

# Uniblitz® FS6

## 6mm Uni-Stable Laser Shutter

### Overview

The Uniblitz FS series shutters are designed and optimized to operate directly from +5VDC and do not require a separate driver. Removing the +5VDC (0VDC) closes these shutters. A simple control circuit can be used to operate these shutter devices from a TTL trigger pulse. This control can be also accomplished with our new **VLM1 TTL control interface module**, which is now available.

This low-cost innovation provides the reliability of Uniblitz shutters (typical lifetime >1 million cycles) at a single operating voltage.

### Key Features

- 6mm aperture
- Default closed operation
- **RoHS Compliant**
- Transfer time on opening:  
3.3 milliseconds
- Transfer time on closing:  
6.0 milliseconds

### Specifications

#### Electrical Specifications

Coil resistance	12 OHMS
Voltage to Open	+5 VDC at 425 mA
Hold Voltage	+5 VDC

#### Mechanical Specifications

Weight Unhoused	25.7 g
Weight Half-Housed	59.5 g
Weight Housed	94.5 g
Operating Temp.	-40 - +65 C
Max. Opening Bounce	15%
Max. Closing Bounce	5%
Max. Freq. of Operation <sup>1</sup>	50 Hz
Number of Shutter Blades	1

<sup>1</sup> (Continuous/Burst) Continuous frequency rating specified at shutter's minimum exposure time (MET).

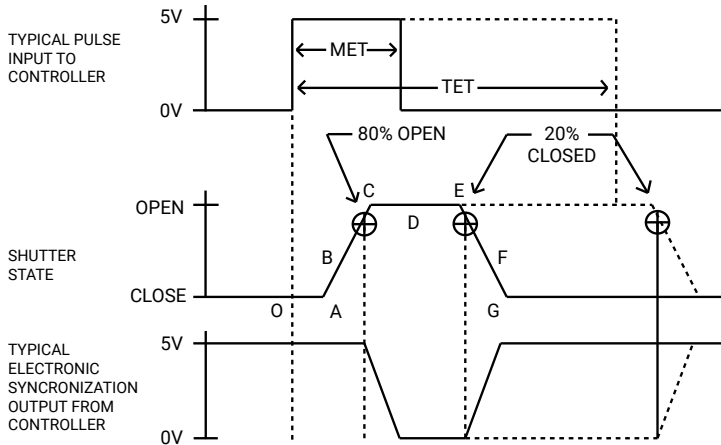


**Need Support?** Please visit our website or email us at [info@uniblitz.com](mailto:info@uniblitz.com).

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## Shutter Timing Data



### MET<sup>1</sup> and TET<sup>2</sup> for FS6

- **Minimum Exposure Time (MET):**  
10.0 msec.<sup>3</sup>
- **Typical Exposure Time (TET):**  
20.0 msec.<sup>3</sup>

FS6 <sup>4</sup> (w/ VLM1 (+5 VDC) and "T" blades) <sup>5</sup>		Min. Exp. Time (msec.)		Typ. Exp. Time (msec.)	
Graph	Description	Mean	Max	Mean	Max
O - A	Delay time on opening after current is applied	4.5	5.5	4.5	5.5
A - C	Transfer time on opening	3.5	4.5	3.5	4.5
O - C	Total opening time	8.0	10.0	8.0	10.0
B - F	Minimum equivalent exposure time	7.7	9.5	19.3	21.0
C - E	Minimum dwell time (based on exposure pulse)	4.0	4.5	15.5	16.0
D - E	Delay time on closing after current is removed	2.0	4.5	3.5	6.0
E - G	Transfer time on closing	3.8	5.5	4.0	5.5
A - G	Total window time	11.3	14.5	23.0	26.0

<sup>1</sup> The minimum exposure pulse required to achieve a full opening and closing.

<sup>2</sup> The exposure pulse required to ensure that the A - G time will change linearly with the exposure pulse (E.g. 1 msec changes in exposure pulse beyond 20 msec will provide 1 msec changes in A-G time).

<sup>3</sup> Exposure pulses provided between 10 msec and 20 msec will open and close the shutter fully, however timing changes between input and output may not be linear. This is due to shutter design, construction, and adjustment.

<sup>4</sup> Individual timing segments may vary.

<sup>5</sup> Under no circumstances should any type of lubricant be applied to the shutter blade area. Lubricating the shutter blades will likely slow the shutter down and may eventually render it inoperable.

## Product Options

FS6 **2** **3** **4** **5** **6** - **7**

Ex: FS6S2Z0L-EC

<p><b>1 Shutter Series:</b></p> <p><b>FS6:</b> Normally Closed</p> <p><b>FSR6:</b> Normally Open</p>	<p><b>2 Voltage:</b></p> <p><b>S:</b> Standard 5 VDC</p>	<p><b>3 Housing:</b><sup>2</sup></p> <p><b>1:</b> Un-Housed</p> <p><b>2:</b> Half-Housed</p> <p><b>3:</b> Fully-Housed</p>	<p><b>4 Blades:</b><sup>3</sup></p> <p><b>T:</b> Low Energy (Teflon®)</p> <p><b>ZM:</b> Laser Energy (AlMgF2)<sup>4</sup></p> <p><b>Z:</b> Laser Energy (AlSiO)<sup>4</sup></p>
<p><b>5 Electronic Sync:</b></p> <p><b>0:</b> Omitted</p> <p><b>1:</b> Included</p>	<p><b>6 Connector:</b></p> <p><b>L:</b> 18" Flying Leads</p>	<p><b>7 Encapsulated Coil:</b></p> <p><b>EC:</b> Included<sup>5</sup></p> <p><i>Leave blank if not required</i></p>	

<sup>2</sup> Various mounting methods available depending on housing option.

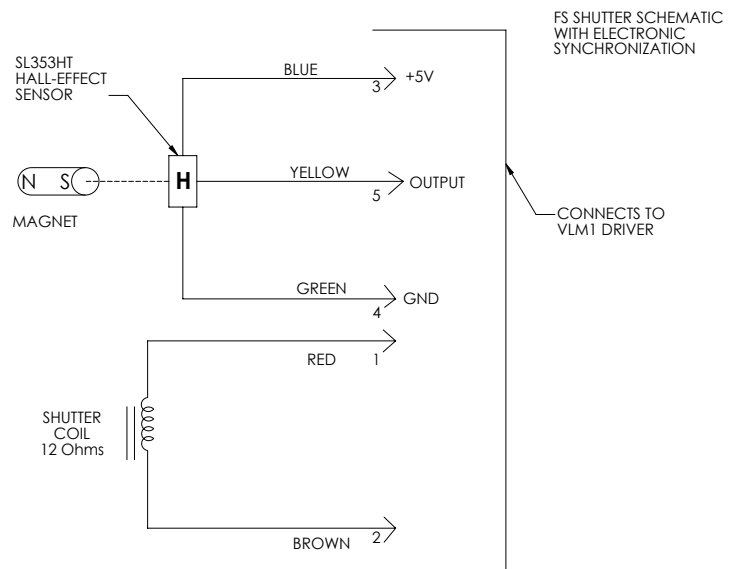
<sup>3</sup> Other blade coating options may be available by special order.

<sup>4</sup> Input side only; Teflon® coating is on opposite side to protect shutter blade surface. Light source must be input to the reflective side only.

<sup>5</sup> Vacuum compatibility up to 10E-10 Torr.

## Electronic Sync.

The synchronization system for FS shutter devices incorporates a small magnet mounted to the driving mechanism and a Hall effect sensor. When the device achieves approximately 80% of full open, the magnet causes the Hall effect sensor to change state, producing a signal to indicate that the shutter has switched to the active state. Shown to the left is the FS series shutter schematic which incorporates the electronic synchronization system. There is no connection to the designated synchronization pins when an electronic sync. is not selected.



