



## Air/Gas Vents

For automatically venting gases from liquids under pressure.



# Selecting The Armstrong Air/Gas Vent

With the desired CFM capacity known, find the orifice size required from the table on this page. Then find the vent or vents with the correct orifice size on pages 3, 4, 6 or 8 that will operate at the required pressure with a liquid of the specific gravity being handled.

**Example—**Find a model number that will vent 52 cfm of air (including safety factor of 1.5 - 2.0) from a liquid with a specific gravity of 0.93 at 250 psi. Using the table on this page, follow the 250 psi line across to the number 60.9. Orifice size is 5/32". Now go to pages 3, 4, 6 or 8 checking the 5/32" orifice lines to locate a vent for 250 psi or higher with 0.90 gravity liquid. Note: Since specific gravity falls between 0.95 and 0.90 use 0.90 gravity data. The model 3-AV on page 4 is the one to use.

## For Venting During Filling Only

If a vent is required only for getting rid of air when a system is started up, such as, when starting up a deep well pump or filling an empty pipe, tank or other vessel, ability of the vent to open at operating pressure can be ignored. In these cases, a model number with a large orifice for fast venting may be selected, **but the vent will not open after air is expelled and the system reaches operating pressure.**

$$V = \frac{W}{d} = \frac{2.05 C A P_2 \times 60}{d} \sqrt{\frac{\left(\frac{P_1}{P_2}\right)^{2.83} \left[\left(\frac{P_1}{P_2}\right)^{2.83} - 1\right]}{T}}$$

- Where:
- V = Volume flow rate, ft<sup>3</sup>/min
  - W = Mass flow rate, lb/min
  - d = density, 0.07494 lb/ft<sup>3</sup> at standard conditions
  - C = Flow Coefficient = 0.65
  - A = Orifice area, in<sup>2</sup>
  - P1 = Upstream pressure, psia
  - P2 = Pressure at throat of orifice or downstream pressure = greater of 0.53 P1 or 14.7 psia
  - T = Upstream temperature = 530°R

Discharge of Air Through an Orifice in Standard Cubic Feet per Minute at a standard atmospheric pressure of 14.7 psia and 70 °F.

Pressure psig	Orifice diameter, inch										
	1/16	5/64	3/32	#38	7/64	1/8	9/64	5/32	3/16	7/32	1/4
5	0.65	1.01	1.45	1.55	1.98	2.58	3.27	4.03	5.81	7.90	10.3
6	0.71	1.10	1.59	1.70	2.16	2.82	3.57	4.41	6.35	8.64	11.3
7	0.76	1.19	1.71	1.83	2.33	3.04	3.85	4.75	6.84	9.31	12.2
9	0.86	1.34	1.93	2.07	2.63	3.43	4.34	5.36	7.72	10.5	13.7
12	0.98	1.54	2.21	2.37	3.01	3.93	4.98	6.14	8.85	12.0	15.7
15	1.09	1.71	2.46	2.63	3.34	4.37	5.53	6.82	9.83	13.4	17.5
20	1.25	1.95	2.81	3.01	3.82	4.99	6.32	7.80	11.2	15.3	20.0
25	1.38	2.16	3.11	3.33	4.23	5.53	6.99	8.63	12.4	16.9	22.1
30	1.54	2.40	3.46	3.70	4.71	6.15	7.78	9.61	13.8	18.8	24.6
35	1.73	2.71	3.90	4.17	5.31	6.93	8.77	10.8	15.6	21.2	27.7
40	1.93	3.01	4.34	4.64	5.90	7.71	9.75	12.0	17.3	23.6	30.8
45	4.77	5.59	6.49	5.10	10.7	13.2	19.1	26.0	33.9	26.0	33.9
50	2.31	3.61	5.20	5.56	7.07	9.24	11.7	14.4	20.8	28.3	37.0
60	2.69	4.20	6.05	6.48	8.23	10.8	13.6	16.8	24.2	32.9	43.00
70	3.06	4.79	6.90	7.38	9.39	12.3	15.5	19.2	27.6	37.5	49.0
80	3.44	5.37	7.74	8.28	10.5	13.8	17.4	21.5	31.0	42.1	55.0
90	3.81	5.96	8.58	9.20	11.7	15.3	19.3	23.8	34.3	46.7	61.0
100	4.19	6.54	9.42	10.1	12.8	16.7	21.2	26.2	37.7	51.3	67.0
110	4.56	7.12	10.3	11.0	14.0	18.2	23.1	28.5	41.0	55.8	72.9
125	5.11	7.99	11.5	12.3	15.7	20.5	25.9	32.0	46.0	62.7	81.8
150	6.04	9.44	13.6	14.6	18.5	24.2	30.6	37.8	54.4	74.0	96.7
200	7.89	12.3	17.8	19.0	24.2	31.6	40.0	49.3	71.0	96.7	126
250	9.74	15.2	21.9	23.5	29.8	39.0	49.3	60.9	87.6	119	156
300	11.6	18.1	26.1	27.9	35.5	46.3	58.6	72.4	104	142	185
400	15.3	23.9	34.4	36.8	46.8	61.1	77.3	95.5	137	187	244
500	19.0	29.6	42.7	45.7	58.1	75.8	96.0	119	171	232	303
600	22.6	35.4	51.0	54.6	69.4	90.6	115	142	204	277	362
750	28.2	44.0	63.4	67.9	86.3	113	143	176	254	345	451
1000	37.4	58.4	84.1	90.1	115	150	189	234	337	458	598

