

# BABY GAUGE SENSOR BS-102 & BS-112 INSTRUCTION MANUAL

Thank you very much for purchasing ONO SOKKI BS-102 & BS-112 BABY Gauge Sensor. To ensure proper operation, read this manual carefully before use. After reading, keep this manual in a convenient place so that you can consult it at any time.

## Precautions for Use

- Disassembling the sensor can cause misoperation. The cover should never be opened. If the cover is opened, metal cuttings, cutting oil or other dirt may enter the sensor.
- Keep the spindle free of oil and dirt. The movement of spindle will be impaired if it is oiled or comes into contact with oil from the hands. To remove such oil or dirt from the spindle, use a dry cloth or soft moistened with dry alcohol. Do not use such liquids as benzene, thinner or gasoline. Avoid leaving the sensor in high-temperature locations for long periods.
- Do not apply force to the spindle in any direction other than the thrust direction. Because of the extremely precise relationship between the spindle and the shaft, if lateral force is applied to the spindle or excessive force is applied in turning the stem, the movement of the spindle will be impaired. When replacing the measurement tip, care must be taken to avoid applying torsional force to the spindle.
- Lowering and raising of the spindle should be performed by the accessory release cable. When the release is not being used, always remember to cover the mounting hole.
- Do not remove the ring from the spindle. Because the ring which is mounted to the spindle is the stopper.

## Operation of the spindle

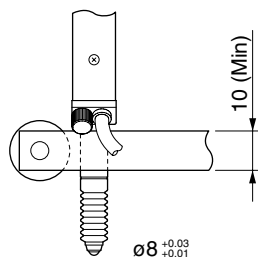
- Use the dedicated lifter. If the spindle is operated directly by hand, there arises a danger that dust or oil (grease) sticks on it to cause errors. To avoid this, it is recommended to use the release dedicated to BS-102&BS-112.
- Use the linear gauge sensor within the maximum response speed. The maximum response speed of BS-102&BS-112 with respect to the moving speed of the spindle is 1 m/s. Moving faster than this might result in malfunction. In addition, the proper method for making the spindle touch the object to be measured is to drop the spindle after making it come within 1 mm from the object.
- Reference point of spindle. If the spindle is not made touch the reference plane, no accurate fixed point can be obtained. For measurement, be sure to make the spindle touch the reference plane and make this pushed condition the reference point.

## How to Mount the Sensor

The following two methods may be mount the Baby Gauge Sensor.

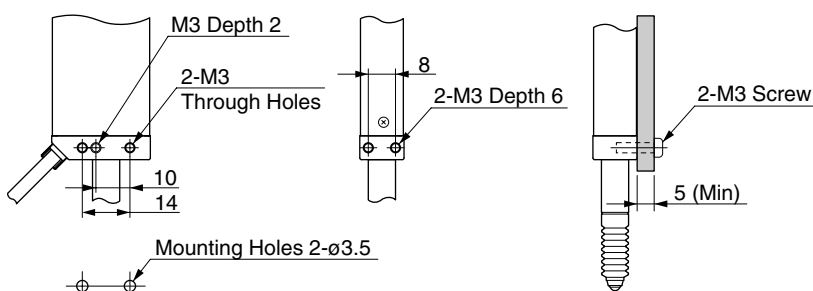
### (1) Fixing by the stem

The stem is finished to  $\phi 8^{+0.03}_{-0.01}$  mm in outer diameter. For this fixing method, prepare a mounting hole of  $\phi 8^{+0.03}_{+0.01}$  mm, and tighten carefully so that no excess force acts on the stem.



