

Vari KNX T, Vari KNX TH, Vari KNX TH-D Combined temperature sensors

Technical specifications and installation instructions

Item numbers
70385 Vari KNX T
70386 Vari KNX TH
70388 Vari KNX TH-D



1. Description

The **Sensors Vari KNX T** for the KNX building bus system record temperature and additionally air humidity and air pressure outside or inside the building, depending on the model.

All measurement values can be used for the control of limit-dependent switching outputs. States can be linked via AND logic gates and OR logic gates. Multi-function modules change input data as required by means of calculations, querying a condition, or converting the data point type.

An integrated PI controller controls a heating/cooling system (according to temperature). Models with humidity sensor have an additional PI controller for ventilation control (humidification/dehumidification).

The compact housing of the **Vari KNX** accommodates the sensors, evaluation circuits and bus-coupling electronics.

Functions 70385 Vari KNX T:

- **Temperature measurement** with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- **Switching outputs** for all measured and computed values. Threshold values can be adjusted per parameter or via communication objects
- **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
- **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 of 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
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values

Additional functions of the models with humidity sensor:

(70386 Vari KNX TH, 70388 Vari KNX TH-D):

- **Humidity measurement** (relative, absolute), with **Mixed value calculation**. The share of internal measurement value and external value can be set as a percentage.
In addition the bus output will indicate whether the values are inside the **comfort field** (DIN 1946). The **dewpoint** will be calculated
- **PI controller for humidity** according to humidity: Ventilate/Air (one-stage) or Ventilate (one or two-stage)
- **4 control variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

Additional functions 70388 Vari KNX TH-D:

- **Air pressure measurement:** Output of the value as normal pressure and optionally as barometric pressure

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. Scope of delivery

- Sensor
- Stainless steel installation band for pole installation
- 4x50 mm stainless steel roundhead screws and 6x30 mm dowels for wall mounting. Use fixing materials that are suitable for the base!

1.1. Technical specification

Housing	Plastic
Colour	White / Translucent
Assembly	Surface mount
Protection category	IP 44
Dimensions	approx. 65 x 80 x 30 (W x H x D, mm)
Weight	approx. 60 g
Operating voltage	KNX bus voltage

Bus current	max. 20 mA
Data output	KNX +/- bus connector terminal
BCU type	Integrated microcontroller
PEI type	0
Group addresses	max. 2000
Assignments	max. 2000

Vari KNX TH-D:

Ambient temperature	Operation -25°...+80°C, Storage -45°...+85°C, avoid condensation
Communication objects:	328
Temperature sensor:	
Measurement range	-25°C ... +80°C
Resolution	0.1°C
Accuracy	±0,8°C at -25...-10°C ±0,5°C at -10...+65°C ±0,6°C at +65...+80°C
Humidity sensor:	
Measurement range	0% RH ... 100% RH
Resolution	0.1% RH
Accuracy	±7,5% RH at 0...10% RH ±4,5% RH at 10...90% RH ±7,5% RH at 90...100% RH
Pressure sensor:	
Measurement range	300 mbar ... 1100 mbar
Resolution	0.1 mbar
Accuracy	±4 mbar

Vari KNX TH:

Ambient temperature	Operation -25°...+80°C, Storage -45°...+105°C, avoid condensation
Communication objects:	294
Temperature sensor:	
Measurement range	-25°C ... +80°C
Resolution	0.1°C
Accuracy	±0,8°C at -25...-10°C ±0,5°C at -10...+65°C ±0,6°C at +65...+80°C
Humidity sensor:	
Measurement range	0% RH ... 100% RH
Resolution	0.1% RH
Accuracy	±7,5% RH at 0...10% RH ±4,5% RH at 10...90% RH ±7,5% RH at 90...100% RH

Vari KNX T:

Ambient temperature	Operation -30°...+50°C, Storage -30°...+70°C
Communication objects:	212
Temperature sensor:	
Measurement range	-30°C ... +50°C
Resolution	0.1°C
Accuracy	±0,5°C at -30...+25°C ±1,5°C at -30...+45°C

The product conforms with the provisions of EU directives.

