KNX TH-B-UP

Thermal hygrometer

Technical specifications and installation instructions

Article numbers 70370 (white), 70374 (aluminium), 70375 (anthracite)

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1. Description

The **Indoor sensor KNX TH-B-UP** measures the temperature and air humidity and calculates the dew point. Via the bus, the sensor receives external measuring values and processes them to an overall temperature and air humidity value (composite results) together with its own data. The **KNX TH-B-UP** features two buttons that may be used to modify the room temperature (nominal temperature), to switch between the operating modes or as freely programmable bus buttons.

The **KNX TH-B-UP** provides six switched outputs with adjustable threshold values as well as additional AND and OR logic links. The sensor features a PI control for heating and cooling (depending on the temperature) as well as ventilation (depending on the air humidity) and can output a warning to the bus as soon as the comfort field (as per DIN 1946) is exited.

The integrated display shows own values as well as data received via the bus (e.g. date, time of day). The housing is supplemented with a frame of the switch series used in buildings, and thus fits seamlessly into the interior fittings.

Functions:

- Measuring the **temperature** and **air humidity** (relative and absolute), calculation of the **dew point**
- **Composite values** from own measured values and external values (proportions are adjusted as a percentage)
- **Display** 1-3 lines (own values or values received via bus)
- **2 buttons**. Configuration as a bus button or to modify the nominal temperature and to switch between the operation modes (see also *Change ambient temperature with the buttons*, Page 8)
- **PI-controller for heating** (one or two-stage) and **cooling** (one or two-stage) according to temperature. Regulation according to separate setpoints or basic setpoint temperature
- **PI controller for humidity** according to humidity: Dehumidifying/ humidifying (single level) or dehumidifying (single or double level)
- **6 Threshold values** can be adjusted per parameter or via communication objects
- **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) are used as inputs for the logic gates. The output from each gate can be configured optionally as 1-bit or 2 x 8-bit

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.

1.1. Deliverables

- Housing with display
- Baseplate

Additionally required (not included in the deliverables):
- Junction box Ø 60 mm, 42 mm depth
- Frame (for insert 55 x 55 mm), compatible with the switch scheme used in the building

1.2. Technical specifications

Housing	Plastic (partially painted)
Colours	• White, glossy (similar to RAL 9016 Traffic White) • Aluminium, matt • Anthracite, matt • Special colours on request
Assembly	Flush mounting, wall mounting in junction box Ø 60 mm, 42 mm depth
Protection category	IP 20
Dimensions	Housing approx. 55 x 55 (W x H, mm), installation depth approx. 15 mm, Baseplate approx. 71 x 71 (W x H, mm),
Total weight	approx. 50 g
Ambient temperature	Operation 0…+50°C, storage -10…+60°C
Ambient humidity	max. 95% RH, avoid condensation
Operating voltage	KNX bus voltage
Bus current	max. 6 mA, max 10 mA when programming LED active
Data output	KNX +/- bus plug-in terminals
BCU type	Integrated microcontroller
PEI type	0
Group addresses	max. 254
Assignments	max. 254
Communication objects	215
Temperature measuring range	0…+50°C
Temperature resolution	0.1°C
Temperature accuracy*	±0.5°C at 0...+50°C
Humidity measuring range	0…100%
Humidity resolution	0.1%
Humidity accuracy	±7,5% RH at 0…10% RH ±4,5% RH at 10…90% RH ±7,5% RH at 90…100% RH
Humidity drift	± 0.5% RH per year in normal atmosphere

* Please note the information on *Measuring accuracy*, Page 4

The product is compliant with the provisions of EU guidelines.

1.2.1. Measuring accuracy

Per poter raggiungere la precisione del sensore stabilita (Offset), sarà necessario correggere sull'ETS le deviazioni del valore misurato dovute a tali sorgenti di interferenze (si veda il capitolo *Luogo di montaggio*).

Con la **misurazione della temperatura** si tiene conto del calore naturale del dispositivo attraverso l'elettronica. La temperatura misurata è compensata dal software e il calore naturale è ridotto di 1,8°C. Durante la fase di riscaldamento di due ore, la temperatura interna indicata/emessa si avvicina sempre di più alla temperatura ambiente effettiva.

2. Installation and start-up

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 position

The sensor will be installed concealed within a socket (Ø 60 mm, 42 mm deep).

The sensor may be installed and operated in dry interior rooms only. Avoid condensation.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:

- Direct sunlight
- Drafts from windows and doors
- When mounted in-wall: Draft from ducts which lead from other rooms to the junction box in which the sensor is mounted
- 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. Construction of the sensor

2.3.1. Housing

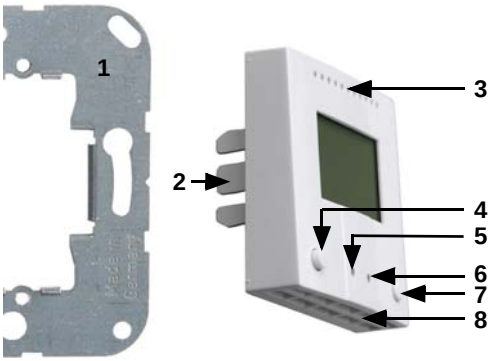

Fig. 1
1 Baseplate
2 Catches
3 Openings for air circulation
4 Key
5 Programming LED (recessed)
6 Programming button (recessed) for teaching the device
7 Key
8 Openings for air circulation (LOWER)

2.3.2. Rear view sensor plate with connection

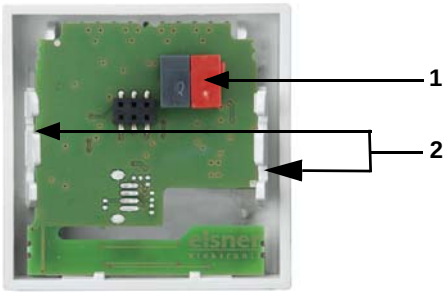

Fig. 2
1 KNX terminal BUS +/-
2 Catches

2.4. Assembly of the sensor

First of all fit the socket with connection. Seal inlet pipes to avoid infiltration.
Then screw the base plate onto the socket and position the frame of the switching programme. Connect the bus line +/- (black-red plug) to the terminals provided on the sensor board of the sensor. Pin the sensor with the notches on to the metal frame, so that sensor and frame are fixed.

2.5. Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. 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.

3. Display and operation at the device

Specifications for the display are set in the ETS and the use of the push buttons is permitted or disabled.

Basically the display can show a two-row or three-row text (e. g. for measured values) or a tempertuare controller. You can switch between the two types by pressing one of the buttons, if this has not been disabled in the ETS.

3.1. Mode display and manual temperature controller

Depending on the ETS setting selected, the mode display will only display show the current target value, or the base target value setting with scale display. The manually adjustable range can be set in the ETS.

The following display options are available:

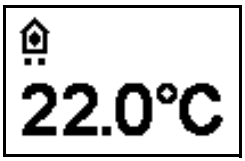

Fig. 3
Mode display with current target value and/or base target value

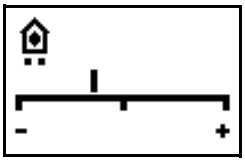

Fig. 4
Mode display with scale display for adjusting the base target value.
The control position in the image reads "Base target value reduced".

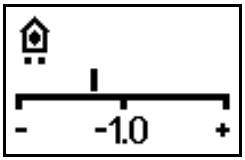

Fig. 5
Mode display with scale display and number.
Shows the set target value change.
The control position in the image reads "Base target value reduced to 1.0°".

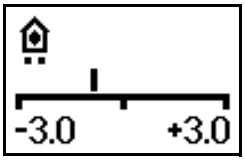

Fig. 6
Mode display with scale display and range.
Shows the possible adjustment range (as set in the ETS).
The control position in the image reads "Base target value reduced".

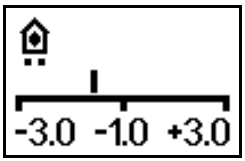

Fig. 7
Mode display with scale display, range and number.
Displays the possible adjustment range (as set in the ETS) and the set target value change.
The control position in the image reads "Base target value reduced to 1.0°".

Symbols

	Comfort mode. Comfort (present) target temperature will be used.		Standby mode. Standby (absent during day) target temperature will be used.
	Eco mode. Night target temperature will be used.		Building protection mode. Building protection target temperature will be used. The symbol will blink when the mode has been activated but the activation delay has not yet expired.
	Heating mode. Heating will be provided.		Cooling mode Cooling will be provided.

Priority (points)

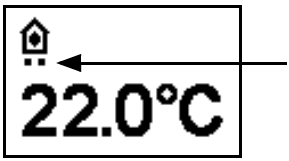

Fig. 8
In "HVAC mode with 2x 8 bits" control mode, points are shown under the symbol, to indicate the running priority of the current mode.

One point: Priority 1/priority control. It is not possible to adjust the temperature automation system manually. Neither the target temperature nor the operating modes can be changed using the buttons on the unit.

Two points: Priority 2. The target temperature and operating mode can be changed using the buttons.

3.2. Change ambient temperature with the buttons

If the mode display is active, the target ambient temperature and the operating mode can be changed manually using the buttons. The button functions can be blocked in the ETS or be suppressed for Priority 1 operating modes. The individual operating modes can also be locked for manual selection in the ETS.

Decrease target temperature (-)	briefly press left button	Ambient temperature in the current mode is decreased. The sep-size is defined in the ETS (0.1°C to 5°C).
Increase target temperature (+)	briefly press right button	Ambient temperature in the current mode is increased. The sep-size is defined in the ETS (0.1°C to 5°C).

Change mode	press left or right button longer than 2 secs.	Changes between the operating modes Comfort, Standby, Eco and Building Protection (if deblocked in the ETS).
Extend Comfort mode	in Eco mode: press both buttons at the same time longer than 2 secs.	Switches from Eco to Comfort mode again for a certain time (e. g. if the rooms are used longer in the evening). The period is defined in the ETS (up to 10 hours). The time remaining in Comfort mode is displayed.