



EVERYTHING

IN A

NEW

LIGHT.

## Triggered Spark Gaps Ceramic-Metal

PerkinElmer's Triggered Spark Gaps are a family of versatile high voltage switches. They consist of three electrodes in a hermetically sealed, pressurized ceramic envelope. Triggered Spark Gaps are generally characterized by a peak current capability of thousands to tens of thousands of amperes, delay times of tens of nanoseconds, arc resistance of tens of milliohms and inductance of 5 to 30 nanohenries. They are suitable for capacitor switching applications such as flash-lamps, electrically pumped gas lasers, medical lithotripters, and as crowbar protection devices.



### Features

- Fast switching operation
- High voltage holdoff
- Ceramic-metal construction
- No warm up period
- High current capability
- Long life

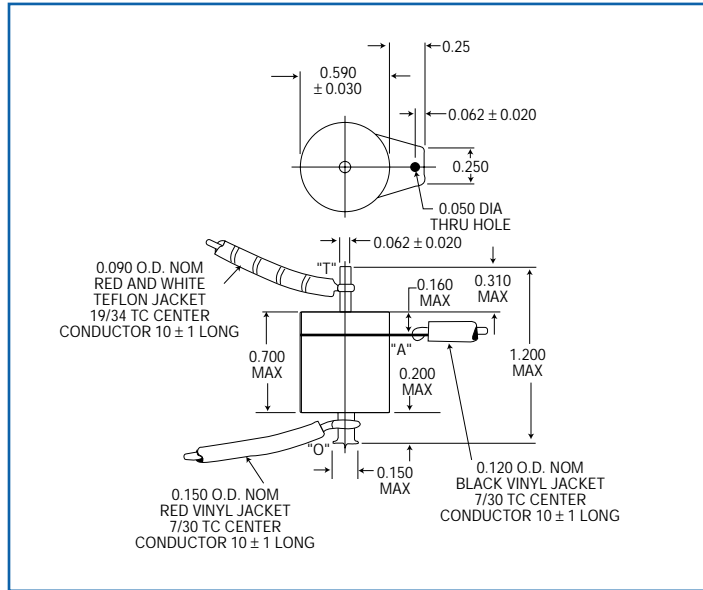
## Triggered Spark Gap Ratings

| PerkinElmer Model No. | O-A Range, kV Min/Max (1, 10) |            | SBV, kV (4) | V <sub>T</sub> Min Trig (kV Open Circuit) (5) | Trigger Mode | Recommended PerkinElmer Transformer (6, 7) | Typical Delay Time*<br>* when operated in mode A (Nanoseconds) |      | Simultaneous Ratings Crowbar Service, Typical Life: 5000-20,000 Shots (11)                                       | Simultaneous Ratings Repetitive Switching Typical Life: 1-5 Million Shots (11) |
|-----------------------|-------------------------------|------------|-------------|---|--------------|--|--|------|--|--|
|                       | At 70% SBV                    | At 40% SBV |             |   |              |  |  |      |  |  |
| <b>GP-89</b>          | 0.7                           | 2.1        | 2.6         | 10  | C            | TR-148A                                    | 100  | 1000 | 5 kA peak<br>0.1 coulomb   | 3 millicoulombs/shot<br>I <sub>b</sub> = 35 mAdc<br>I <sub>p</sub> = 6 Aac     |
| <b>GP-90</b>          | 1.3                           | 3.4        | 4.2         |   | C            |  |  |      |  |  |
| <b>GP-91</b>          | 4.4                           | 10         | 12.5        |   | A,C          | TR-180B                                    |  |      |  |  |
| <b>GP-93</b>          | 8                             | 20         | 25          |   | A, C         |  |  |      |  |  |
| <b>GP-82B</b>         | 0.4                           | 1.6        | 2           | 10  | A,B          | TR-148A                                    | 30   | 300  | 7.5 kA peak<br>0.2 coulomb   | 4 millicoulombs/shot<br>I <sub>b</sub> = 60 mAdc<br>I <sub>p</sub> = 8 Aac     |
| <b>GP-31B</b>         | 2                             | 6          | 7.5         |   | A            | TR-180B                                    |  |      |  |  |
| <b>GP-20B</b>         | 3.5                           | 11         | 14          |   |              |  |  |      |  |  |
| <b>GP-46B</b>         | 8                             | 20         | 25          |   |              |  |  |      |  |  |
| <b>GP-85</b>          | 2                             | 6          | 8           | 20  | A,B          | TR-1795                                    | 30   | 300  | 25 kA peak<br>0.4 coulomb  | 4 millicoulombs/shot<br>I <sub>b</sub> = 100 mAdc<br>I <sub>p</sub> = 10 Aac   |
| <b>GP-86</b>          | 6                             | 15         | 20          |   | A            | TR-180B                                    |  |      |  |  |
| <b>GP-87</b>          | 10                            | 24         | 30          |   |              | TR1700                                     |  |      |  |  |
| <b>GP-70</b>          | 12                            | 36         | 42(8)       |   |              |  |  |      |  |  |
| <b>GP-30B</b>         | 2                             | 6          | 7.5         | 20  | A,B          | TR-1795<br>TR-1700                         | 30   | 300  | 50 kA peak<br>0.5 coulomb  | 10 millicoulombs/shot<br>I <sub>b</sub> = 200 mAdc<br>I <sub>p</sub> = 15 Aac  |
| <b>GP-22B</b>         | 6                             | 15         | 19          |   | A            |  |  |      |  |  |
| <b>GP-12B</b>         | 10                            | 24         | 30          |   |              |  |  |      |  |  |
| <b>GP-14B</b>         | 12                            | 36         | 42(8)       |   |              |  |  |      |  |  |
| <b>GP-41B</b>         | 12                            | 36         | 42          | 20  | A,B          | TR-1795                                    | 30   | 300  | Peak currents up to 100 kA and charge transfer up to 5 coulombs are obtainable at reduced life (100-1000 shots). |  |
| <b>GP-32B</b>         | 20                            | 48         | 60(8)       |   | A            | TR-1700                                    |  |      |  |  |
| <b>GP-15B</b>         | 25                            | 60         | 86(8)       |   |              |  |  |      |  |  |
| <b>GP-74B</b>         | 40                            | 100        | 120(8)      | 20  | A            | TR-1795                                    | 30   | 300  |  |  |
| <b>GP-81B</b>         | 40                            | 100        | 120(9)      |   |              | TR-1700                                    |  |      |  |  |

