Responding to the Needs of Production Floor
Optical Absolute Method
Contact-Type Digital Displacement Sensor

Class-Top Accuracy
Resolution of 0.1 µm and accuracy of 1 µm or less
Optical absolute method for elimination of “value skipping” and “unset zero point”

Slim & Robust
Slim body measuring 11 × 18 × 84.5 mm
Industry's top-level robustness

Dual Display Controller
2-line digital display for unprecedented ease of use
Full-fledged functions designed for optimum ease of operation on production floor
Slim-Design, Robust Contact-Type Digital Displacement Sensor

The slim unit body contains plain bearings featuring a 2-point support structure disperses load and achieves superb durability. The sensor head offers long life and reduces maintenance costs dramatically.

Hot-swappable
The sensor head is hot-swappable. This allows setup change without power cut-off for immediate start of measurement.

10-mm stroke
High-precision sensor head
Resolution 0.1 μm
Indication accuracy
Full range: 1 μm or less
Narrow range: 0.5 μm or less

Bending-resistant cable
Plain bearings with 2-point support structure
Ball-less bearings are installed at the upper and lower sections of the unit. This ensures excellent strength against lateral loads.

Absolute method for reliable measurements
The high-resolution CMOS sensors read the glass scales that have different slit patterns at different read positions to measure the amount of movement. This provides accurate measurements without "value skipping" even in high-speed measuring operations. It also eliminates "unset zero point."

Resolution: 0.5 μm
Measurement range: 10 mm
- Standard type HG-S1010
- Low measuring force type HG-S1010R

Resolution: 0.1 μm
Measurement range: 10 mm
- Standard type HG-S1110
- Low measuring force type HG-S1110R

General purpose
- Resolution: 0.5 μm
- Measurement range: 10 mm
- Standard type HG-S1010
- Low measuring force type HG-S1010R

High precision
- Resolution: 0.1 μm
- Measurement range: 10 mm
- Standard type HG-S1110
- Low measuring force type HG-S1110R

Straight connector
Length: 3 m CN-HS-C3
Length: 7 m CN-HS-C7
Length: 20 m CN-HS-C20

L-shaped connector
Length: 3 m CN-HS-C3L
Length: 7 m CN-HS-C7L
Length: 20 m CN-HS-C20L
Versatile and Easy-to-Use Controller

The controller features the industry’s first* dual display and offers versatile functions and excellent ease of use.

Industry’s first*

Dual display featuring NAVI function for added indication flexibility

The 2-line digital display simultaneously shows head measurement (measured value) and judgment value (calculated value).

* As a sensor product using optical absolute method, as of September 2015 (according to our company's investigation)

All-direction LCD

The high-contrast LCD provides sharp and clear indications and wide viewing angle.

High-speed response of 3 ms in combination with any sensor head

Easy setting

Example of tolerance setting with reference to master workpiece

Press ENTER key in 1-point teaching mode.

Tolerance setting completed!

Master unit

Up to 15 slave units can be connected per master unit.

Slave units

- High performance type (analog current + input / output)
  NPN output type HG-SC101
  PNP output type HG-SC101-P

- High performance type (analog current + input / output)
  NPN output type HG-SC111
  PNP output type HG-SC111-P

- Standard type (input / output)
  NPN output type HG-SC112
  PNP output type HG-SC112-P

- Wire-saving type
  HG-SC113
## Sensor head

### General purpose

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard type</th>
<th>Low measuring force type</th>
<th>Standard type</th>
<th>Low measuring force type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>HG-S1010</td>
<td>HG-S1010R</td>
<td>HG-S1110</td>
<td>HG-S1110R</td>
</tr>
<tr>
<td>Compatible controller</td>
<td>HG-SC101(P)</td>
<td>HG-SC111(P)</td>
<td>HG-SC112(P)</td>
<td>HG-SC113</td>
</tr>
<tr>
<td>Position detection method</td>
<td>Optical absolute linear encoder method</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Measurement range     | 10 mm (Note 1) |
| Measure stroke        | 10.5 mm or more (Note 1) |

<table>
<thead>
<tr>
<th>Measuring force</th>
<th>Downward mount</th>
<th>Upward mount</th>
<th>Side mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force</td>
<td>1.65 N or less</td>
<td>1.35 N or less</td>
<td>1.5 N or less</td>
</tr>
<tr>
<td>(Note 4)</td>
<td>1.1 N (Note 4)</td>
<td>0.85 N (Note 4)</td>
<td>0.95 N (Note 4)</td>
</tr>
<tr>
<td>Force</td>
<td>0.35 N or less</td>
<td>0.12 N or less</td>
<td>0.25 N or less</td>
</tr>
<tr>
<td>(Note 4)</td>
<td>0.3 N (Note 4)</td>
<td>0.05 N (Note 4)</td>
<td>0.2 N (Note 4)</td>
</tr>
</tbody>
</table>

| Resolution            | Full range: 2.0 μm or less | Full range: 1.0 μm or less |
|                       | Narrow range: 1.0 μm or less (any 60 μm) | Narrow range: 0.5 μm or less (any 60 μm) |

**Notes:**
1) Range of 5 to 10 mm in the case of low measurement force type (HG-S1010R / HG-S1110R) in upward mount position.
2) Measured at ambient temperature of +20 °C.
3) In the case of low measurement force type (HG-S1010R / HG-S1110R), measurements were obtained with products in standard configuration without rubber bellows.
4) Typical value near center of measurement.
5) Excludes damage and deterioration to the rubber bellows due to external causes.

### Controller

<table>
<thead>
<tr>
<th>Item</th>
<th>Master unit</th>
<th>Slave unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>HG-SC101</td>
<td>HG-SC111</td>
</tr>
<tr>
<td></td>
<td>HG-SC112</td>
<td>HG-SC112-P</td>
</tr>
<tr>
<td></td>
<td>HG-SC113</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control output (Output 1, Output 2, Output 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;NPN output type&gt; NPN open-collector transistor</td>
</tr>
<tr>
<td>Maximum sink current: 50 mA (Note 4)</td>
</tr>
<tr>
<td>Applied voltage: 30 V DC or less (between output and 0 V)</td>
</tr>
<tr>
<td>Residual voltage: 1.5 V or less (at 50 mA sink current)</td>
</tr>
<tr>
<td>Leakage current: 0.1 mA or less</td>
</tr>
</tbody>
</table>

**Notes:**
1) Measured at a supply voltage of +24 V DC and an ambient temperature of +20 °C, unless otherwise indicated.
2) Power consumption does not include analog current output.
3) Linearity F.S. = 16 mA, and is linearity with respect to digitally measured values.
4) When slave units are connected to the master unit, the maximum sink current / source current of the control output and ambient temperature vary depending on the number of connected slave units.