
TS 608/2-i ; TS 608-G/2-i
TS 608/4-i ; TS 608-G/4-i
TS 1008-i

THERMOSTAT CABINET



a xylem brand

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1 Overview

Applications The thermostat cabinets serve to continuously temper a variety of applications, e. g.:

- 20 °C BOD₅ determination
- 25 °C Enzymatic activity (TTC test)
- 37 °C Colony count

The instruments manage all tempering tasks in the range of 10 °C to 40 °C maintenance-free and reliably.

- Features**
- The fully insulated cabinet exactly controls the internal temperature via an integrated temperature sensor. The compressor cooling unit or the heating unit switches on separately.
 - Depending on the operating mode, an LED display shows the internal measured temperature or the desired temperature that was set.
 - The temperature can be set in the range of 10°C to 40 °C in steps of 1 °C (via 2 keys, which are protected by a robust foil front).
 - The recirculation ventilation is provided by a tangential blower. This guarantees a stable internal temperature in the whole thermostat cabinet.

2 Safety

2.1 Safety information

2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the product. Read this operating manual thoroughly and make yourself familiar with the product before putting it into operation or working with it. The operating manual must be kept in the vicinity of the meter so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the level of danger:

**WARNING**

indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.

**CAUTION**

indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.

NOTE

indicates a situation where goods might be damaged if the actions mentioned are not taken.

2.1.2 Safety signs on the product

Note all labels, information signs and safety symbols on the product. A warning symbol (triangle) without text refers to safety information in this operating manual.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the thermostat cabinet:

- Operating manual of the cooling unit manufacturer (Liebherr)

2.2 Safe operation

2.2.1 Authorized use

The authorized use of the TS 608...-i/1008-i thermostat cabinets consists exclusively of the use as a tempering instrument in water analysis. Only the operation and running of the instrument according to the instructions and technical specifications given in this operating manual is authorized (see chapter 7 TECHNICAL DATA). Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The product may only be operated according to the authorized use specified above.
- The product may only be operated under the environmental conditions mentioned in this operating manual.
- The product may only be supplied with power by the energy sources mentioned in this operating manual.
- Live parts may only be repaired or changed by service personnel.

2.2.3 Unauthorized use

The product must not be taken into operation if:

- it is visibly damaged (e.g. after being transported)
- there is a leakage in the coolant circulation
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 7 TECHNICAL DATA).

The following substances must not be stored with the product (with escaping gases, there is a risk of explosion):

- explosive substances
- inflammable liquid or gases,
e.g. spray cans with inflammable propellants (e.g. propane, butane, pentane etc.)

3 Commissioning

3.1 Unpacking and setting up the instrument



Please also follow the instructions on how to set up the instrument in the enclosed operating manual of the manufacturer of the cooling unit (Liebherr)!

Unpacking When unpacking the instrument pay attention to shipping damages. If you find damages inform the consigner immediately so that you can claim insurance cover.

Scope of delivery

- Thermostat cabinet (variant corresponding to shipping note)
- 2 x Y cable to connect stirring platforms (only for TS 608/2-i and TS 608-G/2-i)
- Operating manual

Positioning at the location Observe the environmental conditions according to chapter 7 TECHNICAL DATA.

NOTE

If your Instrument has a glass door, do not subject it to direct solar radiation so the interior will not heat up too much!

3.2 Initial commissioning

NOTE

After transporting and setting up the thermostat cabinet, wait at least 60 minutes before switching on.

