

# **P100L/P140L/P160L/P180L**

## **Operating Instructions**



**Documentation Temperature Control Unit P100L/P140L/P160L/P180L****Translation from the German document**

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**Regloplas AG  
Spühlstrasse 6  
9016 St. Gallen  
Switzerland**

**Tel.: +41-71-282 58 00  
Fax.: +41-71-282 58 40**

**e-mail: [info@regloplas.com](mailto:info@regloplas.com)  
Website: [www.regloplas.com](http://www.regloplas.com)**

# Contents

|                                                              |          |
|--------------------------------------------------------------|----------|
| <b>General Safety Information</b>                            | <b>1</b> |
| Safety Symbols .....                                         | 1        |
| Range of Application .....                                   | 2        |
| Intended Use .....                                           | 2        |
| Safety Information .....                                     | 2        |
| General Information .....                                    | 2        |
| Process Monitoring .....                                     | 2        |
| Information for Operators and Personnel .....                | 3        |
| Changing the Parameter Settings .....                        | 3        |
| Residual Risks .....                                         | 3        |
| Using This Documentation .....                               | 4        |
| Additional Documentation .....                               | 4        |
| <b>Operating Instructions</b>                                | <b>5</b> |
| General .....                                                | 5        |
| Introduction .....                                           | 5        |
| Operating Range .....                                        | 5        |
| Start-up .....                                               | 6        |
| Setting up the Temperature Control Unit .....                | 6        |
| Operating Instructions .....                                 | 7        |
| Inspection of Consumers .....                                | 7        |
| Water quality .....                                          | 8        |
| Connecting Lines .....                                       | 10       |
| Electrical Connections .....                                 | 10       |
| Operation of the Temperature Control Unit .....              | 11       |
| RT100 Control System .....                                   | 11       |
| Buttons .....                                                | 11       |
| Status LEDs .....                                            | 11       |
| Device Functions .....                                       | 12       |
| Symbols .....                                                | 12       |
| RT100 Operation and Status Displays .....                    | 12       |
| Setting the Set-point values .....                           | 12       |
| Parameter Menu .....                                         | 13       |
| RT100 Control System - Functions .....                       | 13       |
| Switching on the Temperature Control Unit .....              | 13       |
| Emptying .....                                               | 13       |
| Operation with Code/Password .....                           | 14       |
| Operation with Timer .....                                   | 14       |
| Alarm Reset and Alarm History .....                          | 14       |
| Save/Reset of the Setting Values .....                       | 15       |
| RT100 Control System - Activating and Enabling Options ..... | 15       |
| Shutdown .....                                               | 15       |
| Changing Consumers/Decommissioning .....                     | 16       |
| Alarm Messages .....                                         | 16       |
| Alarm list .....                                             | 16       |
| Warnings .....                                               | 16       |
| Alarms .....                                                 | 17       |
| System Errors/System Notes .....                             | 20       |

|                                                       |           |
|-------------------------------------------------------|-----------|
| Maintenance .....                                     | 21        |
| Periodic Inspections and Maintenance Procedures ..... | 21        |
| Cleaning .....                                        | 22        |
| Repairs .....                                         | 23        |
| Transport .....                                       | 23        |
| Emptying the SK pump circuit .....                    | 25        |
| Disposal .....                                        | 25        |
| <b>Maintenance .....</b>                              | <b>26</b> |
| Technical Data P100L/P140L .....                      | 26        |
| Technical Data P160L/P180L .....                      | 27        |
| Basic circuit diagram P100L (DK) .....                | 28        |
| Basic circuit diagram P140L .....                     | 29        |
| Basic circuit diagram P160L .....                     | 30        |
| Basic circuit diagram P180L .....                     | 31        |
| Diagram (Pump capacity) .....                         | 32        |
| Diagram (Cooling capacity) .....                      | 32        |
| Components/Spare parts P100L (DK) .....               | 33        |
| Components/Spare parts P140L .....                    | 35        |
| Components/Spare parts P160L/P180L .....              | 37        |
| Dimension sheet P100L/P140L .....                     | 40        |
| Dimension sheet P160L/P180L .....                     | 41        |
| Valve Block Y8 .....                                  | 42        |
| Valve Block Y2/Y6 .....                               | 43        |
| Solenoid valve Y13 (Suction option) .....             | 44        |
| Overview .....                                        | 44        |
| Level Switch .....                                    | 45        |
| Dismantling/Replacement .....                         | 45        |

# General Safety Information

## Safety Symbols

|  <b>DANGER</b>    |                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Denotes imminent danger.<br>Failure to heed the information can result in death or grave personal injury (disability)!                                         |
|  <b>WARNING</b> |                                                                                                                                                                |
|                 | Denotes a dangerous situation.<br>Failure to heed the information can result in death or grave personal injury (disability)!                                   |
|  <b>CAUTION</b> |                                                                                                                                                                |
|                 | Denotes a potentially dangerous situation.<br>Failure to heed the information can result in property damage as well as minor or moderate personal injury!      |
| <b>NOTE</b>                                                                                        |                                                                                                                                                                |
|                 | 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.

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## 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 the normal use for heating and/or cooling of injection moulds and die casting dies, extruders, calenders, mixers and other 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 other operating conditions and/or with other media, in deviation 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 who 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 user 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 it has been determined 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 use of third-party parts voids any and all warranty claims.

|                                                                                                   |                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>DANGER</b> |                                                                                                                                                                                                                                                                                                   |
|                | <p><b>Danger of electric shock!</b></p> <ul style="list-style-type: none"><li>• <b>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)</b></li></ul> |

Any leaks in the temperature control circuit (device, 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<sub>2</sub> 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 and depending on the outlet temperature, allow the temperature control unit to cool down first 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, economical operation and for 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 P100L/P140L/P160L/P180L as well as important information for safe operation and optimal maintenance.

The operating instructions must be kept near the temperature control unit and 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 | P100L        | P140L        | P160L        | P180L        |
|-------------------------------|--------------|--------------|--------------|--------------|
| Temperature range             | up to 100 °C | up to 140 °C | up to 160 °C | up to 180 °C |
| Heat transfer medium          | Water        | Water        | Water        | Water        |

### 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!

### NOTE



Installations in Canada and the United States of America:  
Preliminary fuse (in class CC or class J) must be installed by the customer, according to the specification in the electrical diagram.

## 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 ensured during set-up. 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!**

**Do not place the temperature control unit close to sources of heat (e.g. furnaces in die-casting plants)!**

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

**The Regloplas AG leakage monitoring function does not constitute any kind of safety element and any warranty claim against Regloplas AG and its affiliated companies or representatives is excluded for the proper functioning, even in conjunction with a die-casting or injection moulding machine.**

**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 belong in the hands of 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 fouling 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

Without special treatment, water is generally not suitable for closed temperature control and cooling circuits. Poor water quality leads to corrosion in the temperature control unit and on the tool. Heat transfer functions less efficiently and thus the quality and performance of the temperature control system worsens.

In order to maintain the quality of the temperature control system and to avoid damage to the temperature control unit or the attached consuming device (tool), the water used has to fulfil certain requirements. Depending on the maximum flow temperature, a fundamental distinction is made in the following two types:

- With flow temperature of up to 160 °C, so-called hardness stabilisers such as the **RK 93** from Regloplas can be used.
- With flow temperature of 180 °C or more, the water has to be de-salinated. Then a corrosion inhibitor such as **RK HT** from Regloplas has to be used to stabilise the pH level.

The following points must also be observed with regard to the water quality:

- Hard water is not suitable due to the high levels of chalk it contains.
- Rusty water can cause even stainless steel to corrode.
- Water containing chlorine leads to pitting corrosion.
- Seawater should not be used under any circumstances.
- Untreated stream water and cooling tower water should not be used due to its microbiological content.
- The water must be free of suspended solids or sediment (use filters).
- Aluminium should be avoided in the temperature control circuit as special precautions are then required.
- The water in the temperature control circuit has to be exchanged regularly. Regloplas units offer the possibility of cyclical exchange of the system water (**rinsing**).

### NOTE



For high flow temperatures, the system water must be prepared as described. The cooling water does not have to meet the same strict requirements as the system water.

Regloplas temperature control units with indirect cooling have optional separate connections for the system water and the cooling water.



### CAUTION



If the temperature control unit is operated with unsuitable water, this will render any warranty claims invalid in case of damage to the temperature control unit.

## Flow temperatures up to 160 °C

With a flow temperature of up to 160 °C, so-called hardness stabilisers such as the **RK 93** from Regloplas can be used.

The following approximate values must be adhered to:

| Criterion                           | approximate value                              |
|-------------------------------------|------------------------------------------------|
| <b>Appearance</b>                   | Clear with no sediment<br>Free of solid matter |
| <b>Cloud</b>                        | < 0.0 NTU (no cloudiness)                      |
| <b>Total hardness</b>               | < 10 °dH                                       |
| <b>pH value</b>                     | 7.5-9.0                                        |
| <b>Conductivity</b>                 | Max. 500 µS/cm                                 |
| <b>Carbonate hardness</b>           | < 5 °dH                                        |
| <b>Chloride ions Cl<sup>-</sup></b> | < 30 mg/l                                      |
| <b>Sulphate So<sub>4</sub></b>      | < 150 mg/l                                     |
| <b>Ammonium NH<sub>4</sub></b>      | < 1 mg/l                                       |
| <b>iron</b>                         | < 0.2 mg/l                                     |
| <b>Manganese</b>                    | < 0.1 mg/l                                     |

## Flow temperatures of 180 °C or more

With a flow temperature of 180 °C or more, the water has to be desalinated. Then a corrosion inhibitor such as **RK HT** from Regloplas has to be used to stabilise the pH level.

The following approximate values must be adhered to:

| Criterion                           | approximate value                              |
|-------------------------------------|------------------------------------------------|
| <b>Appearance</b>                   | Clear with no sediment<br>Free of solid matter |
| <b>Cloud</b>                        | < 0.0 NTU (no cloudiness)                      |
| <b>Total hardness</b>               | < 1 °dH                                        |
| <b>pH value</b>                     | 7.5-9.0                                        |
| <b>Conductivity</b>                 | Max. 50 µS/cm                                  |
| <b>Carbonate hardness</b>           | < 1 °dH                                        |
| <b>Chloride ions Cl<sup>-</sup></b> | < 5 mg/L                                       |
| <b>Sulphate So<sub>4</sub></b>      | < 150 mg/l                                     |
| <b>Ammonium NH<sub>4</sub></b>      | < 1 mg/l                                       |
| <b>iron</b>                         | < 0.2 mg/l                                     |
| <b>Manganese</b>                    | < 0.1 mg/l                                     |

When no water of suitable quality is available, an appropriate additional device such as the **waterCare** from Regloplas should be used.

## 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).

- Outlet and inlet - dimensioning for 140/160 °C (16 bar) and 180/200 °C (25 bar) The connecting lines must be routed so that they are protected against unintentional contact. Thermal expansion must be taken into account in pipe joints
- Cooling water inlet - dimensioning for 100 °C (10 bar). 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 difference (inlet water pressure versus outlet water pressure) must be within the range of 2-6 bar. The minimum cooling water flow rate must be 10 l/min
- Cooling water outlet - dimensioning for 160 °C (10 bar), 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



**When escaping, the temperature of the cooling water can increase to the same temperature as the heat transfer medium!**

## Electrical Connections

### DANGER



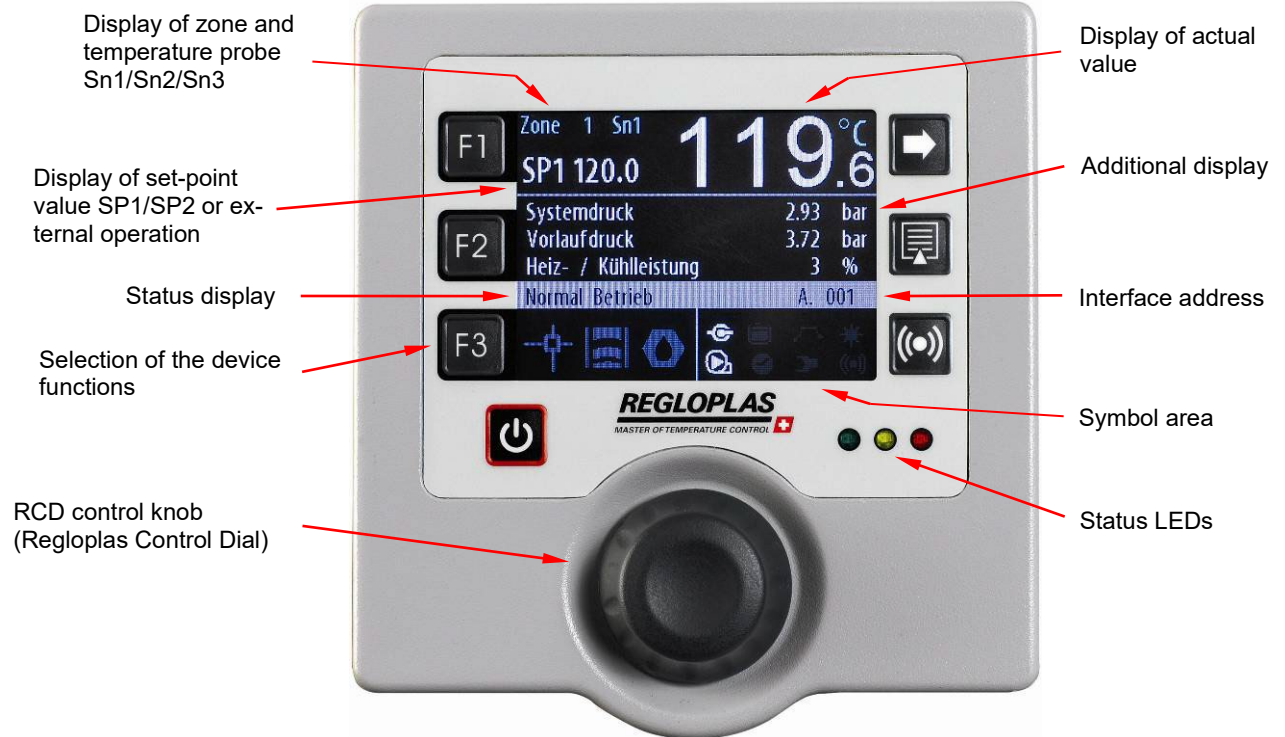
**Danger due to electrical energy and improper connection carrying out!**

- 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 unit
- 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.

