FENIKS PRO d.o.o.
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FENIKS PRO consulting, design, engineering and implementation of automation in buildings and industry d.o.o.

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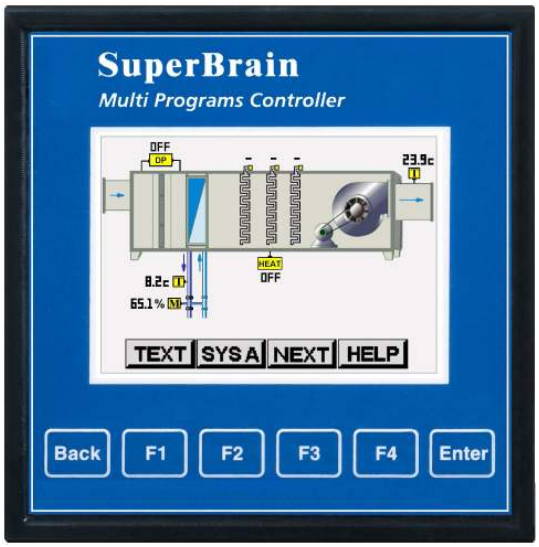
Technical guide



SuperBrain BOX

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Properties

SB-BOX is a free-programmable controller (Direct Digital Controller-DDC) with ready to use applications for HVAC applications (heating, ventilation, air conditioning). Free-programmability gives a good basis for the scalability and flexibility of applications to user's needs. SB-BOX can be used also for other applications e.g. control of lighting, blinds, energy monitoring. control of devices.

With built-in RS485 communication interface (heat pumps, frequency converters, air-conditioning, electric meters, etc.). Special version, also allows the connection of up to 8 M-BUS devices (calorimeters, water meters, electricity meters, etc.).

SB-BOX is a controller built into the casing, adapted for mounting on the wall and prepared for direct connection of all the staples of the peripheral components (pumps, actuators, sensors). Allows for easy installation, and commissioning of the system. pins out

The user has the option of simple control and management with the help of modern color graphic display and embedded keys. SB-BOX via a built-in web server and connecting to the internet network allows you to manage from anywhere via smart phones, tablets, PCs, smart TVs.

Technical data

CONNECTION	
Power (current)	Max 1380VA (6A)
Voltage	230VAC +-10%
Frequency	50Hz
Protection	Inbuilt automatic fuse (C6A)
WORKING CONDITIONS	
Temperature	-20°C do +50°C
Humidity	0-90% RH
DIMENSIONS	
Dimensions	213x185x84mm
Weight	1450g
USER INTERFACE	Color 320x200 points - up to 9 graphical views
PROGAM CLOCK	8-channel weekly
INPUTS/OUTPUTS	
Digital inputs D1…D4	**4x** dry contacts
Universal inputs U1…U8	**8x** 0..10V DC, Ni1000, Pt1000, dry contacts
Digital outputs M1…M4	**4x230V** max 3A (per output)
Digital outputs S1, S2	**2xbreznapetsni** max 4A (per output)
Digital outputs P1…P4	**4(2)x230V** max 1A (per output)
Analog outputs A1…A4	**2(4)x** 0..10V DC
CONNECTIBILITY	
Ethernet RJ45	ModBus, BacNet and WEB over TCP/IP
RS485 (+), (-)	ModBus RTU or BacNet/MSTP over RS485
Power supply for active sensors	
24V (+), (-) (or optional M-BUS interface)	24V DC max 0,3A (or up to 8 M-BUS devices)

Inputs/Outputs

Digital inputs »D«

SB-BOX has 4 digital inputs with tags D1, D2, D3 and D4. If necessary a large number of digital inputs can be used as a universal inputs labeled U1 to the U8. Inputs can be used only as a no-voltage (dry contacts) which means that it is not allowed to connect directly to the 230V or 24V (in this case relays should be used).

Universal inputs »U«

The Regulator has 8 universal inputs of U1, U2, U3, U4, U5, U6, U7 and U8. Universal inputs enable connection of sensors such as: Ni1000, Pt1000 and 0 ... 10VDC. Ports can also be used as a no-voltage (dry contacts) digital inputs.

