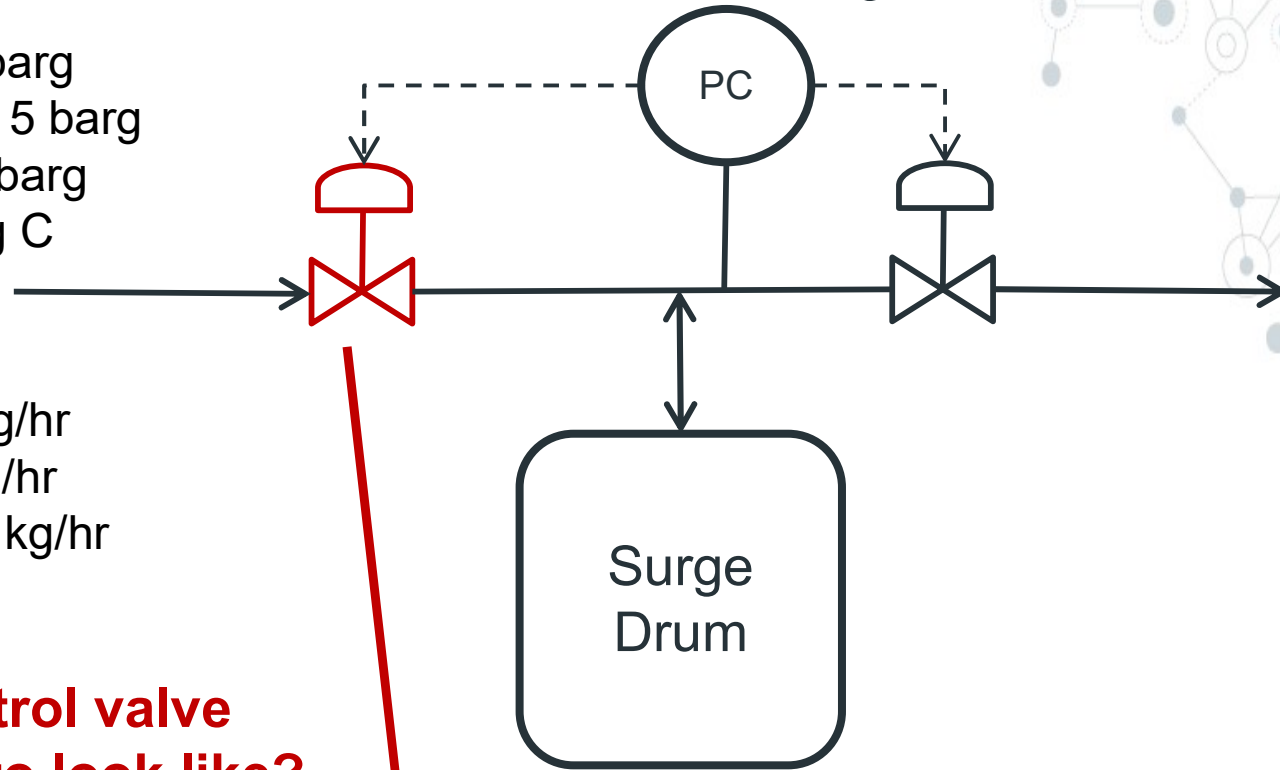


Nitrogen:  
 Pmin = 4 barg  
 Pnormal = 5 barg  
 Pmax = 6 barg  
 T = 40 deg C

Mass flow:  
 Minimum = 50 kg/hr  
 Normal = 100 kg/hr  
 Maximum = 110 kg/hr

Pset = 2.5 barg



**Poll Question:**  
**What is your control valve**  
**datasheet going to look like?**  
**Options are:**

Option 1			
Parameter	Minimum	Normal	Maximum
Pin, barg	4	5	6
Mass flow	50	100	110
Pressure drop, bar	0.7	0.7	0.7

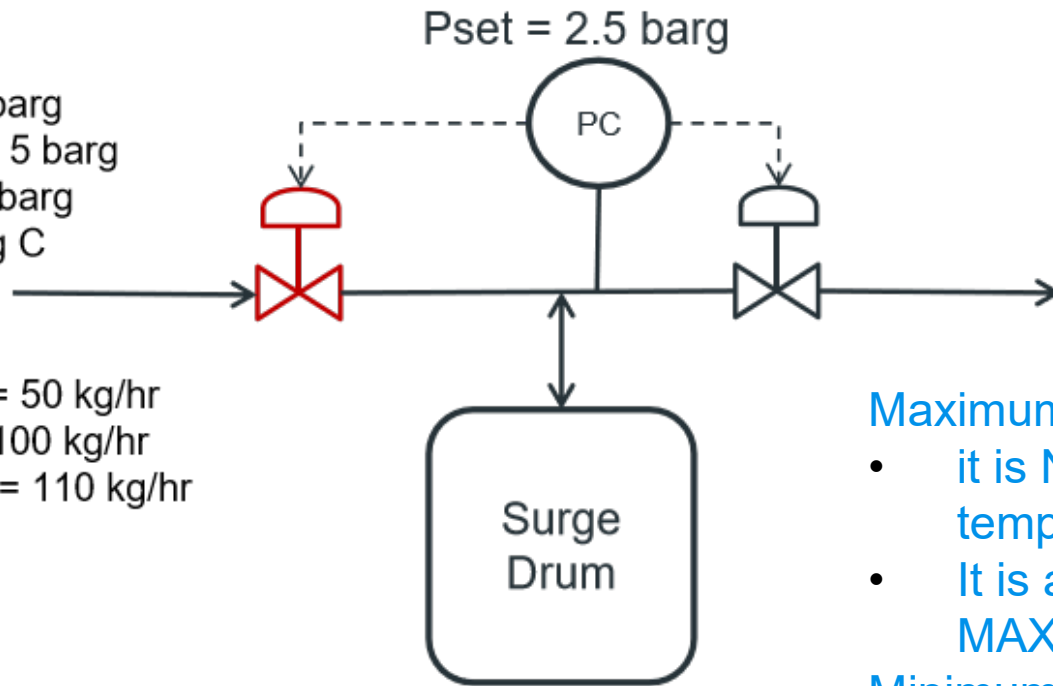
Option 3			
Parameter	Minimum	Normal	Maximum
Pin, barg	6	5	4
Mass flow	50	100	110
Pressure drop, bar	0.7	0.7	0.7

Option 2			
Parameter	Minimum	Normal	Maximum
Pin, barg	4	5	6
Mass flow	50	100	110
Pressure drop, bar	1.5	2.5	3.5

Option 4			
Parameter	Minimum	Normal	Maximum
Pin, barg	6	5	4
Mass flow	50	100	110
Pressure drop, bar	3.5	2.5	1.5

Nitrogen:  
 Pmin = 4 barg  
 Pnormal = 5 barg  
 Pmax = 6 barg  
 T = 40 deg C

Mass flow:  
 Minimum = 50 kg/hr  
 Normal = 100 kg/hr  
 Maximum = 110 kg/hr



- 0.7 bar --> typical lower limit for globe valve
- One of the criteria for control valves in pump circuit
- For non-pump circuit, 0.7 bar is not relevant

Maximum in datasheet:

- it is NOT maximum flow or pressure or temperature or pressure drop
- It is about combination that gives **MAXIMUM Cv**

Minimum --> combination that gives minimum Cv

*Option 4 has such combinations and hence is the right way to prepare CV datasheet*

Critical to get right:

- Max Cv --> valve size
- Min Cv --> Rangeability

Option 1			
Parameter	Minimum	Normal	Maximum
Pin, barg	4	5	6
Mass flow	50	100	110
Pressure drop, bar	0.7	0.7	0.7

Option 3			
Parameter	Minimum	Normal	Maximum
Pin, barg	6	5	4
Mass flow	50	100	110
Pressure drop, bar	0.7	0.7	0.7

Option 2			
Parameter	Minimum	Normal	Maximum
Pin, barg	4	5	6
Mass flow	50	100	110
Pressure drop, bar	1.5	2.5	3.5

Option 4			
Parameter	Minimum	Normal	Maximum
Pin, barg	6	5	4
Mass flow	50	100	110
Pressure drop, bar	3.5	2.5	1.5

# Control Valve: Myths and Realities

Myth	Fact
<p>Let us design this control valve for XYZ bar pressure drop</p>	<p><b>WRONG.</b></p> <p>Control valve does NOT have its own pressure drop. It just connects two pressure systems.</p> <p>E.g. Surge drum blanketing example with Nitrogen header at 5 barg. Even if you specify pressure drop of 0.7 bar in datasheet or 1.5 bar as per option 4, control valve pressure drop in plant would be ~2.5 bar</p> <p>You can only pressure drop for control valve for maximum flow case when estimating pump differential head during design. Once installed, pump discharge control valve pressure drop can not be fixed. System fixes it.</p>
<p>Smaller valve --&gt; large pressure drop Bigger control valve --&gt; less pressure drop</p>	<p><b>WRONG.</b></p> <p>Control valve pressure drop is not decided by valve size. It is set by system.</p> <p>E.g. In example above, either 2", 3" or 4" valve will have same 2.5 bar pressure drop. 2" valve will have high % opening while 4" valve will be less % open for same flow</p>
<p>Control valve hydraulics is the most important activity around control valve.</p>	<p><b>Partially Correct.</b></p> <p>For large pressure drops, detailed line loss calculation is not necessary. It hardly introduces any error. Ensure inlet and outlet velocities are within economic criteria given in design bases</p> <p>Rather focus on type of valve, getting Cvmax and Cvmin case data correct, TSO requirement, handwheel requirement, any position switch, mechanical Cv limit etc correct.</p> <p>Situations where pressure drop can be critical:</p> <ol style="list-style-type: none"> <li>1. Tank vent to flare</li> <li>2. Exchanger bypass TV</li> <li>3. Column related pressure control valves</li> <li>4. Control valves on cooling water related lines</li> <li>5. Steam / condensate related control valves</li> <li>6. Low pressure drop / butterfly valves</li> </ol>
<p>Control valve size shall be less than line size</p>	<p><b>Not Always Correct.</b></p> <p>For liquids, this is usually the case.</p> <p>For gases with large pressure drop, control valve size may need to be larger than inlet line size. Better to increase inlet line size.</p>