

ISO 20653 IPX4K Rain Test Chamber

Automotive IPX4K Increased-Pressure Spray Test Chamber for Road Vehicle Electrical Equipment



Standards: ISO 20653 IPX4K (supports IEC 60529 and GB 4208)

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1. Product Overview

The KingPo ISO 20653 IPX4K Rain Test Chamber is designed to evaluate the waterproof performance of electrical and electronic components used in road vehicles. It performs the IPX4K spray test according to ISO 20653, which specifies higher water pressure compared to standard IPX4 testing.

This chamber is suitable for automotive electronics manufacturers, electric vehicle component suppliers, testing laboratories, and certification bodies to assess the sealing performance of sensors, control modules, lighting systems, wiring harnesses, and high-voltage components under increased-pressure water spray conditions that may be encountered during vehicle operation or cleaning.

2. Key Advantages

- Designed for ISO 20653 IPX4K Increased-Pressure Spray Testing**
Engineering: R400 mm oscillating tube with 25 precision nozzles (φ0.8 mm), higher test pressure (~400 kPa), and controlled flow rate per ISO 20653 IPX4K requirements.
Benefit: Enables accurate evaluation of component sealing performance under more severe water spray conditions than standard IPX4, supporting automotive and EV compliance testing.
- Mitsubishi PLC + Touch Screen Control**
Engineering: Advanced Mitsubishi PLC with 7-inch color touchscreen for precise programming of test parameters, swing angle, speed, duration, and rotation.
Benefit: Delivers highly repeatable, automated, and user-friendly testing with minimal operator intervention and excellent traceability.
- Dual-Function: IPX4K Spray + IPX1/IPX2 Drip Testing**
Engineering: Adjustable drip height (200–1650 mm) and switchable drip flow rate (1+0.05 or 3+0.05 mm/min) for combined IPX1/IPX2/IPX4K testing capability in one chamber.
Benefit: Provides flexible testing options and cost efficiency for laboratories performing multiple ingress protection levels on automotive components.
- Robust SUS304 Stainless Steel Construction**
Engineering: Full SUS304 stainless steel inner chamber, oscillating tube, and components with frequency conversion water control for stable operation and long-term corrosion resistance.
Benefit: Ensures durability in continuous high-humidity testing environments and maintains consistent performance with minimal maintenance.
- Rotating Sample Table with Precise Motion Control**
Engineering: Φ400 mm stainless steel sample table, 1 r/min rotation, 90° every 5 minutes, bidirectional, max load 50 kg.
Benefit: Provides uniform exposure from all directions and supports testing of a wide range of component sizes and weights.

3. Technical Specifications

3.1 Performance Parameters

Parameter	Specification	Remark / Notes
Applicable Standard	ISO 20653 IPX4K	Supports IEC 60529 and GB 4208
Inner Chamber Volume	1 m³ (customizable)	Suitable for various component sizes
Oscillating Tube Radius	R400 mm (SUS304)	25 nozzles, φ0.8 mm aperture, 50 mm spacing
Swing Angle	±180° or ±60° (customizable)	Adjustable per test requirements
Swing Speed	60°/s (adjustable)	Precise motion control
Test Flow Rate (per nozzle)	0.6 L/min	Approx. 400 kPa pressure
Sample Table	Φ400 mm, max load 50 kg	Stainless steel mesh

Rotation Speed	1 r/min, 90° every 5 min, bidirectional	Uniform exposure from all directions
Drip Height (IPX1/IPX2)	200–1650 mm adjustable	Combined testing capability
Drip Flow Rate	1+0.05 or 3+0.05 mm/min (switchable)	IPX1/IPX2 drip testing support

3.2 Control & Construction

Parameter	Specification	Remark / Notes
Control System	Mitsubishi PLC + 7-inch color touchscreen	Programmable parameters and duration
Water Pump	Stainless steel multistage centrifugal	Flow capacity 2000 L/h
Water Control	Frequency conversion control	Stable flow and pressure
Chamber Material	SUS304 stainless steel	Full corrosion resistance
Safety Protection	Leakage, overload, short circuit, phase protection	Comprehensive laboratory safety

4. Testing Principle

The IPX4K test exposes the equipment to water spray from an oscillating tube at defined higher pressure and angle while the sample rotates on a turntable. It uses increased water pressure compared to standard IPX4, simulating more severe water exposure from multiple directions that road vehicle components may encounter during operation or cleaning.

The test evaluates whether water can penetrate the enclosure and affect functionality, ensuring sealing reliability and durability under demanding automotive conditions.

5. Best Practices

1. Ensure nozzles are clean and free from blockage before each test.
2. Verify stable water pressure and flow rate within specified tolerances.
3. Position and secure samples correctly on the rotating table.
4. Maintain correct swing angle, speed, and rotation per ISO 20653 IPX4K.
5. Regularly inspect and maintain the water filtration system to prevent clogging.

6. Applications

- Automotive electronics manufacturers — IPX4K waterproofness testing of sensors, ECUs, lighting, and wiring harnesses
- Electric vehicle component suppliers — High-voltage component sealing verification
- Testing laboratories and certification bodies — ISO 20653 compliance testing
- Research institutions — Study of water ingress behavior in automotive environments
- Quality assurance teams — Routine verification of component sealing performance

7. Supply Options & Support

Customization available for chamber size and additional test functions. Technical support for equipment setup and test method application is available upon request.

8. Compliance & Manufacturer

This chamber is designed to meet ISO 20653 IPX4K requirements for increased-pressure spray testing of road vehicle electrical equipment. It also supports related standards including IEC 60529 and GB 4208.

Manufactured under ISO 9001, ISO 14001, and ISO 45001 certified management systems. CE, RoHS, PSE, and SGS documentation can be provided upon request according to the applicable equipment configuration.

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