EAGLEPICHER TECHNOLOGIES

Cutters

The devices use pyrotechnic generated energy to power a wide variety of cutting mechanisms.

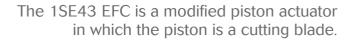
Applications include:

- Severing control or communication wires
- Cutting tubing to release coolant
- Puncturing diaphragms
- Rupturing gas bottle burst disks
- Severing mooring cables
- Cutting reefing lines
- Breaking glass vials to release chemicals.





1SE43 EFC Gas Bottle Cutter



The 1SE43 EFC is used to sever a stainless steel tube and release gas from a storage bottle.



Variations

Although the 1SE43 was designed for a specific application, EaglePicher can adapt it for other uses. The header shape, piston stroke, and output can be modified without losing RF and electrical properties. RF protection can also be eliminated.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

0.90 - 1.30 ohm
4.50 amp, 100 ms
0.95 amp, 5 min
1.0 megohm
25,000 V discharge from a 500 pF capacitor with a 5000 ohm resistor applied between terminals, and terminals to case ground.
MIL-STD-1377, minimum insertion loss 50 dB at 100 MHz
See Drawing
20 gm Max.
.106" (2.69 mm)
Will shear 1/16" (1.59 mm) O.D. x 0.16" (.406 mm) wall CRS (Type 304) tube
Operating range: -40°F to +140°F (-40°C to +60°C)
Lead Azide
Detonator, Electric
1.4B

1SE43 EFC

Safety

Maximum pyrotechnic weight:

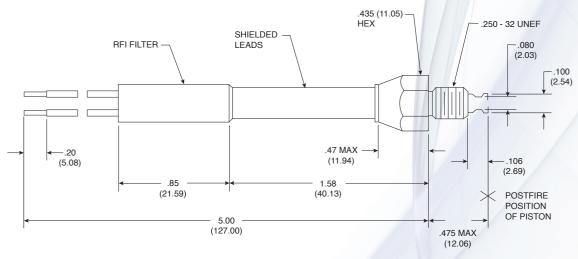
23 mg

Warning:

The 1SE43 EFC cutter may fire or explode if it is exposed to temperatures higher than 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before it has functioned.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.



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EaglePicher Technologies, LLC



1SE192 Wire Cutter

The 1SE192 Wire Cutter is an electrically initiated pyrotechnic-powered device designed to cut electrical or other small-diameter wire.

> The cutter is compact, lightweight, highly reliable and functions in less than 10 milliseconds. It has been used extensively in aerospace applications.

Variations

The 1SE192 has been produced with several ignition systems which fire at different firing energy levels. Other variations are possible in cutting capability, environmental, resistance and firing characteristics.

Characteristics

Some of the characteristics listed here are nominal: others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Specifications		
	Electrical	
	Insulation Resistance @ 500 Vdc, Shunted Leads to Case, Before Firing	50 megohms
	Mechanical	
	Size	See Drawing
	Weight	2.25 gm
	Function Time	10 ms Max.
	Cutting Capability	6 strands of .0049" (.1245 mm) dia. wire per MIS-14001 encased in high-temperature nylon sleeving per MIS-13919 or .014" (.355 mm) dia. music wire.

Specifications Continued		
Environmental		
Temperature	Operating range: -25°F to +125°F (-32°C to +52°C)	
Storage	-80°F to +155°F (-62°C to +68°C)	
Storage Time at 30% Relative Humidity	5 years	
Accelerated Storage Humidity	48 hr at 95% relative humidity and 155°F (68°C)	
Shock	1/2 sine wave with a peak acceleration of 100g's and a duration of 10 ms. Five shocks in each of 2 directions along each of 3 mutually perpendicular axes.	
Vibration MIL-STD-202, Method 204 Modified as Follows	Sinusoidal vibration along 3 perpendicular axes with a cycle of: 5-26 Hz @ 1.3 g's 26-52 Hz @ 0.036" (0.914 mm) d.a. 52-500 Hz @ 5.0 g's	
Chemical		
Ignition Compound	KDNBF	
Freight Classification		
Shipping Name	Wire Cutter	
Identification Number	Not regulated as Class 1	
Hazard Classification	Not regulated as Class 1	

Cutter	Bridge resistance @70°F (21°C)	All-fire current @ -25°F (-32°C) 10 ms	No-fire current @ 125°F (52°C) 5 min
Туре	Ohm	Amp, Min.	Amp, Max.
1SE192A	5.0 - 7.0	0.30	0.03
1SE192B	4.0 - 6.0	0.55	0.10
1SE192C	1.6 - 2.0	1.0	0.10
1SE192F	0.09 - 0.29	4.0	1.0 (1 min)

Maximum pyrotechnic weight:

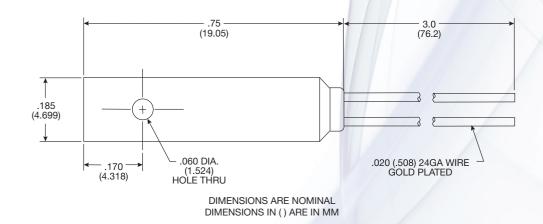
25 mg

Warning:

The cutter is self-contained and will not rupture under normal handling and testing conditions. If the cutter is exposed to temperatures above 200°F (93°C) or an electrical charge exceeding the specified no-fire current, it may rupture. If the unit is cut open before it has functioned, it may fire and emit some shrapnel.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.





EaglePicher Technologies, LLC



1SE601 Puncturing Cutter



The 1SE601 is a pyrotechnic actuated cutter specifically designed to puncture a steel disc and release gas from a cylinder through the hollow piston.

> Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion.

Specifications		
Electrical		
Bridge Resistance @ 70°F (21°C)	1.0 ohm	
All-Fire Current	4.5 amp, 20ms	
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min	
Insulation Resistance	Before fire: Greater than 1 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.	
Electrostatic Discharge	MIL-DTL-23659 D para 4.4.5.2 25 kW discharge from a 500 pF capacitor applied through a 5000 ohm serried resistor.	
Mechanical		
Size	See Drawing (other side)	
Weight	8 gm	
Stroke	Punctures .015 inch thick mild steel disc which is capable of withstanding a gas pressure of 3,000 psig.	
Function Time	20 ms	
Operating Conditions	-67°F - 130°F	
Proof Pressure	6,000 psig	
Leakage	5cm³ per minute after actuation	

Specifications Continued	
Environmental	
Temperature Shock/Humidity/ Altitude	MIL-DTL-23659 D para 4.6.5 (Temperature -65°F to 160°F, Relative Humidity 50% to 95%, Altitude 70,000 ft).
Salt Fog	MIL-STD-810F, Method 509.2, Procedure 1 (5% salt concentration).
Acceleration	MIL-STD-202G, Method 27.2, Test Condition A.
Shock	MIL-DTL-23659 D para 4.6.3 Shock profile is half sine wave with an amplitude of 200g for 1.5 seconds and exceed 65g for 9 ms
Vibration	MIL-DTL-23659D para 4.6.4 (-65°F to 200°F)
Forty Foot Drop	MIL-STD-331, Test Method A3, safe for disposal.
Six Foot Drop	MIL-DTL-23659 D para 4.6.2 Capable of actuation after being subjected to a six foot drop and impacted on a 2 inch thick steel plate.
Freight Classification	
Shipping Name	1SE601
Identification Number	UN0173
Hazard Classification	1.45

Variations

EaglePicher can design and manufacture variations of the 1SE601 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Safety

Maximum pyrotechnic weight:

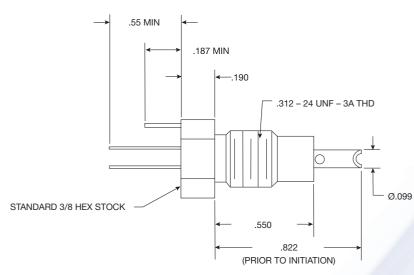
25 mg Barium Styphnate

Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.