Press. psig	Orifice diameter, inch										
	9/32	5/16	11/32	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1 1/16
5	13.1	16.1	19.5	23.2	31.6	41.3	52.3	64.5	92.9	126	186
6	14.3	17.6	21.3	25.4	34.5	45.1	57.1	70.5	102	138	204
7	15.4	19.0	23.0	27.3	37.2	48.6	61.5	76.0	109	149	220
9	17.4	21.4	25.9	30.9	42.0	54.9	69.4	85.7	123	168	248
12	19.9	24.6	29.7	35.4	48.2	62.9	79.6	98.3	142	193	284
15	22.1	27.3	33.0	39.3	53.5	69.9	88.4	109	157	214	316
20	25.3	31.2	37.7	44.9	61.1	79.8	101	125	180	245	361
25	28.0	34.5	41.8	49.7	67.7	88.4	112	138	199	271	399
30	31.1	38.4	46.5	55.3	75.3	98.4	125	154	221	301	444
35	35.1	43.3	52.4	62.4	84.9	111	140	173	250	340	501
40	39.0	48.2	58.3	69.4	94.4	123	156	193	277	378	557
45	42.9	53.0	64.1	76.3	104	136	172	212	305	415	612
50	46.8	57.7	69.9	83.1	113	148	187	231	333	453	667
60	54.4	67.2	81.3	96.8	132	172	218	269	387	527	777
70	62.1	76.6	92.7	110	150	196	248	306	441	601	886
80	69.7	86	104	124	169	220	279	344	495	674	994
90	77.2	95.3	115	137	187	244	309	381	549	747	1102
100	84.8	105	127	151	205	268	339	419	603	820	1210
110	92.3	114	138	164	223	292	369	456	656	893	1317
125	104	128	155	184	251	327	414	511	737	1003	1478
150	122	151	183	217	296	387	489	604	870	1184	1746
200	160	197	239	284	387	505	639	789	1136	1547	2281
250	197	243	295	351	477	623	789	974	1402	1909	2814
300	235	290	350	417	568	741	938	1158	1668	2271	3348
400	309	382	462	550	748	978	1327	1527	2199	2994	4414
500	384	474	574	683	929	1214	1536	1896	2731	3717	5480
600	459	566	685	815	1110	1450	1835	2265	3261	4439	6546
750	571	704	852	1014	1381	1803	2283	2818	4058	5523	8144
1000	757	935	1131	1346	1832	2393	3029	3740	5385	7329	10807

Ref: Baumeister & Marks: Standard Handbook for Mechanical Engineers, 7th Edition

# Fixed Pivot Ball Float Air/Gas Vents

**21AR** - A small high-quality economical air vent. It employs a single lever with a fixed pivot, and viton seat ensuring a tight shut-off.

**21-312AR/VAR** - Forged steel version of the Model 21 with a larger float and higher leverage.



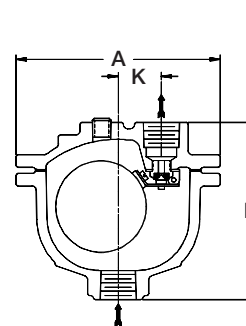
## List of Materials

Model No.	Valve	Seat	Leverage System	Float	Body & Cap	Gasket	Bolting
21AR	Stainless Steel	Stainless Steel with *Viton Insert	Stainless Steel	Stainless Steel	ASTM A48 Class 30 Cast Iron	Non-Asbestos	Bolts SAE Gr. 2 Nuts ASTM A563 Gr. A
21-312 AR 21-312 VAR					ASTM A105 Forged Steel		Bolts and Nuts ASTM B633 Type 1

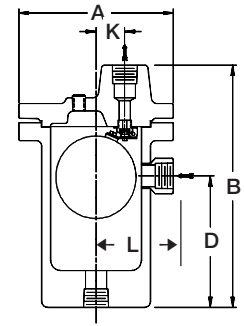
Note: Above vents available in T-316 SS bodies & caps and all SS internals. \*Other seat insert materials available. Consult Factory.

## Physical Data

Model No.	Cast Iron		Forged Steel	
	21 AR		21-312 AR/VAR	
Pipe Connection Size in (mm)	½, ¾	15, 20	½, ¾	15, 20
A in (mm)	6 <sup>3</sup> / <sub>16</sub>	157	6 <sup>3</sup> / <sub>4</sub>	171
B in (mm)	5 <sup>1</sup> / <sub>4</sub>	133	10 <sup>1</sup> / <sub>4</sub>	260
D in (mm)	—	—	5 <sup>9</sup> / <sub>16</sub>	141
K in (mm)	1 <sup>5</sup> / <sub>16</sub>	33	1 <sup>1</sup> / <sub>4</sub>	32
L in (mm)	—	—	3 <sup>5</sup> / <sub>16</sub>	84
Approximate Wt. lb (kg)	8	4	30	14
Maximum Allow. Pressure (Vessel Design)	250 psi @ 450 °F**	17 bar @ 232 °C**	600 psig @ 100 °F 500 psig @ 750 °F**	41 bar @ 38 °C 34 bar @ 399 °C**



Model 21 AR



Model 21-312 AR/VAR

\*\*Viton valve seat insert limited to 400 °F (204 °C).

