



High Temperature Strain Gauges EF series

These gauges have a small grid pattern required for measurement of printed circuit boards and surface mounted devices, which are getting smaller and smaller. The backing of the gauges is made of polyimide resin. The maximum operating temperature is +300°C for single element gauges and +200°C for two and three elements gauges. The lowest operating temperature is -196°C for both gauges.

Operating temperature range

For more information, please see below.

Temperature compensation range

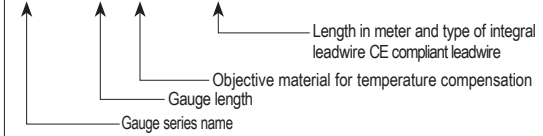
For more information, please see below.

Applicable adhesives

CN	-196~+120°C
EB-2	-60~+200°C
C-1	-196~+200°C
NP-50B	-30~+300°C

Please specify the type number as shown in the example below.

EFLK -02 -11 -4FA3LT-F



Objective material for temperature compensation (coefficient of linear thermal expansion $\times 10^{-6}/^{\circ}\text{C}$)
-11: Mild steel

Gauge pattern	Type	Gauge size(mm)		Backing size(mm)		Resistance Ω
		Length	Width	Length	Width	
 ●Single axis $\text{C}\epsilon$ Operating temperature range -196~+300°C Temperature compensation range +10~+150°C EFLX-02-11	EFLK-02-11	0.2	0.8	1.6	1.2	120
	EFLX-02-11	0.2	0.8	1.8	1.2	120
●0° /90° 2-axis Stacked Operating temperature range -196~+200°C Temperature compensation range 0~+150°C EFCA-05-11-002LE	EFCA-05-11-002LE	0.5	0.4	$\phi 3.8$		120
	-002LE: Polyimide insulated gauge lead of 2-cm pre-attached					
●0° /45° /90° 3-axis Stacked Operating temperature range -196~+200°C Temperature compensation range 0~+150°C EFRA-05-11	EFRA-05-11-002LE	0.5	0.4	$\phi 3.8$		120
	-002LE: Polyimide insulated gauge lead of 2-cm pre-attached					

Minimum order quantity is 10 strain gauges.

High Temperature Strain Gauges HZF series $\text{C}\epsilon$

These adhesive bonded high-temperature strain gages are capable of measuring temperatures up to 350°C. The gage leads are welded to the high-temperature lead wires, making them RoHS compliant. Please specify the desired lead length and place an order.

Operating temperature range -196~+350°C
Temperature compensation range +10~+300°C

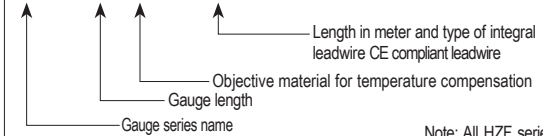
Applicable adhesives

NP-50B	-30~+300°C
C-1	-20~+200°C

*C-1 adhesives can be used up to 350°C for short cycle. For long-term or repeated measurements, please consult our sales representative.

Please specify the type number as shown in the example below.

HZFLA -2 -11 -1LJKT



Objective material for temperature compensation (coefficient of linear thermal expansion $\times 10^{-6}/^{\circ}\text{C}$)
-11: Mild steel -17:Stainless steel -23:Aluminium

Note: All HZF series base colors will be the same regardless of the target material.

Gauge pattern	Type	Gauge size(mm)		Backing size(mm)		Resistance Ω
		Length	Width	Length	Width	
●Single axis HZFLA-2	HZFLA-2	2	0.5	5.4	1.4	120

Minimum order quantity is 10 strain gauges.

Dedicated lead wires $\phi 0.9\text{mm}$ 3 stranded silica glass braided single core wires

Dedicated lead wires for HZF series strain gauges (made to order)

These strain gage leads are suitable for strain measurement up to a maximum operating temperature of 350°C. They are mainly used for the HZF series strain gages. The connection method between gage leads and lead wires is spot welding.

Type and designation of leadwires

Usage	Leadwire name	Operating temperature range of leadwire ($^{\circ}\text{C}$)	Type number example
High temperature	3 stranded silica glass braided single core wires LJKT	-100~+350	HZFLA-2-3LJKT

Standard lead lengths are 1, 3, 5, and 10 m. Lead wires alone are not available.



High & Low Temperature Strain Gauges CEF series C€

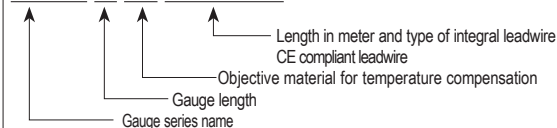
These are strain gauges utilizing polyimide resin for the gauge backing and special alloy foil for the grid. It features a wide range of operating temperature from cryogenic temperature to +200°C. This series is available only in single axis configuration with gauge length of 1,3 and 6mm.

Operating temperature range
-269~+200°C
Temperature compensation range
(approx.)-196~+80°C

Applicable adhesives
EA-2A -269~+50°C
CN -196~+120°C
C-1 -269~+200°C
EB-2 -60~+200°C

Please specify the type number as shown in the example below.

CEFLA -6 -11 -6FA3LT-F



Objective material for temperature compensation
(coefficient of linear thermal expansion $\times 10^{-6}/^{\circ}\text{C}$)

-11: Mild steel -17:Stainless steel -23:Aluminium
Note: The backing color of CEF series gauges are the same for every material for temperature compensation.

Gauge pattern	Type	Gauge size(mm)		Backing size(mm)		Resistance Ω
		Length	Width	Length	Width	
<p>Single axis</p> <p>CEFLA-1 Q ($\times 3$)</p>						
	CEFLA-1	1	0.5	4	2.2	120
	CEFLA-3	3	0.6	6.9	2.8	120
	CEFLA-6	6	1	10.6	3.1	120

Minimum order quantity is 10 strain gauges.

Dedicated leadwire recommended for CEF series strain gauges (made to order)

We supply various leadwires dedicated to strain gauges so as to meet our customers' requirements. Please refer to page 30 to 38 for the details of combination of a strain gauge and a leadwire. For CE marked strain gauges, only the leadwires using lead-free solder are available.

Type and designation of leadwires

Usage	Leadwire name	Operating temperature range of leadwire ($^{\circ}\text{C}$)	Type number example
High & Low temperature	3-wire twisted FEP leadwire 6FA □ LT-F	-269~+200	CEFLA-1-11-6FA3LT-F
	3-wire twisted FEP single-core leadwire 6FB □ LT-F		CEFLA-1-11-6FB3LT-F
	3-wire twisted fluorinated resin (PTFE) leadwire 4FA □ LT-F	-269~+260	CEFLA-1-11-4FA3LT-F
	3-wire twisted fluorinated resin (PTFE) single-core leadwire 4FB □ LT-F		CEFLA-1-11-4FB3LT-F

NB: □ shows the lead wire length in meter