Valve Drive EnOcean
SE/K 1.868.1
Product Manual

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ABB

Valve Drive EnOcean
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1   General

The Valve Drive EnOcean is used for efficient control of room temperature in private and commercial facilities. It communicates wirelessly via a bidirectional EnOcean standard radio protocol, and it features a large display and a rotary knob for manual operation.

It is powered by two 1.5 V AA lithium batteries.

The Valve Drive EnOcean is suitable for use with the ABB i-bus KNX KNX/EnOcean Gateway EG/A 32.2.1).

1.1   Using the product manual

This manual provides detailed technical information on the function, installation and programming of the device. The application is explained using examples.

This manual is divided into the following chapters:

Chapter 1   General

Chapter 2   Device technology

Chapter 3   Commissioning

Chapter 4   Maintenance and battery replacement

Chapter 5   Trouble shooting

Chapter 6   Disposal

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1.2 Safety

Read this document, particularly the safety instructions, prior to installation and operation.

1.2.1 Notes

Notes and safety instructions are represented as follows in this manual:

Note
Tips for usage and operation

Examples
Application examples, installation examples, programming examples

Important
These safety instructions are used as soon as there is danger of a malfunction without risk of damage or injury.

Attention
These safety instructions are used as soon as there is danger of a malfunction without risk of damage or injury.

⚠ Danger
These safety instructions are used if there is a danger to life and limb with inappropriate use.

⚠ ⚡ Danger
These safety instructions are used if there is an extreme danger to life with inappropriate use.

1.2.2   **Proper use**

The electronic heater thermostat Valve Drive EnOcean described here is used for room temperature control, and it adapts the heat supply to the demand in the individual rooms. It must be used exclusively for control in closed interior rooms.

Attention
Loss of all claims against the manufacturer!
• The device must be used in accordance with the installation and operating instructions.
• Unauthorized opening of or modification to the device, except for the battery compartment cover, is not permitted for reasons of safety. It will also lead to the loss of all claims against the manufacturer.

1.2.3   **In operation**

Safe operation is possible only if you properly perform transport, storage, installation, operation and maintenance in line with safety requirements.

2 Device technology

2.1 Valve Drive EnOcean SE/K 1.868.1

2CDC071002S0016

Valve Drive EnOcean SE/K 1.868.1

The Valve Drive EnOcean is used for efficient control of room temperature in private and commercial facilities. It communicates wirelessly via a bidirectional EnOcean standard radio protocol, and it features a large display and a rotary knob for manual operation.

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The Valve Drive EnOcean is suitable for use with the ABB i-bus KNX KNX/EnOcean Gateway EG/A 32.2.1).

2.1.1 Technical data

Type	Electromechanical
Place of use	Dry rooms
Type of motion	Linear
Threaded connection	M30 x 1.5
Permissible supply temperature	Up to 90 °C
Actuating time	3.3 s/mm
Actuating force	100 N
Actuating stroke	5.5 mm
Stroke resolution	< 0.033 mm/step
Detection of end positions	Both sides
Emergency actuating function	Available
Control range	10 °C to 30 °C
Setpoint encoder	Incrementally from 10 °C to 30 °C in steps of 0.5 K (manual setpoint adjustment)
Radio interface frequency	868.3 MHz
Radio interface protocol	EnOcean, Smart Acknowledge
Radio interface telegram structure	Bidirectional EnOcean Equipment Profile, A5-20-04
Range	30 m in building, depending on the building substance
Wake-up time	Event and time controlled (variable)
Sending cycle	Event and time controlled (variable)
Protection	IP30, protection class III
Power supply	2 x 1.5 V AA batteries
Reverse voltage protection	Available
Battery life	Up to 4 years (depending on the number of actuations and wake-up cycles)
Power consumption at standby	2 µW
Maximum power consumption	Active$_{max}$ 450 mW
Display	Adaptation
	Teach-in mode
	Battery status
	Key lock
	Setpoint
	Error codes
	Connection interrupted

