Kuwatec
a Wilmod company

REGLOPLAS

En

90smart / 150smart

Operating Instructions

REGLOPLAS V 04/2019

Documentation Temperature Control Unit 90smart/150smart

Translation from the german document

Printed in Switzerland

Contents

General Safety Information

Safety Symbols

DANGER	
	**Denotes imminent danger. Failure to heed the information can result in death or grave personal injury (disability)!**

WARNING	
	**Denotes a dangerous situation. Failure to heed the information can result in death or grave personal injury (disability)!**

CAUTION	
	**Denotes a potentially dangerous situation. Failure to heed the information can result in property damage as well as minor or moderate personal injury!**

NOTE	
	**Denotes general information, useful advice to users and work recommendations, which, however, do not have any influence on the safety and health of personnel.**

Range of Application

This general safety information is generally valid for all temperature controllers and control systems from Regloplas.

Intended Use

The Regloplas temperature control unit is built according to the current state of the art and the generally accepted principles of safety engineering. The temperature control unit is intended solely for normal use in the heating and/or cooling of injection moulds and die casting dies, extruders, calenders, mixers and other energy-consuming loads ("consumers") in areas where there is no risk of explosion.

Any use beyond this shall be deemed to constitute improper use. The manufacturer is not responsible for damage resulting from improper use; the user is solely responsible for such risks. The temperature control unit may not be used under operating conditions and/or with media deviating from our specifications without the prior consent of Regloplas AG.

The intended use also entails compliance with the operating, servicing and maintenance conditions stipulated by the manufacturer. The temperature control unit may only be operated, serviced and maintained by personnel that are familiar with these tasks and have been instructed as to the risks.

Safety Information

General information

The Regloplas temperature control unit is safe to operate but can cause danger if it is used incorrectly or for a purpose other than its intended use. It should be noted that any such incorrect use or non-compliance with the intended use can cause risks to the life and limb of the operator or third parties, adverse effects on the equipment and other material assets belonging to the user, and risks to the efficient operation of the equipment.

Start-up (i.e., commencement of intended use) is prohibited until certification that the temperature control unit has been set up and wired in accordance with the Machinery Directive (2006/42/EC). EN 60204-1 (Safety of Machinery) must also be observed.

These Operating Instructions must be read carefully before switching on and operating the temperature control unit. The information regarding the intended use and foreseeable misuse must be observed. Local safety regulations must also be obeyed.

If the temperature control unit is used in combination with products made by other manufacturers, the notices and safety regulations of these manufacturers must also be obeyed.

Process Monitoring

In plants in which a malfunction of the temperature control system leads to endangerment of the operating personnel or destruction of the plant, an independent process monitor that reliably shuts down the plant must be used.

Information for Operators and Personnel

The operator and all persons who are tasked with working on the temperature control unit must obey the fundamental regulations regarding work safety and accident prevention. The operator must ensure that only persons who have read and understood these Operating Instructions, in particular the chapter on safety, may work on the temperature control unit.

Any working methods that have a negative effect on the technical safety of the temperature control unit must not be used. The operator must ensure that the temperature control unit is operated only in flawless condition. If necessary, the company using the equipment must obligate the operating personnel to wear protective clothing.

For all tasks relating to set-up, start-up, operating, modification of operating conditions and operational methods, maintenance, inspection and repair, any shut-down procedures stated to be necessary in the Operating Instructions must be followed.

Changing the Parameter Settings

The parameterisation of the control system may only be carried out by personnel trained by Regloplas. In particular, no parameters in the device configuration may be changed without consulting Regloplas.

The relevant accident prevention regulations and the generally accepted principles of safety engineering, occupational medicine and structural engineering must be observed. The national safety regulations must also be obeyed.

Residual Risks

Any unauthorised modifications and changes to the temperature control unit as well as unauthorised changes to the parameterisation of the control system are prohibited for reasons of safety.

If the temperature control unit is damaged, it must not remain in use; the defective part must be replaced or repaired immediately. Only original Regloplas replacement parts may be used. Damage due to the use of third-party parts renders any and all warranty claims null and void.

DANGER	
	**Danger of electric shock!** • **The temperature control unit must be disconnected from electrical power supply before it is opened (unplug the mains plug and, if fitted, press the main switch on the temperature control unit)**

Any leaks in the temperature control circuit (control unit, connecting lines, consumers, etc.) must be repaired immediately.

In the case of temperature control units that use oil as the heat transfer medium, please remember that oil is flammable under certain conditions. For this reason, the temperature control unit must not be located close to heat sources. The thermal insulation in the device must always be kept clean. Insulation that is soaked with thermal oil poses an increased risk of fire.

Burning thermal oil can be extinguished using an AFFF spray foam fire extinguisher, a powder fire extinguisher (to be avoided in the case of

dust-sensitive plants, control systems, EDP, etc.) or a CO_2 fire extinguisher. The appropriate fire extinguisher must be provided by the operator, taking into account the equipment located in the room and the mandatory safety regulations.

The temperature control unit may only be operated when all safety systems are completely installed and intact.

The temperature control unit must be protected against sprays and cleaning agents.

Before detaching connecting lines from the temperature control circuit, first allow the temperature control unit to cool down, as a function of the outlet temperature, and then switch it off. Check that the pump is no longer running.

WARNING	
	**Important - Danger of injury in the event of escaping water or oil!**

Using This Documentation

This documentation contains important information for safe and economical operation and proper maintenance of the device.

Compliance with this documentation helps to avoid danger, minimise repair costs and downtime, and increase the dependability and service life of the device/system.

NOTE	
	**The operating instructions should be kept near the corresponding device/system and always be accessible to operating and maintenance personnel.**

Additional Documentation

The included documentation is completely correct for the basic versions of devices. Components that do not belong to the basic hardware are noted as extra equipment. The corresponding additional documents are included with special versions of devices. Any additional documents supplement and/or replace the descriptions contained in this documentation, which are then either invalid or only conditionally valid.

Operating Instructions

General

Introduction

These Operating Instructions contain a detailed description of the Temperature Control Unit 90smart/150smart/200smart as well as important information for safe operation and optimal maintenance.

The Operating Instructions must be kept near the temperature control unit and must always be accessible to operating and maintenance personnel.

Operating Range

The operating range and heat transfer fluid of the Temperature Control Unit are shown in the following table (in this regard, see also the chapter "Technical Data" in the Maintenance section).

Temperature Control Unit Type	90smart	150smart	200smart
Temperature range	up to 90 °C	up to 150 °C	up to 200 °C
Heat carrier/medium	Water	Oil	Oil

NOTE	
	**The technical data and information for installation, start-up and maintenance of the temperature control unit can be found in the maintenance section of these operating instructions. The Operating Instructions should be kept near the device/system and always be accessible to operating and maintenance personnel.**

Start-up

Setting up the temperature control unit

The temperature control unit is designed for an ambient temperature range of 10-40 °C. Sufficient ventilation must be provided during setup. The distance between the devices and/or between the temperature control unit and a wall must be at least 10 cm. The ventilation slits must not be covered.

- Check the temperature control unit to ensure that it is undamaged and complete
- Do not tip the temperature control unit! Heat transfer medium remaining in the unit from the test run could spill, and there is a risk that the thermal insulation could become soaked with the fluid (medium)
- Position the temperature control unit on a horizontal surface and engage the wheel brake
- Position the temperature control unit in a way that the connection fittings are not directly accessible. If necessary, install a separating protective device as protection against contact (perforated plate or thermal insulation)

⚠ WARNING

Danger of injury due to hot surfaces and temperature control unit connection fittings - Regloplas AG recommends to install separating protective devices!

⚠ WARNING

Never start up the temperature control unit without the side panels and housing!

Never use the temperature control unit in potentially explosive environments and protect it against sprays and cleaning agents that contain solvents!

Any leaks in the temperature control circuit (temperature control unit, connecting lines, consumers, etc.) must be repaired immediately!

Observe local laws during set-up!

⚠ CAUTION	
	**Before detaching connecting lines in the temperature control circuit, the temperature control unit must first be allowed to cool down. The cooling time will depend on the outlet temperature. The shutdown procedure is initiated by pressing the ON/OFF button. The pump continues to run. The temperature control unit cools down until the temperature of the heat transfer medium has reached the programmed coastdown temperature (factory default 60 °C). The pump and the control system are then switched off!** **Check that the pump is no longer running and that the system pressure gauge reads 0 bar (display on the screen reads OFF)!** **The corresponding chapters of the Operating Instructions must be read before starting up the temperature control unit!**

Operating Instructions

The Operating Instructions for the temperature control unit must be kept at all times close at hand for the personnel responsible for start-up and operation. Please ensure that the operating instructions are read. By doing so, you will avoid unnecessary expense and problems during start-up as well as production downtime.

Inspection of Consumers

Before installing the connecting lines between consumer and temperature control unit, the consumer must be subjected to the following inspections:

- Verify that channels are unobstructed
- Remove residual fluid and dirt with compressed air (foreign objects such as shavings etc. can damage the pump)
- Rust and scale deposits must be removed because they greatly interfere with the heat exchange between consumer and heat transfer medium and increase the pressure drop in the consumer. Descaling can be carried out using the Regloplas REG descaling unit (see the "Regloplas Temperature Control Technology" brochure, REG data sheet)

Water Quality

The water used must meet the following requirements to avoid damage to the cooler of the temperature control unit:

Criterion	Requirement
Appearance	clear/without sediment
Cloud	< 0.5 NTU (very light cloud)
Total hardness	< 10 °dH
pH-value	6.5-8.5
Conductivity	max. 500 µS/cm
Carbonate hardness	< 5 °dH

Addition of RK93 corrosion inhibitor is urgently recommended (see the "Regloplas Temperature Control Technology" brochure, RK93 data sheet).

Connecting Lines

The connecting lines must consist only of pressure-resistant and temperature-resistant hoses and screw fittings. The cross-section of the connecting lines may not be reduced (see Maintenance section).

- The connecting lines must be routed so that they are protected against unintentional contact. Thermal expansion must be taken into account in pipe joints
- When connecting to public water mains, the applicable laws and safety regulations must be observed (e.g., connection of the unit via backflow preventer). The water mains pressure must be within the range of 2-6 bar
- Cooling water outlet - must prevent reverse flow and must be always open. The hose must be fastened so that any escaping steam at the start of the cooling procedure does not pose a hazard
- For reasons of safety, the cooling system must always be connected

⚠ CAUTION	
	**The temperature of the emerging cooling water can increase up to the temperature of the heat transfer medium!**

Electrical Connections

⚠ DANGER	
	**Danger due to electrical energy and improper connection carrying out!** • **The temperature control unit may only be connected by a qualified electrician** • **Compare supply voltage and frequency with the information on the rating plate of the temperature control unit** • **Verify the rating of the preliminary fuse according to the information in the electrical diagram, and check that the power consumption conforms to the value on the rating plate of the temperature control** • **Observe the applicable local laws and safety regulations when connecting to the mains**

Operation of the Temperature Control Unit

The temperature control unit must only be switched on after inspecting the consumer, connecting the connecting lines and electrical connections, and opening the outlet/inlet shut-off valves. The vent valves on the consumer and the shut-off valves (if present) must be open.

RT34 Control System

RT34 Control System - front panel

Powering Up

After carrying out the checks on the consumer, connecting the hoses and electrical connections, proceed as follows:

- Open the vent valve on the consumer, and also the shut-off valve (if fitted)
- Switch on the control unit/pump with the I/O switch 
- The operating mode switch on the front panel must be at position **+** (normal mode). After switching on, a function test runs in the RT34 controller for about 5 seconds. All displays flash during the test. After successful conclusion of the test, the actual value appears in the upper display field and the set-point value in the lower display field
- The water is now automatically refilled. This process can take 2-4 minutes depending on the water mains pressure. An alarm rings during this time. The control unit can also be filled manually via the filling opening on the filler cap
- Check direction of rotation of the pump following the arrows on the fan shroud (remove side panels). If the direction of rotation is incorrect, two phases must be reversed on the unit plug

NOTE	
	**Important - The operating mode switch must be at position +, i.e. pressure mode!**

- Check the temperature control circuit (control unit, connecting lines, consumers, etc.) for leaks
- Do not close the vent valve on the consumer until water is flowing out of the consumer at a regular rate

Operating mode switch

Pressure mode

Normal mode - The heat carrier is pumped through the consumer by pressure (switch position **+**)

Leak stop mode

The heat carrier is drawn by the consumer (reduced pump capacity, switch position **-**)

Suction

The heat carrier is drained out of the consumer by suction, switch position **A**. Cool down device and switch off, turn switch to position **-** and switch device on again. Turn switch to position **A** and hold down until fully drained (observe maximum expansion volume!)

