

Presence sensor with 360° detection area

Code: EK-Dx2-TP (x = B, C, D, E)



Datasheet STEKDX2TP_EN

KNX bus device for movement and presence detection in interior rooms. It has to be used in KNX installations for control of homes and buildings.



Description

The presence sensor ekinex® EK-Dx2-TP is a KNX S-mode device for the detection of movement and presence of people in interior rooms with an detection area of 360°, optimized thanks to the 3 passive infrared sensors (PIR). The detection area can be extended using other sensors configured as slave devices. For the lighting function 2 channels (c1 and c2) are available that can carry out a constant brightness regulation (c2 can be set as offset to c1: from -50% to +50%). The light intensity for the constant brightness regulation is measured by the integrated brightness sensor; the value can be furthermore sent on the bus as a Lux value (2 Byte). A function of orientation light can be programmed with a standby value (in %) and a duration value (in min or h). The channel dedicated to the HVAC application allows the independent control of heating, ventilation and air conditioning devices. The device has an integrated bus communication module and is realised for ceiling mounting. Several versions are available differing for the detection range and the form of the frame that holds the lens. The device is powered by the KNX bus line and requires no auxiliary power supply.

Code	Frame	Max detection range [m]	Mounting height [m]
EK-DB2-TP	round	16	2-6
EK-DC2-TP	square		
EK-DD2-TP	round	30	2-8
EK-DE2-TP	square		

Main characteristics

- Semi-automatic or fully automatic operation
- Detection range 360°
- Measuring range from 5 to 2000 Lux
- 3 PIR sensors can be activated individually or in groups
- Sensitivity adjustable (10 levels)
- Brightness sensor with linear output
- High-resolution lens for detection of small movements
- Optical filter integrated

Other characteristics

- Housing, lens and frame in plastic material
- Ceiling mounting (also on wall box 60 mm)
- Protection degree IP20 (according to EN 60529)
- Classification climatic 3K5 and mechanical 3M2 (according to EN 50491-2)
- Pollution degree 2 (secondo IEC 60664-1)

Technical data

- Rated voltage 24 Vdc (21 - 30 Vdc)
- Power absorption 0,4 W

Environmental conditions

- Operating temperature: - 20 ... + 40°C
- Relative humidity: 95% not condensing

Code	Frame	Weight [g]	Dimensions [mm]
EK-DB2-TP	round	55	Ø = 105, P = 50
EK-DC2-TP	square	55	86 x 86 x 50
EK-DD2-TP	round	60	Ø = 105, P = 57
EK-DE2-TP	square	60	86 x 86 x 57

Operation

The presence sensor reacts to the thermal radiation emitted by moving bodies. A person who walks in the detection area automatically activates the lighting. If the sensor no longer detects any movement, the lighting is switched off after the time delay set during the configuration with ETS®. If the standby mode is activated, the lighting remains switched on with a reduced intensity (orientation light function) for the standby time set.

Measurement of brightness

The measurement of the room brightness is carried out by an integrated light sensor with linear output and optical filter set on the profile of the human eye. The photoelectric sensor is able to send a 0 or 1 telegram, which indicates a brightness level lower or higher than a programmed threshold value, independently from the operation mode. The brightness value, measured in Lux, can be transmitted on the bus.

Lighting channel

The lighting channel has two operation modes that can be set in the configuration phase:

- fully automatic
- semi-automatic

The fully automatic mode has 3 states: ready, active and passive. The semi-automatic mode has 2 states: ready and active. The semi-automatic mode does not switch on the lighting after the movement detection, but only after the operation of an external pushbutton.

HVAC channel

The HVAC channel has the same objects and functioning modes of the lighting function; but the movement detection is extended, as it is based on the «long duration» principle. The detection is carried out on several time win-

