

Calculation and Selection – Auto Bypass Valve

Initial data

| | | | |
|------------------|---|-----------------|--|
| 1.50 m3/h | Estimated water flow rate | 3.00 bar | Water pressure before the valve |
| 70 °C | Maximum water temperature at the installation place | 0.30 bar | The pressure drop that will be maintained by the valve |

Calculation results

| | |
|--|--|
| $[1.50 \text{ m}^3/\text{h}] / [0.30 \text{ bar}]^{0.5} = 2.74 \text{ [m}^3/\text{h}]$ | Required Kv value |
| $T_{\text{max}} 70^\circ\text{C} \leq 70^\circ\text{C}$ | There will be no cavitation on the valve |
| $([G 1.50 \text{ m}^3/\text{h}] / [K_{\text{vs}} 4.4 \text{ m}^3/\text{h}])^2 = 0.12 \text{ [bar]}$ | Pressure drop across a fully open valve with $K_{\text{vs}}=4.4 \text{ [m}^3/\text{h}]$ with flow rate $1.50 \text{ [m}^3/\text{h}]$ |
| $[1.50 \text{ m}^3/\text{h}] / \{3600 * 3.14 * ([\text{DN}25] * 0.001)^2 * 0.25\} = 0.8 \text{ [m/s]}$ | The flow rate is within normal limits $V < 3.0 \text{ [m/s]}$ |

Selection result : Auto bypass valve

IMI Hydronic : BPV

Sweden

maintains the specified pressure drop across itself

opens when the pressure differential increases

normally closed

| | |
|-----------------------------|--|
| DN 25 [mm] | Nominal valve diameter |
| Kvs 4.4 [m3/h] | Flow coefficient |
| PN 20 [bar] | Nominal pressure |
| dP 0.10...0.60 [bar] | Pressure setting range |
| dT -20 ... 120°C | Operating temperature |
| brass | Body material |
| 62 % | The percentage of the opening of the valve gate at which $K_v=2.74 \text{ [m}^3/\text{h}]$, and the pressure loss on the valve will be 0.30 [bar] when passing the calculated flow rate $1.50 \text{ [m}^3/\text{h}]$ |

