QUALITEST™

High Performanced Process Temperature Control System

STANDARDS

IEC 60079-0
ISO 80079-36
ISO 80079-37
UL 60079-2

High Performanced Process Temperature Control System – QualiTCS™ HPPT Series

High Performanced Process Temperature Control System (-60°C to 200°C)

Process Thermostat control gets difficult when your process swings from deep sub-zero starts to high-temperature holds. QualiTCS™ HPPT Series is a high performanced Process Temperature Control System designed to circulate a heat-transfer fluid through jackets, coils, and external heat exchangers while tightly controlling temperature from -60°C to 200°C.

The platform supports a wide range of process loads with 10 models and circulating pump flow up to 400 L/min. It is built for stable ramping, soaks, and repeatable batch conditions across R&D and production environments. Custom configurations are available to match your thermal fluid, plumbing, and safety requirements.

APPLICATIONS

High Performanced Process Temperature Control System – QualiTCS™ HPPT 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 High Performanced Process Temperature Control System (-60°C to 200°C) – QualiTCS™ HPPT Series also can be use to:

- Reactor and jacketed vessel temperature control: Maintain consistent product conditions in jacketed reactors where heat-up, hold, and cool-down cycles affect yield and viscosity. The system can control either process material temperature (with an external probe) or thermal-fluid outlet temperature, depending on your control strategy.
- Microchannel and continuous-flow skids: Support precise thermal management in microreactors where residence time is short and temperature drift shows up immediately in conversion. High circulation flow options help stabilize inlet conditions to compact heat exchangers.
- Distillation and condensation loops: Hold condenser, receiver, or column jacket temperatures at setpoints to improve separation repeatability. Temperature trend display and logging help verify steady-state behavior during long runs.
- Extraction and crystallization processes: Control cooling profiles that drive nucleation and crystal growth. Programmable multi-step recipes help standardize the same temperature curve across batches and operators.

- Automotive, pharma, petrochemical, electronics, and aerospace test setups: Run controlled thermal cycles for component tests, material studies, and process validation work. The series is used across multiple industries that require controlled heating and cooling around process equipment.

Standards

- IEC 60079-0 (general requirements) and IEC 60079-2 (pressurized enclosure “p”). QualiTCS™
- UL 60079-2 (U.S. adoption of IEC 60079-2 with national differences).
- ISO 80079-36 / ISO 80079-37 (non-electrical Ex equipment design and protection concepts, when applicable to assemblies).

For general laboratory/industrial electrical safety and EMC, many temperature-control systems are designed and evaluated against common frameworks such as IEC 61010-1 (safety) and IEC 61326-1 (EMC). (Final compliance depends on the exact configuration and certification scope.)

FEATURES

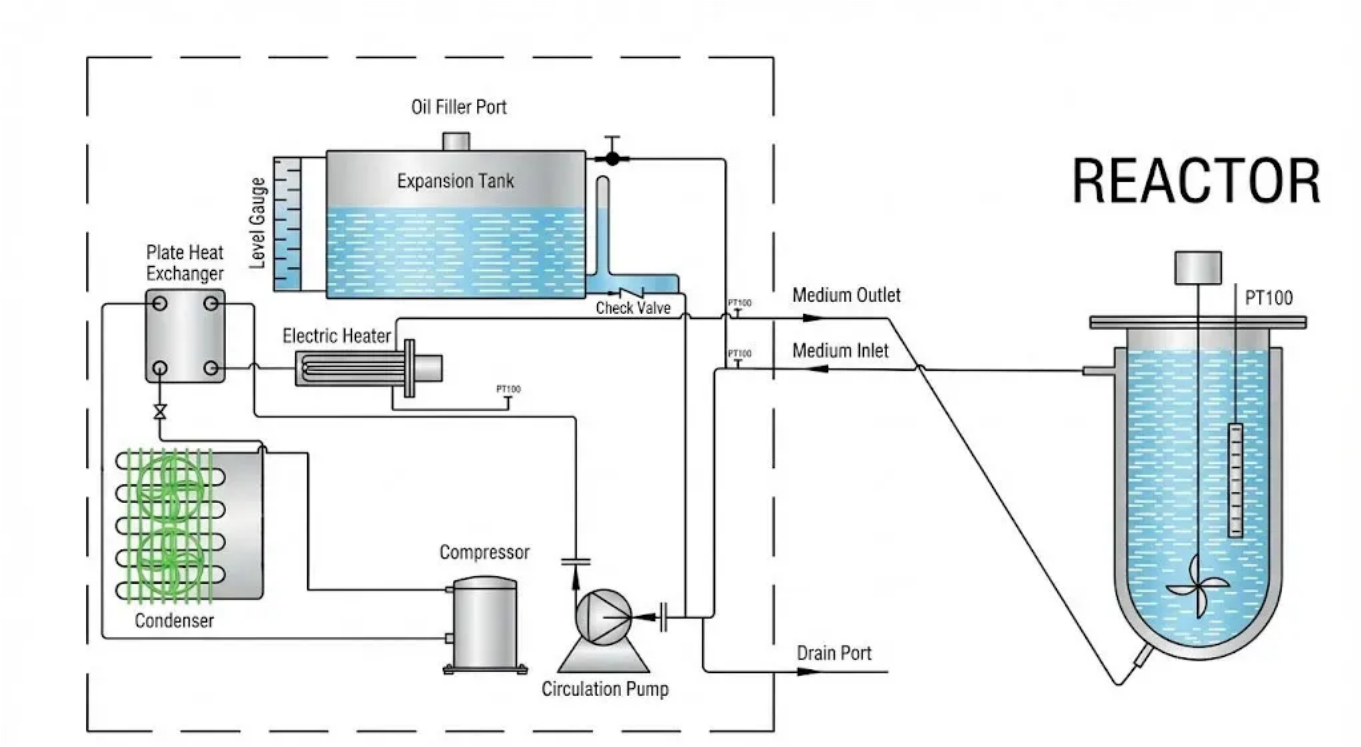
High Performanced Process Temperature Control System – QualiTCS™ HPPT Series Key Features

