

Hot runner system 230 V

Thank you for choosing our externally heated, fully adjustable 230 volt system.

For operating the hot runner system, a 230 volt control unit with an appropriate number of control spots is needed.

When contacting us, please indicate the project number or serial number of the single components.

Components such as hot runner manifolds, gear units and plates are branded at one side with a solidly incorporated project number (see image 1).

All hot runner nozzles and adapters have a consecutive serial number which can be found on the housing or nozzle head (see image 2).

To ensure a quick tracking, we kindly ask you to have the existing project and serial number at hand.

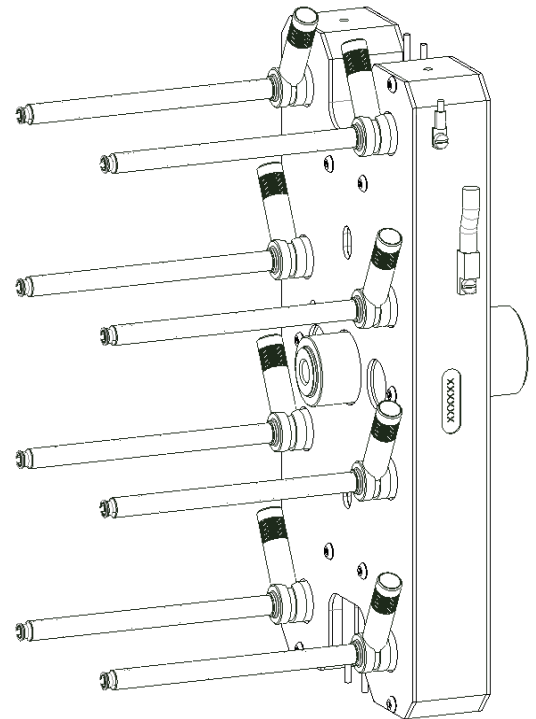


Image 1

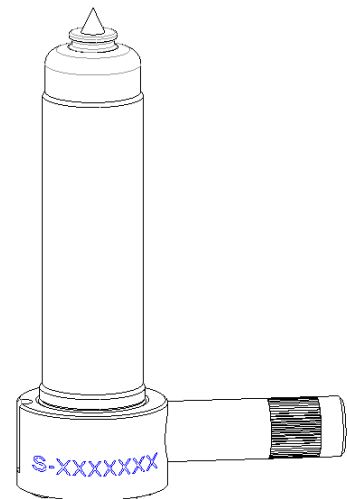


Image 2

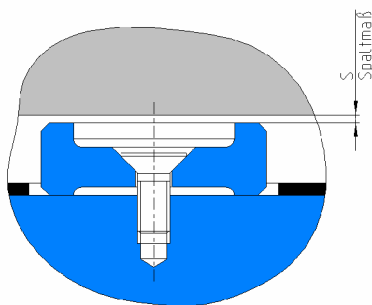
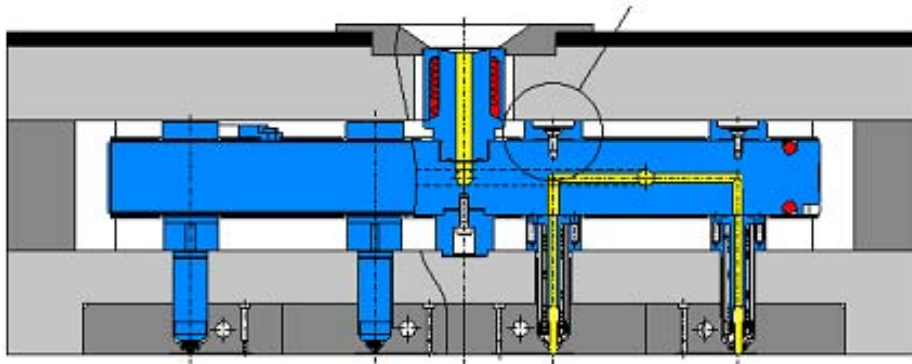
Assembling and maintenance

Attention should be paid to:

