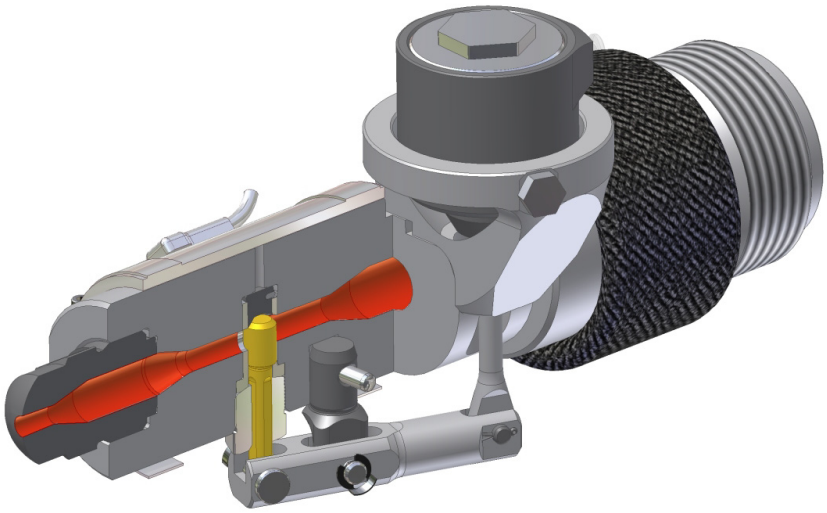
Machine Bolt shut-off nozzle type B2.3

pneumatically or hydraulically controlled



Applications:
Thermoplastics, shear sensitive plastics,
parts with long cavity ways (low pressure drop)

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

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1. Technical Description

Shut-off nozzles are more and more a must for today's economical demands.
Clear melting cut and a reliable closing function during the dosing process are requirements for a trouble free and profitable production.

There are different shut-off systems in the market. Surely, the best solution will be achieved with the needle shut-off version. With that system the melt flow is separated very close to the sprue bushing. In placing the mechanism of the shut-off unit, the melt flow channel needs to be redirected.

With the **bolt shut-off nozzle** (B-nozzle) Herzog has designed a system which allows a strictly 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.
Compared to the needle shut-off system the melt flow, with the B-nozzle system, will be separated quite away from the sprue bushing, i.e. that a longer bore, where the material stands, will result.
For some applications that may be a disadvantage and in such cases we can analyze your process and assign the best nozzle to suit your needs.

The bolt mechanism is placed across the melt flow channel and is so designed that an opening process will be activated automatically by reaching an overpressure.
Using a proper coating technology, on specific parts, increases the life time of each part.

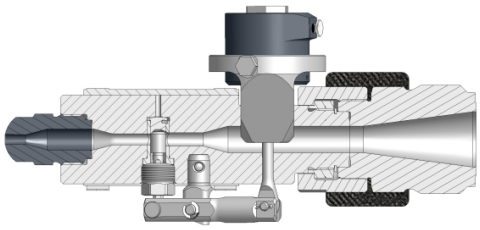
With the single channel system a cleaning of the unit is achievable within a very short time. Experiences have shown, that already after a few shuts (approx. 4-6) clean parts have been injected.

B-nozzles are used for the processing of thermoplastics.
The choice of the nozzle size is depending on the injection volume per second (cm^3/s).

What can you expect from a herzog® bolt shut-off nozzle?

- Efficient working, hydraulically or pneumatically, closing and opening system.
- Controlled, process depending melt shut-off
- Working with higher back pressure → improved homogeneous
- Shorter cycle time → improved productivity
- Single melt stream channel
- Lower pressure drop
- No memory effect throughout the nozzle
- Very good self cleaning effect → color changes done in a very short time
- Compact design
- Customized adaptation geometry

2. Integrated Actuator



The **pneumatically** or **hydraulically** working actuator is integrated into the nozzle which allows a compact unit.

The **2-way working cylinder** is specially designed for Herzog-machine shut-off nozzles. The stroke cylinder will be activated either pneumatically or hydraulically on the machine control unit. The joint lever system activates the shut-off bolt.
Should the melt pressure rise above **300 bar**, the bolt mechanism opens automatically (security issue).

The design of the control cylinder depends on the operational energy sources, such as **compressed air (5-10 bar)** or **Hydraulic (70 bar)**.
When using compressed air, make sure that the **air** is **clean and dry**.

