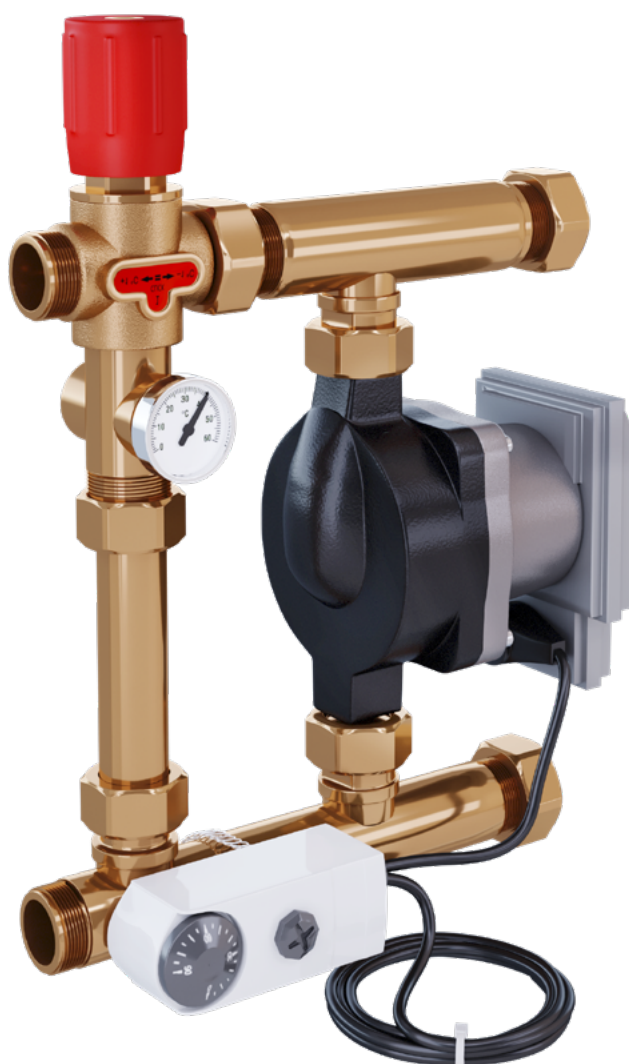


Isotherm

Control station for constant maintenance of the supply temperature in surface heating systems

Installation and Operating Manual
(translated from the original operating manual)



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1 General information

1.1 Important information about this manual

NOTICE The plant operator is responsible for ensuring compliance with the local laws and regulations (e.g. accident prevention regulations, etc.). Incorrect operation or operating the ISOTHERM outside the specifications invalidates all warranty claims.

This installation and operating manual

- is an integral part of the ISOTHERM
- contains instructions and information about safe and correct installation and commissioning of the ISOTHERM
- must be available to all users throughout the entire service life of the ISOTHERM
- is intended for trained personnel who are familiar with the applicable standards and regulations and, in particular, with the relevant safety concepts, operation and maintenance of the ISOTHERM
- is protected by copyright and may not be altered without the manufacturer's permission

1.2 Product conformity

A Declaration of Conformity according to Machinery Directive 2006/42/EC has been issued for the ISOTHERM product.

1.3 Product features

- All connections to the system have 1" male thread and flat sealing
- Very convenient controls, compact, space-saving design.

2 Safety

2.1 Presentation of safety information

⚠ DANGER DANGER indicates an imminent danger that may cause serious physical injury or death if the appropriate safety precautions are not in place.

⚠ WARNING WARNING indicates a danger arising through incorrect behavior (e.g. misuse, disregarding notices, etc.) that may cause serious physical injury or death.

⚠ CAUTION CAUTION indicates a potentially dangerous situation that may cause minor or slight injuries if the appropriate safety precautions are not in place.

NOTICE NOTE indicates a situation that may cause material damage if the corresponding precautions are not taken.

2.2 Important safety information

- Before using the ISOTHERM, read this operating manual through carefully.
- Connect the ISOTHERM only to a power source that corresponds to the mains voltage specified on the rating plate of the ISOTHERM.
- The power supply to the ISOTHERM must be disconnected prior to maintenance, cleaning and repair work.
- Maintenance, cleaning and repair work may be carried out by trained specialist personnel only.
- The ISOTHERM must not be used if it is damaged or is no longer operating correctly. In this case, contact your specialist dealer immediately.
- Observe the maintenance instructions and intervals.
- Protect the ISOTHERM from the weather.
- Never use the ISOTHERM outdoors.
- The unit may be used only in accordance with its intended use.

2.3 Intended use

The control station ISOTHERM is used for constant maintenance of the supply temperature in surface heating systems. The control station is intended for use in dry rooms in residential or commercial areas. It is usually installed in the heating room or in a distribution cabinet.

The ISOTHERM is not intended to be operated by people (including children) with limited physical, sensory or mental capacities, or by people with insufficient experience or previous knowledge.

2.4 Foreseeable misuse

The following is considered to be foreseeable misuse:

- Operating the ISOTHERM beyond its specifications.
- Improper use of the ISOTHERM.
- Modifications to the ISOTHERM that have not been agreed with the manufacturer.
- Use of replacement or wear parts that have not been approved by the manufacturer.
- Operating the ISOTHERM outdoors.

2.5 Responsibilities of the plant operator

The plant operator must ensure that:

- the ISOTHERM is used only for its intended purpose
- the ISOTHERM is installed, operated and maintained according to the specifications of the installation and operating manual
- the ISOTHERM is operated only in accordance with local regulations and occupational health and safety regulations
- all precautionary measures have been taken to avoid dangers originating from the ISOTHERM
- all precautions for first aid and firefighting have been taken
- only authorized and trained users have access to the ISOTHERM and operate it
- users have access to this installation and operating manual at all times

2.6 Personnel groups

Only qualified persons may install and operate the ISOTHERM and carry out maintenance work.

Operators

Operators are deemed to be qualified if they have read these operating instructions and understood the potential hazards associated with improper behavior.

Fitters/commissioning engineers

Fitters/commissioning engineers are in a position to carry out work on the ISOTHERM, taking into consideration the applicable standards, provisions, regulations and laws and their technical training and technical knowledge, and can detect and prevent potential hazards.

2.7 Information on the operating environment

Corrosion and chemical and physical reactions can damage the control station.

The system planner is responsible for evaluating these parameters and developing remedies.

3 Construction

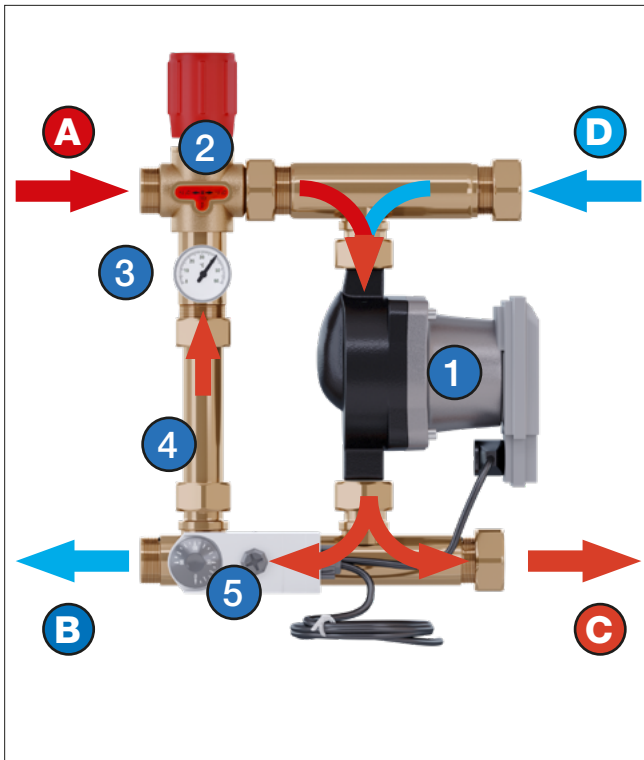


Fig. 3-1: Construction

- 1 Circulation pump
- 2 Thermostatic mixing valve with setting hand wheel
- 3 Thermometer
- 4 Bypass
- 5 Temperature limiter
- A Primary supply (1" male thread)
- B Primary return (1" male thread)
- C Surface heating/cooling supply (1" union nut)
- D Surface heating/cooling return (1" union nut)

4 Function

The mixing valve (2) is designed as a proportional controller and operates without auxiliary energy. The thermostat situated directly in the medium is in continuous contact with the supply temperature at all times. The current supply temperature is displayed on the thermometer (3). 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 primary supply (A).

