

Q-SUN Tester Training

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Q-Lab Corporation

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Q-SUN Principles of Operation

Q-SUN Xenon Arc Models

Simulate light (outdoor direct sunlight, indoor filtered light); heat (elevated temperature), and water (humidity and water spray)

模拟光照（户外直射阳光，晒进室内的阳光）；热（高温），和潮湿（相对湿度和水喷淋）



Q-SUN Overview (Flat Array)

- 1) User interface 用户界面
- 2) USB port for data transfer 数据传输USB接口
- 3) Xenon lamps with irradiance control 氙弧灯管
- 4) Optical filters 滤光片
- 5) Water spray 水喷淋
- 6) Onboard irradiance sensors 辐照度探头
- 7) Black Panel Temp sensor 黑板温度计
- 8) Specimen holders 样品架
- 9) Relative Humidity/CAT sensor 温湿度传感器



Q-SUN Overview (Rotating Rack)

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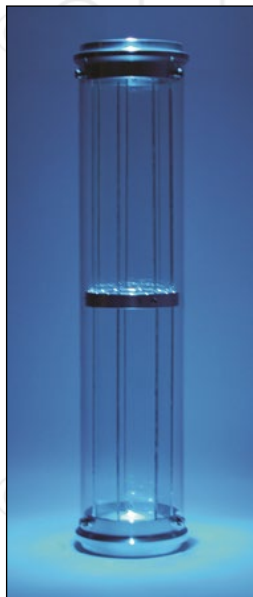


Q-SUN Optional Features

Model/ Configuration		Tester Features					
		Gen 4 + High Irradiance (-E) ³	Humid Control (-H)	Chamber Air Chiller (-C)	Water Spray (-S)	Back Spray (-BS) ⁶	Dual Spray (-DS) ⁶
Xe-1	Xe-1-BE	●					
	Xe-1-BCE	●		●			
	Xe-1-SE	●			●		
	Xe-1-SCE	●		●	●		
	Xe-1-WE	●			● ⁴		
Xe-2	Xe-2-HE	●	●				
	Xe-2-HSE	●	●		●		
	Xe-2-HBSE	●	●		●	●	
Xe-3	Xe-3-HE	●	●				
	Xe-3-HCE	●	●	●			
	Xe-3-HSE	●	●		●		
	Xe-3-HSCE	●	●	●	●		
	Xe-3-HBSE	●	●		●	●	
	Xe-3-HBSCE	●	●	●	●	●	
	Xe-3-HDSE	●	●		●		●
	Xe-3-HDSCE	●	●	●	●		●
	Xe-3-HDSBSE	●	●		●	●	●
	Xe-3-HDSBSCE	●	●	●	●	●	●