### (2) Mounting by Using the Mounting Holes

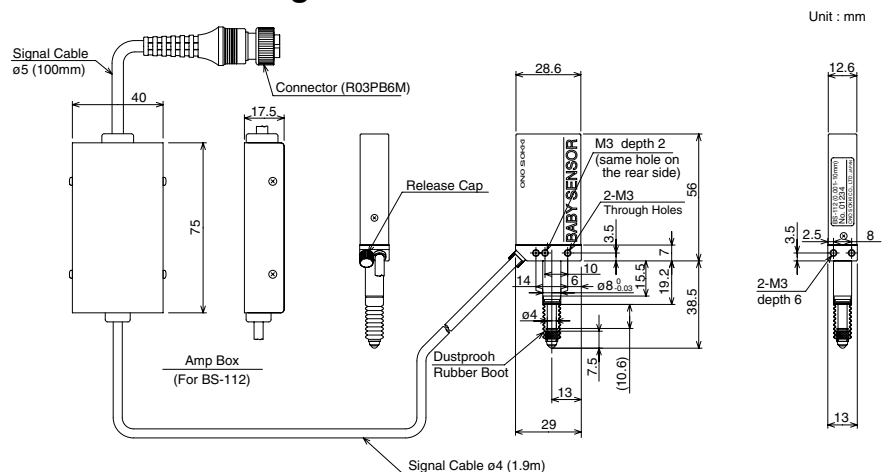
The Gauge may be held using either M3 panhead screws or socket-head bolts in the M3 mounting holes provided in the sensor.



Specifications	BS-102	BS-112
Measuring range	10 mm	10 mm
Measurement unit	10 $\mu$ m	1 $\mu$ m
Indication accuracy	3 $\mu$ m (at 20°C)	3 $\mu$ m (at 20°C)
Maximum response speed	1 (4) m/s *	0.2 (0.8) m/s *
Measurement force	1.47 N or less (If the dustproof rubber boot is removed, the force will be reduced to 0.98 N or less)	
Supply voltage	4.5 to 6 VDC	
Current consumption	Approx 30 mA at 5 VDC	Approx 70 mA at 5 VDC
Output signal	two-phase square wave signal Phase difference: $90^{\circ} \pm 20^{\circ}$ (at 5 VDC) Hi: 4.5 to 6.0 V (in no-load condition) Lo: max. 0.4 V or less BS-102:P=40 $\mu$ m BS-112:P=4 $\mu$ m 	
Terminal connector	R03-PB6M(from Tajimi Musen) 	
Operating temperature	+5°C to +40°C	
Storage temperature	-10°C to +55°C	
Cable length	1.9 m between sensor and counter	1.9 m between sensor and AMP BOX 100 mm between AMP BOX and counter
Mass	Approx. 150 g including cable	Approx. 200 g including AMP BOX and cable
Accessory	• Dustproof Rubber Boot • Instruction Manual	
Option	Finger lift	AA-969
	Release	AA-813, AA-816
	Dust-proof rubber boot	AA-973(with a measuring chip)
	Gauge stand	ST-011, ST-022
	Others	various probes AA-8402 connection joint forexchanging measuring chips (when AA-973 dust-proof boot is used)

\*It is available when our digital gauge counter is used. The value, which is written at ( ), is maximum response speed when it is combined with our model DG-4140/4160.

## Outside Drawing



## Omission of Test Qualification Issuance

Since this product has been tested through a series of strict inspections and a complete program of quality control, issuance of the test qualification has been omitted.

## Warranty

- This product is covered by a warranty for a period of one year from the date of purchase.
- This warranty covers free-of-charge repair for defects judged to be the responsibility of the manufacturer, i.e., defects occurred while the product is used under normal operating conditions according to descriptions in this manual and notices on the unit label.
- For free-of-charge repair, contact either your sales representative or our sales office nearby.
- The following failures will be handled on a fee basis even during the warranty period.
  - Failures occurring through misuse, mis-operation, or modification
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HOME PAGE: <http://www.onosokki.co.jp/English/english.htm>