The injected water volume is mixed with the return water from the manifold (D) at the inlet to the circulation pump (1) and, in this way, keeps the supply temperature constant within a narrow temperature range.

The mixed medium is distributed via the circulation pump (1) to the supply of the surface heating / heating circuit manifold (C) and from there to the connected heating circuits as well as being routed as a pilot flow via the bypass (4).

In the event of malfunction, the temperature limiter (5) switches off the circulation pump to prevent overheating of the surface heating system.

5 Technical Data

Hydraulic performance data		
Max. operating pressure	6 bar	
Max. ambient temperature	40 °C	
Max. operating temperature	90 °C	
Heating demand	up to 15 kW at $\Delta T=10K$	
Media	Water/water-glycol mixture as per VDI 2035/ÖNORM (Austrian standard) 5195	
Setting range of supply temperature ¹⁾	30 - 50 °C	45 - 60 °C
Factory pre-setting of target supply temperature:	44 °C	55 °C
Factory pre-setting of the temperature limiter:	55 °C	65 °C
<small>1) There are two versions of Isotherm with 2 control ranges depending on the version of the mixing valve.</small>		
Connections to pipe network		
Primary (heat generator)	1" male thread, flat sealing	
Secondary (heat distribution)	1" fl. (union nut), flat sealing	
Toques of the fitting		
¾"	35 Nm	
1"	55 Nm	
Materials		
Fittings	Messing CW617 N	
Pipe parts	Messing CW508L	
Seals and O-rings	AFM34/2 and EPDM	
Plastics	Impact resistant and temperature resistant	
Circulation pump and temperature limiter		
Technical data can be found in the enclosed technical documentation.		

