Machine bolt shut-off nozzle type BHP
pneumatically or hydraulically controlled

Applications:
Thermoplastics (not applicable for PVC)

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

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The pneumatically or hydraulically actuated machine bolt shut-off nozzles type BHP are used in processing of thermoplastics.

With the BHP nozzle Herzog has designed a system which allows a single straight-through melt flow channel. Therefore a much larger flow channel is possible which results in low pressure drop. With this single channel principle the so called "Memory effect" can be avoided.

Purging and colour changes can be achieved in a very short time (similar to an open nozzle).

Finds application in: high speed - high through-put applications, shear sensitive materials, high viscosity materials. Ideal for packaging, automotive, white goods and medicinal.

Operation: The assembly integrated actuator (pneumatically or hydraulically activated) controls a bolt which is located at a 90° angle to the melt stream, via a lever mechanism. The melt flow is therefore process independently separated. The bolt mechanism is constructed in such a way, that with over-pressure an automatic opening of the nozzle is ensured. In contrast to a needle shut-off system, the separation takes place further away from the mold. For some applications this may not be suitable due to potential residual material after the shut-off mechanism.

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

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

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**Technical description**

**Highlights:**
- Excellent color change properties
- Operating pressure: 3000 bar at 400°C
- Proven shut-off with high-speed units
- Robust, reliable separation
- Can be adapted to the mold with existing open nozzle
- Compact, interchangeable design

**Advantages of bolt shut-off type BHP**

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

**Productivity factors:**
- Shorter cycle times - increase in productivity
- Increased process reliability and repeatability
- Usability with increased back pressure - improved homogenization
- Add-on capability (on tool side)

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

**What speaks for Herzog**
- Nozzle activity is the core business
- Many years market presence
- Design and assemblies matching today's requirements
- Development for special applications
- Fast delivery
- Service performance
Specially manufactured two-way piston cylinders with temperature resistant seals (up to 180°C) are applied for 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 construction (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 degenerate, 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!

### Integrated Actuator

**Important: Use a flexible cylinder supply!**
- Air connection G1/8"  
- Oil connection G1/4"  
- Water connection G1/8"

(See Optional Extras, Flexible Actuator Supply)

### Machine-side actuator

If a machine-side actuator is to be applied, 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: \(BHP_0 = 800\text{N}, \ BHP_1 = 900\text{N}, \ BHP_2 = 4000\text{N}\)
- Min. cylinder range: \(BHP_0 = 18\text{mm}, \ BHP_1 = 20\text{mm}, \ BHP_2 = 40\text{mm}\)

**Assembly alignment**

The actuator position is rotational within 360°. Proven and tested between 4 and 8 o'clock.
### GIT Gas Module (Type GM) → material saving, quality on 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.

(See document GIT, type GM)

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### 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. Standard files hole sizes are Ø0.6mm and Ø0.9mm. Other sizes available on request.

(See document Open machine nozzles, type FN)

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**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.

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**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.

(See document Optional Extras for shut-off nozzles)

**Retractable bolt mechanism → active opening (only BHP2 size)**

The standard bolt system is not directly connected to the actuator. Once the actuator is opened melt pressure (up to 50 bar) ensures that the bolt moves into its sealed open position. For certain applications where no melt pressure exists before injection (some decompression phases achieve this) the bolt may remain in the closed position. Therefore to ensure it is in the open sealed position it must be retracted by the lever.
Optional variant: without tip, supplied by customer

Tip standard dimensions (mm) | BHP0 | BHP1 | BHP2
--- | --- | --- | ---
Thread | M30 x 2 | M30 x 2 | M45 x 3
Thread length | 24 | 24 | 28
Inlet ø | Ø6 | Ø10 | Ø19
K (length) | 30 | 30 | 50

Other lengths are custom manufactured and available on request. Note: Extended tip lengths require additional heating with separate regulation.

Max. dimensions (mm) | BHP0 | BHP1 | BHP2
--- | --- | --- | ---
a Screw in thread | Ø40 | Ø60 | Ø80
b Depth | 30 | 35 | 60

The stars in the graphic represent exposed areas of the nozzle. The required area should be checked in the machine platen. In certain circumstances a longer tip can avoid collision. In this case the tip dimension K would be adjusted. For standard sizes see Tip types.

