Through manufacturing watches that require absolute precision, CITIZEN has continued to refine its technologies to "grind," "measure" and "assemble."

These three technologies are the basics of craftsmanship.

It is no exaggeration to say that CITIZEN is the only manufacturer of measuring instruments that possesses all three of these technologies.

Our technical abilities, which have been proving their worth in measurements of watch components requiring high precision in micron units, have become the proof of reliability, and they now contribute to measurements in various fields including bearings, auto components and electronic components.

Grind, Measure and Assemble

Our mastery of the basics of craftsmanship is the proof of reliability

Options & Accessories

Displacement Sensor

Digital Gauge
SA series
1 3

Electric Micrometer
ELEMETRON
2 5

Signal Indicator & Micro Indicator
TRI-METRON
Mu-METRON
3 3

Measuring Stand
Horizontal stand
3 7

Options & Accessories
Connection device, etc.
4 1
This lineup of horizontal stands facilitates measurement of product outer and inner diameters. Measure with minimal error by attaching the SA series or Mu-METRON. Measure unusually shaped workpieces or grooves by using special contact points.

Simple structure, no amplifier needed
The most cost-efficient option for simple pass/fail measurement.

High-precision micro indicators
Achieves high precision by adopting the mechanical structure of a watch.

Two types:
Mu-METRON high-precision micro indicators, and TRI-METRON incorporating electric contacts in Mu-METRON

Can measure in units of 0.1 µm
The best choice for high-precision measurement.

Low-measuring-force type available
Can measure soft and fragile objects.

Long-selling products that use differential transformers

Robust
The W-bearing structure enables the product to withstand 200 million sliding operations under a durability test in which load is applied in the vertical, horizontal, and oblique directions.

Accurate
Adoption of the absolute method significantly reduces counting errors compared to conventional digital gauges.

Wide product lineup

Air purge specification
Usable under environments in which the product is exposed to cutting fluid.

Pneumatic drive specification
Facilitates simplification of system design.

Abundant lineup of long-stroke products
Models with 10-mm, 32-mm, 50-mm sensor heads are available.

Controllers adapted to applications

One-channel type for desktop placement
Connectable type to accommodate up to 16 units
Multi-channel type focused on data output.

Measuring Stands
This lineup of horizontal stands facilitates measurement of product outer and inner diameters.

Measure with minimal error by attaching the SA series or Mu-METRON.

Measure unusually shaped workpieces or grooves by using special contact points.
With our precision measuring instruments, all kinds of automobile components can be measured. Our instruments greatly contribute to the modern automotive industry.

**Application Examples:**

- **Automotive Parts**
  - **Steering:** Angle & inner diameter measurement
  - **Brake discs:** Flatness measurement
  - **Crankshafts:** Shape, eccentricity & crank journal runout measurement
  - **Valves:** Outer diameter & height measurement
  - **Engine piston rings:** Front-back judgment & inner diameter measurement
  - **Doors:** Positioning & height measurement
  - **Cylinder head covers (Aluminum diecast products):** Height & flatness measurement
  - **Motors:** Eccentricity measurement
  - **Transmissions:** Positioning & height measurement

- **Key Measurements:**
  - Attachments positions are determined by simultaneous multi-point measurement using multiple contact points.
  - Eccentricity of motor shafts used for windshield wipers or doors is measured while rotating the shafts at high speed.
  - Pass/fail judgments are made in each component assembly process based on height measurement.
  - Shaft inner and outer diameters are measured by two contact points.
  - Disc surface flatness is measured by one contact point while rotating the disc.
  - All measurements required for shafts can be performed.
  - Measurement is instantaneously performed by simultaneous multi-point measurements using multiple contact points.
  - Run the sensor over stacked piston rings to judge the front or back.
  - Height and flatness are measured by simultaneous multi-point measurement using multiple contact points.
Bearings are used in many industrial products. We have handled bearing measurement since our establishment, and we are the leaders in terms of experience and performance in Japan.

The technologies we cultivated through measurement for watches, which are precision instruments, are used to measure the components of mobile phones, which are essential consumer products.

**Positioning & thickness/height/flatness measurement**

- Pass/fail judgments for the lens based on thickness, height, and flatness measurement. Accurate positioning during assembly and pass/fail judgment based on height measurement.

**Height measurement**

- Judgments are made based on height measurement in the final line after processing.

**Mobile Phone**

- **Camera lens cases**
  - Instantaneous judgment by multi-point measurement using multiple contact points.

- **Completed products**
  - Ball bearing rings
    - Pass/fail judgments are made by comparison to the master gauge with one contact point.

  - Measurement is made with two contact points. Outer and inner diameters are measured in separate processes.

  - Balls
    - Pass/fail judgments are made by comparison to the master gauge with one contact point.

**Bearings**

- **Bearings**
  - Thickness & flatness measurement
    - Pass/fail judgments are made by comparison to the master gauge with one contact point.

  - Instantaneous judgment by multi-point measurement using multiple contact points.

  - Instantaneous judgment by multi-point measurement using multiple contact points.
Displacement Sensors

The SA series of digital gauges adopt the absolute method and W-bearing structure to achieve superior precision and durability. The high-precision contact displacement sensor optically detects the spindle’s absolute position and outputs data with a high resolution. The air purge specification type prevents the invasion of foreign objects from the outside by raising the inner pressure. This enables precise measurement in environments with liquids such as permeable oil, coolant liquids, and cutting fluids.

Digital Gauge

SA Series

- The advanced absolute method eliminates counting errors
  SA series displacement sensors adopt the optical absolute encoder method. With this method, the absolute position is read instantaneously when the power is turned on, thereby eliminating the need for master adjustment, which has conventionally been required each time. This method reduces the setup time for each use and improves your work efficiency.

- Slim and tough W-bearing structure
  Metal bearings are provided both above and below the measuring part, and they are housed inside a robust die-cast body to achieve extreme durability. Their incredible robustness to vibrations, shocks, and lateral loads have earned customers’ trust.

Detectors
Absolute method detectors
SA-S110, SA-S110/03N
SA-S150, SA-S150/03N
SA-S350
SA-S10AP / SA-S10AP
Air purge specification
SA-S10PD / SA-S10PD
Pneumatic drive specification

Controllers
Controllers for SA series detectors
SA-CD
SA-SD
SA-MC8 / SA-MC16
SA-ERS
SA-ECL

Accessories
Controllers for SA series detectors
SA connector cables
SA-CD
SA-SD
Output cables
SA-CD-BS1
SA-CD-BS2
AC Adapter
AC-01
For SA-CD1N
For SA-CD1/N50
For SA-CD1/N80
SA connector cables
SA-CD
SA-SD
Contact points
F-000, 100, 200, 300
F-011
F-171
F-105
F-106
F-504
F-505
F-508
SA connector cables
SA-CD
SA-SD
Contact points
F-000, 100, 200, 300
F-011
F-171
F-105
F-106
F-504
F-505
F-508
Rubber bellows
M-137
For SA-S10, 110
M-142
For SA-S150
M-143
For SA-S350
Finger lever
M-129
Indicator bush
M-171
Lug holder
SMA-0417
This series of sensors achieves high durability owing to the W-bearing structure and die-cast body. The series also eliminates counting errors by adopting the absolute method. In addition to a minimum resolution of 0.5 µm (SA-S510, SA-S510/03N), high resolution products with a resolution of 0.1 µm are also available (SA-S110, SA-S110/03N). The series demonstrates superb capabilities in various measuring situations.

**Model**

**SA-S110, SA-S110/03N | SA-S510, SA-S510/03N**

**SA-S532**

A long stroke of 32 mm extends the measurement range while maintaining high durability.

**Measurement method**

Optical absolute encoder method

**Measurement range**

10 mm

**Resolution**

0.1 µm

**Indication accuracy**

Equivalent to IP67

**Measuring force**

2.97 N or less

**Ingress protection rating**

Equivalent to IP67

**Weight**

Approx. 150 g

**Cable**

Sold separately as an option

**Measuring probe**

Ceramic sphere (diameter: 3.175 mm)

**Rubber bellows**

Material: NBR

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1. At an ambient temperature of 20°C
2. When no measuring probe is attached (vertical position shown by 10 mm)
3. Only when the rubber bellows is attached properly and is not damaged
4. For SA-S110/03N, no rubber bellows are attached.

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1. At an ambient temperature of 20°C
2. When the measuring probe is pushed vertically down by 32 mm
3. Only when the rubber bellows is attached properly and is not damaged
4. For SA-S□110/03N, no rubber bellows are attached.

---

This series of sensors achieves high durability owing to the W-bearing structure and die-cast body. The series also eliminates counting errors by adopting the absolute method. In addition to a minimum resolution of 0.5 µm (SA-S510, SA-S510/03N), high resolution products with a resolution of 0.1 µm are also available (SA-S110, SA-S110/03N). The series demonstrates superb capabilities in various measuring situations.
Digital Gauges
SA Series
Detectors

SA-S550

An ultra-long stroke of 50 mm easily accommodates measurements of large components.

Model | Measurement method | Display resolution | Indication accuracy (P-P) | Measuring force | Ingress protection rating | Weight | Cables
---|---|---|---|---|---|---|---
SA-S550 | Optical absolute linear encoder method | 0.5 μm | 3.5 µm or less | 3.5 N or less | Equivalent to IP67 | Approx. 250 g | Sold separately as an option

Ceramic sphere φ1/8 inch

Model | Model | Measurement method | Measurement range | Display resolution | Indication accuracy (P-P) | Measuring force | Weight | Cables
---|---|---|---|---|---|---|---|---
Model | SA-S110AP / SA-S510AP | Air purge specification | 10 mm | 0.1 μm 0.5 μm | 1.0 µm or less 2.0 µm or less | 1.5 to 3 N *2 | Approx. 80 g | *4

Air purge technology provides the ultimate environmental performance. The body’s inner pressure is raised by air-purging, which prevents foreign objects from invading. These sensors exhibit strong performance in severe environments where they are exposed to liquids such as permeable oil, coolant liquids, and cutting fluids.

Model | Model | Measurement method | Position detection method | Used fluid | Operating pressure range | Air tube specification | Withstand pressure | Measuring force | Resolution | Indication accuracy (P-P) | Ingress protection rating | Weight | Cables
---|---|---|---|---|---|---|---|---|---|---|---|---|---|---
Model | Model | SA-S110AP | SA-S510AP | Optical absolute encoder method | Optical absolute encoder method | Air | 0.05 to 0.10 MPa | Outer diameter: 4 mm / Inner diameter: 2.5 mm | 0.2 MPa | 1.5 to 3 N *2 | 0.1 µm 0.5 µm | Equivalent to IP67 | Approx. 80 g | *4

*1 At an ambient temperature of 20°C
*2 This value depends on the supplied air pressure as well as the assembling accuracy of the product and wear of the sealing material (O-ring).
*3 This applies only when the air tube is connected and the sealing part is not degraded or damaged.
*4 Angle-type connector cables cannot be used.

No rubber bellows are attached.
The pneumatic drive structure, which moves the spindle up and down with air, significantly simplifies the system design process while increasing measurement speed.

Model | SA-S110PD | SA-S510PD
---|---|---
Position detection method | Optical absolute encoder method | Optical absolute encoder method
Measurement range | 10 mm | 10 mm
Resolution | 0.1 μm | 0.5 μm
Indication accuracy (P-P) | 1 μm or less | 2 μm or less
Measuring probe | Ceramic sphere (diameter: 3.175 mm) | Ceramic sphere (diameter: 3.175 mm)

*1 At an ambient temperature of 20°C
*2 The measuring force depends on the air pressure used.
*3 Remove the seal cap to use this sensor as a low measuring force type.
*4 This applies only when the air tube is connected and the sealing part is not degraded or damaged.
*5 Angle-type connector cables cannot be used.

See tolerance judgment results at a glance
Depending on the setting value, the backlight changes to green (OK/pass) or red (NG/fail), making it easy to recognize judgment results even from a distance.

See Model SA-CD1N/SA-CD1N/BO/SA-CD1N/RS
A one-channel type compact controller. The backlight changes between red and green, making it easy to recognize judgment results.

Model | SA-CD1N | SA-CD1N/BO | SA-CD1N/RS
---|---|---|---
Display | LCD with green/red backlight (front display panel, 6-digit value, and code) | LCD with green/red backlight (front display panel, 6-digit value, and code) | LCD with green/red backlight (front display panel, 6-digit value, and code)
Display resolution *1 | 0.1 μm | 0.5 μm | 1 μm or less
Display range | -99.9999 to 99.9999 mm | -99.9999 to 99.9999 mm | -99.9999 to 99.9999 mm
Input | DC | DC | DC
Output | BCD | BCD | BCD
Input/output | I/O | BCD | RS
No. of inputs | 1 ch | 0 ch | 0 ch
Data hold method | Data hold with external signals | Data hold with external signals | Data hold with external signals
Sorting function | 2-level display (OK/NG) | 2-level display (OK/NG) | 2-level display (OK/NG)
Peak measurement | Maximum, minimum, maximum-minimum, maximum-minimum/2 | Maximum, minimum, maximum-minimum, maximum-minimum/2 | Maximum, minimum, maximum-minimum, maximum-minimum/2
Power supply voltage | 12-24 V DC (±10%) | 12-24 V DC (±10%) | 12-24 V DC (±10%)
Consumption current | 200 mA or less | 200 mA or less | 200 mA or less
Accessories | Panel mount frame | Panel mount frame | Panel mount frame
Specialty options | Cable for BCD output RS232C cable *2 | Cable for BCD output RS232C cable *2 | Cable for BCD output RS232C cable *2

*1 Depends on the resolution of the sensor head used.
*2 If EXT RS IN (trigger) is not needed, a commercially available interlink cable can be used.

