9.2.2 Plate Actuation, Actuators below Plate

Plate actuation is ideal for synchronized filling of high cavitation molds

- High cavitation synchronized needle opening
- Consistent part filling (weight)
- Low service costs

Basic Elements of the Plate Actuation System:
- Actuation plate
- Stop buttons
- Actuators (pneumatic)
- Piston rod set
- Guiding set complete
- Valve pin suspension assemblies with anti rotation screws

Pitch Dimensions
Nozzle 06E = min. 22 mm
Nozzle 09E = min. 27 mm
9.2.2.1 Mounting the Plate Actuation System

**WARNING**

**Heavy Weight Hazard**
- Transport and lifting equipment should be operated only by trained personnel.
- Operate lifting and transport equipment slowly and carefully to avoid uncontrolled swinging of the manifold.
- Lifting and transport equipment for lifting Hot Runner Systems shall be approved and properly rated taking into account the weight and size of the manifold.
- When unpacking the Plate Actuation Hot Runner System, there is a risk of injury due to falling parts and sharp edges. Maintain a minimum distance of 1 m from the Hot Runner System.
- Use personal protective equipment, such as head gear, safety shoes and work gloves.
- **For first aid contact your medical / safety representing.**

**NOTICE**

**Hazard of Material Damage**
- Without consulting Synventive it is not permitted to do modifications to the hot runner system e.g. geometrical changes to the nozzle tip, except the part shape adjustment in the area of material allowance.
- Never install or remove the hot runner when the manifold or nozzles are hot, this may cause damage to the nozzles.
- Move the Hot Runner System only up or down at room temperature 20 °C (68 °F).
- Always tighten the screws to the torque specified in the respective table in section 4.

**Tools for Assembling, Disassembling and Adjusting the Valve Pins**

Adjusting tool ATCYL2102

Double Tube Wrench

![Image](Doc007519.png)

![Image](Doc007552.png)
9.2.2.2 Assembly of the Actuation Plate

Assembly of the Stop Buttons on both Sides

1) Assemble the stop buttons on both side (Manifold Side / Clamping Plate Side).
2) Fix them with screws.

Assembly of the Valve Pin Suspension Sleeves and Anti-rotation Screws

1) Assemble the valve pin suspension sleeves (1) at the actuation plate from the manifold side.
2) Fix them against turning with the anti-rotation screws from the manifold side.
3) Fix the valve pin suspension sleeves (1) with washers (4) and retaining rings for shafts DIN471 (5) from the clamping plate side.

Details
Valve pin suspension assembly
## Valve Pin Suspension Version 1 for:
Valve pin Ø 3.0 mm VPS-30-01 / Valve pin Ø 3.8 mm VPS-38-01

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>VPSS-01</td>
<td>Valve Pin Suspension Sleeve</td>
</tr>
<tr>
<td>02</td>
<td>PNC4508B-HS-02</td>
<td>Hanger screw M11x1, Valve pin Ø 3.0</td>
</tr>
<tr>
<td></td>
<td>PNC4508B-HS-01</td>
<td>Hanger screw M11x1, Valve pin Ø 3.8</td>
</tr>
<tr>
<td>03</td>
<td>PNC4508B-LS-01</td>
<td>Lock Screw M11x1</td>
</tr>
<tr>
<td>04</td>
<td>W-17-24-2-01</td>
<td>Washer; 17x24x2</td>
</tr>
<tr>
<td>05</td>
<td>DIN471-17X1</td>
<td>Retaining ring for shafts DIN471</td>
</tr>
<tr>
<td>06</td>
<td>DIN7984-M6X8-10.9</td>
<td>Hexagon socket cap screw DIN7984</td>
</tr>
</tbody>
</table>

## Valve Pin Suspension Version 2 for:
Valve pin Ø 3.0 mm VPS-30-02 / Valve pin Ø 3.8 mm VPS-38-02

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>VPSS-02</td>
<td>Valve Pin Suspension Sleeve</td>
</tr>
<tr>
<td>02</td>
<td>PNC4508B-HS-02</td>
<td>Hanger screw M11x1, Valve pin Ø 3.0</td>
</tr>
<tr>
<td></td>
<td>PNC4508B-HS-01</td>
<td>Hanger screw M11x1, Valve pin Ø 3.8</td>
</tr>
<tr>
<td>03</td>
<td>PNC4508B-LS-01</td>
<td>Lock Screw M11x1</td>
</tr>
<tr>
<td>04</td>
<td>W-17-24-2-02</td>
<td>Washer; 17x24x2</td>
</tr>
<tr>
<td>05</td>
<td>DIN471-17X1</td>
<td>Retaining ring for shafts DIN471</td>
</tr>
<tr>
<td>06</td>
<td>DIN7984-M6X8-10.9</td>
<td>Hexagon socket cap screw DIN7984</td>
</tr>
</tbody>
</table>

## Valve Pin Suspension Version 3 for:
Valve pin Ø 3.0 mm VPS-30-03 / Valve pin Ø 3.8 mm VPS-38-03

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>VPSS-02</td>
<td>Valve Pin Suspension Sleeve</td>
</tr>
<tr>
<td>02</td>
<td>PNC4508B-HS-02</td>
<td>Hanger screw M11x1, Valve pin Ø 3.0</td>
</tr>
<tr>
<td></td>
<td>PNC4508B-HS-01</td>
<td>Hanger screw M11x1, Valve pin Ø 3.8</td>
</tr>
<tr>
<td>03</td>
<td>PNC4508B-LS-01</td>
<td>Lock Screw M11x1</td>
</tr>
<tr>
<td>04</td>
<td>W-17-24-2-01</td>
<td>Washer; 17x24x2</td>
</tr>
<tr>
<td>05</td>
<td>DIN471-17X1</td>
<td>Retaining ring for shafts DIN471</td>
</tr>
<tr>
<td>06</td>
<td>DIN7984-M6X8-10.9</td>
<td>Hexagon socket cap screw DIN7984</td>
</tr>
</tbody>
</table>
Assembly of the Guiding Bushings at the Actuation Plate

1) Assemble the Guiding Bushings (GB) in the Guiding Bush Seat (GBS).
2) Fix them with Retaining Rings for shafts DIN471 (RR).
3) Screw the Guiding Bushing Seat (GBS) into the actuation plate (Doc007549.png).

Assembly of the Piston Rod and Actuator

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>00530084</td>
<td>Fixing Unit</td>
</tr>
<tr>
<td>02</td>
<td>PR-11-105-02</td>
<td>Piston Rod; D11.5; L105;</td>
</tr>
<tr>
<td>03</td>
<td>PRB-08-19-10-01</td>
<td>Piston Rod Bush</td>
</tr>
<tr>
<td>04</td>
<td>W-08-19-2-01</td>
<td>Washer; 8.5x19x2</td>
</tr>
<tr>
<td>05</td>
<td>DIN934-M8</td>
<td>Hexagon nut DIN934 / ISO4032</td>
</tr>
<tr>
<td>06</td>
<td>VIOR-5.00x1.50-FPM-75-G</td>
<td>This seal ring is included in actuator 00215485, not a part of the Piston Rod Set</td>
</tr>
</tbody>
</table>
NOTICE
For lubrication use Krytox GPL205. To lubricate the piston sliding surface is essential for the actuator life time.

To lubricate the piston ring seals is helpful to assemble the actuator.

1) Install the seal (06) at the piston rod (02).
2) Assemble the piston rod (02) at the Actuator (A).
3) Assemble the Fixing Unit (01) on the piston rod (02).

NOTICE
Use torque wrench with wrench insert and the torque specified in the respective table in section 4.

4) Insert the actuator Housing Cover 1 (HC).

NOTICE
The seal has to be directed against the cutout bottom

5) Insert the actuators (A) into the Actuation Spacer Plate.

6) Assemble the upper housing cover (HCT).

NOTICE
The two threaded bores (x) must face outwards.

7) Fix the housing cover (HCT) with two hexagon socket set screws (M6) DIN912-M6X10-12.9 and two Washers DIN125 A (W)

NOTICE
Use torque wrench with wrench insert and the torque specified in the respective table in section 4.
9.2.2.3 Mounting of the Hot Runner System

The Control percentages and Control distances are edited in the Control Variables Screen.

**WARNING**

Heavy Weight Hazard

1) Place the Spacer Plate onto the Cavity Plate.
2) Place the Manifold into the Cooling Plate / Cavity Plate.
3) Assemble the Guide Pillars (GP) into the Cooling Plate.

**WARNING**

Heavy Weight Hazard

4) Place the Cooling plate on the Spacer Plate.

---

5) Assemble the Ball Retainers (BR) on the Guide Pillars (GP).

6) Assemble the Piston Rod Bushes (RB) on the Piston Rods (PR).

**WARNING**

Heavy Weight Hazard

7) Place the Actuation Plate into the Cooling Plate.

---

For lubrication use high-pressure long therm lubricant Strack Z9080
8) Attach the Actuator with a Washer (WA) and a Nut DIN934 (NU) by fixing the Piston Rod (PR) with the T Wrench allen key (TW) and fasten the nut with the Box Spanner (BS) and spanner wrench.

