

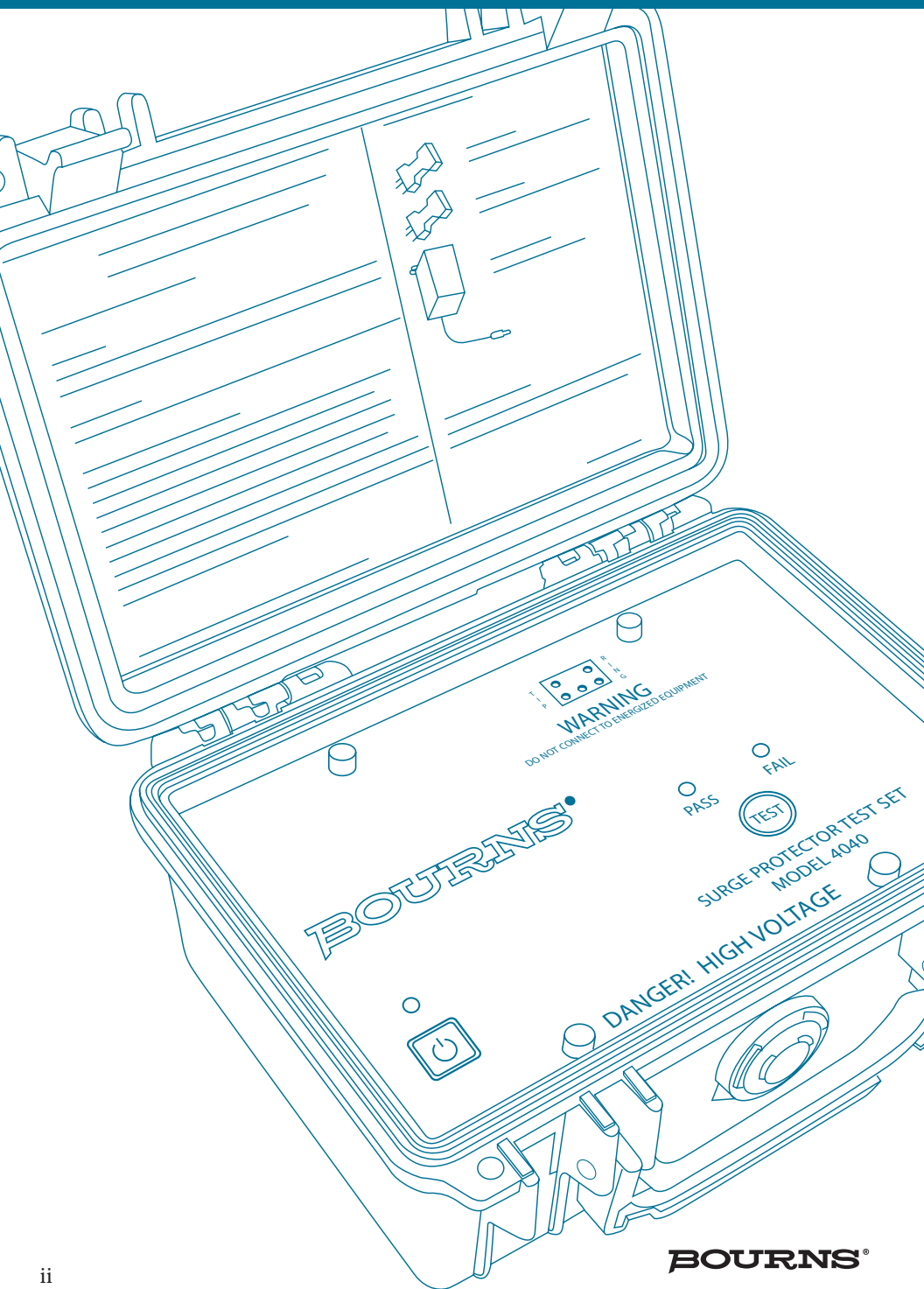


# Bourns® Model 4040 Surge Protector Test Set

**USER  
MANUAL**

**BOURNS®**

# Bourns® Model 4040 Surge Protector Test Set



**BOURNS®**

**WARNING**  
DO NOT CONNECT TO ENERGIZED EQUIPMENT

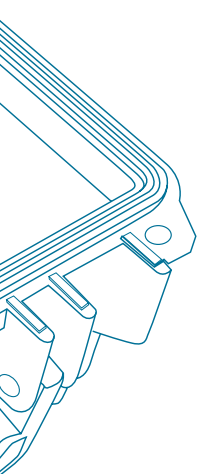
PASS      FAIL  
**TEST**

**SURGE PROTECTOR TEST SET**  
**MODEL 4040**

**DANGER! HIGH VOLTAGE**

## Table of Contents

Safety	4
Description	4
Theory of Operation	4
Calibration	5
Specifications	5
Power ON	6
Automatic Power OFF	6
How to Test a 5-Pin Module	6
AC Power	6
5-Pin Verification Kit	7
Mounting Configurations	8
Removal from the DIN Rail	9
Battery Power Option	10
Battery Power Source Low	10
Installation of 9 V Battery	10
Removal of 9 V Battery	10
Ordering Information	11
Test Accessories	11
4040 Surge Protector Test Set Worksheet	12



# Bourns® Model 4040 Surge Protector Test Set

## Safety

This tester produces a high voltage. The user should exercise care to keep away from the unit under test, and away from any open wires or exposed connections in the test circuit while the TEST button is activated. After the PASS or FAIL LED turns off, then it is safe to remove the module under test.

## Sécurité

*Cet appareil d'essai produit un courant haute tension. L'utilisateur doit faire preuve de prudence et garder ses mains à l'écart de l'unité mise à l'essai et de tout fil nu ou de toute connexion exposée du circuit d'essai tant que le bouton TEST est activé. Le module testé peut être retiré en toute sécurité une fois le voyant DEL PASS (Réussite) ou FAIL (Échec) éteint.*

## Description

The Bourns® Model 4040 Surge Protector Test Set is designed to measure the breakdown or clamping voltage and in-line resistance of a 5-pin module in a single sequence. A microprocessor controller allows the use of a unique one-button interface to perform complete testing of the 5-pin module. A pass or fail LED indicates test completion.

## Theory of Operation

The tester employs a linear voltage ramp generator, a low energy capacitive discharge, a current limiting element, a precise 1 mA current detection and control circuit, and a peak-hold reading metering system. When 1 mA is conducted, the control circuit de-energizes the power supply and records the value to its internal memory before it continues to the next sequences.

For in-line component resistance measurement, the tester employs a 10 mA current through the in-line component while measuring the voltage and converting the voltage value to an actual ohm value.

## Calibration

Calibration is performed at the factory. See Verification Kit instructions for more details on verifying the limit of operation.

## Specifications

Open circuit voltage rate of rise	~1000 V/s
Output voltage	< 1000 V
Measuring range	215–600 V
Sensing current	1 mA ±10 %
Measurement accuracy	5 % tolerance
In-line resistance measurement	< 22 Ω
Operating temperature	0 to +50 °C
Storage temperature	-10 to +60 °C
Battery life* (Lithium 1604LC, requires 2)	> 2,000 tests on a 300 V device
Battery life* (Alkaline 1604A, requires 2)	> 1,000 tests on a 300 V device
Warranty	2 years; any modification voids warranty

\*Battery test cycles were tested on a continuous basis. Actual test cycles may vary and depend on time between tests. The Model 4040 Test Set was meant for AC/DC continuous power. Therefore, batteries are not included.

# Bourns® Model 4040 Surge Protector Test Set

## Power ON

Press and hold the power button until the power blue LED turns on and stays lit. It is normal to hear multiple clicks while the tester is starting up.

## Automatic Power OFF

The tester is programmed to automatically power off after five minutes of inactivity.

## How to Test a 5-Pin Module

Momentarily hold down the TEST button until a click is heard. The testing sequence will start from TIP to Common, RING to Common, In-line resistance from TIP-in to TIP-out and then RING-in to RING-out. If all measurements are within their tolerance limits, the green LED will be lit. However, if the tester detects any measurements out of range during the sequence, the tester will stop and the red LED will be lit. Users are advised to use the appropriate test adapters for modules other than 5-pin modules in order to make electrical contact to the device under test.

## AC Power

The Model 4040 includes an 18 Vdc power supply (P/N 50502) which connects to a receptacle in the back of the unit.

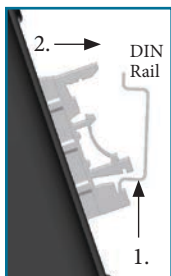
## 5-Pin Verification Kit

The Verification Kit consists of six 5-pin Modules (sold separately, P/N 72296). These modules will test the window ranges of the tester. Four modules are for verifying the overvoltage windows and two are for overcurrent windows. Each module will be labeled as PASS or FAIL. When the tester responds correctly with all these modules, the tester is functioning within the specification.

- Module 1 will have a voltage breakdown of  $200 V_{dc}$ . This is below and outside of the measuring range. Therefore, the **RED LED** will light up.
- Module 2 will have a voltage breakdown of  $225 V_{dc}$ . This is within the measuring range. Therefore, the **GREEN LED** will light up.
- Module 3 will have a voltage breakdown of  $590 V_{dc}$ . This is within the measuring range. Therefore, the **GREEN LED** will light up.
- Module 4 will have a voltage breakdown of  $610 V_{dc}$ . This is outside the measuring range. Therefore, the **RED LED** will light up.
- Module 5 will have a 20 ohm resistance. This is below the limit of the 22 ohm. Therefore, the **GREEN LED** will light up.
- Module 6 will have a 25 ohm resistance. This exceeds the limit of the 22 ohm. Therefore, the **RED LED** will light up.

