

CONTROL VALVE SIZING CALCULATOR (LIQUID)

Project: Feed pump discharge FV 3101

Calc no: CALC CV 001 Rev: 0

Yellow cells: enter data. Grey cells: calculated automatically. Free template from instrumentationblog.in

Fluid and valve data			
Specific gravity (water = 1)	1	Vapour pressure Pv (bar a)	0.0317
Critical pressure Pc (bar a)	220.64	Liquid recovery factor FL	0.9
Rated Cv of selected valve	108	Selected valve	Globe, 3", equal %
FF (calculated)	0.957	Rated Kv (calculated)	93.4

Sizing cases (pressures in bar a)										
Case	Flow Q (m³/h)	Inlet P1	Outlet P2	ΔP (bar)	Choked ΔP (bar)	Sizing ΔP (bar)	Required Kv	Required Cv	Cv ratio (req ÷ rated)	Flow regime
Minimum	20.0	9.00	6.50	2.50	7.27	2.50	12.6	14.6	0.14	OK
Normal	60.0	8.00	6.20	1.80	6.46	1.80	44.7	51.7	0.48	OK
Maximum	85.0	7.50	6.00	1.50	6.05	1.50	69.4	80.2	0.74	OK
Cv ratio at maximum flow (target ≤ 0.85)									OK	
Cv ratio at minimum flow (target ≥ 0.1)									OK	

$C_v = 1.156 \times K_v$. $K_v = Q \times \sqrt{(SG \div \Delta P)}$. Choked $\Delta P = FL^2 \times (P_1 - FF \times P_v)$, $FF = 0.96 - 0.28 \sqrt{(P_v \div P_c)}$. Check noise and cavitation separately for high ΔP services.

Prepared by	Checked by
Name:	Name:
Signature:	Signature:
Date:	Date: