

INSTRUCTION MANUAL



036, 038 Spark Gapped Junction Box

Revision: 1/92

Copyright (c) 1980-1992
Campbell Scientific, Inc.

036, 038 JUNCTION BOX WITH TRANSIENT PROTECTION DESCRIPTION AND INSTALLATION GUIDE

1. OVERVIEW AND DISCLAIMER

The 036 and 038 Junction Box with transient protection is designed to minimize damage to instruments connected to wires on which a high voltage could be induced through electrostatic discharge. A common application is using the 036 or 038 to protect data logging equipment from transients that occur on remote sensor lead wires when lightning strikes.

Due to the variation in circumstances in system installation and the effects of lightning induced voltages, Campbell Scientific, Inc. will not assume any liability for damage to devices using the Model 036 or 038 junction box for transient protection. Any stated or implied capability of this device to provide protection from transients such as those generated by lightning is relative to the magnitude and duration of the transient and to the effectiveness of the ground connection. Since these parameters cannot be adequately quantified for each installation or each time a transient occurs, we are making these junction boxes available with the understanding that they will provide improved protection, but we will not accept liability for damage to the protected device.

2. SPECIFICATIONS

SIZE: 10" high x 8" wide x 4" deep

WEIGHT: approx. 12 Lbs.

MOUNTING: 2 U-bolts to 1 1/4 in. pipe or flat with 4 ea. 5/16 inch diameter holes on a grid 6 inches X 10 3/4 inches.

NUMBER OF SPARK GAPPED
CONDUCTORS: 036 - 20, 038 - 40

RECOMMENDED GROUND WIRE: #2 AWG
stranded bare copper wire from ground bus bar to suitable earth ground.

3. DESCRIPTION

The 036 Junction Box with transient protection is a standard J-box with printed circuit card containing two 20 conductor terminal blocks for

connecting sensor shield wires to ground. Each sensor lead connector on the left side of the card is connected via the circuit card to a spark gap transient suppressor and to the corresponding terminal on the right side.

All of the spark gaps connect to a copper ground plane on the circuit card. This ground plane is also connected to the 10 sensor shield wire connectors and through the mounting screws to the box and the ground wire terminal strip (mounted on the box).

4. INSTALLATION

Connect all incoming sensor leads to the terminal block on one side of the card and the corresponding lead wires from the datalogger to the corresponding terminals on the other side. For example, where a given sensor lead is connected to the 4th terminal from the top on the left side, connect the corresponding instrument lead wire to the 4th terminal from the top on the right side. It doesn't make any difference which side is used for sensors.

Connect all sensor lead shield wires to the ground terminals either on the horizontal terminal block or the grounding busbar on the box. Also connect the datalogger ground leads to one of these terminals.

Connect a large grounding cable (#2 AWG or larger) from the heavy grounding busbar in the box to a good earth ground. Grounding rods are available at most local electrical supply businesses.

When using the 036 or 038 Junction Box with thermocouple lead wires, be sure that the box is protected from large thermal gradients, because the measurements will be in error by the value for the temperature difference between the incoming lead wire connection and the outgoing lead wire connection.

WARNING: Do not use the signal lines for power where the voltage normally exceeds 50 volts.

5. THEORY OF OPERATION

Where there is more than a few feet of separation between sensors and datalogger, transients can occur because for the tremendous voltage gradient in the ground as a lightning strike is being dispersed. The sensor lead provides a better path for dispersion than the earth, so the current arcs to the sensor leads where the voltage is highest and where there is the least separation between the wires and ground. Frequently this is through the datalogger the sensor lead is connected to.

If a spark gap provides a path from the wire back to ground, the current may flow through the spark gap and not damage the datalogger.

Where lightning is severe, heavy conduit or shielding around the sensor lead can carry most of the current directly to ground, minimizing the amount of current to be handled by the sensor lead, the spark gap, and the circuit card.

If the conductor on the circuit card is burned off by excessive current, the current will arc to ground. The circuit card and box are designed so that if the conductors are burned off, the current should still arc to the ground connection.

The 036 or 038 must have a good ground connection. If the connection is not good enough to dissipate all of the electrical energy, the next path to ground could be through the instrument.

Campbell Scientific Companies

Campbell Scientific, Inc. (CSI)

815 West 1800 North
Logan, Utah 84321
UNITED STATES
www.campbellsci.com
info@campbellsci.com

Campbell Scientific Africa Pty. Ltd. (CSAf)

PO Box 2450
Somerset West 7129
SOUTH AFRICA
www.csafrica.co.za
sales@csafrica.co.za

Campbell Scientific Australia Pty. Ltd. (CSA)

PO Box 444
Thuringowa Central
QLD 4812 AUSTRALIA
www.campbellsci.com.au
info@campbellsci.com.au

Campbell Scientific do Brazil Ltda. (CSB)

Rua Luisa Crapsi Orsi, 15 Butantã
CEP: 005543-000 São Paulo SP BRAZIL
www.campbellsci.com.br
suporte@campbellsci.com.br

Campbell Scientific Canada Corp. (CSC)

11564 - 149th Street NW
Edmonton, Alberta T5M 1W7
CANADA
www.campbellsci.ca
dataloggers@campbellsci.ca

Campbell Scientific Ltd. (CSL)

Campbell Park
80 Hathern Road
Shepshed, Loughborough LE12 9GX
UNITED KINGDOM
www.campbellsci.co.uk
sales@campbellsci.co.uk

Campbell Scientific Ltd. (France)

Miniparc du Verger - Bat. H
1, rue de Terre Neuve - Les Ulis
91967 COURTABOEUF CEDEX
FRANCE
www.campbellsci.fr
campbell.scientific@wanadoo.fr

Campbell Scientific Spain, S. L.

Psg. Font 14, local 8
08013 Barcelona
SPAIN
www.campbellsci.es
info@campbellsci.es