HB-Therm®

Instruction Manual

HB-TP180/200

Checking Facility for Temperature Control Units

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Translation of original instruction

(Typenschild)

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1 General

1.1 Information about this manual

After reading this manual, the operator will be able to safely and efficiently handle the checking facility for temperature control units.

The manual is an integral part of the checking facility for temperature control units and must always be kept close to the checking facility for temperature control units and readily accessible for personnel. Before starting any work, the personnel must have carefully read and understood this manual. A basic requirement for safe work is the observance of all safety and handling instructions in this manual.

Furthermore, the local accident prevention regulations and general safety regulations are valid for the application area of the checking facility for temperature control units.

Illustrations in this manual are for basic understanding and may deviate from the actual design.

We reserve the right to make technical modifications in order to improve usability.

1.2 Explanation of symbols

Warnings

Warnings are identified by symbols. These warnings are introduced by signal words, which express the severity of a danger. Adhere to these warnings and act cautiously in order to avoid accidents, personal injuries and damage to property.

DANGER!

… indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

… indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

… indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

ATTENTION!

… indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Hints and recommendations

NOTE!

… emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

General

1.3 Limitation of liability

All information and notes in this Manual were compiled under due consideration of valid standards and regulations, the present status of technology and our years of knowledge and experience.

The manufacturer can not be made liable for damage resulting from:

- disregarding this Manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- technical modifications
- use of unapproved spare parts

In case of customised versions the actual scope of delivery can vary from the explanations and representations in this Manual, because of the utilization of additional options or due to latest technical changes.

Apart from this, the obligations agreed upon in the delivery contract, the general terms and conditions and the delivery conditions of the manufacturer and the legal regulations valid at the time of contract do apply.

1.4 Copyright

1.5 Warranty terms

The warranty terms are provided in the manufacturer's terms and conditions.

1.6 Customer Service

For technical information, please contact the HB-Therm representatives or our customer service department → www.hb-therm.ch.

Furthermore, our employees are always interested in new information and experiences resulting from the application that could be valuable for the improvement of our products.

2 Safety

This paragraph provides an overview of all important safety aspects for optimal protection of personnel as well as safe and trouble-free operation.

Disregarding this Manual and safety regulations specified therein may result in considerable danger.

2.1 Intended Use

The checking facility for temperature control units is designed and constructed exclusively for the intended use described here.

The checking facility for temperature control units serves solely for the quality testing (determining the measuring accuracy of the temperature, pressure and flow measurement) of HB-Therm temperature control units. The checking facility is not suitable for continuous duty (only for the duration of the quality test).

The checking facility for temperature control units must be operated solely in accordance with the values indicated in the Technical Information.

Observance of all information in this manual also pertains to the-intended use.

Any use of the checking facility for temperature control units other than or going beyond the intended use is deemed as misuse and can lead to dangerous situations.

WARNING!
Improper use poses danger!

A misuse of the checking facility for temperature control units can lead to dangerous situations.

In particular the following must not be used:

– You must NOT use heat transfer mediums other than heat transfer oil.
– You must NOT use pressures, temperatures higher than those specified.

Any claims arising from damage as a result of improper use are excluded.

2.2 Customer’s responsibility

The device is implemented commercially. Thus the owner of the device is subject to legal industrial safety obligations.

In addition to the safety instructions in this Manual, the safety, accident prevention guidelines and environmental protection regulations, applicable at the site of implementation must be complied with. In particular:

- Owner must inform himself of applicable industrial safety regulations and determine additional hazards that arise due to the specific working conditions prevailing at the site where the device is implemented, in a risk analysis. The risk assessment must be implemented in the form of work instructions for device operation.
- Owner must check throughout the entire implementation period of the device, whether the work instructions that owner has created satisfy current legislation, and must adapt the instructions if necessary.
- Owner must clearly regulate and specify the responsibilities for installation, operation, maintenance, and cleaning.
- Owner must ensure that all employees who deal with the device have read and understood this Manual.
  In addition, owner must train personnel at regular intervals and inform personnel of the hazards.
- Owner must provide personnel with the required protective equipment.

In addition, owner is responsible to ensure that the device is always in a technically perfect condition, and therefore the following applies:

- Owner must ensure that the maintenance intervals described in these operating instructions are complied with.
- Owner must have all safety devices inspected regularly for function and completeness.

2.3 Personnel requirements

2.3.1 Qualifications

WARNING!
Danger of injury if insufficiently qualified!

Improper operation can lead to serious personal injuries or property damage.

Therefore:

– Have all activities performed only by qualified personnel.

The following qualifications are specified for different areas of activity listed in the Manual.

- **An instructed person**
  has been instructed by the customer in an orientation session on the assigned tasks and possible dangers in case of improper behavior.
- **Qualified personnel**
  based on their professional training, know-how and experience as well as knowledge of the applicable standards and regulations is able to perform assigned work activities and to detect and avoid possible dangers on their own.
- **A professional electrician**
  based on his/her professional training, know-how and experience as well as knowledge of the applicable standards and regulations is able to perform work on electrical systems and to detect and avoid possible dangers on his/her own.
  The professional electrician has been trained for the special location where he/she works and knows the relevant standards and regulations.
- **Hydraulic specialist**
  based on his or her technical training, knowledge and experience as well as knowledge of the relevant standards and regulations, is able to carry out work on hydraulic systems and to independently recognise and avoid possible dangers.
  The hydraulic specialist is trained for the specific location at which he or she is employed and is familiar with the relevant standards.

2.3.2 Unauthorized persons

WARNING!
Danger for unauthorized persons!

Unauthorized persons not meeting the requirements outlined here are not aware of the dangers in the work area.

Therefore:

– Keep unauthorized persons away from the work area.
– If in doubt, address the persons and direct them to leave the work area.
– Interrupt work activities as long as unauthorized persons are present in the work area.

2.4 Personal protective equipment

When working, it may be necessary to wear personal protective equipment in order to minimise dangers to health.

- During work, always wear the protective equipment necessary for the particular work.
- Follow the information placed in the working area with regard personal safety equipment.

Personal protective equipment for special tasks

When performing special tasks it is necessary to wear personal protective equipment. This personal protective equipment will be separately specified in the chapters of this Manual. This special protective equipment is explained below.

Protective clothing

means close-fitting working clothes with long arms and long trousers. It serves primarily as protection against hot surfaces.

Protective gloves

to protect the hands against abrasions, cuts or deeper wounds as well as against contact with hot surfaces.

Safety goggles

to protect the eyes against parts flying around or squirts of fluids.

Safety boots

to protect against heavy parts falling down or slipping on slippery ground.