6 Overall dimensions

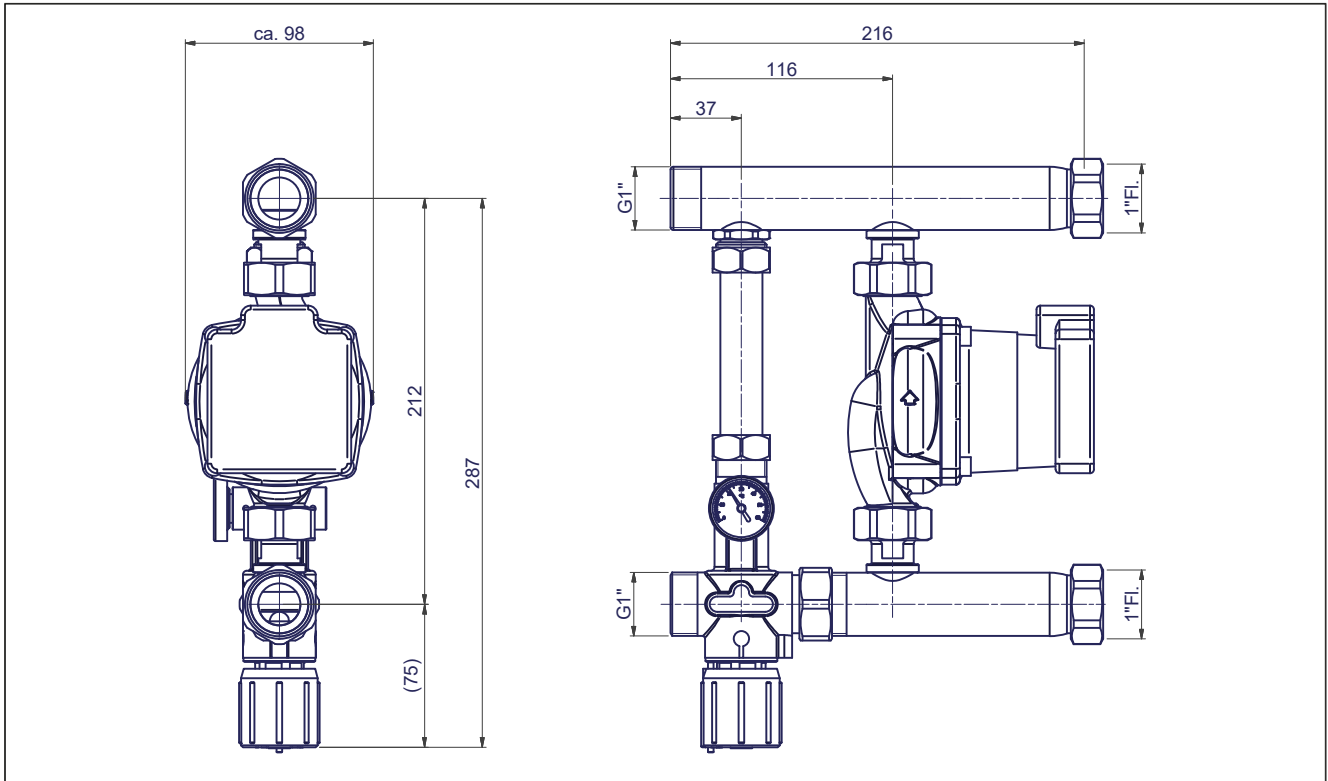


Fig. 6-1: Overall dimensions

7 Pressure loss diagram

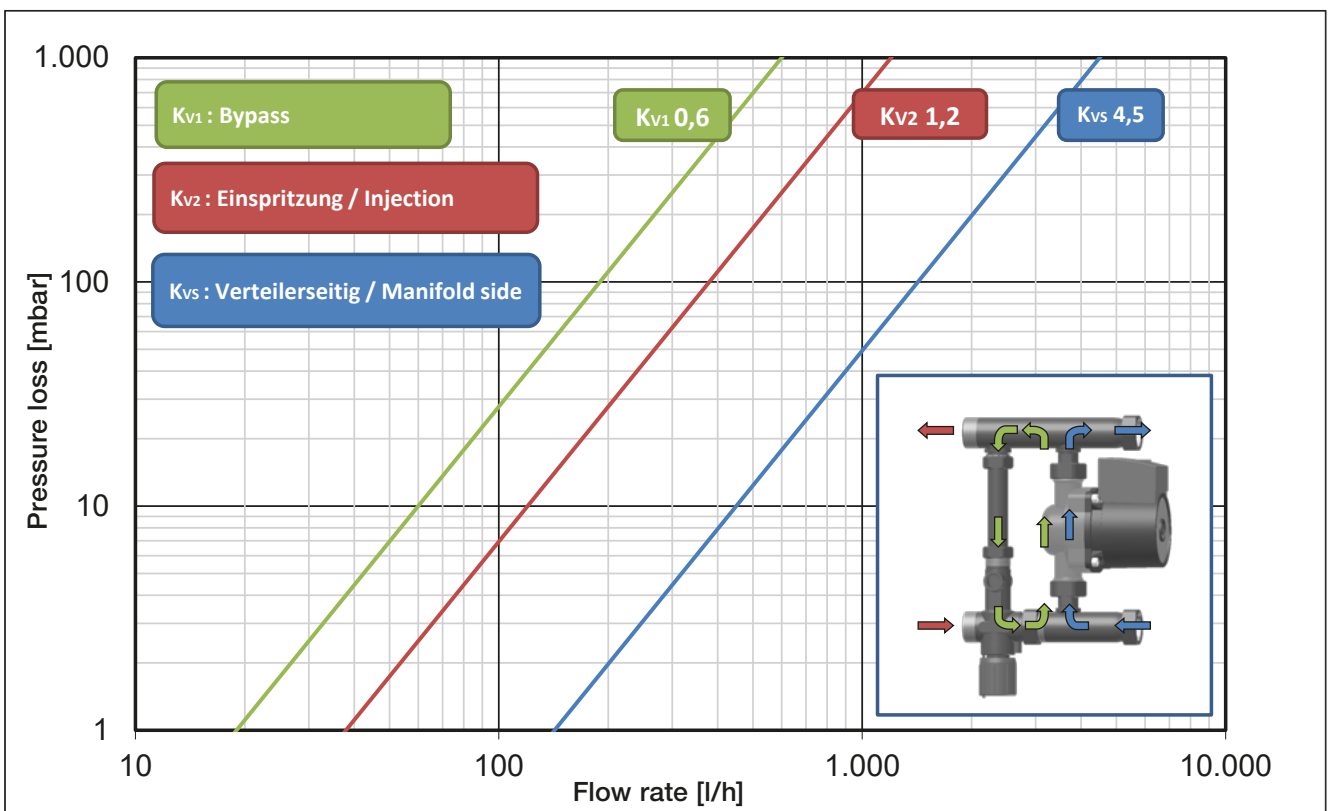


Fig. 7-1: Pressure loss diagram

8 Installation and commissioning

⚠ DANGER Electrical energy!

Risk of death from electric shock.
 Work on parts carrying live voltage must be carried out by qualified electricians only.
 Disconnect the power supply of the system and secure it to prevent it from being switched on again before carrying out any installation, maintenance, cleaning or repair work.

NOTICE The installation and commissioning of the ISOTHERM must be carried out only by trained personnel who have been authorized by the manufacturer.

⚠ CAUTION When repairing the unit or replacing parts, be sure to observe the specified installation positions and flow directions of the parts being replaced!

⚠ CAUTION Material damage!
 Pressure shocks may occur if the stop valve is opened or closed quickly.
 Always open and close the stop valves slowly and in a controlled way.

⚠ WARNING Hot water!
 Risk of severe scalding.
 Do not reach into the hot water when emptying the ISOTHERM. Ensure that the ISOTHERM has cooled down before carrying out maintenance, cleaning and repair work.

8.1 Installation

The control station ISOTHERM is supplied ex-works for mounting to the left of the heating circuit manifold with an axis distance of 210 mm. If you want to mount it to the right of the heating circuit manifold, all you have to do is re-plug the thermometer (see Fig. 8-1).

Depending on space limitations and dimensions of the heating circuit manifold, it may be necessary to rotate the pump in the axis of the screw connections. To do this, loosen the two union nuts on the pump, rotate the pump into the required position, and then tighten the screw connections while holding both the pump and the screw connection element in place.

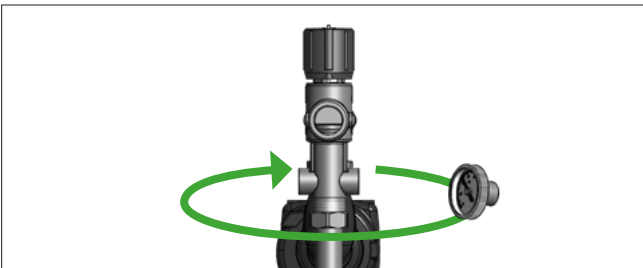


Fig. 8-1

NOTICE We recommend installing a strainer with a mesh size of less than 0.8 mm upstream of the control station. This must be checked at regular intervals and cleaned if necessary.

The hydraulic connections are to be done according to Fig. 8-2 and Fig. 8-3.

1. Fit the control station to the manifold with the 1" nuts and associated seals.
2. Fit the temperature limiter to the supply collector pipe on the manifold.
3. Connect the control station to the power supply.

During installation it must be ensured that:

- the cables from the pump and temperature limiter are not damaged or kinked
 - the sensor capillary tube is not damaged or kinked
 - The cables must not be under tension.
4. Set the target supply temperature on the setting hand wheel.

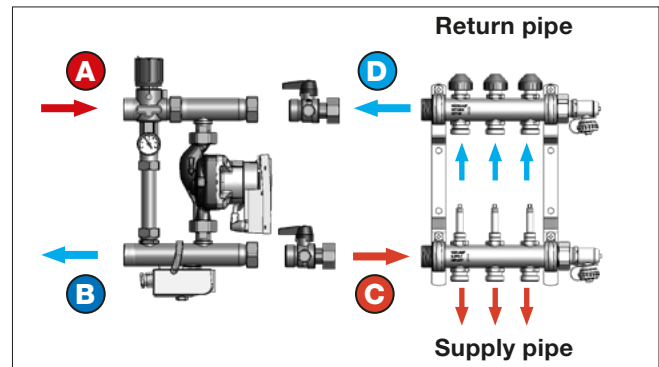


Fig. 8-2

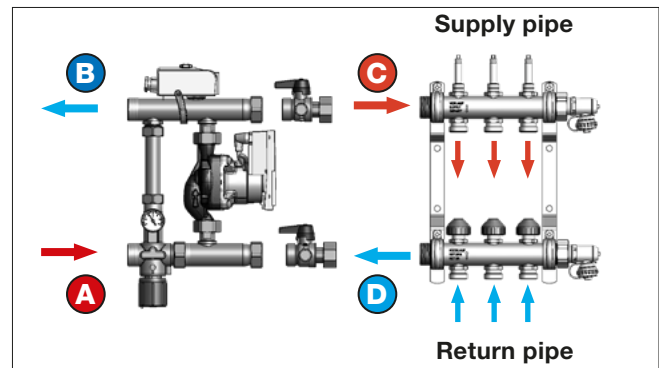


Fig. 8-3

Further information about electrical connection of the control station can be found in the separate documentation for the assemblies.

NOTICE To ensure that the pump runs only when heat is required, the manufacturer recommends connecting the pump to a pump relay (e.g. the pump logic of an electrical control distributor that also controls the actuators). Alternatively, the pump can be operated with a timer switch.

8.2 Temperature limiter

In the event of a fault, the temperature limiter switches off the circulation pump and so avoids overheating of the surface heating system.

- The factory setting of the temperature limiter is 55 °C or 65 °C, depending on the version.
- The temperature limiter must be fitted to the supply pipe of the control station heating circuit manifold.

8.3 Initial commissioning

All screw fittings must be checked and tightened if necessary prior to installation and commissioning!

Torques of the fittings:

- ¾" fittings: 35 Nm
- 1" fittings: 55 Nm

1. Connect the control station to the pipe network.
2. Fill, flush and vent the heating system.

NOTICE Flushing is permitted only in the direction of flow of the heating circuits, i.e. the water must enter through the supply manifold pipe and come out of the return!

The drain must always be open, as otherwise the high water pressure could damage the heating system.

The instructions on flushing in the operating manual for the heating circuit manifold must also be observed.

8.4 Setting of the target supply temperature

In the event of maximum heat output demand (rated output), the boiler supply temperature must be at least 15°C higher than the desired supply temperature in the surface heating circuit!

Factory setting of the target supply temperature is 44° C or 55 °C, depending on the version of the control station. The pilot pin is flush with the setting hand wheel face. By turning the setting hand wheel in minus "-" or plus "+" direction the target supply temperature is changed accordingly.

The hand wheel clicks with the rotation. Each "click" means a target temperature change of approx 1 °C.

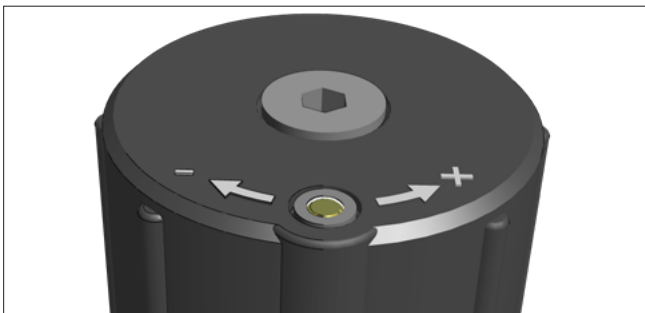


Fig. 8-4: Factory setting

Reduction of the target supply temperature: by turning the setting hand wheel in the clockwise direction ("-").

If the pilot pin moves out from the setting hand wheel, this entails a lower target temperature (see Fig. 8-5 Reduction of the target supply temperature).

Each "click" in the clockwise direction reduces the target supply temperature by approx 1 °C.

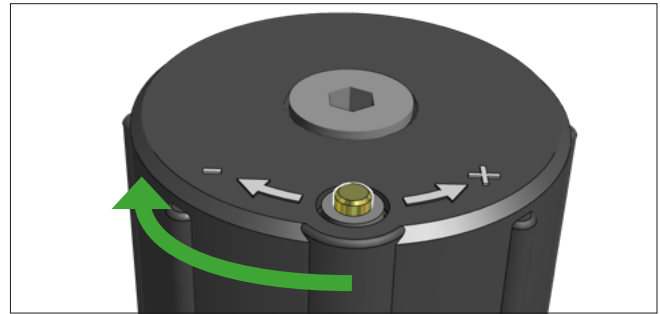


Fig. 8-5: Reduction of the target supply temperature

Increase of the supply temperature set point: by turning the setting hand wheel in the anti-clockwise direction ("+" direction).