Valve Drive EnOcean
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|		
Display size (active area)		1.68"
		33.02 x 26.955 mm (W x H)
Material characteristics		Housing ABS, PA6.6, PMMA
		Valve connection brass MS 58 (2.0401)
		Union nut brass MS 58 (2.0401)
Weight (with batteries)		Approx. 250 g
Sound power level		< 30 dB(A)
Ambient temperature	Operation	+5 °C to +40 °C
	Storage	-15 °C to +60 °C
	Transport	-15 °C to +60 °C
Humidity	Operation	5% to 80% rel. humidity (non-condensing)
	Storage	5% to 80% rel. humidity (non-condensing)
	Transport	5% to 80% rel. humidity (non-condensing)
Certificates		2006/42/EC, Safety of machinery
		DIN EN ISO 12 100
		DIN EN ISO 60 730-1
		DIN EN ISO 60 730-2-8
		1999/5/EC and 2014/53/EU, Radio equipment and telecommunications terminal equipment
		DIN EN 300 220-1
		DIN EN 300 220-2
		DIN EN 301 489-1
		DIN EN 301 489-3
		2011/65/EU, Restriction of the use of certain hazardous substances in electrical and electronic equipment
		Directive 2012/19/EU (WEEE directive)
		Regulation (EC) No. 1907/2006 (REACH)

2.1.2   **Components**
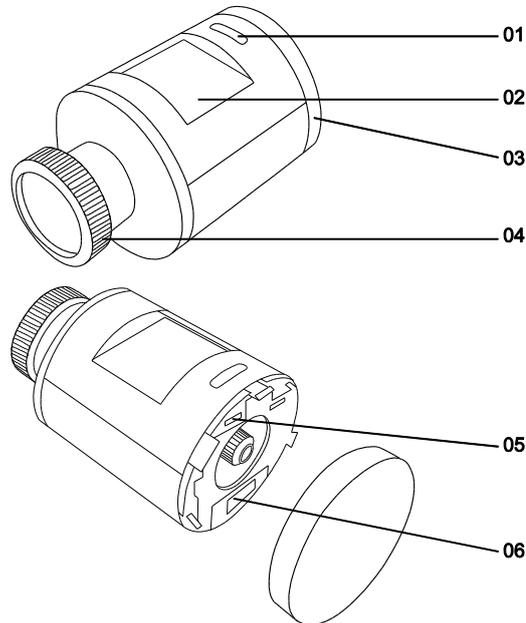
Item	Description	Explanation
01	Button	Adapt, teach-in, display
02	Display	Display of current information
03	Rotary knob	To set the desired temperate
04	Threaded connection	M30 x 1.5
05	Micro USB connection	For external power supply
06	Battery compartment cover	Battery insertion

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2.1.3   **Dimension drawing**

101.00 mm

57.00 mm
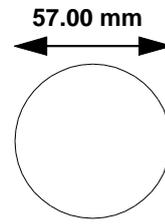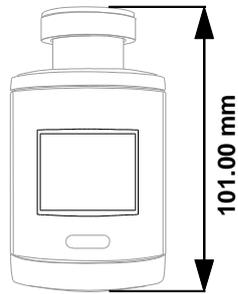
2.1.4   **Display**

The display serves as the user interface and is divided into two areas.

The narrow upper area shows the battery, teach-in and adaptation status. The lower area shows the target temperature and the error message in large letters and numbers, as well as the event symbols.

For further information, see: Key to symbols.

The display is visible only briefly to save energy; press the button to read the display again.
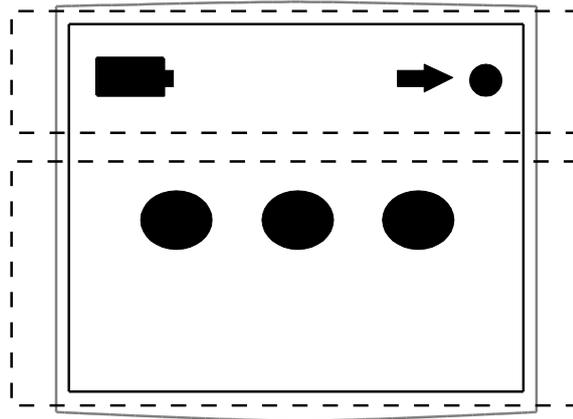
Key to symbols

Symbol	Explanation
● ● ●	Installation position is assumed
➡ ●	Adaptation
➡ ⬅	Teach-in
➡✕⬅	Reset to factory default
⧗	Wait for symbol display
🔋	Batteries discharged
🔒	Key lock

2.1.5   **Functions**

Detection of actuating travel and end positions

Using a patented actuating travel detection process, the Valve Drive EnOcean automatically records the two end positions and, based on this, calculates the available stroke. The corresponding valve position can be transmitted to a higher-level gateway via the associated EnOcean protocol.

