, maximum length of the sensor cable is 2.5 m



## Basic Information

### AXW 13 smart, AXW 13-1 smart

Baulänge	150/180 mm
Zulässiger Betriebsdruck	10 bar
Zulässiger Betriebstemperatur Kurzzeitig bis max. 85 °C	+15 °C bis +65 °C
Wasserhärte	max. 35 °H(20 °dH)
Erforderlicher Betriebsdruck bei 500 m über Meer bei 65 °C Wassertemperatur	0.05 bar
bei 85 °C Wassertemperatur	0.30 bar
Pro ± 100 m Höhe	± 0.01 bar
Gewicht	2.6 kg
Spannung	1x230 V, 50 Hz
Strom	0.12 – 0.3 A
Leistung	14.3 – 32.7 W

Zur Vermeidung von Kondenswasserbildung muss die Medientemperatur immer höher sein als die Umgebungstemperatur

Die Pumpe ist mit internem elektrischem Motorschutz ausgerüstet und benötigt keinen externen Motorschutz.

Die Pumpe startet immer mit einem hohen Drehmoment.

**Pumpengehäuse: Bronze**

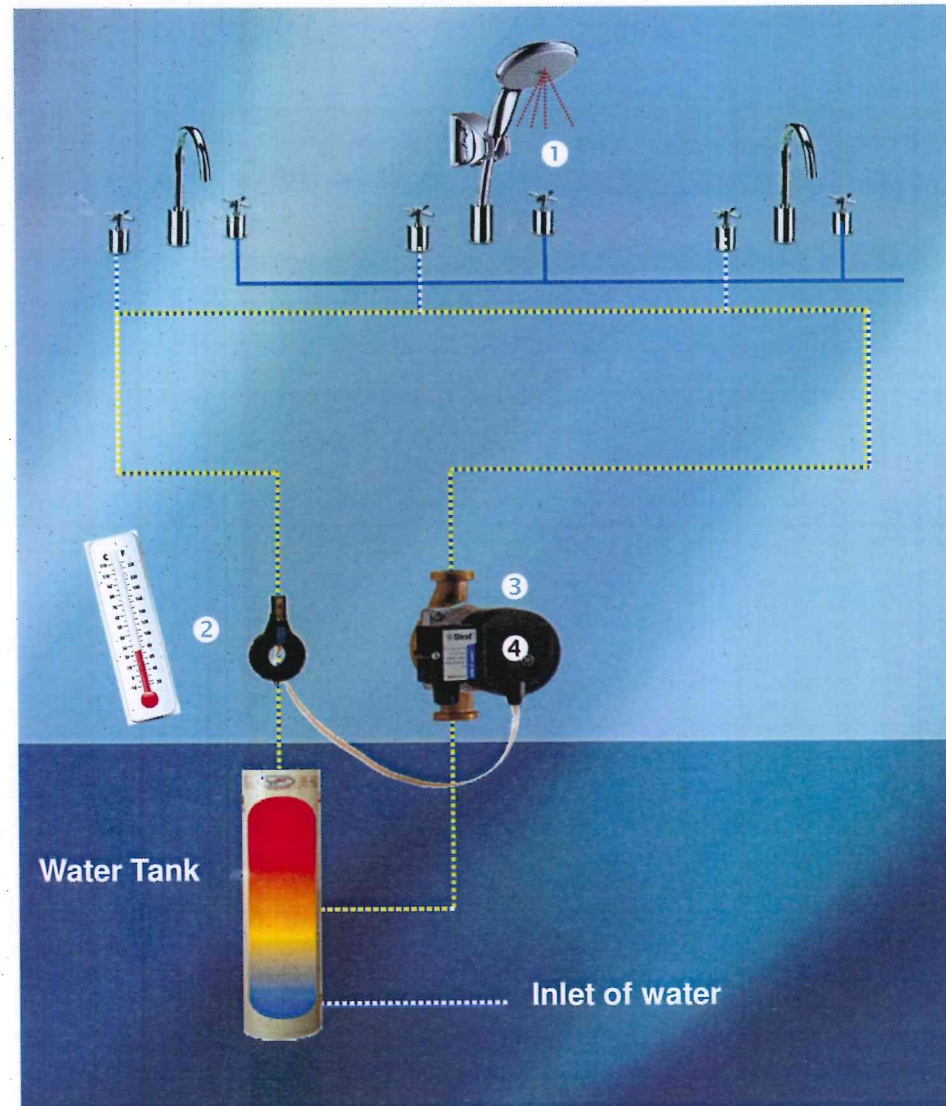
- ① Permissible operating pressure      10 bar
- ② Permissible operating temp.      +15 °C to + 65 °C
- ③ Power Regulation      5...45 W
- ④ To avoid the formation of condensation the media temperature must always be higher than the ambient temperature.
- ⑤ The pump is fitted with internal electrical motor protection and requires no external motor protection.





