10.1.3 Nozzle 12E 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.

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

**Parts of the Nozzle 12E**

1. Threaded nozzle body
2. Nozzle heater
   - 2.1 Thermocouple
3. Nozzle component ring version=1
   - 3.1 Pre centering ring
4. Nozzle component ring version=2
   - 4.1 Heater locating ring
5. Retaining ring DIN471
6. Socket set screw DIN914
7.1 Nozzle Tip Style Complete
   - 7.1.1 Tip nut
   - 7.1.2 Inner parts
   - 7.2.x Valve gate assembly (not shown)

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

**Heater Disassembly Tool Complete AT12E-0101**

- (T1.1) Heater Disassembly Tool 12E Type 01 AT12E-010101
- (T1.2) Heater Disassembly Tool 12E Type 02 AT12E-010102
- (T1.3) Heater Disassembly Tool 12E Type 03 AT12E-010103

**Heater Assembly Tool AT12E-0102**

- (T2) Tip Assemble Tool TTW, TTP, TFP AT12E-0103

**Heater Assembly Tool AT12E-0105**

- (T3) Seal Cap Assemble Tool AT12E-0105
10.1.3.1 Dismounting and Mounting Thermocouple

Dismounting Thermocouple

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

1) Lever the clamp of the heating element (2) with a screwdriver and pull the thermocouple (2.1) from its seat.
2) Pull the top of the thermocouple (2.1) from the bracket of the nozzle heater (2).

**NOTICE**
The thermocouple is pressed in.

Mounting Thermocouple

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

**Color coding of Thermocouples**
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 - White</td>
</tr>
<tr>
<td>K</td>
<td>Green + Green - White</td>
</tr>
</tbody>
</table>

1) Push the thermocouple (2.1) under the bracket on the nozzle heater (2).

**NOTICE**
The fixing is needed to secure the position. A thermocouple (well-fixed in the holder) causes correct measured values.

2) Lever the clamp of the heating element with a screwdriver and fix the thermocouple (2.1) below the clamp at the nozzle heater (2).
10.1.3.2 Disassembly the Nozzle 12E

Disassembling the Nozzle Heater

1) Remove the retaining ring (5) from the nozzle tip (7.1).
2) Remove the nozzle component ring (3).
3) Unscrew and remove the socket set screw (6) from the nozzle heater locating ring (4).

4) Mount the heater disassembly tool Type 01 (T1.1).

**NOTICE**

The lower edge of the heater removal tool type 01 (T1.1) must be set below the heater locating ring (4).

5) Slide disassembly tool Type 02 (T1.2) along the disassembly tool Type 03 (T1.3).
6) Screw disassembly tool Type 03 (T1.3) onto disassembly tool Type 01 (T1.1).
Disassembling the Nozzle Tip and Nozzle Body

7) To remove the nozzle heater (2), slide the disassembly tool Type 02 (T1.2) against the disassembly tool Type 03 (T1.3) repeatedly until the nozzle heater (2) is released.

NOTICE
To dismount the nozzle tip (7.1) from the nozzle, if there is plastic material in the nozzle, the tip (7.1) must be heated-up. Never use an acetylene or welding torch, as severe nozzle damage can occur from over-heating.

1) Heat the nozzle tip (7.1) using a heat gun to the maximum temperature of 200 °C (392 °F).

2) Hold the nozzle body (1) firmly using an engineer’s wrench at the hexagonal shape.

3) Unscrew the nozzle tip (7.1) from the nozzle body (1) using a ring wrench.
**WARNING**

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- PSA.

4) Clean the nozzle tip using pressurized air to remove as much residual plastic as possible.

**WARNING**

Hot Surfaces Hazard

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

5) Cool the nozzle body (1) to approximately 25 °C (77 °F).

6) Unscrew nozzle body (1) from the manifold.

### 10.1.3.3 Assembling the Nozzle 12E

**Parts of the Nozzle 12E**

1) Threaded nozzle body
2) Nozzle heater
2.1 Thermocouple
3) Nozzle component ring version=1 (Pre centering ring)
4) Nozzle component ring version=2 (Heater locating ring)
5) Retaining ring DIN471
6) Socket set screw DIN914
7.1 Nozzle Tip Style Complete
7.1.1 Nozzle Tip Style Complete
Example of a nozzle tip assemblie
7.1.1 Tip nut
7.1.2 Inner parts
7.2.x Valve gate assembly (not shown)
Assembling the Nozzle Body

1) Apply spotting ink on the nozzle body (1) bottom surface (SF1)
2) Screw in the nozzle body (1) hand-tight into the manifold thread until seated.
3) Unscrew the nozzle body (1) from the manifold.

4) Check the matching between the manifold bottom surfaces (SF2) and the nozzle body (1) surface (SF1).

**NOTICE**

The manifold 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.

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

6) 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.

7) Tighten nozzle body (1) to the manifold.

**NOTICE**

Use torque wrench with wrench insert and the torque specified in the torque table in section 13.
8) Slide heater locating, ring (4), onto the nozzle body (1) up to the surface of the hexagon.

**NOTICE**
The opening of the heater locating ring (4), must be line up with the cable connections (see customer drawing).

9) Bend the heater and thermocouple (ex) leads.

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

10) Mount the nozzle heater (2) onto the nozzle (1).

**NOTICE**
Take care that cold length of the nozzle heater (2) must be positioned through the opening of the nozzle component ring (4).
Check the correct position and fixation of the thermocouple (TC).

11) If necessary, use a soft faced hammer to drive the nozzle heater (2) into the final, right position.

**NOTICE**
To avoid damage to the heater use the hammer softly.
The P/N of assembly tool (AT) is AT12E-0102.
Check the correct position and fixation of the thermocouple (TC).
Assembling the Nozzle Tip TTW, TTP, TFP

**TTW Nozzle Tip Assembly**

1) Place the tip nut (a) into the tool (T2).
2) Using the tool (T1) to push the tip insert (b) into the tip nut (a).
3) Place the torpedo (c) on the tip insert (b).
4) Using the tool (T1) to push the torpedo (c) and the tip insert (b) into the tip nut (a).

**TTP Nozzle Tip Assembly**

1) Place the tip nut (a) on the tool (T2).
2) Using the tool (T1) to push the tip insert (b) into the tip nut (a).
3) Place the torpedo (c) on the tip insert (b).
4) Using the tool (T1) to push the torpedo (c) and the tip insert (b) into the tip nut (a).

**TFP Nozzle Tip Assembly**

1) Place the tip nut on the tool (T2).
2) Using the tool (T1) to push the tip insert (b) into the tip nut (a).
Shown are the tip nuts, for checking the correct seating of the tip inserts

**NOTICE**

See examples of good and incorrect insert installations.
Make sure the insert must not exceed the height of the nozzle tip head. Incorrect items should not be further processed.

**Assemble the Seal Cap on VSW, VTW, TTW Nozzle Tips**

**VSW, VTW**

1) Place the tip nut (a) on the tool (T1).
2) Place the seal cap (b) on the tip nut (a).
3) Using the tool (T3) to push the seal cap (b) on the tip nut (a).

**TTW**

1) Place the tip nut (a) on the tool (T1).
2) Place the seal cap (b) on the tip nut (a).
3) Using the tool (T3) to push the seal cap (b) on the tip nut (a).

**NOTICE**
The assembly tool (T3) has an engraved note on both sides, on the front side, for use with VSW, VTW or TTW tip nut (sign on assembly tool T3 is VW or TW).

**Assembling the Nozzle Tip on the Nozzle**

1) Apply spotting ink on the nozzle tip (7.1) bottom surface (SF1).
2) Screw in the nozzle tip (7.1) hand-tight into the nozzle body (1) until seated.
3) Unscrew the nozzle tip (7.1) from the nozzle body (1).
4) 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.

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

6) 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.

7) Tighten the nozzle tip (7.1) at the nozzle by room temperature.

**NOTICE**
Use torque wrench with wrench insert (HEX21) and a torque of 100 Nm.
8) Place the pre centering ring version=1 (3) on the nozzle heater (2).

**NOTICE**

The component ring (3) is for pre centering of the nozzle in the cut-out.

9) Mount the retaining ring (5) at the nozzle tip (7.1).
10) Move the nozzle component ring (4) and nozzle heater (2) tight to the nozzle component ring (3).
11) Fix the nozzle component ring (4) with the socket set screw (6) by a ½ up to ¾ turn.