

KFS Shielded Foil Strain Gage INSTRUCTION MANUAL

Thank you for purchasing the KYOWA product. Before using it, read this instruction manual carefully. Also, keep the manual within easy reach so that you can refer to it whenever necessary.

1. Safety precautions

When using the instrument, be sure to observe the following safety precautions.

Warning! Improper handling may cause the operator's death or serious injury.

- Be sure to bond the gage's insulation sheet to a measuring instrument. Absolutely avoid bonding the gage's copper foil to a measuring object. If the copper foil is bonded to a measuring instrument, the operator may receive an electric shock and/or the measuring instrument may be burnt.
- Take proper insulation measures to keep the exposed gage lead and the shield wire from contacting a measuring object. If contact occurs, the operator may receive an electric shock and/or the measuring instrument may be burnt.
- Faulty connection of the shield wire may cause an electric shock and/or burning of the measuring instrument.

4. Connection methods

4.1 For a measuring object to which voltage or current will be applied

One example is illustrated below.

- (1) Perform wire connection carefully and thoroughly.
- (2) Use a gage terminal whose soldering area and base area are possibly largest.
Faulty gage terminal selection may cause deterioration of the withstanding voltage of the measuring system.
Recommended gage terminals: T-F2 (Base material: glass epoxy)
T-F23 (Base material: polyimide)
- (3) Make the gage lead short between the gage and the gage terminal, and noise affected by an electric field will be reduced. In case of a high electric field, wrap the gage lead in a copper or aluminum foil, then connect the foil to the cable's shield wire, and noise

2. Outline of the gage

The gage is optimum for strain measurement where noise exists from other than the measuring system. The gage enables less noise in strain measurement where a high electric current flows in the gage bonding area or adjacent areas.

● Features

- KFS-5-120-J1 features less noise affected by an electric field.
- KFS-5-350-J1 features less noise affected by electric and magnetic fields.

● Withstanding voltage

- When the gage's insulation sheet is bonded to a measuring object: Approximately 1700Vac/1-minute
- When the exposed foot of gage leads out of the gage's copper foil and of the gage terminal are coated by silicone resin (KE-48RTV): Approximately 2000Vac/1-minute

3. Bonding the gage

Bond the gage at its insulation sheet to a measuring object. Use of the instantaneous adhesive CC-33A or the heat-curing adhesive PC-6 is recommended. For how to bond, see the adhesives' respective instruction manuals.

Safe temperature range using CC-33A: -196 to 120°C

Safe temperature range using PC-6: -196 to 150°C

(The gage's self-compensating temperature range: 10 to 100°C)

effects will then be reduced.

NOTE: Carefully handle a copper or aluminum foil so that either will never contact the measuring object.

NOTE: Make sure that the insulation resistance between the gage lead and gage shield wire is over 100MΩ.
(Apply 50V or less to the insulation resistance tester.)

- (4) To connect the gage to a ridge box (DB-120P, -350P, etc.) or to a measuring instrument, use a shielded cable.

NOTE: To connect the gage to a shielded cable, depend on the 1-gage 3-wire system. Use of the shielded cable will lead to lesser noise affected by an electric field rather than a general lead wire such as a flat vinyl wire.

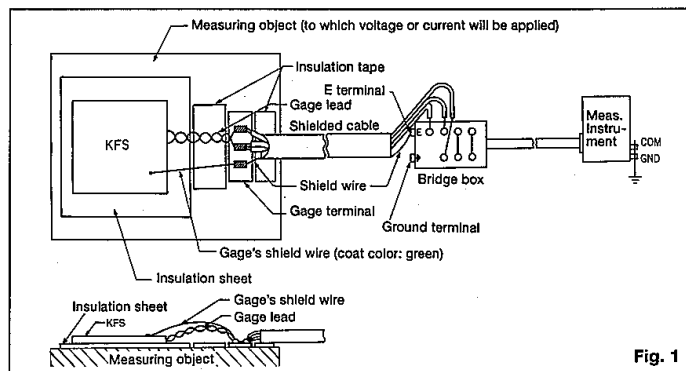


Fig. 1

● Recommendable shielded cables

L-13: Room-temperature-use low-noise 3-conductor shielded cable
(Operating temperature range: -10 to 80°C)

L-14: Room-temperature-use low-noise 4-conductor shielded cable
(Operating temperature range: -50 to 90°C)

L-15: High/low-temperature-use low-noise 3-conductor shielded cable
(Operating temperature range: -269 to 250°C)

L-16: High/low-temperature-use low-noise 4-conductor shielded cable
(Operating temperature range: -269 to 250°C)

- (5) Solder the polyester-coated copper wire (coat color: green), which is attached to the gage's copper foil by soldering, to the cable's shield wire and wind tape, etc. round it to achieve insulation in case of contact with a measuring object or a gage lead.

NOTE: If the exposed polyester copper wire or the cable's shield wire comes to contact a measuring object, an electric shock and/or burning of the measuring instrument may be caused.

- (6) When using a bridge box, connect the shield wire of the shielded cable connected to the gage, to the E terminal on the bridge box.

NOTE: Remove in advance the short-circuiting plate from between the E terminal on the bridge box and the ground terminal.

NOTE: Do not ground the bridge box.

- (7) Be sure to ground the GND terminal on the measuring instrument. About whether or not the COM terminal and the GND terminal on the measuring instrument should be short-circuited, check in advance to see if short-circuiting leads to lesser noise, then decide on it.

4.2 In case of high voltage or high current existing near a measuring object

- (1) Perform the same connection as in the above 4.1 item except grounding of the measuring system.
- (2) Ground the measuring system as illustrated by Fig.2 or 3.
- (3) About whether or not the COM terminal and the GND terminal on the measuring instrument should be short-circuited, check in advance to see if short-circuiting leads to lesser noise, then decide on it.

● Measuring object is grounded

☞ Disconnect the GND terminal of the measuring instrument from the ground.

● Measuring object is not grounded

☞ Connect the GND terminal of the measuring instrument to the ground.

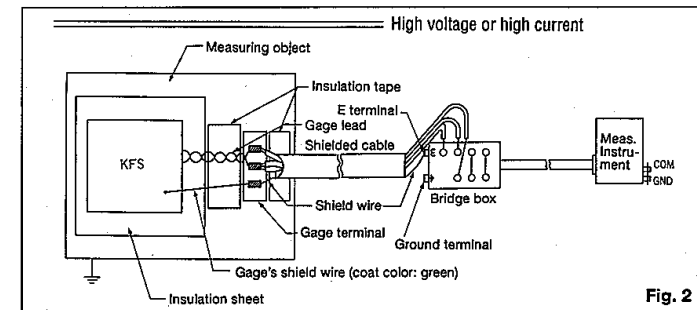


Fig. 2

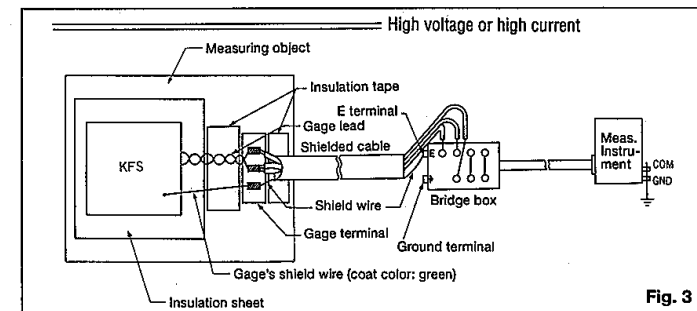


Fig. 3