Q-SUN Light Delivery

Xenon arc lamps



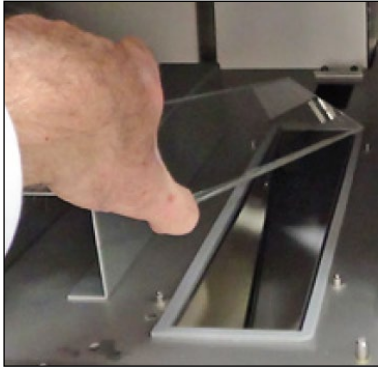
Xe-2 lantern

Optical filters

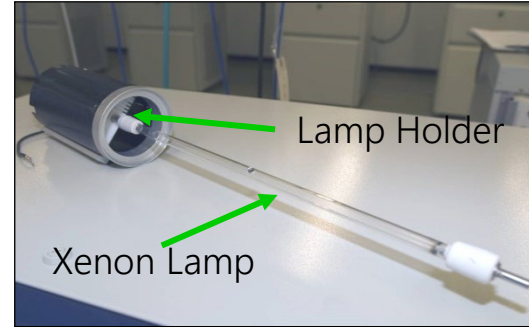


Xe-1 / Xe-3 flat filter

Optical Filters and Lamps



Xe-1
and
Xe-3

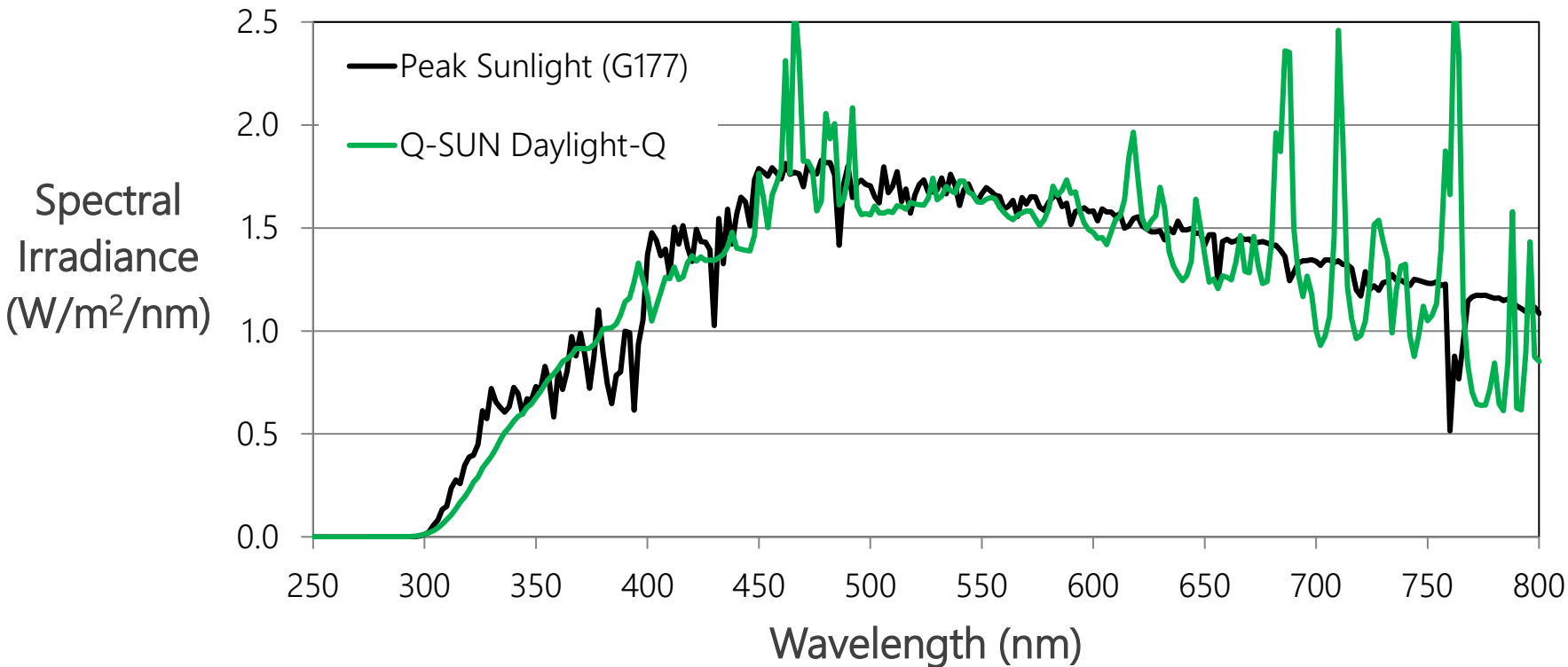


Xe-2



Filter
Lantern

Xenon Arc Spectrum



Q-SUN Irradiance Capability

	Xe-1 & Xe-3 Irradiance Values Typical (& Maximum) ^{A,B,C}			Xe-2 Irradiance Values Typical (& Maximum) ^{A,B,C}		
	W/m ² /nm @ 340 nm	W/m ² /nm @ 420 nm	W/m ² @TUV (300-400 nm)	W/m ² /nm @ 340 nm	W/m ² /nm @ 420 nm	W/m ² @TUV (300-400 nm)
Daylight-F	0.80 (1.30)	1.50 (2.40)	75 (125)	0.80 (0.95)	1.50 (1.70)	75 (85)
Daylight Q	0.68 (1.10)			0.68 (0.80)		
Extended UV (-Q/B, -Quartz ^D)				0.51 (0.61) ^E		
Daylight-B/B				55 (65)		
Window (-Q, -B/SL)				70 (80)		
Window (-SF5, -IR, -B04 ^F)				42 (62)		
	0.55 (0.85)	70 (108)	0.55 (0.65)		70 (80)	
	-	42 (68)	-		42 (62)	

Achievable irradiance values vary by optical filter, tester type, and control point
 辐照度水平和光学滤片, 机器型号和控制点有关