The control cylinders are equipped with heat-resistant seals.
The actuator needs some space. Therefore please check carefully with the stationary machine-plate, see **data sheet** on page 4 **(P, Q, Q1, S, T)** and **collision risk** on page 3. Consider that a longer tip may safe your space problem. In such cases we remind you to pay attention to the heat possibility of the tip.
The nozzle adjustment can be done to any radial position within 360° arc.

More information available in the Handbook under chapter: Actuator.
Alternatively you can visit: www.herzog-ag.com/Actuators/

3. Tip Variations

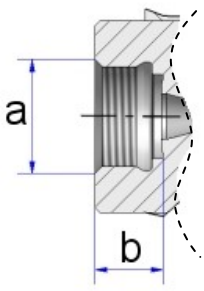
The tip specification can be selected from either of 2 options:

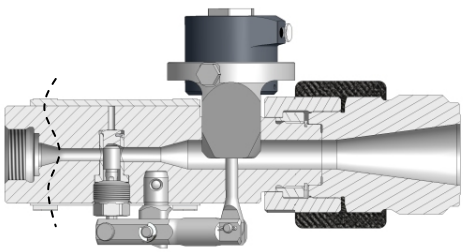
Herzog - Standard variation with tip:

Thread measurements:	**B2.3 (mm)**
tip thread	M45 x 3
thread lenght	30
entry orifice	Ø19

Optional variation supplied without tip:
The tip mounting thread is manufactured to customer‘s specifications.

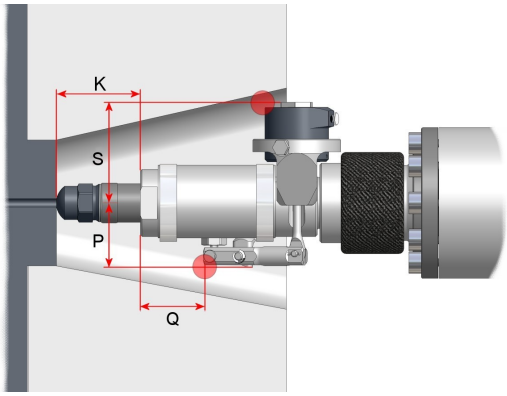
Max. dimensions:	**B2.3 (mm)**
a max. screw-in thread	Ø50
b max. depth	40





4. Risk of collision by driving into the mold

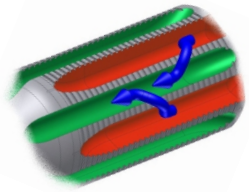
Pay attention to the red marked points at the nozzle. The actuator needs enough space in the stationary plate. Please check the fixed measurements P, Q and S before driving into the mold:



	B2.3 (mm)
P	85
Q	75
S	125
K	Tip lenght variably adjusted to immersion depth

A longer tip may avoid any collision. In such cases a tip heater band with a separate control unit may be needed. Our customer services will be pleased to answer any of your questions.

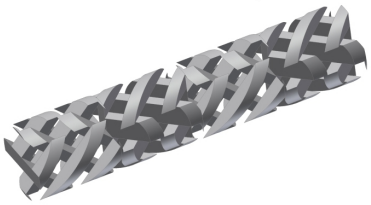
5. Modules



• **Melt 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 melt filter.
For the B-nozzle we offer the Gap filter principle.

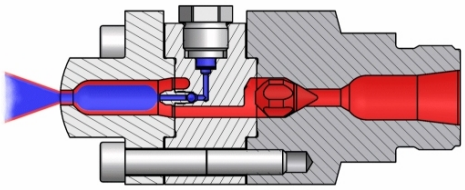
More information available in the Handbook under chapter: Modules.
Alternatively you can visit: www.herzog-ag.com/additional_products/



• **Melt mixer >** improved quality on injection moulded parts

A **homogenized** melt (in colour and temperature) reduces the reject rate and produces a considerable improvement in the quality of the injection-moulded parts.
We favour the X-Mixer technology.

