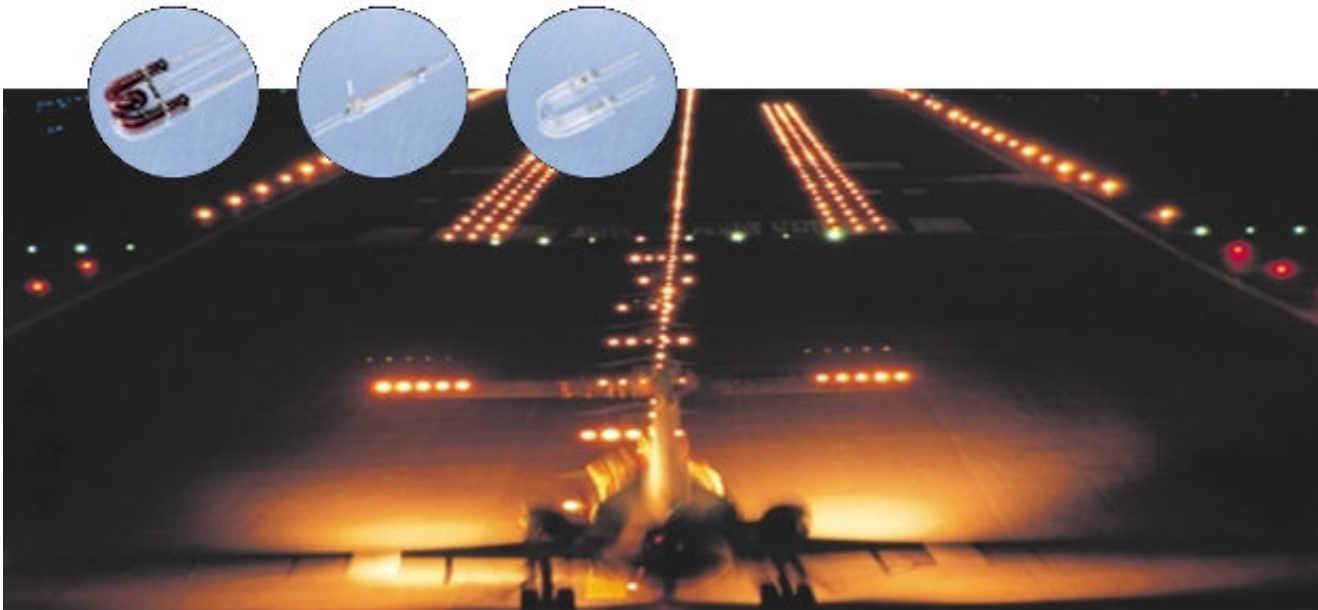


# Flashlamps for Warning Beacons



Excelitas Technologies offers the largest assortment of different lamp shapes for meeting the needs of diverse products within the warning beacon market. We offer many lamp forms, including linear lamps, U-shape, circular, helical and double helix forms. Complete plug-in solutions - lamps, sockets, and integrated trigger coils - are also available and can be customized to meet any customer needs.



Excelitas' comprehensive concept includes all standard materials, from low-cost hard glass to several quartz options. Special long-life electrodes help to drastically reduce service costs, while colored lamps allow one cover for all different colors in use. This creates additional savings in stock and manufacturing costs.

## Features

- Wide variety of lamp designs (different shapes, colors and sizes)
- Several envelope materials for customer-specific spectral and power requirements
- Customization of lamps with trigger electrodes, end caps, flexible or rigid wires, sockets, and sockets with integrated trigger coils
- Excelitas patented Long Life electrodes

## Applications

- Lamps for emergency vehicles (police cars, fire trucks etc.)
- Tower strobes
- Warning beacons on construction sites
- Airport runways
- Aircraft landing lights
- Curing systems
- Speed cameras
- Emergency exits

