

## Tavola riassuntiva delle principali caratteristiche costruttive e di funzionamento / Main fabrication and operating characteristics table

## con anello di regolazione / with adjusting ring (conforme allo std./according to API 526)

Mod.	Tipo di cappello	Certificati	Conessioni
<b>291</b> con bocchaglio pieno e anello di regolazione	Cappello chiuso (molla coperta)	PED-ATEX	Conessioni Std. flangiate ANSI B16.5 (per esecuzioni diverse, fare riferimento all'Ufficio Tecnico)
<b>292</b> con bocchaglio pieno e anello di regolazione	Cappello aperto (molla scoperta)	PED	

Type	Bonnet type	Certifications	Connections
<b>291</b> full nozzle and adjusting ring	Closed (covered spring)	PED-ATEX	Std. connections flanged ANSI B16.5 (for different executions please refer to Technical Dept.)
<b>292</b> full nozzle and adjusting ring	Open (Uncovered spring)	PED	

## Principali caratteristiche funzionali

Applicazioni	Aeriformi	Liquidi
Campo pressioni di taratura p:	da 0.5 a 300 barg	da 0.5 a 300 barg
<b>Materiali di costruzione di corpo e cappello</b>		<b>Interv. temp. di esercizio*</b>
Corpo e cappello in acciaio al carbonio		da -20 a +426°C
Corpo e cappello in acciaio basso legato Cr Mo		da -20 a +538°C
Corpo e cappello in acciaio inossidabile		da -196 a +538°C

\* Per temperature e pressioni diverse da quelle riportate nella presente tabella, fare riferimento all'Ufficio Tecnico.

Coeff. di efflusso equivalenti	Aeriformi	Liquidi
Kd	0.975	0.65

	Aeriformi	Liquidi
<b>Sovrapressione</b>	+10% se $p \geq 1$ bar +0.1 bar se $p < 1$ bar	+10% se $p \geq 1$ bar +0.1 bar se $p < 1$ bar
<b>Scarto di chiusura</b>	-10% 0.1 bar se $p < 1$ bar -0.1 bar se $p < 1$ bar	-20% di p -0.2 bar se $p < 1$ bar

## Massima contropressione pb ammessa generata pb

Valvola senza soffiato di bilanciamento	10% della press. di taratura aeriformi 20% della press. di taratura liquidi
Valvola con soffiato di bilanciamento	40% della press. di taratura

Per l'impiego di valvole in contropressione (pb) imposta fare riferimento all'Ufficio Tecnico.

## Main operating characteristics

Applications	Gaseous	Liquid
Set pressure range p:	from 0.5 to 300 barg	from 0.5 to 300 barg
<b>Body and bonnet construction material</b>		<b>Temperature Range*</b>
Carbon steel body and bonnet		from -20 to +426°C
Cr Mo Alloy steel body and bonnet		from -20 to +538°C
Stainless steel body and bonnet		from -196 to +538°C

\* For temperature and pressure different than those in this table, ask to Technical Department.

Effective coeff. of discharge	Gaseous	Liquid
Kd	0.975	0.65

	Gaseous	Liquid
<b>Overpressure</b>	+10% if $p \geq 1$ bar +0.1 bar if $p < 1$ bar	+10% if $p \geq 1$ bar +0.1 bar if $p < 1$ bar
<b>Blow down</b>	-10% 0.1 bar if $p < 1$ bar -0.1 bar if $p < 1$ bar	-20% of p -0.2 bar if $p < 1$ bar

## Maximum allowable builtup back pressure pb

Safety valves without balancing bellow	10% of set pressure gas and vapour 20% of set pressure liquid
Safety valves with balancing bellow	40% of set pressure

In case of superimposed backpressure, please refer to Technical Department.

LEGENDA: p= pressione di taratura (barg); pb= contropressione (barg).

LEGENDA: p=set pressure (barg) pb= backpressure (barg)

## Note

Alcuni dati riportati nella presente pagina possono variare su specifica richiesta, previa analisi e approvazione delle funzioni competenti di Besa® S.p.A.