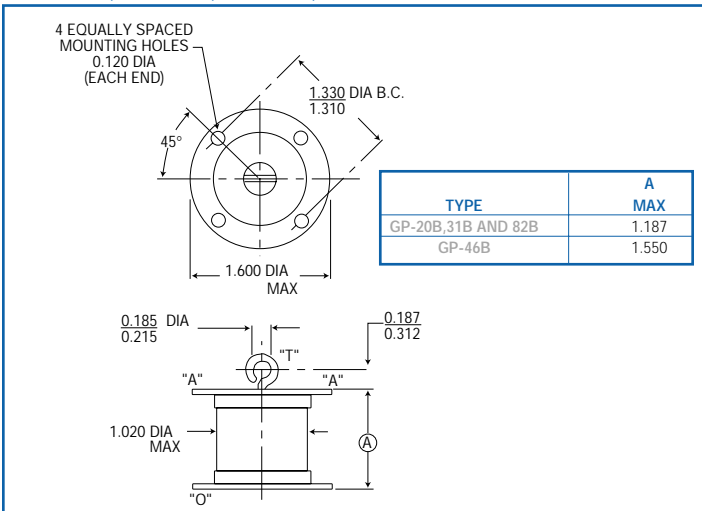
### Notes

- Optimum operating voltage is typically 60 to 80% of SBV.
- Operation below minimum value may result in erratic firing over time.
- Operation at this value may result in self-firing over time.
- Represents minimum main-gap breakdown voltage with no trigger applied.
- Value shown contains safety factor for end-of-life requirements.
- PerkinElmer TM-11A Trigger Module can be used to trigger all gaps.
- Transformers listed vary mechanically and electrically. See PerkinElmer Transformer Data Sheet.
- These units must be operated in a liquid or gas dielectric to prevent external flashover: GP-70 and GP-14B, above 24 kV; GP-32B and GP-15B, above 35 kV; GP-74B and GP-81B, above 60 kV.
- Designed for high altitude, high holdoff conditions.
- Other voltage ranges and mechanical configurations are available on request; for example, the GP-20B can be supplied with a 6 to 16 kV operating range by specifying GP-20B-20. The 20 would be the SBV and E-E maximum would be 80% of SBV = 16kV.
- E = Stored energy in joules ( $\frac{1}{2}CV^2$ ), I<sub>b</sub> = average current in amperes, I<sub>p</sub> = RMS current in amperes, R = total circuit resistance in ohms, P = average power in watts.

