

# High Integrity Laser Safety Beam Shutter

The Lasermet LS-20 Laser Safety Shutter is intended to provide a means of preventing accidental exposure to a potentially harmful laser beam.

It has been designed to form part of a high-integrity safety system and features a gravity-close blade and force-disconnect proving contacts. When closed, the shutter deflects the incoming laser beam onto an internal beam dump where the energy is converted to heat which is dissipated in the aluminium casing of the shutter. When the shutter is open, the laser beam passes through the shutter without interruption.

## SIL Rated Version

A 'SIL3' version is available which, when correctly wired to a Lasermet Interlock Control System can provide a safety interlock which meets Safety Integrity Level 3 to EN 61508.

## Control Options

Standard operation is by means of the 'Open' and 'Close' buttons on top of the shutter case. A remote switching station (LS-RS20) is available for remote operation of the shutter. Alternatively the shutter can be set to open as soon as power is applied. In all cases the shutter will close when power is removed.

## Connection to Beam Tube System

The LS-20 has 16mm diameter entry and exit apertures. These are threaded and beam tubes can be supplied to fit to the shutter case and enclose the laser beam.

## Beam Shutter for High Power Lasers

The maximum average power for use with the internal beam dump is 20W. However for higher powers the beam

dump can be easily removed by unscrewing it from the side of the shutter case. Beam tubes can then be fitted and the beam directed to a remote beam dump. This allows the shutter to be used for much higher powers, even for multi-kilowatt lasers.



SIL3 rated beam shutter on optical pin



LS-20 beam shutter on optical pin

## Shutter Blade Options

The shutter blade is made of stainless steel which is sufficient for most applications. However, standard front silvered or dielectric mirrors can be factory fitted to the blade if required.

This is generally recommended for average powers in excess of 20W when the remote beam dump option is being used. It may also be advisable when using Q-switched lasers as these can cause some minor ablation of the blade even when the average power is below 20W.

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## Fixings

The LS-20 shutter is equipped with an M6 female thread in the base, located under the beam centreline.

An anti-rotation slot is also provided in the base into which a second M6 stud should be located to prevent the shutter turning or coming unscrewed. The slot allows for posts on imperial and metric optical breadboards.

## Laser Beam Power Measurement

When fitted with a mirror, the LS-20 facilitates easy laser beam power measurement. The beam dump can be removed and a laser power meter detector head fitted to the side of the shutter. In this way a power or energy reading can be obtained whenever the shutter is in the closed state

## Extender Leads

LS-20 shutters are supplied with a permanently connected, 3 m long lead, terminated with a 15 pin high density D connector (male). If required this can be extended by use of one or more 3m leads (part no. LEAD-LS20-3M)

## Remote Switching Station

A remote switching station is available, allowing the shutter to be opened and closed by pressing buttons remote from the shutter itself. As well as start and stop buttons there is LED indication of 'power on', 'open' and 'closed'. These are available in 2 types:

### Fixed (LS-RS20)

Wall mounted with shutter socket and terminals for connecting to ICS.

### Floating (LS-RS20-FL)

With shutter socket and 3m flying lead for plugging into a distribution box.

## Specifications

Model No.	LS-20-24	LS-20SIL-24
Max Average Power Using Internal Beam Dump	20 W	20 W
Max Average Power Using Separate Beam Dump	Unlimited	Unlimited
Aperture Diameter	16 mm	16 mm
Operating Voltage	24 V DC	24 V DC
Current Closed	20 mA	40 mA
Current Open	100 mA	200 mA
Internal Beam Dump Cooling	Convection	Convection
Size (mm)	98 x 65 x 37	98 x 65 x 73
Mass	400 g	800 g
Safety Integrity Level (to EN 61508)	TBA	SIL 3
Lifetime	5 x 10 <sup>5</sup> operations	5 x 10 <sup>5</sup> operations

## Electrical Outputs

Shutter open	24 VDC, 50 mA max resistive load
Shutter closed	24 VDC, 50 mA max resistive load
Monitor 1	Common, open, closed rated at 30 VDC, 100 mA resistive load
Monitor 2	Common, open, closed rated at 30 VDC, 100 mA resistive load

LS-20 laser shutter



LS-20SIL laser shutter



## Distribution Box for LS-20 Beam Shutters

These are wall mountable distribution boxes with terminals for connection to a Lasernetmet ICS interlock control system or other shutter power supply. Available with 1, 2 or 4 shutter connections.

### Order code

1 way ICS-DB20-0/1  
2 ways ICS-DB20-0/2  
4 ways ICS-DB20-0/4