



# Inspired by temperature

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## **MPC Immersion Cooler**

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

You can request the full operating instructions from [info@huber-online.com](mailto:info@huber-online.com). Please give the model designation and serial number of your temperature control unit in your e-mail.

**huber**





OPERATION MANUAL

**MPC  
Immersion Cooler**



# Immersion Cooler

MPC®

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

## VALID FOR:

TC®45

TC®50

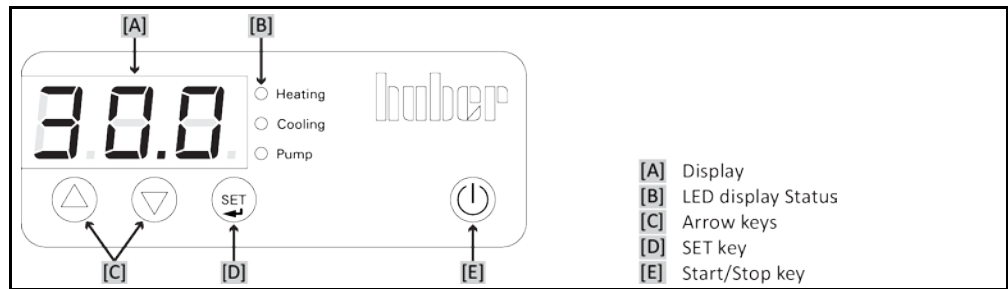
TC®100

### Abbreviations used in model names:

Without = without controller, air cooled, E = with controller and Pt100 sensor,

-F = flexible evaporator, -Flasers = longer evaporator, w = water cooled

MPC controller



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V2.2.0en/21.10.20//1.30

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## Foreword

Dear Customer,

Thank you for choosing a temperature control unit from Peter Huber Kältemaschinenbau AG. You have 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 with regard to transport, start-up, operation, maintenance, repair, storage and disposal of the temperature control unit.

We fully warrant the temperature control unit for the specified intended operation.

The models listed on page 5 are referred to in this operation manual as temperature control units 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

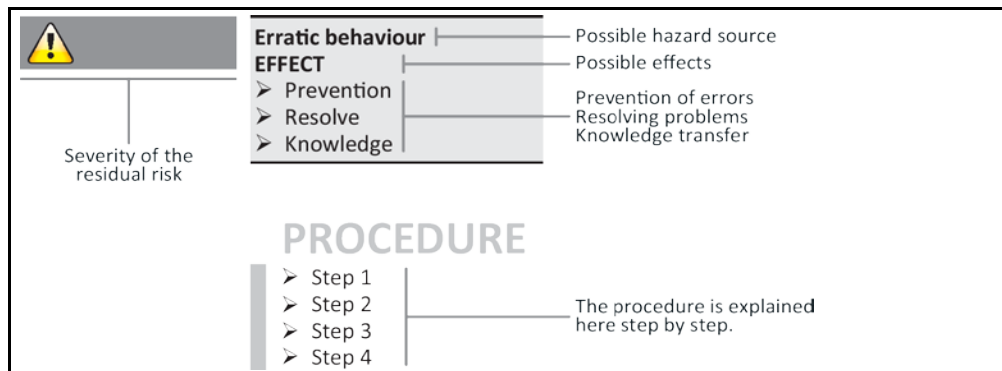
## 1.2 Safety

### 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.

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

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
<b>Mandatory sign</b>	
	- Observe the instructions
<b>Warning sign</b>	
	- General warning sign - observe the instructions
	- Warning of electrical voltage
	- Warning of hot surface
	- Warning of flammable substances

### 1.2.3 Proper operation



**Operating the temperature control unit in a potentially explosive area**  
**DEATH THROUGH EXPLOSION**  
 ➤ Do NOT install or start up the temperature control unit within an ATEX zone.



**Improper use**  
**SERIOUS INJURY AND PROPERTY DAMAGE**  
 ➤ Store the operation manual where it is easy to access in close proximity to the temperature control unit.  
 ➤ Only adequately qualified operators may work with the temperature control unit.  
 ➤ Operators must be trained before handling the temperature control unit.  
 ➤ Check 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 responsible body's safety rules to protect life and limb and to limit damages!



**Modifications to the temperature control unit by third-parties**  
**DAMAGE TO THE TEMPERATURE CONTROL UNIT**  
 ➤ Do not allow third parties to make technical modifications to the temperature control unit.  
 ➤ The EU declaration of conformity becomes invalid if any modifications are made to the temperature control unit without the approval of Huber.  
 ➤ Only specialists trained by Huber may carry out modifications, repairs or maintenance work.  
 ➤ **The following must be observed without fail:**  
 ➤ Only use the temperature control unit 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!

The temperature control unit must not be used for any purposes other than temperature control in accordance with the operation manual.

The temperature control unit is made for industrial use. The temperature control unit is solely intended as a cooling device for cooling liquids in containers. The containers used must be resistant to temperature and thermofluids. The temperature control unit does not have an overtemperature protection and must be additionally protected when used with heating elements. Note the temperature control unit's maximum operating temperature. The installation in public buildings is prohibited. Only use thermofluids suitable for the overall system. The cooling capacity is provided at the **>Probe<** [67]. For technical specifications see the data sheet (from page 46 in section »Annex«). Install, set up and operate the temperature control only according to the instructions in the operation manual. Any failure to comply with the operation manual is considered as improper operation. The temperature control unit was manufactured according to the state of the art and the recognized safety rules and regulations. Safety devices are installed in your temperature control unit.

#### 1.2.4 Reasonably foreseeable misuse

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

The temperature control unit must **NOT** be used for any purposes other than temperature control in accordance with the operation manual.

The manufacturer accepts **NO** liability for damage caused by **technical modifications** to the temperature control unit, **improper handling** or use of the temperature control unit if the operation manual is **not observed**.

### 1.3 Responsible bodies and operators – Obligations and requirements

#### 1.3.1 Obligations of the responsible body

The operation manual is to be stored where it is easy to access in close proximity to the temperature control unit. Only adequately qualified operators (e.g. chemists, CTA, physicists etc.) are permitted to work with the temperature control unit. Operators must be trained before handling the temperature control unit. Check 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.

- 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.

**1.3.1.2 Temperature control unit with natural refrigerants (NR)**



**Over 8 g refrigerant per m<sup>3</sup> room air**  
**DEATH OR SERIOUS INJURY DUE TO EXPLOSION**

- Observe the rating plate (amount of natural refrigerant contained) and the room size (maximum room concentration of natural refrigerant in case of leakage) when installing the temperature control unit.
- Over 8 g refrigerant per m<sup>3</sup> room air: A gas warning sensor must be fitted and functioning.
- The gas warning sensor must be calibrated and maintained at regular intervals (between 6 and 12 months).
- The temperature control unit is not approved for operation **in an ATEX zone**.

Huber products with natural refrigerants work with numerous proven, safe and highly-sustainable technologies. The relevant standards and regulations for temperature control units with natural refrigerants contain a number of stipulations, the importance of complying with which is set out below. Also observe on page 13 the section »**Proper operation**«.

Huber temperature control units are constructed to be permanently sealed and are carefully checked for leak tightness. Temperature control units with more than 150 g natural refrigerant are equipped with an additional gas warning sensor.

The fill quantity of your temperature control unit is stated on the data sheet (from page 46 in section »**Annex**«) or on the rating plate on the rear of the temperature control unit. Observe page 22, section »**Ambient conditions**« and page 24, section »**Installation conditions**«.

Classifying the application field

Class of application field	Application field	Example of the installation location	Max. quantity of refrigerant	AND	Max. permissible quantity above ground level (GL)
A	General	Publicly accessible area in a public building	8 g/m <sup>3</sup> ambient air		1.5 kg
B	Monitored	Laboratories			2.5 kg
C	Access only for authorized persons	Production equipment			10.0 kg
Temperature control units with <b>more than 1 kg</b> refrigerant <b>must not be installed below ground level (GL)</b> .					

**Temperature control units with up to 150 g natural refrigerant**

- The temperature control unit has been constructed to the requirements of EU and EFTA countries.
- Use the table as guidance for classifying the application field. Respect the max. refrigerant quantity stated therein.

**Temperature control units with more than 150 g natural refrigerant**

- The temperature control unit has been constructed to the requirements of EU and EFTA countries.
- Use the table as guidance for classifying the application field. Respect the max. refrigerant quantity or the permissible highest quantity above ground level (GL) stated therein.
- For more information about the pre-installed gas detection sensor:
  - The built-in gas detection sensor enables a **safety shutdown at 20% of the lower explosive limit via a power disconnect relay that is to be installed by the responsible body**. The temperature control unit is thus switched off early and safely in case of fault.
  - A **24 V DC external power supply** must be available for the pre-installed gas warning sensor. The alarm output of the gas warning sensor uses a 4 - 20 mA signal. Please refer to the data sheet of the gas warning sensor for further technical information. A **separate processing unit is available as an accessory** for the control of the power disconnect relay. The processing unit provides a potential-free switching contact and simultaneously provides the power supply and analysis of the gas warning sensor. Both variants require the responsible body to provide the necessary dimensioning and installation. Please refer to the data sheet of the gas warning sensor for the technical information necessary for the installation. The alarm of the gas detection system can be connected to the responsible body's alarm control unit. The responsible body is responsible for this and for the other measures.
  - The responsible body is responsible for the **calibration of the gas detection sensor** prior to initial operation and the observance of calibration and maintenance intervals according to the operation manual. We recommend to set calibration and maintenance intervals between 6 and 12 months if no information is provided. For increased safety requirements, shorter intervals can be specified. On request we will recommend a specialist company to carry out the calibration and maintenance.

### 1.3.2 Requirements for operators

Work on the temperature control unit 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. Under 18-year olds may operate the temperature control unit only under the supervision of a qualified specialist. The operator is responsible vis-a-vis third-parties in the work area.

### 1.3.3 Obligations of the operators

Carefully read the operation manual before operating the temperature control unit. Please observe the safety instructions. When operating the temperature control unit, wear appropriate personal protective equipment (e.g. safety goggles, protective gloves, non-slip shoes).

## 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 temperature control unit is operated with a heating element without additional protection.**  
**RISK OF INJURY**

- The temperature control unit does **not** have an overtemperature protection and must be **additionally protected** when used with heating elements.
- Note the temperature control unit's maximum working temperature provided in the data sheet (see from page 46, Section »Annex«).

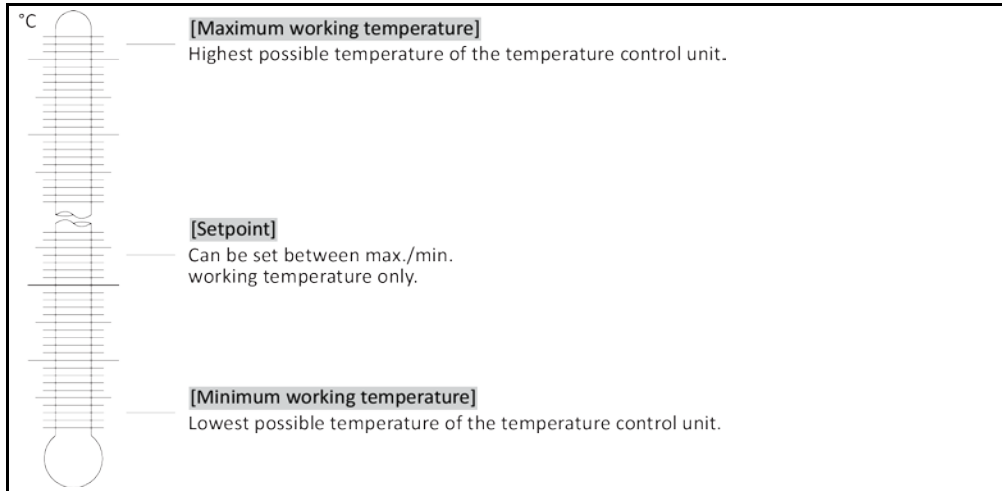
The rating of your temperature control unit is stated on the data sheet in the appendix.

Rating of laboratory thermostats and laboratory baths	Classification	Temperature control medium	Technical requirements	Identification <sup>d)</sup>
	I	Non-combustible <sup>a)</sup>	Overheat protection <sup>c)</sup>	NFL
II	Combustible <sup>b)</sup>	Adjustable overheat protection	FL	
III	Combustible <sup>b)</sup>	Adjustable overtemperature protection and additional low-level protection	FL	

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

- Temperature control units with heating correspond to class number III/FL. These temperature control units are characterized by an "H" in the device name.
- Temperature control units without heating correspond to class number I/NFL.

Overview of the temperature thresholds. The setpoint can only be changed for temperature control units with MPC controller



### 1.4.3 Further protective devices

**INFORMATION**

Emergency strategy – isolate the power supply!

To determine the type of switch or switch combination your temperature control unit is equipped with, please refer to the connection sketch starting on page 46 in the section »Annex«.

**Temperature control units with >Mains isolator< [36] (red/yellow or gray):** Turn the >Mains isolator< [36] to the “0” position!

**Temperature control units with >Mains isolator< [36] (red/yellow) and additional >Appliance switch< [37] (gray):** Turn the >Mains isolator< [36] to the “0” position! Then turn the >Appliance switch< [37] to the “0” position!

**Temperature control units with >Mains isolator< [36] (gray) and >Emergency stop switch< [70] (red/yellow):** Press the >Emergency stop switch< [70]. Then turn the >Mains isolator< [36] to the “0” position!

**Temperature control units with >Mains switch< [37]:** Power supply via socket: Disconnect the temperature control unit from the power supply. Then turn the >Mains isolator< [37] to the “0” position! Power supply via hard wiring: Disconnect the power supply by means of the building’s circuit breaker. Then turn the >Mains isolator< [37] to the “0” position!

**Temperature control units without a switch or inside a protective housing:** Connection via socket: Disconnect the temperature control unit from the power supply. Connection via hard wiring: Disconnect the power supply by means of the building’s circuit breaker.

#### 1.4.3.1 Power interruption

Following a power outage (or when switching on the temperature control unit), this function can be used to determine how the temperature control unit is supposed to respond.

**Auto-Start function is turned off**

The temperature control is started only by manual input when the temperature control unit is turned on.

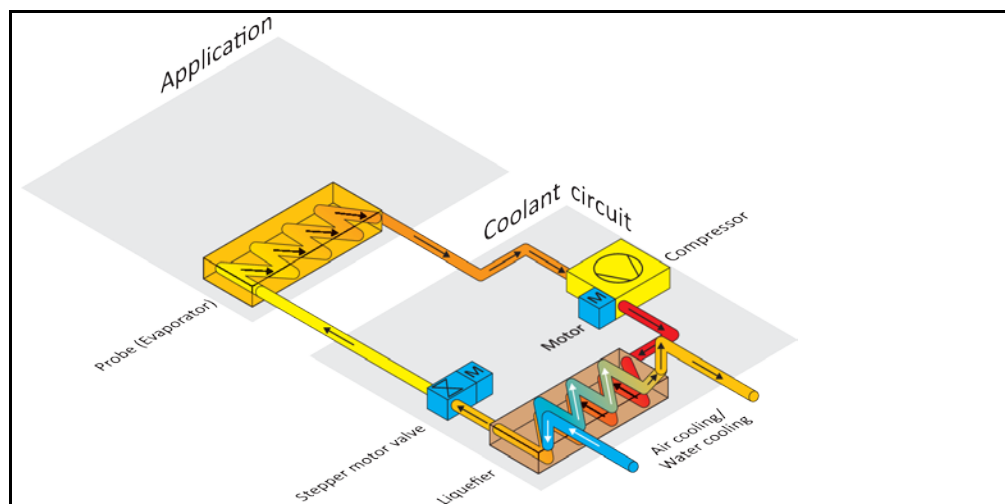
**Auto-Start function is turned on**

The temperature control unit is set to the same state it was in before the power outage. For example, before the power outage: Thermoregulation is off; after power outage: Thermoregulation is off. If temperature control is active during a power outage, the process will automatically continue after the power outage.

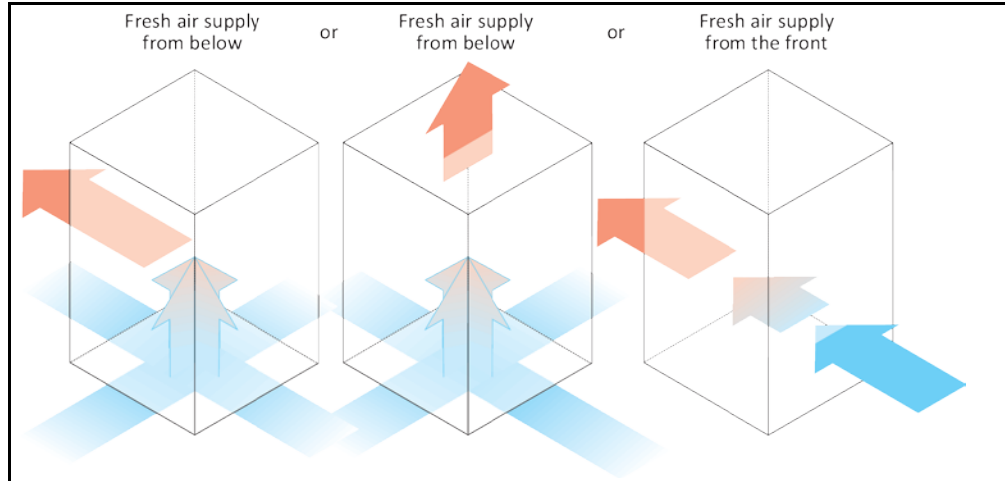
Further information can be found on page 32 in section »Changing the Auto-Start function«.

