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# CLA-VAL

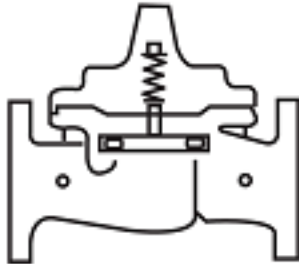
**AUTOMATIC CONTROL VALVES**

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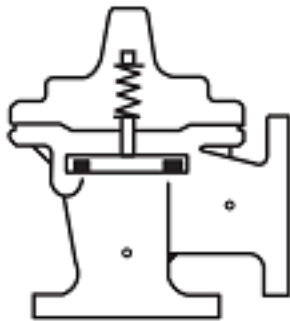
**33A**

Place this manual with personnel responsible  
for maintenance of this valve

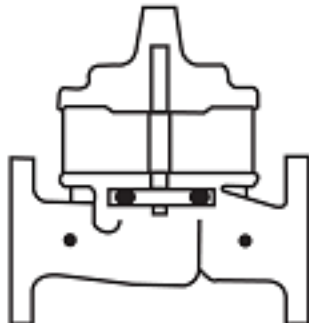
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## *Installation*



## *Operation*



## *Maintenance*

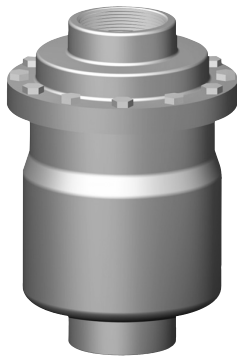




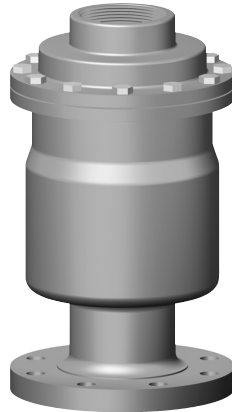
# Series 33A

Sizes 1" - 2" - 3" - 4" - 6"

## Air Release & Vacuum Breaker Valve for Mining Applications



Threaded



Flanged

- Automatically Eliminates Air Pockets
- Easily Serviced Without Removal from Pipeline
- Simple, Effective Patented Design
- Stainless Steel for Harsh Conditions
- Engineered For Lasting Service

Designed to protect pipelines and vertical turbine pump installations in mining applications from air lock and vacuum collapse, the Cla-Val Model 33A Air Release and Vacuum Breaker Valve eliminates air and prevents vacuum formations in pipelines. A large venting orifice and large float clearances freely exhaust or admits air during pipeline filling or draining.

During normal pipeline operation, air accumulation and buoyancy cause the float ball to lower or lift. As the water level lowers inside the valve, small amounts of accumulated air are released through the small orifice. Once air is released, the patented float poppet system closes drip tight.

Valve servicing is simple because the entire float poppet system, can be replaced without removal of the valve body from the pipeline.

### Typical Applications

- Standard Max. D.W.P. 300 psi (For Higher Operating Pressures Consult Factory)
- Transmission Pipeline High Points
- Water Treatment Plant Piping High Points
- Offshore Platforms
- Vertical Turbine Pump Discharge

### Installation

Series 33A Air Release and Vacuum Breaker Valves are typically installed at high points in pipelines for air release, or at anticipated pipeline vacuum occurrence locations. Install Series 33A at regular intervals (approximately 1/2 mile) along uniform grade line pipe. Mount the unit in the vertical position on top of the pipeline, and include an isolation/shutoff valve.

Series 33A is often installed upstream of check valves in pump discharges to vent air during start-up and to allow air reentry when the pump stops.

