

# KV

## Crack Gages

RoHS

1  
-46

Sensor

These strain gages measure crack length and propagation speed when attached using adhesive to a location on a structure or test material where cracking has occurred or is expected to occur. Unlike standard strain gages, the grid is severed and the resistance changes as the crack forms.

### Applicable Adhesives

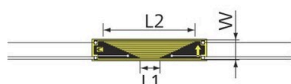
CC-33A  
CC-36  
PC-600

### Models

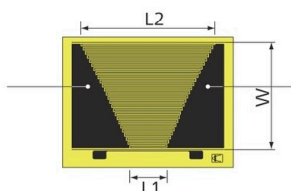
| Patterns,<br>Gage Resistance, Gage Factor | Model | Dimensions(mm) |      |     |       |      | Remarks           |
|-------------------------------------------|-------|----------------|------|-----|-------|------|-------------------|
|                                           |       | Gage(Grid)     |      |     |       | Base |                   |
|                                           |       | L1             | L2   | W   | Pitch |      |                   |
| Resistance: Approx.1.0 Ω                  | KV-5C | 5.4            | 25.2 | 4.5 | 0.1   | 30×5 | 46-step detection |

\*With trigger wires. Trigger wires can be used for automation of measurement by connecting them to an amplifier.

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|                                 |        |     |      |      |   |       |                   |
|---------------------------------|--------|-----|------|------|---|-------|-------------------|
| Resistance: Approx.1.0 $\Omega$ | KV-25B | 9.1 | 33.6 | 25.2 | 1 | 42×32 | 26-step detection |
|---------------------------------|--------|-----|------|------|---|-------|-------------------|

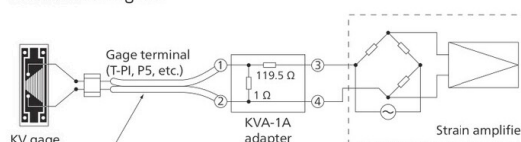


### Adapter KVA-1A(Optional Accessories)

This is an adapter for connecting a strain amplifier.



### Connection Diagram



Note: Use lead wires with a low resistance to connect to the adapter (0.1  $\Omega$  or less).

### How to order

- \*C-type: Polyester-coated copper wires 30 cm long (gage-lead) and 20 mm (trigger wire)
- \*B type: Silver-covered copper wires 25 mm long
- \*5 gages/pkg



Strain Gage

Load Cell

Pressure  
Sensor

Acceleration  
Sensor

Torque  
Sensor

Displacement  
Sensor

Component  
Force  
Sensor

Automotive  
Sensor

Civil  
Engineering  
Sensor



## Strain Gage

Load Cell

Pressure  
SensorAcceleration  
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SensorDisplacement  
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Force  
SensorAutomotive  
SensorCivil  
Engineering  
Sensor

# Strain Gages with Pre-attached Lead-wire Cables

Most KYOWA strain gages come with lead wires attached. Using these types of gages eliminates the need for soldering and is an effective means of reducing the amount of work required for gage attachment. The lead wire type and length vary by gage, as shown below.

## Lineup

| Models of strain gage      |       | KFGS,KFRB, KFRPB,KFRS,KFP, KFLB,KFEL,KFEM | KFGS,KFRB, KFRPB,KFRS, KFP,KFLB | KFGS,KFRB,KFWB,KFWS,KC, KFRPB,KFRS,KFP,KFEL,KFEM                                                                     |            |                                                                                                                                |            |
|----------------------------|-------|-------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------|------------|
| Type of lead-wire cables   |       | 2 polyester-coated copper wires           | 3 polyester-coated copper wires | <br>Vinyl-coated flat 2-wire cables |            | <br>Vinyl-coated flat 3-wire cables         |            |
|                            |       |                                           |                                 | Uniaxial                                                                                                             | Multiaxial | Uniaxial                                                                                                                       | Multiaxial |
| Lengths of lead-wire cable | 15 cm | N15C2                                     | N15C3                           | L15C2R                                                                                                               | L15C2S     | L15C3R                                                                                                                         | L15C3S     |
|                            | 30 cm | N30C2                                     | N30C3                           | L30C2R                                                                                                               | L30C2S     | L30C3R                                                                                                                         | L30C3S     |
|                            | 1 m   | N1M2                                      | N1M3                            | L1M2R                                                                                                                | L1M2S      | L1M3R                                                                                                                          | L1M3S      |
|                            | 3 m   | —                                         | —                               | L3M2R                                                                                                                | L3M2S      | L3M3R                                                                                                                          | L3M3S      |
|                            | 5 m   | —                                         | —                               | L5M2R                                                                                                                | L5M2S      | L5M3R                                                                                                                          | L5M3S      |
| Models, etc.               |       | Twisted for ≥ 50 cm                       |                                 | L-6, L-9 for ≥ 6 m                                                                                                   |            | L-7, L-10 for ≥ 6 m                                                                                                            |            |
| Coating color              |       | KFEL, KFEM are only 2-wire system.        |                                 |  Red<br>Red                         |            |  Red stripe (Independent)<br>White<br>White |            |

| Models of strain gage      | KFGS,KFRB,KFRPB, KFRS,KFLB                                                                                          |                                                                                                                     | KFNB,KFSB                                                                                                                                     | KFRPB,KFHB, KFLB                                                                                                                         | KFU                                                                                                                    | KFHB                                                                                                                                            |                                                                                                                           |
|----------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Type of lead-wire cables   | <br>Mid-temperature 2-wire cable | <br>Mid-temperature 3-wire cable | <br>Vinyl-coated normal-temperature low-noise 3-wire cable | <br>Fluoroplastic coated high/low-temp. 3-wire cable | <br>High-temperature 3-wire cable | <br>Fluoroplastic coated high/low-temperature 3-wire cable |                                                                                                                           |
| Lengths of lead-wire cable | 15 cm                                                                                                               | R15C2                                                                                                               | R15C3                                                                                                                                         | J15C3                                                                                                                                    | F15C3                                                                                                                  | E15C3                                                                                                                                           | A15C3                                                                                                                     |
|                            | 30 cm                                                                                                               | R30C2                                                                                                               | R30C3                                                                                                                                         | J30C3                                                                                                                                    | F30C3                                                                                                                  | E30C3                                                                                                                                           | A30C3                                                                                                                     |
|                            | 1 m                                                                                                                 | R1M2                                                                                                                | R1M3                                                                                                                                          | J1M3                                                                                                                                     | F1M3                                                                                                                   | E1M3                                                                                                                                            | A1M3                                                                                                                      |
|                            | 3 m                                                                                                                 | R3M2                                                                                                                | R3M3                                                                                                                                          | J3M3                                                                                                                                     | F3M3                                                                                                                   | E3M3                                                                                                                                            | A3M3                                                                                                                      |
|                            | 5 m                                                                                                                 | R5M2                                                                                                                | R5M3                                                                                                                                          | J5M3                                                                                                                                     | F5M3                                                                                                                   | E5M3                                                                                                                                            | A5M3                                                                                                                      |
| Models, etc.               |                                                                                                                     | L-11                                                                                                                | L-12                                                                                                                                          | L-13                                                                                                                                     | L-3                                                                                                                    | L-18                                                                                                                                            | L-19                                                                                                                      |
| Coating color              |                                                                                                                     |  Grey<br>Grey                    |  Red (Independent)<br>White<br>Black                       |  Red (Independent)<br>White<br>Black                  |  Red (Independent)<br>Blue<br>Blue |  Red stripe (Independent)<br>White<br>Black stripe         |  Red (Independent)<br>White<br>Black |

\*For other lead-wire cable lengths, contact us.

\*Specifications are for individual strain-gages. For details please contact us.

\*For 2-wire gages, the gage resistance indicated on the package includes that of the lead-wires.

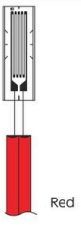
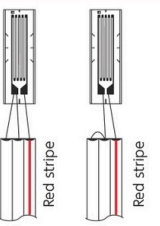
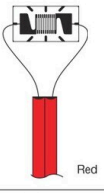
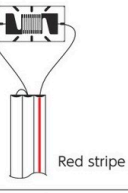
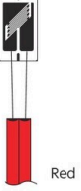
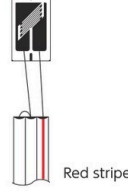
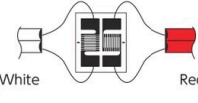
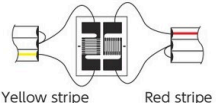
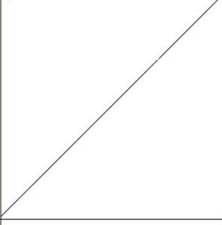
\*For 3-wire gages, the gage resistance indicated on the package is only for the gage itself, and does not include that of the lead-wires.

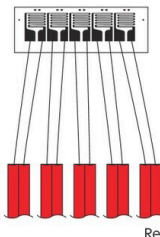
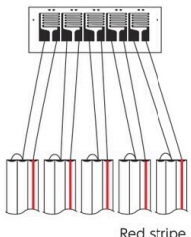
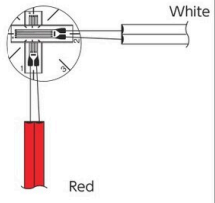
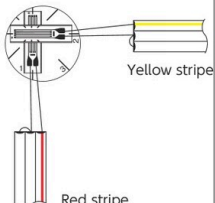
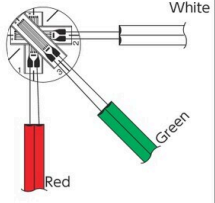
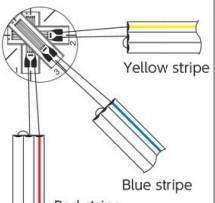
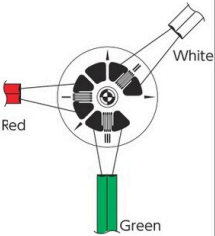
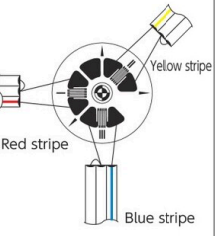
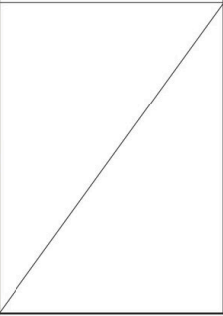
\*Encapsulated gages are provided standard with an MI cable 2 m long and a soft cable 50 cm long.

\*KFB, KFV, KSPB, KSNB, KSPH, KSPLB, KV: Gages with pre-attached lead-wire cable are not available.

\*See page 1-20 for KCW, page 1-38 for KH, page 1-41 KM, page 1-42 for KMP.

# Examples of vinyl-coated flat wire to connect gages

| Cord<br>Type | 2-wire                                                                              | 3-wire                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C1           |    | <br>* 2 connection methods depending on the models. (Same as D16 and D17.)<br>*KFGS: Right only |
| C2<br>C3     |    |                                                                                                 |
| C15<br>C16   |    |                                                                                                 |
| D1           |  |                                                                                               |
| D2           |  |                                                                                                                                                                                  |
| D4           |                                                                                     |                                                                                                                                                                                  |

| Cord<br>Type             | 2-wire                                                                                                                 | 3-wire                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| D9<br>D19<br>D39         |                                      |                                      |
| D16<br>D34               | <br>*The above picture is KFGS-D16.  | <br>*The above picture is KFGS-D16.  |
| D17<br>D22<br>D25<br>D35 | <br>*The above picture is KFGS-D17. | <br>*The above picture is KFGS-D17. |
| D28                      |                                    |                                    |
| D31                      |                                    |                                                                                                                         |
|                          |                                                                                                                        |                                                                                                                         |

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Sensor



Strain Gage

Load Cell

Pressure  
Sensor

Acceleration  
Sensor

Torque  
Sensor

Displacement  
Sensor

Component  
Force  
Sensor

Automotive  
Sensor

Civil  
Engineering  
Sensor



Strain Gage

Load Cell

Pressure Sensor

Acceleration Sensor

Torque Sensor

Displacement Sensor

Component Force Sensor

Automotive Sensor

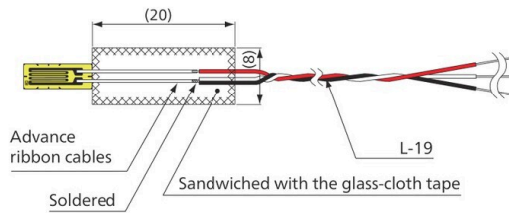
Civil Engineering Sensor

## ■ Connecting section of lead wires

The gage lead section of some types is sandwiched or wrapped with the glass-cloth tape for insulation and reinforcement. (See the figures below.)

### Type A (Strain gage with fluoroplastic-coated high/low-temperature 3-wire cable)

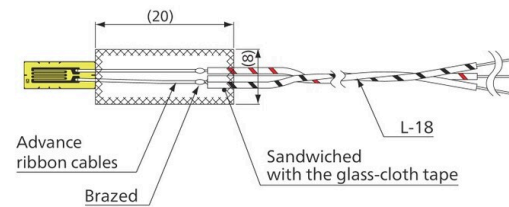
#### ■ For KFHB



\*The above picture is KFHB-5-120-C1-11.

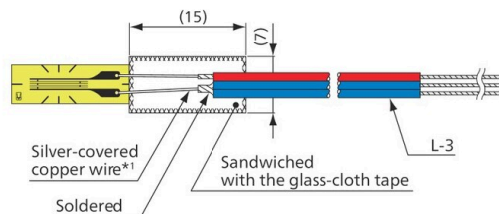
### Type E (Strain gage with high-temperature 3-wire cable)

#### ■ For KFU



### Type F (Strain gage with fluoroplastic-coated high/low-temp. 3-wire cable)

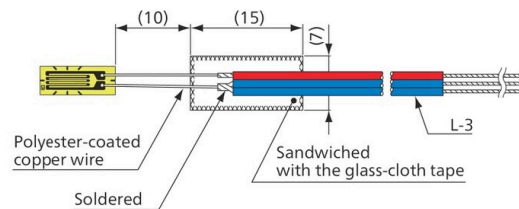
#### ■ For KFHB, KFRPB



\*The above picture is KFRPB-5-120-C1.

\*1 KFHB: Advance ribbon cables

#### ■ For KFLB

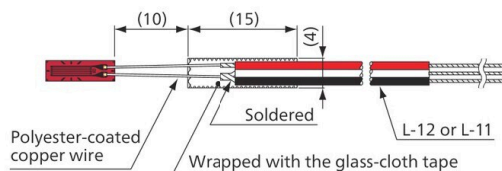


\*The above picture is KFLB-5-120-C1-11.

\*Polyester-coated copper wire operating temp. -196 to 150°C

### Type R (Strain gage with mid-temperature 3-wire cable)

#### ■ For KFGS, KFRB, KFRPB, KFRS, KFLB



\*The above picture is KFGS-5-120-C1-11.