2.5 Specific dangers

The following section lists the residual risks that have been determined by the risk assessment.

- Heed the safety instructions listed here, and the warnings in subsequent chapters of this Manual, to reduce health hazards and to avoid dangerous situations.

Hot materials

WARNING!
Danger of burns due to hot working materials!

During operation, working materials can reach high temperatures and pressures and can cause burns on contact.

Therefore:

– Only allow work on the hydraulics to be carried out by qualified personnel.
– Before beginning work on the hydraulics, check whether working materials are hot and under pressure. If necessary, cool the unit down, depressurise and switch off. Check that the unit is free of pressure.

Hot surfaces

CAUTION!
Danger of burning on hot surfaces!

Contact with hot components can cause severe burns.

Therefore:

– Always wear protective clothes and protective gloves when working on hot components.
– Before starting work make sure that all components have cooled down to ambient temperature.

2.6 Stickers and decals

The following symbols and information decals can be found in the danger zone. They refer to the immediate vicinity around their location.

WARNING!
Danger of injury because of illegible symbols!

Over the course of time stickers and decals may become dirty or illegible for any other reason.

Therefore:

– Keep any safety, warning and operation related decals in legible condition at all times.
– Replace damaged decals or stickers immediately.

Hot surfaces

Hot surfaces, like hot machine parts, tanks or materials, but also hot fluids, are not always detectable. Do not touch without protective gloves.

2.7 CE Declaration of Conformity for Machinery

(CE-Directive 2006/42/EG, Annex II 1. A.)

Product	Checking facility for temperature control units
Unit types	HB-TP180 HB-TP200
Manufacturer Address	HB-Therm AG Piccardstrasse 6 9015 St. Gallen SWITZERLAND www.hb-therm.com
CE guidelines Note on the pressure equipment line 2014/68 / EU	2011/65/EU The above products are in accordance with Article 4 (3). This means that interpretation and production are consistent with good engineering practice in the Member State.
Responsible for documentation	Martin Braun HB-Therm AG 9015 St. Gallen SWITZERLAND
Standards	EN ISO 12100:2010; EN ISO 13732-1:2008; EN IEC 63000:2018

We declare of our own responsibility that the above mentioned products, to which this declaration refers, comply with the appropriate regulations of the CE-Machinery Directive.
(CE-Directive 2006/42/EG), including its appendices and the corresponding legal remission for implementation of the directive in national law.
Furthermore, the above mentioned CE-Directives and standards (or parts/clauses thereof) are applied.

St. Gallen, 2023-08-17

Reto Zürcher
CEO

Stefan Gajic
Compliance & Digitalisation

Safety

2.8 UK Declaration of Conformity for Machinery

(Supply of Machinery (Safety) Regulation 2008, Statutory Instrument 2008 No. 1597)

Product	Checking facility for Temperature Control Units
Unit types	HB-TP180 HB-TP200
Manufacturer Address	HB-Therm AG Piccardstrasse 6 9015 St. Gallen SWITZERLAND www.hb-therm.com
UK guidelines	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 Statutory Instruments 2012 No. 3032
Note on The Pressure Equipment (Safety) Regulations 2016 Statutory Instruments 2016 No. 1105	The above products are in accordance with regulation 8. This means that interpretation and production are consistent with good engineering practice.
Responsible for documentation	Martin Braun HB-Therm AG 9015 St. Gallen SWITZERLAND
Standards	EN ISO 12100:2010; EN ISO 13732-1:2008; EN IEC 63000:2018

We declare of our own responsibility that the above mentioned products, to which this declaration refers, comply with the appropriate regulations of the Electromagnetic Compatibility Regulations 2016, including its appendices. Furthermore, the above mentioned Statutory Instruments and standards (or parts/clauses thereof) are applied.

