Operating instructions

Bidirectional wireless actuator

AVD 20-D

☞ Read instructions before using product!

☞ Observe all safety information!

☞ Keep instructions for future use!

1 Safety

1.1 Intended use

The bidirectional wireless actuator AVD 20-D may only be used for the following applications:

- Room temperature control in individual rooms
- For indoor applications

Any use other than the application explicitly permitted in this instruction manual is not permitted.

1.2 Predictable incorrect application

The bidirectional wireless actuator AVD 20-D must never be used in the following cases:

- In applications which are used for health-saving or life-saving purposes or whose operation may incur hazards to humans, animals or property.

1.3 Safe handling

The bidirectional wireless actuator AVD 20-D represents state-of-the-art technology and is made according to the pertinent safety regulations. Each product is subjected to a function and safety test prior to shipping.

▶ Operate the bidirectional wireless actuator AVD 20-D only when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.

1.4 Staff qualification

The product may only be mounted, commissioned, operated, maintained, decommissioned and disposed of by qualified staff. Electrical work may only be performed by trained electricians and in compliance with all applicable local and national directives.

1.5 Modifications to the product

Changes or modifications made to the product by unauthorised persons may lead to malfunctions and are prohibited for safety reasons. The product does not contain any components; do not open the product with the exception of the battery compartment cover.

2 Product description

The bidirectional wireless actuator AVD 20-D is used to control the room temperature in private and commercial buildings. It provides wireless communication via a bidirectional EnOcean wireless protocol. It features a large display and is equipped with a wheel for manual operation. Two lithium batteries supply the required power.
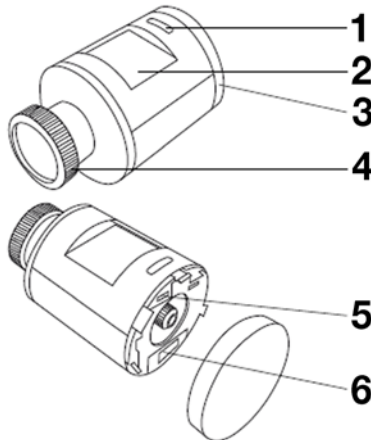
2.1 Controls

Fig. 1:

1	Key	**>**	Adaptation, teach-in, switching on the display
2	Display	**>**	Displays information
3	Wheel	**>**	Used to set the temperature
4	Threaded connection	**>**	M 30 x 1.5
5	Micro USB connection	**>**	For external power supply (servicing)
6	Battery compartment cover	**>**	For inserting/replacing the battery

2.2 Display

The display is divided into two areas.

The upper area shows the battery status, teach-in status and adaptation status. The lower area shows the reference temperature and the actual temperature as well as event symbols.

Table 1: Explanation of symbols

Symbol	Explanation
● ● ●	Actuator moves to mounting position.
➡ ●	Adaptation
➡ ⬅	Teach-in
➡✕⬅	Reset to factory settings
⧖	Waiting
▭	Batteries empty
🔒	Key lock

For reasons of energy saving, the display is only switched on for a short period of time. Press the key to switch on the display again.
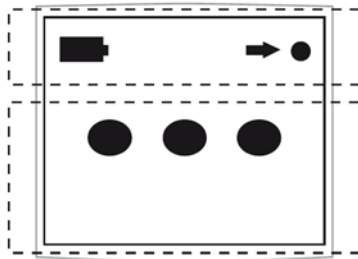

Fig. 2: Display

2.3   Functions

Automatic adaptation

A patented procedure allows for automatic adaptation of AVD 20-D to the standard radiators with M 30 x 1.5 connection.

Battery alarm

If the battery voltage drops below a critical value, AVD 20-D sends an error code to the AFRISOhome gateway. In addition, the display shows a low battery symbol. From now on, you have 30 days to re-place the battery.

The symbol for "Adapted" disappears. After you have replaced the batteries, you must re-adapt AVD 20-D by pressing the key.

Emergency setting function

If the battery voltage is no longer sufficient, AVD 20-D fully opens the valve.

Internal temperature controller

If AVD 20-D permanently loses the wireless connection (3 times waking up without reception) to the AFRISOhome gateway, the internal temperature controller takes over and adjusts the temperature to the previously set reference temperature.

You can still set the reference temperature with the wheel at all times.

