
Operating Instructions

Temperature Control Unit P140S/P160S/P180S



SWISS MADE



Documentation Temperature Control Unit P140S/P160S/P180S

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General Safety Information

Safety Symbols

 DANGER	
	Denotes imminent danger. Failure to heed the information can result in death or grave personal injury (disability)!
 WARNING	
	Denotes a dangerous situation. Failure to heed the information can result in death or grave personal injury (disability)!
 CAUTION	
	Denotes a potentially dangerous situation. Failure to heed the information can result in property damage as well as minor or moderate personal injury!
NOTE	
	Denotes general information, useful advice to users and work recommendations, which, however, do not have any influence on the safety and health of personnel.

Range of Application

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

Intended Use

The Regloplas temperature control unit is built according to the current state of the art and the generally accepted principles of safety engineering. The temperature control unit is intended solely for the normal use for heating and/or cooling of injection and die casting moulds, extruders, calendars, mixers and other consumers in areas in which 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.

Use as intended 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 this device can pose danger to life and limb if it is used incorrectly or for a purpose other than that intended. It should be noted that this poses 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 turning 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 by other manufacturers, their notices and safety regulations must also be obeyed.

Process Monitoring

In plants in which a temperature control system malfunction leads to endangerment of the operating personnel or destruction of the plant, an independent process monitor that shuts down the plant reliably 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, particularly the chapter on safety, 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 having to do with set-up, start-up, operating, modification of operating conditions and operational modes, maintenance, inspection and repair, any shut-down procedures stated to be necessary in the operating instructions must be followed.

Changing the Parameterisation

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.

 DANGER	
	The temperature control unit must be rendered currentless before it is opened (unplug mains plug and, if present, press the main switch on the temperature control unit). Danger due to electrical shock!

Repair leaks in the temperature control circuit (device, connecting lines, consumers, etc.) immediately.

In temperature control units that use oil as a heat transfer medium, it should be noted that oil is flammable under certain conditions. For this reason, the temperature control unit must not be located in the vicinity of 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 a spray foam fire extinguisher, a powder fire extinguisher (avoid with dust-sensitive plants, control systems, EDP, etc.) or a CO₂ 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 in the temperature control circuit and depending on the outlet temperature, allow the temperature control unit to cool down first and then turn 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 P140S/P160S/P180S 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 medium of the P140S/P160S/P180S temperature control unit are shown in the following table (in this regard, see also the chapter "Technical Data" in the service section).

Temperature Control Unit Type	P140S	P160S	P180S
Temperature range	up to 140 °C	up to 160 °C	up to 180 °C
Heat transfer medium	Water	Water	Water
System pressure	10 bar	10 bar	14 bar

NOTE



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

Start-up

Setting up the Temperature Control Unit

The temperature control unit is designed for an ambient temperature 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 it
- Position the temperature control unit on a horizontal surface and engage the wheel brake



WARNING



The temperature control unit may be pressurised - danger of injury in the event of escaping hot water or steam!

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!

Repair leaks in the temperature control circuit (temperature control unit, connecting lines, consumers, etc.) immediately!

Observe local laws during set-up!



CAUTION



Before detaching connecting lines in the temperature control circuit and depending on the outlet temperature, the temperature control unit must be allowed to cool down first! The deactivation 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 run-on temperature (factory default 60 °C). Then the pump and the control system are turned off!

Verify that the pump is no longer running and the system pressure gauge reads 0 bar (display 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 who carry out 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 lime deposits must be removed because they greatly interfere with the heat exchange between consumer and heat transfer medium and increase the pressure drop in the consumer. Descaling can be carried out using the Regloplas REG descaling unit (see the "Regloplas Temperature Control Technology" brochure, REG data sheet)

Water Quality

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

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

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

Connecting Lines

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

- Outlet and inlet - dimensioning for 140 °C (16 bar), 160 °C (16 bar) and 180 °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 water circuit separator). The water mains pressure must be within the range of 2-6 bar
- Cooling water outlet - dimensioning for 160 °C (10 bar), must be hammer-free and 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 must always be connected!



CAUTION



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

Electrical Connections

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 power consumption in accordance with 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 is 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

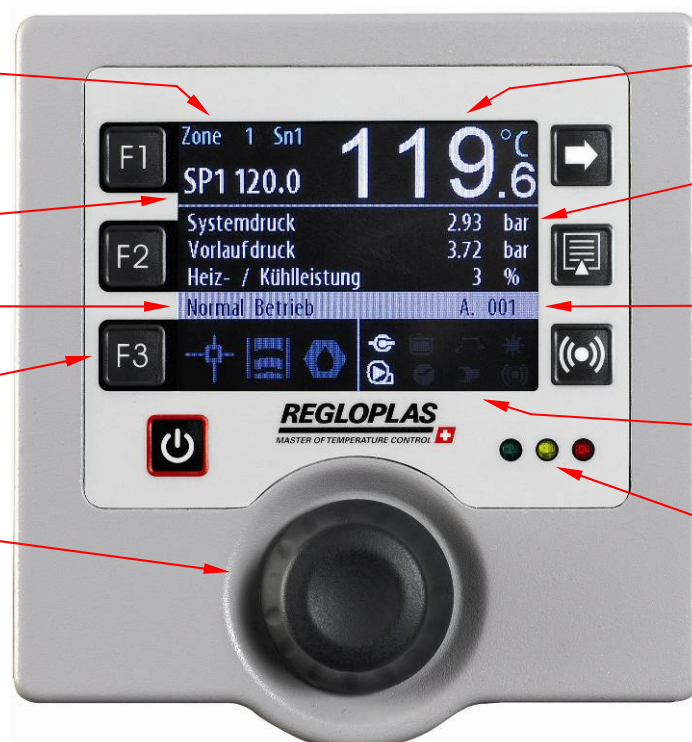
Display of zone and temperature probe
Sn1/Sn2/Sn3

Display of set-point value SP1/SP2 or external operation

Status display

Selection of the device functions

RCD control knob
(Regloplas Control Dial)



Display of actual value

Additional display

Interface address

Symbol area

Status LEDs

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 operation		Warning		Alarm
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Device Functions

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

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, counter clockwise 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 button **ON/OFF**, 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 = External Temperature

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.



Toggling of the set-point values **SP1** and **SP2** is achieved with the **F3** key and selection 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

Powering Up



Upon switching on the main switch, **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.

Draining

The consumer device can be drained with the delivery pump (suction) or with 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 when the pump run-down time elapses, switched on again in the opposite direction. The consumer is drained through suction during the defined period (draining time).

Draining is only possible if the temperature of the heat transfer medium is below the programmed run-on 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 programme makes it possible to drain the consumer connected to the temperature control unit with 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 programme can be cancelled by pressing the **ON/OFF** button. When the **ON/OFF** button is pressed again (wait until the display reads **OFF**), the unit switches back to normal operation.