If the pilot pin moves into the setting hand wheel, this entails a higher target temperature (see Fig. 8-6: Increase of the target supply temperature).

Each "click" in the anti-clockwise direction rises the target temperature by approx 1 °C.

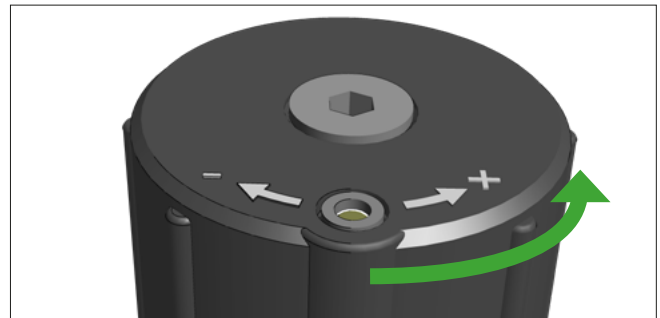


Fig. 8-6: Increase of the target supply temperature

The set temperature range is between 30 and 50 °C or 45 and 60 °C according to the version of ISOTHERM. However, the setting hand wheel can be turned further in both directions. This causes only small changes of the target temperature outside of the temperature range.

9 Troubleshooting

Problem		
	Possible cause	Solution
1	The heating circuits of the surface heating are not heated up	
1.1	<p>The temperature limiter switches off the circulating pump of the compact control station.</p> <p>Cause: the temperature limiter is set to a very low value.</p>	<p>Set the temperature limiter by approx. 10 K higher than the supply temperature for the surface heating.</p> <p>Attention! Take into consideration the surface heating maximum allowable temperature!</p> <p>Instruction: The difference between the switch-on temperature and switch-off temperature of the temperature limiter is around 5 K.</p> <p>Useful tip: The control station may be ready for operation sooner if the temperature limiter is removed for a short time to allow its cooling down to the switch-on temperature.</p>
1.2	<p>The temperature limiter switches off the circulating pump of the control station.</p> <p>Cause: Initially, the circulating pump remains switched on even when all of the heating circuits of the surface heating are blocked. The water circulating on "idle running" through the bypass is heated up by the circulating pump's waste heat. On reaching the maximum temperature, the temperature limiter switches off the circulating pump!</p>	<p>Remove the temperature limiter from the control station and install it at the supply line or, eventually, at the return line of the heating circuit manifold.</p> <p>Use an electrical connecting box with pump relay (pump logic). Due to the relay, the circulating pump operates only if at least one heating circuit of surface heating is opened (requires heat).</p>
1.3	<p>The circulating pump is connected to a room temperature thermostat or to a electrical connecting box.</p> <p>If all the actuators close, the pump is switched off. If the idle period is longer, the supply water for surface heating is cooled down. Therefore, the injection mixing valve opens and hot water is injected from the primary circuit. As a result, the control station is heated up. On reaching the temperature limiter's switch-off temperature, the contact opens. The pump will not switch on again.</p>	<p>Remove the temperature limiter from the control station and install it at the supply line or, eventually, at the return line of the heating circuit manifold.</p> <p>Subsection 1.1 should also be taken into consideration.</p>
1.4	<p>The difference between the temperature of the boiler's supply water and the required supply temperature of the surface heating is too small for the existing heating load.</p>	<p>Set the boiler's supply water temperature to a higher value. At maximum power consumption in the heating circuits of the surface heating, the Heating boiler's supply water temperature should be at least 15° C higher than the required supply temperature for surface heating!</p>
1.5	<p>The thermostatic injection valve is leaking due to debris.</p>	<p>Remove the manual setting wheel and the cover of the injection valve's body, take out the inside parts and clean everything. (See the dedicated manual)</p>
2	The supply water temperature cannot be set tot the required value of it fluctuates within a very wide range	
2.1	<p>The control station's supply (inlet) pipe and return (outlet) pipe are connected to the manifold in the wrong way.</p>	<p>Check all inlets and outlets of the control station for correct connection. Supply inlets and return outlets are marked with stickers.</p> <p>Please take into account Fig. 8-2 and Fig. 8-3 on page 6</p>
2.2	<p>The circulating pump's pressure head/pump stage is set at a very high value.</p>	<p>Increase the rotation frequency, the pump pressure head/pump stage, respectively.</p>
2.3	<p>The heating load is too big for the control station used, i.e., the heat consumption exceeds the rated power of the control station. This state may set in temporarily, e.g., in case of heating a "cold" floor for the first time.</p>	<p>TCheck the maximum heat consumption and compare it with the rated power. If necessary, distribute the heating circuits to a second control station with a respective manifold for heating circuits.</p> <p>If the cause is in the initial heating up of a given surface 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</p>