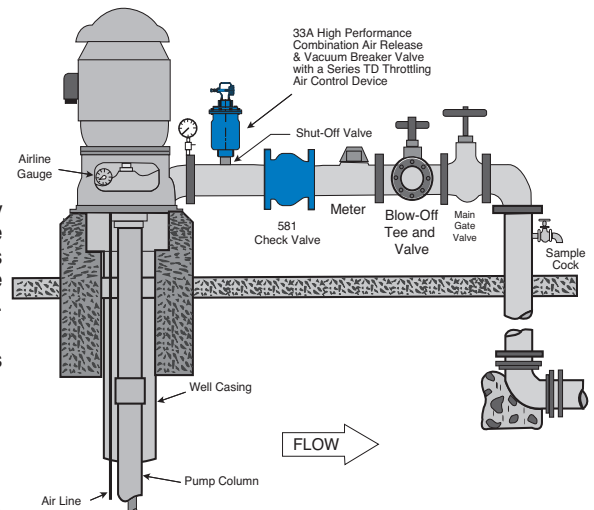
### Operation

#### Air Release Mode—Valve is normally open.

When line is filled or pump started, air is exhausted through the normally open 33A valve. As liquid fills the valve, float ball rises to form a drip-tight closure and remaining air is exhausted through small orifice.

**Vacuum Prevent Mode** When line pressure drops below positive pressure and the liquid level lowers, the float drops, unseating the valve and allowing air into the line, thus preventing a vacuum.

**Note:** Available for Sea Water Service See Material Specifications



## Dimensions (In Inches)

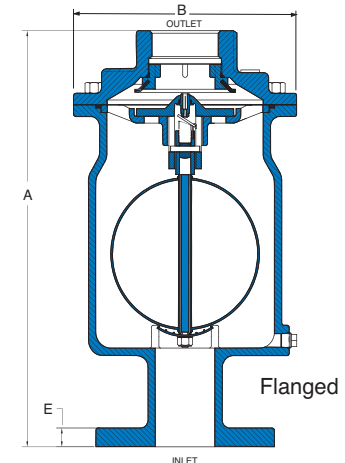
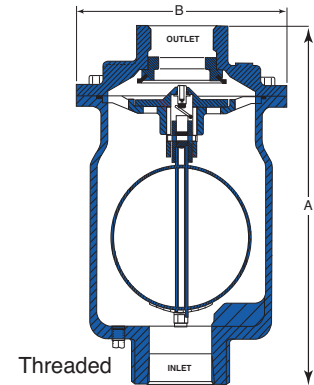
## MODEL 33A - 1", 2", 3", 4" and 6" Sizes

Valve Size	33A Pressure Class 300 Lb Threaded				33A Pressure Class 150 Lb Flanged (INLET)			
	1"	2"	3"	4"	2"	3"	4"	6"
A	9.10	12.44	12.75	12.75	13.88	15.56	15.75	16.38
B	6.25	7.50	9.00	9.00	7.50	9.25	9.25	11.00
E	—	—	—	—	.62	.75	.94	1.00
Inlet (ANSI)	1" NPT	2" NPT	3" NPT	4" NPT	2"	3"	4"	6"
Outlet (NPT)	1" NPT	2" NPT	3" NPT	4" NPT	2"	3"	4"	6"
Number of Holes	—	—	—	—	4	4	8	8
Diameter of Bolts	—	—	—	—	.63	.63	.75	.75
Shipping Wt. (Lb.)	25	29	38	40	39	48	50	70

### Pressure Ratings

Valve Size	Orifice Dia.	Standard Maximum Pressure	Materials of Construction
1"	.076"	300 psi	<ul style="list-style-type: none"> <li>Ductile Iron ASTM A536 65-45-12</li> <li>Epoxy Coated Cast Steel ASTM A 216WCB</li> </ul>
2"	.076"	300 psi	
3" & 4"	.125"	300 psi	<ul style="list-style-type: none"> <li>ASTM B61 Naval Bronze</li> <li>ASTM B 148 NI Aluminum Bronze</li> </ul>
3" & 4"	.076"	300 psi	<ul style="list-style-type: none"> <li>316 Stainless Steel</li> <li>Duplex Stainless Steel</li> </ul>
6"	.076"	300 psi	<ul style="list-style-type: none"> <li>Super Duplex Stainless Steel</li> </ul>

**Note:** Higher Pressures Available upon Request



### Specifications

#### Standard Internals

Float: Stainless Steel 304SS Standard, T316 or Monel optional (extra cost)  
 Balance internals parts Stainless Steel and Delrin  
 Seals Nitrile Rubber or Viton® (extra cost)