### RT100 Control System



RT100 Control System - front panel

### Buttons

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

### 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)        |                                                                                   |                                                         |

## RT100 Operation and Status Displays



In the off state of the RT100 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**

**Sn2 = Temperature, external**

**Sn3 = Inlet 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 through an external digital signal.



To toggle between set-point values **SP1** and **SP2**, press the **F3** button and select of 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.

---

# RT100 Control System - Functions

## Switching on the Temperature Control Unit



Upon switching on the main switch, the message **OFF** appears in the display. The RT100 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.

Depending on the programming, the set-point and actual values, as well as information on the operational state of the control system or the temperature control unit are displayed.

### *Rotational field detection / Direction reversal*

The rotary field detection of the RT100 control system detects a wrong phase sequence and reports this in the display or corrects the direction of rotation automatically.

## Emptying

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** key and selecting the suction symbol. The pump is switched off, and after the pump run-down 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 run-down 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 (Y8) 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 RT100 control system has three password levels that are organised hierarchically:

- User password - Default **0000** (switched off)
- Technician password - Default **0100**
- 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!**

## Operation with Timer

The RT100 control system has an integrated real-time clock. If the **Timer** option is available, the device can be switched on and off with this option.

## 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 once again pressing the **Alarm Reset** button.

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

### 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 RT100 control system provides the facility to load the factory settings or user settings at any time in a simple manner. Two different customer-specific settings can be loaded afresh (user setting 1 and 2).

## RT100 Control System - Activating and Enabling Options

The RT100 control system can be equipped with different hardware and software options.

The software options must be activated with a file via USB stick. This requires the serial number of the control system, which is displayed in the parameter **Options** and can be seen on the base module next to the bar-code.

The serial number consists of 6 letters (e.g. AALASF).

## Shutdown

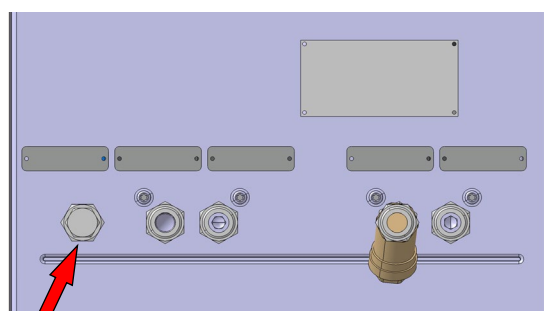
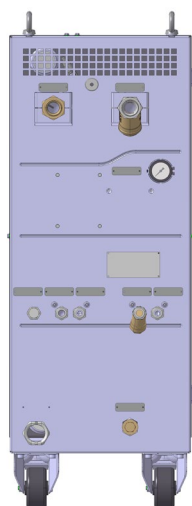


The RT100 control system is switched off by pressing the **ON/OFF** button, by the timer, via a digital input or an interface.

### NOTE



**Before switching off the device, a pressure-less hose must be connected to the „Additional pressure relief“ connection!**



*Additional pressure relief connection*

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 RT100 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 pro-

grammed coastdown temperature. On reaching this temperature, the pump and the control system are effectively switched off. In the case of pressurised water units, the pressure release valve **Y8.1** opens during shutdown. The RT100 control system will then be in standby mode and the message **OFF** appears on the display

## Changing Consumers/Decommissioning

Before detaching the connecting lines, it is necessary to verify that the temperature control unit is turned off and that all circuits are depressurized (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 RT100 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

| No. | Error message                                 | Rectification                                                                                                                    |
|-----|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 380 | Service is due                                | Carry out maintenance procedure according to the operating manual. Increment the parameter <b>Next Maintenance</b> by 1000 hours |
| 388 | Clean the filter                              | Clean the corresponding filter or if required, replace it                                                                        |
| 396 | Current settings lost factory settings loaded | The RT100 Control System has lost the parameters and had to load the factory settings                                            |
| 404 | Outlet pressure sensor failure                | Replace outlet pressure sensor                                                                                                   |
| 412 | Heating contactor 1 failure                   | The contactor Heating 1 does not get actuated correctly any more - replace                                                       |
| 420 | Heating contactor 2 failure                   | The contactor Heating 2 does not get actuated correctly any more - replace                                                       |
| 428 | SSR failure                                   | SSR DC with auxiliary contact has activated. Check SSR                                                                           |

| No. | Error message                                    | Rectification                                                                                  |
|-----|--------------------------------------------------|------------------------------------------------------------------------------------------------|
| 436 | Pre-Alarm Flow active in Multiflow Option        | Check flow rate (possibly leakage) - adjust pre-alarm settings if necessary                    |
| 444 | Pre-Alarm Temperature active in Multiflow Option | Check temperature - adjust pre-alarm settings if necessary                                     |
| 452 | Pre-Alarm Delta T active in Multiflow Option     | Check temperature difference - adjust pre-alarm settings if necessary                          |
| 460 | Illegal or broken characteristic curve F1000     | Switch the main switch off and on. If the error is still present, reload characteristic F1000. |
| 468 | Pump power too low                               | Check/inspect the pump or in the menu F1000 reduce the parameter pump tolerance (default 50%)  |
| 476 | Deviation set-point/actual value underrun        | Check deviation set-point/actual value                                                         |
| 484 | Deviation set-point/actual value exceeded        |                                                                                                |
| 492 | Deviation set-point/outlet underrun              | Adjust the outlet temperature and acknowledge the fault                                        |
| 500 | Deviation set-point/outlet exceeded              |                                                                                                |
| 508 | Deviation set-point/external underrun            | Adjust the external temperature and acknowledge the fault or error                             |
| 516 | Deviation set-point/external exceeded            |                                                                                                |
| 524 | Deviation set-point/inlet underrun               | Adjust the inlet temperature and acknowledge the fault or error                                |
| 532 | Deviation set-point/inlet exceeded               |                                                                                                |
| 540 | Deviation outlet/inlet underrun                  |                                                                                                |
| 548 | Deviation outlet/inlet exceeded                  |                                                                                                |
| 556 | Max. heating time exceeded                       | Check heating circuit                                                                          |
| 564 | Max. cooling time exceeded                       | Check cooling circuit                                                                          |
| 572 | USB stick full                                   | Delete data from USB stick                                                                     |
| 580 | No USB stick                                     | Insert USB stick                                                                               |
| 588 | USB stick failure                                | Replace USB stick                                                                              |
| 596 | Level 2 underrun                                 | Refill heat transfer medium                                                                    |
| 604 | Pressure balance not possible                    | Check water supply line and water pressure (min. 2 bar)                                        |
| 612 | Current monitoring heating activated             | Check heating element(s) and replace if necessary                                              |
| 620 | DEMO MODE Pump current measurement inactive      | System message without correction                                                              |
| 628 | Option OPC UA is updating... Do not switch off!  | ---                                                                                            |
| 636 | Option OPC UA has been updated                   | ---                                                                                            |

## Alarms

| No. | Error message                                           | Rectification                                                                             |
|-----|---------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 692 | Switch over heat carrier reboot of the machine required | Switch on temperature control unit again with main switch                                 |
| 696 | RTC Error or empty battery Time and date settings lost  | Set date/time correctly and/or replace battery in front panel                             |
| 700 | Option OPC UA is updating... Do not switch off!         | ---                                                                                       |
| 704 | External set-point signal disconnected or not available | External set point signal must be present (check external control if necessary)           |
| 708 | Rotation cannot be changed                              | ---                                                                                       |
| 712 | Communication interruption on interface detected        | Switch on temperature control unit again with main switch - Check communication interface |
| 716 | Software version analog option incompatible             | Update the software                                                                       |

| No. | Error message                                                   | Rectification                                                                           |
|-----|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 720 | Software version digital option incompatible                    |                                                                                         |
| 724 | Software version option current monitoring heating incompatible |                                                                                         |
| 728 | Software version option rev. of rotation incompatible           |                                                                                         |
| 732 | Software version option Profibus incompatible                   |                                                                                         |
| 736 | Software version option Profinet incompatible                   |                                                                                         |
| 740 | Software version option universal interface incompatible        |                                                                                         |
| 744 | Software version option Ethernet/IP incompatible                |                                                                                         |
| 748 | Software version option Modbus TCP incompatible                 |                                                                                         |
| 752 | Software version option OPC UA incompatible                     |                                                                                         |
| 756 | Software version option CANOpen incompatible                    |                                                                                         |
| 760 | Software version option CAN Demag incompatible                  |                                                                                         |
| 764 | Software version option calibrator incompatible                 |                                                                                         |
| 768 | Software version option Flow incompatible                       |                                                                                         |
| 772 | Software version option multiflow incompatible                  |                                                                                         |
| 776 | Analog option missing or defective                              | Connect the corresponding option or switch off in the parameter <b>Hardware Options</b> |
| 780 | Digital option missing or defective                             |                                                                                         |
| 784 | Current monitoring heating option missing or defective          |                                                                                         |
| 788 | Rotation reversal option missing or defective                   |                                                                                         |
| 792 | Profibus option missing or defective                            |                                                                                         |
| 796 | Profinet option missing or defective                            |                                                                                         |
| 800 | Universal interface option missing or defective                 |                                                                                         |
| 804 | Ethernet/IP option missing or defective                         |                                                                                         |
| 808 | Modbus TCP option missing or defective                          |                                                                                         |
| 812 | Option OPC UA missing or defective                              |                                                                                         |
| 816 | CANOpen option missing or defective                             |                                                                                         |
| 820 | CAN Demag option missing or defective                           |                                                                                         |
| 824 | Flow option missing or defective                                |                                                                                         |
| 828 | MF 1-4 missing or defective                                     |                                                                                         |
| 832 | MF 5-8 missing or defective                                     |                                                                                         |
| 836 | MF 9-12 missing or defective                                    |                                                                                         |
| 840 | MF 13-16 missing or defective                                   |                                                                                         |
| 844 | Calibrator missing or defective                                 |                                                                                         |
| 848 | Alarm Flow active in Multiflow Option                           | Check flow rate (possibly leakage) Adjust alarm settings if necessary                   |
| 852 | Alarm Temperature active in Multiflow Option                    | Check temperature - adjust alarm settings if necessary                                  |

| No.               | Error message                                                                               | Rectification                                                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 856               | Alarm Delta T active in Multiflow Option                                                    | Check temperature difference - adjust alarm settings if necessary                                                                   |
| 860               | AD converter failure                                                                        | Replace the base module                                                                                                             |
| 864               | Attention: temperature control cabinet too high                                             | Place the temperature control unit in a place with a lower ambient temperature.                                                     |
| 868               | Turn on time refill exceeded                                                                | Check the cooling water network and cooling circuit for leaks.                                                                      |
| 872               | Maximal operating time boost pump exceeded                                                  | Check hose connections to the consumer, repair leaks if necessary.                                                                  |
| 876               | Temp. monitor cooling act cooling disabled                                                  | Check cooling and cooling water flow                                                                                                |
| 880               | Flow switch active                                                                          | Check supply pressure (min. 0.7 bar must be available)                                                                              |
| 884               | Min. flow rate underrun                                                                     | Check min. flow rate (the specified min. flow rate must be available)                                                               |
| 888               | Min. System pressure underrun                                                               | Check system pressure                                                                                                               |
| 892               | Flow rate deviation too high                                                                | Large fluctuation in the flow rate (possible leakage in the circuit)                                                                |
| 896               | Flow monitor Min. pump pressure underrun                                                    | Check flow pressure                                                                                                                 |
| 900<br>904<br>908 | Max. temperature exceeded Sn3<br>Max. temperature exceeded Sn2<br>Max. temperature exceeded | Max. The temperature of the heat transfer medium must not exceed the max. device temperature (check tool temperature if necessary). |
| 912               | Heating thermostat triggered                                                                | Temperature control unit has become too hot - let it cool down and look for the cause                                               |
| 916               | Alarm frequency converter                                                                   | Troubleshooting the frequency inverter                                                                                              |
| 920               | Motor current underrun                                                                      | Check pump/pump motor (with ohmmeter) and replace if necessary.                                                                     |
| 924               | Phase sequence failure                                                                      | Correct phase sequence (turn 2 phases)                                                                                              |
| 928               | Phase sequence unidentified                                                                 | Switch off phase sequence monitoring                                                                                                |
| 932               | Phase missing                                                                               | Check mains, supply line and pump motor                                                                                             |
| 936               | Motor contactor malfunction                                                                 | Check motor contactor and replace if necessary                                                                                      |
| 940               | Temperature sensor Sn1 failure                                                              | Replace temperature sensor Sn1                                                                                                      |
| 944               | Temperature sensor Sn2 failure switched to outlet control                                   | Replace temperature sensor Sn2                                                                                                      |
| 948               | Temperature sensor Sn3 failure                                                              | Replace temperature sensor Sn3                                                                                                      |
| 952               | System pressure sensor inactive                                                             | Activate system pressure sensor                                                                                                     |
| 956               | System pressure sensor failure                                                              | Replace system pressure sensor                                                                                                      |
| 960               | Level 1 underrun                                                                            | Refill heat transfer medium                                                                                                         |
| 964               | Motor current exceed                                                                        | Check pump/pump motor (with ohmmeter) and replace if necessary.                                                                     |
| 968               | Power failure                                                                               | Power supply failure or temperature control unit not properly switched off                                                          |
| 972               | Max. System pressure overrun                                                                | Check system pressure                                                                                                               |
| 976               | Safety thermostat triggered                                                                 | Temperature control unit has become too hot - Determine cause and reset thermostat                                                  |
| 980               | EXTERNAL SWITCHED OFF Kernbruch                                                             | Check monitoring (possible leakage)                                                                                                 |

## System Errors/System Notes

| Error message                                | Rectification                                                    |
|----------------------------------------------|------------------------------------------------------------------|
| 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                         |
| Memory stick missing                         | Insert memory stick                                              |
| Incompatible data on stick                   | Load current software version                                    |
| Communication failure                        | Check the connection between the front panel and the base module |
| Software version error                       | Re-load software (applies to front panel and base module)        |
| Data corrupt on stick                        | Insert new memory stick and re-load device parameters            |
| Settings defect / data not loaded            | Replace the memory stick                                         |
| No data on USB stick or wrong file extension | Load the correct data on USB stick                               |
| More than 1 file on USB stick                | Load the correct data on USB stick                               |
| Data failure - no data loaded from USB stick | Load the correct data on USB stick                               |
| Option not activated                         | Activate the option                                              |
| Saving data                                  | Data saving in progress                                          |
| Data saved                                   | Data saving finished                                             |
| Data error - no data saved to USB stick      | Replace the USB stick                                            |
| Pump is off or has wrong direction           | Adjust the pump rotating field                                   |
| Please close tap                             | Close the tap on the outlet                                      |
| Calibration done - please open tap           | Open the tap on the outlet                                       |
| USB Slave mode operation not possible        | Switch on the temperature control unit again                     |
| Save/Load not possible in USB Slave Mode     | Switch on the temperature control unit again                     |
| Save/Load not possible during device is on   | Switch the temperature control unit to OFF                       |
| Error, password not reset                    | Enter the reset code correctly                                   |
| Password reset                               | Password was reset                                               |
| Illegal operation                            | Observe the operating sequence                                   |
| Zone 1 missing                               | Connect Zone 1, check address of Zone 1                          |
| Zone 2 missing                               | Connect Zone 2, check address of Zone 2                          |

## 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
- The temperature control unit may still be pressurized - depressurise (see section "Switching off the Temperature Control Unit")
- 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 RT100 control system has a service interval display to simplify temperature control unit maintenance procedures. We recommend entering the corresponding maintenance interval (e.g., 2000 hours, see the RT100 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 RT100 control system unit may only be replaced when the mains plug is unplugged

### **WARNING**



**Danger of magnetic fields due to feed pumps with magnetic drive!**

- Persons with pacemakers and surgically implanted metal parts must remain at a safe distance or not be required to perform maintenance and repairs on these pumps
- When assembling the magnetic drive, the motor must be securely retained to prevent any possibility of fingers being crushed between components due to the magnetic forces
- All computers, data media, credit cards, electronic watches etc. must be kept at a safe distance

### 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

|  <b>CAUTION</b>                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br> | <p><b>Danger due to temperature, fire and explosion!</b></p> <ul style="list-style-type: none"> <li>• Always allow the temperature control unit to cool down</li> <li>• Switch off the temperature control unit: press the main switch and unplug from the mains</li> <li>• When using a solvent for cleaning - do not blow out the tank and the cooler, but flush them instead (explosion hazard)</li> <li>• 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</li> </ul> |

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 (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

|  <b>CAUTION</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p><b>Danger due to improper repair!</b></p> <ul style="list-style-type: none"> <li>• Repair work may only be carried out by technically trained specialist personnel</li> <li>• Allow the temperature control unit to cool down and, if necessary, drain it before any repair</li> <li>• Switch off the temperature control unit, press the main switch and unplug from the mains</li> <li>• Disconnect all hose couplings from the temperature control unit</li> </ul> |

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.

|  <b>CAUTION</b> |                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p><b>Danger due to the use of unsuitable spare parts!</b></p> <ul style="list-style-type: none"> <li>• Only original Regloplas spare parts may be used!<br/>In case of damage from the use of non-original parts, the warranty will be rendered null and void!</li> </ul> |

## Transport

|  <b>CAUTION</b> |                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p><b>Danger due to improper transport work!</b></p> <ul style="list-style-type: none"> <li>• 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")</li> </ul> |

- **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) Empty the medium circuit by blowing through the inlet, empty the cooling circuit and the SK circuit



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



## CAUTION



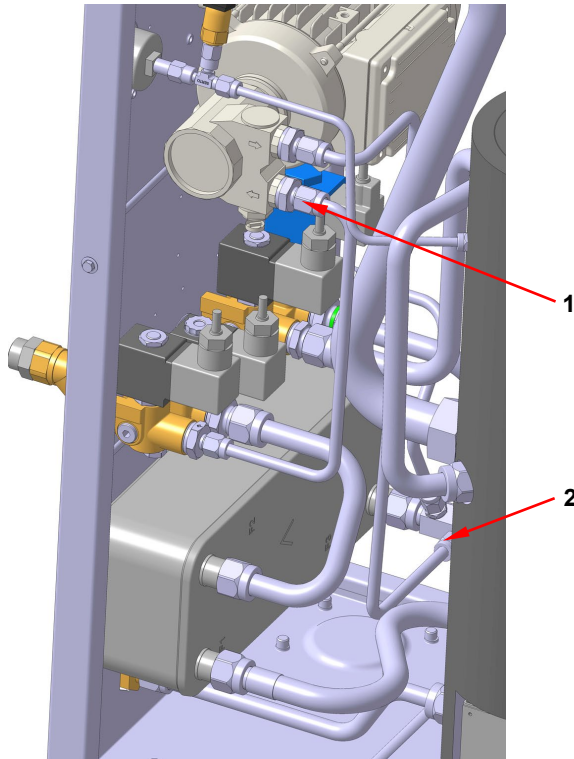
### Danger due to improper transport work!

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

## Emptying the SK pump circuit

Because of the danger of freezing at low temperatures, the SK circuit must be drained as follows:

- 1) Loosen the connection on the filling pump (1) and let drain off the heat transfer medium
- 2) Loosen the lock nut on the distributor (2) and let drain off the residual heat transfer medium



*Emptying the SK pump*

## 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

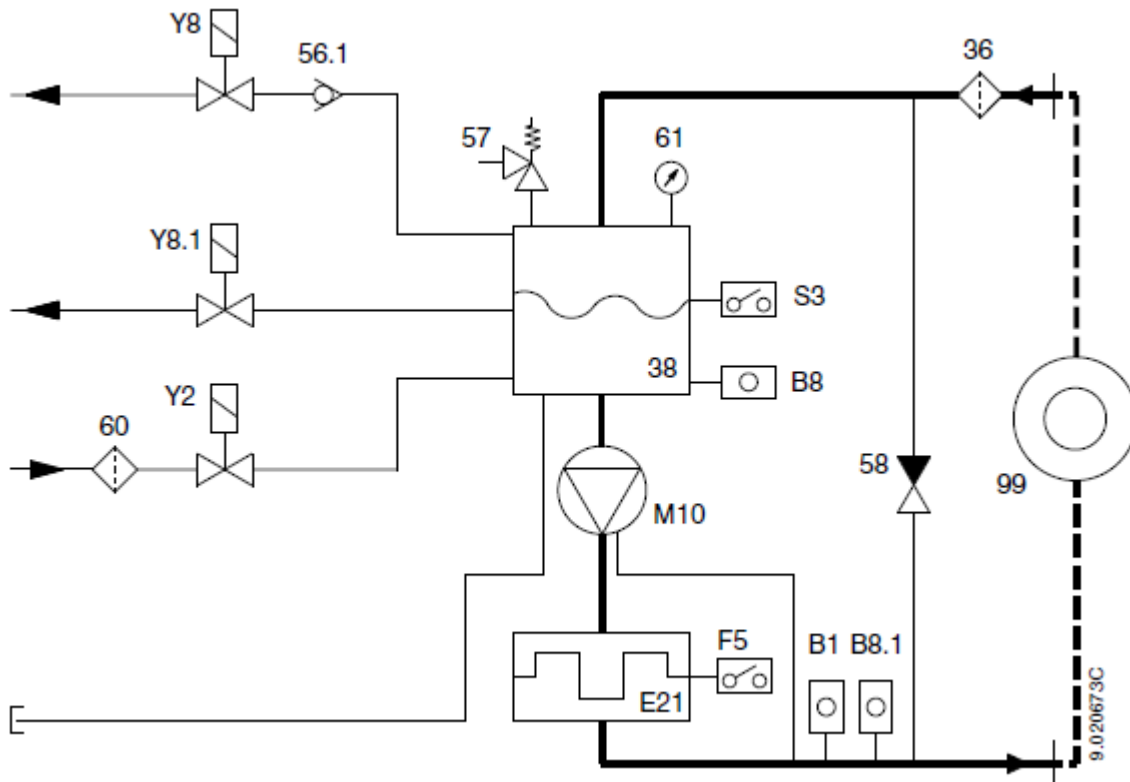
## Technical Data P100L/P140L

| Temperature Control Unit Type               | P100L                                | P140L                     |
|---------------------------------------------|--------------------------------------|---------------------------|
| Max. outlet temperature                     | 100 °C                               | 140 °C                    |
| Heat transfer medium                        | Water                                |                           |
| Filling capacity                            | 12.0 l                               |                           |
| Heating capacity                            | 17 kW/34 kW/51 kW                    |                           |
| Heating switch                              | SSR-Relay                            |                           |
| Cooling capacity                            | 160 kW (DK)                          | 85 kW (SK)<br>95 kW (2SK) |
| at outlet temperature                       | 90 °C                                | 130 °C                    |
| at cooling water temperature                | 20 °C                                |                           |
| Pump type                                   | CRI5                                 | CRI5                      |
| Motor power (pump)                          | 1.1 kW                               |                           |
| Max. delivery rate                          | 140 l/min                            |                           |
| Max. delivery pressure                      | 5.4 bar                              |                           |
| System pressure                             | 10 bar                               |                           |
| Outlet pressure                             | max. 16 bar                          |                           |
| Control System                              | RT100 Control System                 |                           |
| Measurement type (standard)                 | Pt100                                |                           |
| Control voltage                             | 230 V, 50/60 Hz                      |                           |
| Input supply voltages                       | 380-415 V, 50 Hz<br>440-480 V, 60 Hz |                           |
| Total power                                 | (see specification plate)            |                           |
| Outlet/inlet connections (standard)         | G 1" / 60° cone                      |                           |
| Cooling water supply connections (standard) | G 1/2"                               |                           |
| Pressure release connection                 | G 3/8"                               |                           |
| Degree of protection                        | IP54                                 |                           |
| Dimensions W/H/D                            | 350/967/1366 mm                      |                           |
| Weight                                      | approx. 170 kg                       |                           |
| Colour                                      | RAL 9006/7016                        |                           |
| Ambient temperature                         | max. 40°C                            |                           |
| Continuous sound pressure level             | < 70 dB(A)                           |                           |

## Technical Data P160L/P180L

| Temperature Control Unit Type               | P160L                                | P180L                       |
|---------------------------------------------|--------------------------------------|-----------------------------|
| Max. outlet temperature                     | 160 °C                               | 180 °C                      |
| Heat transfer medium                        | Water                                |                             |
| Filling capacity                            | 12.0 l                               |                             |
| Heating capacity                            | 17 kW/34 kW/51 kW                    |                             |
| Heating switch                              | SSR-Relay                            |                             |
| Cooling capacity                            | 101 kW (SK)<br>112 kW (2SK)          | 116 kW (SK)<br>129 kW (2SK) |
| at outlet temperature                       | 150 °C                               | 170 °C                      |
| at cooling water temperature                | 20 °C                                |                             |
| Pump type                                   | CRI5H                                | CRI5H                       |
| Motor power (pump)                          | 1.1 kW                               |                             |
| Max. delivery rate                          | 140 l/min                            |                             |
| Max. delivery pressure                      | 5.4 bar                              |                             |
| System pressure                             | 10 bar                               | 16 bar                      |
| Outlet pressure                             | max. 16 bar                          | max. 20 bar                 |
| Control System                              | RT100 Control System                 |                             |
| Measurement type (standard)                 | Pt100                                |                             |
| Control voltage                             | 230 V, 50/60 Hz                      |                             |
| Input supply voltages                       | 380-415 V, 50 Hz<br>440-480 V, 60 Hz |                             |
| Total power                                 | (see specification plate)            |                             |
| Outlet/inlet connections (standard)         | G 1" / 60° cone                      |                             |
| Cooling water supply connections (standard) | G 1/2"                               |                             |
| Pressure release connection                 | G 3/8"                               |                             |
| Degree of protection                        | IP54                                 |                             |
| Dimensions W/H/D                            | 350/967/1366 mm                      |                             |
| Weight                                      | approx. 170 kg                       |                             |
| Colour                                      | RAL 9006/7016                        |                             |
| Ambient temperature                         | max. 40°C                            |                             |
| Continuous sound pressure level             | < 70 dB(A)                           |                             |

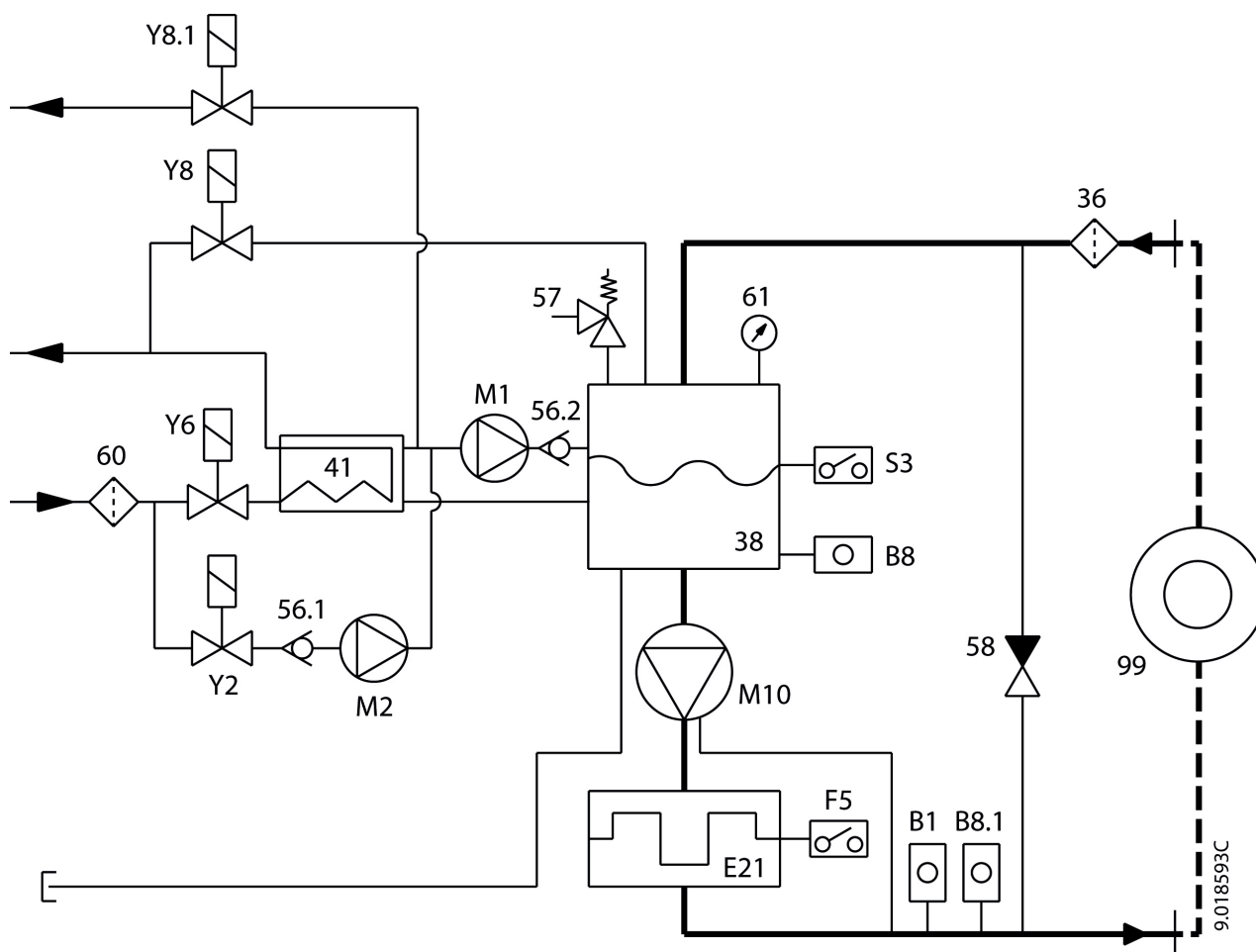
## Basic circuit diagram P100L (DK)



Basic circuit diagram P100L (DK)

| Pos. | Designation            | Pos. | Designation                                  |
|------|------------------------|------|----------------------------------------------|
| 36   | Main circuit filter    | B1   | Temperature probe (internal)                 |
| 38   | Tank                   | B8   | Pressure sensor (system pressure)            |
| 56.1 | One way check-valve    | B8.1 | Pressure sensor (outlet pressure)            |
| 57   | Safety valve           | E21  | Heating                                      |
| 58   | Bypass                 | F5   | Safety thermostat                            |
| 60   | Cooling circuit filter | M10  | Pump                                         |
| 61   | Pressure gauge         | S3   | Level control                                |
| 99   | Consumer               | Y2   | Solenoid valve (automatic water refill)      |
|      |                        | Y8   | Solenoid valve (pressure release)            |
|      |                        | Y8.1 | Solenoid valve (additional pressure release) |

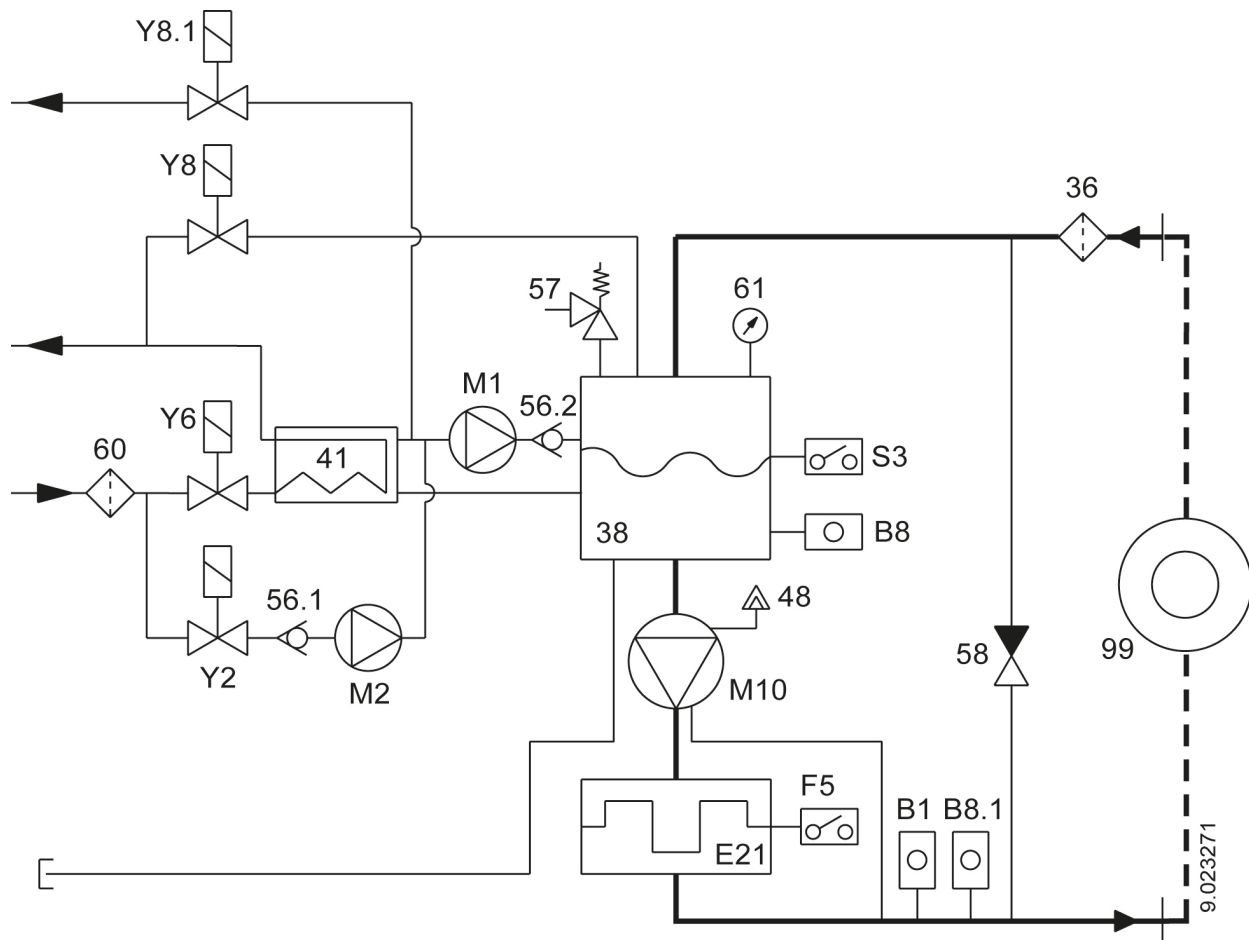
## Basic circuit diagram P140L



Basic circuit diagram P140L

| Pos. | Designation                        | Pos. | Designation                                  |
|------|------------------------------------|------|----------------------------------------------|
| 36   | Main circuit filter                | B8.1 | Pressure sensor (outlet pressure)            |
| 38   | Tank                               | E21  | Heating                                      |
| 41   | Cooler                             | F5   | Safety thermostat                            |
| 56.1 | One way check-valve (water refill) | M1   | Cooling pump (SK cooler)                     |
| 56.2 | One way check-valve (SK cooler)    | M2   | Boost pump                                   |
| 57   | Safety valve                       | M10  | Pump                                         |
| 58   | Bypass                             | S3   | Level control                                |
| 60   | Cooling circuit filter             | Y2   | Solenoid valve (automatic water refill)      |
| 61   | Pressure gauge                     | Y6   | Solenoid valve (cooling)                     |
| 99   | Consumer                           | Y8   | Solenoid valve (pressure release)            |
| B1   | Temperature probe (internal)       | Y8.1 | Solenoid valve (additional pressure release) |
| B8   | Pressure sensor (system pressure)  |      |                                              |

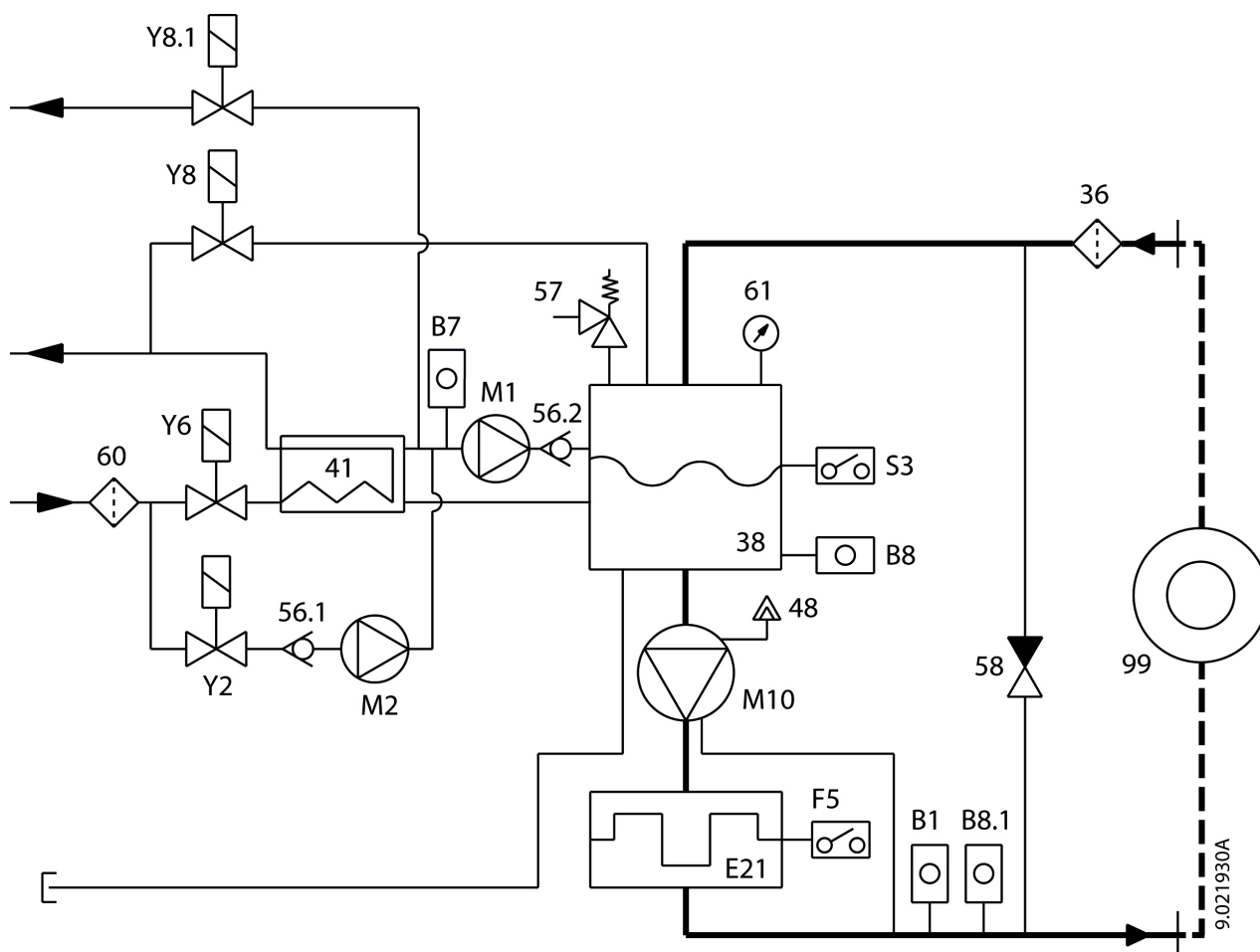
## Basic circuit diagram P160L



Basic circuit diagram P160L

| Pos. | Designation                        | Pos. | Designation                                  |
|------|------------------------------------|------|----------------------------------------------|
| 36   | Main circuit filter                | B8   | Pressure sensor (system pressure)            |
| 38   | Tank                               | B8.1 | Pressure sensor (outlet pressure)            |
| 41   | Cooler                             | E21  | Heating                                      |
| 48   | Air relief valve                   | F5   | Safety thermostat                            |
| 56.1 | One way check-valve (water refill) | M1   | Cooling pump (SK cooler)                     |
| 56.2 | One way check-valve (SK cooler)    | M2   | Boost pump                                   |
| 57   | Safety valve                       | M10  | Pump                                         |
| 58   | Bypass                             | S3   | Level control                                |
| 60   | Cooling circuit filter             | Y2   | Solenoid valve (automatic water refill)      |
| 61   | Pressure gauge                     | Y6   | Solenoid valve (cooling)                     |
| 99   | Consumer                           | Y8   | Solenoid valve (pressure release)            |
| B1   | Temperature probe (internal)       | Y8.1 | Solenoid valve (additional pressure release) |

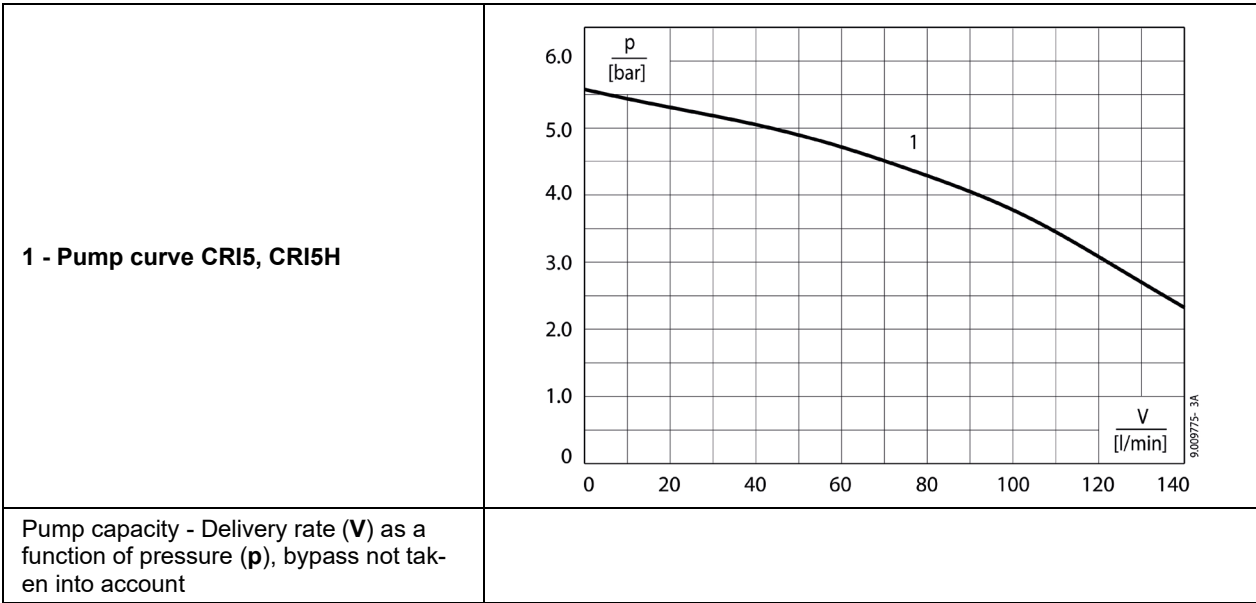
## Basic circuit diagram P180L



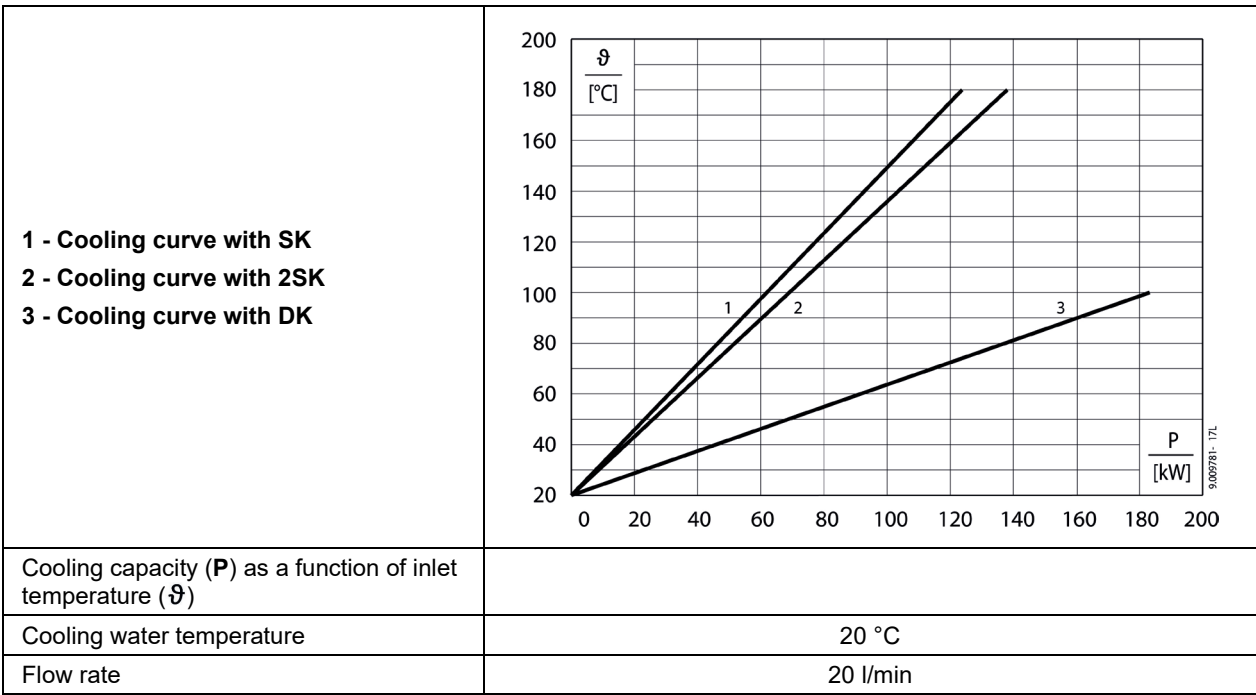
Basic circuit diagram P180L

| Pos. | Designation                        | Pos. | Designation                                  |
|------|------------------------------------|------|----------------------------------------------|
| 36   | Main circuit filter                | B8   | Pressure sensor (system pressure)            |
| 38   | Tank                               | B8.1 | Pressure sensor (outlet pressure)            |
| 41   | Cooler                             | E21  | Heating                                      |
| 48   | Air relief valve                   | F5   | Safety thermostat                            |
| 56.1 | One way check-valve (water refill) | M1   | Cooling pump (SK cooler)                     |
| 56.2 | One way check-valve (SK cooler)    | M2   | Boost pump                                   |
| 57   | Safety valve                       | M10  | Pump                                         |
| 58   | Bypass                             | S3   | Level control                                |
| 60   | Cooling circuit filter             | Y2   | Solenoid valve (automatic water refill)      |
| 61   | Pressure gauge                     | Y6   | Solenoid valve (cooling)                     |
| 99   | Consumer                           | Y8   | Solenoid valve (pressure release)            |
| B1   | Temperature probe (internal)       | Y8.1 | Solenoid valve (additional pressure release) |
| B7   | Temperature probe (SK)             |      |                                              |

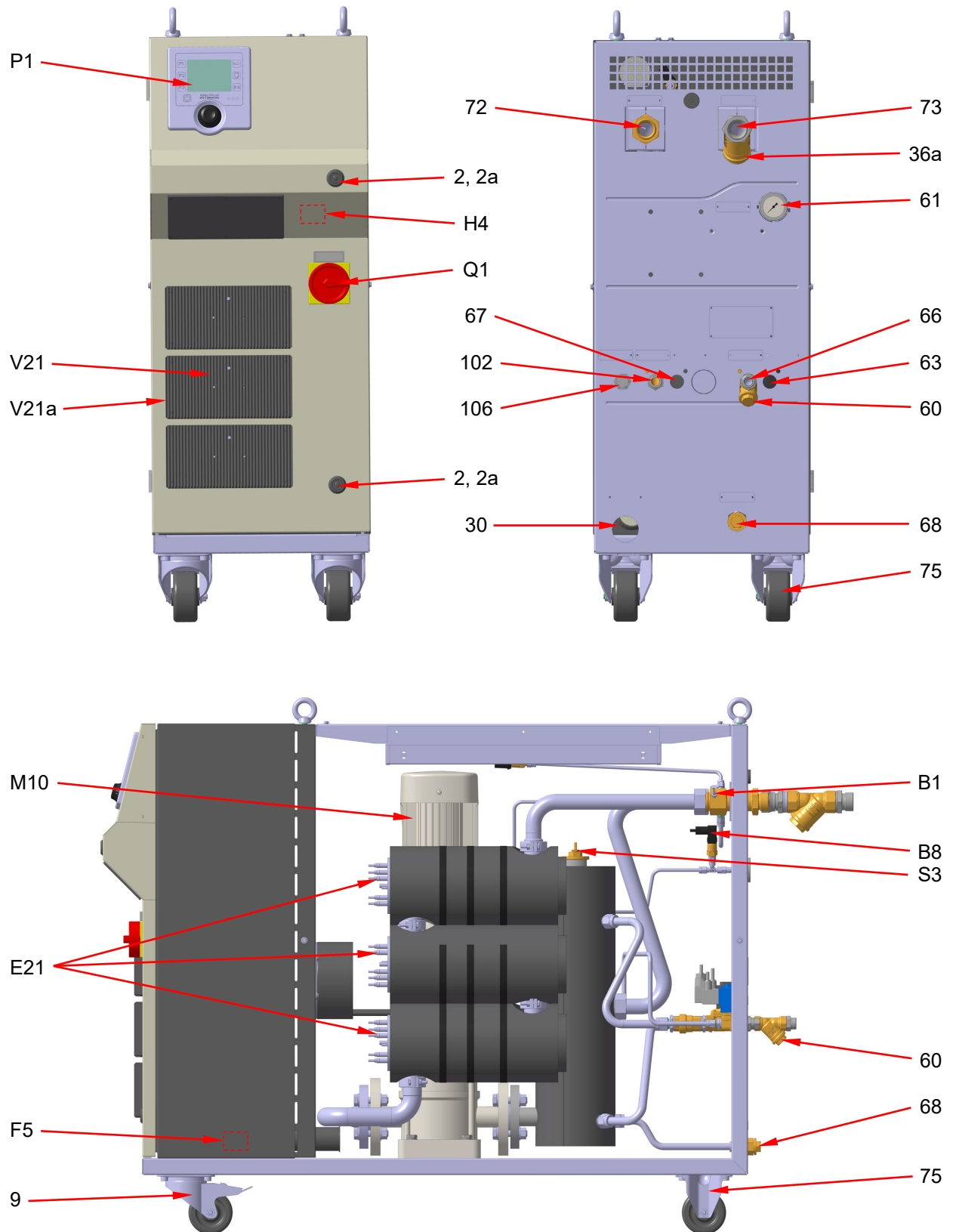
# Diagram (Pump capacity)

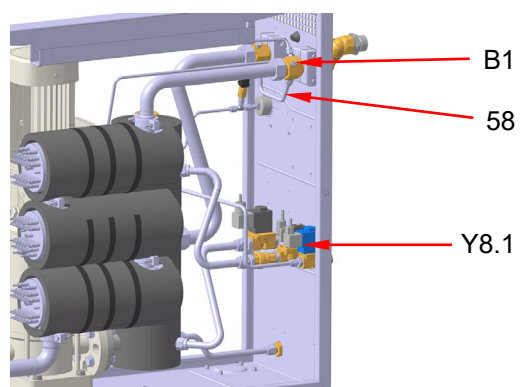
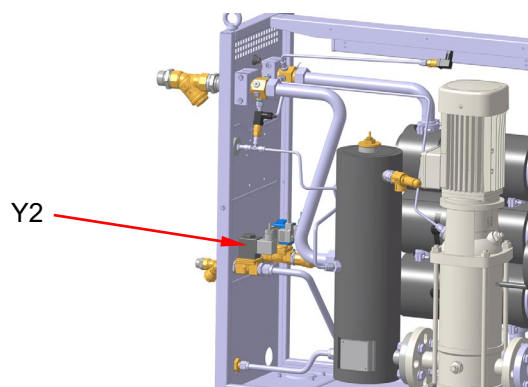
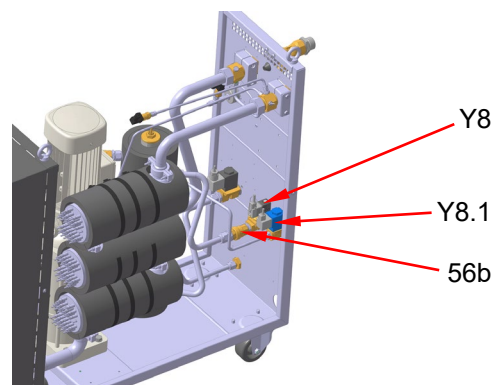
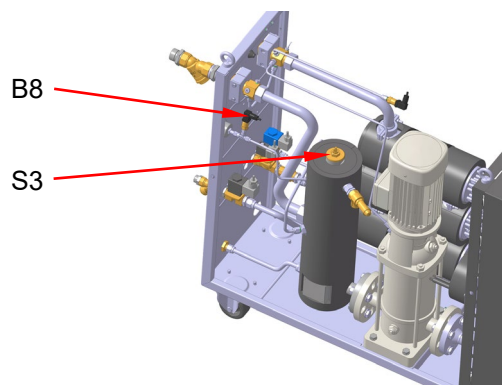
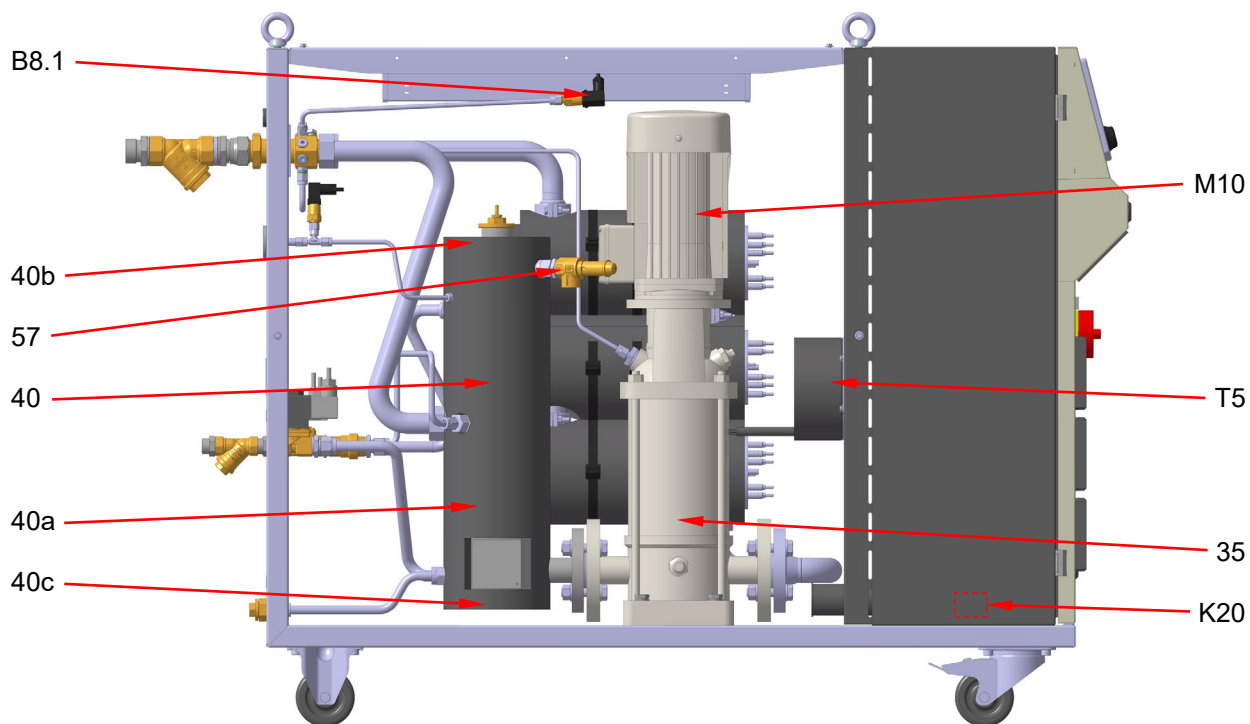


# Diagram (Cooling capacity)

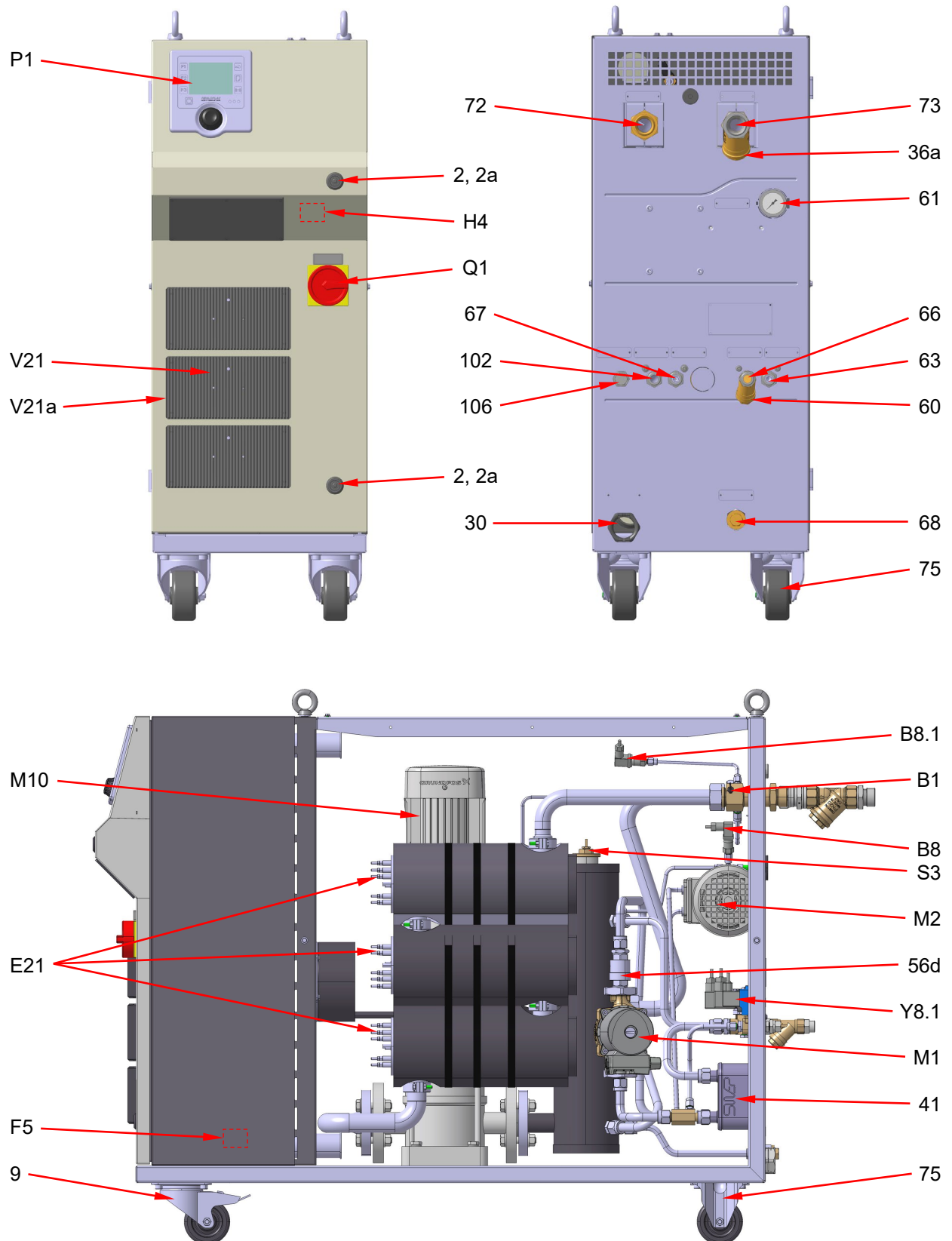


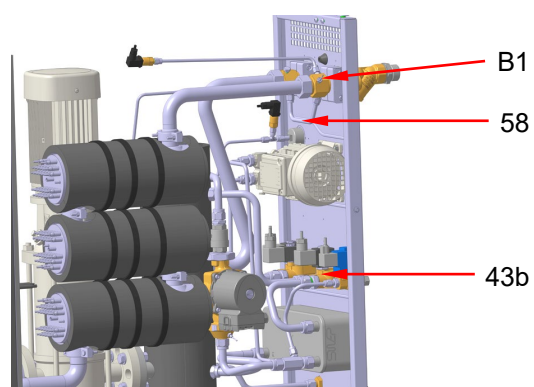
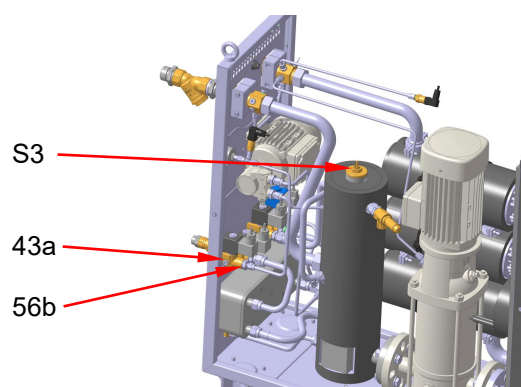
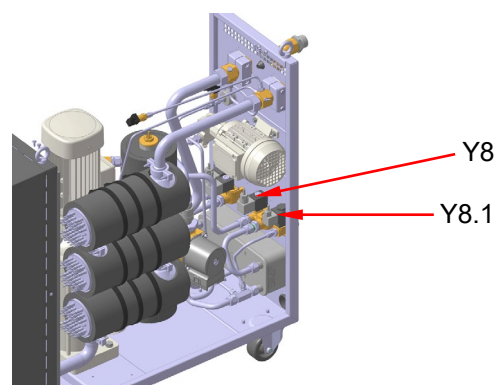
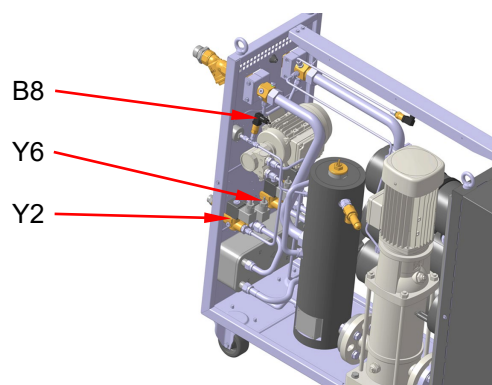
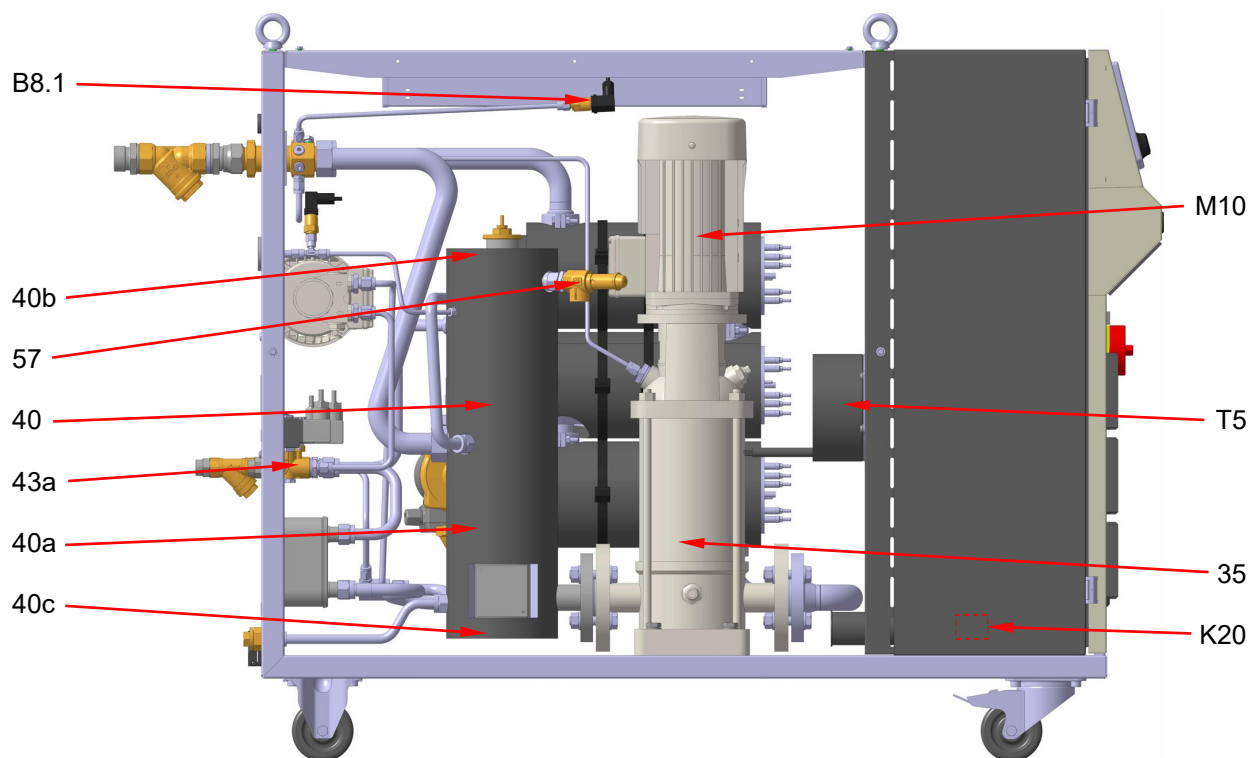
## Components/Spare parts P100L (DK)



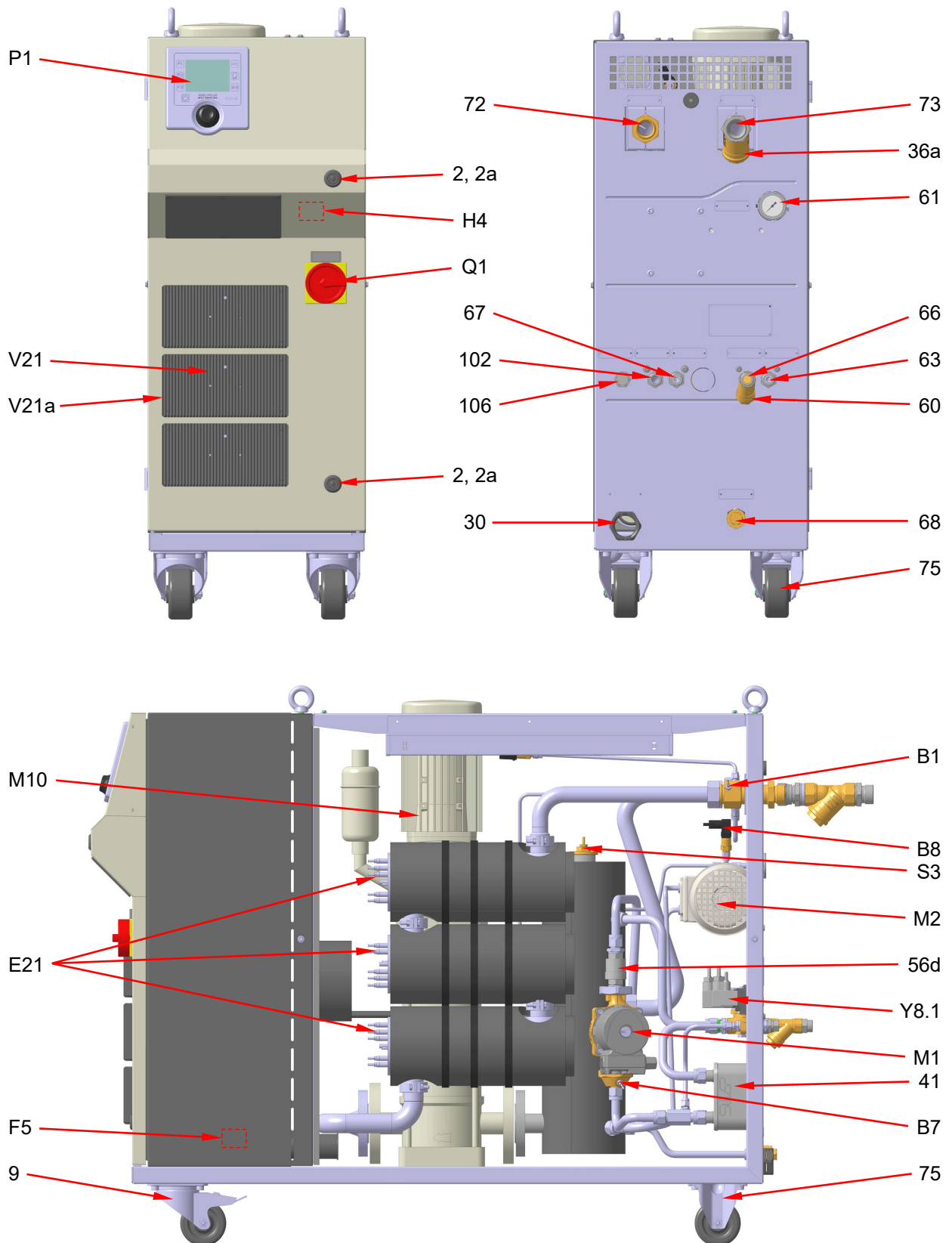


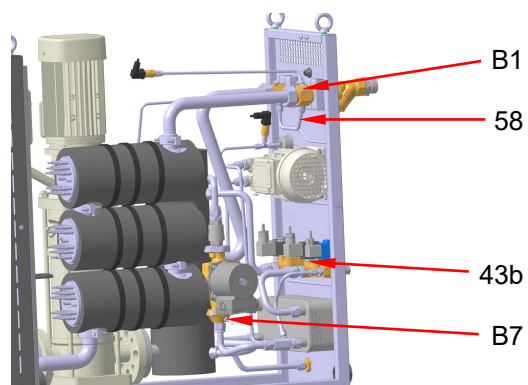
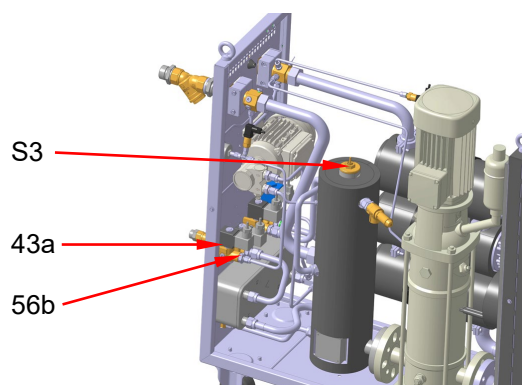
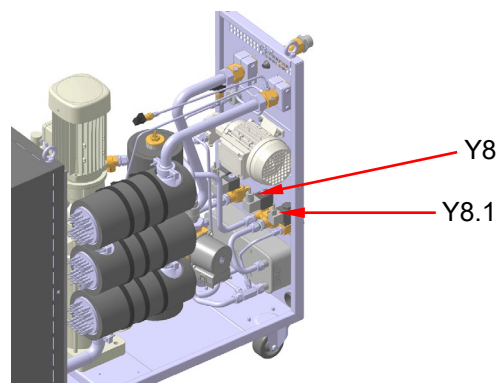
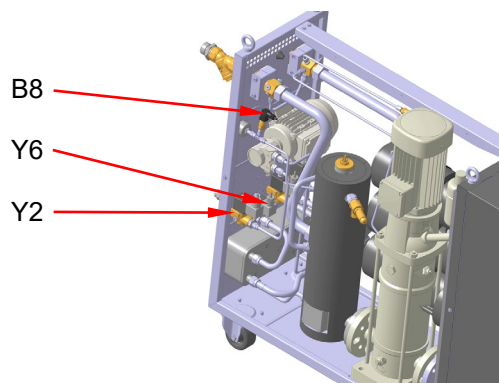
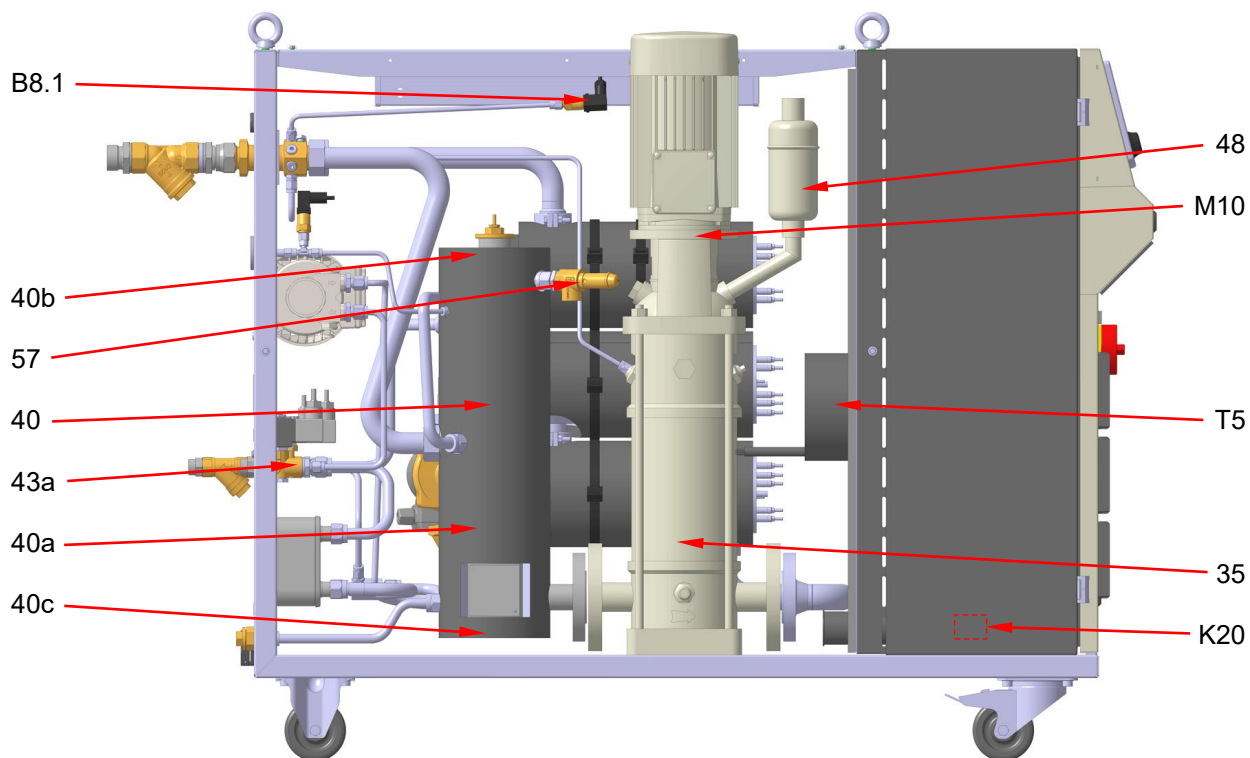
## Components/Spare parts P140L





## Components/Spare parts P160L/P180L





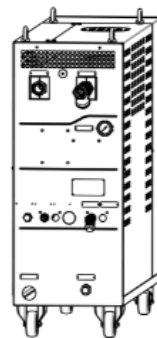
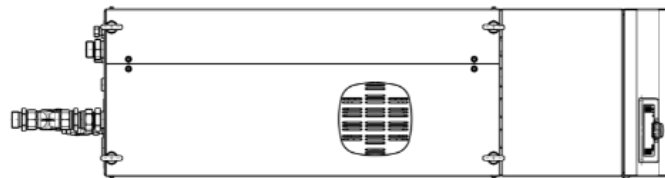
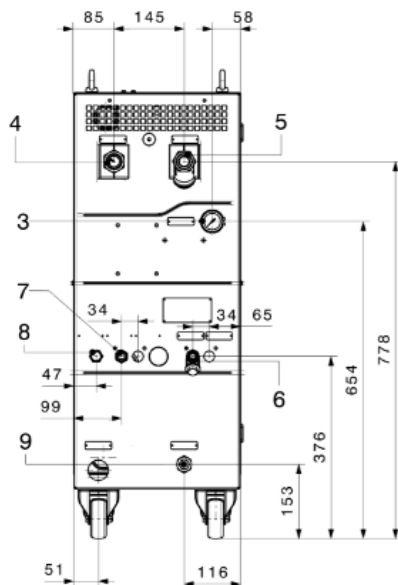
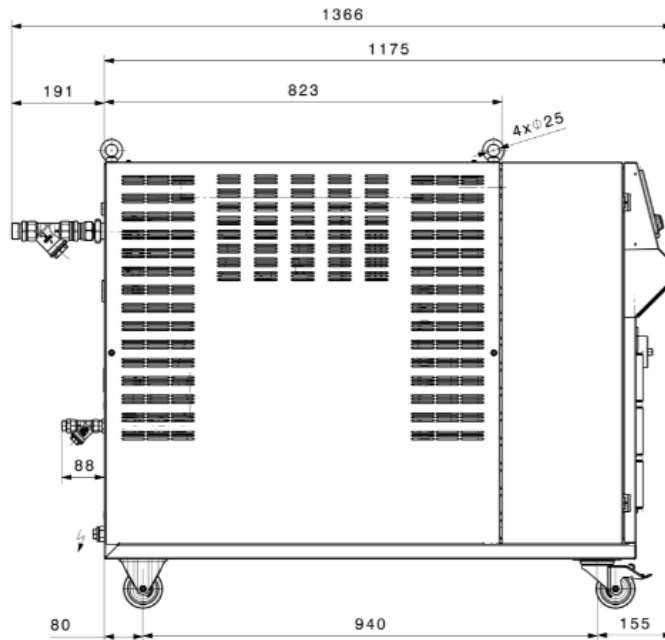
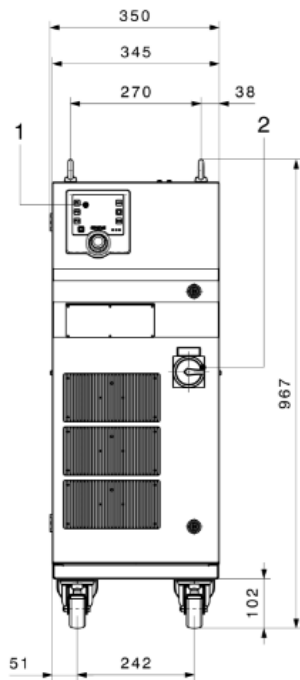
| Item | Designation                                   | Item | Designation                                  |
|------|-----------------------------------------------|------|----------------------------------------------|
| 2    | Lock                                          | B1   | Temperature probe (internal)                 |
| 2a   | Locking tongue                                | B7   | Temperature probe (SK)                       |
| 9    | Castor with wheel lock                        | B8   | Outlet pressure sensor                       |
| 30   | Power cable                                   | B8.1 | System pressure sensor                       |
| 35   | Pump                                          | B14  | Inlet temperature probe (option)             |
| 36a  | Inlet filter sieve                            | H4   | Additional horn (option)                     |
| 40   | System with heating                           | E21  | Heating                                      |
| 40a  | Insulation (system)                           | F5   | Safety thermostat                            |
| 40b  | Insulation (cover)                            | K20  | Main contactor - heating                     |
| 40c  | Insulation (base)                             | M1   | Cooling pump                                 |
| 41   | Cooler                                        | M2   | Boost pump                                   |
| 43a  | Valve block Y2/Y6 (see corresponding chapter) | M10  | Pump motor                                   |
| 43b  | Valve block Y8 (see corresponding chapter)    | P1   | Control system                               |
| 48   | Air relief valve                              | Q1   | Main switch                                  |
| 56b  | One way check-valve (water refill)            | S3   | Level switch (see corresponding chapter)     |
| 56d  | One way check-valve (SK cooling)              | T5   | Control transformer                          |
| 57   | Safety valve (see corresponding chapter)      | V21  | SSR relay with heat sink                     |
| 58   | Bypass                                        | V21a | Seal for SSR relay                           |
| 60   | Cooling water filter                          | Y2   | Solenoid valve (automatic water refill)      |
| 61   | System pressure gauge                         | Y6   | Solenoid valve (cooling)                     |
| 63   | System water IN (option)                      | Y8   | Solenoid valve (pressure release)            |
| 66   | Cooling water IN                              | Y8.1 | Solenoid valve (additional pressure release) |
| 67   | Cooling water OUT                             |      |                                              |
| 68   | Drain plug                                    |      |                                              |
| 72   | Outlet                                        |      |                                              |
| 73   | Inlet                                         |      |                                              |
| 75   | Castor                                        |      |                                              |
| 102  | System water OUT (option)                     |      |                                              |
| 106  | Additional pressure release                   |      |                                              |

**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!

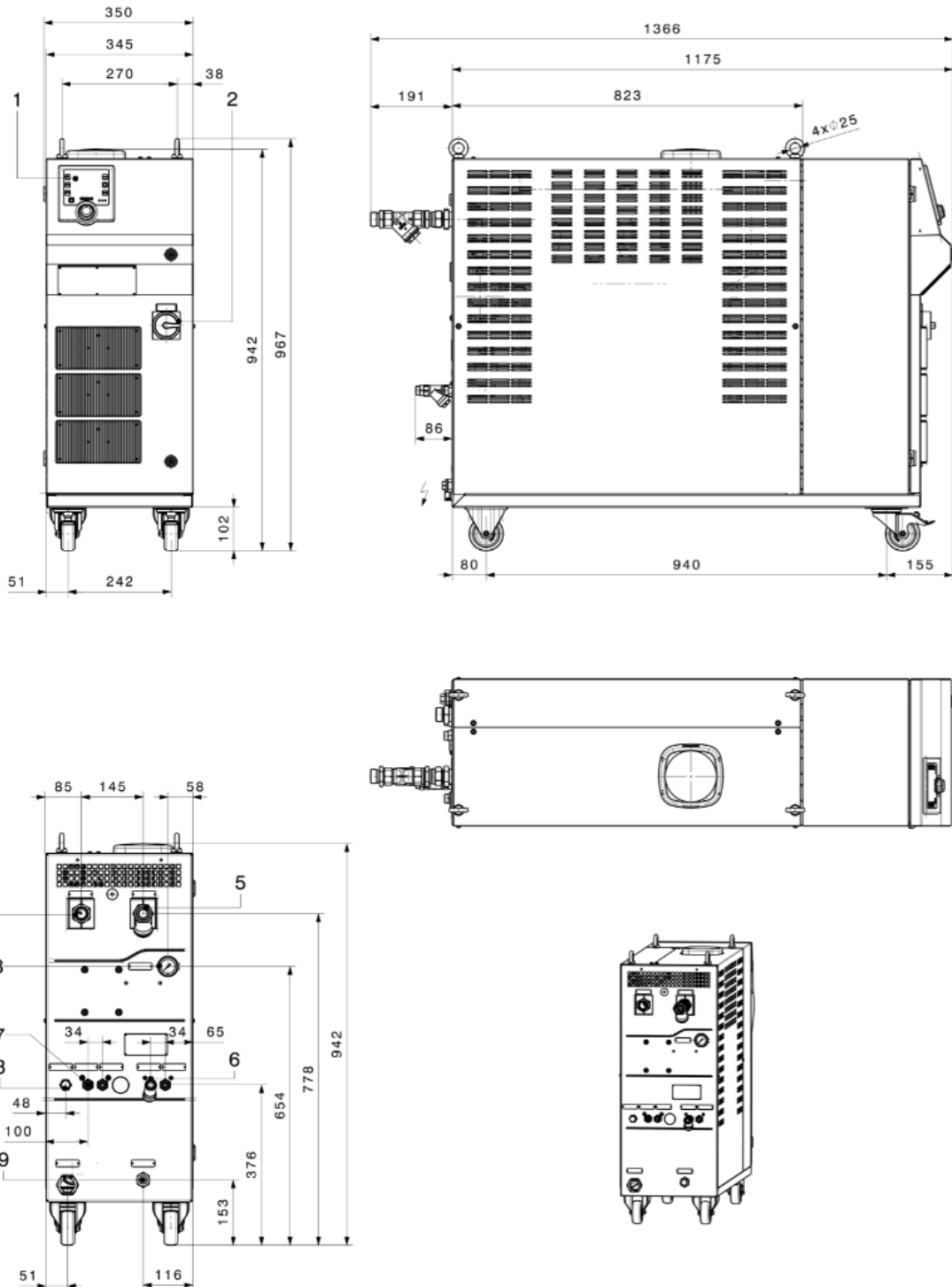
**NOTE****See electrical wiring diagram of the temperature control unit for additional electrical components!**