## 21-AR Maximum Operating Pressures

Minimum Specific Gravity	0.49	0.84
Float wt., (oz)	2.25	4.12
Orifice (in)	Maximum Operating Pressure psi	
7/32	17	—
3/16	23	—
5/32	33	—
9/64	41	—
1/8	52	—
3/32	92	—
5/64	133	—
1/16	208	—
1/16	—	250

## 21-312 AR Maximum Operating Pressures

Model	Minimum Specific Gravity	0.83
Model	Float wt., (oz)	5
Model	Orifice (in)	Maximum Operating Pressure psi
21-312 AR	¼	22
	7/32	28
	3/16	38
	5/32	55
	9/64	68
21-312 VAR	1/8	173
	3/32	308
	5/64	443
	1/16	600

All dimensions and weights are approximate. Use certified print for exact dimensions

# Free Floating Lever Air/Gas Vents - Cast Iron

For Pressures to 250 psig

Maximum Operating Pressures of free floating lever vents with weighted floats for different orifice sizes, and the specific gravities on which they can be used.

1-AV Max. Oper. Pressures	
Minimum Specific Gravity	0.80
Orifice Size (in)	Maximum Operating Pressure, psi
1/8	146
7/64	173
#38	219
5/64	300

Armstrong free floating lever Air/Gas Vents use the same bodies, caps, lever mechanisms, valves, and seats of Armstrong inverted bucket steam traps that have been proven in years of service.

Elliptical floats and high leverage make it possible to open large orifices to provide adequate capacity for vent size and weight. The hemispherical valve, seat, and leverage are identical in design, materials, and workmanship to those for saturated steam service up to 1,000 psig with the exception of the addition of a guidepost to assure a positive, leaktight valve closing under all conditions.

2-AV Maximum Operating Pressures											
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
Float wt., oz.	7.7	7.3	6.9	6.5	6.1	5.7	5.4	5.0	4.6	4.2	3.8
Orifice Size (in)	Maximum Operating Pressure, psi										
5/16	27	25	24	23	22	20	19	18	16	15	14
1/4	44	42	40	38	35	33	31	29	27	24	22
3/16	97	92	88	83	78	73	68	64	59	54	49
5/32	167	159	151	142	134	126	118	110	101	93	85
1/8	250	250	250	244	230	216	202	187	173	159	145
7/64	250	250	250	250	250	250	250	240	222	204	186
#38	250	250	250	250	250	250	250	250	250	250	231
5/64	250	250	250	250	250	250	250	250	250	250	250

3-AV Maximum Operating Pressures									
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
Float wt., oz.	14.9	14.2	13.4	12.7	12.0	11.2	10.5	9.7	9.0
Orifice Size (in)	Maximum Operating Pressure, psi								
1/2	21	20	19	18	17	16	15	14	13
3/8	45	43	41	38	36	34	32	30	27
5/16	72	69	65	61	58	54	51	47	44
9/32	96	91	87	82	77	72	68	63	58
1/4	144	137	130	123	116	109	102	94	87
7/32	206	196	186	176	165	155	145	135	125
3/16	250	250	250	250	249	234	218	203	188
5/32	250	250	250	250	250	250	250	250	250

6-AV Maximum Operating Pressures													
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40
Float wt., oz.	73.5	69.8	66.2	62.5	58.8	55.1	51.5	47.8	44.1	40.4	36.8	33.1	29.4
Orifice Size (in)	Maximum Operating Pressure, psi												
1 1/16	22	21	20	19	18	17	16	14	13	12	11	10	9
7/8	35	33	31	30	28	26	24	23	21	19	18	16	14
3/4	50	48	45	43	40	38	35	33	30	28	25	23	20
5/8	77	73	69	66	62	58	54	50	46	43	39	35	31
9/16	102	97	92	87	82	77	72	67	62	57	51	46	41
1/2	148	140	133	126	119	111	104	97	89	82	75	67	60
7/16	210	200	189	179	168	158	148	137	127	116	106	96	85
3/8	250	250	250	250	250	249	233	216	200	184	167	151	134
11/32	250	250	250	250	250	250	250	250	250	245	223	201	179
5/16	250	250	250	250	250	250	250	250	250	250	250	250	230
9/32	250	250	250	250	250	250	250	250	250	250	250	250	250
1/4	250	250	250	250	250	250	250	250	250	250	250	250	250

\* If specific gravity falls between those shown, use next lowest: e.g. if actual gravity is 0.73, use 0.70 specific gravity data.

# Free Floating Lever Air/Gas Vents - Cast Iron

**1AV** - A cast iron air vent which uses a positive closing free floating lever to ensure leaktight closing under all conditions. This vent is good for low capacity air/gas venting up to 300 psi.

**2AV, 3-AV and 6AV** - Cast iron vents using the same proven free floating lever mechanisms used in Armstrong steam traps. For applications where high air/gas venting capacity is required up to 250 psi.



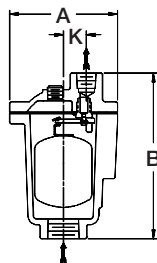
## List of Materials

Model No.	Valve & Seat	Leverage System	Float	Body & Cap	Gasket	Bolts	Nuts
1-AV	Stainless Steel	Stainless Steel	Stainless Steel	ASTM 48 Class 30 Cast Iron	Non-asbestos	ASTM A193 Gr. B7	ASTM A563 Gr. A
2-AV 3-AV 6-AV						SAE Gr. 2	

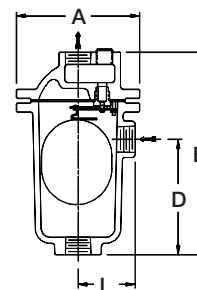
## Physical Data

Model No.	Cast Iron							
	1-AV**		2-AV†		3-AV†		6-AV†	
Pipe Connection Size in (mm)	½, ¾*	15, 20	½, ¾	15, 20	¾, 1	20, 25	1½, 2	40, 50
"A" in (mm)	¾	89	5¼	133	6¾	162	10¾	259
"B" in (mm)	5½	140	8	203	10⅝	270	17	432
"D" in (mm)	—	—	4¾	111	6¾	155	8¾	213
"K" in (mm)	1¾	21	—	—	—	—	—	—
"L" in (mm)	—	—	2⅞	62	2⅞	73	4⅝	—
Approx. Wt. lbs. (kg)	4	1.8	13	6	22	10	80	36
Max. Allow. Pressure (Vessel Design)	300 psig @ 200 °F	21 bar @ 93 °C	250 psig @ 450 °F	17 bar @ 232 °C	250 psig @ 450 °F	17 bar @ 232 °C	250 psig @ 450 °F	17 bar @ 232 °C

\*Outlet connection ¼" (7mm). \*\*Available with side connection if specified on order. † Available in Type 316 Stainless Steel. Consult Factory. Pipe size of side connections if provided are same as that of inlet and outlet connections. Some floats are oil filled - Consult factory for details.



Model 1-AV



Models 2-AV, 3-AV and 6-AV

**All dimensions and weights are approximate. Use certified print for exact dimensions**

# Free Floating Lever Air/Gas Vents - Forged Steel

For Pressures to 1000 psig

## High Temperature Service

Maximum allowable working pressures of floats decrease at temperatures above 100 °F. Allow for approximately:

- 10% decrease at 200 °F
- 15% decrease at 300 °F
- 20% decrease at 400 °F

The float is not always the limiting factor, however. Consult with Armstrong Application Engineering if you have a high-temperature application that also requires maximum operating pressures.

Maximum Operating Pressures of free floating lever vents with weighted floats for different orifice sizes, and the specific gravities on which they can be used.

## 32-AV Maximum Operating Pressures

Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55
Float wt., oz.	11.8	11.2	10.6	10.0	9.4	8.9	8.3	7.7	7.1	6.5
Orifice Size (in)	Maximum Operating Pressure, psi									
5/16	41	39	37	35	33	31	29	27	25	23
1/4	68	64	61	58	54	51	47	44	41	37
3/16	149	142	134	127	120	112	105	97	90	83
5/32	257	244	231	219	206	193	180	168	155	142
1/8	439	417	396	374	352	330	309	287	265	243
7/64	562	534	506	478	450	423	395	367	339	311
#38	600	600	600	595	561	526	491	457	422	387
5/64	600	600	600	600	600	600	600	600	600	571

## Sour Gas Service

Forged steel and stainless steel traps can be modified to resist hydrogen sulfide stress corrosion. These modifications involve annealing the float, which will reduce the maximum working pressure of the float to about half of its normal value. Consult Armstrong Application Engineering for allowable working pressures.

## 33-AV Maximum Operating Pressures

Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
Float wt., oz.	14.9	14.2	13.4	12.7	12.0	11.2	10.5	9.7	9.0
Orifice Size (in)	Maximum Operating Pressure, psi								
1/2	21	20	19	18	17	16	15	14	13
3/8	45	43	41	38	36	34	32	30	27
5/16	72	69	65	61	58	54	51	47	44
9/32	96	91	87	82	77	72	68	63	58
1/4	144	137	130	123	116	109	102	94	87
7/32	206	196	186	176	165	155	145	135	125
3/16	309	294	279	264	249	234	218	203	188
5/32	484	460	437	413	389	365	342	318	294
1/8	900	900	883	835	787	739	691	643	595
7/64	900	900	900	900	900	900	883	822	760

## 36-AV Maximum Operating Pressures

Spec. Grav. *	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40
Float wt., oz.	73.5	69.8	66.2	62.5	58.8	55.1	51.5	47.8	44.1	40.4	36.8	33.1	29.4
Orifice Size (in)	Maximum Operating Pressure, psi												
1 1/16	22	21	20	19	18	17	16	14	13	12	11	10	9
7/8	35	33	31	30	28	26	24	23	21	19	18	16	14
3/4	50	48	45	43	40	38	35	33	30	28	25	23	20
5/8	77	73	69	66	62	58	54	50	46	43	39	35	31
9/16	102	97	92	87	82	77	72	67	62	57	51	46	41
1/2	148	140	133	126	119	111	104	97	89	82	75	67	60
7/16	210	200	189	179	168	158	148	137	127	116	106	96	85
3/8	331	315	299	282	266	249	233	216	200	184	167	151	134
11/32	441	419	398	376	354	332	310	288	266	245	223	201	179
5/16	567	539	511	483	455	427	399	371	342	250	250	250	230
9/32	743	706	669	633	596	559	522	485	449	250	250	250	250
1/4	1000	1000	979	925	871	817	763	710	656	250	250	250	250
7/32	1000	1000	1000	1000	1000	1000	1000	1000	926	250	250	250	250
3/16	1000	1000	1000	1000	1000	1000	1000	1000	1000	250	250	250	250

