Contactless Touch Switches

Features
- Long lasting, stable operation even under frequent use because of lack of physical contact.
- Capable of very high precision in repeatability of operating point.
- The configuration separating moving parts from sensing part enables environment resistance.
- Can be customized to a model of limited operational force.

General specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>DC 5 — 24V</td>
</tr>
<tr>
<td>Output form</td>
<td>NPN or N.O. (N.C. as standard) / N.O as standard</td>
</tr>
<tr>
<td>Without LED max.</td>
<td>100 mA / 100 kΩ / N.O as standard</td>
</tr>
<tr>
<td>Indicator along the cable</td>
<td>Approx. 100mm from the switch head</td>
</tr>
<tr>
<td>Speed of IC response</td>
<td>5 μsec</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>20 — 85°C</td>
</tr>
<tr>
<td>Humidity range</td>
<td>20 — 95% RH</td>
</tr>
</tbody>
</table>

Mechanism
An external input pushing or pulling the probe moves the magnet back or forth, respectively. Sensing the magnet’s movements, the magnetic sensing circuit induces ON / OFF action and functions as a touch switch.

Features
- Long lasting, stable operation even under frequent use because of lack of physical contact.
- Capable of very high precision in repeatability of operating point.
- The configuration separating moving parts from sensing part enables environment resistance.
- Can be customized to a model of limited operational force.

Connection examples (circuit diagrams)
### Option

- **Cable connector**
  
  It is recommendable to use a cable connector when the cable path is long, or a separation of cable path is necessitated. We employ Sumitomo 3M’s sensor connector, namely Mini-Clamp Connector, and have the loose wires coated with hot-melt resin. The connector has high reliability and prevents connect failure when jointing/releasing.

### Precautions

- **Precautions for safety use**
  
  Although our products are designed to ensure safety and address risks, in case that a switch malfunction or failure is expected to lead to serious risks to life or property, please be advised to expand further safety gear such as the incorporation of dual circuit.

- **Correct wiring**
  
  1. *Prevention of reverse connection*—Please observe the circuit diagrams so as to ensure correct connections. Reverse connection of power supply is strictly prohibited.
  2. *Relay drive*—When driving a relay, please connect a free-wheel diode in parallel.

- **Mounting the switch**
  
  1. *Clamping torque*—Please observe the value of torque designated for each switch.
  2. *Cable handling*—Do not subject the connecting part between cable and switch-head to tension (tensile strength as 20N at max., the bending radius as 7mm at least).

### Examples for Application of Screw-type Switches

- **Touch Sensor, Sensor for bottom dead center**
  
  Sensing position

- **Example of mounting in stop wall**
  
  Stopper

- **Example of using stop nut**
  
  Stopper

- **Example of using stop block**
  
  Stopper
Contactless Touch Switch
Micro Switch

Model

MR1 A-H U

Operation
A : N.O.  
B : N.C.

Operation force
H : Standard  
J : Low operation force 
*Low operation force type is not available with rubber sealed models.

Rubber seal
U : with seal  
Blank : without seal

Specifications

Repeatability precision
±0.02mm

Case material  
Heat resistant ABS

Rubber seal material  
Nitrile rubber

Operating temperature range for rubber sealed models : -10°C – 60°C

Precautions
• Because of the possible damage, do not push the button over the stroke range.
• Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

Micro Switch

Model

MS1 A-H U

Operating part
E : Lever type  
Blank : Button type

Operation
A : N.O.  
B : N.C.

Operation force
H : Standard  
J : Low operation force 
*Low operation force type is not available with rubber sealed models.

Rubber seal
U : with seal  
Blank : without seal

Specifications

Repeatability precision
±0.02mm

Case material  
Heat resistant ABS

Rubber seal material  
Nitrile rubber

Cable length
1m

Operating temperature range for rubber sealed models : -10°C – 60°C

Maximum operation force

<table>
<thead>
<tr>
<th>Rubber seal</th>
<th>Standard mode</th>
<th>Low operation force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not included</td>
<td>0.6</td>
<td>0.15</td>
</tr>
<tr>
<td>Included</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Not included</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Included</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Precautions
• Because of the possible damage, do not push the button over the stroke range.
• Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
**Contactless Touch Switch**

### Needle Switch

**Dimensions (mm)**

- Model: **N3 08 - L 100 - D**
  - Needle's diameter: 0.8 mm, 0.4 mm
  - Length of operating point: 7, 10, 50, 75, 100, 150
  - Built-in switch: S: Single, D: Double

**Specifications**

- Repeatability precision: 0.06 mm
- Stroke: 5 mm
- Operation force: 0.25 N
- Needle material: SUS

**Precautions**

- Because of possible damage, do not push the button over the stroke range.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

---

**Needle Switch**

**Dimensions (mm)**

- Model: **N6 A - 60 - LED**
  - Operation: A: N.O., B: N.C.
  - Cable indicator: Blank: without indicator, LED: with indicator

**Specifications**

- Stroke: 1.4 mm
- Idle margin to operation [PT]: 0.3 mm to 0.6 mm
- Hysteresis [MD]: 0.1 mm max.
- Operation force: 0.3 N
- Sensitivity of operating point: 0.002 mm
- Stability of operating point (error margin): 0.01 mm max.
- Case, nut, shaft: SUS303
- Degree of protection: IP65

**Precautions**

- Because of possible damage, do not push the button over the stroke range.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
**Contactless Touch Switch**

**M10 Touch Switch**

- **Strong Case · Outdoor-safe type**

**Dimensions (mm)**

- Stroke: 13
- Operating point 1: 2.5
- Operating point 2: 17.5
- Cable: 1 m as standard

*(Standard double)*

- Operating point 1 (N.O.): 0 ± 0.15
- Operating point 2 (N.C.): 1 ± 0.15
- Stroke: 3

*(Note of optional model)*

N.O. + N.O., N.C. + N.C. are also available

*When specifying the positioning of operating point 2, the max. pitch shall be 1.6 with an error margin of ±0.15.*

**Addition to the series**

**STM10 - S B**

- Built-in switch
  - Single Blank: N.O.
  - Double Blank: N.O. + N.C.

**Specifications**

- **Stroke [FT]**: 3 mm max.
- **Idle margin to operation [PT]**
  - S : Single switch 0.3 ± 0.15mm
  - D : Double point 1 0.3 ± 0.15mm
  - D : Double point 2 1.0 ± 0.15mm
- **Hysteresis [MD]**: 0.1mm max.
- **Operation force**
  - Note: Do not apply force of more than 3N.
- **Sensitivity of operating point**: 0.002 mm
- **Stability of operating point**: 0.01 mm max.
- **Clamping torque**: 15N·m
- **Degree of protection**: Equivalent to IP67
- **Material of Case, nut, axis**: SUS303

**Precautions**

- Because of the possible damage, do not push the button over the stroke range.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

**Model**

**STM8 - B - LED**

- **Operation**
  - Blank: N.O.
  - B : N.C.
  - Cable indicator
  - Blank: without indicator
  - LED: with indicator

**Specifications**

- **Stroke [FT]**: 1.5 mm
- **Idle margin to operation [PT]**: 0.4~0.7 mm
- **Hysteresis [MD]**: 0.1 mm max.
- **Operation force**
  - Note: Do not apply force of more than 3N.
- **Sensitivity of operating point**: 0.002 mm
- **Stability of operating point**: 0.01 mm max.
- **Clamping torque**: 5N·m max.
- **Degree of protection**: Equivalent to IP67
- **Material of Case, nut, axis**: SUS303

**Precautions**

- Because of the possible damage, do not push the button over the stroke range.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
Contactless Touch Switch