Battery warning

When the battery voltage falls below a critical value, the Valve Drive EnOcean transmits an error code to a higher-level gateway. The battery symbol also appears on the display. A period of 30 days from this time remains until the batteries must be replaced.

The symbol for "adapted" goes out. After battery replacement, the Valve Drive EnOcean must be re-adapted at the push of a button (see 4.1 Battery replacement, p. 21).

Note
The Group object for the error codes might have to be activated manually in the gateway.

Emergency actuating function

If the battery voltage falls below the critical value, the Valve Drive EnOcean opens the valve to 100%.

Internal PI controller

As soon as the Valve Drive EnOcean loses the radio connection to its taught-in gateway for an extended period (no reception after 3 wake-up operations), the internal PI controller takes over and adjusts the temperature to the previously set temperature value. Simultaneously, the target temperature can be set locally using the rotary knob.

The symbol ->< additionally appears on the display.
On every wake-up, the Valve Drive EnOcean simultaneously checks the availability of the gateway by means of reclaim telegrams. As soon as the connection is reestablished, the panel takes over control again.

Radio interface

The Valve Drive EnOcean features an EnOcean radio interface, based on 868.3 MHz, according to ISO/IEC 14543-3-10, which is characterized by particularly low energy consumption. The EEP belonging to the Valve Drive EnOcean is A5-20-04.

Manual setting of the target temperature

The target temperature can be set using the rotary knob at any time. The Valve Drive EnOcean monitors the rotary knob setting and shows the setpoint on the display. This temperature is displayed in increments of 0.5 °C in the range from 10 °C to 30 °C.

Manual setting of °C or °F

The target temperature can be displayed in °C and in °F. Manual changeover of the temperature display is performed using the rotary knob in standby mode. Radio communication continues to take place in °C.

**For further information, see: **

Room and supply temperature recording

The supply and room temperatures are each recorded via integrated temperature sensors. A specially developed correction algorithm compensates for other temperature influences on the measured values. This way, the real temperature values are determined and transmitted for further processing.

Building protection

The lowest target temperature is 10 °C. If the drive has been taught in and the radio connection to the gateway exists, the room temperature will not fall below 10 °C. If the drive, via its internal sensors, nevertheless determines that the room temperature has fallen below a value of 10 °C, the gateway is additionally informed (error telegram 0x14 -> !20).

If the radio connection is interrupted for an extended period, the internal PI controller intervenes when the temperature threshold of 10 °C is reached, and it adjusts the room temperature to 10 °C.

The prerequisite for this control is sufficient heating power.

Valve sticking protection

The sticking protection function prevents the cone from becoming stuck when the valve has not moved for an extended period. Any cycle and travel can be defined via the gateway.

If the drive should nevertheless lose contact with the valve tappet of the installed heater valve, this state is output as an operating fault.

For further information, see: 4.3 Trouble shooting, page 22.

Micro USB interface

The Valve Drive EnOcean can be powered via the micro USB interface.

Key lock

The Valve Drive EnOcean can receive a key lock command via the gateway. In this case, it is no longer possible to set the target temperature manually on the Valve Drive EnOcean. If the key lock is active when the batteries are discharged, this function will be suspended for the new adaptation process. If the Valve Drive EnOcean loses its connection to the gateway, the key lock is released to permit manual temperature control.

Sending cycle

The Valve Drive EnOcean is in deep-sleep mode for most of its operating time in order to minimize energy turnover. The deep-sleep phase times can be chosen from a preselection of 63 time cycles by means of an EnOcean telegram. The predefined deep-sleep phase times lie in the range from 10 s to 42 h. If the index of this field variable is set to a value of 50 or higher, the drive interprets this as a prompt to change to the so-called summer mode.

Value	0	1	2	…	9	…	19	…	49	50	51	…	63
Time (sec)	10	60	90	…	300	…	600	…	1,500	…			
Time (min)	0.17	1	1.5	…	5	…	10	…	25	180	360	…	2,520
Time (h)					0.05	…	017	…	0.42	3	6	…	42

Summer mode

Summer mode is characterized by the fact that the deep-sleep phase now lasts at least 3 h. Additionally, the valve is opened completely as soon as this mode is activated. Among other things, this serves to protect the valve seal.

Summer mode can be exited again by reducing the deep-sleep phase cycle time to an index of less than 50 again. The drive should then be re-adapted to the valve to establish reliable operation again.

Adaptation can be triggered via a Group object, see Adaptation, p. 15.