SOLAR EYE Irradiance Control System

- SOLAR EYE Irradiance Control maintains the same light output at all times

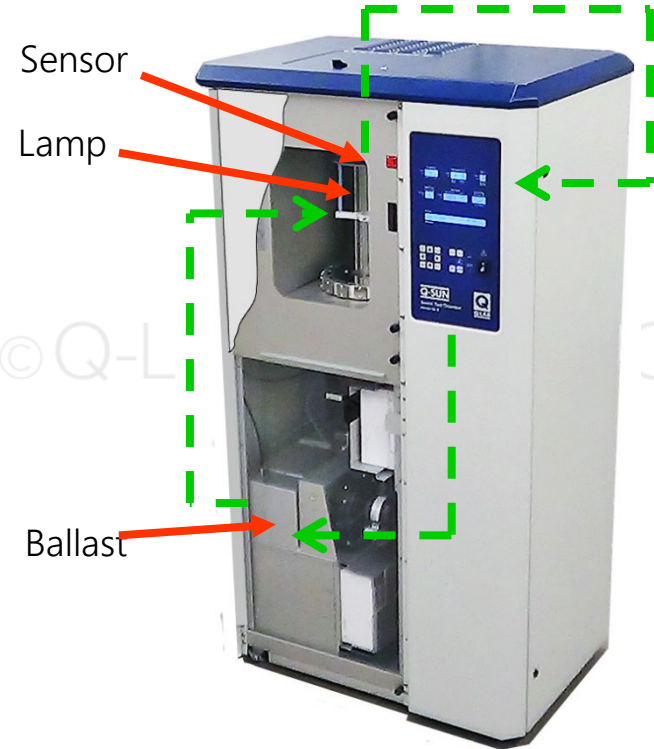
辐照度控制保证了辐照度的输出稳定

- Ballasts control lamp output

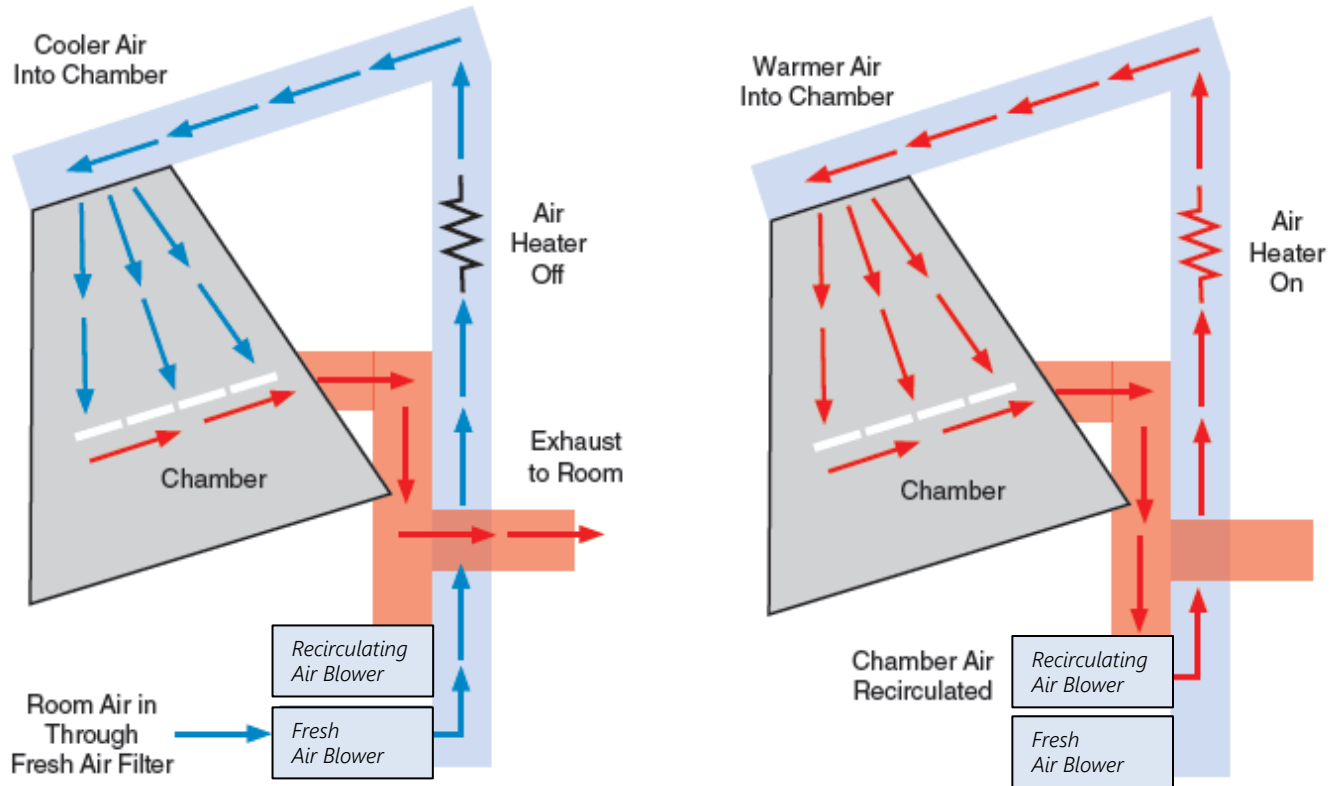
整流器控制灯管输出

- Allows for excellent repeatability and reproducibility



实验结果保证可重复性和可再现性



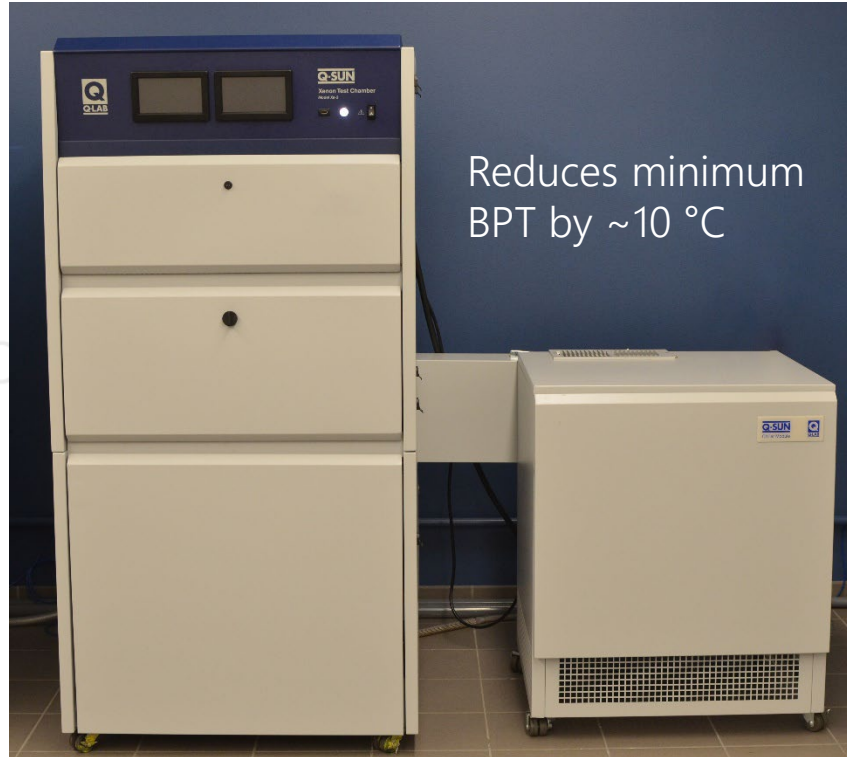
Temperature Control



Black Panel Temperature Sensors

Panel	Construction	ASTM Designation	ISO Designation	Temp Range (°C)
 A photograph of an uninsulated black panel temperature sensor. It consists of a black rectangular panel with a black handle and a blue probe with a silver tip. A blue pen is placed next to it for scale.	Black painted stainless steel	Uninsulated Black Panel	Black Panel	45-110
 A photograph of an insulated black panel temperature sensor. It features a black rectangular panel mounted on a white PVDF base. A black handle and a blue probe with a silver tip are attached. A blue pen is placed next to it for scale.	Black painted stainless steel mounted on 0.6 cm white PVDF	Insulated Black Panel	Black Standard	50-120

Optional Chiller (Xe-1 / Xe-3)



Q-SUN Water Delivery

- Water Spray (optional)
 - Front 前喷
 - Back (Xe-2 / Xe-3) 背喷
 - Dual (Auxiliary) (Xe-3) 双喷
 - Immersion (Xe-1) 水浸
- Relative Humidity control (Xe-2 / Xe-3) 相对湿度控制

Q-SUN Water Quality

- Purified (RO/DI) water is required
使用去离子水
- Spray water requires even higher purity and also low silica
水喷淋用水要求高纯度低硅含量水质
- Q-Lab follows ASTM G151 recommendations