M8 Long Touch Switch

- **Model**
  - STM8L-B-LED
  - **Operation**
    - Blank: N.O.
    - B: N.C.
  - **Cable indicator**
    - Blank: without indicator
    - LED: with indicator

- **Specifications**
  - **Stroke (FT)**: 3 mm
  - **Idle margin to operation (PT)**: 0.4 ~ 0.7 mm
  - **Hysteresis (MD)**: 0.1 mm max.
  - **Operation force**
    - Note: Do not apply force of more than 30N.
    - 0.8N
  - **Sensitivity of operating point**: 0.002 mm
  - **Stability of operating point**: 0.02 mm
  - **Clamping torque**: 5N·m max.
  - **Degree of protection**: Equivalent to IP65
  - **Material of Case, nut, axis**: SUS303

- **Precautions**
  - Because of the possible damage, do not push the button over the stroke range.
  - Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

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M6 Touch Switch

- **Model**
  - STM6-B-LED
  - **Operation**
    - Blank: N.O.
    - B: N.C.
  - **Cable indicator**
    - Blank: without indicator
    - LED: with indicator

- **Specifications**
  - **Stroke (FT)**: 1.2 mm
  - **Idle margin to operation (PT)**: 0.4 ~ 0.7 mm
  - **Hysteresis (MD)**: 0.1 mm max.
  - **Operation force**
    - Note: Do not apply force of more than 30N.
    - 0.3N
  - **Sensitivity of operating point**: 0.002 mm
  - **Stability of operating point**: 0.01 mm
  - **Clamping torque**: 2N·m max.
  - **Degree of protection**: Equivalent to IP67
  - **Material of Case, nut, axis**: SUS303

- **Precautions**
  - Because of the possible damage, do not push the button over the stroke range.
  - Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
**Contactless Touch Switch**

**PM4 type Touch Sensor**

![PM4 type Touch Sensor](image)

**Model**

PM4 - 6S - M4 - 0.8 - 2.5 - 4.0

- **Dimensions (mm)**

<table>
<thead>
<tr>
<th>Part</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball R1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Rubber boot</td>
<td>10</td>
</tr>
<tr>
<td>Hexagon</td>
<td>15</td>
</tr>
<tr>
<td>3 to 6 wire cable</td>
<td>44 (max.)</td>
</tr>
<tr>
<td>Ball contact type</td>
<td>5.5</td>
</tr>
<tr>
<td>Plane contact type</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- **Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>6 mm</td>
</tr>
<tr>
<td>Operation force</td>
<td>0.5 - 1.5 N</td>
</tr>
<tr>
<td>Operation sensitivity</td>
<td>4 μm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.08 mm</td>
</tr>
<tr>
<td>Response speed</td>
<td>5 μ sec max.</td>
</tr>
<tr>
<td>Material of case and nut</td>
<td>Stainless steel (SUS303)</td>
</tr>
<tr>
<td>Clamping torque</td>
<td>20 N·m</td>
</tr>
<tr>
<td>Rubber boot material</td>
<td>Nitrile rubber</td>
</tr>
<tr>
<td>Cable length</td>
<td>1 m</td>
</tr>
</tbody>
</table>

- **Precautions**

- The touch angle of the stroke axis against sensing object should be 5° or less.
- Do not apply rolling force to the contact part (0.1N·m max.).
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the sensor.

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**PM5 type Touch Sensor**

![PM5 type Touch Sensor](image)

**Model**

PM5 - 6C - 3

- **Dimensions (mm)**

<table>
<thead>
<tr>
<th>Part</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Rubber boot</td>
<td>10</td>
</tr>
<tr>
<td>Hexagon</td>
<td>15</td>
</tr>
<tr>
<td>3 to 6 wire cable</td>
<td>44 (max.)</td>
</tr>
<tr>
<td>Indicator (NO. 1-4)</td>
<td>8</td>
</tr>
</tbody>
</table>

- **Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>6 mm</td>
</tr>
<tr>
<td>Operation force</td>
<td>0.5 - 1.5 N</td>
</tr>
<tr>
<td>Operation sensitivity</td>
<td>4 μm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.08 mm</td>
</tr>
<tr>
<td>Response speed</td>
<td>5 μ sec max.</td>
</tr>
<tr>
<td>Material of case and nut</td>
<td>Stainless steel (SUS303)</td>
</tr>
<tr>
<td>Clamping torque</td>
<td>20 N·m</td>
</tr>
<tr>
<td>Tip shape</td>
<td>#3 carbide ball</td>
</tr>
<tr>
<td>Cable length</td>
<td>1 m</td>
</tr>
</tbody>
</table>

- **Precautions**

- The touch angle of the stroke axis against sensing object should be 5° or less.
- Do not apply rolling force to the contact part (0.1N·m max.).
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the sensor.
- As the adjustment screw part at the back end of the case has fine and precision mechanics, due attention and careful handling are required to prevent functional impairments.

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● Contactless Touch Switch

PM6 type Touch Sensor

Probe-changeable type

■ Dimensions (mm)

■ Model

PM6 - 6 - 2

Stroke (mm): 6
The number of switches: 1 - 4

■ Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Stroke</th>
<th>Operation force</th>
<th>Operation sensitivity</th>
<th>Repeatable precision</th>
<th>Hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM6 - 6</td>
<td>6</td>
<td>0.5 - 1.5 N</td>
<td>4 μm</td>
<td>0.01 mm</td>
<td>0.08 mm</td>
</tr>
</tbody>
</table>

■ Probes to replace

(please purchase commercial products)

■ Precautions

- When installing a probe, hold the tip with 5mm spanner, and screw the probe into the case firmly.
- Do not apply a torque of more than 1N·m to the connection between the probe axis and the case.
Contactless Touch Switch

Flat Switch

Dimensions (mm)

Model

STF15 - LED

Specifications

Precautions

Because of the possible damage, do not push the button over the stroke range.

Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

Slim Switch

Dimensions (mm)

Model

STS8 - LED

Specifications

Precautions

Because of the possible damage, do not push the button over the stroke range.

Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
Contactless Touch Switch
Limit Switch

Dimensions (mm)

Features

- Contactless circuit
  Superior reliability and long functional life compared to mechanical contact switches, durable more than 20 million operations.

- Shielded structure
  Immune to hostile environments, available under such conditions as pouring water / oil.

- Stable operation
  Because such parts susceptible to common troubles as hinges and sliding parts, are not exposed, stable operation can be assured.

- High sensibility
  The accuracy of the repeatability of operating point is ±0.02mm.

Specifications

- Power supply: DC 5 – 24V
- Output form: NPN Normally open 15mA max.
- Response speed: 5μ sec max.
- Degree of protection: Equivalent to IP67
- Ambient temperature range: 0 – 100°C
- Case material: Aluminum alloy Black anodite treatment
- Material of chevron shaped lever: SUS304 Nitriding treatment (Hm1300)
- Material of flexural plate: Polyimide resin plate
- Material of corrugated seal: Polyimide plate 0.75µm
- Material of cable seal: Nitrile rubber
- Material of cable protector: SUS304
- Operation force: [OF] 1.2N max.
- Idle margin to operation: [PT] 1.4mm max.
- Hysteresis: [MD] 0.5mm max.
- Operating position: [OP] 18±0.2mm
- Max. stroke: [FT] 3.3mm max.

Precautions

- Because of the possible damage, do not push the lever over the stroke range.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.
**Contactless Touch Switch**

**Stopper Switch**

**Mini Stopper Switch**

---

**Dimensions (mm)**

- **STB30**
  - Operation: Blank: N.O. B: N.C.
  - Cable protector: Blank with cable protector G

- **STM14**
  - Operation: Blank: N.O. B: N.C.

- **STR10**
  - Operation: Blank: N.O. B: N.C.

**Specifications**

- **STB30**
  - Response speed: 5 μ sec max.
  - Case material: SUS304
  - Material of cable seal: Nitrile rubber
  - Degree of protection: Equivalent to IP67
  - Static withstand load: 100N

- **STM14**
  - Response speed: 5 μ sec max.
  - Case material: SUS304
  - Material of cable seal: Nitrile rubber
  - Degree of protection: IP44
  - Static withstand load: 104N

- **STR10**
  - Cable indicator: Blank: without indicator LED: with indicator

**Specifications**

- **STR10**
  - Stroke (FT): 0.7~1.6mm
  - Sensing point from the bottom: 5.0±0.2mm
  - Hysteresis (MD): 0.1 max.
  - Operation force: 0.3N
  - Withstand load of stopper: 1.002N (Static load)
  - Sensitivity of operating point: 0.003mm
  - Stability of operating point: 0.05mm
  - Degree of protection: Equivalent to IP67
  - Material of case and acts: SUS303

**Precautions**

- Do not push the actuator over the stopper level due to risk of damage.
- Do not prod the seal part with edged stuff due to risk of damage.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

---

**Dimensions (mm)**

- **STB30**
  - 2: ø3.5, ø6 Depth of spot facing 4.5

- **STM14**
  - Maximum pulling force: 0.7N

- **STR10**
  - 3: 12.5 Y shaped groove, Width: 0.8
Contactless Touch Switch

M10 Ball Plunger Switch

Dimensions (mm)

Model

STMB10 A - H - LED

Specifications

<table>
<thead>
<tr>
<th>Stroke [FT]</th>
<th>1mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle margin to operation [PT]</td>
<td>0.3 - 0.6mm</td>
</tr>
<tr>
<td>Hysteresis [MD]</td>
<td>0.1mm max.</td>
</tr>
<tr>
<td>Sensitivity of operating point</td>
<td>0.002mm</td>
</tr>
<tr>
<td>Stability of operating point (error margin)</td>
<td>0.01mm max.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20 – +85°C</td>
</tr>
<tr>
<td>Material of case, nut and ball</td>
<td>SUS</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
</tr>
</tbody>
</table>

Examples of use

When used as a touch switch

When used as a ball plunger switch (STMB12 - H)

12 Ball Plunger Switch

Dimensions (mm)

Model

STFB12 A - H - LED

Specifications

<table>
<thead>
<tr>
<th>Stroke [FT]</th>
<th>1mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle margin to operation [PT]</td>
<td>0.3 - 0.6mm</td>
</tr>
<tr>
<td>Hysteresis [MD]</td>
<td>0.1mm max.</td>
</tr>
<tr>
<td>Sensitivity of operating point</td>
<td>0.002mm</td>
</tr>
<tr>
<td>Stability of operating point (error margin)</td>
<td>0.01mm max.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20 – +85°C</td>
</tr>
<tr>
<td>Material of case and ball</td>
<td>SUS</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
</tr>
</tbody>
</table>

Note: When the movement of the ball lacks smoothness, take off the cap, clean the ball, moving axis and spring, and reassemble the parts.
Contactless Touch Switch

Probe Switch

Precautions
Do not push the probe over the stroke due to risk of damage.
Do not roll the probe due to risk of damage.
Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

Dimensions (mm)

Connection example (circuit diagram)

Four-way Probe Switch

Model

AX1 L H - LED

Specifications

Dimensions (mm)

Connection example (circuit diagram)

Model

AX4 H - LED

Specifications

Dimensions (mm)

Precautions
Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

Contactless Switch

Prob Switch

Precautions
Do not push the probe over the stroke due to risk of damage.
Do not roll the probe due to risk of damage.
Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the switch.

