10.4 Sprue Bushings

10.4.1 Sprue Bushing 06S Series

NOTICE
Always tighten the screws to the torque specified in the respective table in section 13.

| 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. |
| For first aid contact your medical / safety representing. |

| **Hazard of Pressurized Air** |
| Pressurized air blow can result in hot plastic or foreign bodies entering the eyes, causing vision damage. |
| Use personal protective equipment: Face protection, hearing protection and gloves. |
| For first aid contact your medical / safety representing. |

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hazard of Material Damage</strong></td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>
Technical Data - Sprue Bushing 06S

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Bore (J)</td>
<td>Ø 6 mm</td>
</tr>
<tr>
<td>Nozzle Length (L SB)</td>
<td>50 - 190 mm</td>
</tr>
<tr>
<td>Thermocouple</td>
<td>Type J, Type K</td>
</tr>
<tr>
<td>Nozzle Tips</td>
<td>TTP, TTW, TFP</td>
</tr>
</tbody>
</table>

**NOTICE**

Always tighten the screws to the torque specified in the respective table in section 13.

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Parts of the Sprue Bushing 06S

In this section the nozzle parts are identified with the numbers indicated in the following figure.

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nozzle body</td>
</tr>
<tr>
<td>2</td>
<td>Component Ring</td>
</tr>
<tr>
<td>3</td>
<td>Version 01</td>
</tr>
<tr>
<td>4</td>
<td>Heating element</td>
</tr>
<tr>
<td>5</td>
<td>Component Ring</td>
</tr>
<tr>
<td>6</td>
<td>Version 02</td>
</tr>
<tr>
<td>7</td>
<td>Nozzle circlip</td>
</tr>
<tr>
<td>8</td>
<td>Nozzle tip</td>
</tr>
<tr>
<td>9</td>
<td>Wear insert</td>
</tr>
<tr>
<td>10</td>
<td>Single head</td>
</tr>
<tr>
<td>11</td>
<td>Thermocouple</td>
</tr>
<tr>
<td>12</td>
<td>Retaining Ring</td>
</tr>
<tr>
<td>13</td>
<td>Parallel Pin</td>
</tr>
</tbody>
</table>
Disassembly / Assembly Tools

Nozzle Disassembly / Assembly Tools

In this section the Stripping and Mounting Tool parts are identified with the numbers indicated in the following figure.

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>AT06S-01</td>
<td>Nut</td>
</tr>
<tr>
<td>T2</td>
<td>AT06S-02</td>
<td>Holder</td>
</tr>
</tbody>
</table>

Nozzle Heater Disassembly / Assembly Tool

In this section the Stripping and Mounting Tool parts are identified with the numbers indicated in the following figure.

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1.1</td>
<td>ATCYL0104</td>
<td>Stop bolt</td>
</tr>
<tr>
<td>T1.2</td>
<td>ATCYL0102</td>
<td>Guide</td>
</tr>
<tr>
<td>T1.3</td>
<td>ATCYL0101</td>
<td>Slide Hammer</td>
</tr>
<tr>
<td>T1.4</td>
<td>AT06E0101</td>
<td>Adapter</td>
</tr>
<tr>
<td>T1.5</td>
<td>Socket head cap screw M4</td>
<td></td>
</tr>
</tbody>
</table>
10.4.1.1 Dismounting and Mounting Nozzle Thermocouple

Dismounting Nozzle Thermocouple

1) Lift the thermocouple (3.1) at the retainer clip (a) out of the heating element (3) slot and pull it off the heating element.

**NOTICE**
The thermocouple (3.1) is clamped at the top of the heater element (3).

Mounting Nozzle Thermocouple

**NOTICE**
For mounting of the thermocouple to the nozzle heater, the nozzle heater must be dismantled from the nozzle.

**Color coding of Thermocouples**

**NOTICE**
Take notice of the production and color identification of thermocouple cables.

Synventive uses J and K type thermocouples. Their color coding is given in the following table.

<table>
<thead>
<tr>
<th>Type</th>
<th>International standard IEC 584-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Black + Black</td>
</tr>
<tr>
<td></td>
<td>- White</td>
</tr>
<tr>
<td>K</td>
<td>Green + Green</td>
</tr>
<tr>
<td></td>
<td>- White</td>
</tr>
</tbody>
</table>

1) Slide the thermocouple (3.1) in leadership of the heating element (3) until it stops.
2) Increase the pressure until the top of the thermocouple (3.1) completely is clamped in to the final position.
3) Check the position of the thermocouple (3.1).
4) Press the retainer clip (a) into the slot at the heating element (3).