High usability with a 7-level sorting function
In addition to the standard types, the BCD type and RS-232C output model are available. Choose the model that best suits your facilities.
**Compact controllers for connecting up to 16 units. Use a DIN rail to connect.**

**SA-SD1AP / SD1AC / SD1C / SDNC**

- **Easy-to-read VA high contrast LCD**
- **Dual digital display for a wide range of uses**
- **An ultra-compact body equipped with various functions**
- **Supports connection of up to 16 units**
- **Up to 15 slave units can be connected to one master unit.**
- **Communication connector specifically for SA-SD controllers, which can also easily be removed.**
- **Up to 15 controllers (1 master unit + 14 slave units) can be connected to a single SA-ERS unit.**

**Easy-to-read VA high contrast LCD**

- **Supports connection of up to 16 units**
- **Use a DIN rail to connect.**

**SA-ERS**

This communication unit supports MODBUS RS485. It enables speedy data communication.

<table>
<thead>
<tr>
<th>Model</th>
<th>SA-ERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supported controller</strong></td>
<td><strong>SA-ERS</strong></td>
</tr>
<tr>
<td><strong>Number of connectable controllers</strong></td>
<td>Up to 15 controllers (1 master unit, 14 slave units can be connected to a single SA-ERS)</td>
</tr>
<tr>
<td><strong>Electrical characteristics</strong></td>
<td><strong>SA-ERS</strong> compliant</td>
</tr>
<tr>
<td><strong>Communication method</strong></td>
<td>Two-wire half-duplex communication</td>
</tr>
<tr>
<td><strong>Communication protocol</strong></td>
<td>MODBUS (RTU,ASCII,RTU) MEWTOCOL*1</td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>24 V DC (±10%)</td>
</tr>
<tr>
<td><strong>Consumption current</strong></td>
<td>40 mA or less</td>
</tr>
</tbody>
</table>

Specifically for SA-SD controllers to integrate measurement and monitoring systems:

SA-ERS can be easily connected to controllers using the integrated communication connector specifically for SA-SD controllers, which can also easily be removed. Up to 15 controllers (1 master unit + 14 slave units) can be connected to a single SA-ERS unit.

**Installed on a 35-mm DIN rail**

**SA-ECL**

This communication unit supports CC-Link. It enables high speed communication up to 10 Mbps.

<table>
<thead>
<tr>
<th>Model</th>
<th>SA-ECL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supported controller</strong></td>
<td><strong>SA-ECL</strong></td>
</tr>
<tr>
<td><strong>Number of connectable controllers</strong></td>
<td>Up to 15 controllers (1 master unit, 14 slave units can be connected to a single SA-ECL unit)</td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>24 V DC ±10%, including 0.5 V ripple (P-P)</td>
</tr>
<tr>
<td><strong>Consumption current</strong></td>
<td>80 mA or less</td>
</tr>
<tr>
<td><strong>Communication method</strong></td>
<td>CC-link v1.1, CC-link v2.0 (switchable)</td>
</tr>
<tr>
<td><strong>Remote station classification</strong></td>
<td>CC-Link v1.1: 2 Stations (1 master, 1 slave), CC-Link v2.0: 2 stations (2 masters)</td>
</tr>
<tr>
<td><strong>No. of occupied stations</strong></td>
<td>CC-Link v1.1: 4 stations, CC-Link v2.0: 2 stations (4 stations)</td>
</tr>
<tr>
<td><strong>Station No. setting</strong></td>
<td>1 to 64 (16 or 65 and above will cause an error)</td>
</tr>
<tr>
<td><strong>Communication speed</strong></td>
<td>156 Kbps, 625 Kbps, 2.5 Mbps, 5 Mbps, 10 Mbps</td>
</tr>
<tr>
<td><strong>Max. transmission distance</strong></td>
<td>1,200 m, 900 m, 400 m, 160 m, 100 m</td>
</tr>
<tr>
<td><strong>Communication method</strong></td>
<td>CC-Link v1.1/2.00 (switchable)</td>
</tr>
</tbody>
</table>

**Self-diagnosis and notification of disconnections & abnormalities**

The controller detects when a sensor head fails or when a message is not connected or becomes disconnected, and immediately notifies you by displaying an error.
SA-MC8 / SA-MC16

These multi-channel type controllers are specifically for RS-232C data output.

8-channel and 16-channel types are available.

**Model**

<table>
<thead>
<tr>
<th>Feature</th>
<th>SA-MC8</th>
<th>SA-MC16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>Status display LED for each channel</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 µm</td>
<td></td>
</tr>
<tr>
<td>Display range</td>
<td>-99.9999 to 99.9999 mm</td>
<td></td>
</tr>
<tr>
<td>No. of sensor head inputs</td>
<td>8 channels</td>
<td>16 channels</td>
</tr>
<tr>
<td>External output</td>
<td>Equipped with RS-232C output terminal (measurement data output)</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 V DC (±10%)</td>
<td></td>
</tr>
<tr>
<td>Consumption current</td>
<td>500 mA or less (with sensor head connected)</td>
<td></td>
</tr>
</tbody>
</table>

*1 Depends on the resolution of the sensor head used.

Supports the SA series. Enables easy, convenient multi-point measurement.

These controllers are sized to be easily handled and enable you to build a safe, reliable multi-point measurement system even for small to large multi-channel systems of general-purpose communication via RS-232C. Measurement data can be output from up to 16 channels.

Easy-to-see status LED lamp with a simple display

8-channel and 16-channel types available

DIN rail guide
Both SA-MC8 and SA-MC16 can be installed on DIN rails.
The ELEMETRON electric micrometers are long-selling products that employ differential transformers to accommodate any measuring conditions with a variety of specifications. These products are optimal for high-precision measurement that requires readings in 0.1-µm units or measurement that requires low measuring force (0.1 g). Besides the standard plunger type, we offer a universal type (lever type) that can freely change the measurement direction and is suitable for measuring objects susceptible to damage or deformation as well as a small-size type that is useful for making measurements in small spaces.

**Plunger**

**Plunger type**

This is the standard sensor head.
A contact point is attached to the tip of the plunger held by the ball retainer and spring.
Thanks to its durable body, this type can accurately measure various targets even in environments with extreme temperature fluctuations.

