SAB+

EasySens® wireless radiator valve actuator for room temperature control

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
Issue date: 23.02.2026 • A150

Valid from product version
V1.10 AA

Please note the version number on the product label on the device

SAB+ airConfig 868,3

#669108-V1.00AA•1¹222   CE

airConfig

enocean®

»APPLICATION

With the electronic radiator valve SAB+, battery changes and the laying of cable harnesses are a thing of the past. It produces the electrical energy required for operation itself and therefore functions without battery or power connection. Maintenance is therefore superfluous. This not only saves heating costs, but also eliminates all other applications due to the maintenance-free operation. The new electronic miniature actuator uses the temperature difference between a warm radiator and a cooler room to produce electrical energy by means of a thermoelectric generator. This energy is stored in a buffer so that the actuator can be permanently supplied with electricity

This product is intended for use as part of an automation solution for (functional) buildings. It transmits sensor data within a building over short distances unencrypted by radio to suitable receivers. No personal data or location data is transmitted.

The product cannot communicate directly with the Internet and is not intended for applications that use the Internet to forward unprocessed sensor data. Automation stations that forward data via the Internet, e.g. to visualise the building status, must ensure that the data to be forwarded is encrypted as required by law.

»TYPES AVAILABLE

Battery-free valve actuator EnOcean with thermal energy harvesting
- SAB+ EEP A5-20-01

» SECURITY ADVICE – CAUTION

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with
- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

» TECHNICAL DATA

Radio Technology	EnOcean (IEC 14543-3-10), transmission power <10 mW
Frequency	868 MHz
Antenna	internal transmitting- / receiving antenna
Data transmission	bidirectional, airConfig ready
Power supply	maintenance-free thermal energy harvesting, micro-USB port (type B)
Measuring range temp.	0..+40 °C
Measuring interval	every 2..20 min., configured via airConfig, (in 1 min. steps)
Transmission interval	= Measuring interval
Functions	radio interface, heating actuator operation, emergency self-control mode, automatic closing point control, frost protection function
Display	status-LED, red
Enclosure	PC, pure white, aluminium
Protection	IP40 according to EN 60529
Ambient condition	0..+50 °C, max. 85% rH non-condensing
Mounting	screw mounted, M30 x 1,5
Notes	Configuration software "airConfig" can be downloaded from Thermokon website. EnOcean USB stick, (i.e. contained in the test tool airScan (item No. 566704) will be required to communicate. Integrated temperature sensor, Operational noise <35 dB(A), nominal stroke 3.8 mm, max. speed 0,24 mm/s, Min. force 100 N

» ENERGY HARVESTING - ENERGIEVERSORGUNG

The SAB + valve actuator is supplied by the temperature difference between the mounting flange and the metal housing. From a temperature difference of> 5K, a low electrical voltage is generated, which is stored in the internal lithium storage.

For permanent operation, it must be ensured that the energy balance (harvesting – consumption) is positive.

When installing the valve make sure that:
- the temperature difference is sufficient (e.g. no accumulation of heat due to cladding)
- the transmission interval of the SAB+ is configured as long as possible.
- the response time of the counterpart (Gateway, Message Server etc.) is as short as possible.
  Thermokon devices typically response within 50 ms

Energy consumption changes proportionally with the response time and inversely proportional to the wake-up interval.

Outside of the heating period, the "summer bit" should be sent to the SAB + by the gateway/controller, which extends the wake-up interval to 8 hours.

It is not possible to charge the device via powerbank!

»INFORMATION ABOUT EASYSENS® (RADIO) / AIRCONFIG GENERAL USAGE

EasySens® - airConfig
Basic information about EasySens® radio and about general usage of our airConfig software, please download from our website. https://www.thermokon.de/direct/files/airconfig-software-manual-en.pdf

»OVERVIEW OF THE RADIO TELEGRAMS

EEP
The structure of the data contained in the telegram can be found in the EEP (EnOcean equipment profile) list provided by the EnOcean Alliance.

»MOUNTING ADVICES AND COMMISSIONING

The SAB+ has to be mounted before the pairing (e.g. with a Message Server / Gateway).

1.	Clean the standard valve thread (M30x1,5) and mount a metal adapter is necessary.
2.	Mount the SAB+ in delivery state (valve push rod fully retracted) on the valve. (If required press the button 3 to 6 seconds with a thin pin to retract the valve push rod)

Learn- button + red LED
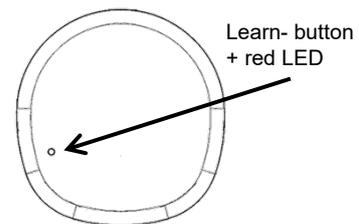
It is not possible to mount the SAB+ with an extended valve push rod!