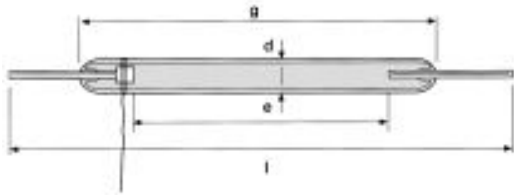


Fig. 1

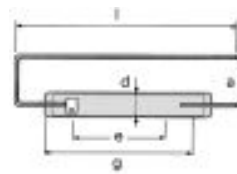


Fig. 2

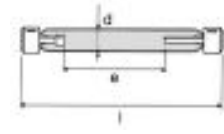


Fig. 3

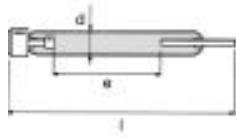


Fig. 4

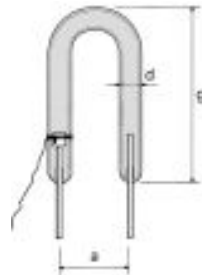


Fig. 5

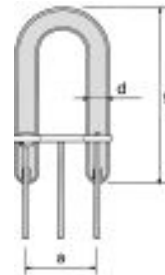


Fig. 6

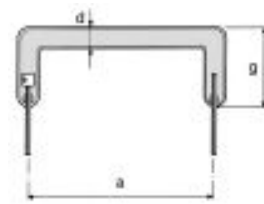


Fig. 7

Type	Figure	Energy / Ws	Power / W	Anode Voltage / V			Dimensions / mm					
				min	nom	max	e	g	l	d	r	a
AGA 0017	1	1	1	170	300	350	17	27	49	3.2	-	-
BGA 1020	1	2	2	180	330	350	20	34	44	3.2	-	-
BG 0625 - 2	2	6	15	250	360	400	25	50	70	5.5	-	10
EG 3770	3	32	32	300	450	600	68	-	117	7	-	-
EGL 3840	4	40	40	400	500	550	40	69	113	8	-	-
AU 0023	5	2	2	150	250	400	-	16	-	3.2	-	7
BUS 0635	6	4	4	250	400	500	-	28	-	6	-	17.5
BUB 0641	6	6	6	200	500	550	-	30	-	6	-	10
BUB 0661	5	8	8	220	400	500	-	41	-	6	-	13
CU 1640	5	10	6	225	500	550	-	37	-	6	-	10
DU 7670	5	15	15	250	400	500	-	45	-	6	-	17.5
BU 2680 - 6	7	15	30	260	290	360	-	29	-	7	-	80
BU 0690	7	7	21	200	450	500	-	23	-	6	-	87
ER 2680	8	25	25	250	350	400	-	27	-	6	20	9
BR 0465	9	10	10	250	340	400	-	-	-	5.5	35	18
BH 0647	10	8	16	280	360	400	-	30	-	6	-	17.5
CH 0601 - 5	11	10	20	300	400	450	-	32	-	6	-	22
CH 0601 - 7	12	10	20	300	400	450	-	40	-	6	-	22
AHF 2640 STD	10	20	25	180	350	600	-	31	-	6	-	15
AHPF 2640 STD	10	20	30	180	350	600	-	31	-	6	-	15
AHF 2647 STD	10	20	25	180	350	600	-	31	-	6	-	17.5
AHPF 2647 STD	10	20	30	180	350	600	-	31	-	6	-	17.5
DHT 2601	13	25	25	300	400	450	-	45	-	7	-	23
BH 3798	12	40	40	250	550	600	-	43	-	7	-	20
SW 503 - 1	13	60	30	400	550	700	-	36	-	7	-	17.5
DW 3670	14	20	20	300	560	600	-	50	50.0	6	32	-
BH 1670	15	25	25	175	300	600	-	48	47.5	6	32	-

\* Borosilicate glass B1 (standard glass): Automatic processing ability. Many tube diameters available.

Borosilicate glass B2: Withstands approx. 30% more power than B1. Requires manual processing.

Quartz glass Q1: UV transparent.

Quartz glass Q2: Reduced generation of ozone. \*\*

Anode voltage doubling trigger

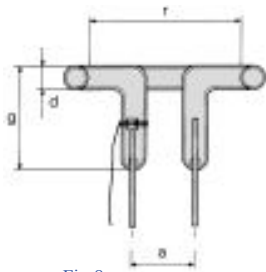


Fig. 8

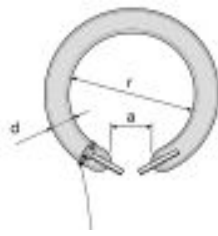


Fig. 9

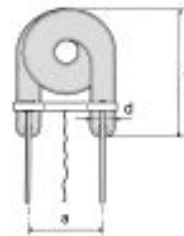


Fig. 10

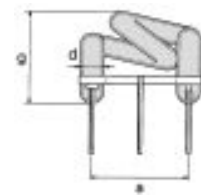


Fig. 11

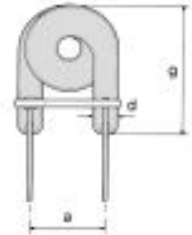


Fig. 12

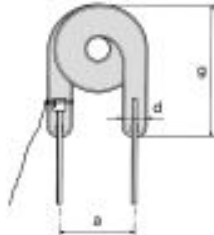


Fig. 13

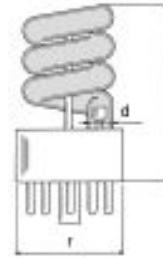


Fig. 14

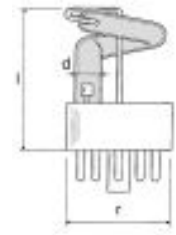


Fig. 15

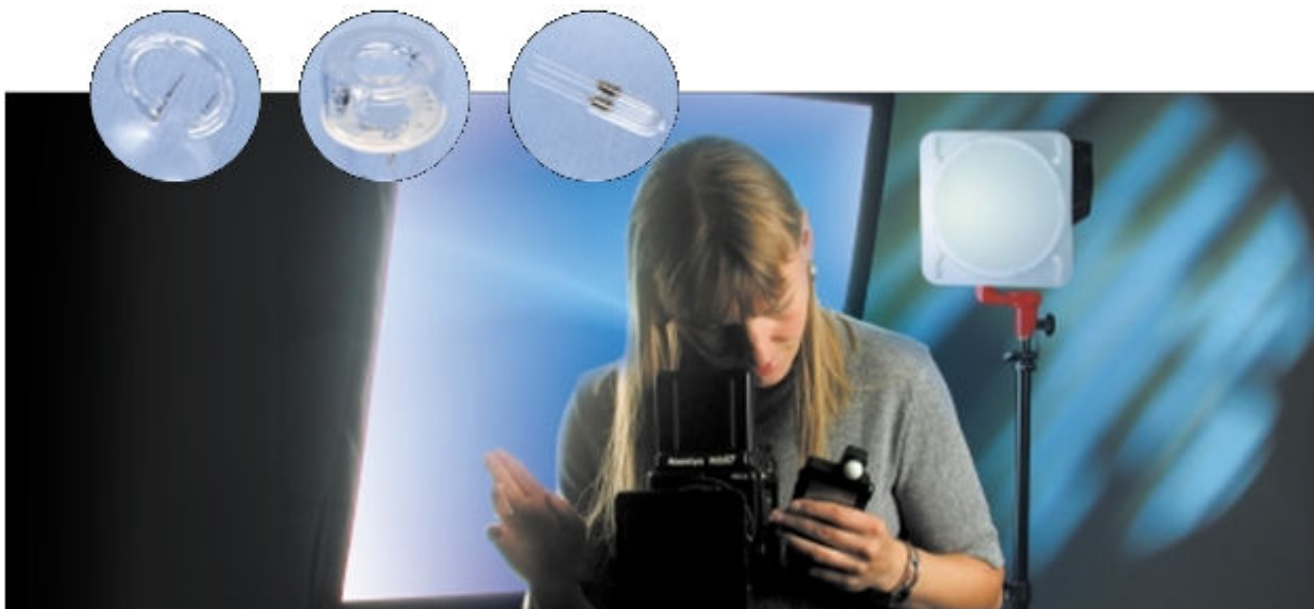
Flashes per sec	Life Flashes	Envelope Material	Recommendations		Primary Trigger Voltage / V
			Trigger Coil	Trigger Capacitor / $\mu\text{F}$	
4	$1 \times 10^6$	B 1*	ZS 1052	0.047	170
4	$3.6 \times 10^6$	B 1*	ZS 1052	0.1	180
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	**
4	$9 \times 10^6$	Q 1*	ZS 1052	0.22	250
4	$1 \times 10^7$	Q 2*	STS 36	0.47	300
4	$1 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	150
4	$5 \times 10^6$	B 1*	ZS 1052	0.22	150
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	150
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	250
3	$5 \times 10^6$	B 2*	ZS 1052	0.22	260
3	$5 \times 10^6$	B 1*	ZS 1052	0.22	200
4	$3 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$1 \times 10^6$	B 1*	ZS 1052	0.22	210
4	$3 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$4 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$4 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$57.6 \times 10^6$	B 1*	ZS 1052	0.22	180
4	$72 \times 10^6$	B 2*	ZS 1052	0.22	180
4	$57.6 \times 10^6$	B 1*	ZS 1052	0.22	180
4	$72 \times 10^6$	B 2*	ZS 1052	0.22	180
4	$3.6 \times 10^6$	B 2*	ZS 1052	0.1	200
4	$3.6 \times 10^6$	B 2*	ZS 1052	0.22	250
4	$5 \times 10^6$	Q 1*	ZS 1052	0.22	300
4	$5 \times 10^6$	B 1*	ZS 1052	0.1	200
4	$3.6 \times 10^6$	B 1*	ZS 1052	0.22	175

### Trigger Transformer Recommendations

Optimal flash module performance and reliability is essential. With that in mind, Excelitas Technologies designs and manufactures trigger coils and transformers for a wide range of specifications - all based on our customers' specific flash applications. Please refer to our Trigger Transformer datasheet to learn which trigger transformer matches your specific lamp and application.

# Flashlamps

## for Professional Photography



Excelitas offers a wide variety of lamp designs for the Professional Photography market. All our lamps are designed for highly stable light output and high efficiency to meet the special requirements of the most demanding photographers. Special Sunlight Coatings to simulate daylight are available.



Special envelope materials, shapes, electrodes and custom glass caps allow us to customize any lamp to meet customer needs. Our expert application engineers will work with you to find the best solution and offer ongoing support in the development of customized flashlamps. A highly-qualified staff and automated electrode production enable us to guarantee reproducible quality for years to come.

### Features

- ▶ Wide variety of lamp designs, including different shapes and sizes made of hard glass and quartz
- ▶ Highly stable light output
- ▶ High efficiency
- ▶ Sunlight Coating
- ▶ Customization of lamps with trigger electrodes, end caps, glass covers, flexible or rigid wires

### Applications

- ▶ Professional studio photography

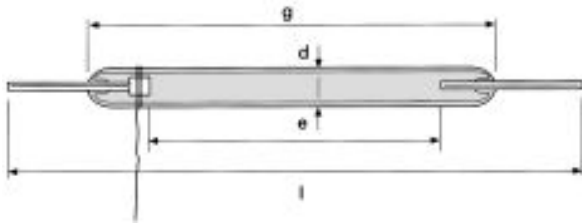


Fig. 1



Fig. 2

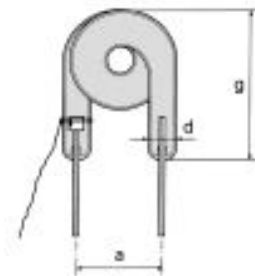


Fig. 3

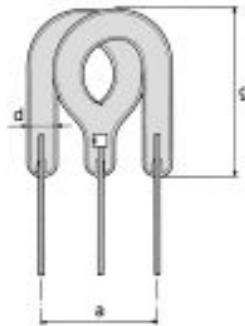


Fig. 4

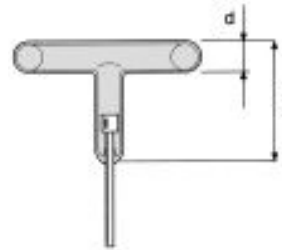
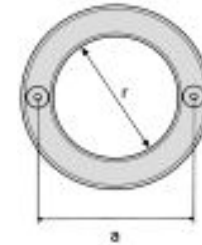


Fig. 5



Type	Figure	Energy / Ws	Anode Voltage / V			Dimensions / mm					
			min	nom	max	e	g	l	d	r	a
CG 6345	1	80	270	330	360	45	68	72	4.50	-	-
CG 8560	1	140	280	360	380	60	84	97	5.45	-	-
NG 6901**	1	120	640	660	700	130	160	240	10	-	-
DG 7650	1	200	300	330	360	50	76	238	6	-	-
EG 9902	1	1500	420	500	700	200	230	388	12	-	-
DU 8901-1	2	250	400	500	600	-	60	-	10	-	14
DU 8902-1	2	500	400	500	660	-	60	-	10	-	14
BU 9902	2	3000	300	500	700	-	94	-	14	-	34
DW 7701-1	3	150	400	500	550	-	32	-	7	-	20
DW 7703-1	4	150	400	500	550	-	35	-	7	-	20
DW 8790-2	4	500	400	500	600	-	34	-	7	-	21
OR 9901**	5	2000	450	550	700	-	8	-	12	40	52
AR 6690	6	100	160	360	400	-	49	-	6	25	15
DR 6702	7	100	300	360	500	-	-	-	6	49	3
DR 7760	8	230	350	500	550	-	40	19	7	13	9
OR 8902**	9	230	350	550	650	-	28	-	10	57	26
MR 8995**	9	240	220	340	360	-	22	-	9	25	12
NR 8901**	9	330	280	360	600	-	35	-	10	45	20
BR 8980	10	460	280	300	310	-	30	-	12	-	61
MR 9902**	9	500	200	300	400	-	28	-	13	54	26
QR 9902**	9	960	600	960	1000	-	20	-	10	59	19
OR 9902**	11	1200	400	700	1200	-	22	-	10	47	28
DR 9902	9	1500	350	550	670	-	28	-	10	57	26
PR 9902**	11	2000	500	600	700	-	24	-	12	47	28
FR 9902-1	9	3200	700	800	1000	-	40	-	11	36	19
DR 9901	9	4000	600	800	1000	-	37	-	13	53	25

\* Borosilicate glass B1 (standard glass): Automatic processing ability. Many tube diameters available.

Borosilicate glass B2: Withstands approx. 30% more power than B1. Requires manual processing.

Quartz glass Q1: UV transparent.

\*\* With Special Sunlight Coating

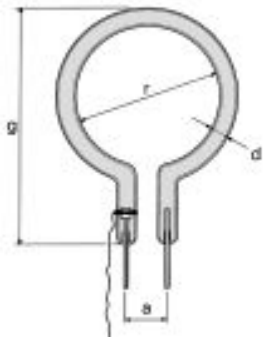


Fig. 6

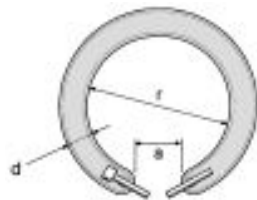


Fig. 7

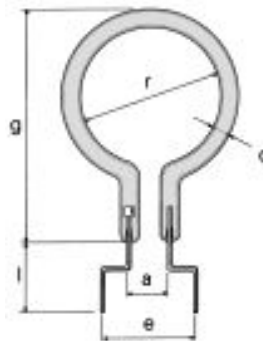


Fig. 8

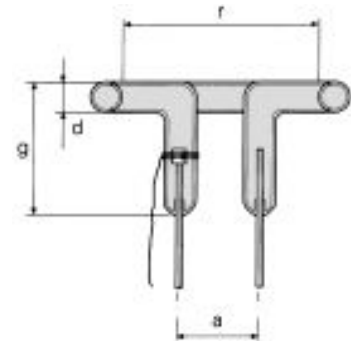


Fig. 9



Fig. 10

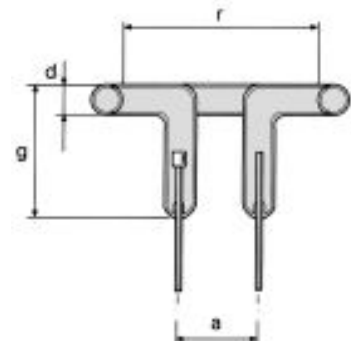


Fig. 11

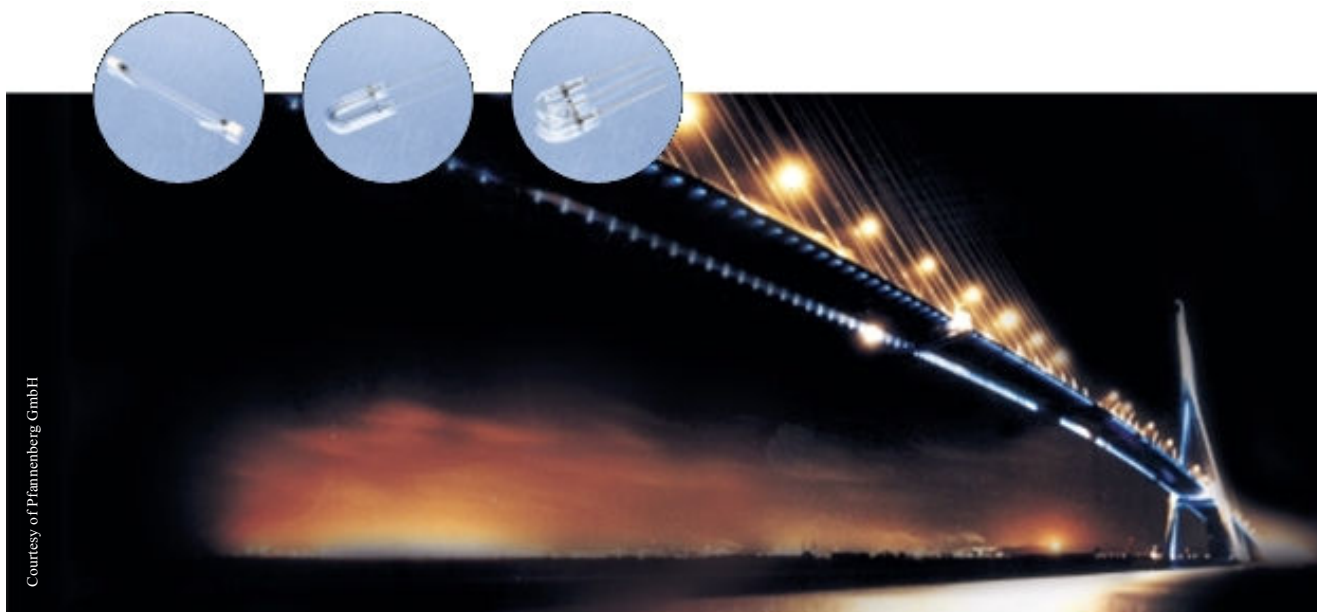
Flashes per min	Life Flashes	Envelope Material	Recommendations Trigger Coil	Trigger Capacitor / $\mu\text{F}$	Primary Trigger Voltage / V
6	3000	B 1*	ZS 1052	0.1	180
6	10000	B 1*	ZS 1052	0.1	200
20	10000	B 2*	ZS 1052	0.22	250
6	10000	Q 1*	ZS 1052	0.1	150
12	10000	Q 1*	ZS 1052	0.22	300
6	10000	B 1*	ZS 1052	0.1	200
6	10000	Q 1*	ZS 1052	0.22	200
6	10000	Q 1*	ZS 1031	0.22	250
6	10000	B 1*	ZS 1052	0.22	200
6	10000	B 1*	ZS 1052	0.22	200
6	10000	Q 1*	ZS 1052	0.22	220
6	10000	Q 1*	ZS 1031	1	350
3	10000	B 2*	ZS 1052	0.1	160
6	10000	B 1*	ZS 1052	0.22	200
3	10000	Q 1*	ZS 1052	0.1	200
6	10000	B 2*	ZS 1052	0.22	200
6	10000	B 2*	ZS 1052	0.1	160
6	10000	B 2*	ZS 1052	0.22	250
6	70000	B 2*	ZS 1052	0.047	280
6	10000	B 2*	ZS 1052	0.22	200
6	10000	B 2*	ZS 1052	0.22	250
6	10000	Q 1*	ZS 1052	0.22	200
6	15000	Q 1*	ZS 1502	0.22	200
6	10000	Q 1*	ZS 1052	0.22	200
4	5000	Q 1*	ZS 1031	0.22	300
6	10000	Q 1*	ZS 1031	0.22	300