NOTE	
	**Important - When switching between the operating modes Pressure and Leak stop mode, the temperature control unit must be switched off at the I/O switch!**

Displays

Display	Remark
OUT 1	The heating is switched on when the LED is on
ALM	The cooler is switched on when the LED is on
Level	The light is on if there is insufficient heat carrier
Motor	The light is on if the thermal relay has been triggered

Setting the set-point value

- Press **SET**, **Sv** flashes
- Set the set-point value using the  or  button
- Press **SET**, the new value is activated

Changing the parameter

- Press **SET** for a few seconds until **Pv** appears
- **Pv** value flashes
- Tap **SET** until **Lkv** appears
- Set **Lkv** to 1 (clearance)
- Tap **SET** until the desired parameter appears
- Set the value using the  or  button
- Press **SET** for a few seconds - End (set-point value/actual value is displayed)

Switch off

- Cool down device or temperature control circuit to a minimum of 80 °C
- Switch off the device/pump with the I/O switch 

WARNING	
	**Danger of injury from escaping hot cooling water!** • **Before detaching connecting lines from the temperature control circuit, first allow the temperature control unit to cool down, as a function of the outlet temperature, and then switch it off** • **Check that the pump is no longer running**

Malfunctions

WARNING	
	**Unplug the mains plug before performing troubleshooting!**

Error messages on the device

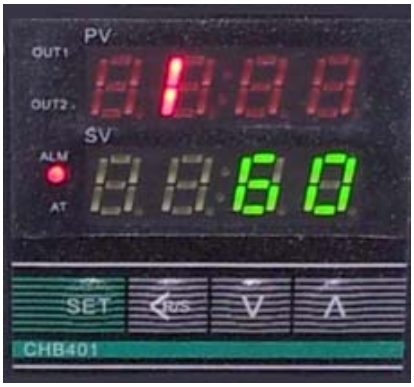
Display	Remark
	The light is on if there is insufficient heat carrier - possible causes: – Device is refilled – Cooling water supply not connected or shut off (shut-off valve) – Filter dirty – Solenoid valve water filling (**Y2**) dirty – Level switch defective

	This light is on if the thermal relay has been triggered - possible causes: – Pump overheated (lines blocked) – Incorrect value set on thermal relay (see information on electrical wiring diagram and rating plate on the pump) – Switch thermal relay on again using the reset button (**S5**) on the back of the control unit

Device malfunctions

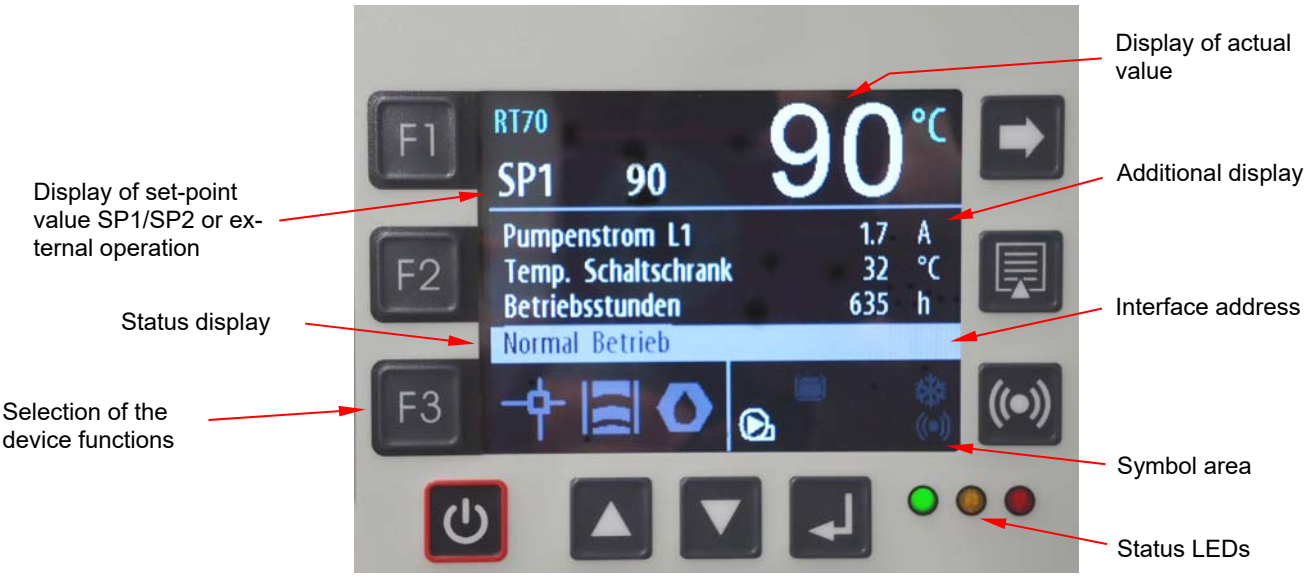
Malfunction	Remark
Device does not heat up	Safety thermostat (**F5**) triggered: – Check level control (water level in the device) and switch safety thermostat (**F5**) on again using reset button on the heating – Heating contactor defective
Device does not cool down	Water flow in cooler too low - possible causes: – Solenoid valve cooling defective or dirty – Filter dirty – Cooler coated with lime – Replace cooler or clean using descaling unit
Device overfilled	Automatic water filling does not switch off. Possible causes: – Float switch defective – Solenoid valve water filling (**Y2**) defective or dirty – Leak in cooler – Clean or replace defective parts

Pt100 Malfunction



This indication means that the internal temperature sensor Pt100 is defective. In this case, the float switch has to be replaced.

RT70 Control System



RT700 Control System - front panel

Buttons

F1	Setting the set-point value		Scrolling through pages
F2	Setting the additional display		Setting the parameters
F3	Selection of the device functions (toggling SP1/SP2, drainage by suction, leak-stop)		Alarm reset and alarm history
	Button ON/OFF		Enter key
	Navigation upward		Navigation downward

Status LEDs

	Normal mode		Warning		Alarm

Device Functions

	Set-point value toggling SP1/SP2		Draining (suction or blowing out)
	Leak-stop mode		

Symbols

	Interface operation		Level of the heat transfer medium (filled quantity) LOW
	Level of the heat transfer medium (filled quantity) OK		Heating
	Ramp program activated		Timer activated
	Cooling		Feed pump, counterclockwise rotation
	Feed pump, clockwise rotation		Alarm
	Maintenance due (flashes if maintenance is due)		

RT70 Operation and Status Displays

In the off state of the RT70 control system, the message **OFF** appears in the display area. Upon switching on with the **ON/OFF** button, the additional display is shown. The top left part of the display shows the set-point temperature **SP1** or **SP2** (SP = Set point). The top right part of the display shows the current outlet temperature (actual value of temperature sensor **Sn1**, **Sn2** or **Sn3**).

Sn1 = Outlet temperature

Three other selectable values are shown in the middle part of the display. The additional display can be set by using the **F2** key and by turning/pressing the RCD control knob (turning selects a value, pressing confirms it).

The symbols for set-point value display, suction operation (draining) and leak-stop operation are shown in the lower left part of the display. The various operational and status displays of the temperature control unit are shown in the lower right part of the display.

Setting the Set-point values

The set-point values **SP1** and **SP2** are set by pressing the key **F1**. The set-point value is then coloured light blue and can be set with the RCD control knob. This setting is also possible in the parameter positions. The set-point values can be selected via an external digital signal.

To toggle between set-point values **SP1** and **SP2**, press the **F3** button and select the set-point toggling function. Set-point toggling is only possible if there is no alarm pending.

Parameter Menu

The parameter menu is activated by pressing the Parameter button. In this menu, all the parameters can be configured by turning/pressing the RCD control knob.

RT70 Control System - Functions

Powering Up

Upon switching on the main switch, the message **OFF** appears in the display. The RT70 control system is now ready for operation and is switched on by pressing the **ON/OFF** button, or by the timer, through a digital input or an interface.

The display, depending on the programming, shows the set-point and actual values, as well as information on the operational state of the control system or the temperature control unit.

Rotational field detection / Direction reversal

The rotary field detection of the RT70 control system detects a wrong phase sequence and reports this in the display or corrects the direction of rotation automatically.

Shutdown

The RT70 control system is switched off by pressing the **ON/OFF** button, by the timer, via a digital input or an interface.

Depending on the temperature of the heat transfer medium, the shutdown program runs as follows:

- The pump and the control system are switched off. The RT70 control system will then be in standby mode and the message **OFF** appears on the display.
- The pump continues to run. The unit cools down until the temperature of the heat transfer medium has reached the programmed coastdown temperature. On reaching this temperature, the pump and the control system are automatically switched off. In the case of pressurised water units, the pump then continues running for a further few seconds in the opposite direction (pressure release). The RT70 control system will then be in standby mode and the message **OFF** appears on the display.

Leak-stop operation

The leak-stop operation is activated by pressing the **F3** key and selecting the leak-stop symbol and is only possible if it is supported by the device type.

The leak stop operation is only possible if water is used as the heat transfer medium and the set-point value is in the vicinity of the value run-on temperature (0-80 °C). Pressurised water units do not have any leak-stop operation.

When oil is used as a heat transfer medium, the set-point value must be within the range 0-250 °C. The heating capacity is then max. 60 %, since the thermal load of the oil must be kept low owing to the reduced pump capacity.

The leak-stop operation can be cancelled by pressing the **ON/OFF** button. When the **ON/OFF** button is pressed again (wait until the display reads **OFF**), the unit switches back to normal operation.

Clearance for the Leak-Stop Function

The leak-stop function is not permitted with every device (e.g. if a change in the direction of rotation of the delivery pump is not possible). The clearance of the leak-stop function is set in the parameter menu.

DANGER

The leak-stop operation is an emergency operation and may only be switched on or cleared for devices intended for the purpose! A leak-stop operation in the case of devices not intended for the purpose can cause a fire!

Emptying (option)

The consumer device can be drained using the delivery pump (suction) or by means of compressed air (blowing out); (setting in the parameter menu).

Drainage by Suction with Pump

The suction program allows the draining of the consumer connected at the temperature control unit and is activated by pressing the **F3** button and selecting the suction symbol. The pump is switched off, and after the pump coastdown time has elapsed the pump is switched on again in the opposite direction. The consumer is drained by suction during the defined period (draining time).

Draining is only possible if the temperature of the heat transfer medium is below the programmed coastdown temperature value. If that is not the case, the heat transfer medium is first cooled to this value.

Blowing out with Compressed Air

The blowing out program enables the user to drain the consumer connected to the temperature control unit by means of compressed air. Blowing out is activated after the pump coastdown time has elapsed and directs compressed air through the consumer. The temperature control unit switches off automatically after the set period (draining time) has elapsed.

The suction or blowing out program can be aborted by pressing the **ON/OFF** button. When the **ON/OFF** button is pressed again (wait until the display reads **OFF**), the unit switches back to normal operation.

NOTE

In the case of pressurised water units, the pressure release valve closes at 5 °C above the coastdown temperature (max. 85 °C) and opens at the programmed coastdown temperature during the cooling process!

Operation with Code/Password

In order to prevent the values that have already been set or programmed from being unintentionally reset/adjusted, the use of a code/password is urgently recommended. The code is defined in the parameter **Code**.

The RT70 control system has three password levels that are organised hierarchically:

- User password - Default **0000** (switched off)
- Technician password - Default **0070**
- Service password - only for personnel trained by Regloplas

NOTE	
	**It is strongly recommended that an operator password should be set up when commissioning the temperature control unit!**

Alarm Reset and Alarm History

Alarm Reset

If an alarm has been triggered, the signal horn can be switched off by pressing the **Alarm Reset** button. After the malfunction has been remedied, the alarm can be reset by again pressing the **Alarm Reset** button.

Alarm History

If there is no alarm pending, the **Alarm Reset** button can be used to view the alarm history.

Save/Reset of the Setting Values

The RT70 control system provides the facility to reload the factory settings or user settings at any time by a simple procedure. Two different new customer-specific settings can be loaded (user setting 1 and 2).

Changing Consumer/Decommissioning

Before detaching the connecting lines, it is necessary to verify that the temperature control unit is turned off and that all circuits are depressurised (see the chapter "Switching off the Temperature Control Unit"). The temperature control unit must be drained completely and stored in a dry place at 10-40 °C when not in use. To restart the unit, proceed as instructed in the "Start-up" chapter.

Alarm Messages

The RT70 control system can display various error messages (warnings and alarms). Attention must be paid to these error messages without fail. Otherwise, malfunctions of / damage to the temperature control unit and production downtimes may result.

Pressing the **Alarm Reset** button allows you to acknowledge/reset an alarm (e.g. switching off the horn). Only after the malfunction has been rectified can the alarm display be cleared by once again pressing the **Alarm Reset** button.

The **Alarm Reset** button also allows manual acknowledgement of the automatic switchover (toggling) from consumer temperature control (or cascade control) **Sn2** to outlet temperature control **Sn1** in the event that sensor **Sn2** is defective or removed from the consumer.

Alarm list

Pressing the **Alarm Reset** button opens the alarm list, as long as there is no active alarm. The last ten alarm messages are displayed in this list, complete with date and time.

Warnings

Error message	Rectification
Service is due	Carry out maintenance procedure according to the operating manual. Increment the parameter **Next Maintenance** by 1000 hours
Deviation set-point value/outlet underrun	Adjust the outlet temperature and acknowledge the fault
Deviation set-point value/outlet exceeded	Adjust the outlet temperature and acknowledge the fault
Leak stop not possible	Reduce the temperature
Leak stop not allowed	Unit is not allowed for leak stop
Suction not possible	Switch the unit to normal operation mode

Alarms

Error message	Rectification
Level 1 underrun	Refill heat transfer medium
Toggling of heat transfer medium - unit must be re-started	Switch the main switch off and on again
External set-point value signal interrupted or not pre-sent	External set-point value signal must be present (if re-quired, check external control system)
Analog option missing or defective	Connect analog option or switch off in the parameter **Hardware Options**
Digital option missing or defective	Connect digital option or switch off in the parameter **Hardware Options**
AD converter failure	Replace base module
Attention - temperature control cabinet too high	Place the temperature control unit in a place with low ambient temperature
Flow switch act	Check the outlet pressure (min. 0.7 bar must be pre-sent)
Max. temperature exceeded	Max. temperature of the heat transfer medium may not exceed the maximum device temperature (if re-quired, check the tool temperature)
Motor current underrun	Check the pump/pump motor (with Ohmmeter) and if required, replace them
Phase sequence failure	Correct the phase sequence (interchange 2 phases)
Phase sequence unidentified	Switch off phase sequence monitoring
Phase missing	Check the mains, input conductor and pump motor
Motor contactor malfunction	Check motor contactor and if required, replace it
Temperature sensor Sn1 failure	Replace temperature sensor Sn1
Motor current exceeded	Check the pump/pump motor (with Ohmmeter) and if required, replace them
Power failure	Failure of the power supply or temperature control unit not switched off properly
Safety thermostat triggered	Temperature control unit has become too hot - deter-mine the cause and reset the thermostat (by using the

Error message	Rectification
	reset button)
Turn on time refill exceeded	Check the cooling water circuit and the cooling circuit for leaks

System Errors/System Notes

Error message	Rectification
Parameter data corrupt	Replace the control unit
Save/Load not possible during device is on	Switch the temperature control unit to OFF
Error, password not reset	Enter he reset code correctly
Password reset	Password has been reset

Maintenance

WARNING

Risk of burns and scalding due to hot cooling water or steam!

- **The temperature control unit must be switched off before carrying out any maintenance work - press the main switch and disconnect from the mains**
- **Check that the system pressure gauge is displaying the value 0 bar!**
- **Before disconnecting the feed lines to the temperature control unit/consumer, first allow the temperature control unit to cool down**

Periodic Inspections and Maintenance Procedures

The RT70 control system has a service interval display to simplify maintenance work on the temperature control unit. We recommend entering the corresponding maintenance interval (e.g., 2000 hours, see the RT70 control system programming instructions).

Please note that the instructions below are based on a daily operating time of 8 hours. In multi-shift operation, the inspections and maintenance procedures must be carried out at correspondingly shorter intervals. Defective parts must be repaired or replaced immediately.

- Temperature control unit inspections and maintenance procedures must be carried out by an expert
- Maintenance procedures involving electrical equipment may only be carried out by qualified electricians
- The RT70 control system unit may only be replaced when the mains plug is unplugged

Daily Inspections/Maintenance Procedures

- Check the entire temperature control circuit (temperature control unit, connecting lines, consumers, etc.) for leakage and repair any leaks immediately
- Check filters and clean if necessary

Monthly Inspections/Maintenance Procedures

- Inspect the cooling air inlet port of the pump motor to ensure that it is free of obstructions. Clean the port by blowing compressed air from inside to outside
- Clean the level switches
- Check filters and clean if necessary

Semi-annual Inspections/Maintenance Procedures

- Inspect the electrical equipment such as grounding wires, secure connection of power supply cord and connecting lines, etc.
- Dismantle solenoid valves (see maintenance section), inspect membranes for lime deposits and damage. Check the core and spring bolt for free movement. Clean or replace parts if necessary
- Descale cooler - exercise caution when tightening the screwed connections on the heat exchanger (max. 170 Nm).
- Check pump capacity (the flow rate and final pressure must comply with the pump characteristic)

Annual Inspections/Maintenance Procedures

- Replace the heat transfer medium (water and corrosion inhibitor) after approx. 2000 working hours (equivalent to approx. one year in single-shift operation). In the event of poor water quality or multi-shift operation (contamination, etc.), the medium must be replaced correspondingly earlier

Cleaning

⚠ CAUTION	
	**Danger due to temperature, fire and explosion!** • **Always allow the temperature control unit to cool down** • **Switch off the temperature control unit: press the main switch and unplug from the mains** • **When using a solvent for cleaning - do not blow out the tank and the cooler, but flush them instead (explosion hazard)** • **When using a solvent, the manufacturer's instructions for use must be observed. Solvents are flammable under certain conditions. For this reason, cleaning must never take place near heat sources**

In the event of unfavourable operating conditions, the procedures listed below must be carried out correspondingly earlier.

1) Drain the temperature control unit by suction or blowing out
2) Clean the filters in the circuit
3) Inspect the cooler for scale deposits and clean using the REG Descaling Unit if necessary
4) Level control - remove and clean the level switches. Important - reinstall level switch correctly (**NO** marking must be on top, see Maintenance section)
5) Dismantle solenoid valves (see Maintenance section), inspect diaphragms for scale deposits and damage. Check the core and

spring bolt for free movement. Clean or replace parts if necessary

6) Inspect pump for corrosion and replace if necessary

7) It is also advisable to inspect the consumers for contamination. Impurities lead to a sharp reduction in heat exchange between consumer and heat transfer medium. Deposits increase the pressure drop in the consumer, so that, over time, the pump capacity of the temperature control unit is no longer sufficient to handle the necessary heating or cooling load

Repairs

⚠ CAUTION	
	**Danger due to improper repair!** • **Repair work may only be carried out by technically trained specialist personnel** • **Allow the temperature control unit to cool down and, if necessary, drain it before any repair** • **Switch off the temperature control unit, press the main switch and unplug from the mains** • **Disconnect all hose couplings from the temperature control unit**

For fast, error-free supply of spares, we need the following data without fail:

- Device type
- Device number
- Voltage and frequency

This information is given on the rating plate on the temperature control unit.

The item numbers of the components can be found in the corresponding drawings in these operating instructions and the electrical circuit diagrams of the temperature control unit.

⚠ CAUTION	
	**Danger due to the use of unsuitable spare parts!** • **Only original Regloplas spare parts may be used!** **In case of damage from the use of non-original parts, the warranty will be rendered null and void!**

Transport

⚠ CAUTION

Danger due to improper transport work!

- **Cool down the temperature control unit, switch off, press the main switch and disconnect from mains (see chapter on "Switching off the temperature control unit")**
- **Disconnect all hose couplings from the temperature control unit**

Before shipping, the temperature control unit must be drained through the discharge port on the delivery pump (see maintenance section). Because of the danger of freezing (bursting of the cooling pipes) at low temperatures, the cooler must be blown out as follows:

1) Switch on the temperature control unit - press the main switch and press the **ON/OFF** button
2) Set the set-point value on the controller to 0 °C
3) Check that the cooler solenoid valve (**Y6**) is open
4) Blow out the cooler with compressed air (max. 6 bar)

5) Switch off the temperature control unit with the **ON/OFF** button, and then press the main switch and unplug the mains plug
6) Do not tip the temperature control unit - heat transfer medium remaining in the unit could spill out
7) Use the original packaging and mark the top side clearly

⚠ CAUTION

Danger due to improper transport work!

- **Transport the temperature control unit suspended on ring eyebolts or attached to a pallet, and protect it against external influences**

Disposal

The temperature control unit must be drained completely and disposed of in accordance with local regulations.

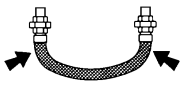
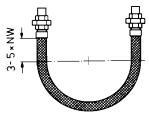
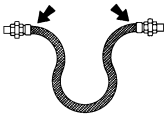
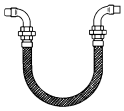
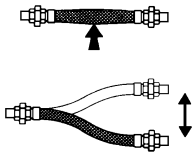
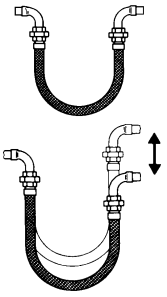
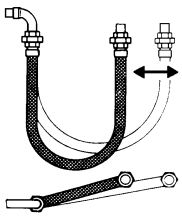
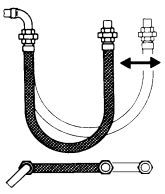
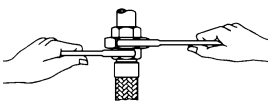
The temperature control unit can also be returned to Regloplas AG, Switzerland, for disposal.

NOTE

The temperature control unit contains valuable raw materials that can be recycled separately (metals, plastics, electrical components, etc.)!

