

Raptor Scientific designs and manufactures a variety of Igniter Circuit Testers, including the 1n-SQB-BPT series. This series of Multiple Test Point Igniter & Weapon Circuit Testers is a family of multimeters with rugged control computers for measuring the resistance (continuity and isolation) and stray voltage in a weapon system's multiple electrical circuit paths.

# 1n-SQB-BTP Series



## Multiple Test Point Igniter & Weapon Circuit Tester

### Application

These fully automated circuit testers are used to test devices such as rocket igniters, fuses, explosive bolts, squibs, blasting caps, bit test lines, and electro-component lines (relays, actuators, diodes, semiconductor devices) that are contained in the weapon. Our 1n-SQB-BTP testers dramatically reduce the risk of accidental detonations without compromising high accuracy.

- **OEM Subassembly Level Testing** - Verify the electrical integrity of weapon subassembly components before they are integrated into the weapon system.
- **OEM System Level Testing** - Perform weapon-level electrical integrity testing before delivery to the customer.
- **Field Level Testing** - Conduct field or depot-level electrical integrity tests before troop deployment or integration with a launch platform.

### System Features

- Six resistance ranges, two stray voltage ranges, and diode testing.
- Fiber optic connection between control computer and tester ensures safety isolation between computer power and weapon system.
- Kelvin four-wire test leads/cable arrangement automatically compensates for lead resistance.
- Reading stabilizes in less than 2 seconds. Large format LCD with clear indication of measurement range and units, battery level, and calibration status.
- Digitally calibrated - insensitive to thermomechanical drift of calibration trim potentiometers. No requirement to open the meter, which allows in-house customer calibration.
- Our modular, scalable product designs support from 8 to 1,024 test points. Our unique matrix selector design permits measurement of any one test point relative to any other test point.
- A verification module proves that the tester and cabling are ready for measurement by simulating the weapon's test paths.

## Tester Control

The 1n-SQB-BTP Series features a separate manual measurement channel (including test cables) that allows the user to verify test circuits without the need for a separate meter. For automated use, the tester can be controlled using either Raptor Scientific's or your own measurement control software.

## Safety Features

Our Multiple Test Point Igniter & Weapon Circuit Testers feature redundant circuits and mechanisms to guarantee that test current remains less than one one-thousandth of a device's firing current. Our power system design ensures protection against power surges and inadvertent operator error, including attaching the tester to a source of voltage or current higher than allowed. Our design incorporates multiple ground isolation barriers to ensure that there are no potential current paths to the ground that could exceed the rated fail-safe current.

To prevent damage to the circuit tester's current-limiting circuitry, we encapsulate and mount these fail-safe devices directly at both the tester's input power and the weapon's test signal connection points. This means that these barriers are after the matrix selector system, yielding an additional level of safety.

## Measurement Ranges & Accuracy\*

Range	Full Scale (FS)	Overage Capacity†	Resolution	Accuracy %FS	Units	Nominal Measurement Current
20 Ω	20 Ω	5%	0.001 Ω	0.05 %	Ω	2.2 mA
200 Ω	200 Ω	5%	0.01 Ω	0.025 %	Ω	2 mA
2 kΩ	2 kΩ	5%	0.1 Ω	0.025 %	kΩ	0.5 mA
20 kΩ	20 kΩ	10%	1 Ω	0.05 %	kΩ	0.044 mA
200 kΩ	200 kΩ	5%	10 Ω	0.5 %	kΩ	0.005 mA
2 MΩ	2 MΩ	5%	100 Ω	1.0 %	MΩ	0.001 mA
DIODE	2.0 VDC	10%	0.001 VDC	0.5 %‡	Volts	2.6 mA
2 VDC	2.0 VDC	10%	0.001 VDC	0.5 %	Volts	None
100 mVDC	100 mVDC	10%	0.001 mVDC	0.5 %	mVolts	None

Notes: \* All accuracies have 3 sigma confidence factors. † Up to full scale plus over-range capacity. ‡ Diode accuracy is specified as the accuracy of measuring the voltage drop across the diode. This voltage drop is a function of the current through the diode, its forward bias voltage and the internal resistance. Once the diode's forward voltage is exceeded, it starts conducting; once past the knee, the more current, the more voltage drop that is generated from the diode's internal resistance. There is no nationally established test current for diode test function; different brand meters will measure different voltages. However, for any given meter's supply current, the voltage measured across the diode is what is certified for accuracy.

## Physical

- Weight
  - 8 to 64 Test Points .....42 to 50 lbs
  - 72 to 128 Test Points ... 52 to 100 lbs
- Dimension
  - 8 to 64 Test Points ..... Overall 12.25"H x 19"W x 18.5"D 7U 19" Rack, Requires 17.5" Minimum Rack Depth, 1.5" Forward Clearance
  - 72 to 128 Test Points ..... Overall 19.6"H x 19"W x 18.5"D 10U 19" Rack, Requires 17.5" Minimum Rack Depth, 1.5" Forward Clearance

## Electrical Specifications

- Failsafe current limit..... 10mA
- Number of Test Points ..... 8 to 128 (Expandable to 1,024)
- Maximum Meter Current Draw .... 0.5A @120 VAC (Optional 0.25A @ 220VAC)
- Input Power ..... 120 VAC (Optional 220 VAC) 50/60 Hz

## Operating Range

- Temperature .. 18°C to 30° (or ± 6 °C of calibration), In storage -10 °C to 60°C
- Humidity Maximum .. 70% non-condensing, In storage 90% non-condensing

## Available Models - Part Number Coding: 1n-SQB-BTP-V-c

1n-SQB-BTP-V-c	1	Tester with measurement capability for Resistance, Diode, and Voltage with matrix switching for automated multi-channel capability
1n-SQB-BTP-V-c	n	Number of test points in matrix Example 8, 16, 24, 32, 40 ... 1,024
1n-SQB-BTP-V-c	BTP	Combination 19" rack and bench top unit
1n-SQB-BTP-V-c	E, F, G, I, L [Optional]	US Department of Commerce International Trade Administration (ITA) Plug Type [100/110V 50/60 Hz Plug Type 'B' if omitted]
1n-SQB-BTP-V-c	[Optional]	Alphanumeric string indicating customer-specific option(s)

Note: All units can have the rack ears removed and feet installed for benchtop use.