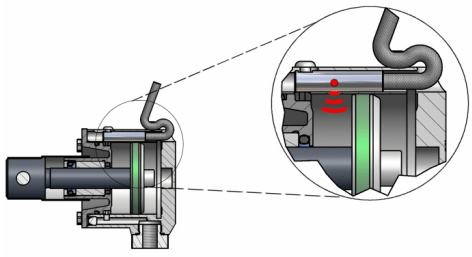
More information available in the Handbook under chapter: Modules.
Alternatively you can visit: www.herzog-ag.com/additional_products/



• **GIT Gas Module (Type GM) >** cycle time, quality on injection moulded parts

With the shut-off nozzle the gas is injected through the core of the gate.
To use the B-nozzle for the GIT process, the tip is changed.
A special valve seals the gas feed area to make it completely polymer-seal.
Our 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 available in the Handbook under chapter: Modules.
Alternatively you can visit: www.herzog-ag.com/additional_products/



• **Actuator with stroke control >** process control, safety aspect

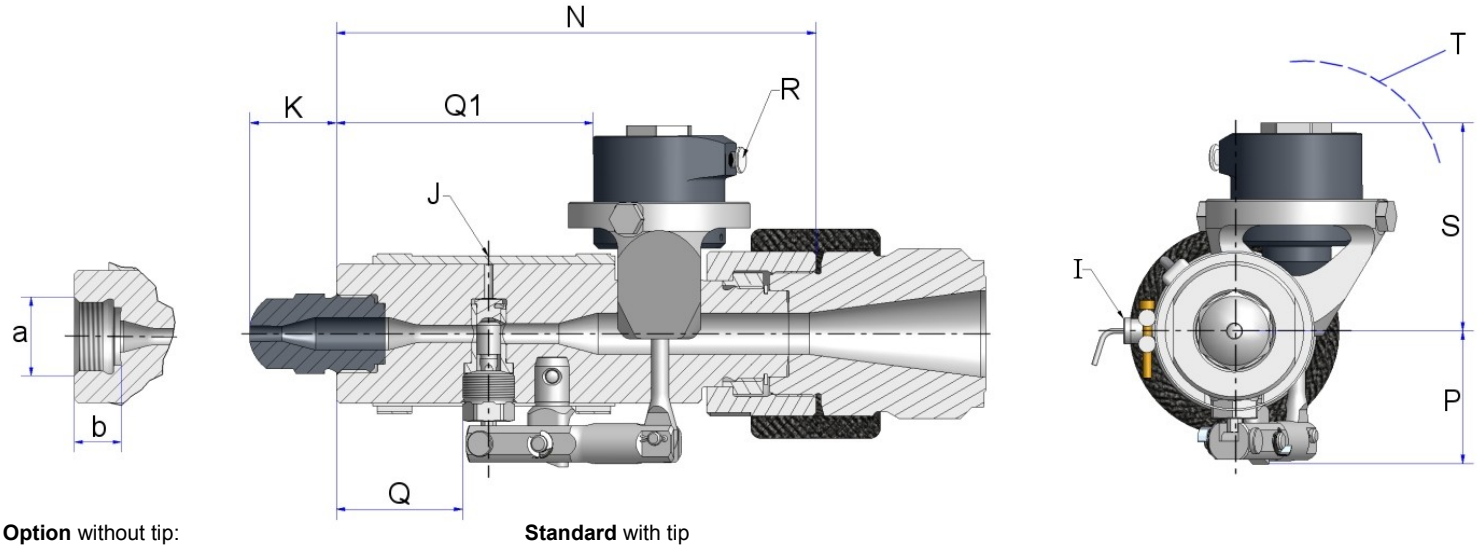
A temperature resistant cylinder houses the sensor which detects the position of the piston ensuring that the nozzle is in an “open“ or „closed“ position.

More information available in the Handbook under chapter: Modules.
Alternatively you can visit: www.herzog-ag.com/additional_products/

6. Data Sheet

Technical modifications reserved

Operating data	B2.3
max. injection rate cm^3 / s based on Polystyrene (PS)	4000
max. contact force (kN)	180
min. orifice (mm) at max. injection rate	Ø 5
approx. screw diameter in mm	ab 120
max. pressure at which nozzle gets closed	200 bar with actuator pneumatic 6 bar / hydraulic 40 bar
max. back-pressure (closed nozzle)	600 bar
Should a higher back pressure be required, or an increased closing force is required, please contact us for more information.	
max. injection pressure / temperature	3000 bar / 400°C



