

INSTALLATION AND OPERATING INSTRUCTIONS

FRG 3005 single zone control unit

IMPORTANT!

Before starting work the fitter must carefully read this installation and operation manual, understand and observe its conditions.

The single zone control unit may be mounted, operated and maintained only by specially trained personnel. Personnel undergoing training may only work on the product under the supervision of an experienced fitter. Only when the above conditions are fulfilled, the manufacture is responsible for the equipment as provided in the statutory regulations.

All instructions in this assembly and operation manual must be observed when working with the single zone control unit. Any other application is not in compliance with the regulations. The manufacturer shall not be responsible for incompetent use of the single zone control unit. Reconfigurations and changes are not acceptable for reasons of safety. The single zone control unit may be repaired only by services approved by the manufacturer.

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

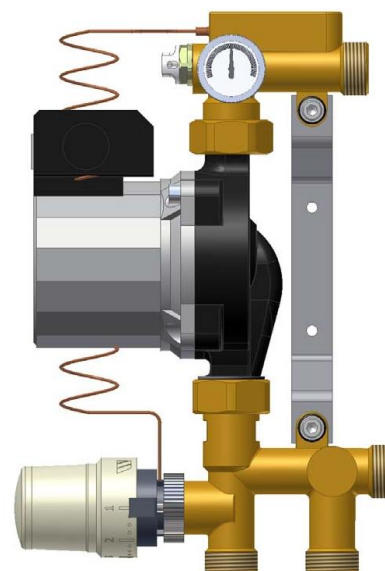


fig. 1

Subject to technical modification.

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1. APPLICATION

- The single zone control unit FRG 3005 is developed for maintaining constant flow temperature in low-temperature heating systems. The flow temperature may be adjusted gradually between 20 and 70 °C, by means of thermostat. The limitation of the adjustment range is possible according to the maximum/minimum temperature.
- The single zone control unit is used in heating installations where the heat emission is conducted on one side by consumers with high flow temperature (e.g. radiators, air heaters, etc.), and on the other side – by heating areas with lower temperature (e.g. wall or floor heating). Because of its compactness it is very suitable for equipping small heating areas as bathrooms, building extensions or other small premises (e.g. conservatories).
- The control unit has been designed for use in dry environments, e.g. in residential rooms, office spaces, and industrial facilities. Usually the unit is installed in the central heating room or in a manifold cabinet.
- Verify that the installation complies with existing regulations before operation to ensure proper use of the installation.

2. DETAILS, 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 resuming documents
- 📌 Important information and application hints
- ⚠ Safety instructions or important not to the function

AG	male thread	MuB	installation leaflet	UFH	underfloor heating
EUKO	Euro cone	RT	room thermostat	UWP	circulation pump
FRG	floor heating control unit	RV	check valve	ZV	zone valve

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 an idle condition. The appliance may be connected and put to operation by qualified personnel only. Make sure to adhere to valid safety regulations, in particular to VDE 0100 (German standard governing power installations with nominal voltages ≤ 1000 VAC).

⚠ The control units are neither splash- nor drip-proof. Therefore, they must be mounted in a dry place.

4. ASSEMBLY

- 1: Floor heating supply (3/4" AG EUKO)
- 2: Floor heating return (3/4" AG EUKO)
- 3: Boiler supply (3/4" AG EUKO)
- 4: Boiler return (3/4" AG EUKO)
- 5: Circulation pump
- 6: Thermostatic head
 - a) supply temperature remote sensor
- 7: Injection/mixing valve
- 8: Check valve (RV); 2x
- 9: Supply temperature thermometer
- 10: Wall holder
- 11: Screw M6; 2x

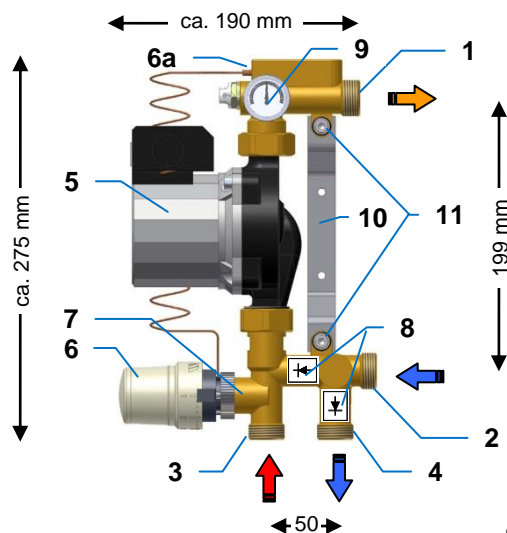


fig.2

5. INSTALLATION AND ELECTRICAL CONNECTION

5.1. HYDRAULIC CONNECTIONS (ASSEMBLY)

The hydraulic connections are to be made according to fig.2. The assembly to a double-pipe heating system is possible without accessories (fig.3.1). In comparison, if it should be used in a single-pipe installation, an additional by-pass (fig.3.2) must be assembled before the unit. A ready by-pass unit may be supplied as accessory.

The single zone control unit is supplied ex-works for left hand side assembly to low-temperature heating circuit. By unwinding the two assembly screws M6 the wall holder may be moved to the other side, thus receiving a right hand side assembly (connection) of the unit. Then re-position the thermometer from the back to the front.

Depending on the amount of space for installation it may be necessary to turn the pump on the fittings axis. For that purpose you must first unscrew the connecting nuts of the pump, to make possible turning the pump into the required position. After that tighten the nuts again, while holding both the pump and the (elbow) fitting.

Please pay attention not to damage or break the cables of the pump and temperature limiter as well as the capillary pipe of the thermostatic heads remote sensor while assembling. The cables must be installed without tension. The correct installation of supply and return has to be ensured (Fig.2 and 3.1 - 3.2).

Installation plan of radiators and underfloor heating double-pipe system

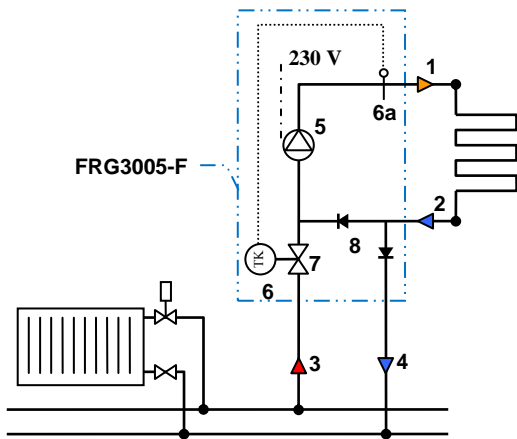


fig.3.1

Installation plan of radiators and underfloor heating single-pipe system

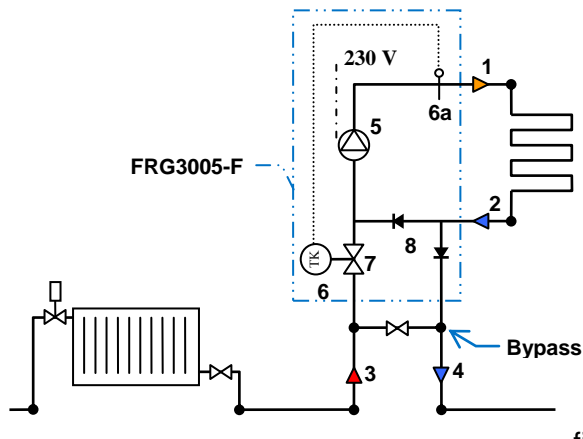


fig.3.2

5.2. ELECTRICAL CONNECTIONS

All electric connections must be done by an authorised specialist in compliance with the local regulations for electric installations. The electric cables must not be in contact with hot parts.

The circulation pump is supplied with cables ex-works (fig.4). The power supply has to be established on site.

In order to make sure that the pump only runs if heat requirement exists, the manufacturer recommends connecting it to a pump relay (e.g. pump logic of an electrical connection box which controls the actuators). Alternatively operate the pump by means of a timer. Another option is to start the pump with a clock-timer.

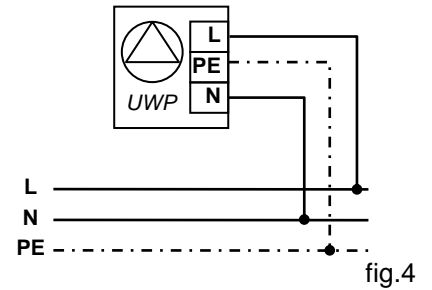


fig.4

5.3. REGULATION IN CONNECTION WITH ROOM THERMOSTAT

When the single zone control unit must be additionally set to a specific temperature (room temperature), the manufacturer recommends the use of zone valve with an electrothermic actuator to the heating circuit supply. The actuator is controlled by the room thermostat (Please refer to fig. 5.1).

As alternative a room thermostat can control the circulation pump (fig. 5.2).

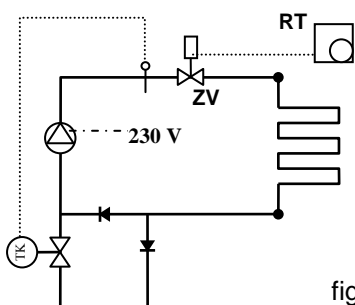


fig.5.1

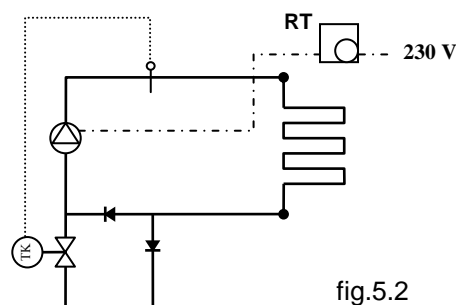


fig.5.2

6. STARTING UP

6.1. PURGING THE SINGLE ZONE CONTROL UNIT AND THE HEATING CIRCUIT

Connect the single zone control unit to the heating system, and then connect the floor heating circuit supply pipe to the unit. Open the shut-off device (should be installed on site) to the heating system and purge the air until the water goes out of the heating circuit return pipe.

