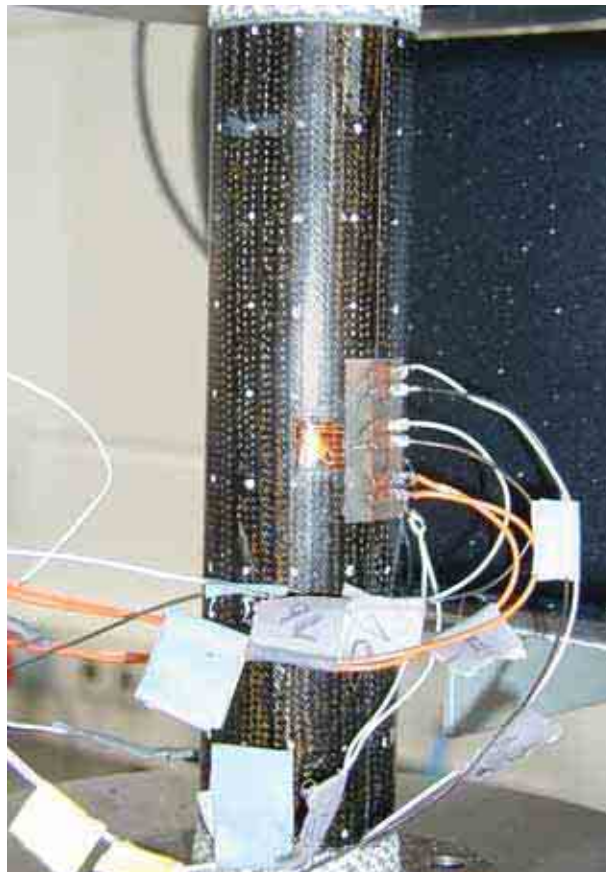


# Y series strain gages

## Y series strain gages

- Universal strain gage
- Excellent measuring characteristics
- Different connection configurations
- Flexible, therefore easy to handle
- Wide range of geometries available ex stock
- Wide range of geometries available with different nominal resistance values (120, 350, 700, 1000  $\Omega$ )



*Pipe specimen made of carbon-fiber reinforced plastic in a torsion fracture test*

## Specifications

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>strain gage construction</p> <p>measuring grid material</p> <p>thickness</p> <p>carrier material</p> <p>thickness</p> <p>cover material</p> <p>thickness</p> <p>connections for strain gages without leads</p>                                                                                                                                                                                                                                                                                                                                                       | <p><math>\mu\text{m}</math></p> <p><math>\mu\text{m}</math></p> <p><math>\mu\text{m}</math></p>                                                                                                                                                       | <p>foil SG complete with embedded measuring grid</p> <p>Constantan foil</p> <p>3.8 or 5, depending on strain gage type</p> <p>polyimide</p> <p>45 <math>\pm</math> 10</p> <p>polyimide</p> <p>25 <math>\pm</math> 5</p> <p>nickel plated Cu leads, approx. 30mm in length, integrated solder tabs, approx. 1.5mm in length, approx. 1.6 ... 2.2mm wide</p>           |
| <p>nominal resistance</p> <p>resistance tolerance</p> <p>gage factor</p> <p>nominal value of the gage factor</p> <p>gage factor tolerance for 0.6mm and 1.5mm measuring grid length</p> <p>for <math>\geq</math> 3 mm measuring grid length</p> <p>temperature coefficient of the gage factor</p> <p>nominal value of the temperature coefficient of the gage factor</p>                                                                                                                                                                                                | <p><math>\Omega</math></p> <p>%</p> <p>%</p> <p>%</p> <p>1/K</p>                                                                                                                                                                                      | <p>120, 350, 700, or 1000, depending on SG type</p> <p><math>\pm</math> 0.3 without; <math>\pm</math> 0.35 with leads)</p> <p>approx. 2</p> <p>specified on each package</p> <p><math>\pm</math> 1.5</p> <p><math>\pm</math> 1</p> <p>approx. <math>(115 \pm 10) \cdot 10^{-6}</math></p> <p>specified on each package</p>                                           |
| <p>reference temperature</p> <p>operating temperature range</p> <p>for absolute, i.e. zero point related measurements</p> <p>for relative, i.e. not zero point related measurements</p>                                                                                                                                                                                                                                                                                                                                                                                 | <p><math>^{\circ}\text{C}</math></p> <p><math>^{\circ}\text{C}</math></p> <p><math>^{\circ}\text{C}</math></p>                                                                                                                                        | <p>23</p> <p>-70 ... + 200</p> <p>-200 ... + 200</p>                                                                                                                                                                                                                                                                                                                 |
| <p>transverse sensitivity</p> <p>within reference temperature range using adhesive Z 70</p> <p>on strain gage type LY 11-6/120</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>%</p>                                                                                                                                                                                                                                              | <p>specified on each package</p> <p>- 0.1</p>                                                                                                                                                                                                                                                                                                                        |
| <p>temperature response</p> <p>temperature response at customer's choice matched to the thermal expansion coefficient</p> <p><math>\alpha</math> for ferritic steel</p> <p><math>\alpha</math> for aluminum</p> <p><math>\alpha</math> for plastic material</p> <p><math>\alpha</math> for austenitic steel</p> <p><math>\alpha</math> for titanium/ gray steel</p> <p><math>\alpha</math> for molybdenum</p> <p><math>\alpha</math> for quartz</p> <p>tolerance of the temperature response</p> <p>temperature response with matching in the range of<sup>3)</sup></p> | <p>1/K</p> <p>1/K</p> <p>1/K</p> <p>1/K</p> <p>1/K</p> <p>1/K</p> <p>1/K</p> <p>1/K</p> <p><math>^{\circ}\text{C}</math></p>                                                                                                                          | <p>specified on each package</p> <p><math>10.8 \cdot 10^{-6}</math></p> <p><math>23 \cdot 10^{-6}</math></p> <p><math>65 \cdot 10^{-6}</math></p> <p><math>16 \cdot 10^{-6}</math></p> <p><math>9 \cdot 10^{-6}</math></p> <p><math>5.4 \cdot 10^{-6}</math></p> <p><math>0.5 \cdot 10^{-6}</math></p> <p><math>\pm 0.3 \cdot 10^{-6}</math></p> <p>-10... + 120</p> |
| <p>mechanical hysteresis<sup>1)</sup></p> <p>at reference temperature and strain <math>\epsilon = \pm 1,000 \mu\text{m}/\text{m}</math></p> <p>on strain gage type LY 11-6/120</p> <p>at 1st load cycle and adhesive Z 70</p> <p>at 3rd load cycle and adhesive Z 70</p> <p>at 1st load cycle and adhesive X 60</p> <p>at 3rd load cycle and adhesive X 60</p> <p>at 1st load cycle and adhesive EP 250</p> <p>at 3rd load cycle and adhesive EP 250</p>                                                                                                                | <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p> | <p>1</p> <p>0.5</p> <p>2.5</p> <p>1</p> <p>1</p> <p>1</p>                                                                                                                                                                                                                                                                                                            |
| <p>maximum elongation<sup>1)</sup></p> <p>at reference temperature using adhesive Z 70</p> <p>on strain gage type LY 11-6/120</p> <p>absolute strain value <math>\epsilon</math> for positive direction</p> <p>absolute strain value <math>\epsilon</math> for negative direction</p>                                                                                                                                                                                                                                                                                   | <p><math>\mu\text{m}/\text{m}</math></p> <p><math>\mu\text{m}/\text{m}</math></p>                                                                                                                                                                     | <p>50,000 (<math>\pm</math> 5 %)</p> <p>50,000 (<math>\pm</math> 5 %)</p>                                                                                                                                                                                                                                                                                            |
| <p>fatigue life<sup>1)</sup></p> <p>at reference temperature using adhesive X 60</p> <p>on strain gage type LY 11-6/120</p> <p>number of load cycles <math>L_W</math> at</p> <p>alternating strain <math>\epsilon_W = \pm 1,000 \mu\text{m}/\text{m}</math> and zero point drift</p> <p><math>\epsilon_m \Delta \leq 300 \mu\text{m}/\text{m}</math></p> <p><math>\epsilon_m \Delta \leq 30 \mu\text{m}/\text{m}</math></p>                                                                                                                                             |                                                                                                                                                                                                                                                       | <p><math>&gt;&gt; 10^7</math> (test was interrupted at <math>10^7</math>)</p> <p><math>&gt; 10^7</math> (test was interrupted at <math>10^7</math>)</p>                                                                                                                                                                                                              |
| <p>minimum radius of curvature, longitudinal and transverse, at reference temperature</p> <p>for strain gages with leads</p> <p>for strain gages with integrated solder tabs</p> <p>within the measuring grid area</p> <p>within the area of the solder tabs</p> <p>bonding material that can be used</p> <p>cold curing adhesives</p> <p>hot curing adhesives</p>                                                                                                                                                                                                      | <p>mm</p> <p>mm</p> <p>mm</p>                                                                                                                                                                                                                         | <p>0.3</p> <p>0.3</p> <p>2</p> <p>Z 70; X 60; X 280</p> <p>EP 250; EPS 310S</p>                                                                                                                                                                                                                                                                                      |

<sup>1)</sup> The data depend on the various parameters of the specific application and are therefore stated for representative examples only.

<sup>2)</sup> With measuring grid lengths of 0.6 mm, the nominal resistance may deviate by  $\pm$  1%. For the types LY 51/ LY5x the deviation is  $\pm$  0.75%. For XY9x, RY9x and the KY types (per chain) it is  $\pm$  0.5%.

<sup>3)</sup> Matching to plastic (code number 8) is only possible in the temperature range of -10...+50°C.

# SG / Y series with 1 measuring grid / linear strain gages

| Stock types    |                | Variants        | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |     | Max. perm. effective bridge excitation voltage | Solder terminals |
|----------------|----------------|-----------------|---------------------|---------------------------------------|-----|------------------------|-----|------------------------------------------------|------------------|
| Steel          | Aluminum       |                 |                     | Measuring grid                        |     | Measuring grid carrier |     |                                                |                  |
|                |                | Others          | $\Omega$            | a                                     | b   | c                      | d   | V                                              |                  |
| 1-LY11-0.6/120 | 1-LY13-0.6/120 | 1-LY1x-0.6/120# | 120                 | 0.6                                   | 1   | 5                      | 3.2 | 1.5                                            | LS 7             |
| 1-LY11-1.5/120 | 1-LY13-1.5/120 | 1-LY1x-1.5/120  | 120                 | 1.5                                   | 1.2 | 6.5                    | 4.7 | 2.5                                            | LS 7             |
| 1-LY11-3/120   | 1-LY13-3/120   | 1-LY1x-3/120    | 120                 | 3                                     | 1.4 | 8.5                    | 4.5 | 4                                              | LS 7             |
| 1-LY11-3/120A  |                | 1-LY1x-3/120A   | 120                 | 3                                     | 1.4 | 8.5                    | 4.5 | 4                                              | LS 7             |
| 1-LY11-6/120   | 1-LY13-6/120   | 1-LY1x-6/120    | 120                 | 6                                     | 2.8 | 13                     | 6   | 8                                              | LS 5             |
| 1-LY11-6/120A  |                | 1-LY1x-6/120A   | 120                 | 6                                     | 2.8 | 13                     | 6   | 8                                              | LS 5             |
| 1-LY11-10/120  | 1-LY13-10/120  | 1-LY1x-10/120   | 120                 | 10                                    | 4.9 | 18.5                   | 9.5 | 13                                             | LS 5             |
| 1-LY11-10/120A |                | 1-LY1x-10/120A  | 120                 | 10                                    | 4.9 | 18.5                   | 9.5 | 13                                             | LS 5             |
| 1-LY11-1.5/350 | 1-LY13-1.5/350 | 1-LY1x-1.5/350# | 350                 | 1.5                                   | 1.2 | 5.7                    | 4.7 | 4.5                                            | LS 7             |
| 1-LY11-3/350   | 1-LY13-3/350   | 1-LY1x-3/350    | 350                 | 3                                     | 1.5 | 8.5                    | 4.5 | 7                                              | LS 7             |
|                |                | 1-LY1x-3/350A   | 350                 | 3                                     | 1.5 | 8.5                    | 4.5 | 7                                              | LS 7             |
| 1-LY11-6/350   | 1-LY13-6/350   | 1-LY1x-6/350    | 350                 | 6                                     | 2.9 | 13                     | 6   | 14                                             | LS 5             |
| 1-LY11-6/350A  |                | 1-LY1x-6/350A   | 350                 | 6                                     | 2.9 | 13                     | 6   | 14                                             | LS 5             |
| 1-LY11-10/350  |                | 1-LY1x-10/350   | 350                 | 10                                    | 5   | 18.5                   | 9.5 | 23                                             | LS 5             |
| 1-LY11-10/350A |                | 1-LY1x-10/350A  | 350                 | 10                                    | 5   | 18.5                   | 9.5 | 23                                             | LS 5             |

## LY11

Linear strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

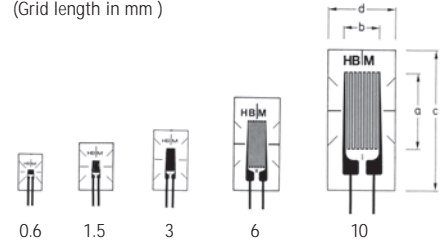
## LY13

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## LY1x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 10 pcs.

| Stock types    |          | Variants        | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |     | Max. perm. effective bridge excitation voltage | Solder terminals |
|----------------|----------|-----------------|---------------------|---------------------------------------|-----|------------------------|-----|------------------------------------------------|------------------|
| Steel          | Aluminum |                 |                     | Measuring grid                        |     | Measuring grid carrier |     |                                                |                  |
|                |          | Others          | $\Omega$            | a                                     | b   | c                      | d   | V                                              |                  |
| 1-LY21-0.6/120 |          | 1-LY2x-0.6/120# | 120                 | 0.6                                   | 0.6 | 3.5                    | 6.4 | 1                                              | LS 7             |
| 1-LY21-1.5/120 |          | 1-LY2x-1.5/120  | 120                 | 1.5                                   | 1.4 | 4.7                    | 8.3 | 2                                              | LS 5             |
| 1-LY21-3/120   |          | 1-LY2x-3/120    | 120                 | 3                                     | 2.8 | 7.5                    | 10  | 6                                              | LS 5             |
|                |          | 1-LY2x-6/120    | 120                 | 6                                     | 5.7 | 11                     | 16  | 12                                             | LS 4             |

Types marked # are only available with matching to aluminum, ferritic or austenitic steel

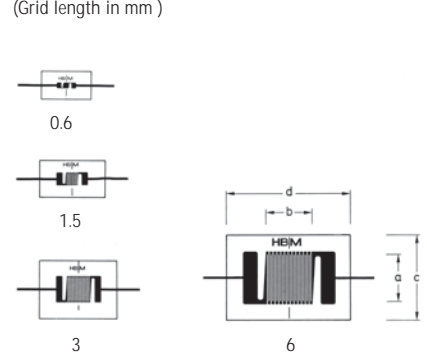
## LY21

Linear strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## LY2x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 10 pcs.

# SG / Y series with 1 measuring grid / linear strain gages

| Stock types    |              | Variants        | Nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |     | Max. perm. effective bridge excitation voltage | Solder terminals (1) |
|----------------|--------------|-----------------|--------------------|---------------------------------------|-----|------------------------|-----|------------------------------------------------|----------------------|
| Steel          | Aluminum     |                 |                    | Measuring grid                        |     | Measuring grid carrier |     |                                                |                      |
|                |              | Others          | Ω                  | a                                     | b   | c                      | d   | V                                              |                      |
| 1-LY41-0.6/120 |              | 1-LY4x-0.6/120# | 120                | 0.6                                   | 1.2 | 6                      | 4   | 1.5                                            | LS 5                 |
| 1-LY41-1.5/120 |              | 1-LY4x-1.5/120  | 120                | 1.5                                   | 1.2 | 7                      | 5   | 2.5                                            | LS 5                 |
| 1-LY41-3/120   | 1-LY43-3/120 | 1-LY4x-3/120    | 120                | 3                                     | 1.1 | 8                      | 5   | 3.5                                            | LS 5                 |
|                |              | 1-LY4x-3/120A   | 120                | 3                                     | 1.1 | 8                      | 5   | 3.5                                            | LS 5                 |
| 1-LY41-6/120   | 1-LY43-6/120 | 1-LY4x-6/120    | 120                | 6                                     | 2.3 | 13.9                   | 5.9 | 8                                              | LS 5                 |
| 1-LY41-6/120A  |              | 1-LY4x-6/120A   | 120                | 6                                     | 2.3 | 13.9                   | 5.9 | 8                                              | LS 5                 |
| 1-LY41-10/120  |              | 1-LY4x-10/120   | 120                | 10                                    | 5   | 18                     | 8   | 14                                             | LS 5                 |
|                |              | 1-LY4x-10/120A  | 120                | 10                                    | 5   | 18                     | 8   | 14                                             | LS 5                 |
| 1-LY41-20/120  |              | 1-LY4x-20/120   | 120                | 20                                    | 0.7 | 31.8                   | 8.2 | 6.5                                            | LS 5                 |
| 1-LY41-50/120  |              | 1-LY4x-50/120   | 120                | 50                                    | 0.9 | 63.6                   | 8.2 | 12                                             | LS 5                 |
| 1-LY41-100/120 |              | 1-LY4x-100/120  | 120                | 100                                   | 1   | 114.8                  | 8.2 | 19                                             | LS 5                 |
| 1-LY41-150/120 |              | 1-LY4x-150/120  | 120                | 150                                   | 1.3 | 165.6                  | 8.2 | 25                                             | LS 5                 |
| 1-LY41-1.5/350 |              | 1-LY4x-1.5/350# | 350                | 1.5                                   | 2.3 | 9.2                    | 5.9 | 6.5                                            | LS 5                 |
| 1-LY41-3/350   | 1-LY43-3/350 | 1-LY4x-3/350    | 350                | 3                                     | 2.5 | 10.9                   | 5.9 | 9                                              | LS 5                 |
| 1-LY41-3/350A  |              | 1-LY4x-3/350A   | 350                | 3                                     | 2.5 | 10.9                   | 5.9 | 9                                              | LS 5                 |
| 1-LY41-6/350   | 1-LY43-6/350 | 1-LY4x-6/350    | 350                | 6                                     | 2.7 | 13.9                   | 5.9 | 15                                             | LS 5                 |
| 1-LY41-6/350A  |              | 1-LY4x-6/350A   | 350                | 6                                     | 2.7 | 13.9                   | 5.9 | 15                                             | LS 5                 |
| 1-LY41-10/350  |              | 1-LY4x-10/350   | 350                | 10                                    | 5   | 18                     | 8   | 24                                             | LS 5                 |
|                |              | 1-LY4x-10/350A  | 350                | 10                                    | 5   | 18                     | 8   | 24                                             | LS 5                 |
| 1-LY41-3/700   | 1-LY43-3/700 | 1-LY4x-3/700    | 700                | 3                                     | 2.7 | 10.9                   | 5.9 | 13                                             | LS 5                 |
| 1-LY41-6/700   |              | 1-LY4x-6/700    | 700                | 6                                     | 4.1 | 13.9                   | 5.9 | 23                                             | LS 5                 |
| 1-LY41-10/700  |              | 1-LY4x-10/700   | 700                | 10                                    | 5   | 18                     | 8   | 33                                             | LS 5                 |
|                |              | 1-LY4x-3/1000#  | 1000               | 3                                     | 2.7 | 10.9                   | 5.9 | 16                                             | LS 5                 |
| 1-LY41-6/1000  |              | 1-LY4x-6/1000#  | 1000               | 6                                     | 4.3 | 13.9                   | 5.9 | 27                                             | LS 5                 |
|                |              | 1-LY4x-10/1000# | 1000               | 10                                    | 5   | 18                     | 8   | 40                                             | LS 5                 |
|                |              |                 |                    |                                       |     |                        |     |                                                |                      |
|                |              |                 |                    |                                       |     |                        |     |                                                |                      |
|                |              |                 |                    |                                       |     |                        |     |                                                |                      |
|                |              |                 |                    |                                       |     |                        |     |                                                |                      |

## LY41

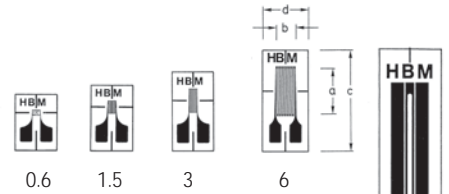
Linear strain gage  
Temperature response matched to steel with  $\alpha = 10.8 \cdot 10^{-6}/K$

## LY43

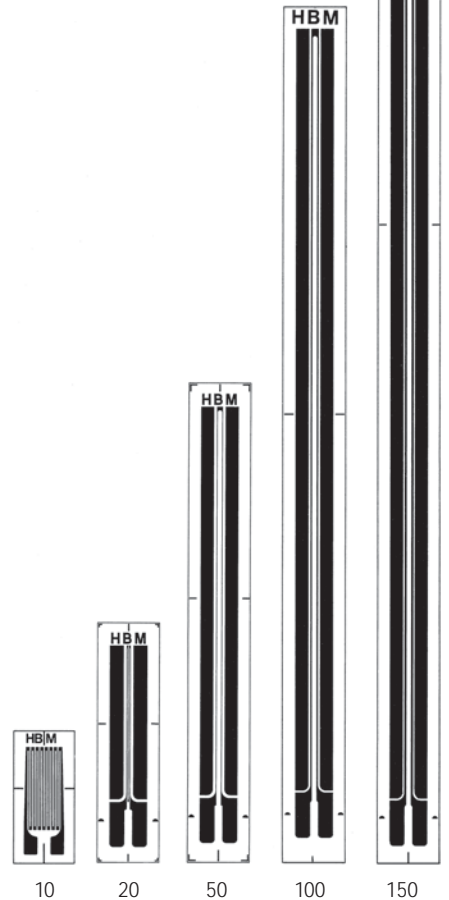
Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## LY4x

Temperature response matching at customer's choice,  
see page 20



Illustrations show actual size  
(Grid length in mm)



Contents per package: 10 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel



# SG / Y series with 1 measuring grid / linear strain gages

| Stock types  |          | Variants     | No-nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                |    |                        | Max. perm. effective bridge excitation voltage | Solder terminals |
|--------------|----------|--------------|-----------------------|---------------------------------------|----------------|----|------------------------|------------------------------------------------|------------------|
| Steel        | Aluminum |              |                       | Others                                | Measuring grid |    | Measuring grid carrier |                                                |                  |
|              |          |              | $\Omega$              | a                                     | b              | c  | d                      | V                                              |                  |
| 1-LY51-3/120 |          | 1-LY5x-3/120 | 120                   | 3                                     | 0.3            | 9  | 4.7                    | 2                                              | LS 7             |
|              |          | 1-LY5x-6/120 | 120                   | 6                                     | 0.4            | 13 | 4.7                    | 3                                              | LS 7             |
|              |          |              |                       |                                       |                |    |                        |                                                |                  |

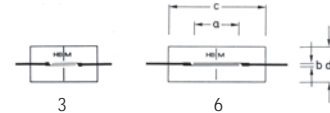
## LY51

Linear strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## LY5x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 10 pcs.

| Stock types    |              | Variants       | No-nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                |      |                        | Max. perm. effective bridge excitation voltage | Solder terminals |
|----------------|--------------|----------------|-----------------------|---------------------------------------|----------------|------|------------------------|------------------------------------------------|------------------|
| Steel          | Aluminum     |                |                       | Others                                | Measuring grid |      | Measuring grid carrier |                                                |                  |
|                |              |                | $\Omega$              | a                                     | b              | c    | d                      | V                                              |                  |
| 1-LY61-1.5/120 |              | 1-LY6x-1.5/120 | 120                   | 1.5                                   | 1.0            | 7.8  | 4.7                    | 2.5                                            | -                |
| 1-LY61-3/120   |              | 1-LY6x-3/120   | 120                   | 3                                     | 1.4            | 9.8  | 4.7                    | 4                                              | -                |
|                |              | 1-LY6x-3/120A  | 120                   | 3                                     | 1.4            | 9.8  | 4.7                    | 4                                              | -                |
| 1-LY61-6/120   | 1-LY63-6/120 | 1-LY6x-6/120   | 120                   | 6                                     | 2.5            | 16   | 6.3                    | 8                                              | -                |
|                |              | 1-LY6x-6/120A  | 120                   | 6                                     | 2.5            | 16   | 6.3                    | 8                                              | -                |
| 1-LY61-10/120  |              | 1-LY6x-10/120  | 120                   | 10                                    | 4.3            | 23.5 | 9.3                    | 13                                             | -                |
| 1-LY61-3/350   |              | 1-LY6x-3/350   | 350                   | 3                                     | 1.7            | 9.8  | 4.7                    | 7                                              | -                |
|                |              | 1-LY6x-3/350A  | 350                   | 3                                     | 1.7            | 9.8  | 4.7                    | 7                                              | -                |
| 1-LY61-6/350   | 1-LY63-6/350 | 1-LY6x-6/350   | 350                   | 6                                     | 2.6            | 16   | 6.3                    | 13                                             | -                |
| 1-LY61-6/350A  |              | 1-LY6x-6/350A  | 350                   | 6                                     | 2.6            | 16   | 6.3                    | 13                                             | -                |
| 1-LY61-10/350  |              | 1-LY6x-10/350  | 350                   | 10                                    | 4.3            | 23.5 | 9.3                    | 22                                             | -                |
|                |              |                |                       |                                       |                |      |                        |                                                |                  |

## LY61

Linear strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

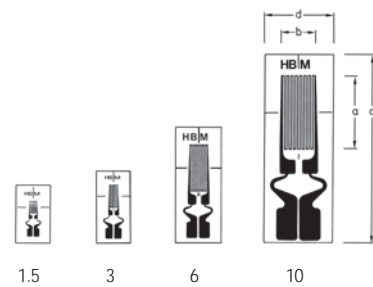
## LY63

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## LY6x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 10 pcs.