- Wide operating window (-60°C to 200°C) for one platform that supports cold starts and high-temperature holds.
- PID fuzzy control strategy tuned for stable regulation under changing thermal loads.
- Selectable control target: regulate process material temperature or thermal-fluid outlet temperature to match your setup.
- 7-inch color touchscreen with real-time temperature curve display and recording for run traceability.
- Recipe programming supports up to 5 programs with up to 30 steps each for repeatable temperature profiles.

- Three-point PT100 temperature feedback (internal fluid, outlet, and external material probe) for tighter process correlation.
- MODBUS RTU over RS-485 for integration with skids, PLCs, and SCADA systems.
- Safety and protection suite includes diagnostics plus overload, pressure, level, over-temperature, and sensor fault protections.
- Sealed circulation design reduces moisture uptake at low temperature and minimizes misting at high temperature, while managing system pressure behavior during operation.
- Customization available for project-specific needs, including configuration choices tied to installation and safety requirements.

THEORY & METHOD

Theory and Method



QualiTCS™ HPPT operates as a closed-loop circulation Process Thermostat. A circulating pump drives thermal fluid through the user's jacket or external heat exchanger, then returns it to the unit for energy exchange.

Cooling is produced through a vapor-compression refrigeration loop, while electric heating elements provide fast heat-up and stable holds. Control logic uses temperature feedback (PT100 sensing points) to regulate either outlet-fluid temperature or product/material temperature, and it can manage temperature-difference control between jacket and material for safer ramps.

TECHNICAL SPECIFICATIONS

High Performanced Process Temperature Control System – QualiTCS™ HPPT Series Technical Specifications

Spec	QualiTCS™ HPPT25W-620	QualiTCS™ HPPT35-620	QualiTCS™ HPPT55-620	QualiTCS™ HPPT75-620	QualiTCS™ HPPT100W-620	QualiTCS™ HPPT150W-620	QualiTCS™ HPPT250W-620	QualiTCS™ HPPT380W-620	QualiTCS™ HPPT600W-620	QualiTCS™ HPPT950W-620
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 @ -40°C	0.95 kW	1.45 kW	2.3 kW	3.1 kW	4.8 kW	7.75 kW	18 kW	22 kW	30 kW	45 kW
Cooling capacity @ -55°C	0.25 kW	0.5 kW	0.75 kW	0.9 kW	1.5 kW	2.8 kW	6 kW	7.5 kW	11 kW	15 kW
Pump max flow	35 L/min	35 L/min	50 L/min	60 L/min	110 L/min	150 L/min	200 L/min	250 L/min	400 L/min	400 L/min
Pump max pressure	2 bar					2.5 bar				

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Thermal interface size	DN15	DN20			DN25		DN32	DN40		DN50
Cooling water requirement @ 20°C	1.2 m³/h	1.5 m³/h	1.8 m³/h	2.6 m³/h	3.2 m³/h	7 m³/h	10 m³/h	14 m³/h	20 m³/h	30 m³/h
Cooling water pressure	1.5–4 bar									
Cooling water interface	G1/2	G1/2	G3/4	G3/4	G1	G1	DN40	DN50	DN65	DN65
Voltage	AC 220V, 50 Hz (110V is also available)	AC 380V, 50 Hz								
Total power (max)	5 kW	7.5 kW	10 kW	14 kW	8 kW	26 kW	38 kW	58 kW	85 kW	130 kW
Compressor	Embraco	Emerson Copeland		Turin / Bitzer / Fujijo (Italy)						
Expansion valve	Danfoss									

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Dimensions (Water-cooled) W×D×H (mm)	400 × 600 × 1150	550 × 700 × 1350	550 × 700 × 1350	650 × 700 × 1650	700 × 800 × 1650	1000 × 950 × 1650*	1250 × 950 × 1650	2000 × 1250 × 1750	2300 × 1450 × 1750	2300 × 1450 × 1750
Dimensions (Air-cooled) W×D×H (mm)	400 × 600 × 1250	550 × 700 × 1450	650 × 700 × 1650	650 × 700 × 1650	750 × 750 × 1800	750 × 750 × 1800	—	—	—	—
Weight (Water-cooled)	170 kg	185 kg	265 kg	305 kg	340 kg	380 kg	980 kg	1150 kg	1380 kg	1750 kg
Weight (Air-cooled)	200 kg	225 kg	300 kg	340 kg	380 kg	—	—	—	—	—

Optional configurations: SUS 304 chassis; Ex d IIB T4 explosion-proof; Ex d IIC T4 explosion-proof; positive pressure explosion-proof (positive pressure explosion-proof is available for water-cooled models only).

QUALITEST™

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