Digital outputs »M«

The Regulator has 4 digital outputs with M1, M2, M3 and M4. The exits are provided for, in particular, for direct connection of pumps and motors 230V. Each output to the max 3A. They can be used also for electric consumers the major powers and flows, in this case they must add more powerful contactors, actuators will output controller.

Digital outputs »S«

The Regulator has two digital outputs with the codes S1 and S2 (dry contacts). The output intended for low-power users (up to Max. 4A). You can apply for the switching on/off: boilers, heat pumps, cooling aggregates, frequency converters, engines, with a maximum current of 4A for each output.

Digital outputs »P«

The Regulator has 4 (2) of the digital outputs with P1, P2, P3 and P4. Outputs are used for a variety of three-point drives (3p) valves, blinds, (mechanical blockage between the signal to open/close). In this case, the use of exit = exit x opening, PxO PxZ = exit x closing (x = 1 .. 4) and N = neutral (zero). Can also be used on other elements. Maximum output is 1A for each output separately.

Note: the Outputs are provided for the use of 230V AC drives. In the case of use for other purposes, it is necessary to state the fact in order to remove a blockage between the signal to open/close and each output can be used separately). * P3, P4 cannot be used when you use exit A3 or A4 (if we want to use the exit of the A4, it is necessary to specify when ordering).

Analog outputs »A«

The Regulator has 2 (4) analogue outputs (0-10V) with the A1, A2, A3 and A4. Outputs can be used for example: for controlling valves, blinds, frequency converters, heat pumps with an input for modulating the power ...

*Outputs A3 or A4 can be used only when the outputs P3 and P4 are not used (specify when ordering).

RS485

RS485 connector used for Modbus RTU or Bacnet MS/TP to communicate with other devices or to connect to the control system (BMS, SCADA). A possible mode of operation is the master or slave.

Ethernet RJ45

SB-BOX has a built-in web server for remote control of the operation of the device. You can also use the MODBUS and BacNet the TCP/IP protocol to connect to the control systems and programs.

Power supply 24V DC

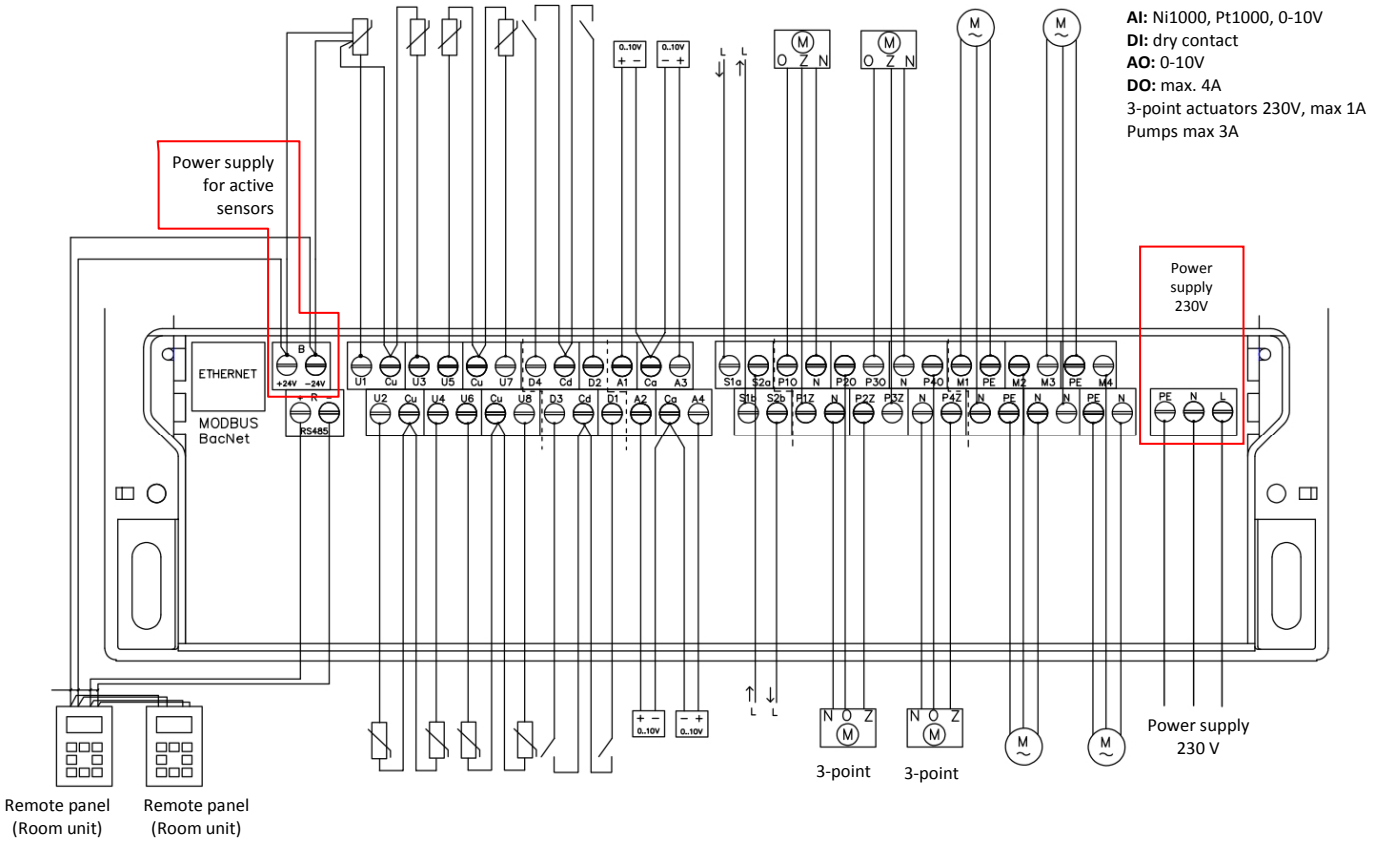
For connecting external active sensors (e.g., pressure, temperature, 0-10V) on the controller supply voltage 24V DC is available up to a maximum load of 0, 3A.

Note: Optionally instead of 24V DC power supply we can deliver SB-BOX with built-in M-BUS interface for the connection of up to 8 M-BUS devices.

Connection terminals

Electrical connection diagram

The image below shows how to connect the elements (e.g. pumps, sensors, switches, ...) on the connection terminal. For each application only needed elements are connected.



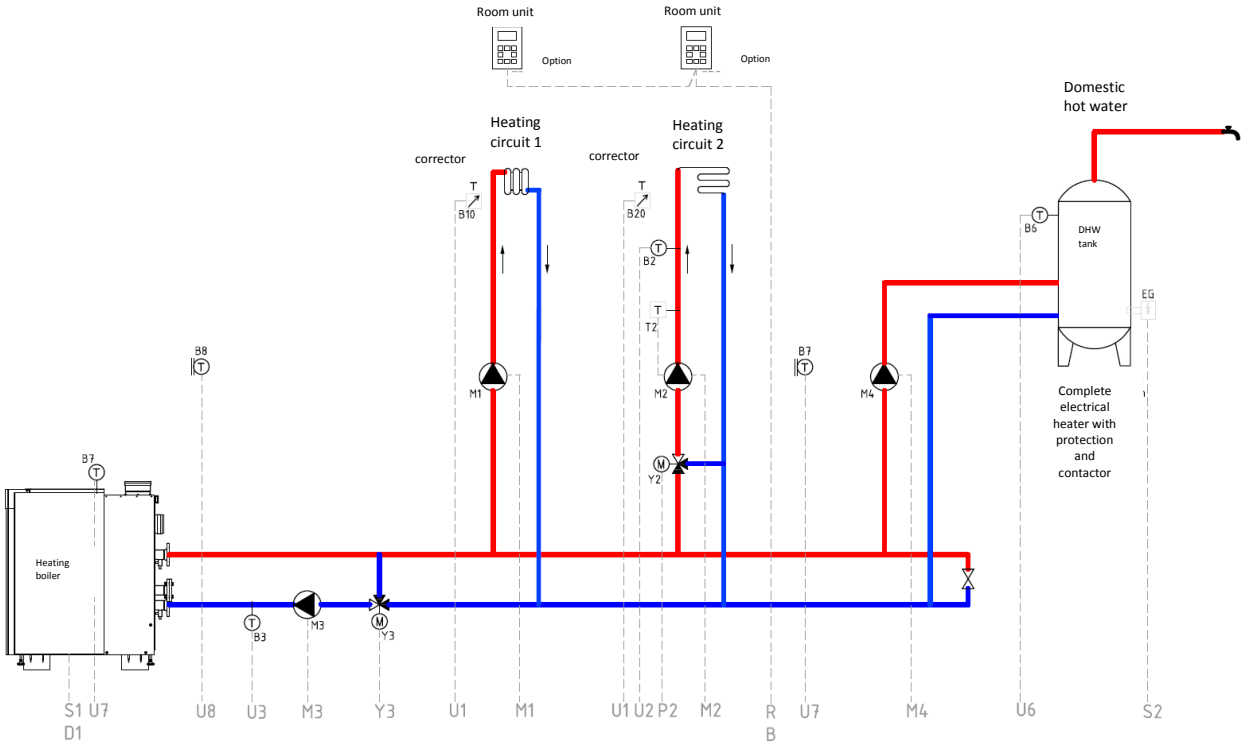
C1L - phase
C1N - zero (neutral)
C1Z - protective conductor (PE)
P1O - opening
P1Z - closing
N - zero (neutral)

