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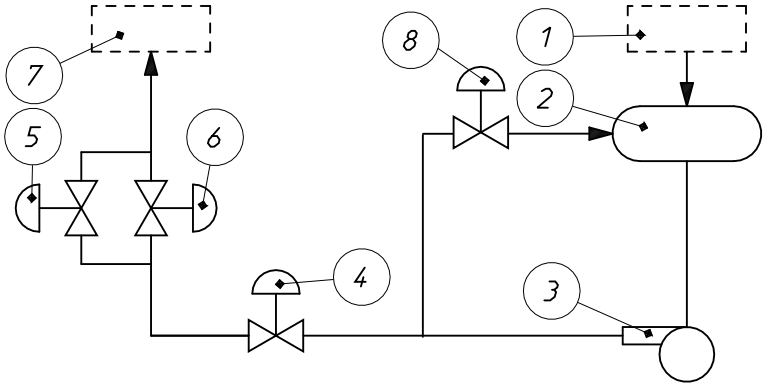
# MINIMUM FLOW VALVES **TYPE Z1B-M**

**APPLICATION:**

The minimum flow valves are dedicated to be used in the sets for recirculation of the pumps feeding the power boilers. They secure the pumps against hydraulic and heating overloading in the case of low receipt of water by the boiler, thus allowing the minimum flow in the bypass circuit of the pump.

## MINIMUM FLOW VALVE TYPE Z1B-M




Drawing 1. Diagram of the feeding water installation for the power boiler.

1) Condensate pump.
2) Degasifier.
3) Boiler feewater pump.
4) Cut-off valve.
5) Boiler feedwater start-up valve.
6) Boiler feedwater control valve.
7) Boiler.
8) Minimum flow valve type Z1B-M.

**FEATURES:**

- structure resistant to cavitation due to the application of multi-stage choking, labyrinth (multi-path) flow path, and selection of proper materials, such as full stellite for the valve head and socket, titanium for the valve pin, highly cured choking cages, alloy cast steel for the body.
- high leakproofness of the lock,
- guaranteed external leakproofness, sealed based on the requirements of the TA Luft provisions for the low pressure zone,
- easy access to the internal elements of the valve,
- regulation or on-off function,
- possibility to apply pneumatic, hydraulic or electric drives,
- wide range of realization, possibility to adapt the valve to individual requirements of a client in terms of the connectors, flow parameters and others
- additional equipment: quick-drain valve for pneumatic actuators (fast opening), spring shock absorber for hydraulic or electric actuators (flexible clamp of the valve head to the socket).
- resistance to hydraulic impacts (water hammer),
- high durability and reliability of operation.

**DESIGN AND TECHNICAL SPECIFIACTION:**

| | |
|---|---|
| **Body:** | cast, pass-through |
| **Nominal dimension:** | DN50; 65; 80; 100 / 2”; 2,5”; 3”; 4” |
| **Nominal pressure:** | PN250; 320 / CL1500; 2500 |
| **Flow coefficient:** | Kv 7; 10; 16; 20 |
| **Characteristic:** | linear |
| **Flow direction:** | under the plug (FTO) |
| **Flow path in cages:** | as per drawing 5 |
| **Pressure recovery coefficient:** | $F_L$=0,97 |
| **Leakproofness of the lock:** | min. class V as per PN-EN 60534-4 |
| **Admissible working pressure:** | 250 bar |
| **Admissible work temperature:** | +250°C |
| **Versions:** | as per Table 1 |
| **List of parts and materials:** | as per Table 2. |

Table 1. Types of versions.

| DN | 50 | | 65 | | 80 | | 100 | |
|---|---|---|---|---|---|---|---|---|
| PN | 250 | 320 | 250 | 320 | 250 | 320 | 250 | 320 |
| Kv | 7 | | 10 | | 16 | | 20 | |
| $q_{MAX}$[t/h] | 50 | | 65 | | 130 | | 200 | |
| BW-Dzxg | 60,3x6,3 | 60,3x8 | 76,1x8 | 76,1x11 | 88,9x11 | 88,9x12,5 | 114,3x14,2 | 114,3x16 |