NOTE



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

Operation with Code/Password

In order to prevent the values that have been set or programmed from being set again unintentionally, 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:

- Operator password - Default **0000** (switched off)
- Technician password - Default **0100**
- Service password - only for personnel trained by Regloplas

NOTE



It is earnestly recommended that an operator password should be set up when commissioning the temperature control device.

Operation with Timer

The RT100 control system has an integrated real-time clock. If the option **Timer** is present, 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 rectified, the alarm can be reset by once again pressing the **Alarm Reset** button.

The **Alarm Reset** button also allows the manual acknowledgement of the automatic toggling from control of the consumer temperature **Sn2** to control of the outlet temperature **Sn1** in case of a faulty or removed sensor **Sn2** in 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 setting values or the 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 - Unlocking Options

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

The software options must be unlocked 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 power section by the barcode.

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

Power Down



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

Depending on the temperature of the heat transfer medium, the switching off programme runs as follows:

- The pump and the control system are turned off. The RT100 control system is in standby mode and the display is **OFF**.
- The pump continues to run. The device cools till the temperature of the heat transfer medium has reached the programmed run-on temperature. Then, the pump and the control system are turned off. In the case of devices using pressurised water, the pump runs for a few seconds in the opposite direction (pressure release). The RT100 control system is in standby mode and the display is **OFF**.

Changing Consumers/Decommissioning

Before detaching the connecting lines, it is necessary to verify that the temperature control unit is turned off and all circuits are pressure less (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 while not in use. Re-starting takes place in accordance with the chapter "Start-up".

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 deleted by once again pressing the **Alarm Reset** button.

The **Alarm Reset** button also allows the manual acknowledgement of the automatic toggling from control of the consumer temperature (or cascade control) **Sn2** to control of the outlet temperature **Sn1** in case of a faulty or removed sensor **Sn2** in the consumer.

Alarm List



Pressing the **Alarm Reset** button opens the alarm list as long as there is no alarm queued. The last ten alarm messages with date and time are displayed here.

Warnings

Error message	Rectification
Maintenance due	Carry out maintenance procedure according to the operating manual. Increment the parameter Next Maintenance by 2000 hours
Clean filter	Clean the corresponding filter or if required, replace it
Current data lost, load factory settings	The RT100 control system has lost the parameters and had to load the factory settings
Sensor outlet pressure faulty	Replace sensor outlet pressure
Malfunction heating contactor 1	The contactor Heating 1 does not get actuated correctly any more - replace
Malfunction heating contactor 2	The contactor Heating 2 does not get actuated correctly any more - replace
Invalid or faulty characteristic curve F1000	Switch the main switch off and on again. If the fault is still present, re-load characteristic curve F1000
Pump capacity too low	Check/inspect the pump or in the menu F1000 reduce the parameter pump tolerance (default 50%)
Deviation set-point value/outlet undershot	Adjust the outlet temperature and acknowledge the fault
Deviation set-point value/outlet exceeded	Adjust the outlet temperature and acknowledge the fault
Deviation set-point value/external undershot	Adjust the external temperature and acknowledge the fault or error
Deviation set-point value/external exceeded	Adjust the external temperature and acknowledge the

Error message	Rectification
	fault or error
Deviation set-point value/inlet undershot	Adjust the inlet temperature and acknowledge the fault
Deviation set-point value/inlet exceeded	Adjust the inlet temperature and acknowledge the fault
Deviation outlet/inlet undershot	Adjust the inlet temperature and acknowledge the fault
Deviation outlet/inlet exceeded	Adjust the inlet temperature and acknowledge the fault
Level 2 undershot	Refill heat transfer medium
Pressure equalisation not possible	Check water inflow pipe and water pressure (min. 2 bar)

Alarms

Error message	Rectification
Toggling of heat transfer medium - unit must be re-started	Device type was changed in the configuration (water/oil); unit must be turned off and then turned on again using the main switch
External set-point value signal interrupted or not present	External set-point value signal must be present (if required, check external control system)
Analogue option missing or faulty	Connect analogue option or switch it off in the parameter Hardware Options
Digital option missing or faulty	Connect digital option or switch it off in the parameter Hardware Options
Current monitoring option absent or faulty	Connect current monitoring option or switch it off in the parameter Hardware Options
Option Reversal of direction of rotation missing or faulty	Connect option Reversal of direction of rotation or switch it off in the parameter Hardware Options
AD converter faulty	Replace base module
Caution - control panel temperature too high	Place the temperature control unit in a place with low ambient temperature
Maximum running time filling pump is exceeded	Check the water inflow pipe and hose couplings to the consumer, rectify leaks if found
Flow monitor has been actuated	Check the outlet pressure (min. 0.7 bar must be present)
Safety thermostat has been actuated	Temperature control unit has become too hot - determine the cause and reset the thermostat
Current monitoring of heating has been actuated	Check heating elements and if required, replace them
Min. flow rate undershot	Check the minimum flow rate (the stated minimum flow rate must be present)
Deviation flow rate too high	Large variation in the flow (there may be a leak in the circuit)
Max. temperature exceeded	Max. temperature of the heat transfer medium may not exceed the maximum device temperature (if required, check the tool temperature)
Motor current undershot	Check the pump/pump motor (with Ohmmeter) and if required, replace them
Phase sequence wrong	Correct the phase sequence (interchange 2 phases)
Phase sequence not recognisable	Switch off phase sequence monitoring
Phase missing	Check the mains, input conductor and pump motor
Malfunction motor protection circuit breaker	Check motor protection circuit breaker and if required, replace it
Temperature sensor Sn1 faulty	Replace temperature sensor Sn1
Temperature sensor Sn2 faulty, switched to outlet control	Replace temperature sensor Sn2

Error message	Rectification
Temperature sensor Sn3 faulty	Replace temperature sensor Sn3
Sensor for system pressure inactive	Activate system pressure sensor
Sensor for system pressure faulty	Replace system pressure sensor
Level 1 undershot	Refill heat transfer medium
Motor current exceeded	Check the pump/pump motor (with Ohmmeter) and if required, replace them
Mains supply failure	Failure of the power supply or temperature control unit not switched off properly

System Errors

Error message	Rectification
Memory stick absent	Insert memory stick
Incompatible data on memory stick	Load current software version
Communications error	Check the connection between the front panel and the base module
Software version error	Re-load software
Data on memory stick corrupt	Insert new memory stick and re-load device parameters
Zone 1 not present	Connect Zone 1, check address of Zone 1
Zone 2 not present	Connect Zone 2, check address of Zone 2

Maintenance

 WARNING	
	Before all maintenance procedures, turn off the temperature control unit, press the main switch and unplug the mains plug! The temperature control unit may be pressurised - danger of injury in the event of escaping hot water or steam! Ensure that the pressure gauge indicates 0 bar! Before disconnecting the feed lines to the temperature control unit/consumer, first allow the temperature control unit to cool down!

Periodic Inspections and Maintenance Procedures

The 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 following information is 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 be replaced only when the mains plug is unplugged
- The safety valve should be vented by blowing off from time to time

 WARNING	
	When working with magnetic drive pumps, be aware of dangers from magnetic fields! People with pacemakers and/or implanted metal components must maintain sufficient distance from the unit and should not perform maintenance procedures on the pump! When pushing the magnetic drive together, hold the motor such that fingers cannot be trapped as a result of magnetic strength! Maintain the necessary distance from computers, data carriers, credit cards, electronic watches etc.!

Daily Inspections/Maintenance Procedures

- Check 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

- Inspection of the inlet port for the pump motor cooling for freedom from obstructions. Cleaning with compressed air from inside to outside
- Clean level switch
- Check filters and clean if necessary

Semi-annual Inspections/Maintenance Procedures

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

Annual Inspections/Maintenance Procedures

- Replacement of 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.), medium must be replaced correspondingly earlier

Cleaning

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

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

- 1) Draining of the temperature control unit through suction or blowing out
- 2) Clean filters in circuit
- 3) Inspect cooler for lime deposits and clean using REG descaling unit, if necessary
- 4) Level control - remove and clean level switch. Important - reinstall level switch properly (**NO** marking must be on top, see maintenance section)
- 5) Dismantle solenoid valves (see maintenance section), inspect membranes for lime deposits and damage. Check 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 advisable to also inspect the consumers for contamination. Contamination leads to a sharp reduction in heat exchange between consumer and heat transfer medium. Deposits increase the pressure drop in the consumer, so that, over time, the pump capacity of the temperature control unit is no longer sufficient to handle the necessary heating or cooling load

Repairs

 CAUTION	
	Allow the temperature control unit to cool down and, if necessary, drain it before any repair!
	Turn off the temperature control unit, press the main switch and unplug the mains plug!
	Disconnect all hose couplings from the temperature control unit!

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

- Device type
- Device number
- Voltage and frequency

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

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

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

Transport

 CAUTION	
	Allow the temperature control unit to cool down, turn it off, press the main switch and unplug the mains plug! 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 whether the cooler (Y6) solenoid valve is open

- 4) Blow out the cooler with compressed air (max. 6 bar)



- 5) Switch off the temperature control unit with the **ON/OFF** button, press the main switch and unplug the mains plug

- 6) Do not tip the temperature control unit - heat transfer medium remaining in the unit could spill out

- 7) Use the original packaging and mark the top side clearly

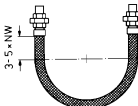
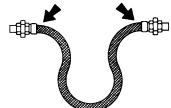
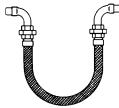
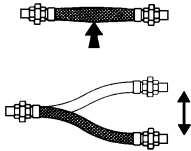
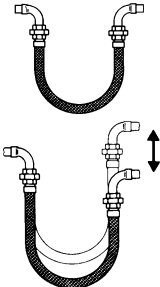
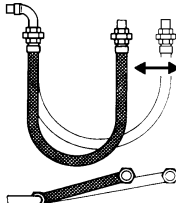
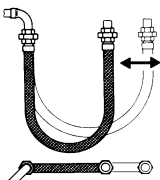
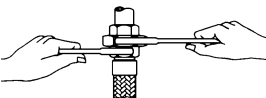
Disposal

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.