# SG / Y series with 2 measuring grids / double strain gages

| Stock types  |              | Variants     | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                           |     | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|--------------|--------------|--------------|---------------------------------|---------------------------------------|-----|---------------------------|-----|------------------------------------------------------------|---------------------|
| Steel        | Aluminum     |              |                                 | Measuring<br>grid                     |     | Measuring grid<br>carrier |     |                                                            |                     |
|              |              | Others       | $\Omega$                        | a                                     | b   | c                         | d   | V                                                          |                     |
| 1-DY11-3/350 | 1-DY13-3/350 | 1-DY1x-3/350 | 350                             | 3                                     | 2.7 | 9                         | 8   | 9                                                          | LS 7                |
| 1-DY11-6/350 | 1-DY13-6/350 | 1-DY1x-6/350 | 350                             | 6                                     | 3.2 | 12.5                      | 9.4 | 14                                                         | LS 7                |
|              |              |              |                                 |                                       |     |                           |     |                                                            |                     |

## DY11

Double strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

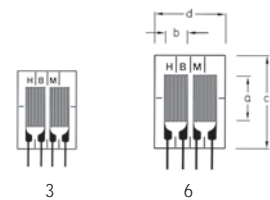
## DY13

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## DY1x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs

| Stock types  |              | Variants     | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                           |   | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals<br>(1) |
|--------------|--------------|--------------|---------------------------------|---------------------------------------|-----|---------------------------|---|------------------------------------------------------------|----------------------------|
| Steel        | Aluminum     |              |                                 | Measuring<br>grid                     |     | Measuring grid<br>carrier |   |                                                            |                            |
|              |              | Others       | $\Omega$                        | a                                     | b   | c                         | d | V                                                          |                            |
| 1-DY41-3/350 | 1-DY43-3/350 | 1-DY4x-3/350 | 350                             | 3                                     | 2.5 | 8.2                       | 8 | 8.5                                                        | LS 7                       |
| 1-DY41-6/350 |              | 1-DY4x-6/350 | 350                             | 6                                     | 2.8 | 10.7                      | 9 | 13                                                         | LS 7                       |
|              |              |              |                                 |                                       |     |                           |   |                                                            |                            |

## DY41

Double strain gage  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

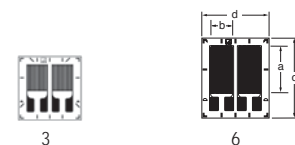
## DY43

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## DY4x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs

(1) Solder terminals are not compulsory

# SG / Y series with 2 measuring grids / T rosette

| Stock types    |                | Variants        | No-<br>minal<br>resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                   |      |                           | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|----------------|----------------|-----------------|----------------------------|---------------------------------------|-------------------|------|---------------------------|------------------------------------------------------------|---------------------|
| Steel          | Aluminum       |                 |                            | Others                                | Measuring<br>grid |      | Measuring grid<br>carrier |                                                            |                     |
|                |                | $\Omega$        | a                          |                                       | b                 | c    | d                         | V                                                          |                     |
| 1-XY11-0.6/120 |                | 1-XY1x-0.6/120# | 120                        | 0.6                                   | 1                 | 6    | 4                         | 1.5                                                        | LS 7                |
| 1-XY11-1.5/120 | 1-XY13-1.5/120 | 1-XY1x-1.5/120  | 120                        | 1.5                                   | 1.5               | 9    | 5                         | 3                                                          | LS 5                |
| 1-XY11-3/120   | 1-XY13-3/120   | 1-XY1x-3/120    | 120                        | 3                                     | 3                 | 14.5 | 7.5                       | 6                                                          | LS 4                |
| 1-XY11-6/120   |                | 1-XY1x-6/120    | 120                        | 6                                     | 6                 | 23.5 | 11                        | 12                                                         | LS 5                |
| 1-XY11-1.5/350 | 1-XY13-1.5/350 | 1-XY1x-1.5/350# | 350                        | 1.5                                   | 1.5               | 9    | 5                         | 5                                                          | LS 5                |
| 1-XY11-3/350   | 1-XY13-3/350   | 1-XY1x-3/350    | 350                        | 3                                     | 3                 | 14.4 | 7.3                       | 10                                                         | LS 4                |
| 1-XY11-6/350   | 1-XY13-6/350   | 1-XY1x-6/350    | 350                        | 6                                     | 6                 | 23.3 | 10.5                      | 20                                                         | LS 4                |

## XY11

0°/90° T rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

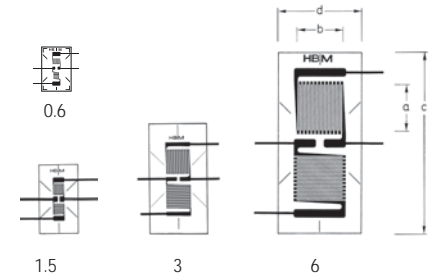
## XY13

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY1x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

| Stock types    |                | Variants        | No-<br>minal<br>resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                   |      |                           | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals<br>(1) |
|----------------|----------------|-----------------|----------------------------|---------------------------------------|-------------------|------|---------------------------|------------------------------------------------------------|----------------------------|
| Steel          | Aluminum       |                 |                            | Others                                | Measuring<br>grid |      | Measuring grid<br>carrier |                                                            |                            |
|                |                | $\Omega$        | a                          |                                       | b                 | c    | d                         | V                                                          |                            |
| 1-XY31-0.6/120 |                | 1-XY3x-0.6/120# | 120                        | 0.6                                   | 1                 | 7    | 6                         | 1.5                                                        | LS7                        |
| 1-XY31-1.5/120 | 1-XY33-1.5/120 | 1-XY3x-1.5/120  | 120                        | 1.5                                   | 1.5               | 8    | 6.3                       | 3                                                          | LS7                        |
| 1-XY31-3/120   |                | 1-XY3x-3/120    | 120                        | 3                                     | 2.8               | 10.5 | 8                         | 5.5                                                        | LS7                        |
| 1-XY31-6/120   |                | 1-XY3x-6/120    | 120                        | 6                                     | 5.8               | 17.5 | 12                        | 11                                                         | LS4                        |
| 1-XY31-1.5/350 | 1-XY33-1.5/350 | 1-XY3x-1.5/350# | 350                        | 1.5                                   | 1.2               | 7.7  | 6.3                       | 5                                                          | LS7                        |
| 1-XY31-3/350   | 1-XY33-3/350   | 1-XY3x-3/350    | 350                        | 3                                     | 2.9               | 10.9 | 7.6                       | 10                                                         | LS5                        |
| 1-XY31-6/350   | 1-XY33-6/350   | 1-XY3x-6/350    | 350                        | 6                                     | 5.7               | 18   | 12                        | 20                                                         | LS4                        |

## XY31

0°/90° T rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

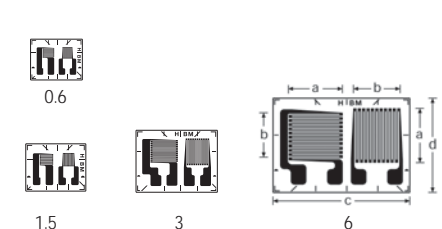
## XY33

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY3x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series with 2 measuring grids / T rosette

| Stock types    |                | Variants       | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                   |     |      |                           | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|----------------|----------------|----------------|---------------------------------|---------------------------------------|-------------------|-----|------|---------------------------|------------------------------------------------------------|---------------------|
| Steel          | Aluminum       |                |                                 | Others                                | Measuring<br>grid |     |      | Measuring grid<br>carrier |                                                            |                     |
|                |                |                | $\Omega$                        | a                                     | b1                | b2  | c    | d                         |                                                            |                     |
| 1-XY91-1.5/120 | 1-XY93-1.5/120 | 1-XY9x-1.5/120 | 120                             | 1.5                                   | 1.2               | 1.2 | 4.7  | 5.2                       | 2                                                          | LS 5                |
| 1-XY91-3/120   | 1-XY93-3/120   | 1-XY9x-3/120   | 120                             | 3                                     | 1.4               | 1.3 | 6.2  | 7.9                       | 3.5                                                        | LS 5                |
| 1-XY91-6/120   | 1-XY93-6/120   | 1-XY9x-6/120   | 120                             | 6                                     | 1.9               | 2.2 | 10   | 9.6                       | 5.5                                                        | LS 4                |
| 1-XY91-10/120  |                | 1-XY9x-10/120  | 120                             | 10                                    | 3.2               | 3.8 | 15.2 | 14.0                      | 9                                                          | LS 212              |
|                |                |                |                                 |                                       |                   |     |      |                           |                                                            |                     |

## XY91

0°/90° stacked T rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

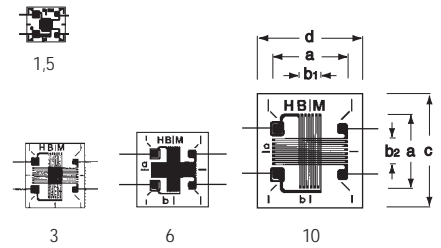
## XY93

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY9x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel



# SG / Y series with 2 measuring grids / torsion / shear strain gages

| Stock types     |               | Variants        | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |      | Max. perm. effective bridge excitation voltage | Solder terminals (1) |
|-----------------|---------------|-----------------|---------------------|---------------------------------------|-----|------------------------|------|------------------------------------------------|----------------------|
| Steel           | Aluminum      |                 |                     | Measuring grid                        |     | Measuring grid carrier |      |                                                |                      |
|                 |               | Others          | $\Omega$            | a                                     | b   | c                      | d    | V                                              |                      |
| 1-XY101-1.5/120 |               | 1-XY10x-1.5/120 | 120                 | 1.5                                   | 1.4 | 8                      | 8.3  | 1.5                                            | LS7                  |
| 1-XY101-3/120   | 1-XY103-3/120 | 1-XY10x-3/120   | 120                 | 3                                     | 2.8 | 10.6                   | 9.8  | 3                                              | LS5                  |
|                 |               | 1-XY10x-6/120   | 120                 | 6                                     | 5.5 | 18                     | 16.5 | 5.5                                            | LS4                  |
| 1-XY101-3/350   | 1-XY103-3/350 | 1-XY10x-3/350   | 350                 | 3                                     | 2.9 | 10.6                   | 8    | 11                                             | LS5                  |
|                 |               | 1-XY10x-6/350   | 350                 | 6                                     | 5.9 | 18                     | 16.5 | 10                                             | LS4                  |

## XY101

0°/90° T rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

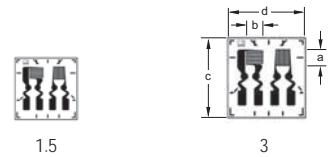
## XY103

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY10x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



1.5

3

Contents per package: 5 pcs.

| Stock types    |              | Variants        | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |      | Max. perm. effective bridge excitation voltage | Solder terminals |      |
|----------------|--------------|-----------------|---------------------|---------------------------------------|-----|------------------------|------|------------------------------------------------|------------------|------|
| Steel          | Aluminum     |                 |                     | Measuring grid                        |     | Measuring grid carrier |      |                                                |                  |      |
|                |              | Others          | $\Omega$            | a                                     | b1  | b2                     | c    | d                                              | V                |      |
| 1-XY21-0.6/120 |              | 1-XY2x-0.6/120# | 120                 | 0.6                                   | 2   | 1.1                    | 7.5  | 4                                              | 2.5              | LS 7 |
| 1-XY21-1.5/120 |              | 1-XY2x-1.5/120  | 120                 | 1.5                                   | 1.7 | 2.5                    | 6.8  | 4.5                                            | 4.5              | LS 7 |
| 1-XY21-3/120   |              | 1-XY2x-3/120    | 120                 | 3                                     | 4.3 | 5.3                    | 11.2 | 9.5                                            | 6                | LS 5 |
| 1-XY21-6/120   |              | 1-XY2x-6/120    | 120                 | 6                                     | 8.0 | 10                     | 17.5 | 12.7                                           | 11               | LS 4 |
| 1-XY21-1.5/350 |              | 1-XY2x-1.5/350# | 350                 | 1.5                                   | 2.1 | 2.5                    | 7.4  | 4.5                                            | 5                | LS 7 |
| 1-XY21-3/350   | 1-XY23-3/350 | 1-XY2x-3/350    | 350                 | 3                                     | 4.0 | 5.3                    | 11.2 | 9.5                                            | 10               | LS 4 |
| 1-XY21-6/350   | 1-XY23-6/350 | 1-XY2x-6/350    | 350                 | 6                                     | 7.8 | 10                     | 17.5 | 12.7                                           | 19               | LS 4 |
|                |              | 1-XY2x-3/700#   | 700                 | 3                                     | 4.0 | 5.3                    | 11.2 | 9.5                                            | 14               | LS 5 |
|                |              | 1-XY2x-6/700    | 700                 | 6                                     | 7.8 | 10                     | 17.5 | 12.7                                           | 27               | LS 4 |

## XY21

Shear/torsion half bridge  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

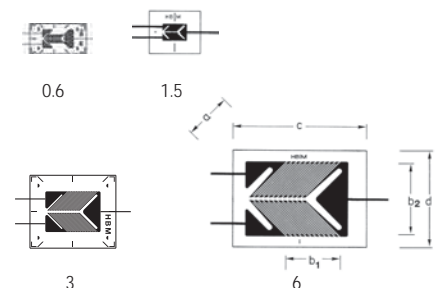
## XY23

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY2x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



0.6

1.5

3

6

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

Contents per package: 5 pcs.

# SG / Y series with 2 measuring grids / torsion / shear strain gages

| Stock types    |                | Variants        | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |      |                           |      | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals<br>(1) |
|----------------|----------------|-----------------|---------------------------------|---------------------------------------|-----|------|---------------------------|------|------------------------------------------------------------|----------------------------|
| Steel          | Aluminum       |                 |                                 | Measuring<br>grid                     |     |      | Measuring grid<br>carrier |      |                                                            |                            |
|                |                | Others          | $\Omega$                        | a                                     | b1  | b2   | c                         | d    |                                                            |                            |
| 1-XY41-0.6/120 |                | 1-XY4x-0.6/120# | 120                             | 0.6                                   | 2.1 | 1.6  | 6.5                       | 4.6  | 1.5                                                        | LS 7                       |
| 1-XY41-1.5/120 | 1-XY43-1.5/120 | 1-XY4x-1.5/120  | 120                             | 1.5                                   | 1.7 | 3.1  | 7.5                       | 4.6  | 2.5                                                        | LS 7                       |
| 1-XY41-3/120   |                | 1-XY4x-3/120    | 120                             | 3                                     | 3   | 5.4  | 11                        | 8    | 5                                                          | LS 7                       |
| 1-XY41-6/120   |                | 1-XY4x-6/120    | 120                             | 6                                     | 6   | 10.2 | 16                        | 12.2 | 9.5                                                        | LS 4                       |
|                |                | 1-XY4x-1.5/350  | 350                             | 1.5                                   | 1.5 | 1.95 | 3                         | 7.5  | 4                                                          | LS 7                       |
| 1-XY41-3/350   | 1-XY43-3/350   | 1-XY4x-3/350    | 350                             | 3                                     | 4.1 | 5.6  | 11                        | 8    | 9.5                                                        | LS 7                       |
| 1-XY41-6/350   |                | 1-XY4x-6/350    | 350                             | 6                                     | 6   | 10   | 16                        | 12.2 | 16                                                         | LS 4                       |
| 1-XY41-3/700   |                | 1-XY4x-3/700#   | 700                             | 3                                     | 4.1 | 5.6  | 11                        | 8    | 13.5                                                       | LS 7                       |
|                |                | 1-XY4x-6/700    | 700                             | 6                                     | 6   | 10   | 16                        | 12.2 | 23                                                         | LS 4                       |
|                |                |                 |                                 |                                       |     |      |                           |      |                                                            |                            |
|                |                |                 |                                 |                                       |     |      |                           |      |                                                            |                            |

## XY41

Shear/torsion half bridge  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## XY43

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## XY4x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



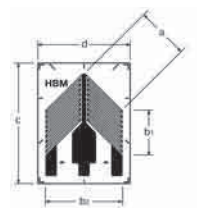
0.6



1.5



3



6

Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series with 3 measuring grids / rosettes

| Stock types   |              | Variants      | No-nominal resistance<br>$\Omega$ | Dimensions (mm)<br>[1 inch = 25.4 mm] |    |     |                        |      | Max. perm. effective bridge excitation voltage<br>V | Solder terminals |
|---------------|--------------|---------------|-----------------------------------|---------------------------------------|----|-----|------------------------|------|-----------------------------------------------------|------------------|
| Steel         | Aluminum     | Others        |                                   | Measuring grid                        |    |     | Measuring grid carrier |      |                                                     |                  |
|               |              |               |                                   | a1                                    | a2 | b   | c                      | d    |                                                     |                  |
| 1-RY11-3/120  | 1-RY13-3/120 | 1-RY1x-3/120# | 120                               | 0.8                                   | 3  | 0.8 | 7                      | 7    | 1.5                                                 | LS 7             |
| 1-RY11-6/120  | 1-RY13-6/120 | 1-RY1x-6/120  | 120                               | 2                                     | 6  | 1.3 | 11                     | 11   | 3                                                   | LS 5             |
| 1-RY11-10/120 |              | 1-RY1x-10/120 | 120                               | 2.9                                   | 10 | 2.6 | 15.4                   | 15.4 | 5                                                   | LS 4             |
|               |              |               |                                   |                                       |    |     |                        |      |                                                     |                  |
|               |              |               |                                   |                                       |    |     |                        |      |                                                     |                  |

## RY11

0°/45°/90° rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

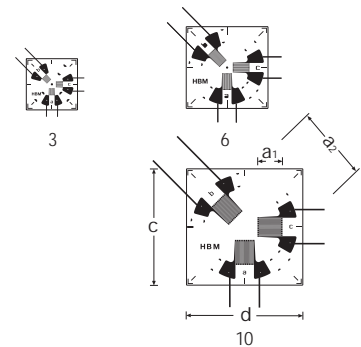
## RY13

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## RY1x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Dimension a2 in mm)



Contents per package: 5 pcs.

