For material handling and clamping of small workpieces

**Power Clamp Cylinder (Compact Type)**

- **ø25, ø32**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td><strong>580 g</strong></td>
</tr>
<tr>
<td>(ø25, Rubber cover)</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td><strong>34 mm</strong></td>
</tr>
<tr>
<td>Height</td>
<td><strong>192.4 mm</strong></td>
</tr>
<tr>
<td>(ø25, Arm opening angle: 90°, Rubber cover)</td>
<td></td>
</tr>
<tr>
<td>Clamping force</td>
<td><strong>1100 N</strong></td>
</tr>
<tr>
<td>(ø32, Arm length: 50 mm, 0.5 MPa pressure)</td>
<td></td>
</tr>
</tbody>
</table>

- **Lightweight**
- **Compact**
- **High clamping force**
- **Lock function**

- **Force amplification with a toggle mechanism and lock function**
  Can hold a clamped state when supply pressure drops or residual pressure is released

- **Spatter-proof construction**
  Fully closed structure prevents the intrusion of spatter

- **Equipped with a proximity switch that can be used in welding magnetic fields**

- **A model with a manually operated handle is available.**
  For manual workpiece setting processes

**Model Numbers**

- **CKZT** -X2797, -X3064 (Base Type)
- **CKZT** -X2798□, -X3174□ (With Manually Operated Handle)

**CKZT Series**

**SMC** 16-E682
Clamp arm

Power Clamp Cylinder  
**Compact Type**  
**CKZT** -X2797, -X3064 -X2798, -X3174  
Ø25, Ø32

**How to Order**

**Base type**

- With manually operated handle

**CKZT** 25 - 105 S - X2797  
**CKZT** 25 - 105 S - X2798 L

**Bore size**

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>25 mm</th>
<th>32 mm</th>
</tr>
</thead>
</table>

**Arm opening angle**

- 90°  
- 105°

* Please contact SMC for other opening angles.

**Top cover**

- Rubber cover (Equivalent to UL94 Standard V0: Flame resistant)
- Metal cover

**Clamp arm**

**Mounted clamp arm**

**Top cover**

- Rubber cover (Equivalent to UL94 Standard V0: Flame resistant)
- Metal cover

**Arm mounting position**

- **Center**
- **Right**
- **Left**

With manually operated handle

90° 105° 105°
Cylinder Specifications

<table>
<thead>
<tr>
<th>Bore size</th>
<th>25</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Double acting</td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.2 MPa</td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>0.8 MPa</td>
<td>0.5 MPa</td>
</tr>
<tr>
<td>Min. operating pressure</td>
<td>0.3 MPa</td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperatures</td>
<td>−10 to 60°C (No freezing)</td>
<td></td>
</tr>
<tr>
<td>Cushion</td>
<td>Clamping side: None</td>
<td>Unclamping side: Rubber bumper</td>
</tr>
<tr>
<td>Operating time</td>
<td>Clamping: 1 sec. or more, Unclamping: 1 sec. or more</td>
<td></td>
</tr>
<tr>
<td>Max. allowable holding moment</td>
<td>75 N·m</td>
<td></td>
</tr>
</tbody>
</table>

*1 Refers to the maximum holding force (torque) while clamped with the operating air exhausted. This is not the possible holding force (torque) for normal use.

Weight

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Base type cylinder</th>
<th>Cylinder with manually operated handle</th>
<th>Clamp arm</th>
<th>Additional weight of the metal cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>580</td>
<td>820</td>
<td>230</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>710</td>
<td>950</td>
<td>230</td>
<td></td>
</tr>
</tbody>
</table>

* The weight is the same for both arm opening angles of 90° and 105°.

Proximity Switch Specifications

<table>
<thead>
<tr>
<th>Part number</th>
<th>CKZ25-36-133NN-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>SENSTRONIC</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>10 to 30 VDC</td>
</tr>
<tr>
<td>Output</td>
<td>N.O., PNP</td>
</tr>
<tr>
<td>Continuous load current</td>
<td>100 mA</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP67</td>
</tr>
<tr>
<td>Housing material</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>Output indication</td>
<td>Clamping side: Red Unclamping side: Yellow</td>
</tr>
<tr>
<td>Voltage indication</td>
<td>Green</td>
</tr>
<tr>
<td>Connection cable length (M12 connector)</td>
<td>100 mm</td>
</tr>
<tr>
<td>Tightening torque for proximity switch mounting bolt</td>
<td>0.63 to 0.82 N·m</td>
</tr>
</tbody>
</table>

* Switch specifications correspond to the manufacturer’s technical information.

Replacement Parts

Top cover kit no.

**CKZ25-53B781EL-R**

Rubber cover

**CKZ25-53-1042T-R**

* The top cover kit includes a top cover and mounting brackets. Refer to page 8 for top cover replacement instructions.

Wiring Diagram (PNP Connection Circuit)

* Please contact SMC for NPN specifications.
Dimensions

**CKZT-X2797, -X3064**

**CKZT-X2797**  
Rubber cover

**CKZT-X2798, -X3174**  
Metal cover type

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Arm opening angle</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>90°</td>
<td>148.4</td>
<td>69.4</td>
<td>72</td>
<td>30</td>
<td>30</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>105°</td>
<td>152.5</td>
<td>73.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>90°</td>
<td>157.7</td>
<td>73.6</td>
<td>71.5</td>
<td>40</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>105°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Dimensions inside ( ) are for metal cover type.
Dimensions: With Manually Operated Handle

CKZT-□-□S-X2798\textsuperscript{R}  
CKZT-□-□S-X3174\textsuperscript{R}

* Refer to the CKZT-□-□S-X2797 (page 3) for dimensions other than those shown below.

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Arm opening angle</th>
<th>F°</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>90°</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>105°</td>
<td>126</td>
</tr>
<tr>
<td>32</td>
<td>90°</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>105°</td>
<td>126</td>
</tr>
</tbody>
</table>
Dimensions: Clamp Arm

CKZT25-A000_L-S-X2797
**Model Selection**

### Relation between arm length and clamping force

![Diagram of arm length and clamping force](image)

**Bore Size: 25**

![Graph for Bore Size 25](image)

**Bore Size: 32**

![Graph for Bore Size 32](image)

**Calculation example**
The maximum clamping force when the arm length is 100 mm and the operating pressure is 0.3 MPa:
With an arm length of 100 mm and an operating pressure of 0.3 MPa, according to the graph, the maximum clamping force is 200 N.

### Allowable arm length

![Diagram for allowable arm length](image)

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Allowable arm length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>25, 32</td>
<td>200</td>
</tr>
</tbody>
</table>

### Allowable load mass

The allowable load mass changes depending on the arm opening angle. Be sure to use the product within the allowable values shown in the graph to the right.

- The load indicates the total weight of the clamp arm, extension arm, and clamping block.
- When the operating time is 1 second

**Calculation procedure for allowable load mass**

1. Calculate the distance \( L \) from the fulcrum to the load center of gravity.
2. Check the arm opening angle of the product.
3. Read the allowable load mass from the graph.

**Calculation example**
With an arm opening angle of 90° and a 125 mm distance to the center of gravity, according to the graph, the maximum allowable load mass is 1 kg.
Precautions

1) There is a mechanical difference of 0 to \(+0.5^\circ\) at the clamping end as shown in Figure 1. Be sure to make adjustments externally using a shim. Refer to page 9.

2) Be sure to use a speed controller, and make adjustments according to the following conditions.
   - Unclamping to clamping: 1 second or more
   - Clamping to unclamping: 1 second or more

3) If excessive kinetic energy is applied, there is a possibility of damage.

