KNX® (EN)

Salva KNX TH, Salva KNX basic
Smoke alarm

Technical specifications and installation instructions
Item numbers 70405 (Salva KNX basic), 70406 (Salva KNX TH)

> 🛑 **This document describes the functions for ALL device models.**
> Please check the information at the beginning of the chapter and in the text which describes the functions available for the respective individual models.

1. Description

Salva KNX TH and Salva KNX basic are smoke detector sensors for the KNX building bus system. Their compact housing accommodates the sensors, evaluation circuits and bus-coupling electronics.

The smoke alarm features an automatic evaluation sensor system for early and accurate fire alarms. Alarms are output as a local acoustic signal and a bus telegram. **Salva KNX basic** signals smoke alarm, **Salva KNX-TH** signals smoke and/or heat alarm.

AND logic gates and OR logic gates allow for a link between data and statuses. Multifunctional modules change input data as required by means of calculations, querying a condition, or converting the data point type.

The **Salva KNX TH** model additionally features integrated sensors for temperature and air humidity. The measured values can be used for the control of limit-dependent switching outputs. The devices have PI controls for heating/cooling (depending on temperature) and for ventilation (depending on humidity).

Functions:
- **Smoke alarm sensors** with optical detection based on the scattered light principle, certified according to EN 14604:2005/AC:2008 and 1172-CPR-150013. Local acoustic alarm signal output (warning sound at least 85 dB) and transfer to KNX bus. Local alarm acknowledgement
- Signalling of **smoke alarm**
- Smoke chamber pollution measurement and pollution display according to UL directive
- Power supply via battery (9 V). Lack of battery capacity is signalled optically and acoustically for 30 days and transmitted to the bus
- High operative safety due to elaborate automatic self-testing of the entire electronics and separate energy measurement
- Faults signalled locally and via the bus
- High deceptive alarm immunity due to powerful measuring chamber and consideration of temperature fluctuations (though no temperature smoke alarm)
- **8 AND and 8 OR logic gates** each with 4 inputs. All switching events as well as 16 logic inputs (in the form of communications objects) can be used as inputs for the logic gates. The output from each gate can be configured optionally as 1-bit or 2 x 8-bit
- **8 multi-function modules** (computers) for changing the input data by calculations, by querying a condition or by converting the data point type
- **4 actuating variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

Additional functions for Salva KNX TH:

- Signalling of **heat alarms**
- **Temperature sensor** and **air humidity sensor** with mixed value calculation, dewpoint calculation, comfort field query (DIN 1946)
- **Threshold values** for measured and calculated values, adjustable via parameters or communication objects
- **PI control for heating/cooling** (depending on temperature)
- **PI controller for ventilation** (depending on air humidity)

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu.

1.0.1. Deliverables

- Sensor (housing with skirting)
- 9 V battery
- 2 screws and dowels for assembly (always use fastening material that is suitable for the material underneath)

1.1. Technical specifications

Housing	ABS, glass
Colour	White / Translucent
Assembly	Surface mount
Protection category	IP 30
Dimensions	Ø approx. 113 mm, height approx. 58 mm
Weight	approx. 280 g
Ambient temperature	Operation -10…+50°C, storage -10°C … +60°C
Surrounding air humidity	max. 90% RH, avoid condensation
Operating voltage	9 V (battery)
Auxiliary supply	KNX bus voltage
Data output	KNX +/- bus connector terminal
BCU type	Integrated microcontroller
PEI type	0
Communication objects	Salva KNX TH: 311 Salva KNX basic: 192
Smoke alarm:	
Detection principle	Tyndall effect (optical)
Alarm display	optically (LED red) and acoustically (signal tone >85 dB(A) / 3 m)
Complies with	EN 14604:2005
Max. monitoring area	60 m² to 6 m height
Air velocity	max. 20 m/s
Response sensitivity	0.15 dB/m typical

Shelf life for the alarm	max. 2 years
Temperature sensor (Salva KNX TH):	
Measurement range	0...+50°C
Resolution	0.1°C
Accuracy*	±1°C at -10...+85°C ±1,5°C at -25...+150°C
Humidity sensor (Salva KNX TH):	
Measurement range	0% RH … 90% RH
Resolution	0.1% RH
Accuracy	± 7,5% RH at 0% …10% RH ± 4,5% RH at 10% … 90% RH

* Please note the information on *Accuracy of temperature/humidity measurement*, page 4

1.1.1. Accuracy of temperature/humidity measurement

Only for Salva KNX TH model.

