
 The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	1 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job №	(WETTED)

Sizing - Medium				
1000	Designation	PSV-2111 WETTED		
1004	Formula			
1001	Molar mass	M	48.1	kg/kmol
1002	Ratio of specific heats	k	1.223	
1003	Compressibility factor	Z	0.954	

Sizing - Firecase				
1050	Calculation type		Wetted	
1051	Type of vessel		Horizontal	
1052	Vessel head design		Ellipsoidal head	
1053	Vessel elevation	H	1,000	mm
1054	Vessel diameter	D	4,200	mm
1055	Vessel length	L	12,600	mm
1056	Liquid depth	Y	3,800	mm
1066	Effective liquid level	Yeff	3,800	mm
1061	Wetted surface, calculated	Awet	156.221	m ²
1062	Wetted surface, manual	Awet		
1057	Drainage presence		No	
1058	Type of isolation		Bare vessel	
1059	Environment factor	F	1.000	
1060	Heat of evaporation	Hvap	431.6	kJ/kg
1072	Minimum required mass flow	W	37,247.28 3	kg/h

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			


 The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	2 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job N°	(WETTED)

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	3.4	bar
1104	Backpressure		3.4	bar-g
1105	Overpressure	dp	21.00	%
1106	Environmental pressure	pu	1.013	bar
1107	Relieving Temperature	T	284	°C
1111	Operating Temperature		32	°C
1108	Required massflow	qm,ab	37,247.283	kg/h
1109	Volume flow to be discharged (working condition)	qvb,ab	2,874.949	m³/h
1110	Volume flow to be discharged (std condition) [T=60 °F P=14.7 psi]	qvn,ab	17,496.147	m³/h
1120	Rupture disc correction factor	Kc	1.000	

Initial Sizing according to API 520 for Balace safety valve		
1150	NPS inlet Orifice NPS outlet	6Q8
1151	PR inlet x PR outtet	#150 x #150
1152	Material	WCB
1153	Required orifice	Q
1154	Selected orifice	Q

Sizing - Calculation				
1200	Certified massflow	qm,zu	61,894.647	kg/h
1201	Certified volume flow (operating condition)	qvb,zu	4,777.368	m³/h
1203	Certified volume flow (standard condition)	qvn,zu	29,073.741	m³/h
1204	Maximum mass flow	qm,max	68,771.83	kg/h
1205	Maximum volume flow (working condition)	qvb,max	5,308.186	m³/h
1206	Maximum volume flow (standard condition)	qvn,max	32,304.157	m³/h
1207	Capacity exceed		66.17	%

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

 The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	3 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job №	(WETTED)

Valve - General			
1500	Article number		5262.6572
1512	Reseller article number		
1513	Quantity of safety valve		1
1501	Certified coefficient of discharge for steam and gases	K,DG	0.801
1502	Certified coefficient of discharge for liquid	K,F	0.579
1453	Orifice		Q
1505	Bonnet / Lifting device		Cap H2
1506	Body-/ Inlet base material		1.0619 / SA 216 WCB
1511	Bonnet		Closed Bonnet
1514	Order code	5262.6572-9 bar_g-H64H79-3.1	


Inlet connection		
1303	Connection standard	acc. to ASME B16.5
1304	DN / NPS	6"
1305	PN / PR	#150
1306	Flange facing	RF

Outlet connection		
1353	Connection standard	acc. to ASME B16.5
1354	DN / NPS	8"
1355	PN / PR	#150
1356	Flange facing	RF

Valve - Dimensions				
1400	Discharge area	Ao	8,741.678	mm ²
1401	Discharge diameter	do	105.5	mm
1402	Centre to Face dimensions	a	240	mm
1403	Centre to Face dimensions	b	241	mm
1405	Height	H	1,120	mm
1406	Weight	M	245	kg
1411	Inlet flange thickness incl. raised face	S1	68	mm

Lift				
1507	Standard		1.331	inch

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

 The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	4 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job №	(WETTED)

Valve - Calculation				
1200	Certified massflow	qm,zu	61,894.647	kg/h
1201	Certified volume flow (operating condition)	qvb,zu	4,777.368	m³/h
1203	Certified volume flow (standard condition)	qvn,zu	29,073.741	m³/h
1204	Maximum mass flow	qm,max	68,771.83	kg/h
1205	Maximum volume flow (working condition)	qvb,max	5,308.186	m³/h
1206	Maximum volume flow (standard condition)	qvn,max	32,304.157	m³/h
1207	Capacity exceed		66.17	%
1600	Required actual discharge area	Ao, req	5,260.612	mm²
1601	Required discharge diameter	do,req	81.841	mm
1617	Back pressure correction factor	Kb	0.957	
1618	Cold differential test pressure	CDTP	9	bar-g
1620	Cold differential test pressure, manually	CDTP		

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

<div>LESER</div> <div>The-Safety-Valve.com</div>	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	5 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job №	(WETTED)

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	316L	1.4404
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	12	B8M	1.4401
12560	56	Nut	12	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

LESER is free to upgrade materials without further notice.

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

LESER The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	6 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job N°	(WETTED)

Drawing

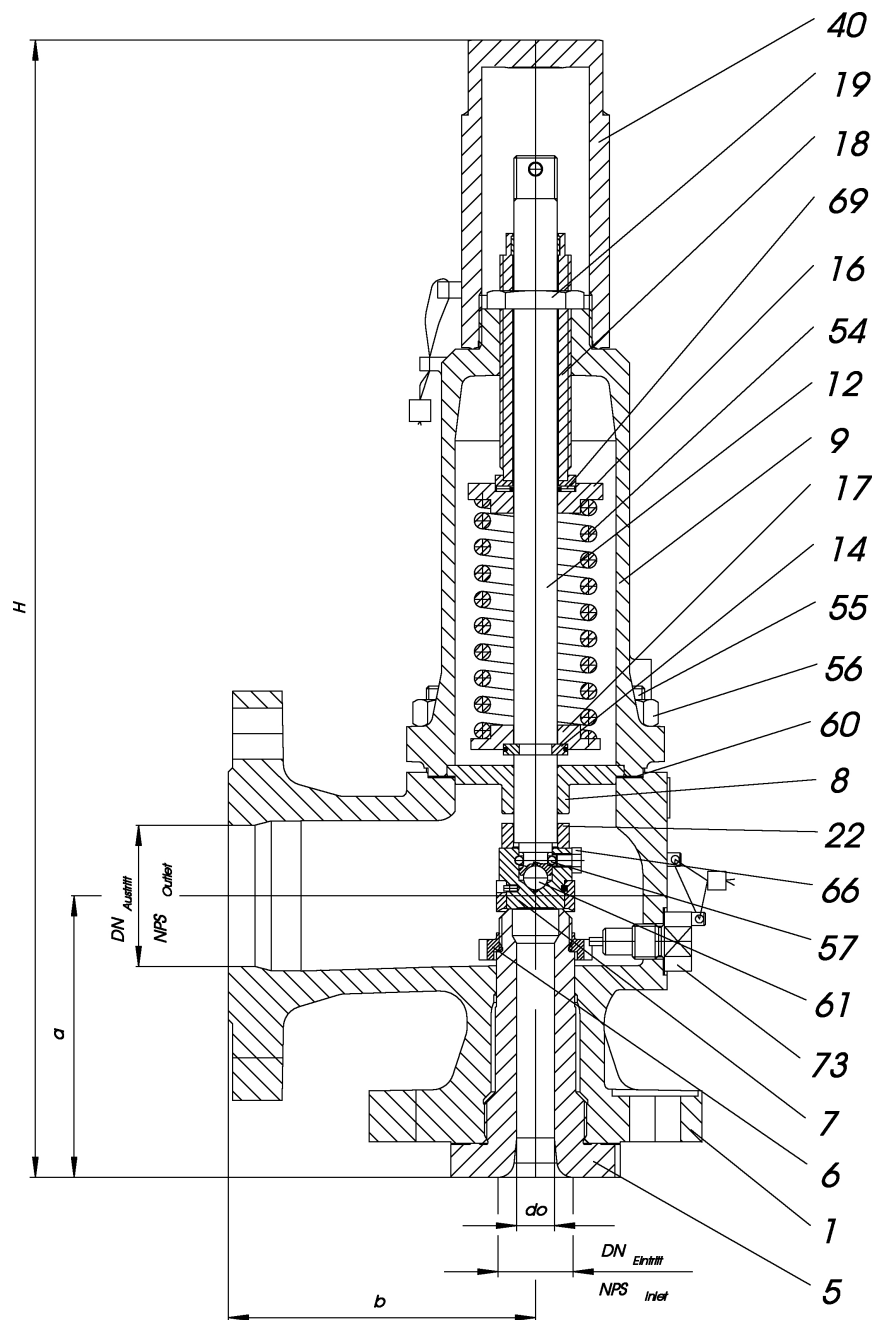


Drawing is a view; the effective geometry could deviate from this view.

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

LESER The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	7 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job N°	(WETTED)

Drawing




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

Messages

Built-up back pressure has too high value. Maximum allowed pressure is $p_{ae} = 0.15 \cdot (p - p_{af}) = 1.35$ [bar].

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			

 The-Safety-Valve.com	Sizing acc. to API 520 for Gas VALVESTAR® – v.7.3.1.60920	Page:	8 of 8
		Date:	2021-09-08 17:06:28
		Project:	binak-summer
		Tag No:	PSV-2111/2112
		LESER Job N°	(WETTED)

Messages
Bellow is needed.
Ask LESER if this valve works properly.

Name	API 520	API 520			
Date	2021-09-08 17:06:28	2022-06-25 10:24:03			
Rev.No	1	2			