3) When using a side guide:
   - Attach the side guide so that lateral loads, such as galling, etc., are not applied to the clamp arm.

Power clamp cylinder mounting and setup procedure

<Ex. 1 When using clamping force only: When equipped with a workpiece receptacle>

**Procedure**

- **A** Set the workpiece
- **B** Supply air → Operate to the end of the clamp → Shim adjustment
- **C** Install a block on the arm side → Make block contact adjustments (arm side) → Shim adjustment
- **D** Exhaust air → Check that the clamp arm is locked

A) Place the workpiece, supply air to the clamping port without attaching the block on the arm side, and operate the clamp arm to the end of the clamp.

B) In the state of A), attach the workpiece and the arm side block, and adjust the shim so that there is a space of about 0 mm. During this step, theoretically, there is no clamping force pressing down on the workpiece.

C) In order to generate a clamping force from the state described in step B), insert an additional shim.
   - The thickness of the shim changes depending on the arm length and the operating pressure. Refer to page 9.
   - Please note that the graph should only be used as a guide, as there is a tolerance of about 10% in the clamp cylinder body.

D) Exhaust the air while in the clamped state, and confirm that the clamp arm does not open.
<Ex. 2 When using a hard stop: When not equipped with a workpiece receptacle>

A) Supply air to the clamping port without installing the upper hard stop, and operate the clamp arm to the end of the clamp.

B) In the state of A), attach the upper hard stop and adjust the shim so that there is a space of about 0 mm between the upper hard stop and the hard stop. During this step, theoretically, there is no clamping force applied to the hard stop.

C) In order to generate a clamping force from the state described in step B), insert an additional shim.

The thickness of the shim changes depending on the distance to the hard stop and the operating pressure. Refer to page 9, and consider the distance to the hard stop as the arm length.

Please note that the graph should only be used as a guide, as there is a tolerance of about 10% in the clamp cylinder body.

D) In the state of C), adjust shim so that the arm side block contacts the workpiece.

E) Exhaust the air while in the clamped state, and confirm that the clamp arm does not open.

Top cover replacement

• Caution Be sure to confirm safety and perform installation while the air is exhausted.

1) Mount the top cover to the clamp cylinder, then tighten to the specified tightening torque below.

- It is not possible to change between cover materials afterwards (rubber cover type/metal cover type).
- Refer to Replacement Parts (page 2) for the part numbers of the top cover replacement parts.
**Relation between shim thickness and clamping force**

- Use this figure as a guide, as there is a tolerance of about 10% in the clamp cylinder body.
- When a shim exceeding the peak clamping force position on the graph is inserted, the lock will not be activated when clamped. Insert a shim of the appropriate thickness.
- The arm length indicates the distance between the clamp arm shaft and the clamping position.

**Bore Size: 25**

**Bore Size: 32**
1. Manual lock release
   Be sure to confirm safety before manually releasing the lock, and only perform work while the air is exhausted. Otherwise, the clamp arm may operate.
   - In case of a rubber cover, the lock can be released easily by hitting the round tab on the cover with a plastic hammer.
   - In the case of a metal cover, the lock can be released easily by opening the cover and hitting the tab of the knuckle joint with a plastic hammer.
   - Provide enough space to perform a manual lock release.

2. Do not disassemble the power clamp cylinder.
   The power clamp cylinder consists of a completely sealed structure in order to protect it from welding spatter. Do not disassemble, except for when replacing any of the replaceable parts, as the performance may deteriorate.

3. Vertical clamping
   When mounting the clamp arm in a vertical clamping position, mount as shown in the figure below. In the case of a metal cover, the metal cover and clamp arm will interfere and the lock cannot be released manually.

4. Proximity switch output
   The switch output signal is output near the clamping end and the unclamping end respectively. The switch output signal on the clamping side does not output the status where the power clamp cylinder is locked by the toggle mechanism.
Power Clamp Cylinder Variations

- For detailed dimensions and specifications, refer to the Web Catalog.