9) Assemble Top Clamp Plate (TCP)

**WARNING**

Heavy Weight Hazard
9.2.2.4 Assembly and Adjust the Valve Pins

Precondition for the following steps are to be performed with the Hot Runner installed in the mold, and the system at operating temperature.

**WARNING**

**Hot Surfaces Hazard**

Contact between the skin and hot surfaces could result in burns. Use personal protective equipment, such as gloves, apron, sleeves and face protection, to guard against burns. When servicing or handling the hot runner system outside the manifold plates or the injection molding machine, care must be taken to heed the hot surface exposure warnings.

1) Fit in the valve pins via the top clamp plate into the cutout.

2) Hang the head of the valve pin (VP) into the Hanger Screw (HS).
3) Screw the Valve Pin (VP) with the Hanger Screw (HS), by using a T-wrench allen key, into the Valve pin Suspension sleeve.
Adjust the valve pins with a hexagon socket wrench as followed:

**NOTICE**

To adjust the valve pin, the Actuation Plate has to be stay on close position.

In order to ensure this, we recommend fixing it with compressed air on the actuator.

The basic setting for the valve gate pin is 16 mm between the Valve pin Suspension (VS) top edge and the top edge from the Hanger Screw (HS).

**NOTICE**

During the fine tuning process it is possible to move the Valve Pin (VP) in every direction 0.5 mm (1/2 rotation).

The exact position for the valve pin has to be checked at the front of the valve pin - depends on the nozzle tip.

The reason to unscrew the Hanger Screw (HS) would be for valve pin maintenance or replacement.

If the deviation to the basic settings of 16 mm is more than 0.5 mm, the adjustments do not correspond to the parameters of the mold or do not correspond to the Synventive standard.
**WARNING**

Hot Surfaces Hazard

Contact between the skin and hot surfaces could result in burns.

4) Heat up the system to the working temperature.
5) Turn with the Adjustment Tool ATCYL2102 (AT) the Locking Screw (LS) up to the Hanger Screw (HS).

**NOTICE**

For actuator assembly the Lock Screw (LS) has to be fastened against the Hanger Screw (HS).

6) Rotate the Lock Screw (LS) with the Adjustment Tool ATCY2102 (AT) into the Valve pin Suspension sleeve (VS).
7) Hold against turning the Hanger Screw (HS) with the hexagon Socket Wrench (SW).
8) At the same time tighten the Locking Screw (LS) with the Adjustment Tool ATCY2102 (AT) and a ring wrench (size 6 mm).
9) Repeat these steps of adjustment for all valve pins.
9.2.2.5 Nozzle Deactivating

If necessary, each nozzle can be deactivated independently.

**NOTICE**
This is a fast solution when using the remaining nozzles.

**WARNING**
Hot Surfaces Hazard
This operation has to be done with the system cooled down to room temperature.

1) Apply compressed air to the pneumatic tool connection CLOSED, to bring the actuation plate to the valve gates closed position.

2) Remove the Retaining Ring DIN471-17X1 (RR) from the valve pin suspension.

**NOTICE**
To remove the retaining ring, without dismounting the clamping plate, an extra long snap ring plier is required.

3) Remove the Washer W-17-24-2-02 (WS) with a Magnetic Rod / Pick-Up tool.
NOTICE
The valve pin can get damaged. To avoid this, the valve pin suspension must be adjusted to the front.

4) Hold against turning the Hanger Screw (HS) with the hexagon Socket Wrench (SW).
5) At the same time loosen the Lock Screw (LS) with the adjustment tool ATCY2102 (AT) and a ring wrench (size 6 mm).
6) Turn the Lock Screw (LS) with the adjustment tool ATCY2102 (AT) three complete turns counter clockwise.

NOTICE
After one and a half turns, the Valve pin Suspension sleeve (VS) is lower than the anti-rotation screw and it may rotate also.

7) Fix the new position by turning the Hanger Screw (HS) counter clockwise and the Lock Screw (LS) clockwise.

NOTICE
Before the system is put back into operation after the nozzles have been deactivated, the heating of the "out of service nozzles" must also be deactivated.
9.2.2.6 Blocking Pin

**NOTICE**

After the unit "Valve Pin Suspension" has been detached from the actuation plate, the position of the valve pin has to be locked with a blocking pin. When this pin is not mounted, the valve pin could be pushed back by the injection pressure and open the nozzle.

1) The length X must be measured.
2) The blocking pin should be manufactured according to the dimensions in image Doc007744.png.
3) The blocking pin has to have contact to the machine plate.