| Stock types   |              | Variants      | No-nominal resistance<br>$\Omega$ | Dimensions (mm)<br>[1 inch = 25.4 mm] |    |     |                        |     | Max. perm. effective bridge excitation voltage<br>V | Solder terminals<br>(1) |
|---------------|--------------|---------------|-----------------------------------|---------------------------------------|----|-----|------------------------|-----|-----------------------------------------------------|-------------------------|
| Steel         | Aluminum     | Others        |                                   | Measuring grid                        |    |     | Measuring grid carrier |     |                                                     |                         |
|               |              |               |                                   | a1                                    | a2 | b   | d                      |     |                                                     |                         |
| 1-RY31-3/120  |              | 1-RY3x-3/120# | 120                               | 0.8                                   | 3  | 0.8 | 7                      | 1.5 | LS 7                                                |                         |
| 1-RY31-6/120  | 1-RY33-6/120 | 1-RY3x-6/120  | 120                               | 2                                     | 6  | 1.3 | 11                     | 3   | LS 5                                                |                         |
| 1-RY31-10/120 |              | 1-RY3x-10/120 | 120                               | 2.9                                   | 10 | 2.6 | 15.4                   | 5   | LS 4                                                |                         |
|               |              |               |                                   |                                       |    |     |                        |     |                                                     |                         |
|               |              |               |                                   |                                       |    |     |                        |     |                                                     |                         |

## RY31

0°/45°/90° rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

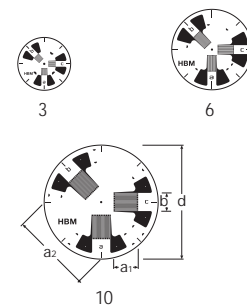
## RY33

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## RY3x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Dimension a2 in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series with 3 measuring grids / rosettes

| Stock types |          | Variants      | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |    |     |                           |      | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|-------------|----------|---------------|---------------------------------|---------------------------------------|----|-----|---------------------------|------|------------------------------------------------------------|---------------------|
| Steel       | Aluminum |               |                                 | Measuring<br>grid                     |    |     | Measuring grid<br>carrier |      |                                                            |                     |
|             |          | Others        | $\Omega$                        | a1                                    | a2 | b   | c                         | d    | V                                                          |                     |
|             |          | 1-RY4x-3/120# | 120                             | 0.8                                   | 3  | 0.8 | 7                         | 7    | 1.5                                                        | LS 7                |
|             |          | 1-RY41-6/120  | 120                             | 2                                     | 6  | 1.3 | 11                        | 11   | 3                                                          | LS 5                |
|             |          | 1-RY41-10/120 | 120                             | 2.9                                   | 10 | 2.6 | 15.4                      | 15.4 | 5                                                          | LS 4                |
|             |          |               |                                 |                                       |    |     |                           |      |                                                            |                     |
|             |          |               |                                 |                                       |    |     |                           |      |                                                            |                     |

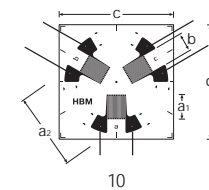
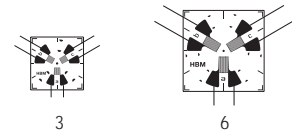
## RY41

0°/60°/120° rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## RY4x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Dimension a2 in mm)



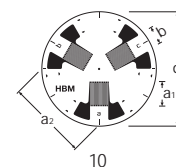
Contents per package: 5 pcs

| Stock types |          | Variants      | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |    |     |                           | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals<br>(1) |
|-------------|----------|---------------|---------------------------------|---------------------------------------|----|-----|---------------------------|------------------------------------------------------------|----------------------------|
| Steel       | Aluminum |               |                                 | Measuring<br>grid                     |    |     | Measuring grid<br>carrier |                                                            |                            |
|             |          | Others        | $\Omega$                        | a1                                    | a2 | b   | d                         | V                                                          |                            |
|             |          | 1-RY7x-3/120# | 120                             | 0.8                                   | 3  | 0.8 | 7                         | 1.5                                                        | LS 7                       |
|             |          | 1-RY7x-6/120  | 120                             | 2                                     | 6  | 1.3 | 11                        | 3                                                          | LS 5                       |
|             |          | 1-RY7x-10/120 | 120                             | 2.9                                   | 10 | 2.6 | 15.4                      | 5                                                          | LS 4                       |
|             |          |               |                                 |                                       |    |     |                           |                                                            |                            |
|             |          |               |                                 |                                       |    |     |                           |                                                            |                            |

## RY7x

0°/60°/120° rosette  
Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Dimension a2 in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series with 3 measuring grids / rosettes

| Stock types    |              | Variants        | No-nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |      | Max. perm. effective bridge excitation voltage | Solder terminals (1) |
|----------------|--------------|-----------------|-----------------------|---------------------------------------|-----|------------------------|------|------------------------------------------------|----------------------|
| Steel          | Aluminum     |                 |                       | Measuring grid                        |     | Measuring grid carrier |      |                                                |                      |
|                |              | Others          | $\Omega$              | a                                     | b   | c                      | d    | V                                              |                      |
|                |              | 1-RY8x-0.6/120# | 120                   | 0.6                                   | 1.2 | 4.8                    | 8.7  | 1.6                                            | LS 7                 |
| 1-RY81-1.5/120 |              | 1-RY8x-1.5/120  | 120                   | 1.5                                   | 1.2 | 8.2                    | 14.6 | 2.5                                            | LS 7                 |
| 1-RY81-3/120   | 1-RY83-3/120 | 1-RY8x-3/120    | 120                   | 3                                     | 0.9 | 9.7                    | 14.6 | 3                                              | LS 7                 |
| 1-RY81-6/120   |              | 1-RY8x-6/120    | 120                   | 6                                     | 2.6 | 13.2                   | 22.9 | 7.5                                            | LS 7                 |
|                |              | 1-RY8x-1.5/350# | 350                   | 1.5                                   | 1.6 | 8.2                    | 14.6 | 5                                              | LS 7                 |
|                |              | 1-RY8x-3/350    | 350                   | 3                                     | 0.9 | 9.7                    | 14.6 | 5.5                                            | LS 7                 |
| 1-RY81-6/350   |              | 1-RY8x-6/350    | 350                   | 6                                     | 2.6 | 13.1                   | 22.9 | 13                                             | LS 5                 |

## R Y81

0°/45°/90° rectangular rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

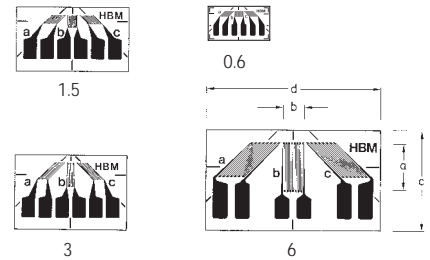
## R Y83

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## R Y8x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

| Stock types    |              | Variants       | No-nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |      |                        |    | Max. perm. effective bridge excitation voltage | Solder terminals |
|----------------|--------------|----------------|-----------------------|---------------------------------------|------|------------------------|----|------------------------------------------------|------------------|
| Steel          | Aluminum     |                |                       | Measuring grid                        |      | Measuring grid carrier |    |                                                |                  |
|                |              | Others         | $\Omega$              | a                                     | b    | c                      | d  | V                                              |                  |
| 1-RY91-1.5/120 |              | 1-RY9x-1.5/120 | 120                   | 1.5                                   | 1.25 | 9                      | 8  | 1.5                                            | LS 7             |
| 1-RY91-3/120   | 1-RY93-3/120 | 1-RY9x-3/120   | 120                   | 3                                     | 1.25 | 9                      | 9  | 2                                              | LS 7             |
| 1-RY91-6/120   | 1-RY93-6/120 | 1-RY9x-6/120   | 120                   | 6                                     | 2.5  | 12.5                   | 11 | 4.5                                            | LS 7             |
| 1-RY91-10/120  |              | 1-RY9x-10/120  | 120                   | 10                                    | 4    | 18.5                   | 16 | 7                                              | LS 7             |

## R Y91

0°/45°/90° rosette, stacked measuring grids  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

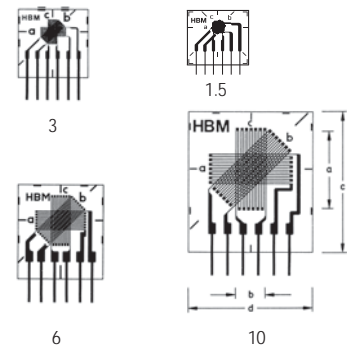
## R Y93

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## R Y9x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory  
Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series with 3 measuring grids / rosettes

| Stock types     |               | Variants        | Nominal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |      | Max. perm. effective bridge excitation voltage | Solder terminals (1) |
|-----------------|---------------|-----------------|--------------------|---------------------------------------|-----|------------------------|------|------------------------------------------------|----------------------|
| Steel           | Aluminum      |                 |                    | Measuring grid                        |     | Measuring grid carrier |      |                                                |                      |
|                 |               | Others          | $\Omega$           | a                                     | b   | c                      | d    | V                                              |                      |
| 1-RY101-1.5/120 |               | 1-RY10x-1.5/120 | 120                | 1.5                                   | 1.2 | 8.2                    | 13.5 | 2.5                                            | LS 7                 |
| 1-RY101-3/120   | 1-RY103-3/120 | 1-RY10x-3/120   | 120                | 3                                     | 0.9 | 9.7                    | 13.5 | 3                                              | LS 7                 |
|                 |               | 1-RY10x-6/120   | 120                | 6                                     | 2.8 | 16.4                   | 22.9 | 7.5                                            | LS 4                 |
| 1-RY101-3/350   | 1-RY103-3/350 | 1-RY10x-3/350   | 350                | 3                                     | 1   | 9.7                    | 13.5 | 5.5                                            | LS 7                 |
|                 |               | 1-RY10x-6/350   | 350                | 6                                     | 2.4 | 16.4                   | 22.9 | 12                                             | LS4                  |
|                 |               |                 |                    |                                       |     |                        |      |                                                |                      |
|                 |               |                 |                    |                                       |     |                        |      |                                                |                      |

## RY101

0°/45°/90° rectangular rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## RY103

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

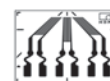
## RY10x

Temperature response matching at customer's choice,  
see page 20

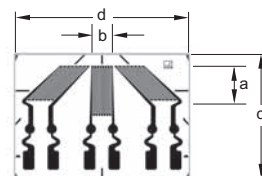
Illustrations show actual size  
(Grid length in mm)



1.5



3



6

Contents per package: 5 pcs.

