Machine nozzle with needle shut-off type HP
pneumatically or hydraulically controlled

Applications:
Thermoplastics (not applicable for PVC)

Shut-off mechanism:
Needle shut-off with integrated 2-way actuator
pneumatically or hydraulically operated

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The pneumatically or hydraulically actuated machine needle shut-off nozzles type HP are used in processing of thermoplastics, principally with low viscosity materials such as: PA, PPS, PE, POM, PP.

In this nozzle’s favour are:
Cycle time reduction, shut-off at the nozzle orifice, dosing with retracted injection unit.

Finds application in:
Packaging, automobile and leisure industries, medicinal and electronic equipment.

Operation:
The assembly integrated actuator (pneumatically or hydraulically activated) controls a nozzle-axis positioned needle via a lever mechanism. The melt flow is therefore process independently separated at the nozzle orifice. The needle mechanism is constructed in such a way, that with over-pressure an automatic opening of the nozzle is ensured.

Modules for filters, mixers and GAIM-applications complete the range of shut-off nozzle products.

Note:
Values and measurements in this documentation refer to standard applications.

### Technical description

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### Advantages of needle shut-off type HP

Prevents:
- Stringing
- Material leakage when dosing with a retracted injection unit
- Material leakage while vertically injecting

Applicable for special applications such as:
- Physical and chemical foaming
- Pre-compressing the melt
- Hot-runner injection molding (e.g., containers, pots)

Supported process control:
- Actuator piston position sensors (indicates if nozzle is “open” or “closed”).

Productivity factors:
- Controlled, clean shut-off of the melt stream
- Shorter cycle times - increase in productivity
- Increased process reliability and repeatability
- Usability with increased back pressure - improved homogenization

Options:
- Filter module
- Mixer
- GIT
- Process monitoring with piston position sensors on the actuator

Highlights:
- Melt flow separation at nozzle orifice
- Operating pressure: 3000bar at 400°C
- Proven shut-off with high-speed units
- Robust, reliable separation
- Suitable for special applications
- Compact, interchangeable design
Specially manufactured two-way piston cylinders with temperature resistant seals (up to 180°C) are used in the pneumatic and hydraulic actuators. The actuator together with the nozzle assembly forms a compact unit. The cylinders are operated from input data on the machine control unit.

**Advantages on an integrated actuator:**
- No installation errors
- Adjustments such as; stroke, force, etc. on the control unit are eliminated
- No alignment between nozzle and cylinder is required

**Control cylinder contruction (acc. to usual energy sources):**
- Pneumatic: 5 - 10 bar
- Hydraulic: 40 - 70 bar

**Water cooling on the hydraulic cylinder**
Heat conduction from the nozzle warms the cylinder. To ensure the hydraulic oil does not degrade, the cylinder temperature should remain between 20 - 60°C.

**Cylinder supply:**
Cylinder supply length and cross-section can influence the speed of the shut-off mechanism!

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**Integrated Actuator**

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**Machine-side actuator**

If a machine-side actuator is to be used, the leverage installation and connection (range, force and alignment) with the nozzle must be carefully carried out. For a smooth, trouble-free operation, the following requirements must be met:

**Two-way actuator:**
- Max. force on lever: HP0 = 800N, HP1 = 900N, HP2 = 2000N
- Min. cylinder range: HP0 = 18mm, HP1 = 20mm, HP2 = 26mm

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**Assembly alignment**

The actuator position is rotational within 360°.

Proven and tested between 4 and 8 o'clock.
The stars in the graphic represent exposed areas of the nozzle. The required area should be checked in the machine plate.

<table>
<thead>
<tr>
<th>(mm)</th>
<th>HP 0</th>
<th>HP 1</th>
<th>HP 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>K length in mm</td>
<td>24</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Heater band (Ø x width in mm)</td>
<td>—</td>
<td>Ø26 x 16</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø35 x 18</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø50 x 30</td>
<td>—</td>
</tr>
</tbody>
</table>

* Standard tip (included in the base model)

In certain circumstances a longer tip can ensure collision avoidance. In this case the tip dimension K would be adjusted. For standard sizes see Tip types.

