



PROPER SIZING AND SELECTION OF CONTROL VALVES REQUIRES DETAIL

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Process data:

- What is the medium to be controlled. Is it a liquid, gas, or slurry?
- Is it corrosive, abrasive, explosive or clean single-phase medium?
- What is the upstream or inlet pressure. Don't guess – use a gauge?
- What is the downstream pressure when valve is closed, and when flowing?
- Are the Vapor pressure, viscosity or specific gravity and critical properties known?
- What are the inlet and outlet pipe size(s) [May be different] and schedule?
- Normal, Minimal, and Startup conditions for flow, pressures and temperatures?
- What impact will even a small seat leakage create when shut off. What Class is required?
- Is the installation in an occupied area. Noise or other hazardous considerations?
- What is the "fail safe" orientation? In place, closed or open?
- If in a fail safe orientation, is a manual readjustment to be expected?
- What is the ANSI Pressure Class of the pipe flanges and valves in the loop?
- What has been the operational history in an existing application?
- What material is the existing piping made of. Is it considered compatible?
- Is there an existing valve in place and a face-to-face dimension to match? "drop and play"
- Where will the valve be located – elevation – within a piping nightmare?
- What maintenance – routine or preventative is normal and expected?
- What are preferences for Control Valve Actuation – pneumatic or electric? WHY?
- Is the customer going to actuate it himself and buy a "bare stem" valve?
- Is the stem boss compatible with his actuator stem. Double "D" or square?
- Is the calculated flow velocity below limits of 100 – 125 fps for saturated steam?
- Is the calculated flow velocity below limits of 5 fps for liquids?
- Is the calculated flow velocity below limits of 250 – 400 fps for gases?

Beyond these considerations, real world insight may also be appropriate for long term functional excellence:

Could moving vehicles damage the valve, in a specific installed location.

Might seismic forces or fires present a danger to workers.

What codes may be in effect? Body pressure Code, Leakage Criteria

Might workers use the valve as a stepladder when conditions dictate?

Is the application a “continuously modulating” or an on / off practice?

Might the process be shutdown for nights or weekends?

What might result when started back up after an extended shutdown?
(Appreciate acceptable or unacceptable long-term leakage)

Use your imagination, anticipate the worst, and ask more questions
– more, in this case, is always better.

What range air set is available for actuator or positioner?
Could it allow a higher than safe pressure?

Where will the user store documentation for IO&M purposes?

Is routine maintenance allowed or is an annual shutdown more typical.

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QUESTIONS A CONTROL VALVE EXPERT MUST CONSIDER

<input type="checkbox"/>	Flowing media to be controlled. Steam, Liquid or Gas?	Different formulae
<input type="checkbox"/>	Pressures upstream and downstream, therefore the differential.	Shutoff/actuation
<input type="checkbox"/>	Two way – modulating, or on/off. Three way diverting or mixing?	Valve design
<input type="checkbox"/>	Is the material abrasive, explosive, or clean.	Hazardous or destructive
<input type="checkbox"/>	Hot or Cold water chemically treated?	Chemicals create “barnicles”
<input type="checkbox"/>	What are inlet and outlet pipe sizes and schedules?	Impacts pressure and velocity
<input type="checkbox"/>	Maximum, Normal and Startup conditions?	Gain, Curve, Trim style, Cv, trim materials
<input type="checkbox"/>	Leakage allowed	Safety / temperature creep
<input type="checkbox"/>	Valve in occupied area	Noise level allowed
<input type="checkbox"/>	Previous usage history	Duplicate / “drop and play” or fix a problem
<input type="checkbox"/>	Pipe material of construction	Material compatibility information/cost
<input type="checkbox"/>	Actuation Pneumatic or Electric	Cost, speed, flexibility, operational costs
<input type="checkbox"/>	Maintenance allowed or anticipated	Accessibility, frequency, down time
<input type="checkbox"/>	IO&M storage and accessibility?	Documentation always last or lost
<input type="checkbox"/>	Control signal – PID compatibility	Accuracy and stability required
<input type="checkbox"/>	Mounting restrictions	Vertical, horizontal or otherwise supported
<input type="checkbox"/>	How was valve “sized?”	Proper size for choked, flashing or cavitation avoidance

These are a few concerns. Extensive research is required before accepting solution liability.



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