EN

INSTALLATION AND OPERATING INSTRUCTIONS
FWR25

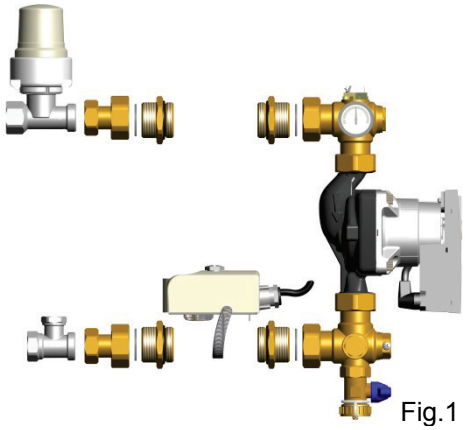


Fig.1

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

The fix-point control unit FWR25 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 legal regulations.

All instructions in this assembly and operation manual must be observed when working with the water floor heating control unit. Any other application is not in compliance with the regulations. The manufacturer shall not be responsible for incompetent use of the fix-point control unit FWR25. Reconstructions and changes are not acceptable for reasons of safety. The fix-point control unit FWR25 may be repaired only by services approved by the manufacturer.

The contents of the set depend on the model and equipment. This manual and enclosed documents of further components are part of the product and must be respected and kept with the product.

Subject to technical modification!

1. RANGE OF APPLICATION

- The fix-point control unit is developed for maintaining constant flow temperature in radiant heating systems. The flow temperature may be adjusted gradually between 20 and 70 °C, by means of the thermostat. The limitation of the adjustment range is possible according to the maximum/minimum temperature. The temperature value can be read from the thermometer of the control unit.
- The fix-point 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).
- The fix-point control unit can be mounted either to the right or left of heating circuit manifolds with 1" male thread and axis distance of 210 mm. For that it is equipped with union nuts G 1". For the use with hollow bar brass manifolds the manufacturer offers special adaptor pieces which may be part of the scope of supply.
- The fix-point 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 note to the function.

AG	male thread
EUKO	male thread with eurocone
FH	radiant heating
FH/K	floor heating and cooling
FK	floor cooling
FRG	floor heating control unit
HK	pump unit
HKM	pump / mixing valve unit
HKV	manifold
IG	female thread
KE	cooling generator
KFE	fill and drain valve
MuB	installation leaflet
RV	check valve
SKB	gravity flow stop
TB	temperature limiter
UM	union nut
UWP	circulation pump
WDS	heating insulation box
WE	boiler / heat generator
WP	heat pump

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. DESIGN

A: Floor heating supply
B: Floor heating return
C: Primary supply (1/2“ IG)
D: Primary return (1/2“ IG)
E: Circulation pump
F: Thermostatic head
G: Thermostatic injection valve
H: Control / lock-shield valve
I: Supply temperature thermometer
J: Temperature limiter (optional)
K: Fill and drain cock
L: Adapter fitting (optional)
M: Tamper-proof cover SE 148 GA (optional)

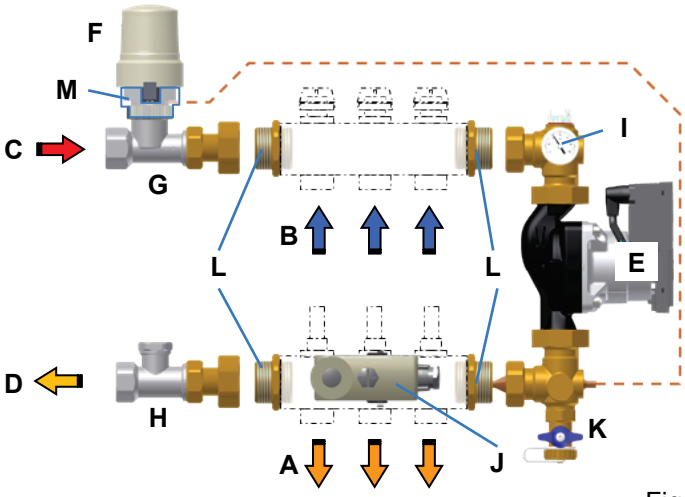


Fig.2

Installation diagram radiator and floor heating
Common ascending pipe
Manifold supply branch on top

