



Die flexiblen Verteilersysteme aus Kunststoff für Sanitär und Heizung

# Operating guide

## SBK TwinCo 3000 distribution station

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## **SBK TEMPUS CONTROL**

### **Overview**

Tempus is a modern digital controller which combines the simple operation known from normal analogue devices with the precision and wide-ranging functions of a digital device.

- Tempus controls the flow temperature based on the outside temperature with automatic limitation of the maximum flow temperature.
- Tempus can also be used as a fixed value controller, i.e. the set flow temperature is adhered to precisely (standard model).
- Tempus controls valves to set the afflux. The valves open and close slowly (approx. 5 minutes). The controller is optimal for use with underfloor heating.

### **Integrated safety functions**

In addition, Tempus has numerous integrated safety functions to protect the system.

- **Safety temperature limitation**  
Every heating system should be secured by a double safety function, therefore a safety thermostat (safety temperature limiter) has also been integrated in addition to the safety functions of the controller to limit the maximum performance of the heating system.
- **Anti-block logic for the pump**  
When the system is controlled by the outside temperature or boiler temperature, the pump switches off as soon as the outside temperature is approximately 1 °C higher than the set room temperature (control knob B). The pump is switched back on again as soon as the outside temperature drops approximately 2 °C below the set room temperature.  
If the outside temperature is higher than the room temperature for a longer period of time e.g. in the summer, the pump is switched off and only switched on again for a short period at fixed intervals to prevent the pump from getting stuck.  
If control knob C is turned to OFF, this function is activated automatically.
- **Anti-blocking logic for valve**  
The valve is also switched on for a short period of time in the same way as the pump is in order to prevent it from getting stuck.
- **Failure of a sensor**  
If the outside sensor is missing or has failed, the system automatically switches into the “constant flow temperature” mode.  
  
If the flow sensor is missing or has failed, the valve is controlled with the opening half open and therefore a basic heating is established for safety reasons.

### Thermal function of the SBK TwinCo 3000

The well know principle of heating circuit distribution for underfloor heating made up of flow distributor and return distributor is supplemented by a control valve and a pump.

