



# Series "F" Foil Strain Gauge



Compatible adhesive & Operational temperature  
 CN: - 20~ + 80° C  
 P-2: - 20~ + 80° C      EB-2: - 20~ + 80° C

Operational temperature -20~+80°C  
 Temperature compensation range -10~+80°C

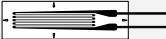





## GENERAL USE

Gauge pattern		Type	Gauge size		Backing		Resistance	
			L	W	L	W	in Ω	
<p>This gauge employs alloy foils which are 0.003 to 0.007 mm thick. Its gauge backing is made of epoxy resin with thickness of 0.03 mm which exhibits excellent electrical insulation performance. The backing is color coded for distinction of object specimen material for self temperature compensation.</p> <p>■Single-element (G.F. 2.1 approx.)</p>			L : length    W : width (Unit : mm)					
 <b>FLG-02</b>	 (x3)	Single-element	<b>FLG-02-11</b>	0.2	1.4	3.5	2.5	120
			-17					
			-23					
			<b>FLG-1-11</b>	1	1.1	6.5	2.5	120
			-17					
			-23					
 <b>FLG-1</b>	 (x3)		<b>FLA-03-11</b>	0.3	1.4	3.0	2.0	120
			-17					
			-23					
 <b>FLA-03</b>	 (x3)		<b>FLA-05-11</b>	0.5	1.2	5.0	2.2	120
			-17					
			-23					
 <b>FLA-1</b>	 (x3)		<b>FLA-1-11</b>	1	1.3	5.0	2.5	120
			-17					
		-23						
 <b>FLA-2</b>	 (x3)	<b>FLA-2-11</b>	2	1.5	6.5	3.0	120	
		-17						
		-23						
 <b>FLA-3</b>	 (x3)	<b>FLA-3-11</b>	3	1.7	8.8	3.5	120	
		-17						
		-23						
 <b>FLA-3-60</b>	 (x3)	<b>FLA-3-60-11</b>	3	1.2	8.0	3.0	60	
		-17						
		-23						
 <b>FLA-5</b>	 (x3)	<b>FLA-5-11</b>	5	1.5	10.0	3.0	120	
		-17						
		-23						
 <b>FLA-6</b>	 (x3)	<b>FLA-6-11</b>	6	2.2	12.5	4.3	120	
		-17						
		-23						
 <b>FLA-1-350-</b>	 (x3)	350Ω	<b>FLA-1-350-11</b>	1	2.0	5.0	4.0	350
			<b>FLA-1-350-17</b>					
			<b>FLA-1-350-23</b>					
			<b>FLA-2-350-11</b>	2	1.9	6.1	3.5	350
			<b>FLA-2-350-17</b>					
			<b>FLA-2-350-23</b>					
			<b>FLA-3-350-11</b>	3	3.2	8.5	5.0	350
			<b>FLA-3-350-17</b>					
			<b>FLA-3-350-23</b>					
 <b>FLA-6-350-11</b>	 (x3)		<b>FLA-6-350-11</b>	6	2.6	12.5	4.5	350
			<b>FLA-6-350-17</b>					
			<b>FLA-6-350-23</b>					

Each package contains 10

Compatible adhesive & Operational temperature  
 CN: -20~ +80°C  
 P-2: -20~ +80°C      EB-2: -20~ +80°C

## GENERAL USE

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$	
		L	W	L	W		
		L : length		W : width (Unit : mm)			
	FLA-6-1000-11 -17 -23	6	4.6	13.5	7.0	1000	
 FLA-10	Single- element	FLA-10-11 -17 -23	10	2.5	16.7	5.0	120
 FLA-30		FLA-30-11 -17 -23	30	2.0	36.1	5.1	120
 FLK-1	FLK-type with narrow gauge width	FLK-1-11 -17 -23	1	0.7	4.5	1.4	120
 FLK-2		FLK-2-11 -17 -23	2	0.9	5.5	1.5	120
 FLK-6		FLK-6-11 -17 -23	6	1.0	11.2	2.2	120
 FLK-10		FLK-10-11 -17 -23	10	1.6	16.2	3.8	120

FLA - 1 - 1 1 Materials for S-T-C




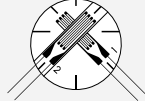
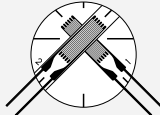
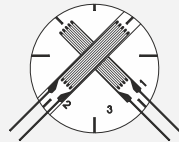
Gauge  
length

- 11 Mild steel
- 17 Stainless steel
- 23 Aluminium



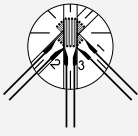

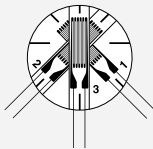
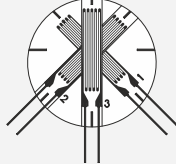
Each package contains 10 gauges.



## GENERAL USE

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$	
		L	W	L	W		
<ul style="list-style-type: none"> <li>• 90° 2-element Cross (G.F. 2.1 approx.)</li> </ul> <b>Stacked type</b>		L : length W : width (Unit : mm)					
 <b>FCA-1</b>	FCA-1-11 -17 -23	1	0.7	$\phi$ 4.5		120	
 <b>FCA-2</b>	FCA-2-11 -17 -23	2	0.9	$\phi$ 7.0		120	
 <b>FCA-3</b>	FCA-3-11 -17 -23	3	1.7	$\phi$ 11.0		120	
	90° 2-element Cross, Stacked type						
 <b>FCA-5</b>		FCA-5-11 -17 -23	5	1.9	$\phi$ 12.0		120
 <b>FCA-6</b>		FCA-6-11 -17 -23	6	2.4	$\phi$ 14.0		120
 <b>FCA-10</b>		FCA-10-11 -17 -23	10	2.5	$\phi$ 17.0		120
	350 $\Omega$	FCA-3-350-11 FCA-3-350-17 FCA-3-350-23	3	2	$\phi$ 11.0		350
Each package contains 10 gauges.							

## GENERAL USE

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$
		L	W	L	W	
<p>●45°/90°3-element Rosette (G.F. 2.1 approx.)</p> <p><b>Stacked type</b></p>  <p>FRA-1</p>  <p>FRA-2</p>  <p>FRA-3</p>  <p>FRA-5</p>  <p>FRA-6</p>  <p>FRA-10</p>	<p>45° /90° 3-element Rosette, Stacked type</p>	<p>FRA-1-11 -17 -23</p>	<p>1</p>	<p>0.7</p>	<p><math>\phi</math>4.5</p>	<p>120</p>
		<p>FRA-2-11 -17 -23</p>	<p>2</p>	<p>0.9</p>	<p><math>\phi</math>7.0</p>	<p>120</p>
		<p>FRA-3-11 -17 -23</p>	<p>3</p>	<p>1.7</p>	<p><math>\phi</math>11.0</p>	<p>120</p>
		<p>FRA-5-11 -17 -23</p>	<p>5</p>	<p>1.9</p>	<p><math>\phi</math>12.0</p>	<p>120</p>
		<p>FRA-6-11 -17 -23</p>	<p>6</p>	<p>2.4</p>	<p><math>\phi</math>14.0</p>	<p>120</p>
		<p>FRA-10-11 -17 -23</p>	<p>10</p>	<p>2.5</p>	<p><math>\phi</math>17.0</p>	<p>120</p>
		<p>FRA-3-350-11 FRA-3-350-17 FRA-3-350-23</p>	<p>3</p>	<p>2</p>	<p><math>\phi</math>11.0</p>	<p>350</p>

Each package contains 10 gauges.

## Point

- **Gauge size**

The location of gauge installation and the material on which it is installed impose restrictions on the strain gauge size. Also, because lead wires have to be connected to the connecting terminals and a coating materials applied to protect the gauge from moisture, the space required for the coating materials must also be considered.

- **Gauge length**

Gauges with short gauge lengths are used to measure localized strain, while gauges with long gauge lengths can be used to measure averaged stress over a larger area.

- **Gauge width**

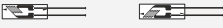
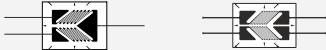

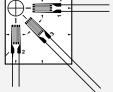

Strain gauges with the same gauge length are also available in a narrower width (FLK-type). Select narrow strain gauges for thin specimens such as cylindrical pipes, etc.



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 Temperature compensation range -10~+80°C



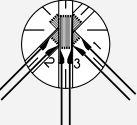
## SPECIAL USE

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$	
		L	W	L	W		
L : length    W : width (Unit : mm)							
<b>Shearing strain measurement</b>  <b>FLT-05A    FLT-05B</b> (Not actual size shown)	<b>Shearing strain Measurement</b>	<b>FLT-05A-11</b>	0.5	0.66	4.0	1.3	120
		<b>-17</b>					
		<b>-23</b>					
<b>Torque measurement</b>  <b>FCT-2                  FCT-2-350</b>	<b>Torque Measurement</b>	<b>FCT-2-11</b>	2	1.5	8.7	6.5	120
		<b>-17</b>					
		<b>-23</b>					
<b>90° 2-element Cross, Plane type</b>  <b>FCB-2</b>	<b>90° 2-element Cross, Plane type</b>	<b>FCB-2-11</b>	2	1.5	8.2	8.0	120
		<b>-17</b>					
		<b>-23</b>					
<b>3-element Residual Stress measurement</b>  <b>FRAS-2</b>	<b>3-element Residual Stress measurement</b>	<b>FRAS-2-11</b>	6	2.0	10.0	13.0	350
		<b>-17</b>					
		<b>-23</b>					
 <b>FRS-2                  FRS-3</b>	<b>Residual Stress Measurement</b>	<b>Gauge center diameter <math>\phi</math>7.0mm</b>	2	1.1	9.0	9.0	120
		<b>FRS-2-11</b>	1.5	1.3	$\phi$ 9.5	120	
		<b>-17</b>					
		<b>-23</b>					
		<b><math>\phi</math>5.14mm</b>	3	2.6	$\phi$ 17.5	120	
		<b>FRS-3-11</b>					
		<b>-17</b>					
		<b>-23</b>					

Each package contains 10 gauges.



