

RELIEF VALVE SIZING CALCULATOR (GAS, API 520)

Project: Air receiver PSV 1001

Calc no: CALC PSV 001 Rev: 0

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

Relief case

Required relieving flow W (kg/h)	10000	Set pressure (bar g)	10
Allowable overpressure (%)	10	Total back pressure (bar g)	0
Relieving temperature (°C)	50	Molecular weight	28.96
Specific heat ratio k	1.4	Compressibility Z	1
Discharge coefficient Kd	0.975	Back pressure correction Kb	1
Rupture disc factor Kc (1.0 or 0.9)	1	Relief case	Blocked outlet

Results

Relieving pressure P1 (kPa a)	1201.3	Coefficient C	0.02703
Required area (mm²)	1055.0	Critical flow check	OK (critical)

API 526 orifices

Letter	Area (mm²)	Area (in²)	% used	Selection
D	71.0	0.110	1487	
E	126.5	0.196	834	
F	198.1	0.307	533	
G	324.5	0.503	325	
H	506.5	0.785	208	
J	830.3	1.287	127	
K	1186.0	1.838	89	SELECT
L	1841.0	2.854	57	
M	2323.0	3.601	45	
N	2800.0	4.340	38	
P	4116.0	6.380	26	
Q	7129.0	11.050	15	
R	10323.0	16.001	10	
T	16774.0	26.000	6	
Selected orifice				K

$A = W \div (C \times K_d \times P_1 \times K_b \times K_c) \times \sqrt{(T \times Z \div M)}$, A in mm², W in kg/h, P1 in kPa a, T in K. $C = 0.03948 \times \sqrt{(k \times (2 \div (k + 1)))^{(k + 1) \div (k - 1))}$. Overpressure is typically 10 % (single valve), 16 % (multiple valves) or 21 % (fire case).

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