**Universal**

**Universal type (lever type)**

The strong lever bearing mechanism is resistant to breakage caused by large loads or fluctuations.
In addition, since the measuring direction can be changed freely, this type can be used in any location, freeing you of concern about damaging or deforming measurement targets.
This type is suitable for measuring bearing runout, etc.

**Measurement range**

<table>
<thead>
<tr>
<th>Bottom dead center</th>
<th>Top dead center</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero-point position</td>
<td>Measure-</td>
<td>range</td>
</tr>
<tr>
<td>Output range</td>
<td>(- side)</td>
<td>(+ side)</td>
</tr>
</tbody>
</table>

**Accessories**

**Electric Micrometers**

- **Output cable**
  - EM-SA1-002
  - EM-SA1-003
  - EM-SA1-005
  - EM-SA1-006
  - EM-SA1-007

- **Conversion cable**
  - RCA-0494

- **Contact point**
  - F-000, 101, 201, 301
  - F-012
  - F-013
  - F-014
  - F-015
  - F-016
  - F-017
  - F-018
  - F-019
  - F-020
  - F-021
  - F-022
  - F-023
  - F-024

- **Rubber bellows**
  - M-131

- **Indicator bush**
  - M-130

- **Finger lever**
  - M-120

- **Lug holder**
  - SMA-0417

**Detectors**

**Electric Micrometers**

- DTH-P
- DTH-P-S
- DTH-P-SH
- DTH-L
- DTH-L-SH

**Amplifiers**

**Electric Micrometers**

- EM-SA1R
- DTM-FA
- DTM-FA-A
- DTM-FA-A-H
- DTM-FA-A-D
**DTH - P**

Optimal for measurement that requires a low measuring force. We offer products for various measuring forces.

**Model**
- DTH-P20
- DTH-P40
- DTH-P70
- DTH-P16AL

<table>
<thead>
<tr>
<th>Model</th>
<th>DTH-P20</th>
<th>DTH-P40</th>
<th>DTH-P70</th>
<th>DTH-P16AL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring force</td>
<td>0.196N</td>
<td>0.392N</td>
<td>0.686N</td>
<td>0.157N</td>
</tr>
<tr>
<td>Measurement range</td>
<td>±1 mm</td>
<td>±1 mm</td>
<td>±1 mm</td>
<td>±1 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>2 mm</td>
<td>2 mm</td>
<td>2 mm</td>
<td>2 mm</td>
</tr>
<tr>
<td>Zero-point position</td>
<td>Approx. 2 mm</td>
<td>Approx. 3.5 mm</td>
<td>Approx. 2 mm</td>
<td>Approx. 3.5 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
</tr>
<tr>
<td>Accuracy guaranteed temperature range</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td>Weight (main body only)</td>
<td>Approx. 25g</td>
<td>Approx. 25g</td>
<td>Approx. 25g</td>
<td>Approx. 25g</td>
</tr>
<tr>
<td>Standard specifications</td>
<td>Cable length</td>
<td>Approx. 3 m</td>
<td>Approx. 3 m</td>
<td>Approx. 3 m</td>
</tr>
<tr>
<td></td>
<td>Contact point</td>
<td>F-171</td>
<td>F-171</td>
<td>F-171</td>
</tr>
<tr>
<td></td>
<td>Rubber bellows</td>
<td>M-131</td>
<td>M-131</td>
<td>M-131</td>
</tr>
</tbody>
</table>

**DTH - P-S**

Small in size and optimal for installation in a machine

**Model**
- DTH-P20S
- DTH-P40S
- DTH-P70S

<table>
<thead>
<tr>
<th>Model</th>
<th>DTH-P20S</th>
<th>DTH-P40S</th>
<th>DTH-P70S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring force</td>
<td>0.196N</td>
<td>0.392N</td>
<td>0.686N</td>
</tr>
<tr>
<td>Measurement range</td>
<td>±0.7 mm</td>
<td>±0.7 mm</td>
<td>±0.7 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>2 mm</td>
<td>2 mm</td>
<td>2 mm</td>
</tr>
<tr>
<td>Zero-point position</td>
<td>Approx. 1 mm</td>
<td>Approx. 1 mm</td>
<td>Approx. 1 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
</tr>
<tr>
<td>Accuracy guaranteed temperature range</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td>Weight (main body only)</td>
<td>Approx. 20 g</td>
<td>Approx. 20 g</td>
<td>Approx. 20 g</td>
</tr>
<tr>
<td>Standard specifications</td>
<td>Cable length</td>
<td>Approx. 3 m</td>
<td>Approx. 3 m</td>
</tr>
<tr>
<td></td>
<td>Contact point</td>
<td>F-171</td>
<td>F-171</td>
</tr>
<tr>
<td></td>
<td>Rubber bellows</td>
<td>M-131</td>
<td>M-131</td>
</tr>
</tbody>
</table>

**DTH - P-SH**

Small in size with a laterally connected cord

**Model**
- DTH-P20SH
- DTH-P40SH
- DTH-P70SH

<table>
<thead>
<tr>
<th>Model</th>
<th>DTH-P20SH</th>
<th>DTH-P40SH</th>
<th>DTH-P70SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring force</td>
<td>0.196N</td>
<td>0.392N</td>
<td>0.686N</td>
</tr>
<tr>
<td>Measurement range</td>
<td>±0.7 mm</td>
<td>±0.7 mm</td>
<td>±0.7 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>2 mm</td>
<td>2 mm</td>
<td>2 mm</td>
</tr>
<tr>
<td>Zero-point position</td>
<td>Approx. 1 mm</td>
<td>Approx. 1 mm</td>
<td>Approx. 1 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
<td>0.3 μm</td>
</tr>
<tr>
<td>Accuracy guaranteed temperature range</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
<td>24°C±5°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td>Weight (main body only)</td>
<td>Approx. 20 g</td>
<td>Approx. 20 g</td>
<td>Approx. 20 g</td>
</tr>
<tr>
<td>Standard specifications</td>
<td>Cable length</td>
<td>Approx. 3 m</td>
<td>Approx. 3 m</td>
</tr>
<tr>
<td></td>
<td>Contact point</td>
<td>F-171</td>
<td>F-171</td>
</tr>
<tr>
<td></td>
<td>Rubber bellows</td>
<td>M-131</td>
<td>M-131</td>
</tr>
</tbody>
</table>
The lever-type sensor is optimal for measuring flatness and roundness. This small-size amplifier enables up to eight units to be linked.