Dimensions (mm)

Connection example (circuit diagram)
Contactless Touch Switch
High-precision Tool Sensor

Features

- **Ultra high repeatable precision**
  Benefits of unique magnetic circuit and application of Hall IC realized the accuracy of 0.2 \( \mu m \) (3 \( \sigma \)) in repeatability of operating position. Perfect for evolutionary NC processing machines.

- **Trouble free with non-contact structure**
  Contactless circuit structure assures operations free from any troubles caused by contact degradation. The installation is easy because the output can be relayed directly into e.g., sequencers without amplification along the path.

- **Smooth and reliable**
  Ball slide system ensures smooth movement. Capable of low-profile mode, suited to small drills, etc., as well.

Dimensions (mm)

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>UTS-10-2T</th>
<th>UTS-10-2F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>DC 24V ±10%</td>
<td>DC 24V ±10%</td>
</tr>
<tr>
<td>Stroke</td>
<td>10 mm</td>
<td>10 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.2 ( \mu m ) (3 ( \sigma ), 20°C)</td>
<td>0.2 ( \mu m ) (3 ( \sigma ), 20°C)</td>
</tr>
<tr>
<td>Application direction</td>
<td>Vertical and horizontal directions</td>
<td>Vertical and horizontal directions</td>
</tr>
<tr>
<td>Measuring force</td>
<td>1.8 N (Referential value)</td>
<td>1.8 N (Referential value)</td>
</tr>
<tr>
<td>Output form</td>
<td>Open collector with a pull-up</td>
<td>Open collector floating</td>
</tr>
<tr>
<td>Consumption current</td>
<td>20 mA max.</td>
<td>50 mA max.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C to 50°C (with no condensation)</td>
<td>0°C to 50°C (with no condensation)</td>
</tr>
<tr>
<td>Output capacity (DC24V)</td>
<td>15 mA</td>
<td>12 mA</td>
</tr>
<tr>
<td>Output capacity (AC100V)</td>
<td>5 mA</td>
<td>5 mA</td>
</tr>
<tr>
<td>Operational time lag</td>
<td>5 ( \mu ) sec max.</td>
<td>8 ( \mu ) sec max.</td>
</tr>
</tbody>
</table>

Connection examples (circuit diagrams)

Precautions

- Do not push the actuator over the stroke due to risk of damage.
- Extremely strong magnetic field (more than 1,200 Gauss) might cause malfunction of the sensor.
Contactless Touch Switch

Tool Sensor for Extra-Fine Drills

Features

- Unprecedented ultra-low operation power
  With the measuring force as only 0.01N (1g-f), capable of measuring ultra-fine drills and probes without inclination.

- Repeatability of micron accuracy
  The repeatable precision marks 2μm. Suitable also for diamond core tools because ruby is used for the actuator part as standard component.

- Trouble free with non-contact structure
  Contactless circuit structure assures operations free from any troubles caused by contact degradation. The installation is easy because the output can be relayed directly into e.g., sequencers without amplification along the path.

Dimensions (mm)

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>BTS-2-1T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>DC 5~24V</td>
</tr>
<tr>
<td>Stroke</td>
<td>2mm</td>
</tr>
<tr>
<td>Repeatable precision</td>
<td>2μm</td>
</tr>
<tr>
<td>Application direction</td>
<td>Vertical</td>
</tr>
<tr>
<td>Measuring force</td>
<td>0.01N (1g-f)</td>
</tr>
<tr>
<td>Output form</td>
<td>NPN Open collector output X1</td>
</tr>
<tr>
<td>Consumption current</td>
<td>10mA max.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0~+50°C (with no condensation)</td>
</tr>
</tbody>
</table>

Connection example (circuit diagram)

Precautions

- Do not push the actuator over the stroke due to risk of damage.
- Do not push the actuator to other directions than the stroke due to risk of damage.
- Extremely strong magnetic field (more than 1,000 Gauss) might cause malfunction of the sensor.
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