Control of MINIB convectors with a single-circuit heat

EB unit EBI-2e

The EBI-2e electronic unit (a part of the convector) is intended to control the direct current (DC) low voltage brushless motors used as drives for heating convector fans with a single-circuit heat exchanger. This is a microprocessor controlled unit on a double-sided printed circuit board (PCB) with dimensions of 57x53 mm and fitted with aluminum casing which also acts as a radiator. EB unit is supplied by safety transformer 230 V AC/12V AC. It is possible to choose between three output versions TT100, TT240 and TT300 (VA). EB unit must not be connected when energized!

EB UNIT EBI-2E WORKS IN TWO MODES

HEATING

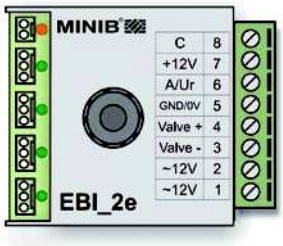
If the thermistor temperature sensor detects that the temperature of the heating water flowing in the heat exchanger is higher than +30 °C and at the same time the condition of a switched-on thermostat or connected control voltage higher than 2 V is fulfilled, the convector fans will start turning. If the temperature of the heating water flowing in the heat exchanger is lower than 30 °C the fans will not start turning even if the thermostat is switched on and the control voltage is higher than 2 V. The speed can be controlled steplessly within the range of the analog control signal A/Ur between 2 and 10 V DC. Subject to fulfillment of these conditions the electrothermic head for controlling the heat exchanger circuit will open.

COOLING

The EB unit will switch to this mode by switching the +12 V DC voltage from terminal 7 to terminal 8 - C (COOL). If the temperature of the cooling water is lower than +18 °C the thermostat is switched on and at the same time the control voltage is higher than 2 V, the fans will start turning. The speed can be controlled steplessly within the range of the analog control signal A/Ur between 2 and 10 V DC. Subject to fulfillment of these conditions the electrothermic head for controlling the heat exchanger circuit will open.

A more detailed description of the control signals is found in section entitled Convector control by means of a superior system (EBI-2e).

- EB unit power supply: AC and DC
- 4x outlet for DC motor
- 1x outlet for valve, short-circuit resistant
- 1x input for thermistor temperature sensor
- 0-10 V DC analog signal control
- Input for distinguishing between heating and cooling mode
- Selection of connected motors and control method
- Jumper setup
- Possible firmware upgrade
- Motor speed detection
- Optical indication of motor speed synchronization
- Optical indication of sufficiently hot/cold water



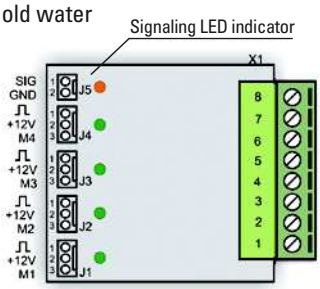
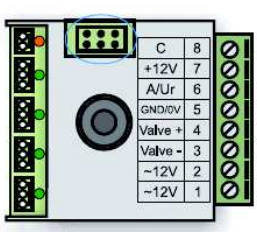
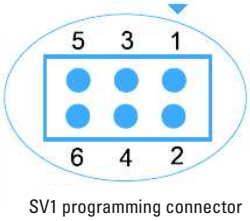


TABLE OF JUMPERS OF THE EB UNIT (EBI-2E AND EBI-2R)





SV1 programming connector

CONNECTION

MOTORS

Connector	Contact	Function
J1-J4	1	Speed signal
	2	+ 12 V
	3	Motor x

TEMPERATURE SENSOR

Connector	Contact	Function
J5	1	Temperature signal
	2	GND

TERMINAL BAR

Bus	Contact	Function
X1	1	12 V ACa
	2	12 V ACb
	3	Valve – (GND)
	4	Valve + (+12 V)
	5	0V/GND
	6	A/Ur (analog input 0–10 V)
	7	+12 V
	8	COOL (input +12 V)

MAXIMUM VALUES

Symbol	Parameter	Value	Unit
Vcc AC	AC supply voltage	15	V
Vcc DC	DC supply voltage	20	V
I out 1-4	Output current for 1 motor	2,5	A
I out 5	Output current for the valve	0,3	A
I max	Sum of output currents	4,5	A
Tj	Operating temperature	0-85	°C
Tstg	Storage temperature	-55 to +105	°C

