QUALITEST™

Precision Process Temperature Control System

STANDARDS

IEC 61010-1
IEC 61326-1
ISO 12100

Precision Process Temperature Control System – QualiTCS™ PPT Series

Precision Process Temperature Control System (-25°C to 200°C)

QualiTCS™ PPT Series provides closed-loop heating and cooling for reactors, jackets, heat exchangers, and pilot skids that need stable temperature control from -25°C to 200°C.

The system circulates a heat-transfer fluid through an external loop, using PID control and multi-point temperature feedback to hold setpoint under changing process loads. A sealed circulation design helps reduce oil mist at higher temperatures and limits moisture pickup during low-temperature operation.

QualiTCS™ PPT Series is a process temperature control platform built around a circulating pump, refrigeration module, electric heater, and intelligent controller. It supports fast ramping for heating and cooling, plus protection functions such as overload, high-pressure, over-temperature, low-level, and sensor fault alarms.

Temperature feedback can be monitored at the fluid, outlet, and an external sensor location to match your control strategy. Options are available, including a SUS 304 shell and explosion-proof configurations for certain installations.

APPLICATIONS

Precision Process Temperature Control System – QualiTCS™ PPT Series Applications

1) Reaction Still

Reaction still systems are widely used across petroleum, chemical, rubber, pesticide, dye, pharmaceutical, and food processing, as well as R&D labs. Common workflows include hydrolysis, neutralization, crystallization, distillation, evaporation, storage, hydrogenation, polymerization, condensation, and heated mixing.

Stable temperature control supports faster heat-up and cool-down, while enabling real-time recording of reaction temperature during the full process.

2) Microchannel Reactor

Microchannel reactors support multiple reaction types, including fast reactions with strong heat release, liquid-phase reactions, gas–liquid reactions, and absorption processes. Typical chemistry routes include nitration, sulfonation, oxidation, peroxidation, alkylation, amination, and photochemical or gasification-related reactions (process-dependent).

A wide operating temperature range and precise, intelligent control help maintain consistent conditions with a single heat-transfer fluid, reducing the need to change thermal media during development work and fine chemical synthesis.

Reaction Still

Microchannel Reactor

This Precision Process Temperature Control System (-25°C to 200°C) – QualiTCS™ PPT Series also can be use to:

- Reactor jacket temperature control: Maintain reaction temperature during synthesis, polymerization, crystallization, or neutralization using a stable circulating thermal loop. The external sensor option helps control based on reactor content temperature when jacket temperature alone is not enough.
- Heat exchanger and skid thermal management: Provide consistent inlet temperature to plate or tubular exchangers for pilot systems and production support skids. This helps standardize process conditions across batches and improves repeatability during scale-up work.
- Material and component testing: Run controlled thermal cycling and dwell testing for components that need defined temperatures and stable circulation flow. The closed system design supports long-duration operation without frequent

thermal-fluid handling.
- Low-temperature process support: Support cooling steps where moisture absorption and frosting risk need to be minimized in the thermal circuit. A sealed circulation loop helps limit moisture ingress during low-temperature operation.

Standards

- IEC 61010-1 (Safety for electrical measurement, control, and laboratory equipment).
- IEC 61326-1 (EMC requirements for measurement, control, and laboratory equipment).
- ISO 12100 (Safety of machinery—risk assessment and risk reduction methodology).

FEATURES

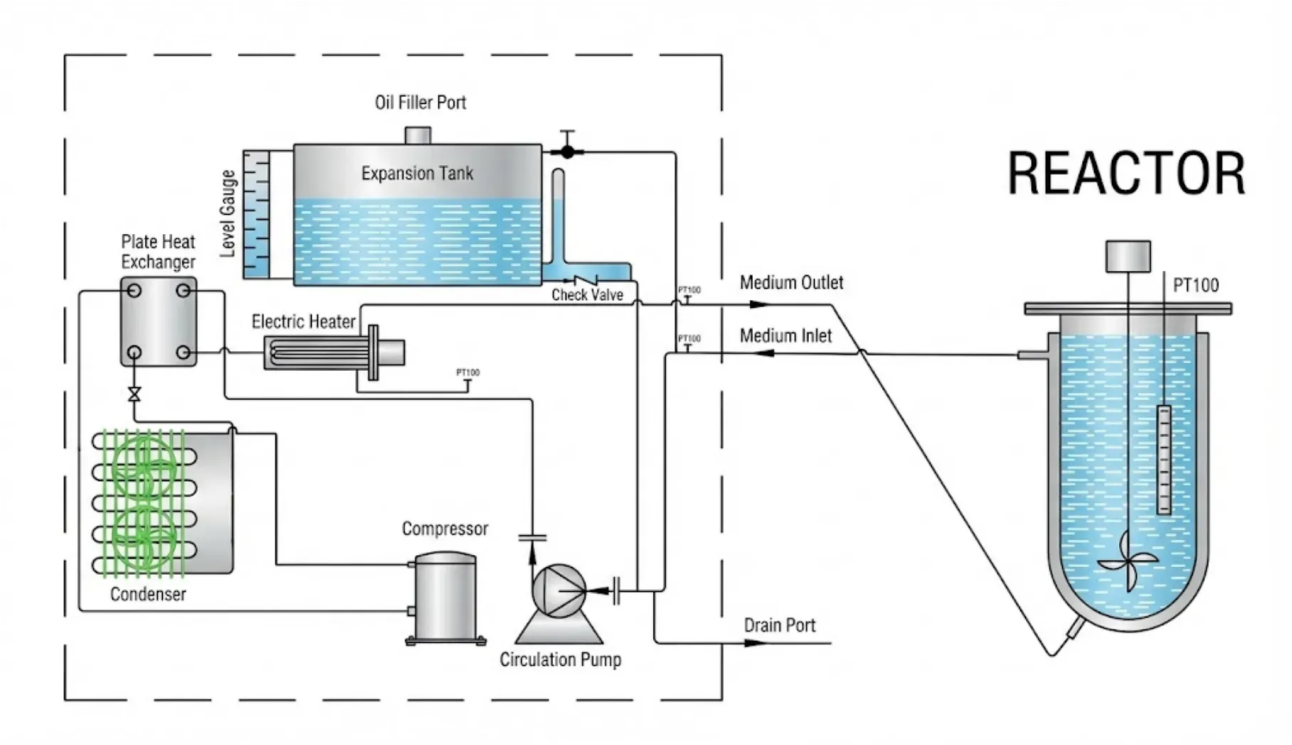
Precision Process Temperature Control System – QualiTCS™ PPT Series

Key Features

- Wide operating range for heating and cooling across -25°C to 200°C process workflows.
- Closed-loop circulation design intended to reduce oil mist at high temperature and moisture absorption at low temperature.
- Multi-point temperature feedback with PT100 monitoring for local fluid, outlet, and external sensor positions.
- Comprehensive protection logic including overload, high-pressure, over-temperature, low-level, and sensor fault alarms.
- Model range from compact to high-capacity with heating power up to 95 kW and high-flow pump options.
- Options for demanding sites such as SUS 304 shell and explosion-proof configurations (certain options may require water cooling

THEORY & METHOD

Theory and Method



QualiTCS™ PPT Series controls process temperature by circulating a heat-transfer fluid through your external loop and adjusting heating and refrigeration output in real time. A PID controller uses PT100-based feedback points (local fluid, outlet, and optional external sensor) to match temperature control to your process. The closed circulation circuit is designed to reduce thermal-fluid loss at high temperatures and limit moisture uptake at low temperatures. The pump maintains flow and pressure to support stable heat transfer across jackets or exchangers.

TECHNICAL SPECIFICATIONS

Precision Process Temperature Control System – QualiTCS™ PPT Series Technical Specification

QualiTCS™ PPT Series Series (-25°C to 200°C) — Models QualiTCS™ PPT 25 to 100 Series

Spec	QualiTCS™ PPT 25-220	QualiTCS™ PPT 35-220	QualiTCS™ PPT 55-220	QualiTCS™ PPT75-220	QualiTCS™ PPT100-220	QualiTCS™ PPT 150-220	QualiTCS™ PPT 250-220	QualiTCS™ PPT 380-220	QualiTCS™ PPT 600-220	QualiTCS™ PPT 950-220
Heating power	2.5 kW	3.5 kW	5.5 kW	7.5 kW	10 kW	15 kW	25 kW	38 kW	60 kW	95 kW
Cooling capacity @ 200°C	2.5 kW	3.5 kW	5.5 kW	7.5 kW	10 kW	15 kW	25 kW	38 kW	60 kW	95 kW
Cooling capacity @ 100°C	2.5 kW	3.5 kW	5.5 kW	7.5 kW	10 kW	15 kW	25 kW	38 kW	60 kW	95 kW
Cooling capacity @ 20°C	2.5 kW	3.5 kW	5.5 kW	7.5 kW	10 kW	15 kW	25 kW	38 kW	60 kW	95 kW
Cooling capacity @ -5°C	2.0 kW	3.0 kW	4.5 kW	6.6 kW	8.0 kW	12 kW	19 kW	30 kW	46 kW	70 kW
Cooling capacity @ -20°C	1.0 kW	1.8 kW	2.8 kW	3.8 kW	4.6 kW	7 kW	12 kW	16 kW	22 kW	32 kW
Pump max flow	30 L/min	30 L/min	42 L/min	56 L/min	56 L/min	110 L/min	120 L/min	150 L/min	300 L/min	400 L/min
Pump max pressure	1.5 bar	1.5 bar	2.0 bar	2.0 bar	2.0 bar	2.5 bar	2.5 bar	2.5 bar	2.5 bar	2.5 bar

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Compressor	SECOP	EMERSON COPELAND					DORIN / BITZER / FRASCOLD			
Expansion valve	DANFOSS						EMERSON COPELAND / DANFOSS			
Thermal medium interface	DN15	DN20			DN25	DN32		DN40		
Cooling water demand @ 20°C	0.6 m³/h	0.8 m³/h	1.0 m³/h	1.2 m³/h	1.6 m³/h	2 m³/h	6 m³/h	10 m³/h	14 m³/h	20 m³/h
Cooling water pressure	1.5–4 bar									
Cooling water interface	G1/2		G3/4			G1	DN32	DN40	DN50	DN65
Dimensions (Water-cooled) (W×D×H)	400 × 600 × 1150 mm	400 × 600 × 1150 mm	500 × 680 × 1250 mm	550 × 700 × 1600 mm	500 × 680 × 1250 mm	700 × 800 × 1650 mm	1000 × 950 × 1650 mm	1000 × 950 × 1750 mm	2000 × 1250 × 1750 mm	2000 × 1250 × 1750 mm
Dimensions (Air-cooled) (W×D×H)	400 × 600 × 1250 mm	450 × 650 × 1300 mm	550 × 750 × 1400 mm	570 × 750 × 1500 mm	650 × 700 × 1650 mm	750 × 750 × 1800 mm	—	—	—	—
Weight (Water-cooled)	100 kg	135 kg	160 kg	205 kg	250 kg	280 kg	480 kg	750 kg	1000 kg	1250 kg

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Weight (Air-cooled)	115 kg	165 kg	285 kg	230 kg	280 kg	300 kg	—	—	—	—
Voltage	AC 220V, 50 Hz (110V is also available)	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz	AC 380V, 50 Hz
Total power (max)	4 kW	6 kW	8 kW	11 kW	14 kW	21 kW	34 kW	51 kW	78 kW	120 kW

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