Risk of collision by diving into the mold

Dimension (mm) | BHP 0 | BHP 1 | BHP 2
--- | --- | --- | ---
P | 71 | 77 | 132
Q | 57 | 68 | 93
S | 84 | 96 | 175
T | 87 | 115 | 201
K | Tip length variable to immersion depth (see Tip types)
Machine shut-off nozzle, type BHP

### Operating Data

<table>
<thead>
<tr>
<th></th>
<th>BHP0</th>
<th>BHP1</th>
<th>BHP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. injection rate cm³/s based on Polystyrol (PS)</td>
<td>500</td>
<td>3500</td>
<td>5000</td>
</tr>
<tr>
<td>approx. screw diameter (mm)</td>
<td>Up to 50</td>
<td>50 - 120</td>
<td>120 - 200</td>
</tr>
<tr>
<td>flow channel cm³</td>
<td>10</td>
<td>30</td>
<td>360</td>
</tr>
<tr>
<td>max. contact force (kN)</td>
<td>120</td>
<td>160</td>
<td>260</td>
</tr>
<tr>
<td>smallest nozzle orifice (mm) M at max. injection rate</td>
<td>Ø4</td>
<td>Ø7</td>
<td>Ø10</td>
</tr>
<tr>
<td>max. back pressure</td>
<td>400 bar</td>
<td>200 bar</td>
<td>400 bar</td>
</tr>
<tr>
<td>max. injection pressure / temperature</td>
<td>3000 bar at 400°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Standard dimensions (mm)

<table>
<thead>
<tr>
<th>Key Description</th>
<th>BHP0</th>
<th>BHP1</th>
<th>BHP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>K tip length (other sizes on request)</td>
<td>30</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>N body length</td>
<td>138</td>
<td>176</td>
<td>314</td>
</tr>
<tr>
<td>I temperature sensor</td>
<td>type J (FeCuNi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J heater band (manufactured acc. to drawing)</td>
<td>ø60*75 600W</td>
<td>ø80*100 1250W</td>
<td>ø110*200 2000W</td>
</tr>
<tr>
<td>P pneumatic</td>
<td>71</td>
<td>77</td>
<td>132</td>
</tr>
<tr>
<td>Q hydraulic / water cooling</td>
<td>G1/8&quot;</td>
<td>G1/4&quot; / G1/8&quot;</td>
<td>93</td>
</tr>
<tr>
<td>R pneumatic</td>
<td>84</td>
<td>96</td>
<td>175</td>
</tr>
<tr>
<td>Optional variant - customer specific tip dimensions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a max. thread Ø</td>
<td>40</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>b max. thread length incl. centering</td>
<td>30</td>
<td>35</td>
<td>60</td>
</tr>
</tbody>
</table>

Technical modifications reserved. For orders or enquiries please fill out the Dimension sheet.
Machine shut-off nozzle, type BHP

Common dimensions, see Datasheet. Measurements in mm.

**Nozzle size**
- BHP0 (up to 500 cm³/s with PS) pneumatic (integrated)
- BHP1 (up to 3500 cm³/s with PS) hydraulic (integrated)
- BHP2 (up to 5000 cm³/s with PS) none (machine-side)

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

**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)

**Incl. Heater band**

**Tip contour**
- (radius or angle)

**Orifice**

**Temperature sensor bore**
- (thread ø, thread pitch)
- (ø x depth)

**Thread length**
- (incl. centering)

**Temperature sensor bore**
- (thread ø, thread pitch)

**Centering length**

**Centering ø**

**Immersion depth**
- (screw tip/angle)

**Inlet ø**

**Thread length**
- (without centering)
- (with centering)

**Options**
- Temperature sensor - type J(FeCuNi) Cable length 2m
- Filter (standard hole size ø0.6mm or ø0.9mm)
- Mixer
- Piston position sensors
- Retractable bolt mechanism (BHP2 size only)

**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.