

Description

ekinex® EK-HH1-TP allows to control a mixing group for conveying fluid in heating and/or cooling applications for building. The device controls the opening / closing of a servomotor for mixing valve and starts / stops the circulating pump of the hydraulic circuit. The regulation mode can be set separately for heating and cooling. The device allows the acquisition of the delivery and return temperatures of the conveying fluid and the external air temperature, depending on the choosen regulation mode. It can be used a 3-point floating servomotor points or one with 0-10V input signal .The seasonal changeover (heating / cooling) may happen from the bus, through a binary input (configured for the purpose) or manually on the membrane keyboard. The device integrates a KNX bus communication module and is realized for mounting on a standard 35 mm rail. The device is supplied by the KNX bus and requires an additional 230 Vac power supply to operate.

Functional characteristics

- Control of a servomotor for mixing valve (3-point floating actuator or actuator with 0-10 V control signal)
- Start / stop of a circulating pump
- 2 relay outputs for switching / controlling additional functions
- 3 inputs for passive temperature sensors (NTC 10 kΩ at 25°C) for acquisition of conveying fluid delivery and return temperatures and external air temperature
- 2 configurable inputs as analogic for passive temperature sensor (NTC sensor 10 kΩ at 25°C) or digital (e.g. for condensation sensor or flow request contact)
- Connection of 230 Vac or 24 Vac external power supply for 3 point floating servomotor
- Two logical functions with 16 objects each
- Overtemperature (heating) and undertemperature (cooling) alarm management
- Condensation sensor alarm management
- Monitoring of operating parameters through alphanumeric display and membrane keyboard
- Change of a subset of regulation parameters through alphanumeric display and membrane keyboard

Operation	Regulation mode
Heating	<ul style="list-style-type: none">- fixed point- external compensation- recalibration on the internal conditions- recalibration on the return temperature- external compensation and recalibration on the internal conditions
Cooling	<ul style="list-style-type: none">- fixed point- external compensation- recalibration on the thermohygrometric internal conditions- external compensation and recalibration on the thermohygrometric internal conditions

Technical data

Power supply

- 30 Vdc by KNX bus (electronics) and 230 Vac 50/60 Hz auxiliary (loads)
- Current consumption from bus < 11 mA
- Power consumption from bus 300 mW

Outputs

- Control of a 3 point floating servomotor (CLOSE / COM / OPEN): 1 A, 250 Vac
- Control of a servomotor with 0-10 V signal (AO1): connection of high impedance input
- Load control for additional functions (DO1, DO2, DO3): 10(5) A, 250 Vac

Inputs

- Analogic (IN1, IN2, IN3): exclusively for connection of NTC temperature sensors 10 kΩ at 25°C
- Configurable (IN4, IN5) as analogic (exclusively for NTC temperature sensors 10 kΩ at 25°C) or digital (potential free)

Other characteristics

- Housing in plastic material
- Mounting on 35 mm rail (according to EN 60715)
- Protection degree IP20 (installed device)
- Safety class II
- Weight 380 g
- Modular device 8 MU (1 MU = 18 mm)
- Dimensions 144 x 90 x 60 mm (WxHxD)

Environmental conditions

- Operating temperature: 0 ... + 45°C
- Storage temperature: - 25 ... + 55°C
- Transport temperature: - 25 ... + 70°C
- Relative humidity: 95% not condensing)

Control, display and connection elements

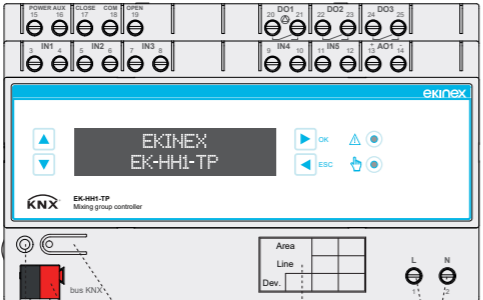
The device is provided with a programming pushbutton and LED, a terminal for connecting the KNX bus line, a backlighted display, 4 pushbuttons for menu scrolling, and screw terminals for connecting inputs, outputs and 230 Vac power supply.

Terminal blocks for connection of inputs and outputs



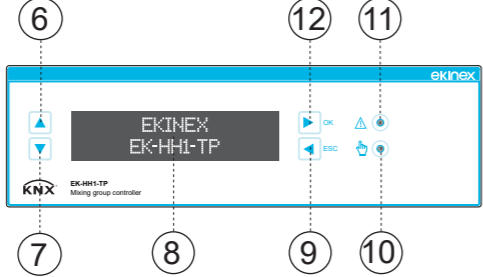
Nr.	Marking	Connection
3-4	IN1	Input 1 (delivery temperature sensor)
5-6	IN2	Input 2 (return temperature sensor)
7-8	IN3	Input 3 (external temperature sensor)
9-10	IN4	Input 4 (configurable)
11-12	IN5	Input 5 (configurable)
13-14	AO1	0-10 V servomotor control output
15-16	POWER AUX	TRIAC power supply (230 Vac or 24 Vac)
17	CLOSE	Servomotor control output (closing)
18	COM	Servomotor control output (common)
19	OPEN	Servomotor control output (opening)
20-21	DO1	Relay output for circulating pump
22-23	DO2	Relay output (additional functions)
24-25	DO3	Relay output (additional functions)

Lower part of the casing



- 1) Programming LED
- 2) Terminal block for KNX bus line
- 3) Programming pushbutton
- 4) Field for physical address
- 5) Terminal blocks (1, 2) for 230 Vac power supply

Membrane keyboard and display



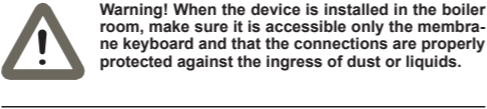
- 6) Pushbutton for scrolling menu up
- 7) Pushbutton for scrolling menu down
- 8) Backlighted alphanumeric display 16 columns x 2 rows
- 9) Pushbutton "back"
- 10) Manual mode LED
- 11) Alarm LED
- 12) Pushbutton "confirm"

Mounting

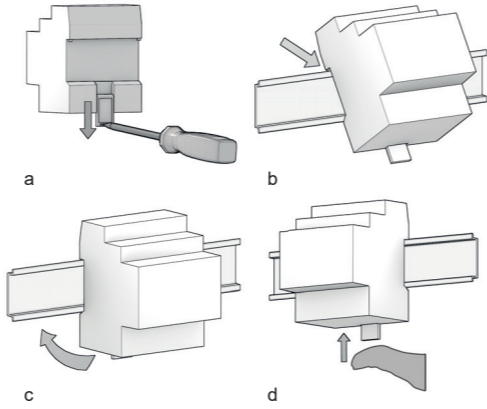
The device has degree of protection IP20, and is therefore suitable for use in dry interior rooms. The housing is made for rail mounting according to EN 60715 in boards or cabinets for electrical distribution. The correct mounting is when the KNX bus terminal is located at the bottom. When installing be sure to leave accessible only the front panel; all other sides must not be accessible. For the mounting proceed as follows:

- with the aid of a tool bring the locking device in the fully lowered position (a);
- place the upper edge of the rear inner profile on the upper edge of the rail (b);
- rotate the device towards the rail (c);
- push the locking device upward until it stops (d).

Before removing the device, be sure that inputs, outputs, power supply have been disconnected and the bus terminal has been extracted from its slot. Use a screwdriver to slide down the locking device and remove the device from the rail.

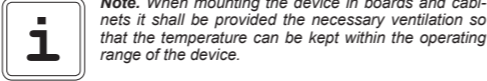


Warning! When the device is installed in the boiler room, make sure it is accessible only the membrane keyboard and that the connections are properly protected against the ingress of dust or liquids.



Connection of the KNX bus line

The connection of the KNX bus line is made with the terminal block included in delivery and inserted into the slot at the left bottom of the housing.



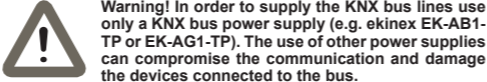
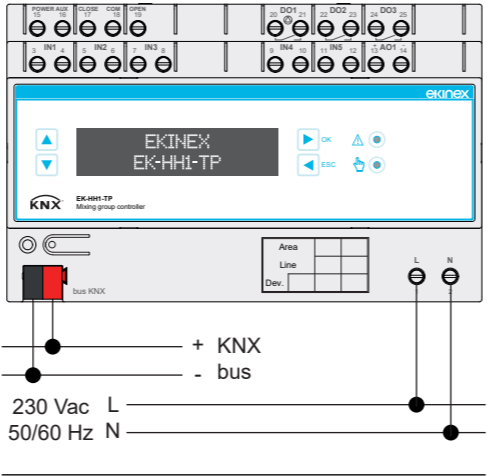
Note. When mounting the device in boards and cabinets it shall be provided the necessary ventilation so that the temperature can be kept within the operating range of the device.

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

Connection of power supply

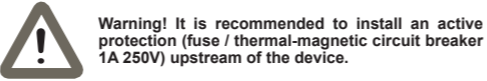
The connection of the 230 Vac 50/60 Hz power supply is made with the screw terminals 1 and 2 (L, N) located at the bottom front of the device.



Warning! In order to supply the KNX bus lines use only a KNX bus power supply (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.

Characteristics of the terminals

- screw clamping of conductors
- maximum cross section of conductor 2,5 mm²
- recommended wire stripping approx. 6 mm
- torque max 0,5 Nm

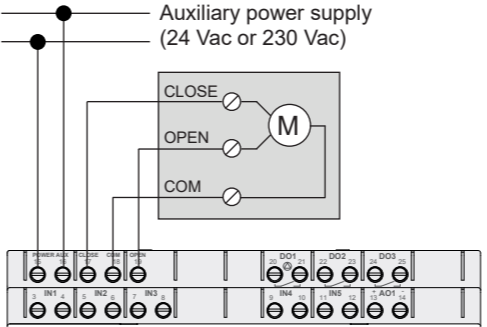


Warning! It is recommended to install an active protection (fuse / thermal-magnetic circuit breaker 1A 250V) upstream of the device.

Connection of servomotor

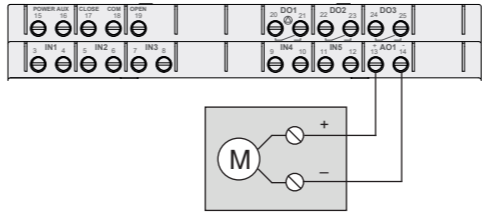
3 point floating servomotor

The connection of the servomotor is made with the terminals 17, 18 and 19 (CLOSE / COM / OPEN); it is necessary also the connection of a 230 Vac or 24 Vac auxiliary power supply with the screw terminal blocks 15 and 16 (POWER AUX).



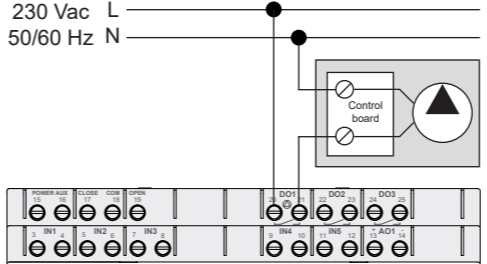
Servomotor with 0-10 V control signal

The connection of the servomotor is made with the terminal blocks 13 and 14 (AO1).



Connection of circulating pump

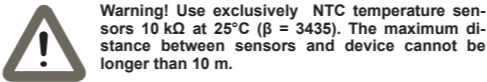
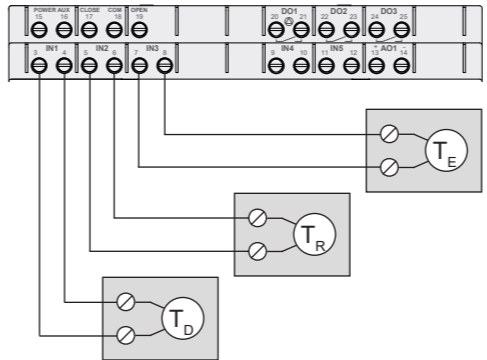
The connection of the circulating pump is made with the terminal blocks 20 and 21 (DO1).



Connection of temperature sensors

The connection of the temperature sensors has to be done respectively to the following terminal blocks:

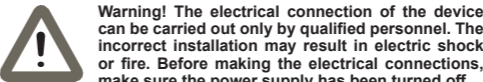
- 3 and 4 (IN1) for fluid delivery temperature (T_D)
- 5 and 6 (IN2) for fluid return temperature (T_R)
- 7 and 8 (IN3) for external air temperature (T_E)



Warning! Use exclusively NTC temperature sensors 10 kΩ at 25°C (β = 3435). The maximum distance between sensors and device cannot be longer than 10 m.

Characteristics of the terminals

- screw clamping of conductors
- maximum cross section of conductor 2.5 mm² (single-wire) or 1.5 mm² (multi-wire)
- recommended wire stripping approx. 6 mm
- torque max 0.8 Nm

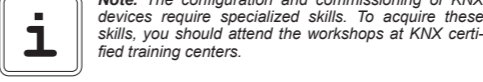


Warning! The electrical connection of the device can be carried out only by qualified personnel. The incorrect installation may result in electric shock or fire. Before making the electrical connections, make sure the power supply has been turned off.

Configuration and commissioning

Configuration and commissioning of the device require the use of the ETS® (Engineering Tool Software) program V4 or later releases. These activities must be carried out according to the design of the building automation system done by a qualified planner.

Configuration



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.

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

Commissioning

Product code	Application software (## = release)	Communication objects (max nr.)	Group addresses (max nr.)
EK-HH1-TP	APEKHH1TP##.knxprod	185	254

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.

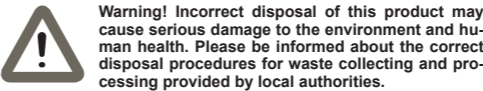
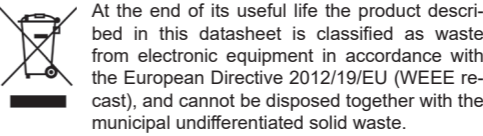
Marks

- KNX
- CE: the device complies with the Low Voltage Directive (2014/35/EU) and the Electromagnetic Compatibility Directive (2014/30/EU). Tests carried out according to EN 50491-2:2010, EN 50491-3:2009, EN 50491-4-1:2012, EN 50491-5-1:2010, EN 50491-5-2:2010, EN 50428:2005 + A1:2007 + A2:2009

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



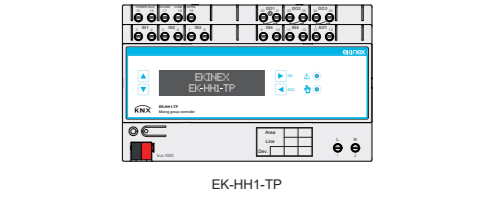
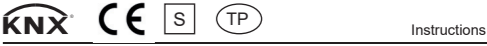
Warning! Incorrect disposal of this product may cause serious damage to the environment and human health. Please be informed about the correct disposal procedures for waste collecting and processing provided by local authorities.

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® defective devices must be returned to the manufacturer at the following address: Ekinex S.p.A. Via Novara 35, I-28010 Vaprio d'Agogna (NO) Italy

KNX controller for mixing group

Code: EK-HH1-TP



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Other information

- The instruction sheet must be delivered to the end customer with the project documentation
- 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
- Each ekinex® device has a unique serial number on the label. The serial number can be used by installers or system integrators for documentation purposes and has to be added in each communication addressed to the EKINEX technical support in case of malfunctioning of the device
- KNX® and ETS® are registered trademarks of KNX Association cvba, Brussels

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EK-HH1-TP

Direct access to documentation
The QR code allows the direct access to the technical documentation on the website using mobile devices (smart phones, tablets) with a standard QR code reader.