



ASPC Project



END CUSTOMER	: Arya Sasol Polymer Company
CONTRACTOR	: DYPNF Co., Ltd.
VENDOR NAME	: Airpack Netherlands BV
EQUIPMENT DESCRIPTION	: Screw Compressor & Roots Blower
PURCHASE ORDER NUMBER	: PO-PC2312-08

Customer Number Document : 3944-VD-0171-DYP-RE-400-CAL-0007

Airpack Document Number : 23383-12D

Document Title : PSV sizing calculations

Review Code and Status		Contractor Initials/Signature	Date signed
<input type="checkbox"/>	Code 1 REJECTED - Vendor to revise and Resubmit. Work cannot proceed		
<input type="checkbox"/>	Code 2 Comments As Noted - Work May proceed, subject to compliance with and incorporation of comments		
<input type="checkbox"/>	Code 3 No Comments - Work may proceed.		
<input type="checkbox"/>	Code 4 Information only - Review not required.		

00	Issued for Information	24-12-2025	SC	SC	JJ
Rev. No.	Description	Date	Prepared by	Checked by	Approved by

44C-40001A/B

Safety Relief Valve Sizing Report

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1 General			
2	Tag No.	tba1	Project
3 Valve - General			
4	Article Number		Quantity 1
5	Valve Type	Conventional Design	Lifting Device Packed lever - screwed (H4)
6	Body Material	1.0619/SA-216 WCB/WCC - CS	Cap Type
7	Bonnet Type	Closed	Test Gag No
8	Nozzle Type	Full nozzle	Design Standard API 526
9	Sealing Type	Metal sealing	Discharge coefficient acc. to ASME XIII / VIII (UV)
10 Connections			
11	Inlet		Outlet
12	Standard	EN 1092	Standard EN 1092
13	Type	Integrated flange	Type Integrated flange
14	DN/NPS	DN 100	DN/NPS DN 150
15	PN/PR	PN 16	PN/PR PN 16
16	Flange Facing	Form B1	Flange Facing Form B1
17 Service Condition			
18	Design Pressure (min/max)	Not specified	Required Capacity Not specified
19	Set Pressure	4,20 bar-g	Required Capacity Std-Cond. 0,00 SCFM
20	Overpressure	10,00 %	Volume Flow Standard ASME (60°F @ 14.7psi)
21	Relieving Pressure	5,63 bar-a	Fluid State Gas
22	Operating Pressure	Not specified	Fluid Designation Nitrogen
23	Environmental Pressure	1,01 bar-a	Ratio of Specific Heats, k 1,400
24	Rupt. Disc Correc. Factor	1,000	Compressibility Factor, Z 1,000
25			Molecular Weight, M 28,010 kg/kmol
26	Backpressure		Temperature
27	Constant Superimposed	0,00 bar-g	Relieving 20,00 °C
28	Variable Superimposed	0,00 bar	Normal Operating 25,00 °C
29	Built-up	0,00 bar	Min Design Not specified
30	Total	0,00 bar-g	Max Design Not specified
31 Sizing & Selection - Summary			
32	Required Discharge Area	Not specified	Discharge Coefficient (Kd) 0,801
33	Selected Discharge Area	2.248,006 mm²	Nameplate Capacity 4.164,48 SCFM
34	Selected Diameter	53,500 mm	Cold Differential Test Pressure 4,20 bar-g
35	Selected API Orifice	L	Back Pressure Correction Factor 1,000
36	Certified Capacity	8.476,30 kg/h	Reaction Force, API 520-2 (2020) 833,57 N
37	Certified Capacity Std-Cond.	4.218,48 SCFM	Noise Level in 1 m, API 521 137 dB
38	Capacity Exceed	N/A	
39 Notes		Dimensions & Weight	
40	- Noise level calculation based on API 521 at fully gaseous state to atmosphere without consideration of possible discharge pipe.		a 179 mm
41			b 181 mm
42			H 853 mm
43			M 107,0 kg

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44C-80004A/B

Safety Relief Valve Sizing Report

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1 General			
2	Tag No.		Project
3	Customer		
4 Valve - General			
5	Article Number	5262.6464	Quantity 2
6	Valve Type	Conventional Design	Lifting Device Packed lever - screwed (H4)
7	Body Material	1.0619/SA-216 WCB/WCC - CS	Cap Type
8	Bonnet Type	Closed	Test Gag No
9	Nozzle Type	Full nozzle	Design Standard API 526
10	Sealing Type	Metal sealing	Discharge coefficient acc. to ASME XIII / VIII (UV)
11 Connections			
12	Inlet		Outlet
13	Standard	EN 1092	Standard EN 1092
14	Type	Integrated flange	Type Integrated flange
15	DN/NPS	DN 100	DN/NPS DN 150
16	PN/PR	PN 16	PN/PR PN 16
17	Flange Facing	Form B1	Flange Facing Form B1
18 Service Condition			
19	Design Pressure (min/max)	Not specified	Required Capacity 10.056,00 kg/h
20	Set Pressure	3,50 bar-g	Required Capacity Std-Cond. 7.784,89 m³/h
21	Overpressure	10,00 %	Volume Flow Standard Physical (0°C @ 1.013bar)
22	Relieving Pressure	4,86 bar-a	Fluid State Gas
23	Operating Pressure	Not specified	Fluid Designation Air
24	Environmental Pressure	1,01 bar-a	Ratio of Specific Heats, k 1,400
25	Rupt. Disc Correc. Factor	1,000	Compressibility Factor, Z 1,000
26			Molecular Weight, M 28,960 kg/kmol
27	Backpressure		Temperature
28	Constant Superimposed	0,00 bar-g	Relieving 280,00 °C
29	Variable Superimposed	0,00 bar	Normal Operating 280,00 °C
30	Built-up	0,00 bar	Min Design Not specified
31	Total	0,00 bar-g	Max Design Not specified
32 Sizing & Selection - Summary			
33	Required Discharge Area	4.173,329 mm²	Discharge Coefficient (Kd) 0,801
34	Selected Discharge Area	5.026,548 mm²	Nameplate Capacity 8.048,04 SCFM
35	Selected Diameter	80,000 mm	Cold Differential Test Pressure 3,59 bar-g
36	Selected API Orifice	P	Back Pressure Correction Factor 1,000
37	Certified Capacity	12.111,91 kg/h	Reaction Force, API 520-2 (2020) 1.609,09 N
38	Certified Capacity Std-Cond.	9.376,48 m³/h	Noise Level in 1 m, API 521 141 dB
39	Capacity Exceed	20,44 %	
40 Notes		Dimensions & Weight	
41	- Noise level calculation based on API 521 at fully gaseous state to atmosphere without consideration of possible discharge pipe.		a 181 mm
42			b 229 mm
43			H 855 mm
44			M 114,0 kg

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45 Tag numbers

46	VM140	VM140		
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Safety Relief Valve Sizing Report

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1	General				
2	Tag No.		Project		
3	Valve - General				
4	Article Number		Quantity	1	
5	Valve Type	Conventional Design	Lifting Device	Packed lever - screwed (H4)	
6	Body Material	1.0619/SA-216 WCB/WCC - CS	Cap Type		
7	Bonnet Type	Closed	Test Gag	No	
8	Nozzle Type	Full nozzle	Design Standard	API 526	
9	Sealing Type	Metal sealing	Discharge coefficient	acc. to ASME XIII / VIII (UV)	
10	Connections				
11	Inlet		Outlet		
12	Standard	EN 1092	Standard	EN 1092	
13	Type	Integrated flange	Type	Integrated flange	
14	DN/NPS	DN 100	DN/NPS	DN 150	
15	PN/PR	PN 16	PN/PR	PN 16	
16	Flange Facing	Form B1	Flange Facing	Form B1	
17	Service Condition				
18	Design Pressure (min/max)	Not specified	Required Capacity	Not specified	
19	Set Pressure	2,80 bar-g	Required Capacity Std-Cond.	0,00 SCFM	
20	Overpressure	10,00 %	Volume Flow Standard	ASME (60°F @ 14.7psi)	
21	Relieving Pressure	4,09 bar-a	Fluid State	Gas	
22	Operating Pressure	Not specified	Fluid Designation	Air	
23	Environmental Pressure	1,01 bar-a	Ratio of Specific Heats, k	1,400	
24	Rupt. Disc Correc. Factor	1,000	Compressibility Factor, Z	1,000	
25			Molecular Weight, M	28,960 kg/kmol	
26	Backpressure		Temperature		
27	Constant Superimposed	0,00 bar-g	Relieving	20,00 °C	
28	Variable Superimposed	0,00 bar	Normal Operating	25,00 °C	
29	Built-up	0,00 bar	Min Design	Not specified	
30	Total	0,00 bar-g	Max Design	Not specified	
31	Sizing & Selection - Summary				
32	Required Discharge Area	Not specified	Discharge Coefficient (Kd)	0,801	
33	Selected Discharge Area	2.248,006 mm²	Nameplate Capacity	3.026,06 SCFM	
34	Selected Diameter	53,500 mm	Cold Differential Test Pressure	2,80 bar-g	
35	Selected API Orifice	L	Back Pressure Correction Factor	0,995	
36	Certified Capacity	6.230,96 kg/h	Reaction Force, API 520-2 (2020)	602,62 N	
37	Certified Capacity Std-Cond.	2.999,30 SCFM	Noise Level in 1 m, API 521	135 dB	
38	Capacity Exceed	N/A			
39	Notes		Dimensions & Weight		
40	- Noise level calculation based on API 521 at fully gaseous state to atmosphere without consideration of possible discharge pipe.			a	179 mm
41				b	181 mm
42				H	853 mm
43				M	106,4 kg

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