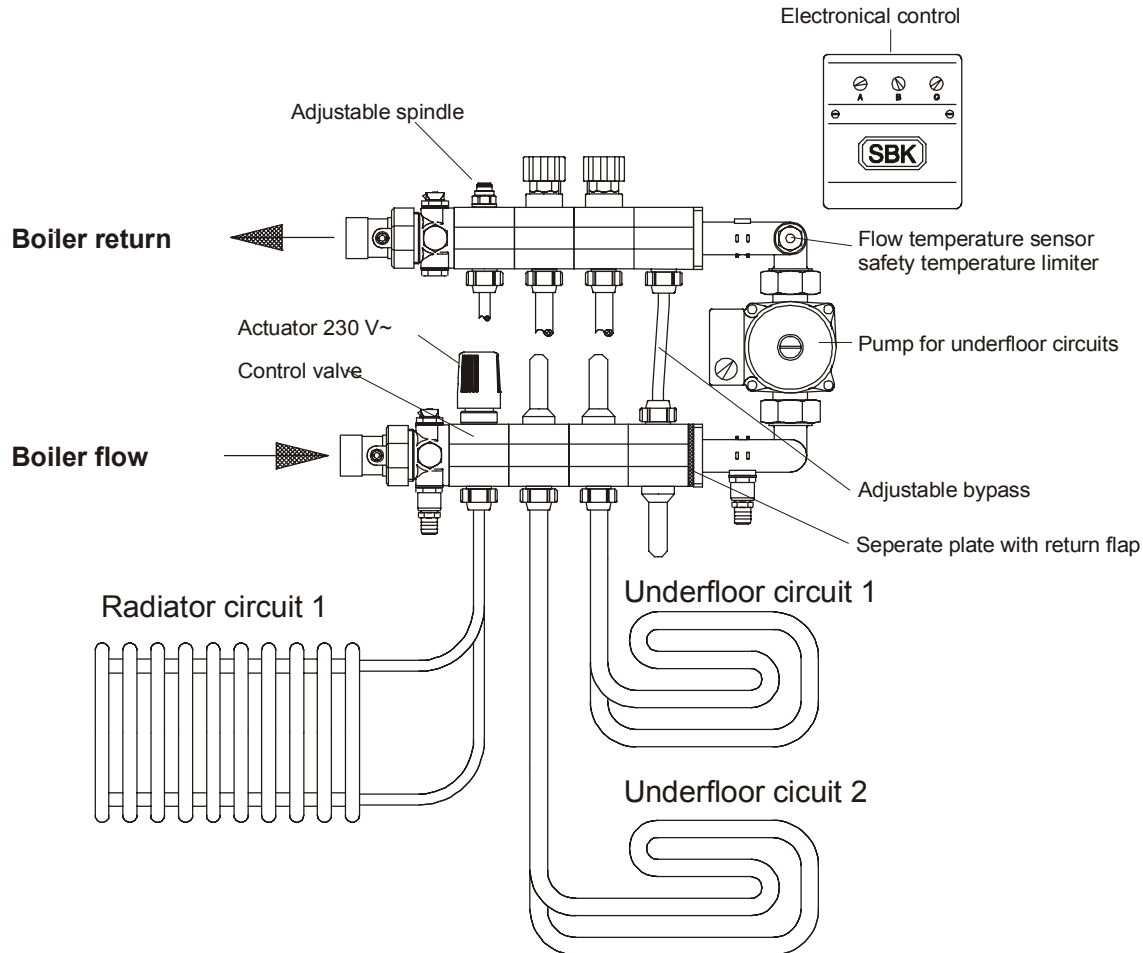


Fig. 1: TwinCo 3000

Warm heating water flows from the flow distributor through the underfloor heating pipes – during which it cools down – and then into the return flow distributor. Here it is mixed with the warm heating water from the heat generator (boiler, gas circulator) and then pressed back into the flow distributor by a pump. This pump also serves as the transport pump of the water in the underfloor heating circuit. The volume of heating water coming from the heat generator is controlled by a valve. However, in this particular case, the boiler flow is connected to the underfloor distributor return flow and the boiler return flow is connected to the underfloor distributor flow. The control valve is positioned in front of the supply line of the underfloor return distributor beam (see diagram).

SBK Tempus controls the pump and the valve which influences the flow of heating water into the return flow distributor. If the required flow temperature has not been reached, the valve is opened. If the required flow temperature is exceeded, the valve is closed. The valve opens and closes slowly in small steps.

The required flow temperature is set either by selecting the flow temperature using control knob "C" (see page 4) or by calculation using the current outside or boiler flow temperature.

**Installation and connection**

The system is installed and connected according to Fig. 2. The electrical connection must be made by a qualified electrician and he will also be responsible for ensuring that the safety regulations are adhered to as required by the current stand of technology. The outside sensor (special accessories) should be fitted in a protected place facing north. The cross-section of the cable connecting the sensor to the controller is not important.

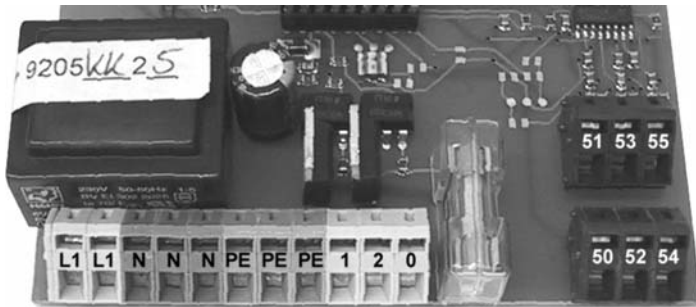


Fig. 2: Connecting diagram

**Terminal allocation**

Voltage supply 230 V	L1, N, PE
Safety temperature limiter	L1,0
Pump	N,1,PE
Actuator for control valve	N,2
Flow sensor underfloor heating circuit	50,51