## 1.5 Exemplary illustrations of the cooling variants

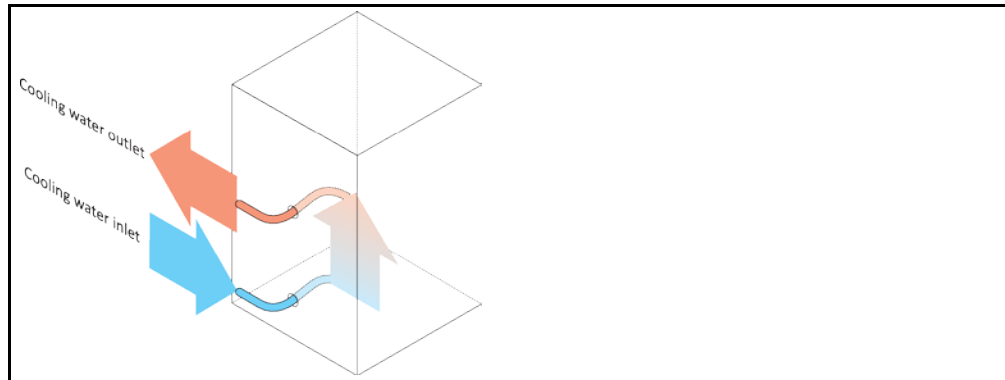
Example: Air and water cooling



Air cooling: Air inlet



Water cooling: Water connection



## 2 Commissioning

### 2.1 In-plant transport

**WARNING**

Temperature control unit is not transported / moved according to the specifications in this operation manual

**DEATH OR SERIOUS INJURY DUE TO CRUSHING**

- Always transport / move the temperature control unit according to the specifications in this operation manual.
- Wear personal protective equipment during transport.
- Always work with the specified number of persons when moving the temperature control unit on casters (if any).
- If the temperature control unit is equipped with casters and parking brakes: 2 parking brakes are always freely accessible when moving the temperature control unit. Activate the **2 parking brakes** in an emergency! If only **one** parking brake is activated on the casters in an emergency: The temperature control unit is not stopped but rotates around the axis of the caster with the activated parking brake!

**NOTE**

Temperature control unit transported in a horizontal position

**DAMAGE TO THE COMPRESSOR**

- Only transport the temperature control unit in an upright position.

**NOTE**

Filled temperature control unit is transported

**MATERIAL DAMAGE DUE TO OVERFLOWING THERMAL FLUID**

- Only transport an emptied temperature control unit.
- If available, use the lugs on the top side of the temperature control unit for transportation.
- Use an industrial truck for transport.
- The casters (if present) on the temperature control unit are not suitable for transport. The casters are symmetrically loaded with 25% of the total mass of the temperature control unit.
- Remove the packing material (e.g. the palette) only at the place of installation.
- Protect the temperature control unit from transport damage.
- Do not transport the temperature control unit 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 (if any) and/or the leveling feet (if any) must be unscrewed/activated before the temperature control unit is put into operation (see page 27, section »Unscrewing/activating the leveling feet (if any)«).

#### 2.1.1 Lifting and transporting the temperature control unit

##### 2.1.1.1 Temperature control unit with lifting eyes

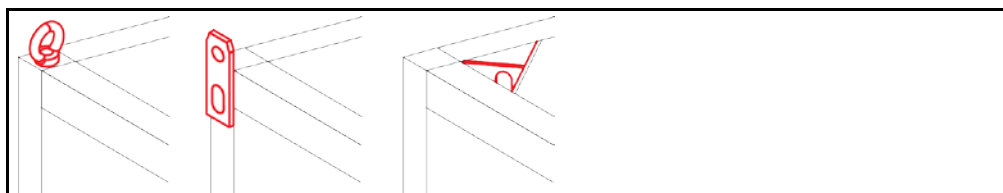
**NOTE**

The temperature control unit is raised at the lifting eyes without load handling attachments

**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Always use load handling attachments when lifting and transporting the temperature control unit.
- 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.

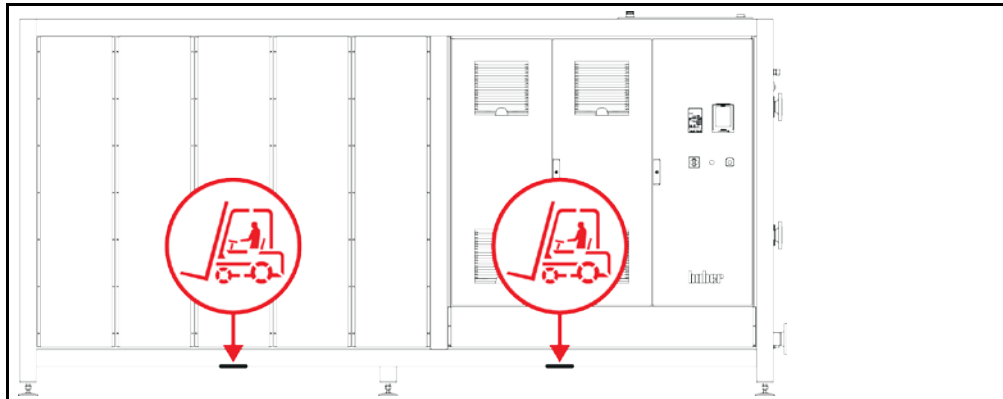
Example: lifting eyes (round, angular, and recessed (left to right))



- Do not lift and transport the temperature control unit at the lifting eyes alone and without aids.
- Lift and transport the temperature control unit at the lifting eyes only with a crane or an industrial truck.
- The crane or industrial truck must have a lifting force equal to or greater than the weight of the temperature control unit. For the weight of the temperature control unit see the data sheet (from page 46 in section »Annex«).
- If the leveling feet were removed for shipment: Do not lower the temperature control unit until all leveling feet have been mounted (see page 21 section »Mounting/removing leveling feet«).

**2.1.1.2 Temperature control unit 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 temperature control unit alone and without aids.
- Lift and transport the temperature control unit only with an industrial truck.
- The industrial truck must have a lifting force equal to or greater than the weight of the temperature control unit. For the weight of the temperature control unit see the data sheet (from page 46 in section »Annex«).
- If the leveling feet were removed for shipment: Do not lower the temperature control unit until all leveling feet have been mounted (see page 21 section »Mounting/removing leveling feet«).

**2.1.2 Mounting/removing leveling feet**

Only valid if the leveling feet have been removed for shipping.

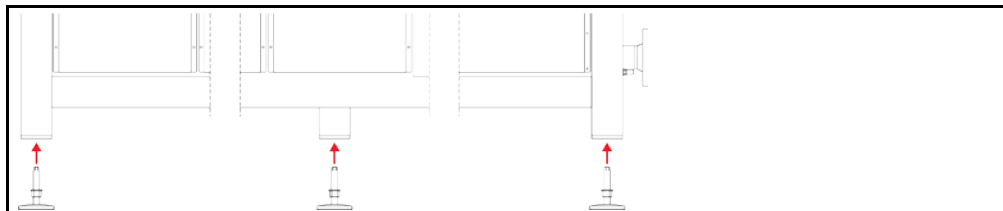


**WARNING**

**The temperature control unit is not secured against slipping and/or lowering  
DEATH OR SERIOUS INJURY DUE TO CRUSHING**

- Secure the temperature control unit against slipping and/or lowering before the leveling feet are mounted.
- Do not stand or lie under the temperature control unit for mounting.

Example: mounting the leveling feet



**INFORMATION**

The leveling feet were removed for shipping the temperature control unit. Before placing / positioning the temperature control unit all leveling feet must be mounted. If the temperature control unit is re-shipped: Remove all leveling feet before packaging.

- The leveling feet can only be mounted while the temperature control unit is lifted.
- Secure the temperature control unit against slipping and/or lowering.
- Do not stand or lie under the temperature control unit while mounting the leveling feet.
- Do not lower the temperature control unit until all leveling feet have been mounted.

