JB-112TH, JB-112TH-AN
Bus temperature, humidity and CO_2 sensor with thermostat function

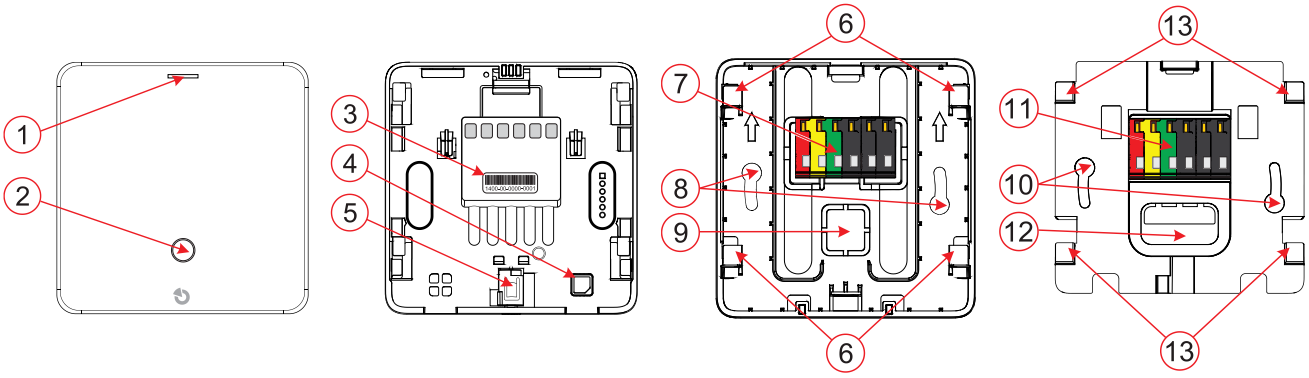
*The product is a component of **JABLOTRON** systems and, in combination with a control panel, is designed for zone temperature control and ventilation using built-in air temperature and humidity measurement. In combination with the JB-TS-NTC10K external sensor (sold separately), the thermostat measures and limits the floor temperature.* ***The product is enhanced with an integrated carbon dioxide (CO_2) concentration sensor for advanced air quality monitoring and ventilation control based on the measured CO_2 concentration.***

The product is compatible with JA-103K and JA-107K control panels and Futura S and L heat recovery units. The thermostat automatically detects which system it is connected to based on the supply voltage (12V = JA-100+ / 24V = Futura) and the corresponding firmware is launched accordingly. ***This manual describes the installation and behaviour of the thermostat when connected to the JABLOTRON 100+ system. If connecting the thermostat to a Futura heat recovery unit, follow the Futura unit manual.***

The product combines the features of an alarm system with temperature control in buildings, enabling automatic functions that respond to system events, such as switching to economy mode when users are absent, turning off the heating when a window is opened, and so on.

To use all the product's functions, the system must be registered with the JABLOTRON Cloud (some functions may be subject to a fee).

The product is intended for installation by a trained technician with a valid Jablotron certificate.



Front part on both sides **Rear part A** PLV-**JB11xTx** **Rear part B**

***Fig. 1**: Description of individual product parts*

***1** – LED indicator; **2** – capacitive button; **3** – serial number; **4** – CO_2 sensor, **5** – locking mechanism; **6** – rear part A PLV-JB11xTx latches **7** – location of terminal blocks for surface mounting; **8** – screw holes; **9** – break-out square for cable routing; **10** – holes for fixing screws; **11** – location of terminal blocks in the rear part for partially recessed mounting; **12** – hole for cable routing, **13** – latches of part B*

Installation

Always connect the bus when the system power is completely turned off.

The product does not detect tampering; in alarm systems with security grade 2, it is necessary to connect the product behind the JA-110T bus separator – bus tamper protection.

It is not advisable to install the device in the immediate vicinity of windows or doors, where rapid changes in CO_2 concentration may occur, affecting measurement accuracy and proper ventilation logic.

Surface mounting with rear part PLV-JB11xTx

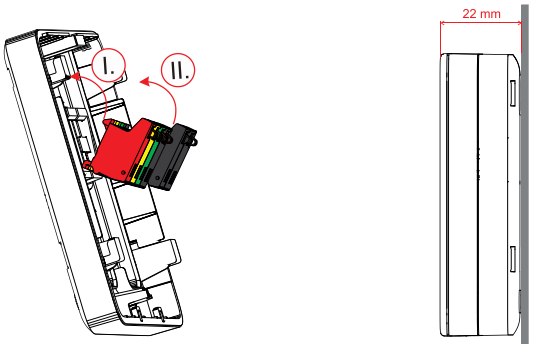


***Fig. 2**: Illustration of surface mounting*

I. Bus terminal block
II. floor sensor terminal block

1. Break out the plastic square from the rear part A (PLV-JB11xTx – not included – must be purchased separately as an accessory) pull the cables through the square hole and fix the rear part to the wall using the two screws (8).
2. Connect the bus wires and, if applicable, the floor sensor wires to the terminal block.
3. Then insert the upper part into the latches (5) and pull down to secure the product.
4. Secure by turning the locking mechanism clockwise.

Partially recessed mounting in an electrical installation box

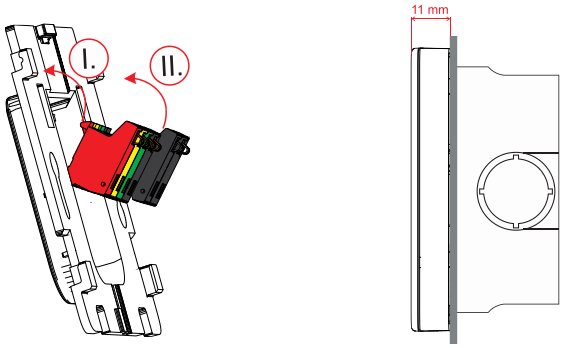


***Fig. 3**: Illustration of partially recessed mounting*

I. Bus terminal block
II. floor sensor terminal block

1. Pull the cables through the hole (11) and connect the bus and floor sensor wires to the terminal block.
2. Fix the rear part B to the wiring box using two screws (not included).
3. Then insert the front part into the latches (5) and pull down to secure the product.
4. Turn the locking mechanism (5) clockwise on the bottom side of the thermostat.

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Teaching the system:

a. In the **F-Link** software, select the desired position in the **Devices** tab and press the **Enrol** button to activate enrolment mode.
b. Open the **Scan/add new BUS devices** selection and double-click to select the appropriate thermostat. Then continue to Internal device settings.

Notes: *Enrolment can also be performed by entering the serial number (3) in the F-Link software. Enter all digits (serial number format: 1400-00-0000-0001).*

Product function diagram

The product allows you to control heating, cooling or ventilation using three PG outputs of the control unit in On/Off mode, see the figure below.

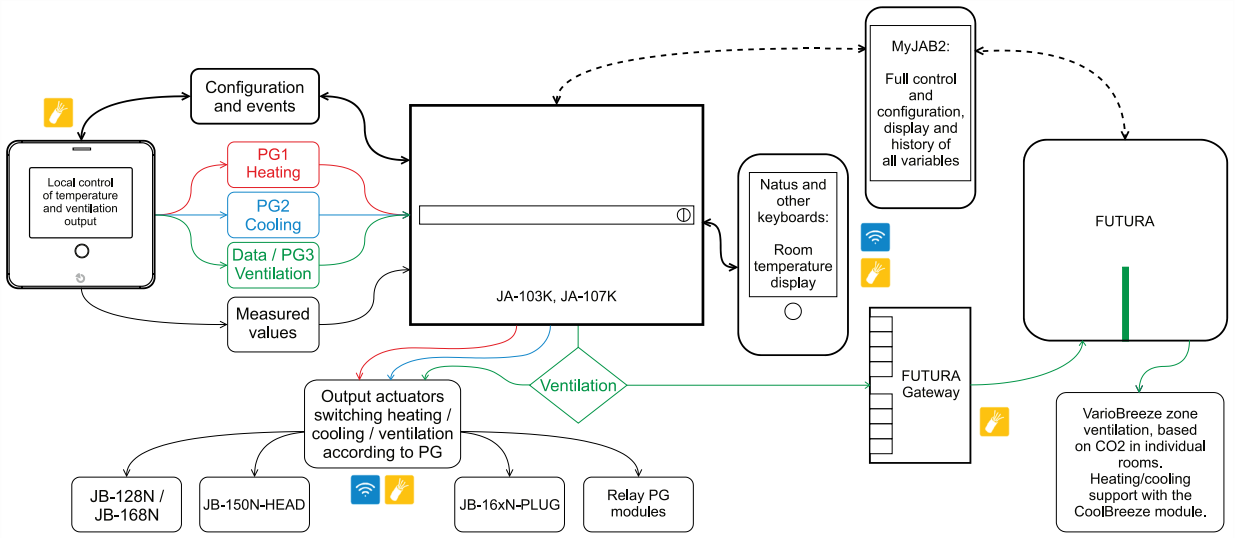


Fig. 4: *General configuration of heating, air conditioning and ventilation control.*

The thermostat settings are divided into two blocks:

- **Installation:** Basic thermostat settings performed by an F-Link installation technician during installation. These settings are necessary for the product to function properly and limit user settings and functions. Once the installation settings have been made and the product has been registered with the JABLOTRON Cloud, it can be handed over to the customer for use.
- **User:** The operating settings contain parameters for normal use of the product, such as the required temperatures for individual modes, hysteresis, calendar functions, etc. The settings are primarily intended for the user and are performed in MyJABLOTRON. In cases where it is necessary to hand over a product with detailed settings to the user, the user section is accessible to the installation partner in MyCOMPANY.

Internal settings in F-Link – installation settings:

The basic functions necessary for putting the product into operation can be set in the internal settings of the thermostat. After leaving service mode, the thermostat switches to heating mode with manual temperature setting. It thus maintains a constant temperature (20 °C by default). In this mode, the thermostat can simply maintain the desired temperature in the building, for example, until the system is fully completed and later registered on the JABLOTRON Cloud. All other functions and controls are part of the user settings in MyJABLOTRON / MyCOMPANY, see below.

Heating / cooling / ventilation modes – All three modes can be activated using the checkboxes. When activated, each mode opens up the option to select an individual PG that will switch the relevant appliance. Activating individual modes also affects the availability of user settings in MyJABLOTRON / MyCOMPANY. The heating and cooling modes do not work together. The user must manually switch between the heating and cooling seasons in MyJABLOTRON. Depending on this, the thermostat switches either the heating or cooling PG.

The ventilation mode, on the other hand, works in parallel, independently of heating and cooling. The thermostat controls the selected PG output of the control panel, switching on the relevant appliance when there is a request to reduce the CO_2 or humidity value. The ventilation PG switches on when the CO_2 or humidity threshold value is reached until it drops by the set hysteresis. Both parameters are part of the user settings in the mobile application.

Upper and lower temperature limits adjustable by the user – Limits (0 °C - 40 °C) determine the range within which the user can set the desired temperature in MyJABLOTRON.

Switch to economy temperature – if the thermostat is in programme mode, with the selected method of securing the section to which it is enrolled, it automatically shortens the comfort period of the calendar and maintains only the economy temperature. This is maintained until the calendar requires the comfort temperature again. **Floor sensor** – If the JB-TS-NTC10K floor sensor is connected, you can set a limit for the floor temperature that the thermostat will not exceed when heating (5 °C - 40 °C). In residential buildings, we recommend not exceeding the default temperature of 29 °C, which is recommended by hygiene standards for living spaces. An exception may be rooms for short-term use (e.g. bathrooms), where the maximum permissible floor temperature is 33 °C. When the limit temperature is reached, the thermostat stops heating until the temperature drops by 1°C. The floor sensor function is only a limit function; the thermostat uses the air temperature for normal regulation.

Error event declaration based on critical temperature measurement – the thermostat can declare a selected event (fault/alarm) when the set critical low or high temperature is reached from the selected temperature measurement source:

- Air and floor (the first source to reach the set temperature).
- Air (floor temperature is ignored).
- Floor (air temperature is ignored, only the external sensor is evaluated).

The event is reported by the system to the user or to the PCO. This function is suitable for preventing damage in the event of a heating system failure or for monitoring the temperature in areas where this value is critically monitored. For heating control in standard buildings, dynamic monitoring of critical temperatures can be activated (-5 °C from off mode or +10 °C to comfort mode). The values at which the thermostat reports an error event are then calculated automatically according to the user-set temperature in off mode / comfort temperature for heating mode.

CO_2 alarm – The system can be set to trigger an alarm at a specific level. Options include Level 4 / Level 5 / Off.

Level on the display	CO_2 ppm value	User description
1	<750	Fresh air
2	750–1200	Slight increase in CO_2
3	1200–1500	Satisfactory quality
4	1500–2500	Poor air quality
5	>2500	Extremely poor air quality

Table 1*: CO_2 concentration levels and their values*

PG output settings

F-Link automatically enrols and locks the on/off function to the PG outputs controlled by the thermostat. In zone heating control, each thermostat controls its own PG output, which controls the switching of the heating source in the room where the thermostat is installed (e.g. a head in a floor heating manifold, a radiator head, a relay switching electric floor heating in a room, etc.). If the system is equipped with a central heat source (boiler, heat pump), the heat source should be switched by a common PG output that copies the OR logic of the individual thermostats' PG (if at least one thermostat requests heating, the common PG copies the request; if none of the thermostats are heating, the common PG is switched off).

Blocking PG outputs

PG outputs controlled by thermostats can be blocked by various events, such as activation of devices (open window), securing a section, or custom logic (blocking by another PG output). If the PG is blocked, the thermostat does not heat until the temperature drops to the value set for the off mode. When this value is reached, the thermostat overcomes the block and continues to maintain the temperature in the off mode until the end of the block, when it returns to its default state.

User settings of the thermostat in MyJABLOTRON / MyCOMPANY

For the product to function properly, the system must be registered in the JABLOTRON Cloud. The settings in the applications respect the installation settings in F-Link; only parameters for enabled operating modes are available, and the range of temperatures that can be set in the application is limited by the range enabled in the installation settings. User settings are made separately for the heating, cooling and ventilation operating modes.

Heating function settings:

Automatic switch to economy temperature: if the thermostat is in programme mode, with the selected method of securing the section to which it is enrolled, it automatically shortens the comfort period of the calendar and maintains only the economy temperature. This is maintained until the calendar requires the comfort temperature again. By default, the thermostat automatically switches to economy temperature when the section is fully secured.

Hysteresis: Determines how much the temperature must drop after reaching the desired temperature before the thermostat starts heating again. Correct hysteresis setting prevents the heating source from switching on too often. By default, the hysteresis for heating is set to 0.5 °C.

Temperature correction: Allows you to manually calibrate the air temperature measured by the thermostat in cases where the thermostat is affected by an external source, such as air flow.

Floor temperature will not exceed: Display of the floor temperature limit set in the installation settings. The default value is 29 °C.

Comfort temperature: The temperature that the thermostat maintains in programme operating mode at set times when a higher temperature is required (typically in the morning and evening). The default comfort temperature is set to 22 °C. If automatic switching to economy temperature is active, the thermostat automatically shortens the comfort section when it is activated.

Economy temperature: The temperature maintained by the thermostat in operating mode outside the set comfort periods (typically at night or when no one is in the building). The default economy temperature is 18 °C.

Off: The temperature maintained by the thermostat when switched to heating mode and the operating mode is turned off. For normal interiors, it is recommended that the temperature does not fall below the default setting of 12 °C. Lower temperatures may lead to mould growth and other undesirable phenomena. The thermostat maintains the temperature in the off mode even when the PG for heating is blocked, for example by an open window or prolonged locking of the section (long-term absence from the building), etc.

Cooling function settings:

Automatic switchover to economy temperature: if the thermostat is in programme mode, when the selected method of securing the section to which it is enrolled is selected, it automatically shortens the comfort section of the calendar and maintains only the economy temperature. This is maintained until the calendar requires the comfort temperature again. By default, the thermostat automatically switches to economy temperature when the section is fully secured.

Hysteresis: Determines how much the temperature must rise again after reaching the desired temperature for the thermostat to start cooling again. Correct hysteresis settings prevent the cooling from switching on too often. The hysteresis setting for cooling is individual and is typically higher than for heating, with a default of 1 °C.

Comfort temperature: The temperature that the thermostat maintains in operating mode during set time periods when a lower temperature is required (typically in the afternoon and for sleeping). By default, the comfort temperature for cooling is set to 23 °C. If automatic switching to the comfort temperature is active, the thermostat automatically shortens the comfort period when securing the comfort section.

Economy temperature: The temperature that the thermostat maintains in the programme operating mode outside the set comfort periods, typically when no one is in the building, but it is desirable to prevent the interior from overheating so that it can quickly return to a comfortable temperature. The default economy cooling temperature is 25 °C.

Ventilation function settings:

Ventilation switches on when relative humidity is reached: The thermostat simply switches on the enrolled appliance when the set humidity threshold is reached, by default 50%. The threshold value can be set in the range from 0% (ventilation is switched on permanently) to 100% (ventilation is not switched on at all). The function is permanently active, regardless of the current thermostat settings. The function is suitable, for example, for automatic switching of the fan in the bathroom, etc.

Humidity hysteresis: Determines by how many percent the humidity must drop after the ventilation is switched on in order for the ventilation to switch off again. The default hysteresis is 5% (when the humidity reaches 50%, the thermostat switches on the ventilation and switches it off when the humidity drops to 45%).

Setting the CO_2 threshold value for switching on ventilation – Ventilation switches on when the set CO_2 threshold level is reached in the room. The individual CO_2 concentration levels are described in Table 1. The default setting is level 3 (1200 ppm).

CO_2 hysteresis – Determines the value by which the measured CO_2 value must drop after ventilation is activated in order for ventilation to be deactivated again. The default hysteresis value is set to 500 ppm.

Calendar settings:

In the calendar, it is possible to set multiple comfort periods for each day during which the thermostat maintains the set comfort temperature. At the beginning of the comfort period, the thermostat starts heating to the desired temperature. Achieving this temperature depends on the thermal inertia of the space and the output of the heating system, so the start of the comfort period must be set well in advance to ensure that the desired temperature is reached in the required time. Calendar settings are made separately for the heating and cooling functions.

Thermostat operation

All controls are performed only in the MyJABLOTRON application in the thermostats and thermometers tab.

Seasonal function: If both functions are enabled in the installation settings, the thermostat allows you to switch between the heating and cooling functions. Switching is done manually in the application when transitioning between seasons; simultaneous operation of both modes is not possible. ***Warning:*** *When the thermostat is switched to cooling, heating is completely deactivated, even if the temperature drops below the off mode setting. We recommend leaving the error event notification active at critically low temperatures (installation settings) so that the user is notified in time if they forget to activate* the heating function.

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Thermostat operating modes:

– **Calendar** – the thermostat automatically switches between comfort and economy temperatures according to the schedule set in the calendar. This mode is most suitable for economical operation of the heating system in the building. Outside of peak times, the thermostat heats to a lower temperature, thereby reducing the building's operating costs.

If automatic switching to economy temperature is active, the thermostat shortens any ongoing comfort period when the section is secured and switches to economy temperature immediately upon securing. The next comfort period starts according to the calendar settings, even if the section is secured.

In calendar mode, the current desired temperature can be changed manually in the application in case of sudden user need. The thermostat then maintains the newly set temperature until the next change in the calendar (transition from economy temperature to comfort temperature or vice versa). The temperature is then set again according to the calendar schedule.

Calendar mode is available for both heating and cooling, with individual settings for each function.

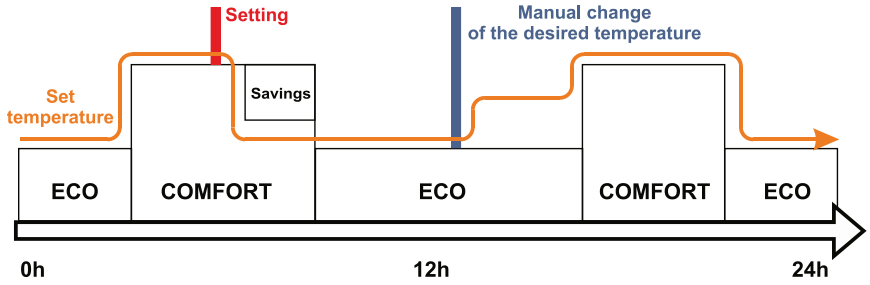


***Fig. 5**: Temperature development during individual actions in the system*

– **Manual temperature** – the thermostat maintains a constant temperature set by the user. The desired temperature can only be changed in the app. The system security does not affect the behaviour of the thermostat in this mode. Manual mode is available for both cooling and heating.
– **Off** – When the heating function is active, the thermostat maintains a constant temperature set for the off mode. When cooling, the thermostat does not maintain any temperature when switched off. The off mode is activated automatically if the relevant PG for heating or cooling is blocked by the system.

Display of current values: The thermostat reports the current measured temperature and humidity values to the application at 5-minute intervals. MyJABLOTRON displays the last known values. The application creates a graph from the room temperature values, allowing you to monitor the temperature history.

Optical indication

The product is equipped with an LED indicator in the upper part of the product. The intensity of the light is automatically controlled according to the ambient lighting. The LED only lights up when the capacitive button is pressed.

LED indication	Indicated function
Green light	Idle state – heated/cooled to the desired temperature
Red light	Active state – thermostat is currently heating or cooling
Red flashing	Heating/cooling is blocked
Yellow light	Thermostat malfunction (communication error with the control unit, external sensor error, internal error)
Yellow flashing	Thermostat not programmed into the system

Technical parameters

Temperature measuring range with external sensor ..... *-40 to +125 °C (± 0.2 °C)*
Operating temperature range ..... *-10 to +40 °C*
Humidity measurement range ..... *0 to 100 % RH (±1.8)*
CO_2 measurement range ..... *400–5,000 ppm*
CO_2 measurement accuracy ..... *400–1,000 ppm: ±50.0 ppm ±2.5 % m.v.*
1,001–2,000 ppm: ±50.0 ppm ±3.0 %w.b.
2,001–5,000 ppm: ±40.0 ppm ±5.0 %w.b.
CO_2 measurement resolution ..... *1 ppm*
**Temperature controller class* ..... *I. (according to Regulation (EU) No. 813/2013)*
**Contribution of regulators to seasonal efficiency* ..... *ηS = 1 % (according to Regulation (EU) No 813/2013)*
**for both parameters in configuration with control unit*
Power ..... *from the JA-100+ control panel bus 12 V DC (8–15 V)*
from the Futura unit bus 24 V DC (18–30 V)
Quiscent current consumption ..... *5.2 mA*
Maximum current consumption ..... *22 mA*
IP resistance ..... *IP 31*
Dimensions ..... *82 x 82 x 22 mm*
Weight ..... *82.9 g*
Operating humidity ..... *75 % RH (non-condensation)*
Environment ..... *Indoor general*
Also complies with ..... *EN 50130-4, EN 55032, EN IEC 63000*
Recommended screws ..... *2x ø 3.5 mm (half-round head)*

JABLOTRON a.s. declares that the JB-112TH, JB-112TH-AN products are designed and manufactured in accordance with the harmonised legislation of the European Union: Directives No.: 2014/30/EU, 2009/125/EC, 2011/65/EU, when used as intended. The original declaration of conformity is available at www.jablotron.com in the Downloads section.

Note: Although the product does not contain any harmful materials, do not dispose of it in the rubbish, but take it to an electronic waste collection point. For more detailed information, visit www.jablotron.com in the Downloads section.