St. Gallen, 2023-08-17

Reto Zürcher
CEO

Stefan Gajic
Compliance & Digitalisation

3 Technical data

3.1 General Information

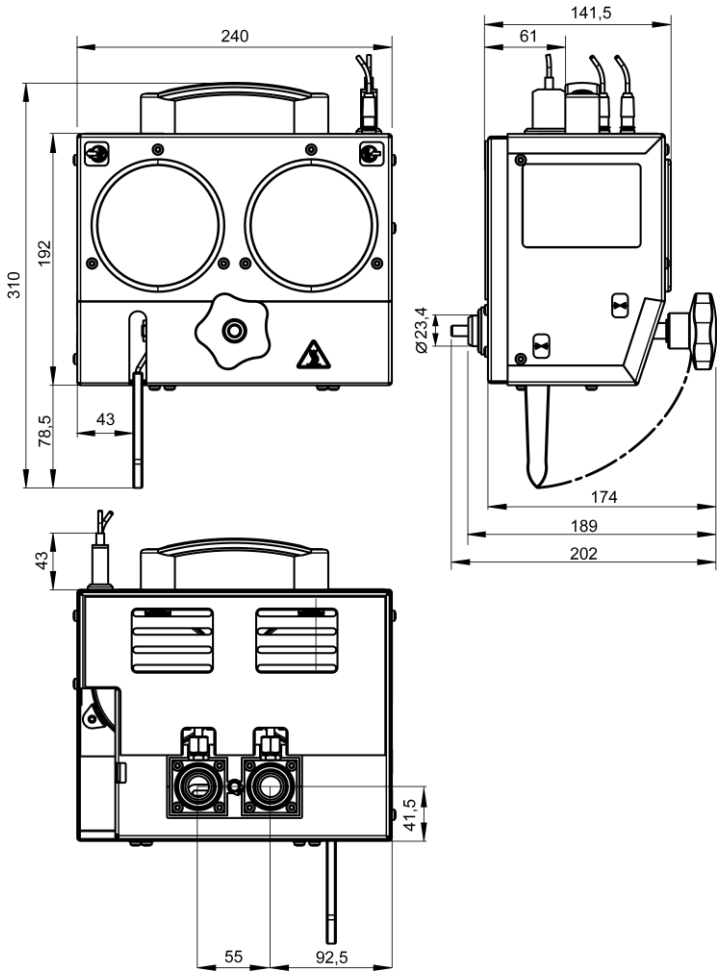


Fig. 1: Dimension HB-TP180/200-12

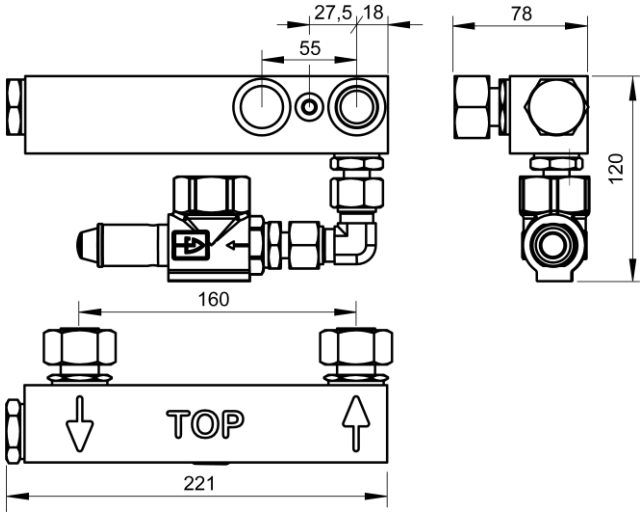


Fig. 2: Dimension Adapter HB-200/230Z for HB-TP180-12

Technical data

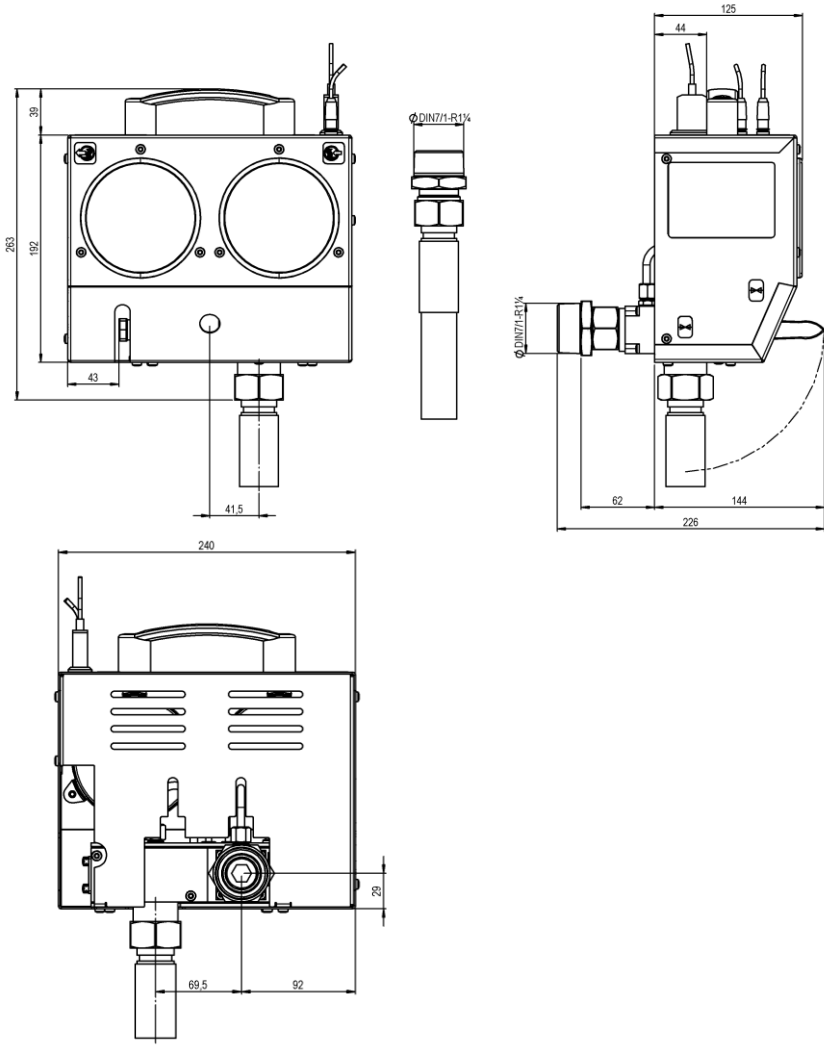


Fig. 3: Dimension HB-TP180-45

Max. weight

	Value	Unit
HB-TP180/200-12	9	kg
HB-TP180-45	9	kg
Adapter HB-200/230Z for HB-TP180-12	3,5	kg

3.2 Emissions

	Value	Unit
Surface temperature	>75	°C

3.3 Operating conditions

Environment

The checking facility for temperature control units may only be operated indoors.

	Value	Unit
Temperature range	5–60	°C
Relative humidity *	35–85	% RH

* non-condensing

3.4 Connection values

Connection main and return line

	Value	Unit
Thread HB-TP180-45	R 1¼	
Resistance	25, 200	bar, °C

R… Connector internal thread in inches

	Value	Unit
Thread Adapter HB-200/230Z for HB-TP180-12	M30x1,5	
Resistance	25, 200	bar, °C

M… Connection - metric internal thread

Technical data

3.5 Operating fluids

Depending on the version, the following materials are used:

- Copper
- Brass
- Bronze
- Nickel
- Chrome steel
- MQ (silicon)
- Titan
- NBR (Nitrile rubber)
- FPM (Viton®)
- PTFE (Teflon)
- FFKM (Perfluorinated rubber)
- PEEK (Polyether ether ketone)
- Ceramic (Al_2O_3)

Viton® is a trademark of Dupont Dow Elastomers

Heat transfer medium water (HB-TP180)

Hydrological data	Temperature range	Guideline value	Unit
pH	-	7.5, – 9	
Conductivity	up to 110 °C	<150	mS/m
	110–180 °C	<50	
	over 180 °C	<3	
Total hardness	up to 140 °C	<2.7	mol/m^3
		<15	°dH
	over 140 °C	<0.02	mol/m^3
		<0.11	°dH
Carbonate hardness	up to 140 °C	<2.7	mol/m^3
		<15	°dH
	over 140 °C	<0.02	mol/m^3
		<0.11	°dH
Chloride ions (CI) -	up to 110 °C	<50	mg/L
	110–180 °C	<30	
	over 180 °C	<5	
Sulphate SO4 2-	-	<150	mg/L
Ammonium NH4 +	-	<1	mg/L
Iron Fe	-	<0.2	mg/L
Manganese Mn	-	<0.1	mg/L
Particle size	-	<200	µm

Heat transfer oil (HB-TP200)

Suitable heat transfer oils must be used for operation with oil.

WARNING!
Danger may result if unsuitable heat transfer oils are used

Using unsuitable oil poses the risks of cracking, overheating and fire.

Therefore:

– The maximum permitted main line temperature must exceed the maximum working temperature of the unit.
– The permitted film temperature and the boiling point must be at least 340 °C.

Do not use any aggressive medium that can destroy materials in contact with the heat transfer medium.

NOTICE!

For further information, you can go to www.hb-therm.ch to download "Oil recommendation for temperature control units (DF8082-X, X=language).

3.6 Nameplate

The nameplate is located on the rear panel of the unit, on the inside of the service flap and on page 2 o these operating instructions.

The following information can be taken from the nameplate:

- Manufacturer
- Type designation
- Unit number
- Year of manufacture
- Performance data
- Connection data
- Type of protection
- Additional equipment

4 Structure and function

4.1 Overview

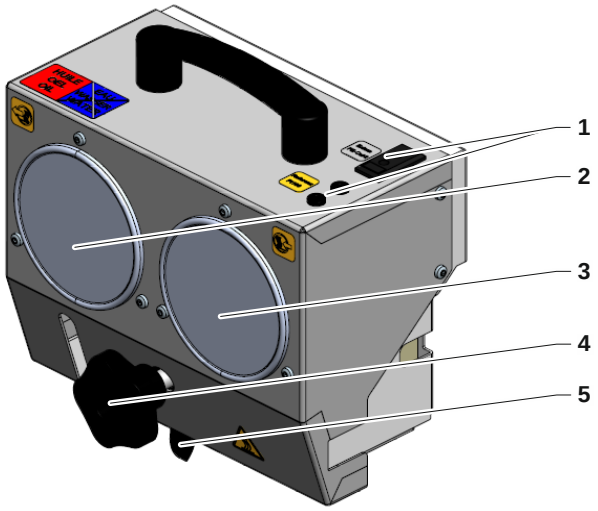


Fig. 4: Overview

1 Connection for temperature measurement Pt 100 and thermocouple Type J
2 Pressure gauge main line
3 Pressure gauge return line
4 Central lock
5 Shut-off valve

4.2 Functional principle

The checking facility for temperature control units serves for quality and safety testing the temperature control units. The pressure is measured using pressure gauges. The temperature is measured using a resistance thermometer and/or a thermocouple. The flow is measured based on a pressure differential.

Values determined by the checking facility are entered manually into a test and calibration certificate or directly into the unit (only Thermo-5).

4.3 Connections

see chapter 11.1 on page 46

4.4 Work and danger zones

Working areas

- The primary working area is located at the front of the temperature control unit or the Panel-5 control module.
- The secondary working area is located at the rear of the temperature control unit.

Danger areas

- Use the port on the back of the temperature control unit to connect the checking facility. There is the danger of burning and scalding at accessible hot surfaces. From a bursting hose, hot steam or hot water can escape and cause burns and scalds.

5 Transport, packing and storage

5.1 Safety notes for transport

Improper transport

ATTENTION!
Damage due to improper transport!

Improper transport can result in considerable material damage.

Therefore:

– Only use original or equivalent packaging.
– On delivery as well as during internal transport, proceed carefully when unloading the packages and observe the notices on the packaging.
– Only remove the packaging shortly before assembly.

5.2 Transport inspection

Check the delivery immediately on receipt for completeness and transport damage.

If externally detectable transport damage is found, proceed as follows:

- Do not accept the delivery, or only with reservation.
- Record the extent of transport damage in the transport documents or on the delivery note of the forwarding agent.
- Start complaints procedure.

NOTE!

Claim any damage as soon as it is detected. Compensation claims can only be submitted within the applicable complaints periods.

5.3 Packing

Fig. 5: Packaging

The checking facility is packed in a carrying case appropriate to the expected transport conditions.

The packaging should protect the individual components from transport damage, corrosion and other damage. Therefore, do not destroy the packaging.

When ordered with accessories, the unit is shipped in a cardboard box.

Handling packing materials

If there is no returns agreement for the packing, separate materials according to type and size and direct to further use or recycling.

ATTENTION!
Environmental damage caused by incorrect waste disposal!

Packing materials are valuable raw materials and can continue to be used in many cases or sensibly reconditioned and recycled.

Therefore:

– Dispose of packing materials environmentally.
– Follow the locally valid waste disposal regulations. If necessary employ a special waste disposal company to dispose of packing material.

Transport, packing and storage

Recycling codes for packaging materials

Recycling codes are markings on packaging materials. They provide information about the type of material used and facilitate the disposal and recycling process.

These codes consist of a specific material number framed by an arrow-triangle symbol. Below the symbol is the abbreviation for the respective material.

Transport pallet

→ Wood

Folding carton

→ Cardboard

Strapping band

→ Polypropylene

Foam pads, cable ties and quick release bags

→ Polyethylene low density

no recycling code

Stretch film

→ Polyethylene linear low density

5.4 Symbols on the packing

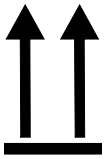
Protect against wetness

Protect packages against wetness and keep dry.

Fragile

Identifies packages with fragile or sensitive content.

Handle package with care, do not drop and do not subject to shock loads.



Top

The arrows in this sign symbolize the top side of the package. They must always point up, as otherwise the content may get damaged.

5.5 Storage

Storing the packages

Store the packages under the following conditions:

- Do not store out of doors.
- Store dry and dust-free.
- Do not expose to aggressive media.
- Protect from sunlight.
- Avoid mechanical vibrations.
- Storage temperature: 15 to 35 °C.
- Relative humidity: max. 60 %.

6 Installation

6.1 Safety

Personnel

- The installation and commissioning must only be carried out by qualified personnel.
- Work on the electrical system must only be carried out by certified electricians.
- Work on the hydraulic system must only be carried out by qualified hydraulics technicians.

Special dangers

The following dangers exist:

- Danger of fatal injury by electric current.
- Risk of burns due to hot materials.
- Risk of burns due to hot surfaces.
- Danger of crushing due to rolling away or tipping.

Improper installation and initial commissioning

WARNING!
Risk of injury due to improper installation and initial commissioning!

Improper installation and initial commissioning can lead to severe personal injury or material damage.

Therefore:

– Before starting work, ensure that there is sufficient space for assembly.
– Open components with sharp edges should be handled carefully.

6.2 Installation work

Before checking the temperature control unit, prepare the temperature control unit as follows:

Connect cooling water inlet and outlet

NOTE!

In order to optimally utilize the cooling capacity of the temperature control unit, keep the cooling water outlet as short and free of back-pressure as possible.

1. Connect cooling water inlet and outlet to cooling water system.

Connect system water inlet and outlet

2. Optionally connect system water inlet and outlet to system water system.

Install the checking facility

3. Remove any hoses, couplings and fittings at the main and return line.

4. Only for HB-200/230Z units:

Warning!

Bolted assemblies, especially combinations of stainless steel / stainless steel or steel / stainless steel tend to adhere strongly or can seize up after a longer period of operation at high temperatures. This results in difficulties in dismantling.

Therefore:

– Use a suitable lubricant (e.g., Klüberpaste, included in the delivery of the HB-200/230Z adapter).

- Connect the HB-200/230Z adapter to the temperature control unit.

5. Connect the HB-TP180/200 checking facility to the temperature control unit or connection adapter.

Make electrical connections

6. Electrical connections should be made by a certified electrician under the following conditions:

- Only make the electrical connections after the hydraulic connections have been made.
- Ensure that mains voltage and frequency corresponding to the specification on the nameplate and in the technical data are observed.
- Prefuse the temperature control unit in accordance with the electrical specifications (→ Instruction Manual Thermo-5).

7 Testing

7.1 Test principle

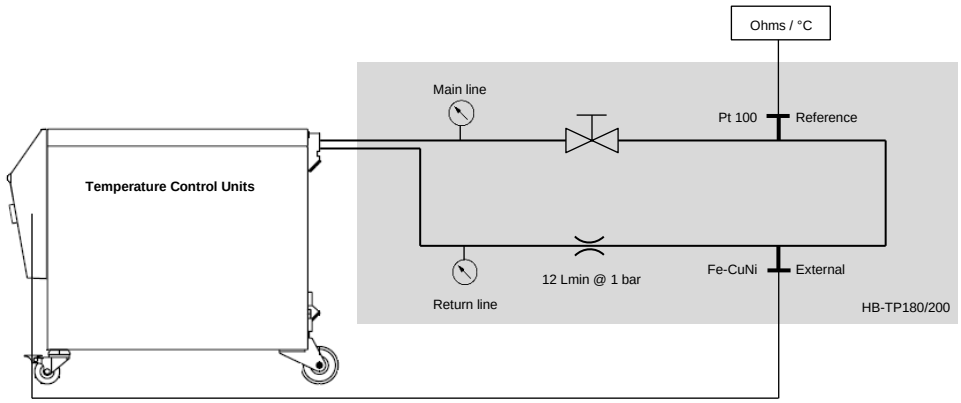


Fig. 6: Test principle

7.2 Thermo-6 test sequence

The necessary requirements and the guided test procedure with a Thermo-6 are described in the HB-Therm Knowledge, see link.

Direct access Knowledge for instructions for a quality test with a Thermo-6 unit.

→ http://hb.click/55-000-EN

7.3 Thermo-5 test sequence

Requirement

The following software version or higher is required for the automatic test process:

- SW51-2_2302 for unit type HB-200/230Z with adapter to HB-TP180-12
- SW51-2_1548 for remaining unit types

NOTICE!

Quality testing in the factory and at the customer's site with the checking facility relate to various reference measurement variables.

If a quality test is carried out with the checking facility on a newly delivered temperature control unit, the measurement accuracy of the measured variables may differ from one another.

NOTICE!

Values entered in Ohm (Ω) from Pt 100 temperature measurement are converted into degrees Celsius (°C) using a formula. The basis for this is the Pt 100 table according to the ITS-90 (International Temperature Scale).

Testing

7.3.1 Flow chart up to SW51-2_1825

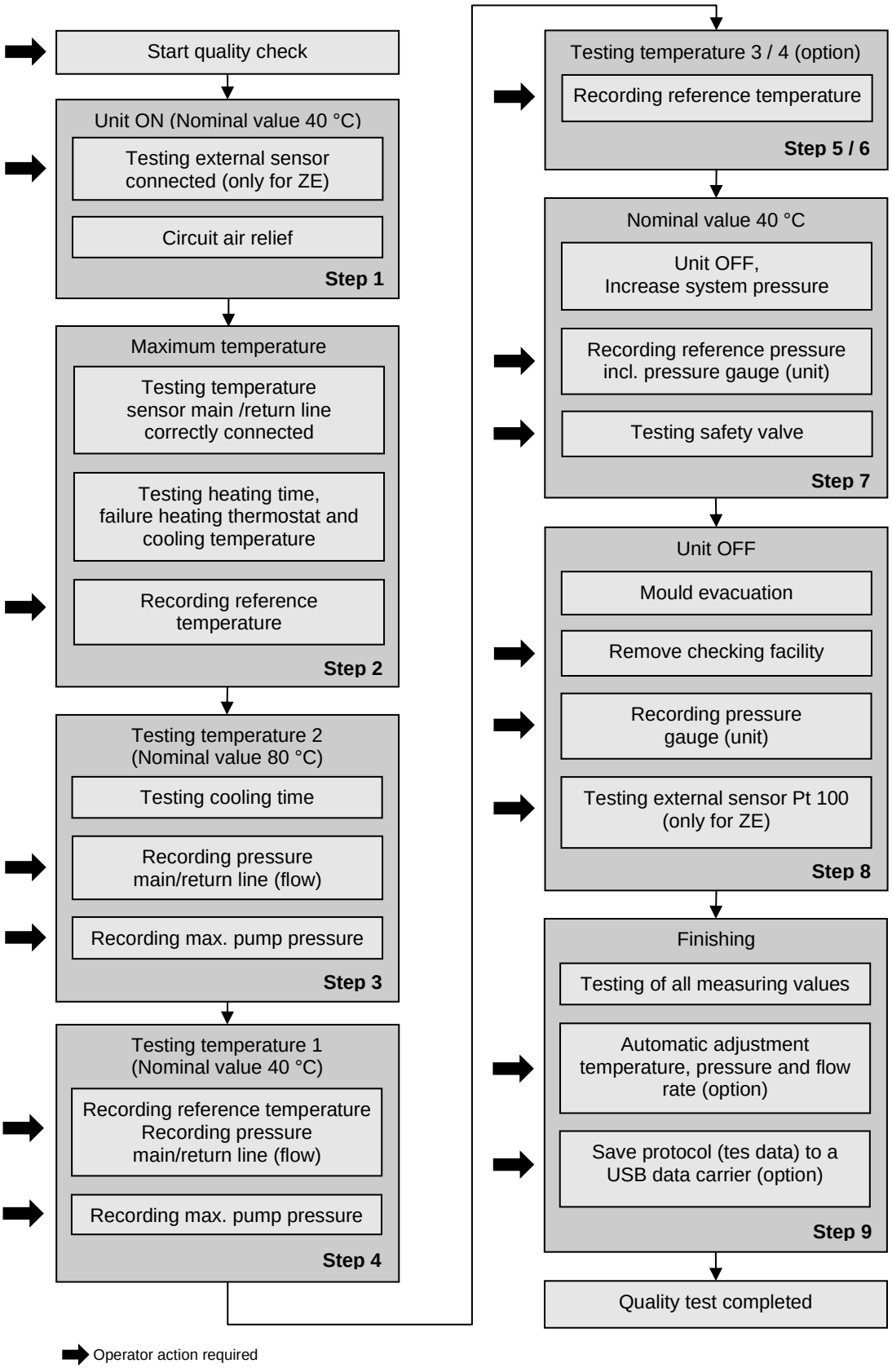


Fig. 7: Process diagram

7.3.2 Flow chart from SW51-2_1844

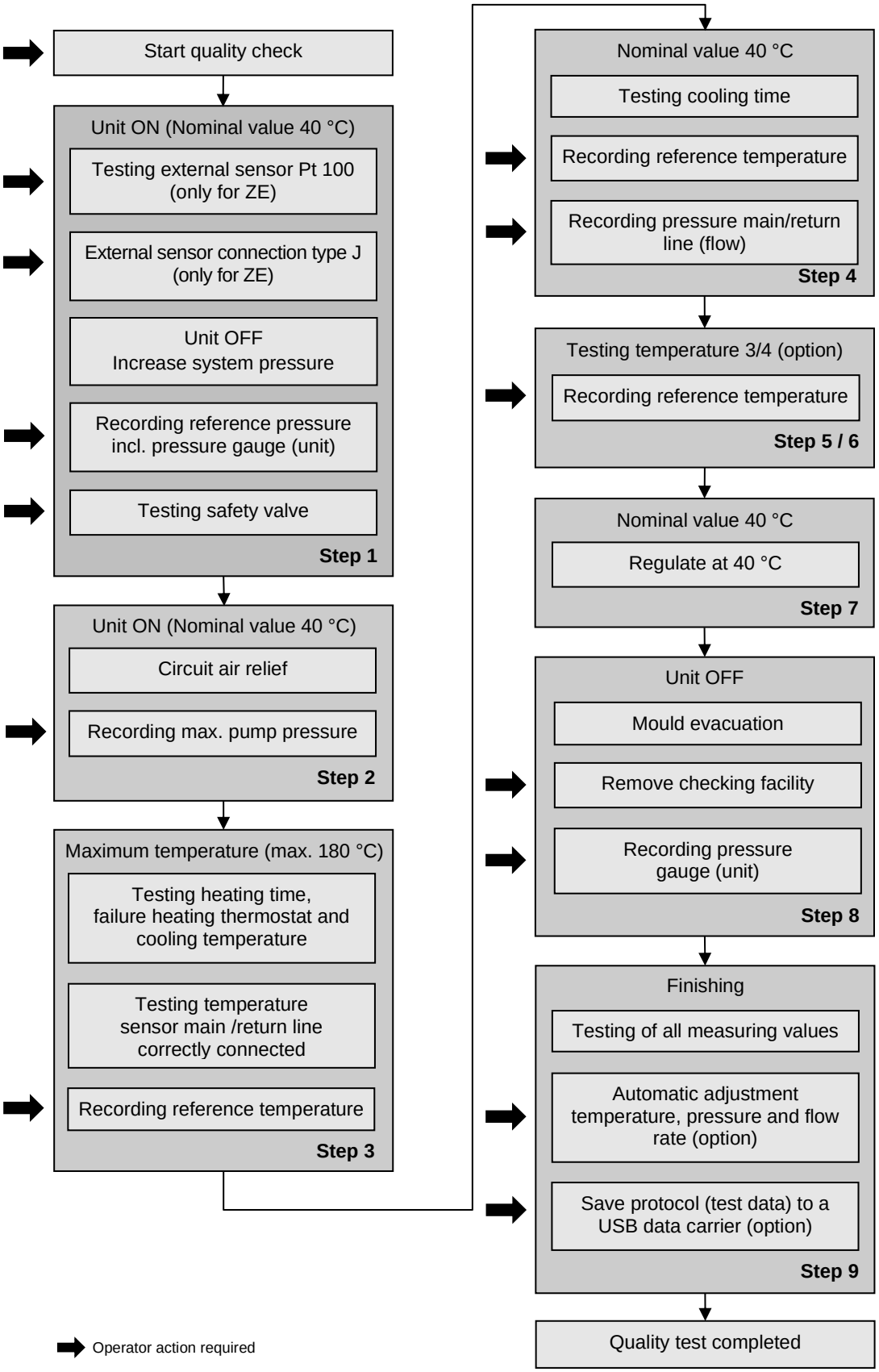


Fig. 8: Process diagram

7.3.3 Testing

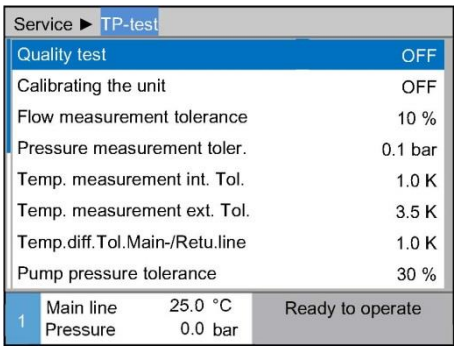


Fig. 9: Start quality test

Proceed as follows to start the test sequence automatically:

1. Open the shut-off valve (move the lever upward).
2. Open the Service \ TP-test menu page.
3. Set the Quality Test parameter to „ON“.

→ The quality test starts automatically.

→ Follow the instructions on the screen.

→ The current testing step, according to the process diagram (→ page 35), is displayed in the symbol field.

NOTICE!

At the end of the test, you can save a CSV file to a USB data carrier. A test and calibration certificate can be generated by using the VIP diagramming software. You can download the software on www.hb-therm.ch.

NOTICE!

When measuring the Pt 100 reference temperature with a multimeter, the ohmic resistance of the test lines must be considered. This resistance must be subtracted from the measurement result.

The ohmic resistance of the measurement cables supplied by HB-Therm is 0,3 ohms, which corresponds to a measurement error of approx. 0,8 K.

Safety test

4. Remove unit covers as described in the Operating Instructions (Maintenance Chapter).
5. Carry out the following visual checks:
   - Power Cord: Inspect insulation and connector area for damage.
   - Thermal isolation: Check for saturation by heat transfer medium, damage and location.
   - Tightness: Check the connections for signs of leakage.
   - General condition of unit: Check for signs of exterior damage and dirt accumulation.
6. At the end of the visual checks, reinstall the unit covers as described in the Operating Instructions.

7.3.4 Settings

Testing temperatures

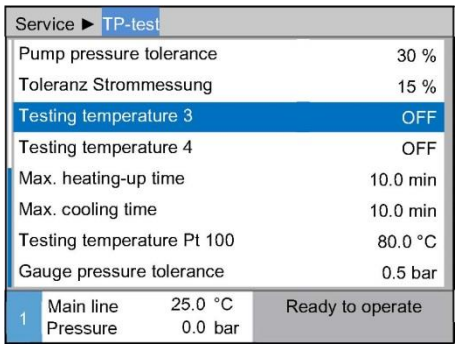


Fig. 10: Additional test temperatures

If additional testing temperatures must be run, this can be conducted using Testing temperature 3, Testing temperature 4. Proceed as follows in order to set the testing temperatures:

1. Open the Service \ TP-test menu page.
2. Set Testing temperature 3, Testing temperature 4 parameter to the desired figure.

NOTICE!

The predefined Testing temperatures 1 and 2 cannot be changed.
Testing temperature 1 is set to 40 °C (Test step 4) and Test temperature 2 is set to maximum temperature (Test step 3).

NOTICE!

By default, Testing temperature 3 and Test temperature 4 are set to "OFF". The test temperatures are not run when the "OFF" setting is activated.

Tolerances

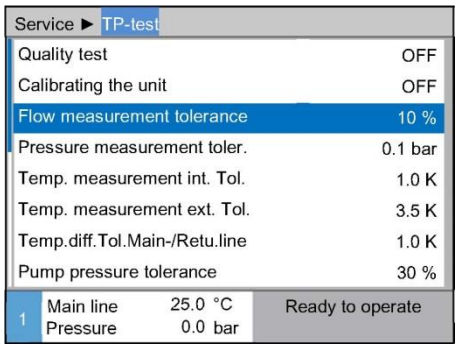


Fig. 11: Setting tolerances

Proceed as follows in order to set the tolerances:

1. Open the Service \ TP test menu page.
2. Set the desired figures for the following parameters:

   Flow measurement tolerance
   Pressure measurement tolerance
   Temp. measurement int. tolerance
   Temp. measurement ext. tolerance
   Temp. diff. Tol. Main-/Return line
   Pump pressure tolerance
   Gauge pressure tolerance

NOTICE!

By default, the tolerances are adjusted according to the recommendations of HB-Therm.

Testing

7.3.5 Calibrating the unit

With the automatic testing, the important measured values, of the temperature control unit, can be adjusted in comparison with the entered values at the end of the test. The measured values are:

- Temperature (Temperature sensor main line and return line)
- Pressure (Pressure sensor, system and main line (only with ZU))
- Flow rate (Flow measurement)

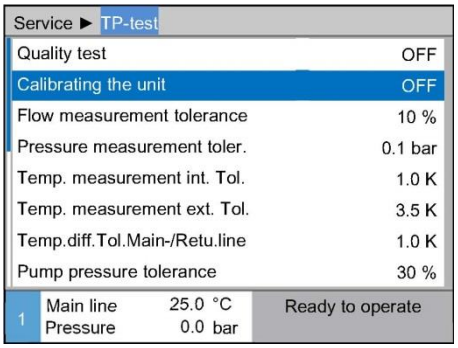


Fig. 12: Calibrating the unit

If the unit needs to be adjusted at a later point in time, proceed as follows:

1. Open the Service \ TP test menu page.
2. Set parameter Calibrating the unit to „ON“.

→ Follow the instructions on the screen.

NOTICE!

The function can only be performed if the automatic test has been performed at least once.

7.3.6 Save protocol to a USB data carrier

With the automatic test, a protocol can be stored on a USB data carrier at the end of the test.

NOTICE!

Only USB data carriers in FAT32 format are supported.

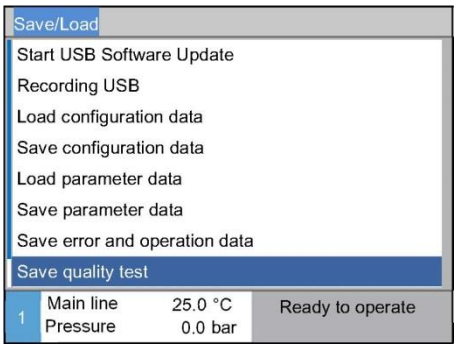


Fig. 13: Save protocol

If the protocol is to be stored on a USB data carrier at a later time, proceed as follows:

1. Display menu page Save/Load.
2. Connect USB data carrier to front connector.
3. Select the parameter Save quality test and confirm with the OK key.
4. In the Explorer window, select the directory and confirm with OK.

→ The file is saved to the selected directory on the USB.

NOTICE!

A test and calibration certificate can be generated by using the VIP diagramming software. You can download the software on www.hb-therm.ch.

7.4 Series 4 and 3 test sequence

Requirement

For Series 4 and 3 units, a quality check must be carried out manually. The TPC calculation program is required for this. This programme is used to manually record the actual data, to evaluate it and to create a test and calibration certificate.

Please contact your HB-Therm representative for this (→ www.hb-therm.ch).

8 Maintenance

8.1 Safety

Personnel

- Maintenance tasks described here can be performed by the operator, unless otherwise indicated.
- Some maintenance tasks must only be carried out by qualified personnel or by the manufacturer exclusively. If this is required, it is pointed out separately in the description of the respective faults.
- As a rule, work on the electrical system must only be carried out by certified electricians.
- Work on the hydraulic system must only be carried out by qualified hydraulics technicians.

Personal protective equipment

Wear the following protective equipment for all maintenance/repair work:

- Safety goggles
- Protective gloves
- Safety shoes
- Protective clothing

NOTE!

For specific work, the warning notices in this chapter draw special attention to further protective equipment.

Special dangers

The following dangers exist:

- Risk of burns due to hot materials.
- Risk of burns due to hot surfaces.
- Danger of crushing due to rolling away or tipping.

Maintenance / repair work carried out improperly

WARNING!

Danger of injury due to maintenance / repair work carried out improperly!

Improper maintenance / repair work can lead to severe personal injury or material damage.

Therefore:

– Before starting work, ensure that there is sufficient space for assembly.

– When assemblies are removed, observe correct assembly, re-assemble all fixing elements and observe screw torque specifications.

Maintenance

8.2 Maintenance schedule

The next paragraphs describe the maintenance work necessary for optimum and trouble-free operation.

If, during regular checks, increased wear is detected, then the required maintenance intervals are to be reduced corresponding to the actual signs of wear.

For questions concerning maintenance work and intervals, please contact the HB-Therm representative (→ www.hb-therm.ch).