Error messages

Various errors can occur during normal operation or during commissioning. The error messages are shown on the display and transmitted by radio to the gateway.

Refer to the checklist for the possible error messages.

For further information, see: 4.3.1 Checklist in the event of operating faults, page 22.

2.1.6   **Communication**

The Valve Drive EnOcean features a bidirectional EnOcean interface. Data can be transmitted in both directions between the Valve Drive EnOcean and the panel via this pathway.

The names of the Group objects specified below refer to the ABB KNX/EnOcean Gateway EG/A 32.2.1. They can differ if a different gateway is used.

The following data can be sent by the Valve Drive EnOcean:

- Current valve position

  The current valve position is transmitted as a percentage in the range between 0% and 100%.

  Group object: In_Status_Current Position
  DPT 5.001   Flags: C, R, T

- Supply temperature

  The current supply temperature is transmitted in the range between 20 °C and 80 °C.

  Group object: In_Status_Feed Temperature
  DPT 9.001   Flags: C, R, T

- Target temperature

  The target temperature in the range between 10 °C and 30 °C manually set on the Valve Drive EnOcean is transmitted.

  This Group object must be connected with the setpoint input of the controller to permit adjustment via the Valve Drive. The controller must return the updated setpoint to the Valve Drive for confirmation.

  Group object: In_Status_Temperature Setpoint
  DPT 9.001   Flags: C, R, T

- Room temperature

  The current room temperature is transmitted in the range between 10 °C and 30 °C.

  The Group object can be used as an actual-temperature input for the controller.

  Group object: In_Status_Room Temperature
  DPT 9.001   Flags: C, R, T

- Error codes

  Error codes can be sent from the Valve Drive EnOcean to a remote station.

  Group object: In_Status_Failure Code
  DPT 7.001   Flags: C, R, T

**For further information, see: **

- Teach-in telegram

  It is also possible to send a teach-in telegram (according to the EnOcean Smart Acknowledge Standard) to connect the Valve Drive EnOcean with a gateway.

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The following data can be received by the Valve Drive EnOcean:

- Setpoint valve position

  The setpoint valve position is transmitted as a percentage in the range between 0% and 100%.

  This value is sent by the controller (e.g. KNX RDF/A 1.1 to EG/A 32.2.1) and specifies the control variable for the drive.

Group object:	Out_Control _Valve Position
DPT 5.001	Flags: C, W

- Target temperature

  A target temperature in the range between 10 °C and 30 °C can be forwarded from a panel to the Valve Drive EnOcean.

  This Group object describes the value to be shown on the display of the Valve Drive.

Group object:	Out_Control _Temperature Setpoint
DPT 9.001	Flags: C, W

- Sending cycle

  The sending cycle can be adapted with a command. Possible time values were defined for this purpose.

  The wake-up cycle of the Valve Drive is defined via the value. A lower value leads to a faster reaction of the drive to new values, but this also discharges the battery faster.

Group object:	Out_Control _Wake-up Cycle
DPT 5.010	Flags: C, W

- Adaptation

  A new adaptation process can be initiated via a command.

Group object:	Out_Control_Service Command
DPT 5.010	Flags: C, W

- Installation state

  The thermostat tappet can be fully retracted by a command to permit installation or removal.

Group object:	Out_Control_Service Command
DPT 5.010	Flags: C, W

- Input lock

  Local inputs via the rotary knob and the operating button can be disabled and released with a telegram from a panel.

  If operation is disabled, it is no longer possible to perform adjustment on the drive itself.

Group object:	Out_Control_Button Lock Control
DPT 1.002	Flags: C, W

- Temperature measurement

  Temperature measurement can be deactivated by a telegram (if a separate, external temperature sensor is used).

Group object:	Out_Control_Measurement Control
DPT 1.003	Flags: C, W

- Summer/winter function

  Switchover between summer function and winter function.

  Switchover is performed by adapting the cycle time.

Note
EnOcean Equipment Profile (EEP code) available on request.

3   Commissioning

The Valve Drive EnOcean is easy to install. It is not necessary to drain water from the heating system or to intervene in it.

The Valve Drive EnOcean is suitable for all commercially available valves with an M30 x 1.5 connection.

Two AA batteries are included with the device.