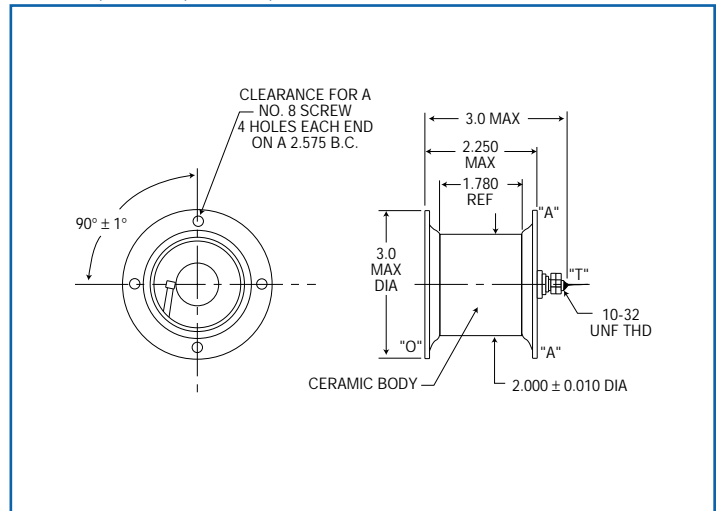
GP-89, GP-90, GP-91 AND GP-93



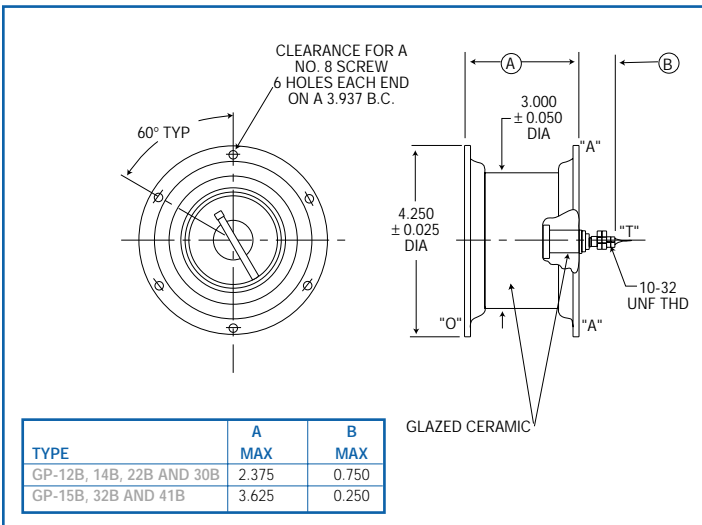
GP-20B, GP-31B, GP-46B, AND GP-82B



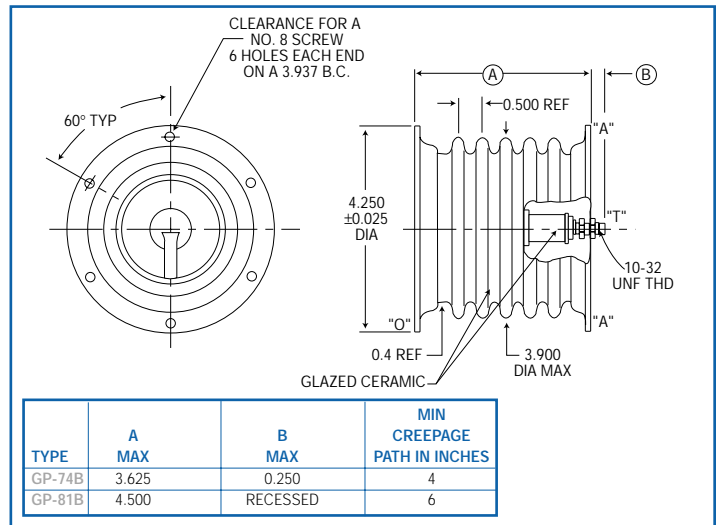
GP-70, GP-85, GP-86, AND GP-87



GP-12B, GP-14B, GP-15B, GP-22B, GP-30B, GP-32B AND GP-41B



GP-74B and GP-81B



"A" = ADJACENT ELECTRODE, "O" = OPPOSITE ELECTRODE, "T" = TRIGGER PROBE

Note: Dimensions in inches

All data and specifications subject to change without notice.

### Environmental Specifications

|                                |                              |
|--------------------------------|------------------------------|
| Ambient temperature range      |                              |
| Operating temperature range    | -54 to +100°C                |
| Nonoperating temperature range | -65 to +125°C                |
| Vibration                      | 15 to 500 Hz at 10 g maximum |
| Shock                          | 50 g, 11 milliseconds        |
| Thermal Shock                  | -65 to +125°C                |

### Electrical Specifications

|                           |  |
|---------------------------|--|
| Electrode capacity        | Less than 5 pf.                              |
| Interelectrode resistance | Greater than 10 <sup>10</sup> ohms at 500 V. |

### Mechanical Specifications

|                         |  |
|-------------------------|--|
| Envelope                | Ceramic-metal, hermetically sealed, exposed metal parts nickel plated. |
| Torque applied to studs | 6 inch-pounds maximum.   |

#### Marking

PerkinElmer's trademark, part designation, and date code.

PerkinElmer welcomes inquiries about special types. We would be pleased to discuss the requirements of your application and the feasibility of designing a type specifically suited to your needs.

### *Our Quality and Environmental Policy*

*“Our goal is to supply our customers  
the agreed quantity of specified products and services,  
defect free and on time while conducting business  
in an environmentally responsible manner”*

\* All values are nominal; specifications subject to change without notice.

To request additional information, receive a quote, or place an order, please contact PerkinElmer Optoelectronics at office listed below.



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