10.4.1.2 Disassembly the Nozzle 06S

**NOTICE**

For work on the nozzle (with assembled nozzle head), the nozzle must be clamped in a vice via using the tool holder (T2). It is not allowed to clamp the nozzle in a vice directly.

**Disassembling Nozzle Head Heater**

1) Dismount the retaining ring (11) from the nozzle head (8).

2) Pull the nozzle head heater (10) from the nozzle head (8).
Disassembling the Nozzle Heater

1) Dismount the nozzle head heater (10) from the nozzle head (8), as described in the above page 463.

2) Remove the circlip (5) from the nozzle tip (6).

3) Pull the thermocouple (9) out of the nozzle head (8).

3) Remove the component ring version 02 (4).
**NOTICE**

To pull the nozzle heater (3), the nozzle has to be clamped on the round nozzle head (8) surface on a vice by using protective caps. A clamping of the flats would deform the nozzle head (8).

4) Fix the nozzle head (8) in a vice.
5) Move the adapter of the dismantling tool (T1.4) over the heater (3).
6) Fix the heater (3) with 2 socket head cap screws M4 (T1.5).
7) Screw the guide (T1.2) together with the stop bolt (T1.1) and the slide hammer (T1.3) into the adapter (T1.4).
8) To remove the nozzle heater (3) slide the hammer (T1.3) against the stop bolt (T1.1) repeatedly until the nozzle heater is released.
Disassembling the Nozzle and the Nozzle Tip

WARNING

Hazard of Pressurized Air

Pressurized air blow can result in hot plastic or foreign bodies entering the eyes, causing vision damage.

Following work must be carried out by qualified and experienced persons.

Use personal protective equipment: Face protection, hearing protection and gloves.

For first aid contact your medical / safety representing.

1) Dismount the nozzle head heater (10) from the nozzle head (8), as described in the above page 463.

2) Dismount the nozzle heater (3) from the nozzle (1), as described in the above page 464.

3) Fix the holder (T2) in a vice.

NOTICE

For work on the nozzle (with assembled nozzle head), the nozzle must be clamped in a vice via using the tool holder (T2). It is not allowed to clamp the nozzle in a vice directly.

4) Place the nozzle (1) with the head side (8) in the holder (T2) to fix the nozzle against rotation.

5) Place the tool nut (T1) along the nozzle body (1) at their hexagonal shape.

6) Use a wrench to loosen the nozzle (1) from the nozzle head (8) via the tool nut (T1) by rotation (counter clockwise).
HOT RUNNER TECHNOLOGY
Hot Runner System Installation Guide
Service and Maintenance / Sprue Bushing 06S Series

⚠️ WARNING

Hazard of Pressurized Air and Hot Surfaces
Following work must be carried out by qualified and experienced persons. Use personal protective equipment: Face protection, hearing protection and gloves.

7) Fix the dismounted nozzle body (1) on the hexagonal shape in a vice.

⚠️ WARNING

Hot Surfaces Hazard
Contact between the skin and the hot nozzle could result in burns.

NOTICE

Never use an acetylene or welding torch, as severe nozzle damage can occur from over-heating.

8) To remove cold plastic in melt consistence, heat the nozzle (6) by using a heat gun, to the maximum temperature of 200 °C (392 °F).

9) Unscrew the nozzle tip (6) from the nozzle body (1) using a ring wrench.

⚠️ WARNING

Hazard of Pressurized Air
Pressurized air blow can result in hot plastic parts or foreign bodies entering the eyes, causing vision damage.

10) Clean the nozzle body (1) and nozzle tip (6) using pressurized air to remove as much residual plastic as possible.

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Doc006722.png
10.4.1.3 Assembling the Nozzle 06S

**NOTICE**

For work on the nozzle (with assembled nozzle head), the nozzle must be clamped in a vice via using the tool holder (T2). It is not allowed to clamp the nozzle in a vice directly.

---

**Assembling the Nozzle Body**

**NOTICE**

For work on the nozzle (with assembled nozzle head), the nozzle must be clamped in a vice via using the tool holder (T2). It is not allowed to clamp the nozzle in a vice directly.

1) Fix the holder (T2) in a vice.
2) Place the nozzle head (8) in the holder (T2).

3) Apply spotting ink on the nozzle body (1) bottom surface (SF1)

4) Screw in the nozzle body (1) hand-tight into the nozzle head thread until seated.
5) Unscrew the nozzle body (1) from the nozzle head (8).