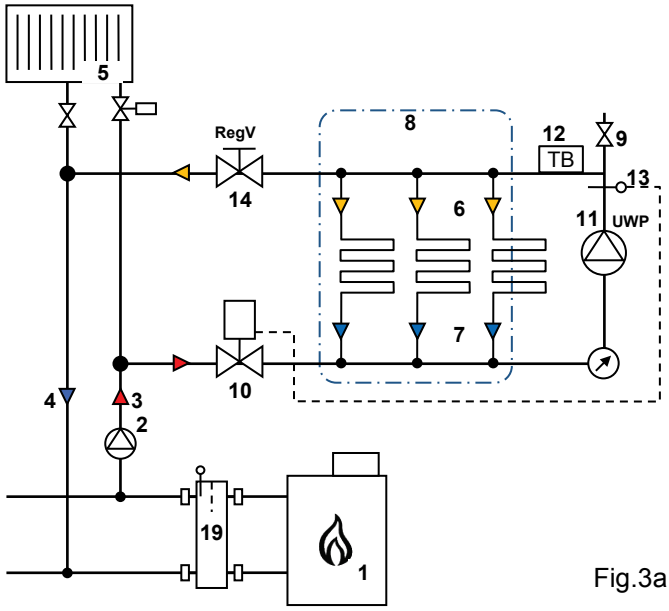


Fig.3a

Installation diagram radiator and floor heating
Common ascending pipe
Manifold return branch on top

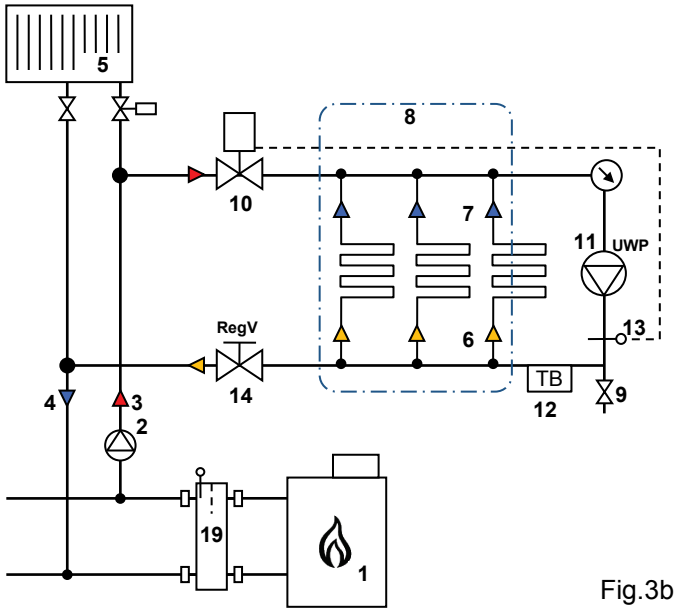


Fig.3b

1	Boiler
2	Circulation pump boiler / radiator circuit
3	Boiler / Radiator supply
4	Boiler / radiator return
5	Radiator
6	FH supply
7	FH return
8	Manifold (HKV)
9	Fill and drain cocks (KFE)
10	2-way injection valve with thermostatic head
11	Circulation pump for FH
12	Temperature limiter (option)
13	Remote sensor of thermostatic head
14	Control / lock-shield valve
19	Hydraulic switch

5. INSTALLATION AND ELECTRICAL CONNECTION

5.1. MOUNTING OF THE CONTROL UNIT

The unit is dedicated for flat sealing connecting to a manifold with 1” female thread or flat sealing 1” male thread and an axis distance of 210 mm.
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).

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 parts.

Both the circulation pump and the temperature limiter are connected with cables ex-works. The power supply has to be established on site (see Fig.4).
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.

➔ Further information about electrical connections exists in the MuB of the pump and temperature limiter

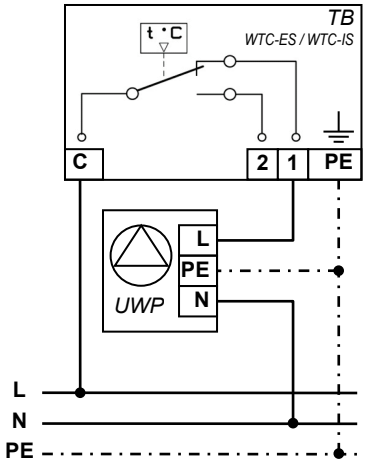


Fig.4

5.3. TEMPERATURE LIMITER (TB)

In the event of malfunction, the TB switches off the circulating pump to prevent overheating of the floor heating system. To avoid undesired activation, the temperature on the TB should be set several degrees above the desired flow temperature. In practice the usual maximum temperature value is approx. 55 °C. That corresponds to the factory setting of the TB. If necessary this maximum temperature must be adapted to the local conditions. ➔ 6.2

If all floor heating circuits are equipped with actuators and no pump relay is used, the TB should be installed on the supply branch of the manifold according to position A.