Measured value deviations for temperature and humidity due to sources of interference (see chapter *Installation location*) must be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

During **temperature measurement**, the self-heating of the device is taken into consideration by the electronics. The software compensates the self-heating by reducing the measured temperature. During the 2 hour warm-up phase, the displayed interior temperature measured value increasingly approaches the actual room temperature.

2. Installation and commissioning

2.1. Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.
- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Installation location

2.2.1. Equipping the building with smoke alarms

Fig. 1

☐ *Minimum equipment*

☐ *Ideal equipment*

☐✿ *Equipment with limitations*
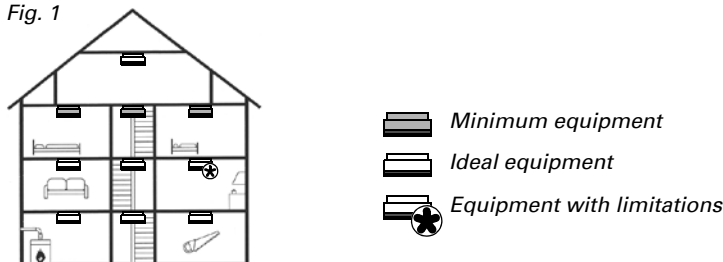
The minimum protection is the installation of smoke alarms in the bedrooms and halls and/or corridors to ensure that you are woken up during the night in case of a smoke alarm. If the building has several floors, at least one smoke alarm should be installed in the hall on every floor. Please refer to DIN 14676 for further installation guidelines.
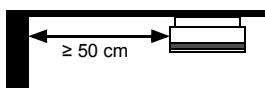
2.2.2. Positioning and distances

Install the smoke alarm on the room ceiling. If the smoke alarm is installed in the middle of the room, it has its best detection characteristics.

⚠ **WARNING!**
Mains voltage for in-wall concealed cables!
• If the device is attached by means of screws, first ensure that there is no power line installed under the assembly point!
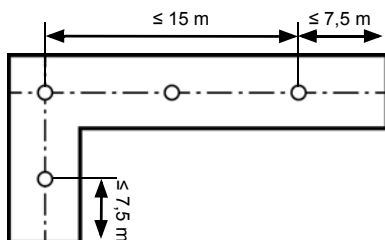

≥ 50 cm

Maintain a minimum distance of 50 cm to:
• walls
• lamps
• live wires

Small rooms: If the minimum distance to the wall cannot be maintained, install the alarm on the wall. Keep a distance of at least 0.50 m and maximum 1 m to the ceiling.

Halls and corridors:

Attach the first alarm at a maximum distance of 7.50 m to the end of the room in long structures. Distribute at least 3 alarms on 15 m of corridor. Attach alarms in the middle of corners and crossroads in the corridor.

Gables:
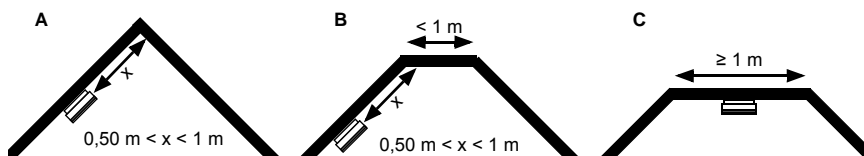
A + B: For pointed and flat gables with a ceiling area of less than 1 m width: Attach alarms at a minimum distance of 0.50 m and a maximum distance of 1 m to the top.
C: For flat gables with a ceiling area of more than 1 m width: Attach to the middle of the ceiling like in other rooms.

Rooms with a gallery: Attach an additional alarm underneath the gallery if said gallery is longer and wider than 2 m and has more than 16 m².

Segmented ceilings: If there are separate areas in the ceiling with a depth of more than 0.20 m and an area of more than 32 m² (e.g. due to beams separating the areas), install an alarm in each area (on the ceiling or on the beams).

The device is only approved for interior spaces. Do not install in rooms with temperatures of less than -10°C or more than +50°C! Avoid condensation.

Do not install in rooms in which a high degree of water vapour is produced under normal circumstances (e.g. kitchen, bathroom, toilet)!

Do not install near places of fire or open fireplaces!

Do not install near ventilation shafts (e.g. of air conditioning or circulating air systems)!

⊘   Do not paint the smoke alarms!

Avoid the following sources of interference in order to limit distortion of measuring results for temperature, humidity and pressure:
• Direct sunlight
• Draughts from windows and doors
• Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
• Connection lines, which lead from warmer or colder areas to the sensor
Temperature variations from such sources of interference must be corrected in the ETS in order to ensure the specified accuracy of the sensor (temperature offset).
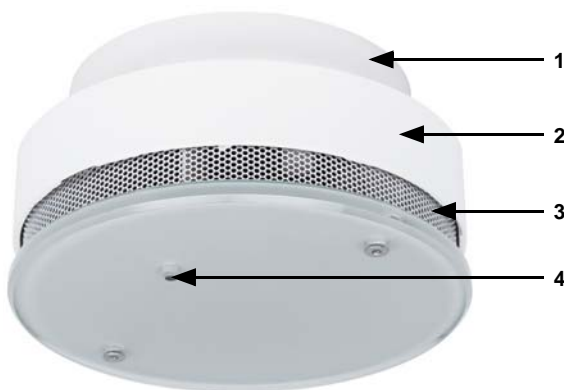
2.3.   Device design

2.3.1. Exterior view

Fig. 2
1   Skirting
2   Housing with electronics and battery
3   Openings for air circulation
4   Light transmission bar: Red LED for Operating and alarm signals, page 14 *and Push-button for Function test, page 12*
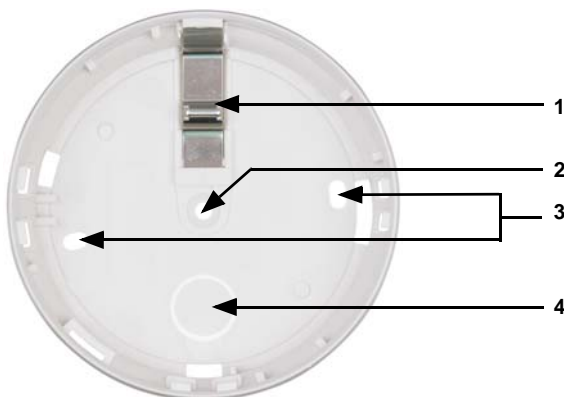
2.3.2. Skirting

Fig. 3
1   *Battery assembly lock (the housing cannot be closed without a battery)*
2   *Fastening opening with 1 screw*
3   *Openings for fastenings with 2 screws (distance 67 mm)*
4   *Opening for bus cable*
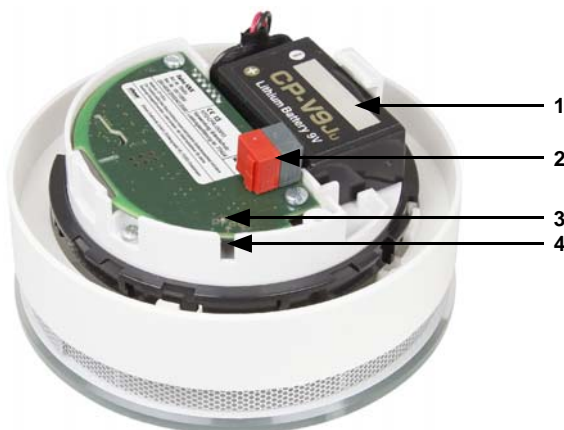
2.3.3. Interior view of the housing

Fig. 4
1   *Battery*
2   *KNX terminal*
3   *LED programming*
4   *Programming key (recessed) for bus addressing,*
    see Addressing the equipment, page 11

2.4. Installing the device

2.4.1. Instructions for assembly and initial start-up

Never expose the device to water (e.g. rain) or dust (e.g. drilling dust). This can damage the electronics and the sensor system. A relative air humidity of 93% may not be exceeded. Avoid condensation.

