

TUNABLE LIGHT SOURCES

TLS-55-X300

TLS-72-X300

TLS-55-X300-SS

TLS-55-Q250

TLS-72-Q250



Features

- Monochromatic light from 200 nm up to 2500 nm
- Collimated, condensed, or coupled output light options. Light can be coupled to any optical system (including fibers and fiber bundles)
- Adjustable optical resolution from 20 nm down to 0.2 nm
- Flexibility of optional features: full automation, various sources and monochromators and more

Applications

- Absorption/transmission/reflection measurement systems
- An excitation light in fluorescence measurement systems
- Eye protection products measurement system
- PEC photochemistry measurement systems
- Solar cell quantum efficiency measurement systems



TUNABLE LIGHT SOURCES

I. Overview

Sciencetech offers a series of computer-controlled adjustable sources of monochromatic light, our Tunable Light Source (TLS) line. These complete plug-and-play systems vary by functional spectral range, optical resolution, intensity of output light, optical parameters of the output beam, coupling options, accessories, and by different extent of automation.

The standard configuration of a TLS includes a lamp housing with Xe or QTH lamp, power supply with touchscreen, monochromator (1/8 or 1/4 meter), automated 6 position filter wheel (with 4 long pass filters) mounted to a metal breadboard to create a compact, fully assembled illuminator. Each system is pre-aligned during production and packaged with the system's test data and detailed manual. Sciencetech's tunable light sources are motorized instruments controlled by Sciencetech's TLS software. LabView drivers are also available for purchase for integrating Sciencetech's TLS systems into LabView experiments.

Sciencetech offers 4 base models in our tunable light source line that are equipped with multiple standard configurations:

TLS-55-X300 TLS-72-X300
TLS-55-Q250 TLS-72-Q250

The variation in the base models is in the combination of two most popular motorized Sciencetech monochromators: 9072S (1/8 meter) and 9055 (1/4 meter) with two light sources: 300 W Xe arc lamp and 250 W QTH lamp.

The overall operable spectral range is 0-2500 nm. However the choice of lamp and optics used in the TLS system limit the functional spectral range.

The QTH lamp has a smooth spectrum from 400 nm through the longer wavelengths. Xenon lamps have more ultraviolet light that allows extension of the spectra to 280 nm*. Xenon lamps are also very bright sources allowing higher throughput than with QTH lamps.

All components of the system, including the light source and monochromator, can be changed. Available light sources includes continuous Xe, Xe-Hg and Hg lamps from 75 W to 1.0 kW, QTH lamps from 50 W to 500 W, a dual deuterium/QTH source, and infrared sources. The available spectral range is 180 nm – 10 um and more, depending on selected options. It is also possible to integrate dual or triple custom sources. Optional monochromators include 1/8 m, 1/4 m, 1/2 m and 1 m focal length, as well as double additive models of each base type.

Each base model comes with standard features: 1" collimated light output and two adjustable slits for optical bandpass control. Output optics are available as output beam optics or optical couplings such as fiber couplers.

There are several available output options: different focusing and collimating beams, different coupling with fibers/bundles, or coupling with different optical devices.

The standard model has a safety quartz window at the output port to eliminate harmful UVB rays, and to contain any harmful ozone that may be generated by the lamp within (from ozone producing lamps only). This safety quartz window can be replaced with a UV grade fused silica window if the application requires UV light to pass through or BK7 glass window if no UV light is required.

Available optional upgrades include: Motorized or manual Iris, motorized slit (manual slit is standard), optical light feedback for additional source stabilization**, and various power meters.

Please see page 6 for a full list of options. If you do not see the upgrade you are looking for, contact sales@sciencetech-inc.com and let us know what upgrade you would like and we will design it just for you!

* specialized Xe and Hg lamps and optics are available to extend spectrum down to 200nm

** Only available with Xe and Xe-Hg Lamps

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2. Specifications

Sciencetech's software, Sci-Spec, controls all components of the system. In the standard configuration, it controls the power supply of the light source, shutter, filter wheel, and monochromator. As an option, the user can add computer control on the input and output slits, and/or control of the iris.

In the standard configuration, the output beam can be collimated or focused. Coupling with different devices is available as an option, such as coupling with a sample chamber, fiber, or fiber bundle.