The display shows the symbol ->><-. A message can be sent from the AFRISOhome gateway to the smartphone/PC.

Whenever AVD 20-D wakes up, it checks whether the AFRISOhome gateway is available. Once the connection is re-established, the AFRISOhome gateway takes over control.

Wireless interface

AVD 20-D features an EnOcean 868.3 MHz wireless interface as per ISO/IEC 14543-3-10 which excels with very low energy consumption. The EnOcean Equipment Profile of AVD 20-D is A5-20-04.

Manual adjustment of the reference temperature

The reference temperature can be manually adjusted via the wheel. AVD 20-D wakes up when the wheel is turned and shows the adjusted reference value on the display. In the range from 10 °C to 30 °C, the reference temperature is displayed in increments of 0.5 °C.

Measurement of room temperature and flow temperature

The flow temperature and the room temperature are measured by means of integrated temperature probes. A correction algorithm removes external temperature influences.

Frost protection

The lowest adjustable reference temperature is 10 °C. If the actuator
has been taught in and if there is a wireless connection to the
AFRISOhome gateway, the room temperature does not drop below a
value of 10 °C. If the sensor system of the actuator detects that the
room temperature has dropped below a value of 10 °C, a message is
sent to the AFRISOhome gateway (error 0x14 -> !20).

If the wireless connection is permanently interrupted, the internal
temperature controller takes over and adjusts the room temperature
to 10 °C if the temperature threshold of 10 °C is reached.

This function requires sufficient heating capacity to operate.

Micro USB interface

AVD 20-D can supplied with power via the micro USB interface. In
addition, the micro USB interface can be used for service purposes.

Error messages

During regular operation and during commissioning, the actuator can
detect various errors. The corresponding error messages are shown
on the display. See chapter 8, page 14 for a list of error messages.

2.4 Data transmission

AVD 20-D features a bidirectional EnOcean interface. Data can be transmitted in both directions between AVD 20-D and the AFRISO-home gateway.

The following data can be sent by AVD 20-D:

- Reference temperature
  The reference temperature between 10 °C and 30 °C set manually at AVD 20-D is transmitted.
- Room temperature
  The current room temperature between 10 °C and 30 °C is transmitted.
- "Learn" telegram
  A "Learn" telegram can be transmitted to connect AVD 20-D to an AFRISOhome gateway.

The following data can be received by AVD 20-D:

- Reference temperature
  A reference temperature between 10 °C and 30 °C can be transmitted from an AFRISOhome gateway to AVD 20-D.

3 Technical specifications

Table 2: Technical specifications

Parameter	Value
Type	Electromechanical
Colour	White, similar to RAL 9010
Installation site	Dry indoor rooms
Motion type	Linear
Threaded connection	M 30 x 1.5
Permissible flow temperature	Up to 90 °C
Response time	3.3 s/mm
Adjustment force	100 N
Stroke	5.5 mm
Stroke resolution	< 0.033 mm/step
Limit position detection	At both ends
Emergency setting function	Yes
Adjustment range	10 °C … 30 °C

Parameter	Value
Adjustment of reference values	10 °C … 30 °C in increments of 0.5 K
Frequency wireless interface	868.3 MHz
Protocol wireless interface	EnOcean, Smart Acknowledge
Telegrams wireless interface	Bidirectional EnOcean Equipment Profile, A5-20-04
Range	30 m in buildings, depending on construction material and arrangement
Wake up time	Event- and time-controlled
Transmission cycle	Event- and time-controlled
Degree of protection	IP 30
Protection class	II
Power supply	Batteries 2 x 1.5 V, type AA
protection against reverse polarity	Yes
Battery service life	Approx. 2 years
Power input standby	2 µW
Power input maximum	$Active_{max}$ 450 mW
Display indication	Adaptation, teach-in mode, battery status, key lock, reference value, error codes, connection interrupted
Display size (active area)	1.68 " 33.02 x 26.955 mm (W x H)
Materials	Housing ABS, PA6.6, PMMA Valve connection MS 58 (2.0401) Union nut MS 58 (2.0401)
Weight (with battery)	Approx. 250 g
Sound level	< 30 dB(A)
Ambient temperature	
Operation	5 °C … 40 °C
Storage	-15 °C … 60 °C
Transport	-15 °C … 60 °C
Humidity/moisture	
Operation	5% … 80% r.h. (non-condensing)