After the bus voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.

2.4.2. Assembly preparation and skirting assembly

Determine the installation point on the room ceiling. Please observe the instructions in chapter *Installation location*, page 5 for this.

⚠️ **BEWARE!**
Injury hazard in case of improper fastening!
The device may fall and injure people if it is not fastened properly.
- Observe, the carrying capacity of the wall/ceiling material when selecting the place of installation.
- Use fixing materials that are suitable for the material underneath.

If you are using the screws and dowels provided, use a 6mm drill to drill holes with a distance of 67 mm (if you are using two screws for installation). Use the skirting of the smoke alarm as a stencil. Insert the dowels into the drilling holes.

Fig. 5

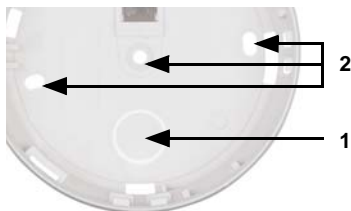The housing is removed from the skirting by turning it anti-clockwise.

Fig. 6

Remove the cover on the opening for the supply line (1) from the skirting and thread the cable through it.

Screw the smoke alarm skirting onto the ceiling (2, openings for screws).

As an alternative, the skirting of the alarm may be attached to the ceiling with double-sided adhesive pad (VdS approved). Carefully check the ceiling surface carefully for lasting carrying and adhesive capacity before using adhesive pads. If necessary, do a test glueing application. Optimum adhesive power can only be obtained on a clean surface.

Remove the protective foil form one side of the adhesive pad and attach the pad in the middle of the alarm skirting. Then remove the protective foil on the other side and attach the skirting by firmly pressing it to the ceiling.

2.4.3. Connection

The supply line of the smoke alarm occurs via a 9 V battery. In addition, the KNX module receives the bus voltage via the KNX terminal.

⚠ **WARNING!**
Danger of explosion in case of improper handling of the battery!
Property damage by battery leakage.
- Do not recharge batteries.
- Do not short-circuit batteries.
- Do not force batteries open or damage them
- Do not bring batteries in contact with fire, water or high temperatures.

🛑 **ATTENTION!**
Do not use rechargeable batteries or mains units for voltage supply!
- In case of mains voltage, the device would be out of order if the mains is out and could not signal any fire.
- The lower rechargeable battery voltage would trigger a low battery capacity alarm.
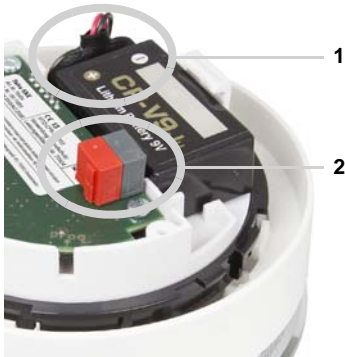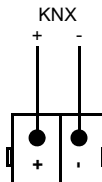

Fig. 7

1. Connect the battery (check for correct polarity!) and insert it into the battery compartment.

2. Connect the device to the KNX bus via the pluggable terminal (+|-).

KNX
+   -

+   -

2.4.4. Completing the installation

Fig. 8

Place the housing onto the skirting and fasten it by turning it clockwise.

Check if the LED is flashing and conduct a function test.
> *Function test*, page 12

3.   Addressing the equipment

The equipment is delivered with the bus address 15.15.250. You can program a different address in the ETS by overwriting the address 15.15.250 or by teaching the device via the programming button.

The programming button is on the inside of the housing. The housing is removed from the skirting by turning it anti-clockwise, and fixed in place by turning clockwise.

Fig. 9

Use a thin object to reach the button, e.g. a wire.

4.   Maintenance

In some German federal states, the owner of houses and flats are responsible for the installation and functioning of smoke alarms according to LBO (State construction laws) (see www.rauchmelder-lebensretter.de). Maintenance has to be conducted at least annually and, according to DIN 14676 includes a visual inspection, a function test and, if required, a battery change. A function test also has to be conducted after any longer absence, at ‚after 1 year at the latest.

The used battery and the device must be disposed of correctly so that valuable resources may be recycled. Neither the battery nor the device may be disposed of together with domestic or company waste.

4.1.   Function test

⚠️ **BEWARE!**
🔊 **Danger of hearing damage!**
During the function test (pressing on the light transmission bar),
a loud, shrill tone is sounded (at least 85 dB).
• Keep a minimum distance of 50 cm between smoke alarm and ear.

1. Conducting a visual inspection:

Check:
• Is the device found at the expected position?
• Are the smoke entry openings clean? - Remove dust if necessary. The device
  must not be painted over.
• Is the device free from mechanical damage? - Replace the device if it is
  damaged.

2. Conducting a function test:

Fig. 10

Press the light transmission bar for at least 1
second.

If the function test is successful, a signal tone sounds. The smoke alarm works properly. If there is no signal tone, the device is not functioning. In this case, replace the battery and conduct the function test again. If there is still no signal tone, the device is defect and must be replaced.

🛑 Smoke alarms must be replaced with new devices after a maximum
period of 10 years according to DIN 14604.

4.2.   Replace the battery

The device is supplied with 9 V voltage from a battery. Lack of battery capacity is signalled optically and acoustically for 30 days and transmitted to the bus.

Fig. 11

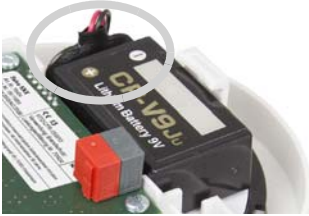Separate the smoke alarm from the skirting
by turning it anti-clockwise.

Fig. 12

Connect the new battery to the smoke alarm (check for correct polarity!) and insert it into the battery compartment.

Fig. 13

Place the housing with the new battery onto the skirting and fasten it by turning it clock-wise.

Check if the LED is flashing and conduct a function test.
> *Function test*, page 12

4.2.1. Types of batteries

⚠ **WARNING!**
Danger of explosion in case of improper handling of the battery!
- Only replace with a lithium battery type DFK CP-V9Ju.
- Do not use rechargeable batteries or mains units for voltage supply to ensure a sufficiently high voltage and supply even in case of a mains outage.
- Do not recharge batteries and do not short-circuit them.
- Do not force batteries open or damage them and do not bring them into contact with fire, water or high temperatures.

Approved battery type	FDK CP-V9Ju Only use lithium batteries
Average service life	approx. 10 years (typical), under normal conditions as per EN 14604

🗑 The used battery and the device must be disposed of properly so that valuable resources may be recycled. Neither the battery nor the device may be disposed of together with domestic or company waste.

4.2.2. Serial number

The serial number on the type plate inside the device contains the production data and device number:

Ser.no. 15111801

Year of production | Device number
-month
-day
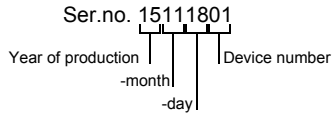
5.   Device alarm functions

5.1.   Alarm mute (acknowledgement)

Fig. 14

The alarm can be muted by pressing the flashing light transmission bar.

In this case, only the LED continues to flash every 10 seconds. After about 10 minutes, the devices switches back to normal operating mode.

5.2.   Alarm memory

An alarm is saved in the device for 24 hours. During this time, the LED briefly flashes 3 times every 43 seconds. The alarm memory can be reset by pressing the light transmission bar (red LED) once.

5.3.   Operating and alarm signals

Function / meaning	Signal tone	Red LED
Normal operating mode (automatic self-test)	No sound	Flashes every 40 seconds
Alarm status	Loud interval tone in 0.5 second rhythm	Flashing twice per second
Fault / dirt	Short signal tone 3 times every 40 seconds	LED off
Battery exchange display	1x Short signal tone every 40 seconds	Flashes every 40 seconds together with the signal tone
Alarm mute (acknowledgement)	No sound	Flashes every 10 seconds

Function / meaning	Signal tone	Red LED
Alarm memory active (i.e. there was an alarm state during the previous 24 hours)	No sound	Flashes 3 times every 43 seconds
Function test	Loud interval tone	Flashing twice per second while the light transmission bar is pressed