Maintenance

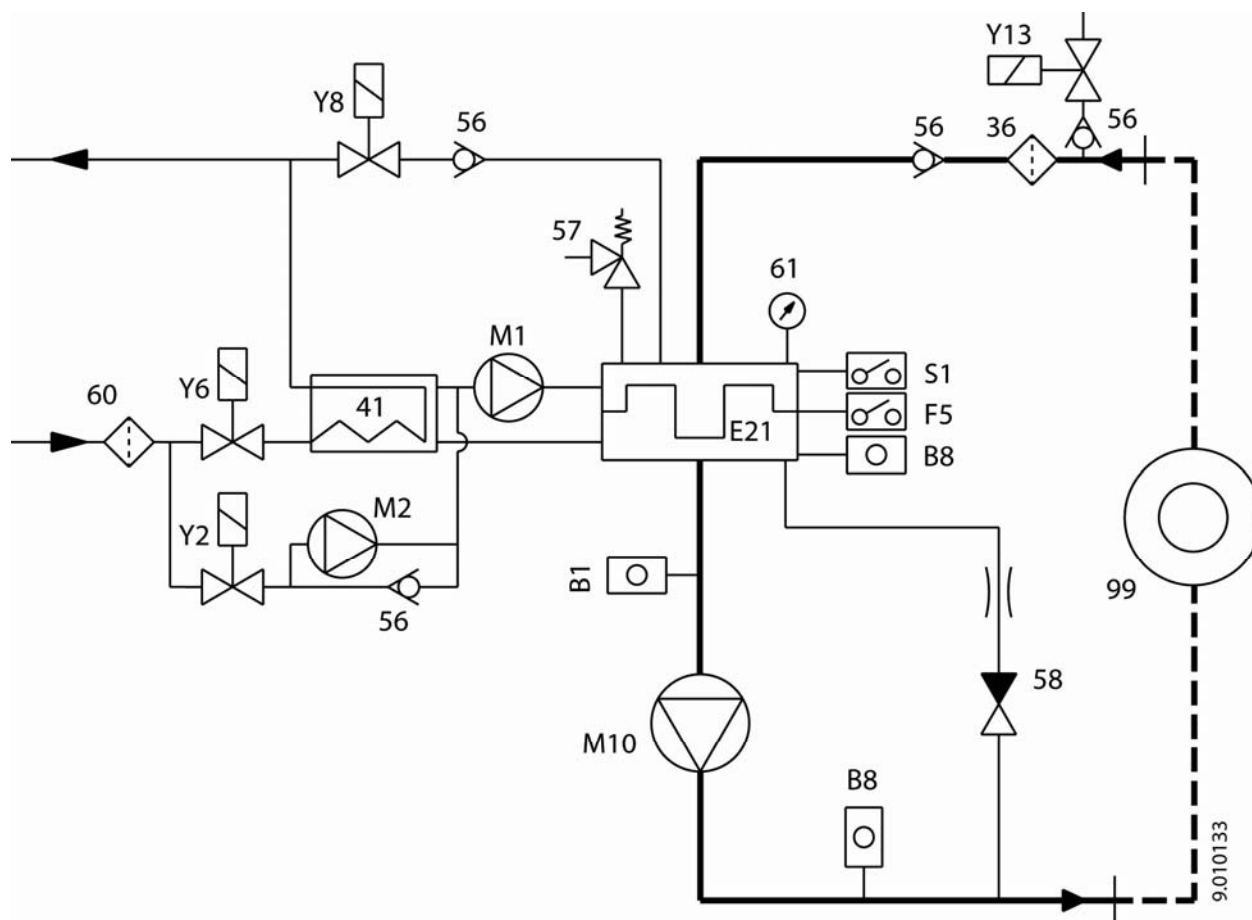
Guidelines for Connecting Hoses

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

Technical Data P140S/P160S/P180S

Temperature Control Unit Type	P140S	P160S	P180S
Max. outlet temperature	140 °C	160 °C	180 °C
Heat transfer medium	water		
Filled quantity	1.0 l	1.0 l	1.0 l
Heating capacity	8 kW	8 kW	8 kW
Heating switching device	SSR relay	SSR relay	SSR relay
Cooling capacity	33 kW (1K)	39 kW (1K)	45 kW (1K)
at outlet temperature	130 °C	150 °C	170 °C
Pump type	SM22	SM23	SM23H
Pump capacity	0.5 kW	0.5 kW	0.5 kW
Max. delivery rate	40 l/min	40 l/min	40 l/min
Max. delivery pressure	5.5 bar	5.5 bar	5.5 bar
System pressure	10 bar	10 bar	14 bar
Outlet pressure	max. 16 bar	max. 16 bar	max. 20 bar
Control	RT100 Control System		
Measurement type (standard)	Pt100	Pt100	Pt100
Control voltage	115/230 V 50/60 Hz	115/230 V 50/60 Hz	115/230 V 50/60 Hz
Input supply voltages	200-600 V 50/60 Hz	200-600 V 50/60 Hz	200-600 V 50/60 Hz
Total power	8.5 kW	8.5 kW	8.5 kW
Outlet/inlet connections (standard)	G 1/2"	G 1/2"	G 1/2"
Cooling water network connections (standard)	G 1/2"	G 1/2"	G 1/2"
Degree of protection	IP54	IP54	IP54
Dimensions W/H/D	236/589/812 mm	236/589/812 mm	236/589/812 mm
Weight	approx. 52 kg	approx. 52 kg	approx. 52 kg
Colour	RAL 9006/7016	RAL 9006/7016	RAL 9006/7016
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C
Continuous sound pressure level	< 70 dB(A)	< 70 dB(A)	< 70 dB(A)

Principle P140S/P160S/P180S



Principle 140S/160S/180S

Pos.	Designation	Pos.	Designation
36	Main circuit filter	E21	Heating
41	Cooler	F5	Safety thermostat
56	One way check-valve	M1	Cooling pump (SK cooler)
57	Safety valve	M2	Filling pump
58	Bypass	M10	Pump
60	Cooling circuit filter	S1	Level control
61	Pressure gauge	Y2	Solenoid valve automatic water refill
99	Consumer	Y6	Solenoid valve cooling
B1	Internal temperature probe	Y8	Solenoid valve pressure release
B8	Pressure sensor	Y13	Solenoid valve suction

Diagram (Pump capacity)

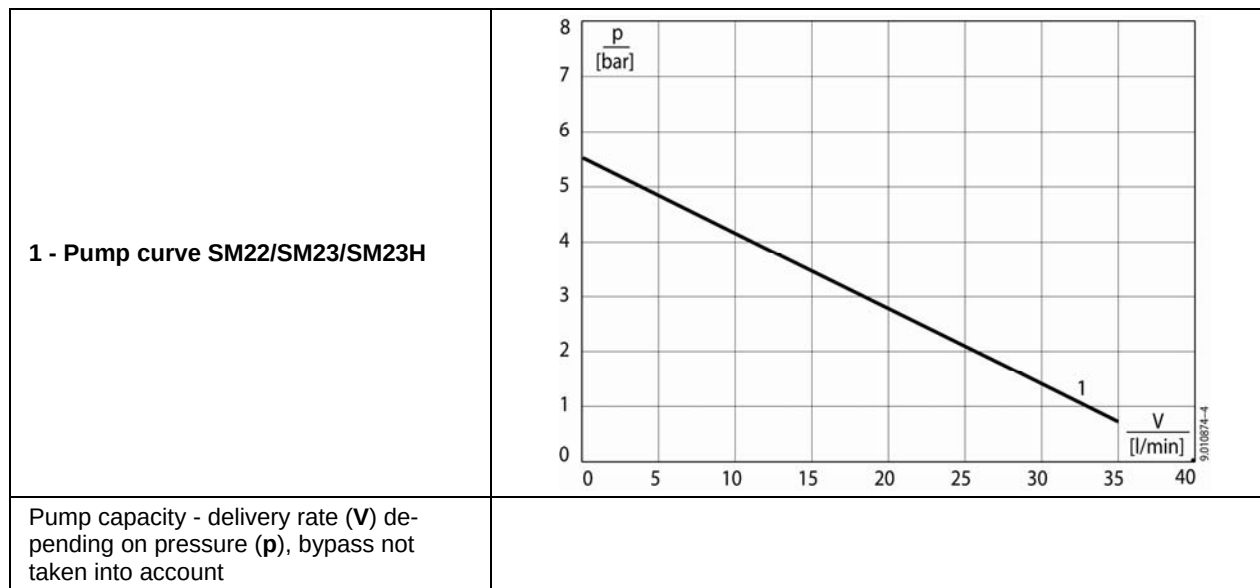
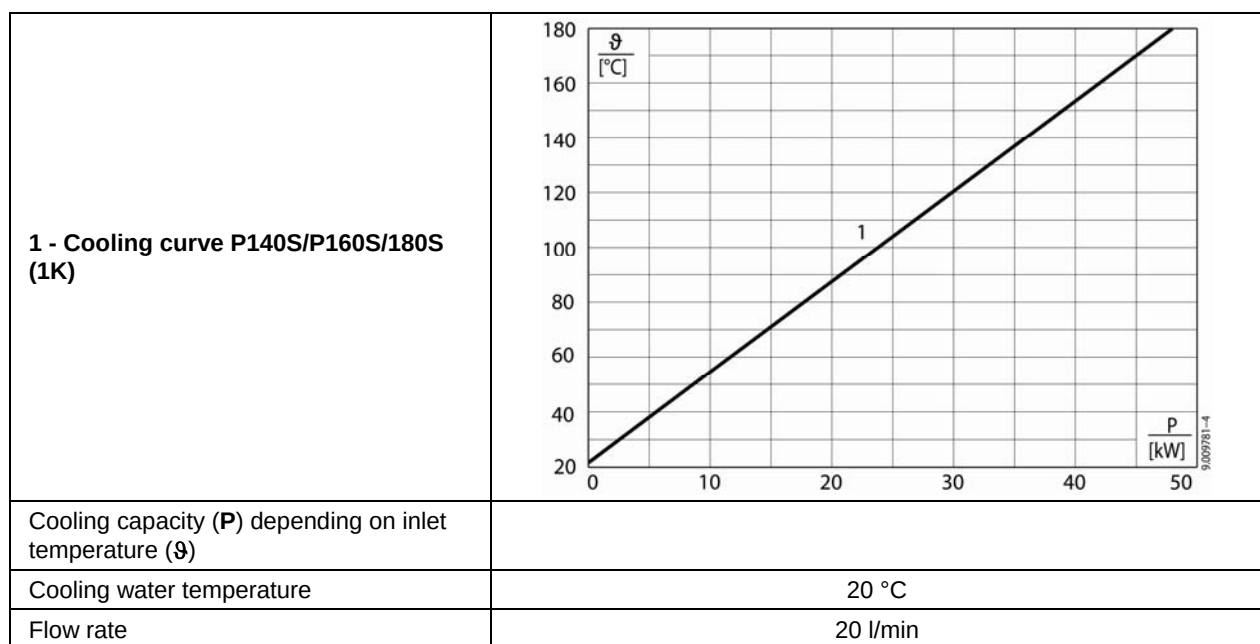
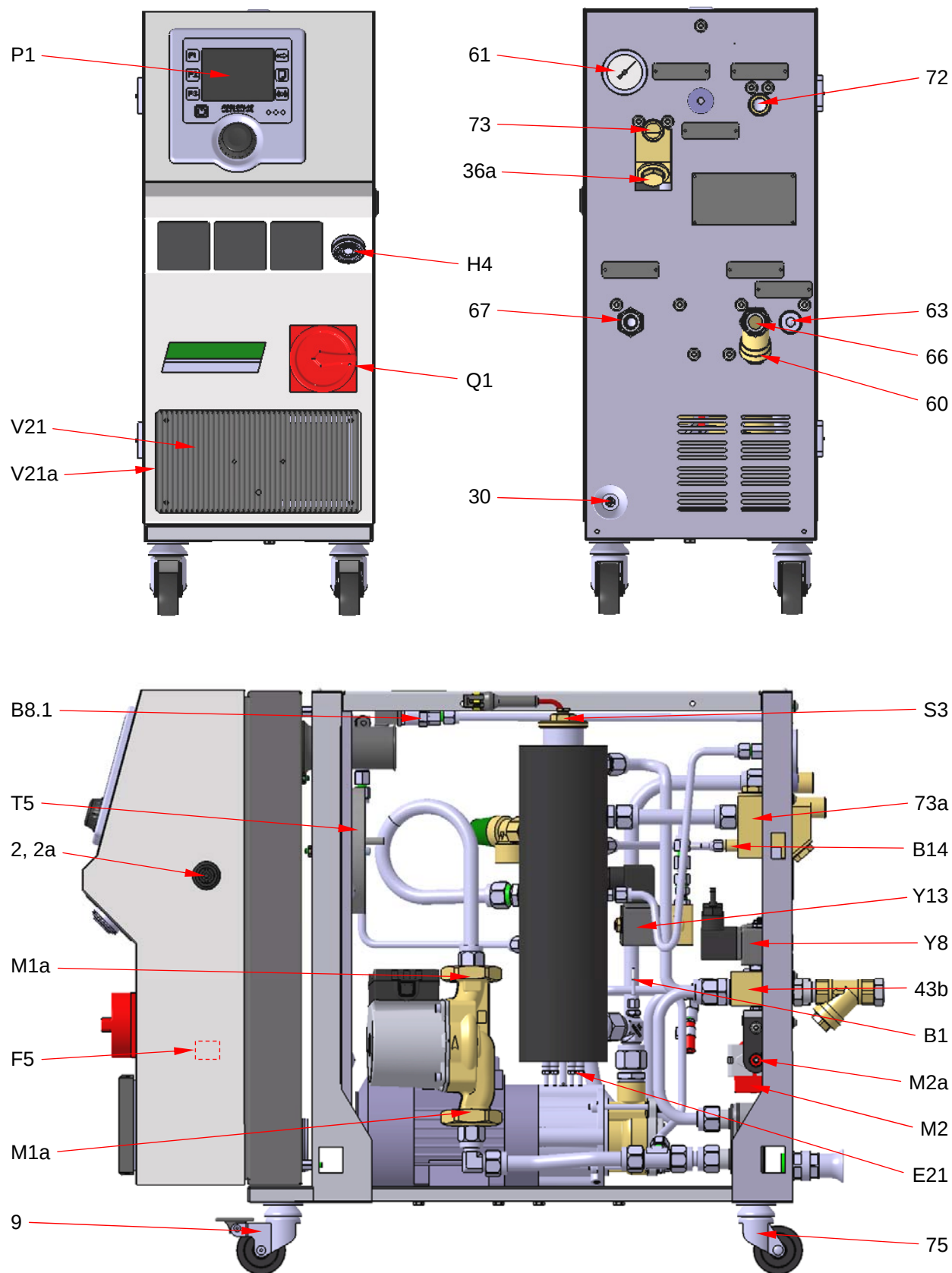
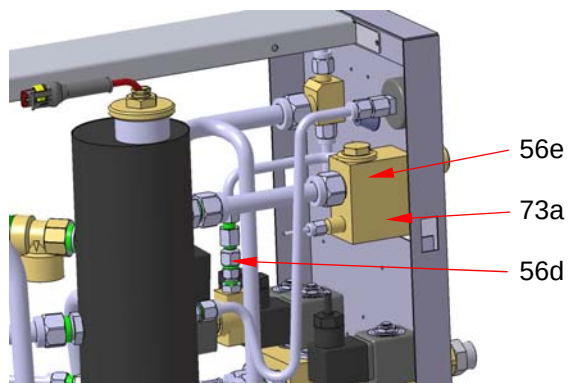
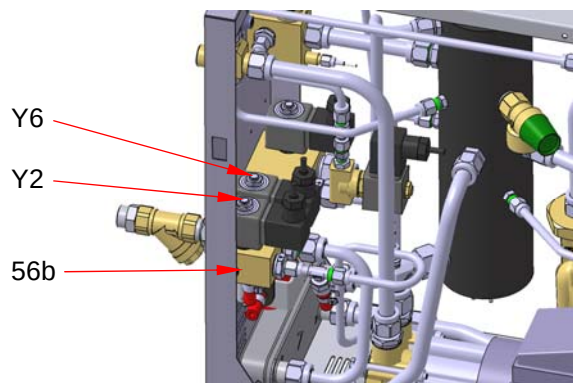
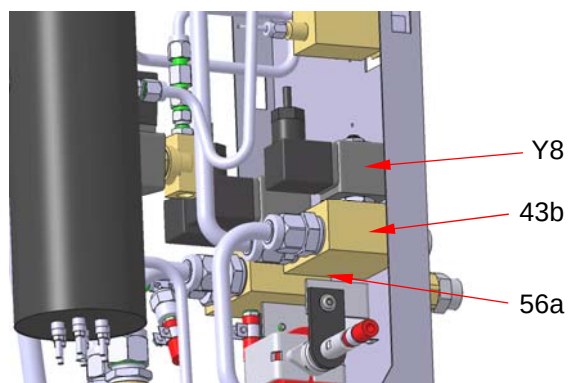
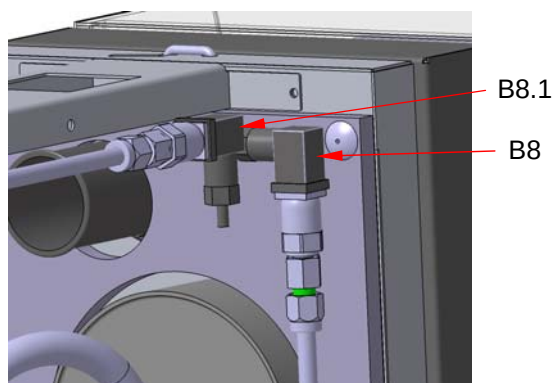
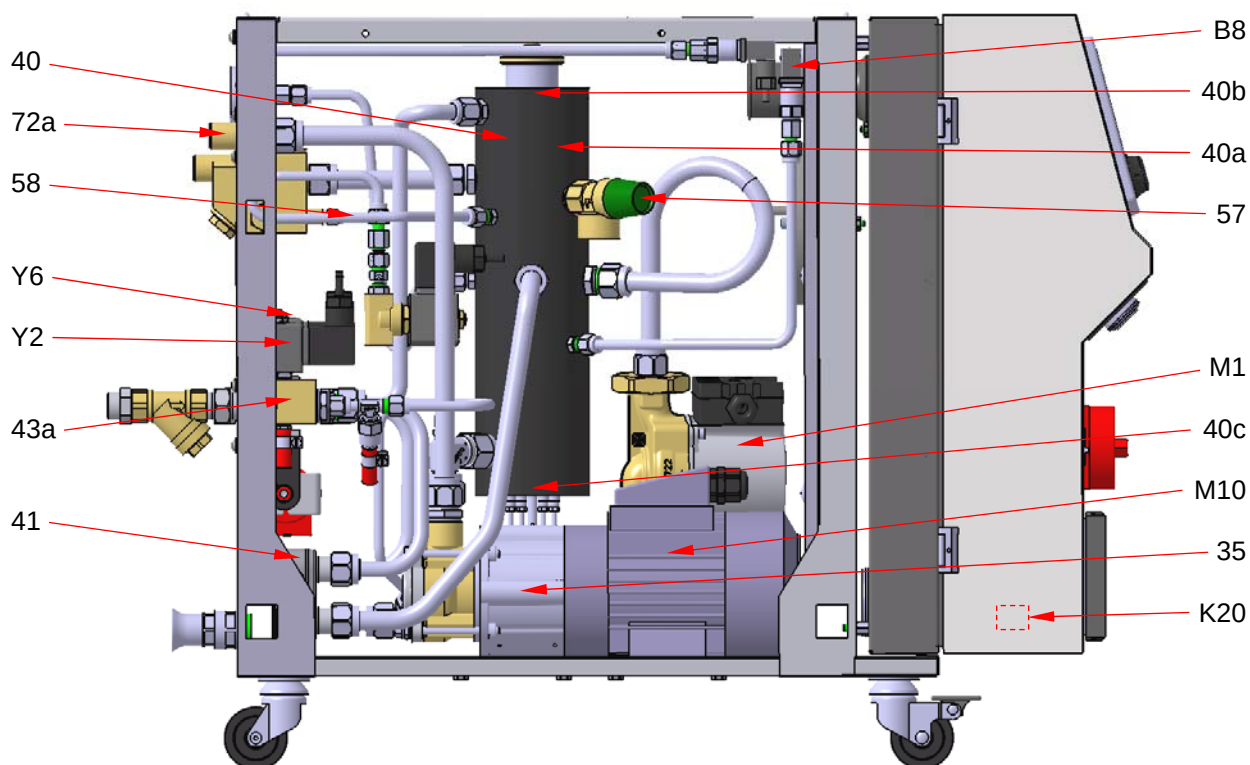