## GLASS/CERAMIC MATERIALS

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$	
		L	W	L	W		
L : length    W : width (Unit : mm)							
<ul style="list-style-type: none"> <li>Single-element (G.F. 2.1 approx.)</li> </ul>  <b>FLA-5-8</b>	<b>Single-element</b>	<b>FLA-2-8</b>	2	1.5	6.5	3.0	120
		<b>FLA-5-8</b>	5	1.5	10.0	3.0	120
<ul style="list-style-type: none"> <li>90° 2-element Cross (G.F. 2.1 approx.)</li> <li>Stacked type</li> </ul>  <b>FCA-2-8</b>	<b>90° 2-element Cross, Stacked type</b>	<b>FCA-2-8</b>	2	0.9	$\phi$ 7.0	120	
		<b>FCA-5-8</b>	5	1.9	$\phi$ 12.0	120	
<ul style="list-style-type: none"> <li>45°/90° 3-element Rosette (G.F. 2.1 approx.)</li> <li>Stacked type</li> </ul>  <b>FRA-5-8</b>	<b>45° /90° 3-element Rosette, Stacked type</b>	<b>FRA-2-8</b>	2	0.9	$\phi$ 7.0	120	
		<b>FRA-5-8</b>	5	1.9	$\phi$ 12.0	120	

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# STRESS CONCENTRATION MEASUREMENT

Gauge pattern	Type	Gauge size		Backing		Resistance in $\Omega$
		L	W	L	W	
L : length W : width (Unit : mm)						
<p>●5-element Single-axis (G.F.2.1 approx.)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>FXV-1-11-002LE</b>  <small>magnified</small> </div> <div style="text-align: center;">   <b>FYV-1-11-002LE</b>  <small>magnified</small> </div> </div>	<p><b>5-element Single-axis</b> [gauge pitch 2mm]</p>	<p><b>FXV-1-11-17-23</b> -002LE</p> <p><b>FYV-1-11-17-23</b></p>	<p>1 1.3</p> <p>1 1.4</p>	<p>5.0 12.0</p> <p>5.0 12.0</p>	<p>120</p> <p>120</p>	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>FBXV-04</b>  <small>magnified</small> </div> <div style="text-align: center;">   <b>FBYV-06</b>  <small>magnified</small> </div> </div>	<p><b>5-element Single-axis</b> [gauge pitch 1mm]</p>	<p><b>FBXV-04-11</b> -005LE</p> <p><b>FBYV-06-11</b></p>	<p>0.4 1.3</p> <p>0.6 0.8</p>	<p>5.4 7.4</p> <p>5.3 7.0</p>	<p>120</p> <p>120</p>	
<p>●10-element 2-axis X and Y axis</p> <div style="display: flex; justify-content: space-around;">   <b>FCV-1</b>  <small>magnified</small> </div> <p>Y-axis leadwire is marked for identification.</p>	<p><b>10-element 2-axis</b> [gauge pitch 2mm]</p>	<p><b>FCV-1-11-17-23</b> -005LE</p>	<p>1 1.4</p>	<p>7.5 12.0</p>	<p>120</p>	
<p>●Single-element (G.F. 2.1 approx.) Single element cut away from Stress Concentration gauge</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>FBX-04 (x3)</b> </div> <div style="text-align: center;">   <b>FBY-06 (x3)</b> </div> <div style="text-align: center;">   <b>FLX-1 (x3)</b> </div> </div>	<p><b>Single-element</b></p>	<p><b>FBX-04-11</b> -005LE</p> <p><b>FBY-06-11</b></p> <p><b>FLX-1-11-17-23</b> -002LE</p>	<p>0.4 1.3</p> <p>0.6 0.8</p> <p>1 1.3</p>	<p>5.4 1.0</p> <p>5.3 1.0</p> <p>5.0 2.0</p>	<p>120</p> <p>120</p> <p>120</p>	<p>Gauge leads -002LE: <input type="checkbox"/> Polyimide 2cm pre-attached -005LE: <input type="checkbox"/> Polyimide 5cm pre-attached</p>
<p>●Chain Strain Gauges CCFXX/CCFYX</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <b>CCFXX-1</b>  <small>magnified</small>  X-axis 10-element </div> <div style="text-align: center;">   <b>CCFYX-1</b>  <small>magnified</small>  Y-axis 10-element </div> </div> <p>These gauges are specially designed to use our New method for strain measurement and need our Datalogger TDS-303 and TDS-602 with built-in the method. For the details, contact Altheris bv.</p> <p>Each package contains 10 gauges.</p>	<p><b>10-element Single-axis</b> [gauge pitch 1.5mm]</p>	<p><b>CCFXX-1</b></p> <p><b>CCFYX-1</b></p>	<p>1 1.5</p> <p>1 1.5</p>	<p>16.4 4.5</p> <p>16.4 4.5</p>	<p>120</p> <p>120</p>	

LEADERS IN SENSORS & HEAVY DUTY JOYSTICKS

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