

Linear Gauge Sensor

GS-1513

Resolution: 10 μ m

GS-1530

Resolution: 10 μ m

GS-1613

Resolution: 1 μ m

GS-1630

Resolution: 1 μ m

Instruction Manual

Overview and Features

The GS-1500 and GS-1600 Series Linear Gauge Sensors are detectors which use the linear scaling method for the displacement conversion mechanism and directly convert the displacement of a spindle to an electric signal.

When connected to the Ono Sokki digital gauge counter (DG-4000 Series), dimensions can be measured with high precision.

● Features

- Automation of measurement with attachment of an optional air lifter
- IP64's environment-proof performance is highly resistant to dust and water
- Durable body design achieves 5 million sliding counts (in our endurance testing)
- Applicable to all types of Ono Sokki gauge counters (except absolute counters)

Notes on Usage

- The GS-1500 and GS-1600 Series Linear Gauge Sensors are precision equipment. Do not drop or give excessive vibration or impact.
- Do not disassemble the GS-1500 or GS-1600 Series Linear Gauge Sensors as it will cause dust or dirt to enter inside the sensors resulting in a fault. IP64 is not guaranteed in such a case.
- Do not pull the GP-1500 or GP-1600 Series cables with a force of 20N (2 kgf) or more.
- Do not suddenly release the spindle of a GP-1500 or GP-1600 Series Linear Gauge Sensor which has been pushed inside. Do not make any measurements in such a manner. It will distort the sensor precision and damage the internal mechanism.

When a measurement method with spindle release is necessary, always observe the allowable range of 1 mm or less from the measured object.

- Do not give a transverse force to the spindle of the GS-1500 or GS-1600 Series Linear Gauge Sensor. Do not tighten the stem with excessive

force. Doing so will adversely affect the spindle operation and reduce the sensor lifetime.

- Do not fix the GS-1500 or GS-1600 Series Linear Gauge Sensor by directly applying screws to the stem portion.
- When replacing the probe of the GS-1500 or GS-1600 Series Linear Gauge Sensor, use great care to protect the spindle from excessive torsion force.
- Do not use the GS-1500 or GS-1600 Series Linear Gauge Sensor in a location with corrosive or flammable gases.
- When using an air lifter, secure the Sensor with only one mounting hole. In this case, the protection measures equivalent to IP64 are not applied to the air lifter.
- Protection measures equivalent to IP64 have been applied to the GS-1500 and GS-1600 Series Linear Gauge Sensor. However, be sure to protect the Sensor using a cover not to get water directly. Avoid using the Sensor in a location which is exposed to direct jet.

Measurement Method

Use the following procedure to make measurements with the GS-1500 or GS-1600 Series Linear Gauge Sensor:

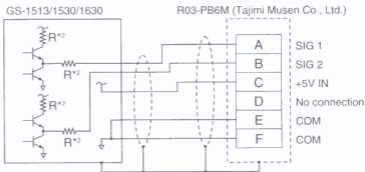
- (1) Connect the GS-1500 or GS-1600 Series Linear Gauge Sensor to the gauge counter.
- (2) Hold the probe portion by hand, carefully move the spindle, and measure the target (lower the spindle after approaching to within 1 mm from the measurement target).

- Notes
- The spindle stopper inside the sensor is made of rubber, therefore, it cannot be used as the reference point. Use the position where the spindle is pushed in 0.2 mm or more.
 - Never remove the dust-proof rubber cover which protects the spindle. If it should be damaged, immediately contact your sales representative or our sales office to order a new replacement.

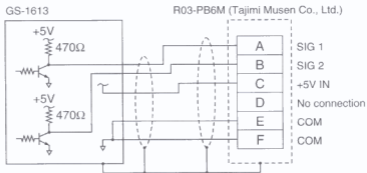
Output Connector Pin Arrangement and Output Circuit

The following diagrams show the connector pin arrangement and output circuit of the GS-1500 and GS-1600 Series Linear Sensors, and the phase relationship of the output signals SIG1 and SIG2 in the spindle operation.

A single pitch of the output signal corresponds to 40 μm for the GS-1500 Series and 4 μm for the GS-1600 Series, respectively.



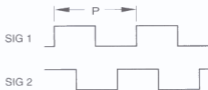
*2: GS-1500 Series: 68 Ω , GS-1630: 220 Ω



P = 40 μm or 4 μm



When the spindle is pushed in

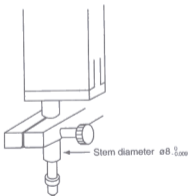


When the spindle is extracted

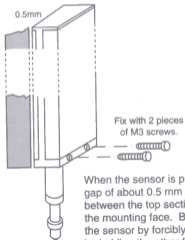
Mounting on the Retainer

Refer to the drawings below to mount the GS-1500 or GS-1600 Series Linear Sensor on the retainer so that the direction of motion of the spindle matches the length direction (displacement) of the object to be measured.

[Fix by holding the stem]



[Fix using the mounting holes]



Troubleshooting

If you suspect a failure, check the following items. If the sensor does not operate normally after the troubleshooting, contact your sales representative or our sales office.

Symptom	Cause	Countermeasure/Checked Item
Spindle operates awkwardly.	Stem is too tight.	Do not tighten the stem portion with excessive force.
	Dust-proof rubber cover has degraded due to oil or chemicals.	The rubber cover has no anti-oil or anti-chemical performance. After replacing the dust-proof rubber cover with a new replacement, take proper measures to prevent contact with oil or chemicals.
Measured values are unstable.	Sensor mounting is unstable.	Firmly fix the gauge sensor.
	Probe installation section is loose.	Firmly install the probe.
	Electrical noise is generated.	Isolate the sensor cable as far as possible from the power cable or equipment which generates electrical interference including switching surge.

Specifications

● Mechanical specifications

Item	GS-1513	GS-1530	GS-1613	GS-1630
Measurement range (mm)	13	30	13	30
Resolution (μm)	10	10	1	1
Precision (μm)	3	3	2	3
Response speed (m/s)	1	1	0.3	0.3
Measurement force (N)	1.5	2.0	1.5	2.0

● Electrical specifications

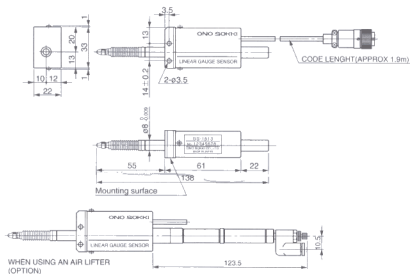
Item	GS-1513	GS-1530	GS-1613	GS-1630
Power supply	4.5 to 6.0 VDC			
Current consumption	50 mA or less (5 VDC)		100 mA or less (5 VDC)	
Signal output	2-phase square wave signal Phase difference: $90^\circ \pm 20^\circ$ Output voltage Hi: 4.0V or higher and not exceeding the power voltage Lo: 0.5V or lower			
Output impedance	Approx. 140 Ω		Approx. 470 Ω	Approx. 440 Ω

● General specifications

Operating temperature range	0 °C to +40°C	
Storage temperature range	-10 °C to +55 °C (annual average humidity 75% or less) * No condensation	
Cable length	Approx. 1.9 m	
Cable extension	Up to 30 m	
Mass	GS-1513/1613: Approx. 190 g / GS-1613/1630: Approx. 220 g	
Accessory	Operation Manual (this document): 1 copy	
Protection class	IP64	
Option (separately available)	<ul style="list-style-type: none"> • Air lifter: AA-6100 (13 mm) / AA-6101 (30 mm) • Finger lift: AA-969 • Gauge stand: ST-011/022/044B (AA-892 is required for ST-044B.) • Spare dust-proof rubber cover: AA-4100 (13 mm) / AA-4101 (30 mm) 	
* Refer to the catalog for details.		

Dimensional Outline Drawing

● GS-1513/1613 Dimensional Outline Drawing



● GS-1530/1630 Dimensional Outline Drawing