\* If specific gravity falls between those shown, use next lowest: e.g. if actual gravity is 0.73, use 0.70 specific gravity data.



# Free Floating Lever Air/Gas Vents - Forged Steel

**32AV, 33AV and 36AV** - Forged steel vents using the same proven free floating lever mechanisms used in Armstrong steam traps.

For applications where high air/gas venting capacity is required up to 1000 psi.

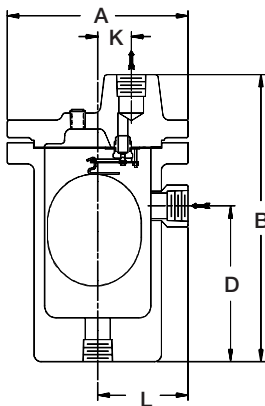
## List of Materials

Model No.	Valve & Seat	Leverage System	Float	Body & Cap	Gasket	Bolting
32-AV 33-AV 36-AV	Stainless Steel	Stainless Steel	Stainless Steel	ASTM A-105 Forged Steel	Non-asbestos	Bolts ASTM A193 Gr. B7 Nuts ASTM A194 Gr. 2H

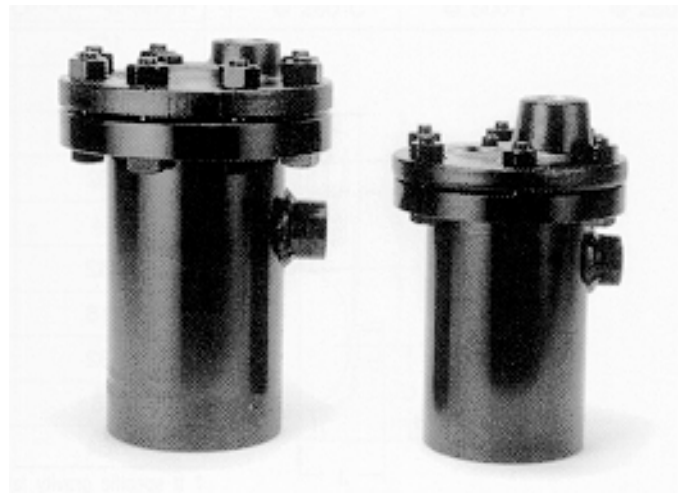
## Physical Data

Model No.	Forged Steel					
	32-AV†		33-AV†		36-AV†	
Pipe Connection Size in (mm)	½, ¾	15, 20	¾, 1	20, 25	1½, 2	40, 50
"A" in (mm)	6¾	171	8	203	11⅞	301
"B" in (mm)	10⅜	259	11⅞	294	17⅞	435
"D" in (mm)	5⅞	141	6⅞	154	9	229
"K" in (mm)	1¼	32	1⅞	37	2⅞	54
"L" in (mm)	3⅞	86	3⅞	98	6⅞	154
Approx. Wt. lb (kg)	31	14	49	22	163	74
Max. Allow. Pressure (Vessel Design)	600 psig @ 100 °F 500 psi @ 750 °F	41 bar @ 38 °C 34 bar @ 399 °C	1000 psig @ 100 °F 600 psig @ 750 °F	69 bar @ 38 °C 41 bar @ 399 °C	1000 psig @ 100 °F 600 psig @ 750 °F	69 bar @ 38 °C 41 bar @ 399 °C

† Available in Type 316 SS. Consult Factory. Pipe size of side connections if provided are same as that of inlet and outlet connections. Some floats are oil filled - Consult factory for details.



Models 32-AV, 33-AV and 36-AV



*All dimensions and weights are approximate. Use certified print for exact dimensions*

# Free Floating Lever Air/Gas Vents - All Stainless Steel

For Pressures to 570 psig

The Armstrong all-stainless steel guided lever air vents have been developed to provide positive venting of air/gases under pressure.

The body and cap and all working parts of the No. 11-AV, 12-AV and 13-AV are made of high strength, corrosion resistant stainless steel. Body and caps are welded together to form a permanently sealed, tamperproof unit with no gaskets. Elliptical floats and high leverage provide up to 115 SCFM capacity for these compact air/gas vents. Lever action is guided to assure proper seating of the valve under all operating conditions.

Maximum Operating Pressures of free floating lever vents with weighted floats for different orifice sizes, and the specific gravities on which they can be used.

11-AV Maximum Operating Pressures		
Minimum Specific Gravity	0.75	0.50
Float wt., oz.	2.90 (Standard)	1.90 (Special)
Orifice Size (in)	Maximum Operating Pressure psi	
1/8	178	118
#38	267	177
5/64	400	311

12-AV Maximum Operating Pressure											
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
Float wt., oz.	10.0	9.5	9.0	8.5	8.0	7.5	5.4	5.0	4.6	4.2	3.8
Orifice Size (in)	Maximum Operating Pressure, psi										
5/16	35	33	31	30	28	26	19	18	16	15	14
1/4	57	54	51	49	46	43	31	29	27	24	22
3/16	126	120	113	107	101	95	68	64	59	54	49
5/32	217	206	195	185	174	163	118	110	101	93	85
1/8	371	352	334	316	297	279	202	187	173	159	145
7/64	474	451	427	404	380	357	258	240	222	204	186
#38	590	561	532	503	473	444	321	298	276	253	231
5/64	600	600	600	600	600	600	473	440	407	374	341

13-AV Maximum Operating Pressures									
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
Float wt., oz.	14.9	14.2	13.4	12.7	12.0	11.2	10.5	9.7	9.0
Orifice Size (in)	Maximum Operating Pressure, psi								
1/2	21	20	19	18	17	16	15	14	13
3/8	45	43	41	38	36	34	32	30	27
5/16	72	69	65	61	58	54	51	47	44
9/32	96	91	87	82	77	72	68	63	58
1/4	144	137	130	123	116	109	102	94	87
7/32	206	196	186	176	165	155	145	135	125
3/16	309	294	279	264	249	234	218	203	188
5/32	484	460	437	413	389	365	342	318	294
1/8	570	570	570	570	570	570	570	570	570
7/64	570	570	570	570	570	570	570	570	570

\* If specific gravity falls between those shown, use next lowest: e.g. if actual gravity is 0.73, use 0.70 specific gravity data.



# Free Floating Lever Air/Gas Vents - All Stainless Steel

**11AV, 12AV and 13AV** - All stainless steel construction where exposure to either internal or external corrosion is a problem. These air/gas vents have the same proven free floating mechanisms used in other Armstrong steam traps. Pressures to 570 psi @ 100°F.



## List of Materials

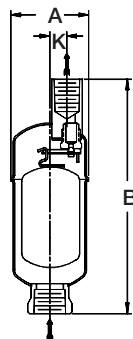
Model No.	Valve & Seat	Leverage System	Float	Body & Cap	Gasket
11-AV 12-AV 13-AV	*440 Stainless Steel	Stainless Steel	Stainless Steel	Sealed Stainless Steel 304-L	—

\* Type 316 S.S. valve and seat available. Consult Factory.

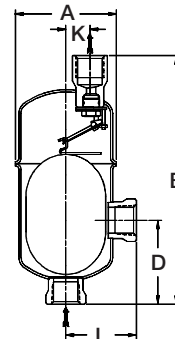
## Physical Data

Model No.	11-AV		12-AV		13-AV	
Pipe Connection Size in (mm)	¾ **	20 **	¾	20	1	25
A in (mm)	2¾	70	3 <sup>15</sup> / <sub>16</sub>	100	4½	114
B in (mm)	7¼	184	8 <sup>19</sup> / <sub>16</sub>	224	11¾	289
D in (mm)	—	—	3	76	6⅛	156
K in (mm)	⅞	14	7/8	22	1 <sup>3</sup> / <sub>16</sub>	30
L in (mm)	—	—	2 <sup>11</sup> / <sub>16</sub>	68	3¼	83
Approx. Wt. lb (kg)	1¾	0.80	3¼	1.5	7½	3.4
Max. Allow. Pressure (vessel Design)	500 psig @ 100 °F 440 psig @ 500 °F	34 bar @ 38 °C 30 bar @ 260 °C	600 psig @ 100 °F 475 psig @ 500 °F	41 bar @ 38 °C 33 bar @ 260 °C	570 psig @ 100 °F 490 psig @ 500 °F	39 bar @ 38 °C 34 bar @ 260 °C

\*\* ½" (15mm) outlet



Model 11-AV



Models 12-AV and 13-AV

**All dimensions and weights are approximate. Use certified print for exact dimensions**

# Metric Tables

21-AR Maximum Operating Pressures		
Minimum Specific Gravity	0.49	0.84
Float wt., g.	64	118
Orifice Size (in)	Maximum Operating Pressure, bar	
7/32	1.2	—
3/16	1.6	—
5/32	2.3	—
9/64	2.8	—
1/8	3.6	—
3/32	6.4	—
5/64	9.2	—
1/16	14	—
1/16	—	17

21-312 AR/VAR Maximum Operating Pressures		
Model	Minimum Specific Gravity	0.83
	Float wt., g.	143
21-312 AR	Orifice (in)	Maximum Operating Pressure bar
	1/4	1.5
	7/32	1.9
	3/16	2.7
	5/32	3.8
21-312 VAR	9/64	4.7
	1/8	12
	3/32	21
	5/64	31
1/16	41	

Maximum Operating Pressures of free floating lever vents with weighted floats for different orifice sizes, and the specific gravities on which they can be

1-AV Maximum Operating Pressures	
Minimum Specific Gravity	0.80
Orifice Size (in)	Maximum Operating Pressure, bar
1/8	10
7/64	12
#38	15
5/64	21

