

INSTALLATION AND OPERATING INSTRUCTIONS

Heating/Cooling control unit FBC-HC

⚠ IMPORTANT!

It is strongly recommended that both the installer and end user should carefully read and understand the installation and operation manual, prior to commencing installation.

The control units FBC-HC must only be mounted, operated and maintained by a qualified fitter; failure to comply with this condition could render the manufacturer's warranty obsolete.

The manufacturer shall not be responsible for any incompetent use of the FBC-HC and appropriate observance of all instructions in the above manual is considered mandatory. "For reasons of safety" modifications to the unit are not permitted and repairs, if necessary, must only be carried out with approval by the manufacturer.

The temperature range and the contents of the set depend on the model and equipment.



Fig.1

Subject to technical modification.

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1. INTENDED USE

- The hydraulic control unit FBC-HC is used for variable flow temperature control of the supply temperature in floor and panel heating/cooling systems. The required flow temperature is controlled in conjunction with the outside temperature according to a selectable curve. The inclination of this heating/cooling curve can be selected due to the local climatic conditions.
- With the heating-cooling controller CC-HC the system can either be operated solely in heating mode, cooling mode or in combined mode of heating and cooling. The heating / cooling commutation can be done manually or via an external switching signal (e.g. from a reversible heat pump, etc.).
- With the controller CC-HC the operation of water surface heating / cooling system can be adjusted to the individual needs of the installation. Particularly suitable for the regulation of single-family homes or different units in apartment buildings with individual user behaviour. The controller has a 7-day programming with 9 factory-set integrated standard programs as well as 4 programs which can be set as required by the user.
- A room temperature controller can optionally be connected to the CC-HC climate controller. Suitable cable based or radio-controlled programmable room thermostats are available as accessories. These enable heating/cooling system operation to be optimised based on the usage pattern of a reference room.
- The FBC-HC have been designed for use in dry environments, e.g. in residential rooms, office spaces and industrial facilities. Usually it is installed in the central heating room.
- Verify that the installation complies with existing regulations before operation to ensure proper use of the installation.
- If the control unit FBC-HC is used in systems with cooling function, then it might be associated with a suitable and properly affixed insulation to prevent condensation on the control unit or pipes.
- The included heat insulation box may be used only for heating purposes. Local regulations regarding heat / cold insulation must be considered and also to be observed.

2. REFERENCES, SYMBOLS AND ABBREVIATIONS

For better understanding in this document references are used in the form of symbols and abbreviations, which are described below.

➔	Reference to further documents	FBH	Floor heating	RT	Room thermostat
ⓘ	Important information and application hints	FH/K	Radiant heating / cooling	TB	Temperature limiter
⚠	Safety information or important information about functions	KE	Chiller	UWP	Circulation pump
		MuB	Installation and operating instruction	WDS	Heat insulation box
				WE	Boiler / heat generator

3. SAFETY INSTRUCTIONS



WARNING: Always disconnect the power supply prior to performing any installation or connection operations!

All installation and wiring work at the unit must be carried out only in a safe (idle) condition.

The appliance may be connected and operated by qualified personnel only. Make sure to adhere to valid local safety regulations.

- ⚠ The control units are neither splash- nor drip-proof. Therefore, they must be mounted in a dry place.
- ⚠ Do not interchange the connections of the sensors and the 230V connections under any circumstances! Interchanging these connections may result in life endangering **electrical hazards** or the destruction of the appliance and the connected sensors and other appliances.

4. DESIGN

- 1: Ball valve (supply)
 - with gravity flow stop
 - supply sensor connection
 - red ball valve handle, L=92
 - thermometer 0 – 120 °C
- 2: circulation pump
- 3: valve drive
- 4: 3-way mixing valve
- 5: CC-HC
- 6: return pipe
- 7: Ball valve (return)
 - supply sensor connection
 - blue ball valve handle, L=92
 - thermometer 0 – 120 °C
- 8: brackets with screws and dowels
- 9: heat insulation box (two-parts)

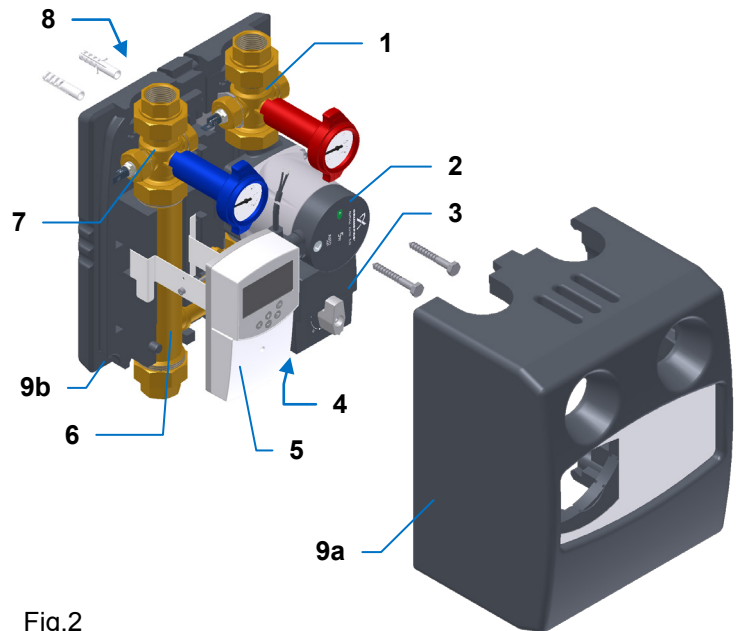


Fig.2

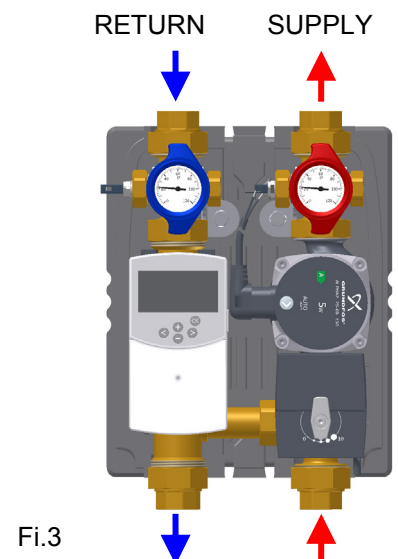
5. INSTALLATION AND ELECTRICAL CONNECTION

5.1. MOUNTING AND HYDRAULIC CONNECTIONS

The FBC-HC can be installed directly on a dry, sufficiently firm background (wall). Remove the front part of the heat insulation box (Fig.2_10). Using screws and dowels fit the back-part of the WDS (Fig.2_9) together with the brackets to the wall.

Please pay attention not to damage or brake the cables of the control, pump, valve drive or temperature limiter while assembling. The cables must be installed without tension. The cables will be fixed by means of the device for strain relief at the heating controller.

The hydraulic connections are to be made as shown in Fig.3.



Fi.3

5.2. ELECTRICAL CONNECTION

All electrical connections must be performed by an authorised specialist in accordance with the local regulations governing electrical installation work. The electrical cables must not come into contact with any hot components.

Usually cables for power supply, circulation pump, valve drive and flow temperature sensors are wired ex-works. Just the outside temperature sensor as well as an optional temperature limiter and room thermostat has to be connected on site (fig. 4).

Remove the cable jumper if an additional wired room thermostat is connected (fig. 4).

- ➔ If the heating controller possesses RF thermostat interface please refer to the MuB both of the RF thermostat and heating control.
- ➔ Further information about electrical connections exists in the MuB of the heating control.

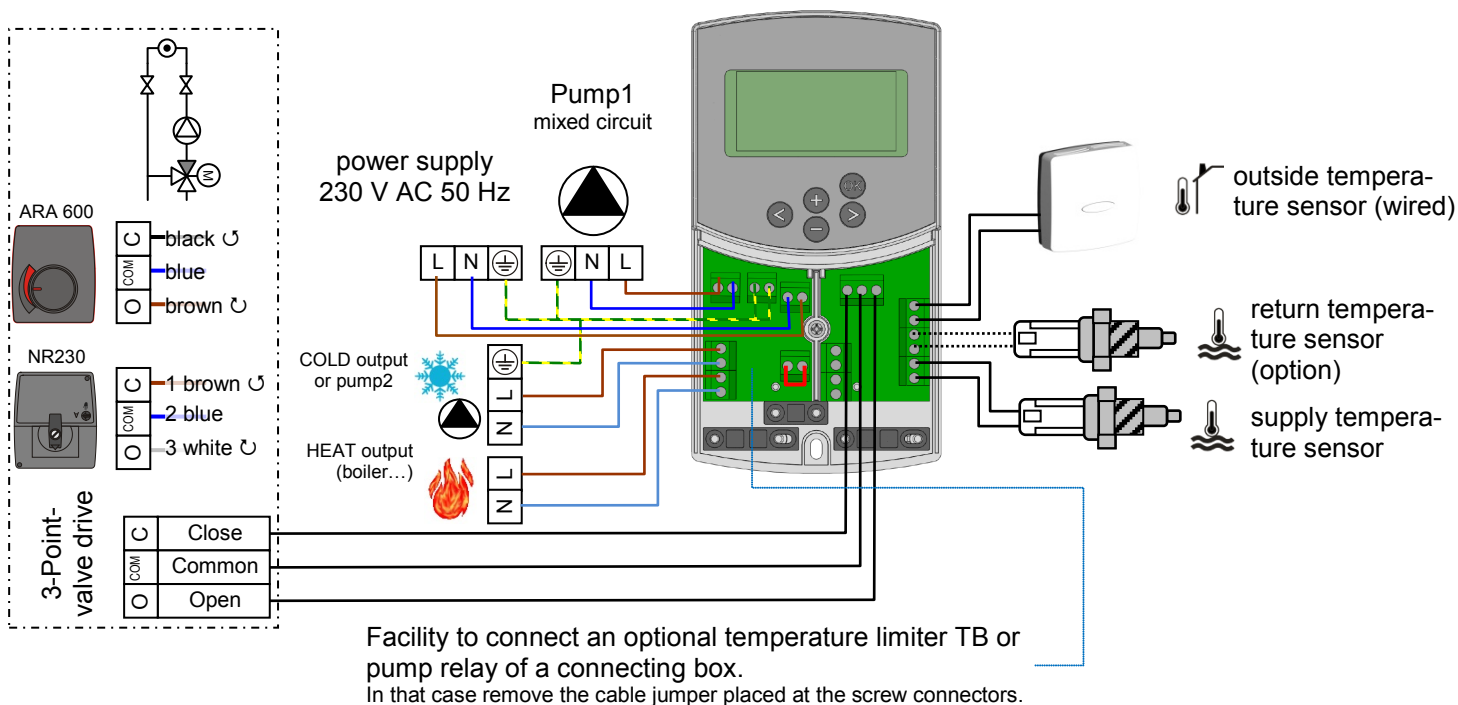


Fig.4

6. TECHNICAL DATA

Fittings and circulation pump

Max. ambient temperature:	0...+50 °C ¹⁾
Max. fluid operating temperature:	0...+90 °C ¹⁾
Max. operating pressure:	6 bar
Power supply:	230 VAC
Power consumption pump :	¹⁾
1) Please refer also to technical leaflets of the pump	

Control	CC-HC
Power supply:	230 VAC ±10 %, 50 Hz
Max. operating temperature:	0...+50 °C
Temperature precision:	0,1 °C
Regulation characteristics:	Non linear PID Intelligent 3-point valve drive (finds the operating point)
Degree of protection:	IP 30
Protection class:	II
Output pump:	Relay 250 V, 5 A
Output valve drive (3-point):	2 Triacs 230 V, 2 A
Outside temperature sensor:	CTN 10 KΩ at 25 °C (class II – IP 55)
Water (flow) temperature sensor:	CTN 10 KΩ at 25 °C (class I – IP 68; except for connector)
Software version:	Displayed when control is turned OFF. Cr_..

Valve drive	NR230-00	ARA 661
Power supply:	230 VAC \pm 15 %, 50/60 Hz	230 VAC, 50 Hz
Power consumption:	2,5 VA	5 VA
Degree of protection:	n/a	IP 41
Protection class:	II	II
Connection:	Wires, 3 \times 0,75 mm ²	Wires, 3 \times 0,75 mm ²
Angle of rotation:	90° electrically limited	90°
Torque:	5 Nm	6 Nm
Running time:	140 s (50 Hz)	120 s / 90°
Direction of rotation:	selectable on terminals	
Manual operation:	mechanical disengagement	
Indication of position:	yes, reversible scale	
Ambient temperature:	0...+50 °C	-5...+55 °C
EMC:	CE accord. 89/336/EWG	EMC 86/336/EEC
Low voltage directive:	CE accord. 73/23/EWG	LVD 2006/95/EC
Maintenance:	maintenance free	n/a

7. MATERIALS

Valves / fittings:	Brass Ms 58
Pipes:	Precision steel pipe, coated
Plastic:	Impact- and temperature resistant
Gaskets:	EPDM-Elastomers or AFM 34
O-Rings:	EPDM

8. TROUBLE SHOOTING

X.	PROBLEM	
X.X	Possible cause	Solution
1.	HEATING CIRCUIT IS NOT GETTING WARM	
1.1	The optional temperature limiter (TB) has switched off the pump (UWP). <u>Cause:</u> TB is set to a very low value.	Set the TB by approximately 10 K higher than the required flow temperature. ⚠ Take into consideration the max. admissible flow temperature! ⚠ Differential gap of the TB: approx. 5 - 10 K. 🔧 The control unit may be ready for operation sooner if the TB is removed for a short time to allow it to cool down more quickly to reach the switching temperature.
1.2	The temperature of the boiler's supply water is lower than the required flow temperature of the UFH.	Set the boiler's supply water temperature to a higher value.
2.	THE SUPPLY WATER TEMPERATURE CANNOT BE SET TO THE REQUIRED VALUE OR IT FLUCTUATES WITHIN A VERY WIDE RANGE	
2.1	The control unit's SUPPLY and RETURN are not correctly connected.	Check all inlets and outlets of the control unit for correct connection. Please take into account Fig. 3.
2.2	The circulating pump's pressure head/pump stage is set at a very low value.	Increase the rotation frequency, the pump's pressure head/pump stage, respectively.
2.3	The heating load is too big for the control unit used, i.e., the heat consumption exceeds the rated power of the control unit. This state may set in temporarily, e.g., in case of heating a "cold" floor for the first time.	Check the maximum heat consumption and compare it with the rated power. If necessary, distribute the heating circuits to a second control unit / heating circuit. If the cause is in the initial heating up of a given floor heating system, the function may be normalized after the heating up phase. This is possible when the heating load is at maximum and will then take longer to achieve the required temperature.