EB-A CONTROL TYPE

Description	Jumper position	
Voltage output (without speed detection)	-	
Fan 65 mm	1-2	
Fan 50 mm	3-4	
Fan 30 mm	5-6	

EB-B AND EB-C CONTROL TYPES

Description	Jumper position	
Voltage output (without speed detection)	2-4	
Fan 65 mm	1-3	
Fan 50 mm	3-5	
Fan 30 mm	4-6	

EB unit EBI-2r

Control of MINIB convectors with a two-circuit heat exchanger (4P)

Unlike EBI-2e, the EBI-2r electronic unit (a part of the convector) offers the option to connect two electrothermic heads and two temperature sensors for each circuit of the heat exchanger separately. These properties are used in 4P convectors which are equipped with a heat exchanger with two independent circuits (heating/cooling). EB unit is supplied by safety transformer 230 V AC/12 V AC. It is possible to choose between three output versions TT100, TT240 and TT300 (VA). EB unit must not be connected when energized!

EB UNIT EBI-2R WORKS IN TWO MODES

HEATING

If the thermistor temperature sensor detects that the temperature of the heating water flowing in the heat exchanger is higher than +30 °C and at the same time the condition of a switched-on thermostat or connected control voltage higher than 2 V is fulfilled, the convector fans will start turning. If the temperature of the heating water flowing in the heat exchanger is lower than 30 °C the fans will not start turning even if the thermostat is switched on and the control voltage is higher than 2 V. The speed can be controlled steplessly within the range of the analog control signal A/Ur between 2 and 10 V DC. Subject to fulfillment of these conditions the electrothermic head for controlling the heating circuit will open and the head for controlling the cooling circuit will remain closed.

COOLING

The EB unit will switch to this mode by switching the +12 V DC voltage from terminal 7 to terminal 8 - C (COOL). If the temperature of the cooling water is lower than +18 °C the thermostat is switched on and at the same time the control voltage is higher than 2 V, the fans will start turning. The speed can be controlled steplessly within the range of the analog control signal A/Ur between 2 and 10 V DC. Subject to fulfillment of these conditions the electrothermic head for controlling the cooling circuit will open and the head for controlling the heating circuit will remain closed.

A more detailed description of the control signals is found in section entitled Convector control by means of a superior system (EBI-2r).

- EB unit power supply: AC and DC
- 3x outlet for DC motor
- 2x outlet for valve, short-circuit resistant
- 2x input for thermistor temperature sensor
- 0–10 V DC analog signal control
- Input for distinguishing between heating and cooling mode
- Selection of connected motors and control method
- Jumper setup
- Possible firmware upgrade
- Motor speed detection
- Optical indication of motor speed synchronization
- Optical indication of sufficiently hot/cold watery

CONNECTION

MOTORS

Connector	Contact	Function
J1-J3	1	Speed signal
	2	+12 V
	3	Motor x

COOL TEMPERATURE SENSOR + COOL HEAD

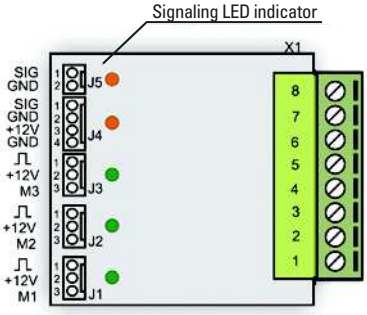
Connector	Contact	Function
J4	1	Cool temperature signal
	2	GND
	3	Valve – (GND) Cool
	4	Valve + (+12 V) Cool

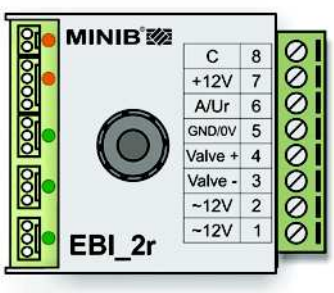
HEAT TEMPERATURE SENSOR

Connector	Contact	Function
J5	1	Heat temperature signal
	2	GND

TERMINAL BAR

Bus	Contact	Function
X1	1	12 V ACa
	2	12 V ACb
	3	Ventil – (GND) Heat
	4	Ventil + (+12 V) Heat
	5	0V/GND
	6	A/Ur (analog input 0–10 V)
	7	+12 V
	8	COOL (input +12 V)





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