

GX75

XENON
WEATHER
METER

Suga Test Instruments
Co., Ltd.



*Are you satisfied with your
current weather meter?*

This is the World Wide Model

Since 1920

The history of Suga Test Instruments is the history of weather meters. Our weathering tests are in correlation with ISO and other international standards (ISO 4892-2, SAE J2527, ASTM G155, AATCC TM16.3, etc.). Since 1958, Suga Test Instruments has been taking part in conferences for international standards such as ISO, IEC, ASTM, AATCC, CIE and JIS.

*ISO 4892-2
SAE J2527
ASTM G155
AATCC TM16.3*

GX75 is designed to artificially simulate outdoor and indoor deterioration factors such as sunlight, high and low temperatures, rainfall and dew. It exposes materials to these factors and accelerates the deterioration process to predict their lifespan in a relatively short period of time.

By various industrial demands, we have established incomparable and innovative weathering technology.

Test standards are periodically revised. Please check latest standards. Options or customization is required, depending on test standards.

Advanced weathering technology in a compact body



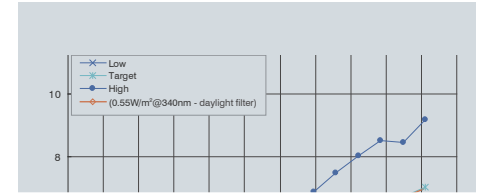
Highly reliable simulation of solar radiation

P.3, P.4



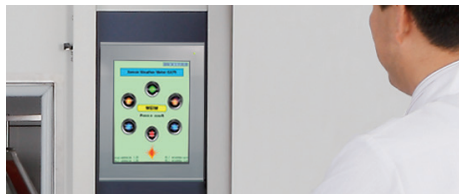
Accurate repeatability and reproducibility

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Consistent and uniform reliable test results

P.7



User-friendly operation

P.8



Superior performance

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Various specimen holders

P.9

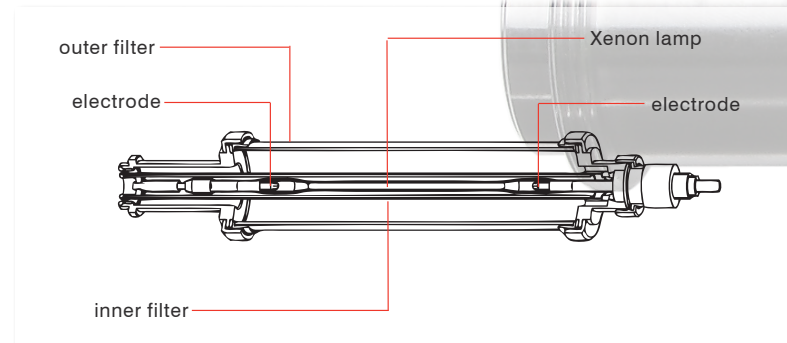


Matches various global standards

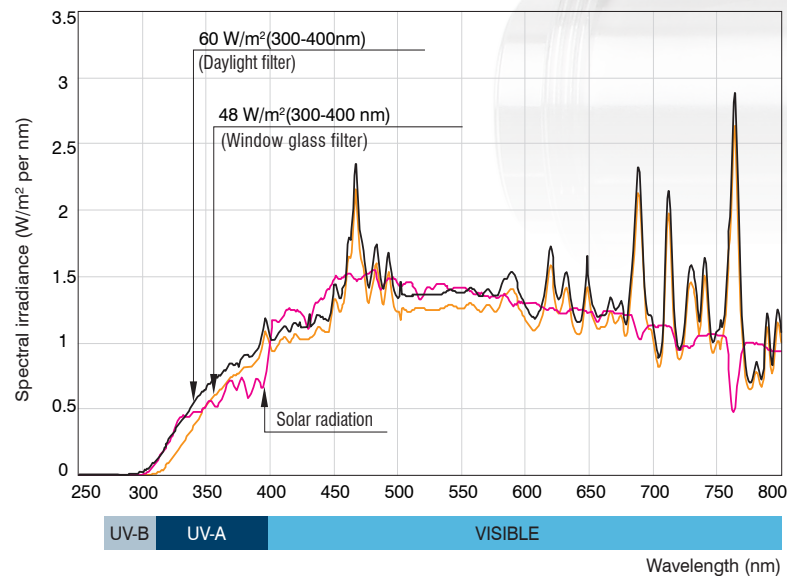
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Highly reliable simulation of solar radiation