3.1   Valve Drive teach-in with the KNX/EnOcean Gateway EG/A 32.2.1

1.   Open the plug-in of the EG/A 32.2.1 in the ETS (from version V1.0.0.14).
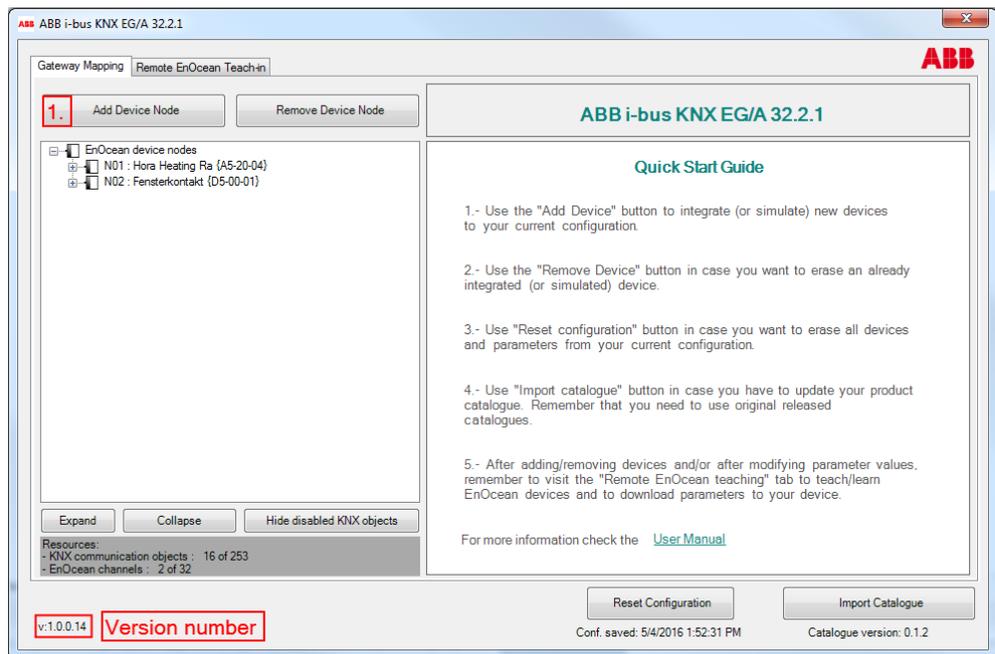
2.   Click *Add Device Node* and, in the window that opens, select the device family *Heating Actuators* and, in this family, select the profile *Hora Heating Radiator Valve Actuating Drive {A5 20 04}*. Click *Add Device Node*.

3. Change to the tab *Remote EnOcean Teach-in*. In the Valve Drive line, click the arrow *Learn*.
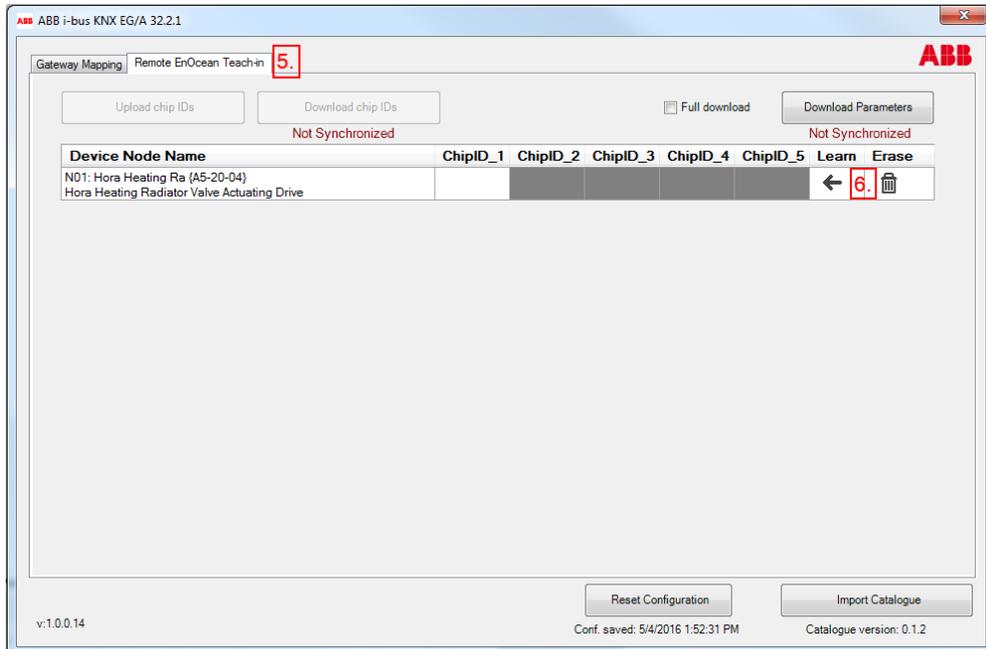
4. Now continue with the steps in chapter 3.2 Initialization/installation, p. 19.

