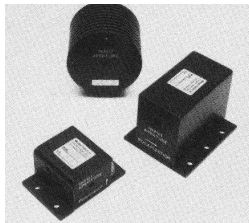
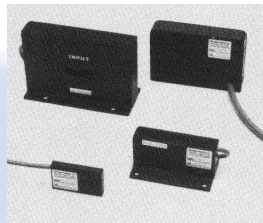


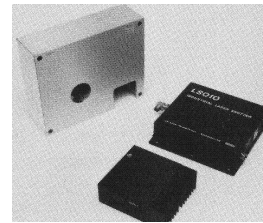
Laser Safety Shutters



LS series



LST series



Industrial series

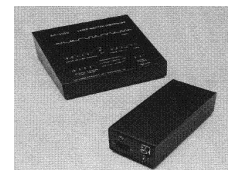
Laser safety shutters are acting as programmable beam dumps. These shutters pass the laser beam undisturbed in the open position, and dump the laser energy safely into the shutter body when in the closed position. This requires well designed thermal properties of the moving optical element and the stationary absorbing element. Both elements are designed to handle high irradiance and fluence values, with high damage threshold, good thermal conductivity and low back scattering. Failsafe closure is inherent and rapid switching speed are available. These shutters can be designed to be used from X-rays to Far Infra-Red radiations.

LS series is either air cooled or conduction cooled. It can handle optical power up to 200 Watts and peak power up to 50 Megawatts. Thanks to a grazing incidence blade, pulse width of less than 1 ms can be achieved, allowing to also use the shutter as a modulation device.

LST series are conduction cooled. They have a very small dimension in the beam propagation direction, which is a very important characteristic for compact systems or highly divergent beams. The LST-200 is the most compact unit, the LSTX-13 is very popular as a pulse picker or a safety shutter for Excimer laser while the LST-4WBK2 is mainly used for safety purposes.

Industrial series can be used with up to 4 kWatts laser power. For obvious safety reasons, they are only available in a “normally closed” configuration. On top of safety purposes, they can also be used for exposure time control.

Drivers : our electronics allow to achieve the best performance out of each shutter. From a 4-12 VDC signal provided by the user, they are factory adjusted to deliver the right signal level and shape to control the selected shutter.



WARNING : to make sure of the compatibility of the selected shutter with your application, we need to know in details what you need : wavelength, average power, repetition rate, energy per pulse, pulse duration, beam diameter and divergence, polarization, conditions of use and, possibly, details of the application.

www.bfioptilas.com

Modulation / Exposure / Gating Shutters

These shutters are mainly used for high rep rate and/or fast switching speed applications, such as exposure control, pulse selection ... LS models use near-grazing incidence optics, providing high damage threshold and faster switching speeds while LST models use 45° incidence optics.

Specifications	LST200	LS200/500F	LSO55	LSC4B	LSTXY	EXP4A
Aperture (mm)	2.3	4 / 2.3	8	4	14	22
Max rep rate (Hz)	150	250 / 500	50		5	10
Max Optical Power (W)	15	50	200	25		100
Damage Threshold (J/cm ²)			1 - 2		5	
Switching speed (ms)	0.3	0.4 / 0.2	2		30	
Min; exposure time (ms)	1	1 / 0.8	4		60	10
Application	Narrow working zone	Continuous chopping	Processing, X-Ray exposure	Clean room	Gating	Arc lamp and large beams
Specificity	Thin housing	High rep rate	Ultra-high reliability	Silent, low vibration	1 inch thick	Beam reflected back to source

Laser Safety and Process Shutters

These shutters are primarily designed for Laser Safety purpose and process control at low repetition rate. Power up to several kWatts can be handled with water cooling.

Specifications	LST18	LST200SLP	LST4WBK2	LST400	LSY300
Aperture (mm)	2.5	2.3	4	8	10
Max rep rate (Hz)	5		2	5	
Max Optical Power (W)	0.5	1	20	25	4 000
Damage Threshold (J/cm ²)					
Switching speed (ms)			10	20	40
Application	Diode Laser Safety, OEM integration	OEM integration, tight working zone	Safety interlock	Safety, OEM integration	Multi-kW YAG safety shutter
Specificity	12 V / 2 W drive	Smallest size, high speed and reliability	Thin design	Compact	Water cooled

Custom and OEM configurations : Many other configuration are available on request. To list just a few of custom designed already made : high power CO2 lasers safety shutters, 20 channel matrix, powermeter/shutter combination, beam dumps (beam terminators), miniature shutters, large aperture shutter ...

Driving electronics which can be provided vary from simple PCB to multi-shutter drivers including position sensors logic outputs. It must be notices that electronic driving waveform is essential to achieve the best shutter performance in terms of switching speed, acoustic noise and vibration, heat dissipation, lifetime ... Please ask your local sales team for recommendations.