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EaglePicher Technologies, LLC



1SE603 Puncturing Cutter



The 1SE603 is a pyrotechnic actuated cutter specifically designed to puncture a steel disc and release gas from a cylinder through the hollow piston.

> Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion.

Specifications	
Electrical	
Bridge Resistance @ 70°F (21°C)	1.0 ohm
All-Fire Current	4.5 amp, 20ms
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min
Insulation Resistance	Before fire: Greater than 1 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.
Electrostatic Discharge	MIL-DTL-23659 D para 4.4.5.2 25 kW discharge from a 500 pF capacitor applied through a 5000 ohm serried resistor.
Mechanical	
Size	See Drawing (other side)
Weight	8 gm
Stroke	Punctures .008 inch thick inconel disc which is capable of withstanding a gas pressure of 4,700 psig.
Function Time	20 ms
Operating Conditions	-67°F - 187°F
Proof Pressure	6,000 psig
Leakage	5cm³ per minute after actuation

Specifications Continued	
Environmental	
Temperature Shock/Humidity/ Altitude	MIL-DTL-23659 D para 4.6.5 (Temperature -65°F to 160°F, Relative Humidity 50% to 95%, Altitude 70,000 ft).
Salt Fog	MIL-STD-810F, Method 509.2, Procedure 1 (5% salt concentration).
Acceleration	MIL-STD-202G, Method 27.2, Test Condition A.
Shock	MIL-DTL-23659 D para 4.6.3 Shock profile is half sine wave with an amplitude of 200 g for 1.5 seconds and exceed 65g for 9 ms
Vibration	MIL-DTL-23659D para 4.6.4 (-65°F to 200°F)
Forty Foot Drop	MIL-STD-331, Test Method A3, safe for disposal.
Six Foot Drop	MIL-DTL-23659 D para 4.6.2 Capable of actuation after being subjected to a six foot drop and impacted on a 2 inch thick steel plate.
Freight Classification	
Shipping Name	1SE603
Identification Number	UN0173
Hazard Classification	1.4S

Variations

EaglePicher can design and manufacture variations of the 1SE603 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Safety

Maximum pyrotechnic weight:

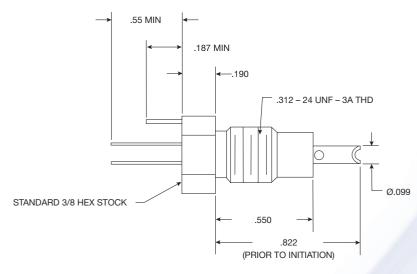
25 mg Barium Styphnate

Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.



DIMENSIONS ARE NOMINAL DIMENSIONS ARE IN INCHES



EaglePicher Technologies, LLC



1SE606 Puncturing Cutter

The 1SE606 is a pyrotechnic actuated cutter specifically designed to puncture a steel disc and release gas from a cylinder through the hollow piston.

> Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion. The design is capable of being used in an oxygen environment.

Variations

EaglePicher can design and manufacture variations of the 1SE606 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Specifications	
Electrical	
Bridge Resistance @ 70°F (21°C)	1.0 ohm
All-Fire Current	4.5 amp, 20ms
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min
Insulation Resistance	Before fire: Greater than 1 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.
Electrostatic Discharge	MIL-DTL-23659C 25 kW discharge from a 500 pF capacitor applied through a 5,000 ohm serried resistor.
Mechanical	
Size	See Drawing
Weight	15 gm
Stroke	Punctures .006 inch thick nickel disc which is capable of withstanding a gas pressure of 3,000 psig.
Function Time	20 ms
Operating Conditions	-67°F - 162°F
Proof Pressure	6,000 psig
Freight Classification	
Shipping Name	1SE606A
Identification Number	Not regulated
Hazard Classification	None

Maximum pyrotechnic weight:

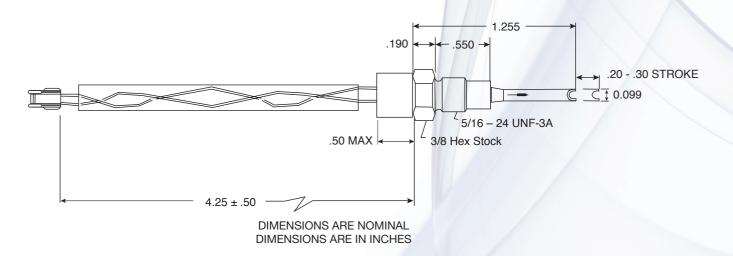
25 mg Barium Styphnate

Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.





EaglePicher Technologies, LLC



1SE607 Puncturing Cutter

The 1SE607 is a pyrotechnic actuated cutter specifically designed to cut a steel tube.

> Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion.

Variations

EaglePicher can design and manufacture variations of the 1SE607 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification,

Specifications	
Electrical	
Bridge Resistance @ 70°F (21°C)	1.0 ohm
All-Fire Current	4.5 amp, 20ms
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min
Insulation Resistance	Before fire: Greater than 1 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.
Electrostatic Discharge	MIL-DTL-23659C 25 kW discharge from a 500 pF capacitor applied through a 5,000 ohm serried resistor.
Mechanical	
Size	See Drawing
Connector	MIL-C-24308/3 part number M24308/3-IF, Lead wires are terminated into pins 1 and 2.

Specifications Continued	
Lead Length	7 inches
Weight	20 gm
Stroke	Cut a corrosion resistance steel, type 304 tube with an outside diameter of 0.0625 with a wall thickness of 0.016 which is capable of withstanding a gas pressure of 8.500 psig.
Function Time	20 ms
Operating Conditions	-40°F - 140°F
Proof Pressure	8,500 psig
Leakage	Not greater than 60 cm ³ for a period of 10 min after actuation.
Environmental	
Temperature Shock	(-40°F to 85°F)
Humidity	Relative Humidity 50% to 95%, Temperature 68°F to 104°F for 120 hours.
Salt Fog	MIL-STD-810F, Method 509.2, Procedure 1 (5% salt concentration).
Acceleration	MIL-STD-202G, Method 27.2, Test Condition A.
Shock	Shock levels shall be as defined by operating shock response spectrum define by Figure 1.
Random Vibration	Random vibration spectrum shall consist of a frequency: 20 to 5,000 Hz; power spectrum density: 0.01 gravity units squared per hertz.
Freight Classification	
Shipping Name	1SE-607
Identification Number	UN0173
Hazard Classification	1.4S

Joplin, Missouri 64802-0047 USA | tel 417.623.8000 | fax 417.623.0850

www.eaglepicher.com

Maximum pyrotechnic weight:

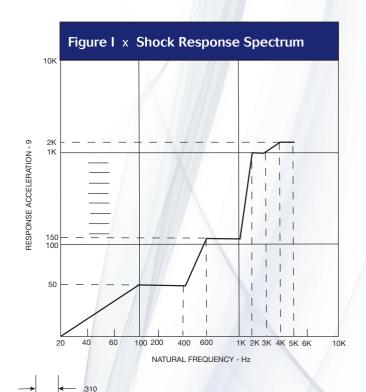
36 mg Barium Styphnate

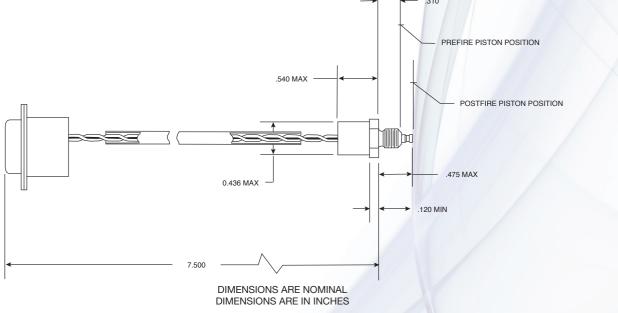
Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.



