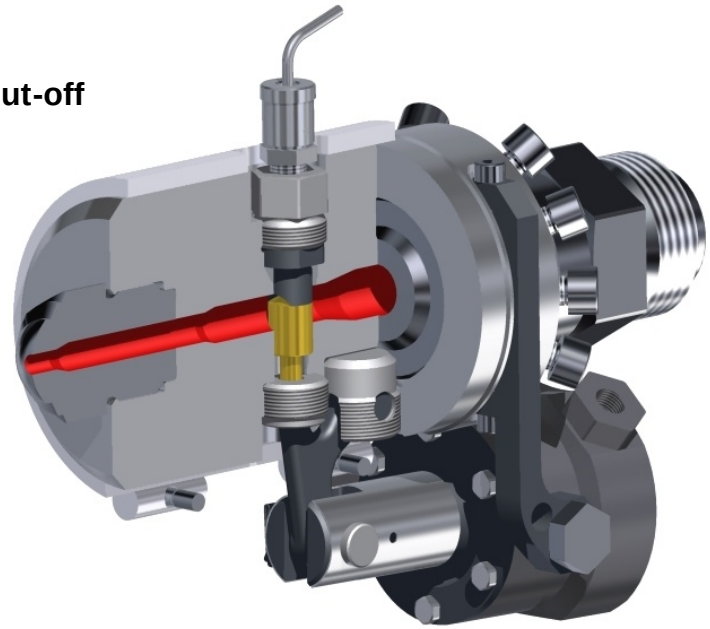
Machine bolt shut-off nozzle type BHP pneumatically or hydraulically controlled

Bolt shut-off



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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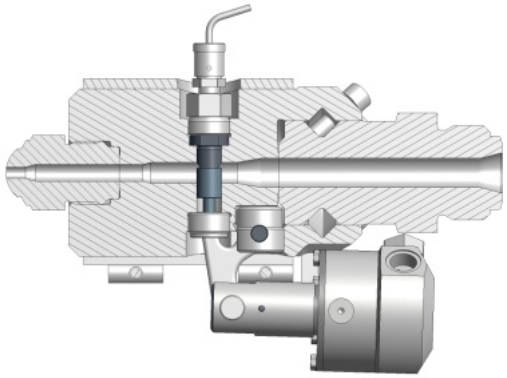

Technical description

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

Nozzle highlights included: Cycle time reduction, shut-off in the nozzle of the melt-stream while withdrawing or dosing. With the BHP nozzle Herzog has designed a system which allows a single through-going melt flow channel. Therefore a much bigger flow channel is possible and that is responsible for a reduced pressure drop. With this single channel principle the so called “Memory effect” can be avoided.
With the single channel system a cleaning of the unit is done within very short time (similar to an open nozzle).

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

Operation: The assembly integrated actuator (pneumatically or hydraulically activated) controls a radial positioned bolt via a lever mechanism. The melt flow is therefore process dependently separated. The bolt mechanism is constructed in such a way, that with overpressure an automatic opening of the nozzle is ensured. In contrast to a needle shut-off system, the separation takes place further back. Because of this a longer bore exists between the nozzle orifice and the shut-off unit. For some applications this may not be suitable.

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.

Arguments for this nozzle type

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- Material leakage when dosing with a withdrawn injection unit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

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

For & Against

For:
- Excellent color change properties
- Opening and closing occurs independent of melt pressure
- Operating pressure: 3000bar 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

Against:
- Integrated actuator requires space on the machine
- Installation must follow instruction manual

What speaks for Herzog

- Nozzle activity is the core business
- Many years market presence
- Design and assemblies matching today‘s requirements
- Development of special applications
- Fast delivery
- Service performance

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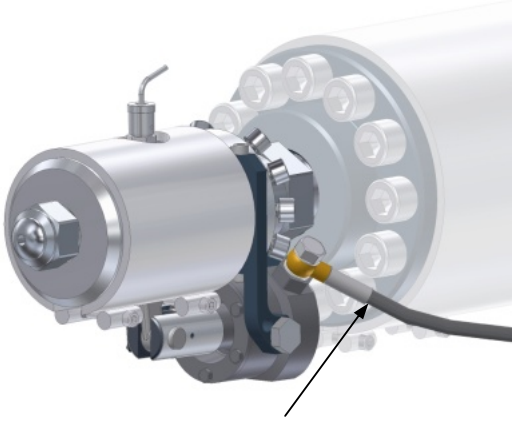


Note! Use a flexible cylinder supply
- Air connection G1/8“
- Oil connection G1/4“
- Water connection G1/8“

Integrated Actuator

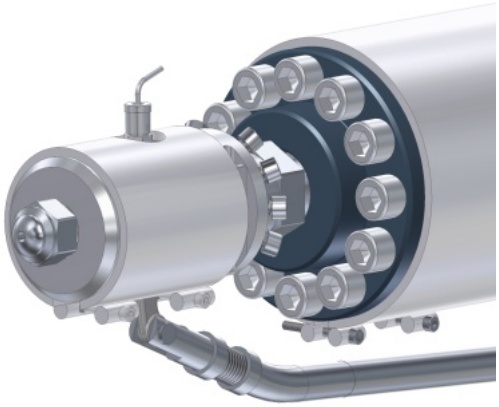
Specially manufactured two-way piston cylinders with temperature resistant seals (up to 180°C) are applied for the pneumatic and hydraulic actuators. The actuator together with the nozzle assembly froms a compact unit.
The cylinders are operated from input data on the machine control unit.

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):
- Pnuematic: 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.

(See **Optiona Extras, Flexible Actuator Supply**)



Machine-side actuator

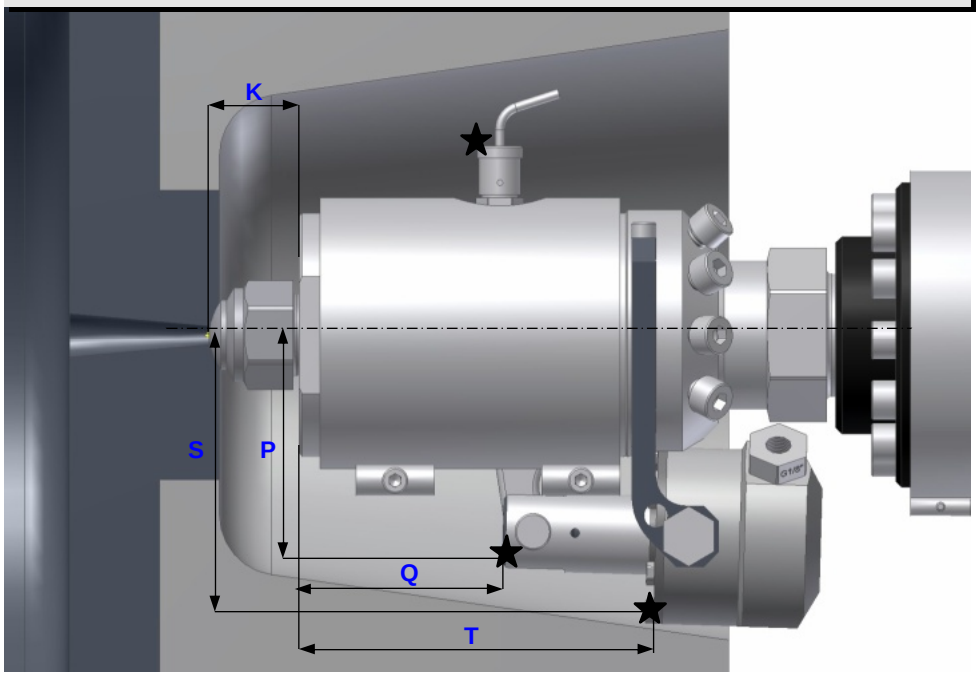
If a machine-side actuator is to be applied, the leverage installation and connection (range, force and alignment) with the nozzle must be carefully carried out.
For a smooth, trouble-free operation, the following requirements must be met:

- Two-way actuator
- Max. force on lever: **BHP0** = 800N, **BHP1** = 900N, **BHP2** = 4000N
- Min. cylinder range: **BHP0** = 18mm, **BHP1** = 20mm, **BHP2** = 40mm

Risk of collision by diving into the mold

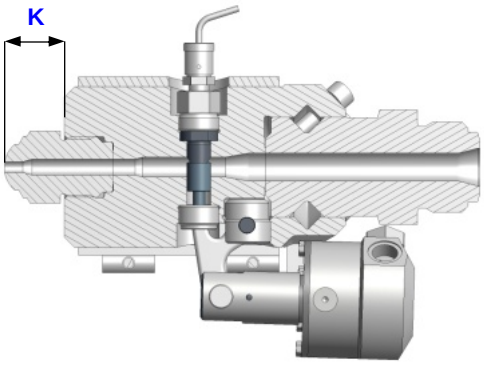
★ The stars in the graphic represent exposed areas of the nozzle. The required area should be checked in the machine plate.

(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**)		

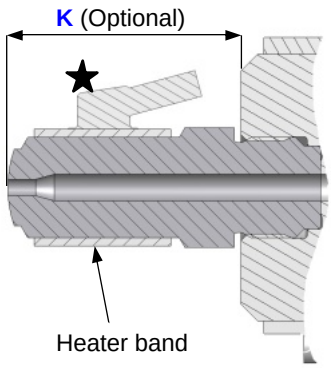


In certain circumstances a longer tip can ensure the collision avoidance. In this case the tip dimension **K** would be adjusted. For standard sizes see **Tip types**.

Tip types



Tip dimensions	Standard dimensions (mm) BHP0 + BHP1	Standard dimensions (mm) BHP2
thread	M30 x 2	M45 x 3
Thread length	24	28
Orifice	**BHP0** Ø6 / **BHP1** Ø10	Ø18
K-dimension in mm (other dimensions on request)	30	50



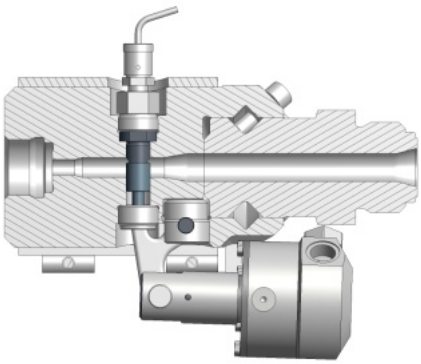
Option: In between lengths are custom manufactured
Note: Extensions require an adjustable heating system

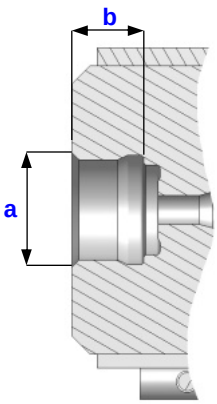
★ The star represents an exposed area

For restricted spaces there exist different heating possibilites, see **Alternative tip heating systems** on page 6.

(See **Optional Extras, Heating Systems**)

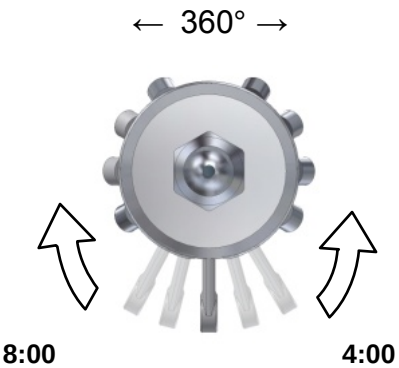
Optional variant: without tip, supplied by customer





	max. dimensions (mm):		
	BHP0	**BHP1**	**BHP2**
a max. screw in thread	Ø40	Ø60	Ø80
b max. depth	30	35	60