5. The Valve Drive ID appears in the column *ChipID_1* when the drive has been taught in.
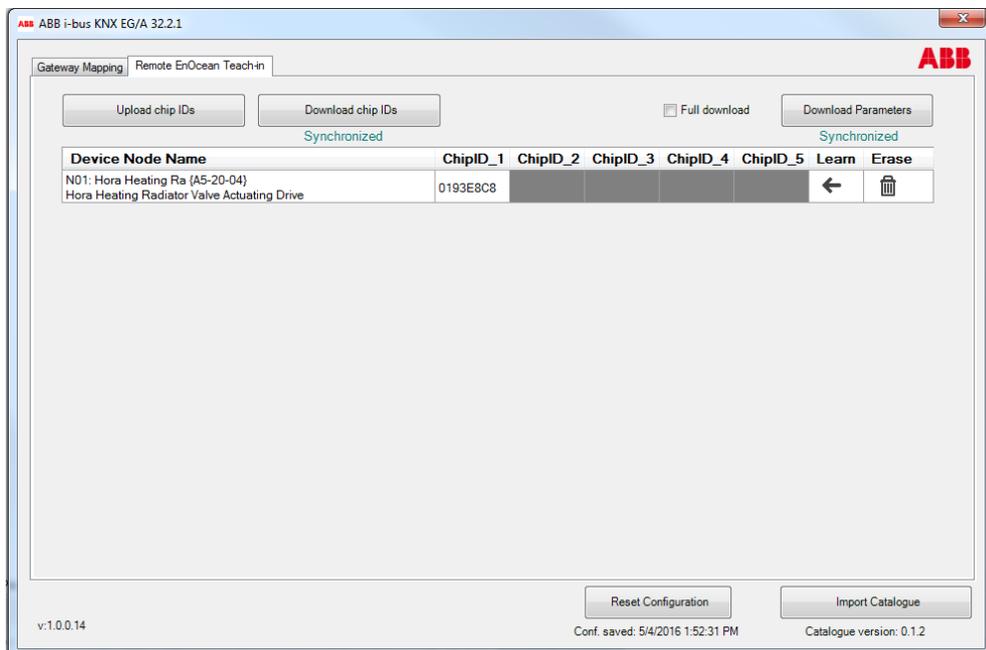
6. The plug-in can now be closed, and the group addresses can be assigned.
Normal programming of the gateway via the ETS now takes place.

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Commissioning

3.2   **Initialization/installation**
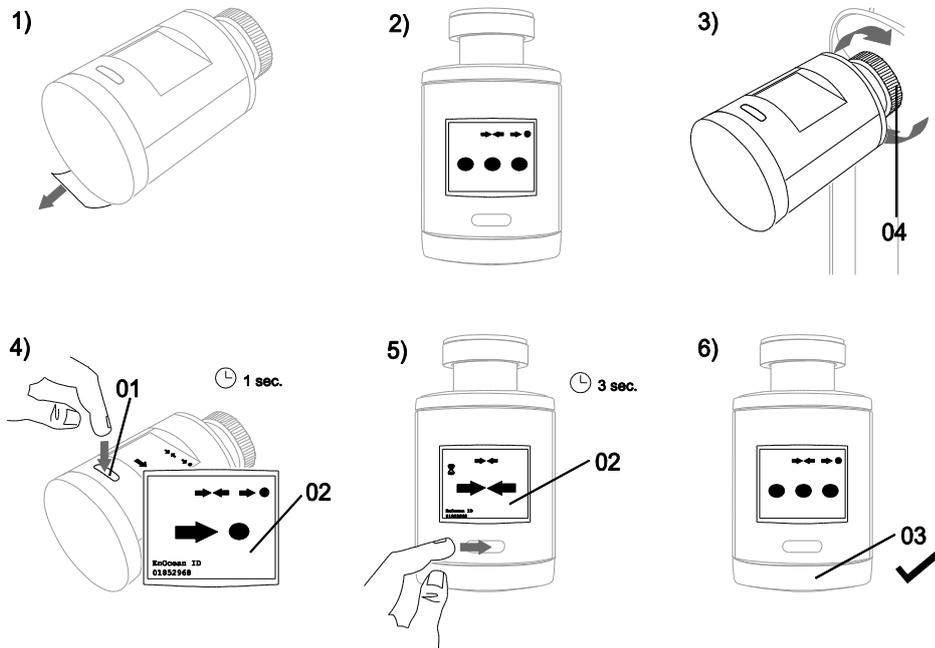
**The Valve Drive EnOcean is initialized and installed as follows:**

1. Remove the protective film.

2. The drive tappet moves back to facilitate installation of the valve.

3. Screw the Valve Drive EnOcean with threaded connection (04) onto the heater valve and tighten the threaded connection by hand. Make sure that the Valve Drive EnOcean is properly screwed in place.

Note
Activate the teach-in mode of the gateway if necessary (see EnOcean Equipment Profiles (EEP)).

4. Briefly press the button (01). The adaptation process starts. Wait until the adaptation process is complete and the symbol goes out on the display (02). The Valve Drive EnOcean is ready for operation.

5. Press the button (01) until the teach-in symbol is shown on the display of the Valve Drive EnOcean. The Valve Drive EnOcean now sends the teach-in telegram to the higher-level central unit.

6. Optionally, you can set the comfort temperature with the rotary knob (03).

3.3 Setting the target temperature in °C or °F
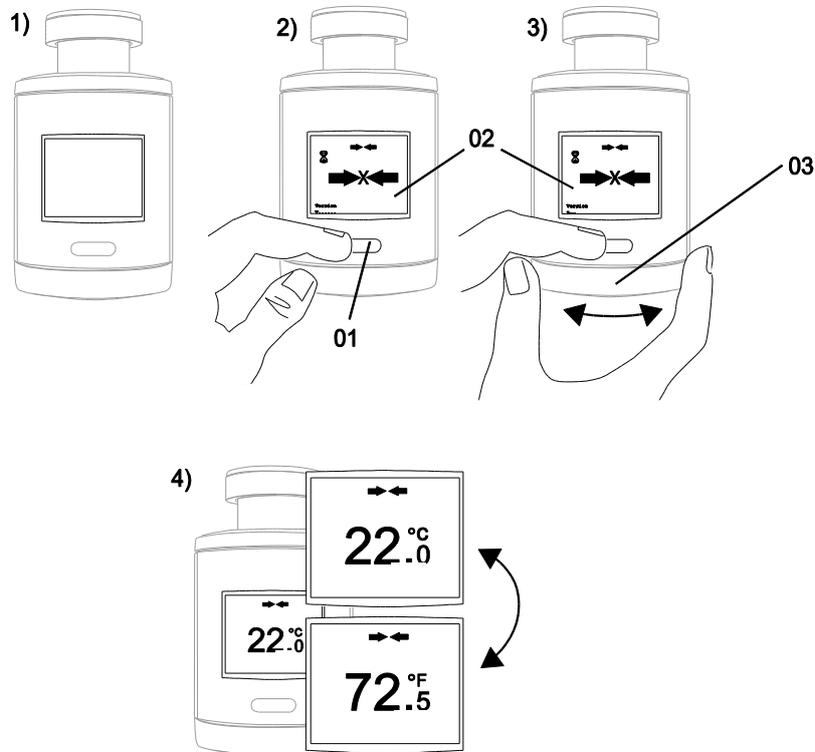
This is how to change the desired target temperature indication to °F:

1. The display must be in standby mode.

2. Press the button (01) for approx. 10 seconds until the symbols appear on the display (02).

3. Keeping the button (01) pressed, turn the rotary knob (03) a half a turn (180°) clockwise.

4. Release the button (01). The temperature is now indicated in °F.

This is how to change the desired target temperature indication to °C:

5. The display must be in standby mode.

6. Press the button (01) for approx. 10 seconds until the symbols appear on the display (02).

7. Keeping the button (01) pressed, turn the rotary knob (03) a half a turn (180°) clockwise.

8. Release the button (01). The temperature is now indicated in °C.

4 Maintenance and servicing

4.1 Battery replacement

1)

03

2)

06

3)

4)

06

5)

03

6)

