



Inspired by temperature

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Automatic refilling device

Betriebsanleitung · Manual de instrucciones · 사용 설명서 · Инструкция по эксплуатации · Kullanım talimatı · 操作说明书 · Betriebsanleitung · Manual de instrucciones · 사용 설명서 · Инструкция по эксплуатации · Kullanım talimatı · 操作说明书 · Betriebsanleitung · Manual de instrucciones · 사용 설명서 · Инструкция по эксплуатации · Kullanım talimatı · 操作说明书

This documentation does not contain a device-specific technical appendix.

You can request the full installation guide from info@huber-online.com. Please give the model designation and serial number of your temperature control unit in your e-mail.

huber



OPERATION MANUAL

Automatic refilling device

Automatic refilling device

This operation manual is a translation of the original operation manual.

VALID FOR:

**HUBER temperature control units
in conjunction with a
Bath vessel (externally open application)**

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V1.2.0en/12.01.24

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Foreword

Dear Customer,

Thank you for choosing accessories from Peter Huber Kältemaschinenbau SE. You made a good choice. Thank you for your trust.

Please read the operation manual carefully before putting the unit into operation. Strictly follow all notes and safety instructions.

Follow this operation manual for transport, start-up, operation, maintenance, repair, storage and disposal.

We fully warrant the accessory for the specified normal operation.

In this operation manual, the component listed on page 5 is referred to as accessory, and Peter Huber Kältemaschinenbau SE as Huber company or Huber.

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1 Introduction

1.1 Identification / symbols in the operation manual

The following identifications and symbols are used in the texts and illustrations.

Overview	Identification / symbol	Description
	→	Reference to information / procedure.
	»TEXT«	Reference to a chapter in the operation manual. In the digital version, the text is clickable.
	>TEXT< [NUMBER]	Reference to the wiring diagram in the annex. The designation and the search digit are specified.
	>TEXT< [LETTER]	Reference to a drawing in the same paragraph. The designation and the search digit are specified.
	▪	List, first level
	–	List, second level

1.2 Information on the EU Declaration of Conformity

The equipment complies with the basic health and safety requirements of the European Directives listed below:

- Machinery Directive
- Low Voltage Directive
- EMC Directive

1.3 Safety

1.3.1 Symbols used for Safety Instructions

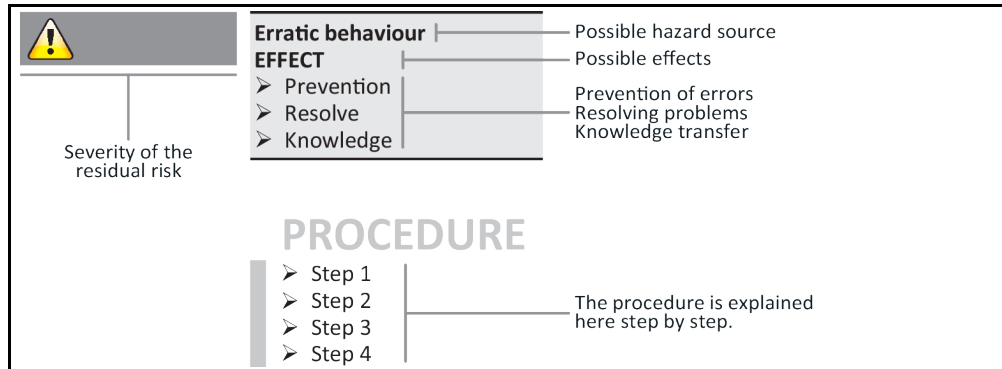
Safety instructions are marked by the below combinations of pictograms and signal words. The signal word describes the classification of the residual risk when disregarding the operation manual.

DANGER	Denotes an immediate hazardous situation that will result in death or serious injuries.
WARNING	Denotes a general hazardous situation that may result in death or serious injuries.
CAUTION	Denotes a hazardous situation that can result in injury.
NOTE	Denotes a situation that can result in property material damage.
INFORMATION	Denotes important notes and usable hints.



Notes in conjunction with Ex px cabinets.

Safety information and procedure



The safety information in this operation manual is designed to protect the operating company, the operator and the equipment from damage. First inform yourself about any residual risks due to misuse before you start an operation.

1.3.2 Representation of symbols on the accessory

The following pictograms are used as safety identifiers. The table gives an overview of the safety identifiers used here.

Identifier	Description
Mandatory sign	
	- Observe the instructions
Warning sign	
	- General warning sign - Observe the instructions
	- Warning of electrical voltage
	- Warning of hot surface
	- Warning of flammable substances
Miscellaneous	
	Follow the national and local instructions for the disposal of electrical appliances. → Page 32, section »Disposal«

1.3.3 Safety during commissioning

The following chapters are relevant for accessories in connection with a Huber temperature control unit, and apply in addition to the operation manual of the temperature control unit used here. If you have any questions, please contact our Customer Support. → Page 32, section »Contact data«. Keep this operation manual for future reference.

1.3.4 Extension of specified normal operation



DANGER

The accessories are operated in a potentially explosive area

DEATH FROM EXPLOSION

- Do NOT install or start up the accessories within an ATEX zone.



WARNING

Improper use

SEVERE INJURIES AND MATERIAL DAMAGE

- Keep the operation manual easily accessible in the immediate vicinity of the temperature control unit and/or the accessories.
- Only adequately qualified operators may work with the temperature control unit and/or the accessories.
- Operators must be trained before handling the temperature control unit and/or its accessories.
- Check to ensure that the operators have read and understood the operation manual.
- Define precise responsibilities of the operators.
- Personal protective equipment must be provided to the operators.
- Be sure to follow the safety rules of the responsible body to protect life and limb and to limit damages!

NOTE

Modifications to the accessory by third-parties

DAMAGE TO THE ACCESSORY AND THE TEMPERATURE CONTROL UNIT

- Do not allow third parties to make technical modifications to the accessories.
- Any modification that is not approved by Huber invalidates all EU Declarations of Conformity for the accessories.
- Only specialists trained by Huber may carry out modifications, repairs or maintenance work.
- **It is imperative to observe:**
- Only use the accessories in a fault-free condition!
- Have the start-up and repairs carried out by specialists only!
- Do not ignore, bypass, dismantle or disconnect any safety devices!

When properly installed at the temperature control unit, the accessory can automatically refill the temperature control unit to maintain the level in the temperature control unit. The accessory itself can **not** be used without being connected to the temperature control unit. Otherwise the intended use as described in the temperature control unit's operation manual applies.

1.3.5 Reasonably foreseeable misuse



Without an Ex px cabinet, the temperature control unit / accessory is **NOT** protected against explosion and must **NOT** be installed or put into operation within an ATEX Zone. Only the temperature control unit specified on the rating plate of the Ex px cabinet (model and serial number) is suitable for operation inside the Ex px cabinet. When operating the temperature control unit / accessory in conjunction with an Ex px cabinet, the information in the annex (section ATEX operation) must be observed and followed. This annex is only provided for temperature control units / accessories delivered in conjunction with an Ex px cabinet. If this annex is missing, please immediately contact the Customer Support. → Page 32, section »Contact data«.

Use with medical devices (e.g. in Vitro diagnostic procedure) or for direct foodstuff temperature control is **NOT** permissible.

The temperature control unit / accessory **must not be used** for any purposes other than temperature control in accordance with the operation manuals.

The manufacturer accepts **NO** liability for damage caused by **technical modifications** to the temperature control unit / accessory **improper handling** or use of the temperature control unit / accessory if the operation manuals are **not observed**.

1.4 Responsible bodies and operators – Obligations and requirements

1.4.1 Obligations of the responsible body

Keep the operation manual easily accessible in the immediate vicinity of the accessories. Only adequately qualified operators (e.g. machine operators, chemists, chemical technical assistants, physicist etc.) are allowed to work with the accessories. Operators must be trained before handling the accessories. Check that the operators have read and understood the operation manual. Define precise responsibilities for the operators. Personal protective equipment must be provided to the operators.

- The responsible body must install a condensation water / thermal fluid drip tray below the temperature control unit (including accessories).
- The use of a drip tray may be prescribed by national legislation for the installation area of the temperature control unit (incl. accessory). The responsible body must check and apply the national regulations applicable for it accordingly.
- The temperature control unit (including accessory) complies with all applicable safety standards.
- Your system, which uses our temperature control unit (including accessory), must be equally safe.
- The responsible body must design the system to ensure it is safe.
- Huber is not responsible for the safety of your system. The responsible body is responsible for the safety of the system.
- Whilst the temperature control unit (including accessory) provided by Huber meets all the applicable safety standards, integration into a system may give rise to hazards that are characteristic of the other system's design and beyond the control of Huber.
- It is the responsibility of the system integrator to ensure that the overall system into which this temperature control unit (including accessory) is integrated is safe.
- The **>Mains isolator<** [36] on the temperature control unit/accessory can be locked in the off position to facilitate safe system installation and maintenance of the temperature control unit (including accessory). Accessories with own power supply must be **additionally** disconnected from the power grid connection! It is the responsibility of the responsible body to develop any lock-out/tag-out procedure for the energy source in accordance with local regulations (e.g. CFR 1910.147 for the US).

1.4.1.1 Proper disposal of resources and consumables

Do comply with all national disposal regulations applicable for you. Contact your local waste management company for any questions concerning disposal.

Overview	Material / Aids	Disposal / Cleaning
	Packaging material	Keep the packaging material for future use (e.g. transport).
	Thermal fluid	Please refer to the safety data sheet of the thermal fluid used for information on its proper disposal. Use the original thermal fluid container when disposing it.
	Filling accessories, e.g. beaker	Clean the filling accessories for reuse. Make sure that the materials and cleaning agents used are properly disposed of.
	Aids such as towels, cleaning cloths	Tools used to take up spilled thermal fluid must be disposed of in the same fashion as the thermal fluid itself. Tools used for cleaning must be disposed of depending on the cleaning agent used.
	Cleaning agents such as stainless steel cleaning agents, sensitive-fabrics detergents	Please refer to the safety data sheet of the cleaning agent used for information on its proper disposal. Use the original containers when disposing of large quantities of cleaning agents.

Material / Aids	Disposal / Cleaning
Consumables such as air filter mats, temperature control hoses	Please refer to the safety data sheet of the consumables used for information on their proper disposal.

1.4.2 Requirements for operators

Work on the temperature control unit / accessory is reserved for appropriately qualified specialists, who have been assigned and trained by the responsible body to do so. Operators must be at least 18 years old. Persons under the age of 18 years may operate the temperature control unit / accessory only under the supervision of a qualified specialist. The operator is responsible for other people within the unit's working range.

1.4.3 Obligations of the operators

Carefully read the operation manual before you handle the temperature control unit / accessories. Always observe the safety instructions. Wear appropriate personal protective equipment (e.g. safety goggles, protective gloves, non-slip shoes) when operating the temperature control unit / accessories.

1.5 General information

1.5.1 Description of workstation

The workstation is located at the control panel in front of the temperature control unit. The workstation is determined by the customer's connected peripheries. Accordingly, it must be designed safe by the responsible body. The workstation design also depends on the applicable requirements of the German occupational health and safety regulations [BetrSichV] and the risk analysis for the workstation.

1.5.2 Safety devices to DIN 12876

The rating of your temperature control unit is stated on the data sheet in the appendix.

Rating of laboratory thermostats and laboratory baths

Classification	Temperature control medium	Technical requirements	Identification ^{d)}
I	Non-combustible ^{a)}	Overheat protection ^{c)}	NFL
II	Combustible ^{b)}	Adjustable overheat protection	FL
III	Combustible ^{b)}	Adjustable overtemperature protection and additional low-level protection	FL

^{a)} Usually water; other fluids only if non-combustible even within the temperature range of an individual fault.
^{b)} The temperature control media must have a fire point of ≥ 65 °C.
^{c)} The overheat protection can, for instance, be realized using a suitable fill level sensor or a suitable temperature limiter.
^{d)} Optional at the choice of the manufacturer.