Diagram (Cooling capacity)



Components/Spare Parts P140S/P160S/P180S





Pos.	Designation	Pos.	Designation
2	Lock	B1	Internal temperature probe
2a	Closure tongue	B8	Outlet pressure sensor
9	Castor with wheel lock	B8.1	System pressure sensor
30	Power cable	B14	Inlet temperature probe (option)
35	Pump	H4	Additional horn (option)
36a	Inlet filter screen	E21	Heating
40	System with heating	F5	Safety thermostat
40a	Insulation (system)	K20	Main contactor heating
40b	Insulation (cover)	M1	Cooling pump
40c	Insulation (base)	M1a	Cooling pump seal
41	Cooler	M2	Filling pump
43a	Valve block Y2/Y6 (see corresponding chapter)	M2a	Filling pump hose
43b	Valve block Y8 (see corresponding chapter)	M10	Pump motor
56a	One way check-valve (pressure release)	P1	Control system
56b	One way check-valve (water refill)	Q1	Main switch
56d	One way check-valve (suction)	S3	Level switch (see corresponding chapter)
56e	One way check-valve (inlet)	T5	Control transformer
57	Safety valve (see corresponding chapter)	V21	SSR relay with heat sink
58	Bypass	V21a	SSR relay seal
60	Cooling water filter	Y2	Solenoid valve (automatic water refill)
61	System pressure gauge	Y6	Solenoid valve (cooling)
63	System water (option)	Y8	Solenoid valve (pressure release)
66	Cooling water ON	Y13	Solenoid valve (suction)
67	Cooling water OFF		
72	Outlet		
72a	Outlet valve block		
73	Inlet		
73a	Inlet valve block		
75	Castor		

NOTE



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

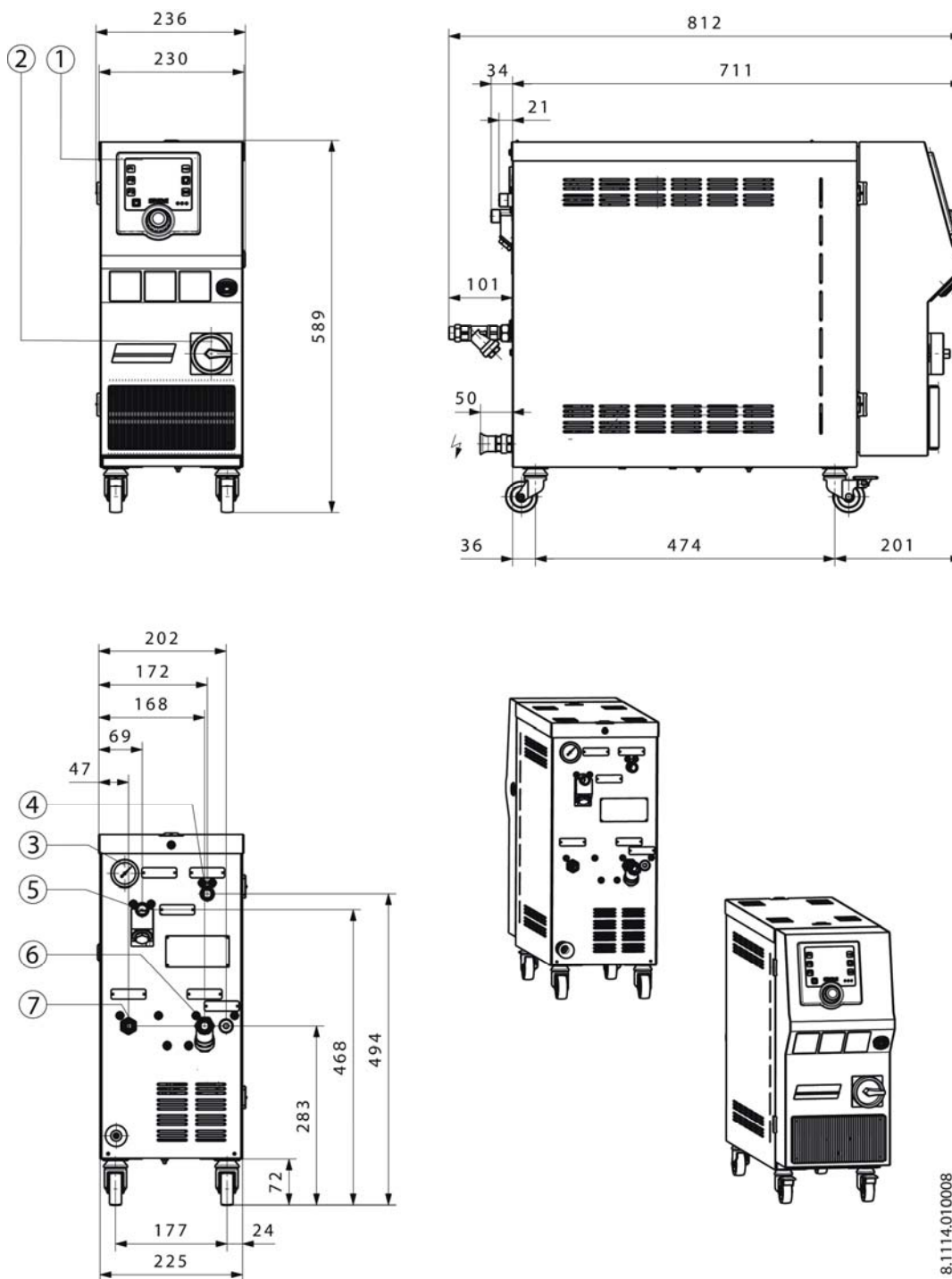


CAUTION



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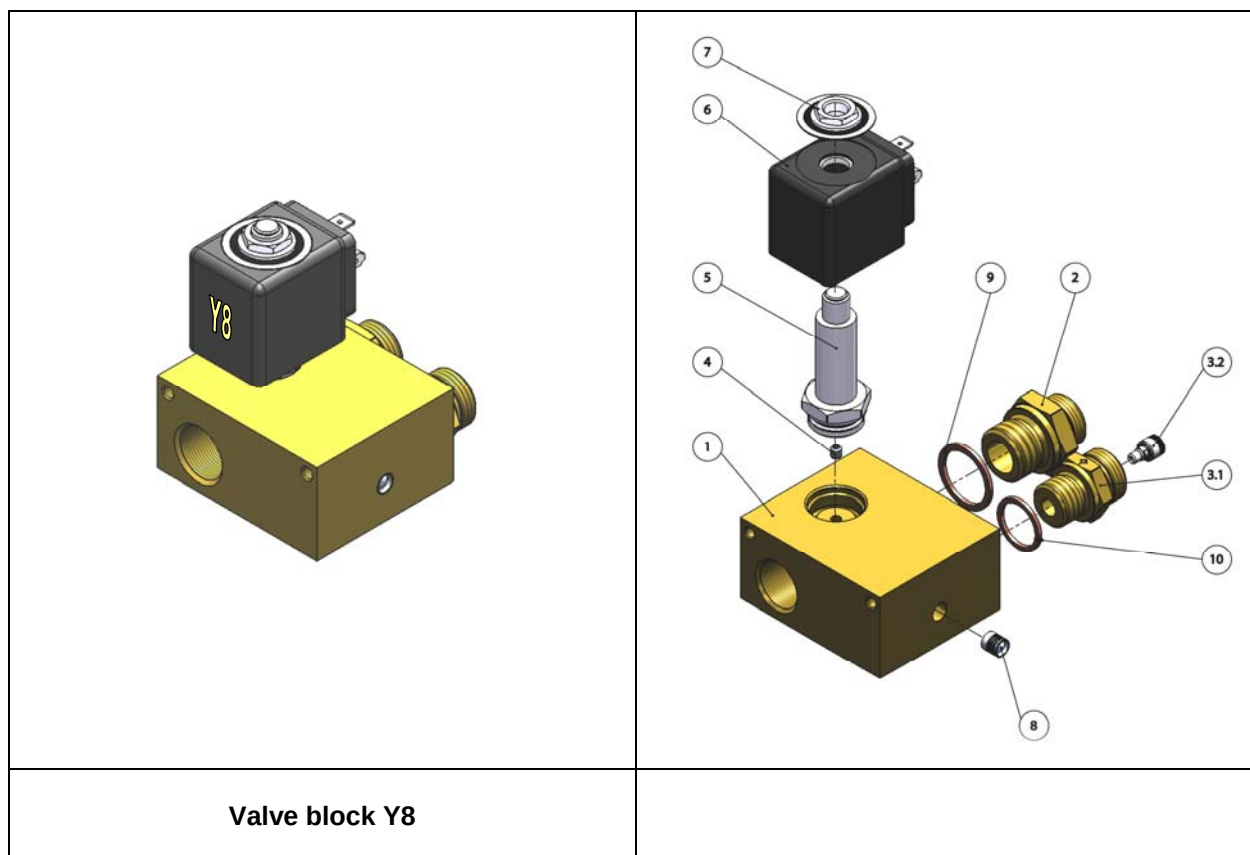
Dimension Sheet P140S/P160S/P180S