# Bourns® Model 4040 Surge Protector Test Set

## Mounting Configurations - Wall Mount/ Frame Mount Option



**NOTE:** *The Wall Mount/Frame Mount option must be specified when ordering or returning to the factory for case modification.*

The Wall Mount/Frame Mount option is based on DIN 3 Rail hardware. An 8.7 inch DIN Rail is included with this option.

### ■ Installing the DIN Rail to the wall securely before installing the Model 4040 Test Set:

1. Using an appropriate fastener (not included), mount the DIN Rail to the wall.
2. Position fastener at an angle from the bottom (see arrow 1) and then push the top portion (see arrow 2) until a click is heard.

### ■ Installing the DIN Rail to the frame:

1. Locate the tester away from other operating switches or buttons.
2. Secure the DIN Rail to the frame using a 10/32 screw and/or nut (not included) or standard screw for your specific frame or cabinet.
3. Position fastener at an angle from the bottom (see arrow 1) and then push the top portion (see arrow 2) until a click is heard.

### ■ Installing the DIN Rail to the vertical frame:

1. With a small screwdriver, lift up the top portion of the DIN Rail adapter on both sides.
2. Tilt in a forward/downward direction and remove.
3. **WARNING:** Do not force removal as the DIN Rail adapter may break or the screw holding the adapter may be stripped.

■ In the Wall Mount/Frame Mount configuration, the lid is open and in the down position.





# Bourns® Model 4040 Surge Protector Test Set

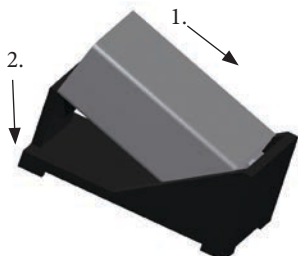
## Battery Power Option

The Model 4040 Test Set is designed to use an external power supply adapter of 18 Vdc as a main source. A battery powered option is provided by the use of two 9 V Alkaline or Lithium batteries (batteries are not included). The Model 4040 may draw approximately 150 mA while the unit is ON. For this reason, it is recommended to use the external power supply adapter.

## Battery Power Source Low

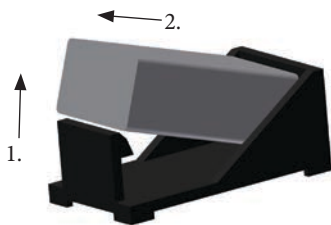
If the voltage source (battery or power supply) drops to below 14 V, the tester will not operate and the “Pass/Fail” LED light will blink alternatively.

## Installation of 9 V Battery



1. Observe the polarity of the battery.
2. Position at an angle, push the battery until the mating fully connects.
3. Push the battery down to the flush position.

## Removal 9 V Battery



1. Lift the battery from the base.
2. Pull away from the holder.

## Ordering Information

4040 - 01 - W

Model Number Designator : \_\_\_\_\_

Tester Configuration: \_\_\_\_\_

- 01      Standard Tester

Mounting Configuration: \_\_\_\_\_

- (Blank)      Portable

- W      Wall Mount / Frame Mount

## Test Accessories



P/N 72292  
Adapter for 1-pin to 5-pin module



P/N 72293  
Adapter for 4-pin to 5-pin module



P/N 50502-01  
120 V<sub>ac</sub> to 18 V<sub>dc</sub> Adapter



P/N 72296  
5-Pin Verification Kit - For verifying the operation of the tester

# 4040 Surge Protector Test Set Worksheet

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

SN: \_\_\_\_\_

Tested By: \_\_\_\_\_

Visual Inspection: \_\_\_\_\_ Done

Ramp Test: \_\_\_\_\_ V/s  
1500 V/s ~ 2000 V/s

Verification Test:

Low Fail Module P / F

Low Pass Module P / F

High Pass Module P / F

High Fail Module P / F

20 Ohm Pass Module P / F

20 Ohm Fail Module P / F

5-minute Automatic Shutoff P / F

Test Equipment	Model	Serial Number	Calibration Due Date
Oscilloscope			
Verification Kit			
Software Version			

[www.bourns.com](http://www.bourns.com)

COPYRIGHT © 2013 • BOURNS, INC. • 12/13 • e/OSP1322  
"Bourns" is a registered trademark of Bourns, Inc.  
in the U.S. and other countries.

**BOURNS®**