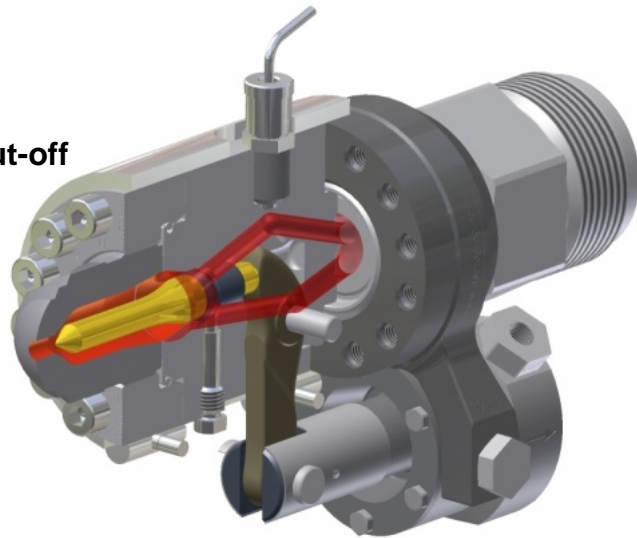


Machine nozzle with needle shut-off type HP pneumatically or hydraulically controlled

Needle shut-off



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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Technical description

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, withdrawal while dosing

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 dependently 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.

Arguments for needle shut-off type HP

Prevents:

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- Material leakage when dosing with a withdrawn injection unit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

Applicable for special applications such as:

- Physical foaming
- Pre-compressing the melt
- Hot-runner injection molding (e.g.. containers, pots)

Supported process control:

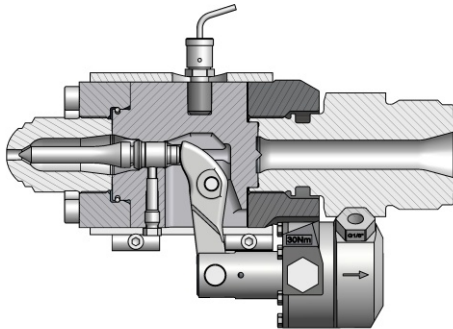
- Actuator piston position sensors (indicates if nozzle is "open" or "closed").

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
- Add-on capability (on tool side)

Options:

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



For & Against

For:

- Opening and closing occurs independent of melt pressure
- Melt flow separation at nozzle orifice
- Operating pressure: 3000bar at 400°C
- Proven shut-off with high-speed units
- Robust, reliable separation
- Special application applicable
- 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

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 forms a compact unit.

The cylinders are operated from input data on the machine control unit.

Advantages on an integrated actuator:

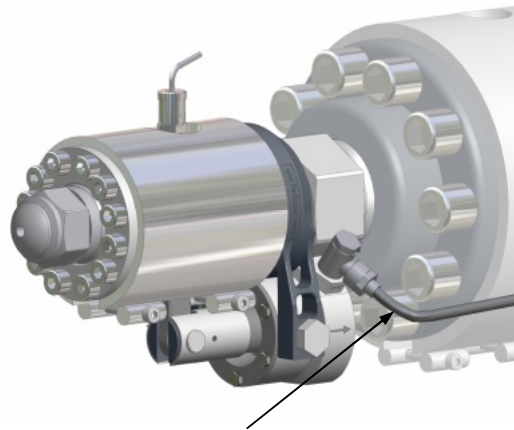
- No installation errors
- Adjustments such as; stroke, force, etc. on the control unit are eliminated
- No alignment between nozzle and cylinder is required

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.



Note! Use a flexible cylinder supply

- Air connection G1/8"
- Oil connection G1/4"
- Water connection G1/8"

(More information under: **Optiona Extras for shut-off nozzles**)

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:

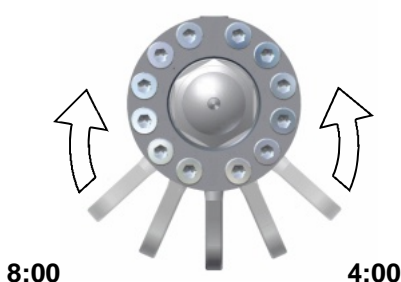
- Two-way actuator
- Max. force on lever: **HP0** = 800N, **HP1** = 900N, **HP2** = 2000N
- Min. cylinder range: **HP0** = 18mm, **HP1** = 20mm, **HP2** = 26mm

Assembly alignment

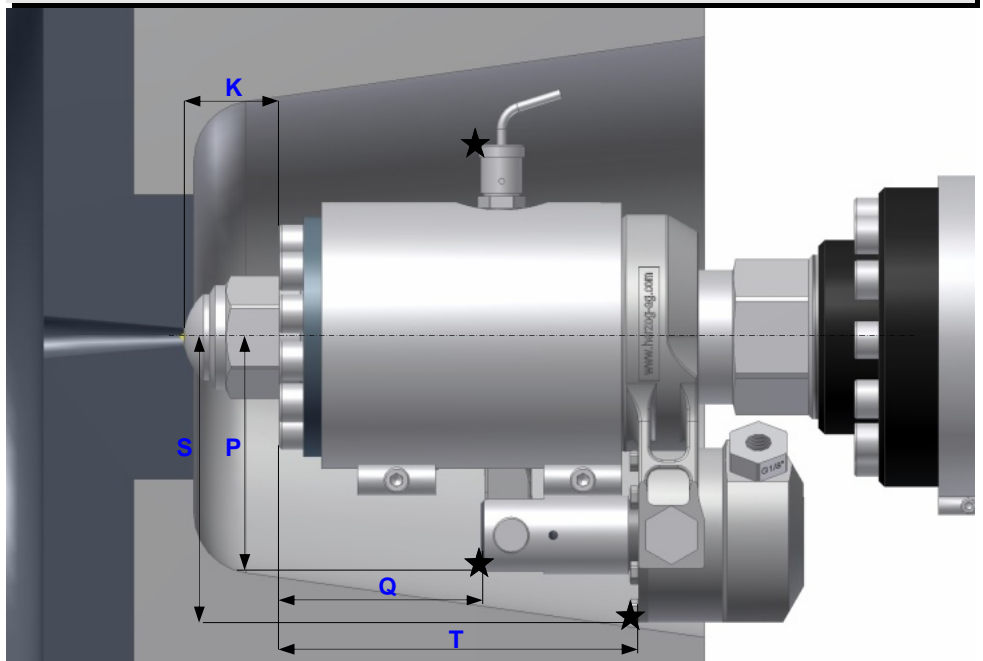
The actuator position is rotational within 360°.

Proven and tested between 4 and 8 o'clock.

← 360° →



Risk of collision by diving into the mold

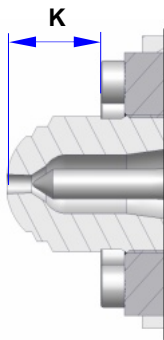


★ The stars in the graphic represent exposed areas of the nozzle. The required area should be checked in the machine plate.

(mm)			
	HP 0	HP 1	HP 2
P	70	77	96
Q	51	64	92
S	84	95	124
T	87	117	173
K	Tip length variable to immersion depth (see Tip types)		

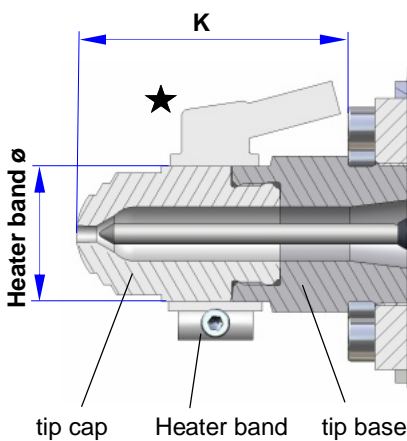
In certain circumstances a longer tip can ensure the collision avoidance. In this case the tip dimension **K** would be adjusted. For standard sizes see **Tip types**.

Tip types



One-piece tip: two lengths	HP 0		HP 1		HP 2	
K length in mm	24 *	40	32 *	50	50 *	80
Heater band (ø x width in mm)	—	Ø26 x 16	—	Ø35 x 18	—	Ø50 x 30

* **Standard tip** (included in the base model)



Two-piece tip	HP 0	HP 1	HP 2
K length in mm	60, 80, 100, 130, 160	80, 100, 130, 160, 190	100, 130, 160, 190
Heater band	Ø35 x K-40mm	Ø40 x K-55mm	Ø60 x K-70mm