**Outside temperature controlled flow temperature**

Voltage supply 230 V	L1, N, PE
Safety temperature limiter	L1,0
Pump	N,1,PE
Actuator for control valve	N,2
Flow sensor underfloor heating circuit	50,51
Outside temperature sensor (optional)	52,53

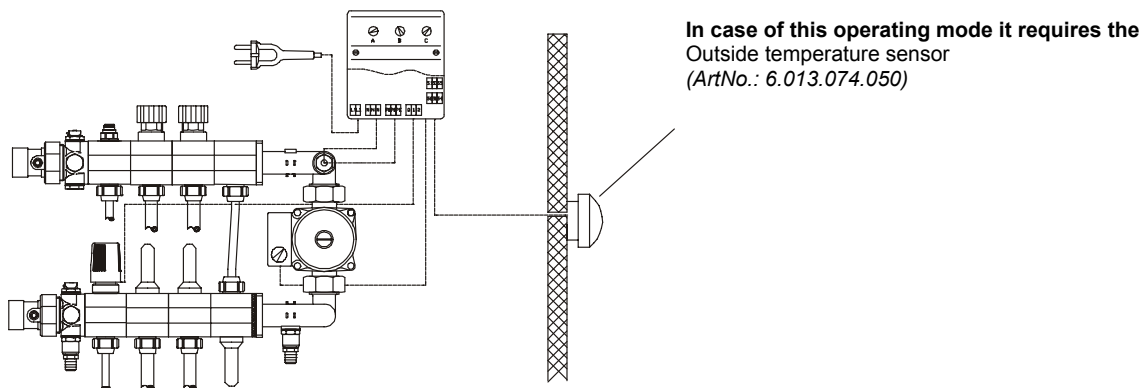


Fig. 3 TwinCo 3000 with outside temperature sensor

**Boiler controlled flow temperature**

- Voltage supply 230 V
- Safety temperature limiter
- Pump
- Actuator for control valve
- Flow sensor underfloor heating circuit
- Flow sensor for boiler temperature (optional)
- Bridge between

- L1, N, PE
- L1,0
- N,1,PE
- N,2
- 50,51
- 52,53
- 54, 55

In case of this operating mode it requires the

Bypass  
(OrderNo. 6.013.074.070)

supply sensor  
(Order No.: 6.013.074.051)

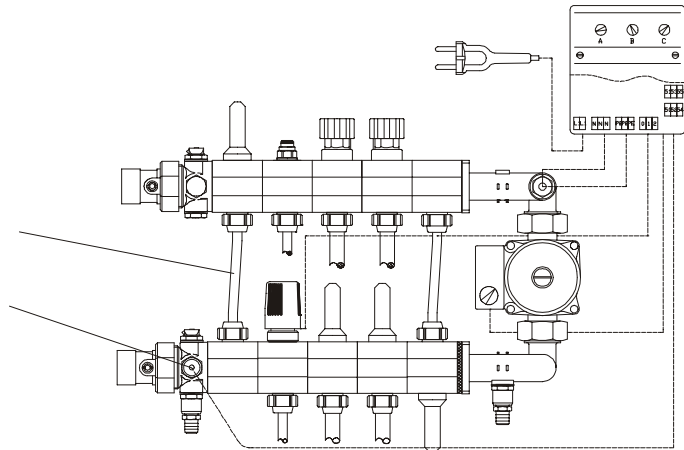


Fig. 4: TwinCo 3000 with supply sensor

## Operation and operating modes

The controller SBK Tempus can work in three different modes

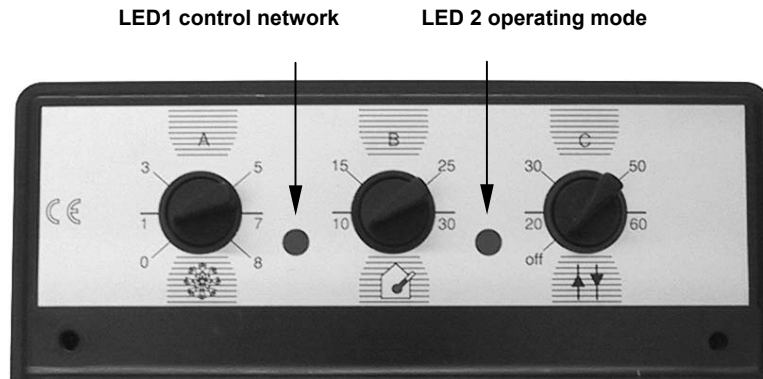


Fig. 5: Operating panel of the control unit

### Constant flow temperature

If it controls an additional heating system, in the bathroom or conservatory, the floor should always have a constant temperature. An outside sensor may not be connected for this operating mode

**Control knob A** must be turned completely to the right

**Control knob B** has no function

**Control knob C** is used to set the required flow temperature

### Climate controlled or outside temperature controlled flow temperature

The heating curve is set in accordance with the planning documents. In compliance with DIN 4701, the planning data is always based on a room temperature of 20°C at an outside temperature of -15°C.

**Control knob A** is used to set the calculated flow temperature (diagram 1 page 7)

**Control knob B** is used to set the required room temperature

**Control knob C** is used to set the maximum admissible flow temperature.

**ATTENTION: The set temperature must be higher than the temperature set at control knob A.**

### Boiler controlled flow temperature

The heating curve is set in accordance with the planning documentation. The data is always based on a room temperature of 20°C at a boiler flow temperature of 70°C.

**Control knob A** is used to set the calculated flow temperature (diagram 2 page 8)

**Control knob B** is used to set the required room temperature

**Control knob C** is used to set the maximum admissible flow temperature.

**ATTENTION: The set temperature must be higher than the temperature set at control knob A.**

### Special operating mode

**Pump test mode:** Control knob B must be turned all the way to the right, the pump is switched on, the valve is switched off.

**Valve test run:** Control knob must be turned all the way to the right. Both the pump and the valve are switched on.

**Switching off pump:** Control knob C must be turned all the way to the left, the pump is switched off (summer mode: function anti-block logic for pump and valve is active).

**Settings of control knob A for outside temperature controlled operating mode**

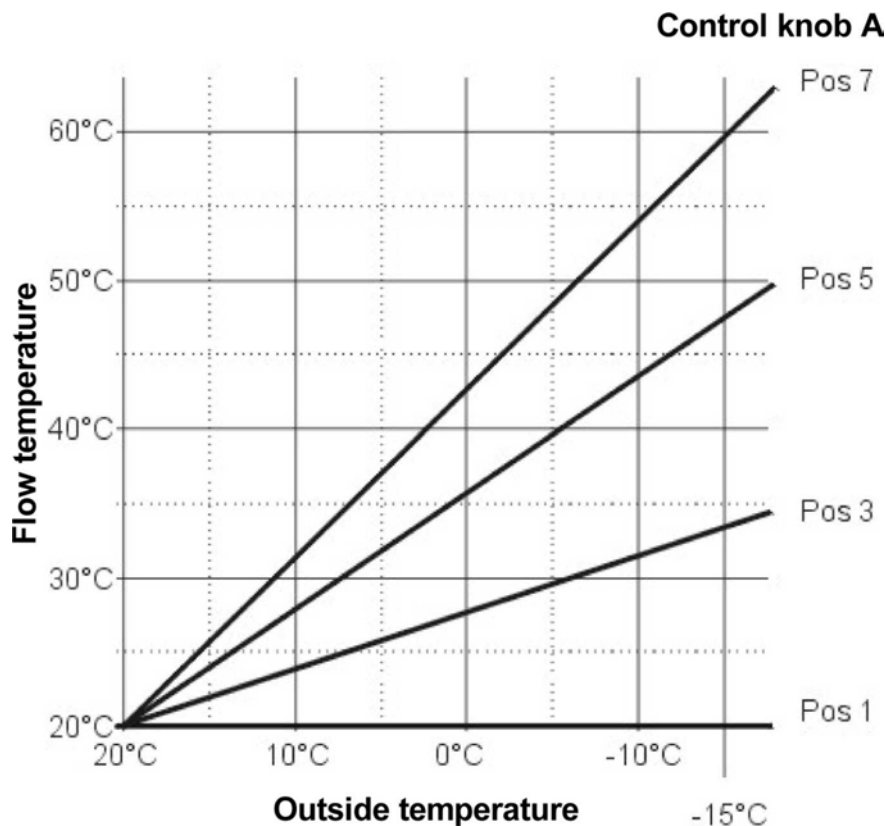


Fig. 6: Diagram 1 heating curve for operation controlled by outside temperature

The heating curve is set in accordance with the planning documentation. According to DIN 4701 the planning data is always based on a room temperature of 20°C at an outside temperature of -15°C.

**Control knob A in position 1**

Calculated flow temperature 20°C at an outside temperature of -15 °C and 20°C room temperature

**Control knob A in position 3**

Calculated flow temperature 33°C at an outside temperature of -15°C and 20 °C room temperature

**Control knob A in position 5**

Calculated flow temperature 48°C at an outside temperature of -15°C and 20 °C room temperature

**Control knob A in position 7**

Calculated flow temperature 60°C at an outside temperature of -15°C and 20 °C room temperature.

**Settings of control knob A for boiler temperature controlled operating mode**

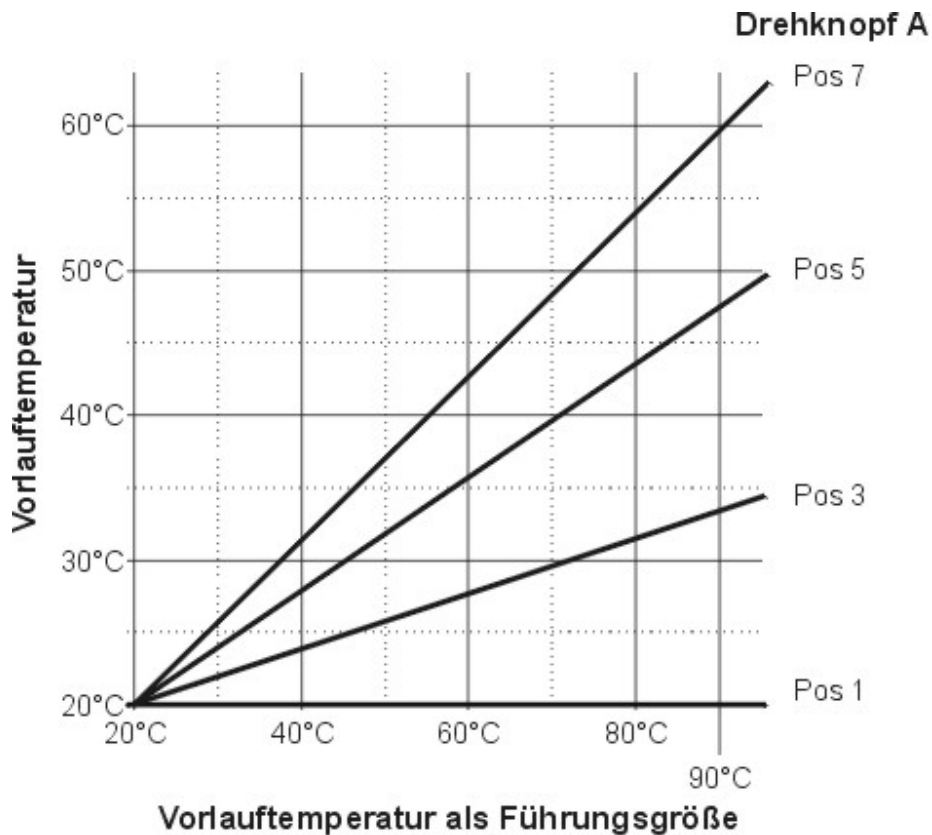


Fig. 7: Diagram 2 heating curve for operation controlled by boiler flow temperature