Maintenance

Guidelines for Connecting Hoses

Wrong		Right	
	Hose too short - hose is bent at the connections		Provide sufficiently long neutral hose ends (3-5 x DN)
Wrong		**Right**	
	Excessive bending load at the connections		Pipe elbows fitted
Wrong		**Right**	
	Incorrect installation - compression along the longitudinal axis		Pipe elbows fitted
Wrong		**Right**	
	Torsion - hose axis and direction of movement not in the same plane		The pipe axes must be parallel and in the same plane as the direction of movement
	Important - twisting of the hoses can also be caused during installation.		When attaching/detaching a hose, always hold it in place with a second wrench

Technical Data 90smart/150smart

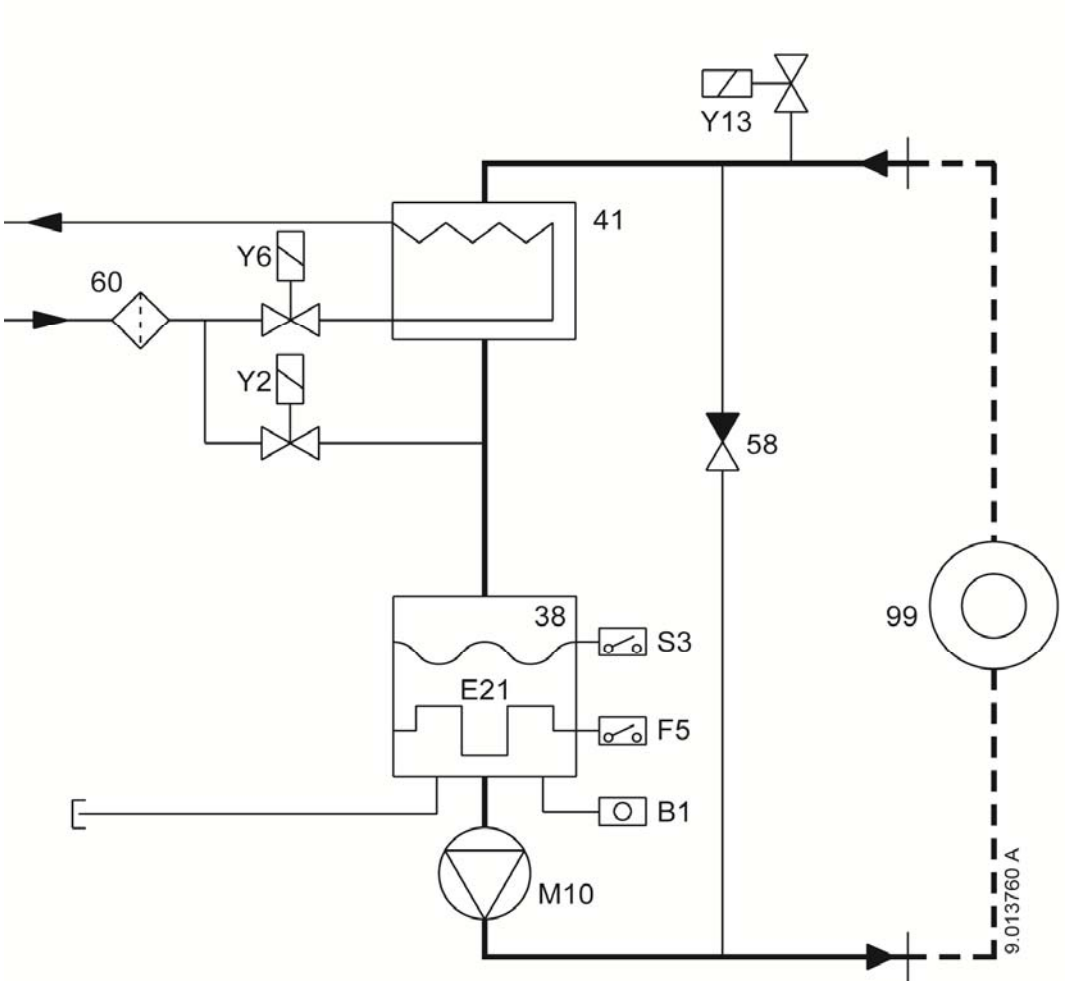
Temperature Control Unit Type	90smart		150smart	
Max. outlet temperature	**90 °C**		**90 °C/150 °C**	
Heat carrier/medium	**Water**		**Oil**	
Filling capacity	7.0 l		7.5 l	
Max. expansion volume	2.5 l		4.5 l	
Heating capacity	**6/9 kW**		**6 kW**	
Heating switch	SSR relay		SSR relay	
Cooling capacity	**51 kW (1K) 75 kW (2K)**		**29 kW (Oil) 38 kW (Water)**	
at outlet temperature	80 °C		140 °C	
at cooling water temperature	20 °C		20 °C	
Pump type	**TP20**	**TS22**	**TP20**	**TS22**
Motor power (pump)	0.5 kW	0.92 kW	0.5 kW	0.92 kW
Max. delivery rate	60 l/min	70 l/min	60 l/min	70 l/min
Max. delivery pressure	3.8 bar	5.4 bar	3.8 bar	5.4 bar
Control System	**RT34 / RT70**			
Measurement type (standard)	Pt100			
Control voltage	115/230 V, 50/60 Hz			
Input supply voltages	**200-600 V, 50/60 Hz**			
Total power	**(see specification plate)**		**(see specification plate)**	
Outlet/inlet connections (standard)	G 1/2"		G 1/2"	
Cooling water supply connections (standard)	G 1/2"		G 1/2"	
Degree of protection	IP40		IP40	
Dimensions W/H/D	202/560/661 mm		202/560/661 mm	
Weight	approx. 44 kg		approx. 50 kg	
Colour	RAL 9006/7016		RAL 9006/7016	
Ambient temperature	max. 40°C		max. 40°C	
Continuous sound pressure level	< 70 dB(A)		< 70 dB(A)	

Technical Data 200smart

Temperature Control Unit Type	200smart
Max. outlet temperature	**200 °C**
Heat carrier/medium	**Oel**
Filling capacity	11.5 l
Max. expansion volume	3.5 l
Heating capacity	**2 kW**
Heating switch	SSR relay
Cooling capacity	**Emergency cooling***
at outlet temperature	200 °C
at cooling water temperature	20 °C
Pump type	**TS22H**
Motor power (pump)	0.92 kW
Max. delivery rate	70 l/min
Max. delivery pressure	5.4 bar
Control System	**RT70 Control System**
Measurement type (standard)	Pt100
Control voltage	115/230 V, 50/60 Hz
Input supply voltages	**200-600 V, 50/60 Hz**
Total power	**(see specification plate)**
Outlet/inlet connections (standard)	G 1/2"
Cooling water supply connections (standard)	G 1/2"
Degree of protection	IP40
Dimensions W/H/D	203/614/901 mm
Weight	ca. 50 kg
Colour	RAL 9006/7016
Ambient temperature	max. 40°C
Continuous sound pressure level	< 70 dB(A)

* Minimal cooling capacity, for cooling the temperature control unit to turn-off temperature

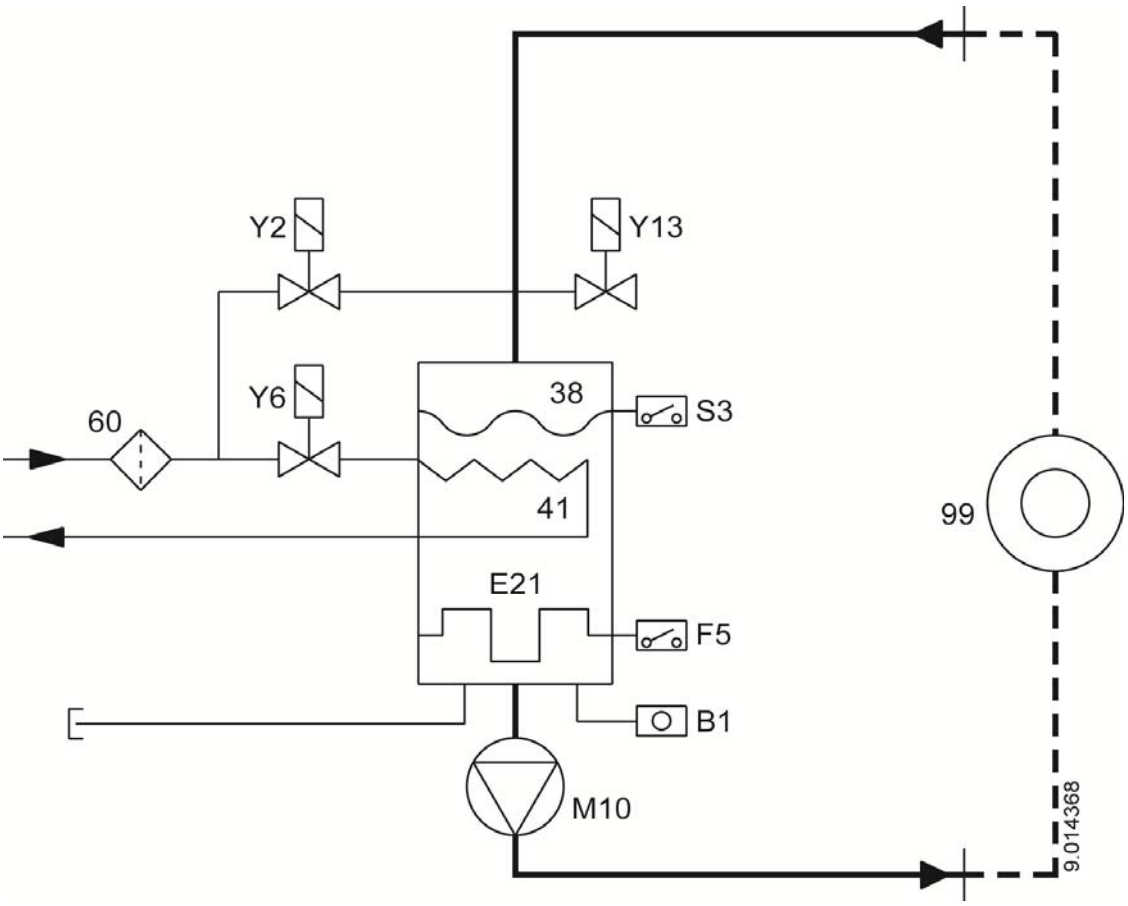
Block diagram 90smart



Block diagram 90smart

Item	Designation	Item	Designation
38	Vessel, reservoir, tank	F5	Safety thermostat
41	Cooler	M10	Pump
58	Bypass	S3	Level control
60	Filter - cooling circuit	Y2	Solenoid valve - auto. water refill
99	Consumer	Y6	Solenoid valve - cooling
B1	Temperature probe - internal	Y13	Solenoid valve - suction (optional)
E21	Heating		

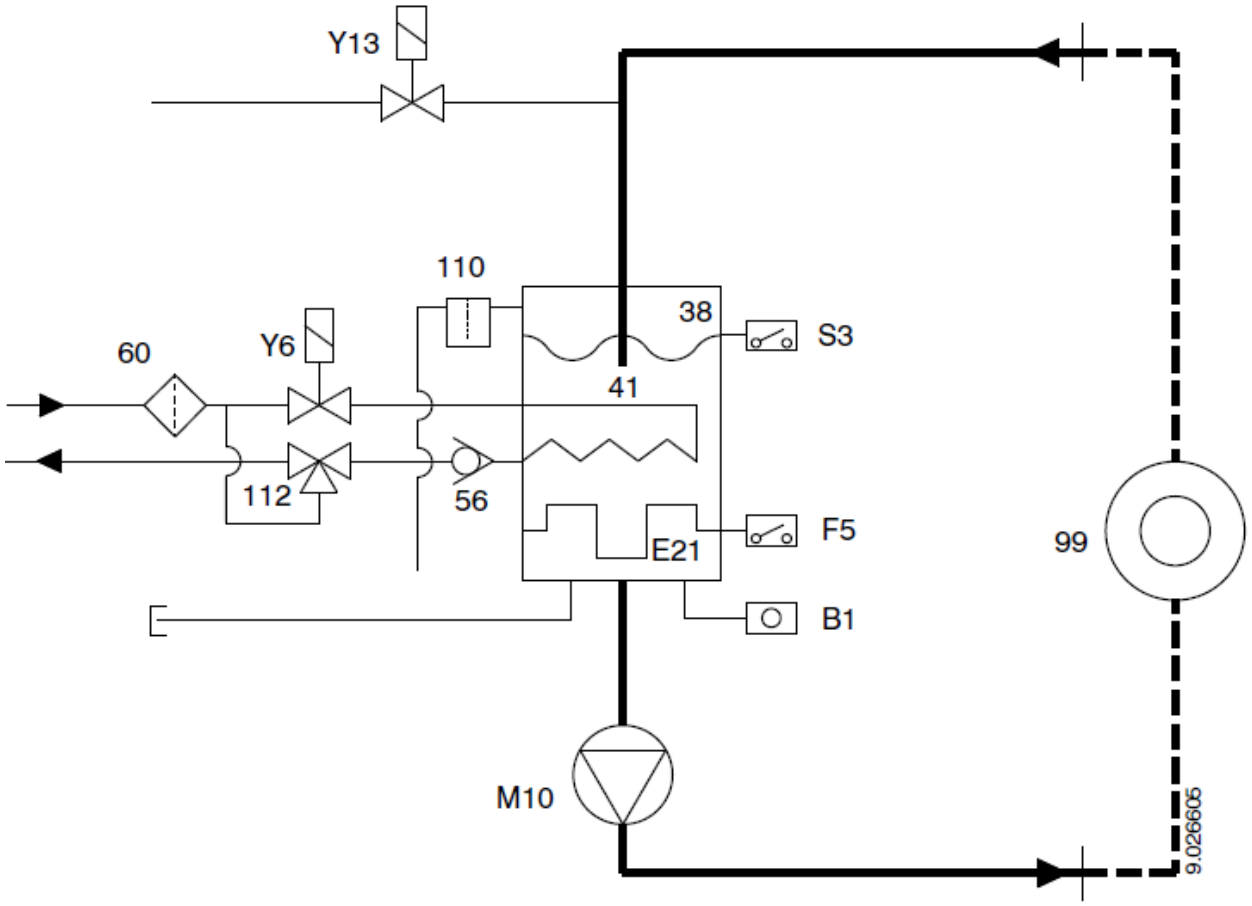
Block diagram 150smart



Block diagram 150smart

Item	Designation	Item	Designation
38	Vessel, reservoir, tank	F5	Safety thermostat
41	Cooler	M10	Pump
60	Filter - cooling circuit	S3	Level control
99	Consumer	Y2	Solenoid valve - auto. water refill
B1	Temperature probe - internal	Y6	Solenoid valve - cooling
E21	Heating	Y13	Solenoid valve - suction (optional)