Option without tip:
Customer specified dimensions

Standard with tip

Key			Standard dimensions in mm B2.3	Required fitting tool B2.3
K	tip lenght		50	Ring spanner AF 46
N	body lenght		265	AF 70 wrench to counter the tip
I	our temperature sensor		Type J (FeCuNi)	
J	special body heater-band		ø80*140 1600W / 230V	
P	min. distance		85	
Q	distance to lever		75	
Q1	distance to actuator		135	
R	pneumatic		G1/8“	
	hydraulic / cooling water		G1/4“ / G1/4“	
S	max. dimension		120	
T	max. dimension		140	
Option	a	max. screw-in thread Ø	M50	
	b	max. depth	40	

For **inquiries** or **orders** please complete **dimension sheet** on page 6.

7. Dimension sheet for inquiries or order

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

Standard dimensions in mm

J	**ø80***140 special 1600W / 230V
K	50
N	265
a	max. screw-in thread Ø50
b	max. depth 40

B2.3 (up to 4000 cm³/s with PS)

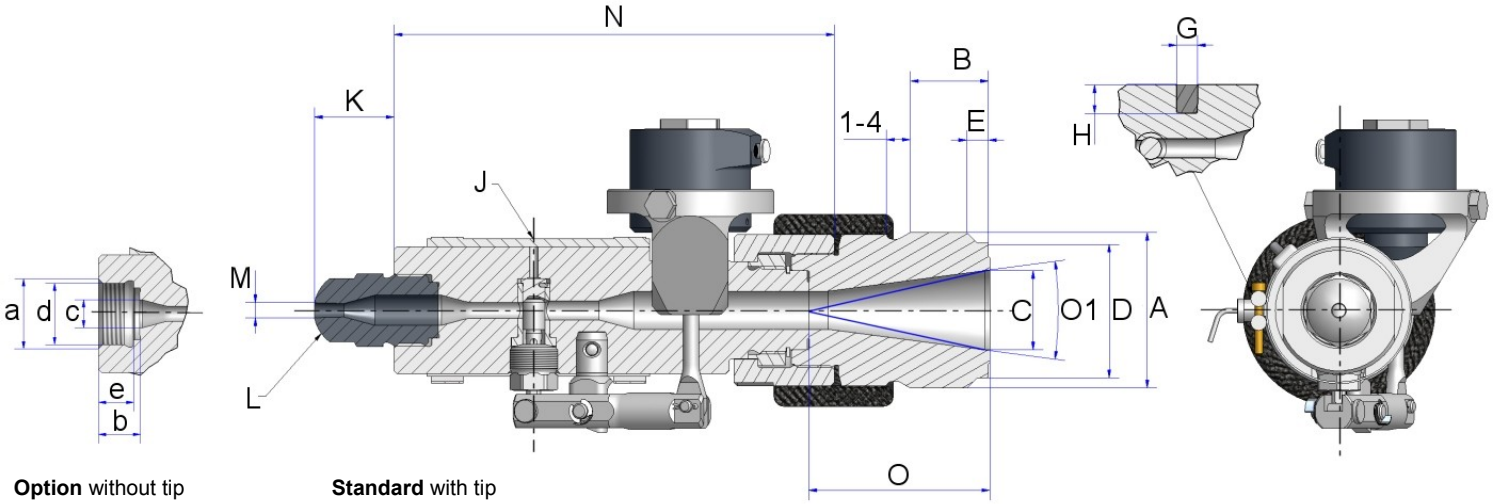
screw diameter	
machine type:	

Actuator

pneumatic ☐
hydraulic ☐

Module Mehr Informationen über unsere Module finden Sie auf Seite 4.

filter ☐ mixer ☐ GIT– gas injected through the gate core ☐ actuator sensor ☐



Option without tip **Standard** with tip

Your dimensions in mm	**Key**	
	A	connecting thread
	B	thread length incl. length of centring device (E)
	C	inlet diameter
	D	centring diameter
	E	lenght of centering device
	G	T/C - ø - pitch
	H	depth of T/C
Delivered with temperature sensor Yes ☐ No ☐	I	temperature sensor type J (FeCuNi), if yes, G and H are adjusted to our sensor
Delivered with heater band Yes ☐ No ☐	J	heater band
	K	tip length (standard measurements 30, other length are available)
	L	tip profile: (radius or angle)
	M	orifice at tip
	O / O1	immersion depth of screw tip into nozzle, and angle if applicable

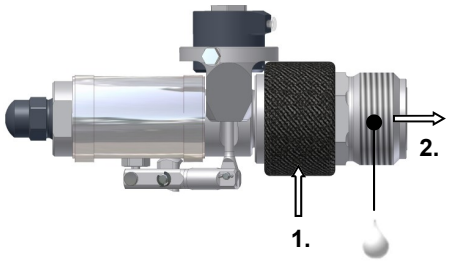
Your dimension for the **option without tip** in mm

	a	tip thread
	b	tip thread length **with** centring (if required)
	c	tip entry diameter
	d	tip centring diameter
	e	thread length **without** centring

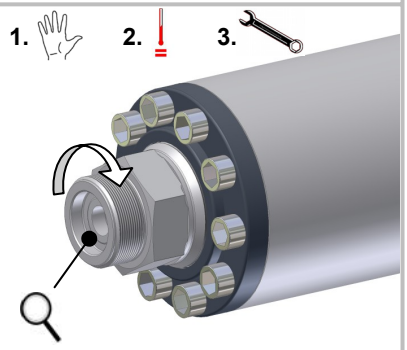
Customer information

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.

A) 1. Remove insulation
2. Screw out adapter



B)



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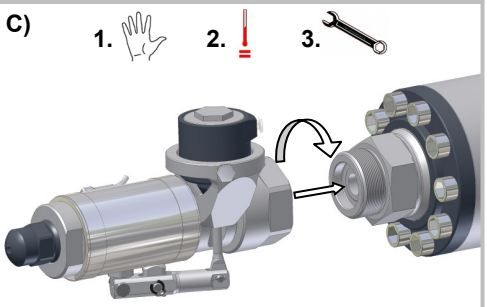


8. Installation Instructions

The nozzle is delivered pre-assembled.
Follow the instructions according to the graphics on the left.
When mounting the adapter, refer also to the machine handbook.

Max. working conditions: 3000 bar at 400°C

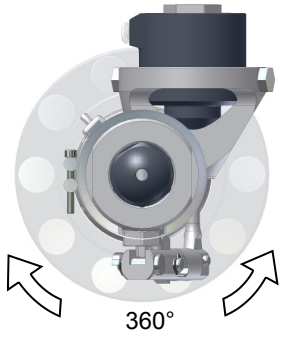
Legend

Manually
Grease with high temperature paste
Inspection
Temperature equalisation

Tools required: **B2.3**

Allen key:	**Size**	**Torque**
page 8, key no. 15	AF 8	25 Nm
page 8, key no. 27	AF 4	manully
Socket wrench:		
page 8, key no. 28	AF 14	180 Nm
page 8, key no. 20	AF 85	800 Nm at 2500 bar 900 Nm at 3000 bar
Ring spanner:		
page 8, key no. 25	AF 46	150 Nm
page 8, key no. 5	AF 27	150 Nm
page 8, key no. 17	AF 17	50 Nm
page 8, key no. 23	AF 46 / 60	acc. machine handbook
Flat wrench:		
counter on the body for mounting the tip. page 8, key no. 1	AF 70	manually

D)

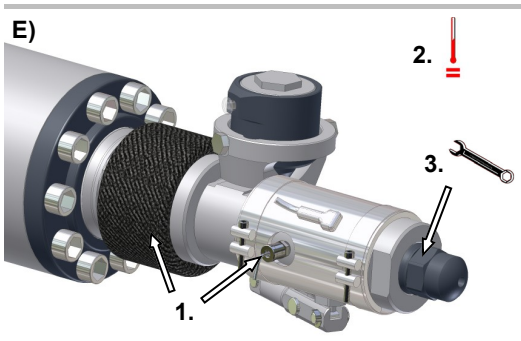


Adjust the component
The actuator position is selectable within an angle of 360°.

Initial operation:
Heat nozzle to process temperature.

Repeated operation:
Melt the polymer fully in the nozzle.
First eject the heated material. This is done by extrusion at low speed (time 25 - 30 sec.) or by ejection at three to five times the injection time.
Production can begin when the nozzle temperature is the same as the melt temperature.

