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15-RV-006.361

Nomenclature:

A	=	Selected Orifice Area (See Table 1)	=	830	mm ²
		Ref: Orifice Letter: J			
Ac	=	Calculated Orifice Area (From Data Sht.)	=	602	mm ²
N	=	Number of Working Valves	=	1	
Ps	=	Set Pressure in "bara"	=	14.00	bara
	=	Set Pressure in barg (13) + 1 bar			
T	=	Absolute Relief Temperature	=	375.15	K
	=	Relief Temperature in °C (102) + 273.15K			
γ	=	Ratio of Specific Heats = Cp/Cv	=	1.2	
W1	=	Discharge Rate (From Data Sht.)	=	101610.9	Kg/h
Wm	=	Maximum Disch. Rate / Valve = $\frac{W1 \cdot A}{N \cdot Ac}$	=	140095	Kg/h
W	=	Maximum Disch. Rate / Valve = $\frac{Wm}{3600}$	=	38.92	Kg/s
M	=	Molecular Weight	=	18.46	
R	=	Gas Constant = $\frac{8.314}{M}$	=	0.45	kJ/kg°K
g	=	Acceleration due to Gravity	=	9.81	m/s ²

Table 1

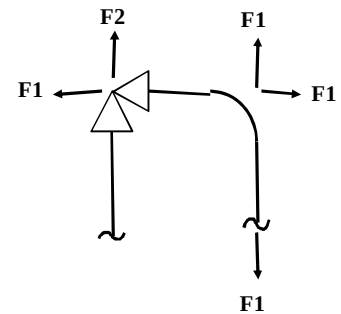
"A" Orifice Area (mm ²)	Size	"A" Orifice Area (mm ²)	Size	"A" Orifice Area (mm ²)	Size
71	D	830	J	4116	P
126	E	1186	K	7129	Q
198	F	1841	L	10323	R
325	G	2323	M	16774	T
506	H	2800	N		

Formulae

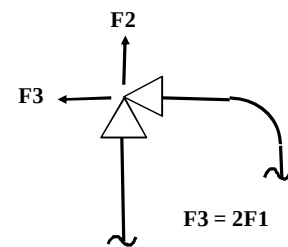
$$F1 = \frac{129 W}{1000} \sqrt{\frac{\gamma \times T}{(\gamma + 1)M}} = \frac{129 \times 38.92}{1000} \sqrt{\frac{1.2 \times 375.15}{(1.2+1) \times 18.46}} = 16.714 \text{ kN}$$

$$F2 = \frac{W^2 R T}{0.1 \times Ps A} = \frac{38.92^2 \times 0.5 \times 375.15}{0.1 \times 14 \times 830} = 220.199 \text{ kN}$$

$$F3 = 2 \times F1 = 2 \times 16.7 = 33.428 \text{ kN}$$

Established Flow Condition

Only F2 is Effective,
as other forces are balanced.

At RV. Pop Condition

With Impact factor of 2