If there is not sufficient space available on-site - for example, manifold installed in a cabinet - the temperature limiter can also be attached at position B.
Alternatively, the TB can be placed on the return branch of the manifold according to position C. The adjustment of the permissible maximum temperature should then be reduced by at least the value of the temperature difference between supply and return.
Example: Setting at TB 55 ° C; delta t 6 K; Setting TB to max. 49 ° C (rather some °K less).

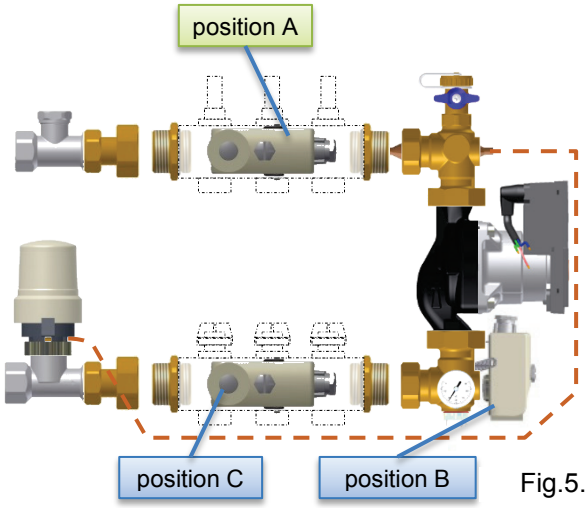


Fig.5.a

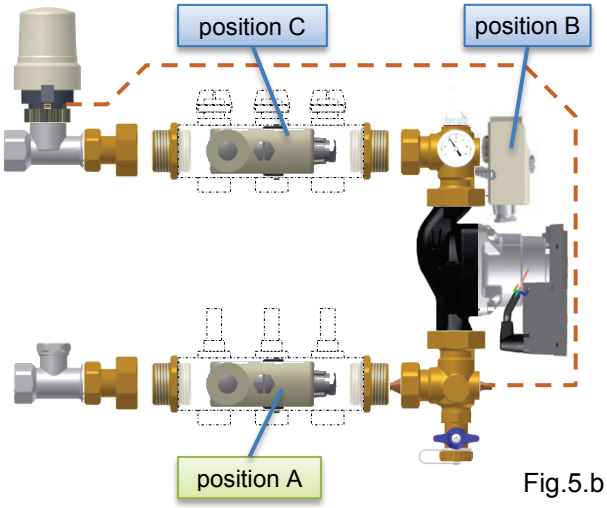
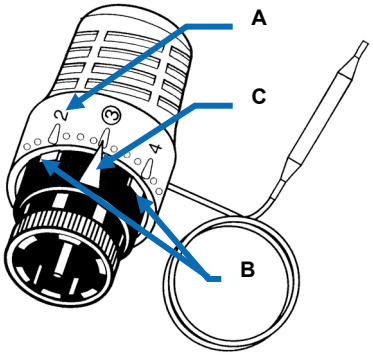


Fig.5.b

6. START-UP

6.1. ADJUSTMENT OF THE FLOOR HEATING FLOW TEMPERATURE

The flow temperature may be adjusted gradually between 20 to 70 °C (68 to 158 °F). The regulating hand wheel of the thermostat is supplied with a scale 1-7 (Fig.6_A). Please see the temperatures set on the scale in the table (Fig.6)



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

Fig.6

6.2. LIMITATION OF THE FLOOR HEATING FLOW TEMPERATURE

As a rule, the flow temperature in floor heating systems should not be higher than 50 °C (120 °F). 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 excess temperature, the flow temperature set value for the TB may be defined and limited.

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, place the blocking elements (Fig.6_B) right before and behind the pointer (Fig.6_C). The tamper-proof cover can be secured against unauthorized access.

6.3. ADJUSTMENT OF THE LOCK-SHIELD VALVE

The unit will be supplied with the lock-shield valve completely open.

Typical values for lock.shield valve adjustment:

heating surface [m²]	**heat demand** [kW]	**number of zones**	**lock-shield valve** [turns open]
< 20	< 1,8	2	1,5
20…40	1,8…3,6	4	1,5
40…60	3,6… 5,4	6	2,0
60…80	5,4…7,2	8	2,5
80…100	7,2…9,0	10	3,5
100…120	9,0…10,8	12	Maximum

If the required temperature in the FH supply is not reached at maximum heat demand (full load), the lock-shield valve will be opened in small steps until the required value is reached.

7. MODE OF OPERATION OF THE CONTROL UNIT

The injection valve is designed as a proportional controller and operates without auxiliary energy. The thermostat situated in the supply is in continuous contact with the flow temperature at all times.
Deviations from the target value result in an immediate change in valve stroke and, accordingly, a change in the volume of the hot water injected from the boiler circuit.
The injected water volume is mixed with the return water from the manifold at the inlet to the circulation pump and, in this way, keeps the flow temperature constant within a narrow temperature range.

8. TECHNICAL DATA / MATERIALS

Admissible ambient temperature range:	0…40 °C (32…104 °F) [1]
Admissible operating flow temperature range:	0…90 °C (32…176 °F) [1]
Maximum operating pressure:	6 bar (87 psi)
Flow temperature setting range:	20…50 °C (68…122 °F) / 20…70 °C (68…158 °F) [2]
Rated heat output:	approx. 10 kW [3]
Power supply:	230 VAC – 50 Hz
Fittings:	Brass Ms 58
Plastic:	Impact- and temperature resistant
Gaskets:	AFM 34 or EPDM
O-Rings:	EPDM

1) Please refer also to technical leaflets of the pump
2) The setting of the flow temperature can be secured against unauthorized access using tamper-proof cover SE 148 GA.
3) To achieve the rated heat output the pressure difference primary circuit (boiler-/radiator circuit) to the secondary circuit (floor heating) should be at minimum 150 mbar (2.2 psi). The temperature difference between primary and secondary circuit should be at least 15 K.

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 temperature limiter (TB) switches off the circulating pump of the control unit. Cause: TB is set to a very low value.	Set the TB by approx. 10 K higher than the required flow temperature for FH. ⚠ Take into consideration the max. admissible flow temperature! ⚠ Differential gap of the TB: approx. 6 K. ℹ The unit restarts quicker if the TB is removed from the unit for a short time to allow a faster cooling down to switch-on temperature.
1.2	The TB switches off the circulating pump of the control unit. Cause: Initially, the circulating pump remains switched on even when all of the floor heating circuits are blocked. The "idle running" of the pump without water circulation heats up the water due to waste heat of the pump motor. On reaching the maximum temperature, the TB switches off the circulating pump!	Remove the TB from the compact control unit and install it at the supply line or, eventually, at the return line of the heating circuit manifold. Use an electrical connecting box with pump relay (pump logic). Thanks to the relay, the circulating pump operates only if at least one heating circuit of FH is opened (requires heat).
1.3	The circulating pump is connected to a room-temperature thermostat or to an electrical connecting box. If all the actuators close, the pump is switched off. If the idle period is longer, the supply water for FH is cooled down. Therefore, the injection mixing valve opens and hot water is injected from the primary circuit. As a result, the control unit is heated up. On reaching the TB's switch-off temperature, the contact opens. The pump will not switch on again.	Remove the TB from the compact control unit and install it at the supply line or, eventually, at the return line of the heating circuit manifold. *Subsection 1.1 should also be taken into consideration.*
1.4	The difference between the temperature of the boiler's supply water and the required flow temperature of the FH 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 FH's heating circuits, the Heating boiler's supply water temperature should be at least 15° C higher than the required flow temperature for FH!
1.5	Operation of pump: pressure difference variable (Δp-v). Especially for small heating surfaces, few open heating circuits, partial load operation, the pump degreases the pressure difference. As a result the heating circuits are not adequately supplied.	Operate the pump either in constant speed or in differential pressure constant (Δp-c) mode ➔ For more information please refer to the MUB of the pump
	➔ **2.1 / 2.2 / 2.3 / 2.4**	
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.
	➔ **1.4 / 1.5**	