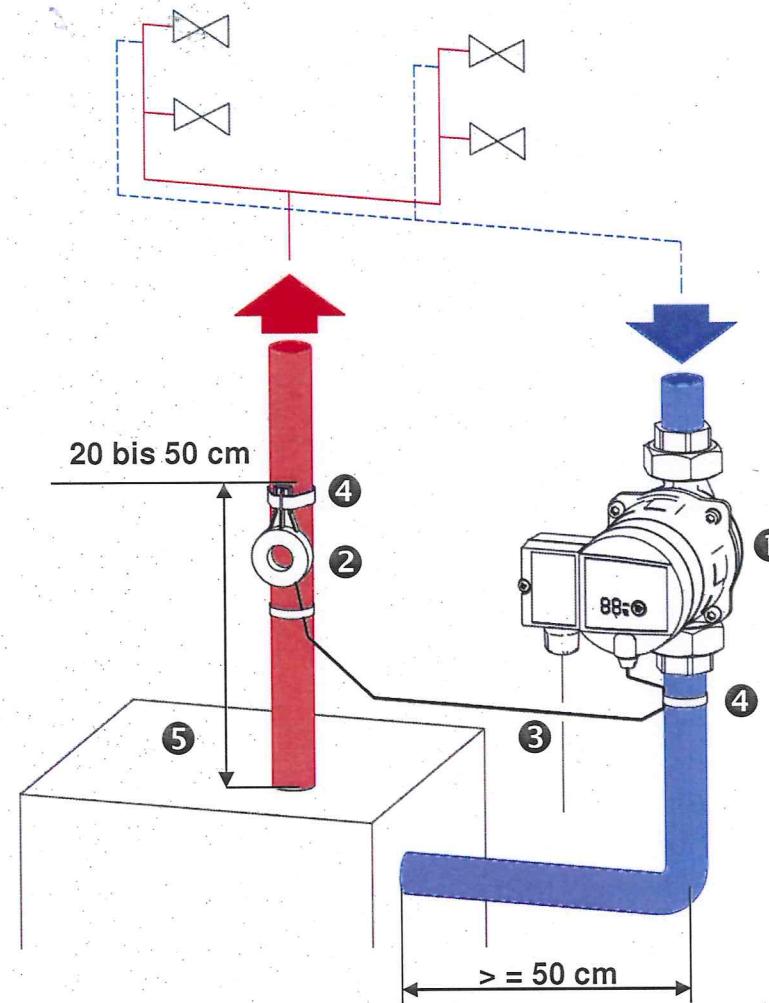
## Learn modus of AXW smart

- 1 Hot water is tapped.
- 2 The supply line warms up which is detected by the (temperature sensor).
- 3 The pump starts running and „memorizes“ the time when the hot water has been tapped.
- 4 The pump provides hot water proactively according to the learned tapings.
- 5 The pump only runs on request according to learned tapping's or for a disinfection run against legionella bacteria min. 20 minutes.



## Mode of installation

- ① Pump
- ② Cable box with  
Temperaturesensor
- ③ Sensorcable
- ④ Cable clip
- ⑤ Heater





## Run - time optimization of AXW smart

After some time hot water is only conveyed up to the last tapping point and no longer all the way to the pump.

The pump does not start up if there is a request for hot water while the circulation pipe already is hot.

The pump does not run if the circulation pipe is cooling down (hot water not being tapped).

The pump does not run during absentism (exception: a „learned“ disinfection run and flushing run every 24 hours)

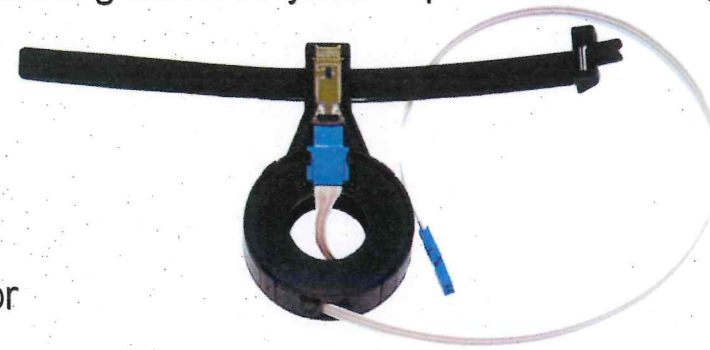


## Cabel roller with surface temperature sensors

The temperature sensor measures and control the regulation of liquids flowing in pipes. The temperature sensing element is an n-conducting silicon crystal in planar technology embedded in soft silicon rubber on small PCB.

### Features

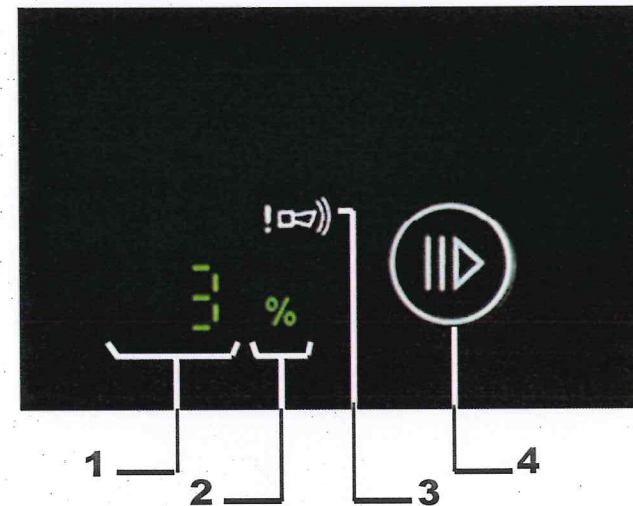
- Silicon based temperature dependent resistor
  - Positive temperature coefficient (PTC)
  - Temperature range – 50 °C to + 150 °C (– 60 F to 300 F)
  - High reliability due to silicon based construction
  - Resistance tolerance (R25) of  $\pm 1\%$
  - Maximum length of the sensor cable is 2.5 m
- Do not destroy silicone surface, it is the contact surface with the pipe





## Settings

- 1 Illuminated symbols: comfort level, operation in % and type of error
- 2 Illuminated symbols: percentage and «operation/ ready»
- 3 Illuminated symbols: pump fault
- 4 Control button

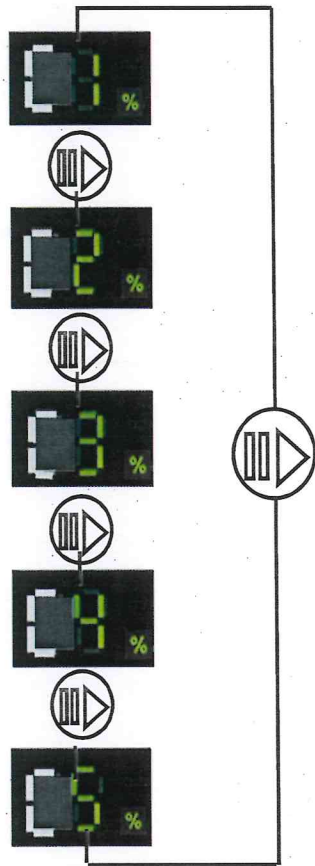


### Normal operation

- If no button is pressed for longer than 8 seconds, the display changes to the normal operation status. The figure indicates the proportion of pump running time to the total operating time.



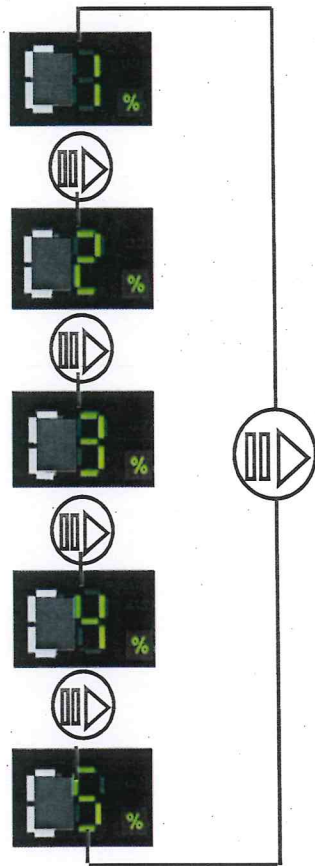
## Comfort setting



- C 1 Maximum energy saving,**  
Minimum pump running times (pump learns gradually, very regular tapping's necessary, responds above all «on request»)
- C 2 High energy saving**  
Short pump running time
- C 3 Normal comfort (delivery condition)**  
Average pump running time (sufficient for practically all cases)
- C 4 High comfort**  
Normal pump running time
- C 5 Maximum comfort**  
Increased pump running time (pump gradually «forgets», also responds with anticipation to tapping processes long past).



