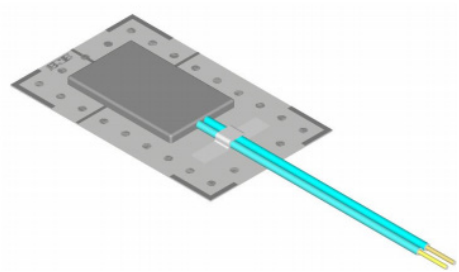
Welded strain gauges

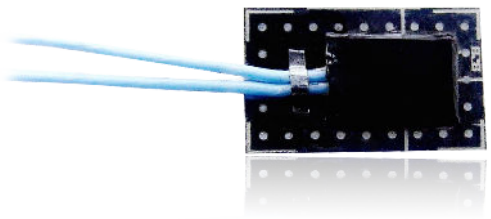
Introduction and features

The welded strain gage is a special resistance strain gauge that inherits the typical characteristics of a universal resistance strain gauge, especially for metal structures, precision stress measurement and analysis.

Our company introduced two welded strain gauges: one is HCY series, with the temperature of -30 ℃ ~ 150 ℃ . Another one is HKB series, with temperature -30 ℃ ~ 250 ℃ .



Welded Strain Gauge Schemes



Welded strain gauge physical map

The welded strain gage has the following characteristics:

1. Spot welding installation which means measuring when welding at the same time.
2. Mark positioning logo on the metal base body to position easily.
3. Mark circular position logo on the metal base body to ensure consistency of spot welding installation.
4. Protect the lead wire to ensure the wire is fixed and reliable.
5. Improve the thickness of the backing and the quality of the protective layer, the test will be more stable.
6. Strain gauges and metal base body strictly matched, to ensure its temperature performance self-compensated and consistency.

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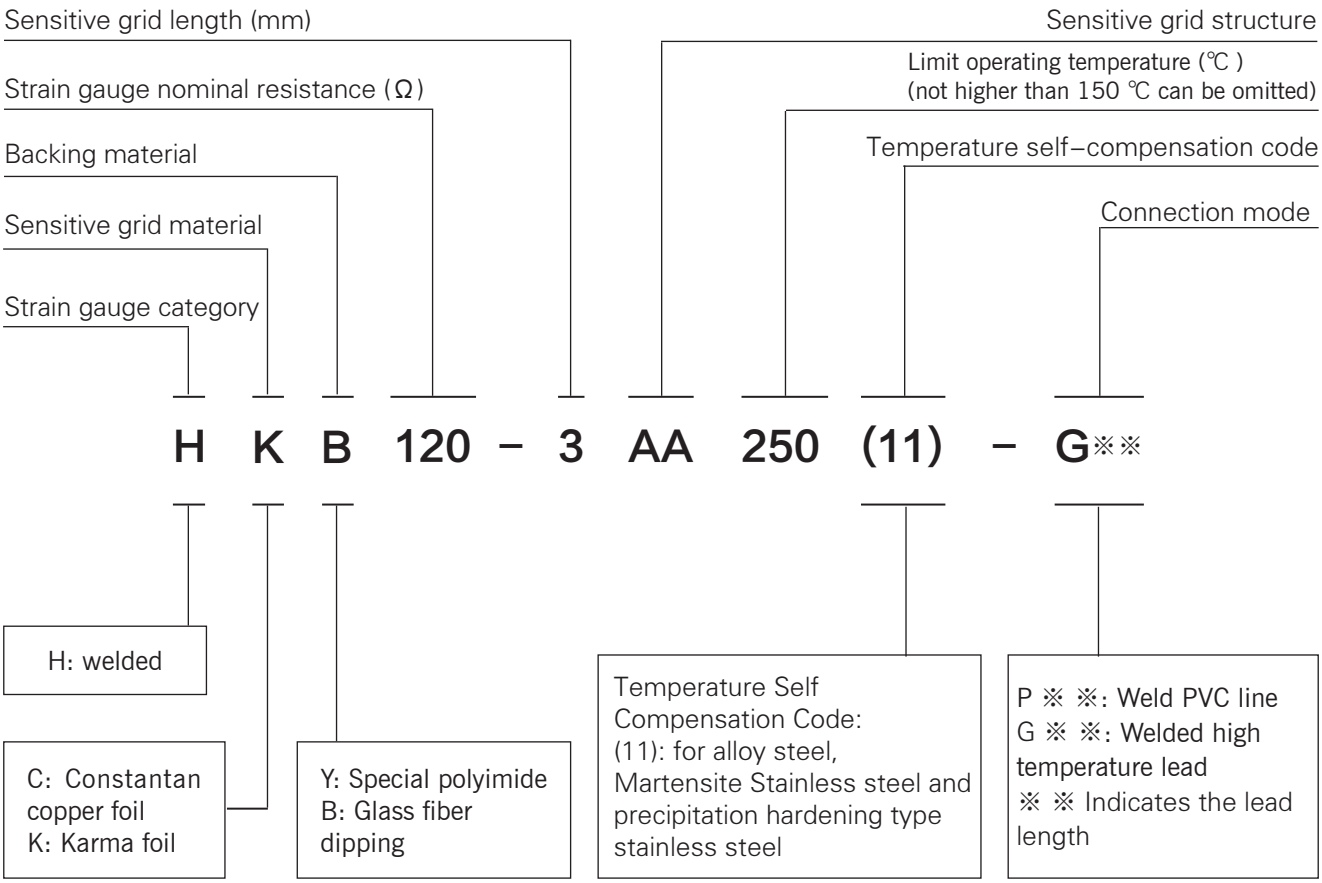
Welded Strain Gauge Naming Rules

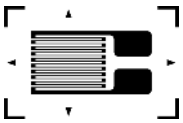
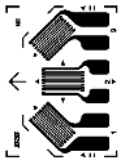
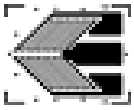
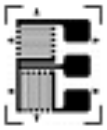


Technical specifications for welded strain gauges

	Welded strain gauges in room temperature HCY series	250 ℃ welded strain gauges HKB series
Sensitive grid material	Constantan	Kama
Backing material	Special polyimide	Glass fiber reinforced polyimide
Base body material	Stainless steel	Stainless steel
Base body thickness (mm)	0.1	0.1
Typical resistance (Ω)	120、350	120、350
Resistance Tolerance	≤±0.1%	≤±0.1%
Typical sensitivity coefficient	1.80~2.2	1.70~2.1
Sensitivity coefficient dispersion	≤±2%	≤±2%
Use temperature range	-30℃ ~+150℃	-30℃ ~+250℃
Strain limit	±3000μ ε	±3000μ ε
Protection mode	Silicone protection	Silicone protection
Installation method	Spot welding installation	Spot welding installation

Welded strain gauges

Welded strain gauges series

Product form	Product Model	Sensitive grid size Long (L) × width (W) (mm)	Backing size Long (L) × Width (W) (mm)
	HCY120-3AA (11)-P**	6.4×3.5	14.6×8.9
	HCY350-3AA (11)-P**	7.4×4.4	15.6×9.6
	HKB120-3AA (11)-G**	6.4×3.5	14.6×8.9
	HKB350-3AA (11)-G**	7.0×3.8	14.6×8.9
	HCY120-3CA-T(11)-P**	11.7×8.5	16.9×15.5
	HKB120-3CA-T(11)-G**	11.7×8.5	15.5×14.9
	HCY350-3HA-B (11)-P**	9.5×7.8	17.3×12.3
	HCY350-3BB-A (11)-P**	9.8×6.8	17.3×12.3
	HCY120-3BB-A (11)-P**	8.5×6.5	13.7×13
	HKB350-3BB-A (11)-G**	8.5×6.5	13.7×13

Description:

1. In addition to the models listed in above table, our company can design and manufacture according to user's requirement, drawing or sample.
2. The strain gauge size is subject to change without prior notice, please the physical size shaplease refer to the actual product size.

Installation Method

To install the welded strain gauges, generally shall select the special spot-welding machine. At present, our company can provide the imported or domestic spot welding machine.

After determining the solderability of the welded strain gauge and the measured metal parts, we shall prepare the spot-welding machine, power, grinding and cleaning and other auxiliary tools, ten we can start to install the welded strain gage.

(1) Remove rust, oxide layer, protective film

First, use sandpaper (300 ~ 450 mesh) to polish the area that strain gauge is to be welded, to remove the paint, rust, coating, oxide layer and so on.

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At the same time to polish the back of the welded strain gauge metal base body and the upper surface edge to remove the oxide layer, and form a fresh metal surface, so that it's easy to weld strongly.

(2) Crossed positioning

On the measured area of the metal part, make mark along the pre-installed direction. Use a 3H hard pencil or scribe device to do a visible mark as the positioning mark.

(3) Clean the welded area

Clean the surface of the welding area with an organic solvent such as acetone or anhydrous ethanol. During the cleaning process, wipe in a single direction until the stains on the cotton are not visible. To avoid reciprocating wiping, otherwise it can not effectively clean the surface of the welding area.

(4) Trial welding, adjust the welding parameters

First use the welding trial piece supplied by the manufacture and the measured metal part to weld and adjust the welding parameters. Read the spot welding instruction carefully,check the spot-welding machine to ensure reliable grounding and meet the safe operation environmental requirements, then open the spot-welding machine power, set the welding parameters (set and try the welding power from low to high). Generally the suitable welding parameters, which can weld the trial piece firmly to the test specimen without deeper welding nuggets. Record and save the appropriate welding parameters, prepare to formally install the welding strain gauges.

(5) Fix tape

In order to accurately align the welding line, we need to use tape temporarily fixing the welded strain gauge. When Fixing, please make clear positive and negative surface of the welded strain gauge,the positive surface shall be upwards, visually confirm the welded strain gauge positioning target alignment strain gauge installation location line, use a tape to fix the weldded strain gauge on the measured metal part. And then use the spot-welding machine to spot-weld a position welding point at the position showing in Figure [5] to confirm its initial location. After the position is fixed, tear off the tap the tape and prepare the tape and prepare for the next step to sopt to sopt-welding and install the strain gages.

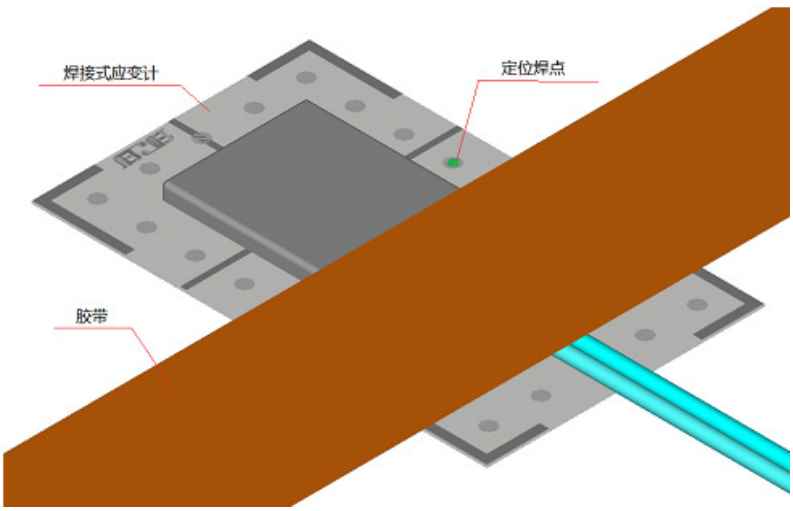

Figure [5]

Welded strain gauges

(6) Formal spot welding

Spot-welding machine output two welding hands, one welding hand clamped on the measured part, the other welding hand was catched by the operator, almost vertically press on the edge of the welded strain gage base body, slightly apply pressure and open or close the switch of the welding machine, then one time spot-welding process will be completed. So and so on, spot- welding one by one to finish the whole installation.
Install the entire strain gauge strain gauge.

The welding order is shown in Fig. 6, followed by A1, A2, A3, A4, A5, A6, A7, and A8, as shown by arrows. The start point shall be near the center of the strain gauge edge, then spot weld according to the direction of the arrows shown by the solder joints, solder joint spacing evenly, the diameter of the solder dot is about 0.8mm.

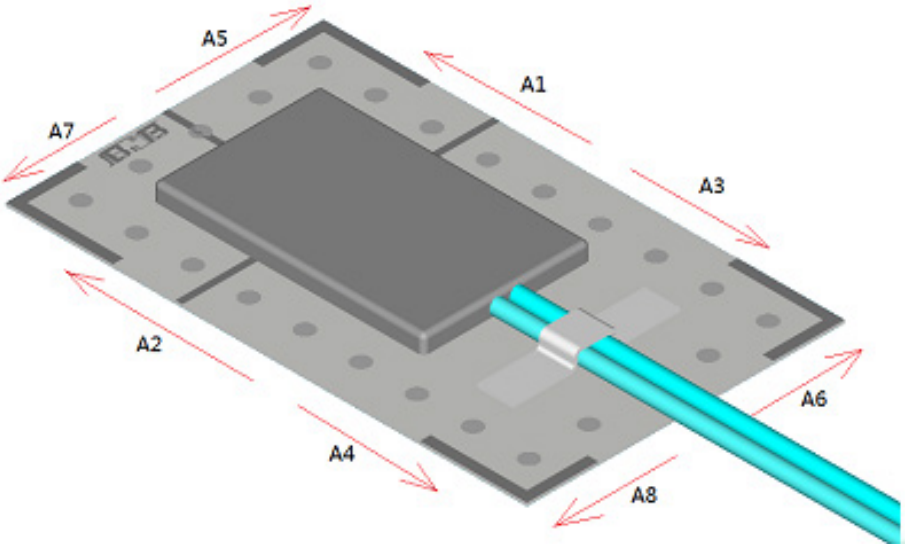

Fig. 6

(7) Inspect the installation quality

After installation is completed, check the strain gauge resistance, insulation resistance, sealing layer, protective layer, lead wires and other quality issues. If there is no installation quality problems, we can start wiring, wiring testing or doing further protection as needed.

With the above steps, you can successfully complete the installation of the welded strain gauges.

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Precautions

1. Welded strain gauges should be stored in a dry, cool environment, to prevent the metal base body is oxidized.
2. In the installation of the welded strain gauge, must fully polish and remove the oxide, glue film, stains of the welding area, otherwise resulting in low welding strength or poor welding and other quality issues.
3. Before spot-welding the strain gauge, please trial welding the test piece in order to find out the appropriate welding parameters to ensure the good quality for the official installation. (Welding trial piece is stainless steel piece with the same thickness as the welded strain gauge, 1 to 2 pieces will be supplied by the manufacturers freely.
4. After a while of the usage of the Spot-welding machine, the welding hand electrode will be oxidized, need to be re-polished by using sandpaper or rasp. Otherwise if continue to use the machine, there will be sparking on the welding electrode and metal base body (with strong light and large sound).
5. In the installation of the welded strain gauge, please wear the protective glasses and protective gloves, so as not to harm the eyes and arms by the sparks.
6. When use spot-welding machine to install the strain gauge, must ensure the reliable grounding, the surrounding environment has no splashing liquid, to eliminate the possible shock risk factors.
7. If you have special requirements or other requirements, please contact and communicate with us in time.
8. The sensitive coefficient of the welded strain gage is about 10% smaller compared to the non-welded strain gauge.