## Dimension sheet P100L/P140L



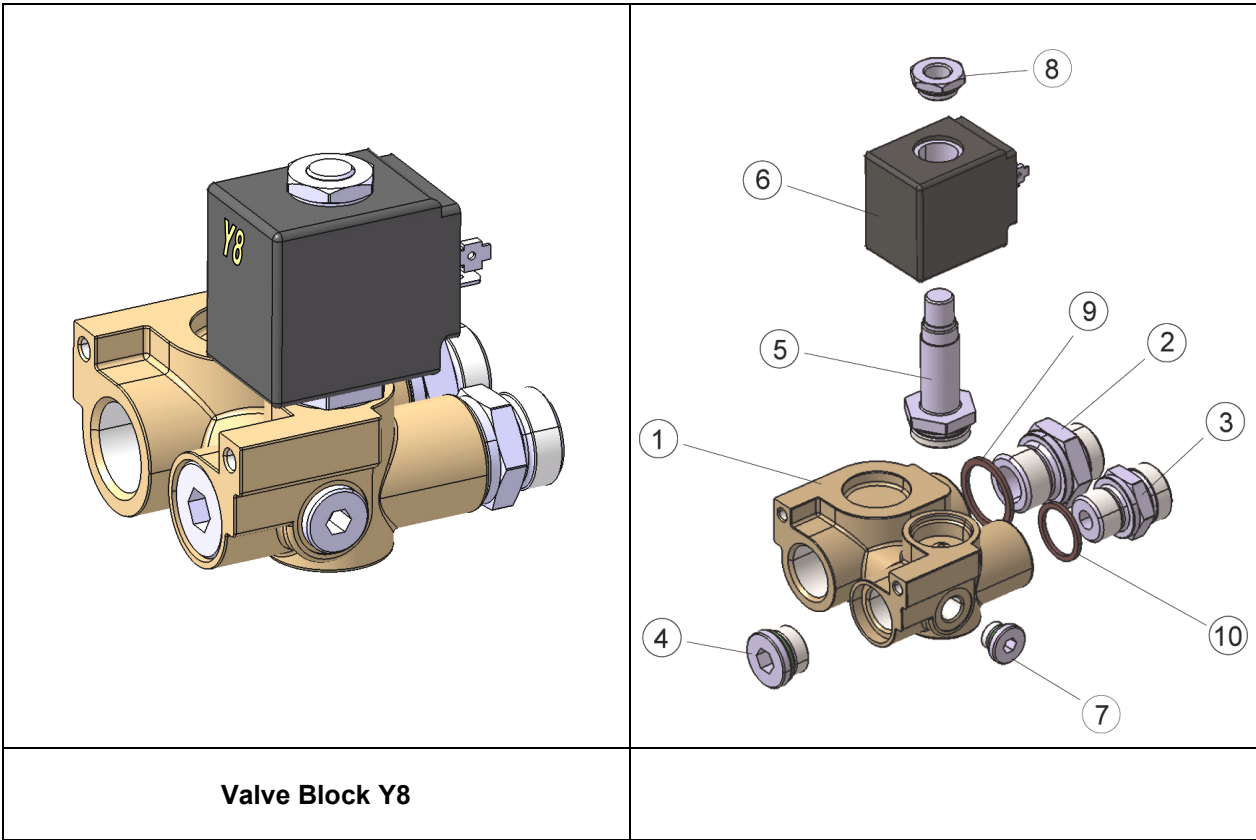
| Item | Designation          | Item | Designation       |
|------|----------------------|------|-------------------|
| 1    | RT100 Control System | 6    | Cooling water IN  |
| 2    | Main switch          | 7    | Cooling water OUT |
| 3    | Pressure gauge       | 8    | Pressure release  |
| 4    | Outlet               | 9    | Drain plug        |
| 5    | Inlet                |      |                   |

## Dimension sheet P160L/P180L



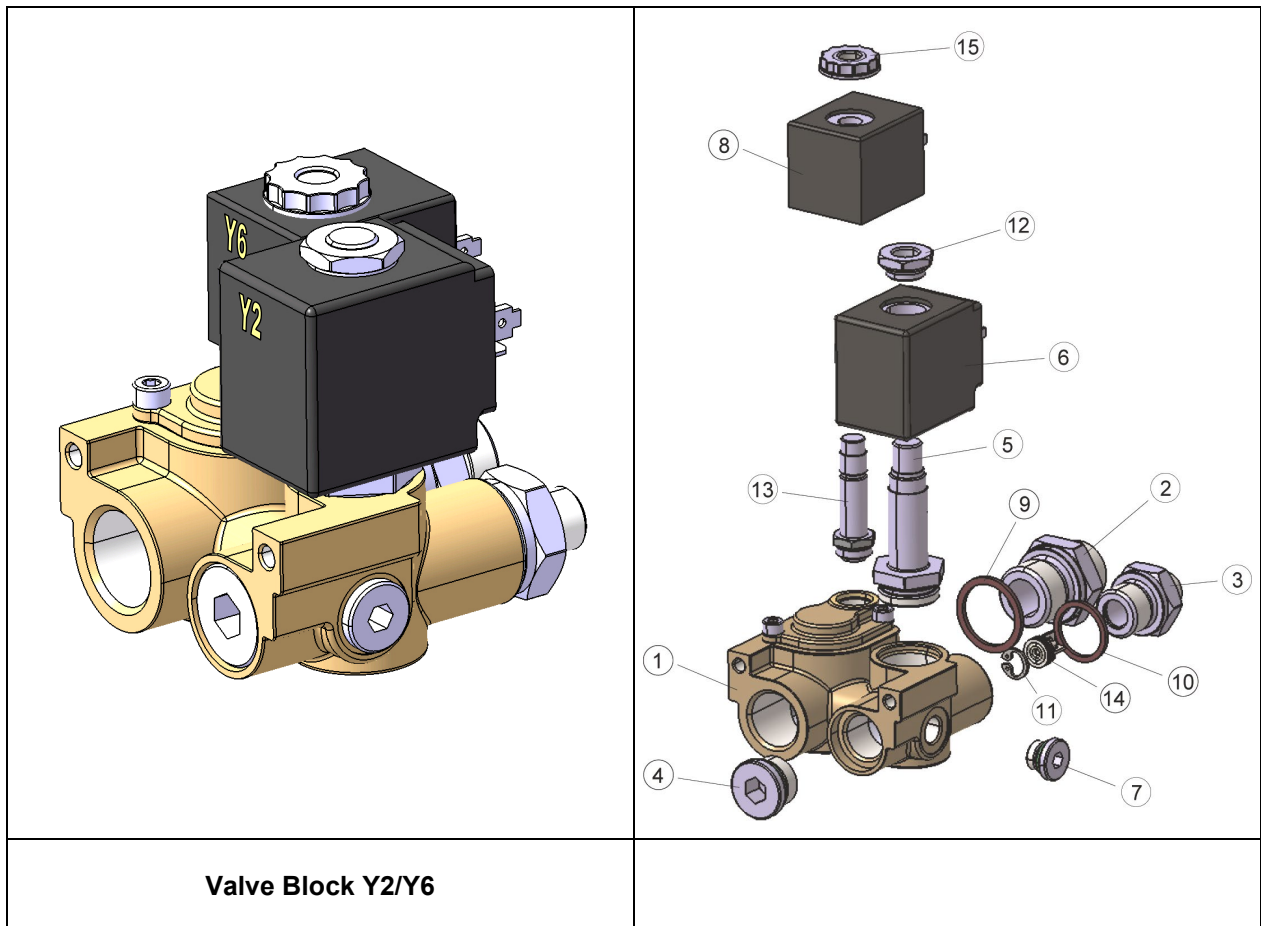
| Item | Designation          | Item | Designation       |
|------|----------------------|------|-------------------|
| 1    | RT100 Control System | 6    | Cooling water IN  |
| 2    | Main switch          | 7    | Cooling water OUT |
| 3    | Pressure gauge       | 8    | Pressure release  |
| 4    | Outlet               | 9    | Drain plug        |
| 5    | Inlet                |      |                   |

# Valve Block Y8



| Item | Designation                  | Item | Designation                  |
|------|------------------------------|------|------------------------------|
| 1    | Valve block                  | 6    | Coil Y8                      |
| 2    | Double nipple G 1/2"-M20x1.5 | 7    | Plug M5 with O-ring          |
| 3    | Double nipple G 3/8"-M20x1.5 | 8    | Nut                          |
| 4    | Plug 1/8" with O-ring        | 9    | Sealing washer (copper) 1/2" |
| 5    | Control member Y8            | 10   | Sealing washer (copper) 3/8" |

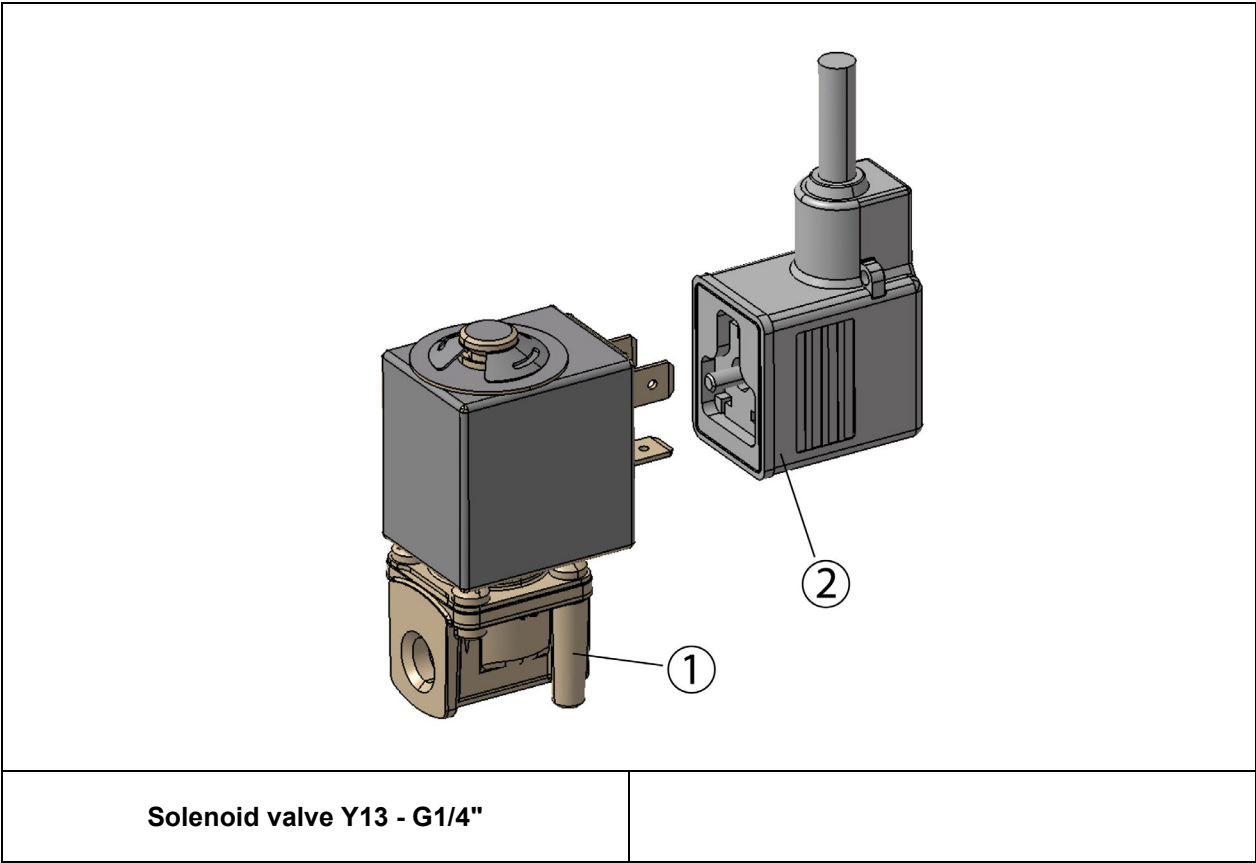
## Valve Block Y2/Y6



| Item | Designation                  | Item | Designation                  |
|------|------------------------------|------|------------------------------|
| 1    | Valve block                  | 9    | Sealing washer (copper) 1/2" |
| 2    | Double nipple G 1/2"-M20x1.5 | 10   | Sealing washer (copper) 3/8" |
| 3    | Double nipple G 3/8"-M12x1   | 11   | Snap ring                    |
| 4    | Plug 1/8" with O-ring        | 12   | Nut                          |
| 5    | Control member Y2            | 13   | Control member Y6            |
| 6    | Coil Y2                      | 14   | Check valve                  |
| 7    | Plug M5 with O-ring          | 15   | Nut                          |
| 8    | Coil Y6                      |      |                              |

Solenoid valve Y13 (Suction option)

Overview



| Item | Designation                     | Item | Designation     |
|------|---------------------------------|------|-----------------|
| 1    | Solenoid valve compl. with coil | 2    | Connecting plug |

## Level Switch

### Dismantling/Replacement

When replacing the level switch, the marking must be on top as pictured, otherwise the level control will not function properly!