## 2.1.3 Positioning the temperature control unit

### 2.1.3.1 Temperature control unit with casters

- Do **not** use the casters for transportation to the place of installation. Observe page 20, section »**Lifting and transporting the temperature control unit**« for the transport to the place of installation.
- Use the rollers only for positioning at the place of installation.
- Only ever move the temperature control unit on casters if the surface is level, without a gradient, non-slip and stable.
- Do not move the temperature control unit alone.
- **At least 2 persons** are required to move the temperature control unit on casters. **At least 5 persons** are required to move the temperature control unit on casters if the total weight of the temperature control unit is **over 1.5 tons**.
- The parking brakes must be activated at the casters and/or the leveling feet (if any) must be unscrewed/activated before the temperature control unit is put into operation (see page 27, section »**Unscrewing/activating the leveling feet (if any)**«).

### 2.1.3.2 Temperature control unit without casters

- An industrial truck must be used for positioning the temperature control unit.
- Do not move the temperature control unit alone.
- **At least 2 persons** are required to move the temperature control unit.
- The industrial truck must have a lifting force equal to or greater than the weight of the temperature control unit. See the data sheet (from page 46 in section »**Annex**«) for the weight of the temperature control unit.
- The leveling feet (if any) must be unscrewed/activated before the temperature control unit is put into operation (see page 27, section »**Unscrewing/activating the leveling feet (if any)**«).

## 2.2 Unpacking



### WARNING

#### Starting up a damaged temperature control unit

#### MORTAL DANGER FROM ELECTRIC SHOCK

- Do not operate a damaged temperature control unit.
- Please contact the Customer Support. The telephone number can be found on page 45, section »**Contact data**«.

## PROCEDURE

- Check for damage to the packaging. Damage can indicate property damage to the temperature control unit.
- Check for any transport damage when unpacking the temperature control unit.
- Always contact your forwarding agent regarding the settlement of claims.
- Follow the instructions for the disposal of packaging material on page 15 section »**Proper disposal of resources and consumables**«.

## 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 circulation pump and the compressors. The warm exhaust air must be able to escape upwards unhindered.

#### Free-standing model

For the connection data, see the data sheet (from page 46 in Section »**Annex**«).

Use of the temperature control unit 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 altitude 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 temperature control unit and work area). Ensure adequate floor clearance for air-cooled temperature control units. Do not operate this temperature control unit from within the box or with an inadequately dimensioned bath. This inhibits the exchange of air.
- Ambient temperature values are provided on the technical data sheet; compliance with the ambient conditions is mandatory, to ensure trouble-free operation.
- Relative humidity up to 32 °C max. 80% and decreasing linearly to 50% up to 40 °C.
- Short distance to supply connections.
- The temperature control unit must not be installed so as to hinder or prevent access to the isolator (to the power supply).
- Magnitude of the power supply fluctuations: see data sheet from page 46 in section »Annex«.
- Transient surges, as would normally occur in the power supply system
- Installation Class 3
- Applicable pollution degree: 2.
- Surge category II.

Observe page 18 of section »Exemplary illustrations of the cooling variants«.

Wall clearances

Side	Distance in cm	
[A2] Top	free standing	
[B] Left	min. 20	
[C] Right	min. 20	
[D] Front	min. 20	
[E] Rear	min. 20	
Side	Distance in cm (for operation in a bath)	
[A2] Top	free standing	
[B] Left	min. 20	
[C] Right	min. 20	
[D] Front	min. 20	
[E] 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 incl. their connections with external applications: Installation and wiring must be carried out professionally. Topics affected: "Electrical safety" and "EMC-compliant wiring".

**Cable lengths**

For flexible/fixed cable routing longer 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**

**Temperature control unit is connected to the power supply line**

**DEATH FROM ELECTRICAL SHOCK BY DAMAGE TO THE POWER CABLE.**

- Do not put temperature control unit on power cable.

 **CAUTION**

**Operating the temperature control unit fitted with castors without brakes activated**

**CRUSHING OF LIMBS**

- Activate brakes on the wheels.

- Allow the temperature control unit to acclimate for about 2 hours when changing from a cold to a warm environment (or vice versa). Do not turn on the temperature control unit before!
- Install upright, stable and without tilt.
- Use a non-combustible, sealed subsurface.
- Keep environment clean: Prevent slip and trip hazards.
- Wheels must be locked after the installation, if installed!
- Spilled/leaked thermofluid must be disposed of immediately and properly. Follow the instructions on page 15, section »Proper disposal of resources and consumables« for the disposal of thermofluid and material.
- Observe the floor load bearing capacity for large units.
- Observe the ambient conditions.

## 2.5 Recommended cooling water hoses

 **CAUTION**

**Use of unsuitable/defective hoses and/or hose connections**

**INJURIES**

- Reinforced hoses must be used to satisfy tougher safety requirements.
- Shut off the cooling water supply to the temperature control unit even for shorter downtimes (e.g. overnight).



**! 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).

- We **exclusively** recommend reinforced hoses for connecting to the cooling water supply. Cooling water hoses can be found in the Huber catalog under Accessories.

## 2.6 Wrench sizes and torques

Note the wrench sizes that result for the pump connection on the temperature control unit. The following table lists the pump connections and the resulting wrench sizes, and torque values. A leak test must always be performed, and the connections tightened if necessary. 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 Temperature control units with water cooling

**! WARNING**

**Open electrical wires below the temperature control unit if the temperature falls below the dew point.**

**DEATH FROM ELECTRICAL SHOCK BY WATER ENTRY INTO THE ELECTRIC LINES.**

- A temperature below the dew point may result in condensation in the temperature control unit and at the cooling water connections. The condensation is caused by high humidity at the cooling water-bearing components. The condensation exists the temperature control unit at the bottom.
- Electrical lines directly below the temperature control unit must be protected against liquid ingress.

**! CAUTION**

**Use of unsuitable/defective hoses and/or hose connections**

**INJURIES**

- Reinforced hoses must be used to satisfy tougher safety requirements.
- Shut off the cooling water supply to the temperature control unit even for shorter downtimes (e.g. overnight).

**NOTE**

**No protection against corrosion**

**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- The addition of anti-corrosion agents is mandatory if salts (chlorides, bromide) have been added to the water circuit.
- Ensure that the materials used in the cooling water circuit are resistant with respect to the cooling water. See the data sheet from page 46 in section »Annex« for information on the materials used.
- Take suitable measures to maintain the warranty conditions.
- For information about water quality, see [www.huber-online.com](http://www.huber-online.com).

**NOTE**

**Usage of un-filtered river/sea or ocean water as cooling water**

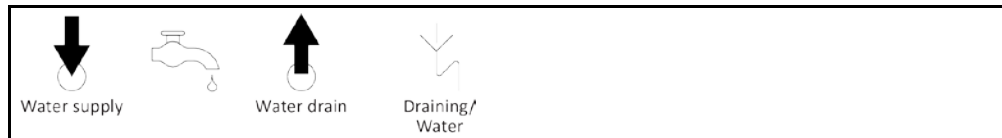
**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Un-filtered river or sea water is not suitable for use as cooling water due to its contaminants.
- Use drinking water or filtered river or sea water for cooling.
- Sea water must not be used for water cooling.
- For information about water quality, see [www.huber-online.com](http://www.huber-online.com).

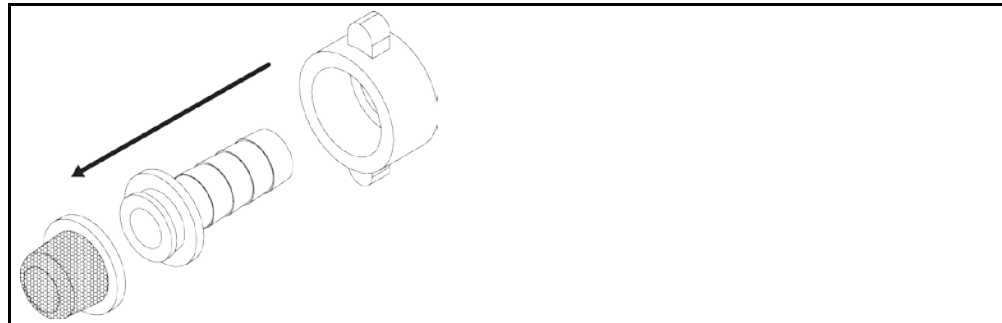
**INFORMATION**

To minimize cooling water consumption, Huber temperature control units with water cooling are equipped with a cooling water regulator. It limits the flow of cooling water to the amount required by the current load situation. If only a low cooling capacity is requested, only a small amount of cooling water is consumed. It cannot be ruled out that cooling water flows when the machine is switched off. Shut off the cooling water supply to the temperature control unit even for shorter downtimes (e.g. overnight).

