



# Inspired by **temperature**

**Cap set**

**Installation Guide**

**huber**





## INSTALLATION GUIDE

### **Cap set**



# Cap set

This installation guide is a translation of the original German installation guide.

**VALID FOR:**

**Huber Cap  
Huber Lock Nipples**

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## Foreword

Dear Customer,

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

Please read the installation guide carefully before putting it into operation. Strictly follow all notes and safety instructions.

Follow the installation guide with regard to transport, start-up, operation, maintenance, repair, storage and disposal of the accessory.

We fully warrant the accessory for the specified normal operation.

The component listed on page 5 is referred to in this installation guide as accessory and Peter Huber Kältemaschinenbau SE as Huber company or Huber.

Liability for errors and misprints excluded.




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# 1 Introduction

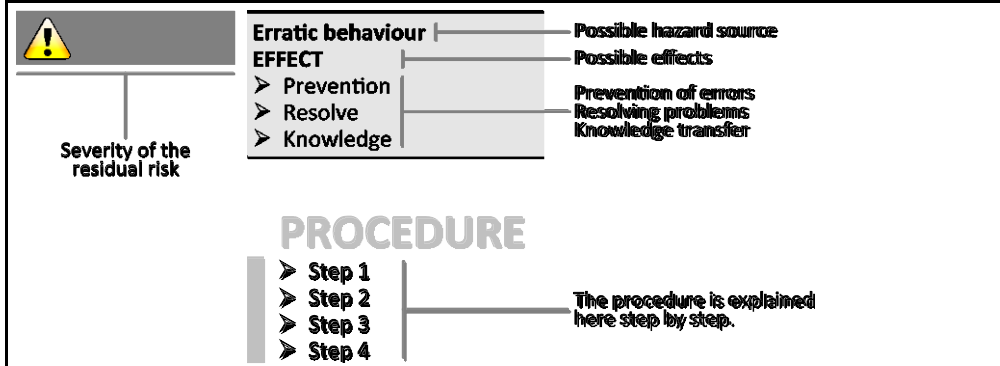
## 1.1 Safety

### 1.1.1 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 installation guide.

 <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 the installation guide is designed to protect the responsible body, operator and the equipment from damage. First inform yourself about any residual risks due to misuse before you start an operation.

## 1.2 Safety and warning notices

The HUBER accessories must be operated according to the installation guide for safe use.

 <b>CAUTION</b>	<p><b>Use of unsuitable/defective hoses and/or hose connections</b></p> <p><b>INJURIES</b></p> <ul style="list-style-type: none"> <li>➤ Use appropriate hoses and/or hose connections.</li> <li>➤ Check periodically for leaks and the quality of the hose and hose connections and take suitable measures (replace) as required.</li> <li>➤ Isolate and protect temperature control hoses against contact/mechanical load.</li> </ul>
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**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****The bending radius of the temperature control hose is smaller than the minimum bending radius****INJURIES DUE TO BREAKAGE OF THE TEMPERATURE CONTROL HOSES**

- Ensure compliance with the minimum bending radius of the temperature control hoses.
- We recommend using 90° elbows between temperature control unit and cap.
- Do not exceed the tightening torque of the coupling nut.

**CAUTION****Using non-approved accessories in ATEX zones****INJURIES**

- In the ATEX zone, only use accessories approved for the zone, explosion subgroup and temperature range.

**CAUTION****Accessories do not close completely after uncoupling****INJURIES OR MATERIAL DAMAGE FROM LEAKING THERMAL FLUID**

- It cannot be completely excluded within the life cycle that the accessories will not close completely after uncoupling.
- Wear your personal protective equipment (e.g. temperature-resistant safety gloves, safety goggles, safety footwear).
- Reconnect the accessories in the event of a malfunction.

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

**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.
- The EU declaration of conformity of any accessory loses its validity in case of technical changes.
- Only specialists may carry out modifications, repairs or maintenance work.
- **The following must be observed without fail:**
- Only use the accessory in a fault-free condition!
- Have the start-up and repairs carried out by trained specialists only!
- Do not ignore, bypass, dismantle or disconnect any safety devices!

**NOTE****Carrying out maintenance work not described in this installation guide****DAMAGE**

- Contact Huber for maintenance work not described in the installation guide.
- Only service the accessories when specified in this installation guide.

**NOTE****The temperature control unit is not completely stopped when the accessories are disconnected****MATERIAL DAMAGE FROM OVERPRESSURE**

- Stop the active temperature control.
- Stop a pump (or similar device) in the thermal fluid circuit.