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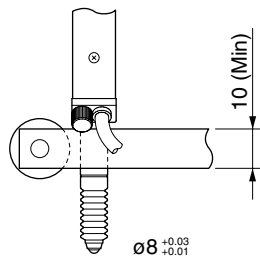
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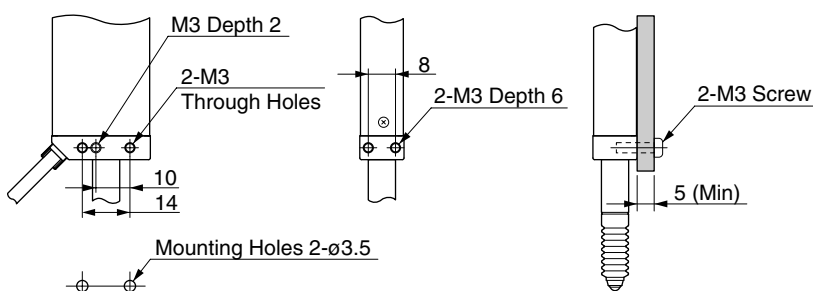
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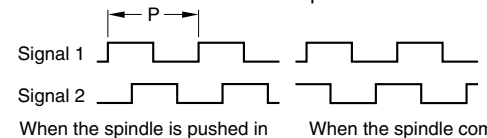
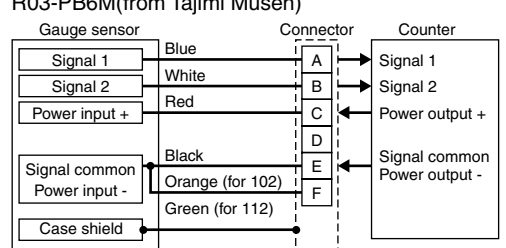
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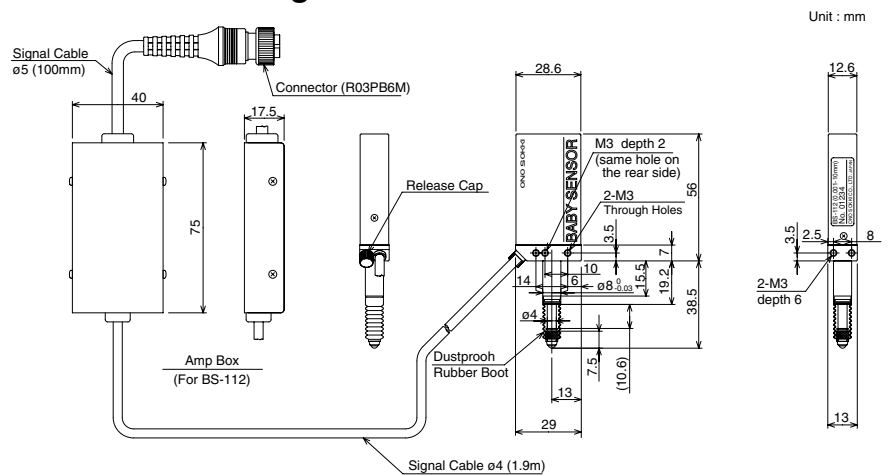
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# BSシリーズ ベビーゲージセンサ

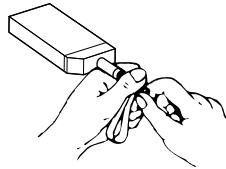
BS-102 / 112

## 取扱説明書

このたびは、小野測器のBS-102/112ベビーゲージセンサをご採用いただきまして、誠にありがとうございます。本器の性能を十分に生かして、ご使用いただくために、ご一読をお願いいたします。  
また、お読みになった後も、大切に保管してください。

### ご使用に際しての注意

- ベビーゲージセンサを分解することは、故障の原因となります。  
ベビーゲージセンサのカバーを開けますと、内部に切粉や切削油などのゴミ、ホコリが入り故障の原因となりますので、絶対に開けないでください。カバーを開けた場合には、保証期間内でも保証の対象とはなりませんので、ご注意ください。
- 精密機器ですので、落としたり急激な衝撃を加えたりしないように取扱いには十分ご注意ください。
- スピンドルは、油やゴミを嫌います。スピンドルに注油したり、手の脂などが付着しますと、スピンドルの動きが悪くなりますので、スピンドルに注油したり、素手で触ることは避けてください。  
また、スピンドルに付着した油（脂）やゴミをふき取る場合には、乾いた柔らかい布または、無水アルコールを湿らせた柔らかい布でふき取ってください（ベンジン、シンナー、ガソリンなどは使用しなしてください）。
- スピンドルには横方向の力を加えないでください。  
スピンドルと軸受の関係は、非常に精密に加工されていますので、スピンドルに横方向の力を加えたり、ステムを必要以上の力で締め付けるとスピンドルの動きが悪くなります。
- スピンドルに取り付けてあるリングは、ストッパーになっていますので、絶対に外さないでください。
- 測定子の交換  
測定子を交換する場合には、スピンドルにねじれ力が加わらないように十分にご注意ください。もし、測定子が緩まない場合には、図のようにスピンドルにゴムバンドを巻き、手でしっかりとおさえて、測定子を回してください。また、測定子を取り付ける場合も同様に行ってください。



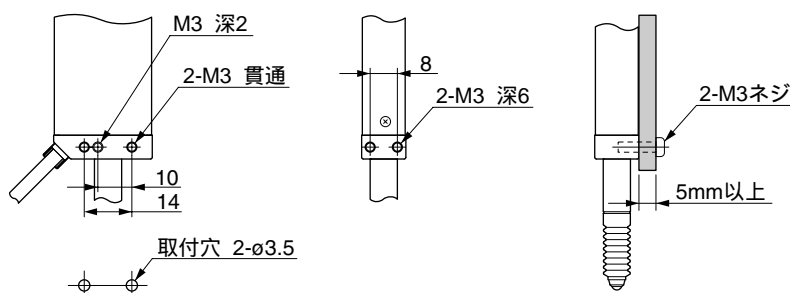
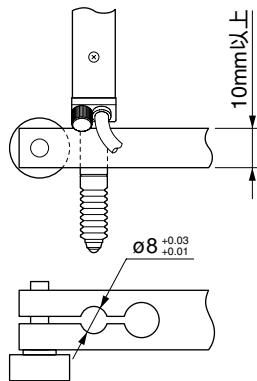
### スピンドルの操作について

- スピンドルの追従速度は、BS-102は1m/s、BS-112は0.2m/sとなっています。この速度以上で動かしますと、誤作動をすることがあります。  
また、被測定体へスピンドルを当てるときは、1mm以内に近づけてからスピンドルを落下させるのが、望ましい使い方です。
- オプションのリリースを使用する場合、本体のリリース取付穴用ふたをはずし、ねじ込んで取り付けてください。リリースを押すとスピンドルが押し上げられます。急激に押し上げたり、勢いよく離したりしないでください。  
(ゲージスタンドST-011/022に取り付けてリリースを使用する場合は、右側にリリースが出るようになります。)
- スピンドルを基準面に当てない状態では、正確な定点とはなりません。必ず、スピンドルを基準面に当て、押し込んだ状態を基準点としてください。

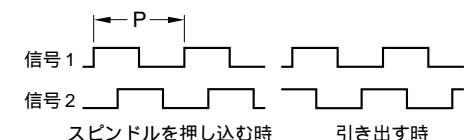
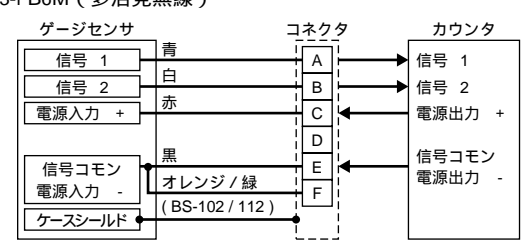
### センサの取付方法

本器を取り付けるには、次の二つの方法があります。スピンドルの移動方向と被測定物の長さの方向が一致するように固定してください。

- ステムをつかんで固定する方法  
ステムの直径は $\phi 8_{-0.03}^0$  mmに仕上げられていますので、 $\phi 8_{+0.01}^{+0.03}$  mmの取付穴を加工してステムに必要な力がかからないように締め付けてください。
- 取付穴で固定する方法  
M3のナベビスまたは六角穴付ボルトを使用して取り付けます。  
(センサの3面にM3のネジが切っていますので、取り付けやすい方向をお選びください。)