Then, connect the heating circuit return pipe to the unit and restore the working pressure in the system.

Switch on the pump of the regulating device (switch position 1) for a short time.

Immediately after that purge the air from the heating circuit and control the working pressure.

6.2. ADJUSTMENT OF THE TEMPERATURE OF THE FLOOR CIRCUIT FLUID

When maximum power is required (rated power) the supply temperature of the boiler must be at least 15 °C higher than the required temperature of the flow temperature in the floor circuit.

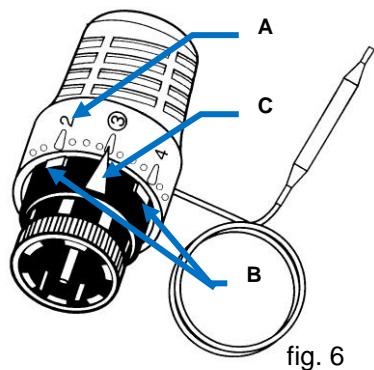


fig. 6

The flow temperature may be adjusted gradually between 20 and 70°C. The regulating hand wheel of the thermostat is supplied with a scale 1-7 (A). Please see the temperatures set on the scale in the table below:

1	2	3	4	5	6	7
20 °C	28 °C	37 °C	45 °C	53 °C	62 °C	70 °C

As a rule, the flow temperature in floor heating systems should not be higher than 50 °C. However, the data of the floor heating system can deviate and should be considered. The flow temperature of the system is often lower than the adjustable maximum value of the thermostat. To avoid damages in the floor structure caused by higher temperature, the flow temperature set value for the thermostat may be defined and limited.

6.3. LIMITATION OF THE FLOOR HEATING FLOW TEMPERATURE

Therefore, it is most important to set the determined value and check it by means of thermometer during operation of the floor heating system. If it is correct, then you can place blocking elements (B) immediately before and after the pointer (C).

When the floor is very sensitive and valuable, it would be wise to control the flow temperature with an additional temperature-limiter, which shall switch off the circulating pump in case of failure.

7. OPERATION OF THE SINGLE ZONE CONTROL UNIT

The injection valve is developed as a proportional regulator and is controlled by a thermostat with capillary tube and sensor for the floor heating circuit supply. Any deviation from the set value causes an immediate change in the opening range of the valve thus proportionally changing the amount of hot water injected from the boiler circuit.

The injected amount of hot water is mixed with the water returned from the heating circuit, thus maintaining the flow temperature value constant within a narrow temperature range.

The respective temperature of the floor heating circuit supply may be read directly on the thermometer.

8. TECHNICAL DATA / MATERIALS

Max. acceptable environmental temperature:	0 - 50 °C
Max. acceptable working temperature:	0 - 80 °C
Maximum acceptable working pressure:	6 bar
Temperature regulation range:	20 - 70 °C
Nominal heating power:	approx. 5 kW
Pump power:	approx. 100 W *
Fittings:	Brass Ms 58
Piping:	Brass Ms 63
O-Rings:	EPDM
Flat gaskets:	AFM 34 or EPDM
Plastic:	Impact-resistant and temperature-resistant

* Please follow the information label on the pump!

9. TROUBLESHOOTING

X.	PROBLEM	
X.X	Possible cause	Solution
1.	THE HEATING CIRCUITS OF THE FLOOR HEATING (FH) ARE NOT HEATED UP	
1.1	The difference between the temperature of the boiler's supply water and the required flow temperature of the UFH is too small for the existing heating load.	Set the boiler's supply water temperature to a higher value. At maximum power consumption in the under-floor heating circuits, the heating boiler's supply water temperature should be at least 15° C higher than the required flow temperature for UFH!
2.	THE SUPPLY WATER TEMPERATURE CANNOT BE SET TO THE REQUIRED VALUE OR IT FLUCTUATES WITHIN A VERY WIDE RANGE	
2.1	The compact control unit's supply (inlet) pipe and return (outlet) pipe are misconnected.	Check all inlets and outlets of the compact control unit for correct connection. Supply inlets and return outlets are marked with stickers. Please take into account fig. 2 and 3.
2.2	The circulating pump's pressure head/pump stage is set at a very high 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 heat output of the compact 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 heat output. If necessary, distribute the heating circuits to a second control unit with a respective manifold. 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 chiefly in an operating mode within the top values of the rated power.
2.4	Thermostatic head is defective	Replacement of thermostatic head.