	TLS-72-X300	TLS-72-Q250	TLS-55-X300	TLS-55-Q250
Lamp Type	Xe 300 W	QTH 250 W	Xe 300 W	QTH 250 W
Monochromator Type	9072S (1/8 meter)		9055 (1/4 meter)	
Functional Spectral range *	300-1800 nm			
Optical resolution	0.5 nm @ 300-700 nm 0.7 nm @ 700-1800 nm		0.2 nm @ 300-700 nm 0.4 nm @ 700-1800 nm	
Filter wheel with filter set	Computer-controlled 6-position filter wheel			
Shutter	Optional computer-controlled shutter and exposure control			
Beam output	1" diameter collimated			
Wavelength Repeatability	0.1 nm		0.03 nm	
Wavelength Accuracy	0.2 nm			
Intensity Control	Source intensity adjustable Optional manual iris			
Gratings	2 plane ruled gratings 30x30 mm 1200 gr/mm@300nm 600 gr/mm@1000nm		2 plane ruled gratings 50x50 mm 1200 gr/mm@300nm 600 gr/mm@1000nm	
Slits	Two manual bilaterally-adjustable slits with vertical curtain attenuators			
Optical Height	76.2 mm			
Power supply	Touchscreen, Constant Current			
Software	Sci-Spec			
Computer Interface	USB—monochromator and filter wheel , RS232 Power Supply			

* Functional spectral range depends on gratings installed. 9072 and 9055 systems can have up to 3 gratings installed for up to 200-2500nm range



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3. Tunable Light Source—Solar Simulator

Sciencetech also offers a tunable light source solar simulator combination instrument. This combination system allows a selectable output at the target plane of spatially uniform sun light or monochromatic light.

The tunable light source—solar simulator combination system adds a homogenization unit to the exit port of the monochromator that includes an electronic shutter and 2 position filter tray.

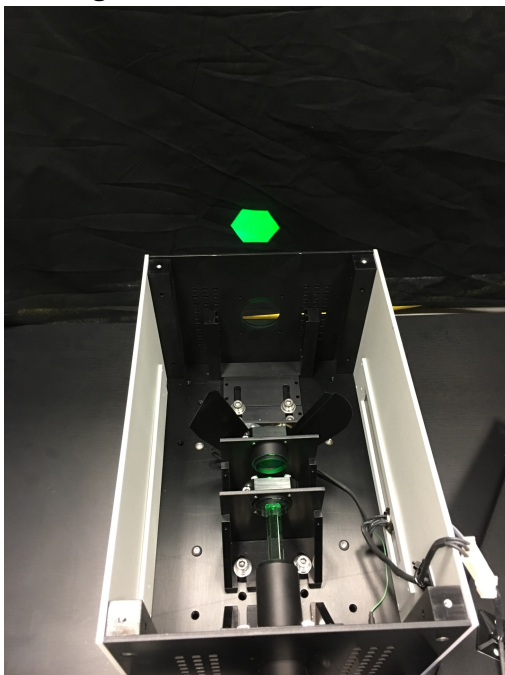
The tunable light source functions the same as the other models in Sciencetech's tunable light source line but adds the extra functionality of a solar simulator with broadband spatially uniform white light.

Sciencetech currently offers one model of tunable light source-solar simulator:

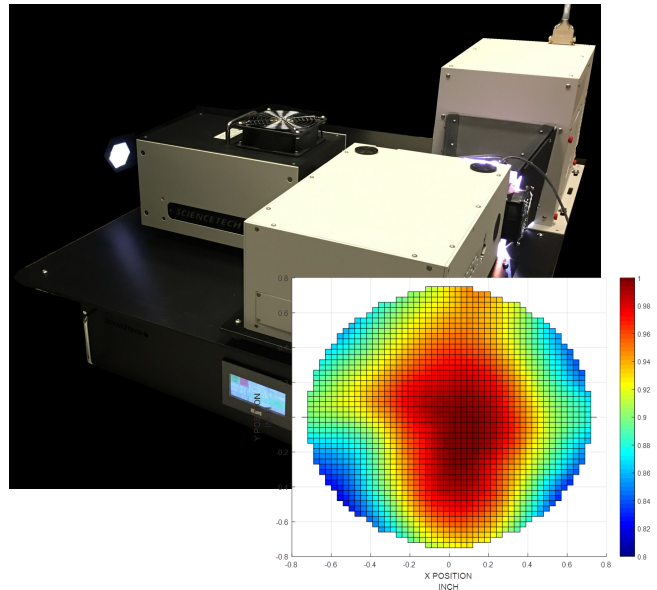
TLS-55-X300-SS

The standard configuration of a TLS-SS includes a lamp housing with an elliptical reflector and xenon lamp, power supply with touchscreen, 1/4 meter monochromator, automated filter wheel (with order sorting filters) and electronic shutter mounted to a metal breadboard to create a compact, fully assembled illuminator, controlled by original software. Each system is pre-aligned during production and packaged with the system's test data and detailed manual.