Connection diagram



Installing a suction strainer (table-top models only)



**Preparing the temperature control unit with water cooling:**

**INFORMATION**

In the event of outdoor installation, the responsible body must ensure that the cooling water supply and return lines are laid frost-protected. The cooling water temperature must not fall below 3 °C. At ambient temperatures below 3 °C, the cooling water supply must be heated.

The minimum pressure differential in the cooling water circuit and the recommended cooling water inlet temperature can be found on the data sheet (from page 46 in Section »Annex«).

The illustration "connection diagram" can be found on page 46 in section »Annex«.

**PROCEDURE**

- Close (if fitted) the >Cooling water drain< [15].
- Connect the >Cooling water outlet< [14] to the water return flow. A seal must be used.
- Insert the suction strainer (dirt trap) into the >Cooling water return< [13].
- Connect the >Cooling water inlet< [13] to the water supply.

**NOTE**

**Leaking cooling water connections**

**DAMAGE BY ROOM FLOODING**

- Slowly open the building-side shut-off valves of the cooling water supply and return line.
- If water leaks from the cooling water connections: shut off the cooling water supply and return line immediately.
- Provide leakproof cooling water connections.

- Open the shut-off valves in the water line on the temperature control unit and on the building side.
- Check the connections for leaks.

## 2.8 Preparations for operation

### 2.8.1 Unscrewing/activating the leveling feet (if any)



#### WARNING

**The leveling feet are not unscrewed/activated before switching on the temperature control unit  
DEATH OR SERIOUS INJURY DUE TO CRUSHING**

- The parking brakes must be activated at the casters (if any) and/or the leveling feet must be unscrewed/activated before the temperature control unit is put into operation.
- The temperature control unit may move if the parking brakes of the casters (if any) are not activated and/or the leveling feet are not unscrewed/activated.

Always unscrew/activate the leveling feet before switching on the temperature control unit. Uneven floors can be compensated by adjusting these leveling feet.

## PROCEDURE

- Verify that the parking brakes of the casters (if any) have been activated.
- Unscrew the leveling feet.
- Compensate uneven floors by adjusting these leveling feet, if necessary. Use a spirit level to horizontally align the temperature control unit.
- Tighten the lock screws on the leveling feet after aligning the temperature control unit. This prevents the leveling feet from changing their height during operation.

### 2.8.2 Use of the Probe [67]

The illustration "connection diagram" can be found on page 46 in section »Annex«.



#### CAUTION

**The >Probe< [67] is touched in icy condition  
SEVERE FROSTBITES CAUSED BY HOUSING PARTS**

- The >Probe< [67] **must not** be touched in icy condition.
- Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).

#### NOTE

**The protective and insulating hose is twisted or bent  
DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Ensure the protective and insulating hose is never bent or twisted.

#### NOTE

**The protective and insulating hose is immersed into the thermofluid  
DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Ensure the protective and insulating hose is not immersed into and does not come into contact with the thermofluid.

#### NOTE

**The cooling coil is moved / bent when cold.  
MATERIAL DAMAGE CAUSED BY INTERNAL FRACTURE**

- The cooling coil may only be moved / bent when the cooling coil temperature is at room temperature.

The minimum bending radius of the hose is 400 mm and **must never** be smaller.

**Valid for temperature control units with MPC controller:**

Controlling the temperature requires the Pt100 process control sensor to be connected to the socket (>Pt100 Process< [49]). Further information can be found on page 36 in section »Interfaces and software update«.

**2.8.2.1 Immersion depth of the probe [67]**

Make sure that the >Probe< [67] is immersed into the thermofluid to be cooled at least up to the upper end of the cooling coil.

Otherwise, ice crystals will form on the >Probe< [67], resulting in an inferior transmission of energy.

**Model F** (with flexible >Probe< [67]):

Never reduce a bending radius of 40 mm when bending the flexible >Probe< [67].

**2.8.3 Connecting the functional earth**

**PROCEDURE**

- If required, connect the temperature control unit's >Functional earth terminal< [87] to the building's grounding point. Use a ground strap for this purpose. For the exact position and thread size please refer to the wiring diagram from page 46 in Section »Annex«.

**2.9 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 temperature control unit at any time from the mains. Have the mains cable only replaced by a qualified electrician.

**2.9.1 Connection using socket with protective earth (PE)**



**Connecting to a power socket without protective earth (PE)**

**MORTAL DANGER FROM ELECTRIC SHOCK**

- Always connect the temperature control unit to safety sockets (PE).



**Damaged power cable/power cable connection**

**MORTAL DANGER FROM ELECTRIC SHOCK**

- Do not start up the temperature control unit.
- Isolate the temperature control unit 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**.



**Incorrect power supply connection**

**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

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

**INFORMATION**

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

**2.9.2 Connection via hard wiring**



**Connection/adjustment to the power supply not carried out by an electrician**

**MORTAL DANGER FROM ELECTRIC SHOCK**

- Have the connection/adjustment to the power supply carried out by an electrician.

**DANGER****Damaged power cable/power cable connection****MORTAL DANGER FROM ELECTRIC SHOCK**

- Do not start up the temperature control unit.
- Isolate the temperature control unit 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 TEMPERATURE CONTROL UNIT**

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

### 3 Function description

#### 3.1 Function description of the temperature control unit

##### 3.1.1 General functions

The temperature control unit is especially suited for cooling applications.

The temperature control unit is solely intended as a cooling device and must not be used for heating.

##### 3.1.2 Other functions

**Valid for temperature control units with MPC controller:**

The **LED display** shows the current temperature. A new setpoint can be easily entered with a simple keyboard.

A **connection jack for Pt100 process controller sensor** enables you to accomplish **external temperature control tasks** with ease.

#### 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 15 in section »Proper disposal of resources and consumables«.



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

**MATERIAL DAMAGE**

- Observe the classification of your temperature control unit according to DIN 12876.
- Ensure the following materials are resistant with respect to the thermal fluid: Stainless steel 1.4301/ 1.4401 (V2A).



**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
<b>Thermal fluid: Water without ethylene glycol</b>	
Use	do not use
<b>Thermal fluid: Water-ethylene glycol mixture</b>	
Use	do not use



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 13 in section »Proper operation«.

The focus is on your application. Bear in mind that the system performance depends on the temperature.

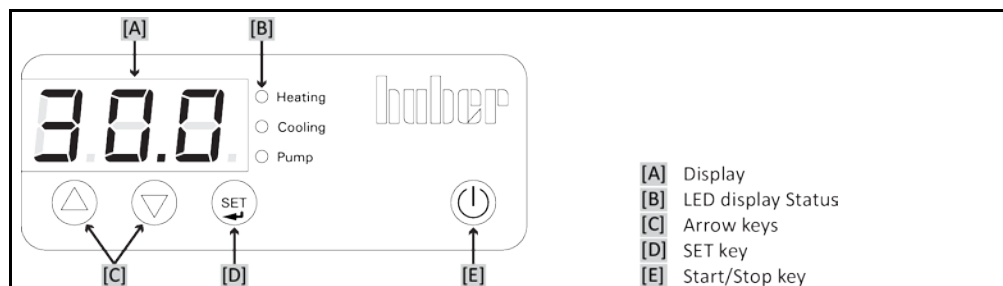
- Make sure that the electrical connection is adequately dimensioned.
- The installation location of the temperature control unit should be selected so as to ensure adequate fresh air, even with water-cooled chillers.
- The thermal fluid used must be chosen to not only allow the minimum and maximum working temperature but it must also be suitable with regard to the fire point, boiling point and viscosity. In addition, the thermal fluid must be compatible with all the materials in your system.
- Avoid bending the cooling coil and cooling water hoses (if required). Use suitable angle pieces and lay the hose connections with a large radius. Take the minimum bending radius from the data sheet of the coolant hoses used.
- Avoid bending/moving the cooling coil in a cold state.
- Check the hoses at regular intervals for any material fatigue (e.g. cracks, leaks).
- 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.

**INFORMATION** For water-cooled temperature control units, please take the cooling water temperature necessary for perfect operation and the required differential pressure from the data sheet from page 46 onward in the Section »Annex«.

### 3.4 Only valid for temperature control units with MPC controller:

#### 3.4.1 Display and control instruments

The control panel:  
Displays and keys



##### 3.4.1.1 Display

The value of the internal temperature is displayed. For example, this is the bath temperature for temperature control units with a bath, or the flow temperature of chillers. Different key combinations also display the setpoint, a menu item or settings.

##### 3.4.1.2 LED display status

These LEDs indicate the current operating condition.

##### 3.4.1.3 Arrow keys

These keys are used to (▲) increase or decrease (▼) the setpoint or select or change a menu item. The >Arrow keys< [C] are also required to call the menu up.

##### 3.4.1.4 SET key

The >SET key< [D] is used to switch to the setpoint temperature. It is used to display and modify the setpoint temperature. The >SET key< [D] is also used to display the values of the various menu items.





**3.4.1.5 Start/Stop key**

This key starts or stops the thermoregulation.

**3.4.2 Menu function**

Your temperature control unit is equipped with a menu function.

Overview of the menu items

Menu item	Display	Description
ADR		Without a function
C40		Auto-Start function
PA		Service menu Only for Huber service personnel.
--		

**3.4.3 Function examples**

**3.4.3.1 Display setpoint**

**PROCEDURE**

- Press the >SET key< [D] and keep it pressed. The setpoint is displayed.
- Release the >SET key< [D]. The internal temperature is displayed again.

**3.4.3.2 Set/change setpoint**

**INFORMATION**

The setpoint can be changed only, when the temperature control was stopped using the [Start/Stop key].

**PROCEDURE**

- Press the >SET key< [D] and keep it pressed. The setpoint is displayed.
- Use the >Arrow keys< [C] to select the required value.
  - ⬆ (up) the temperature increases, ⬇ (down) the temperature decreases.
- Release the >SET key< [D]. The new setpoint is set.

**3.4.3.3 Changing the Auto-Start function**

Following a power outage (or when switching on the temperature control unit), this function can be used to determine how the temperature control unit is supposed to respond.

**Auto-Start function is turned off**



The temperature control is started only by manual input when the temperature control unit is turned on.

**Auto-Start function is turned on**








The temperature control unit is set to the same state it was in before the power outage. For example, before the power outage: Thermoregulation is off; after power outage: Thermoregulation is off. If temperature control is active during a power outage, the process will automatically continue after the power outage.



Settings in the menu item "C40" auto-start function

Setting	Display	Description
0		The auto-start function is turned on.
1		The auto-start function is turned off.

## PROCEDURE

- Press the **>Arrow keys**< [C]  and  simultaneously for 3 seconds. The display changes from the display of the temperature to the display of the first menu item.
- Press the **>Arrow key**< [C]  until the menu item "C40" is displayed.
- Press the **>SET key**< [D] and keep it pressed.
- Press the **>SET key**< [D] and simultaneously the **>Arrow keys**< [C]  and . The display changes from "0" (auto-start function is ON) to "1" (auto-start function is OFF). Release the **>SET key**< [D] after the required setting was made.
- Press the **>Arrow keys**< [C]  and  simultaneously for 1 second. Or wait a few seconds after releasing the **>SET key**< [D]. The selected function is saved and menu is exited. The display shows the temperature again.

## 4 Setup mode

### 4.1 Setup mode

**CAUTION**

**Moving the temperature control unit during operation**  
**SERIOUS BURNS/FREEZING OF THE HOUSING PARTS/ESCAPING THERMAL FLUID**  
 ➤ Do not move temperature control units that are in operation.

**NOTE**

**The cooling coil is moved / bent when cold.**  
**MATERIAL DAMAGE CAUSED BY INTERNAL FRACTURE**  
 ➤ The cooling coil may only be moved / bent when the cooling coil temperature is at room temperature.

#### 4.1.1 Turning on the temperature control unit - without controller

##### PROCEDURE

- Switch on the temperature control unit using the >Mains isolator< [36]/>Mains switch< [37]. Temperature control starts **immediately** for single-stage cooling machines (up to TC50), in a two-stage cooling machine (from TC100) temperature control begins shortly after turning on the temperature control unit. The temperature is lowered until the heat input to the probe corresponds to the cooling capacity of the temperature control unit.

#### 4.1.2 Turn temperature control unit off - without controller

##### PROCEDURE

- Switch off the temperature control unit using the >Mains isolator< [36]/>Mains switch< [37]. The temperature control stops **immediately**.

#### 4.1.3 Turning off the temperature control unit / with controller

##### PROCEDURE

- Switch on the temperature control unit using the >Mains isolator< [36]/>Mains switch< [37]. Thermoregulation is **off**. The cooling capacity of the temperature control unit is available only 6 minutes after switch-on.

#### 4.1.4 Turning off the temperature control unit - with controller

**NOTE**

**The power supply is interrupted before the temperature control process was terminated properly**  
**DAMAGE TO THE TEMPERATURE CONTROL UNIT**  
 ➤ End the temperature control process before the power supply is interrupted (by switching off or disconnecting from the voltage).

**INFORMATION**

Do not switch off the temperature control unit while the temperature control process is running. Only switch off the temperature control unit after the temperature control process is finished. Please see on page 35 the section »Ending the temperature control process - with controller«.

##### PROCEDURE

- Switch off the temperature control unit using the >Mains isolator< [36]/>Mains switch< [37]. Switch off the temperature control unit only when **no** thermoregulation is activated! Please see page 35, section »Ending the temperature control process - with controller«.

## 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

##### The cooling coil is moved / bent when cold.

##### MATERIAL DAMAGE CAUSED BY INTERNAL FRACTURE

- The cooling coil may only be moved / bent when the cooling coil temperature is at room temperature.

#### 5.1.1 Temperature control

##### 5.1.1.1 Starting the temperature control process - without controller

The temperature control process can be started after the probe has been placed in the thermofluid. To start the temperature control process, proceed as described on page 34 in Section »Turning on the temperature control unit - without controller«.

##### 5.1.1.2 Ending the temperature control process - without controller

To stop the temperature control process, proceed as described on page 34 in Section »Turn temperature control unit off - without controller«.

##### 5.1.1.3 Starting the temperature control process - with controller

The temperature control process can be started after the probe has been placed in the thermofluid.

### PROCEDURE

- Switch the temperature control unit on (see page 34, Section »Turning off the temperature control unit / with controller«).
- Set the desired value See also on page 32, section »Set/change setpoint« The setpoint can **not** be changed while a temperature control process is running.
- With the temperature control unit switched on and thermoregulation/circulation stopped, press the >Start/Stop button< [E]. Thermoregulation starts.

##### 5.1.1.4 Ending the temperature control process - with controller

Thermoregulation can be terminated at any time.

### PROCEDURE

- With the temperature control unit switched on and thermoregulation/circulation started, press the >Start/Stop button< [E]. Thermoregulation stops. The temperature control unit is in standby mode.
- Switch off the temperature control unit. Further information can be found on page 34 in Section »Turning off the temperature control unit - with controller«.

## 6 Interfaces and software update

**NOTE**

The specifications of the interface used are not being met.

**PROPERTY DAMAGE**

- Only connect components that meet the specifications of the interface used.

### 6.1 Interfaces on the temperature control unit - applies to MPC controller only

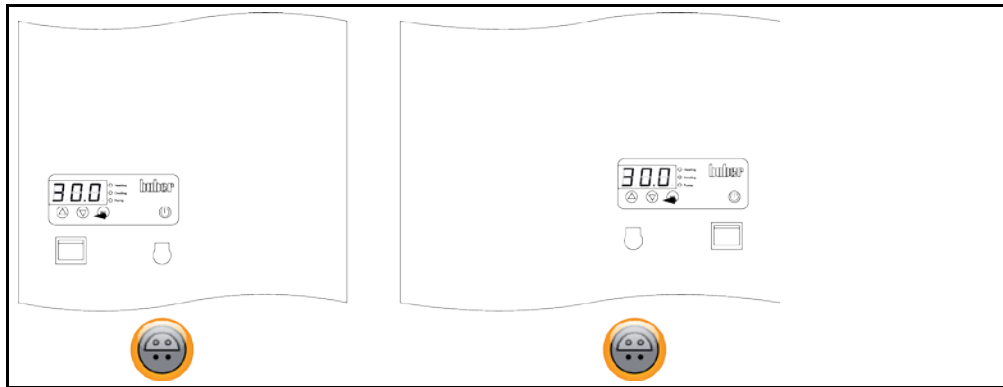
**NOTE**

Connecting to the interfaces at the temperature control unit during operation

**DAMAGE TO THE INTERFACES**

- When devices in operation are connected with interfaces of the temperature control unit, interfaces may get damaged.
- Before connecting, ensure the temperature control unit and the device to be connected are turned off.

Standard interface on temperature control unit with MPC controller



#### 6.1.1 Connection jack for Pt100 process controller sensor



A temperature sensor located in the connected application (Pt100, 4-wire technology, Lemosa connector) is connected to the Pt100 connection jack. The external actual temperature is then recorded and the operating temperature of the temperature control unit is permanently calculated and adjusted.

**INFORMATION**

Depending on the operating temperature, isolation losses and exothermic heat, the operating temperature (flow temperature) of the application can be significantly less than the setpoint of the application. In this context, safety-critical thresholds for the temperature control fluid must be strictly observed.

The control results contained in the data sheet can only be achieved with **shielded** sensor leads. We recommend the external Pt100 process control sensor from the Huber accessories program.

Pin assignment (front view)



Pin assignment

Pin	Signal
1	I+
2	U+
3	U-
4	I-

Pt100

Pin 1: I+    Pin 2: U+    Pin 3: U-    Pin 4: I-

## 7 Service/maintenance

### 7.1 Electrical fuse (if available)







To find out whether your temperature control unit is equipped with fuses, refer to the “connection diagram” from page 46 in Section »Annex«.

The overcurrent circuit breakers for all pole breaking (L and N) are located at the back of the temperature control unit. In case of a fault (no function and no display on the temperature control unit) please first check if the overcurrent circuit breaker has tripped. If the overcurrent circuit breaker triggers again immediately after reversing, please unplug the power cord and contact Customer Support immediately (see phone number can be found on page 45 in section »Contact data«).

### 7.2 Display of errors - only for MPC controllers

The device displays an alarm or warning message in the event of a fault.

Overview of messages

Display	Cause	Effect, measure
 Flashing display of the temperature value	Warning: Over or under temperature.	<b>Control continues.</b> Setpoint limits: $\pm 2$ K
 F1 - flashing	Error Sensor1 Break or short circuit	Control is inactive. (Pump off, compressor off, heating off) <b>Check the sensor.</b>
 E1 - flashing	Input E1 reports an error. a) No enable signal, level alarm  b) Valid for temperature control units with heater: The internal temperature is above the set value of the overtemperature protection. The overtemperature protection was triggered.	a) Control is inactive. (Pump off, compressor off, heating off) Check level. <b>Restart only possible when level OK.</b> b) The value of the overtemperature protection must be above the internal temperature and/or the setpoint. Do not set the setpoint above the temperature set for the overtemperature protection.
 E2 - flashing	Input E1 reports an error. a) Pump runs and no flow or pump is running and no water pressure.  b) Valid for temperature control units with heater: The internal temperature is above the set value of the overtemperature protection. The overtemperature protection was triggered.	a) Control is inactive. (Pump off, compressor off, heating off) <b>Restart only possible by interrupting the power supply.</b> b) The value of the overtemperature protection must be above the internal temperature and/or the setpoint. Do not set the setpoint above the temperature set for the overtemperature protection.
 E3 - flashing	Although the control is off, the input E1 signals a flow	Control is inactive. (Pump off, compressor off, heating off) <b>The error is corrected automatically when input E1 is open in standby again.</b>
 EP - flashing	Loss of data in the parameter memory	Control is inactive. (Pump off, compressor off, heating off)

**INFORMATION**

During the output of the error message, the error message and the actual value are displayed alternately.

Please check the fuses on the rear of the unit below the mains connection jack if no display appears on the controller.

Please contact our service hotline (+49 781 9603 244) if any of the above messages appear and cannot be fixed.

## 7.3 Maintenance

**DANGER**

**Cleaning/maintenance while the temperature control unit is operating**

**MORTAL DANGER FROM ELECTRIC SHOCK**

- Stop an ongoing temperature control process.
- Turn off the temperature control unit.
- Also disconnect the temperature control unit from the power supply.

**NOTE**

**Performing maintenance work not described in these operation manual**

**MATERIAL DAMAGE ON THE TEMPERATURE CONTROL UNIT**

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

### 7.3.1 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	Exchange leaking hoses and hose connections prior to switching on the temperature control unit. Please see on page 39 the section »Replacing coolant hoses«.	Operating company and/or operators
A/W	Check power supply cable	Prior to switching on the temperature control unit or on relocation	Do not start the temperature control unit if the power supply cable is damaged.	Qualified electrician (BGV A3)
A	Check liquefier fins	As required, after 3 months at the latest	Please see on page 39 the section »Clean liquefier fins (air-cooled temperature control unit)«	Operating company and/or operators
W	Check hat-type strainer (dirt trap)	As required, after 3 months at the latest	Please see on page 40 the section »Clean hat-type strainer (dirt trap) (water-cooled temperature control unit)«	Operating company and/or operators
A/W	Check temperature control unit for damage and stability	Every 12 months or after a change of location		Operating company and/or operators
W	Check cooling water quality	Every 12 months	Descale the cooling water circuit as required. Documentation on water quality available at: <a href="http://www.huber-online.com">www.huber-online.com</a>	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 45 in section »Contact data«	Operating company

\*A = Air cooling; W = Water cooling; U = Applicable only for Unistats

### 7.3.2 Replacing coolant hoses

Replace defective coolant hoses **before** turning on the temperature control unit.

#### PROCEDURE

- Drain the cooling water as described on page 43 in section »Draining the cooling water«.
- Replace the defective coolant hoses. When disposing of them, observe page 15, section »Proper disposal of resources and consumables«.
- Reconnect the temperature control unit to the building’s cooling water supply. Proceed as described on page 25 in section »Temperature control units with water cooling«.
- Restart the temperature control unit in normal mode.

### 7.3.3 Clean liquefier fins (air-cooled temperature control unit)

#### CAUTION

**Manual cleaning**  
**RISK OF BEING CUT ON THE LIQUEFIER FINS**

- Wear suitable cut-resistant gloves for cleaning work.
- Depending on the ambient conditions, use cleaning equipment such as vacuum cleaners and/or a hand brush/brush. Follow the local regulations when cleaning. Do not clean the liquefier fins in a clean room with items like a brush and do not use a vacuum cleaner without an extra-fine particle filter.

#### NOTE

**Cleaning using pointed or sharp-edged tools**  
**DAMAGE TO THE LIQUEFIER FINS**

- Clean the liquefier fins using suitable cleaning appliances.

#### INFORMATION

Make sure there is adequate ventilation (removal of waste heat, fresh air supply) for the temperature control unit, in case of **air cooling, maintain wall clearance** (see page 18, section »Exemplary illustrations of the cooling variants« and page 22, section »Ambient conditions«). The liquefier fins must be cleaned (dust) from time to time as only then will the temperature control unit perform at its maximum cooling capacity.

#### PROCEDURE

##### Liquefier fins on lower surface

- Switch off the temperature control unit.
- Disconnect the temperature control unit from the power supply.
- Tilt the temperature control unit to its side. Make sure the cooling coil is not bent.
- Clean the liquefier fins using suitable cleaning appliances. Observe the local regulations and ambient conditions when selecting cleaning appliances.
- Make sure the liquefier fins are not damaged or deformed as this will impair the air flow.
- Put the temperature control unit upright immediately after cleaning the liquefier fins and wait for **60 minutes** to allow the compressor oil to flow back.
- Connect the temperature control unit to the power supply.
- Switch on the temperature control unit.

### 7.3.4 Clean hat-type strainer (dirt trap) (water-cooled temperature control unit)

**NOTE**

**Building side shut-off valves are not closed**

**DAMAGE BY ROOM FLOODING**

- Close the building's shut-off valves in the cooling water supply and return lines.
- For table-top models, place a collection container below the >Cooling water drain< [15] (see connection diagram page 46, section »Annex«).

**INFORMATION**

The strainer at the cooling water inlet must be inspected and cleaned on a regular basis, depending on water quality.

## PROCEDURE

**Table-top models:**

- Turn off the temperature control unit.
- Disconnect the temperature control unit from the power supply.
- Close the customer's shut-off valves in the cooling water supply and return lines.
- Place a collecting container below the >Cooling water inlet< [13].
- Remove the cooling water supply line and take out the hat-type strainer for inspection and cleaning.
- Clean the suction strainer under running water.
- Following inspection/cleaning, reinsert the hat-type strainer and fasten the cooling water supply line.
- Remove the collecting container from below the >Cooling water inlet< [13].
- Open the customer's shut-off valves in the cooling water supply and return lines.
- Connect the temperature control unit to the power supply.
- Turn on the temperature control unit.

## PROCEDURE

**Free-standing models:**

- Turn off the temperature control unit.
- Disconnect the temperature control unit from the power supply.
- Close the customer's shut-off valves in the cooling water supply and return lines.
- Remove the panel around the >Cooling water inlet< [13] and >Cooling water outlet< [14]. Information: Located immediately behind the >Cooling water inlet< [13] is the dirt trap.
- Place a collecting container below the >Cooling water inlet< [13].
- Carefully detach the cover (hexagonal).
- Remove and clean the metal strainer located below.
- Clean the metal strainer under running water.
- Re-insert the metal strainer after cleaning work.
- Carefully fasten the cover (hexagonal).
- Remove the collecting container from below the >Cooling water inlet< [13].
- Re-mount the panel around the >Cooling water inlet< [13] and >Cooling water outlet< [14].
- Open the customer's shut-off valves in the cooling water supply and return lines.
- Connect the temperature control unit to the power supply.
- Turn on the temperature control unit.