Interval	Assembly / Component	Maintenance work	Carried out by
quarterly	Seals	Check for damage	Specialist
		Replace if necessary	Specialist
Every 2 years	Safety valve (HB-200/230 adapter)	Check function (→ page 43)	Qualified personnel
		If necessary clean or replace	Qualified personnel
	Hydraulic hoses (HB-TP180-45) [1)]	Check for damage on outer sheath and in the sealing area	Hydraulic specialist
		Replace if necessary	Hydraulic specialist
	Checking facility	Carry out the quality test (pressure, temperature and flow rate)	HB-Therm/CH

1) The maintenance of external hoses is to be carried out according to the manufacturer's instructions.

8.3 Maintenance tasks

8.3.1 Cleaning

CAUTION!
Risk of burns due to hot surfaces!

Contact with hot parts can cause burns.

Therefore:

– Wait for the unit to cool down, depressurise it and switch it off.

– Before carrying out any work, ensure that all parts have cooled down to ambient temperature.

Clean the unit under the following conditions:

- Only clean the outer parts of the unit with a soft, moist cloth.
- Do not use any aggressive cleaning agents.

8.3.2 Safety valve

Checking the operation of the safety valve on the HB-200/230Z to HB-TP180-12 adapter.

- Only to be carried out by a specialist.

Procedure

1. Switch on temperature control unit (normal operation).

2. Set nominal value to 40 °C.

3. Open the knurled nut on the safety valve until a little water escapes via the overflow.

→ If no water escapes through the safety valve, then correct functioning is no longer guaranteed and the safety valve must be replaced.

4. Re-close the knurled nut on the safety valve.

→ If the safety valve closes correctly again, then functioning is OK.

9 Disposal

9.1 Safety

Personnel

- Disposal must only be carried out by qualified personnel.

9.2 Disposal of materials

Once the end of the useful life has been reached, the unit must be disposed of in an environmentally compatible manner.

As long as no return or disposal agreement was made, dismantled constituent parts are to be recycled:

- Metals should be scrapped.
- Plastic elements should be passed on for recycling.
- Other materials should be sorted and disposed of according to material composition.

ATTENTION!
Environmental pollution on wrong disposal!

Electrical waste, electronic components, grease and other additives are subject to the treatment of special refuse and may only be disposed of by approved specialised companies.

The local authority or specialised disposal companies can give information on environmentally compatible disposal.

10 Spare parts

WARNING!
Safety risk due to wrong spare parts!

Wrong or defective spare parts can impair safety and can lead to damage, malfunctions or total breakdown.

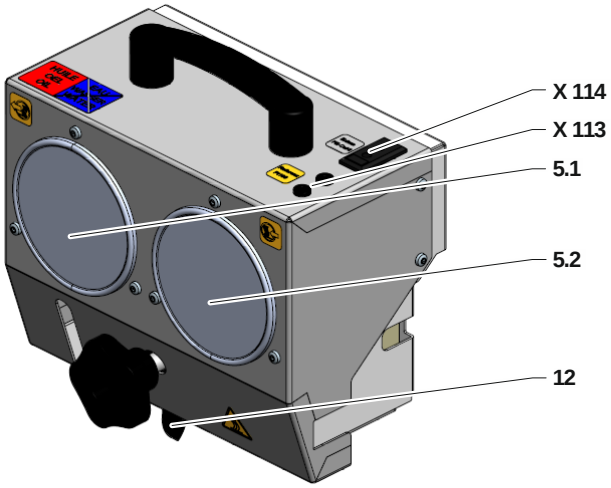
Therefore:

– Use only the manufacturer's genuine replacement parts.

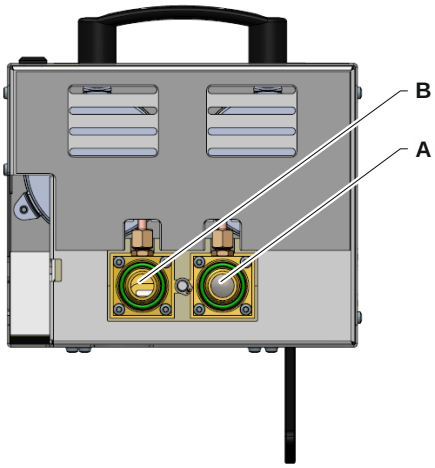
For repairs, the checking facility must be shipped to HB-Therm Switzerland(→ www.hb-therm.ch). Following a repair, HB-Therm will check and, if required, adjust the checking facility.

11 Technical information

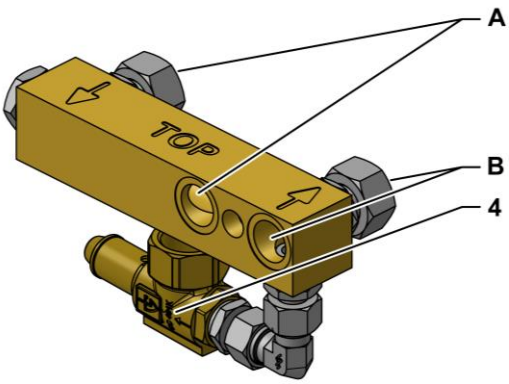
11.1 Item location

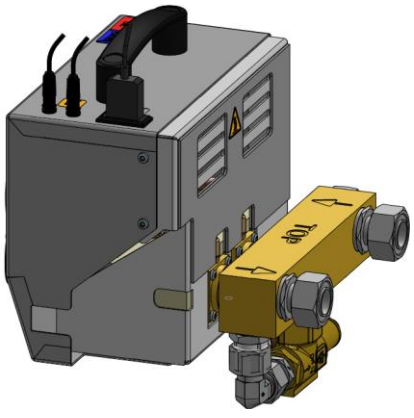


HB-TP180/200-12

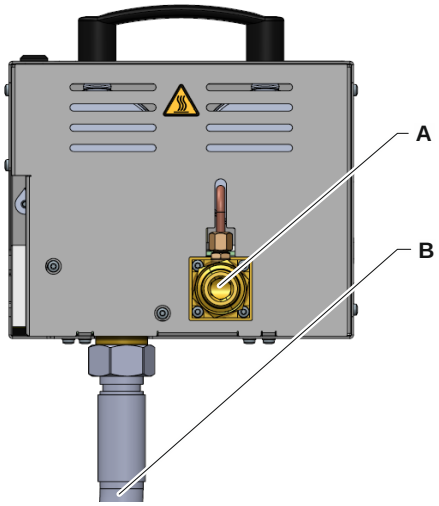


HB-TP180-12 with Adapter HB-200/230Z





HB-TP180-45



11.2 Legend

KZ	Designation	only with version
A	Main line	
B	Return line	
4	Safety valve	
5.1	Main line pressure gauge	
5.2	Return line pressure gauge	
12	Shut-off valve	
X 113	Pt 100 output socket	
X 114	Fe-CuNi output socket	