3.	Note the mounting position. (Type of protection IP40)
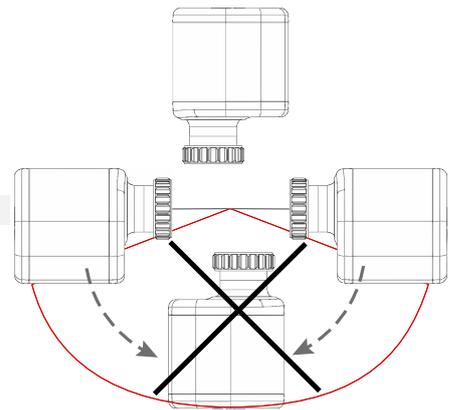
Do not orientate downwards, see illustration.

4.	Start teach in process.

»TEACH-IN PROCESS

The teach-in process of the SAB + to the gateway (MSG server) corresponds to the battery powered model SAB05.

1. Mount the SAB+ on the heating valve.

2. Set the gateway (MSG-Server) into teach-in mode. →*(see radio receiver manual)*

3. Press the SAB+ learn button.

   LED flashes 1x ✓ SAB+ is connected to the gateway.

   LED flashes 3x ✗ The teach-in process has to be repeated. (if necessary shorten the radio range)

4. The SAB+ performs a initial drive to identify the mechanical limits (1x 100% fully opened /1x 0% closed, to determine the closing position)

   If there is no automatic initialization run, it must be triggered manually.

5. The actuating value of a MSG-server (or gateway) can be set.

It may be necessary to manually trigger a learning telegram from the gateway in order to teach in the valve actuator. Please refer to the instructions of the gateway.

»FUNCTION DESCRIPTION

The SAB+ communicates according to the EEP A5-20-01 and the set measuring-/ transmission interval. After sending data, new transmissions are awaited from the gateway (o.e.)

Communication cycle interval (factory default): 10 minutes (individually configurable via airConfig: 2..20 min in 1 min steps.)

Valve Safe position
The SAB+ moves into a valve safety position if a usual operation because of insufficient power is not possible. (factory default: 50%, configurable via airConfig).

Frost prevention function
Before the room temperature falls below 8°C the valve actuator opens the heating valve until the ambient room temperature reaches 10°C (Hysteresis 2 K).

Communication loss (Emergency self regulation mode)
If no valid telegram is received during 9 consecutive intervals, the valve actuator enables the emergency self regulation mode and extends the transmission interval to 1 hour. During emergency self regulation mode the valve actuator uses the internal temperature sensor and the configured setpoint ("set point on communication loss").

**Note the influence of the internal temperature sensor by the heating flow temperature.**

Position referencing
After every 30 movements (= changes in the valve position), the actuator references its position. For this purpose, the valve is fully opened and immediately closed again in order to check the end positions for the 100% and 0% position and to correct them if necessary. This referencing takes place regardless of whether the SAB+ is controlled with setpoint temperature and room temperature or with setpoint position, and also when the summer bit is set.

Charging function
The SAB+ includes its energy status in every telegram and displays, for example, an impending failure due to an empty energy storage.

The micro USB (type B) port on the valve side of the device can be used for charging. Use a USB power supply, via a power plug, for charging *(full charge about 3,5h)*

Micro-USB
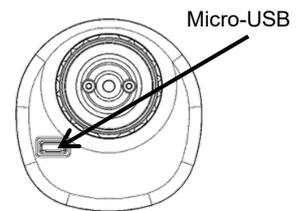
ℹ️ **Charging via a power bank is often not possible because the charging current of the device is too low and the power bank switches off after a short time!**

ℹ️ **SAB+ devices that are not connected to heated radiator valves (e.g. SAB+ replacement units) must be fully charged at least once a year. Deep discharge of the energy storage device can cause damage.**

Reset/ device restart
To reset/restart the device, press and hold the button. After approx. 6 seconds, the red LED will light up. Once the LED turns off, you can release the button (the device has been restarted).

Learn-button + red LED
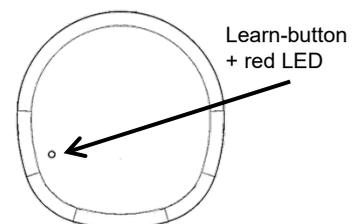
»CONFIGURATION VIA AIRCONFIG

i **For the configuration of the SAB+ airConfig Version 5.03.03 is required.**

After selecting the SAB+ in the Airconfig driver list (left) and pressing the LRN button on the SAB+ valve actuator, it is displayed in the device list (centre-left). Clicking on the corresponding device displays the parameters in the device configuration area.

