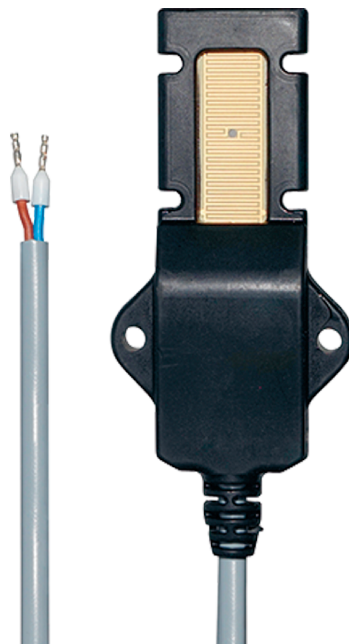


Product documentation

Condensation sensor
Art. No. BTS01



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1 Product definition

1.1 Product catalogue

Product name: Condensation sensor

Use: Sensor

Design: SM

Art. No. BTS01

1.2 Function

General

The device serves to detect unwanted condensation, in particular on coolant lines in residential or functional buildings. For example, condensed water can run down coolant lines or drip from cooling ceilings to the false ceiling and cause damage to it. If condensation is detected early, damage can be kept minor.

The device is fitted to the pipe that is to be monitored and, in combination with an appropriate KNX evaluation unit, it is a convenient and smart solution to detect condensation. The evaluation unit evaluates the signals of the device and transmits the appropriate telegrams to the KNX. KNX pushbutton interfaces or similar binary inputs can be suitable evaluation units.

- i** The device is a conventional sensor that is operated on an evaluation unit (e.g. KNX valve drive (motor-operated) with controller).

Application examples

In cooling ceilings:

- On coolant lines

2 Mounting, electrical connection and operation

2.1 Safety instructions



Electrical devices may only be mounted and connected by electrically skilled persons.

Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

Danger of electric shock. During installation and cable routing, comply with the regulations and standards which apply for SELV circuits.

2.2 Device components

The device consists of a unit, including connection cable. The device may not be opened.

i The device will be destroyed if it is opened.

2.2.1 Parts

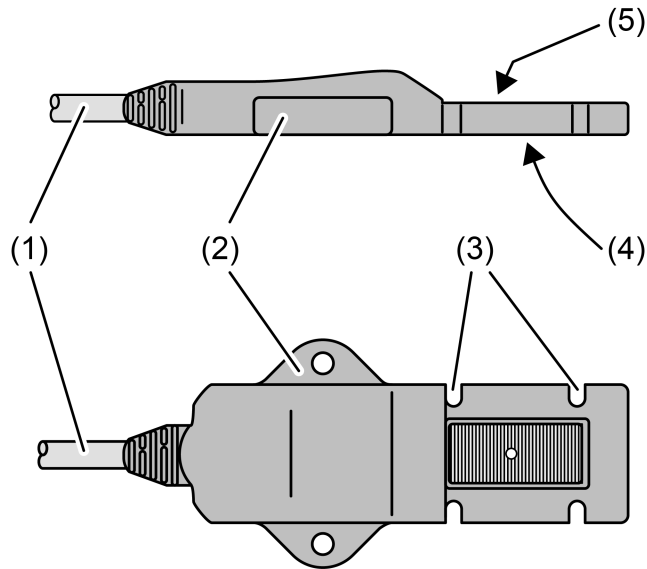


Figure 1: Device components Condensation sensor

- (1) Connecting cable
- (2) Fixing strap
- (3) Recession for fitting on ductwork with cable ties
- (4) Recession for a thermally conducting pad
- (5) Sensor surface

2.2.2 Dimensions (mm)

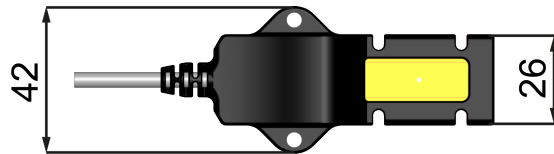


Figure 2: Top view

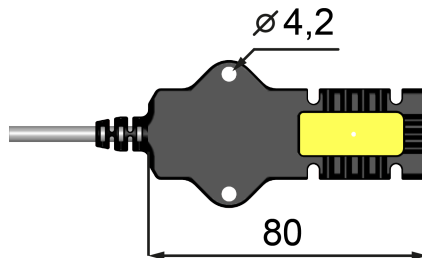


Figure 3: Bottom view



Figure 4: Side view



Figure 5: Front view

2.3 Fitting and electrical connection

Fitting the condensation sensor

The installation location should be the position that is most likely to have condensation. That can be the coldest spot within a pipeline circuit.

