



# Progressive opening safety relief valve. (AP)

Mod. 196 | EN



## Operation

The valve works as an automatic pressure relief regulator acting by the static pressure at the valve inlet.

## Regulation

- UNE-EN ISO 4126-1
- UNE-EN ISO 4126-7
- UNE-EN 12516-2
- UNE-EN 12516-4
- UNE-EN 1092-1
- UNE-EN 1092-2
- UNE-EN 12266-1

## Specifications

### Size

- DN-20 x 32 to DN-200 x 300

### Temperature range

- -60 °C to +450 °C

### Applications

- Gas, steam and liquids

### Materials

- Cast iron
- Nodular iron
- Cast steel
- Stainless steel

### Maximum pressure

- Up to 0,2 bar

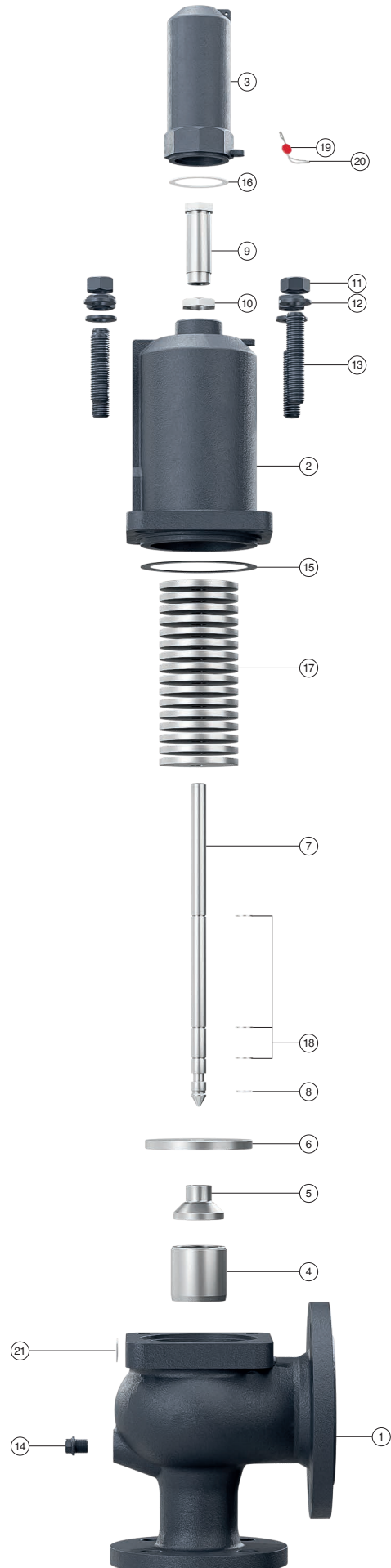
## Certification



N°. PIECE	PIECE	MATERIAL			
		CAST IRON	NODULAR IRON	CAST STEEL	STAINLESS STEEL
1	Body	Cast iron (EN-5.1301)	Nodular iron (EN-5.3106)	Carbon steel (EN-1.0619+N)	Stainless steel (EN-1.4408)
2	Closed bell	Cast iron (EN-5.1301)	Nodular iron (EN-5.3106)	Nodular iron (EN-5.3106)	Stainless steel (EN-1.4408)
3	Hood	Nodular iron (EN-5.3106)	Nodular iron (EN-5.3106)	Nodular iron (EN-5.3106)	Stainless steel (EN-1.4408)
4	Seating	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4542)
5	Plug	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4542)
6	Guide	Stainless steel (EN-1.4301)	Stainless steel (EN-1.4301)	Stainless steel (EN-1.4301)	Stainless steel (EN-1.4301)
7	Rod	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4401)
8	Safety ring	Stainless steel ( EN-1.4310)	Stainless steel ( EN-1.4310)	Stainless steel ( EN-1.4310)	Stainless steel ( EN-1.4310)
9	Hollow screw	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)
10	Hollow screw nut	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)	Stainless steel ( EN-1.4305)
11	Nut	Carbon steel (EN-1.1141)	Carbon steel (EN-1.1141)	Carbon steel (EN-1.1141)	Carbon steel (EN-1.4401)
12	Washer	Carbon steel (EN-1.1141)	Carbon steel (EN-1.1141)	Carbon steel (EN-1.1141)	Carbon steel (EN-1.4401)
13	Stud	Carbon steel (EN-1.1181)	Carbon steel (EN-1.1181)	Carbon steel (EN-1.1181)	Carbon steel (EN-1.4401)
14	Cap	Carbon steel (EN-1.1181)	Carbon steel (EN-1.1181)	Carbon steel (EN-1.1181)	Carbon steel (EN-1.4401)
15	Body coupling	Graphite	Graphite	Graphite	PTFE (Teflon)
16	Hood coupling	PTFE (Teflon)	PTFE (Teflon)	PTFE (Teflon)	PTFE (Teflon)
17	Calibration disc	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)
18	Clip	Stainless steel (EN-1.4568)	Stainless steel (EN-1.4568)	Stainless steel (EN-1.4568)	Stainless steel (EN-1.4568)
19	Seal	Plastic	Plastic	Plastic	Plastic
20	Sealing whire	Sealing whire	Sealing whire	Sealing whire	Sealing whire
21	Characteristic plate	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)	Stainless steel ( EN-1.4301)
DN1 x DN2		20 x 32 to 200 x 300			
PN		16	40	40	40
OPERATING CONDITIONS	PRESSURE [bar]	0,2	0,2	0,2	0,2
	MAX. TEMP. [°C]	300	350	450	400
	MIN. TEMP. [°C]	-10	-10	-10	-60



Isometric view

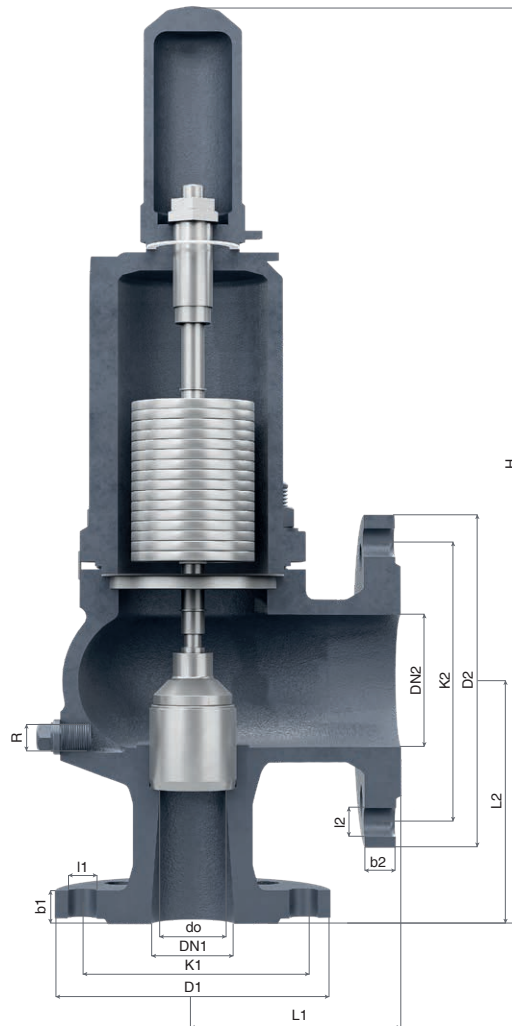


Exploded view

DN1 x DN2		20 x 32	25 x 40	32 x 50	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150	125 x 200	150 x 250	200 x 300
do		16	20	25	32	40	50	63	77	93	110	155
$A_o = \frac{\pi \cdot do^2}{4}$ [mm <sup>2</sup> ]		201	314	491	804	1257	1964	3117	4657	6793	9503	18869
H [mm]		350	395	415	500	555	660	710	810	858	1029	1252
L1 [mm]		85	95	100	115	125	140	155	175	215	225	265
L2 [mm]		95	105	110	130	145	150	170	180	220	245	290
R [mm]		1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"
Whitworth gas-tight cylindrical female thread ISO 228/1 (DIN-259)												
INLET FLANGE	PN-10/16 EN-1092-2 (1)											
	PN-25/40 EN-1092-2 (2)											
	PN-25/40 EN-1092-2 (3)											
	PN-25/40 EN-1092-1											
OUTLET FLANGE	PN-10/16 EN-1092-2 (1)											
	PN-25/40 EN-1092-2 (2)											
	PN-25/40 EN-1092-2 (3)											
	PN-25/40 EN-1092-1											
MODEL		ES										
WEIGHT [kgs.]	CAST IRON	6,7	8,1	10,9	15,7	21,3	30,2	42,8	62,1	79,9	112,7	177,1
	NODULAR IRON	6,6	8,0	10,8	15,8	20,9	29,9	39,7	61,9	79,8	112,7	178,1
	CAST STEEL	7,4	8,9	11,8	16,8	22,8	32,2	43,3	67,0	87,5	124,2	193,3
	STAINLESS STEEL	7,5	9,0	12,0	17,0	23,1	32,6	43,8	67,8	88,5	125,6	195,5
CODE	CAST IRON 2002-196.	53462	51062	51462	51262	52062	52262	53062	54062	55062	56062	58062
	NODULAR IRON 2002-196.	83462	81062	81462	81262	82062	82262	83062	84062	85062	86062	88062
	CAST STEEL 2002-196.	83442	81042	81442	81242	82042	82242	83042	84042	85042	86042	88042
	STAINLESS STEEL 2002-196.	83422	81022	81422	81222	82022	82222	83022	84022	85022	86022	88022

(1) From DN-125x200 PN-10.  
(2) DN-200x300 PN-10.  
(3) DN-200x300 PN-25.

\* Cast steel (EN-1.0619) and Stainless steel (EN-1.4408).  
• Nodular iron (EN-5.3106).



SET PRESSURE												
DN1 x DN2		20 x 32	25 x 40	32 x 50	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150	125 x 200	150 x 250	200 x 300
SET PRESSURE [bar g]	<b>MAXIMUM</b> (LIQUIDS AND GASES)	PN-16	0,2									
		PN-40	0,2									
	<b>MAXIMUM</b> (SATURATED STEAM)	PN-16	0,2									
		PN-40	0,2									
	<b>MINIMUM</b>	STEAM AND GASES	0,05									
		LIQUIDS	0,05									

RECOMMENDED RANGES OF APPLICATION			
MODEL		ES	
FLUID	SATURATED STEAM		
	GASES		*
	LIQUIDS		*
PERMISSIBLE BACK PRESSURE IN % OF SET PRESSURE	INTERNAL OR GENERATED	SATURATED STEAM	15
		GASES	15
		LIQUIDS	—
	EXTERNAL CONSTANT (1) (2)	SATURATED STEAM	50
		GASES	50
		LIQUIDS	90

OPENING, OVERPRESSURE AND RESET PRESSURES			
FLUID	OPENING PRESSURE	OVERPRESSURE	RESET PRESSURE
SATURATED STEAM AND GASES	The higher of $\pm 3\%$ or $\pm 0,1\%$ bar	The higher of $\pm 10\%$ or $0,1\%$	The higher of $\pm 15\%$ or $0,3\%$
LIQUIDS	The higher of $\pm 3\%$ or $\pm 0,1\%$	The higher of $\pm 10\%$ or $0,1\%$	The higher of $\pm 20\%$ or $0,6\%$

- With external constant backpressure, the spring is adjusted deducting the backpressure from the set pressure.
- If the set pressure < 3 bar we must consider the total atmospheric pressure (1 bar) as external constant backpressure being freely released.

If  $p_b > 0,25 p_o$  we must limit plug speed with the consequent reduction of the ad coefficient of discharge  $K_{dr}$ .

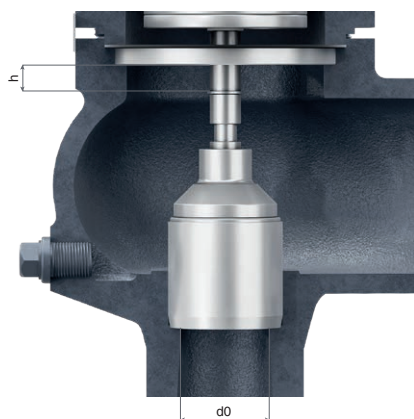
With the new reduced coefficient we determine the  $d_o$ , in order to remove the necessary volume.

$p_a$  = Backpressure permitted (bar) absolute.

$p_o$  = Set pressure (bar) absolute.

$K_{dr}$  = Discharge coefficients.

DISCHARGE COEFFICIENTS												
DN1 x DN2	20x32	25x40	32x50	40x65	50x80	65x100	80x125	100x150	125x200	150x250	200x300	
d0 [mm]	16	20	25	32	40	50	63	77	93	110	155	
h [mm]	4,5	5,5	7	9,5	12	14	16	22	28	30	40	
h/d0 [mm]	0,28	0,28	0,28	0,30	0,30	0,28	0,25	0,29	0,30	0,27	0,26	
DISCHARGE COEFFICIENT [kdr]	SATURATED STEAM		0,78								0,74	
	GASES											
	LIQUIDS		0,60				0,52					



DN1 x DN2	20 x 32			25 x 40		
d0 [mm]	16			20		
$A_0 = \frac{\pi \cdot d_0^2}{4}$ [mm <sup>2</sup> ]	201			314		
p [barg]	I	II	III	I	II	III
0,05	99	90	2381	155	140	3721
0,06	100	92	2459	156	144	3843
0,07	100	95	2535	156	149	3961
0,08	100	98	2608	157	153	4076
0,09	101	101	2680	158	157	4187
0,10	101	103	2750	158	161	4296
0,11	102	106	2817	159	165	4402
0,12	102	108	2884	160	169	4506
0,13	103	111	2949	160	173	4607
0,14	103	113	3012	161	176	4706
0,15	103	115	3074	162	180	4803
0,16	104	117	3135	162	183	4898
0,17	104	120	3195	163	187	4992
0,18	105	122	3253	163	190	5083
0,19	105	124	3311	164	194	5173
0,20	115	126	3367	179	197	5262

■ I - Saturated steam in kg/h.

■ II - Air to 0°C and 1,013 bar in [Nm<sup>3</sup>/h].

■ III - Water to 20°C in l/h.

**ATTENTION:** Flow rates according to UNE EN ISO 4126-7 with 10% overpressure.

DISCHARGE CAPACITY

DN1 x DN2	32 x 50			40 x 65			50 x 80			65 x 100			80 x 125			100 x 150			125 x 200			150 x 250			200 x 300		
d <sub>0</sub> [mm]	25			32			40			50			63			77			93			110			155		
	491			804			1257			1963			3117			4657			6793			9503			18869		
p [barg]	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
0,05	242	219	5813	397	358	9525	620	560	14882	968	874	23253	1537	1388	36917	2296	2074	55148	3350	3025	69721	4686	4232	97540	8828	7972	193670
0,06	243	226	6004	398	370	9837	622	578	15370	972	903	24016	1544	1433	38128	2306	2141	56956	3364	3123	72008	4707	4369	100739	8866	8230	200022
0,07	244	233	6189	400	381	10140	625	595	15843	977	930	24755	1550	1477	39301	2316	2206	58709	3379	3218	74224	4727	4502	103840	8904	8481	206178
0,08	245	239	6368	402	392	10434	628	612	16303	981	957	25473	1557	1519	40441	2326	2269	60411	3393	3310	76376	4747	4631	106850	8942	8724	212155
0,09	246	246	6543	403	403	10720	630	629	16749	985	983	26171	1564	1560	41549	2336	2331	62067	3407	3400	78469	4767	4756	109778	8980	8959	217969
0,10	247	252	6713	405	413	10998	633	645	17184	989	1008	26851	1570	1600	42628	2346	2390	63679	3422	3487	80507	4787	4878	112630	9017	9189	223631
0,11	248	258	6878	407	423	11270	636	661	17609	993	1032	27514	1577	1639	43681	2355	2448	65252	3436	3572	82495	4807	4997	115411	9055	9412	229154
0,12	249	264	7040	408	433	11535	638	676	18023	997	1056	28161	1583	1677	44709	2365	2505	66787	3450	3654	84437	4827	5113	118127	9092	9631	234546
0,13	250	270	7199	410	442	11794	641	691	18428	1001	1080	28794	1590	1714	45714	2375	2561	68288	3464	3735	86334	4847	5226	120782	9129	9843	239818
0,14	251	276	7353	412	452	12048	643	706	18825	1005	1102	29414	1596	1750	46697	2384	2615	69757	3478	3814	88191	4866	5336	123380	9166	10052	244976
0,15	252	281	7505	413	461	12296	646	720	19213	1009	1125	30020	1603	1786	47660	2394	2668	71196	3492	3891	90010	4886	5444	125924	9203	10255	250027
0,16	253	287	7654	415	470	12540	649	734	19593	1013	1147	30615	1609	1820	48604	2404	2720	72606	3506	3967	91792	4905	5550	128418	9240	10455	254979
0,17	254	292	7799	417	478	12779	651	748	19967	1017	1168	31198	1615	1855	49530	2413	2770	73989	3520	4041	93541	4925	5654	130864	9277	10650	259836
0,18	255	297	7943	418	487	13013	654	761	20333	1021	1189	31770	1622	1888	50438	2423	2820	75346	3534	4114	95257	4944	5755	133266	9313	10842	264604
0,19	256	302	8083	420	496	13243	656	774	20693	1025	1210	32333	1628	1921	51331	2432	2869	76680	3548	4185	96944	4963	5855	135625	9349	11030	269288
0,20	280	308	8221	459	504	13470	717	787	21047	1120	1230	32885	1777	1953	52209	2655	2917	77991	3873	4255	98601	5419	5953	137943	10208	11214	273891

For other, not so dense liquids, other than water at 20 °C apply:

$$V_L = \sqrt{\frac{\rho_A}{\rho_L}} \cdot V_A \quad \text{ó} \quad V_A = V_L \cdot \sqrt{\frac{\rho_L}{\rho_A}}$$

V<sub>A</sub> = Water flow according to table.  
 V<sub>L</sub> = Liquid flow  
 ρ<sub>A</sub> = Water density at 20 °C.  
 (ρ<sub>A</sub> = 998 kg/m<sup>3</sup>)  
 ρ<sub>L</sub> = Liquid density

## Depending on demand

1.- Totally free of oil and grease, to work with oxygen, avoiding possible fire risks (UV-Oxygen-VBG 62).

## Specifications

- 90° angular flow.
- Activated by a system of weights.
- Simplicity of construction ensuring minimum maintenance.
- Materials carefully selected for their resistance to corrosion. With the exception of washers and couplings, the valves are free of non-ferric materials.
- Internal body designed to offer favourable flow profile.
- Sealing surfaces treated and balanced, making them extremely tightness, even exceeding API-527 requirements.
- Great discharge capacity.
- Equipped with draining screws for removing condensation.
- Auto-centering plug.
- All the valves are supplied sealed at the set pressure requested, simulating operational conditions, and are vigorously tested.
- All components are numbered, registered and checked. If requested in advance, material, casting, test and efficiency certificates will be enclosed with the valve, and the instruction manual.



[www.vycindustrial.com](http://www.vycindustrial.com)

+34 93 735 76 90 | 119 | [info@vycindustrial.com](mailto:info@vycindustrial.com)

Avenc del Daví, 22 | Pol. Ind. Can Petit | 08227 · Terrassa (Barcelona) España

Informative brochure, without obligation and subject to our General Sales Conditions.