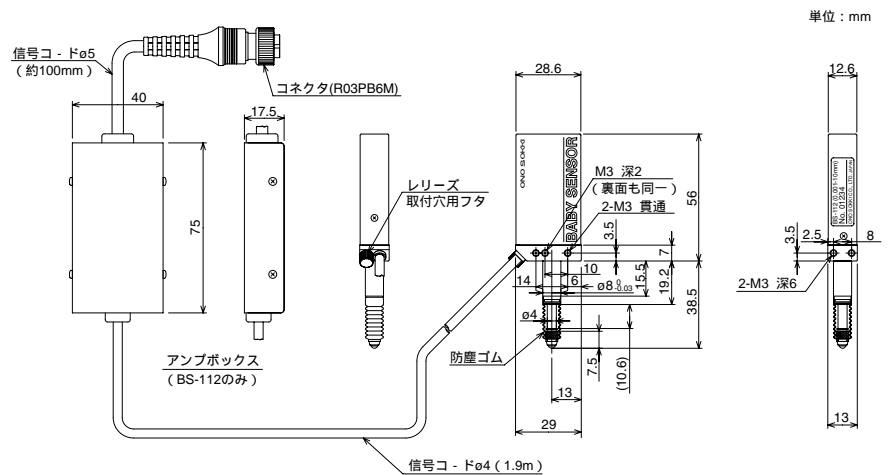


### 仕様

型名	BS-102	BS-112
測定範囲	10 mm	10 mm
測定単位	10 $\mu$ m	1 $\mu$ m
指示精度	3 $\mu$ m (20 )	3 $\mu$ m (20 )
最大応答速度	1 (4) m/s *	0.2(0.8) m/s *
測定力	1.47 N 以下 (防塵ゴムをはずした場合 0.98 N 以下) * オプションにて測定力改造可能範囲 (0.39 N ~ 0.98 N)	
供給電源電圧	DC 4.5 V ~ 6.0 V	
消費電流	約 30 mA (DC5 V において)	約 70 mA (DC5 V において)
出力信号	2相方形波信号 位相差 90° ± 20° (DC5 V において) Hi : 4.5 V ~ 6.0 V (無負荷時) Lo : 0.4 V 以下 BS-102 : P=40 $\mu$ m / BS-112 : P=4 $\mu$ m 	
端末コネクタ	R03-PB6M (多治見無線)  センサ内では、ケースと信号コモン間は接続されていません。	
使用温度範囲	+ 5 ~ + 40	
保存温度範囲	- 10 ~ + 55	
コード長	センサ~カウンタ間 1.9 m	センサ~アンプ間 1.9 m アンプ~カウンタ間 100 mm
	* オプション延長ケーブルにて 30 m まで延長可能	
質量	約 150 g (ケーブル含む)	約 200g (ケーブル、アンプボックス含む)
付属品	防塵ゴム・取扱説明書	
オプション	リリース (AA-813 / 816) フィンガーリフト (AA-969) ゲージスタンド (ST-011 / 022) 取替用防塵ゴム (測定子付) AA-973 測定子各種 (防塵ゴムとの併用不可) 測定子交換用継手 AA-8402 (防塵ゴムとの併用のとき)	

\* 当社ゲージカウンタ使用時。  
( ) 内は DG-4140/4160 で使用した時の最大応答速度です。

### 外形寸法図



**検査合格証の省略について**  
本製品は、工場出荷に際して弊社の厳重な出荷検査を受け、正常に動作することが確認されておりますが、検査合格証の発行は省略しております。あらかじめご了承ください。

**輸出または国外へ持ち出す際のご注意**  
本製品 (役務を含む) を輸出または国外へ持ち出す際は、外国為替および外国貿易管理法の規定により、法令該当品の場合、日本政府 (通商産業省) への輸出許可申請の手続きが必要となります。また、非該当品であっても、通関上非該当判定書を要する場合があります。輸出または国外へ持ち出す際は、弊社までご相談ください。

**保証規定**  
1. お買い上げ日から一年間は保証期間です。故障の場合には無償にて修理いたします。  
2. 保証期間内であっても、次のような場合には有償修理になります。  
・使用上の誤りおよび不当な修理や改造等による故障や損傷  
・お買い求めいただいた後の取り付け場所移動時などの故障や損傷  
・火災、地震、水害、落雷、その他天災地変、公害や異常電圧等による故障や損傷  
・消耗品、予備品、付属品等の補充  
3. 本保証規定は日本国内においてのみ有効です。  
This warranty is valid only in Japan.  
\* 保証期間後の修理などについてご不明な場合は、お買い求めの販売店または弊社までお問い合わせください。

**ONO SOKKI**  
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