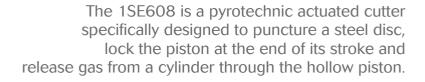




EaglePicher Technologies, LLC



1SE608 Puncturing Cutter



Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion.

Variations

EaglePicher can design and manufacture variations of the 1SE608 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal: others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Specifications		
Electrical		
Bridge Resistance @ 70°F (21°C)	1.0 ohm	
All-Fire Current	3.5 amp, 20ms	
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min	
Insulation Resistance	Before fire: Greater than 10 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.	
Electrostatic Discharge	MIL-DTL-23659F 25 kW discharge from a 500 pF capacitor applied through a 5,000 and 500 ohm serried resistor.	

Specifications Continued	
Mechanical	
Size	See Drawing (other side)
Lead Length	18 inches
Weight	12 gm
Stroke	Punctures .012 inch thick inconel disc which is capable of withstanding a gas pressure of 17,500 psig.
Function Time	20 ms
Operating Conditions	-67°F - 187°F
Push Back Force	Will withstand up to 350 lbs of force for up to one minute after actuation.
Proof Pressure	22,000 psig
Burst Pressure	37,000 psig
Leakage	1.0 cm³ per min after actuation

Specifications Continue	ed .
Environmental	
High Temperature	MIL-STD-810C, Method 501.1, Procedure 1, except steps 4 & 5 are omitted (187°F).
Low Temperature	MIL-STD-810C, Method 502.1, Procedure 1, except steps 4 & 5 are omitted (-67°F)
Temperature Shock	MIL-STD-810C, Method 503.1, Procedure 1 (-80°F to 187°F)
Humidity	MIL-STD-810F, Method 507.4, Procedure 1 (85-95% relative humidity at -68°F to 140°F)
Salt Fog	MIL-STD-810F, Method 509.1, Procedure 1 (5% salt concentration)
Fungus	MIL-STD-810F, Method 509.1, Procedure 1, except that the test period shall be 90 days.
Temperature–Altitude	MIL-STD-810C, Method 504.1, for equipment category 3 non-operating, except that the temperatures shall be the following: Step 1b: -67°F Steps 2 & 3: -45°F Step 6: 187°F Steps 8 & 11: 145°F
Free Flight Acceleration	MIL-STD-810C, Method 513.2, Procedure 1, The Bottle Cutters shall be exposed to acceleration peak levels as follows for 1.5 seconds in each of the axes. Longitudinal Axis (Forward): 34g Longitudinal Axis (Aft): 14g Vertical Axis (Up): 40g Vertical Axis (Down): 40g Transverse: 40g
Shock	MIL-DTL-23659F
Vibration	MIL-DTL-23659F
Freight Classification	
Shipping Name	1SE608
Identification Number	UN0173
Hazard Classification	1.4S

Maximum pyrotechnic weight:

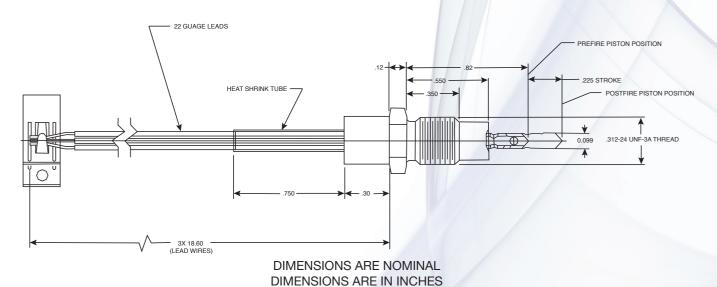
30 mg Barium Styphnate

Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.

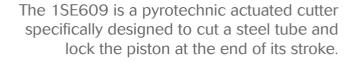




EaglePicher Technologies, LLC



1SE609 Puncturing Cutter



Extremely rugged in construction, the cutter can be used in any application where strength and output power are important in providing linear motion.