Block diagram 200smart



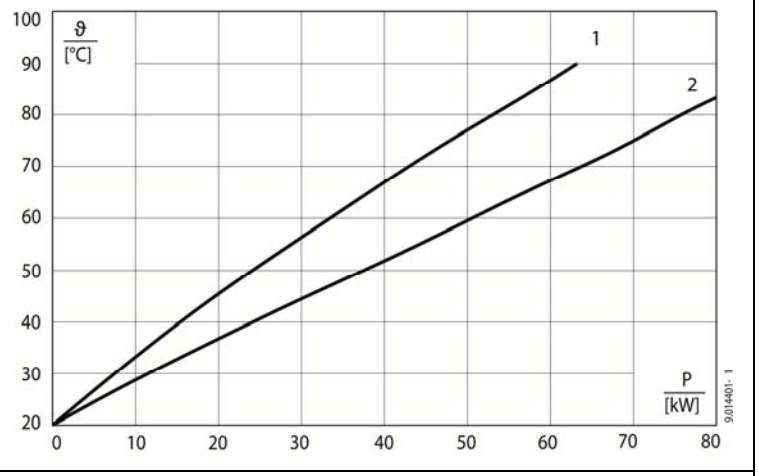
Block diagram 200smart

Item	Designation	Item	Designation
38	Vessel, reservoir, tank	B1	Temperature probe - internal
41	Cooler	E21	Heating
56	Check-valve (optional)	F5	Safety thermostat
60	Filter - cooling circuit	M10	Pump
99	Consumer	S3	Level control
110	Airlock	Y6	Solenoid valve - cooling
112	Mixing valve (optional)	Y13	Solenoid valve - suction (optional)

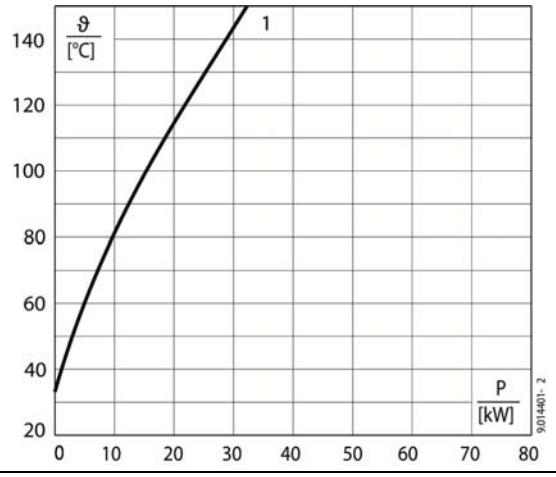
Graph (pump capacity)

1 - Pump curve TP20 **2 - Pump curve TS22, TS22H**	
Pump capacity - Delivery rate **V** as a function of pressure (**p**), bypass not taken into account	

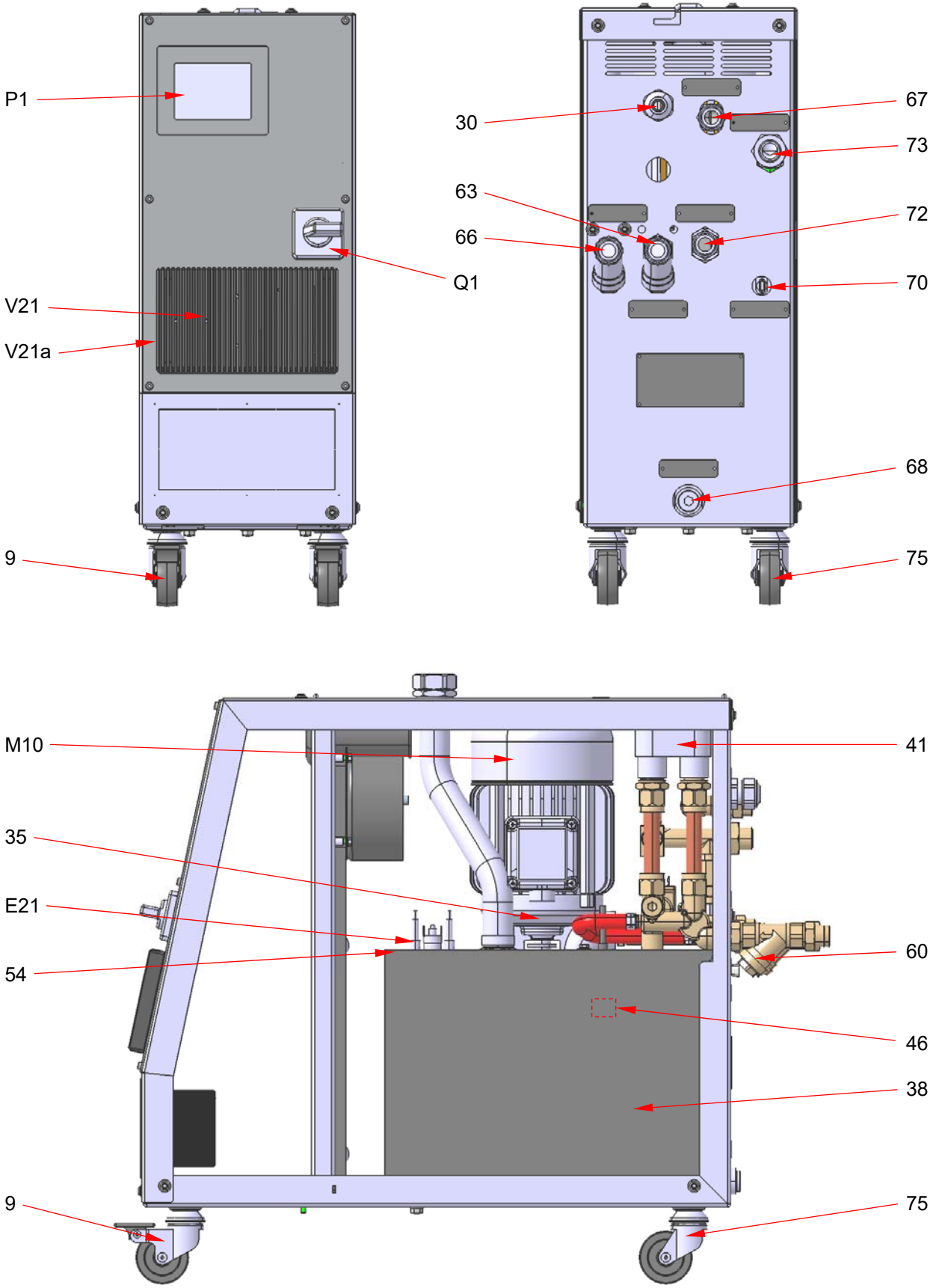
Graph (Cooling capacity 90smart)

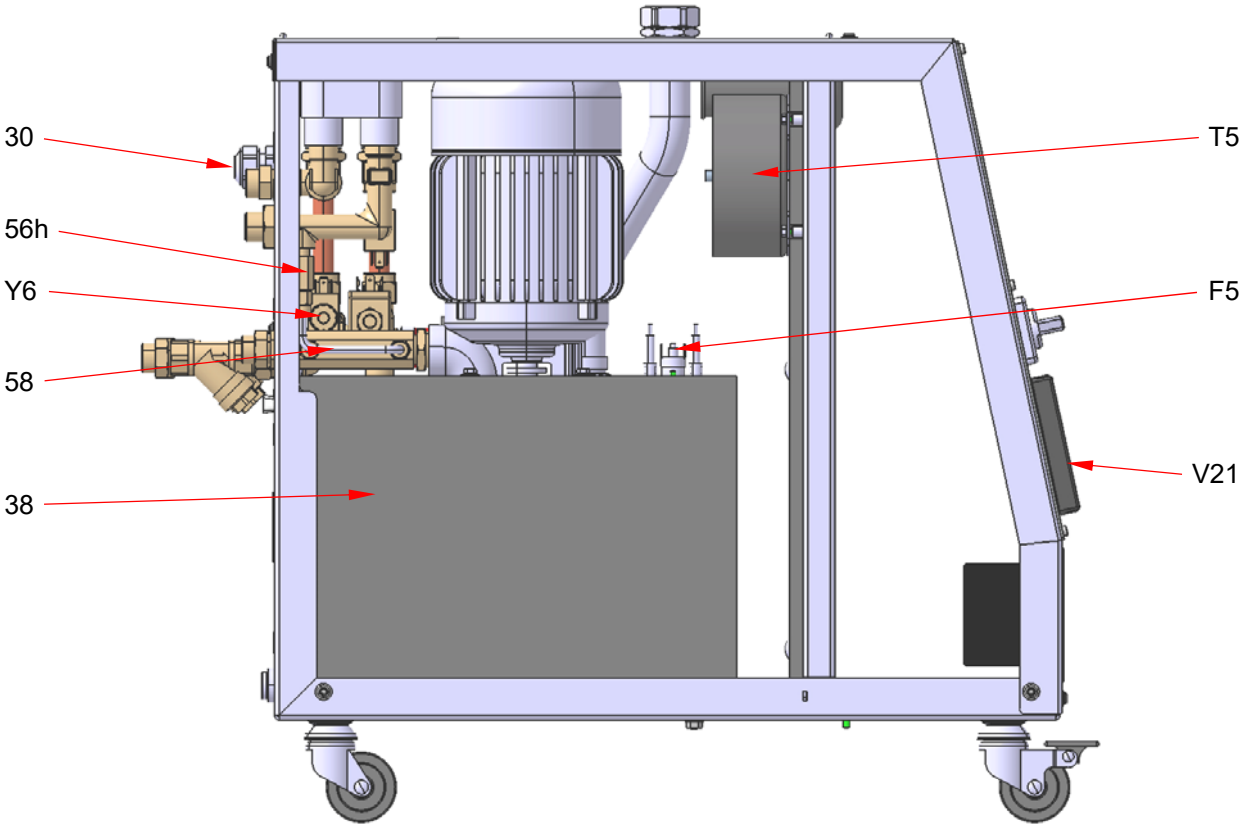
1 - Cooling curve 90smart (1K) **2 - Cooling curve 90smart (2K)**	
Cooling capacity (**P**) as a function of outlet temperature (ϑ)	
Cooling water temperature	20 °C
Flow rate	20 l/min

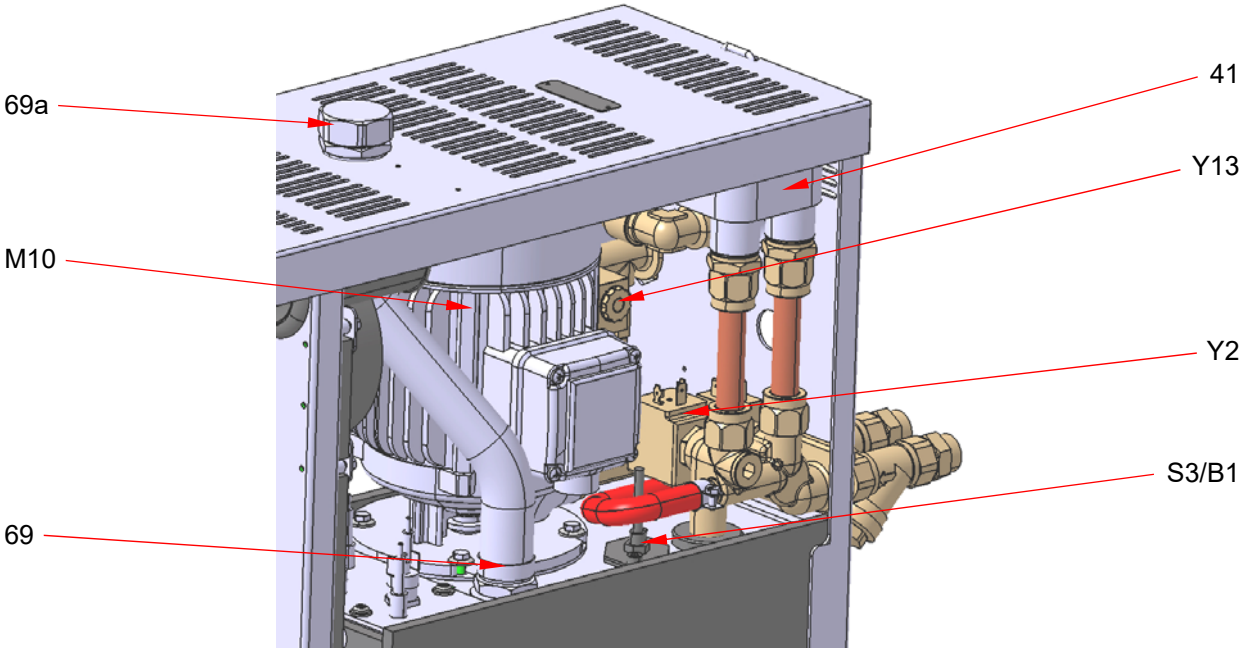
Graph (Cooling capacity 150smart)

1 - Cooling curve 150smart (Oil)	
Cooling capacity (**P**) as a function of outlet temperature (ϑ)	
Cooling water temperature	20 °C
Flow rate	10 l/min

Components/Spare parts 90smart




30
56h
Y6
58
38
T5
F5
V21


69a
M10
69
41
Y13
Y2
S3/B1

Item	Designation	Item	Designation
9	Castor with wheel lock	B1	Temperature probe - internal
30	Power cable	E21	Heating
35	Pump	F5	Safety thermostat
38	Tank with insulation	M10	Pump motor
41	Cooler	P1	Control system
46	Float	Q1	Main switch
54	Filler cap	S3	Level switch (see corresponding chapter)
56h	Check valve Bypass	T5	Control transformer
58	Bypass	V21	SSR relay with heat sink
60	Filter - cooling water	V21a	Seal for SSR relay
63	System water IN	Y2	Solenoid valve (auto. water refill)
66	Cooling water IN	Y6	Solenoid valve (cooling)
67	Cooling water OUT	Y13	Solenoid valve (suction)
68	Discharge port		
69	Filler pipe		
69a	Filler pipe (option)		
70	Overflow		
72	Outlet		
73	Inlet		
75	Castor		

⚠ CAUTION

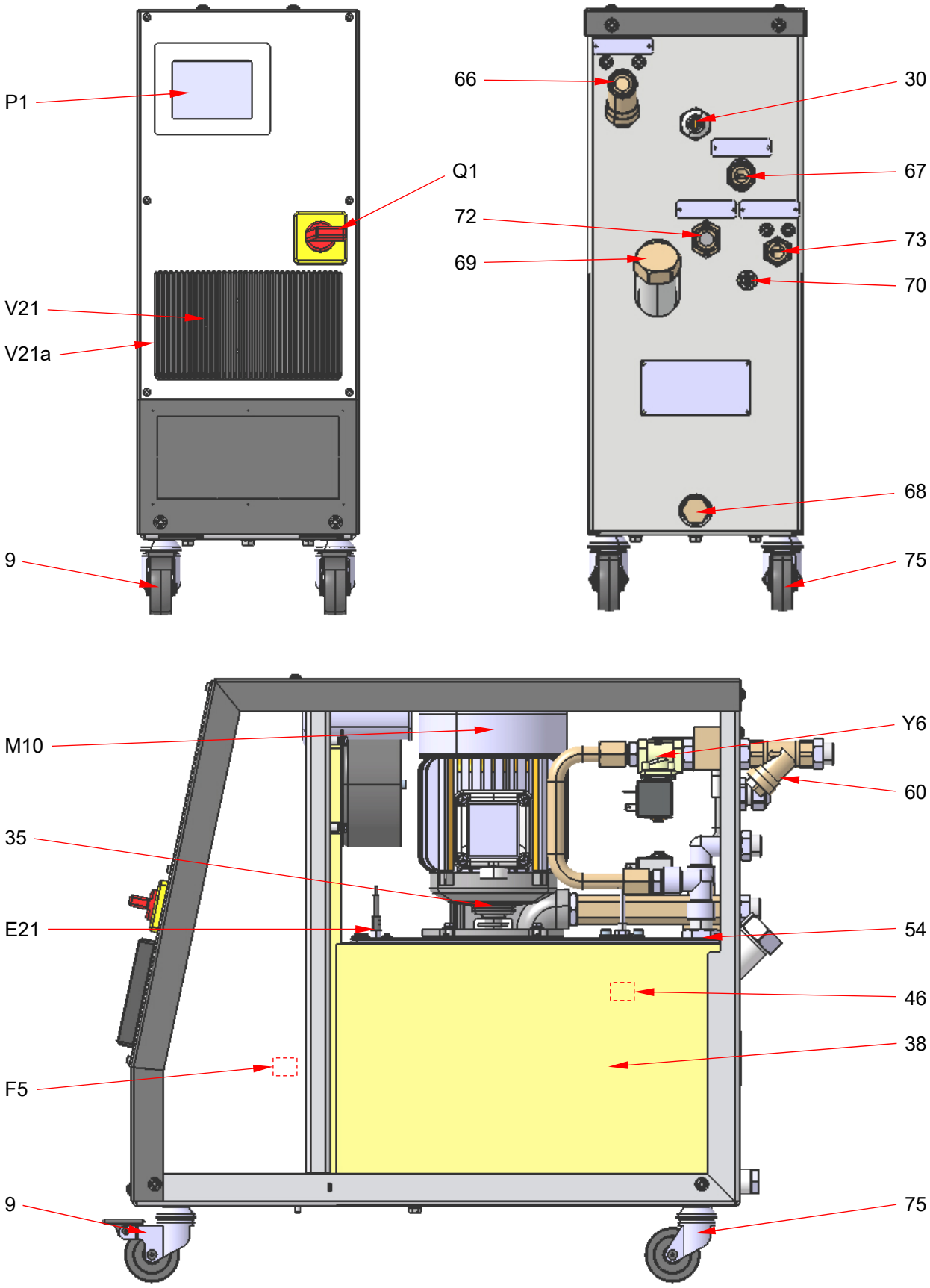
Danger due to the use of unsuitable spare parts!

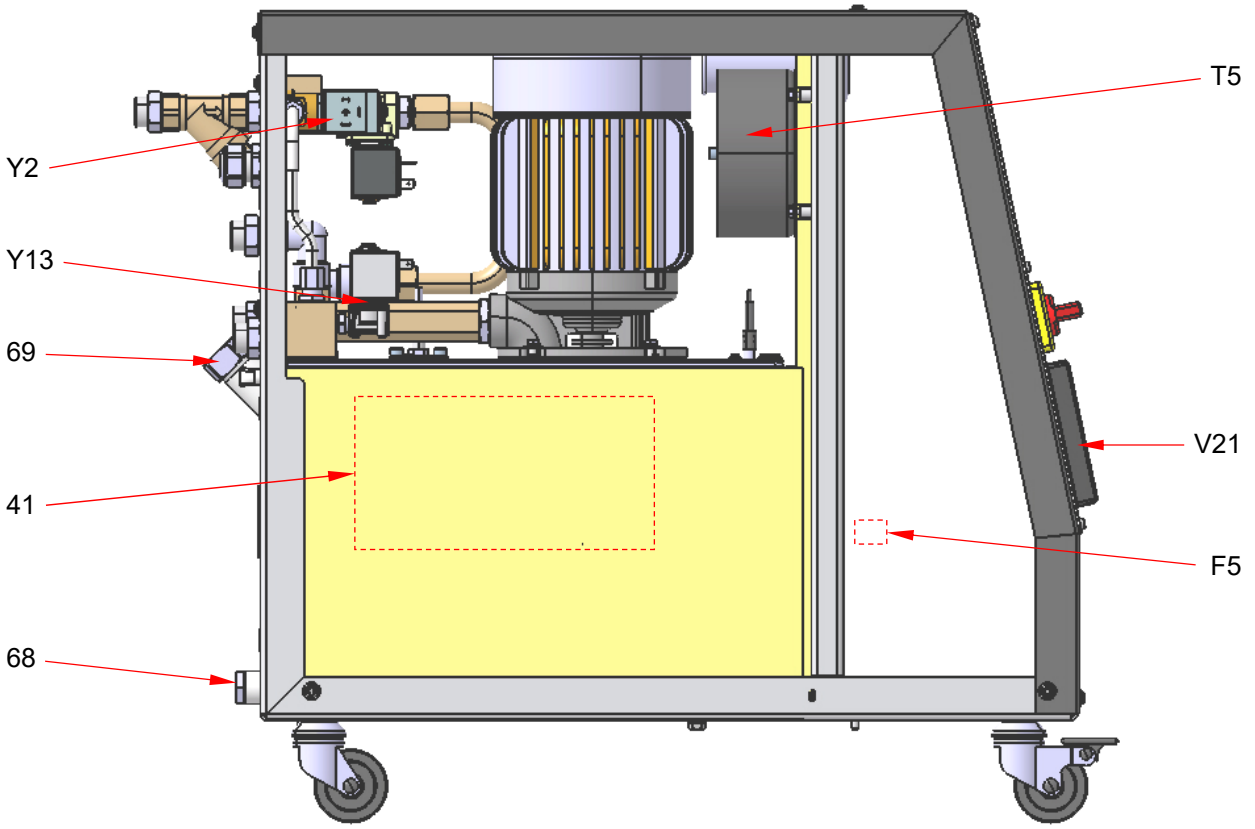
- **Only original Regloplas spare parts may be used!**
  In case of damage from the use of non-original parts, the warranty will be rendered null and void!

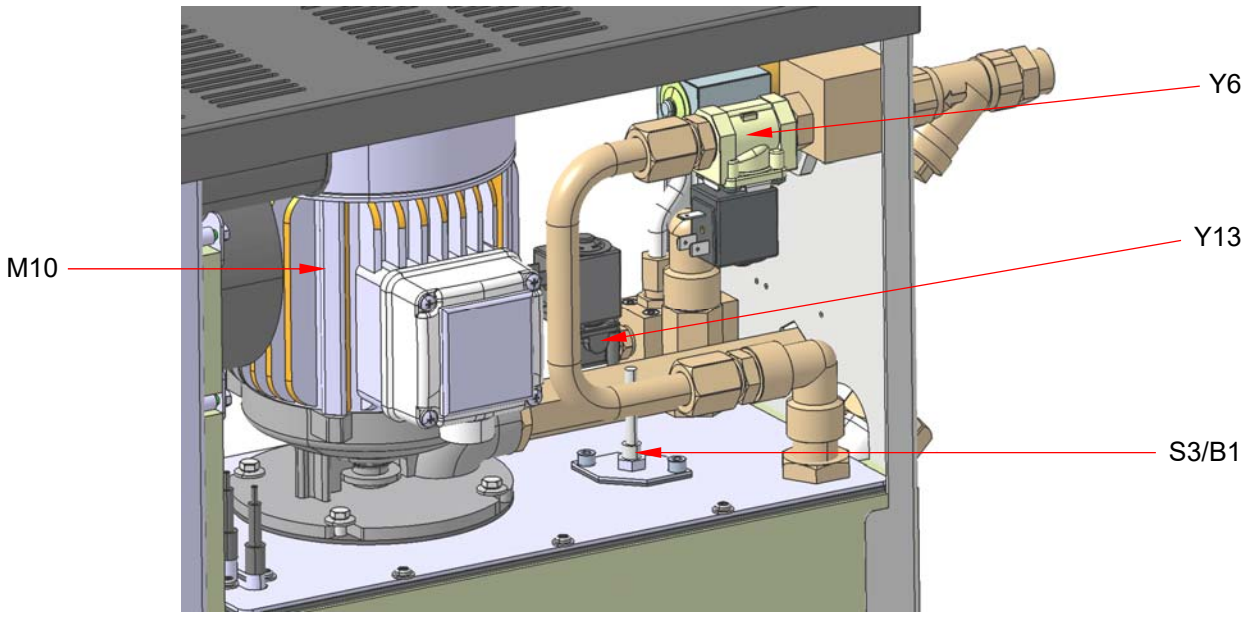
NOTE

See electrical wiring diagram of the temperature control unit for additional electrical components!

Components/Spare parts 150smart




T5
Y2
Y13
69
V21
41
F5
68


Y6
Y13
M10
S3/B1

Item	Designation	Item	Designation
9	Castor with wheel lock	B1	Temperature probe - internal
30	Power cable	E21	Heating
35	Pump	F5	Safety thermostat
38	Tank with insulation	M10	Pump motor
41	Cooler	P1	Control system
46	Float	Q1	Main switch
54	Filler cap	S3	Level switch (see corresponding chapter)
60	Filter - cooling water	T5	Control transformer
66	Cooling water IN	V21	SSR relay with heat sink
67	Cooling water OUT	V21a	Seal for SSR relay
68	Discharge port	Y2	Solenoid valve (auto. water refill) (option)
69	Filler pipe	Y6	Solenoid valve (cooling)
70	Overflow	Y13	Solenoid valve (suction)
72	Outlet		
73	Inlet		
75	Castor		

⚠ CAUTION

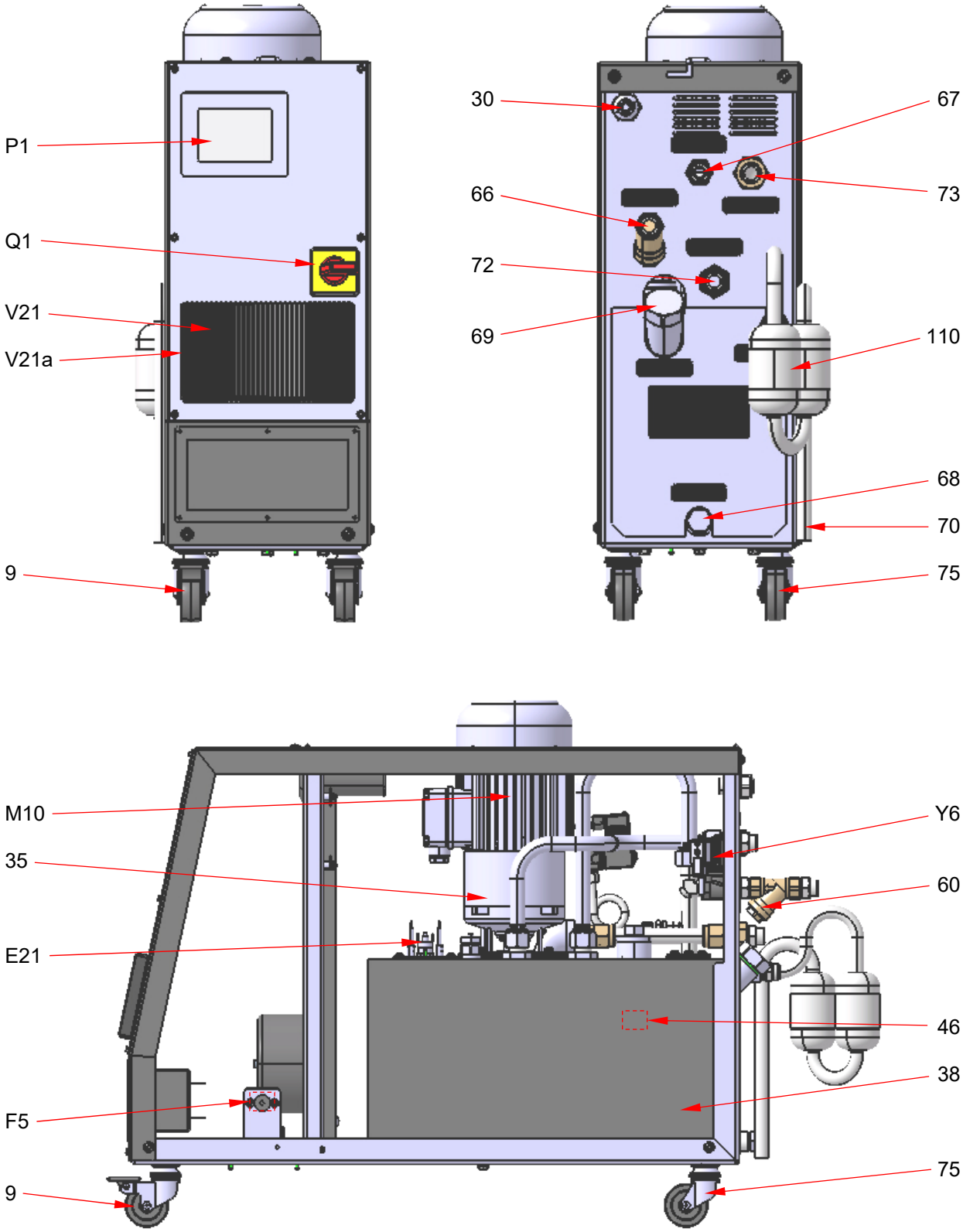
Danger due to the use of unsuitable spare parts!

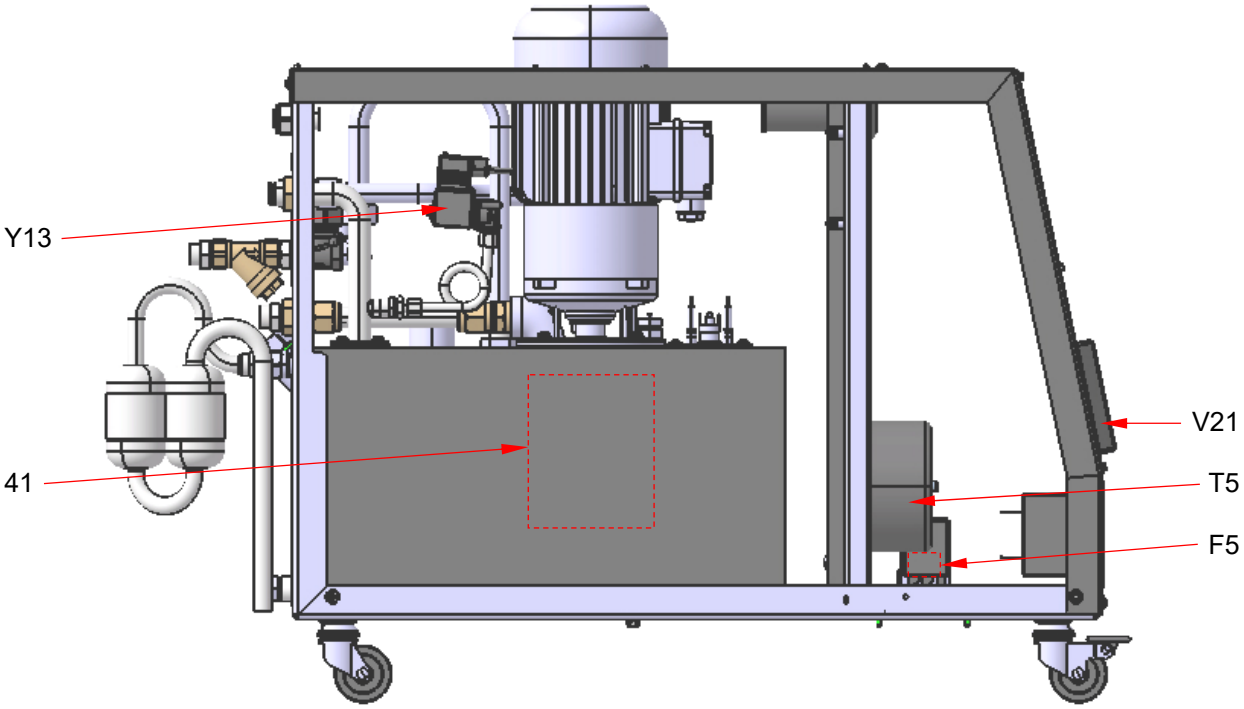
- **Only original Regloplas spare parts may be used!**
  In case of damage from the use of non-original parts, the warranty will be rendered null and void!

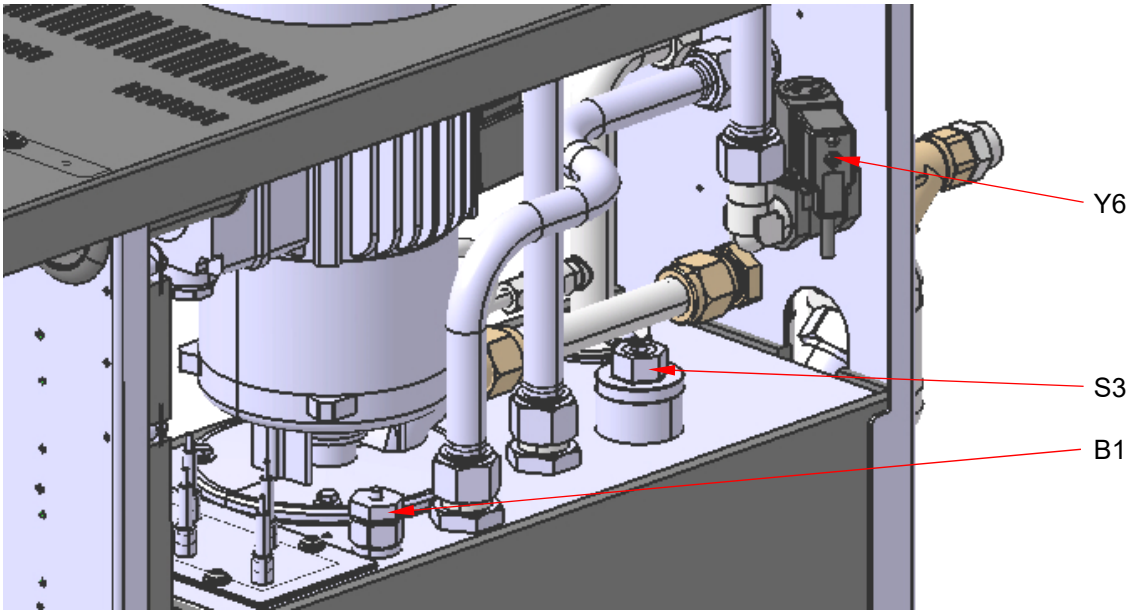
NOTE

See electrical wiring diagram of the temperature control unit for additional electrical components!