2-AV Maximum Operating Pressures												
Spec. Grav.**	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	
Float wt., g.	217	206	195	184	174	163	152	141	130	119	109	
Orifice Size (in)	Maximum Operating Pressure, bar											
5/16	1.8	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	
1/4	3.0	2.9	2.7	2.6	2.4	2.3	2.1	2.0	1.8	1.7	1.5	
3/16	6.7	6.4	6.0	5.7	5.4	5.0	4.7	4.4	4.1	3.7	3.4	
5/32	12	11	10.4	9.8	9.3	8.7	8.1	7.6	7.0	6.4	5.8	
1/8	17	17	17	17	16	15	14	13	12	11	10.0	
7/64	17	17	17	17	17	17	17	17	15	14	13	
No. 38	17	17	17	17	17	17	17	17	17	17	16	
5/64	17	17	17	17	17	17	17	17	17	17	17	

*3-AV/33-AV Maximum Operating Pressures									
Spec. Grav.**	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
Float wt., g.	423	402	381	360	339	318	296	275	254
Orifice Size (in)	Maximum Operating Pressure, bar								
1/2	1.5	1.4	1.3	1.3	1.2	1.1	1.0	1.0	0.9
3/8	3.1	3.0	2.8	2.7	2.5	2.3	2.2	2.0	1.9
5/16	5.0	4.7	4.5	4.2	4.0	3.8	3.5	3.3	3.0
9/32	6.6	6.3	6.0	5.6	5.3	5.0	4.7	4.3	4.0
1/4	9.9	9.4	8.9	8.5	8.0	7.5	7.0	6.5	6.0
7/32	14	13	13	12	11	10.7	10.0	9.3	8.6
3/16	21	20	19	18	17	16	15	14	13
5/32	33	32	30	28	27	25	24	22	20
1/8	62	62	61	58	54	51	48	44	41
7/64	62	62	62	62	62	62	61	57	52

32-AV Maximum Operating Pressures												
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	
Float wt., g.	282	268	254	240	226	212	152	141	130	119	109	
Orifice Size (in)	Maximum Operating Pressure, bar											
5/16	2.4	2.3	2.2	2.0	1.9	1.8	1.3	1.2	1.1	1.0	0.9	
1/4	3.9	3.7	3.5	3.4	3.2	3.0	2.1	2.0	1.8	1.7	1.5	
3/16	8.7	8.2	7.8	7.4	7.0	6.5	4.7	4.4	4.1	3.7	3.4	
5/32	14.9	14.2	13.5	12.7	12.0	11.2	8.1	7.6	7.0	6.4	5.8	
1/8	25.6	24.3	23.0	21.8	20.5	19.2	13.9	12.9	12.0	11.0	10.0	
7/64	32.7	31.1	29.5	27.9	26.2	24.6	17.2	16.5	15.3	14.0	12.8	
No. 38	40.7	38.7	33.8	31.9	30.1	28.2	17.2	17.2	17.2	16.1	14.7	
5/64	41.4	41.4	41.4	41.4	41.4	41.4	17.2	17.2	17.2	17.2	17.2	

*6-AV/36-AV Maximum Operating Pressures														
Spec. Grav.**	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	
Float wt., g.	2084	1979	1875	1771	1667	1563	1459	1354	1250	1146	1042	938	833	
Orifice Size (in)	Maximum Operating Pressure, bar													
1 1/16	1.5	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.8	0.8	0.70	0.62	
7/8	2.4	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2	1.1	1	
3/4	3.5	3.3	3.1	3.0	2.8	2.6	2.4	2.3	2.1	1.9	1.8	1.6	1.4	
5/8	5.3	5.0	4.8	4.5	4.3	4.0	3.7	3.5	3.2	2.9	2.7	2.4	2.2	
9/16	7.0	6.7	6.3	6.0	5.6	5.3	4.9	4.6	4.2	3.9	3.6	3.2	3.9	
1/2	10.2	9.7	9.2	8.7	8.2	7.7	7.2	6.7	6.2	5.6	5.1	4.6	4.1	
7/16	14	14	13	12	12	11	10.2	9.5	8.7	8.0	7.3	6.6	5.9	
3/8	23	22	21	19	18	17	16	15	14	13	12	10.4	9.3	
11/32	30	29	27	26	24	23	21	20	18	17	15	14	12	
5/16	39	37	35	33	31	29	27	26	24	17	17	17	16	
9/32	51	49	46	44	41	39	36	33	31	17	17	17	17	
1/4	69	69	67	64	60	56	53	49	45	17	17	17	17	
7/32	69	69	69	69	69	69	69	69	64	17	17	17	17	
3/16	69	69	69	69	69	69	69	69	69	17	17	17	17	

\* Above 17 bar use only forged steel traps

\*\* If specific gravity falls between those shown, use next lowest: e.g. if actual gravity is 0.73, use 0.70 specific gravity data.