**Model**
- DTH-L02U
- DTH-L08U
- DTH-L15U

**Specifications**
- Measuring cone: 0.015N, 0.02N, 0.08N, 0.15N
- Measurement range: ±0.5 mm
- Stroke: 1.5 mm
- Zero-point position: Approx. 0.1 mm
- Repeatability: 0.3 µm
- Accuracy guaranteed temperature range: 24°C ±5°C
- Operating temperature range: 0 to 50°C
- Weight (main body only): Approx. 110 g
- Cable length: 3 m

**Zero set function**
Can be reset by the switch on the front face or at any position by an external signal.

**Display**
LCD with 6 digits/polarity, mode display, and 2-color backlight (red/green).

**No. of detector inputs**
1 ch

**Data hold method**
Hold of the display and data by an external signal

**Display resolution**
0.1 / 1 / 10 µm (selectable by setting)

**Installation on DIN rails**
Up to 8 slave units can be linked to a single master unit. All amplifiers can be controlled collectively.

**Confirm Pass or Fail at a glance with the 2-color (red/green) display**
The backlight switches between green (Pass) and red (Fail) in accordance with the set value. This makes it easy to confirm judgment results even from a distance. You are also notified immediately if an error occurs by a red backlight and error message.

**Innovative, compact form enables various kinds of link-up installations**
Because the display unit is detachable, it can be removed from the amplifier’s body and mounted on a panel. Arranging the elements close together helps save space in the system. Together with the optional display mounting unit (EM-SA1-DPM), it is required.

**While maintaining high sensitivity and high accuracy with a resolution of 0.1 µm, the Elemetron EM-SA1R has an ultra-compact form with a volume just one-fiftieth that of previous models.** Additionally, new functions that enable multiple peak measurement have been added (such as link-up installation and batch control by combining base and client devices). Thus, space savings are achieved while expanding upon the range of functions offered previously.

**Conversion cable**
DMC-AN3-15 or M-3SEA2834 (9-pin, 15 cm)
Amplifiers

These flexible amplifiers can be used in a wide range of applications. All the modes are arranged on the front panel, enabling easy operation.

DTM-FAB

This analog indication type is equipped with a sensitivity selection function (three ranks).

<table>
<thead>
<tr>
<th>Model</th>
<th>DTM-EA</th>
<th>DTM-EA/H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity selection</td>
<td>HIGH: ±1999 μm, resolution: 1 μm</td>
<td>LOW: ±1999 μm, resolution: 1 μm</td>
</tr>
<tr>
<td>Display</td>
<td>4-digit LED display &amp; polarity (1)</td>
<td>4-digit LED display &amp; polarity (1)</td>
</tr>
<tr>
<td>No. of sensor head inputs</td>
<td>2 channels</td>
<td>2 channels</td>
</tr>
<tr>
<td>Simple measurement</td>
<td>±A, ±B, ±(A-B)</td>
<td>±A, ±B, ±(A-B)</td>
</tr>
<tr>
<td>Pre-set method</td>
<td>Can be reset by the front switch or at any point by an external signal</td>
<td>Can be reset by the front switch or at any point by an external signal</td>
</tr>
<tr>
<td>Data hold function</td>
<td>Hold of the display and data by an external signal</td>
<td>Hold of the display and data by an external signal</td>
</tr>
<tr>
<td>Measurement condition selection</td>
<td>4-digit &amp; polarity</td>
<td>4-digit &amp; polarity</td>
</tr>
<tr>
<td>Accuracy guaranteed temperature range</td>
<td>24°C to 30°C</td>
<td>24°C to 30°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 40°C</td>
<td>0°C to 40°C</td>
</tr>
<tr>
<td>Power supply</td>
<td>100 to 240 V AC ±10%, 50/60 Hz</td>
<td>100 to 240 V AC ±10%, 50/60 Hz</td>
</tr>
<tr>
<td>Dimensions</td>
<td>110 (W) × 175 (D) × 185 (H) mm</td>
<td>110 (W) × 175 (D) × 185 (H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 1.1 kg</td>
<td>Approx. 1.1 kg</td>
</tr>
</tbody>
</table>

*Accuracy guaranteed temperature range differs depending on the display range and indication error.

DTM-ED

This digital indication type is equipped with a sensitivity selection function (two ranks).

<table>
<thead>
<tr>
<th>Model</th>
<th>DTM-ED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity selection</td>
<td>HIGH: ±1999 μm, resolution: 1 μm</td>
</tr>
<tr>
<td>Display</td>
<td>3-digit LED display &amp; polarity</td>
</tr>
<tr>
<td>No. of sensor head inputs</td>
<td>2 channels</td>
</tr>
<tr>
<td>Simple measurement</td>
<td>±A, ±B, ±(A-B)</td>
</tr>
<tr>
<td>Pre-set method</td>
<td>Can be reset by the front switch or at any point by an external signal</td>
</tr>
<tr>
<td>Data hold function</td>
<td>Hold of the display and data by an external signal</td>
</tr>
<tr>
<td>Measurement condition selection</td>
<td>4-digit &amp; polarity</td>
</tr>
<tr>
<td>Page measurement</td>
<td>±P, ±P, ±P, ±P (P: Maximum, -P: Minimum)</td>
</tr>
<tr>
<td>Accuracy guaranteed temperature range</td>
<td>24°C to 50°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td>Power supply</td>
<td>100 to 240 V AC ±10%, 50/60 Hz</td>
</tr>
<tr>
<td>Dimensions</td>
<td>110 (W) × 175 (D) × 185 (H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 1.0 kg</td>
</tr>
</tbody>
</table>

*Accuracy guaranteed temperature range differs depending on the display range and indication error.

*The power cable attached to the unit has a rating of 125 V/10 A. Using the unit with a higher voltage, pressure, and use a high-voltage cable with a suitable rating.
Signal Indicators & Micro Indicators

TRI-METRON

Mu-METRON

How to use TRI-METRON

1. Checking
   - Move the spindle up and down to confirm that the needle moves over the entire scale range.

2. Zero point setting
   - Use the master gauge to adjust the detector's zero-point position. Loosen the clamp screw, move the detector up and down until the needle points to zero. Tighten the clamp screw.

3. Fine adjustment
   - If the needle does not point to zero after moving the detector up and down, turn the scale plate to adjust it. Then, move the spindle up and down for a few times. Ensure that the needle returns to the zero-point position.

4. Minus tolerance
   - Press the handle fully against the workpiece and turn the right limit setting dial to the minus limit position. Ensure that the needle moves within the minus limit range.

5. Plus tolerance
   - Press the handle fully against the workpiece and turn the right limit setting dial to the plus limit position. Ensure that the needle moves within the plus limit range.

6. Tolerance check
   - Press the handle fully against the workpiece and turn the right limit setting dial to the plus limit position. Ensure that the needle moves within the tolerance range.