### Trigger Transformer Recommendations

Optimal flash module performance and reliability is essential. With that in mind, Excelitas designs and manufactures trigger coils and transformers for a wide range of specifications - all based on our customers' specific flash applications. Please refer to our Trigger Transformer datasheet to learn which trigger transformer matches your specific lamp and application.

# Flashlamps

## for Stroboscopic Applications



Courtesy of Pfannenberg GmbH

Excelitas develops lamps that are perfectly suited for high repetition rates in stroboscopic applications. Typically, linear, U-shaped, or helix form the range of standard stroboscopy lamps, covering everything from low-power 2 mm arc length up to more than 600 mm and 3000 W.



For high power and UV applications, we offer a range of different quartz envelope materials. For applications with less stringent requirements, hard glass is the preferred solution for achieving optimal price competitiveness and a maximum grade of manufacturing automation. Our expert application engineers will work with you to find the best solution and offer ongoing support in the development of customized flashlamps that meet special customer requirements.

### Features

- ▶ Wide variety of lamp designs
- ▶ Different shapes, colors and sizes (from below 10 mm to approx. 600 mm)
- ▶ Wattage ranging from 1 to several thousand Watts
- ▶ Large variety of envelope materials for customer-specific spectral requirements
- ▶ Customization of lamps with trigger electrodes, end caps, flexible or rigid wires

### Applications

- ▶ Sport photography
- ▶ Machine vision
- ▶ Display effect lights
- ▶ Medical
- ▶ Architectural lighting