**INFORMATION**

We also provide service training. Please contact the Customer Support. The telephone number can be found on page 45, section »Contact data«.

## 7.4 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 15, section »**Proper disposal of resources and consumables**« for the disposal of cleaning agents and material.

## 7.5 Plug contacts

**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.

Protective caps are supplied for all plug contacts. Make sure that any plug contacts not required are protective with the caps.

## 7.6 Decontamination/repairs

**CAUTION****Returning a not decontaminated temperature control unit for repair****PHYSICAL INJURY AND PROPERTY DAMAGE CAUSED BY HAZARDOUS MATERIALS IN OR ON THE TEMPERATURE CONTROL UNIT**

- 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](http://www.huber-online.com).

As the responsible body you are responsible for carrying out decontamination **before** third-party personnel come into contact with the temperature control unit / accessory. Decontamination must be carried out **before** the temperature control unit / accessory is returned for repair or inspection. Attach a clearly visible written notice stating that the temperature control unit / 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](http://www.huber-online.com).

## 8 Shutting down

### 8.1 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 temperature control unit to safety sockets (PE).



**Damaged power cable/power cable connection**

**MORTAL DANGER FROM ELECTRIC SHOCK**

- Do not start up the temperature control unit.
- Isolate the temperature control unit 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.

**INFORMATION**

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

### 8.2 Switch-off

#### PROCEDURE

- Turn off the temperature control unit.
- Disconnect the temperature control unit from the power supply connection.

### 8.3 Remove probe [67] from thermal fluid



**The >Probe< [67] is touched in icy condition**

**SEVERE FROSTBITES CAUSED BY HOUSING PARTS**

- The >Probe< [67] **must not** be touched in icy condition.
- Wear your personnel protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).

**NOTE**

**The protective and insulating hose is twisted or bent**

**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Ensure the protective and insulating hose is never bent or twisted.

**NOTE**

**The protective and insulating hose is immersed into the thermofluid**

**DAMAGE TO THE TEMPERATURE CONTROL UNIT**

- Ensure the protective and insulating hose is not immersed into and does not come into contact with the thermofluid.

**NOTE**

**The cooling coil is moved / bent when cold.**

**MATERIAL DAMAGE CAUSED BY INTERNAL FRACTURE**

- The cooling coil may only be moved / bent when the cooling coil temperature is at room temperature.

The Wiring diagram can be found from page 46 in section »Annex«

Remove the >Probe< [67] from the thermal fluid. The minimum bending radius of the hose is 400 mm and **must never** be smaller. **Model F** (with flexible >Probe< [67]): Never use a bending radius of less than 40 mm when bending the flexible >Probe< [67].

## 8.4 Draining the cooling water

### INFORMATION

This section must be observed when using water-cooled temperature control units.

### 8.4.1 Draining process

#### CAUTION

#### Pressurized cooling water connections

##### RISK OF INJURY

- Wear your personnel protective equipment (e.g. safety goggles).
- Carefully open the cooling water connection. Open slowly (1-2 signal edges) and drain the cooling water slowly.

#### NOTE

#### The building's isolating valves are not closed

##### DAMAGE BY ROOM FLOODING

- Close the building's isolating valves in the cooling water supply and return lines.
- For table-top models, place a collection container below the >Cooling water outlet< [14] and/or >Cooling water drain< [15] (if any).

## PROCEDURE

### Temperature control units with >Cooling water drain< [15]

- Close the building's isolating valves in the cooling water supply and return lines.
- Place a collecting container below the >Cooling water outlet< [14] and >Cooling water drain< [15].
- Undo the screw cap on the >Cooling water drain< [15]. The cooling water will begin to drain out. Allow all the cooling water to drain out to prevent the risk of freezing during transport and storage!

## PROCEDURE

### Tempering without >Cooling water drain< [15]

- Close the building's isolating valves in the cooling water supply and return lines.
- Place the collecting container below the >Cooling water outlet< [14].
- Open the >Cooling water outlet< [14]. The cooling water will begin to drain out. Allow all the cooling water to drain out to prevent the risk of freezing during transport and storage!

## 8.5 Packing

Use the original packaging wherever possible! Further information can be found on page 22 in section »Unpacking«.

## 8.6 Shipping

### NOTE

#### Temperature control unit transported in a horizontal position

##### DAMAGE TO THE COMPRESSOR

- Only transport the temperature control unit in an upright position.

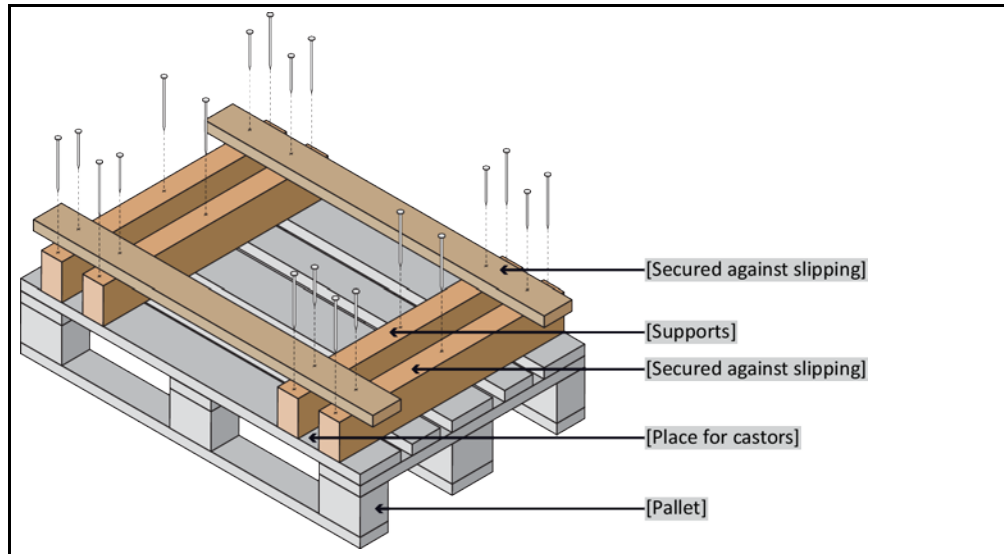
### NOTE

#### Temperature control unit transported incorrectly

##### PROPERTY DAMAGE

- Do not transport by truck on the castors or feet.
- Comply all requirements in this section to avoid damage to the temperature control unit.

Pallet with squared timber for free-standing units



Transport using the lugs, if fitted, on the top of the temperature control unit. Do not transport the temperature control unit alone and without aids.

- Always use the original packaging for transportation.
- Indicate the upright transport position with arrows on the packaging.
- Always transport the temperature control unit upright on a pallet!
- Protect attachments from damage during transportation!
- During transport, place the temperature control unit 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.

## 8.7 Disposal

### CAUTION

#### Uncontrolled or incorrect opening of the coolant circuit

#### RISK OF INJURY AND ENVIRONMENTAL DAMAGE

- Work on the coolant circuit and disposal of the refrigerant must be carried out by approved refrigeration/air-conditioning system contractors.

### NOTE

#### Improper disposal

#### ENVIRONMENTAL DAMAGE

- Spilled/leaked thermofluid must be discarded immediately and correctly. Follow the instructions for the disposal of thermofluid and material on page 15 in section »Proper disposal of resources and consumables«.
- To avoid environmental damage, have “disused” temperature control units disposed of exclusively by approved waste management companies (e.g. refrigeration and air conditioning companies).

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 CO<sub>2</sub> emissions in the production of these materials. Follow the laws and regulations of your jurisdiction when disposing material.

## 8.8 Contact data

### INFORMATION

Contact your supplier or local specialist retailer **prior** to returning the temperature control unit. The contact data can be found on our homepage [www.huber-online.com](http://www.huber-online.com) under the heading „Contact“. Please keep the serial number of the temperature control unit ready. The serial number can be found on the nameplate of the temperature control unit.

### 8.8.1 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](http://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

### 8.8.2 Telephone number: Sales

Telephone: +49-781-9603-123

### 8.8.3 Email address: Customer Support

Email: [support@huber-online.com](mailto:support@huber-online.com)

## 8.9 Certificate of Compliance

Please read page 41, section »Decontamination/repairs«.

## 9 Annex



# Inspired by **temperature** designed for you

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