- i** For proper function, the sensor surface must be ventilated so that condensation can form on it.

- i** When fitted in the vicinity of mixer valves, place the device on the colder inflow.

Precondition: an appropriate fitting site

- Clean the outer surface of the pipe.
Remove any existing remaining paint.
- Remove the protective film from the enclosed thermally conducting pad.
- Put the self-sticking thermally conducting pad in the recession for the thermally conducting pad and slightly press on.
Result: The thermally conducting pad adheres to the recession on the bottom side of the device.
- Place the bottom side of the device directly on the pipe that is to be monitored.
- Fit the device to the pipe with the accompanying cable ties.
- Fit the connecting cable, e.g. with nail clamps.

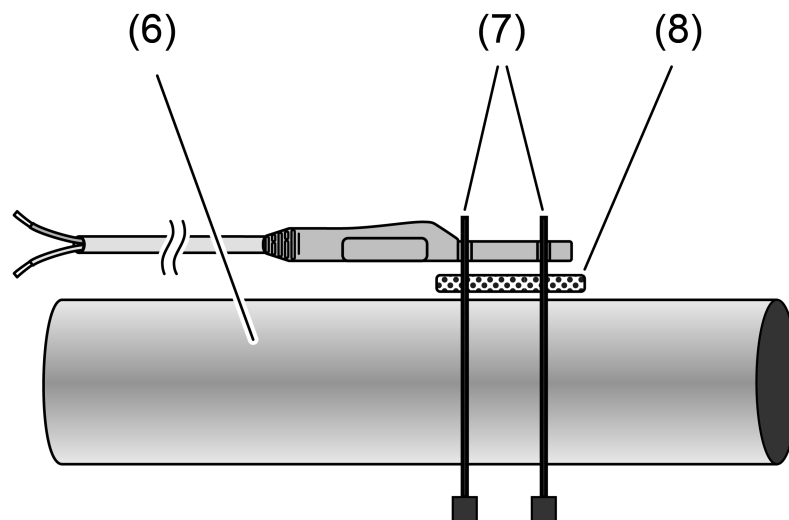


Figure 6: Fitting the device

- (6) Pipe
- (7) Cable tie
- (8) Thermally conducting pad

Connecting the condensation sensor

The device is directly connected to an evaluation unit (e.g. KNX valve drive (motor-operated) with controller) and electrically supplied by it.

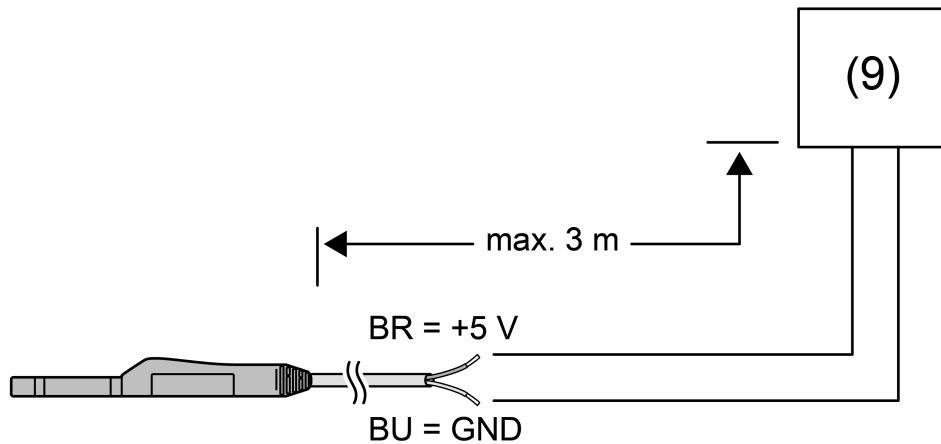


Figure 7: Connecting the device

(9) Evaluation unit

- Connect the device to an evaluation unit that supplies and monitors the device.

i Observe the polarity:
Brown = +
Blue = - / **GND**

i Reverse polarity protection protects the device from incorrect connection (Polarity from + and - / **GND**). The device does not function but is not destroyed.

i The device will be destroyed if it is connected to a voltage source that allows for a high current (voltage)!