(1) Solder terminals are not compulsory

# SG / Y series with 4 measuring grids / full bridges

| Stock types  |          | Variants     | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |    |                        |      | Max. perm. effective bridge excitation voltage | Solder terminals |
|--------------|----------|--------------|---------------------|---------------------------------------|----|------------------------|------|------------------------------------------------|------------------|
| Steel        | Aluminum |              |                     | Measuring grid                        |    | Measuring grid carrier |      |                                                |                  |
|              |          | Others       | $\Omega$            | a                                     | b  | c                      | d    | V                                              |                  |
| 1-VY11-3/120 |          | 1-VY1x-3/120 | 120                 | 3                                     | 7  | 13.5                   | 13.5 | 6                                              | LS 5/7           |
| 1-VY11-6/120 |          | 1-VY1x-6/120 | 120                 | 6                                     | 14 | 23                     | 23   | 12                                             | LS 5/7           |
|              |          |              |                     |                                       |    |                        |      |                                                |                  |
|              |          |              |                     |                                       |    |                        |      |                                                |                  |

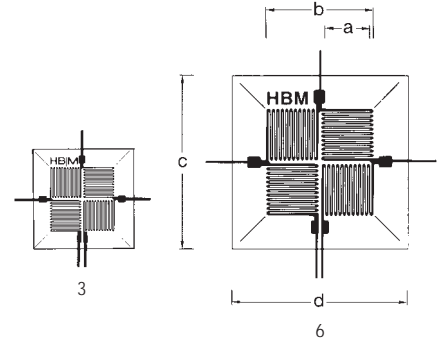
## VY11

0°/90° T full bridge  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## VY1x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs

| Stock types  |              | Variants      | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                        |    | Max. perm. effective bridge excitation voltage | Solder terminals (1) |
|--------------|--------------|---------------|---------------------|---------------------------------------|-----|------------------------|----|------------------------------------------------|----------------------|
| Steel        | Aluminum     |               |                     | Measuring grid                        |     | Measuring grid carrier |    |                                                |                      |
|              |              | Others        | $\Omega$            | a                                     | b   | c                      | d  | V                                              |                      |
| 1-VY41-3/120 |              | 1-VY41x-3/120 | 120                 | 3                                     | 1.3 | 9.8                    | 10 | 3.5                                            | LS7                  |
|              |              | 1-VY41x-6/120 | 120                 | 6                                     | 2.7 | 18                     | 17 | 7.5                                            | LS4                  |
| 1-VY41-3/350 | 1-VY43-3/350 | 1-VY41x-3/350 | 350                 | 3                                     | 1.2 | 9.8                    | 10 | 6                                              | LS7                  |
|              |              | 1-VY41x-6/350 | 350                 | 6                                     | 2.7 | 18                     | 17 | 13                                             | LS4                  |
|              |              |               |                     |                                       |     |                        |    |                                                |                      |

## VY41

Shear/torsion full bridge  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

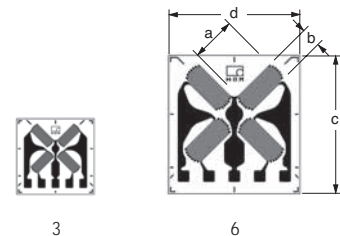
## VY43

Temperature response matched to aluminum  
with  $\alpha = 23 \cdot 10^{-6}/K$

## VY4x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Grid length in mm)



Contents per package: 5 pcs.

(1) Solder terminals are not compulsory

# SG / Y series full bridge / diaphragm rosettes

| Stock types   |          | Variants      | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |   |                           |   | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|---------------|----------|---------------|---------------------------------|---------------------------------------|---|---------------------------|---|------------------------------------------------------------|---------------------|
| Steel         | Aluminum |               |                                 | Measuring<br>grid                     |   | Measuring grid<br>carrier |   |                                                            |                     |
|               |          | Others        | $\Omega$                        | a                                     | b | c                         | d | V                                                          |                     |
|               |          | 1-MY2x-6/120  | 120                             | 6                                     | – | 7.3                       | – | 3.5                                                        | LS 7                |
| 1-MY21-15/350 |          | 1-MY2x-15/350 | 350                             | 15                                    | – | 17                        | – | 13                                                         | LS 5                |
|               |          |               |                                 |                                       |   |                           |   |                                                            |                     |

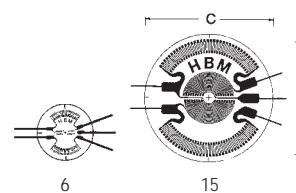
## MY21

Diaphragm rosette  
Temperature response matched to steel  
with  $\alpha = 10.8 \cdot 10^{-6}/K$

## MY2x

Temperature response matching at customer's choice,  
see page 20

Illustrations show actual size  
(Dimension a in mm)



Contents per package: 5 pcs.



# SG / Y series strain gage chains

| Stock types  |              | Variants      | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                |     |                        |   | Max. perm. effective bridge excitation voltage | Solder terminals |
|--------------|--------------|---------------|---------------------|---------------------------------------|----------------|-----|------------------------|---|------------------------------------------------|------------------|
| Steel        | Aluminum     |               |                     | Others                                | Measuring grid |     | Measuring grid carrier |   |                                                |                  |
|              |              |               | $\Omega$            | a                                     | b              | c   | d                      | t | V                                              |                  |
| 1-KY11-1/120 | 1-KY13-1/120 | 1-KY1x-1/120# | 120                 | 0.6                                   | 1              | 7.2 | 14.5                   | 1 | 2                                              | LS 7             |
| 1-KY11-2/120 | 1-KY13-2/120 | 1-KY1x-2/120  | 120                 | 1.5                                   | 1.3            | 6.7 | 24.5                   | 2 | 2.5                                            | LS 7             |
| 1-KY11-4/120 |              | 1-KY1x-4/120  | 120                 | 3                                     | 2.1            | 9.7 | 44.5                   | 4 | 5                                              | LS 7             |
|              |              |               |                     |                                       |                |     |                        |   |                                                |                  |
|              |              |               |                     |                                       |                |     |                        |   |                                                |                  |

## KY11

Strain gage chain  
Comprising 10 measuring grids in parallel to the chain axis and 1 compensating strain gage.  
Temperature response matched to steel with  $\alpha = 10.8 \cdot 10^{-6}/K$

## KY13

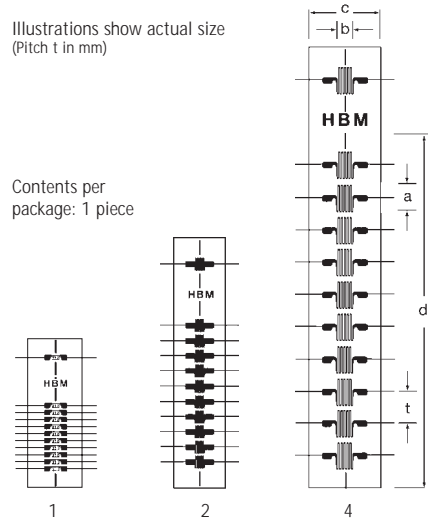
Temperature response matched to aluminum with  $\alpha = 23 \cdot 10^{-6}/K$

## KY1x

Temperature response matching at customer's choice, see page 20

Illustrations show actual size (Pitch t in mm)

