Alignment and positioning of transferred workpieces

Contributes to space saving on conveyor lines

Heavy workpieces can now be aligned and positioned with small cylinders, resulting in compact conveyor lines.

**Table** Max. allowable load weight: 1000 kg (MACM10)

Workpieces can be moved in any direction: forward/backward, right/left, at an angle, and even rotated (360°). Ball bearings allow for smooth operation.

Table centering accuracy ±1 mm or less (Workpiece not loaded)

3 types of table material can be selected.

- Stainless steel
- Ultra high molecular weight polyethylene
- Cast nylon

Table center movable range

Max. Ø100 mm (MACM10-50)

Table can be held in any position.

Built-in air locking mechanism

For lock/unlock confirmation

External photo sensor mountable

Select from lock port side or opposite side of port installation.

MACM Series
Centering Unit  MACM Series

<Application Examples>

1 Transferred workpieces are stopped
Workpieces transferred at an angle are stopped at an alignment point (stops where the centering unit is installed).

2 Centering unit rises
Cylinder rises to lift the workpiece (separates roller conveyor from workpiece).

3 Workpiece alignment/table lock
Alignment cylinder corrects skewed workpieces and realigns them.
After alignment, the table of the centering unit is locked to maintain the corrected position even after the adjustment cylinders are released.

4 Centering unit descends/workpiece is transferred to next step
Cylinder descends, places workpiece back on the roller conveyor, and transfers it to the next step.
Liquid Crystal Cassette Transfer

1. Stops in front of rack
   Is transferred to and stopped in front of the rack where skewed liquid crystal cassettes are to be stored

2. Is stored in rack

3. Alignment of cassette/table lock
   The alignment cylinder corrects skewed workpieces and aligns the liquid crystal cassettes. After alignment, the table of the centering unit is locked to maintain the corrected position even after the alignment cylinders are released.
## Working Principle

### Neutral (Centering) condition

- When a force is applied to the table in the lateral direction, the bearing slides. When the bearing slides, the spring for returning to center also expands and contracts.
- When the force in the lateral direction is released, the center shaft is returned to the neutral position by the spring for returning to center.

### Movable condition

![Diagram of Movable condition]

## Lock Mechanism

### Unlocked condition

The table becomes free when unlocked.

- When air is supplied from the locking port, the piston for locking descends and pushes the center shaft down. When the center shaft lowers, the bearing holder plate is pressed, and the table is locked.
- When air is supplied from the unlocking port, the piston for locking ascends and releases the lock.

### Locked condition

The table is locked in place when locked.

- When air is supplied from the locking port, the piston for locking descends and pushes the center shaft down. When the center shaft lowers, the bearing holder plate is pressed, and the table is locked.
- When air is supplied from the unlocking port, the piston for locking ascends and releases the lock.
Centering Unit

MACM Series

How to Order

MACM 4 - 20 P - X114

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>MACM2-12</th>
<th>MACM4-20</th>
<th>MACM6-30</th>
<th>MACM10-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. allowable load weight [KN]</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Stroke [mm]</td>
<td>12</td>
<td>20</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Table center movable range [mm]</td>
<td>ø24</td>
<td>ø40</td>
<td>ø60</td>
<td>ø100</td>
</tr>
<tr>
<td>Centering accuracy [mm]</td>
<td>±1 or less</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cylinder for lock

<table>
<thead>
<tr>
<th>Action</th>
<th>Double acting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>0 to 60</td>
</tr>
<tr>
<td>Operating pressure [MPa]</td>
<td>0.4 to 0.7</td>
</tr>
<tr>
<td>Proof pressure [MPa]</td>
<td>1</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Non-lube</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Precautions

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

Caution

1. Use the product within the movable range.
2. Use the product within the allowable load weight.
3. Load workpieces within the load range.
4. Load workpieces within the allowable inclination range.
5. Do not use the product in applications where excessive external force or impact force is applied to it.
   Improper handling includes the following:
   - Applying impact on the side of the table to move it to full stroke
   - Continuously moving the table in a circle while the table is at a full stroke
   - Repeating reciprocation of the table at full stroke
   - Holding the body and swinging the table

6. Prevent over strokes.
7. Secure the table in place when transporting the product or the equipment it is mounted on.
8. This is not a clean room series product.
Dimensions

MACM Series

At maximum offset

| Dimensions | Model | A  | B  | C  | D  | DA | DB | E  | F  | H  | P  | PA | PB | PC | PD | PE | Q  | S  | T  | U  | W  |
|------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| MACM2 X114 |      | 68 | 74 | 76 | 60 | 64 | 30 | 46 | 52 | 50 | 19 | 17 | 22.5° | 10° | 7.4 | 12 | 6  | 62 | 4  | 34 |
| MACM2 X115 |      | 86 | 90 | 90 | 6.6 | 72 | 78 | 12 | 32.5 | 56 | 54 | 19 | 17 | 18° | 7 | 19 | 32 | 20 | 6  | 78 | 4  | 40 |
| MACM4 X114 |      | 118 | 125 | 125 | 97 | 113 | 33.8 | 19 | 17 | M5 | 28 | 33.3 | 30 | 6  | 98 | 60 | 4  | 60 | 40 |
| MACM4 X115 |      | 185 | 197 | 198 | 11 | 152 | 182 | 18 | 53.8 | 31 | 24 | 13° | 0° | 53.3 | 50 | 6  | 108 | 70 |
| MACM4 X116 |      | 185 | 197 | 198 | 11 | 152 | 182 | 18 | 53.8 | 31 | 24 | 13° | 0° | 53.3 | 50 | 6  | 108 | 70 |

[mm]
Centering Unit **MACM** Series

**Dimensions**

<table>
<thead>
<tr>
<th>P: Port side photo sensor mounted type</th>
<th>B: Port back side photo sensor mounted type</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram P" /></td>
<td><img src="image2.png" alt="Diagram B" /></td>
</tr>
</tbody>
</table>

**Mounted example of EE-SX671□ made by OMRON**

- 2 x M3 thread depth 4 (Holes for mounting photo sensor)

![Diagram P](image3.png)

- Commercially available bolt
- Sensor

- The above photo sensor made by OMRON should be provided by the customer.
- Mounting position adjustment may be required depending on the individual differences of the sensor.
Centering Unit  MACM Series