Tip types

<table>
<thead>
<tr>
<th>One-piece tip: two lengths</th>
<th>HP 0</th>
<th>HP 1</th>
<th>HP 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>K length in mm</td>
<td>60, 80, 100, 130, 160</td>
<td>80, 100, 130, 160, 190</td>
<td>100, 130, 160, 190</td>
</tr>
<tr>
<td>Heater band (Ø x width in mm)</td>
<td>Ø35 x K-40mm</td>
<td>Ø40 x K-55mm</td>
<td>Ø60 x K-70mm</td>
</tr>
</tbody>
</table>

Option: Other lengths are custom manufactured

Risk of collision by diving into the mold

For restricted spaces different heating possibilities are available, see Alternative tip heating systems on page 6.

(See Optional Extras, Heating Systems)
Machine shut-off nozzle, type HP

Optional Extras

**Filter →** preventive strategy

*Keep* gates in hot runners free of foreign bodies or filter out unwanted fragments when using re-grinded material. We offer a low pressure drop screen filter.

(More information under **Optional Extras, Melt filter**)

**Mixer →** improved quality on injection molded parts

A *homogenized* melt (in colour and temperature) reduces the reject rate and produces a considerable improvement in the quality of the molded part. The installation of the mixer takes place either before or after the nozzle. We use a static mixer.

(More information under **Open machine nozzles, type M**)

**GIT (Gas Injection Technology) →** cycle time, quality on injection molded parts

Gas is injected through the gate core. To use the nozzle for the GIT process, the tip is changed. A special valve closes the gas feed area to make it completely polymer-sealed. The robust, maintenance free gas module ensures a safe process. Optimally the module is used in combination with the shut-off nozzle, but for certain processes the module can also be used without the shut-off nozzle.

(More information under **Open machine nozzles, type GM**)

herzog systems ag

Tel. +41 (0)71 394 19 69  www.herzog-ag.com
Fax. +41 (0)71 394 19 60 info@herzog-ag.com  T. D. Version 0.8
Alternative tip heating systems - Note: requires adjustable heating

- **Space saving external heating system**
  A standard heater band requires space in the nozzle immersion area (machine plate - mold).
  Possibility for restricted spaces:
  Heater band with flat cap connection and wedge clamping or cylindrical heat cartridges.
  (More information under Optional Extras, Heating systems)

- **Integrated tip heating system**
  Tip mounted heater bands have exposed areas. When injecting out the problem of over injecting can arise. This requires time consuming cleaning which can result in damage to the heater band.
  An alternative to this is a tip with integrated heat cartridges.

- **Tip with heat conduction jacket**
  Heat conduction tips are applied in situations of tight mold clearance. These enable heat distribution until the end of the tip in the immersion area without extra heating.
  (More information under Open machine nozzle, type W)

**Position sensor for actuator → process control**

A temperature resistant cylinder houses the sensor which detects the position of the piston ensuring that the nozzle is in an "open" or "closed" position.

(More information under Optional Extras for shut-off nozzles)
## Operating data

<table>
<thead>
<tr>
<th></th>
<th>HP0</th>
<th>HP1</th>
<th>HP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. injection rate cm³/s based on Polystyrol (PS)</td>
<td>500</td>
<td>1600</td>
<td>3500</td>
</tr>
<tr>
<td>approx. screw diameter (mm)</td>
<td>bis 50</td>
<td>50 – 120</td>
<td>ab 120</td>
</tr>
<tr>
<td>flow channel cm³</td>
<td>20</td>
<td>50</td>
<td>130</td>
</tr>
<tr>
<td>max. contact force (kN)</td>
<td>70</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>smallest nozzle orifice (mm) M at max. injection rate</td>
<td>Ø 3</td>
<td>Ø 5</td>
<td>Ø 8</td>
</tr>
<tr>
<td>max. back pressure</td>
<td>600 bar</td>
<td>600 bar</td>
<td>600 bar</td>
</tr>
</tbody>
</table>