7.5 kW WATER-COOLED XENON LONG LIFE ARC LAMP



Spectral-irradiance comparison between xenon arc lamp and solar radiation



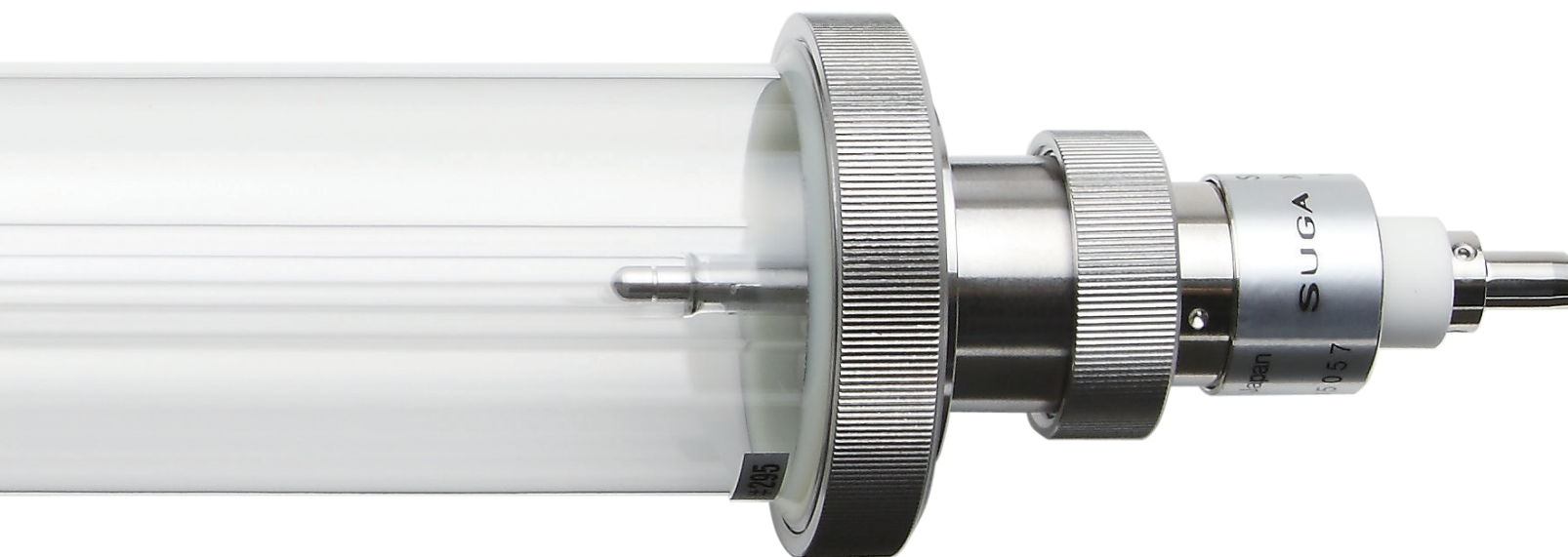
Accurately simulates solar radiation

The 7.5kW water-cooled xenon long life arc lamp used for the light source of GX75 can accurately simulate the spectral irradiance of both indoor and outdoor sunlight via combination of inner and outer filters.

Filter with less solarization: high transmittance of ultraviolet range

The filter developed by Suga exclusively for its xenon lamps has very minimal solarization, allowing for about 2500 hours of use, and has an excellent transmittance for ultraviolet range, which is the main cause for material degradation. This allows for the filters of Suga's xenon lamp house and the lamp to be replaced simultaneously (excluding with inner filter of #275).