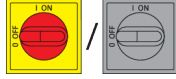
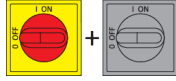
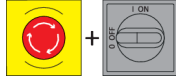
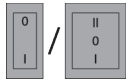
1.5.3 Further protective devices

INFORMATION

Emergency strategy – interrupt the power grid connection!

To determine the type of switch used or the switch combination installed, please refer to the connection sketch. → From page 33, section »Annex«.

Overview of switch types

Switch	Designation	Interrupting the power grid connection
	>Mains isolator< [36] (red-yellow) or >Mains isolator< [36] (grey)	Turn the >Mains isolator< [36] to the "0" position.
	>Mains isolator< [36] (red-yellow) and additional >Appliance switch< [37] (gray):	Turn the >Mains isolator< [36] to the "0" position, then the >Appliance switch< [37] to the "0" position.
	>Emergency stop switch< [70] (red-yellow) and >Mains isolator< [36] (gray):	Press the >Emergency stop switch< [70], then set the >Mains isolator< [36] to the "0" position.
	>Power switch< [37]	Power connection via socket: Pull the plug, then set the >Power switch< [37] to the "0" position. Connection via hard wiring: Use the building's circuit breaker, then set the >Power switch< [37] to the "0" position.
–	Without a switch or inside a protective housing	Power connection via socket: Pull the plug. Power connection via hard wiring: Use the building's circuit breaker.

2 Commissioning

2.1 In-plant transport

CAUTION

Accessories are not transported / moved in accordance with the specifications in these operation manual

INJURIES DUE TO CRUSHING

- Always transport / move accessories in accordance with the specifications in these operation manual.
- Wear personal protective equipment during transport.

CAUTION

The temperature control unit is transported / moved when the accessory is installed

INJURIES CAUSED BY TILTING THE TEMPERATURE CONTROL UNIT

- Remove the accessory before the temperature control unit is transported / moved.

NOTE

Transport of filled temperature control unit and/or accessory

MATERIAL DAMAGE DUE TO OVERFLOWING THERMAL FLUID

- Only transport empty temperature control unit and/or accessory.

Accessories installed at the factory:

- Protect accessories from transport damage.
- Observe the specifications in the operation manual of the temperature control unit.

Independent accessory:

- If available, use the eyes on the top side of the accessory for transportation.
- Use an industrial truck for transportation.
- The casters (if present) on the accessory are not suitable for transportation. The casters are each symmetrically loaded with 25% of the total mass of the accessory.
- Remove the packing material (e.g. the palette) only at the place of installation.
- Protect accessory from transport damage.
- Do not transport the accessory alone and without aids.
- Check the load bearing capacity of the transportation route and the place of installation.
- The parking brakes must be activated at the casters before the accessory is put into operation.

2.1.1 Lifting and transporting the accessories

2.1.1.1 Accessories without lifting eyes

- Do not lift and transport the accessory on your own and without aids.
- Lift and transport the accessory only with an industrial truck.
- The industrial truck must have a lifting force equal to or greater than the weight of the accessory. You will find the weight of the accessory on the data sheet. → From page 33, section »Annex«.

2.1.2 Positioning the accessories

2.1.2.1 Accessories with casters

- Do NOT use the casters for transportation to the place of installation. → Page 16, section »Lifting and transporting the accessories«.
- Use the casters only for positioning at the place of installation.
- Only move the accessory on the casters when the surface is level, without gradient, non-slip and stable.
- Do not move the accessory on your own.
- At least 2 persons are required to move the accessory on the casters. If the total weight of the accessory exceeds 500 kg, at least 5 persons are required to move the accessory on the casters.
- The parking brakes at the casters must be activated before the accessory is put into operation.

2.1.2.2 Accessories without casters

- An industrial truck must be used for positioning the accessory.
- Do not move the accessory on your own.
- **At least 2 persons** are required to move the accessory.
- The industrial truck must have a lifting force equal to or greater than the weight of the accessory. You will find the weight of the accessory on the data sheet. → From page 33, section »Annex«.

2.2 Unpacking



WARNING

Commissioning damaged accessories

DANGER TO LIFE FROM ELECTRIC SHOCK

- Do not start up damaged accessories.
- Please contact Customer Support. → Page 32, section »Contact data«.

PROCEDURE

- Check for damage to the packaging. Damage can indicate property damage to the accessory.
- Check for any transport damage when unpacking the accessory.
- Exclusively contact your forwarding agent regarding the settlement of claims.
- Observe the proper disposal of packaging material. → Page 13, section »Proper disposal of resources and consumables«.

2.3 Ambient conditions



CAUTION

Unsuitable ambient conditions / unsuitable installation

SERIOUS INJURY DUE TO CRUSHING

- Comply with all requirements! → Page 17, section »Ambient conditions« and → Page 18, section »Installation conditions«.

INFORMATION

Make sure there is adequate fresh air available at the site for the accessory. The warm exhaust air must be able to escape upwards unhindered.

Use of the accessory is permitted only under normal ambient conditions in accordance with the currently valid DIN EN 61010-1.

- Use only indoors. The illuminance must be at least 300 lx.
- Installation altitude up to 2,000 meters above sea level.
- Maintain wall and ceiling clearance for adequate air exchange (dissipation of waste heat, supply of fresh air for the accessory and work area). Ensure adequate floor clearance for air-cooled accessories. Do not operate the accessory from within the box or with an inadequately dimensioned bath as this inhibits the air exchange.
- Ambient temperature values are provided on the technical data sheet; to ensure trouble-free operation, compliance with the ambient conditions is mandatory.
- Relative humidity max 80% to 32 °C and 40 °C decreasing linearly to 50%.
- Short distance to supply connections.
- The accessory must not be installed so as to hinder or prevent access to the disconnecting device (to the power grid).
- For the magnitude of the mains voltage fluctuations, refer to the datasheet. → From page 33 in the section »Annex«.
- Transient surges, as would normally occur in the power supply system.
- Installation Class 3
- Applicable degree of soiling: 2.
- Surge category II.