The heating curve is set in accordance with the planning documentation. The data is always based on a room temperature of 20°C at a boiler flow temperature of 70°C.

**Control knob A in position 1**

Calculated flow temperature 20°C at an boiler flow temperature of 70 °C and 20°C room temperature

**Control knob A in position 3**

Calculated flow temperature 29°C at a boiler flow temperature of 70°C and 20 °C room temperature

**Control knob A in position 5**

Calculated flow temperature 38°C at a boiler flow temperature of 70°C and 20 °C room temperature

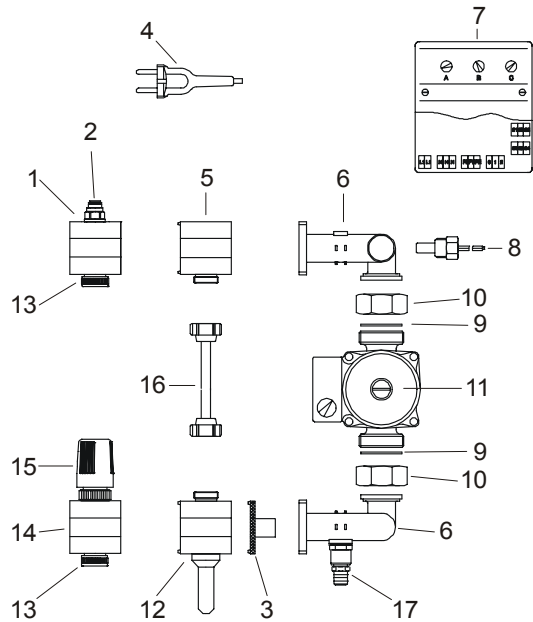
**Control knob A in position 7**

Calculated flow temperature 47°C at a boiler flow temperature of 70°C and 20 °C room temperature.



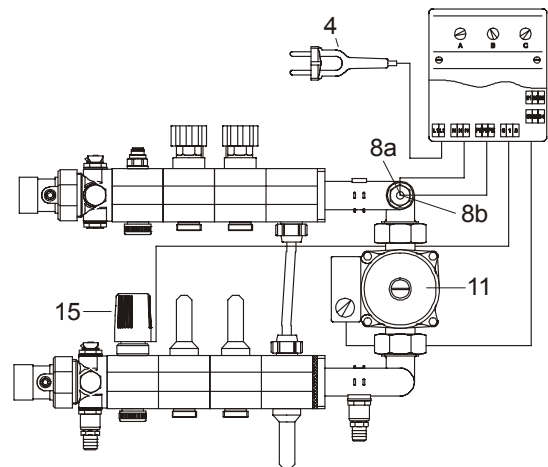
**Appendix SBK TwinCo 3000 individual parts**

Pos.	Name	Quant.
1	SBK throttle valve	1
2	Adjust spindle	1
3	Seperating plate with return valve	1
4	Mains plug 230 V~	1
5	SBK HKV 2000 flow segment	1
6	Connectng arm for pump	2
7	Electronic control	1
8	Immersion sleeve with flow temperatur sensor and safety temperature limiter	1
9	Flat packing	2
10	Union nut	2
11	Pump	1
12	SBK HKV 3000 return flow segment DFM 177	1
13	Locking cap 3/4"	2
14	SBK controle valve	1
15	SBK actuator 230V~	1
16	Bypasspipe 16x2 MSV-pipe With connections	1
17	Filling and drain valve	1