Accessories

Signal Indicators/Micro Indicators

TRI-METRON

Mu-METRON

Contact points
- F-001, 101, 201, 301
- F-012
- F-071
- F-045
- F-096
- F-091
- F-092
- F-063
- F-054
- F-085
- F-087
- F-908

Back mounts
- F-M100
- F-M150
- F-M101
- F-M101-1
- C-M100
- C-M101
- C-M101-1
- SMA-0417

Release
- M-140

Finger lever
- M-123

Rubber bellows
- M-131

These analog models of signal indicators and micro indicators have simple structures that do not require amplifiers. They are the most cost-efficient options for simple pass/fail measurement. We offer Mu-METRON high-precision mechanical micro indicators, and TRI-METRON with electrical contacts incorporated into Mu-METRON. The LP type enables you to confirm pass or fail judgment results even from a distance via lamp lighting.
TRI-METRON

These signal indicators can be directly connected to a controller, such as a sequencer. The green and red judgment indication lamps enable you to visually confirm pass/fail results.

Model | 1S-100P | 1S-010P
---|---|---
Graduation | 1 µm | 10 µm
Range | ±0.05 mm | ±0.1 mm
Precision | ±1 µm | ±5 µm
Measuring force | 0.19 N | 0.79 N
Spindle stroke | 2.5 mm
Contact rating | 24 VDC, 4 kΩ (resistance load)
Standard attachments | Contact point: F-021
Cable: 3MMA-0001-1.5 (1.5 m)
Rubber bellows: M-140

Option | Release
---|---
Release M-140

* In the 2S series, the contacts are connected to the body.
* Only measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

---

These are small-size signal indicators.

Model | 1S-100 | 1S-010 | 1S-010FIS
---|---|---|---
Graduation | 1 µm | 10 µm | 100 µm
Range | ±0.05 mm | ±0.1 mm | ±0.5 mm
Precision | ±1 µm | ±5 µm | ±0.5 µm
Measuring force | 0.19 N | 0.79 N | 0.05 N
Spindle stroke | 2.5 mm
Contact rating | 24 VDC, 4 kΩ (resistance load)
Standard attachments | Contact point: F-021
Cable: 3MMA-0001-1.5 (1.5 m)

Optional cable: Model SBM-0006-3

---

This low-priced version features a large display.

Model | 2S-100 | 2S-200 | 2S-010 | 2S-010FIS
---|---|---|---|---
Graduation | 1 µm | 10 µm | 100 µm | 1000 µm
Range | ±0.05 mm | ±0.1 mm | ±0.5 mm | ±5 mm
Precision | ±1 µm | ±5 µm | ±0.5 µm | ±5 µm
Measuring force | 1.58 N | 1.58 N | 1.58 N | 1.58 N
Spindle stroke | 2.8 mm
Contact rating | 24 VDC, 4 kΩ (resistance load)
Standard attachments | Contact point: F-021
Cable: 3MMA-0001-1.5 (1.5 m)
Rubber bellows: M-140

Option | Release
---|---
Release M-140

* In the 2S series, the contacts are connected to the body.
* Only measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

---

The low-priced version has a graduation of 1 µm.

Model | 2M-100 | 3M-100 | 4M-100
---|---|---|---
Graduation | 1 µm | 10 µm | 100 µm
Range | ±0.05 mm | ±0.1 mm | ±0.5 mm
Precision | ±1 µm | ±5 µm | ±0.5 µm
Measuring force | 0.19 N | 0.79 N | 0.05 N
Spindle stroke | 2.8 mm
Contact point: F-021
Standard attachments: F-M101
Rubber bellows: M-140

Option | Release
---|---
Release M-140

* In the 2S series, the contacts are connected to the body.
* Only measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

---

The standard type has a graduation of 1 µm.

Model | 1S-100P | 1S-010P | 1S-010FIS
---|---|---|---
Graduation | 10 µm | 100 µm | 1000 µm
Range | ±0.1 mm | ±0.5 mm | ±5 mm
Precision | ±5 µm | ±0.5 µm | ±5 µm
Measuring force | 0.784 N | 0.588 N | 0.05 N
Spindle stroke | 13.5 mm
Contact rating | 24 VDC, 4 kΩ (resistance load)
Standard attachments | Contact point: F-021
Cable: 3MMA-0001-1.5 (1.5 m)
Rubber bellows: M-140

Option | Release
---|---
Release M-140

* In the 2S series, the contacts are connected to the body.
* Only measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

---

The high-precision type has a graduation of 0.5 µm.

Model | 2M-100 | 3M-100 | 4M-100
---|---|---|---
Graduation | 0.5 µm | 1 µm | 10 µm
Range | ±0.025 mm | ±0.05 mm | ±0.5 mm
Precision | ±0.5 µm | ±5 µm | ±0.5 µm
Measuring force | 0.19 N | 0.79 N | 0.05 N
Spindle stroke | 13.5 mm
Contact point: F-021
Standard attachments: F-M101
Rubber bellows: M-140

Option | Release
---|---
Release M-140

* In the 2S series, the contacts are connected to the body.
* Only measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

---

* Please refer to the specifications for the operation of the unit.
You can measure the over-pin diameter, large diameter, and small diameter using the BST-2B or BST-1B (3LB) inner diameter measuring instruments and a special-order contact point. Although different measurement methods are used for odd and even numbers of teeth, the following gives some measurement examples.

* Since these measurements are comparative measurements against a master (reference work), a master workpiece is required.

<table>
<thead>
<tr>
<th>Even No. of teeth</th>
<th>Odd No. of teeth</th>
<th>Contact point selection condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-pin diameter</td>
<td>Over-pin diameter</td>
<td>For both even and odd numbers of teeth, measurement can be performed using a two-point type ball contact point. However, to ensure that the contact point does not touch the large diameter surface, you must consider the ball diameter at the tip or whether the ball has been cut into a D-shape.</td>
</tr>
<tr>
<td>Large diameter</td>
<td>Large diameter</td>
<td>To enable the contact point to come into contact with the large diameter surface, it is necessary to select a ball diameter that can contact the large diameter surface and the gear surface. The standard contact point has a diameter of 1 mm.</td>
</tr>
<tr>
<td>Small diameter</td>
<td>Small diameter</td>
<td>For an even number of teeth, two R-shaped contact points are used. For an odd number of teeth, two ball contact points and an R-shaped contact point are used.</td>
</tr>
</tbody>
</table>

Our lineup of horizontal stands can be used to measure inner and outer diameters. By attaching SA series displacement sensors or Mu-METRON to these stands, you can obtain measurement values with minimal measurement error. In addition, you can measure abnormally shaped workpieces or grooves by using special contact points. Use the H-2 series to measure outer diameters and the BST series to measure inner diameters.
**H-2B • H-2LB**

These stands support measurement of outer diameters within the range of 0 to 25 mm.

**Measurement Range**
- Outer diameter: 0 to 25 mm
- Inner diameter: 18 to 45 mm

**Precision**
- As per the indicator’s measuring force

**Model**
- H-2B: Without indicator
- H-2LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-150

**Notes**
- Various other contact points are available.

---

**BST-2B**

This stand supports measurement of inner diameters within the range of 2 to 23 mm.

**Measurement Range**
- Inner diameter: 2 to 23 mm

**Model**
- BST-2B: Without indicator
- BST-2LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-080

**Notes**
- Error will result if the dimensional difference between this gauge and the target workpiece is large.

---

**BST-3LB**

This stand supports measurement of inner diameters within the range of 10 to 260 mm.

**Measurement Range**
- Inner diameter: 10 to 260 mm

**Model**
- BST-3LB: Without indicator
- BST-3LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-070, F-071, F-072, F-073

**Notes**
- Error will result if the dimensional difference between this gauge and the target workpiece is large.

---

**BST-1B**

This stand supports measurement of inner diameters within the range of 4 to 67 mm.

**Measurement Range**
- Inner diameter: 4 to 67 mm

**Model**
- BST-1B: Without indicator
- BST-1LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-040

**Notes**
- Error will result if the dimensional difference between this gauge and the target workpiece is large.

---

**BST-1B**

This stand supports measurement of inner diameters within the range of 4 to 67 mm.

**Measurement Range**
- Inner diameter: 4 to 67 mm

**Model**
- BST-1B: Without indicator
- BST-1LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-040

**Notes**
- Error will result if the dimensional difference between this gauge and the target workpiece is large.

---

**BST-3LB**

This stand supports measurement of inner diameters within the range of 10 to 260 mm.

**Measurement Range**
- Inner diameter: 10 to 260 mm

**Model**
- BST-3LB: Without indicator
- BST-3LB: With indicator 3M-100

**Contact Point**
- Standard contact point: F-070, F-071, F-072, F-073

**Notes**
- Error will result if the dimensional difference between this gauge and the target workpiece is large.
Option & Accessories
Contact Points

<table>
<thead>
<tr>
<th>Shape</th>
<th>Dimensions</th>
<th>Steel</th>
<th>Carbide</th>
<th>Ceramic</th>
<th>Nylon</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 m</td>
<td>L=7</td>
<td>F-001</td>
<td>F-101</td>
<td>F-201</td>
<td>F-301</td>
</tr>
<tr>
<td>2 m</td>
<td>L=9</td>
<td>F-002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R=0.4</td>
<td>F-105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R=0.6</td>
<td>F-106</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=5, L2=12.3, φD=5</td>
<td>F-501</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=2.8, L2=14.5, φD=1.0</td>
<td>F-502</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=2.8, L2=14.5, φD=1.5</td>
<td>F-503</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=2.8, L2=14.5, φD=2</td>
<td>F-504</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=6, L2=12.3, φD=0.5</td>
<td>F-505</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=6, L2=12.3, φD=1.0</td>
<td>F-507</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m</td>
<td>L1=6, L2=12.3, φD=2.0</td>
<td>F-508</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The fixing screw is M2.5P0.45. It can be used commonly for the SA series, ELEMETRON, TRI-METRON, Mu-METRON, etc.
### For ELEMETRON Lever Type

<table>
<thead>
<tr>
<th>Shape</th>
<th>Dimensions</th>
<th>Applicable model</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>φD=φ68</td>
<td>L =28</td>
<td>DTH-L</td>
<td>F-138</td>
</tr>
<tr>
<td>φD=φ68</td>
<td>L =28</td>
<td>DTH-L</td>
<td>F-139</td>
</tr>
<tr>
<td>φD=φ68</td>
<td>L =18.3</td>
<td>DTH-L (Universal type)</td>
<td>F-118</td>
</tr>
</tbody>
</table>

#### Shape Dimensions
- Carbide
- L
- M1.7P=0.35
- φ
- φD=
- φD=
- φD=
- φD=

---

### Indicator bush

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable models</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All models with an 8 mm diameter stem can be fixed with this indicator bush.</td>
<td>M-150</td>
</tr>
</tbody>
</table>

---

### Lug holder

<table>
<thead>
<tr>
<th>Shape</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMA-0417</td>
</tr>
</tbody>
</table>

---

### Rubber bells

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable models</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA - S510, SA - S510 / 03N</td>
<td>M-137</td>
</tr>
<tr>
<td></td>
<td>SA - S532</td>
<td>M-142</td>
</tr>
<tr>
<td></td>
<td>SA - S550</td>
<td>M-143</td>
</tr>
</tbody>
</table>

---

### Horizontal stands

Table plates (hardened lap)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable stand</th>
<th>Dimensions (mm)</th>
<th>Product No.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BST-18 (Auxiliary table)</td>
<td>25.0 x 40.0</td>
<td>TP-106**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BST-28</td>
<td>25.0 x 40.0</td>
<td>TP-107</td>
<td>A=3</td>
</tr>
<tr>
<td></td>
<td>BST-28</td>
<td>25.0 x 40.0</td>
<td>TP-108</td>
<td>A=5.6</td>
</tr>
</tbody>
</table>

**Make-to-order manufacturing**

---

### Options & Accessories

- TRIMETRON / Mu-METRON
- Release / Finger Lever
- Option A: 4M-100P
- Option B: 2M-100
- Option C: 1S-100LP, 2S-100, 2M-100

---

### For ELEMETRON Lever Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (mm)</th>
<th>No. of holes</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M, 4M, 4M-100P</td>
<td>φD=φ68</td>
<td>4</td>
<td>F-M100</td>
</tr>
<tr>
<td>2S, 2M-100</td>
<td>φD=φ63.2</td>
<td>4</td>
<td>F-M101</td>
</tr>
<tr>
<td>1S, 1S-100LP, 1S-010LP</td>
<td>φD=φ47.1</td>
<td>3</td>
<td>F-M103-1</td>
</tr>
<tr>
<td>3M, 4M-100P</td>
<td>φD=φ68</td>
<td>4</td>
<td>C-M100</td>
</tr>
<tr>
<td>2S, 2M-100</td>
<td>φD=φ63.2</td>
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<td>1S, 1S-100LP, 1S-010LP</td>
<td>φD=φ47.1</td>
<td>3</td>
<td>C-M103-1</td>
</tr>
</tbody>
</table>

---

### Indicator bush

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable models</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All models with an 8 mm diameter stem can be fixed with this indicator bush.</td>
<td>M-150</td>
</tr>
</tbody>
</table>

---

### Lug holder

<table>
<thead>
<tr>
<th>Shape</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMA-0417</td>
</tr>
</tbody>
</table>

---

### Rubber bells

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable models</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA - S510, SA - S510 / 03N</td>
<td>M-137</td>
</tr>
<tr>
<td></td>
<td>SA - S532</td>
<td>M-142</td>
</tr>
<tr>
<td></td>
<td>SA - S550</td>
<td>M-143</td>
</tr>
</tbody>
</table>

---

### Horizontal stands

Table plates (hardened lap)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable stand</th>
<th>Dimensions (mm)</th>
<th>Product No.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BST-18 (Auxiliary table)</td>
<td>25.0 x 40.0</td>
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</tr>
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<td></td>
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**Make-to-order manufacturing**

---

### Options & Accessories

- TRIMETRON / Mu-METRON
- Release / Finger Lever
- Option A: 4M-100P
- Option B: 2M-100
- Option C: 1S-100LP, 2S-100, 2M-100

---

### For ELEMETRON Lever Type

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
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<td>F-M103-1</td>
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### Indicator bush

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<tr>
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<tbody>
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</table>

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### Lug holder

<table>
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<th>Product No.</th>
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<tr>
<td></td>
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### Rubber bells

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<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA - S510, SA - S510 / 03N</td>
<td>M-137</td>
</tr>
<tr>
<td></td>
<td>SA - S532</td>
<td>M-142</td>
</tr>
<tr>
<td></td>
<td>SA - S550</td>
<td>M-143</td>
</tr>
</tbody>
</table>

---

### Horizontal stands

Table plates (hardened lap)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable stand</th>
<th>Dimensions (mm)</th>
<th>Product No.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BST-18 (Auxiliary table)</td>
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<td>TP-106**</td>
<td></td>
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<tr>
<td></td>
<td>BST-28</td>
<td>25.0 x 40.0</td>
<td>TP-107</td>
<td>A=3</td>
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<td></td>
<td>BST-28</td>
<td>25.0 x 40.0</td>
<td>TP-108</td>
<td>A=5.6</td>
</tr>
</tbody>
</table>

**Make-to-order manufacturing**
### Contact Points (BST-1B)

<table>
<thead>
<tr>
<th>Product No.</th>
<th>F-050</th>
<th>F-051</th>
<th>F-052</th>
<th>F-053</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shape</strong></td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
</tr>
<tr>
<td>Measurement range (mm)</td>
<td>φ 4 to 59</td>
<td>φ 12 to 67</td>
<td>φ 1.5 to 56</td>
<td>φ 67 to 128</td>
</tr>
<tr>
<td>Measurement depth (mm)</td>
<td>0 to 7</td>
<td>0 to 12</td>
<td>0 to 2.5</td>
<td>0 to 12</td>
</tr>
</tbody>
</table>

### Contact Points (BST-2B)

<table>
<thead>
<tr>
<th>Product No.</th>
<th>F-060</th>
<th>F-061</th>
<th>F-062</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shape</strong></td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
</tr>
<tr>
<td>Measurement range (mm)</td>
<td>φ 2 to 20</td>
<td>φ 10 to 23</td>
<td>φ 25 to 23</td>
</tr>
<tr>
<td>Measurement depth (mm)</td>
<td>0 to 2</td>
<td>2 to 5</td>
<td>2 to 5</td>
</tr>
</tbody>
</table>

### Contact Points (BST-3LB)

<table>
<thead>
<tr>
<th>Product No.</th>
<th>F-070*</th>
<th>F-071*</th>
<th>F-072*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shape</strong></td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
</tr>
<tr>
<td>Measurement range (mm)</td>
<td>L = 42.5, L = 35.5, L = 29</td>
<td>L = 44.5, L = 35.5, L = 29, L = 34.5</td>
<td>L = 37.5, L = 29, L = 21.5</td>
</tr>
<tr>
<td>Measurement depth (mm)</td>
<td>13 to 26</td>
<td>0 to 15</td>
<td>13 to 26</td>
</tr>
</tbody>
</table>

### Contact Points (H-2B, H-2LB)

<table>
<thead>
<tr>
<th>Product No.</th>
<th>F-150</th>
<th>F-152</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shape</strong></td>
<td>![Shape Diagram]</td>
<td>![Shape Diagram]</td>
</tr>
<tr>
<td>Measurement range (mm)</td>
<td>φ 4 to 59</td>
<td>φ 12 to 67</td>
</tr>
<tr>
<td>Measurement depth (mm)</td>
<td>0 to 7</td>
<td>0 to 12</td>
</tr>
</tbody>
</table>

---

**Options & Accessories**

- **Horizontal Stands**
- **Contact Points** (Contact points come in sets of two: one for the movable side and the other for the fixed side.)

- Made of SK carbon hardened steel.
- Made of SK carbon hardened steel. Can be used with BST-1B. * Make-to-order manufacturing
- Made of SK carbon hardened steel.
- Made of SK carbon hardened steel. F-050 is provided as standard. Note that a table plate (TP-108) is required when using F-061 or F-062.

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**List of Discontinued Products**

- **Amplifier** (ELEMETRON) DTM-FA
  - NE-8
  - NE-6
  - NE-6
  - NE-D
  - ECO-T
  - ECO-D

- **I/O interface card** (For DTM-FA, DGM-FC)
  - RS232C
  - RS232C-9F
  - CN-N
  - CN-C

- **Amplifiers** (ELEMETRON) DTM-CD
  - DTM-CA
  - DTM-CA/H

- **Detector** (ELEMETRON) DTM-CB
  - DTM-CB/1V
  - DTM-CB/5V
  - DTM-CB/10V
  - DTM-MD4

- **Light boxes for signal indicators**
  - TLB-1 TLB-7 TLB-3L TLB-3B TLB-5L

- **Amplifier** (ELEMETRON) DTM-AM

- **Detector** (ELEMETRON) DGM series
  - DGM-0501B
  - DGM-0505B
  - DGM-1001B
  - DGM-1005B
  - DGM-2501B
  - DGM-2505B
  - DGM-0201BT
  - DGM-0205BT

- **Machining sound level detectors**
  - DGN-2R

- **Counter** (DIGIMETRON)
  - DGN-FC
  - C-105E
  - C105EP

- **Detector** (DIGIMETRON)
  - IPD-C1003

- **Paper thickness measuring instrument**
  - NE-10B

- **Paper thickness measuring instrument**
  - NE-10B

- **Small bore measuring instruments** (Bore Check)
  - MEI-6D
  - MEI-6E

- **Small bore measuring instruments** (Bore Check)
  - MEI-6F

- **Rubber hardness tester / soft material hardness tester**
  - CH-801V
  - CH-801BHHD