# High Durability Series

**Longer Life Cylinder**

**New technology offers at least 4 times better durability**

- The maintenance intervals will be extended

- Employs the same specification and dimensions as the existing models, CXS2 Dual Rod Cylinder series

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### Series Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Bearing type</th>
<th>Model</th>
<th>Bore size [mm]</th>
<th>Cushion</th>
<th>Standard stroke [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual rod cylinder</td>
<td>Slide bearing</td>
<td>CXS2M-XB24</td>
<td>6  10  16  20  25  32</td>
<td>Rubber bumper</td>
<td>ø6: 10 to 100</td>
</tr>
<tr>
<td>CXS2 series</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ø10: 10 to 150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ø16 to ø32: 10 to 200</td>
</tr>
</tbody>
</table>

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**EMPLACES**:

- **CXS2-XB24**

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**High Durability Series**

High Durability Series is the series name for the “special specification” that offers superior durability and environmental resistance compared to standard products.
Longer Life Cylinder

CXS2-XB24

ø6, ø10, ø16, ø20, ø25, ø32

How to Order

CXS2 M 20 - 100 - M9BW - XB24

Bearing type
M Slide bearing

Bore size
6 6 mm
10 10 mm
16 16 mm
20 20 mm
25 25 mm
32 32 mm

Thread type
Symbol Type Bore size
Nil M thread ø6 to ø20
TN NPT1/8 ø25, ø32
TF G1/8

Number of auto switches
Nil 2
S 1
n n

Auto switch
Nil Without auto switch (Built-in magnet)

Cylinder stroke [mm]
For applicable auto switches, refer to the table below.

Applicable Auto Switches / Refer to the Web Catalog for further information on auto switches.

<table>
<thead>
<tr>
<th>Type</th>
<th>Special function</th>
<th>Electrical entry</th>
<th>Indicator light</th>
<th>Wiring (Output)</th>
<th>Load voltage</th>
<th>Auto switch model</th>
<th>Lead wire length [m]</th>
<th>Pre-wired connector</th>
<th>Applicable load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid state auto switch</td>
<td>—</td>
<td>Grommet Yes</td>
<td>3-wire (PNP)</td>
<td>5 V, 12 V</td>
<td>M9NV</td>
<td>M9N</td>
<td>0.5 (Nil) 1 (M)</td>
<td>—</td>
<td>IC circuit</td>
</tr>
<tr>
<td>Diagnostic indication (2-color indicator)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>24 V</td>
<td>M9PV</td>
<td>M9P</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Water resistant (2-color indicator)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2-wire 12 V</td>
<td>M9B</td>
<td>M9B</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Reed auto switch</td>
<td>—</td>
<td>Grommet Yes</td>
<td>3-wire (PNP)</td>
<td>5 V</td>
<td>M9NWV</td>
<td>M9NW</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire 24 V</td>
<td>12 V</td>
<td>M9PVW</td>
<td>M9PW</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M9BWV</td>
<td>M9BW</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.

*2 The 1 m lead wire is only applicable to the D-A93.

*3 Lead wire length symbols: 0.5 m ……… Nil (Example) M9NWV
1 m ………… M M9NWVM
3 m ………… L M9NWL
5 m ………… Z M9NWZ

* Solid state auto switches marked with a “○” are produced upon receipt of order.

* Since there are applicable auto switches other than those listed above, refer to the Web Catalog for details.

* For details on auto switches with pre-wired connectors, refer to the Web Catalog.

* Auto switches are shipped together with the product but do not come assembled.
Precautions

- Refer to the Web Catalog for cylinders with auto switches.
  - Auto Switch Proper Mounting Position (Detection at stroke end)
  - Operating Range
  - Auto Switch Mounting Dimensions
  - Auto Switch Mounting

Moisture Control Tube
IDK Series

When operating an actuator with a small bore size and a short stroke at a high frequency, dew condensation (water droplets) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the Web Catalog.

⚠️ Precautions

Refer to page 6 before handling.

