

pilot-scale glass reactor with adjustable speed and heating

Pilot-scale glass reactor is a multifunctional reaction system designed for reaction process amplification and process optimization, which is widely used in the fields of new material synthesis, drug development, chemical pilot test and natural product extraction.

Pilot-Scale Glass Reactor

The pilot-scale glass reactor is designed for precise control of temperature, pressure, and stirring in scale-up chemical processes. Serving as a bridge between laboratory research and industrialized production, this equipment is ideal for pharmaceutical, chemical, bioengineering, materials, and environmental applications.

Main Features

1. **Reaction Vessel:** Made of 3.3 borosilicate glass for superior thermal shock resistance and acid/alkali corrosion resistance, ensuring long-term safe operation.
2. **Wide Working Conditions:** Temperature range from -80°C to 200°C ; pressure range from 0 to -0.1MPa , suitable for low-temperature synthesis and decompression reactions.
3. **Optimized Pipeline Design:** Jacket interface uses stainless steel insulated hoses to prevent interface stress damage from thermal cycling.



4. **High Sealing Stirring System:** Sealed bearings ensure smooth operation and prevent impurity entry into the reaction system.
5. **Anticorrosive Components:** PTFE stirring blades and PTFE-coated stainless steel shaft combine mechanical strength and chemical stability.
6. **Movable Bracket:** Stainless steel and aluminum alloy spray frame, neat and corrosion-resistant, with brake wheels for easy positioning and cleaning.
7. **Safe Discharge Design:** Inclined, non-accumulating discharge valve at the top reduces residue, simplifies collection and post-processing.
8. **Convenient Data Monitoring:** Digital display and vacuum gauge for real-time temperature, stirring speed, and system pressure monitoring.
9. **Structural Protection:** External circulation pipe fixed to frame, avoiding glass interface stress and extending service life.

Working Principle

1. Double-layer jacket allows heat/cold source (thermal oil, water, ethanol) to circulate, controlled by external thermostat; insulated hose connections prevent glass stress for stable temperature control.
2. Motor-driven stirring shaft creates effective mixing, solid suspension, and uniform heat transfer; blade shapes selectable for different fluid characteristics; pressure monitored by vacuum gauge for vacuum or atmospheric operation.
3. Inclined bottom discharge port enables smooth, residue-free material discharge and easy cleaning after reaction.

Application Areas

1. **Pharmaceutical Industry:** API synthesis, crystal screening, impurity reaction assessment.
2. **Fine Chemical Industry:** Development of flavors, dyes, additives, catalysts, high-value products.
3. **Organic Synthesis Research:** Condensation, cyclization, redox, coordination reactions.
4. **Bioengineering:** Enzyme reactions, cell extraction, optimization of organic acid or polysaccharide synthesis.
5. **New Material Development:** Synthesis of nanoparticles, polymers, MOFs, and high-performance materials.
6. **University Research Platform:** Reaction process scale-up, pilot demonstrations, teaching.
7. **Environmental Engineering:** Reactivity testing, water treatment additive optimization, experimental program development.

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Model	TR-10	TR-10Ex	TR-20	TR-20Ex	TR-50	TR-50Ex
Vessel volume	10L		20L		50L	
Jacket volume	8L	3L	9L	6L	13L	16L
Funnel volume	1.0L		2.0L		2L	
Operating pressure	Ordinary or negative pressure					
Working temperature	-80°C to 200°C					
Condenser cooling area	0.234 square meters		0.341 square meters		0.265 square meters	
Stirring speed	20rpm to 500rpm	50rpm to 500rpm	20rpm to 500rpm	50rpm to 500rpm	20rpm to 500rpm	50rpm to 500rpm
Power supply	100-	220-	100-240V,	220-240V,	100-240V,	220-240V,

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Model	TR-10	TR-10Ex	TR-20	TR-20Ex	TR-50	TR-50Ex
	240V, 50/60Hz	240V, 50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Drain port, ground clearance	320mm		320mm	355mm	320mm	
Dimensions(WxDxH)	845x640x1780mm		845x640x1910mm	870x580x1910mm	900*690*2100mm	900x690x2050mm

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Model	TR-100	TR-100Ex
Vessel volume	100 L	
Jacket volume	25 L	30L
Feeding flask volume	10 L	
Receiving flask volume	20 L	

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Model	TR-100	TR-100Ex
Glass material	High borosilicate glass 3.3	
Frame and connection parts material	SUS304 + aluminum plate spraying	SUS304
Operating pressure	Ordinary or negative pressure	
Working temperature	-80°C to 200°C	
Condenser cooling area	0.954 square meters	
Stirring speed	20rpm to 500rpm	50rpm to 500rpm
Power supply	100-240V, 50/60Hz	220-240V, 50/60Hz
Drain port ground clearance	340mm	
Dimensions(WxDxH)	1270x810x2360mm	1200x790x2360mm