Type	Standard						SUGA filter combination	
	SAE	ASTM		ISO	AATCC		Inner filter	Outer filter
Extended UV filters	J1885 J1960 J2412 J2527	G155	-	105-B06	-	-	Quartz	#275
Daylight filters	J2527	G155	D6695 D4798 D5071	105-B10 3917	4892-2 16474-2	-	Quartz	#295
							#275	#275
Window glass filters	-	G155	-	105-B02 105-B04 105-B06	4892-2 16474-2	TM16.3	Quartz	#320
							#275	#320



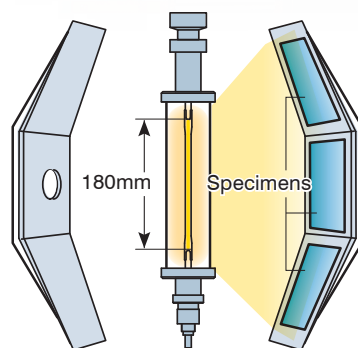
2500 Hours Long Life Arc Lamp (at 60W/m², 300-400nm)

Suga's cutting-edge technology solves following problems for incomparable long-life.

- Degradation of transmittance of the lamp interior surface.
- Irradiance increase in the infrared range with sustaining the irradiance in the ultraviolet range.

Capable of delivering even distribution of irradiance to specimens

The light is emitted from the distance of 180mm between the electrodes, delivering highly even distribution of irradiance to a maximum of 60 specimens placed around the lamp.



Minimize the power reduction of the ultraviolet irradiance

A high power rating of 7.5kW and long arc can minimize the power reduction. It is capable of testing at twice the power of ultraviolet irradiance. (60W/m² to 120W/m² between 300 - 400nm)

Efficiently cuts the infrared range, preventing the chamber air temperature from rising

To prevent the chamber from overheating is an important factor to improve test reproducibility. In order to effectively cut the infrared portion of light, which increases as the lamp is more used, the amount of water (which absorbs infrared light) between the lamp and the filter is thickened by determining the outer filter's size as $\phi 60\text{mm}$.



Lamp and the instrument both manufactured in-house

The lamp for accelerated weathering test instrument is manufactured in-house along with its electrode to provide a perfect match of lamp, ignition and instrument.



Manufacturing xenon lamps



Inspecting xenon lamps

Accurate repeatability and reproducibility

“Automatic irradiance control”

“Automatic black panel(standard) temperature control”

Tests that are performed multiple times under the same settings, must be able to give the same test results. Repeatability and reproducibility are crucial factors.

To improve the test reproducibility, GX75 is equipped with “Automatic irradiance control” and “Automatic black panel(standard) temperature control” developed by Suga. Light receptor and BPT(BST) sensor attached to specimen rack, measure and control the irradiance and BPT(BST), while rotating at the same position with specimen surface.

Here are our leading weathering technologies we have established with high quality-oriented customers from automotive and other industries.

Controls the irradiance on the specimen surface constantly

GX75 automatically and consistently controls the irradiance from the light source with its light receptor attached to the specimen rack that rotates together with other specimens. It controls at the ultraviolet broadband of 300 to 400nm, which is the main factor for material degradation (narrow band control of 340nm or 420nm are also available). The periodic calibration of the light receptor is to guarantee the accurate irradiance and the test reproducibility. Rather than removing the lamp house and attaching an expensive calibration standard lamp, the light receptor can be checked and calibrated with the simple operation of the attached calibration radiometer (R). The calibration radiometer (R) is accurately calibrated with our calibration technology accredited by ISO/IEC 17025.



Light Receptor

Controls the temperature and humidity(dew) constantly

The BPT or BST and the chamber air temperature-humidity are automatically controlled via a system composed of heater, humidifier and temperature-humidity control unit.