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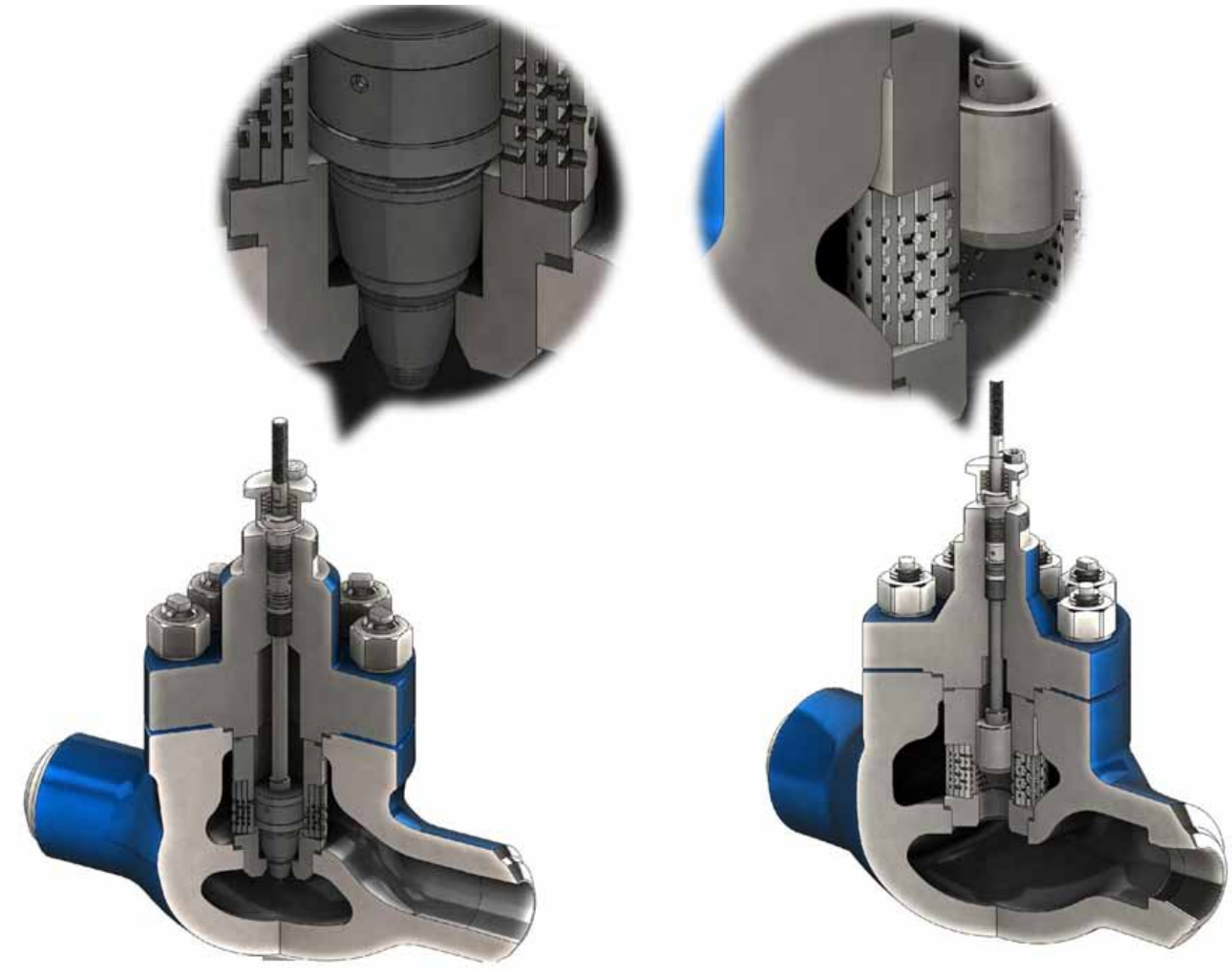
**NOTE:**
- maximum flow $q_{MAX}$ with the assumption of maximum flow speed up to 8m/s,
- other types of connections – at request.



DN50 ; 65. DN80 ; 100.