Wall clearances

Side	Distance in cm
Top	free standing
Front	min. 20
Right	min. 20
Left	min. 20
Rear	min. 20

2.3.1 EMC-specific notes

INFORMATION

Connecting cables in general

Prerequisites for a failure-free operation of the temperature control units/accessories incl. their connections with external applications: Installation and wiring must be carried out professionally. Related topics: "Electrical safety" and "EMC-compliant wiring".

Cable lengths

For flexible/fixed cable routing of more than 3 meters, the following must amongst other things be observed:

- Equipotential bonding, grounding (see also technical data sheet "Electromagnetic compatibility EMC")
- Compliance with "external" and/or "internal" lightning/overvoltage protection.
- Design protection measures, professional cable selection (UV resistance, steel pipe protection, etc.)

Attention:

The operating company is responsible for compliance with national/international directives and laws. This also includes the testing of the installation/wiring required by law or standards.

This device is suitable for operation in "industrial electromagnetic environments". It meets the "immunity requirements" of the currently applicable EN61326-1, which are required for this environment.

It also meets the "interference emission requirements" for this environment. It is a **Group 1** and **Class A** device according to the currently applicable EN55011.

When operating the temperature control unit in another environment, its electromagnetic compatibility can in rare cases not be ensured.

Group 1 specifies that high frequency (HF) is only used for the function of the device. **Class A** defines the interference emission limits to be observed.

2.4 Installation conditions

WARNING

The accessory is put onto the power supply line

DEATH FROM ELECTRICAL SHOCK BY DAMAGE TO THE POWER CABLE.

➤ Do not put the accessory on power cables.

- Allow the accessory to acclimate for about 2 hours when changing from a cold to a warm environment (or vice versa). Do not turn on the accessory beforehand!
- Install upright, stable and without tilt.
- Use a non-combustible, sealed foundation.
- Keep the environment clean: Prevent slip and trip hazards.
- Wheels, if installed, must be locked after installation!
- Spilled/leaked thermal fluid must be disposed of immediately and correctly. Observe the proper disposal of thermal fluid and aids. → Page 13, section »Proper disposal of resources and consumables«.
- Observe the ambient conditions.

2.5 Recommended temperature control hoses



Use of unsuitable/defective hoses and/or hose connections

INJURIES

- Pay attention to the permissible pressure and temperature range when selecting temperature control hoses.
- Use appropriate hoses and/or hose connections.
- Check periodically for leaks and the quality of the hoses and hose connections and take suitable measures (replace) as required.
- Isolate and protect temperature control hoses against contact/mechanical load.



Hot or cold thermal fluid and surfaces

BURNS TO LIMBS

- Avoid direct contact with the thermal fluids or the surfaces.
- Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).



Uncontrolled formation of ice at the connections and hoses of the thermal fluid circuit

RISK OF SLIPPING AND OVERTURNING

- If the temperature is controlled in the minus range, ice forms at the hoses and connections of the thermal fluid circuit. This occurs by condensing and freezing of atmospheric humidity.
- Check the thickness of the ice formation. Too much ice increases the risk of the accessories tipping over. Secure the accessories against tipping over if this is the case.
- Check the ground below the ice formation for condensation water. Collect the condensation water with a suitable container or thoroughly remove it at regular intervals. You thus prevent the danger of slipping caused by condensation.

To connect applications, use only temperature control hoses that are compatible with the thermal fluid used.

- We recommend you use only temperature-insulated temperature control hoses with your accessory. The user is responsible for the insulation of connection valves.

2.6 Wrench sizes and torques

Observe the proper wrench sizes for the thermal fluid connection at the accessory. The following table lists the thermal fluid connections and the resulting wrench sizes, as well as the torque values. Always perform a leak test afterwards and re-tighten the connections if required. The values of the maximum torque (see table) must **not** be exceeded.

Overview
wrench sizes and
torques

Connection	Sleeve nut wrench size	Connector wrench size	Recommended torques in Nm	Maximum torques in Nm
M16x1	19	17	30	35
M24x1.5	27	27	47	56
M30x1.5	36	32	79	93
	36	36	79	93
M38x1.5	46	41/46	130	153
M45x1.5	50	50	200	210
G-thread (flat-sealing)	Adapt the torque to the material of the flat seal used. First hand-tighten the temperature control hose. When using adapter pieces, do not overtighten the G-thread on the pump connection when connecting a temperature control hose. When connecting a temperature control hose to the adapter piece, secure the G-thread against overtightening.			

2.7 Preparations for operation

2.7.1 Installing the accessory

NOTE

Operating the accessory without a pressure reducer

PROPERTY DAMAGE CAUSED BY FLOODING THE ROOMS

- A pressure reducer **must** be installed when using the accessory. The pressure reducer must be adjusted so that the feed rate is not greater than the max. discharge rate of the **>Overflow< [12]**.

NOTE

Using water with additives as thermofluid and connecting the >Overflow< [12] to the urban sewage system

ENVIRONMENTAL DAMAGE

- If the thermofluid does not only consist of **pure water**, the **>Overflow< [12]** must not be connected to the urban sewage system.
- If the thermofluid consists of **water with additives**: Collect the overflowing thermofluid in suitable containers and dispose of it properly.

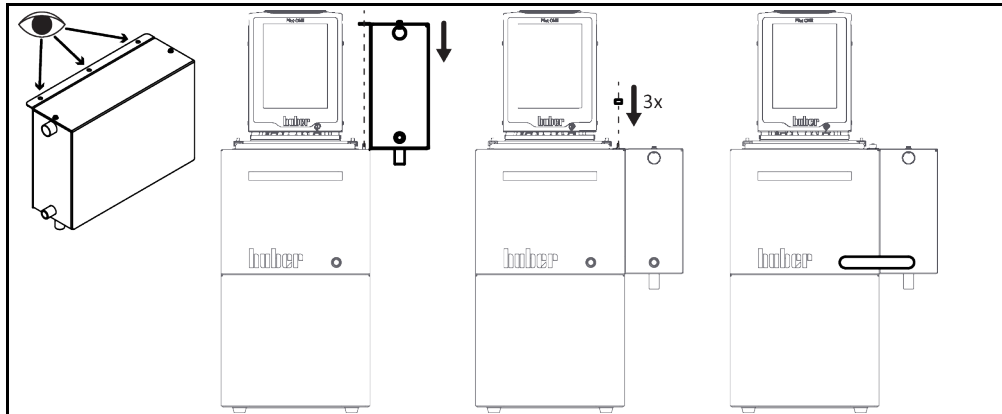
The accessory ensures that the level of the thermofluid (water) is maintained in the temperature control unit.