Specifications	
Electrical	
Bridge Resistance @ 70°F (21°C)	1.0 ohm
All-Fire Current	3.5 amp, 20ms
No-Fire Current @ 70°F (21°C)	1.0 amp, 5 min
Insulation Resistance	Before fire: Greater than 1 megohm with 500 Vdc leads to case. Per MIL-STD-202, Method 302, Test Conditions B.
Electrostatic Discharge	MIL-DTL-23659C 25 kW discharge from a 500 pF capacitor applied through a 5,000 ohm serried resistor.
Mechanical	
Size	See Drawing (other side)
Lead Length	2.53 inches
Weight	10 gm
Stroke	Cut a corrosion resistance steel, type 304 tube with an outside diameter of 0.0625 with a wall thickness of 0.016 which is capable of withstanding a gas pressure of 12,200 psig.
Function Time	20 ms
Operating Conditions	-40°F - 150°F
Push Back Force	Will withstand up to 350 lbs of force for up to one minute after actuation.
Proof Pressure	12,200 psig
Leakage	60cc per min after actuation

Specifications Continued		
Environmental		
Temperature Shock/Humidity/ Altitude	MIL-DTL-23659 para 4.6.5 (Temperature -65°F to 160°F, Relative Humidity 50% to 95%, Altitude 70,000 ft).	
Salt Fog	MIL-STD-810F, Method 509.2, Procedure 1 (5% salt concentration).	
Acceleration	MIL-STD-202G, Method 27.2, Test Condition A.	
Triangular Shock	MIL-DTL-23659D para 4.6.4 (Waveform – Triangular, Amplitude – 400g, Rise Time – 2.0 ms, Decay Time 2.0 ms).	
Vibration	MIL-DTL-23659D para 4.6.4 (-65°F to 200°F)	
Random Vibration	Random vibration spectrum shall consist of a fequency: 20 to 5,000 Hz; power spectrum density: 0.01 gravity units squared per hertz.	
Forty Foot Drop	MIL-STD-331, Test Method A3, safe for disposal.	
Six Foot Drop	Capable of actuation after being subjected to a six foot drop and impacted on a 2 inch thick steel plate.	
Freight Classification		
Shipping Name	1SE-609	
Identification Number	UN0173	
Hazard Classification	1.4S	

Variations

EaglePicher can design and manufacture variations of the 1SE609 to meet customer requirements.

Characteristics

Some of the characteristics listed here are nominal; others are levels to which the units have been tested. There are no limits on design capabilities. Please consult an EaglePicher representative before using this data as a specification.

Safety

Maximum pyrotechnic weight:

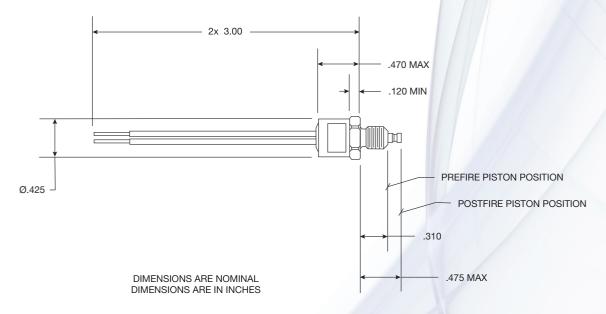
30 mg Barium Styphnate

Warning:

The cutter may fire if exposed to temperatures above 200°F (93°C), an electrical charge exceeding the specified no-fire current, or if it is cut open before functioning.

If your company does not have a safety program, it is essential that one is established before explosive items are handled or used. For a brief overview of safety precautions, see the Safety Procedures Data Sheet or contact an EaglePicher representative.

Energetic devices are considered articles; therefore a Material Safety Data Sheet (MSDS) does not apply. However, MSDS may apply to individual components. For more information, contact your EaglePicher representative.





EaglePicher Technologies, LLC