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 the intended purpose described in this manual. 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

The **Sensors Vari KNX T** can be installed outside or inside the building.

The **Vari KNX TH-D und Vari KNX TH** should be protected from condensation. For critical applications in which the formation of condensation is expected, please consult Elsner Elektronik about special solutions.

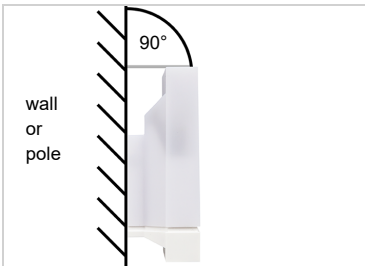


Fig. 1
The device must be attached to a vertical wall (or a pole).



Fig. 2
The device must be mounted in the horizontal (transverse) direction.

Temperature measurements can also be distorted by external influences such as warming or cooling of the building structure on which the sensor is mounted (sunlight, heating or cold water pipes). 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

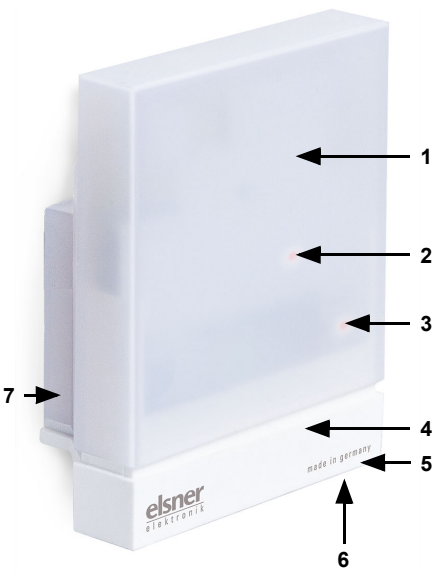


Fig. 3
1 Semi-transparent cover
Vari KNX TH-D: pressure sensor below
2 Position of the Signal LED (under the cover). LED is freely controlled via two objects
3 Position of the programming LED (under the cover)
4 Lower part of housing
5 Temperature and humidity sensor for Vari KNX TH-D and Vari KNX TH. Temperature sensor for Vari KNX T
6 Programming key on the bottom of the housing (recessed), see Device design
7 Wall/Pole holder

2.4. Installing the device

ATTENTION!
Even a few drops of water can damage the device electronics.

- Do not open the device if water (e.g. rain) can get into it.

2.4.1. Preparation for installation



Fig. 4
The cover and lower part of the housing are connected together. Pull both parts apart in a straight line.

2.4.2. Fitting the lower part of the housing with mounting

Now, first of all, assemble the lower part of the housing with the integrated mounting for wall or pole installation.

Wall installation

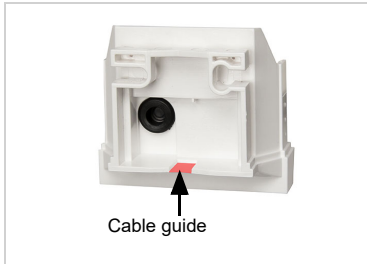
Use fixing materials (dowels, screws) that are suitable for the base.



Fig. 5
The device is installed with two screws. Break off the two longitudinal holes in the housing.



Fig. 6 a+b
a) If the power lead is to be hidden when installed, it must emerge from the wall in the vicinity of the rear of the housing (marked area).



b) If the power lead is to be surface-mounted, the cable guide is broken off. The lead is then fed into the device from the bottom of the housing.

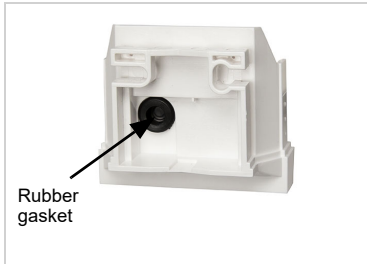


Fig. 7
Feed the power lead through the rubber gasket.

Drilling plan

ATTENTION! The print out of the data sheet doesn't have original size!
A separate, dimensionally correct drilling plan is included ex works and this can be used as a template.