#### When Ordering, Please Specify

1. Catalog No.
2. Valve Size
3. Pressure Rating
4. Materials

#### Temperature Range

Water to 180° F

#### Optional:

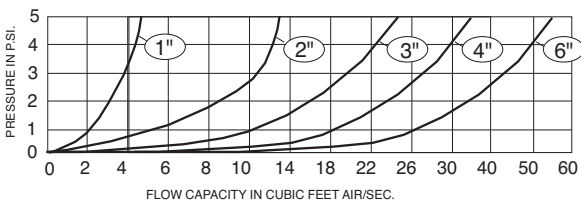
1. Fusion epoxy lined and coated
2. For Well Service Throttling Device on the Outlet Specify Model TD

### Valve Sizing Selection

#### Large Orifice Air-Vacuum Capacity

Determine anticipated water flow and allowable pressure differential for the pipeline application. Select valve from chart to exhaust or admit air at the same rate as water filling or draining (in CFS). For larger flows, two or more Model 33A's may be installed in parallel

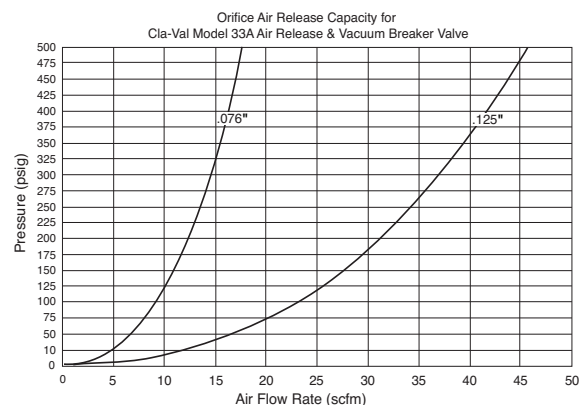
#### Large Orifice



Note: For sizing made easy request:  
 Cla-Val Selector Slide Rule

#### Small Orifice Capacity

During pressurized pipeline operation, small pockets of entrapped air will be released through the float actuated 0.076 or .125 inch orifice. Use chart to determine discharge capacity.





# Series 33A

Sizes 1" - 2" - 3" - 4" - 6"

## High Performance Combination Air Release & Vacuum Breaker Valve



Threaded



Flanged



This product meets Federal Mandate for Lead Content Limit



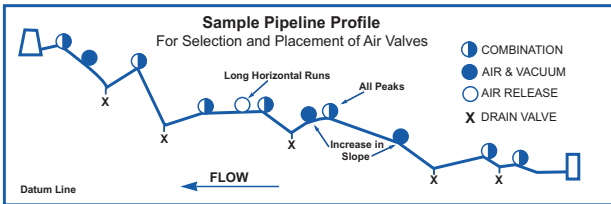
NSF/ANSI 61 & 372

- Standard Maximum Operating Pressure 300 psi
- Standard Epoxy Coated Ductile Iron Body
- Automatically Eliminates Entrapped Air Pockets and Provides Vacuum Protection
- Easily Serviced
- Tested to Seal at 2 psi
- Meets AWWA C512 Requirements

Designed to protect pipelines and vertical turbine pump applications from air lock and vacuum collapse, the Cla-Val Model 33A High Performance Combination Air Release and Vacuum Breaker Valve eliminates air and prevents vacuum formations in pipelines. A large venting orifice and large float clearances freely exhaust or admits air during pipeline filling or draining.

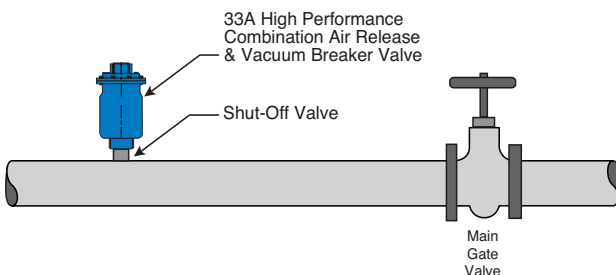
During normal pipeline operation, air accumulation and buoyancy cause the float ball to lower or lift. As the water level lowers inside the valve, small amounts of accumulated air are released through the small orifice. Once air is released, the float poppet system closes drip tight.

Valve servicing is simple because the entire float poppet system can be replaced without removal of the valve body from the pipeline.



### Typical Applications

- Transmission Pipeline High Points
- Water Treatment Plant Piping High Points
- Vertical Turbine Pump Discharge



### Installation

Series 33A Combination Air Release and Vacuum Breaker Valves are typically installed at high points in pipelines for air release, or at anticipated pipeline vacuum occurrence locations. Install Series 33A at regular intervals (approximately 1/2 mile) along uniform grade line pipe. Mount the unit in the vertical position on top of the pipeline, and include an isolation/shutoff valve.

Series 33A is often installed upstream of check valves in pump discharges to vent air during start-up and to allow air reentry when the pump stops.

### Operation

#### Air Release Mode— Valve is normally open.

When line is filled or pump started, air is exhausted through the normally open 33A valve. As liquid fills the valve, float ball rises to form a drip-tight closure and remaining air is exhausted through small orifice.

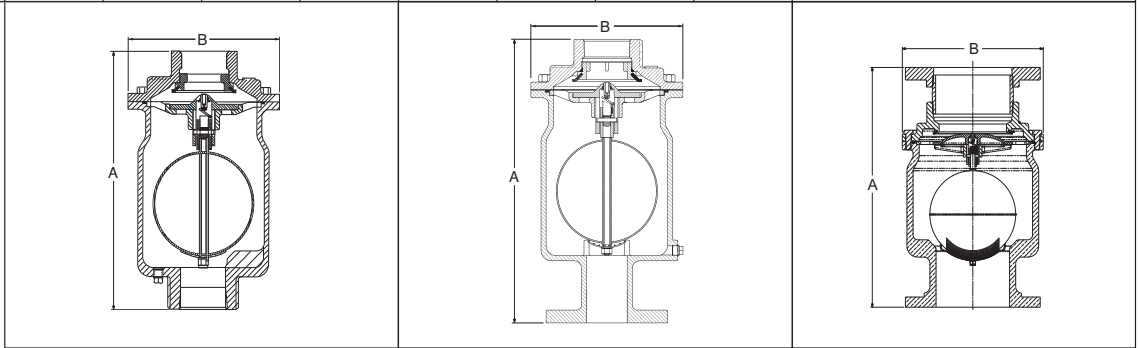
**Vacuum Prevent Mode** When line pressure drops below positive pressure and the liquid level lowers, the float drops, unseating the valve and allowing air into the line, thus preventing a vacuum.

**Note:** Available for Sea Water Service See Material Specifications

## Dimensions (In Inches)

## MODEL 33A Sizes - 1" - 2" - 3" - 4" - 6"

Valve Size	33A Pressure Class 300 Lb Threaded X Threaded				33A Pressure Class 150 Lb Threaded X Flanged				33A Pressure Class 150 Lb Flanged X Flanged	
	1"	2"	3"	4"	2"	3"	4"	6"	6"	
A	9.10	12.44	12.75	12.75	13.88	15.56	15.75	16.38	19.14	
B	6.25	7.50	9.00	9.00	7.50	9.25	9.25	11.00	11.00	
C	—	—	—	—	.62	.75	.94	1.00	1.06	
Inlet (ANSI)	1" NPT	2" NPT	3" NPT	4" NPT	2"	3"	4"	6"	6"	
Outlet (NPT)	1" NPT	2" NPT	3" NPT	4" NPT	2" NPT	3" NPT	4" NPT	6" NPT	6"	
Number of Holes	—	—	—	—	4	4	8	8	8"	
Diameter of Bolts	—	—	—	—	.63	.63	.75	.75	.75	
Shipping Wt. (Lb.)	25	29	38	40	39	48	50	70	75	



## Pressure Ratings

Size	Orifice Dia.	Std Max. Pressure	Available Materials of Construction
1"	.076"	300 psi	<ul style="list-style-type: none"> <li>Epoxy Coated Ductile Iron ASTM A536 65-45-12</li> <li>Epoxy Coated Cast Steel ASTM A 216WCB</li> <li>ASTM B61 Naval Bronze</li> <li>ASTM B 148 NI Aluminum Bronze</li> <li>316 Stainless Steel</li> <li>Duplex Stainless Steel</li> <li>Super Duplex Stainless Steel</li> <li>Bronze</li> </ul>
2"	.076"	500 psi	
3" & 4"	.076"	300 psi	
6"	.076"	300 psi	
3" & 4"	Optional upon request .125"	300 psi	