BPT or BST is constantly and automatically controlled by the BPT or BST sensor on the specimen surface. Touch panel controller can select BPT (BST) control or BPT (BST) and CAT control.

GX75 incorporates the air vent method of introducing ambient air to control the temperature and humidity.

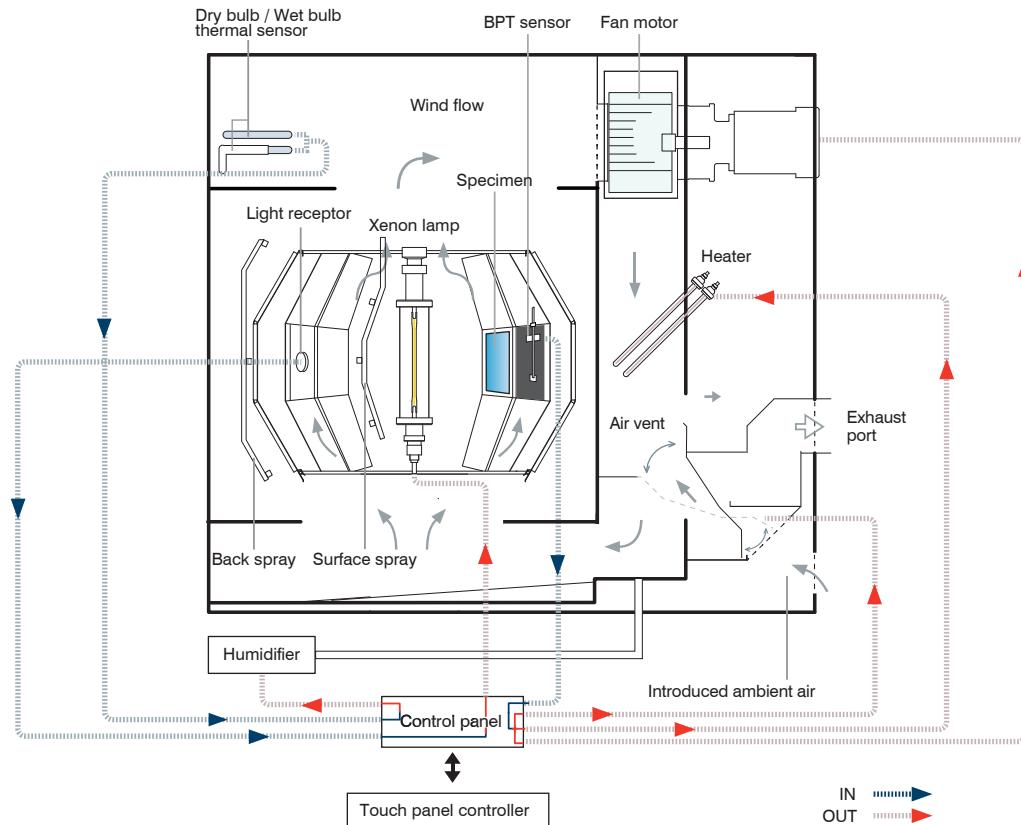


BPT Sensor



BST Sensor

Controll diagram of GX75



Humidifier

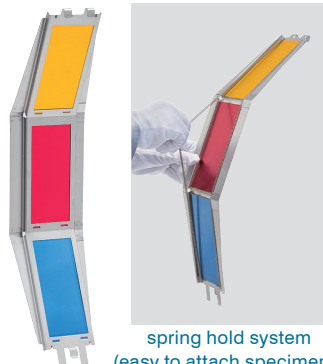
Evaporated steam humidifier has good response of controlling humidity by adjusting heater, which does not require air compressor. It provides only steam into the chamber without any problem that water stain(solid impurity) adhere to test specimens.

Specimen spray

Spray for specimen's surface simulates rain and spray for specimen's back simulates dew according to various standards.

Specimen holder

3 in one specimen holder(Upper/middle/lower position), prevents light leakage and reduces disturbance of air-flow on the specimens surface.



BPT : Black Panel Temperature BST : Black Standard Temperature

Automatic calibration of irradiance for GX75
ISO/IEC 17025 calibration certificate is available*

A calibration radiometer comes as a standard accessory.

R

RADIOMETER



The radiometer attached to the specimen rack of GX75 weather meter can continuously measure irradiance and radiant exposure. The measured calibration results can be input to GX75 by pushing the button of the touch panel controller, using the automatic calibration function. Automatic calibration function avoids, human errors such as "input mistakes".

ISO/IEC 17025 accredited calibration certification, can be issued for radiometer*, platinum resistance thermometer, and pressure gauge. This is certified by ANAB.

Suga's calibration ability supports the test's stability and reproducibility

The stability of the irradiance control and the temperature - humidity control, is determined by the accuracy of BPT (BST) and the chamber temperature-humidity sensor. The BPT(BST) sensor can be calibrated with a calibration Black panel (Black standard) thermometer.



Black panel thermometer
(for calibrating BPT sensor)

ISO/IEC 17025 : General requirements for the competence of testing and calibration laboratories.
ANAB : ANSI National Accreditation Board

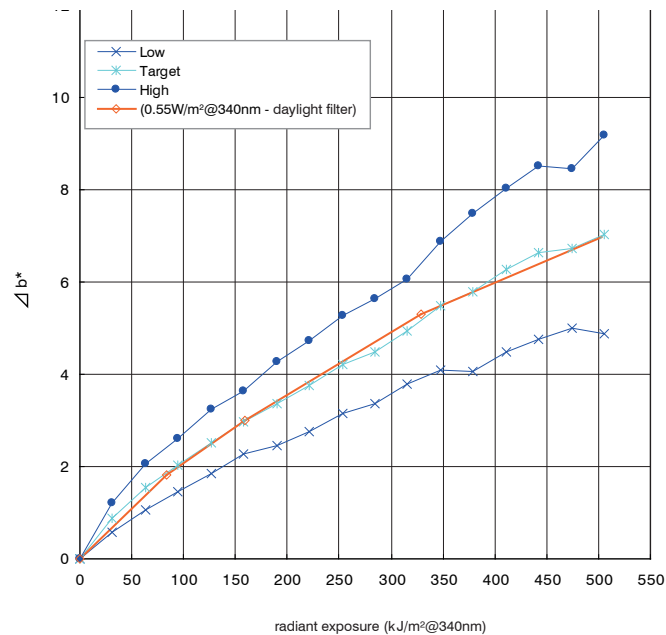
Annual periodic calibration is required for followings.
-Calibration radiometer (R)
-Black panel thermometer or Black standard thermometer
-BPT or BST sensor
-Chamber air temperature and humidity sensor

*Model : RX34(300nm-400nm)

Consistent and uniform reliable test results

GX75 utilizes the latest control technology that allows for a wide range of irradiance, temperature and humidity at high accuracy. As a global standard model, its performance is confirmed via testing its accuracy and repeatability with the SAE reference specimen.

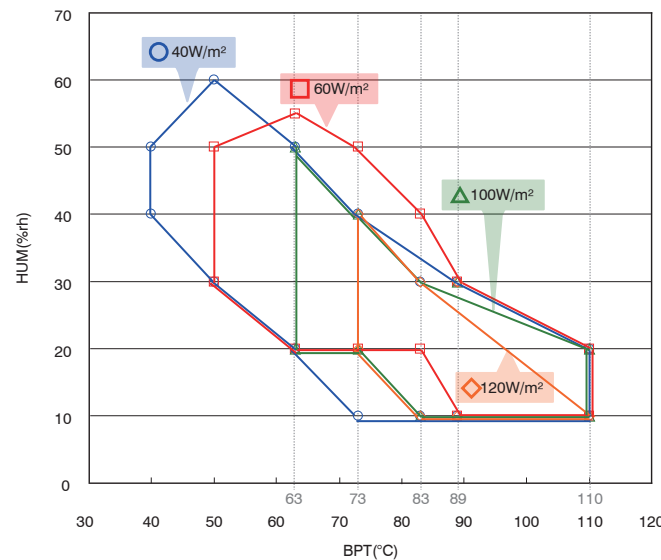
Test result



The graph above is the result of measurement using a polystyrene film as specified in SAE J2527.(daylight filter)

An installation place of 23°C±5°C and 65%rh±10%rh is recommended. (IEC Publication 160, JIS Z 8703)

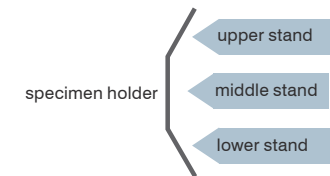
Controllable range
(Filter : daylight filter)



BPT : 40 to 110°C
Humidity : 10 to 60%rh

It is not possible to control all combination with range above. Controllable range depends on irradiance as the graph above.

Distribution of irradiance and temperature



Distribution of irradiance (W/m²)

upper stand	60.0
middle stand	60.0
lower stand	61.1

Distribution of temperature (°C)

upper stand	64.5
middle stand	63.0
lower stand	61.4

Irradiance : 60W/m² (300–400nm)

Test condition : BPT 63°C / CAT 38°C / 50%rh (synchronous control)

The figure above is the result of measuring the irradiance and the specimen's surface temperature on the top, middle and the bottom sections of the specimen holder. All sections achieved uniform values.

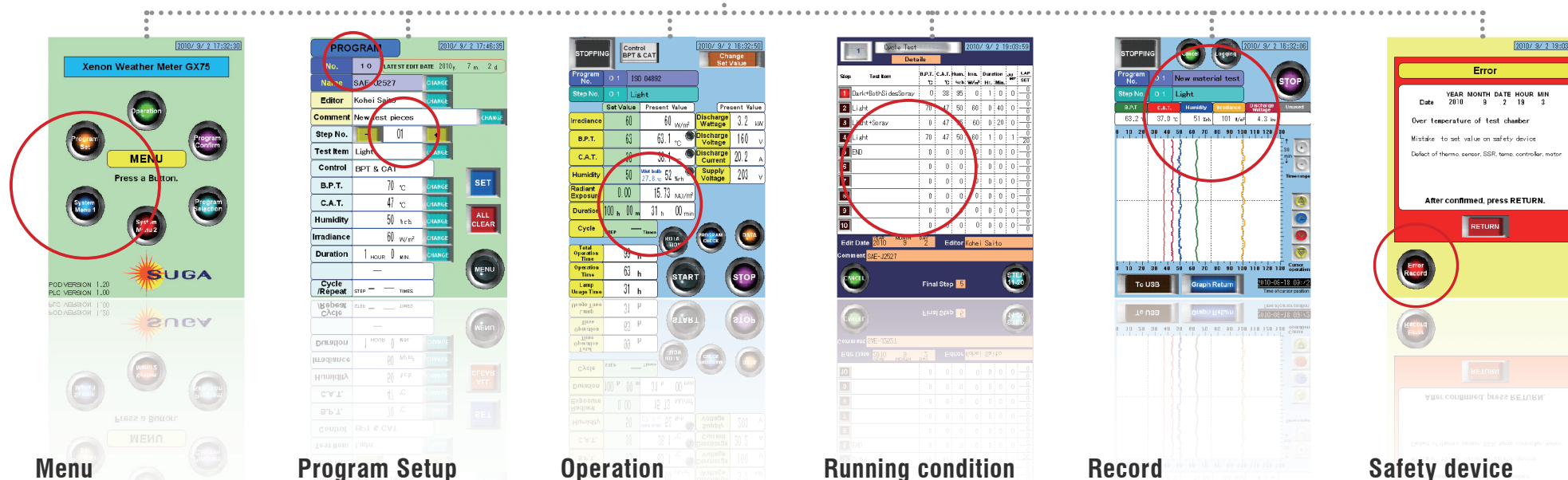
User-friendly operation



GX75 is operated with an 8.4 inch liquid crystal colour touch panel controller that allows for easy and direct operation. It provides data record and USB memory port.

LAN connection capability

Our attached central management software, GX-LAN, displays the running conditions on a distant PC monitor.



Menu

The buttons are divided by colour, allowing the user to visually distinguish which buttons to press, thus reducing the stress of pressing the wrong button.

Program Setup

Up to 15 test programs can be set up. Each program will be composed of up to 19 different test items as required. Each item can be set up on a same screen. Also includes a warning display that informs the user when there is an input error.

Operation

All the running conditions can be checked on a same screen. The set value and the present value are displayed in green and white respectively, allowing the user to distinguish the two, at a glance.

Running condition

Up to 10 items for each program is observed in the same screen. The condition of the ongoing test can be checked, at a glance.

Record

BPT or BST, chamber air temperature, humidity, irradiance, and discharge wattage can be displayed and recorded together with test item, test duration and present time. The data can be taken out by USB memory.

Safety device

Over 20 safety devices protect the test specimens and the instrument. The defection and the possible causes are displayed on the same screen, making it easier for the user to resolve the problem. The error record can be viewed by pressing the error record button.

BPT : Black Panel Temperature BST : Black Standard Temperature

Superior performance and Various specimen holders



Specification of GX75

Light source	Xenon lamp (water-cooled) 7.5kW:1unit		
Irradiance	40 to 120W/m ² (300-400nm, Filter:daylight filter)		
Test	Light, Light + Surface spray, Dark, Dark + Back spray, Dark + Both sides spray		
Temperature and humidity range	Light	BPT 63 to 110±2°C (depending on irradiance) Humidity 50±5%rh (depending on test condition)	
	Light + Surface spray (rain)	CAT 38±2°C	
	Dark	CAT 38±2°C, Humidity 95±5%rh	
	Dark + Back spray (dew)	CAT 38±2°C	
	Dark + Both sides spray	CAT 38±2°C	
Specimen	Dimension:150×70×1mm, Number:60pcs.(exclude BPT sensor, light receptor)		
Specimen holder	Inclined type, Number:21pcs.		
Specimen rack	Diameter:approx.φ648mm, Speed:approx.2rpm		
Electric capacity	Three-phase 200V Approx.55A (50Hz/60Hz), ELB:75A (For other voltage, step-down transformer is available.)		
Water volume	Pure water	For wet bulb pot, humidifier	Approx.5L/h
		For surface spray	Approx.0.24L/min (at 0.1MPa)
		For back spray	Approx.0.24L/min (at 0.1MPa)
	Tap water or cooling tower water	For cooling the lamp cooling water	Approx.6L/min (at water temp. 25°C)
External dimension	Approx.103×144×185cm (WxDxH)		
Operating weight	Approx.540kg		
Installation place	23±5°C in temperature, 65±10%rh in humidity		

BPT : Black Panel Temperature CAT : Chamber Air Temperature

Special Specimen Holders

Your requested holders can be made as special.

Automobile interior material	Dumbbell-shaped test specimen	Ball	Finished product	Lens filter	Bottle
					