INFORMATION

The accessory can be used only in conjunction with an **>Overflow< [12]**. There may be temperature variations if large amounts of fresh water are added too fast.

The pressure reducer must be adjusted for filling. Ensure that the full amount of water can be drained through the **>Overflow< [12]** if the water supply is permanently open. → Page 24, section **»Filling, venting and draining«**.

Installation of the accessory on the example of a cooling bath



PROCEDURE

- Check that the knurled screw has been mounted at the **>Drain< [8]** on the accessory.
- Connect the outlet **>Drain< [8]** on the temperature control unit to the **>Connection for extra expansion vessel< [20]** on the accessory.
- Connect the outlet **>Overflow< [12]** on the accessory with the building's discharge system.
- Install a pressure reducer on the building's water supply.
- Connect the outlet **>Feed (fresh water)< [79]** on the accessory to the pressure reducer.
- Do **not** open the building's water supply shut-off valves.

2.7.2 Connecting the functional ground

PROCEDURE

- If required, connect the **>functional ground terminal< [87]** on the accessory with the building grounding point. Use a ground strap for this purpose. For the exact position and thread size please refer to the wiring diagram. → From page 33, section **»Annex«**.

2.8 Connecting to the power supply

INFORMATION

Based on local circumstances, it may be that you need to use an alternative power cable instead of the supplied original power cable. Do not use a power cable that is longer than **3 m** to be able to disconnect the accessory from the mains at any time. Have the mains cable only installed by a qualified electrician.

2.8.1 Connection using socket with protective earth (PE)

DANGER

Connecting to a power socket without protective earth (PE)

MORTAL DANGER FROM ELECTRIC SHOCK

- Always connect the accessory to safety sockets (PE).

DANGER

Damaged power cable/power cable connection

MORTAL DANGER FROM ELECTRIC SHOCK

- Do not start up the accessory.
- Isolate the accessory from the power supply.
- Have the power supply cable/power supply connection replaced and inspected by an electrician.
- Do not use a power cable that is longer than **3 m**.

NOTE

Incorrect power supply connection

DAMAGE TO THE ACCESSORY

- Your building's existing power supply voltage and frequency must match the data provided on the rating plate of the accessory.

INFORMATION

In case of uncertainties about an existing protective earth (PE), have the connection inspected by an electrician.

PROCEDURE

- Connect the **>Power supply<** [35] on the **accessory** with the building's power supply. The cable required is included. The automatic refilling device starts running and starts refilling once the accessory is connected to the power supply. Make sure the building's water supply is open.

3 Function description

3.1 Function description of the accessory

3.1.1 General functions

The accessory ensures that the level of the thermofluid (water) is maintained in the temperature control unit.

3.2 Information on the thermal fluids

CAUTION

Non-compliance with the safety data sheet for the thermal fluid to be used

INJURIES

- Risk of injury to the eyes, skin, respiratory tract.
- The safety data sheet for the thermal fluid to be used must be read prior to using it and its content must be respected.
- Observe the local regulations/work instructions.
- Wear your personal protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).
- Danger of slipping because floor and work area are contaminated. Clean the workplace; observe the proper disposal of thermal fluid and aids. → Page 13, section »Proper disposal of resources and consumables«.

NOTE

Non-compliance with the compatibility between the thermal fluid and your temperature control unit / accessory

MATERIAL DAMAGE

- Observe the classification of your temperature control unit / accessory according to DIN 12876.
- Ensure the following materials are resistant to the thermal fluid: Stainless steel 1.4301/ 1.4401 (V2A), copper, nickel, FKM, red bronze/brass, silver solder and plastic.
- The maximum viscosity of the thermal fluid must not exceed 50 mm²/s at the lowest working temperature!
- The maximum density of the thermal fluid may not exceed 1 kg/dm³!

NOTE

Mixing different thermofluids in a thermal fluid circuit

PROPERTY DAMAGE

- Do **not** mix different types of thermofluid (such as mineral oil, silicone oil, synthetic oil, water, etc.) in a thermofluid circuit.
- The thermal fluid circuit **must** be rinsed when changing from one type of thermal fluid to another. No residues of the previous type of thermal fluid may remain in the thermal fluid circuit.

Thermal fluid: Water

Designation	Specification
Calcium carbonate per liter	≤ 1.5 mmol/l; corresponds to a water hardness of: ≤ 8.4 °dH (soft)
pH value	between 6.0 and 8.5
Ultrapure water, distillates	Add 0.1 g of sodium carbonate (Na ₂ CO ₃) per liter
Non-approved water	Distilled, deionized, demineralized, chloric, ferruginous, ammoniacal, contaminated or untreated river water or sea water
Volume circulated (at least)	3 l/min. (not valid for cooling baths)
Thermal fluid: Water without ethylene glycol	
Use	≥ +5 °C
Thermal fluid: Water-ethylene glycol mixture	
Use	< +5 °C
Thermal fluid composition	The mixture's temperature must be 10 K below the permissible min. temperature. For the permissible temperature range, refer to the datasheet. → From page 33, section »Annex«.

INFORMATION We recommend the ethylene glycols listed in the Huber catalogue.

3.3 To be noted when planning the test

INFORMATION Please also note: → Page 12, section »Extension of specified normal operation«.

The focus is on your application. Bear in mind that system performance is influenced by heat transfer, temperature, thermal fluid viscosity, volume flow, and flow speed.