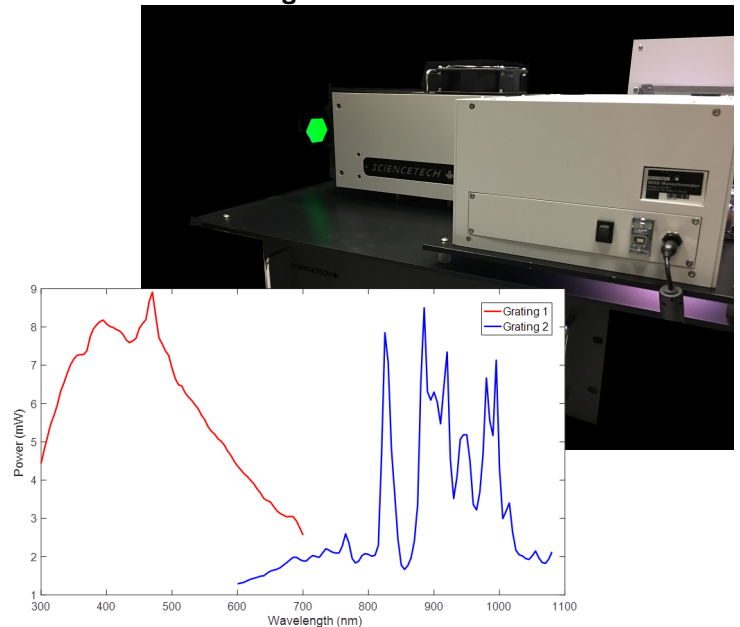
Homogenization Unit



Solar Simulator Mode



Tunable Light Source Mode



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4. Specifications

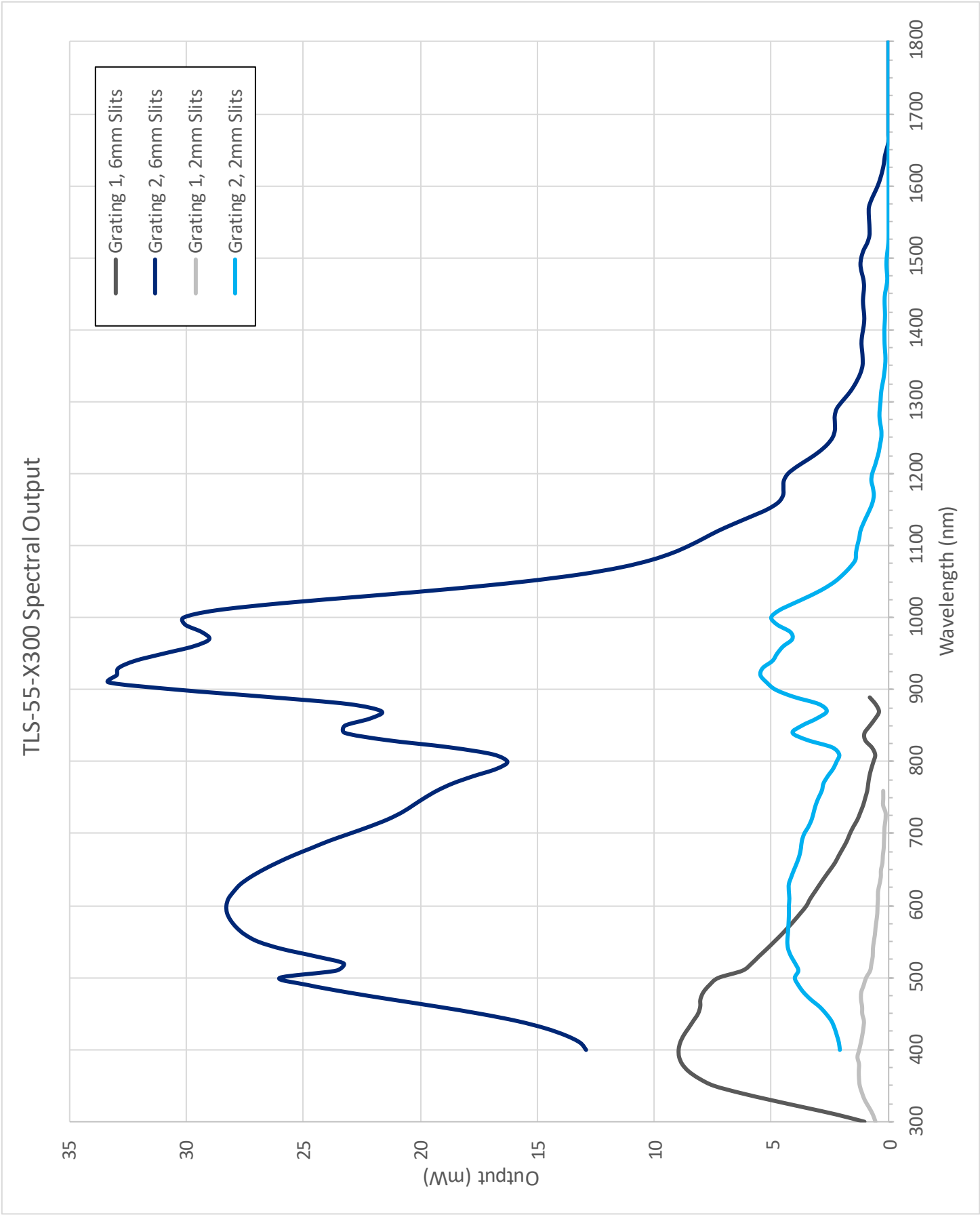
Sciencetech's software, Sci-Spec, controls all components of the system. In the standard configuration, it controls the power supply of the light source, shutter, filter wheel, and monochromator. As an option, the user can add computer control on the input and output slits, and/or control of the iris.

