

# Model 1669 Series Transient Protector

# BOURNS®

## INSTALLATION INSTRUCTIONS

### IMPORTANT:

The protector(s) described in this Installation Instruction shall be installed in accordance to the applicable requirements

described in the National Electric Code, ANSI/NFPA70, Article 800, Section C.

### General

These full weather protectors are designed to provide lightning protection for field transmitters and instrumentation operating on 24 Vdc (nom.) signaling circuits and control loops. The voltage source may be floating or grounded (+ or -). The protectors are intended to mount into ½ inch NPT threaded ports found on most field devices and enclosures.

The Model 1669-02 and 1669-06 are used for standard ground resistance conditions, while Model 1669-01 and 1669-05 (with higher voltage isolation to ground) are for sites with high resistance soil conditions or where significant ground potential differences are known to exist.

### Connections

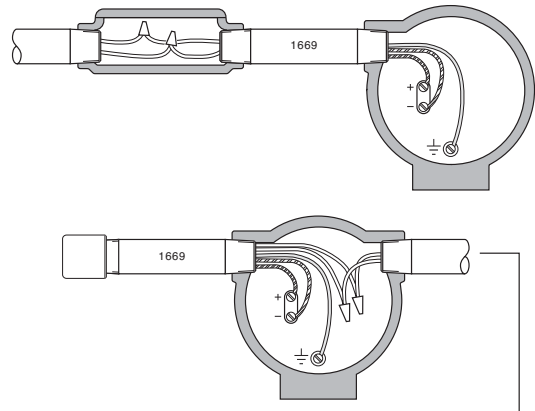
#### Installation Technique for Models 1669-01 and 1669-02:

The “double ended” protector type is used when the field device only has a single ½ inch port: the protector attaches to the instrument and the connections to the field wiring are made inside an external, appropriately rated box on the other end of the protector.

#### Installation Technique for Models 1669-05 and 1669-06:

The “single ended” protectors are useful when the field device has dual conduit ports; the field wiring conduit connects to one port and the Model 1669 attaches to the second; all connections are made within the instrument’s wiring cavity, thus simplifying the tasks of adding a protector into existing conduit runs and of isolating for maintenance testing.

The protector wiring is AWG #20 (0.5 mm<sup>2</sup>). The solid colored red and black wires are to be connected to the field wiring while the striped red/white and black/white wires (the ‘protected’ output) connect to the terminals of the field device. The Model 1669 protection circuit is bidirectional



and symmetric: either red or black can be used for positive or negative. In the case of Model 1669-05 and 1669-06, minimize looping of the solid colored input and ground conductors to reduce field coupling of surges into the protected output.

### Grounding

The protector body (stainless steel nipple) and green wire are electrically common. The green wire should connect to a grounding screw found within the wiring cavity of the instrument. If there is no screw and the housing is metal, it is recommended to create one by drilling and tapping. Plastic bodied instruments may not contain a point for ground wire attachment, in which case the green wire should be cut short

and capped. If the instrument is plastic without a ground screw, or if it is poorly grounded or ungrounded, strap a #6 (13 mm<sup>2</sup>) tinned copper conductor to the protector body using a stainless steel clamp and route this conductor to the grounding system by the shortest and straightest path possible.

### Troubleshooting

Cumulative surge duty will eventually cause an increase in the leakage (between lines or between one or both lines and ground) while a major lightning strike exceeding the protector rating can cause shorting (generally of one or both lines to ground). Sustained ground potential rise or conduction from AC faults or induction can affect the value of the series

resistance (red to red/white, black to black/white) which is 22 ohms  $\pm 10\%$ , but this rarely occurs without the simultaneous shorting of one or both lines to ground. All of these parameters are easily checked by a VOM. Invariably, a faulty protector can be first detected by distortion or absence of the 24 V signal.

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