Specifications

<table>
<thead>
<tr>
<th>Bore size [mm]</th>
<th>6</th>
<th>10</th>
<th>16</th>
<th>20</th>
<th>25</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air (Non-lube)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.05 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>0.7 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. operating pressure</td>
<td>0.15 MPa</td>
<td>0.1 MPa</td>
<td>0.05 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperatures</td>
<td>−10 to 60°C (No freezing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston speed</td>
<td>30 to 800 mm/s</td>
<td>30 to 700 mm/s</td>
<td>30 to 600 mm/s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cushion</td>
<td>Rubber bumper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke adjustable range</td>
<td>0 to –5 mm compared to the standard stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8</td>
<td>Rc (NPT, G) 1/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing type</td>
<td>Slide bearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable kinetic energy</td>
<td>0.016 J</td>
<td>0.064 J</td>
<td>0.095 J</td>
<td>0.17 J</td>
<td>0.27 J</td>
<td>0.32 J</td>
</tr>
</tbody>
</table>

Standard Stroke Range

<table>
<thead>
<tr>
<th>Model</th>
<th>Stroke range</th>
<th>Standard stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXS2M6</td>
<td>1 to 100</td>
<td>10, 20, 30, 40, 50, 60, 70, 75, 80, 90, 100</td>
</tr>
<tr>
<td>CXS2M10</td>
<td>1 to 150</td>
<td>10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150</td>
</tr>
<tr>
<td>CXS2M16</td>
<td>10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200</td>
<td></td>
</tr>
<tr>
<td>CXS2M20</td>
<td>10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200</td>
<td></td>
</tr>
<tr>
<td>CXS2M25</td>
<td>10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200</td>
<td></td>
</tr>
<tr>
<td>CXS2M32</td>
<td>10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200</td>
<td></td>
</tr>
</tbody>
</table>

> Intermediate strokes are available as special orders.

The model selection, non-rotating accuracy, deflection at the plate end, max. load mass, allowable kinetic energy, allowable loads at the rod end, theoretical output, and weight are equivalent to those of the Dual Rod Cylinder CXS2 series. For details, refer to the Web Catalog.
High Durability Series

CXS2-XB24

Dimensions: Ø6

- 2 x M3 thread depth 4.5
- 2 x Ø6.5 counterbore depth 3.3
- 2 x M5 x 0.8 (Piping port) (Opposite side: Same)
  - Equipped with plug at time of shipment

- 2 x M3 x 0.5 thread depth 4.5 (Piping port) (Opposite side: Same)
  - Equipped with plug at time of shipment
  - Opposite side not equipped with plug

- 2 x Ø3.2 through

- Opposite side not equipped with plug

- Through-hole

- Through-hole

- M3 (Through-hole)

- M3 (Through-hole)
Dimensions: \( \varnothing10, \varnothing16 \)

### Dimensions by Stroke

<table>
<thead>
<tr>
<th>Model</th>
<th>SS</th>
<th>Z</th>
<th>ZZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXS2M10</td>
<td>55</td>
<td>30</td>
<td>72</td>
</tr>
<tr>
<td>CXS2M16</td>
<td>60</td>
<td>25</td>
<td>79</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>NN</th>
<th>P</th>
<th>Q</th>
<th>QQ</th>
<th>R</th>
<th>U</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXS2M10</td>
<td>46</td>
<td>17</td>
<td>44</td>
<td>15</td>
<td>7.5</td>
<td>2 x M4 x 0.7</td>
<td>35</td>
<td>20</td>
<td>4</td>
<td>8</td>
<td>20</td>
<td>2 x M3 x 0.5</td>
<td>thread depth 5</td>
<td>( \varnothing6 )</td>
<td>34</td>
<td>8.5</td>
<td>7</td>
<td>30</td>
<td>2 x M4 x 0.7</td>
<td>thread depth 7</td>
</tr>
<tr>
<td>CXS2M16</td>
<td>58</td>
<td>20</td>
<td>56</td>
<td>18</td>
<td>9</td>
<td>2 x M5 x 0.8</td>
<td>45</td>
<td>25</td>
<td>5</td>
<td>10</td>
<td>30</td>
<td>2 x M4 x 0.7</td>
<td>thread depth 6</td>
<td>( \varnothing8 )</td>
<td>45</td>
<td>10</td>
<td>10</td>
<td>38.5</td>
<td>2 x M5 x 0.8</td>
<td>thread depth 8</td>
</tr>
</tbody>
</table>
**Dimensions: ø20, ø25, ø32**

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>NN</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXS2M20</td>
<td>64</td>
<td>25</td>
<td>62</td>
<td>23</td>
<td>11.5</td>
<td>2</td>
<td>50</td>
<td>28</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>30</td>
<td>2 x ø5.5 through</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x ø9.5 counterbore depth 5.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x M4 x ø0.7</td>
<td>ø10</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>CXS2M25</td>
<td>80</td>
<td>30</td>
<td>78</td>
<td>28</td>
<td>14</td>
<td>2</td>
<td>60</td>
<td>35</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>30</td>
<td>2 x ø6.9 through</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x ø11 counterbore depth 6.3</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x M5 x ø0.8</td>
<td>ø12</td>
<td></td>
<td>59.6</td>
</tr>
<tr>
<td>CXS2M32</td>
<td>98</td>
<td>38</td>
<td>96</td>
<td>36</td>
<td>18</td>
<td>2</td>
<td>75</td>
<td>44</td>
<td>8</td>
<td>16</td>
<td>14</td>
<td>30</td>
<td>2 x ø6.9 through</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x ø11 counterbore depth 6.3</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x M5 x ø0.8</td>
<td>ø16</td>
<td></td>
<td>75</td>
</tr>
</tbody>
</table>

**Dimensions by Stroke**

<table>
<thead>
<tr>
<th>Model</th>
<th>SS</th>
<th>Z</th>
<th>ZZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXS2M20</td>
<td>70</td>
<td>30, 25</td>
<td>94</td>
</tr>
<tr>
<td>CXS2M25</td>
<td>72</td>
<td>30, 25</td>
<td>96</td>
</tr>
<tr>
<td>CXS2M32</td>
<td>82</td>
<td>40, 50</td>
<td>112</td>
</tr>
</tbody>
</table>
Mounting

⚠️ Caution

1. Make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less).
   Dual rod cylinders can be mounted from 3 directions, however, make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less). Otherwise, the accuracy of the piston rod operation is not achieved, and malfunctioning can occur.

2. Piston rod must be retracted when mounting the cylinder.
   Scratches or gouges in the piston rod may lead to damaged bearings and/or seals and cause a malfunction or air leakage.

Piping

⚠️ Caution

1. Plug the appropriate supply port (s) according to the operating conditions.
   Dual rod cylinders have 2 supply ports for each operating direction (3 supply ports for ø6 only). Plug the appropriate supply port according to the operating conditions. Depending on the operating conditions, change the position of the plugs. When changing the port position, use the removed plug or a new plug.
   If reusing the removed plug, apply sealant, etc., before reassembly.
   If using a new M5 plug, apply a thin layer of grease all the way around the male thread before use. In addition, clear any foreign matter adhered to the port the plug was removed from before piping. After reassembly, be sure to check for air leakage before operating the product.

   Plug part no.: (ø6) CXS10-08-28747B
   CXS20-08-28749A
   (ø25 to ø32) CYP025-08B29449A (Rc1/8)
   CXS25-08-A3025B (NPT1/8)
   CXS25-08-A3911A (G1/8)

Stroke Adjustment

⚠️ Caution

3. The bumper located at the end of the bumper bolts
   If the bumper has permanently settled onto the product or if it is lost, an order can be placed by using the part numbers listed below.

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>6, 10, 15</th>
<th>20, 25</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>CXS10-34A 28747</td>
<td>CXS20-34A 28749</td>
<td>CXS32-34A 28751</td>
</tr>
<tr>
<td>Qty.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Disassembly and Maintenance

⚠️ Caution

1. Never use a cylinder with its plate removed.
   When removing the hexagon socket head cap screw on the end plate, the piston rod must be secured to prevent from rotating. However, if the sliding parts of the piston rod are scratched and gouged, a malfunction may occur.

2. When disassembling and reassembling the cylinder, please contact SMC or refer to the separate operation manual.

Warning

1. Take precautions when your hands are near the plate and housing.
   Take sufficient care to avoid getting your hands or fingers caught when the cylinder is operated.

Operating Environment

⚠️ Caution

1. Do not operate the cylinder in a pressurized environment.
   The pressurized air may flow inside the cylinder due to its construction.

2. Do not use as a stopper. This may cause a malfunction.
   When using as a stopper, select a stopper cylinder (RS series) or a compact guide cylinder (MGP series).

Speed Adjustment

⚠️ Caution

1. A sudden extension may occur with CXS2-6.
   CXS2-6 has a low internal volume and sudden extension/erratic movement may occur particularly when it is used at low speed. This sudden extension can be mitigated by combining the use of meter-in and meter-out speed controllers.

Durability of The Cylinder

The durability of a longer life cylinder has been evaluated by comparison with the existing cylinders under SMC’s test conditions.

The durability of a cylinder depends on the customer’s operating conditions and operating environment. Therefore, durability of four times or longer will not be guaranteed under all conditions.
These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\(^1\), and other safety regulations.

> **Safety Instructions**

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\(^1\), and other safety regulations.

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### Caution

- **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

### Warning

- **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

### Danger

- **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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#### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

#### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

#### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

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### Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

### Limited warranty and Disclaimer

**Limited warranty and Disclaimer**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

**Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\(^2\)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\(^2\) Vacuum pads are excluded from this 1 year warranty.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.