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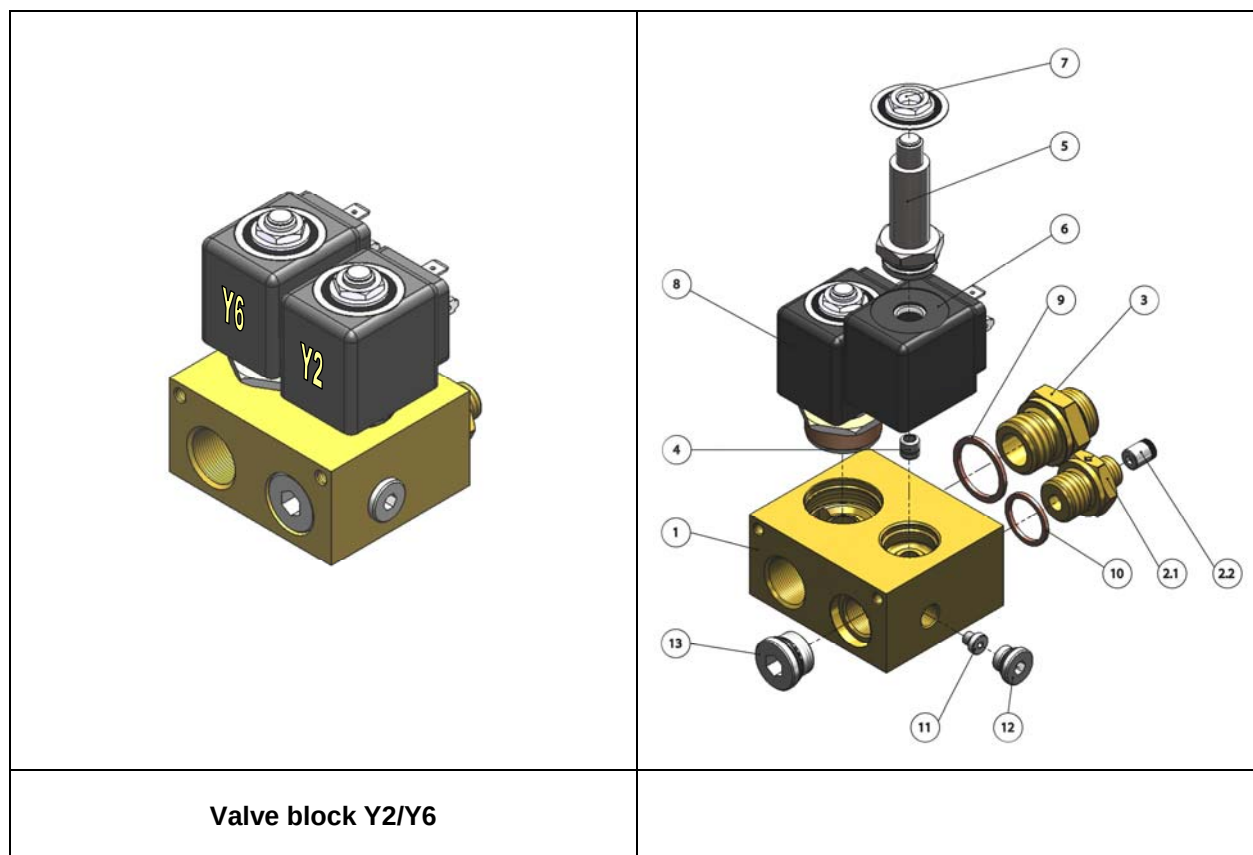
Pos.	Designation	Pos.	Designation
1	RT100 control system	5	Inlet
2	Main switch	6	Cooling water ON
3	Pressure gauge	7	Cooling water OFF
4	Outlet		

Valve Block Y8



Pos.	Designation	Pos.	Designation
1	Valve block	6	Coil Y8
2	Double nipple G 1/2"-M20x1.5	7	Plate, nut, spring washer
3.1	Double nipple G 3/8"-M20x1.5	8	Locking pin
3.2	One way check-valve	9	Sealing washer (copper) 1/2"
4	Nozzle Ø 2 mm	10	Sealing washer (copper) 3/8"
5	Control member		

Valve Block Y2/Y6

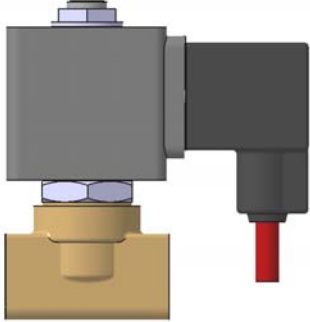
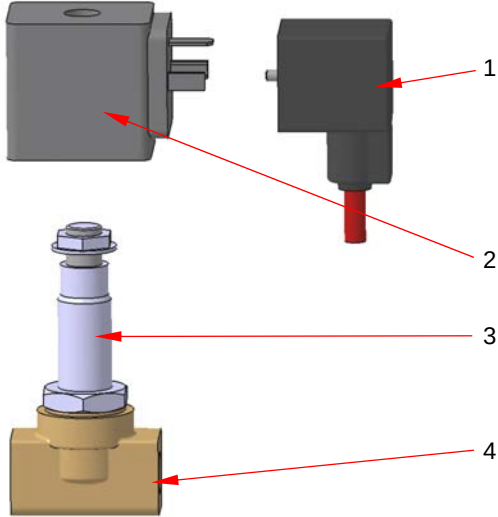


Valve block Y2/Y6

Pos.	Designation	Pos.	Designation
1	Valve block	7	Plate, nut, spring washer
2.1	Double nipple G 3/8"-M12x1	8	Coil Y6
2.2	One way check-valve	9	Sealing washer (copper) 1/2"
3	Double nipple G 1/2"-M20x1.5	10	Sealing washer (copper) 3/8"
4	Nozzle Ø 4 mm	11	Plug M5 with O-ring
5	Control member	12	Plug 1/8" with O-ring
6	Coil Y2	13	Plug 3/8" with O-ring

Solenoid valve Y13 (Drainage option)

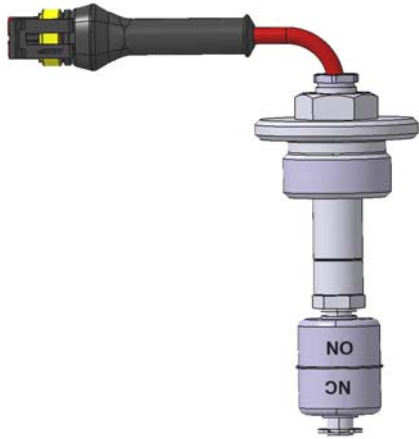
Overview

	
Solenoid valve E121K - G1/4"	

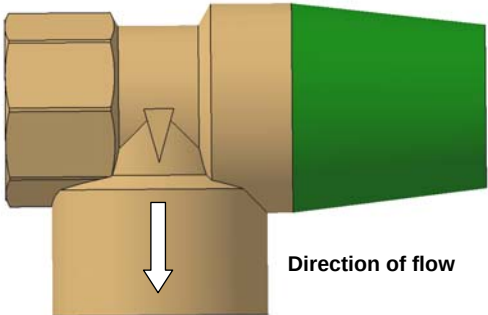
Pos.	Designation	Pos.	Designation
1	Terminal plug	3	Guide with anchor and spring
2	Coil	4	Housing with membrane and O-ring

Level switch

Disassembly/Replacement

When replacing the level switch, the NO marking must be on top as pictured, otherwise the level control will not function properly!	
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Safety valve

The safety valve is the final element of safety with regard to the permissible pressure in the unit. For this reason, it is necessary to verify from time to time that the safety valve is functioning correctly (interval dependent on water quality, e.g., level of contamination)! Procedure: In the event of leakage (e.g., due to contamination between the sealing surfaces), the valve can be vented for cleaning by turning the cap counter clockwise with a max. system pressure of 2 bar in the unit. After it is turned further until it engages, the valve operates normally again with the set pressure. Important: Any safety valve malfunctions must be eliminated immediately! In the event of disassembly, make certain that the safety valve is not under pressure!	 Direction of flow
	Safety valve - G 1/2"-G 3/4"