- For higher back pressure (melt precompression) or closing against solid melt pressure (physical foaming) please contact us for more information.

| max. injection pressure / temperature | 3000 bar / 400°C | 3000 bar / 400°C | 3000 bar / 400°C |

## Standard dimensions (mm)

<table>
<thead>
<tr>
<th>Key Description</th>
<th>HP0</th>
<th>HP1</th>
<th>HP2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K</strong></td>
<td>tip length; one-piece tip length; two-piece</td>
<td>24*, 40** (60, 80, 100, 130, 160)**</td>
<td>32*, 50** (80, 100, 130, 160, 190)**</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>max. orifice (cylindrical)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>body length</td>
<td>138</td>
<td>176</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td>temperature sensor</td>
<td>Typ J (FeCuNi)</td>
<td>Typ J (FeCuNi)</td>
</tr>
<tr>
<td><strong>J</strong></td>
<td>heater band</td>
<td>ø60*80 special 600W / 230V</td>
<td>ø80*100 special 1250W / 230V</td>
</tr>
<tr>
<td><strong>JK</strong></td>
<td>heater band dimensions</td>
<td>one-piece tip; two-piece tip;</td>
<td>Ø26 x 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø35 x K-40</td>
<td>Ø40 x K-55</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>70</td>
<td>77</td>
<td>96</td>
</tr>
<tr>
<td><strong>Q</strong></td>
<td>51</td>
<td>64</td>
<td>95</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>pneumatic hydraulic / water cooling</td>
<td>G1/8&quot;</td>
<td>G1/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G1/4&quot; / G1/8&quot;</td>
<td>G1/4&quot; / G1/8&quot;</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>84</td>
<td>95</td>
<td>124</td>
</tr>
</tbody>
</table>

*Standard tip included in base model. **Optional tip dimensions. Other tip dimensions custom manufactured.

## Technical modifications reserved. For orders or enquiries please fill out the **Dimension sheet**.

herzog systems ag  
Tel. +41 (0)71 394 19 69  
Fax. +41 (0)71 394 19 60  
www.herzog-ag.com  
info@herzog-ag.com  
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**Dimension Sheet for enquiry**

<table>
<thead>
<tr>
<th>Company:</th>
<th>Contact person:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street:</td>
<td>Tel.:</td>
</tr>
<tr>
<td>City / Zip:</td>
<td>Fax:</td>
</tr>
<tr>
<td>Land:</td>
<td>E-Mail:</td>
</tr>
</tbody>
</table>

**Shut-off nozzle type HP, pneu. / hydr. operated**

**Nozzle size**
- HP0 (up to 500 cm³/s with PS)
- HP1 (up to 1600 cm³/s with PS)
- HP2 (up to 3500 cm³/s with PS)

**Actuation**
- pneumatic (integrated)
- hydraulic (integrated)
- none (machine side)

**Options**
- Temperature sensor - Type J (FeCuNi), Cable length 2m
- Tip with abrasion protection (above 30% fillers)
- Corrosion protection; recommended for additives such as flame retardants

**Optional Extras:**
- Filter, active opening, mixer, GIT (Gas Injection Technology), actuator sensors

**Special applications:**
- Physical foaming, melt pre-compression

**Customer information:**
We need additional information for requirements which vary from our standard range e.g. drawing sample.
Our customer services will be pleased to help you.

**Standard dimensions, see Datasheet. Measurements in mm.**

- Temperature sensor bore (thread ø, thread pitch)
- Temperature sensor bore (ø x depth)
- Thread length (incl. centering)
- Connection thread (thread ø, thread pitch)
- Centering length
- Centering ø
- Immersion depth (screw tip / angle)
- Inlet ø

**Tip length** (check standard dimensions)

**Optional Extras:**
- Filter, active opening, mixer, GIT (Gas Injection Technology), actuator sensors

**Special applications:**
- Physical foaming, melt pre-compression

If optional extras are required or when processing with the above special applications, please enter here: