4.6 Installation of HR Systems with Threaded Nozzles (APT)

⚠️ 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 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 13.

Depending on system complexity, some Synventive Hot Runners will include special assembly notes and instructions, which will be included on the system general assembly drawing.

The following pages use numbers for the individual parts of the Hot Runner System based on the figure on this page.

Parts of the Hot Runner System with Threaded Nozzles.

(1) Insulation plate *
(2) Thrust pad
(3) Nozzle tip
(4) Center support
(5) Cavity plate *
(6) Spacer plate *
(7) Clamping plate *
(8) Center locating ring *
(9) Inlet bushing
(10) Positioning dowel
* Not included in delivery
4.6.1 Preparation for System Installation

1) Clean the nozzle cutout and remove metal chips if necessary.

2) Confirm that the nozzle cutout match the hot runner general assembly drawing.

3) Confirm the positioning dowel (10) locations match the hot runner general assembly drawing.

4) Install the positioning dowel (10) into the cavity plate (5).

5) Apply plasticine or any other similar substance on the nozzle tip (3).

6) Apply a general-purpose grease to the mating surface (d) of the nozzle tip.

7) If your Hot Runner System has guiding elements, install them into the respective bores.

**NOTICE**

Take care the guiding elements are fully seated in the drilled holes.
8) Spoting ink the contact surface of:
   - Thrust pad (2)
   - Center support (4).

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### WARNING

**Heavy Weight Hazard**

**NOTICE**

Ensure no wires are pinched or crushed during installation.

9) Lower the Hot Runner System into the mold without twisting.

   Carefully and slowly lower the Hot Runner System, paying close attention especially during the last 10 mm.

   The guiding elements have to remain inside the mold.

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10) Once the hot runner is in the mold and resting on the support pillar, ensure that the Hot Runner System seats completely on the cavity plate

11) Take measurements to confirm proper thrust pad clearance or preload.

**NOTICE**

The proper top thrust pad clearance or preload is shown on the general assembly drawing.

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12) Spoting ink the contact surface of:

   - Thrust pads (2)
   - Spacer plate (6)

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13) Lubricate the thread of the fastening screws (clamping plate / spacer plate / cavity plate) with high-temperature assembly paste (anti-seize compound).

**NOTICE**

This is an important measure to prevent thread corrosion due to aggressive gases, which could be released during plastics processing.
14) Bolt together the clamping plate (7), spacer plate (6) and the cavity plate (5).

**NOTICE**

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

15) Unscrew the fastening screws cavity plate (5), spacer plate (6), clamping plate (7).

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**WARNING**

Heavy Weight Hazard

16) Lift up the clamping plate (7) carefully.

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17) Check the spotting ink surfaces of:

- Thrust pads (2)
- Spacer plate (6)

**NOTICE**

All contact surfaces have to be clearly recognizable.

If not check the mold and the support elements, if necessary rework them.

In case of any uncertainty, please contact the Synventive Customer Service.

18) Clean spotting ink surface.
19) Check possible damages from the first assembly.

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**WARNING**

Heavy Weight Hazard

20) Lift up the Hot Runner System carefully from the cavity plate (5).
21) Check the spotting ink matching of:
   - Thrust pad (2)
   - Center support (4)

**NOTICE**
The edge of the center support should not bear on the manifold.
If this happens, the issue must be resolved by the corresponding beveling of the outer edge of the center support (4).

22) All contact surfaces have to be clearly recognizable.

**NOTICE**
If not check the mold and the support elements, if necessary rework them.
In case of any uncertainty, please contact the Synventive Customer Service or Technical Support.

23) Clean spotting ink surface.
24) Check possible damages from the first assembly.

25) Check if the plasticine at the nozzle tip (3) or nozzle is evenly distributed.

**NOTICE**
Ensure there is enough gap between mold and nozzle tip (3).
If not rework them.
Please note that the distance between mold and nozzle tip (3) will be reduced by thermal expansion while the hot runner is heated up.

26) Remove the plasticine.
4.6.2 Nozzle Tip Adjustment

In some cases it is necessary to adjust the nozzle tips to the cutout shape for the injected part. If the nozzle tips are too long, they have to be removed and cut shorter.

**WARNING**

Hot Surfaces Hazard

- Contact between the skin and the hot injection mold could result in burns.
- Use personal protective equipment, such as gloves, apron, sleeves and face protection, to guard against burns.
- For first aid contact your medical / safety representing.

Precondition for nozzle tip adjustment is a complete installed system (Hot half)

1) Heat up the complete assembled system to operating temperature.
2) Check the length from the nozzle tip (3) at the cavity plate.
3) Mark the contour at the nozzle tip.

4) Wait until the system cool down to room temperature.
5) Unscrew the fastening screws cavity plate (5), spacer plate (6), clamping plate (7).

**WARNING**

Heavy Weight Hazard

6) Lift up the Hot Runner System carefully.

7) Check possible damages from the first assembly.

**NOTICE**

In case of any uncertainty, please contact the Synventive Customer Service or Technical Support.
8) If necessary you must shorten the nozzle tip (3).

    NOTICE

    Unscrew the nozzle tip (3) and machine to length.

9) Install the shortened nozzle tip on the nozzle (e.g. section)

    ![Image](Doc003068.png)

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**WARNING**

Heavy Weight Hazard

10) After reassembly of the Hot Runner System lower it into the mold without twisting.

    NOTICE

    Carefully and slowly lower the Hot Runner System, paying close attention especially during the last 10 mm.

    ![Image](Doc003120.png)
Installation of HR Systems with Threaded Nozzles (APT)

11) Lubricate the thread of the fastening screws (Hot Runner System / cavity plate) with high-temperature assembly paste (anti-seize compound).

**NOTICE**
Ensure that the Hot Runner System seats completely on the cavity plate.

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

12) Install fastening screws (Hot Runner System / cavity plate).

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

13) Remove all guiding elements if used.

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**WARNING**
Hot Surfaces Hazard

14) Heat the hot runner to normal operating temperature.
15) Contour the nozzle tip to the cavity if required.
16) Machine the contour of the nozzle tip when nozzle is installed in the cavity.
17) In the case where the final contour needs to be placed on the valve pin, the valve pin must be rounded at the adjusted area also.

**NOTICE**
Generally only tips with extension are allowed to be contoured.

**WARNING**
Heavy Weight Hazard

18) Install the clamping plate (7) and the insulation plate (1).
Installation of HR Systems with Threaded Nozzles (APT)

Requirements on the injection mold:

- The machine nozzle orifice diameter (machine nozzle – inlet bushing) shall be made with a tolerance of 0 /-0.0006 mm (0 /-0.04”).
- The machine nozzle shall be centered with respect to the inlet bushing.
- The inlet bushing shall be centered as instructed by Synventive using a centering ring and secured against lateral stress.

19) Place the center locating ring (8) on the inlet bushing.
20) Check if the center locating ring inner diameter correctly accommodates the fit diameter of the inlet bushing without side pre-load or a gap.

21) Lubricate the threads of the center locating ring (8) fastening screws 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.

22) Screw center locating ring (8) together with the clamping plate (7).

**NOTICE**

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

23) Bolt together the hot half and the mold plate.

**NOTICE**

Use torque wrench with wrench insert and the torque specified in the respective table in section 13.
4.6.3 For non pre-wired Systems

**DANGER**

**Danger to Life by Electric Shock**

Serious personal injury or death can result from electrical contact.

Power supply should only be connected by properly trained and qualified personnel.

Verify that all power source connections are properly grounded (proceed as described in section 5.2).

For first aid contact your medical / safety representing.

1) Run all the wiring through wire slots in the cavity plate out to the location of the wiring box.

**NOTICE**

Allow enough wire length for a service loop, which will allow the connectors to be removed from the terminal box without removing the wiring.

Re-label the wires before cutting to length.

2) If wire lengths are excessive, trim wires to proper length.

3) It may be necessary to re-label the zone numbers if the original numbers are on the length of wire being removed.

4) Connect wires to power and thermocouple connectors.

**NOTICE**

The manner in which they connect is dependent on the electrical connectors being used.

4.6.4 For pre-wired Systems

**DANGER**

This terminal box contains components with electrical potential, if it is connected to voltage.

Do not open this housing.

**NOTICE**

Removal of the Synventive label external and internal will void the warranty.