Assembly alignment



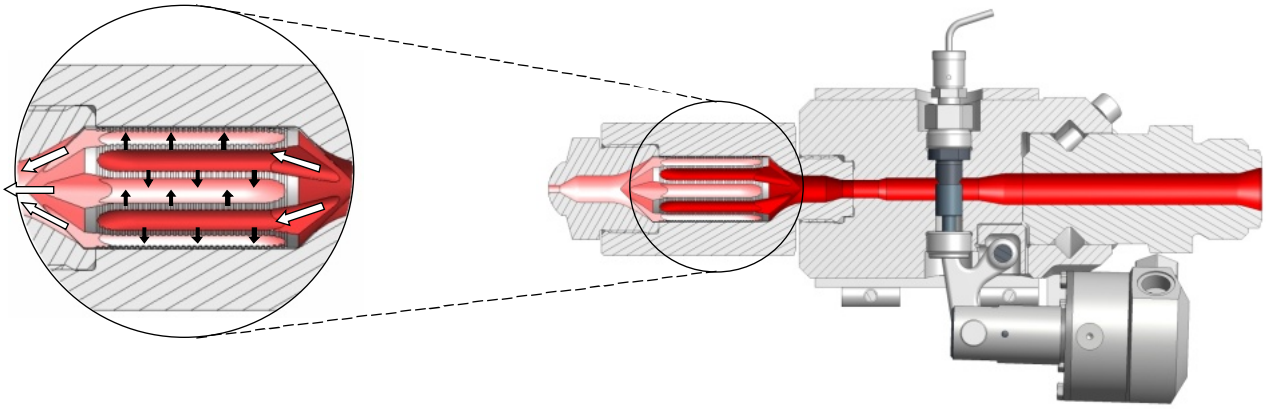
The actuator position is rotational within 360°.

Proven and tested between 4 and 8 o‘clock.

Optional Extras

Filter → preventive strategy

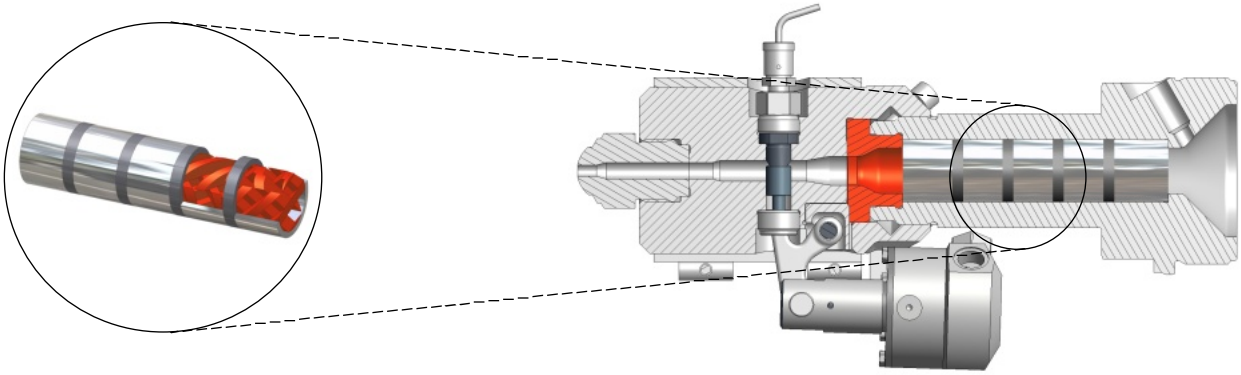
Keeping free feed openings in the hot runner or filtering of the polymer mass in reclaimed material processing requires the use of a filter. We offer the gap filter.



(See document **Open machine nozzles, type F**)

Mixer → improved quality on injection molded parts

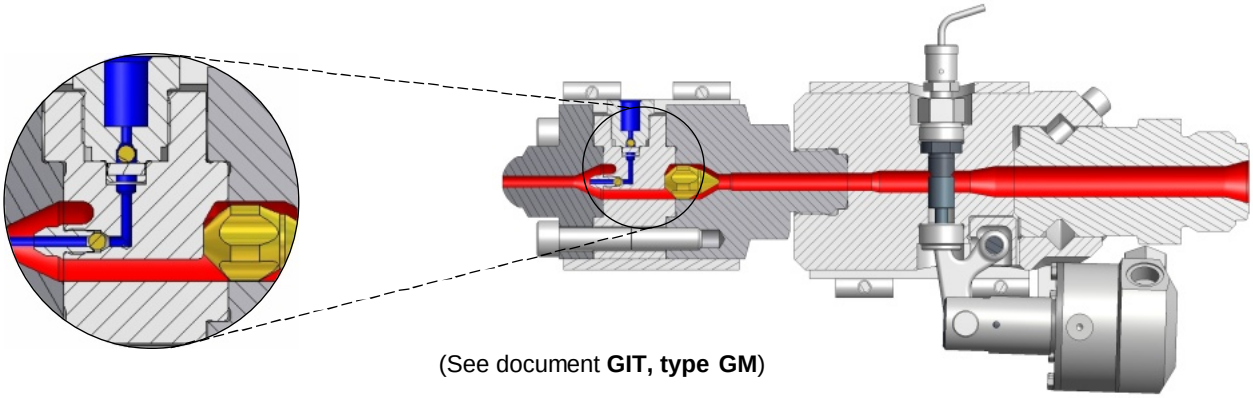
A **homogenized** melt (in colour and temperature) reduces the reject rate and produces a considerable improvement in the quality of the injection-molded parts. The installation of the mixer takes place either before or after the nozzle. We favour the X-Mixer technology.



(See document **Open machine nozzles, type M**)

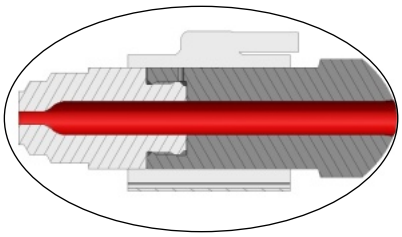
GIT Gas Module (Type GM) → cycle time, quality on injection molded parts

With the shut-off nozzle the gas is injected through the gate core. To use the nozzle for the GIT process, the tip is changed. A special valve seals the gas feed area to make it completely polymer-seal. 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**)

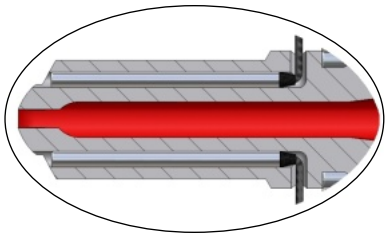
Alternative tip heating systems→ Note: requires adjustable heating



- **Space saving external heating system**

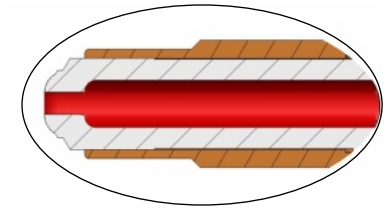
A standard heater band requires space in the nozzle immersion area (machine plate - mold).
Possibility for restricted spaces:
Heater band with flat cap connection and wedge clamping or cylindrical heat cartridges.

(See document **Optional Extras, Heating systems**)



- **Integrated tip heating system**

Tip mounted haterbands 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.



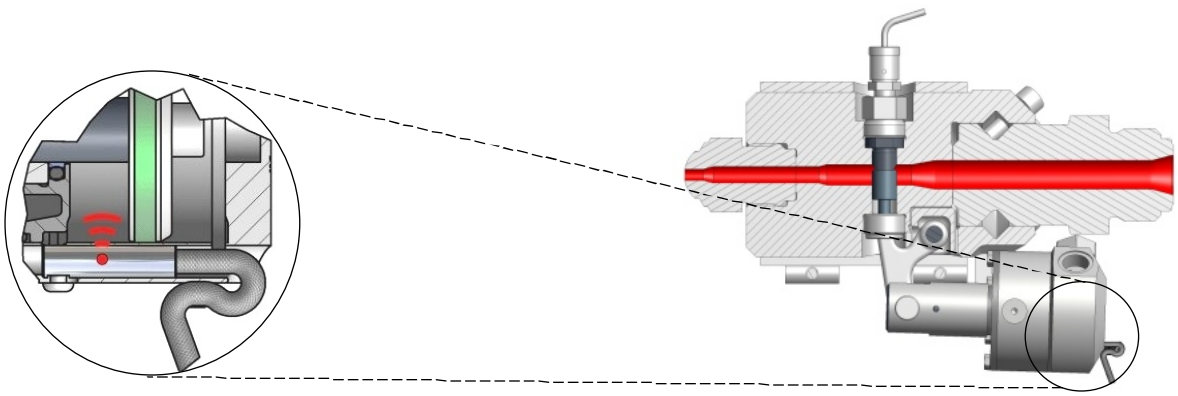
- **Tip with heat conduction jacket**

Heat conduction tips are applied in situations of tight tool clearance.
These enable heat distribution until the end of the tip in the immersion area without extra heating.

(See document **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.



(See document **Optional Extras for shut-off nozzles**)

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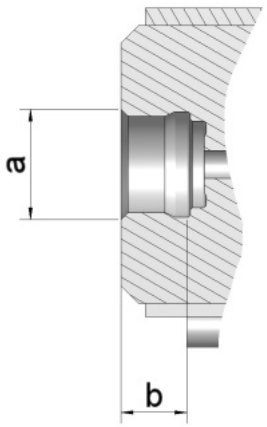
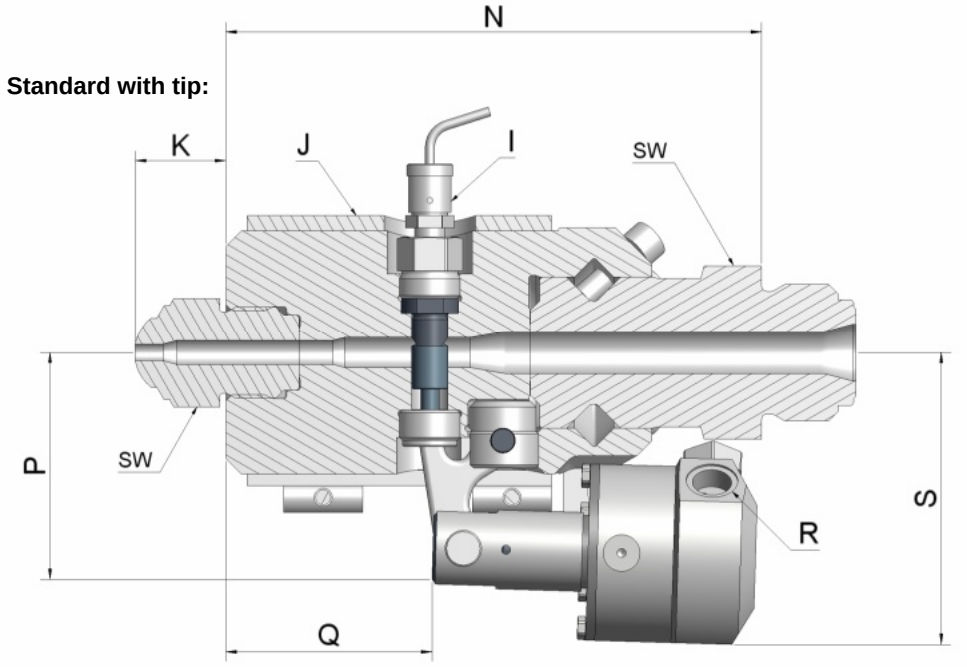
Data sheet - machine shut-off nozzle, type BHP, pneumatically / hydraulically controlled

Operating data	BHP0	BHP1	BHP2
max. injection rate cm^3 / s based on Polystyrol (PS)	500	3500	5000
approx. screw diameter (mm)	Up to 50	50 - 120	120 - 200
flow channel cm^3	10	30	360
max. contact force (kN)	70	120	180
smallest nozzle orifice (mm) **M** at max. injection rate	Ø4	Ø7	Ø10
max. back pressure (closed nozzle)	400 bar	400 bar	400 bar
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 at 400°C		

Optional variant without tip:
Customer specific installation thread



Standard with tip:



Standard dimensions (mm)

Key	Description	BHP0	BHP1	BHP2
K	tip length (other sizes on request)	30	30	50
N	body length	138	176	314
I	temperature sensor	type J (FeCuNi)		
J	heater band (manufactured acc. to drawing)	ø60*75 600W	ø80*100 1250W	ø110*200 2000W
P		71	77	132
Q		57	68	93
R	pneumatic	G1/8“		
	hydraulic / water cooling	G1/4“ / G1/8“		
S		84	96	175
Optional variant - customer specific tip dimensions				
a	max. thread Ø	40	60	80
b	max. thread length **incl.** centering	30	35	60

