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		LESER Job N°	(UNWETTED)

Sizing - Medium				
1000	Designation	PSV-2121A/B/C-UNWETTED		
1004	Formula			
1001	Molar mass	M	24.523	kg/kmol
1002	Ratio of specific heats	k	1.245	
1003	Compressibility factor	Z	0.975	

Sizing - Firecase				
1050	Calculation type		Unwetted	
1051	Type of vessel		Vertical	
1052	Vessel head design		Ellipsoidal head	
1054	Vessel diameter	D	900	mm
1055	Vessel length	L	3,000	mm
1070	Exposed surface area of the vessel, calculated	A'	9,754,645.189	mm ²
1071	Exposed surface area of the vessel, manual	A'		
1063	Vessel wall temperature	Tw	593.3	°C
1064	Normal operating gas pressure	Pn	4.9	bar-g
1065	Normal operating gas temperature	Tn	36.78	°C
1068	Coefficient of discharge	Kd	0.975	
1069	Minimum value of factor F'	F'min	0.010	
1072	Minimum required mass flow	W	268.884	kg/h
1073	Minimum required effective discharge area	A	51.556	mm ²

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Sizing - Service condition				
1009	Case for blow off		Firecase	
1100	Maximum allowable working pressure			
1101	Set pressure	p	9	bar-g
1102	Constant superimposed back pressure	paf		
2102	Variable superimposed back pressure			
1103	Built up back pressure	pae	3.3	bar
1104	Backpressure		3.3	bar-g
1105	Overpressure	dp	21.00	%
1106	Environmental pressure	pu	1.013	bar
1107	Relieving Temperature	T	350.7	°C
1111	Operating Temperature		36.78	°C
1108	Required massflow	qm,ab	268.885	kg/h
1109	Volume flow to be discharged (working condition)	qvb,ab	46.586	m³/h
1110	Volume flow to be discharged (std condition) [T=60 °F P=14.7 psi]	qvn,ab	253.199	m³/h
1120	Rupture disc correction factor	Kc	1.000	

Initial Sizing according to API 520 for Balance safety valve		
1150	NPS inlet Orifice NPS outlet	1D2
1151	PR inlet x PR outlet	#150 x #150
1152	Material	WCB
1153	Required orifice	D
1154	Selected orifice	D

Sizing - Calculation				
1200	Certified massflow	qm,zu	408.935	kg/h
1201	Certified volume flow (operating condition)	qvb,zu	70.851	m³/h
1203	Certified volume flow (standard condition)	qvn,zu	385.079	m³/h
1204	Maximum mass flow	qm,max	454.373	kg/h
1205	Maximum volume flow (working condition)	qvb,max	78.723	m³/h
1206	Maximum volume flow (standard condition)	qvn,max	427.865	m³/h
1207	Capacity exceed		52.09	%

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Valve - General			
1500	Article number		5262.0012
1512	Reseller article number		
1513	Quantity of safety valve		1
1501	Certified coefficient of discharge for steam and gases	K,DG	0.455
1502	Certified coefficient of discharge for liquid	K,F	0.343
1453	Orifice		D
1505	Bonnet / Lifting device		Cap H2
1506	Body-/ Inlet base material		1.0619 / SA 216 WCB
1511	Bonnet		Closed Bonnet
1514	Order code	5262.0012-9 bar_g-H64H79-3.1	


Inlet connection		
1303	Connection standard	acc. to ASME B16.5
1304	DN / NPS	1"
1305	PN / PR	#150
1306	Flange facing	RF

Outlet connection		
1353	Connection standard	acc. to ASME B16.5
1354	DN / NPS	2"
1355	PN / PR	#150
1356	Flange facing	RF

Valve - Dimensions				
1400	Discharge area	Ao	153.938	mm ²
1401	Discharge diameter	do	14	mm
1402	Centre to Face dimensions	a	105	mm
1403	Centre to Face dimensions	b	114	mm
1405	Height	H	440	mm
1406	Weight	M	17.3	kg
1411	Inlet flange thickness incl. raised face	S1	30	mm


Lift				
1507	Standard		0.059	inch

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1206	Maximum volume flow (standard condition)	qvn,max	427.865	m³/h
1207	Capacity exceed		52.09	%
1600	Required actual discharge area	Ao, req	101.218	mm²
1601	Required discharge diameter	do,req	11.352	mm
1617	Back pressure correction factor	Kb	0.941	
1618	Cold differential test pressure	CDTP	9	bar-g
1620	Cold differential test pressure, manually	CDTP		

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Valve - Part list					
	PosNo	Denomination	Q	Material ASME	Material DIN
12010	1	Body	1	SA 216 WCB	1.0619
12050	5	Full nozzle	1	CF8M or 316L	1.4408 or 1.4404
12060	6	Adjusting ring	1	CF8M	1.4408
12070	7	Disc	1	Hardened Stainless steel	1.4122
12080	8	Guide	1	Carbon steel/chrome st. Tenifer	1.0501 / 1.4104 tenifer
12090	9	Bonnet	1	SA 216 WCB	1.0619
12120	12	Spindle	1	420	1.4021
12140	14	Split ring	2	Chrome steel	1.4104
12160	16	Spring plate	1	Steel	1.0718
12170	17	Spring plate	1	Steel	1.0718
12180	18	Adjusting screw	1	Chrome steel	1.4104
12190	19	Lock nut	1	Steel	1.0718
12220	22	Lift stopper	1	316L	1.4404
12400	40	Cap H2	1	SA 105	1.0460
12540	54	Spring	1	High temperature alloy steel	1.8159
12550	55	Bolt	4	B8M	1.4401
12560	56	Nut	4	8M	1.4401
12570	57	Ball	15	316	1.4401
12600	60	Gasket	1	Graphite / 316	Graphit / 1.4401
12610	61	Ball washer	1	Hardened stainless steel	1.3541
12660	66	Hex. nut	1	B8M	1.4401
12690	69	Thrust needle bearing	1	316L	1.4404
12730	73	Locking screw	1	8M	1.4404
12870	87	Plug	1	B8M	1.4401

LESER is free to upgrade materials without further notice.

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Drawing

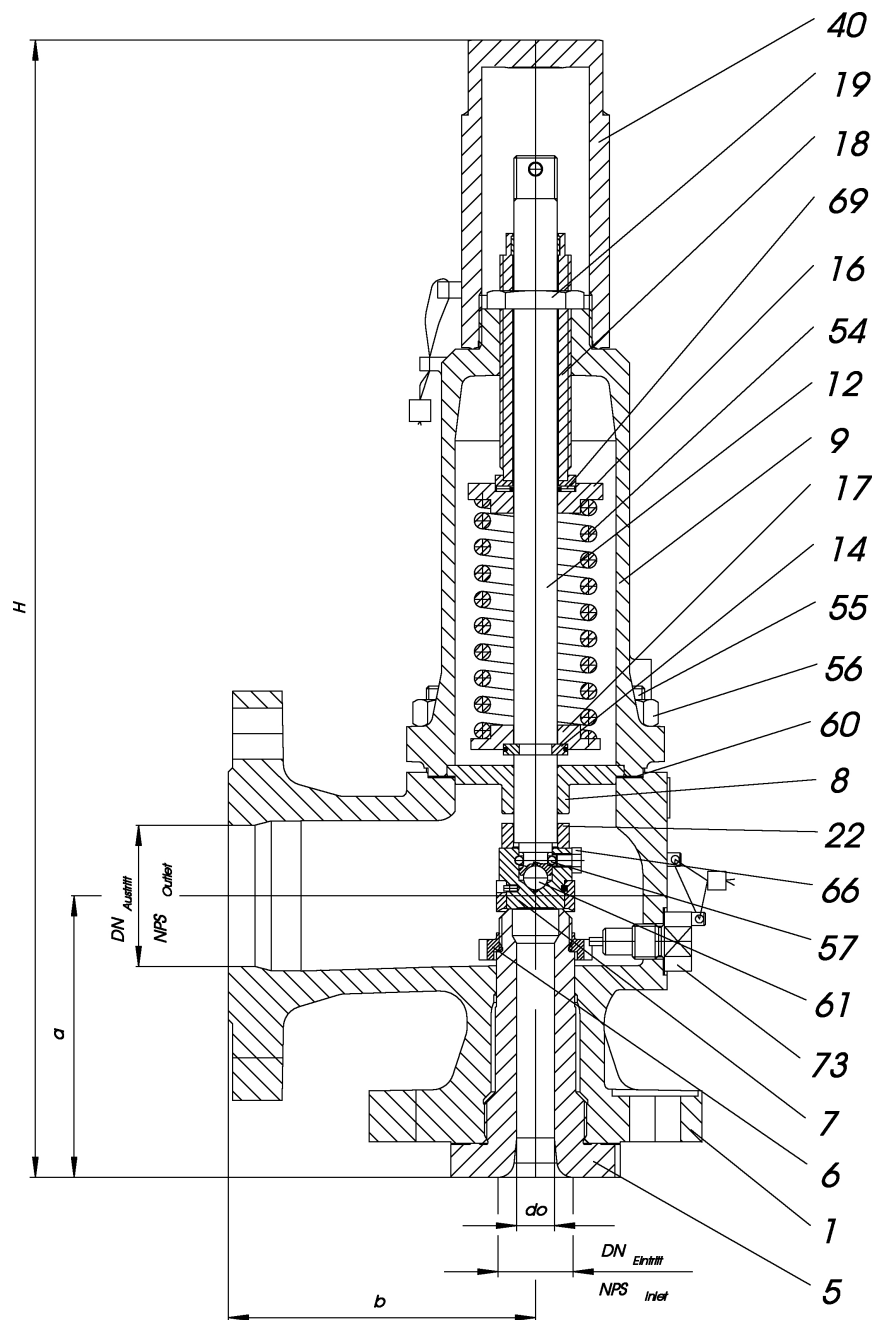


Drawing is a view; the effective geometry could deviate from this view.

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Drawing




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Messages

The set pressure is out of the allowed range for the inlet flange. Choose a different flange connection.

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Messages
In accordance with LESER Works Standard please consider a stainless steel bellows with closed bonnet design.
Built-up back pressure has too high value. Maximum allowed pressure is $p_{ae} = 0.15 \cdot (p - p_{af}) = 1.35$ [bar].
Bellow is needed.
Ask LESER if this valve works properly.

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