Benchtop Educational Automatic Continuous Flow Microreactor Tubular Plate Microchannel Reactor System

Item Number: PL-WT07

Introduction

Achieve precise laboratory chemical synthesis with this premium automated continuous flow microreactor system featuring high borosilicate glass plates, robust PTFE tubular channels, and an advanced digital touch screen control interface for exceptional heat and mass transfer operational efficiency.

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Application	Description	Key Benefit
Fine Chemical Synthesis	Continuous synthesis of specialty compounds, additives, and high-value intermediates under precise stoichiometric control.	Reduces side-product formation and enhances overall space-time yield compared to batch vessels.
API & Pharmaceutical Development	Rapid screening of multi-step reaction pathways, energetic intermediates, and transient catalytic steps.	Safe handling of highly exothermic reactions via superior localized heat dissipation.
Flavors and Fragrances	Continuous processing of volatile, temperature-sensitive organic compounds and aromatic molecules.	Prevents thermal degradation and preserves product purity through precise temperature profiles.
Agrochemical Formulation	Automated pilot-scale synthesis of complex pesticides, herbicides, and crop protection active ingredients.	Ensures highly consistent batch-to-batch quality with automated recipe execution.
Academic Research & Education	Demonstration of advanced microfluidic principles, transport phenomena, and continuous flow chemistry in university laboratories.	Interactive touchscreen controls and visual glass reactors facilitate safe student instruction.
Nanoparticle Synthesis	Controlled precipitation and growth of uniform nanoparticles, such as Dendritic Mesoporous Silica Nanoparticles (DMSN).	Eliminates localized concentration gradients to achieve exceptionally narrow particle size distributions.

Parameter	Sub-Component / Category	Specification / Value
Overall Dimensions	Main System Frame	85 × 57 × 67 cm
Reactor Material	Plate-type Microreactor	High-borosilicate glass
	Tubular Microreactor	PTFE (Fluoropolymer)
Hold-up Volume	Plate-type Microreactor	15 mL
	Tubular Microreactor	47 mL
Temperature Range	Integrated System Limits	-20°C to 180°C
Working Pressure	Standard Operating Limit	0.3 MPa (Standard configuration)
	High-Pressure Option	Up to 3.0 MPa (With optional 316L stainless steel connectors)
Heat Exchange Area	Plate-type Microreactor	400 cm^2 (Double-sided heat exchange)
	Tubular Microreactor	4580 cm^2
Minimum Channel Size	Plate-type Microreactor	1.5mm × 1.0mm to 3.0mm × 1.0mm (Depth: 1.2mm – 1.8mm)
	Tubular Microreactor	Outer Diameter: 2.0 mm, Inner Diameter: 1.0 mm

Component Name	Quantity	Primary Material	Functional Purpose
Plate-type Microreactor	2	High-borosilicate glass	Provides primary reaction space with high visual transparency and thermal transfer
Tubular Microreactor	1	PTFE / 304 Stainless Steel	Secondary reaction path inside an oil bath for prolonged residence times
System Frame	1	304 Stainless Steel	Rigid structural support for all fluidic and electrical components
Transparent Shield	1	Polycarbonate (PC)	Impact-resistant safety enclosure to protect laboratory operators
Temperature Probe	3	Thermocouple	High-accuracy, real-time temperature tracking at critical stages
Smart Controller	1	Liquid Crystal Display (LCD)	Digital readout and local processing of thermal sensors
Pressure Relief Valve	1	Pure Copper (Filter Core)	Active filtration and continuous system pressure regulation
Pressure Sensor	1	PTFE Wetted Parts	Precise inline system pressure monitoring
Peristaltic Pump	3	Engineering Plastic	Pulse-free, high-precision reagent dosing and flow rate control
Flow Indicator	1	304 Stainless Steel	Visual conformation of thermofluid and oil circulation
One-way Check Valve	1	316 Stainless Steel	Prevents backflow and cross-contamination of reactant streams
Touchscreen Panel	1	LCD Glass	Central Human-Machine Interface (HMI) for fully automated recipe execution
Protective Collar	16	Rubber	Dampens vibration and prevents wear on critical connection lines
Corrugated Hoses	6	304 Stainless Steel / Silicone	High-temperature fluid transfer lines with integrated thermal insulation