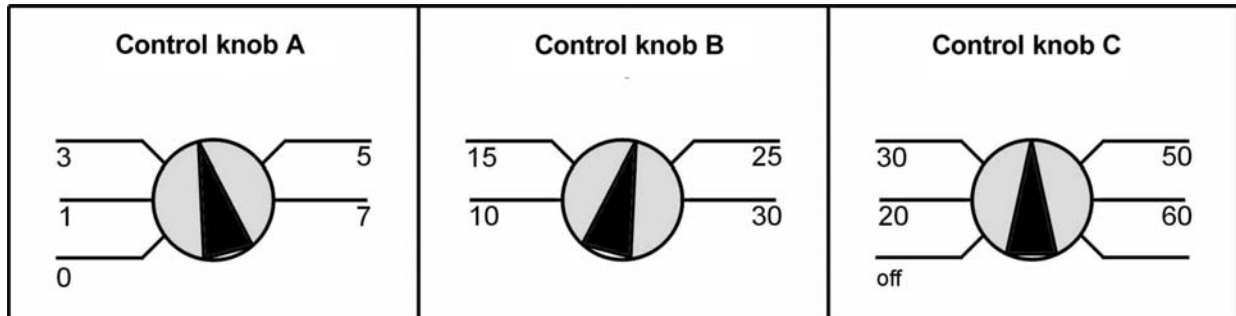


**Appendix : Electrical connection**

Pos.	Name	Terminal
4	Main plug 230 V~	L1 and N
8a	Flow temperature sensor	50 and 51
8b	Safety temperatur sensor	L1 and 0
11	Pump	N and 1
15	SBK actuator 230V~	N and 2
	Outside temperatur sensor (optional)	52 and 53
	Alternative	
	Boiler flow sensor	52 and 53
	Bridge between	54 and 55



**Function of control knobs**



Operating mode based on climate or outside temperature controlled		
<p>This control knob is used to set the heating circuit flow temperature which is to be realized by the control system according to the design of the heating system (DIN 4701)</p> <p><b>Together with control knob B is it is used to calculate the heating curve</b></p> <p><b>Special function</b></p>	<p>This control knob is used to specify which required set value temperature is to be realized.</p> <p><b>It is used to calculate the heating curve together with control knob A.</b></p> <p><b>Special function:</b> Turn the control knob all the way to the right, pump starts up, valve remains closed</p>	<p>This control knob is used to set the maximum permissible flow temperature for the heating circuits.</p> <p><b>Attention: The set temperature must be higher than the temperature set using control knob A</b></p> <p><b>Special function:</b> Turn control knob all the way to the right. Pump is activated. Valve is opened. Turn the control knob all the way to the left. Pump is switched off</p>
Operating mode constant flow temperature		
<p>Turn control knob all the way to the right to switch off the outside sensor. If no outside sensor is connected, the operating mode constant flow temperature is set automatically</p> <p><b>Special function:</b></p>	<p>Control knob does not have a function</p> <p><b>Special function:</b> Turn the control knob all the way to the right, pump starts up, valve remains closed.</p>	<p>Use this control knob to set the maximum permissible flow temperature for the heating circuits.</p> <p><b>Special function:</b> Turn the control knob all the way to the right. Pump starts up, valve is opened. Turn the control knob all the way to the left. Pump is switched off.</p>
<p><b>Attention: Never turn all three control knobs all the way to the right at the same time whilst the system is operational, as otherwise an internal test function is inadvertently activated which can lead to faults with the control unit.</b></p>		

**Attention safety information:**  
**(Please fix this sheet in a clearly visible place on the station)**

Before starting up the TwinCo 3000 distributor station, the system must be filled with water and completely de-aired to protect the pump.

The electrical connection must be made by a qualified electrician who will ensure that the safety regulations are be adhered to.

**Started up by:**

Company: \_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Please enter the position of the control knobs here when starting up the system.**

Control knob A	Control knob B	Control knob C