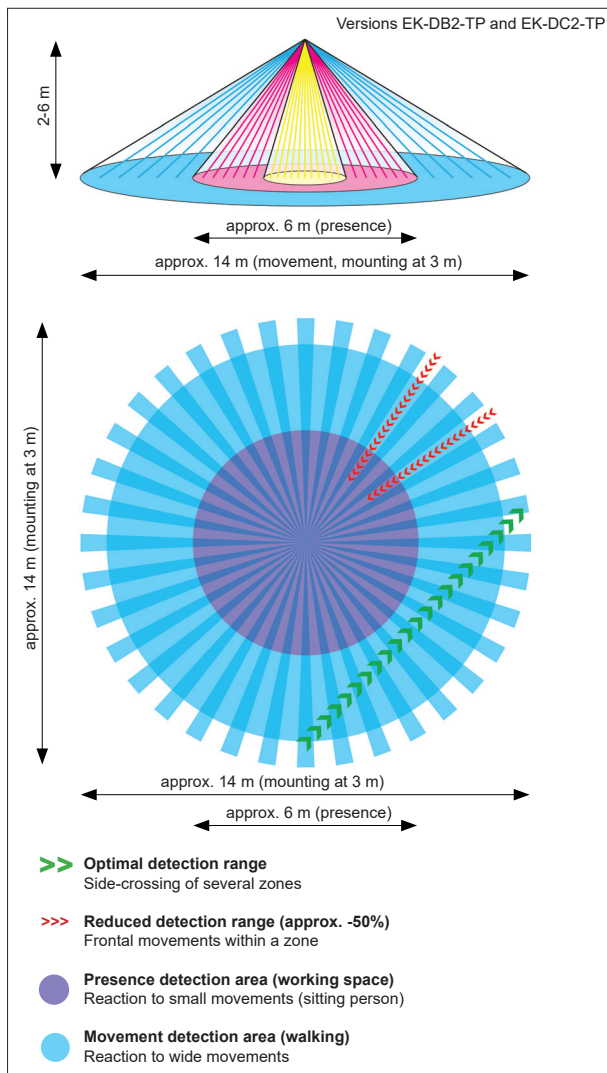
dows (from 2 to 20) of the same length in each of them at least one movement has to be detected.

Actual detection range

The actual detection range of the sensors depends on the mounting height. For the sensors EK-DB2-TP and EK-DC2-TP the presence (sitting person, small movements) is detected in a range from 4 to 8 metres, while the movement (person walking through the detection area) is detected in a range from 10 to 16 metres. The optimal range is achieved walking through several portions of the detection area.

Mounting height [m]	Sitting person, Ø in [m]*	Walking person, Ø in [m]*
2,0	4	10
2,5	5	12
3,0	6	14
3,5	7	16
4,0	8	16
5,0	8	16
6,0	8	16

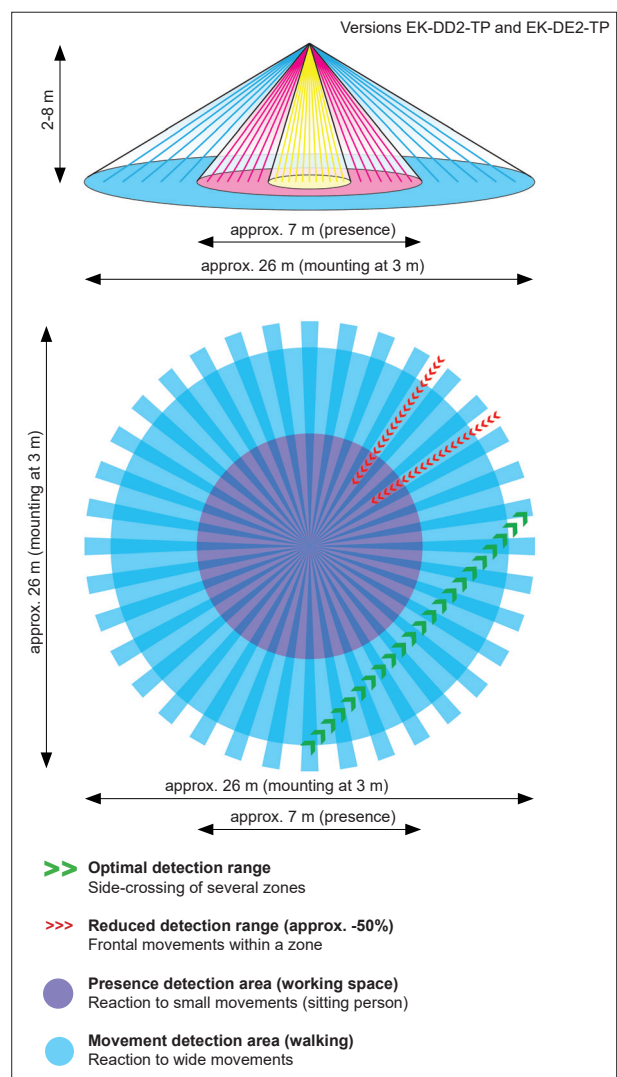
*) Max. values, versions EK-DB2-TP and EK-DC2-TP



For the sensors EK-DD2-TP and EK-DE2-TP the presence (sitting person, small movements) is detected in a range from 5 to 10 metres, while the movement (person walking through the detection area) is detected in a range from 20 to 30 metres.

