

# Tank Fitting

## PV Breather Valves



### SERIES 8300

The Series 8300 range of Pressure & Vacuum Breather Valves minimize vapour losses from storage tanks during operations, whilst preventing internal pressure and vacuum conditions from exceeding the tank design limits. Hence, both product and vessel are protected, as well as the tank environmental conditions.

### INSTALLATION

The Pressure & Vacuum Breather Valve should be mounted on tank roof nozzles as close as possible to the tank roof, to ensure that pressure under the pallet is maintained within 3% of the tank pressure.

### FLANGE ADAPTORS

A range of steel adaptor flanges is available for non-standard drilling on tank nozzle flange and for use where tank flanges differ dimensionally for valve flanges.

### PRINCIPLE OF OPERATION

**Figures 1 and 3** - indicate the position of both the pressure and vacuum pallets, when tank and atmospheric pressure are equal. i.e. both pallets are fully seated.

**Figures 2** - shows the position of both pallets, as set pressure is reached, with escaping vapour lifting the pressure pallet and holding the vacuum pallet closed.

**Figures 4** - shows the position of both pallets, as set vacuum is reached, with atmospheric pressure lifting the hinged vacuum pallet to allow ingress of air into the tank, whilst holding the pressure pallet closed.

### VALVE SIZING

Tables 1 and 2 indicate flow rates for Series 8300 Open Vent Pressure & Vacuum Breather Valves (2" to 12") in both cubic feet per hour and cubic meters per hour, of standard air.

### FEATURES

#### COMBINED UNITS

Series 8300 Pressure & Vacuum Breather Valves can be fitted in combination with Series 8350 Flame Arresters.

**Note** - This type of installation reduces valve flow capacities and thus special sizing calculations are applicable. (See Table 3)



### CHEMICAL SERVICE

Series 8300 Pressure & Vacuum Breather Valves can be supplied in a range of alternative materials for chemical and/or cryogenic services and can be used with air dryers fitted at the vacuum inlet port, to protect those products which could be adversely affected by normal atmospheric air.

It is suitable for wide range of services in the petroleum, chemical and related industries for land tankages only.

### LOW BLOW-DOWN

Blow-down is the difference between opening and closing pressures.

The floating diaphragm operation ensures that blow-down is minimised to 10% for pressure relief and 10-15% for vacuum relief.

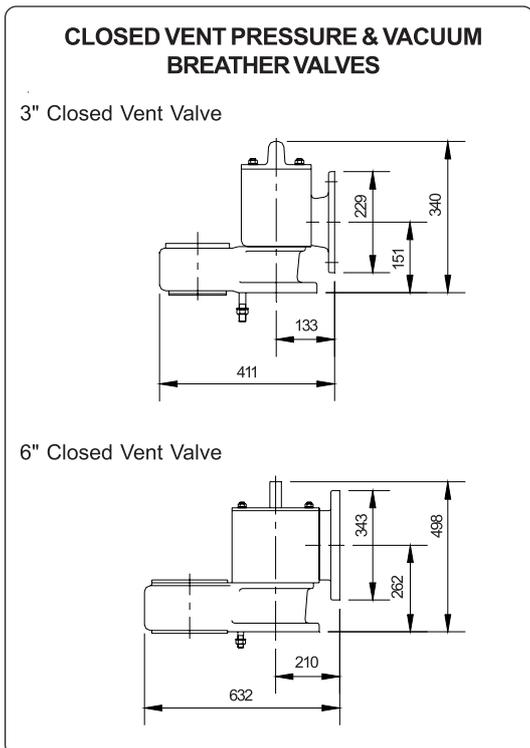
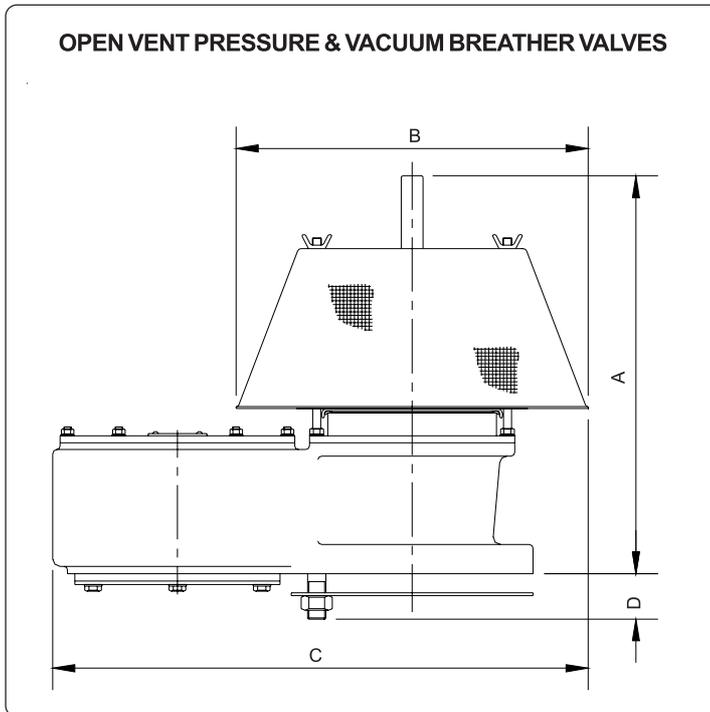
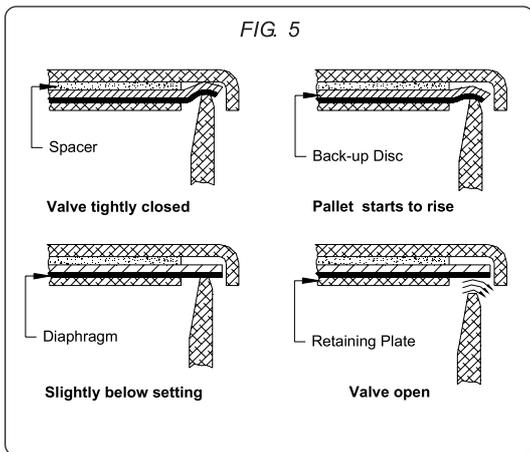
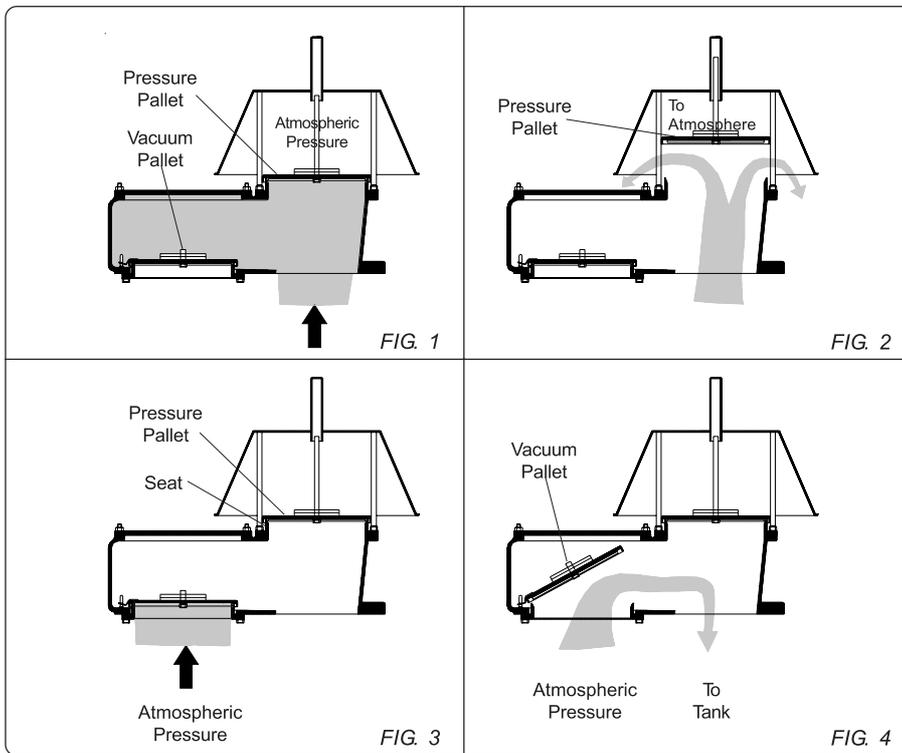
### LOW LEAKAGE

Figure 5 - shows capability of the resilient diaphragm to wrap around the edge of the pallet seat. The high ratio of seating force to seating area provides a tight seal.

As the pressure or vacuum rises, the relevant pallet begins to lift, but the diaphragm wrap around at the edge of the seat maintains a good seal.

As the pressure or vacuum continues to rise, the pallet lifts further, but the diaphragm naturally assumes a good seal.

When pressure or vacuum reaches the set conditions, the pallet opens fully.



**DIMENSIONS**

Valve Size		A	B	C	D	No. of Studs	No. of Bolts
mm	inch						
50	2	271	171	308	43	1	3
80	3	327	241	398	44	1	3
100	4	386	267	471	44	2	6
150	6	433	400	622	44	4	4
200	8	540	518	779	48	4	4
250	10	651	648	949	54	6	6
300	12	759	759	1102	57	6	6

**TABLE 1 - OPEN VENTED VALVES (flow in thousands of cubic feet per hour, of standard air)**

		Valve Size																				
		2" (50 mm)			3" (80 mm)			4" (100 mm)			6" (150 mm)			8" (200 mm)			10" (250 mm)			12" (300 mm)		
Over-pressure		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Set Pressure	1" w.g.	-	-	-	13.0	15.3	-	22.7	30.4	-	49.0	59.5	-	77.0	98.0	-	129	160	-	174	216	-
	2" w.g.	7.3	8.3	-	15.0	17.2	-	27.0	30.0	-	60.0	70.0	-	87.0	110	-	159	186	-	214	254	-
	3" w.g.	7.5	8.5	-	16.6	18.5	-	28.8	32.5	-	69.5	79.0	-	100	120	-	183	210	-	252	285	-
	4" w.g.	8.0	9.0	-	17.7	20.0	-	31.4	35.4	-	76.0	86.0	-	110	128	-	201	231	-	277	313	-
	6" w.g.	8.4	9.3	-	20.0	22.0	-	35.8	39.0	-	87.0	97.0	-	126	141	-	234	263	-	320	362	-
	8" w.g.	8.7	9.5	-	22.2	24.0	-	38.4	42.1	-	97.0	110	-	139	155	-	262	292	-	358	395	-
	14" w.g.	9.7	10.8	-	25.7	28.0	-	45.1	50.0	-	124	135	-	176	191	-	329	352	-	468	498	-
	21.5" w.g.	10.3	11.2	11.8	28.0	30.7	32.6	50.5	54.7	58.0	140	155	165	213	226	237	377	412	447	560	585	610
	1 psi	-	-	-	-	-	-	-	-	-	160	173	183	236	246	257	428	470	505	627	645	670
	1.5 psi	12.5	13.3	14.1	35.7	38.0	41.0	63.0	69.0	74.0	-	-	-	-	-	-	-	-	-	-	-	-
Set Vacuum	0.75" w.g.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77.0	105	127	115	147	182
	1" w.g.	-	-	-	8.3	11.0	12.8	14.0	19.0	22.0	27.0	42.0	52.0	50.0	67.0	79.0	75.0	101	120	116	150	177
	2.5" w.g.	3.5	4.3	4.9	8.0	9.9	11.6	15.0	20.5	24.0	31.0	43.0	52.0	59.0	73.0	85.0	75.0	94.0	112	128	164	186

Above values are for Open Vented Valves, use 80% of values for Closed Vent Valves. Over-pressures A = 0.5 in.w.g., B = 1.0 in.w.g., C = 1.5 in.w.g.

**TABLE 2 - OPEN VENTED VALVES (flow in thousands of cubic metres per hour, of standard air)**

		Valve Size																				
		2" (50 mm)			3" (80 mm)			4" (100 mm)			6" (150 mm)			8" (200 mm)			10" (250 mm)			12" (300 mm)		
Over-pressure		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Set Pressure	25 mm w.g.	-	-	-	0.35	0.41	-	0.62	0.73	-	1.33	1.57	-	2.03	2.57	-	3.48	4.22	-	4.80	5.72	-
	50 mm w.g.	0.194	0.224	-	0.40	0.463	-	0.72	0.83	-	1.63	1.88	-	2.37	2.92	-	4.27	4.91	-	5.90	6.83	-
	75 mm w.g.	0.21	0.235	-	0.457	0.515	-	0.81	0.91	-	1.91	2.14	-	2.76	3.23	-	4.95	5.60	-	7.00	7.84	-
	100 mm w.g.	0.215	0.238	-	0.50	0.552	-	0.88	0.97	-	2.13	2.35	-	3.00	3.44	-	5.53	6.20	-	7.70	8.60	-
	150 mm w.g.	0.227	0.253	-	0.54	0.61	-	0.95	1.06	-	2.40	2.68	-	3.37	3.82	-	6.33	7.80	-	8.80	9.75	-
	200 mm w.g.	0.244	0.268	-	0.61	0.67	-	1.08	1.19	-	2.77	3.04	-	3.90	4.38	-	7.30	8.00	-	10.1	11.0	-
	350 mm w.g.	0.266	0.29	-	0.72	0.78	-	1.23	1.37	-	3.45	3.75	-	4.85	5.27	-	9.00	9.80	-	12.6	13.7	-
	550 mm w.g.	0.294	0.317	0.336	0.83	0.89	0.93	1.48	1.56	1.65	4.30	4.53	4.76	5.95	6.33	6.65	10.9	11.7	12.3	15.9	16.7	17.2
	700 mm w.g.	-	-	-	-	-	-	-	-	-	4.60	4.84	5.03	6.53	6.85	7.10	12.0	12.7	13.2	17.5	18.3	19.0
	1050 mm w.g.	0.345	0.37	0.386	1.06	1.10	1.14	1.90	1.98	2.04	-	-	-	-	-	-	-	-	-	-	-	-
Set Vacuum	20 mm w.g.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.93	2.60	3.13	2.88	3.80	4.20
	25 mm w.g.	-	-	-	0.215	0.285	0.333	0.37	0.495	0.60	0.74	0.96	1.17	1.40	1.80	2.05	1.90	2.53	3.04	2.90	3.85	4.20
	65 mm w.g.	0.093	0.113	0.13	0.22	0.265	0.305	0.41	0.50	0.59	0.88	1.05	1.25	1.60	1.88	2.12	1.98	2.40	2.80	3.33	4.10	4.75

Above values are for Open Vented Valves, use 80% of values for Closed Vent Valves. Over-pressures A = 10 mm w.g., B = 20 mm w.g., C = 30 mm w.g.

**TABLE 3 - COMBINED BREATHER VALVE AND FLAME ARRESTER (flow in thousands of cubic feet per hour, of standard air)**

		Valve Size																				
		2" (50 mm)			3" (80 mm)			4" (100 mm)			6" (150 mm)			8" (200 mm)			10" (250 mm)			12" (300 mm)		
Over-pressure		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Set Pressure	1" w.g.	-	-	-	5.5	8.0	-	9.9	14.2	-	18.5	27.4	-	33.0	48.0	-	54.5	78.0	-	81.0	119	-
	2" w.g.	2.7	3.7	-	6.0	8.2	10.1	10.7	14.6	18.0	19.5	27.6	34.7	34.0	48.5	60.0	56.0	80.0	100	86.0	122	154
	3" w.g.	2.95	3.85	4.65	6.4	8.4	10.25	11.5	15.2	18.5	21.0	28.5	35.0	37.0	49.5	61.0	60.0	82.0	103	93.0	125	155
	4" w.g.	3.2	4.0	4.75	6.9	8.8	10.5	12.5	15.7	19.0	23.0	29.5	36.0	40.0	51.5	63.0	65.0	84.0	104	100	130	157
	6" w.g.	3.6	4.3	5.0	7.8	9.5	11.0	14.3	17.3	20.0	26.0	32.0	37.4	45.5	56.0	66.0	74.0	90.0	107	115	140	165
	8" w.g.	3.9	4.65	5.25	8.7	10.1	11.6	16.0	18.7	21.2	28.5	34.0	39.0	50.5	60.0	69.0	81.0	97.0	113	129	150	174
	14" w.g.	4.9	5.5	6.1	10.5	12.0	13.3	19.5	22.0	24.3	37.0	41.0	46.0	64.0	72.0	80.0	104	117	130	160	180	197
	21.5" w.g.	5.8	6.4	7.0	13.0	14.5	15.7	23.5	26.5	28.5	44.0	48.0	52.5	79.0	86.0	92.5	127	137	150	195	210	227
	1.0 psi	6.5	7.2	7.8	14.4	15.7	17.2	25.5	28.6	31.0	51.5	55.0	59.0	90.0	97.0	104	140	155	165	220	238	255
	1.5 psi	7.8	8.4	8.9	17.0	18.7	20.0	32.0	35.0	37.0	-	-	-	-	-	-	-	-	-	-	-	-
Set Vacuum	1" w.g.	-	-	-	4.55	6.42	8.0	8.0	11.4	14.1	16.6	23.7	29.6	30.0	43.0	53.0	49.0	69.5	86.0	71.0	100	124
	1.5" w.g.	2.15	2.95	3.63	4.75	5.7	8.1	8.3	11.5	14.3	17.5	24.3	30.0	32.0	44.0	54.5	50.5	70.0	86.0	74.0	102	125
	2.5" w.g.	2.36	3.1	3.72	5.1	6.78	8.2	8.8	11.7	14.4	19.0	25.0	30.5	35.0	45.5	55.0	55.0	73.0	88.0	80.0	105	127

