

Vari KNX 3L, Vari KNX 3L-T, Vari KNX 3L-TH, Vari KNX 3L-TH-D, Vari KNX 3L-TH-D GPS Combined brightness sensors

Technical specifications and installation instructions

Item numbers
70382 Vari KNX 3L
70383 Vari KNX 3L-T
70384 Vari KNX 3L-TH
70389 Vari KNX 3L-TH-D
70390 Vari KNX 3L-TH-D GPS



1. Description

The **Sensors Vari KNX 3L** for the KNX building bus system records brightness (sun) and additionally temperature, air humidity and air pressure outside, depending on the model. The model Vari KNX 3L-TH-D GPS also receives the GPS signal for time and location and uses it to compute the position of the sun (azimuth and elevation).

The 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.

Models with a temperature sensor have an integrated PI controller for heating/cooling. Models with humidity sensor have a PI controller for ventilation.

The compact housing of the **Vari KNX 3L** accommodates the sensors, evaluation circuits and bus-coupling electronics.

Functions 70382 Vari KNX 3L:

- **Brightness measurement:** The current light intensity is measured by three sensors. Of the three measurement values, the maximum value or a calculated mixed value can be output optionally.
- **Switching outputs** for all measured and computed values. 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) 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

Additional functions of the models with temperature sensor:

- (70383 Vari KNX 3L-T, 70384 Vari KNX 3L-TH, 70389 Vari KNX 3L-TH-D, 70390 Vari KNX 3L-TH-D GPS)
- **Temperature measurement with mixed value calculation.** The share of internal measurement value and external value can be set as a percentage
 - **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
 - **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:

- (70384 Vari KNX 3L-TH, 70389 Vari KNX 3L-TH-D, 70390 Vari KNX 3L-TH-D GPS)
- **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 of the models with air pressure sensor:

- (70389 Vari KNX 3L-TH-D, 70390 Vari KNX 3L-TH-D GPS)
- **Air pressure measurement:** Output of the value as normal pressure and optionally as barometric pressure

Additional functions 70390 Vari KNX 3L-TH-D GPS:

- **GPS receiver**, outputting the current time and location coordinates. The **Sensor Vari KNX 3L-TH-D GPS** also computes the position of the sun (azimuth and elevation)

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 micro controller
PEI type	0
Group addresses	max. 2000
Assignments	max. 2000
Brightness sensor:	
Measurement range	0 lux ... 150,000 lux
Resolution	1 lux up to 300 lux 2 lux up to 1,000 lux 25 lux up to 150,000 lux
Accuracy	±15% of the measurement value at 30 lux ... 30,000 lux

Vari KNX 3L-TH-D GPS:

Ambient temperature	Operation -25...+80°C, Storage -40...+85°C, avoid condensation
Communication objects:	603
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 3L-TH-D:

Ambient temperature	Operation -25...+80°C, Storage -40...+85°C, avoid condensation
Communication objects:	455
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 3L-TH:

Ambient temperature	Operation -25...+80°C, Storage -40...+85°C, avoid condensation
Communication objects:	421
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
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Vari KNX 3L-T:

Ambient temperature	Operation -30...+50°C, Storage -30...+70°C
Communication objects:	339
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


Vari KNX 3L:

Ambient temperature	Operation -30...+50°C, Storage -30...+70°C
Communication objects:	274

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 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

Due to the GPS receiver, the Sensor **Vari KNX 3L-TH-D GPS** must be installed outside. The **other models** can be mounted outside or inside.

The **Vari KNX 3L-TH-D GPS, Vari KNX 3L-TH-D and Vari KNX 3L-TH** should be protected from condensation. For critical applications in which the formation of condensation is expected, please consult Elsner Elektronik about special solutions.

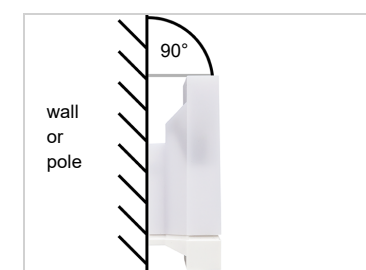


Fig. 1
The device must be attached to a vertical wall (or a pole).



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

Select an installation position on the building where the sensors can measure sunshine without any obstructions. The weather station should not be shaded by structures or, for example, trees. Ensure no shadow is thrown on the device by an extended awning.

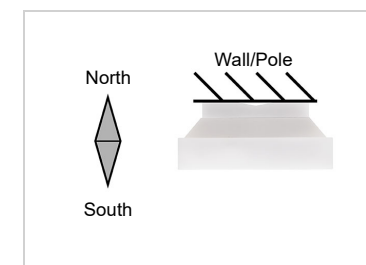


Fig. 3
For installation in the northern hemisphere, the device must be aligned to face south.

For installation in the southern hemisphere, the device must be aligned to face north.

Note for devices with temperature sensor:

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).

Note for devices with GPS receiver:

Magnetic fields, transmitters and interference fields from electrical consumers (e.g. fluorescent lamps, neon signs, switch mode power supplies etc.) can block or interfere with the reception of the GPS signal.

2.3. Device design

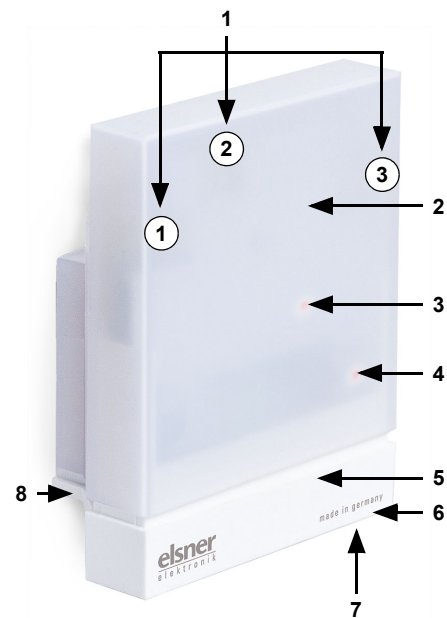


Fig. 4
1 Position of the brightness sensors 1-3. With alignment of the device to the south
Sensor 1 = West
Sensor 2 = South
Sensor 3 = East
2 Semi-transparent cover Vari KNX TH-D GPS: GPS receiver and pressure sensor below.
Vari KNX TH-D: pressure sensor below.
3 Position of the Signal LED (under the cover). LED is freely controlled via two objects

- 4 Position of the programming LED (under the cover)
- 5 Lower part of housing
- 6 Temperature and humidity sensor for Vari KNX 3L-TH-D GPS, Vari KNX 3L-TH-D, Vari KNX 3L-TH. Temperature sensor for Vari KNX 3L-T.
- 7 Programming key on the bottom of the housing (recessed), see Addressing the device
- 8 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. 5
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.

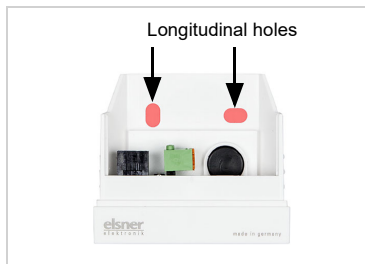
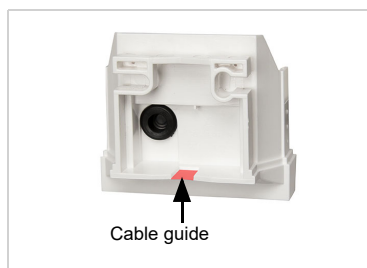


Fig. 6
The device is installed with two screws. Break off the two longitudinal holes in the housing.



Fig. 7 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. 8
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.

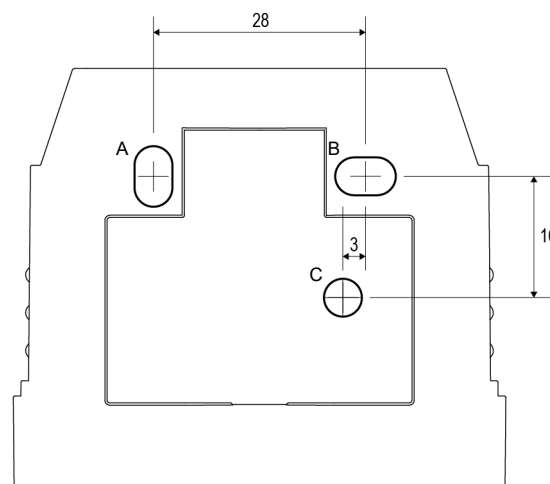


Fig. 9
Dimensions in mm. Variations are possible for technical reasons

- A/B 2x 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. 10
Feed the mounting band through the eyelets in the lower part of the housing.

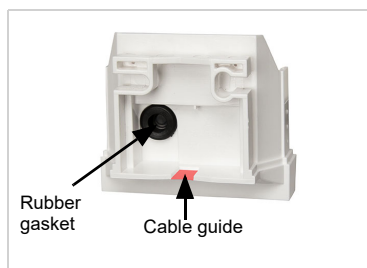


Fig. 11
Break the cable guide off. Feed the power lead through the rubber gasket.

2.4.3. Connection

The connector is in the lower part of the housing.

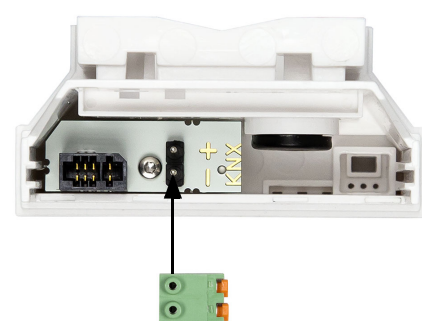
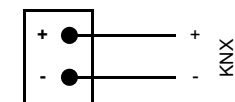


Fig. 12
Connect the device to the KNX bus via the pluggable terminal (+/-).



2.4.4. Completing the installation



Fig. 13
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. 14 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.