


PROJECT :			DATE :	3/4/2011
PROJ. NO. :			BY :	S.RAHIMI
CLIENT:			REV :	A
UNIT :			DOC NO.:	

PRESSURE SAFETY VALVE CALCULATION SHEET (VAPOR/GAS)

General Data		
PSV Tag No.	PSV-4102	
P&ID No.	8-FS-DWG-B-0041	
Protected Equipment	20-D-801	
Cause of Overpressure	FIRE	
Molecular Weight	----	53.5
Ratio of Specific Heat (k)	----	1.07
Compressibility Factor (Z)	----	1.00

Combination

Without Rupture Disk


With Rupture Disk

Operating Condition		
Maximum Operating Pressure	barg	70.00
Maximum Operating Temperature	°C	40.00
Max. Allowable Working Pressure	barg	75.00

Relieving Condition		
Required Relieving Capacity	Kg/hr	16310.0
Set Pressure	barg	75.00
Allowable Overpressure	%	21.0
Superimposed Back Pressure (Constant)	barg	0.50
Superimposed Back Pressure (Variable)	bar	0.00
Built Up Back Pressure	bar	0.00
Relieving Temperature	°C	75.0

Calculation Results		
Flow Regime	CRITICAL	
Recommended Type (Conv./Bellows/Pilot)	PILOT OPERATED	
Total Back Pressure	barg	0.50
Reliving Pressure	bara	91.75
Combination Correction Factor (K _c)	----	1.000
Capacity Correction Factor (K _b)	----	1.000
Effective Coefficient of Discharge (K _d)	----	0.975
C Coefficient	----	324.0
Minimum Required Discharge Area	mm ²	185.93
Selected Discharge Area	mm ²	198.06
Orifice Designation	----	F
Inlet Size	in	1.5
Outlet Size	in	2.0
Actual Relieving Capacity	kg/hr	17374.8
No. of PSVs Required	----	1

General Notes

PROJECT :	0		DATE :	40606
PROJ. NO. :	0		BY :	S.RAHIMI
CLIENT:	0		REV :	A
UNIT :	0		DOC NO.:	

PSV SUCTION LINE SIZING CALCULATION FORM

PSV Tag No. :	PSV-4102	
P&ID No.	8-FS-DWG-B-0041	
Cause of Overpressure	FIRE	
Fluid phase (Liquid/Vapor)	----	VAPOR
Actual Flow Rate	kg/hr	17374.85
Molecular Weight	kg/kgmol	53.50
Relieving Temperature	°C	75.00
Set Pressure	barg	75.00
Flowing Density	kg/m ³	171.91
Flowing Viscosity	Cp	0.0100

Sizing Flow Rate

Required Flow Rate

Actual Flow Rate

Inlet Line Fitting Data		
Pipe Length	m	50
Nominal Pipe Size	inch	6
Pipe Schedule No.	----	40
Pipe Roughness (DEF.)	inch	0.00180
Fittings Quantity		
* tee flow thru	no.	0
* tee branch	no.	0
* elbow 90 deg LR	no.	5
* elbow 90 deg screwed	no.	0
* elbow 45 deg LR	no.	0
* elbow 45 deg screwed	no.	0
* close pattern return bend	no.	0
* gate valve	no.	0
* ball valve	no.	0
* globe valve	no.	0
* angle valve	no.	0
* butterfly valve (2" - 8")	no.	0
* butterfly valve (10" - 14")	no.	0
* butterfly valve (16" - 24")	no.	0
* check valve swing	no.	0
* check valve lift	no.	0
* check valve stop lift	no.	0
* check valve tilting disk	no.	0
* foot valve hinged disc	no.	0
* foot valve poppet disc	no.	0
* reducer / expander	no.	0
* entrance (projecting)	no.	0
* entrance (sharp-edged)	no.	0
* entrance (flush)	no.	0
* exit (projecting)	no.	0
* exit (sharp-edged)	no.	0
* exit (rounded)	no.	0

Calculation Results		
Pipe Internal Diameter	mm	154.05
Velocity	m/s	1.51
Reynolds No.	----	3988801
Friction Factor	----	0.0148
Pipe Pressuer Loss	bar	0.009
Fitting Pressure Loss	bar	0.009
Calcalatyed ΔP	bar	0.018
Allowable ΔP	bar	2.250
Statement	OK	

General Notes