Option: In between lengths are custom manufactured

Extensions require an adjustable heating system

★ The star represents an exposed area

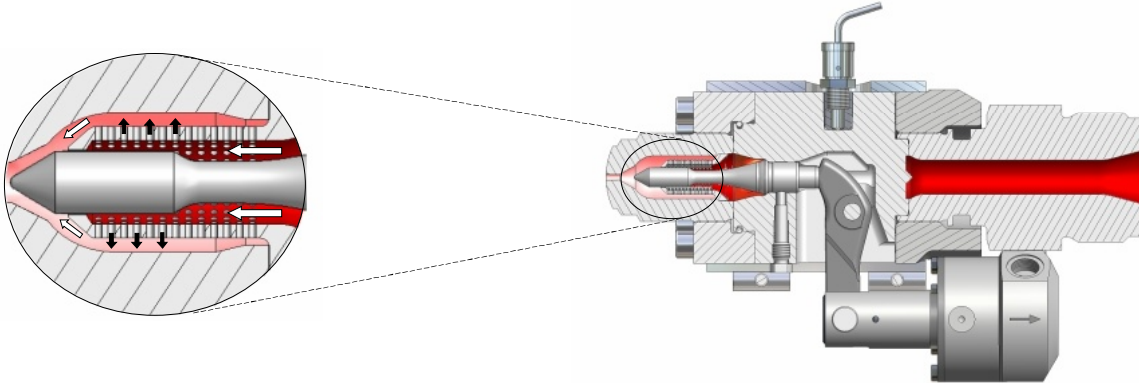
For restricted spaces there exist different heating possibilities, see **Alternative tip heating systems** on page 6.

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

Optional Extras

Filter → preventive strategy

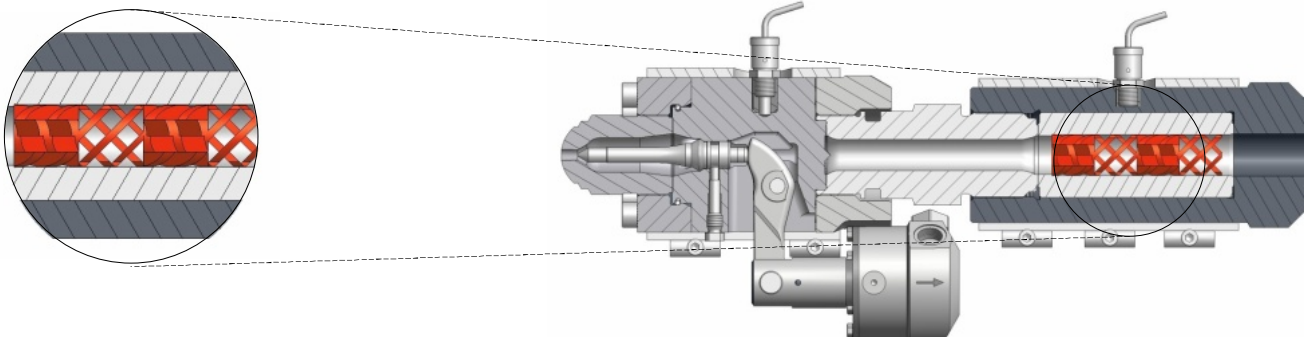
Keeping free feed openings in the hot runner requires the use of a filter. We offer the screen or sieve filter.



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

Mixer → improved quality on injection molded parts

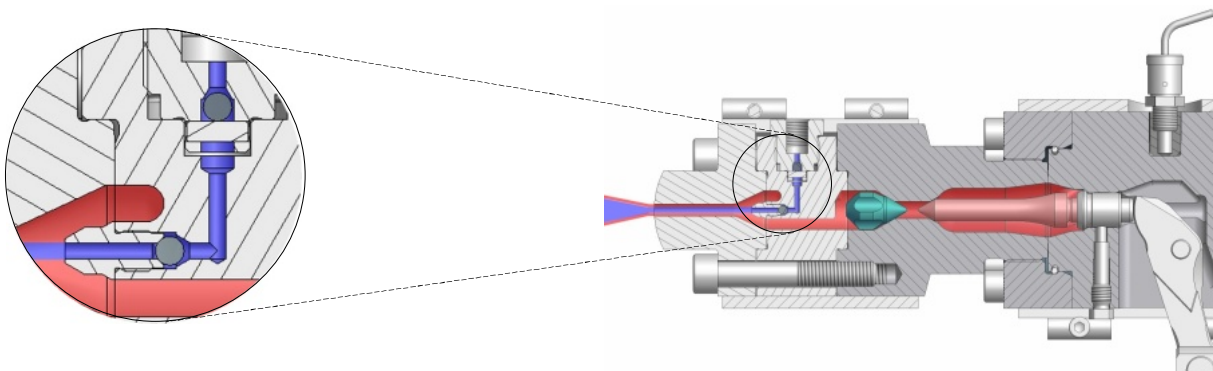
A **homogenized** melt (in colour and temperature) reduces the reject rate and produces a considerable improvement in the quality of the injection-molded parts. The installation of the mixer takes place before the nozzle. We favour the X-Mixer technology.



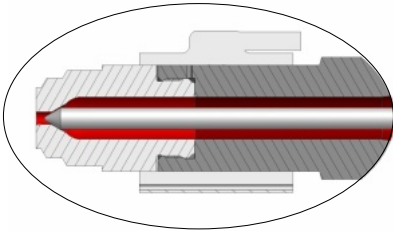
(More information under **Open machine nozzles, type,M**)

GIT (Gas Injection Technology) → 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.



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

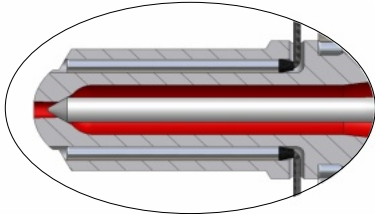
Alternative tip heating systems → Note: requires adjustable heating

• Space saving external heating system

A standard heater band requires space in the nozzle immersion area (machine plate - mold).

Possibility for restricted spaces:

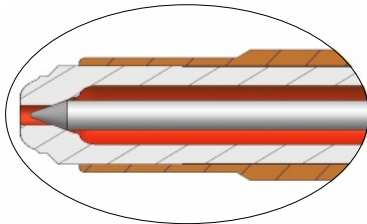
Heater band with flat cap connection and wedge clamping or cylindrical heat cartridges.

(More information under **Optional Extras, Heating systems**)


• Integrated tip heating system

Tip mounted heaterbands 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

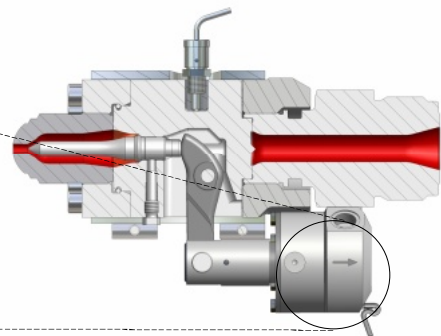
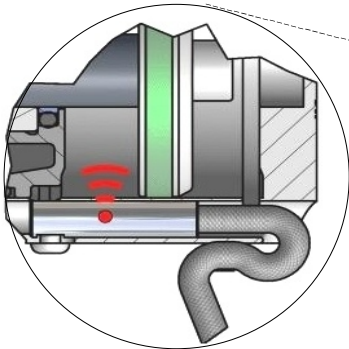
Heat conduction tips are applied in situations of tight tool clearance.

These enable heat distribution until the end of the tip in the immersion area without extra heating.

(More information under **Open machine nozzle, type W**)

Position sensor for actuator → process control

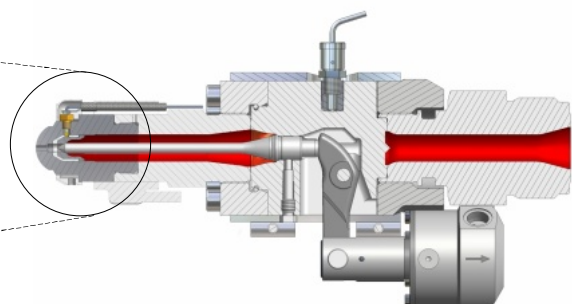
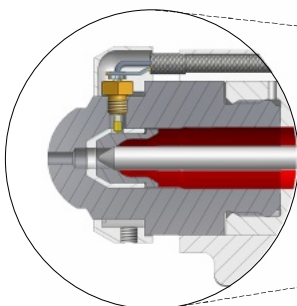
A temperature resistant cylinder houses the sensor which detects the position of the piston ensuring that the nozzle is in an "open" or "closed" position.



(More information under **Optional Extras for shut-off nozzles**)

Needle monitoring → Process control, safety feature

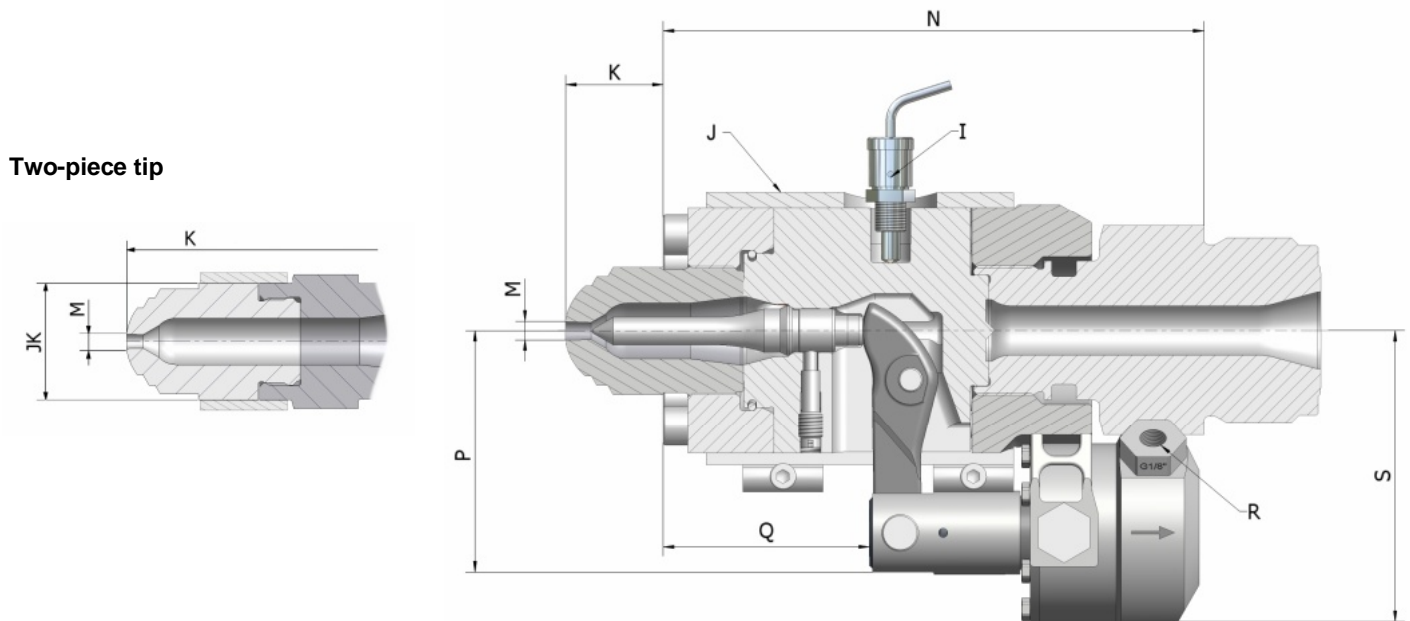
The needle closes the nozzle opening with contact force in the needle fitting, inside the nozzle tip. This contact sends a signal indicating the open / closed situation of the nozzle.



(More information under **Optional Extras for shut-off nozzles**)

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

Operating data	HP0	HP1	HP2
max. injection rate cm ³ / s based on Polystyrol (PS)	500	1600	3500
approx. screw diameter (mm)	bis 50	50 – 120	ab 120
flow channel cm ³	20	50	130
max. contact force (kN)	70	120	180
smallest nozzle orifice (mm) M at max. injection rate	Ø 3	Ø 5	Ø 8
max. back pressure (closed nozzle)	1000 bar	1000 bar	1000 bar
<ul style="list-style-type: none"> 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)

Key Description	HP0	HP1	HP2
K tip length; one-piece tip length; two-piece	24* , 40** (60, 80, 100, 130, 160)**	32* , 50** (80, 100, 130, 160, 190)**	50* , 80** (100, 130, 160, 190)**
*Standard tip included in base model. **Optional tip dimensions. Other tip dimensions custom manufactured.			
M max. orifice (cylindrical)	6	8	11
N body length	138	176	244
I temperature sensor	Typ J (FeCuNi)	Typ J (FeCuNi)	Typ J (FeCuNi)
J heater band (manufactured acc. to drawing)	Ø60*80 special 600W / 230V	Ø80*100 special 1250W / 230V	Ø115*140 special 2000W / 230V
JK heater band dimensions	one-piece tip; two-piece tip; Ø26 x 16 Ø35 x K-40	Ø35 x 18 Ø40 x K-55	Ø50 x 30 Ø60 x K-70
P	70	77	96
Q	51	64	95
R pneumatic hydraulic / water cooling	G1/8" G1/4" / G1/8"	G1/8" G1/4" / G1/8"	G1/8" G1/4" / G1/4"
S	84	95	124