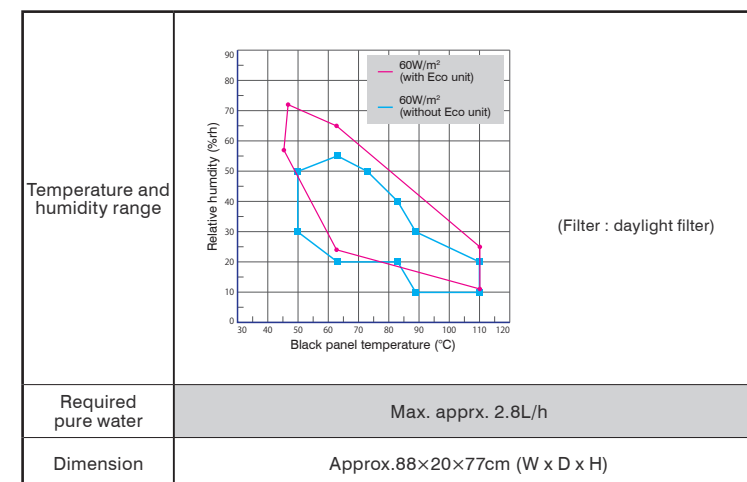
GX75CE is with CE marking. It is also important for the test's reproducibility to control the spray water's quality. We ask for our users to prepare water with the quality that meets ASTM G155 (Electrical conductivity 5μS/cm, solid content under 1ppm, silica concentration under 0.1ppm). Product specifications are subject to change without prior notice for product improvement.

Option : Eco Unit

The fluctuation in chamber air temperature and humidity can be suppressed, by using the Eco Unit. As a result, energy and water consumption can be reduced, by shortening heater and humidifier ON time. Also, temperature and humidity control range is expanded.



Eco Unit on the GX75 back side.



It is not possible to control all combination with range above. Controllable range depends on irradiance as the table above.

Matches various global standards

Compatible Standards

SUGA supplies test instruments those satisfy the latest standards at all times, by participating in various industrial standardization of weather meters.

Standard	ISO/IEC	ASTM / SAE / AATCC / DIN	JIS / JASO
Plastics	ISO 4892-1		JIS K 7350-1
	ISO 4892-2		JIS K 7350-2
Paints	ISO 16474-1		
	ISO 16474-2	ASTM D6695	JIS A 5600-7-7
		ASTM D7869	
Building materials	ISO 11431		JIS A 1415 / JIS A 1439
Printed matters & Inks	ISO 12040		JIS K 5701-1
Textiles	ISO 105-B02 / ISO 105-B10	AATCC TM16.3	JIS L 0891
	ISO 105-B04	AATCC TM169	JIS L 0843
	ISO 105-B06		
Aluminium	ISO 2135		JIS H 8685-1
Glass	ISO 3917		
Rubber	ISO 4665		JIS K 6266
			JIS K 6404-4
Electric / Electronics	IEC 60068-2-5		
Automotive		SAE J2527	
		SAE J2412	
			JASO M 346
			JASO M 351
			JIS D 0205
		DIN 75202	
Railway			JIS E 4037
Packing Material			JIS Z 0237 / JIS Z 1528
Non-metallic Materials		ASTM G151	
		ASTM G155	
Safety sign	ISO 17398		JIS Z 9107
			JIS Z 9117
Test Instruments			JIS B 7754



ISO : International Organization of Standardization, IEC : International Electrotechnical Commission, ASTM : American Society for Testing and Materials,

AATCC : American Association of Textile Chemists and Colourists, SAE : Society of Automotive Engineers, JIS : Japanese Industrial Standards, JASO : Japanese Automotive Standards Organization

GX75 conforms to each automobile manufacturer's standards.

Ford	GM	HONDA	MAZDA	MITSUBISHI	NISSAN	PEUGEOT	RENAULT	SUBARU	SUZUKI	TOYOTA	VDA	VW
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Test standards are periodically revised. Please check latest standards.

Options or customization is required, depending on test standards.

SUGA Global Network



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Please be sure to check safety and operating environment and to read the specification sheet, drawing, installation manual and installation check sheet before installing the test instruments. The test instruments shall be carried out daily cleaning, daily checking, regular maintenance and calibration. Please be sure to read the instruction manual and operate the test instruments properly. Note that the specifications of the test instruments described in this catalog are subjected to change without notice due to improving. Please check the specification sheet for the current specifications and accessories / optional products. Also, the information of test standards is as of March, 2018. As the test standard is periodically revised, please check the latest standards.