With installation of a control station ISOTHERM into a heating system with boilers with small water volumes, with combined radiator and surface heating systems or with plants with warm water priority function the installation of a hydraulic separator between boiler and heating circuit is recommended, in order to disconnect the heating circuits hydraulically from the boiler. Thus operational disturbances as well as supply noises at the boiler and/or in the heating circuits can be avoided.

10 Maintenance

⚠ DANGER Electrical energy!

Perform maintenance work on the ISOTHERM only when the power supply has been disconnected.

⚠ WARNING Hot water!

Risk of severe scalding.

Do not reach into the hot water when emptying the ISOTHERM. Ensure that the ISOTHERM has cooled down before carrying out maintenance, cleaning and repair work.

⚠ WARNING Hot surfaces!

Risk of serious burns.

Do not touch the pipes or components during operation. Ensure that the ISOTHERM has cooled down before carrying out maintenance, cleaning and repair work. Wear heat-resistant safety gloves if it is necessary to carry out work on hot components.

NOTICE Maintenance of the ISOTHERM must be carried out only by trained personnel who have been authorized by the manufacturer.

10.1 Annual maintenance

1. General visual inspection

- Check the control station for leaks and retighten sealing connections or replace seals, as required.

2. Functional check

- Check that settings and operating and performance parameters are set correctly.
- Check supply noise during operation.
- Ask users if there are any noticeable problems.

3. Action to be taken following maintenance work

- Check that all screw fittings that were unscrewed have been retightened and retighten if necessary.
- Remove all tools, materials and other equipment used from the working area.
- Restore the power supply.
- Slowly pressurize the ISOTHERM and vent it.
- Readjust the system settings if required.

10.2 Replacement of wear parts

Please note that the ISOTHERM contains parts that, for technical reasons, are subject to wear depending on the intensity of use, even if the specified care and maintenance has been provided.

This applies especially to mechanical parts and parts that come into contact with water and steam, such as seals, valves, etc.

By their nature, defects caused by wear do not constitute a fault and are therefore not covered by the warranty or any guarantee. Nevertheless, these defects and malfunctions must be remedied by trained specialist personnel only. Contact your specialist dealer for this.

11 Disposal

⚠ WARNING Potential for contamination of the environment and groundwater from improper disposal! The legal regulations and guidelines in the country of operation must be observed when disposing of components and operating materials.

1. Ensure that all assemblies and components are de-energized.
2. Disassemble the ISOTHERM properly or commission a specialist company to do so.
3. Sort the assemblies and component parts into recyclable materials, hazardous substances and operating materials.
4. Dispose of the assemblies and components in accordance with local laws and regulations or take them to be recycled.

11.1 Return to the manufacturer

Get in contact with the manufacturer if you would like to return the ISOTHERM or parts of it.

11.2 Notification of administrative bodies and the manufacturer

Inform the manufacturer of decommissioning and disposal of the ISOTHERM for statistical purposes.

12 Warranty

WATTS products are tested extensively. WATTS therefore guarantees only to replace or repair components of the products supplied free of charge – at the sole discretion of WATTS – if, in the opinion of WATTS, they exhibit verifiable manufacturing faults. Warranty claims due to defects or defects of temperature limiters may be asserted within one (1) year of delivery/transfer of risk. Excluded from the warranty is damage attributable to normal product use or friction and to damage resulting from modifications or unauthorized repairs to the products, for which WATTS rejects all claims for compensation (direct or indirect). (For more detailed information, please refer to our website.) In all cases, supply is subject to the General Terms and Conditions, which can be found on www.wattswater.eu/gtc/.

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