

Three Leadwire Attachment

Application Note TT-612, The Three-Wire Quarter-Bridge Circuit, describes the advantages of the three-wire quarter-bridge circuit, and explains why it is generally recommended for static strain applications. Because the three-wire circuit has become the standard in contemporary strain gage technology, gage users need to be familiar with techniques for connecting three leadwires to the solder tabs of a gage. Briefly described here are procedures for attaching leadwires to several widely used types of strain gages.

CEA-SERIES GAGES

This popular line of general-purpose gages features a fully encapsulated grid, and large, copper-coated solder tabs. Because of the special tab construction, the leads from a three-conductor cable such as Micro-Measurements 326-DFV can be attached directly to the solder tabs as shown below in Diagram (1). Following is the lead attachment procedure, assuming that the gage is already bonded (or welded) in place.

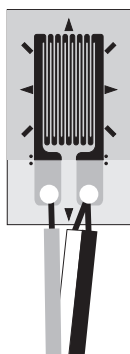


Diagram (1)

1. Strip about an inch (25mm) of the vinyl insulation from the end of the cable with a thermal wire stripper.
2. The cable conductors are distinguished by their insulation colors - red, white, and black. Separate the strands belonging to the red conductor from the others, and twist the strands tightly together.
3. Twist the combined strands from the white and black conductors tightly together to form a single leadwire.
4. Tin both resulting leadwires (the red, and the white/black).
5. Dress the leads to project axially from the cable end, and trim off all but the last 3/32 inch or so (~2mm) of the bare wire.
6. Tin the solder tabs of the gage.
7. After forming a small hump in the cable, near the end, tape the cable in place so that the tinned leads press down directly on the solder tabs.

8. Solder the leads to the tabs to complete the attachment.
9. Clean the gage installation with Rosin Solvent, and apply an appropriate protective coating.

These and other detailed instructions for making soldered connections to strain gages are given in Micro-Measurements Application Note TT-609, Strain Gage Soldering Techniques.

GAGE INSTALLATIONS WITH BONDABLE TERMINALS

The usual practice for standard strain gages (not equipped with copper-coated solder tabs) is to install a set of bondable solder terminals adjacent to the tab end of the gage, as shown in diagrams (2) to (5). These terminals are commonly bonded in place simultaneously with the gage. The ends of the cable conductors are then soldered to the terminals; and short, single-strand strain-relief jumpers complete the connections to the gage solder tabs.

Attachment of the cable conductors to the terminals is done with essentially the same procedure as for the CEA-Series gage described previously. In fact, when only two terminals are used, as in (2), the procedure is identical.

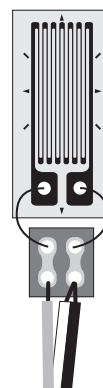


Diagram (2)