2.4 Commissioning and function

Commissioning of the dew sensor

The following specification must be set in the parameters of the evaluation unit (e.g. KNX valve drive (motor-operated) with controller):

- Debounce time: 127 ms

Function of the dew sensor

The device monitors the electrical conductivity between the conductive coatings on the sensor surface. If it is dampened with water, the device detects the change and signals it.

The device is electrically supplied by an evaluation unit. The signaling of an alarm takes place by short-circuiting the supply voltage. The device supplies itself internally while it is short circuited.

When the sensor surface is moistened, the device signals an alarm (rising edge) of the evaluation unit. An internal clock measures the time beginning at this moment. The device of the evaluation unit signals an alarm for the duration of 1 minute. The device signals an alarm as long as the sensor surface is moistened. Even if the sensor surface is free from liquid within the first minute, the device still signals an alarm for one minute. After the minute is up, the device checks to see if the sensor surface is still moistened. As soon as the sensor surface is no longer moistened, the device cancels the alarm signal (falling edge).

The signal is recorded by the KNX device used by the evaluation unit and transmitted to the KNX in accordance with the project design. As a rule, the polarity of the KNX telegrams can be set in the parameters of the KNX device. In accordance with the project design, "1" telegrams or "0" telegrams are transmitted on the KNX if there is a rising or falling edge.

The device does not function in the event of prolonged supply voltage failure. The device automatically resumes functioning upon the return of the supply voltage.

- i** The device cannot prevent the accumulation of condensation, but still detects and registers it early, so that the impact of the unwanted condensation can be kept minor.
- i** The sensor surface can be damaged if it comes into contact with aggressive media (e.g., detergent solutions, scrubbing brines or acidic condensation from condensing boilers). The sensor area is to be checked after every alarm. The device is to be exchanged in the event of significant damage from corrosion.

2.5 Obvious misuse

The device works with the upper surface of the sensor. The lower surface of the sensor is not active. The device is not suitable for use as a leakage sensor.

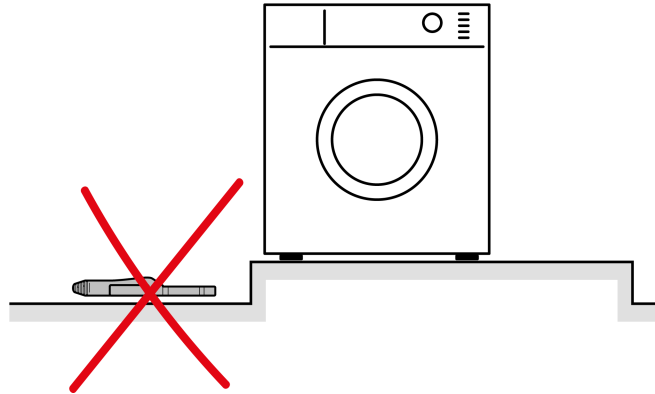


Figure 8: Example of obvious misuse of the device

3 Technical data

Rated voltage	DC 3,3 ... 5 V SELV
Current consumption	typ. 0,5 mA
Short-circuit current	max. 100 mA
Protection class	III
Ambient temperature	0 ... +50 °C
Storage/transport temperature	-40 ... +100 °C
Connecting cable	2 m
Degree of protection	IP 67

4 Application examples

4.1 Example "valve drive (motor-operated) with controller"

Example: direct operation on KNX valve drive (motor-operated) with controller (Art. no.: 2177SVR)

This application example shows the direct operation of the condensation sensor on KNX valve drive (motor-operated) with controller.

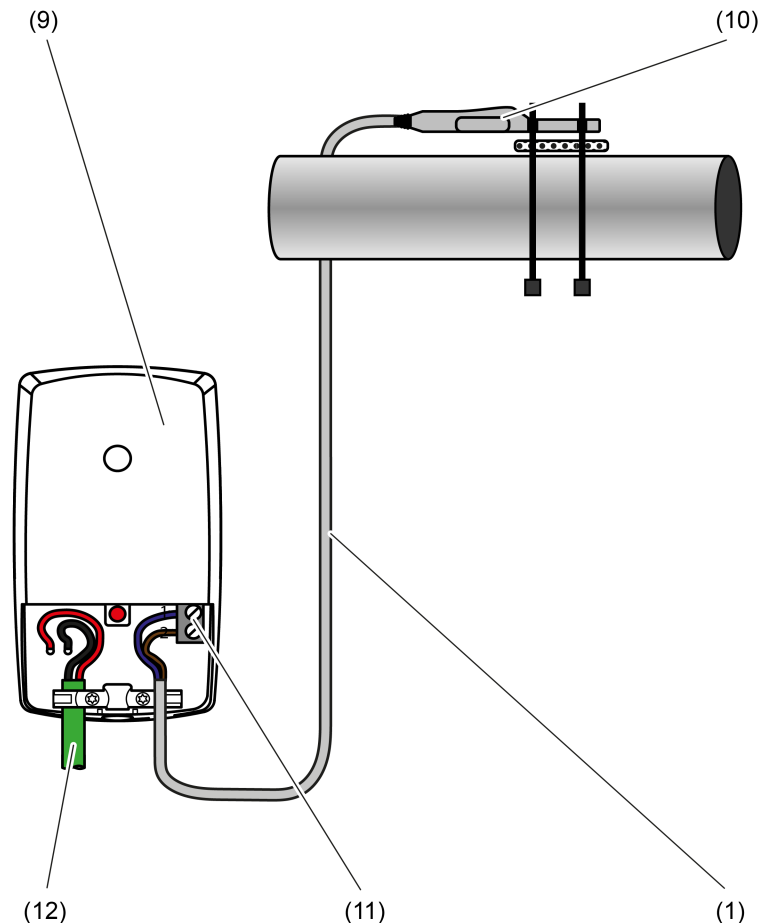


Figure 9: Connecting the condensation sensor to KNX valve drive (motor-operated) with controller

- (1) Connecting cable to the condensation sensor
- (9) Evaluation unit (here: KNX valve drive (motor-operated) with controller)
- (10) Dew sensor
- (11) Device connection terminal for potential-free contact or remote sensor
- (12) Connecting cable KNX

The KNX valve drive (motor-operated) with controller is planned with the ETS and brought into operation. So that the condensation sensor can be operated on the KNX valve drive (motor-operated) with controller, the following settings are to be changed in the parameters of the KNX valve drive (motor-operated) with controller, on the "entry" side of the parameters:

- "Function of the input" = "Switching"

With the "Switching" function, the ETS displays two 1-bit communication objects (switching 1.1 and 1.2). It is possible to use these two objects to transmit different switching telegrams to the KNX depending on the signal edge at the input. The input parameter on the parameter page "Input" can be used to define which object value is transmitted to the KNX when there is a rising or falling edge at the input (no reaction, ON, OFF, TOGGLE - switchover of the object value).

- "Delay after reset or when bus voltage returns" = 5 seconds

This parameter defines the delay after a reset or bus voltage return. Within the first few seconds (approx. 4 seconds), the leakage sensor signals an alarm after it is supplied with voltage. The alarm is triggered and then cancelled during the start-up phase of the device. For each evaluation unit implemented, a lag time can be set depending on bus voltage discovery, through which the transmission of the first KNX telegrams can be suppressed due to the startup phase of the leakage sensor.

- "Debounce time": 127 ms

The debounce time of the signal is defined by the device software via the parameter "Debounce time". The debounce time is defined for the functions of the binary input, after which actuation period the binary inputs identify a valid actuation of the connected contacts. In this way, it is possible to prevent the device from mistakenly identifying short conduction faults as a signal. The debounce time makes it possible to adapt the signal evaluation to the contact quality of the connected switches or push-buttons as well. The debounce time must be increased in the ETS if undesirable signal evaluations with very fast edge changes occur regularly or sporadically resulting in rapidly changing states of the KNX telegrams.

- "Command on rising edge" = ON

This parameter can be used to define which object value is transmitted first to the KNX via the first communication object of the input when there is a rising edge.

- "Command on falling edge" = OFF

This parameter can be used to define which object value is transmitted first to the KNX via the first communication object of the input when there is a falling edge.

4.2 Example: "KNX pushbutton interface"

Example: direct operation on jung knx pushbutton interface 2-gang (Art. no.: 2076-2 T)

This application example shows the direct operation of the condensation sensor on a KNX pushbutton interface without additional voltage supply.

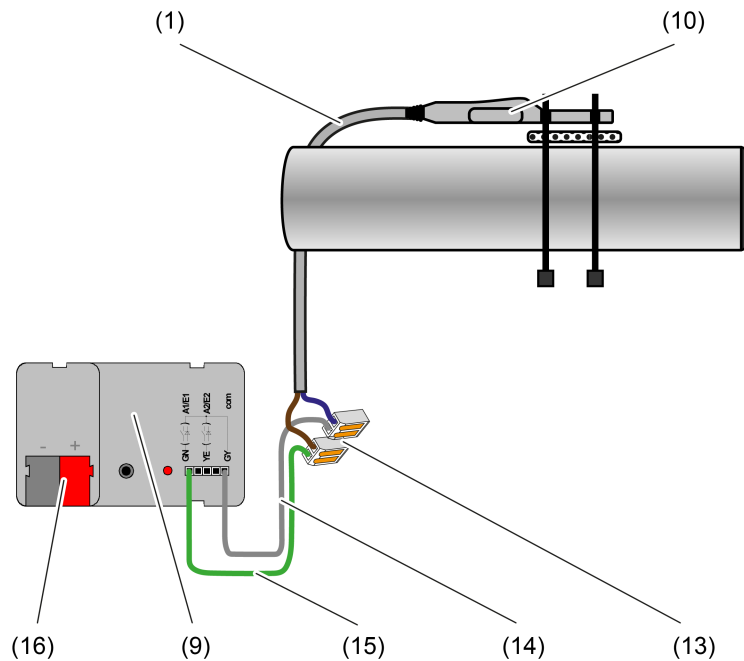


Figure 10: Connecting the condensation sensor to the KNX pushbutton interface

- (1) Connecting cable to the condensation sensor
- (9) Evaluation unit (here: KNX pushbutton interface)
- (10) Dew sensor
- (13) Two-conductor terminals
- (14) Connecting cable reference potential (com) of the KNX pushbutton interface
- (15) Channel 1 connecting cable of the KNX pushbutton interface
- (16) Device connection terminal KNX

i Maximum one sensor may be connected to a channel of an jung KNX pushbutton interface. With simultaneous signaling of alarms on both channels, the second message will sent delayed on the KNX.

The KNX pushbutton interface is planned with the ETS and brought into operation. So that the condensation sensor can be operated on the KNX pushbutton interface, in the parameters of the KNX pushbutton interface, the following settings are to be changed:

- "Function of Channel x" = binary input

This parameter defines the functions of the channel.

- "Delay after bus voltage returns" = 5 seconds

After reset or bus voltage return, the application program of the KNX pushbutton interface can be disabled for a defined time period until the corresponding reactions are executed. No pending signals will be evaluated on the inputs during this time and the switch outputs are not controlled! Even a feedback will only be transmitted after the time delay has elapsed at the earliest. Within the first few seconds (approx. 4 seconds), the leakage sensor signals an alarm after it is supplied with voltage. The alarm is triggered and then cancelled during the start-up phase of the device. For each evaluation unit implemented, a lag time can be set depending on bus voltage discovery, through which the transmission of the first KNX telegrams can be suppressed due to the startup phase of the leakage sensor.

- "Debounce time for binary inputs" = 127 ms

Specifies the software debounce time for all binary inputs together. On the basis of the time set here, a signal edge is evaluated at the input with a delay.

- "Function of the input" = "Switching"

With the "Switching" function, the ETS displays two 1-bit communication objects (switching object 1.1 and 1.2). It is possible to use these two objects to transmit different switching telegrams to the KNX depending on the signal edge at the input. The input parameter on the parameter page "Input" can be used to define which object value is transmitted to the KNX when there is a rising or falling edge at the input (no reaction, ON, OFF, TOGGLE - switchover of the object value).

- "Command on rising edge" = ON

This parameter can be used to define which object value is transmitted first to the KNX via the first communication object of the input when there is a rising edge.

- "Command on falling edge" = OFF

This parameter can be used to define which object value is transmitted first to the KNX via the first communication object of the input when there is a falling edge.

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