**NOTE**

**The thermal fluid temperature is higher/lower than the room temperature when the accessories are disconnected**

**MATERIAL DAMAGE CAUSED BY OVER- OR UNDERPRESSURE**

- Prevent temperature changes in the thermal fluid circuit after disconnecting the accessories. Pressure caused by temperature changes after disconnecting the accessories cannot be compensated for at the application side. Even small temperature changes cause larger pressure changes (> 0.5 bar).
- Use the temperature control unit to adjust the thermal fluid to room temperature before disconnecting.
- Protect the application against heat sources such as sunlight and the like.
- Do not close the shut-off valves in the thermal fluid circuit.
- Do not exceed the maximum admissible pressure of the application. Provide safety devices against overpressure, if necessary. This could be a rupture disc or an approved safety valve.

**NOTE****Use of non-approved thermal fluids****MATERIAL DAMAGE CAUSED BY LEAKS**

- Using fluids other than Huber thermal fluids is a misuse of accessories and can destroy the seals.
- Only use Huber thermal fluids
- **Exception:**
- DW-Therm is **not** suitable for the accessories.
- Ethanol as thermal fluid sets the lower operation limit of the accessories to -60C.

**NOTE****Using contaminated thermal fluid****MATERIAL DAMAGE CAUSED BY LEAKS**

- Never use contaminated thermal fluid.
- Ensure that the thermal fluid is not contaminated by foreign objects (e.g. moisture, chips, etc.).
- Foreign objects can impair or destroy the function of the seals in the accessories.

## 2 Commissioning

### 2.1 Wrench sizes and torques

The following table lists thermal fluid circuit connections and the resulting wrench sizes and 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.			

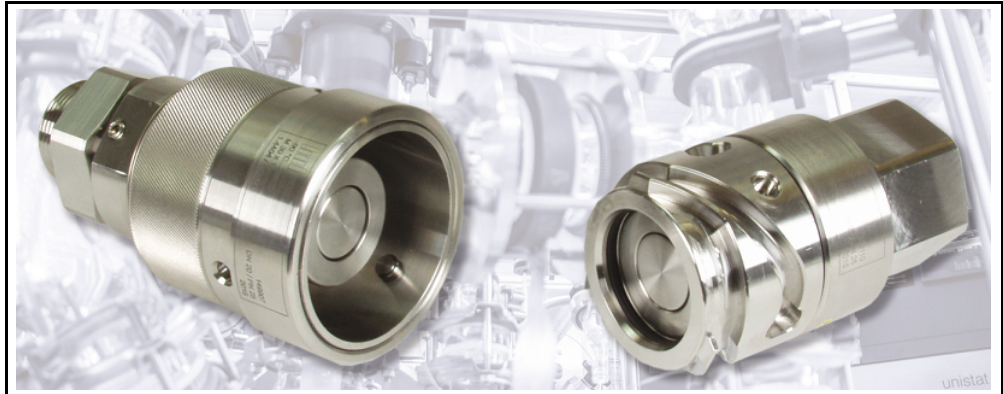
### 2.2 Installing the accessory

#### PROCEDURE

- Connect a 90° elbow to the >Circulation output< [1] and the >Circulation input< [2] of the temperature control unit. The 90° elbows must point downwards.
- Connect the appropriate accessories to the 90° elbows (see on page 17 Section »**Connection options**«).
- Mount the appropriate accessory to the temperature control hoses (see on page 17 Section »**Connection options**«).
- Connect the accessories (see on page 14 Section »**Coupling process**«).
- Do **not use any** additional sealing material.
- Check the connections for leaks.

## 3 Product description

From left to right: Lock nipple (M30 x 1.5 thread, for temperature control hoses), cap (1", for Huber temperature control units or applications)



The accessory consists of a lock nipple and/or a cap with connection thread. The cap's scope of delivery includes a 90° elbow. The 90° elbow is attached either to the temperature control unit or to the application.

### 3.1 Intended use

The accessory is only intended for connecting Huber temperature control units with applications provided by the responsible body. The connections must be established with Huber temperature control hoses. The accessory is intended for use in the commercial and industrial sector. Qualified personnel must train the operator in the handling of technical equipment / tools.

The cap is used at the temperature control unit and/or the application. The lock nipple is used at the temperature control hose. The connection and disconnection process is manual. The accessory is intended to be used at the thermal fluid connections of Huber temperature control units.

Huber thermal fluid must be used in the temperature control circuit. DW-Therm is not suitable for the accessories. Other thermal fluids subject to special testing. Observe the notes on page 15 in Section »Maintenance and functional test«. Ethanol as thermal fluid sets the lower operation limit of the accessories to -60°C.

The accessories may only be connected and disconnected at room temperature (20 °C) and when the pump in the thermal fluid circuit has come to a complete standstill.

### 3.2 Description of application

The highly dynamic Huber temperature control units constitute a revolution in the thermoregulation of fluids. They are perfectly suited for the fast and highly accurate thermoregulation. Especially when using externally closed applications. The temperature control units are predestined for applications in process technology and process engineering.