02
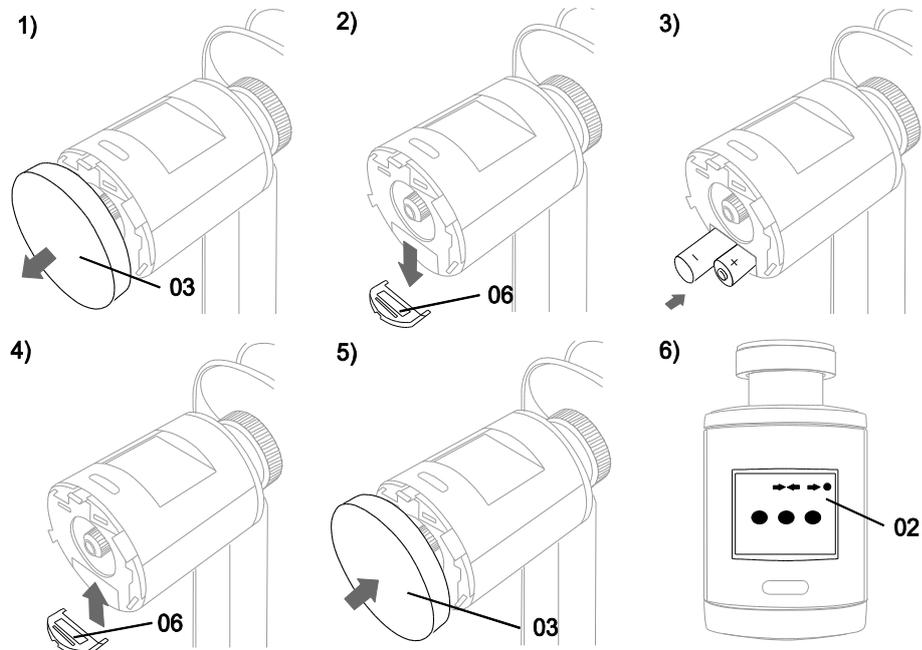
This is how to replace the batteries:

1. Remove the rotary knob (03).

2. Remove the cover (06) of the battery compartment.

3. Insert the batteries.

Attention

Do not use rechargeable batteries!

- Do not use rechargeable batteries, because their voltage is too low.
- Pay attention to the correct polarity when inserting the batteries.

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4. Re-fit the cover (06) of the battery compartment.

5. A closing symbol appears on the display (02).

6. Re-fit the rotary knob (03).

4.2 Maintenance

Except for battery replacement, the Valve Drive EnOcean is maintenance-free for the user. The batteries must be replaced when the weak battery state is indicated on the display or signaled via the central device. The Valve Drive EnOcean does not require ongoing or periodic maintenance.

The surface must not be cleaned with sponges or abrasives. This could lead to scratches or a matt surface. Use only a damp, lint-free cloth for cleaning. Avoid abrasives or cleaning agents.

4.3 Trouble shooting

If the Valve Drive EnOcean does not work properly, proceed as follows to remedy the fault:

1. Check whether the Valve Drive EnOcean was installed properly.
2. Remedy the faults based on the checklist.

4.3.1 Checklist in the event of operating faults

Message	Fault/possible cause	Remedy
!17	Measurement failed/An error occurred when recording the temperatures	If this fault occurs multiple times, contact the Service department
!18	Batteries empty/Voltage below predefined threshold	Replace the batteries
!20	Building protection/The temperature is below 10 °C	The heating power is insufficient. Close the window if necessary or check the heating system.
!33	Problems with travel adjustment, heater valve stuck, Valve Drive EnOcean stuck	Check whether the valve tappet moves smoothly; contact the Service department if necessary
!36	Fault during adaptation; tappet contact did not trigger/Valve Drive stuck or valve sluggish	Check whether the valve tappet moves smoothly; contact the Service department if necessary
!40	Fault during adaptation; valve not recognized/End position not recognized/Valve sluggish or unsuitable	Check whether the Valve Drive EnOcean is securely installed; contact the Service department if necessary
!49	No gateway; address unknown to panel	Perform a reset, repeat the teach-in process, contact the Service department if necessary
!53	Telegram call-off failed/Connection to panel disrupted	Reposition the central unit or use a repeater.
!54	Address of the panel could not be saved/Teach-in process failed	Contact the Service department

A   Appendix

A.1   Disposal

Do not dispose of the EnOcean or batteries as domestic waste. They must be disposed of according to the country-specific directives and laws. This allows you to protect the environment and support sustainable recycling of raw materials.

A.2   Ordering details

Short description	Description	Order No.	bbn 40 16779 EAN	Weight 1 pc [kg]	Packaging [pcs.]
SE/K 1.868.1	Valve Drive EnOcean	2CDG120051R0011	4016779996990	0.24	1

Notes

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