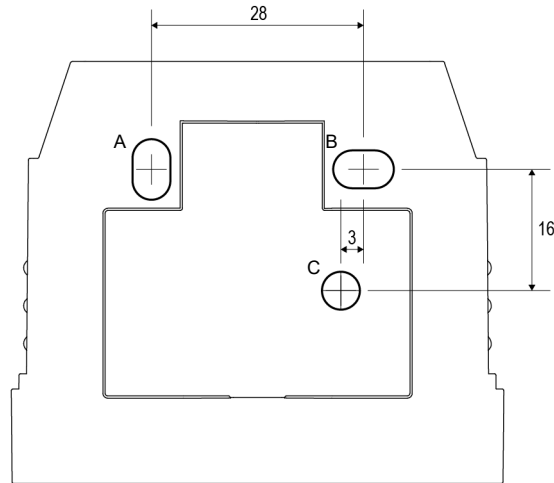


Fig. 8
Dimensions in mm.
Variations are possible for technical reasons
A/B2x longitudinal holes
8 mm x 5 mm
C Position of the cable outlet (rubber gasket) in the housing

Pole installation

The device is installed on the pole with the enclosed stainless steel mounting band.



Fig. 9
Feed the mounting band through the eyelets in the lower part of the housing.

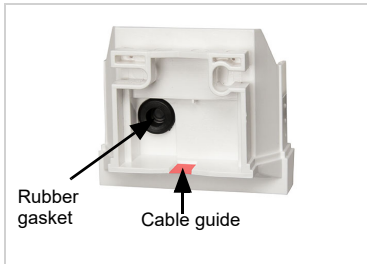


Fig. 10
Break the cable guide off.
Feed the power lead through the rubber gasket.

2.4.3. Connection

The connector is in the lower part of the housing.

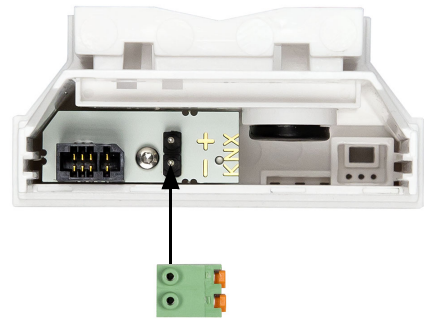
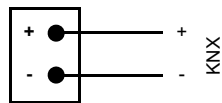


Fig. 11
Connect the device to the KNX bus via the pluggable terminal (+/-).



2.4.4. Completing the installation



Fig. 12
Put the cover on the lower part. This also makes the plug-in connection between the board in the cover and the socket in the lower part.

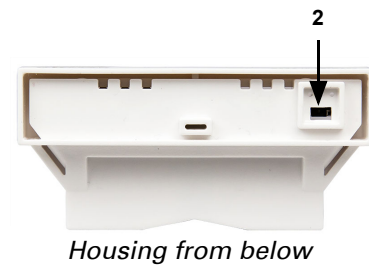
3. Addressing the device

The device is delivered ex works with the bus address 15.15.255. You can program a different address in the ETS by overwriting the address 15.15.255 or by teaching the device via the programming button.

The programming button can be reached through the opening on the underside of the housing; it is recessed by approx. 8 mm. Use a thin object to reach the button, e.g. a 1.5 mm² wire.



Fig. 13 a+b
1 Programming LED (under the semi-transparent cover)
2 Programming button for teaching the device



4. Maintenance



WARNING!
Risk of injury due to automatically moved components!
The automatic control may cause parts of the system to start up and pose a danger to humans.
• Always disconnect the system from the mains power before maintenance or cleaning.

The device should be regularly checked twice a year for soiling and cleaned if required. If there is major soiling, the function of the sensor may be compromised.



ATTENTION
The device may be damaged if water penetrates the housing.
• Do not clean with high pressure cleaners or steam jets.

5. Disposal

After use, the device must be disposed of or recycled in accordance with the legal regulations. Do not dispose of it with the household waste!