## Comfort setting



### Recommendation

The comfort setting should only be adjusted to requirements after two weeks.

### Which comfort settings are recommended?

Factory settings:

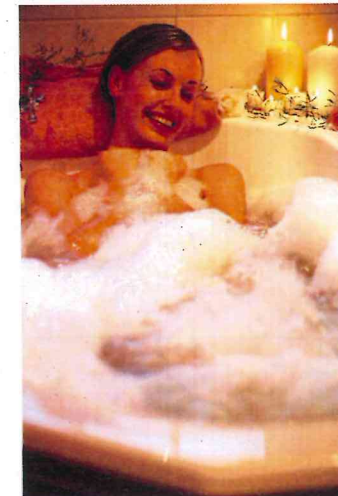
Level 3 (sufficient for almost all cases)

Min. setting: Level 1

(Pump learns slowly, very regular tapping required, reacts mainly to "request"), shorter pump operation times.

Max. setting: Level 5

(Pump "forgets" slowly, reacts to previous tapping proactively.)  
Longer pump operation times



## Questions & Answers on Operation AXW smart

### How long will the pump run (before it is turned off again)?

- Between 10 and 20 minutes (depending on comfort settings), after 1 week considerably shorter (approx. 5 to 10 minutes). Pump has optimized its on time in the mean time, hot water is only pumped to the last tapping point no longer to the pump.

### How long will the pump in disinfection mode?

- Pump will continue running until the return flow temperature does no longer increase; It will run for at least 20 minutes and longer in larger circulation systems.

### How does the system know when it's weekend?

- The pump electronics will detect regular and significant differences in tapping habits between Monday to Friday after being in use for at least 2 weeks. On weekends the pump is only switched on when hot water is tapped!

### How does holiday mode work?

- If 10 learned hot water requests are not received or after 18 hours without tapping, at the latest, automatic starting of the pump is deactivated. When hot water is tapped again, the rhythm which was active before the interruption is activated again.



## Installation condition

AXW smart circulation pumps are basically fitted in the circulation pipe

It must be ensured that the pump is not installed too close to the hot water heater

The heat transmitted from the hot water heater through the pipes can influence the function of the thermostat.

Optimum spacing of cable box with temperature sensor from hot water heater: 20 to 50 cm

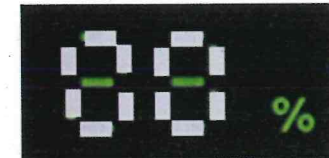
Carefully fit sensor cable with blue plug



## Commissioning/operating control

### Venting

- The pump is vented automatically after a brief period of operation. A short period of dry running (max. 2 mins.) does not harm the pump.
- The pump also has an additional «venting» mode of operation:
- The pump changes to the «venting» («- -») mode of operation after holding down the control button (for at least 5 secs.)



### Deblocking

- Owing to the very high torque of the permanent magnet motor, it is unnecessary to deblock the pump. The electronic system also has an automatic deblocking program.

### Warning

- **The pump must not be operated without water!**




## Energy saving

### Example:

WX 10 vs. AXW 12 (csl) vs.  
 AXW 10 smart

Pump running time 647 h/a (7.5%)

Total Energy saving 98%

	Conventional pump	with PM-technology	with smart-technology
<b>Pump capacity</b>	286 kWh/year	Saving 76% 68 kWh/year	Saving 93% 5 kWh/year
<b>Heating energy for supply of hot water</b>	approx. 900 kWh/year	approx. 900 kWh/year	approx. 80 kWh/year Saving up to 90%
	 WX	 AXW	 AXW smart

Power cost saving  
**98%**  
 Excl. Saving of heat energy



## Benefits of WXW smart

### End - user

#### **Self-taught**

recognises your consumption habits  
and provide hot water at the right time

#### **Variable comfort setting**

From maximum energy saving to maximum comfort

#### **No sticking**

Thanks to electronic deblocking programme

#### **Protection against legionella bacteria**

Automatic circulation, in case of thermic disinfection.

#### **Information on LED display**

Mean pump running time, comfort setting and faults are displayed

#### **Saving cost and energy**

Optimum pump run-times mini-mize the consumption of energy.

