



Integrated Process Temperature Control System



STANDARDS

ASTM E2500

IEC 61010-1

IEC 61326-1

ISO 12100

Integrated Process Temperature Control System - QualiTCS™ IPT Series

Integrated Process Temperature Control System (-40°C to 200°C)

Process Thermostat QualiTCS™ IPT Series delivers integrated heating and mechanical cooling for closed-loop circulation to reactors, jackets, and process skids. The platform supports a wide working range of -40°C to 200°C for temperature control where setpoint stability matters during changing heat loads.

A circulation pump drives heat-transfer fluid through the external loop, while the controller balances heater output and refrigeration capacity to track the setpoint. Multiple model sizes let you match flow rate and thermal power to your process scale.

QualiTCS™ IPT Series is an integrated temperature control system combining a heater, refrigeration module, circulation pump, and digital control in one unit. It is designed for process thermostat applications that require both rapid cooling and controlled heating within the same workflow.

The system circulates thermal fluid through an external load and regulates temperature using closed-loop feedback control. Model selection is typically based on required temperature range, cooling power at operating temperature, flow rate, and site power availability.

APPLICATIONS

Integrated Process Temperature Control System - QualiTCS™ IPT 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 Integrated Process Temperature Control System (-40°C to 200°C) - QualiTCS™ IPT Series also can be use to:

- **Precision Control for Jacketed Vessels:** Achieve rock-solid stability for synthesis, polymerization, and crystallization. By maintaining high-accuracy circulation within reactor jackets, you eliminate erratic temperature gradients and ensure every batch meets your exact specifications—every single time.
- **Seamless Scale-Up for Pilot Plants:** Bridge the gap between lab-scale and production with consistent inlet temperatures for plate or tubular heat exchangers. Whether you are running pilot skids or process development loops, these systems ensure repeatable thermal conditions that make method transfer predictable and efficient.
- **Specialized Equipment & Material Conditioning:** Keep your infrastructure at the perfect setpoint. From conditioning intricate process lines and test loops to stabilizing specific fixtures, continuous circulation provides the long-term thermal uniformity required for sensitive testing and extended production runs.

- High-Performance Sub-Zero Processing: Master volatile, low-temperature stages with cooling capabilities down to -40°C. Rapid pull-down times and steady-state holding provide a critical safety net for managing aggressive exothermic reactions and protecting temperature-sensitive materials.

Standards

- IEC 61010-1 – General safety requirements for electrical measurement, control, and laboratory equipment. QualiTCS™
- IEC 61326-1 – EMC requirements (immunity and emissions) for measurement, control, and laboratory equipment. QualiTCS™
- ISO 12100 – Risk assessment and risk reduction methodology for machinery safety.
- ASTM E2500 – Risk-based approach for specification, design, and verification of pharma/biopharma manufacturing systems and equipment (when used in regulated environments).

FEATURES

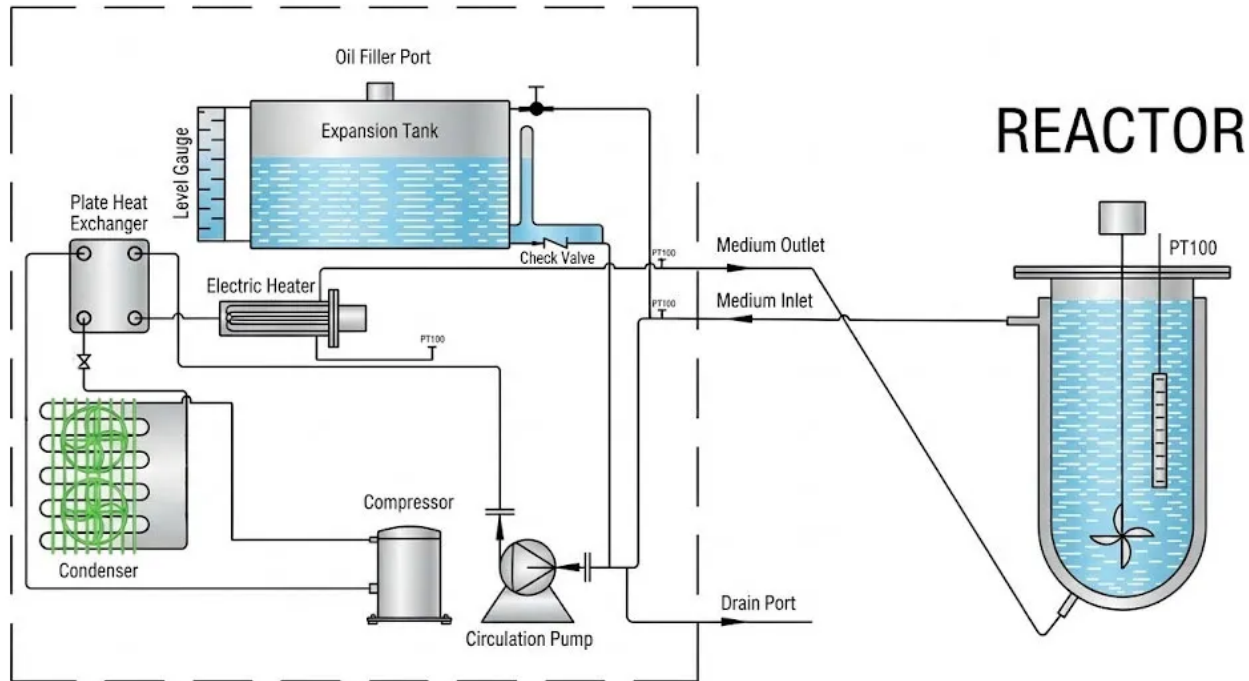
Integrated Process Temperature Control System - QualiTCS™ IPT Series

Key Features

- Wide control range (-40°C to 200°C) for combined cooling and heating workflows.
- Integrated heating + refrigeration in one process thermostat platform for continuous circulation control.
- Multiple capacity options from compact units to high-flow, high-power models for larger skids.
- High circulation flow choices up to 400 L/min to support demanding heat-transfer loops.
- Industrial power configurations with 220V single-phase on HL25-420 and 380V three-phase on larger models.
- Scalable footprint across the lineup to match lab, pilot, and production support spaces.

THEORY & METHOD

Theory and Method



QualiTCS™ IPT Series controls process temperature using a circulating heat-transfer fluid that moves energy between the unit and your external load. A controller compares measured temperature to the setpoint and adjusts heater output and refrigeration capacity to correct deviations.

Cooling performance changes with temperature, so the model's rated cooling capacity helps predict pull-down time and heat-load handling at your target range. Flow rate and pump pressure influence heat transfer through jackets and exchangers, so selecting the right model improves stability and response.

TECHNICAL SPECIFICATIONS

Integrated Process Temperature Control System - QualiTCS™ IPT Series

Technical Specification

Spec	QualiTCS™ IPT25-420	QualiTCS™ IPT35-420	QualiTCS™ IPT55-420	QualiTCS™ IPT75-420	QualiTCS™ IPT100- 420	QualiTCS™ IPT150- 420	QualiTCS™ IPT250- 420	QualiTCS™ IPT380- 420	QualiTCS™ IPT600- 420	QualiTCS™ IPT950- 420
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 @ 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 @ 0°C	2.0 kW	3.0 kW	5.0 kW	7.0 kW	10 kW	15 kW	25 kW	38 kW	60 kW	95 kW
Cooling capacity @ -20°C	0.9 kW	1.5 kW	2.9 kW	4.2 kW	6 kW	11 kW	16 kW	26 kW	34 kW	50 kW
Cooling capacity @ -35°C	0.25 kW	0.45 kW	0.9 kW	1.5 kW	2 kW	3.8 kW	4.7 kW	9 kW	12 kW	18 kW
Pump max flow	20 L/min	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
Pump max pressure	2 bar					2.5 bar				