- Make sure that the electrical connection is adequately dimensioned.
- The installation location of the temperature control unit /accessory should be selected so as to ensure adequate fresh air, even with water-cooled chillers.
- Cross-section reduction or shut-off in the thermal fluid circuit must be avoided.
- Select the thermal fluid to be used in such a way that it not only permits the minimum and maximum working temperature but is also suitable with regard to fire point, boiling point and viscosity. In addition, the thermal fluid must be compatible with all the materials in your system.
- Avoid bending the temperature control hoses. Use suitable angle pieces and lay the hose connections with a large radius. Take the minimum bending radius from the data sheet of the temperature control hoses used.
- The selected hose connections must be able to withstand the thermal fluid, the working temperatures and the admissible maximum pressure.
- Check the hoses at regular intervals for any material fatigue (e.g. cracks, leaks).
- Only valid for continuous-operation cooling baths: Water as well as water and anti-freeze mixes must not be used as thermal fluids!
- Basically, you should only use the thermal fluids recommended by the manufacturer and only within the usable temperature and pressure range.
- Fill the temperature control unit slowly, carefully and steadily. Wear the necessary personal protective equipment, such as goggles, heat-proof and chemical-resistant gloves, etc.

4 Setup mode

4.1 Setup mode

CAUTION

Moving the accessory during operation
SERIOUS BURNS/FREEZING DUE TO HOUSING PARTS/ESCAPING THERMAL FLUID
 ➤ Do not move the accessory when in operation.

4.1.1 Switching the accessory on / off

The accessory is turned on by connecting it to the power supply and can only be turned off by disconnecting it from the power supply.

Start/Stop the temperature control unit as described in the operation manual of the temperature control unit.

4.2 Filling, venting and draining

Observe the wiring diagram. → From page 33, section »Annex«.

CAUTION

Extremely hot / cold surfaces, connections and thermal fluids
BURNS/FREEZING OF LIMBS
 ➤ Surfaces, connections and tempered thermal fluids can be extremely hot or cold depending on the operating mode.
 ➤ Avoid direct contact with surfaces, connections and thermal fluids!
 ➤ Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles).

NOTE

During an active circulation, the thermal fluid circuit is shut off by shut-off valves
MATERIAL DAMAGE TO THE CIRCULATING PUMPS INSTALLED IN THE TEMPERATURE CONTROL UNIT
 ➤ Do not close the thermal fluid circuit during an active circulation by means of shut-off valves.
 ➤ Warm the thermal fluid to room temperature before stopping the circulation.

4.2.1 Filling, venting, degassing and draining the bath thermostat

CAUTION

Non-compliance with the safety data sheet for the thermal fluid to be used
INJURIES
 ➤ Risk of injury to the eyes, skin, respiratory tract.
 ➤ The safety data sheet for the thermal fluid to be used must be read prior to using it and its content must be respected.
 ➤ Observe the local regulations/work instructions.
 ➤ Wear your personal protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).
 ➤ Danger of slipping because floor and work area are contaminated. Clean the workplace; observe the proper disposal of thermal fluid and aids. → Page 13, section »Proper disposal of resources and consumables«.

NOTE

Operating the accessory without a pressure reducer
PROPERTY DAMAGE CAUSED BY FLOODING THE ROOMS
 ➤ A pressure reducer **must** be installed when using the accessory. The pressure reducer must be adjusted so that the feed rate is not greater than the max. discharge rate of the **>Over-flow<** [12].

4.2.1.1 Filling of bath thermostat

- Please observe any measures that may be required during filling, e.g. grounding the container, the funnel and other aids.
- Fill from the lowest possible height.
- Permanently monitor the initial filling with the accessory.
- Please also note: → Page 20, section »Installing the accessory«.

PROCEDURE

- Connect the accessory to the power supply.
- Open the building's shut-off valves of the water feed line to the accessory. The accessory starts filling the temperature control unit immediately. Excess thermofluid (water) discharges through the >Overflow< [12]. The amount of water introduced will not be completely discharged through the >Overflow< [12] if the pressure regulator is set too high. If this is the case, reduce the amount of water at the pressure reducer.
- Continue filling as described in the operation manual of your temperature control unit.
- Disconnect the accessory from the power supply when the filling operation is complete.
- Close the building's shut-off valves of the water feed line to the accessory.

4.2.1.2 Draining the bath thermostat**CAUTION****Hot or very cold thermal fluid****SEVERE BURNS/FROSTBITE OF LIMBS**

- Before draining, ensure that the thermal fluid has room temperature (20 °C).
- If, at this temperature, the thermal fluid is too viscous to be drained: Control the temperature of the thermal fluid for a few minutes until the viscosity will allow drainage. Never control the temperature of the thermal fluid when the drain is open.
- Danger of burns when draining thermal fluids at temperatures above 20 °C.
- Wear your Personal Protective Equipment for draining.
- Only drain using suitable drainage hose and collecting container. These must be compatible with the thermal fluid and its temperature.

PROCEDURE

- Close the building's shut-off valves of the water feed line to the accessory.
- Disconnect the accessory from the power supply.
- Continue draining as described in the operation manual of your temperature control unit.
- Open the >Drain< [8] on the accessory after emptying the temperature control unit. As soon as you have opened the knurled screw at the >Drain< [8] the remaining thermal fluid will drain. Collect it and dispose of it properly. → Page 13, section »Proper disposal of resources and consumables«.
- Close the >Drain< [8] on the accessory after fully emptying the temperature control unit.

5 Normal operation

5.1 Automatic operation

CAUTION

Extremely hot / cold surfaces, connections and thermal fluids

BURNS/FREEZING OF LIMBS

- Surfaces, connections and tempered thermal fluids can be extremely hot or cold depending on the operating mode.
- Avoid direct contact with surfaces, connections and thermal fluids!
- Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles).

NOTE

During an active circulation, the thermal fluid circuit is shut off by shut-off valves

MATERIAL DAMAGE TO THE CIRCULATING PUMPS INSTALLED IN THE TEMPERATURE CONTROL UNIT

- Do not close the thermal fluid circuit during an active circulation by means of shut-off valves.
- Warm the thermal fluid to room temperature before stopping the circulation.

5.1.1 Temperature control

5.1.1.1 Starting the temperature control process

The temperature control process can be started only after the temperature control unit and the accessory have been started. Prerequisite: The temperature control unit is filled and the accessory is connected to the building's water supply.