Above values are indicative only, as the combination of Breather Valve and Flame Arrester has not been subjected to exhaustive testing, as the valve alone.

## SPECIFICATIONS

Sizes : 50 mm (2")  
80 mm (3")  
100 mm (4")  
150 mm (6")  
200 mm (8")  
250 mm (10")  
300 mm (12")

### Pressure Settings

Minimum : 38 mm (2" valve size)  
25 mm (3" to 10" valve sizes)  
19 mm (12" valve size)  
Maximum : 1056 mm (2" to 4" valve sizes)  
704 mm (6" to 12" valve sizes)

### Vacuum Settings

Minimum : 25 mm (All valve sizes)  
Maximum : 65 mm (All valve sizes)

End Connections : ASA 150 FF

Outlet : 4"(for 3" Valve)  
(for Closed Vent) 8"(for 6" Valve)  
12"(for 10" Valve)

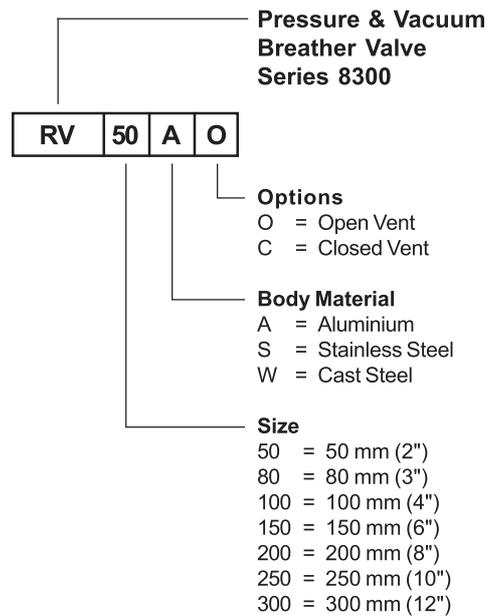
To process your enquiry, please furnish the following information :

1. Enquiry/order number
2. Liquid and its flash point
3. Tank diameter and height
4. Type of tank and end connections
5. Pumping-in and pumping-out rates
6. Required pressure and vacuum settings

## MATERIALS OF CONSTRUCTION

Body : Aluminium alloy LM-25  
Seat : Aluminium alloy LM-25  
Pallet : Aluminium  
Screen : Stainless Steel AISI 304  
Guides : Stainless Steel AISI 304  
Diaphragm : Fluorinated Ethylene Propylene (FEP)  
Hood : Galvanised Steel  
Hardware : Mild Steel  
(Optional) (Zinc Plated / Yellow Passivated)

### MODEL DESIGNATION



☐ Specifications are subject to change without notice.  
☐ All dimensions are in mm unless otherwise specified.

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