Mounting height [m]	Sitting person, Ø in [m]*	Walking person, Ø in [m]*
2	5	20
3	7	26
4	9	28
5	10	30
6	10	30
7	10	30
8	10	30

*) Max. values, versions EK-DD2-TP and EK-DE2-TP



Mounting

The device has degree of protection IP20, and is therefore suitable for use in dry interior rooms. The device has to be installed with the plastic support and the screws (included in the delivery) either directly at the ceiling or on a wall box with 60 mm distance between fixing holes. Previously connect the bus terminal block to the bus cable (see: "Connection of the KNX bus line") and enter it in its slot on the rear of the device. At this point it is recommended to carry out the commissioning of the device (see

“Commissioning”) or at least the download of the physical address. Eventually snap the frame on the device.

Switching, display and detection elements

The device is equipped with a programming LED and a programming pushbutton, a signalling LED, three PIR sensors and a brightness sensor a.

Switching elements

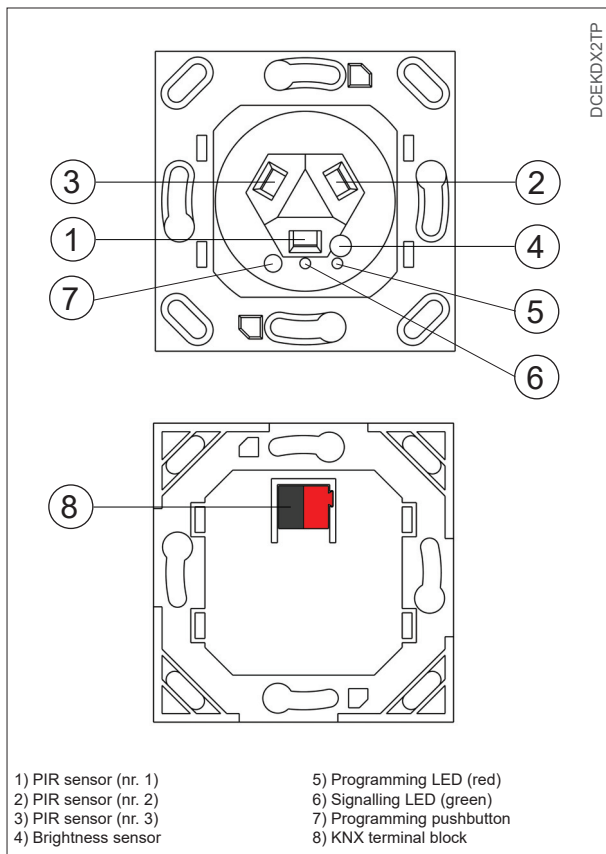
- Pushbutton (7) for switching between the normal and programming operating modes

Signalling elements

- Red LED (5) for indication of the active operating mode (on = programming, off = normal operation)
- Green LED (6) for signalling the movement/presence detection through a blinking

Sensors

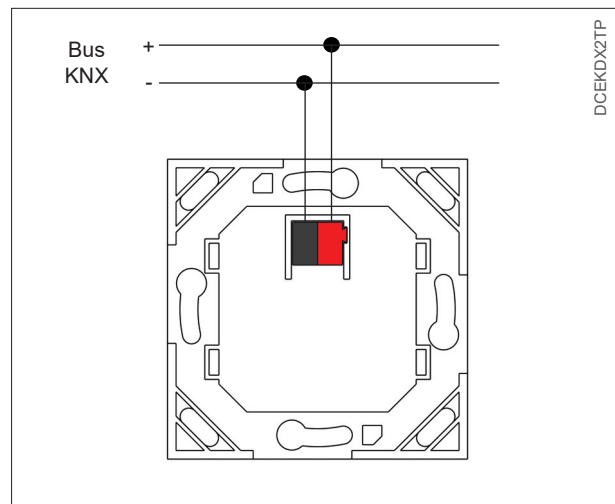
- Brightness sensor (4) with linear output for measuring the light intensity in the room (range: 5 ... 2000 Lux)
- Three passive infrared sensors (1, 2, 3) that can be activated individually or in groups. The numbers shown in the figure correspond to the ones used by the application program of the device



Note. Programming pushbutton and LED are accessible from the front side of the device. It is therefore possible addressing the device after the sensor has been mounted on the ceiling. Once the addressing has been carried out, the device configuration can be later downloaded without pressing the programming pushbutton.

Connection of the KNX bus line

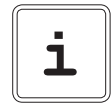
The connection of the KNX bus line is made with the terminal block (8) included in delivery and inserted into the slot of the housing.



Warning! The electrical connection of the device can be carried out only by qualified personnel. The incorrect installation may result in electric shock or fire. Before making the electrical connections, make sure the power supply has been turned off.

Characteristics of the KNX terminal block

- spring clamping of conductors
- 4 seats for conductors for each polarity
- terminal suitable for KNX bus cable with single-wire conductors and diameter between 0.6 and 0.8 mm
- recommended wire stripping approx. 5 mm
- color codification: red = + (positive) bus conductor, black = - (negative) bus conductor



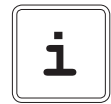
Note. After the connection to the KNX bus it is necessary to wait approximately a minute before the sensor reaches a stable functioning condition.