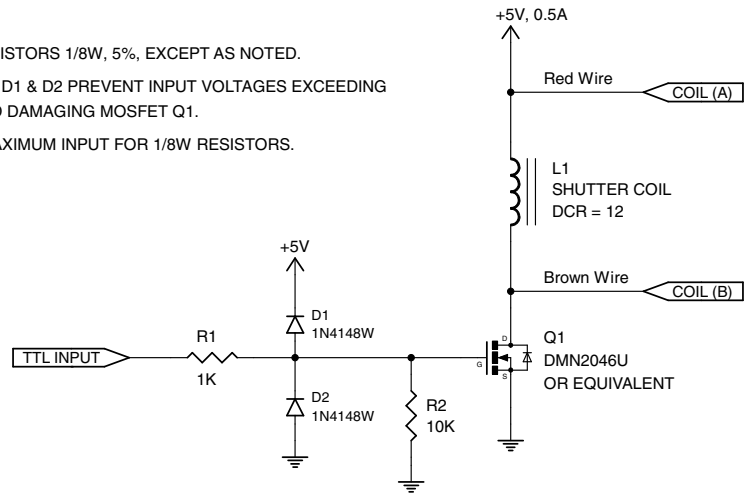
## Typical Control Circuit

This simple control circuit to the right can be used to operate the shutter device from a TTL trigger pulse.<sup>1</sup> This control can also be accomplished with the [VLM1 interface module](#).

<sup>1</sup> Note that the shutter will not operate directly from a TTL signal.

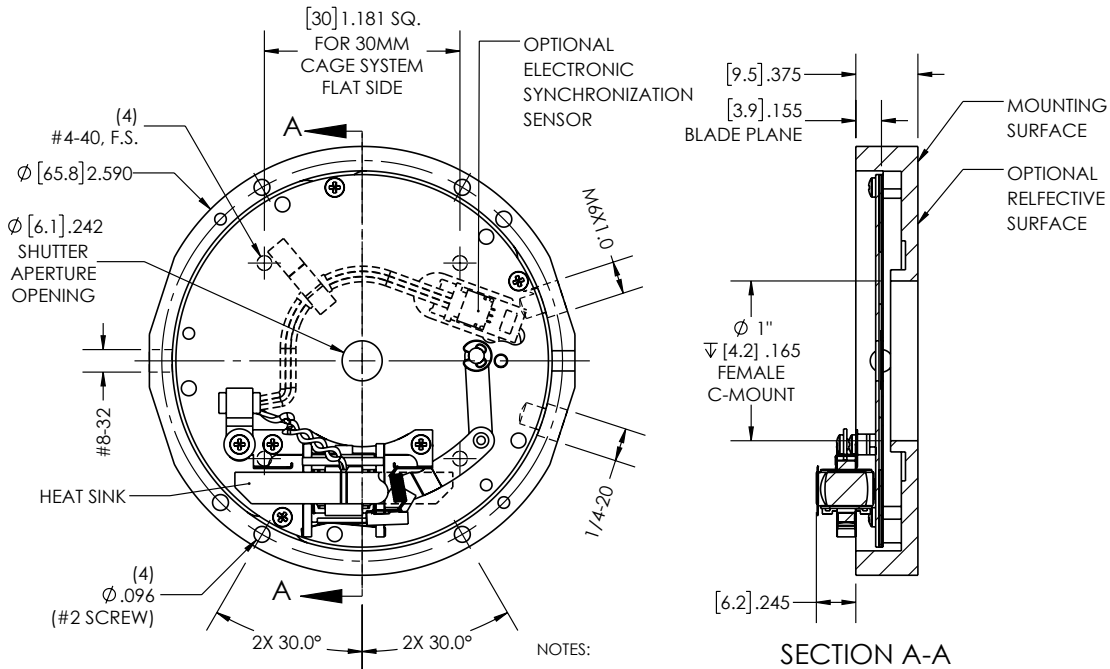
### NOTES:

1. ALL RESISTORS 1/8W, 5%, EXCEPT AS NOTED.
2. DIODES D1 & D2 PREVENT INPUT VOLTAGES EXCEEDING +5V AND DAMAGING MOSFET Q1.
3. +12V MAXIMUM INPUT FOR 1/8W RESISTORS.