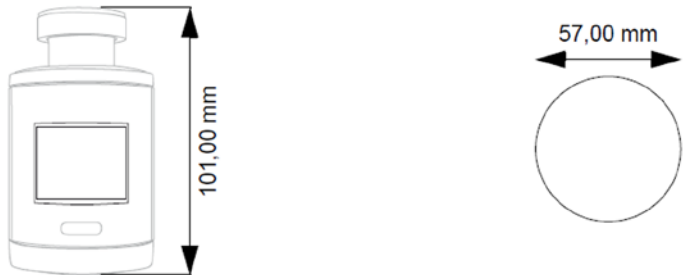| Parameter	Value
Storage	5% … 80% r.h. (non-condensing)
Transport	5% … 80% r.h. (non-condensing)
Directives and standards	
99/5/EC, Radio and telecom-munications terminal equipment	EN 300 220-1 EN 300 220-2 EN 301 489-1 EN 301 489-3
2011/65/EU, Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment RoHS	
Directive 2002/96/EC (WEEE directive)	
Regulation (EC) no. 1907/2006 (REACH)	

3.1   Dimensions

Fig. 3: Dimensions

4 Transport and storage

CAUTION	**Damage to the product due to improper transport.**
⚠️	▶ Do not throw or drop the product.

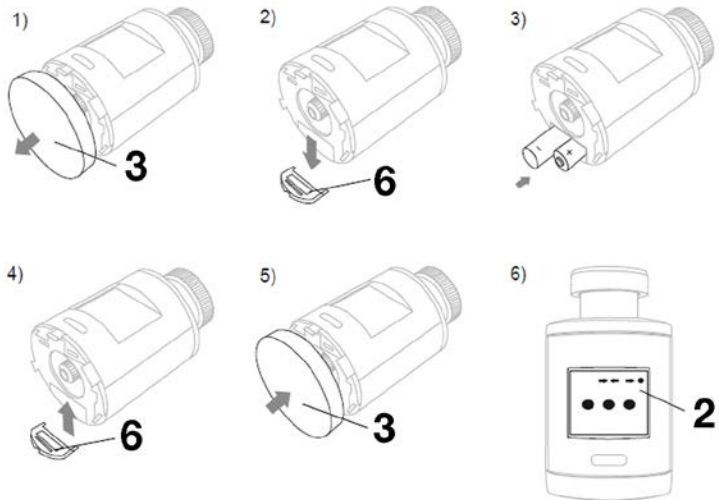|	
CAUTION	**Damage to the product due to improper storage.**
⚠️	▶ Store the product in a clean and dry environment.
	▶ Only store the product within the permissible temperature range.

5 Mounting

AVD 20-D can be mounted to the standard valve bodies. Since it is not necessary to interrupt the heating water circuit, mounting does not lead to dirt or water stains.

5.1 Verifying delivery

▶ Verify the packaging for damage.

▶ Dispose of the packaging in compliance the environmental regulations.

▶ Verify that the delivery is correct and complete using the delivery note.

▶ Notify the manufacturer of missing or damaged products.

5.2   Inserting/replacing the battery

The scope of delivery includes two batteries, type AA.

1.   Remove the wheel (3).
2.   Remove the cover (6) of the battery compartment.
3.   Insert the batteries.

NOTE   Verify correct polarity.

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4.   Refit the cover (6) of the battery compartment.
5.   The display (2) shows a symbol.
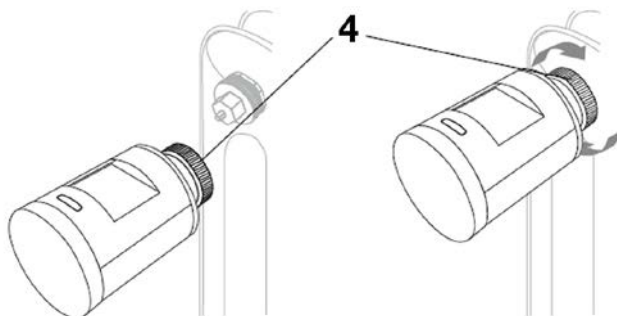6.   Refit the wheel (3).

CAUTION   **Incorrect handling of batteries**

▶   Do not recharge the batteries, do not disassemble the batteries.

▶   Protect batteries from heat - hazard of leakage.

▶   Do not use new batteries together with used batteries.