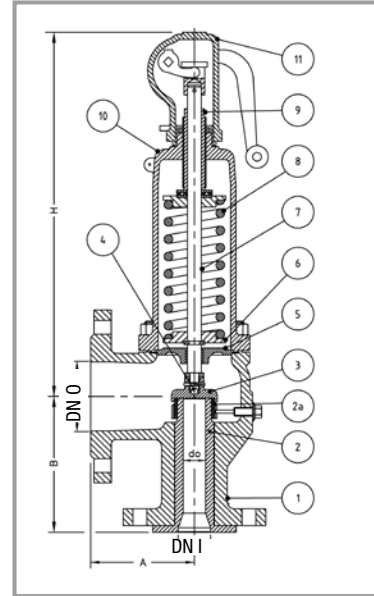
## Note

Some information given on these pages can be changed upon specific requests, after Besa® qualified office approval.

Valvole di sicurezza Modello 291-292  
Safety Valves Type 291-292

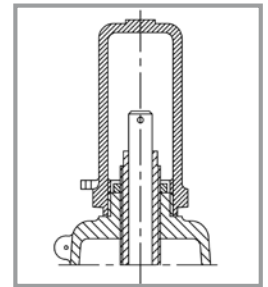
## Std. material legenda

Description	291-C / 292-C Valve with carbon steel body	291-L / 292-L Valve with alloy steel body	291-I Valve with stainless steel body
1 Valve body	Carbon steel ASTM A216 WCB - EN 1.0619	Alloy steel ASTM A217 WC6 - EN 1.7357	Stainless steel ASTM A351 CF8M - EN 1.4408
2 Full nozzle (seat)	Stainless steel ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
2a Adjusting ring	Stainless steel ASTM 316 - EN 1.4401 - ASTM 420 - EN 1.4028	Stainless steel ASTM 316 - EN 1.4401 - ASTM 420 - EN 1.4028	Stainless steel ASTM 316 - EN 1.4401
3 Disc	Stainless steel ASTM 420 - EN 1.4028 or ASTM 316 - EN 1.4401	Stainless steel ASTM 420 - EN 1.4028 or ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
4 Ball	Stainless steel ASTM 420 - EN 1.4028 or ASTM 316 - EN 1.4401	Stainless steel ASTM 420 - EN 1.4028 or ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
5 Guide	Carbon steel with bush ASTM 430F tenifer or Stainless steel ASTM 316 - EN 1.4401	Carbon steel with bush ASTM 430F tenifer or Stainless steel ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
6 Spring plate	AVP steel or Stainless steel ASTM 316 - EN 1.4401	AVP steel or Stainless steel ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
7 Spindle	Stainless steel ASTM 430F - EN 1.4104 or ASTM 316 - EN 1.4401	Stainless steel ASTM 430F - EN 1.4104 or ASTM 316 - EN 1.4401	Stainless steel ASTM 316 - EN 1.4401
8 Spring	Carbon steel Alloy steel	Carbon steel Alloy steel	Stainless steel ASTM 316 S42
9 Pressure adjusting screw	AVP steel or Stainless steel ASTM 316 - EN 1.4401 with bush PTFE	AVP steel or Stainless steel ASTM 316 - EN 1.4401 with bush PTFE	Stainless steel ASTM 316 - EN 1.4401 with bush PTFE
10 Bonnet	Carbon steel ASTM A216 WCB - EN 1.0619	Carbon steel ASTM A216 WCB - EN 1.0619	Stainless steel ASTM A351 CF8M - EN 1.4408
11 Tight cap H4 with lifting lever	Carbon steel ASTM A216 WCB - EN 1.0619	Carbon steel ASTM A216 WCB - EN 1.0619	Stainless steel ASTM A351 CF8M - EN 1.4408