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

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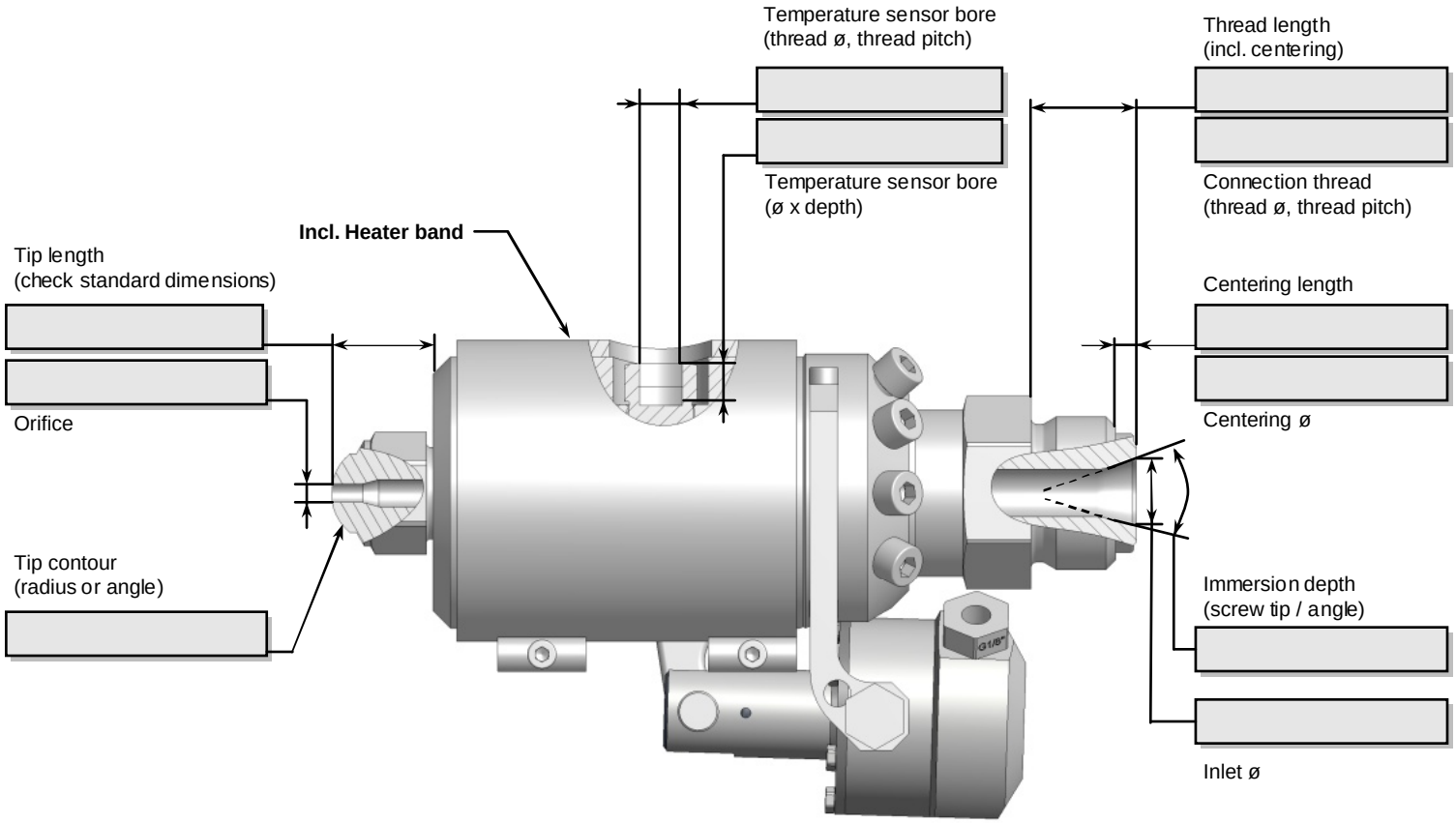
Dimension Sheet for enquiry		**or order**		Machine shut-off nozzle type BHP, pneu. / hydr. operated

Company:	Contact person:
Street:	Tel.:
City / Zip:	Fax:
Land:	E-Mail:

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



Nozzle size

- ☐ **BHP0** (up to 500 cm³/s with PS)
- ☐ **BHP1** (up to 3500 cm³/s with PS)
- ☐ **BHP2** (up to 5000 cm³/s with PS)

Actuation

- ☐ pneumatic (integrated)
- ☐ hydraulic (integrated)
- ☐ none (machine-side)

Machine type (when known)

Screw diameter

Option

Temperature sensor– type J(FeCuNi) Cable length 2m	**Yes** ☐

Optional Extras:
Filter, mixer ,GIT (Gas Injections Technology), alternative tip heating, position sensor for actuator

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

Note: Technical modifications reserved. 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.

Optional variant without tip (customer specifc)