**Micro Clamp Cylinder: CKZM16-X2800/X29000**
- Compact: Width 20 mm, Lightweight: 250 g
- Maximum clamping force: 200 N, Maximum holding force: 300 N
- Flat clamping characteristics
- Outputs constant clamping force for workpiece thicknesses up to 3.5 mm

<table>
<thead>
<tr>
<th>Type</th>
<th>Series</th>
<th>Action</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base type</td>
<td>CKZM16-X2800</td>
<td>Double acting</td>
<td>16</td>
</tr>
<tr>
<td>Tandem type</td>
<td>CKZM16-X2900</td>
<td>Double acting</td>
<td>16</td>
</tr>
</tbody>
</table>

**Power Clamp Cylinder Compact Type: CKZT-X2797, -X3064, -X2998, -X3174**
- Lightweight: Weight: 580 g (ø25)
- Compact: Width: 20 mm, Lightweight: 250 g
- Maximum clamping force: 200 N, Maximum holding force: 300 N
- Flat clamping characteristics
- Outputs constant clamping force for workpiece thicknesses up to 3.5 mm
- Reduction of design/assembly labor by unitization
- Arm assembly and mounting assembly have been added to the clamp cylinder.

<table>
<thead>
<tr>
<th>Series</th>
<th>Arm opening angle</th>
<th>Switch</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKZT-X2797, -X3064</td>
<td>90°, 105°</td>
<td>SENSTRONIC</td>
<td>25, 32</td>
</tr>
<tr>
<td>CKZT-X2798, -X3174</td>
<td>90°, 105°</td>
<td>SENSTRONIC</td>
<td>25, 32</td>
</tr>
</tbody>
</table>

**Power Clamp Cylinder: CKZ3T-X2734/X2568**
- Simple switch adjustment greatly reduces work hours.
- Switch can be adjusted easily when changing the arm opening angle.
- With metal switch cassette cover
- Weight reduced by up to 39%
- High clamping force: 4000 N
- Spatter-proof construction
- Select from 2 types of top cover
- A model with a manually operated handle is available.

<table>
<thead>
<tr>
<th>Series</th>
<th>Arm opening angle</th>
<th>Switch</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKZ3T-X2734</td>
<td>15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>50, 63</td>
</tr>
<tr>
<td>CKZ3T-X2568</td>
<td>15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>50, 63</td>
</tr>
</tbody>
</table>

**NAAMS Standards Compliant Power Clamp Cylinder: CKZ3N-X2742A/X2568**
- Weight reduced by up to 38%
- Simple switch adjustment greatly reduces work hours.
- Switch can be adjusted easily when changing the arm opening angle.
- High clamping force: 4000 N
- Spatter-proof construction
- Select from 2 types of top cover
- A model with a manually operated handle is available.

<table>
<thead>
<tr>
<th>Series</th>
<th>Arm opening angle</th>
<th>Switch</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKZ3N-X2742A</td>
<td>15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>50, 63</td>
</tr>
<tr>
<td>CKZ3N-X2568</td>
<td>15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>50, 63</td>
</tr>
</tbody>
</table>

**Power Clamp Cylinder: CKZT**
- Spatter-proof construction

<table>
<thead>
<tr>
<th>Series</th>
<th>Arm opening angle</th>
<th>Switch</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKZT</td>
<td>30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>40, 50, 63, 80</td>
</tr>
</tbody>
</table>

**NAAMS Standards Compliant Power Clamp Cylinder: CKZ2N**
- Spatter-proof construction

<table>
<thead>
<tr>
<th>Series</th>
<th>Arm opening angle</th>
<th>Switch</th>
<th>Bore size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKZ2N</td>
<td>30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°</td>
<td>TURCK/P&amp;F</td>
<td>50, 63, 80</td>
</tr>
</tbody>
</table>

⚠️ Safety Instructions: Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.