Warning! In order to supply the KNX bus lines use only KNX bus power supplies (e.g. ekinex EK-AB1-TP or EK-AG1-TP). The use of other power supplies can compromise the communication and damage the devices connected to the bus.

Configuration and commissioning

Configuration and commissioning of the device require the use of the ETS® (Engineering Tool Software) program V3 or later releases. These activities must be carried out according to the design of the building automation system done by a qualified planner.



Note. The configuration and commissioning of KNX devices require specialized skills. To acquire these skills, you should attend the workshops at KNX certified training centers.

Configuration

For the configuration of the device parameters the corresponding application program or the whole ekinex® product database must be loaded in the ETS program. For detailed information on configuration options, refer to the application manual of the device available on the website www.ekinex.com.

Code	Application program (## = release)	Communi- cation objects (max nr.)	Group ad- resses (max nr.)
EK-Dx2-TP (x = B, C, D, E)	APEKSP2TP##.vd4	19	254

Commissioning

For commissioning the device the following activities are required:

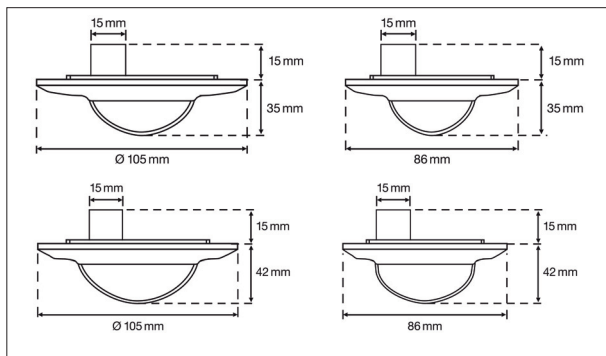
- make the electrical connections as described above;
- turn on the bus power supply;
- switch the device operation to the programming mode by pressing the programming pushbutton located on the front side of the housing. In this mode of operation, the programming LED is turned on;
- download into the device the physical address and the configuration with the ETS® program.

At the end of the download the operation of the device automatically returns to normal mode; in this mode the programming LED is turned off. Now the bus device is programmed and ready for use.

Troubleshooting

Error	Cause / action
The load does not switch	- the twilight value is too high - check the lighting devices - check the power supply / the protections
The sensor is activated without reason / the light never switches off	- check if in the detection area there are potential causes of unjustified activation, such as presence of pets, heating sources, etc. - check the distance from the lighting devices (heating reflexion or direct influence of the light) - the sensibility of the sensor is too high; reduce the sensibility of the detection area (1...10) with ETS
The light switches on during the daytime	- twilight regulation is set to a too high value; set a lower value with ETS

Dimensions [mm]



Marks

- KNX
- CE: the device complies with the Low Voltage Directive (2006/95/EC) and the Electromagnetic Compatibility Directive (2004/108/EC). Tests carried out according to EN 50491-5-1:2010, EN 50491-5-2:2010 and EN 50491-5-3:2010.

Maintenance

The device is maintenance-free. To clean use a dry cloth. It must be avoided the use of solvents or other aggressive substances.

Disposal



At the end of its useful life the product described in this datasheet is classified as waste from electronic equipment in accordance with the European Directive 2002/96/EC (WEEE), and cannot be disposed together with the municipal undifferentiated solid waste.



Warning! Incorrect disposal of this product may cause serious damage to the environment and human health. Please be informed about the correct disposal procedures for waste collecting and processing provided by local authorities.

Document

This datasheet refers to the release A1.0 of the ekinex® device EK-Dx2-TP (x = B, C, D, E), and is available for download at www.ekinex.com as a PDF (Portable Data Format) file.

File name	Device release	Updating
STEKDX2TP_EN.pdf	A1.0	03 / 2014

Warnings

- Installation, electrical connection, configuration and commissioning of the device can only be carried out by qualified personnel in compliance with the applicable technical standards and laws of the respective countries
- Opening the housing of the device causes the immediate end of the warranty period
- In case of tampering, the compliance with the essential requirements of the applicable directives, for which the device has been certified, is no longer guaranteed
- ekinex® KNX defective devices must be returned to the manufacturer at the following address: EKINEX S.p.A. Via Novara 37, I-28010 Vaprio d'Agogna (NO) Italy

Other information

- This datasheet is aimed at installers, system integrators and planners
- For further information on the product, please contact the ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com
- KNX® and ETS® are registered trademarks of KNX Association cvba, Brussels

© EKINEX S.p.A. The company reserves the right to make changes to this documentation without notice.