In the standard configuration, the output beam can be collimated or focused. Coupling with different devices is available as an option, such as coupling with a sample chamber, fiber, or fiber bundle.

	TLS-55-X300-SS
Lamp Type	Xe 300 W
Monochromator Type	9055 (1/4 meter)
Operable Spectral range	200-2500 nm
Optical resolution	Up to 0.2 nm @ 200-700 nm Up to 0.4 nm @ 700-2500 nm
Filter wheel with filter set	Computer-controlled 6-position filter wheel
Shutter	Computer-controlled shutter and exposure control
Beam output	Spatially uniform output over 1" diameter
Solar Simulator, Spectral Match	Class A, AM1.5G Class B, AM0
Solar Simulator, Non-Uniformity	Class B
Solar Simulator, Temporal Instability	Class A
Working Distance	80 to 140 mm
Wavelength Repeatability	0.03 nm
Wavelength Accuracy	0.2 nm
Gratings	2 plane ruled gratings 50x50 mm 1200 gr/mm@300nm 600 gr/mm@1000nm
Slits	Two manual bilaterally-adjustable slits
Optical Height	76.2 mm
Power supply	Touchscreen, Constant Current
Software	Sci-Spec
Computer Interface	USB

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4. Specifications



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5. Accessories

Host Computer

A host computer is required to operate Sciencetech's line of Tunable Light Sources. Software can be provided for installation on a customer's own host computer, or a preconfigured host computer system can be purchased at the time order, which comes with all software preinstalled and tested for easiest setup.

SKU	Product
490-0128	Preconfigured Host Desktop Computer System
490-0127	Preconfigured Host Tablet Computer System

Optional Accessories

A number of accessories are available to upgrade the mechanical components of the system or add additional features.

SKU	Product
I 20-9053	(SS-80-M) Motorized slit(s)
Please inquire	Manual or Motorized Iris
I 15-9027	(FS-02-N) Light Intensity Stabilizer
590-0100 with 590-0176	Broadband Thermopile Detector - (1mW to 15W) with (UNO-I) Handheld Monitor for Thermopile Detectors

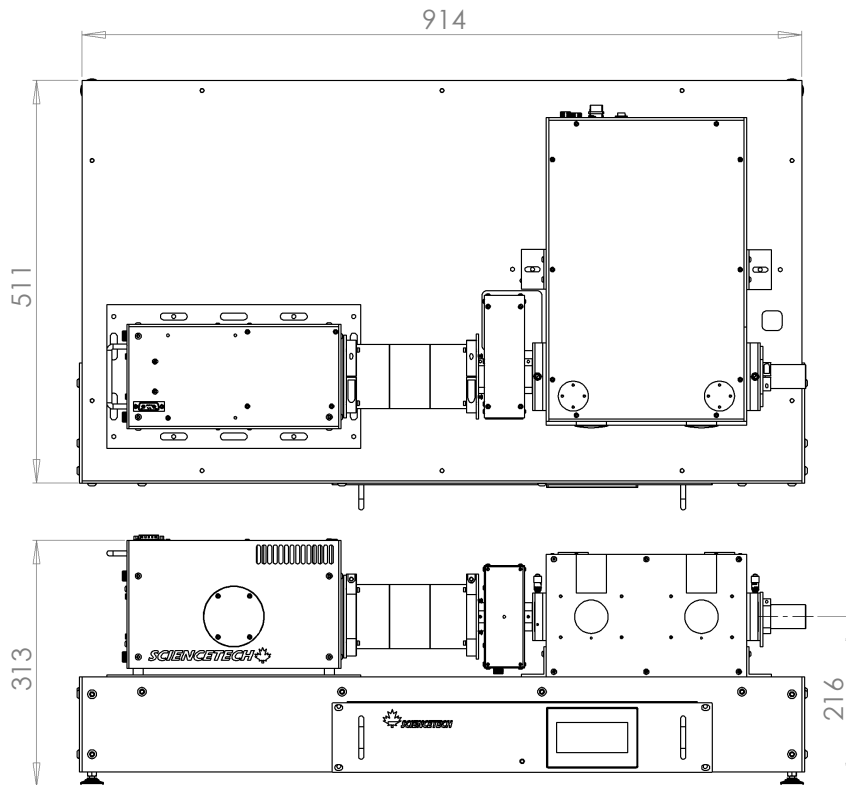
Output Accessories

Different output accessories can be fitted to the monochromator output to customize the system for different applications—either as a stand-alone unit or to be used in conjunction with other components.

SKU	Product
Please inquire	Focused Light Output (F/ ...)
Please inquire	Coupling to Fiber Cable/Bundle
Please inquire	Optical Fiber (2m standard, custom lengths available); Optical bundle (custom length)
Please inquire	Custom requirements

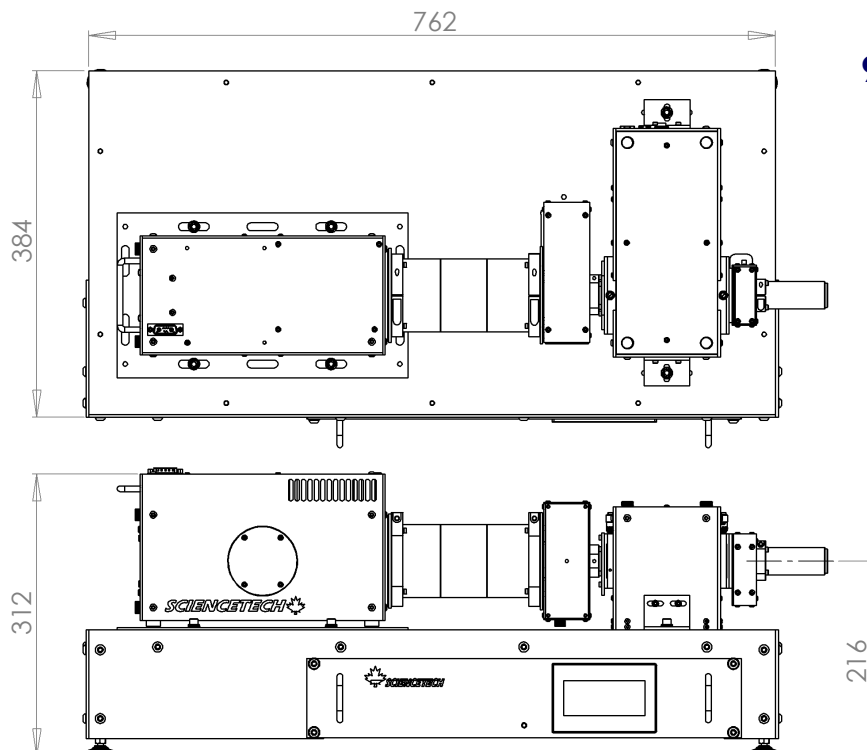
TUNABLE LIGHT SOURCES

6. Dimensions (mm)



9055 Monochromator-Based:

Left: The dimensions of the Sciencetech Tunable Light Sources are different for different models, but the 9055 monochromator-based model has the following dimensions in millimeters.



9072 Monochromator-Based:

Left: The dimensions of the Sciencetech Tunable Light Sources are different for different models, but the 9072 monochromator-based model has the following dimensions in millimeters.

For TLS-55-X300-SS dimensions please contact a Sciencetech Application Scientist.

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