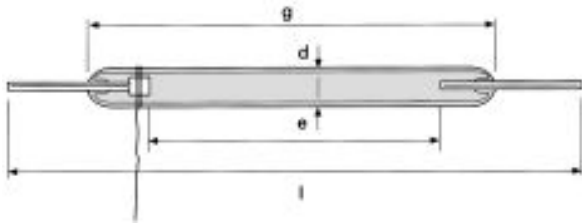


Fig. 1

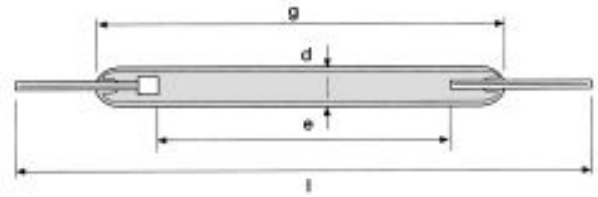


Fig. 2

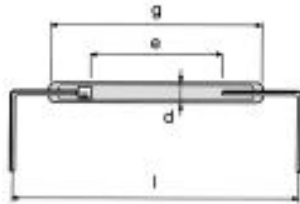


Fig. 3

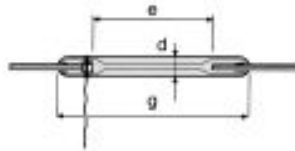


Fig. 4

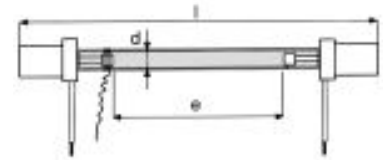


Fig. 5

Type	Figure	Power / W	Anode Voltage / V			Dimensions / mm					Flashes per sec
			min	nom	max	e	g	l	d	a	
CGA 1010	1	1	250	280	360	10	19	23	3.20	-	5 - 100
AGA 0210	2	3	150	250	400	10	24	32	3.60	-	5 - 50
CGA 0414	1	3	250	400	600	14	28	40	4.55	-	5 - 300
BGG 0613	3	4	230	600	750	12	30	35	5.45	-	5 - 100
SG 301	4	4	400	550	600	27	45	-	6.00	-	5 - 1000
DGA 0050	3	5	300	330	360	50	65	75	3.15	-	5 - 100
SG 302-1	1	6	350	550	600	39	64	-	6.00	-	5 - 300
DGS 0610	1	10	280	320	360	10	30	44	6.00	-	5 - 100
SG 305	1	25	400	550	600	40	69	103	8.00	-	5 - 300
SG 304	1	100	400	600	660	100	130	160	8.00	-	5 - 100
DG 8901-1	5	750	360	550	700	158	-	238	10.00	-	2 - 14
EG 9902-1	5	1500	480	550	700	312	-	392	10.00	-	2 - 14
FG 9902-1	5	2500	600	800	1000	457	-	537	10.00	-	2 - 14
GG 9902-1	5	3000	600	800	1000	615	-	695	10.00	-	2 - 14
BUS 0635	6	3	220	400	440	-	28	-	6.00	17.5	5 - 300
SU 401-1	6	4	400	550	650	-	40	-	6.00	13.0	5 - 300
BUB 0641	6	6	200	500	550	-	30	-	6.00	10.0	5 - 250
BUB 0661	7	8	220	400	500	-	42	-	6.00	13.0	5 - 300
SU 414	8	25	400	650	1000	-	35	-	7.00	11.5	5 - 300
BUS 0980	7	100	250	500	700	-	59	-	10.00	17.5	5 - 300
SU 405-2	7	150	600	900	1000	-	90	-	9.00	15.0	5 - 300
SH 203	9	8	300	550	600	-	22	-	6.00	14.0	5 - 300
BH 0647	10	16	280	360	400	-	30	-	6.00	17.5	5 - 300
SH 204	9	20	400	550	600	-	50	-	6.00	19.5	5 - 300
SH 205	9	30	400	550	700	-	70	-	6.00	19.5	5 - 300
SW 503-1	9	30	400	550	700	-	35	-	7.00	17.5	5 - 300

\* Borosilicate glass B1 (standard glass): Automatic processing ability. Many tube diameters available.  
 Borosilicate glass B2: Withstands approx. 30% more power than B1. Requires manual processing.  
 Quartz glass Q1: UV transparent.  
 Quartz glass Q2: Reduced generation of ozone.



