



SSL Resource Goniophotometer Overview



Basic Goniophotometers
SSL C-1 Series

Advanced Goniophotometers
SSL LUMI Series

Advanced Goniophotometers
SSL DECO 27

Pro-Lite supplies the photometric test equipment designed and manufactured by SSL Resource Ltd in Salo, Finland. A goniophotometer generally comprises a motorised, two-axis platform that tilts and rotates a light source with respect to a fixed photodetector (photometer, colorimeter and/or spectroradiometer) that records the light output (illuminance or spectral irradiance as a function of angle. Depending upon the configuration of goniophotometer chosen, the optical (photometric, radiometric, colorimetric & spectral) and electrical parameters that can be reported include the directional luminous or radiant intensity (candelas or Watts per steradian), the total luminous flux (lumens),

the luminous efficacy (lumens per Watt), the useful lumens, the CIE chromaticity (Cx & Cy), the correlated colour temperature (CCT, Kelvin), the colour rendering, the input power and power factor, the UV irradiance and (for horticultural lamps), the photosynthetically active radiation (PAR).

One of the key requirements that many users will have from their goniophotometer is the creation of so-called "photometric data files". These are computer-readable data files that contain the luminous or radiant intensity from the device under test reported as a function of angle of rotation/tilt. These data files are commonly formatted in either of two industry-standard formats, known as IES and EULUMDAT. The software supplied with SSL Resource goniophotometer systems automatically generates properly formatted files in both the .ies and .ldt formats. These are then able to be used with third party lighting design software for the creation of lighting schemes.

Table 1 (below) lists all of the available SSL Resource goniophotometer systems together with their IES motion type (see below for definition), the maximum size and weight for the device under test and the recommended types of samples they are designed to accommodate (lamps, luminaires, vehicle lighting or transportation signal lamps).



SSL Resource Goniophotometer Range Overview

SSL Resource Goniophotometer Range Overview																											
			Maximum Sample Size & Weight				Recommended Sample Types																				
Goniometer Model	IES Motion Type	Family	Length (cm)	Depth (cm)	Height (cm)	Weight (kg)		Lamps	Tubular Lamps	LED Modules	Flash Lights	LED Strips	Downlights	LED Panel	Large Linear	Heavy Flood	Street Lights	Automotive	Decorative	Marine Lights	Airfield Lights	Bicycle Lights	Traffic Lights	Warning Lights	VMS	Railway Lights	
SSL LAMP 30	C*	C-1	30	30		3		X			X																
SSL LAMP 30.B	B	C-1	30		20	3			X	X								X				X					
SSL LAMP 200	C	C-1	200	10		4				X		X	(X)	X													
SSL LEDI 70	C	C-1	70	15		3				X			X	X													
SSL LUMI 90	C*	LUMI	90	30		9		X		X	X	X	X	X													
SSL LUMI 90.B	B	LUMI	60		50	9												X				X	X	X	X	X	
SSL LUMI 120	C*	LUMI	120	50		18		X	X	X	X	X	X	X		X		X									
SSL LUMI 120.B	B	LUMI	180		20	20												X			(X)	X	X	X	X	X	
SSL UNI 150	C	C-1	150	25		10		X	X	X	X	X	X	X			X		(X)								
SSL LUMI 180	C*	LUMI	180	60		25		X	X	X	X	X	X	X	X		X	X	(X)								
SSL LUMI 180.B	B	LUMI	100		100	25												X			(X)	X	X	X	X	X	
SSL UNI 200	C	C-1	200	80		30		X	X	X	X	X	X	X	X	X	X		(X)								
DECO 27	C**	DECO	27	30		6		X		X	X		X						X								
SSL AUTO 100	B	AUTO	100		55	15												X			(X)	X	X	X	X	X	
SSL AUTO 1000	B	AUTO	100		170	50										X	X	X		X	X		X	X	X	X	

Table 1: The SSL Resource Goniophotometer Range

* Native type C (horizontal) motion with option to convert between type C and type B motion (at additional cost).

** Type C vertical (base-up or base-down) motion.

(X) denotes the use of accessories (at additional cost): for decorative fittings, the ALI (Absolute Lumen Integrator); for marine lights, air-field lights or other omnidirectional light sources measured in a horizontal plane, the A-type accessory.



Family Type

To guide you through the extensive choices available, please consider the following parameters. SSL Resource goniophotometer systems fall into one of four design categories which are called: C-1 (comprising the LAMP, LEDI & UNI models); LUMI; DECO; and AUTO. The key features of each of these model families is explained in the Table 2. For an explanation of type C and type B motion, see below.

SSL Family	Description & Key Features	Motion
C-1	The C-1 family comprises the LAMP, LEDI and UNI models and are our most cost-effective, type C motorised goniometers.	Type C motion only
LUMI	The LUMI systems are natively type C motion, but they can be delivered configured for either type C (horizontal) or type B motion. Furthermore, accessory kits are offered that allow the user to convert their goniometer between type B and C motion, or vice versa. Over and above the entry-level C-1 systems, LUMI goniophotometers offer additional features that enhance ease-of-use, increase productivity and promote application flexibility. More details can be found in the configuration guide.	Type C or type B motion. Option to convert between motion types. Option to comply with IES LM-79-19 and CIE S025.
DECO	The DECO systems are type C motion with the sample held vertically (base-up or base-down). As such, the DECO goniophotometer inherently meets the requirements of CIE S025 and IES LM-79-19 for fixed burning position without the need for optional accessories. A DECO goniophotometer is ideal for testing decorative luminaires and light fittings.	Type C motion only. Complies with IES LM-79-19 and CIE S025.
AUTO	The AUTO systems are natively type B motion and are designed for testing directional lighting products such as vehicle lighting as well as transportation-type signage (e.g. VMS, traffic lights).	Type B motion only.

Table 2: The SSL Resource Goniophotometer Families Compared



Type C Motion Goniophotometers

Table 3 compares the capabilities of the SSL Resource type C goniophotometers. For an explanation of type C motion, see below. Type C goniophotometers are generally chosen when measuring lamps, luminaires and architectural lighting products. Certain type C models can be converted by the user to type B motion (and vice versa) with the purchase of an accessory kit.

SSL Resource Type C Goniophotometer Comparison																			
Goniometer Model	IES Motion Type	Family		Maximum Sample Size & Weight					Recommended Sample Types										
				Length (cm)	Depth (cm)	Height (cm)	Weight (kg)		Lamps	Tubular Lamps	LED Modules	Flash lights	LED Strips	Downlights	LED Panels	Large Linear	Heavy Flood	Street Lights	Decorative Fittings
SSL LAMP 30	C	C-1		30	30		3		X		X								
SSL LAMP 200	C	C-1		200	10		4				X		X	(X)	X				
SSL LEDI 70	C	C-1		70	15		3				X			X	X				
SSL LUMI 90	C*	LUMI		90	30		9		X		X	X	X	X	X				
SSL LUMI 120	C*	LUMI		120	50		18		X	X	X	X	X	X	X		X		X
SSL UNI 150	C	C-1		150	25		10		X	X	X	X	X	X	X			X	(X)
SSL LUMI 180	C*	LUMI		180	60		25		X	X	X	X	X	X	X	X		X	(X)
SSL UNI 200	C	C-1		200	80		30		X	X	X	X	X	X	X	X	X	X	(X)
DECO 27	C**	DECO		27	30		6		X		X	X		X					X

Table 3: SSL Resource Type C Goniophotometer Capabilities

* Native type C (horizontal) motion with option to convert between type C and type B motion (at additional cost).

** Type C vertical (base-up or base-down) motion.

(X) denotes the use of accessories (at additional cost).



All of the type C motion goniophotometers except for the DECO 27 mount the device under test (DUT) in a vertical plane, such that the optical axis (and usually the direction of peak intensity) is horizontal. While the lamp does not tilt with respect to gravity during a scan, it will rotate about its own horizontal (azimuth) axis. Given that most architectural light fittings tend to be ceiling mounted and shine vertically down, it can be desirable to mount the DUT in the same (vertical, base-up) orientation. To this end, we offer the SSL-ALI accessory. This is the Absolute Lumen Integrator, and attaches to the C-plane motor of the host goniometer system to mount the DUT in a vertical-down (base up) orientation. It is designed to mount architectural or decorative light fittings with relatively small luminous areas.

In the event that you cannot mount the DUT in its intended orientation, we offer the SSL-BPC Burn Position Corrector accessory. This device also attaches to the C-plane motor of the host goniometer and allows the operator to measure the difference in light output from the DUT in its design orientation compared to that in which it is mounted onto the goniophotometer. The goniophotometer software will then compute a correction factor which it will then automatically apply to the subsequent measurement of that product.

The DECO 27 goniophotometer is also a type C motion model, however unlike the other models, the DUT is mounted in a vertical-down orientation. As such, the DECO model fully complies with the fixed burn position requirements of CIE S025 and IES LM79-19 without recourse to either the ALI or BPC accessory options.

Table 4 lists the compatibility of the type C motion goniophotometers with the ALI and BPC accessories. It shows which models comply with CIE S025 - for the models denoted with (X), the use of accessory items will be required for compliance with this standard. The table also compares the speed of measurement of each of the goniometer models and shows which models are compatible with the accessory kits that allow the user to convert their goniophotometer between the native type C and type B motion (and vice versa).

* Speed: from [4] = fast to [1] = slow

(X) denotes the use of accessories: ALI (Absolute Lumen Integrator) or BPC (Burn Position Corrector).

SSL Resource Type C Goniophotometer Features Comparison											
Goniometer Model	IES Motion Type	Family	Maximum Sample Size & Weight				Features				
			Length (cm)	Depth (cm)	Height (cm)	Weight (kg)	CIE S025 Compliant	Speed*	OPTION: SSL-ALI	OPTION: SSL-BPC	OPTION: type B
SSL LAMP 30	C	C-1	30	30		3		4			X
SSL LAMP 200	C	C-1	200	10		4	(X)	3		X	
SSL LEDI 70	C	C-1	70	15		3		4			
SSL LUMI 90	C	LUMI	90	30		9	(X)	3		X	X
SSL LUMI 120	C	LUMI	120	50		18	(X)	2		X	X
SSL UNI 150	C	C-1	150	25		10	(X)	3	X	X	
SSL LUMI 180	C	LUMI	180	60		25	(X)	2	X	X	X
SSL UNI 200	C	C-1	200	80		30	(X)	1	X	X	
DECO 27	C	DECO	27	30		6	X	3			

Table 4: Comparing the Features of the SSL Resource Type C Goniophotometers



Type B Motion Goniophotometers

Table 5 compares the capabilities and features of the SSL Resource type B goniophotometers. For an explanation of type B motion, see below. Please note that the dedicated type B goniophotometers (AUTO models) do not (and cannot) satisfy the requirements of CIE S025 or IES LM79-19. Type B goniophotometers are generally chosen when measuring directional light sources, such as vehicle lighting (e.g. automotive headlamp and marker/side lamps) as well as other types of transportation lighting and signalling. Apart from the AUTO models, the other type B goniometers can be converted by the user to type C motion (and vice versa) with the removal of the supplied accessory kit.

SSL Resource Type B Goniophotometer Comparison																				
				Maximum Sample Size & Weight					Recommended Use											
Goniometer Model	IES Motion Type	Family		Length (cm)	Depth (cm)	Height (cm)	Weight (kg)		Automotive	Marine Lights	Airfield Lights	Torch Lights	Traffic Lights	Warning Lights	VMS Signal Lights	Railway Lights	Street Lights	Flood Lights		
SSL LAMP 30.B	B	C-1		30		20	3		X			X								
SSL LUMI 90.B	B	LUMI		60		50	9		X			X	X	X	X	X				
SSL LUMI 120.B	B	LUMI		180		80	20		X		(X)	X	X	X	X	X				
SSL LUMI 180.B	B	LUMI		100		100	25		X		(X)	X	X	X	X	X				
SSL AUTO 100	B	AUTO		100		55	15		X		(X)	X	X	X	X	X				
SSL AUTO 1000	B	AUTO		100		170	50		X	X	X		X	X	X	X	X	X		

Table 5: Comparing the Features & Capabilities of SSL Resource Type B Goniophotometers



Motion Type

SSL Resource goniophotometers are available in type A/B or type C motion models, as defined in IES LM75-19. Certain lamp technologies suffer from a change in light output as the lamp or luminaire tilts with respect to gravity. The effect on discharge lamps can be large, while for solid state (LED) lighting, the effect can be much smaller (or even non-existent), but this depends upon the thermal design of the luminaire. A goniometer employing type B motion will tilt the device under test during a scan, whereas a type C motion system will maintain the orientation of the lamp with respect to gravity. To avoid errors arising from the lamp tilting with respect to gravity during a goniometric scan, international standards such as CIE S025 require that the sample is measured using a type C goniophotometer, and/or a correction should be applied to the goniometer readings if the sample is orientated differently to its design direction.

Pro-Lite's type B goniophotometer models are the SSL AUTO series, as well as the SSL LAMP 30 and SSL LUMI series of native type C models fitted with the accessory type B conversion kit. Type C models are the entry-level C-1 series (comprising the LAMP, LEDI and UNI goniometers), the advanced LUMI series and the DECO 27 system. Certain type B models (the SSL LAMP 30, SSL LUMI 90, SSL LUMI 120 and SSL LUMI 180) are available with an accessory kit that allows the user to swap between type B and type C motion. This inherent flexibility allows one goniophotometer to be used to test both general lighting products and (for example) vehicle lighting.

Load Capacity

When specifying a goniophotometer, the key factor that drives the overall system cost is the size and weight of the products that you wish to test. The tables above list the maximum sample sizes and weights that each goniophotometer system is rated to. Recommended sample types are also shown for convenience. For help in choosing the optimum goniophotometer for your application, Pro-Lite's photometry application specialists will be delighted to assist you.