Contents per package: 1 piece



| Stock types  |              | Variants      | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                |     |                        |   | Max. perm. effective bridge excitation voltage | Solder terminals |
|--------------|--------------|---------------|---------------------|---------------------------------------|----------------|-----|------------------------|---|------------------------------------------------|------------------|
| Steel        | Aluminum     |               |                     | Others                                | Measuring grid |     | Measuring grid carrier |   |                                                |                  |
|              |              |               | $\Omega$            | a                                     | b              | c   | d                      | t | V                                              |                  |
| 1-KY21-1/120 | 1-KY23-1/120 | 1-KY2x-1/120# | 120                 | 0.8                                   | 0.8            | 6.9 | 15                     | 1 | 1.5                                            | LS 7             |
| 1-KY21-2/120 |              | 1-KY2x-2/120  | 120                 | 1.7                                   | 1.7            | 9.5 | 27                     | 2 | 3.5                                            | LS 7             |
|              |              |               |                     |                                       |                |     |                        |   |                                                |                  |
|              |              |               |                     |                                       |                |     |                        |   |                                                |                  |

## KY21

Strain gage chain  
Comprising 10 measuring grids vertical to the chain axis and 1 compensating strain gage.  
Temperature response matched to steel with  $\alpha = 10.8 \cdot 10^{-6}/K$

## KY23

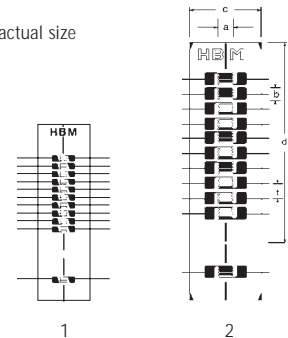
Temperature response matched to aluminum with  $\alpha = 23 \cdot 10^{-6}/K$

## KY2x

Temperature response matching at customer's choice, see page 20

Illustrations show actual size (Pitch t in mm)

Contents per package: 1 piece



Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series strain gage chains

| Stock types  |          | Variants     | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                   |      |                           |   | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|--------------|----------|--------------|---------------------------------|---------------------------------------|-------------------|------|---------------------------|---|------------------------------------------------------------|---------------------|
| Steel        | Aluminum |              |                                 | Ω                                     | Measuring<br>grid |      | Measuring<br>grid carrier |   |                                                            |                     |
|              |          | Others       |                                 |                                       | a                 | b    | c                         | d | t                                                          | V                   |
|              |          | 1-KY4x-2/120 | 120                             | 1.2                                   | 1.3               | 9.2  | 24.5                      | 2 | 2.5                                                        | LS 7                |
| 1-KY41-4/120 |          | 1-KY4x-4/120 | 120                             | 3                                     | 3                 | 11.5 | 44.5                      | 4 | 6                                                          | LS 5                |
|              |          |              |                                 |                                       |                   |      |                           |   |                                                            |                     |

## KY41

### Strain gage chain

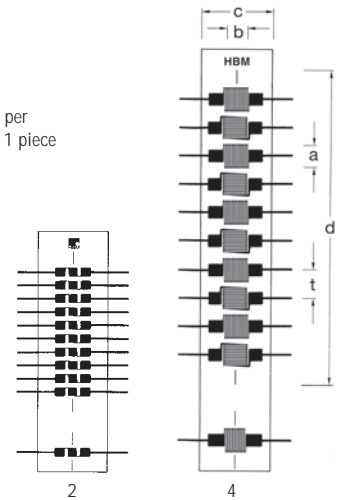
Comprising 10 measuring grids (5 in parallel, 5 vertical to the chain axis, alternatingly) and 1 compensating strain gage. Temperature response matched to steel with  $\alpha = 10.8 \cdot 10^{-6}/K$ .

## KY4x

Temperature response matching at customer's choice, see page 20

Illustrations show actual size  
(Pitch t in mm)

Contents per  
package: 1 piece



| Stock types |          | Variants     | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |                   |     |                           |   | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|-------------|----------|--------------|---------------------------------|---------------------------------------|-------------------|-----|---------------------------|---|------------------------------------------------------------|---------------------|
| Steel       | Aluminum |              |                                 | Ω                                     | Measuring<br>grid |     | Measuring<br>grid carrier |   |                                                            |                     |
|             |          | Others       |                                 |                                       | a                 | b   | c                         | d | t                                                          | V                   |
|             |          | 1-KY3x-4/120 | 120                             | 1.3                                   | 4.1               | 8.3 | 25                        | 4 | 2.5                                                        | LS 7                |
|             |          |              |                                 |                                       |                   |     |                           |   |                                                            |                     |

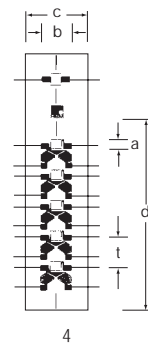
## KY3x

### Strain gage rosette chain

comprising 5 rosettes each with 3 0°/60°/120° measuring grids and 1 compensating strain gage

Temperature response matching at customer's choice, see page 20

Illustrations show actual size  
(Pitch t in mm)



Contents per package: 1 piece

# SG / Y series strain gage chains

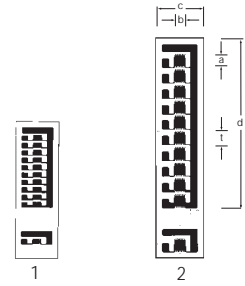
| Stock types |          | Variants      | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |          |                |      |                        | Max. perm. effective bridge excitation voltage | Solder terminals |
|-------------|----------|---------------|---------------------|---------------------------------------|----------|----------------|------|------------------------|------------------------------------------------|------------------|
| Steel       | Aluminum |               |                     | Others                                | $\Omega$ | Measuring grid |      | Measuring grid carrier |                                                |                  |
|             |          |               |                     |                                       |          | a              | b    | c                      | d                                              | t                |
|             |          | 1-KY5x-1/120# | 120                 | 0.6                                   | 1.1      | 5.6            | 12.8 | 1                      | 1.5                                            | -                |
|             |          | 1-KY5x-2/120  | 120                 | 1.5                                   | 1.3      | 6              | 22.8 | 2                      | 2.5                                            | -                |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |

## KY5x

Strain gage chain comprising 10 measuring grids with common connection in parallel to the measuring chain axis and 1 compensating strain gage

Temperature response matching at customer's choice, see page 20

Illustrations show actual size (Pitch t in mm)



Contents per package: 5 pcs

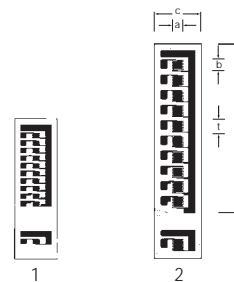
| Stock types |          | Variants      | No-minal resistance | Dimensions (mm)<br>[1 inch = 25.4 mm] |          |                |      |                        | Max. perm. effective excitation bridge voltage | Solder terminals |
|-------------|----------|---------------|---------------------|---------------------------------------|----------|----------------|------|------------------------|------------------------------------------------|------------------|
| Steel       | Aluminum |               |                     | Others                                | $\Omega$ | Measuring grid |      | Measuring grid carrier |                                                |                  |
|             |          |               |                     |                                       |          | a              | b    | c                      | d                                              | t                |
|             |          | 1-KY6x-1/120# | 120                 | 0.8                                   | 0.6      | 5.6            | 12.8 | 1                      | 1.2                                            | -                |
|             |          | 1-KY6x-2/120  | 120                 | 1.3                                   | 1.5      | 6              | 22.8 | 2                      | 2.5                                            | -                |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |
|             |          |               |                     |                                       |          |                |      |                        |                                                |                  |

## KY6x

Strain gage chain comprising 10 measuring grids with common connection vertical to the measuring chain axis and 1 compensating strain gage

Temperature response matching at customer's choice, see page 20

Illustrations show actual size (Pitch t in mm)



Contents per package: 5 pcs

Types marked # are only available with matching to aluminum, ferritic or austenitic steel

# SG / Y series strain gage chains

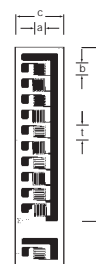
| Stock types |          | Variants     | No-<br>minal<br>resis-<br>tance | Dimensions (mm)<br>[1 inch = 25.4 mm] |     |                              |      |       | Max. perm.<br>effective<br>bridge<br>excitation<br>voltage | Solder<br>terminals |
|-------------|----------|--------------|---------------------------------|---------------------------------------|-----|------------------------------|------|-------|------------------------------------------------------------|---------------------|
| Steel       | Aluminum |              |                                 | Measuring<br>grid                     |     | Measuring<br>grid<br>carrier |      | Pitch |                                                            |                     |
|             |          | Others       | $\Omega$                        | a                                     | b   | c                            | d    | t     | V                                                          |                     |
|             |          | 1-KY7x-2/120 | 120                             | 1.3                                   | 1.5 | 6                            | 22.8 | 2     | 2.5                                                        | -                   |
|             |          |              |                                 |                                       |     |                              |      |       |                                                            |                     |
|             |          |              |                                 |                                       |     |                              |      |       |                                                            |                     |
|             |          |              |                                 |                                       |     |                              |      |       |                                                            |                     |
|             |          |              |                                 |                                       |     |                              |      |       |                                                            |                     |

## KY7x

Strain gage chain comprising 10 measuring grids with common connection (5 in parallel, 5 vertical to the measuring chain axis, alternatingly) and 1 compensating strain gage

Temperature response matching at customer's choice, see page 20

Illustrations show actual size (Pitch t in mm)



Contents per package: 5 pcs