- Geometry, measures and their tolerances indicated in the catalogue must be observed.
- The impermeability of the hot runner system is achieved by means of linear extension of the single components and a remaining initial tension. Before the gap dimension of the pressure elements is adjusted by the customer, it is highly important to measure the existing plate thickness in order to guarantee an adjustment of the gap dimensions "S".
- If the material behind the pressure elements has no tensile strength of at least 1000 N/mm², hardened pressure elements must be inserted.
- The manifold can additionally be screwed with 2 x M6 screws. In this case, spacers must be inserted on the screw to prevent the manifold from tilting.
- The seal rings between nozzles and manifold should be replaced on each assembly.
- The open systems are designed for a maximum operation pressure of 2,000 bar. Valve gate systems may be operated with max. 1,500 bar. Extreme tension peaks during the injection process must be avoided in order to sustain the service life of the hot runner components.
An improper operation leads to the expiry of the warranty claim.
- The hot runner components must be protected from direct humidity.
- On each assembly, the hot runner components must have room temperature.
- Around the melt seal, the seal surfaces must not have eroded structures, but should be made by means of grinding.
- Electrical installations may only be executed by qualified staff.
- For Witosa hot runner systems, thermocouples type J (FeCu-Ni) are used, however, they can be equipped with all current market types as a special solution.
- On application of WITOSA control units, the thermocouples in the connection plugs must be mounted as follows:
terminal 9 – 16 / thermocouple conduit white (-)
terminal 1 – 8 / thermocouple conduit black (+)
- All connection conduits must be protected from being clamped / bruised between the single components and the direct contact to the heated components.
- Sufficient bending radii and bending distances of the conductors need to be observed. The connection conduits must not be strained on tension.

- The hot runner system has to be grounded carefully.
- The connection plugs must be protected from thermal influences.
- Before putting into operation, valve gate systems must be checked in respect of being waterproof, airtight and impermeable to oil.
- Before each dismantling of oil- respectively water-leading mould superstructures, the medium in question must be removed carefully.
- Moves of the needle may only take place on operation temperature.
- The needle may only be adjusted and removed on operation temperature.

Gap dimension hot runner system



Detail
Z

PP 210 °C ΔT

| | | POM | PET | ABS | PC | PP |
|-------------|------------|------------|------------|------------|-----------|-----------|
| Nozzle type | D9 | 0,020 | 0,046 | 0,077 | 0,092 | 0,099 |
| | D14 | 0,030 | 0,056 | 0,087 | 0,102 | 0,109 |
| | D16 | 0,030 | 0,056 | 0,087 | 0,102 | 0,109 |
| | D20 | 0,025 | 0,051 | 0,082 | 0,097 | 0,104 |
| | D24 | 0,042 | 0,072 | 0,107 | 0,125 | 0,134 |
| | D32 | 0,042 | 0,072 | 0,107 | 0,125 | 0,134 |
| Nozzle type | D9 | 0,032 | 0,062 | 0,097 | 0,115 | 0,124 |
| | D14 | 0,042 | 0,072 | 0,107 | 0,125 | 0,134 |
| | D16 | 0,042 | 0,072 | 0,107 | 0,125 | 0,134 |
| | D20 | 0,037 | 0,067 | 0,102 | 0,120 | 0,129 |
| | D24 | 0,054 | 0,088 | 0,128 | 0,148 | 0,158 |
| | D32 | 0,054 | 0,088 | 0,128 | 0,148 | 0,158 |
| Nozzle type | D9 | 0,044 | 0,078 | 0,118 | 0,138 | 0,148 |
| | D14 | 0,054 | 0,088 | 0,128 | 0,148 | 0,158 |
| | D16 | 0,054 | 0,088 | 0,128 | 0,148 | 0,158 |
| | D20 | 0,049 | 0,083 | 0,123 | 0,143 | 0,153 |

manifold height 36

manifold height 46

manifold height 56

| | | | | | |
|------------|-------|-------|-------|-------|-------|
| D24 | 0,066 | 0,105 | 0,149 | 0,171 | 0,182 |
| D32 | 0,066 | 0,105 | 0,149 | 0,171 | 0,182 |

Caution!

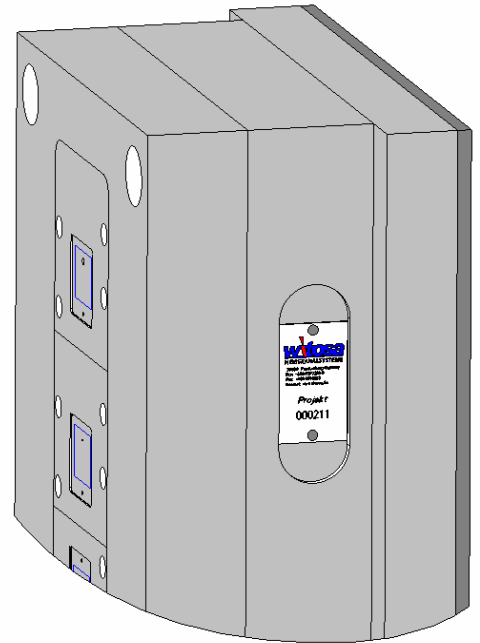
The reference values of the table refer to the medium processing temperature of these materials.
On temperature modification due to the production flow, the measure „S“ must be adjusted.

Installation instructions for the project plate

The project plate is included in every order.

The number allows the respective order to be identified immediately. This is particularly important and efficient when equipment needs to be reordered.

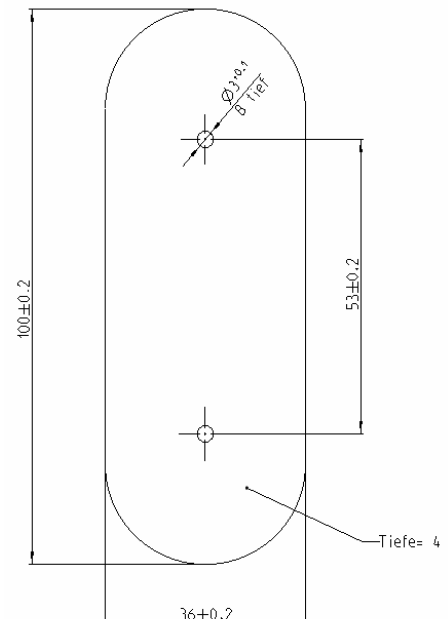
Please attach this project plate in a visible position on the outside of the tool (operator side) to guarantee quick order assignment at any time.



The round head rivets to DIN 660ST 3 x 6 required for easy assembly are included in the scope of supply.



Mould recess to be worked



Initial operation

- The radius of the machine nozzle (RM) must be adjusted to the one of the adapter (RA). $RM = RA - 1$.
- You may only work with clinging injection aggregate.
- The pressure for the aggregate should be chosen as low as possible. In order to avoid a damage of the nozzle components, this power should be maximum 20 KN.
- A sufficient grounding of the injection moulding machine must be ensured.
- The wiring of the connection conduits needs to be done carefully in order to ensure trouble-free production.
- Plug in power and thermo-conduits.
- Heat the respective heating zones to the processing temperature recommended by the plastics manufacturer and prepare operation conditions.
- The hot runner system may only be operated with a control unit with softstart start-up control. A dehydration phase of 100 – 120 °C needs to be observed. Otherwise the heating elements may fail ahead of time.
We recommend the application of WITOSA control units, as they are perfectly adjusted on the hot runner components.
As a consequence, a safe operating condition and a positive effect on the service life of the heating elements is achieved.
- The recommended processing temperature should be achieved for approx. 10 minutes before the filling of the hot runner system can be started.

Filling an empty hot runner system

- All components must have processing temperature (see chapter “initial operation”).
- For filling the empty hot runner only natural material without additives should be used.
- Set up the pressure of the injection aggregate and fill the empty hot runner with a specific back pressure of 200 – 400 bar until the plastic flows out of the injection points.
- Start with the injection process.

Starting up a filled hot runner system

- All components must have processing temperature (see chapter “initial operation”).
- When the material on the connection nozzle is fused, remove the surplus plastic which is not yet heated.
- Inject injection unit and start with the injection process.

General information about valve gate systems

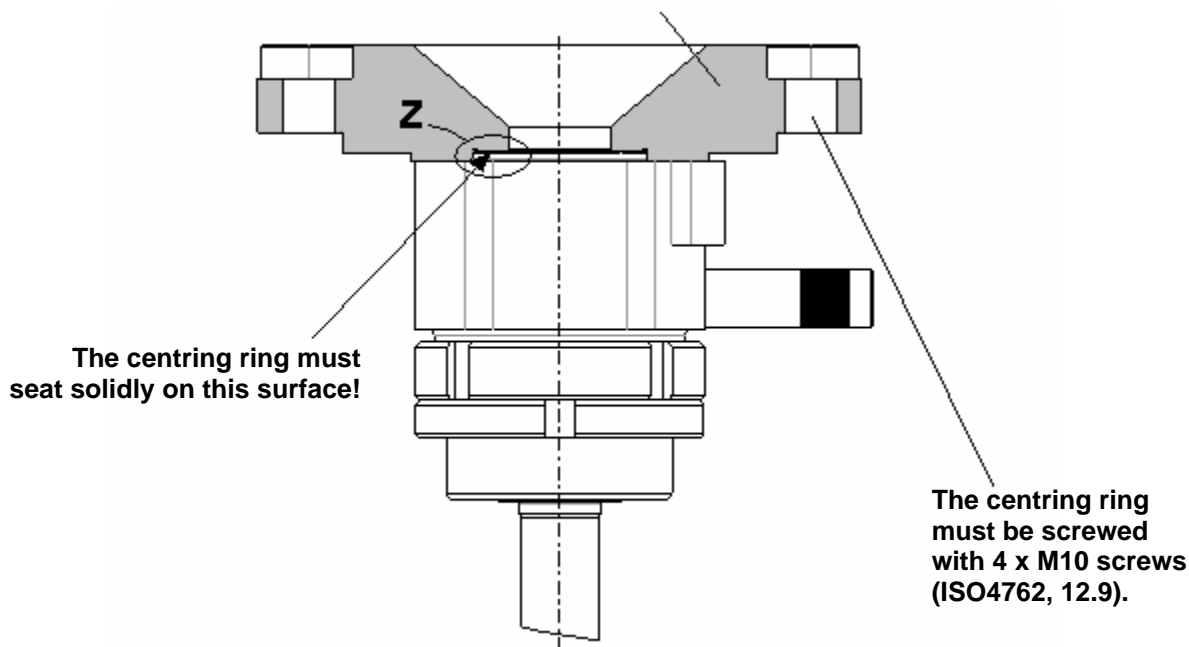
- The operation pressure of a pneumatic valve gate system is 6 – 8 bar.
- The standard gear units NS respectively NK may be operated at max. + 80 °C.
- The valve gate system NE must always be operated pneumatically
- A medium discharge of 3.000 – 3.500 l/min compressed air must be guaranteed.
- The compressed air must be free of oil and humidity in order to ensure trouble-free production.
- On dismantling of the hot runner, the needles should always be in the rear position to avoid damages of the contours.
- Before turning off the hot runner system, the needle must always be closed in order to avoid an overflow of material during the heating-up on a later start-up.
- Moves of the needles may only take place on operating temperatures.
- For the tuning of the needle length: Bring the hot runner system on operating temperature, calculate the difference value and adjust the needle to the required length.
- In case of using a single valve gate nozzle, the centring ring being in the scope of delivery must be implicitly used. It must be fixed with at least 4 x M10, 12.9, ISO 4762 and be adjusted according to the catalogue indications h +0,05.
- Witosa valve gate systems are dimensioned for a max. operation pressure of 1,500 bar.
- Due to the mechanic moves taking place during the operation, valve gate systems are subject to certain maintenance expenditure. In order to guarantee a trouble-free functionality in perpetuity, each valve gate system should be maintained at regular intervals depending on the kind of application and the plastic in use. The customer can do the maintenance or, after prior consultation, Witosa can take care of that. In order to obtain further information, please contact the authorized field representative or the customer service department at our headquarter.

General information about Control Units

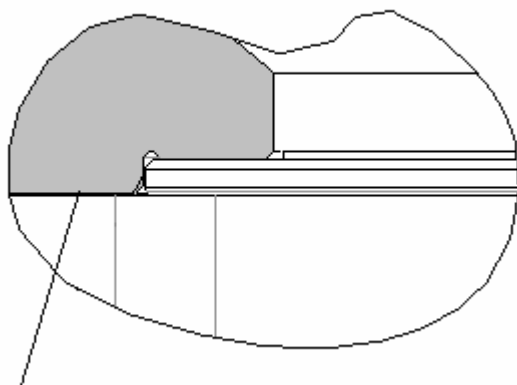
- The hot runner system may only be operated with a control unit with soft start start-up control. A dehydration phase of 100 – 120 °C must be observed. Otherwise the heating elements may fail ahead of time.
We recommend the application of WITOSA control units, as they are perfectly adjusted on the hot runner components.
As a consequence, a safe operating condition and a positive effect on the service life of the heating elements is achieved.
- The functionality of the control unit should work on the basis of “phase section” or with a switching frequency of at least 1 time per second.
- Detection probe break and polarity reversal
- Function for constant heating
- Function for lifting and lowering
- Self-optimisation mode
- Load circuit monitoring

Installation instructions for NE-

The single valve gate nozzle may only be operated in connection with a fitting centring ring. It is in the scope of delivery of each NE-nozzle.



View Z



Due to tolerances, an air gap of approx. 0,05 mm may develop here.

CAUTION!

The centring ring withstands the forces emerging during the operation. Before operating the hot runner nozzle, proper assembly must be checked carefully. If the assembly is incorrect, damages of the hot nozzle during operation may occur.

Difference values for the calculation of the nozzle length

Please note: Use this table only for standard lengths

The Witosa hot runner nozzles were designed for a Delta t of 160 °C. On derivations, the following length modifications must be considered during design of the injection moulding tool:

(Delta t: melting temperature of plastic – mould temperature)

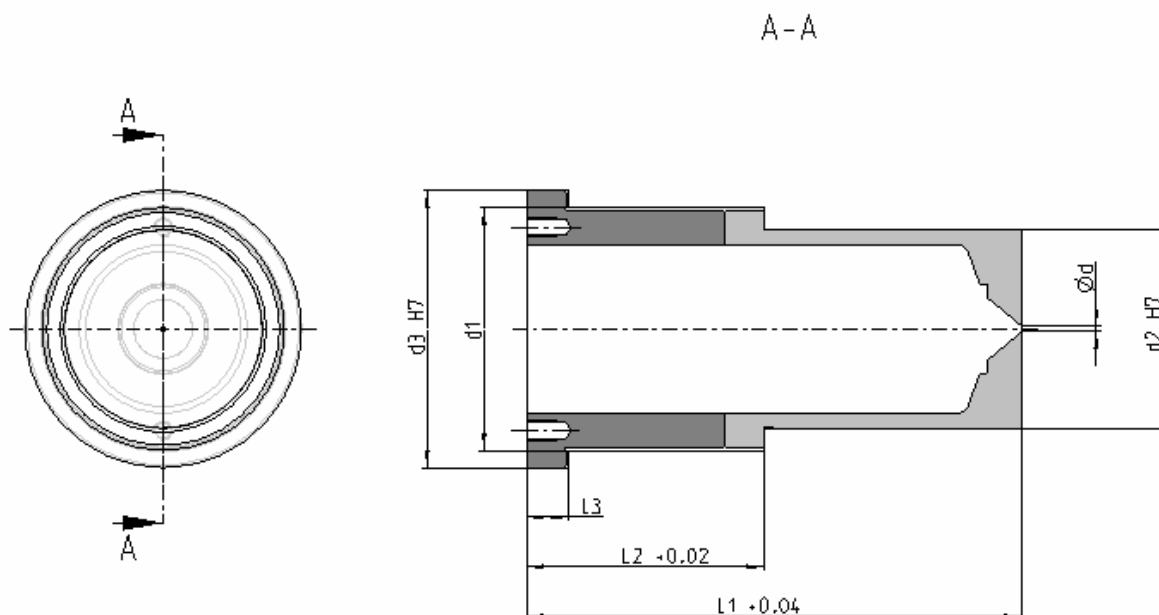
| Nozzle length | Delta T 100 | Delta T 160 | Delta T 200 | Delta T 250 | Delta T 300 |
|---------------|----------------|----------------|----------------|----------------|----------------|
| 40 | -0,02 | 0 | 0,01 | 0,03 | 0,04 |
| 50 | -0,03 | 0 | 0,02 | 0,04 | 0,06 |
| 60 | -0,03 | 0 | 0,02 | 0,05 | 0,08 |
| 80 | -0,05 | 0 | 0,03 | 0,07 | 0,11 |
| 100 | -0,06 | 0 | 0,04 | 0,09 | 0,14 |
| 120 | -0,08 | 0 | 0,05 | 0,11 | 0,18 |
| 140 | -0,09 | 0 | 0,06 | 0,14 | 0,21 |
| 160 | -0,11 | 0 | 0,07 | 0,16 | 0,25 |
| 180 | -0,12 | 0 | 0,08 | 0,18 | 0,28 |
| 200 | -0,13 | 0 | 0,09 | 0,20 | 0,31 |
| 240 | -0,16 | 0 | 0,11 | 0,24 | 0,37 |
| 280 | -0,19 | 0 | 0,13 | 0,28 | 0,44 |
| 320 | -0,22 | 0 | 0,15 | 0,33 | 0,51 |

Fluctuations of the length expansions are possible!
Please ensure that the tip seal ring abuts on and seals only in the diameter and not frontal on the steel.

Indications of Witosa regarding the injection diameter are recommendations and are based on experience value. A later optimisation of the injection diameter may be necessary.

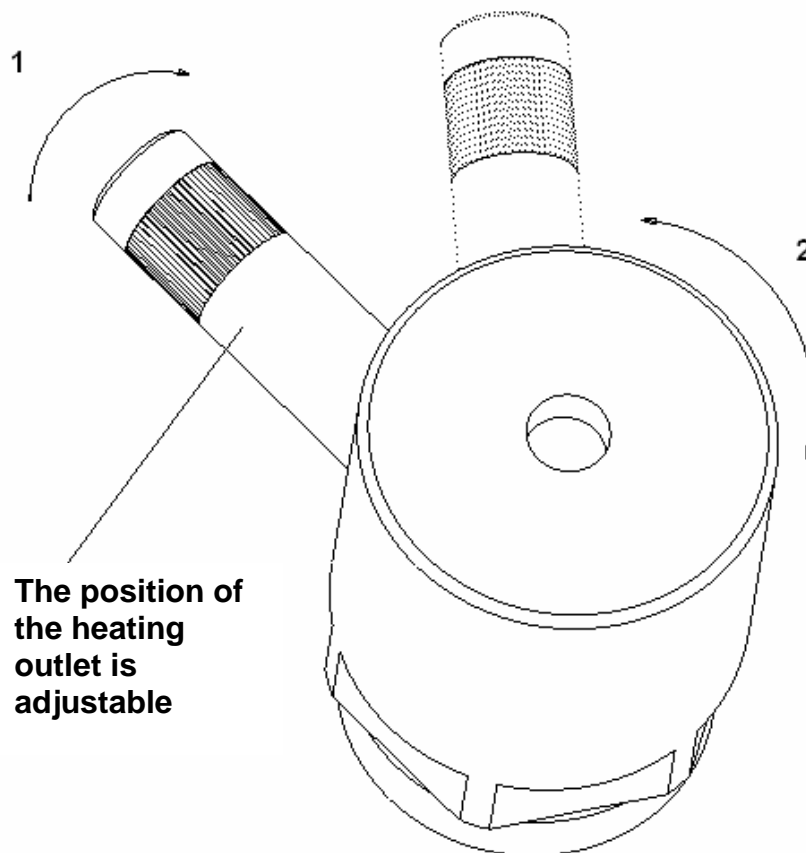
Installation instructions for gate bush

Gate bushes which are longer than 180 mm get another bush for extension. As a result, the geometry changes as shown below.



| Nozzle D-32 | D1 | D2 | D3 | L1 | L2 | L3 |
|-------------|------|------|------|-------|-------|-----|
| 200 | 49,0 | 40,0 | 56,0 | 200,0 | 48,0 | 8,5 |
| 240 | 49,0 | 40,0 | 56,0 | 240,0 | 88,0 | 8,5 |
| 280 | 49,0 | 40,0 | 56,0 | 280,0 | 128,0 | 8,5 |
| 320 | 49,0 | 40,0 | 56,0 | 320,0 | 168,0 | 8,5 |

Adapter Rotatability of the outlet sleeve



1. Loose the outlet threaded sleeve (right-hand thread).
2. Turn the outlet threaded sleeve with the heating outlet in the required position.
3. By means of seizing the outlet threaded sleeve, the parts are fixed.