6) Check the matching between the nozzle head (8) bottom surfaces (SF2) and the nozzle body (1) surface (SF1).

**NOTICE**
The nozzle head must bear on all surfaces uniformly and flatly, in particular on the nozzle head contact face.

In case of any uncertainty, clean the surfaces with a cleaning cloth. If the next ink test is still unsatisfactory, please contact Synventive Customer Service or Technical Support.

7) With a positive ink test, clean the surfaces and proceed to the next step.
8) Lubricate the thread (not the face) of the nozzle body with high-temperature assembly paste (antiseize compound).

**NOTICE**

This is an important measure to prevent thread corrosion due to aggressive gases, which could be released during plastics processing.

9) Tighten the nozzle body (1.1) to the nozzle head.

**NOTICE**

Use torque wrench with wrench insert and the torque specified in the torque table in section 13.

---

**Mount the Nozzle Heater**

**NOTICE**

For work on the nozzle (with assembled nozzle head), the nozzle must be clamped in a vice via using the tool holder (T2). It is not allowed to clamp the nozzle in a vice directly.

1) Slide the component ring version 01 (2), onto the nozzle body (1) up to the surface of the hexagon.

**NOTICE**

The component ring version 01 (2), is not assembled in all configurations. Reference system bill of materials.
**NOTICE**

Ensure the orientation of the wire leads matches opening in nozzle head (8).

2) Push the nozzle heater (3) onto the nozzle (1).

---

**NOTICE**

To ensure the temperature control of the nozzle tip, the heater must be flush with the nozzle body.

3) Control the position of the heater.
4) Bend the heater and thermocouple (ex) leads.

**NOTICE**
Use round-nosed pliers only.

Assembling the Nozzle Tip

1) The nozzle heater (3) must be mounted on the nozzle, and the nozzle inserted with the head side in the holder (T2), as described in the above page 470.
2) The holder (T2) is fixed in a vice.

**NOTICE**
The Nozzle head is still placed in the holder, fixed in a vice.

3) Apply spotting ink on the nozzle tip (6) bottom surface (SF1).
4) Screw in the nozzle tip (6) hand-tight into the nozzle body (1) until seated.
5) Unscrew the nozzle tip (6) from the nozzle body (1).
6) Check the matching between the nozzle body surface (SF2) and the nozzle tip surface (SF1).

**NOTICE**

The nozzle must bear uniformly on the outer surfaces uniformly and flatly, in particular on the nozzle tip contact face.

**NOTICE**

In case of any uncertainty, clean the surfaces with a cleaning cloth. If the next ink test is still unsatisfactory - please contact Synventive Customer Service or Technical Support.

7) With a positive ink test clean the surfaces and proceed to the next step.

8) Lubricate the thread (not the face) of the nozzle tip body with high-temperature assembly paste (antiseize compound).

**NOTICE**

This is an important measure to prevent thread corrosion due to aggressive gases, which could be released during plastics processing.

9) Screw in the nozzle tip (6) into the nozzle body (1) hand-tight.

10) Tighten the nozzle tip (6) to nozzle body(1) at room temperature.

**NOTICE**

Use torque wrench with wrench insert and the torque specified in the respective table in section 13.
11) Add the component ring version 02 (4) on the nozzle body (1).

12) Cool the nozzle to approximately 25 °C (77 °F).
13) Mount the circlip (5) on nozzle tip (6).

**Mount the Nozzle Head Heater**

1) Align the nozzle head thermocouple and supply line in the same direction as the heater wire leads.
2) Install the thermocouple, ensuring it is seated correctly in the internal nozzle head groove.
3) Place the nozzle head heater (10) on the nozzle head (8).

**NOTICE**
The nozzle head heater secures the thermocouple by covering it in the vertical groove.
The heating wire must exit through the central recess of the nozzle head.

4) Mount the retaining ring (11) on the nozzle head (8).
10.4.1.4 Grounding of the Sprue Bushing

**DANGER**

**Danger to Life by Electric Shock**

The Sprue Bushing has to be properly grounded to prevent serious personal injury or death.

- Electrical work must be carried out by qualified persons.
- Verify that all power source connections are properly grounded.
- In Emergency case - Switch all systems off.
- For first aid contact your medical / safety representing.

1. Guide the ground wire into the hole of the single head (8).
2. Tighten the ground wire with a socket set screw (DIN 913).