For material handling and clamping of small workpieces

**Power Clamp Cylinder**

**Compact Type**

Ø 25

- **Lightweight**: 580 g
- **Compact**: Width: 34 mm, Height: 192.4 mm (Arm opening angle: 90°)
- **Clamping force**: 660 N (Arm length: 50 mm, 0.5 MPa pressure)

**Features**

- 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

**CKZT25**

- X2797 (Base Type)
- X2798 (With Manually Operated Handle)
Power Clamp Cylinder  Compact Type

**CKZT25 -X2797 -X2798 Ø 25**

**How to Order**

<table>
<thead>
<tr>
<th>Base type</th>
<th>(Without clamp arm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With manually operated handle</td>
<td>(Without clamp arm)</td>
</tr>
</tbody>
</table>

**CKZT 25 -105S -X2797**

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

- **Bore size**: 25 mm
- **Arm opening angle**: 90° 90°, 105° 105°
- *Please contact SMC for other opening angles.*

**Manualy operated handle mounting position**

| L (Left side mounting) | R (Right side mounting) |

**Clamp arm**

**CKZT 25 -A000 C S -X2797**

- **Bore size**: 25 mm
- **Arm mounting position**
  - C: Centre
  - R: Right
  - L: Left

With manually operated handle

Mounted clamp arm
Cylinder Specifications

<table>
<thead>
<tr>
<th>Bore size</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Double acting</td>
</tr>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.2 MPa</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>0.8 MPa</td>
</tr>
<tr>
<td>Min. operating pressure</td>
<td>0.3 MPa</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>-10 to 60 °C (No freezing)</td>
</tr>
<tr>
<td>Cushion</td>
<td>Clamping side: None</td>
</tr>
<tr>
<td></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>
</tr>
<tr>
<td>Max. allowable clamping moment</td>
<td>75 N·m</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>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder</td>
<td>580</td>
</tr>
<tr>
<td>Cylinder with manually operated handle</td>
<td>820</td>
</tr>
<tr>
<td>Clamp arm</td>
<td>230</td>
</tr>
</tbody>
</table>

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

Cylinder Stroke

<table>
<thead>
<tr>
<th>Bore size</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm opening angle</td>
<td>90°</td>
</tr>
<tr>
<td>35.4</td>
<td>39.5</td>
</tr>
</tbody>
</table>

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>Aluminium 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>
</tbody>
</table>

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

Wiring Diagram (PNP Connection Circuit)

- Black S1 Load (Unclamping side)
- Blue S2 Load (Clamping side)
- White (-)
- Brown (+)

* Please contact SMC for NPN specifications.

Replacement Parts

Top cover kit no.

CKZ25-53-781EL-R

* The top cover kit includes a top cover and mounting brackets.

Replacement procedure

⚠️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.

<table>
<thead>
<tr>
<th>Bore size</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque (N·m)</td>
<td>1.5 to 2.0</td>
</tr>
</tbody>
</table>
Dimensions

CKZT25-S-X2797

<table>
<thead>
<tr>
<th>Arm opening angle</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td>148.4</td>
<td>69.4</td>
</tr>
<tr>
<td>105°</td>
<td>152.5</td>
<td>73.5</td>
</tr>
</tbody>
</table>

Proximity switch

2 x 4 x M5 x 0.8 depth 6

Clamp arm (Refer to page 5 for details.)
Dimensions: With Manually Operated Handle

CKZT25□S-X2798

* Refer to the CKZT25□S-X2797 (page 3) for dimensions other than those shown below.

<table>
<thead>
<tr>
<th>Arm opening angle</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td>110</td>
</tr>
<tr>
<td>105°</td>
<td>126</td>
</tr>
</tbody>
</table>

Handle position: Left

Handle position: Right

Unclamping position
Dimensions: Clamp Arm

CKZT25-A000\textsubscript{L}S-X2797

2 x Ø 6.5 through

2 x Ø 4H7 through

L: Left
R: Right
C: Centre
**Relation between arm length and clamping force**

![Diagram of clamp components](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 of clamp components](image)

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Allowable arm length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</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 graphs below.

- 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 centre of gravity.
2. Check the arm opening angle of the product.
3. Read the allowable load mass from the graph.

![Graph showing allowable load mass vs. distance to the centre of gravity](image)

**Calculation example**

Arm opening angle: 90°, Distance to the centre of gravity L: 125 mm

With an arm opening angle of 90° and a 125 mm distance to the centre 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° 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
   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) 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.
Power clamp cylinder mounting and setup procedure

<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 ① 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 ② 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.
### 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.

#### Table

<table>
<thead>
<tr>
<th>Shim thickness [mm]</th>
<th>Clamping force [N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 MPa</td>
<td>100</td>
</tr>
<tr>
<td>0.5 MPa</td>
<td>200</td>
</tr>
<tr>
<td>0.8 MPa</td>
<td>300</td>
</tr>
</tbody>
</table>

#### Graph

- **Arm length:** 100 mm
- **Clamping force position**
- **Shim thickness [mm]**
- **Arm length:** 100 mm
- **Peak clamping force position**
- **0.3 MPa**
- **0.5 MPa**
- **0.8 MPa**
**Caution**

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.
   
   - The lock can be released easily by hitting the round tab on the cover with a plastic hammer.

   ![Round tab of rubber cover](image)

   - Provide enough space to perform a manual lock release.

   ![Space](image)

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.

   ![Clamping position](image)

   ![Unclamping position](image)

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.

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**Specific Product Precautions**

Be sure to read this before handling the products. For safety instructions and actuator precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: http://www.smc.eu