Valve safe position
Fixed, pre-set position in which the valve actuator operates when the internal power supply is lost.

Set point on communication loss
Set point that the valve actuator uses as long as the communication is lost for the self-controlled mode.

Ki
Ki (Integration coefficient Kn=1/Tn | Ki=1/Ti): Increase Ki until the steady-state error with respect to the setpoint is corrected fast enough, without affecting the initial dynamics too much. Typical value = 100

Kp
(Amplification factor) Raise Kp until the system's response is sufficiently fast to track step changes in your setpoint. This proportional component of a PID defines the 'stiffness' of your control system's response. Typical value = 10

Kd
Raise Kd until the system's response is adequately damped. You don't need this if you don't have an overshoot. This component defines an artificial damping for your system. Typical value = 0

Temperature offset
The valve actuator is **mounted** directly on the radiator, therefore the measured temperature most likely will be too high. The set value is subtracted from the internal sensed value.

RF interval
The transmission/reception interval can be set in 1 min increments from 2 min up to 20 min. Please note that more frequent transmission results in higher energy consumption which may exceed the amount of harvested energy. In this case the valve will move to the safe position and may stop working until the internal energy buffer is sufficiently charged.

Factory Reset
Resets the device to factory settings.

| Settings | Status |

Storage/Supply voltage: 0.0 V

Harvester voltage: 0 mV

Motor distance count: 0

Motor move counts: 0

Error state: no error

Valve safe position: ☐
Summer mode: ☐

Status Tab
The Status tab provides information on the characteristics performed so far. Voltage of the internal storage will be displayed as well as the harvester voltage. Motor distance counts (incremental steps) and move counts (incremented by 1 when leaving the current position and travel to a new position)

Valve safe position (Info Box)
Fixed, pre-set position in which the valve actuator operates when the internal power supply is lost.

Summer Mode (Info Box)
Reduces the energy consumption by extending the wake-up interval to 8h.

» UNMOUNTING

To unmount the SAB+ from the valve, press the button for approx. 3..6 seconds. The SAB+ will move in the mounting position with the stem fully retracted and stops communicating.

After 10 minutes the radio communication is continued in the previously configured interval / or in the factory default settings (10 min).

» DIMENSIONS (MM)

Ø62 · 63 · 85 · 60 · M30x1,5
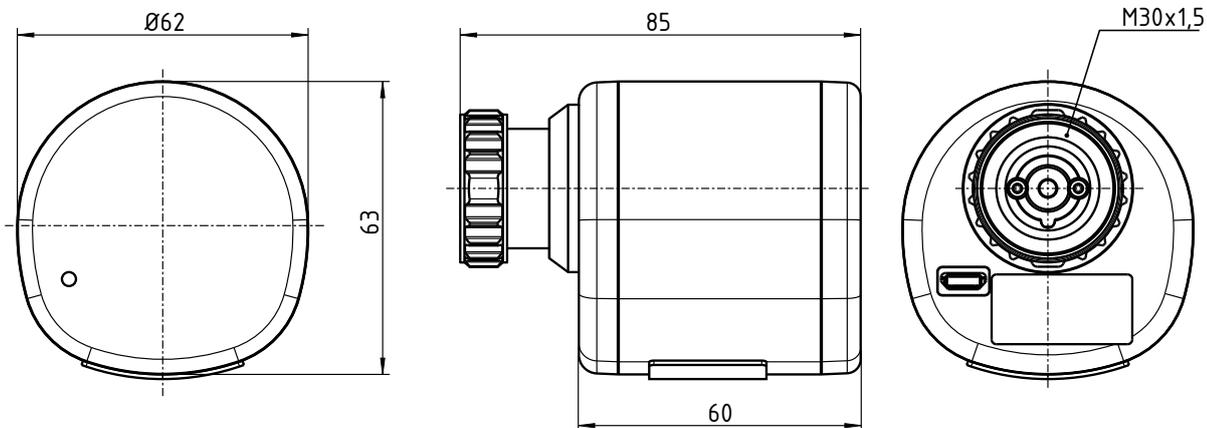
» ACCESSORIES (OPTIONAL)

EnOcean USB transceiver for airConfig/airScan (incl. license)　　　　Item No. 566704

» PRODUCT TESTING AND CERTIFICATION

CE

Declaration of conformity
The declaration of conformity of the products are available on our website
https://www.thermokon.de/direct/en-gb/categories/sabplus

» NOTES ON DISPOSAL

The crossed-out wheelie bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.de