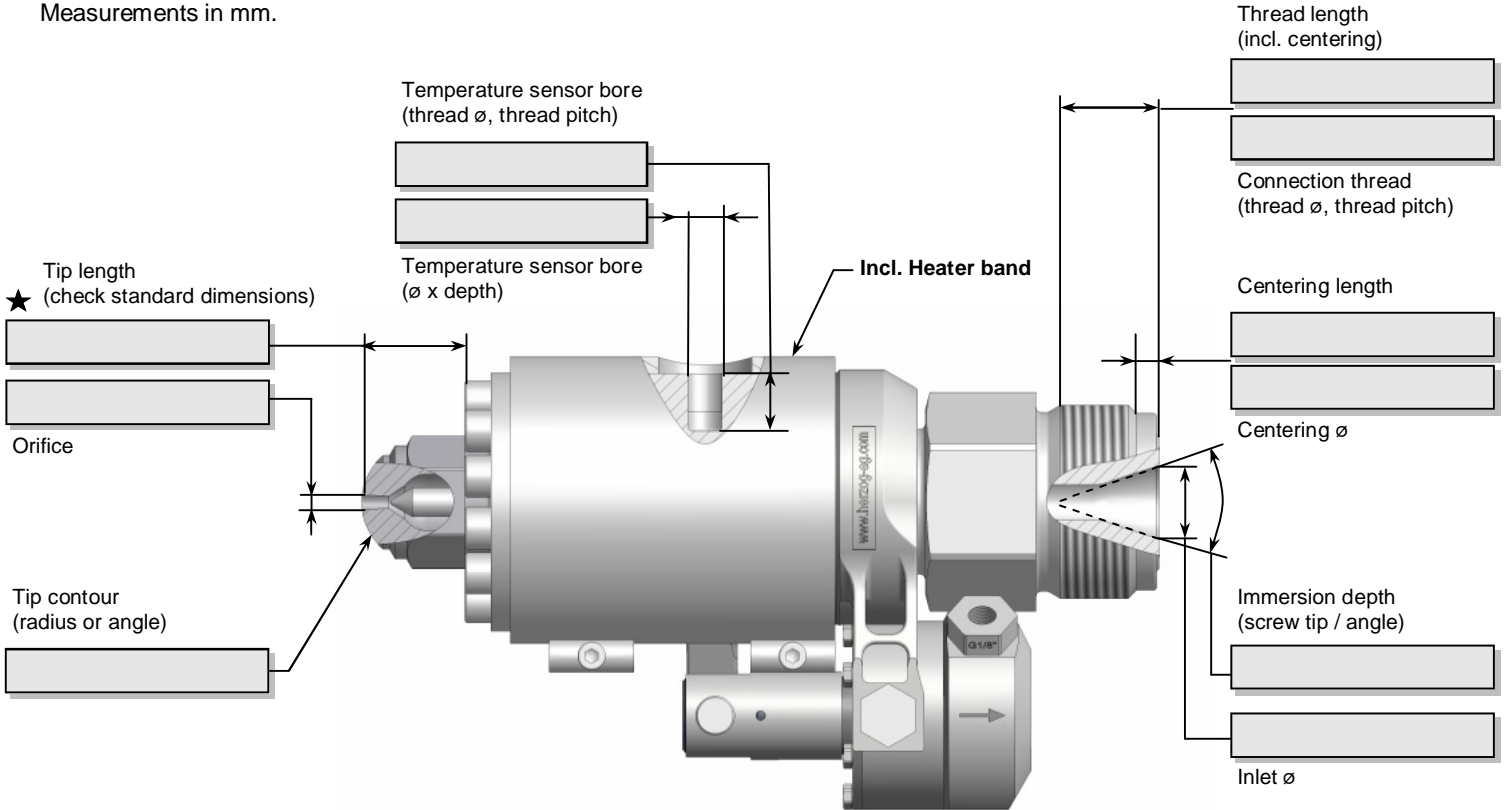
Technical modifications reserved. For orders or enquiries please fill out the **Dimension sheet**.

Dimension Sheet for enquiry	or order	Shut-off nozzle type HP, pneu. / hydr. operated
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Company:
Street:
City / Zip:
Land:

Contact person:
Tel.:
Fax:
E-Mail:

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



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)

Machine type (when known)

Options

Temperature sensor - Type J (FeCuNi), Cable length 2m	Yes <input type="checkbox"/>
Tip with abrasion protection (above 30% fillers)	Yes <input type="checkbox"/>

Optional Extras:

Filter, mixer ,GIT (Gas Injections Technology), alternative tip heating, position sensor for actuator, needle monitoring

Special applications:

Physical foaming, melt precompression

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.