PROCEDURE

- Connect the accessory to the power supply.
- Open the building's shut-off valves of the water feed line to the accessory.
- Continue as described in the operation manual of your temperature control unit.

5.1.1.2 Ending the temperature control process

The temperature control process can be ended at any time. The temperature control process in the connected temperature control unit continues to run after turning off the accessory. The temperature control process in the connected temperature control unit must be stopped separately.

PROCEDURE

- Stop the temperature control process as described in the operation manual of your temperature control unit.
- Close the building's shut-off valves of the water feed line to the accessory.
- Disconnect the accessory from the power supply.

6 Service/maintenance

6.1 Electrical fuse

Position of fuses (exemplary layout)



The thermal overcurrent circuit breakers for all-pole disconnection (L and N) are located at the back. In case of a fault (no function and/or no display) please first check if the overcurrent circuit breakers have tripped. If the overcurrent circuit breakers trigger again immediately after reversing, please unplug the power cord and contact Customer Support immediately. → Page 32, section »Contact data«.

6.2 Maintenance



Cleaning/maintenance while the temperature control unit and the accessory are operating
MORTAL DANGER FROM ELECTRIC SHOCK

- Stop an ongoing temperature control process.
- Adjust the temperature of the thermal fluid to room temperature after switching off.
- Disconnect the temperature control unit and the accessory from the power supply.



Carrying out maintenance work not described in this operation manual

MATERIAL DAMAGE TO THE ACCESSORY

- Please contact Huber for maintenance work that is not described in these operating instructions.
- Maintenance work not described in these operating instructions is reserved for qualified specialists trained by Huber.
- Safety-relevant components may only be replaced by equivalent components. The specified safety values for the respective component must be observed.

6.2.1 Function check and visual inspection

Control intervals

Cooling*	Description	Maintenance interval	Comment	Person responsible
A/W	Visually inspect hoses and hose connections	Prior to switching on the temperature control unit / accessory	Replace leaking hoses and hose connections before you switch on the temperature control unit / accessory. → Page 28, section »Replacing temperature control hoses«.	Operating company and/or operators
A/W	Check the power cable	Prior to switching on the temperature control unit / accessory or when you change the installation location	Do not start up the temperature control unit / accessory if the power cable is damaged.	Qualified electrician (BGV A3)
A/W	Inspect the temperature control unit / accessory for damage	Every 12 months or after a change of location		Operating company and/or operators

Cooling*	Description	Maintenance interval	Comment	Person responsible
A/W	Exchange safety-relevant electric and electromechanical components	20 years	Have the exchange only carried out by certified personnel (such as Huber service engineers). Please contact Customer Support. → Page 32, section »Contact data«.	Operating company
*A = Air cooling; W = Water cooling				

6.2.2 Replacing temperature control hoses

Replace defective temperature control hoses **before** you switch on the temperature control unit / accessories.

PROCEDURE

- Drain the temperature control unit and accessories. → Page 25, section »Draining the bath thermostat«.
- Replace defective temperature control hoses. Follow the instructions for the proper disposal. → Page 13, section »Proper disposal of resources and consumables«.
- Reconnect your external application as described in the operation manual of your temperature control unit.
- Fill the temperature control unit with thermal fluid as described in the operation manual of the temperature control unit.
- Vent the temperature control unit as described in the operation manual of the temperature control unit.
- Restart the temperature control unit in normal mode.

6.3 Thermal fluid inspection, replacement and circuit cleaning

PROCEDURE

- Do not disconnect the accessory.
- Proceed as described in the operation manual of the temperature control unit when performing the thermal fluid inspection and changing and cleaning the thermal fluid circuit. Please note additionally: → Page 24, section »Filling, venting and draining«.

6.4 Cleaning the surfaces

CAUTION

Extremely hot / cold surfaces, connections and thermal fluids

BURNS/FREEZING OF LIMBS

- Surfaces, connections and tempered thermal fluids can be extremely hot or cold depending on the operating mode.
- Avoid direct contact with surfaces, connections and thermal fluids!
- Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles).

NOTE

Exposed plug contacts

DAMAGE CAUSED BY FLUID INGRESS

- Protect unused plug contacts with the protective caps supplied.
- Clean surfaces only with a damp cloth.

A standard stainless steel cleaning agent is suitable for cleaning the stainless steel surfaces. Carefully clean painted surfaces (damp only) using a solution of sensitive-fabrics detergent. Observe the proper disposal of thermal fluid and aids. → Page 13, section »Proper disposal of resources and consumables«.

6.5 Decontamination/repairs

CAUTION

Returning an accessory for repair that was not decontaminated

PHYSICAL INJURY AND PROPERTY DAMAGE CAUSED BY HAZARDOUS MATERIALS IN OR ON THE ACCESSORY

- Carry out appropriate decontamination.
- The decontamination process depends on the type and quantity of the materials used.
- Consult the relevant safety data sheet.
- You will find a prepared return receipt at www.huber-online.com.

As the responsible body you are responsible for carrying out decontamination **before** third-party personnel come into contact with the accessory. Decontamination must be carried out **before** the accessory is returned for repair or inspection. Attach a clearly visible written notice stating that the accessory has been decontaminated.

To simplify the process, we have prepared a form for you. This is available for download at www.huber-online.com.

7 Shutting down

7.1 Safety instructions and basic principles



DANGER

Connection/adjustment to the power supply not carried out by an electrician and/or connection to a power socket without protective earth (PE)

MORTAL DANGER FROM ELECTRIC SHOCK

- Have the connection/adjustment to the power supply carried out by an electrician.
- Always connect the accessory to safety sockets (PE).



DANGER

Damaged power cable/power cable connection

MORTAL DANGER FROM ELECTRIC SHOCK

- Do not start up the accessory.
- Isolate the accessory from the power supply.
- Have the power supply cable/power supply connection replaced and inspected by an electrician.
- Do not use a power cable that is longer than **3 m**.



WARNING

Risk of tipping due to unstable temperature control unit

SERIOUS INJURY AND PROPERTY DAMAGE

- Avoid risk of tipping due to unstable temperature control unit.