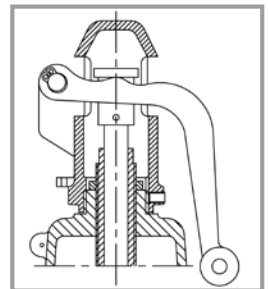


## Caps

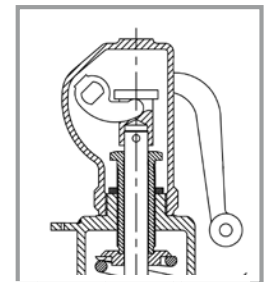
Tight Cap H2 without lifting lever



Open Cap H3 with plain lifting lever



Tight cap H4 with packed lifting lever



## Inlet x outlet flange ratings

DN I	Orifice	ASME CL 150 x 150		ASME CL 300 x 150		ASME CL 600 x 150		ASME CL 900 x 150		ASME CL 900 x 300		ASME CL 1500 x 150		ASME CL 1500 x 300		ASME CL 2500 x 300		H mm	
		A mm	B mm	A mm	B mm	A mm	B mm	A mm	B mm	A mm	B mm	A mm	B mm	A mm	B mm	A mm	B mm		
1" x 2"	D/E	114.3	104.8	114.3	104.8	114.3	104.8											320	
1 1/2" x 2"	D									139.7	104.8			139.7	104.8			373	
	E									139.7	104.8			139.7	104.8				
	F	120.7	123.8	120.7	123.8	152.4	123.8	152.4	123.8										
1 1/2" x 3"	D																177.8	139.7	
	E																177.8	139.7	
	F									165.1	123.8			165.1	123.8		177.8	139.7	
	G	120.7	123.8	120.7	123.8	152.4	123.8	152.4	123.8	165.1	123.8							386	
	H	123.8	130.2	123.8	130.2					165.1	123.8								
2" x 3"	G															171.4	155.5	171.4	155.5
	H			123.8	130.2	161.9	153.9	161.9	153.9					161.9	153.9			425	
	J	123.8	136.5	123.8	136.5														
3" x 4"	J			180.9	184.1	180.9	184.1	180.9	184.1					180.9	184.1			580	
	K	161.9	155.6	161.9	155.6	180.9	184.1												
3" x 6"	L							215.9	198.4					215.9	196.9			645	
	K			181	179.4	181	179.4	222.3	196.9		222.3	196.9							
4" x 6"	M	184.2	117.8	184.2	177.8	203.2	177.8	222.3	196.9									684	
	N	209.6	196.9	209.6	196.9	222.3	196.9	222.3	196.9										
	O	228.6	181	228.6	181	254	225.4	254	225.4										
	P	228.6	181	254	181	254	225.4	254	225.4										
6" x 8"	Q	241.3	239.7	241.3	239.7	241.3	239.7											766	
	R	241.3	239.7	241.3	239.7														
6" x 10"	R			266.7	239.7	266.7	239.7											766	
8" x 10"	T	279.4	276.2	279.4	276.2													1280	

approximate dimensions to be confirmed at order

Valves can be manufactured with materials different than those in this table upon request and after Besa® Technical Dept. approval.

Pressione di taratura P / Set pressure P	ORIFIZIO D / ORIFICE D			ORIFIZIO E / ORIFICE E			ORIFIZIO F / ORIFICE F			ORIFIZIO G / ORIFICE G		
	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam
	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h
1	2461	105	71	4368	187	126	6864	293	198	11266	481	325
2	3481	173	118	6177	307	209	9707	483	328	15933	792	539
3	4263	243	159	7565	432	282	11889	679	443	19514	1114	728
4	4923	316	208	8736	561	369	13728	881	579	22533	1447	951
5	5504	380	249	9767	675	442	15348	1061	694	25193	1742	1139
6	6029	445	290	10699	789	514	16813	1240	808	27597	2036	1327
7	6512	509	331	11556	903	587	18160	1419	923	29808	2330	1514
8	6962	574	372	12354	1018	659	19414	1599	1036	31866	2625	1701
9	7384	638	412	13104	1132	732	20592	1779	1150	33799	2920	1888
10	7783	702	453	13813	1247	804	21705	1959	1264	35628	3216	2075
12	8526	831	534	15131	1475	948	23777	2318	1489	39028	3804	2444
14	9209	960	615	16343	1704	1092	25682	2678	1716	42155	4396	2816
16	9845	1090	696	17472	1934	1236	27456	3038	1942	45066	4987	3188
18	10442	1219	778	18532	2163	1380	29121	3399	2168	47800	5579	3559
20	11007	1348	859	19534	2392	1525	30696	3759	2396	50385	6169	3932
22	11544	1477	940	20487	2622	1668	32194	4120	2620	52844	6762	4301
24	12058	1606	1022	21398	2851	1813	33626	4479	2849	55194	7353	4677
26	12550	1736	1104	22272	3081	1959	34999	4841	3079	57448	7947	5053
28	13024	1865	1187	23113	3310	2106	36320	5201	3310	59617	8537	5433
30	13481	1995	1269	23924	3540	2252	37595	5563	3539	61709	9132	5809
35	14561	2319	1475	25841	4115	2618	40607	6466	4114	66653	10614	6753
40	15567	2643	1685	27725	4690	2990	43411	7370	4699	71255	12097	7713
45	16511	2967	1896	29301	5266	3364	46044	8275	5287	75578	13583	8677
50	17404	3290	2107	30886	5839	3740	48535	9176	5877	79666	15061	9647
55	18253	3615	2323	32393	6416	4123	50904	10082	6479	83554	16549	10635
60	19065	3939	2542	33834	6989	4511	53167	10983	7088	87270	18028	11634
70	20593	4585	2987	36545	8137	5301	57427	12786	8330	94262	20988	13673
80	22014	5229	3445	39068	9279	6113	61392	14582	9606	100770	23935	15767
90	23350	5872	3819	41438	10421	6777	65116	16376	10650	106883	26879	17481
100	24613	6511	4405	43679	11555	7818	68639	18158	12285	112665	29805	20165
110	25814	7131	4916	45811	12656	8724	71989	19887	13708	118164	32643	22501
120	26962	7759	5444	47848	13769	9661	75190	21637	15182	123418	35515	24919
130	28063	8388	6007	49802	14885	10660	78260	23391	16751	128457	38394	27495
140	29122	9010	6607	51682	15990	11725	81215	25128	18425	133307	41245	30243
150	30145	9626	7089	53496	17083	12581	84065	26844	19770	137985	44062	32451
200	34808	12635	/	61772	22423	/	97070	35236	/	159332	57837	/
250	28916	15514	/	69063	27531	/	108527	43263	/	178138	71013	/
300	42631	18261	/	75655	32406	/	118886	50924	/	/	/	/
350	46047	20870	/	81716	37036	/	/	/	/	/	/	/
400	49226	23366	/	87358	41467	/	/	/	/	/	/	/

Pressione di taratura P / Set pressure P	ORIFIZIO H / ORIFICE H			ORIFIZIO J / ORIFICE J			ORIFIZIO K / ORIFICE K			ORIFIZIO L / ORIFICE L		
	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam	acqua/ water	aria/ air	vapore d'acqua sat. / sat. steam
	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h	a 25°C kg/h	a 25°C kg/h	kg/h
1	17541	750	506	28733	1230	830	41114	1757	1390	63820	2727	1840
2	24807	1233	839	40691	2023	1377	58144	2891	1967	90255	4488	3053
3	30382	1735	1133	49836	2845	1859	71211	4066	2656	110540	6311	4123
4	35082	2252	1481	57546	3695	2429	82228	5279	3471	127640	8195	5387
5	39223	2712	1774	64338	4448	2909	91934	6356	4157	142706	9866	6453
6	42967	3170	2065	70479	5199	3388	100708	7429	4841	156327	11532	7514
7	46409	3627	2358	76126	5950	3867	108777	8502	5526	168852	13198	8578
8	49614	4087	2648	81382	6705	4344	116288	9581	6207	180511	14872	9634
9	52623	4546	2939	86318	7456	4821	123342	10654	6889	191461	16539	10694
10	55470	5006	3230	90988	8212	5298	130014	11734	7571	201817	18215	11752
12	60764	5923	3806	99672	9716	6242	142423	13883	8920	221080	21551	13846
14	65633	6843	4384	107658	11225	7192	153834	16040	10276	238793	24899	15952
16	70164	7765	4964	115091	12737	8142	164456	18199	11634	255281	28251	18059
18	74420	8687	5541	122073	14249	9089	174432	20361	12988	270766	31606	20161
20	78446	9605	6122	128676	15755	10042	183867	22513	14350	285413	34946	22275
22	82275	10529	6697	134957	17270	10985	192841	24678	15696	299343	38307	24365
24	85933	11447	7282	140957	18777	11944	201416	26831	17067	312654	41649	26493
26	89442	12372	7868	146713	20294	12906	209641	28999	18441	325420	45014	28626
28	92818	13291	8458	152251	21802	13874	217555	31153	19825	337705	48359	30774
30	96076	14218	9045	157595	23322	14836	225190	33325	21200	349558	51729	32908
35	103774	16525	10514	170222	27106	17247	243233	38733	24644	377565	60124	38254
40	110939	18835	12009	181975	30895	19699	260027	44147	28148	403634	68528	43694
45	117669	21147	13510	193014	34688	22161	275801	49566	31666	428119	76940	49154
50	124034	23449	15019	203455	38465	24636	290719	54963	35203	451277	85317	54645
55	135872	25765	16558	213385	42263	27161	304909	60390	38810	473303	93742	60245
60	135872	28069	18114	222873	46042	29712	318467	65790	42457	494349	102124	65904
70	146759	32676	21288	240731	53599	34919	343984	76589	34919	533958	118887	77452
80	156892	37265	24548	257352	61126	40267	367734	87344	57539	570825	135582	89316
90	166409	41849	27217	272963	68645	44645	390041	98088	63794	605452	152259	99026
100	175410	46404	31395	287728	76118	51498	411139	108766	73586	638202	168835	114226
110	183972	50823	35033	301772	83366	57464	431207	119122	82112	/	/	/
120	192152	55294	38798	315191	90699	63640	450381	129602	90937	/	/	/
130	199998	59777	42808	328061	98053	70219	468771	140110	100337	/	/	/
140	207548	64215	47086	340445	105333	77236	486467	150512	110364	/	/	/
150	214833	68602	50524	352394	112528	82875	503541	160794	118421	/	/	/
200	/	/	/	/	/	/	/	/	/	/	/	/
250	/	/	/	/	/	/	/	/	/	/	/	/
300	/	/	/	/	/	/	/	/	/	/	/	/
350	/	/	/	/	/	/	/	/	/	/	/	/
400	/	/	/	/	/	/	/	/	/	/	/	/

Nota 1: le portate sono state calcolate secondo le formule indicate dalla norma API RP 520 e con una sovrappressione pari al 10% della pressione di taratura p (0,1 bar se p < 1 barg).

Nota 2: i valori intermedi possono essere approssimativamente ricavati per interpolazione lineare.

Nota 3: le portate indicate nella presente tabella non vincolano in alcun modo Besa®, la quale si riserva di eseguire sempre il dimensionamento fluidodinamico di ogni valvola di sicurezza, indicando il valore della portata calcolata sui documenti applicabili (Specifiche di prodotto nel caso di offerta; Certificato di collaudo nel caso di ordine; modulo di calcolo ove applicabile)

Note 1) Flow rates have been calculated according to API RP 520 rules with overpressure 10% (0,1 bar if p < 1 barg)

Note 2) Approximate intermediate values can be obtained by linear interpolation

Note 3) Flow rates given in this table are undemanding; Besa® will always check fluid mechanical sizing of each safety valve, and indicate calculated flow rate in every relevant document (Specification sheet in case of offer, inspection certificate in case of order, calculation sheet when applicable)