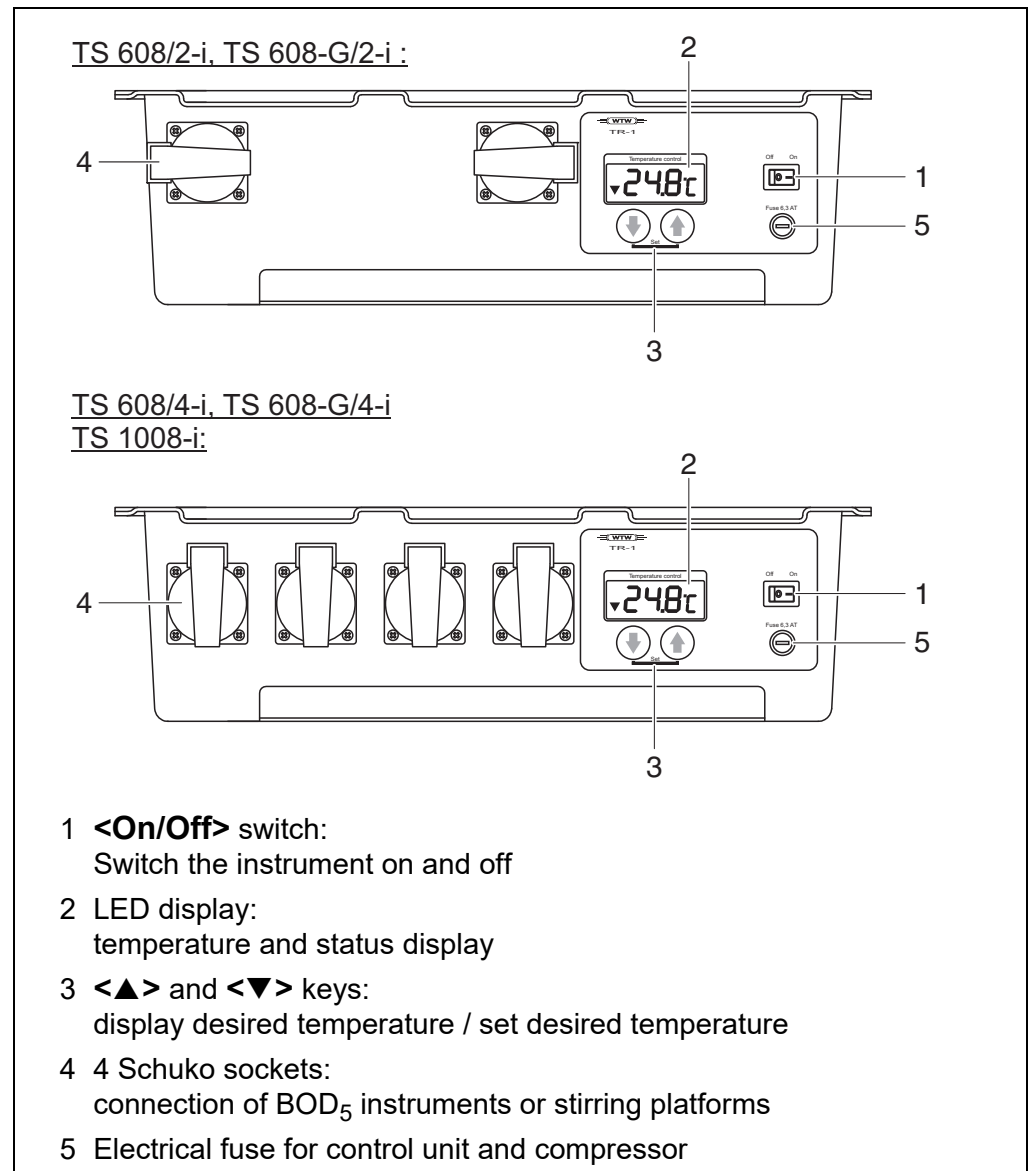
Course of the initial commissioning

- 1 Connect the power plug to the power socket (electrical data: see chapter 7.2 ELECTRICAL DATA).
- 2 Switch on the thermostat cabinet and set the desired temperature (see chapter 4 OPERATION).

4 Operation

4.1 Operating elements

Control unit inside
the thermostat
cabinet



With the models TS 608/2-i and TS 608-G/2-i, the additional illumination and operation unit at the right-hand side is without function.

4.2 Switching on the thermostat cabinet

To switch on, set the **<On/Off>** switch of the control unit to **On**. In the switched on condition, the Schuko sockets are supplied with voltage.

To switch off, set the **<On/Off>** switch to **Off**.

4.3 Connecting the stirring platforms

NOTE

Observe the maximum sum load for all 4 sockets (see section 7 TECHNICAL DATA). If the sum load is too high, the temperature control may be disturbed.

Connecting the stirring platforms

- 1 Open the door.
- 2 Equip the thermostat cabinet with stirring platforms. When doing so, observe the following points:
 - Place the stirring platforms and other fillings in the center of the gratings to ensure an optimum air circulation!
 - If the cabinet is only partly filled, use the upper levels.
- 3 Connect the stirring platforms to the sockets of the control unit.

Note for models TS 608/2-i and TS 608-G/2-i:

Up to four stirring platforms can be connected with the aid of the supplied Y-cables (for example 4 x IS 6).

- 4 Close the door.

4.4 Setting the desired temperature

Setting the desired temperature

- 1 Open the door.
- 2 Press the **<▲>** and **<▼>** keys simultaneously for a short period of time. The LED display flashes and displays the current desired temperature.
- 3 With the aid of the **<▲>** or **<▼>** key set the desired temperature to the required value (increment of 1°C):
 - **<▲>** Increase the desired temperature
 - **<▼>** Decrease the desired temperature.
- 4 Take over the adjusted value:
After approx. 3 seconds without pressing the **<▲>** or **<▼>** keys, the LED display shows the current internal temperature again and stops flashing. The control unit now regulates to the newly adjusted temperature.

- 5 Close the door.



The newly adjusted temperature is permanently saved.

So when the instrument is restarted, e.g. after a power failure or after being switched off, the specified temperature value is active again.

**Operating example:
Changing the desired temperature set in the factory**

The desired temperature set in the factory should be changed from 20°C to 25°C.

- 1 Press the <▲> and <▼> keys simultaneously for a short period of time. The LED display flashes and shows 20.0°C.
- 2 Press the <▲> keys until the LED display shows 25.0°C.
- 3 Wait for approx. 3 seconds until the LED display shows the actual inside temperature again. The control unit now regulates the temperature to 25.0°C.

Status display

The current operating mode is displayed with the aid of two arrow symbols on the left side of the temperature display:

▲ : Heating

▼ : Cooling

The required sample temperature is achieved after an adjustment time of one to three hours. The necessary duration of the adjustment time depends on the sample quantity.

While the sample temperature is being controlled, the air temperature in the thermostat cabinet (it is displayed as the actual value at the control unit) may fluctuate by up to several degrees centigrade.

The actual temperature of the sample liquid, however, fluctuates by a maximum of $\pm 0.5^\circ\text{C}$.



To check the actual sample temperature, see chapter 6 WHAT TO DO IF....

5 Maintenance, cleaning, disposal

5.1 General information

**WARNING**

If live parts come into contact with water, there is the risk of death by electric shock.

Prior to any cleaning (also inside the cabinet) disconnect the mains plug of the thermostat cabinet from the socket (do not only switch off the power switch).

Cleaning Remove any dust inside the instrument every 6 to 8 months.

Clean the inside and outside of the cabinet with a soft, moist cloth. This avoids electrostatic charging. Suitable detergents are lukewarm water with a little washing-up liquid or common household detergents for synthetic surfaces.

NOTE

Do not use any chafing detergents or sponges.

Do not use any aggressive cleaning agents like alcohol, organics solvents or chemical detergents. These types of cleaning agent can attack the surface of the housing.

Remove the dust from the convection grids on the back of the instrument using a dry brush. Take care not to tear off cables or bend pipes.

For more information on cleaning, see the operating manual of the cooling unit manufacturer (Liebherr).

Defrosting The instrument has an automatic defroster. Condensation water is collected in the condensation container and evaporates automatically. Take care that the condensation water can flow through the outlet in the back wall without obstructions. If necessary, clean the outlet with an elongated object, e. g. with a bottle brush.

For more information on defrosting, see the operating manual of the cooling unit manufacturer (Liebherr).

Transport Ship the instrument shock-protected (if possible in original packaging). Mark the packing accordingly (Keep dry / Attention, risk of fracture).

5.2 Disposal

Instructions on how to dispose of the packing material and thermostat cabinet can be found in the operating manual of the cooling unit manufacturer (Liebherr).

6 What to do if...

6.1 Testing the thermostat cabinet

Test procedure

- 1 **Prepare the test.**
Disconnect all consumers from the sockets of the control unit.
- 2 **Switch on the instrument.**
The actual temperature must be displayed.
- 3 **Test the ventilator:**
The ventilator must blow downwards. Hold your hand closely below the ventilator grating and check the air stream.
- 4 **Test the cooling.**
Set the required temperature to 10 °C. Make sure that the real temperature is more than the required temperature. The compressor of the thermostat cabinet must switch itself on. This switching on may be delayed by 5 minutes due to the switch lock preventing too frequent switching. The ▼ status display must appear. The temperature in the thermostat cabinet must drop. For testing use an additional thermometer without water-filled BOD bottle.
- 5 **Test the heating and switching-off of the compressor.**
Set the desired value to 40 °C. Close the cabinet door. The compressor of the thermostat cabinet must switch off. The heating must switch on. The ▲ status display must appear. The temperature in the thermostat cabinet must increase. For testing use an additional thermometer without water-filled BOD bottle.
- 6 **Test the controller function of the thermostat cabinet.**
Set the desired value to 20 °C. Close the cabinet door. The actual value of the sample temperature should come to within the range 19.0 °C to 21.0 °C. Test see: Measuring the actual value of the sample temperature.
- 7 **Test the power sockets.**
Connect a small consumer (e.g. stirring platform) to each power socket of the control unit. The small consumer must work at each socket.

If all test points are OK, the thermostat cabinet is OK. In the case of an error, contact the service department.

6.2 Measuring the actual value of the sample temperature

Test procedure

- 1 Place a BOD sample bottle filled with approx. 400 ml water on a grating in the center of the thermostat cabinet.