CAUTION

Non-compliance with the safety data sheet for the thermal fluid to be used

INJURIES

- Risk of injury to the eyes, skin, respiratory tract.
- The safety data sheet for the thermal fluid to be used must be read prior to using it and its content must be respected.
- Observe the local regulations/work instructions.
- Wear your personal protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).
- Danger of slipping because floor and work area are contaminated. Clean the workplace; observe the proper disposal of thermal fluid and aids. → Page 13, section »**Proper disposal of resources and consumables**«.



CAUTION

Hot or very cold thermal fluid

SERIOUS BURNS/FREEZING OF LIMBS

- Before draining, ensure that the thermal fluid has room temperature (20 °C).
- If, at this temperature, the thermal fluid is too viscous to be drained: Control the temperature of the thermal fluid for a few minutes until the viscosity will allow drainage.
- Danger of burns when draining thermal fluid at temperatures above 20 °C.
- Wear your personal protective equipment when carrying out the drainage operation.

INFORMATION

All safety instructions are important and must be followed accordingly during working operations!

7.2 Switch-off

PROCEDURE

- Switch off the temperature control unit.
- Disconnect the temperature control unit from the power supply.
- Disconnect the accessory from the power supply.
- Close the building's shut-off valves of the water feed line to the accessory.

7.3 Draining the accessory

PROCEDURE

- Proceed with the draining operation as described in the operation manual of the temperature control unit.
- Drain the accessory. → Page 25, section »Draining the bath thermostat«.

7.4 Uninstalling the accessory

PROCEDURE

- Disconnect the >System fluid filling port< [79] on the accessory from the pressure reducer.
- Remove the pressure reducer from the building's water supply.
- Disconnect the outlet >Overflow< [12] on the accessory from the building's discharge system.
- Disconnect the outlet >Drain< [8] on the temperature control unit from the >Connection for extra expansion vessel< [20] on the accessory.

7.5 Packing

Always use the original packaging! → Page 17, section »Unpacking«.

7.6 Shipping

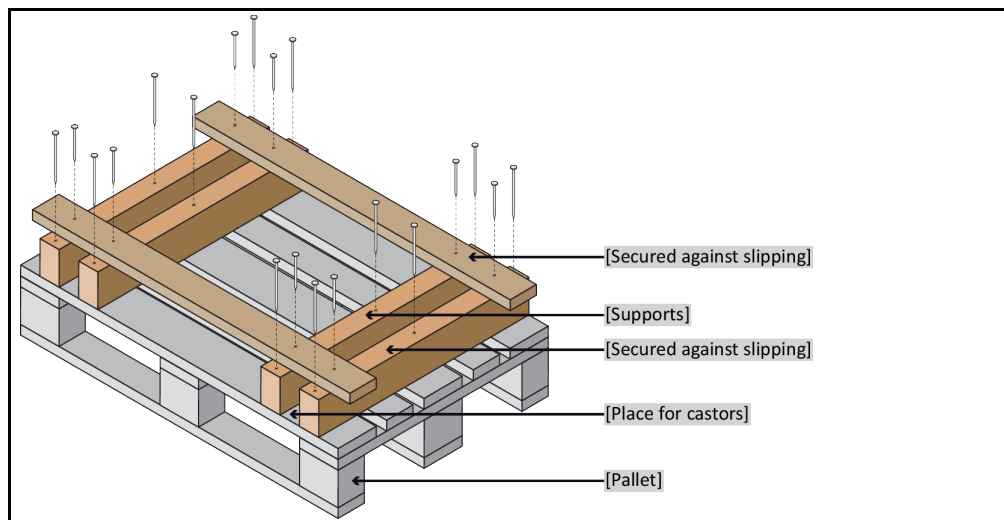
NOTE

Improper transport of accessory

PROPERTY DAMAGE

- Comply with all requirements in this section to avoid damage to the accessory.

Pallet with squared timber for free-standing units



If fitted, use the lugs located on the top of the accessory for transportation. Do not transport the accessory alone and without aids.

- Always use the original packaging for transportation.
- Indicate the upright transport position with arrows on the packaging.
- Always transport the accessories upright on a pallet!
- Protect attachments from damage during transportation!
- During transportation, place the accessories on squared timber to protect the castors/feet.
- Secure with tensioning belts/lashing straps that are suitable for the weight.
- Additionally secure (depending on model) with plastic film, cardboard and straps.

7.7 Disposal

The operating company must observe the national and local regulations for the proper disposal.

Huber temperature control units and Huber accessories are made of high quality, recyclable materials. For example: Stainless steel 1.4301 / 1.4401 (V2A), copper, nickel, FKM, Perbunan, NBR, ceramic, carbon, Al-Oxid, red brass, brass, nickel-plated brass and silver solder. Proper recycling of the temperature control unit and accessories can actively help reduce CO₂ emissions in the production of these materials. Follow the laws and regulations of your jurisdiction when disposing material.

7.8 Contact data

INFORMATION

Please contact your supplier and/or local dealer **before** you return your accessories. The contact information can be found "Contact" on our home page www.huber-online.com. Please have the serial number of the accessories ready. The serial number can be found on the rating plate of the accessories.

7.8.1 Telephone number: Customer Support

If your country is not mentioned in the list below: The responsible service partner can be found on our homepage www.huber-online.com under the heading „Contact“.

- Huber Deutschland: +49 781 9603 244
- Huber China: +86 (20) 89001381
- Huber India: +91 80 2364 7966
- Huber Ireland: +44 1773 82 3369
- Huber Italia: +39 0331 181493
- Huber Swiss: +41 (0) 41 854 10 10
- Huber UK: +44 1773 82 3369
- Huber USA: +1 800 726 4877 | +1 919 674 4266

7.8.2 Telephone number: Sales

Telephone: +49-781-9603-123

7.8.3 Email address: Customer Support

Email: support@huber-online.com

7.9 Clearance certificate

This certificate must be enclosed with the temperature control unit. → Page 29, section »**Decontamination/repairs**«.

8 Annex

Inspired by **temperature** designed for you

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