



## JIS D 0203 Rain & Spray Test Chamber | Automotive Waterproof Validation System

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Standard Compliance: JIS D 0203-1994, KS R 0015, ISO 16750-4 (Partial)

### 1. Executive Summary

The **KingPo JIS D 0203 Rain & Spray Test Chamber** is a premier environmental simulation system specifically engineered for the automotive industry. It evaluates the moisture resistance and sealing integrity of external and internal automotive components—such as lighting systems, sensors, and electronic control units—against natural rain and high-pressure spray.

Fully compliant with **JIS D 0203** (R1, R2, S1, S2 conditions), the system utilizes a high-precision PLC-controlled architecture to simulate rigorous waterproof requirements, ensuring that every component meets the stringent safety and durability standards required by global OEMs.

### 2. Key Features & Metrological Advantages

- **Comprehensive JIS Simulation:** Dedicated hardware for **R1/R2 (Rain Sprinkling)** and

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S1/S2 (High-Pressure Spray) testing protocols.

- **Advanced Closed-Loop Control:** High-accuracy flow sensors and frequency converters integrated with a PLC system for precise water pressure regulation.
- **Precision Drive System:** Features a **Panasonic servo motor** for turntable rotation and a dedicated stepper motor for water pipe oscillation, ensuring ultra-stable speeds.
- **Dual-Standard Capability:** While optimized for JIS D 0203, the system is engineered to handle extended protocols, including splash water tests with controlled temperature differentials.
- **Premium Material Grade:** Full **SUS304 stainless steel** construction (interior and exterior) for maximum corrosion resistance against deionized or salt-laden water.

### 3. Detailed Technical Specifications

#### 3.1 JIS D 0203 Test Condition Parameters

Condition	Mode	Simulation Type	Key Application
R1	Rain	1.9 mm/min Sprinkling	Standard rain simulation for general parts
R2	Rain	3.2 mm/min Sprinkling	Heavy rain simulation for exposed parts
S1	Spray	24.5 L/min High-pressure	Direct water spray from external sources
S2	Spray	39.2 L/min High-pressure	Extreme water ingress / car wash simulation

#### 3.2 Chamber Engineering & Performance

Category	Parameter	Specification	Remark / Notes
Performance	Water Flow Rate	0.1 L/min – 40 L/min	Controlled via digital flowmeter
	Water Pressure	0 – 500 kPa (Adjustable)	Closed-loop sensor feedback
	Turntable Speed	1 – 17 r/min (Adjustable)	Panasonic Servo Control
	Pipe Rotation	23 r/min (45° angle)	Stepper motor driven
Construction	Interior Material	<b>SUS304 Stainless Steel</b>	Mirror finish, easy to clean
	Internal Volume	1000 × 1000 × 1000 mm	1.0 m³ Testing Space
	Load Capacity	50 kg	Heavy-duty rotating stage
Measurement	Control System	7-inch Color Touchscreen	PLC-based, English/Multilingual
	Data Resolution	0.01 L (Flow) / 1s (Time)	High-precision acquisition
	Observation	Tempered Glass Window	Includes wiper and LED lighting

### 4. Engineering Excellence & Professional Construction

- **Intelligent PLC Architecture:** The system employs a sophisticated PLC logic controller that manages the synchronization between water flow, pressure, and the dual-axis rotation of the turntable and nozzle arms.
- **Sealing & Exhaust:** The chamber features a heavy-duty silicone door seal and an independent exhaust system to prevent localized pressure buildup and moisture leakage into the laboratory environment.

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- **Corrosion-Proof Components:** All internal piping, nozzles, and specimen stages are manufactured from SUS304 or non-corrosive polymers to ensure zero contamination of the test liquid.
- **Safety Matrix:** Includes comprehensive protections for water shortage, phase sequence errors, electrical leakage, and over-current, ensuring operator safety during long-term automated cycles.

## 5. Testing Principle & Procedure

The specimen is secured to the center of the turntable. Depending on the target JIS condition (R or S), the system activates the corresponding spray head:

1. **R-Series (Sprinkling):** Water is delivered via natural drip/spray heads to simulate overhead rain.
2. **S-Series (Spray):** High-pressure nozzles direct a concentrated stream at the specimen while the turntable rotates to ensure 360° exposure.
3. **Data Capture:** The PLC monitors and records flow stability and duration. Post-test, the component is examined for ingress, dielectric strength, and functional stability.

## 6. Common Error Mitigation

- **Nozzle Integrity:** Regularly inspect spray heads for mineral buildup. Using deionized water is strongly recommended to prevent clogging.
- **Alignment Accuracy:** Ensure the specimen is centered on the turntable; an offset center can cause uneven spray distribution and skewed results.
- **Pressure Stabilization:** Always allow a 30-second stabilization period after the flow starts before beginning the official test timer.
- **Drainage Management:** Verify that the internal filtration system is clear to prevent water backup, which could result in partial immersion of the specimen.

## 7. Industrial Applications & Business Value

- **Automotive OEMs & Tier 1s:** Essential for validating headlights, sensors, cameras, and exterior trim.
- **EV Battery Systems:** Validating the sealing integrity of battery enclosures and high-voltage charging ports.
- **Certification Labs (SGS, TÜV, Intertek):** Providing traceable JIS D 0203 and KS R 0015 compliance data for international markets.
- **R&D Optimization:** Rapidly iterate on gasket and seal designs to reduce field failure rates and warranty claims.

## 8. Ordering & Support Information

Model Code	Description	Scope of Supply
KP-JISD0203-1000	Rain Spray Chamber (1.0m³)	Chamber, PLC, Turntable, R/S Nozzles
KP-JISD0203-CAL	Traceable Calibration	Annual certificate & sensor validation

### Standard Package Includes:

- Main SUS304 Test Chamber
- High-Precision Flow & Pressure Control System

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- Adjustable Stainless Steel Specimen Stage (50kg)
  - Factory Traceable Calibration Certificate
  - Comprehensive Operations & Maintenance Manual
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**Manufacturer Information:**

**KingPo Test Equipment Co., Ltd.**

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