▶   Do not use rechargeable batteries.

It is recommended to use alkaline batteries.
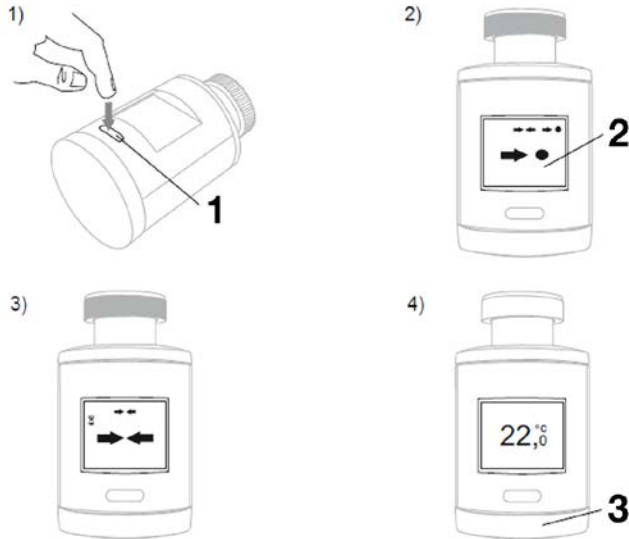

5.3 Mounting to the radiator

1. Screw AVD 20-D with the threaded connection (4) to the radiator valve.
2. Hand-tighten the screw connection.

6 Commissioning

Verify that AVD 20-D has been properly mounted.

6.1 Adaptation and teach-in

☑ AVD 20-D is in the vicinity of the AFRISOhome gateway.

☑ The AFRISOhome gateway must be in "Learn" mode. See the operating instructions of the AFRISOhome gateway for information on learning and deleting.

1. Briefly press the key (1).
2. The adaptation procedure starts. Wait until the adaptation procedure completes and the symbol is no longer shown on the display (2).
3. AVD 20-D is ready for operation.
4. Keep the key (1) pressed until AVD 20-D displays the teach-in symbol. AVD 20-D sends a "Learn" telegram to the AFRISOhome gateway.

7 Maintenance

AVD 20-D is maintenance-free; you only have to replace the batteries. The display or the AFRISOhome gateway indicates when it is necessary to replace the batteries.

Do not clean the surfaces with abrasive sponges or abrasive cleaning agents. This causes scratches and a dull surface. Only use a damp, lint-free cloth for cleaning.

8 Troubleshooting

If AVD 20-D does not operate properly, perform the following troubleshooting activities:

1. Verify that AVD 20-D was properly mounted.
2. Remove the malfunction using the checklist.

Table 3: Troubleshooting checklist

Message	Detected error/possible reason	Remedy
!17	Temperature measurement not correct	▶ Contact service
!18	Batteries empty	▶ Replace the batteries
!20	Frost protection (temperature dropped below 10 °C)	▶ Insufficient heating capacity. Close the window, if required, or check the heating system
!33	Problems with adjustment by actuator	▶ Contact service
!36	Adaptation error	▶ Contact service
!40	Adaptation error	▶ Verify that AVD 20-D was properly mounted; contact service.
!49	No AFRISOhome gateway found, unknown address	▶ Reset the product to the factory setting, restart the teach-in procedure, contact service
!53	Communication with AFRISOhome gateway interrupted	▶ Re-position the AFRISOhome gateway or use a repeater
!54	Unsuccessful attempt to store the address of the AFRISOhome gateways teach-in procedure not successful	▶ Contact service

9 Decommissioning, disposal

1. Dismount the bidirectional wireless actuator AVD 20-D.

2. To protect the environment, this product must **not** be disposed of together with the normal household waste. Dispose of the product according to according to local directives and guidelines.

This product consists of materials that can be reused by recycling firms. The electronic inserts can be easily separated and the device consists of recyclable materials.

10 Spare parts and accessories

Part	Part no.
Bidirectional wireless actuator AVD 20-D	78966

11 Warranty

The manufacturer's warranty for this product is 24 months after the date of purchase. This warranty shall be good in all countries in which this product is sold by the manufacturer or its authorised dealers.

12 Customer satisfaction

Customer satisfaction is our prime objective. Please get in touch with us if you have any questions, suggestions or problems concerning your product.

13 Addresses

The addresses of our worldwide representations and offices can be found on the Internet at www.afriso.com.