Fig.2 Structural types

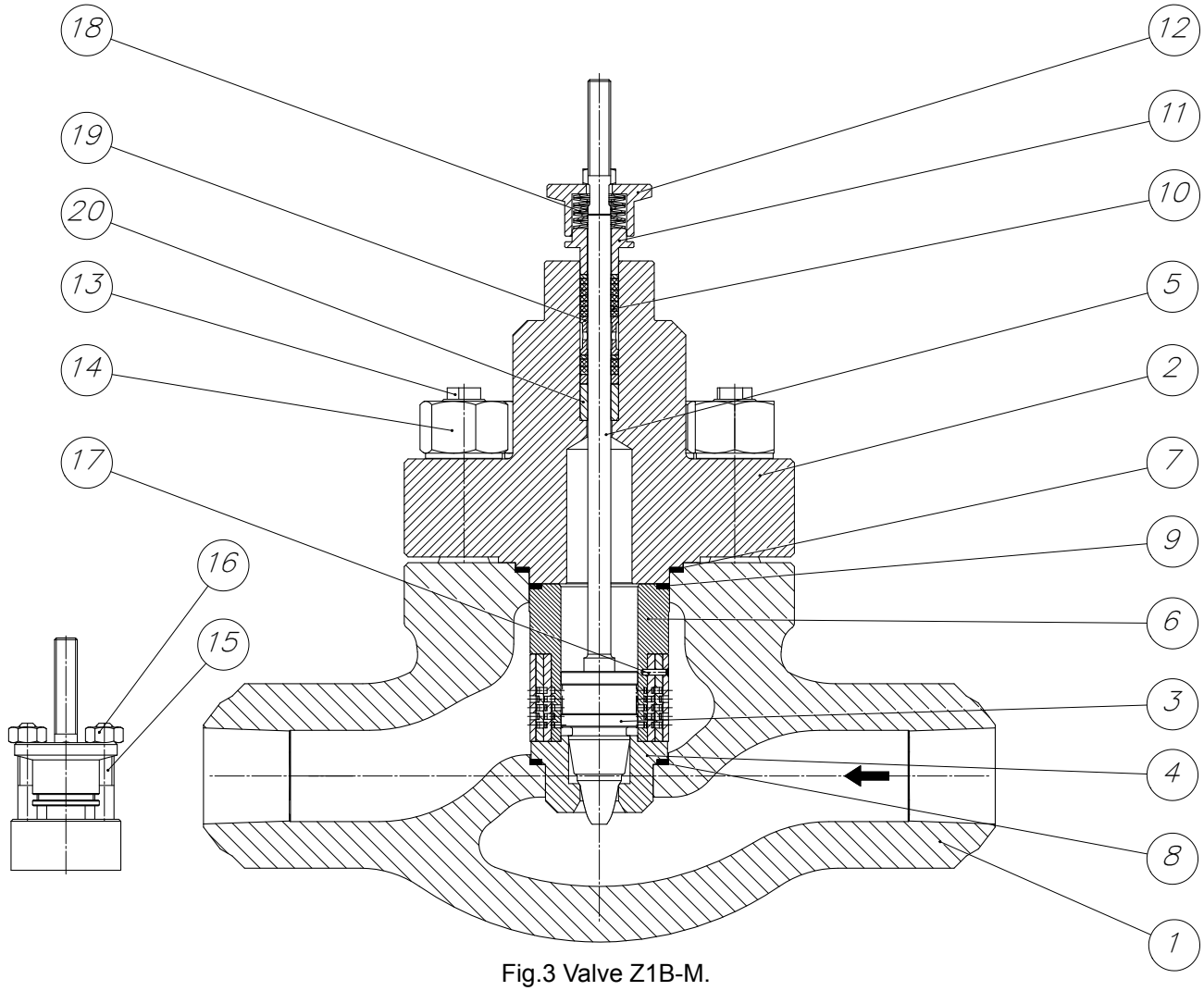



Fig.3 Valve Z1B-M.

Table 2. Parts and Materials List

| POZ. | Name of part | Material | Norm |
|---|---|---|---|
| 1 | Body | G17CrMo 9-10 ; (1.7379) * | PN-EN 10213-2 |
| 2 | Gland | 13CrMo4-4 ; (1.7335)* | PN-EN 10028 |
| 3 | Plug | Stellite No 6 | - |
| 4 | Socket | Stellite No 6 | - |
| 5 | Pin | Ti6Al4V Tytan Grade 5* | ASTM 3348-08a |
| 6 | Cage setk | X17CrNi 16-2 ; (1.4057) + heat processing | PN-EN 10088 |
| 7 | Body gasket | GRAPHITE (98%) + 1.4404 (spiral) | - |
| 8 | Socket gasket | | |
| 9 | Regulation cage gasket | | |
| 10 | Sealing set | PTFE „V" (Rings) | - |
| 11 | Clamp sleeve | X6CrNiMoTi 17-12-2 ; (1.4571) | PN-EN 10088 |
| 12 | Clamp panel | X6CrNiMoTi 17-12-2 ; (1.4571) | PN-EN 10088 |
| 13 | Body screw | 21CrMoV5-7 ; (1.7709) | PN-EN 10269 |
| 14 | Body nut | 21CrMoV5-7 ; (1.7709) | PN-EN 10269 |
| 15 | Gland screw | A4-70 | PN-EN ISO 3506-2 |
| 16 | Gland nut | A4-70 | PN-EN ISO 3506-2 |
| 17 | Peg with notches | X6CrNiMoTi 17-12-2 ; (1.4571) | PN-EN 10088 |
| 18 | Disk springs | X10CrNi18-8 ; (1.4310) | PN-EN 10088 |
| 19 | Distance sleeve | X6CrNiMoTi 17-12-2 ; (1.4571) | PN-EN 10088 |
| 20 | Pilot sleeve | X6CrNiMoTi 17-12-2 ; (1.4571) + CrN | PN-EN 10088 |