Applications

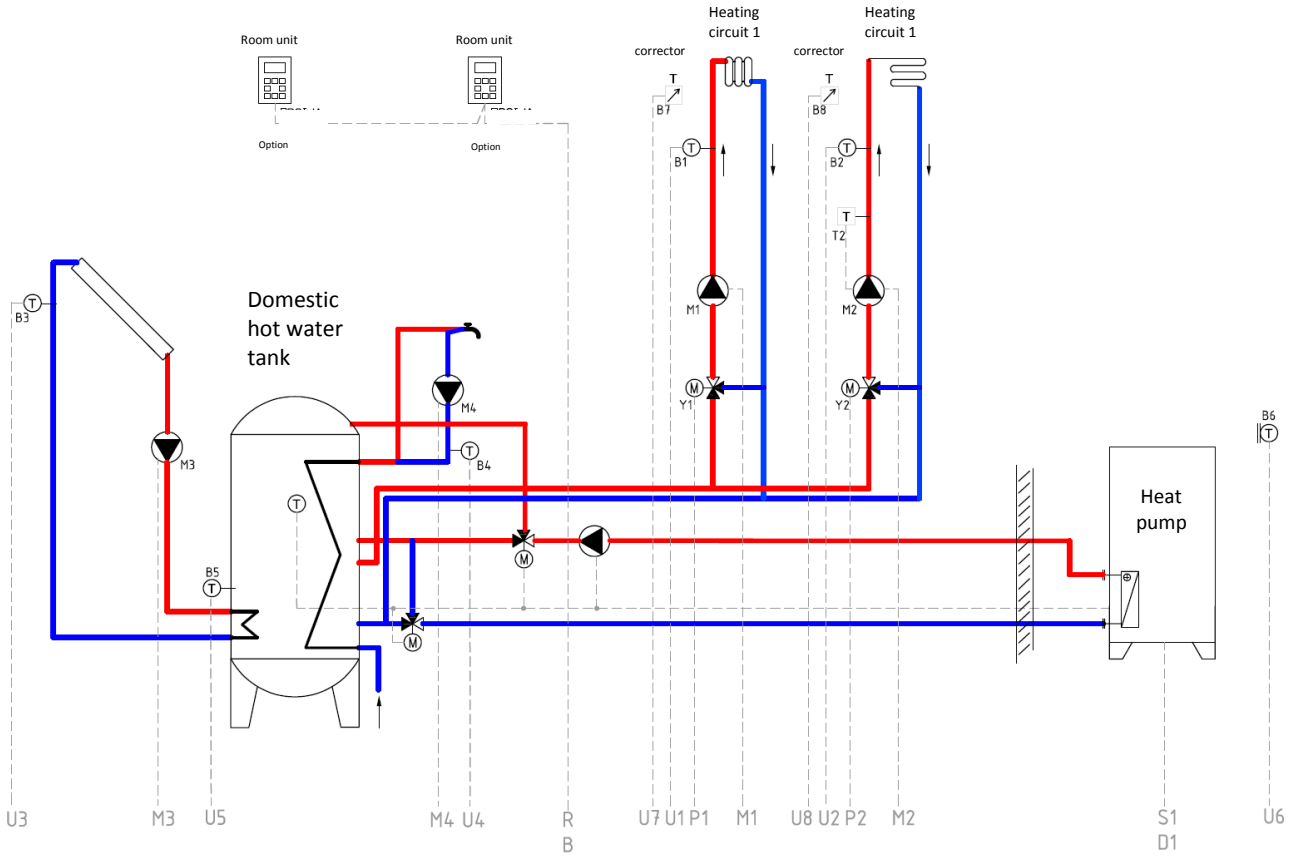
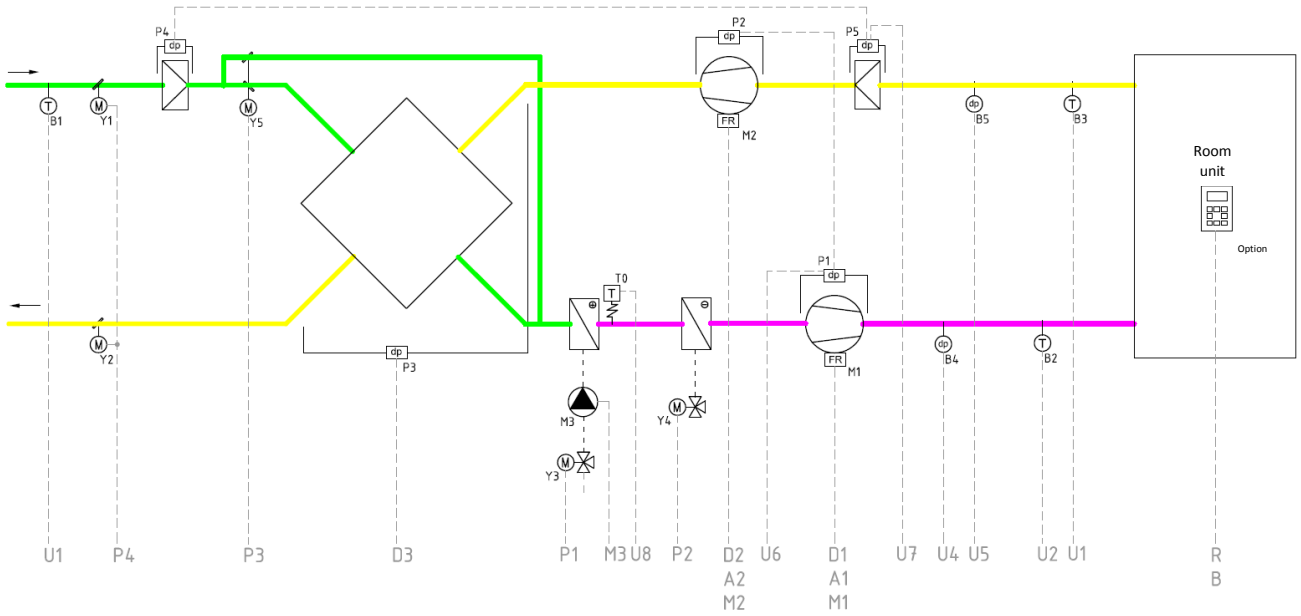
The images below show the possibility of using (connections) of the controller. In the preparation of several applications, each application can be customized for the end user.

Note: the various applications can vary, so it is impossible to cover all the possible variants of the applications. Prior the SuperBrain is and free programmable controller, the images of applications are used only as examples.

Example: Heating plant 1



Example: Heating plant 2



Example: Air handling unit (AHU)