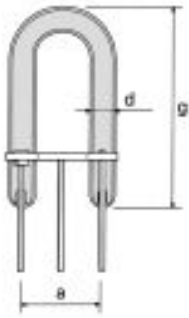


Fig. 6

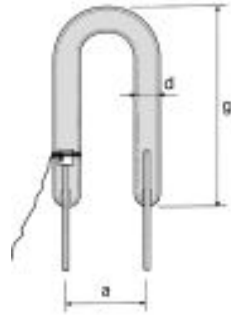


Fig. 7

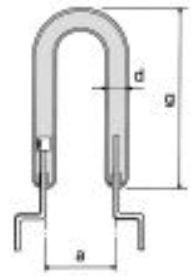


Fig. 8

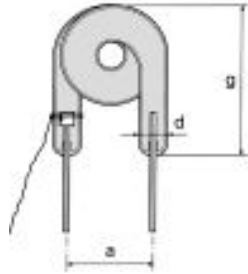


Fig. 9

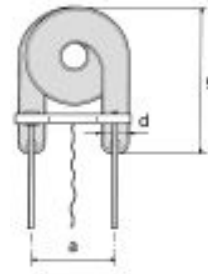


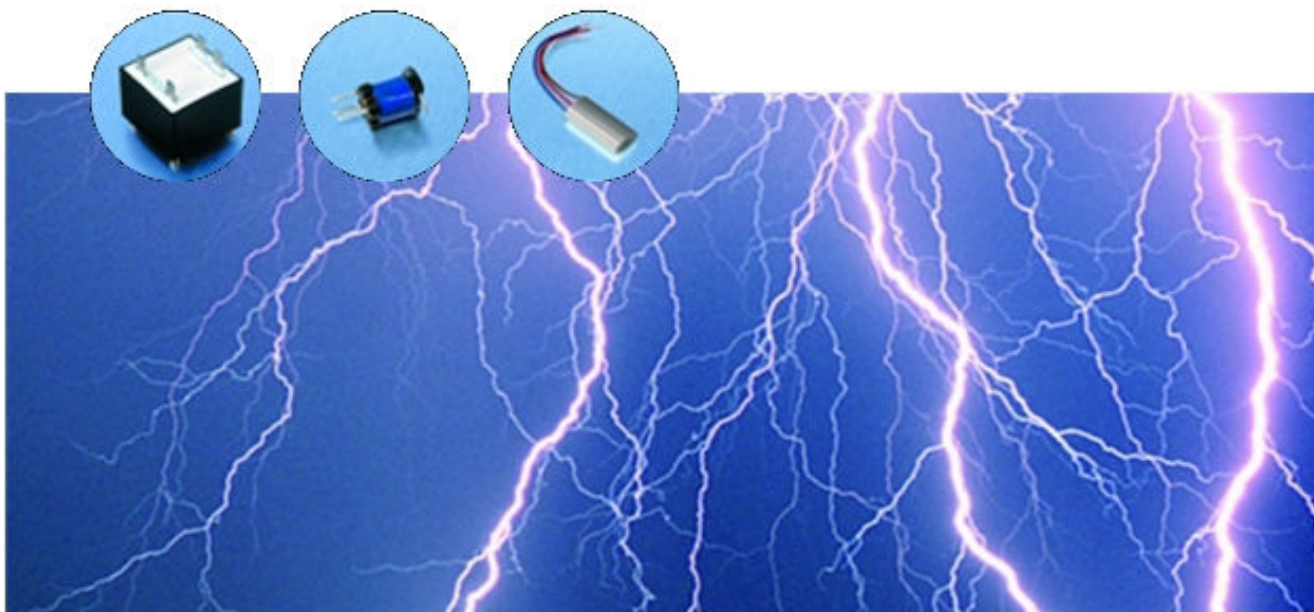
Fig. 10

Life Hours	Envelope Material	Recommendations		
		Trigger Coil	Trigger Capacitor / $\mu\text{F}$	Primary Trigger Voltage / V
50	B 1*	ZS 1052	0.047	180
60	B 1*	ZS 1052	0.047	150
250	B 1*	ZS 1052	0.068	100
60	B 1*	ZS 1052	0.022	100
250	B 2*	ZS 1052	0.1	170
100	B 1*	ZS 1052	0.047	200
250	B 1*	ZS 1052	0.1	170
500	Q 2*	ZS 1052	0.047	250
250	Q 2*	ZS 1052	0.22	200
250	Q 1*	ZS 1052	0.22	250
500	Q 2*	ZS 1052	0.22	250
500	Q 2*	ZS 1052	0.22	250
500	Q 2*	ZS 1052	0.22	180
500	Q 2*	ZS 1031	0.47	300
250	B 1*	ZS 1052	0.1	150
250	B 1*	ZS 1052	0.047	150
250	B 1*	ZS 1052	0.22	150
250	B 1*	ZS 1052	0.1	150
250	Q 1*	ZS 1052	0.1	200
70	B 2*	ZS 1052	0.1	250
250	Q 1*	ZS 1052	0.1	300
250	B 1*	ZS 1052	0.1	200
250	B 1*	ZS 1052	0.1	200
250	B 1*	ZS 1052	0.22	200
250	B 1*	ZS 1052	0.22	200
250	Q 1*	ZS 1052	0.22	300

### Trigger Transformer Recommendations

Optimal flash module performance and reliability is essential. With that in mind, Excelitas designs and manufactures trigger coils and transformers for a wide range of specifications - all based on our customers' specific flash applications. Please refer to our Trigger Transformer datasheet to learn which trigger transformer matches your specific lamp and application.

# Trigger Transformers



The process that effects the initial ionization within a flashlamp is known as "triggering." Triggering creates a voltage gradient in the gas of sufficient magnitude to cause ionization of the lamps. Most flashlamp applications use a trigger coil to produce high-voltage pulses of short duration, usually a few microseconds or less.

Two different types of circuits and transformers are used to introduce the voltage necessary to achieve ionization - series injection triggering and external triggering with the associated coils.

External triggering uses a high-voltage trigger pulse to create a thin ionized streamer between the anode and cathode within the lamp. The coupling of this voltage to the lamp can be achieved using a thin nickel wire wrapped around, or a metal stripe on the surface of the lamp envelope. These types of trigger coils are generally lighter, smaller, and less expensive than those used for series injection triggering. Series triggering offers higher timing accuracy and is often used in combination with liquid cooled lamps in lasers. Trigger coils are typically larger, since they not only generate the HV ignition, but also must cope with lamp currents in the order of several thousand Amps.