# Metric Tables

## 11-AV Maximum Operating Pressures

Minimum Specific Gravity	0.75	0.50
Float wt., g.	82 (Standard)	54 (Special)
Orifice Size (in)	Maximum Operating Pressure, bar	
1/8	12	8
# 38	18	12
5/64	28	21

## 12-AV Maximum Operating Pressures

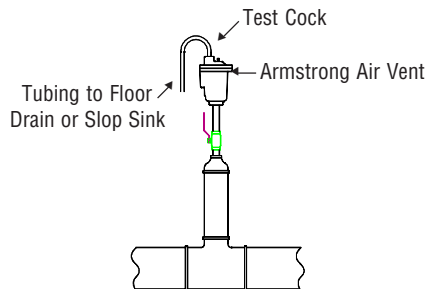
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50
Float wt., g.	282	268	254	240	226	212	152	141	130	119	109
Orifice Size (in)	Maximum Operating Pressure, bar										
5/16	2.4	2.3	2.2	2.0	1.9	1.8	1.3	1.2	1.1	1.0	0.9
1/4	3.9	3.7	3.5	3.4	3.2	3.0	2.1	2.0	1.8	1.7	1.5
3/16	8.7	8.2	7.8	7.4	7.0	6.5	4.7	4.4	4.1	3.7	3.4
5/32	14.9	14.2	13.5	12.7	12.0	11.2	8.1	7.6	7.0	6.4	5.8
1/8	25.6	24.3	23.0	21.8	20.5	19.2	13.9	12.9	12.0	11.0	10.0
7/64	32.7	31.1	29.5	27.9	26.2	24.6	17.8	16.5	15.3	14.0	12.8
No. 38	40.7	38.7	36.7	34.7	32.7	30.6	22.1	20.6	19.0	17.5	15.9
5/64	41.4	41.4	41.4	41.4	41.4	41.4	32.6	30.3	28.1	25.8	23.5

## 13-AV Maximum Operating Pressures

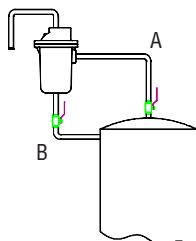
Spec. Grav.*	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
Float wt., g.	423	402	381	360	339	318	296	275	254
Orifice Size (in)	Maximum Operating Pressure, bar								
1/2	1.5	1.4	1.3	1.3	1.2	1.1	1.0	1.0	0.9
3/8	3.1	3.0	2.8	2.7	2.5	2.3	2.2	2.0	1.9
5/16	5.0	4.7	4.5	4.2	4.0	3.8	3.5	3.3	3.0
9/32	6.6	6.3	6.0	5.6	5.3	5.0	4.7	4.3	4.0
1/4	9.9	9.4	8.9	8.5	8.0	7.5	7.0	6.5	6.0
7/32	14	13	13	12	11	10.7	10.0	9.3	8.6
3/16	21	20	19	18	17	16	15	14	13
5/32	33	32	30	28	27	25	24	22	20
1/8	39	39	39	39	39	39	39	39	39
7/64	39	39	39	39	39	39	39	39	39

\* If specific gravity falls between those shown, use next lowest: e.g. if actual gravity is 0.73, use 0.70 specific gravity data.

## Typical Applications



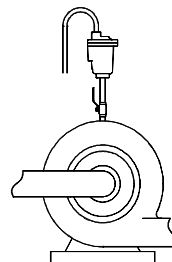
Model 1AV automatically venting air from a pipeline.



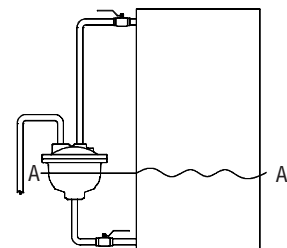
Continuous venting using an equalizing line where large amounts of air must be vented. As air enters through line A, water leaves through line B.

## Installation Notes

1. A single pipe 3/4" or larger connection is suitable for occasional venting. Once the system is filled with water, only small additional amounts of air needed to be vented, so there is no difficulty in getting air to enter the vent counter-current to the water displaced.
2. An equalizing line usually is necessary for continuous operation. Where gas enters the system continuously or when very fast venting is required, an equalizing line should be provided.
3. Be certain vent is installed properly **with the cap at the top** for air and gas relief service.



Model 1AV venting air from a centrifugal pump.



Model 21AR installation for venting surplus air from a water storage tank. Line A-A shows water level - position vent to secure level desired.

# Armstrong's 1-AVC Air Vent

Capacities to 24.3 SCFM, Pressures to 150 psig 150°F.



## A See-Thru Body So You'll Know When It's Working

Now, you can literally see what you've been missing —the early warning signs of a system problem. Since you'll know the operating condition of the air vent, you won't waste time and money scheduling maintenance that isn't needed. In other words, you will be able to react to a condition before it becomes a problem.

A simple ball float mechanism requiring no electricity to operate, the new Armstrong 1-AVC discharges automatically only when air/gas are present. That means no liquid loss as with manual purging.

Reference Bulletin 460

## How To Order Air/Gas Vents

### Specify:

1. Vent size by model number and state orifice size. If you are not sure of correct sizes, specify required gas discharge in cubic feet per minute (specify actual or standard cfm).
2. **Specific Gravity of Liquid.**
3. Maximum operating pressure (and temperature if above 100°F).
4. Pipe connection - size and type
5. If vent is to be used for "For venting during filling only".

Designs and materials subject to change without notice.



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Steam Traps \ Humidifiers \ Steam Coils \ Valves \ Water Heaters \ Air Vents \ Pumping Traps

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