10.3.3 Single Axis Valve Gate Nozzle 09SVP

**Technical Data**

<table>
<thead>
<tr>
<th>Valve pin operation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation medium</td>
<td>pneumatic</td>
</tr>
<tr>
<td>Pressure range</td>
<td>5 - 10 bar (72.5 - 145 psi)</td>
</tr>
<tr>
<td>Flowrate</td>
<td>1.2 l/min / 5 bar (72.5 psi)</td>
</tr>
<tr>
<td>Reaction time</td>
<td>~1.2 s</td>
</tr>
<tr>
<td>Valve pin stroke</td>
<td>8 mm</td>
</tr>
<tr>
<td>Adjustment</td>
<td>± 1.5 mm Via adjustment threads from outside.</td>
</tr>
<tr>
<td>Closing force</td>
<td>792 N / 6 bar (87 psi)</td>
</tr>
<tr>
<td>Opening force</td>
<td>792 N / 6 bar (87 psi)</td>
</tr>
<tr>
<td>Connection</td>
<td>M10x1 (8-L)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve pin diameter</td>
</tr>
<tr>
<td>Attachment</td>
</tr>
</tbody>
</table>

**Heating Power**

- Zone 1 (From a nozzle length of 50 mm) 150 - 250 Watt
- Zone 2 (From a nozzle length of 170 mm) 270 - 490 Watt
- Head 500 plus 500 Watt

**NOTICE**

To ensure long life and continued flawless operation of the actuator, we recommend using filtered compressed air.
Technical Data / Exploded View - Cooling Unit CU07SVP01

**NOTICE**

If the mold temperature is 80 °C or more, the Cooling Unit CU07SVP01 is required.

<table>
<thead>
<tr>
<th>Technical Data CU07SVP01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method:</strong> Cooling water</td>
</tr>
<tr>
<td><strong>Temperature:</strong> min. 30 °C / max. 60 °C</td>
</tr>
<tr>
<td>Temp. difference IN/OUT max. 5 °C</td>
</tr>
<tr>
<td><strong>Flow rate per unit:</strong> 4 l/min</td>
</tr>
<tr>
<td><strong>Pressure:</strong> max. 8 bar</td>
</tr>
<tr>
<td><strong>Connections:</strong> M14x1.5 (10-L)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Qty.</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2</td>
<td>CU07SVP-CS01</td>
<td>Cooling Sleeve</td>
</tr>
<tr>
<td>02</td>
<td>1</td>
<td>CU07SVPCT01</td>
<td>Connecting Tube</td>
</tr>
<tr>
<td>03</td>
<td>2</td>
<td>Z942/6</td>
<td>Sealing Plug</td>
</tr>
<tr>
<td>04</td>
<td>4</td>
<td>GE08LMEDVITOMDCF</td>
<td>Straight Coupling</td>
</tr>
<tr>
<td>05</td>
<td>2</td>
<td>EW08LVITOMDCF</td>
<td>Elbow Coupling</td>
</tr>
<tr>
<td>06</td>
<td>2</td>
<td>PSR08LX</td>
<td>Cutting Ring</td>
</tr>
<tr>
<td>07</td>
<td>2</td>
<td>M08LCFX</td>
<td>Nut</td>
</tr>
<tr>
<td>08</td>
<td>3</td>
<td>DIN912-M6x95-12.9</td>
<td>Hexagon Socket Cap Screw</td>
</tr>
</tbody>
</table>

Position of the cooling unit on the nozzle head.

CU07SVP01 mounted on Single Axis Valve Gate Nozzle 09SVP
10.3.3.1 Single Axis Valve Gate Nozzle 09SVP Parts List

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

**NOTICE**

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

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Qty.</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Isolation nut</td>
<td>CBN0010S</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Isolation ring</td>
<td>CBN0020S</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Nozzle head top</td>
<td>CBN0030S### (varied)</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Bridge</td>
<td>CBN0040S</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Sealing sleeve</td>
<td>CBN0050S</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Cooling bar</td>
<td>CBN0060S</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>Nozzle head bottom</td>
<td>CBN0071S</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Pneumatic cylinder housing top</td>
<td>CBN0081S</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>Piston sealing</td>
<td>CBN0090S</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Threaded ring</td>
<td>CBN0100S</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Pneumatic cylinder housing bottom</td>
<td>CBN0111S</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Guide sleeve</td>
<td>CBN120S</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Sleeve nut</td>
<td>CBN0160S</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Head body ring</td>
<td>09SVPHB-R-01</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Shutoff nozzle tip</td>
<td>(varied)</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Shutoff valve pin</td>
<td>(varied)</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Heater band</td>
<td>HB320691</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>Hexagon socket cap screw</td>
<td>DIN912-M3X14-12.9</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Hexagon socket cap screw</td>
<td>DIN912-M4X12-12.9</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>Hexagon socket cap screw</td>
<td>DIN7984-M5X40-10.9</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>Hexagon socket cap screw</td>
<td>DIN912-M5X6-12.9</td>
</tr>
<tr>
<td>22</td>
<td>4</td>
<td>Hexagon socket cap screw</td>
<td>DIN7984-M4X40-8.8</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>Hexagon socket set screw</td>
<td>DIN915-M5X10-45H</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>Parallel pin</td>
<td>DIN6325-3M6X12</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>Hexagon socket set screw</td>
<td>DIN914-M3X5-45H</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>Thermocouple</td>
<td>XTA00115001</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>Nozzle body complete</td>
<td>09E01 (varied)</td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>Head body</td>
<td>09SVPHB-01</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>Hexagon socket cap screw</td>
<td>DIN912-M3X10-12.9</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>Clamping device</td>
<td>GAN0170S</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>Heater band</td>
<td>IB32H-022-01</td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>Hexagon socket cap screw</td>
<td>DIN6325-3M6X8</td>
</tr>
</tbody>
</table>
Assembly Tools
In this section the Stripping and Mounting Tool parts are identified with the numbers indicated in the following figure.

Nozzle Disassembly Tool

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>AT09SVP-01</td>
<td>Nut</td>
</tr>
</tbody>
</table>

Heater Disassembly Tool Compl. 09E AT09E03

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1.1</td>
<td>AT09E0301</td>
<td>Heater Disassembly Tool 09E Type 01</td>
</tr>
<tr>
<td>T1.2</td>
<td>AT09E0302</td>
<td>Heater Disassembly Tool 09E Type 02</td>
</tr>
<tr>
<td>T1.3</td>
<td>AT09E0303</td>
<td>Heater Disassembly Tool 09E Type 03</td>
</tr>
</tbody>
</table>
## Safety Instructions for the Service at the Single Axis Valve Gate Nozzle 09SVP

### 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.

### 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.  
Any impact against the nozzle tip may result in its damage.  
Never hammer or impact the nozzle tip from the front (i.e. from the side of the mold).  
Twisting could damage the nozzle tip.  
When replacing the nozzles, the sealing rings must always be replaced.
10.3.3.2 Dismounting the Pneumatic Cylinder Housing and Sealing

1) Remove the socket head cap screw (19).
2) Remove the dasher and grounding cable.

3) Solve the hexagon socket set screws (25).
4) Lower the head body ring (14).
5) Tension the nozzle on the flanks of the head body (28) in a vice.

6) Remove the isolation nut (1).
7) Loosen the hexagon socket set screw (23).
8) Uncrew the complete actuator housing (11) (8) from the guide sleeve (12).

9) Remove the 4 socket head cap screws (22).

10) Lift the cylinder housing top (8) from the cylinder housing bottom (11).

11) Lift the threaded ring (10) out of the cylinder housing bottom (11).
Disassembly Nozzle 09E from the Head Body

1) Fix the nozzle (27) at the head body (28) in a vice.

**NOTICE**
Refer to the procedure section 10.1.2.2 including „Disassembling the Nozzle Heater“ and „Disassembling the Nozzle Tip“
The difference is as follow:
- The 09SVP nozzle is fixed in a vice
- The 09E is fixed in the manifold.

**NOTICE**
Using the tool „at09svp-01“

2) Place the tool nut (T1) over the nozzle body (1.1) at the hexagonal shape.

3) Use a wrench to loosen the nozzle (1.1) from the nozzle head (2.1) via the tool nut (T1) by rotation (counter clockwise).

12) Dismount the piston sealing (9) out of the threaded ring (10).

Setup for the Disassembly and Assembly of the Nozzle from / to the Head body

(T1) - Nozzle Disassembly Tool AT09SVP-01
(28) - Head body
10.3.3.3 Assembly of the Pneumatic Actuator on the Nozzle

Assembly of the Threaded Ring into the Cylinder Housing

NOTICE
After disassembly of the sealing elements, the original seals should be replaced as required by Synventive.

1) Lubricate the piston sealing (9) with hydraulic oil or white grease.
2) Mount the piston sealing (9) into the seal groove of the threaded ring (10).

NOTICE
Avoid damage of the piston sealing and check the correct fit. Damaged piston sealing (9) has to be replaced.

3) Assemble the cylinder housing top (8) on cylinder housing bottom (11).

4) Attach the 4 hexagon socket cap screws (22).

NOTICE
Tighten the hexagon socket cap screws (22) crosswise. Use torque wrench with wrench insert and the torques indicated in the torque table (Section 13).
Mounting the Nozzle 09E on the Head Body

1) Check the matching between the head body surfaces and the nozzle body surface.

**NOTICE**

The head body must bear on all surfaces uniformly and flatly, in particular on the head body 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. With a positive ink test clean the surfaces and proceed to the next step.

2) 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.

Setup for the Disassembly and Assembly of the Nozzle from / to the Head body

3) Fix the nozzle (27) at the head body (28) in a vice.
4) Tighten the nozzle body

**NOTICE**

Using the tool “at09svp-01”

Torque value – 100 Nm

**NOTICE**

To complete the nozzle refer to the procedure section “Assembling Nozzle 09E-02” on page 287 including „Assembling the Nozzle Heater“ and „Assembling the Nozzle Tip and Nozzle Body“

The difference is as follow:

- The 09SVP nozzle is fixed in a vice
- The 09E is fixed in the manifold
Mounting the Pneumatic Cylinder Housing on the Nozzle Assembly

1) Screw the hexagon socket set screw (23) into the guide sleeve (12).

2) Sleeve the guide sleeve (12) over the heater band (17).

3) Solve the hexagon socket set screws (25).
4) Lower the head body ring (14).
5) Tension the nozzle on the flanks of the head body (28) in a vice.
**NOTICE**

Examine whether the isolation ring (2) at the nozzle head top (3) is placed in the right position.

6) Screw in the pneumatic cylinder housing (11) (8) at the guide sleeve (12).

---

7) Orientate the housing within parallel pin (24) and press up the pneumatic cylinder housing to the limit stop.

---

8) Check the movement of the cooling bar (6).

**NOTICE**

If the movement of the cooling bar (6) is restricted, contact the Synventive Customer Service or Technical Support.
9) Screw in the isolation nut (1) at the nozzle head top (3) and tighten the isolation nut (1).

**NOTICE**
Torque value - 40 Nm

10) Tighten the hexagon socket set screw (23).

11) Remove the nozzle, which is fixed in a vise at the nozzle head base body (28), out of this fixing and fix it now, if necessary at the isolation nut (1).

12) Slide the head body ring (14) over the head body (28).

13) Tighten the head body ring (14) with the two hexagon socket set screws (25).

14) Check the position of the cooling bar (6) on the pneumatic cylinder housing bottom (11).

**NOTICE**
The cooling bar (6) must be easily movable to be positioned on the pneumatic cylinder housing bottom (11).
If this is not possible, contact Synventive customer service.

15) Tighten the cooling bar (6) and ground wire with a socket cap screw (19) on the cylinder housing bottom (11).

**NOTICE**
See the order of the components in the image of the right side Doc007413.png
10.3.3.4 Dismounting and Mounting of the Thermocouple

Dismounting of the Thermocouple

**NOTICE**
For dismounting and mounting the thermocouple there is not a need to have the cylinder housing dismounted.

1) Loosen the hexagon socket cap screw (29).
2) Move the clamping device (30) to the side, away from the thermocouple (26).

3) Pull the thermocouple (26) out of the bore of the heater band (17).

4) Loosen the hexagon socket set screws (25).
5) Move the head body ring (14), then move the heater band (31).
6) Pull the thermocouple (26) out of the bore of the head body (28).
Mounting of the Thermocouple

**NOTICE**

For dismounting and mounting the thermocouple there is not a need to have the cylinder housing dismounted.

1) Guide the thermocouple (26) through the heater band (17) into the thermocouple hole on the nozzle head bottom (7).

2) Bring the clamping device (30) to vertical position.

3) Fix the thermocouple (26) with the hexagon socket cap screw (29).

4) Align the thermocouple (26) in the nozzle heater (17) direction.

5) Fix the thermocouple (26) with heat resistant adhesive tape at the outlet of the nozzle heater (17).
6) Guide the thermocouple (26) into the thermocouple hole of the head body (28).
7) Mount the heater band (31).
8) Slide the head body ring (14) over the head body (28).
9) Tighten the head body ring (14) with the two hexagon socket set screws (25).

**10.3.3.5 Grounding of the Single Axis Valve Gate Nozzle**

**DANGER**

**Danger to Life by Electric Shock**

The Single Axis Valve Gate Nozzle 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) Check the position of the cooling bar (6) on the pneumatic cylinder housing bottom (11).

**NOTICE**

The cooling bar (6) must be easily movable to be positioned on the pneumatic cylinder housing bottom (11). If this is not possible, contact Synventive customer service.

2) Tighten the cooling bar (6) and ground wire with a socket cap screw (19) on the cylinder housing bottom (11).

**NOTICE**

See the order of the components in the image of the right side Doc007413.png.
10.3.3.6 Valve Pin Height Adjustment

1) Use pneumatic pressure with reduced pressurized air of approx. 2.76 bar (40 psi) on connection (A) to drive the valve pin in valve gate closed position.

2) Unscrew the socket set screw (23).

3) Adjust valve pin position with an pin Ø 5 mm in holes of the threaded ring (10).

4) Turn the threaded ring (10) by using a pin (ø 5) to get the valve pin front into basic position 0,15 mm.

**NOTICE**

Turning one hole forward results in a height adjustment of 0,25 mm at the valve pin.

5) Tighten the socket set screw (23) - screw up to stop and then turn 90° degree to tying up.
10.3.3.7 Disassembling the Single Axis Valve Gate Nozzle out of the Mold

**NOTICE**

The Single Axis Valve Gate Nozzle is located on the fit diameters of the nozzle tip and the lower part of the cylinder housing in the mold.

Disassembling the Single Axis Valve Gate Nozzle inclusive of actuator out of the mold

1) Cool down the Single Axis Valve Gate Nozzle and the mold to room temperature.
2) Lift the Single Axis Valve Gate Nozzle inclusive of actuator out of the mold.

**NOTICE**

If it is not possible to lift the Single Axis Valve Gate Nozzle inclusive of actuator out of the mold, please contact the Synventive Customer Service or Technical Support.

(1) Isolation nut
(10) Threaded ring
(11) Cylinder housing bottom
(15) Nozzle tip