The temperature control units are connected to systems (e.g. reactors) by insulated temperature control hoses. The disconnection points are equipped with metal-sealing threaded joints.

The cap sets available in the market are not suitable for the temperature ranges of Huber temperature control units and for the wide spectrum of Huber thermal fluids. The cap sets' design-based high pressure losses result in a considerably worse performance of the overall system.

The cap set developed by Huber is specially designed for Huber temperature control units and Huber thermal fluids. Previously, the entire thermal fluid circuit had to be emptied when changing an application; this is no longer necessary with the Huber cap set. It satisfies the special requirements of temperature control technology and reduces the amount of thermal fluid escaping during discon-

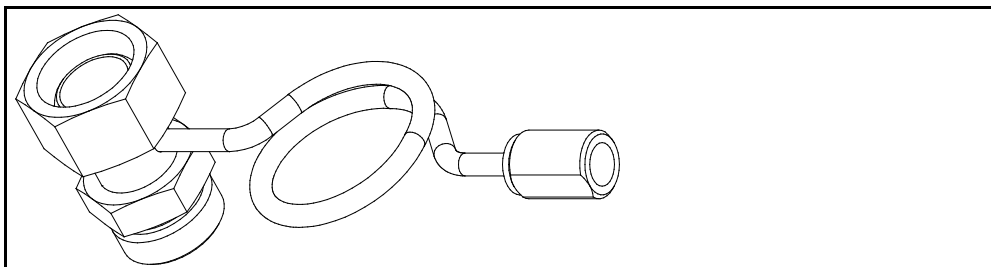
nection to a minimum (a few drops). The Huber cap set avoids high pressure losses and therefore does not affect the overall system performance.

### 3.3 Features and advantages

- Excellent flow rates ensure the least pressure losses and optimum temperature control processes.
- High quality and durable sealing material ensures safe operation.
- Rotational freedom prevents the temperature control hoses from twisting.
- You can install it in a partition plate and then connect it to a glass reactor.
- Various connections are possible, thus existing systems can be equipped too.
- The bayonet locking device produces low axial coupling forces with DN 20 and DN 25.
- Low leakage rate during disconnection.
- Compact design for small installation spaces.
- Smooth surfaces around valves make cleaning easy.
- Wear parts such as seals can be changed, especially the main seal can be changed from the outside without disassembly.
- Service and maintenance possible.

### 3.4 Optional connection set for protective devices

Schematic representation



We offer an adapter for the integration of a pressure relief valve. The connection set has two connecting threads for the thermal fluid circuit and a thermally decoupled R ¼ connection for integrating the safety device. The safety device is not included in the delivery. The connection set must not be shut off from the application side.

### 3.5 Optional equipment

- Dust caps: Plastic, POM, for both coupling units.
- Hook wrench: Using the hook wrench can further reduce the force needed during coupling.

### 3.6 Optional approvals

- ATEX approval for Zone 2, II 2G IIC Tx
- Zone 1 on request

### 3.7 Optional certificates

Acceptance test certificate to DIN EN 10204-2.1, -2.2 and 3.1 on prior request

## 4 Operating manual

Accessories may only be used for the operating conditions specified from page 12 in Section »**Product description**«. Failure to do so may result in dangerous personal injuries and damage to the accessory.

### 4.1 Coupling process

Visually inspect the cap and lock nipples prior to any coupling. Damaged parts must be replaced in case of visible damage or deformations. Remove visible contamination prior to connecting.

Hold the temperature control hose's lock nipple at the locking sleeve.

**Connecting process:**

Perform a clockwise coupling movement (turn to the right).

Cap and lock nipple move away from each other slightly past the dead center and before the end position is reached.

Cap and lock nipple are now mechanically locked.

### 4.2 Disconnection procedure

Hold the lock nipple as you did when engaging the coupling.

**Disconnection sequence:**

The disconnection movement is counterclockwise (turning to the left).

During the disconnection process and until the parts are beyond the dead center, the closing coupling and the closing nipple first approach one another by a short way. The valves in cap and lock nipple close at the same time. A few drops of thermal fluid may escape during disconnection.

## 5 Maintenance and functional test

Prevent any external damage to the elements and any moving parts when using the accessory.

Maintain and functionally test the accessories at suitable intervals. This guarantees the accessories' function and thus protects the operator. The interval depends on the operating conditions.

Maintenance and functional test	Description	Comment	Person responsible
	Visually inspect the accessories for external damage and contamination when uncoupled.	Wipe off any contamination from the externally accessible functional range (sealing area, operating elements).	Operating company and/or operating personnel
		In case the accessory is damaged or has cracked or corroded parts: Remove the accessories concerned and return them to Huber for repair.	Operating company and/or operating personnel
	Leak test	If the seal is worn out, brittle or overaged: Repair the accessory yourself or send it to Huber for repair. The sealing surface in the groove must not be damaged when replacing the housing seal. We recommend the repair to be performed by Huber.	Operating company and/or operating personnel
	Severe contamination	Repair the accessory yourself or send it to Huber for repair. We recommend the repair to be performed by Huber.	Operating company and/or operating personnel

### 5.1 Operating restrictions

The housing seal can swell slightly, depending on the thermal fluid used. This can make it more difficult to separate the accessories. It may even appear to be stuck. The following procedure has proven to be very helpful.

#### PROCEDURE

- Disassemble the accessories from the temperature control unit and the temperature control hoses and, if possible, remove any thermal fluid left. Ideally, cap and lock nipple are separated from each other.
- Allow to dry for a few days in the ambient air (at about 20 °C).
- The O-rings will have returned to their original size after this waiting time. The O-rings can still be used.
- Repeat as needed.

The outer housing seal can be replaced on site. The housing seal for the DN-20 version is available as spare part No. 61099. We will make you an offer if you require all seals to be replaced and a final inspection to be performed. Review and shipping takes about 3 weeks.

### 5.2 Decontamination/repairs

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

## 6 Storage

The accessories must be stored such that no damage can occur. Install protective transport caps on all connections to avoid damage or contamination. The storage conditions of the accessories must follow the guidelines of the installed seals. Incorrect storage may alter the seals.

The following points must be observed:

- The seals must be stored dry.
- The seals must be protected from daylight.
- The seals must be kept in their packaging to protect them from oxygen.

## 7 Decommissioning / 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 at the end of the life can actively support reducing CO2 emissions in the production of these materials. Follow the laws and regulations of your jurisdiction when disposing material.



## 8 Technical data

Overview	Description	M24 x 1.5 / DN 12	M30 x 1.5 / DN 20	G 1"
	Temperature range	-75 °C ... 230 °C	-90 °C ... 230 °C	-90 °C ... 230 °C
	Materials	Media-bearing parts are made of stainless steel 1.4404, and the remaining parts are made of stainless steel 1.4571		
	Operating temperature	20 °C		
	Operating pressure	Max. 25 bar @ 20 °C		
	Nominal diameter (DN)	12 mm	20 mm	20 mm
	Sealing material	Special material, PTFE		
	Theoretical pressure drop <sup>a)</sup> at 20 / 40 / 100 l/min.	0.10 bar / 0.40 bar / –	– / 0.04 bar / 0.25 bar	– / 0.04 bar / 0.25 bar
	Leakage volume	< 0.5 ml/10 drops per disconnecting cycle <sup>a)</sup>		
a) Measured with water (20 °C) at a room temperature of 20 °C				

### 8.1 Connection options

Overview	Point of connection	Order no.	Connection A	D	SW	L	LG	O	Weight
				(approx. mm)					(g)
Temperature control unit, application		10787	M16 x 1 A <sup>d) e)</sup>	–	–	–	–	–	250
		10791	M16 x 1 A <sup>d) f)</sup>	40	36	74	–	–	250
		10789	M24 x 1,5 A <sup>d) e)</sup>	–	–	–	–	–	250
		10529 <sup>a)</sup>	M24 x 1.5 A <sup>d) f)</sup>	40	36	74	–	–	250
		10407 <sup>a)</sup>	M30 x 1.5 <sup>b) g)</sup>	54	41	104	174	15	917
		10409	1 in NPT <sup>c) f)</sup>	54	41	94	184	18	785
Temperature control hose		10786	M16 x 1 <sup>b) e)</sup>	–	–	–	–	–	390
		10790	M16 x 1 <sup>b) f)</sup>	40	36	80	–	–	390
		10788	M24 x 1,5 <sup>b) e)</sup>	–	–	–	–	–	390
		10530	M24 x 1,5 <sup>b) f)</sup>	40	36	80	–	–	390
		10406	M30 x 1,5 A <sup>d) g)</sup>	67	41	116	–	14	1130
a) Including 90° elbow b) Sealing cone to DIN 3863 Y c) Internal thread d) Sealing cone to DIN 3863 Y Temperature range: e) -45 ... 220 °C; f) -75 ... 230 °C; g) -90 ... 230 °C									

## 9 Contact data

**INFORMATION**

Please contact your supplier and/or local dealer **before** you return your accessories. The contact information can be found "Contact" on our home page [www.huber-online.com](http://www.huber-online.com).

### 9.1 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

### 9.2 Telephone number: Sales

Telephone: +49-781-9603-123

### 9.3 Email address: Customer Support

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



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