- 2 Completely immerse the probe of a temperature meter (accuracy at least 0.5 °C, resolution at least 0.1 °C) in the sample bottle. The probe must not touch the bottle wall.
- 3 After three hours adjustment time read the temperature value.

6.3 Error diagnosis

**Control unit is switched on,
- no display indication
- no reaction**

Cause	Remedy
Mains power supply failed	Check mains power supply, connect an operable consumer (e.g. lamp) to the power socket
Fuse of the control unit defective	Check the fuse of the control unit. If it is defective, replace it with a new fuse (value, see chapter 7 TECHNICAL DATA). The fuse is available in specialist shops.
Control unit defective	Contact the service department

**Display of the control unit works.
Desired temperature is not achieved. The actual temperature is too low**

Cause	Remedy
The waiting time was not sufficient for the loading of the thermostat cabinet.	Wait for a longer period of time and observe the development of the actual value.
The ambient temperature is too low.	Check the ambient temperature.
Control unit defective, compressor runs permanently.	Contact the service department

Display of the control unit works. Desired temperature is not achieved. The actual temperature is too <i>high</i>	Cause	Remedy
	The waiting time was not sufficient for the loading of the thermostat cabinet.	Wait for a longer period of time and observe the development of the actual value.
	The heat output capacity of the consumers inside the instrument is too high.	Check the power consumption of the consumers inside the thermostat cabinet and reduce it if necessary. Also see chapter 7 TECHNICAL DATA, "Maximum sum load for all four sockets".
	The ambient temperature is too high.	Check the ambient temperature.
	The thermostat cabinets with transparent doors are exposed to direct sunlight.	Avoid direct sunlight on transparent doors.
	Compressor runs, cooling unit defective.	Contact the Liebherr service department.
	The compressor of the cooling unit does not work or the control unit does not switch on the compressor.	Contact the service department

7 Technical data

7.1 General data

Test certificates CE

Ambient conditions

Site altitude	Instruments with a glass door (TS 608-G...): max. 1500 m above sea level Instruments without a glass door: max. 2000 m above sea level
Operation	+ 10 °C ... + 32 °C (climatic class SN) + 10 °C ... + 43 °C (climatic class SN-T) Operation only in buildings
Storage	- 10 °C ... + 50 °C

Guidelines and norms used

EMC	EC directive 2014/30/EC EN 61326-1
Instrument safety	EC directive 2014/35/EC EN 61010-1
RoHS	EC directive 2011/65/EC

7.2 Electrical data

Power supply

Nominal voltage	220 - 240 VAC
Supply frequency	50 Hz according to DIN IEC 60038
Protective class	I
Internal instrument safety	6,3 A delay fuse, for TR-1 control unit and compressor. The fuse is on the operating front of the control unit.



WARNING

If an unsuitable fuse is used, there is the risk of cable fire. The original fuse may only be replaced with a fuse of the same type and by the same manufacturer.

Protective class I

	TS 608/2-i	TS 608-G/2-i	TS 608/4-i	TS 608-G/4-i	TS 1008-i
Max. electric power consumption	160 W	320W	380W	380W	380W
Max. electric current	1.5 A	1.7 A	2.0 A	2.0 A	2.0 A

Consumers connected to the sockets of the control unit are not taken into account for these specifications.

7.3 Temperature control unit TR-1

Control range	10 °C ... 40 °C
Setting increment	1 °C (1 K)
Constancy of the sample temperature	± 0.5 °C (0.5 K)
Recirculation ventilation	120 m ³ /h by means of tangential ventilator
Temperature and status display	<ul style="list-style-type: none"> ● 3-digit LED display for temperature, resolution 0.1°C (0.1K) ● Status displays for heating and cooling phases
Connections	2 or 4 Schuko sockets, maximum sum power consumption:

TS 608/2-i	TS 608-G/2-i	TS 608/4-i	TS 608-G/4-i	TS 1008-i
50 W	50 W	100 W	100 W	100 W

7.4 Dimensions, weight, equipment

	TS 608/2-i	TS 608-G/2-i	TS 608/4-i	TS 608-G/4-i	TS 1008-i
Volume [l]	150	150	315	315	500
Outer dimensions [mm]					
Height	850	850	1640	1640	1640
Width	600	600	600	600	750
Depth	600	600	610	610	730
Inner dimensions [mm]					
Height	702	702	1452	1452	1452
Width	513	513	470	470	600
Depth	441	441	440	440	560
Weight [kg]					
Gross (incl. packing material)	37	46	58	74	75
Net	34	43	53	69	69
Gratings					
Number	3	3	4	4	4
Refrigerant gas					
	R600a				
Quantity (g)	35	35	52	52	58

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