Water Delivery	Resistivity ($\Omega \cdot \text{cm}$)	Conductivity ($\mu\text{S}/\text{cm}$)	Silica (ppm)	Total Dissolved Solids (ppm)	pH
Spray	> 5 M	< 0.2	< 0.1	< 0.1	6-8
Humidity	> 200 k	< 5.0	No requirement	< 2.5	6-8

Xe-1 / Xe-3 Water Spray System

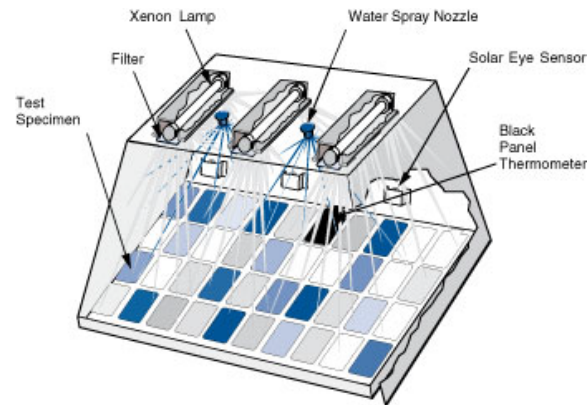
- Features
 - Pulse Rate Control 喷淋脉冲比
 - Automatic Fault Detector 错误诊断
- Two nozzles, used for:
 - Mist 细雾
 - Thermal Shock 热冲击
 - Erosion 侵蚀



Xe-1



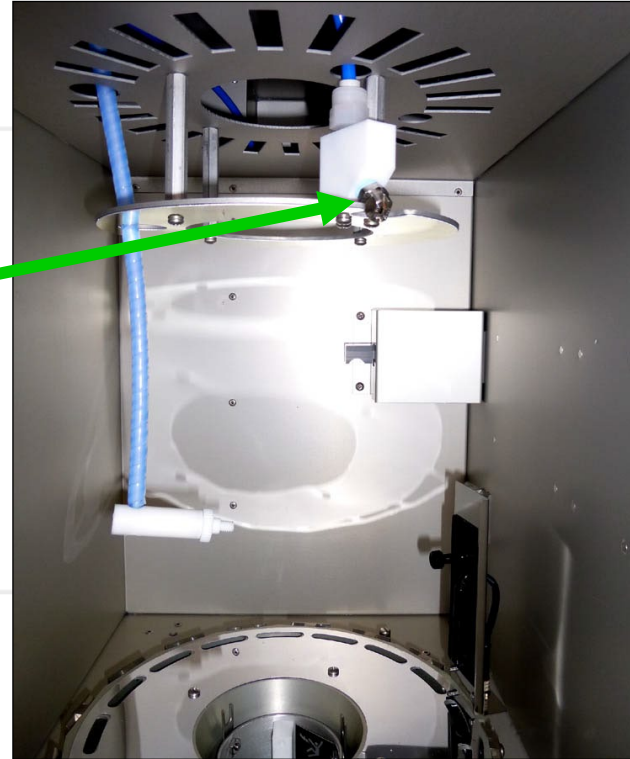
Xe-3



Xe-2 Water Spray System

- Features
 - Pulse Rate Control
 - Automatic Fault Detector
- One nozzle, used for:
 - Mist
 - Thermal Shock
- Second Nozzle for optional Back Spray

有背喷功能选项



Specialized Test Modes



Xe-1 Immersion



Xe-3 Dual Spray

Relative Humidity Control (Xe-2 / Xe-3)

- Feedback Loop System
- RH/CAT Sensor
- Main Controller
- Humidity Generator 加湿器
 - Nebulizer (超声波) in Xe-2
 - Boiler (锅炉) in Xe-3



Xe-2



Xe-3



Specimen Mounting

- Specimen Capacity
 - Xe-1: 17 (51 × 102 mm)
 - Xe-2: 31 (45 × 132 mm)
 - Xe-3: 55 (51 × 102 mm)
- Type of holder
 - Open-Backed (thick, rigid specimens)
 - Solid-Backed (flexible specimens)
 - Three-dimensional
- Specimen Tray
 - Solid
 - Mesh (open)
- Masking
 - Commonly used in textile testing

Thank you for your attention!

Questions?

Send your inquiry to:
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