Components/Spare parts 200smart




Y13
41
V21
T5
F5


Y6
S3
B1

Item	Designation	Item	Designation
9	Castor with wheel lock	B1	Temperature probe - internal
30	Power cable	E21	Heating
35	Pump	F5	Safety thermostat
38	Tank with insulation	M10	Pump motor
41	Cooler	P1	Control system
46	Float	Q1	Main switch
60	Filter - cooling water	S3	Level switch (see corresponding chapter)
66	Cooling water IN	T5	Control transformer
67	Cooling water OUT	V21	SSR relay with heat sink
68	Discharge port	V21a	Seal for SSR relay
69	Filler pipe	Y6	Solenoid valve (cooling)
70	Overflow	Y13	Solenoid valve (suction)
72	Outlet		
73	Inlet		
75	Castor		
110	Airlock		

⚠ CAUTION

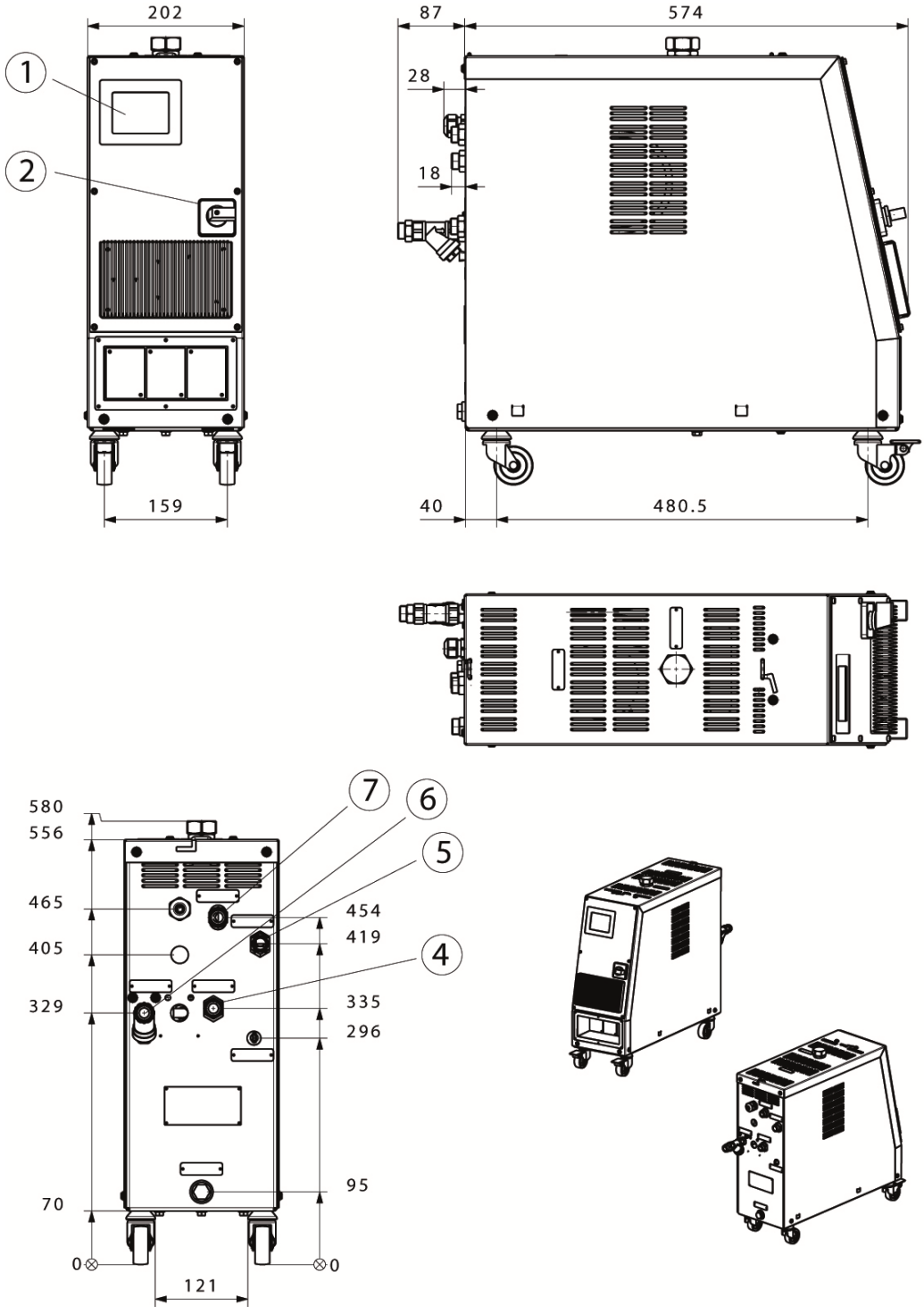
Danger due to the use of unsuitable spare parts!

- **Only original Regloplas spare parts may be used!**
  In case of damage from the use of non-original parts, the warranty will be rendered null and void!

NOTE

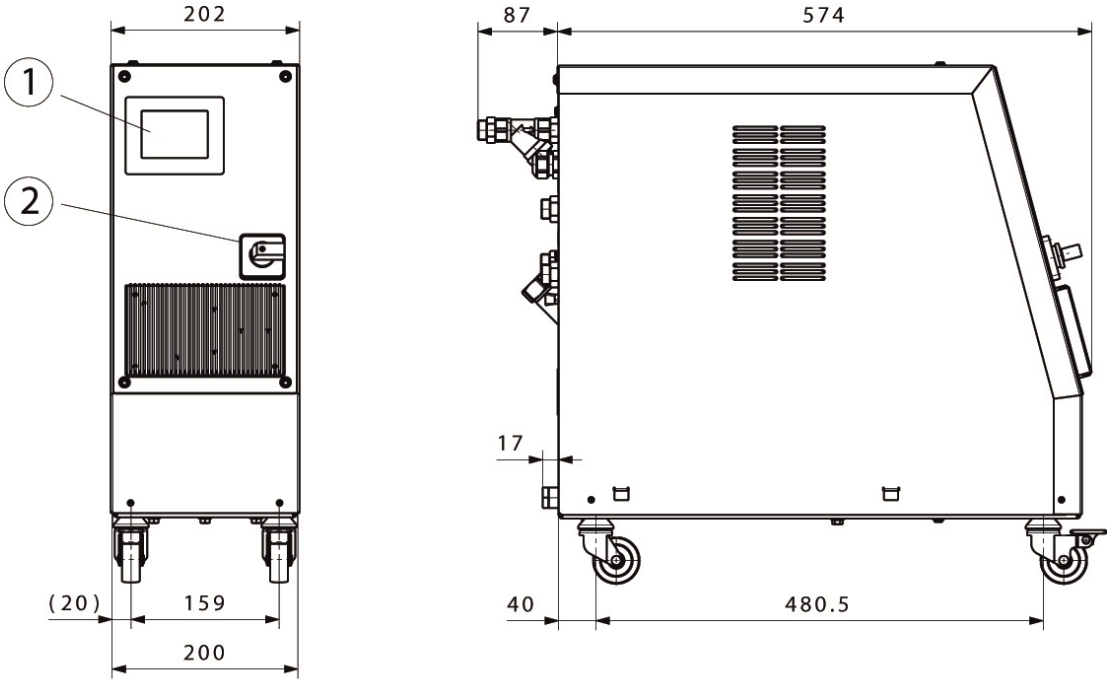
See electrical wiring diagram of the temperature control unit for additional electrical components!

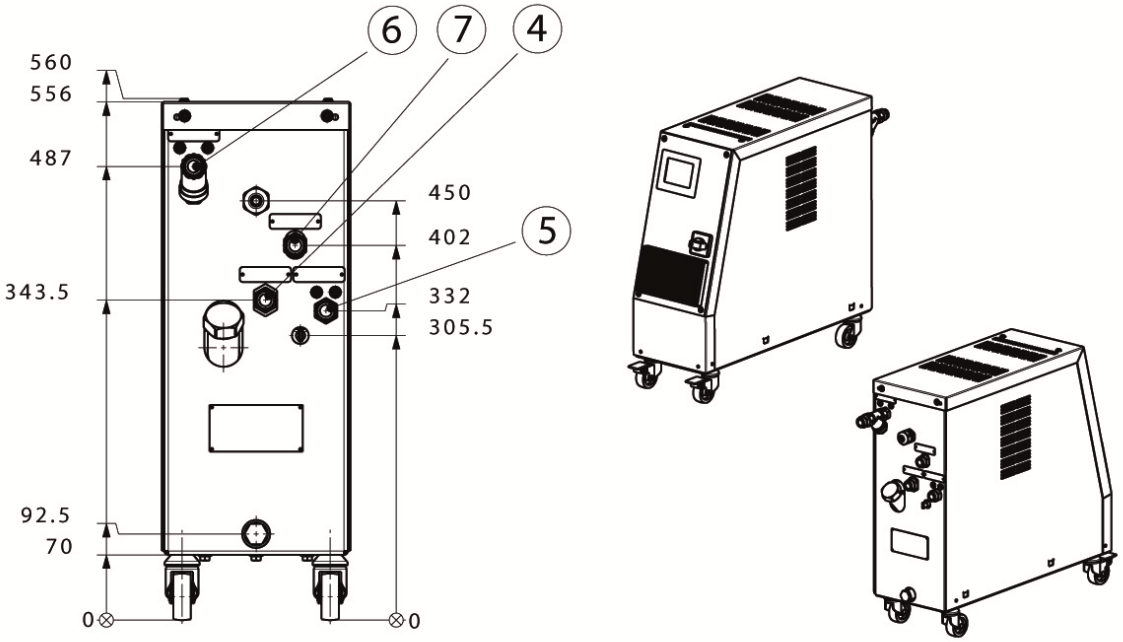
Dimension sheet 90smart



Item	Designation	Item	Designation
1	RT70 Control System	5	Inlet
2	Main switch	6	Cooling water IN
3	---	7	Cooling water OUT
4	Outlet		

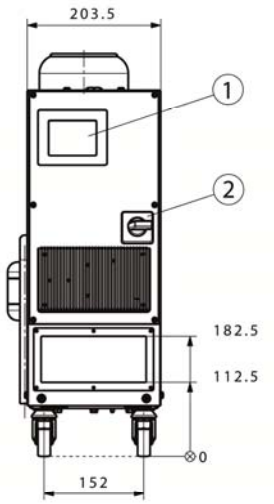
Dimension sheet 150smart

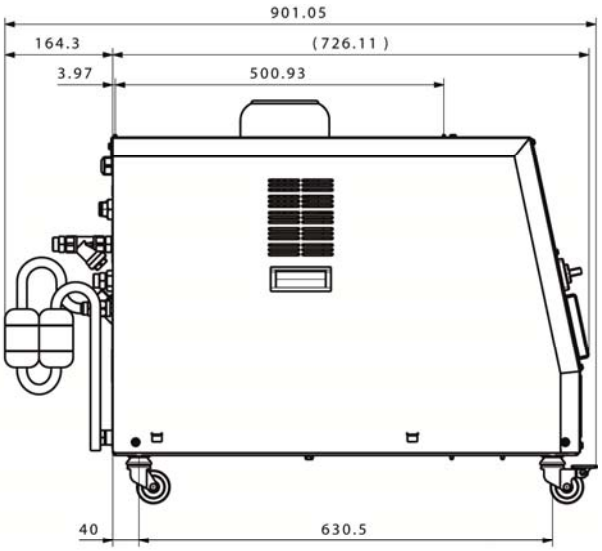


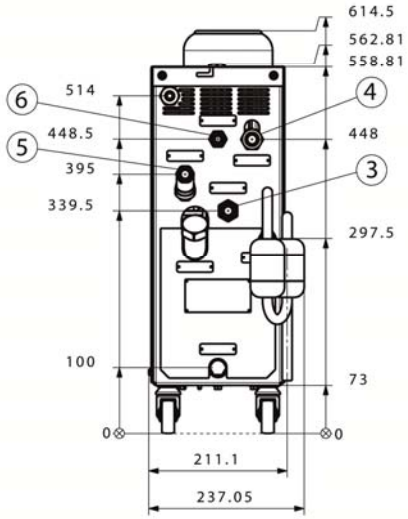


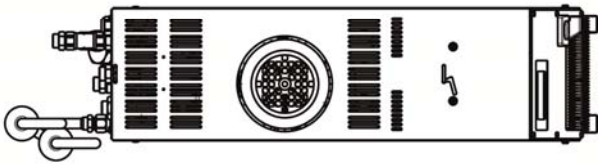
Item	Designation	Item	Designation
1	RT70 Control System	5	Inlet
2	Main switch	6	Cooling water IN
3	---	7	Cooling water OUT
4	Outlet		

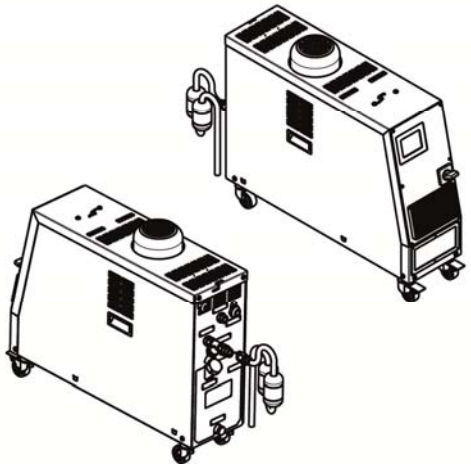
Dimension sheet 200smart











Item	Designation	Item	Designation
1	RT70 Control System	4	Inlet
2	Main switch	5	Cooling water IN
3	Outlet	6	Cooling water OUT