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Automatic refilling device

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

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V1.1.0en/14.10.20

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Foreword

Dear Customer,

Thank you for choosing accessories from Peter Huber Kältemaschinenbau AG. 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 the operation manual for transport, start-up, operation, maintenance, repair, storage and disposal.

We fully warrant the accessory for the specified normal operation.

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

Liability for errors and misprints excluded.

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1 Introduction

1.1 Details on the declaration of conformity





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

- Machinery Directive
- Low Voltage Directive
- EMC Directive

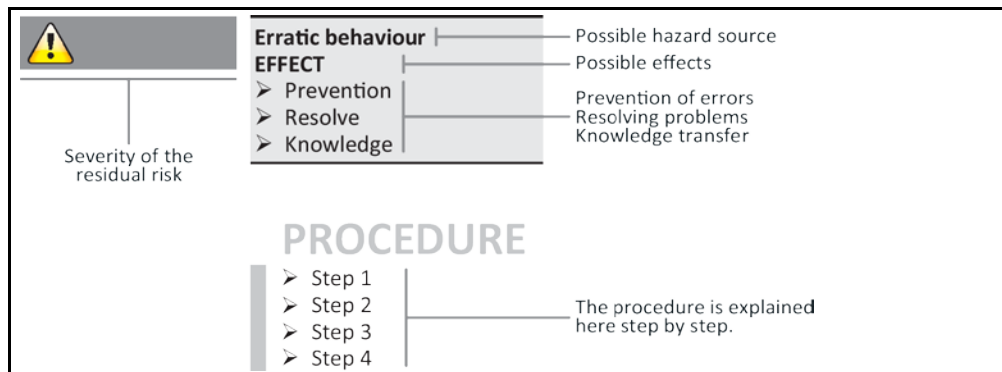
1.2 Safety

1.2.1 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 responsible body, the operator and the equipment from damage. Safety instructions appear at the beginning of each chapter and before instructions. First inform yourself about any residual risks due to misuse before you start an operation.

1.2.2 Representation of safety identifiers

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

1.2.3 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. Please contact our Customer Support (see page 32 in section »Contact data«) if you have any queries. Keep these operation manual for future reference.

1.2.4 Extension of specified normal operation



The accessories are operated in a potentially explosive area
DEATH FROM EXPLOSION
 ➤ Do NOT install or start up the accessories within an ATEX zone.



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.

1.2.5 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. 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 with an Ex px cabinet. If this annex is missing, please immediately contact the Customer Support of Huber (the telephone number is provided on page 32 in 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**.

1.3 Responsible bodies and operators – Obligations and requirements

1.3.1 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.
- The use of a drain tray may be prescribed by national law for the installation area of the temperature control unit (including accessories). The responsible body must check and apply the applicable national regulations.
- Our temperature control unit complies with all applicable safety standards.
- Your system, which uses our temperature control unit, must be as 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.

- Although the temperature control unit 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 is integrated, is safe.
- The >Mains isolator< [36] (if present) may be provided with a facility to lock the main isolator in the off position to facilitate safe system installation and maintenance of the temperature control unit. It is the responsibility of the responsible body to develop any lock-out/tag-out procedure in accordance with local regulations (e.g. CFR 1910.147 for the US).

1.3.1.1 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.

Material / Aids	Disposal / Cleaning
Packing 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.
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.

1.3.2 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.

1.3.3 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.

1.4 General information

1.4.1 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.

1.4.2 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, can be realized using a suitable fill level sensor or a suitable temperature limiter.
^{d)} Optional at the choice of the manufacturer.

1.4.3 Further protective devices

INFORMATION

Emergency strategy – interrupt the power grid connection!

To determine the type of switch or switch combination your accessory is equipped with, please refer to the connection sketch starting on page 33 in section »Annex«.

Accessory with >Main switch< [36] (red/yellow or grey): Turn the >Main switch< [36] to the "0" position.

Accessory with >Main switch< [36] (red/yellow) and additional >Appliance switch< [37] (gray): Turn the >Main switch< [36] to the "0" position. Then turn the >Appliance switch< [37] to the "0" position!

Accessory with >Main switch< [36] (gray) and >Emergency stop switch< [70] (red/yellow): Press the >Emergency stop switch< [70]. Then turn the >Main switch< [36] to the "0" position!

Accessory with >Mains isolator< [37]: Power supply via socket: Disconnect the accessory from the power grid. Then turn the >Mains isolator< [37] to the "0" position! Power supply via hard wiring: Disconnect the power grid supply by means of the building's circuit breaker. Then turn the >Mains isolator< [37] to the "0" position!

Accessory without a switch or inside a protective housing: Connection via socket: Disconnect the accessory from the power grid. Connection via hard wiring: Disconnect the power grid supply by means of 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 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 with lifting eyes

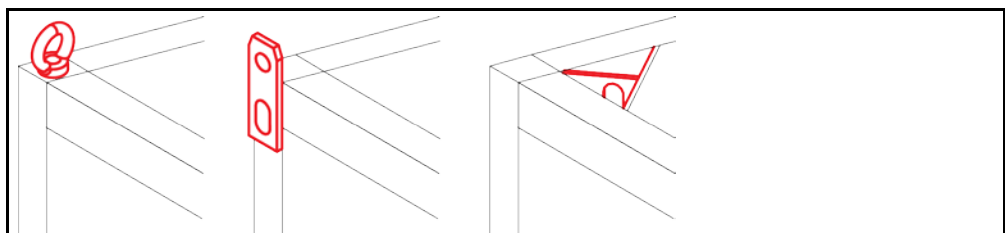
NOTE

The accessories are lifted at the lifting eyes without load handling equipment

DAMAGE TO THE ACCESSORIES

- Always use load handling equipment when lifting and transporting the accessories.
- The lifting eyes are only designed for a load **without** inclination (0°).
- The load handling attachment used must be adequately dimensioned. Take the dimensions and weight of the temperature control unit into account.

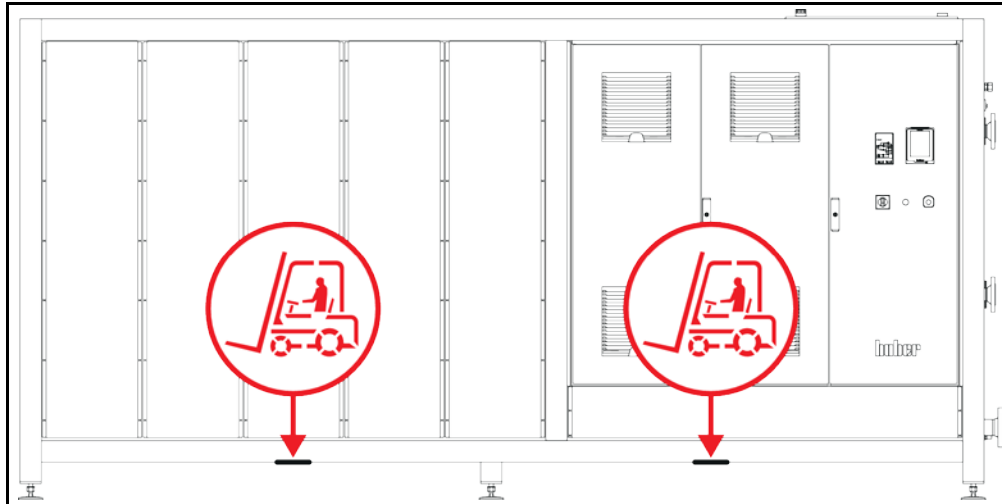
Example: lifting eyes
(round, angular, and
recessed (left to right))



- Never lift and transport the accessory on the lifting eyes on your own and without aids.
- Lift and transport the accessory at the lifting eyes only with a crane or an industrial truck.
- The lifting force of the crane or industrial truck must correspond at least to the weight of the accessory. You will find the weight of the accessory on the data sheet (from page 33 in section »Annex«).

2.1.1.2 Accessories without lifting eyes

Example: Supporting points for forklift arms for free-standing models from a certain overall size. For the exact position please refer to the wiring diagram in the annex.



- 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 in section »Annex«).

2.1.2 Positioning the accessories

2.1.2.1 Accessories with casters

- Do **not** use the casters for the transportation to the place of installation. For the transportation to the place of installation, follow the instructions on page 15 in section »Lifting and transporting the accessories«.
- Use the casters only for positioning at the place of installation.
- Only move the accessory on casters when the surface is level, without a gradient, non-slip and stable.
- Do not move the accessory on your own.
- **At least 2 persons** are required to move the accessory on casters. **At least 5 persons** are required to move the accessory on casters if the total weight of the accessory **exceeds 500 kg**.
- 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 accessories.
- Do not move the accessories on your own.
- **At least 2 persons** are required to move the accessories.
- The lifting force of the crane or industrial truck must correspond at least to the weight of the accessories. See the data sheet (from page 33 in section »Annex«).

2.2 Unpacking



WARNING

Using damaged accessories

MORTAL DANGER FROM ELECTRIC SHOCK

- Do not operate damaged accessories.
- Please contact Customer Support. The telephone number can be found on 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.
- Always contact your forwarding agent regarding the settlement of claims.
- Follow the instructions on page 13, section »Proper disposal of resources and consumables« for the disposal of packaging material.

2.3 Ambient conditions



CAUTION

Unsuitable ambient conditions/unsuitable installation

SERIOUS INJURY DUE TO CRUSHING

- Comply with the requirements under sections »Ambient conditions« and »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 DIN EN 61010-1:2011:

- Use only indoors. The illuminance must be at least 300 lx.
- Installation elevation up to 2000 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 supply).
- Magnitude of the power supply fluctuations: see data sheet from page 33 in 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 lines, general

Prerequisites for trouble-free operation of the temperature control units and/or accessories, including 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.
- Constructional protective measures, professional cable selection (UV resistance, steel pipe protection, etc.)

Attention:

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

These devices are suitable for the 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** unit according to the currently applicable **EN55011**.

Group 1 specifies that high frequency (HF) is only used for the function of a device. **Class A** specifies 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 present, must be locked after the installation!
- Spilled/leaked thermal fluid must be discarded immediately and correctly. Follow the instructions for the disposal of thermal fluid and material on page 13 in Section »**Proper disposal of resources and consumables**«.
- Observe the ambient conditions.

2.5 Recommended temperature control hoses

CAUTION

Use of unsuitable/defective hoses and/or hose connections

INJURIES

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

CAUTION

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).

CAUTION

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. When selecting temperature control hoses, also pay attention to the temperature range in which the hoses are to be 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	20	24
M24x1.5	27	27	47	56
M30x1.5	36	32	79	93
	36	36	79	93
M38x1.5	46	46	130	153
G-thread (flat-sealing)	Adapt the torque to the material of the flat seal used. First hand-tighten the temperature control hose. When using adapters, 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 overwinding.			

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. Further information can be found on page 24 in section »Filling, venting and draining«.

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.

2.8 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.

2.8.2 Connecting the functional earth

PROCEDURE

- If required, connect the **>functional ground terminal<** [87] on the accessories 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 in section **»Annex«**.

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



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 work station and follow the instructions for the disposal of thermal fluid and material on page 13 in section »Proper disposal of resources and consumables«.



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 with respect 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!



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
Not approved water	Distilled, deionized, demineralized, chloric, ferruginous, ammoniacal, or contaminated 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 in Section »Annex«.

INFORMATION

For thermal fluids we recommend the media listed in the Huber catalog. The name of a thermal fluid is derived from its working temperature range and its viscosity at 25 °C.

3.3 To be noted when planning the test

INFORMATION

Also observe page 11, 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



Moving the accessory during operation
SERIOUS BURNS/FREEZING OF THE HOUSING PARTS/ESCAPING THERMOFLUID
 ➤ 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

The illustration "connection diagram" can be found on page 33 in section »Annex«.



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).



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



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 work station and follow the instructions for the disposal of thermal fluid and material on page 13 in section »Proper disposal of resources and consumables«.



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].

4.2.1.1 Filling of bath thermostat

- During the fill process, ensure any necessary measures, such as earthing the tanks, funnels and other aids, have been taken.
- Fill to the lowest possible height.
- Permanently monitor the initial filling with the accessory.
- Also observe the information provided on page 19 in 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**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. The remaining thermofluid will drain from the temperature control unit as soon as you have opened the knurled screw on the >Drain< [8]. Collect it and dispose of it properly. Please read 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 (the phone number can be found on page 32 in 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. Please see on page 28 the section »Replacing temperature control hoses«.	Operating company and/or operators
A/W	Check the power supply 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. The telephone number can be found on page 32 in 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 the accessory as described on page 25 in section »Draining the bath thermostat«.
- Replace defective temperature control hoses. When disposing of them, observe 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 thermofluid 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 thermofluid inspection and changing and cleaning the thermofluid circuit. Observe page 24 of 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. Follow the instructions on page 13, section »Proper disposal of resources and consumables« for the disposal of cleaning agents and material.

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



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).



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**.



Risk of tipping due to unstable temperature control unit

SERIOUS INJURY AND PROPERTY DAMAGE

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



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 work station and follow the instructions for the disposal of thermal fluid and material on page 13 in section »Proper disposal of resources and consumables«.



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.



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 the draining operation as described in the operation manual of the temperature control unit.
- Drain the accessory as described on page 25 in 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

Use the original packaging wherever possible! Further information can be found on page 17 in section »Unpacking«.

7.6 Shipping

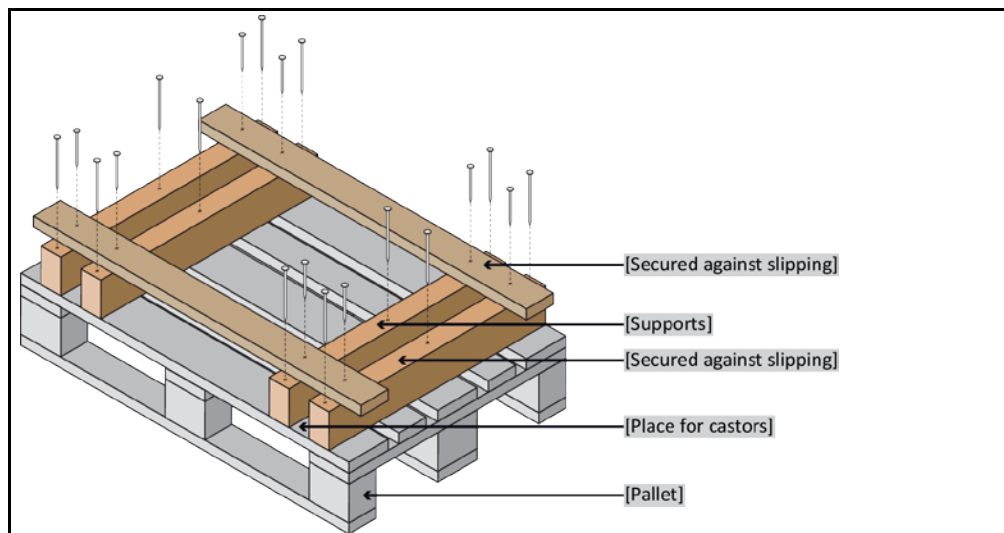
NOTE

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.
- 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 casters/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

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 accessory. The contact information can be found on our home page www.huber-online.com under "Contact". Please have the serial number of the accessory ready. The serial number can be found on the nameplate of the accessory.

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 Certificate of Compliance

Please read page 29, section »Decontamination/repairs«.

8 Annex

Inspired by **temperature** designed for you

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