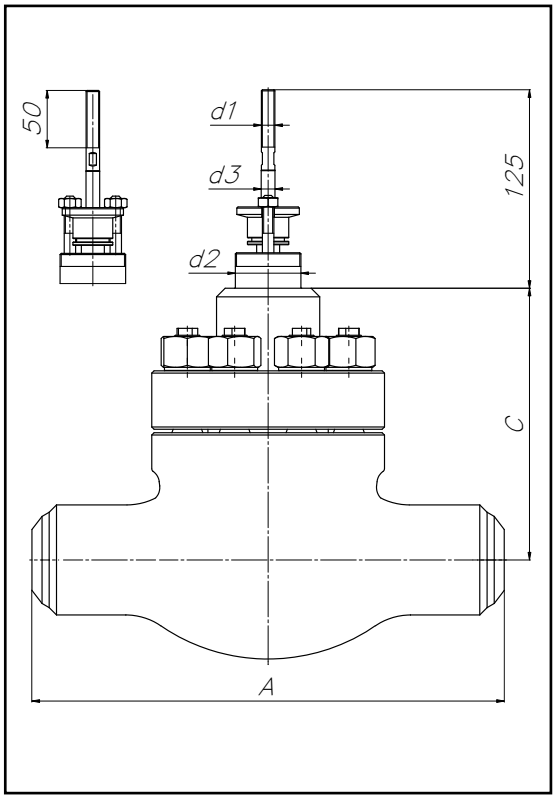



Fig. 4 Connection dimensions of the valve.

* - other materials on request.

Table 3. Connection dimensions of the valve

| DN | 50 | | 65 | | 80 | | 100 | |
|---|---|---|---|---|---|---|---|---|
| PN | 250 | 320 | 250 | 320 | 250 | 320 | 250 | 320 |
| A | 400 | | 400 | | 500 | | 580 | |
| C | 237 | | 237 | | 257 | | 329 | |
| d1 | M12x1,25 | | | | M16x1,5 | | | |
| d2 | 57,15 / 2 1/4" - 16UN2A | | | | | | | |
| d3 | 12 | | | | 16 | | | |

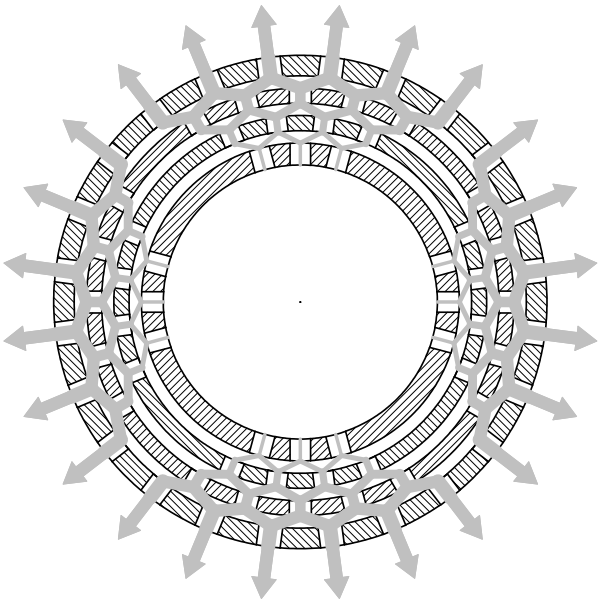


Fig.5 Flow path in cages.

**DRIVE TYPE:**

**Demand for available drive power:**

Fs=19kN

**Stroke:**

DN50; 65: 20 mm
DN80; 100: 38 mm

**Recommended pneumatic membrane spring servomotors:**

DN50; 65: P-630-20-5; P1-630-20-5; spring range 60...100kPa, pz=400kPa
DN80; 100: P-630-38-1; P1-630-38-1; spring range 20...100kPa, pz=400kPa

**NOTE:**
The actuators are equipped with a quick-drain valve and an electromagnetic valve. The remaining data - as per the catalogue cards of the P/R and P1/R1 actuator.

**ORDERING:**
The order should describe the type of valve, DN, PN, Kv, type of connector, type of drive and valve work parameters which will be used for verifying the correctness of the client's selection or for suggesting a more beneficial solution.


Revision: Z1B-M/07/2014
Valid until next revision