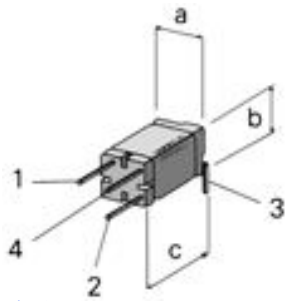


Fig. 1

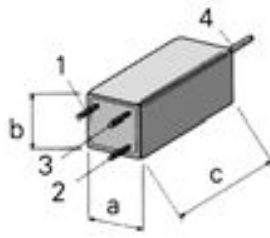


Fig. 2

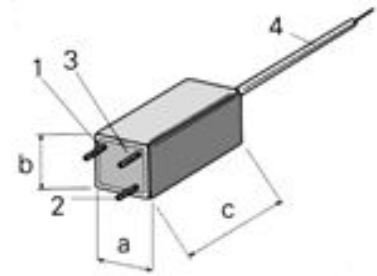


Fig. 3

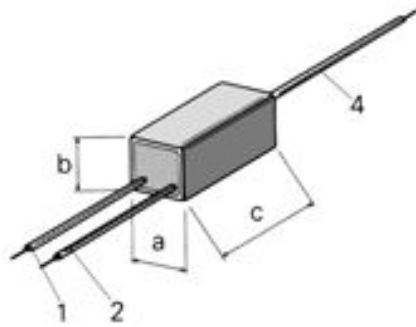


Fig. 4

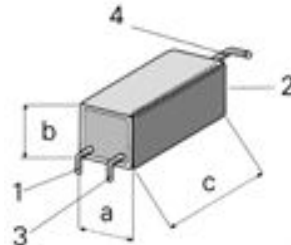


Fig. 5

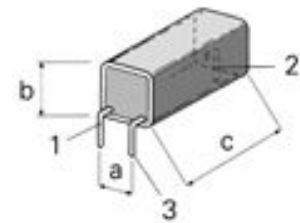


Fig. 6

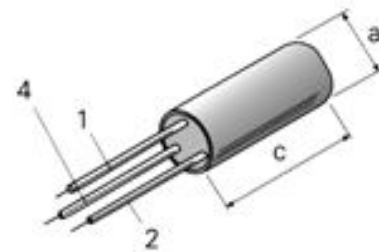


Fig. 7

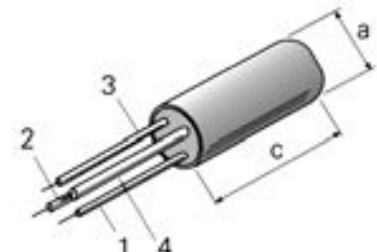


Fig. 8

#### External Trigger Transformers

Type	Figure	Sec. Voltage max / kV unloaded	Prim. Voltage max. unloaded V	Trigger Energy max/mWs	Trigger Power max / W	Transformer Ratio	Prim. Inductance $\mu$ H
ZS 1092	1	5	250	3	0.2	1:43	2
ZS 1052*	2	11	300	10	0.5	1:36	20
ZS 1052/1*	3	11	300	10	0.5	1:36	20
ZS 1052/11*	4	11	300	10	0.5	1:36	20
ZS 1052/12*	5	11	300	10	0.5	1:36	20
ZS 1052/1 (600)*	3	8	400	10	0.5	1:17	20
ZS 1052 AC*	6	11	300	10	0.5	1:36	20
ZS 1031	7	20	400	30	1	1:70	11
ZS 1031/11	8	20	400	30	1	1:70	11
ZS 1031/15	9	20	400	30	1	1:70	11
ZS 1031/7A	10	20	400	30	1	1:70	11
ZS 1032*	11	20	400	30	1	1:70	11
ZS 261816	12	15	250	10	0,5	1:65	39

\* Available with UL-listed materials, suitable for higher operation temperatures

#### Series Injection Trigger Transformers

Type	Figure	Sec. Voltage max / kV unloaded	Prim. Voltage max. unloaded V	Transformer Ratio	Prim. Inductance $\mu$ H
STS 36	13	25	600	1:44	33

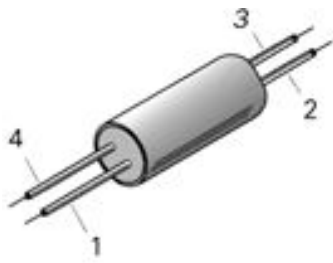


Fig. 9

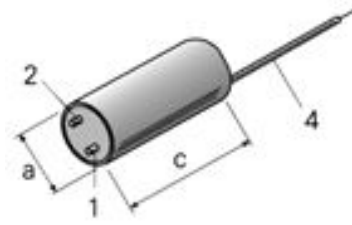


Fig. 10

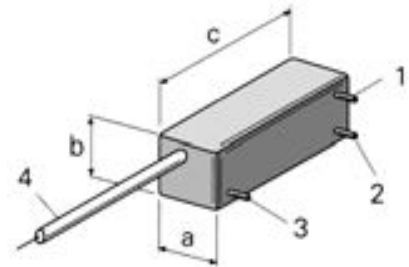


Fig. 11

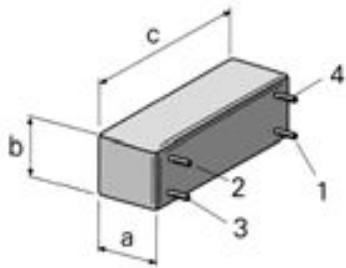


Fig. 12

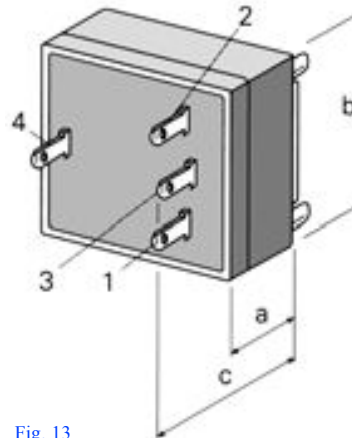


Fig. 13

Trigger Capacitor CZ / $\mu$ F	Dimensions / mm			Connections Figure
	a	b	c	
0.022-0.068	4.8	4.8	7.7	101
0.047-0.22	8	8	16	102
0.047-0.22	8	8	16	102
0.047-0.22	8	8	16	101
0.047-0.22	8	8	16	102
0.047-0.22	8	8	16	102
0.047-0.22	8	8	16	103
0.1-0.47	16	-	35	101
0.1-0.47	16	-	35	102
0.1-0.47	16	-	35	102
0.1-0.47	16	-	35	101
0.1-0.47	17	17	43	102
0.1-0.22	18	15,5	25,4	102

Trigger Capacitor CZ / $\mu$ F	Dimensions / mm			Connections of prim. and sec. Figure
	a	b	c	
0.47 - 1	32	45	37	102

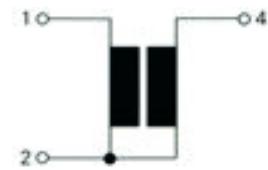


Fig. 101

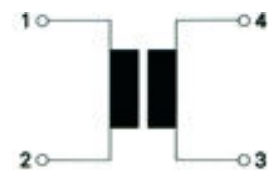


Fig. 102

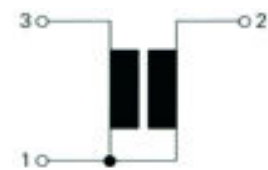


Fig. 103

## Your Partner of Choice

With a broad customer base in all major markets, built on ninety years of solid trust and cooperation with our customers, Excelitas is recognized as a reliable partner that delivers high quantity, customized, and superior “one-stop” solutions. Our products - from lamps to trigger transformers, reflectors, power supplies, and more - meet the highest qualitative and environmental standards. Our worldwide Centers of Excellence along with our Customer and Technical Support teams always work with you to find the best solutions for your specific needs.

## Excelitas

Excelitas is a global technology leader providing market-driven, integrated solutions for a wide range of applications, which leverage our lighting, sensors, and imaging expertise. Our technologies, services and support are fueling the medical, genomic and digital revolutions by enhancing our customers’ productivity, optimizing performance, and accelerating time-to-market.

So contact us and put Excelitas’ expertise to work in your demanding lighting applications. Let us show you how our innovations will help you deliver the perfect product.

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