E)



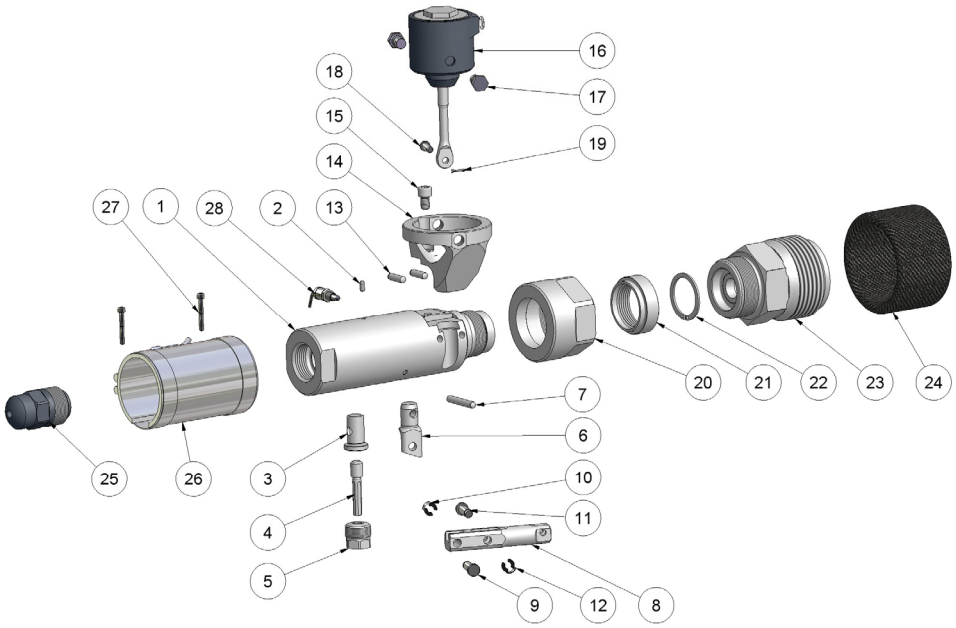
Actuator operating pressure:
According to engraving on cylinder.

Leckage:
Between needle and guide there is a melt film which prevents needle from blocking.
The melt film will be continuously renewed and will eventually leak out of the nozzle.

Hinweis:
When the machine is at rest, lower the nozzle temperature.
Some plastics give off gases when they are left for a long time in stationary, heated nozzles. These can escape in an explosive fashion through the outlet hole.

9. Nozzle design / Service

Assemble the nozzle according to the numerical order. Disassemble the opposite way around.



Key	Quantity	Description	Key	Quantity	Description
1	1	Body	15	1	Support screw
2	1	Positioning pin	16	1	Actuator
3	1	Bolt guide	17	2	Actuator screw
4	1	Bolt B2	18	1	Bolt
5	1	Locking nut	19	1	Splint
6	1	Lever pivot	20	1	Clamping nut
7	1	Bolt	21	1	Ring
8	1	Lever	22	1	Splint
9	1	Bolt	23	1	Adapter
10	1	Splint	24	1	Insulation
11	1	Bolt	25	1	Tip
12	1	Splint	26	1	Heater-band
13	2	Actuator pin	27	2	Heater-band screw
14	1	Actuator Support	28	1	Temperature sensor

Before dismantling we recommend cleaning the nozzle in a fluidized-bed or ultrasonic cleaning tank. If cleaning equipment is not available, heat the nozzle with a band heater or gas torch and dismantle as described while it is hot. Clean individual parts with a wire brush.
Best results for nozzles used with materials like LCP, PPS or PEEK can be expected, if the nozzle is heated up to 500°C **(Remove actuator!)** and hold it at that temperature level for about 2 hours. If you do so the material will burn.

Never heat steel parts above 520°C!
Actuator never heat above 200°C!

Service Actuator:
More information available in the Handbook under chapter: Actuator
Alternatively you can visit: www.herzog-ag.com/Actuators/

Parts subject to wear
For optimum productivity you should always stock the following parts:
Bolt, heater-band, temperature sensor.
To order replacement parts see page 9.

Make the most of our inexpensive cleaning service. The nozzle is dismantled and checked by us.

10. Spare parts order form

Your full contact information please:

Company	
Street	
Zip/City	
Contact	
Tel / Fax	
E-Mail	

Identity Nr. (marked on the hexagonal part)

Quantity	Part name / no. (see page 5)

Send to:

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