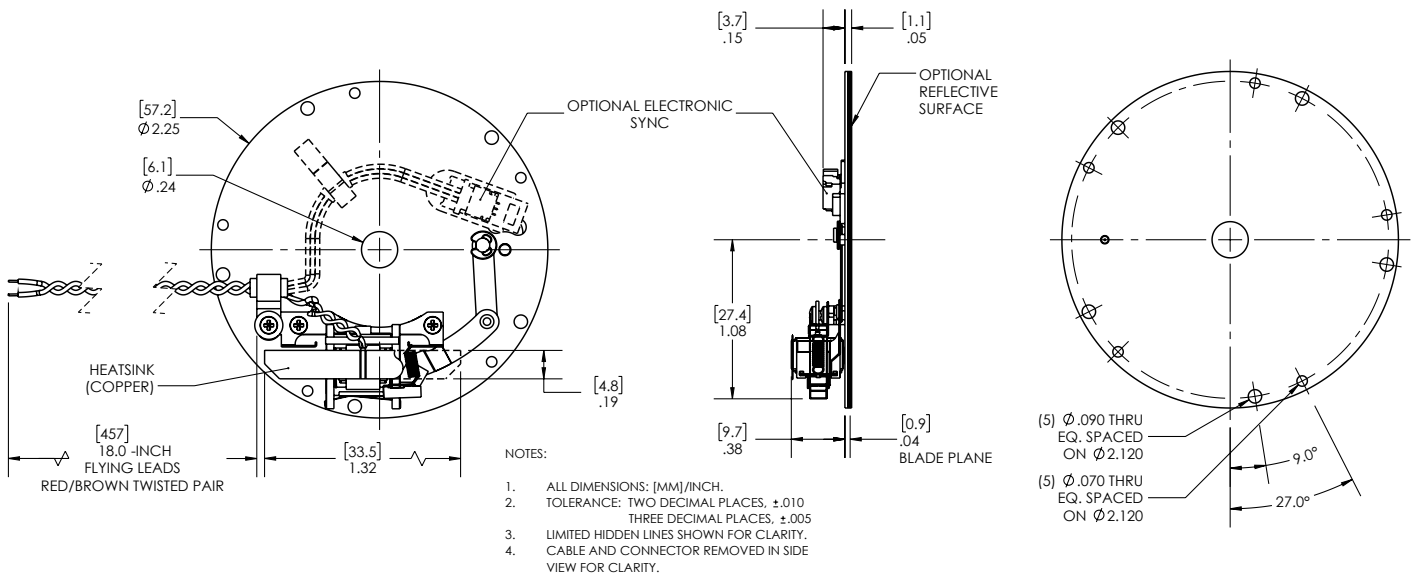
# Uniblitz® FS6 Technical Drawings

## Half-Housing - FS6S2T0L



1. UNITS: [MM]/INCH.
2. LIMITED HIDDEN LINES SHOWN FOR CLARITY.
3. LEADS WIRES REMOVED FOR CLARITY.

## Un-Housed - FS6S1T0L



1. ALL DIMENSIONS: [MM]/INCH.
2. TOLERANCE: TWO DECIMAL PLACES, ±.010  
THREE DECIMAL PLACES, ±.005
3. LIMITED HIDDEN LINES SHOWN FOR CLARITY.
4. CABLE AND CONNECTOR REMOVED IN SIDE  
VIEW FOR CLARITY.

# Uniblitz® FS6 Technical Drawings

## Full-Housing - FS6S3T0L