Spec	QualiTCS™ IPT25-420	QualiTCS™ IPT35-420	QualiTCS™ IPT55-420	QualiTCS™ IPT75-420	QualiTCS™ IPT100- 420	QualiTCS™ IPT150- 420	QualiTCS™ IPT250- 420	QualiTCS™ IPT380- 420	QualiTCS™ IPT600- 420	QualiTCS™ IPT950- 420
Thermal interface size	DN15	DN20			DN25		DN32	DN40		DN50
Cooling water requirement @ 20°C	0.6 m³/h	1.2 m³/h	1.5 m³/h	1.8 m³/h	2.6 m³/h	3.2 m³/h	7 m³/h	12 m³/h	17 m³/h	24 m³/h
Cooling water pressure	1.5-4 bar									
Cooling water interface	G1/2		G3/4		G1		DN40	DN50	DN65	
Voltage	AC 220V, 50 Hz (110V is also available)	AC 380V, 50 Hz								
Total power (max)	4.5 kW	6.5 kW	9 kW	11.5 kW	16 kW	23 kW	36 kW	55 kW	89 kW	135 kW
Compressor	Taikang / Haili	Emerson Copel and	Turin / Bitzer / Fujijo (Italy)							
Expansion valve	Danfoss									

Spec	QualiTCS™ IPT25-420	QualiTCS™ IPT35-420	QualiTCS™ IPT55-420	QualiTCS™ IPT75-420	QualiTCS™ IPT100- 420	QualiTCS™ IPT150- 420	QualiTCS™ IPT250- 420	QualiTCS™ IPT380- 420	QualiTCS™ IPT600- 420	QualiTCS™ IPT950- 420
Dimensions (Water-cooled) W×D×H (mm)	400 × 600 × 1150	400 × 600 × 1150	500 × 680 × 1250	550 × 700 × 1600	500 × 680 × 1250	700 × 800 × 1650	1000 × 950 × 1650	1000 × 950 × 1750	2000 × 1250 × 1750	2000 × 1250 × 1750
Dimensions (Air-cooled) W×D×H (mm)	400 × 600 × 1250	450 × 650 × 1300	550 × 650 × 1400	570 × 700 × 1550	650 × 700 × 1650	750 × 750 × 1800	—	—	—	—
Weight (Water-cooled)	100 kg	135 kg	160 kg	205 kg	250 kg	280 kg	620 kg	820 kg	1100 kg	1350 kg
Weight (Air-cooled)	115 kg	165 kg	285 kg	230 kg	280 kg	300 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).



ADVANCED TESTING TECHNOLOGIES

USA | CANADA | UAE | GCC | EU | INDIA | APAC | AFRICA | LATIN AMERICA

Connect with us

Contact our **QualiTeam** today to find out how we can help your organization **select the most suitable testing solution** for your application, requirements, and budget.

Qualitest USA (Corporate Sales Office)

Toll-Free: 1.877.884.TEST (8378) | Fax: 954.697.8211
E-mail: info@qualitest-inc.com
Address: 8201 Peters Rd., #1000,
Plantation, FL 33324, USA.

Qualitest Canada & International

Tel: +1.905.944.9825 | Fax: +1.905.944.0304
E-mail: sales@qualitest-inc.com
Address: 70 East Beaver Creek Rd., #9, Richmond Hill,
Ontario L4B 3B2, Canada.

Qualitest Latin America (Mexico and LATAM Region)

E-mail: ventas@qualitest-inc.com

Qualitest KSA (Regional Office)

Tel: +966 11 500 6659
Address: Level 7, 3.09, District 3, King Abdullah
Financial District, Riyadh, Saudi Arabia

Qualitest Singapore (ASIA PACIFIC Regional Office)

Tel: +65 6393 5480 | E-mail: singapore@qualitest-inc.com
Address: 50 Raffles Place, Singapore Land Tower,
Level 46, Singapore, 048623.

Qualitest Indonesia (Representative Office)

Tel: +62 21 2985 9522 | Fax: +62 21 2985 9889
E-mail: indonesia@qualitest-inc.com
Address: One Pacific Place Level 11, Jl. Jend. Sudirman,
Kav. 52-53, SCBD Area, Jakarta 12190, Indonesia.

Qualitest FZE (Regional GCC/ME Office)

Tel: +971 4 8819252 | Fax: +971 4 8819262
Email: gcc@qualitest-inc.com
Address: Jafza One, BB 1610, Jebel Ali Free Zone,
PO Box 261440, Dubai, UAE.

Qualitest India

E-mail: india@qualitest-inc.com
Address: 15th Floor, Dev Corpora, Pokhran Road No.1,
Eastern Express Highway, Thane, Maharashtra,
Mumbai, 400601, India