**Note:** Higher Pressures Available upon Request for sizes 2", 3", & 4"

## Specifications

### Standard Internals

**Float:** Stainless Steel 304SS Standard,  
Optional T316 or Monel

**Seals:** Nitrile Rubber or Optional Viton®

**Remainder of Internal Components:**  
Stainless Steel and Delrin

### Temperature Range

Water to 180° F

### Optional:

- Hood / Screen Assembly

## When Ordering, Specify:

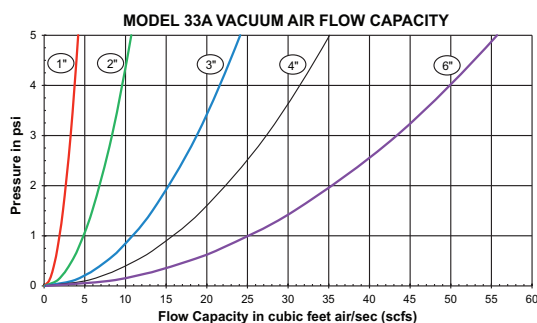
- Catalog # 33A
- Valve Size
- Pressure Rating.
- Materials



## Valve Sizing Selection

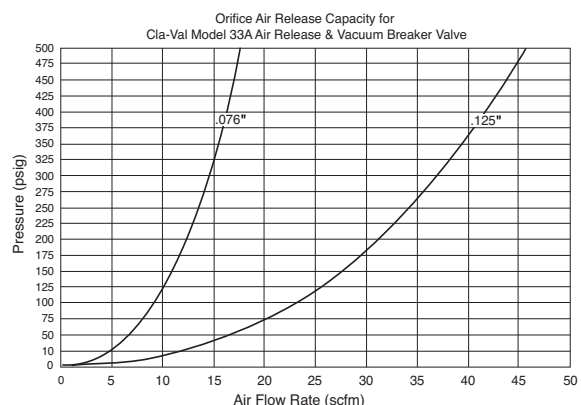
### Large Orifice Vacuum Capacity

Determine anticipated water flow and allowable pressure differential for the pipeline application. Select valve from chart to exhaust or admit air at the same rate as water filling or draining (in CFS). For larger flows, two or more Model 33A's may be installed in parallel



### Small Orifice Capacity - Air Release

During pressurized pipeline operation, small pockets of entrapped air will be released through the float actuated 0.076 or .125 inch orifice. Use chart to determine discharge capacity.





# Series 33A

Sizes 1" - 2" - 3" - 4" - 6" - 8" - 10" - 12"

## High Performance Combination Air Release & Vacuum Breaker Valve



Threaded

now available in sizes  
1" through 12"



Flanged



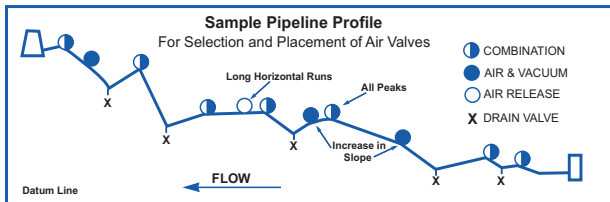
This product meets Federal Mandate for Lead Content Limit

- Standard Maximum Operating Pressure 300 psi
- Standard Epoxy Coated Ductile Iron Body
- Automatically Eliminates Air Pockets
- Easily Serviced Without Removal from System
- Engineered For Lasting Service

Designed to protect pipelines and vertical turbine pump applications from air lock and vacuum collapse, the Cla-Val Model 33A High Performance Combination Air Release and Vacuum Breaker Valve eliminates air and prevents vacuum formations in pipelines. A large venting orifice and large float clearances freely exhaust or admits air during pipeline filling or draining.

During normal pipeline operation, air accumulation and buoyancy cause the float ball to lower or lift. As the water level lowers inside the valve, small amounts of accumulated air are released through the small orifice. Once air is released, the float poppet system closes drip tight.

Valve servicing is simple because the entire float poppet system can be replaced without removal of the valve body from the pipeline.



### Typical Applications

- Transmission Pipeline High Points
- Water Treatment Plant Piping High Points
- Vertical Turbine Pump Discharge

### Installation

Series 33A Combination Air Release and Vacuum Breaker Valves are typically installed at high points in pipelines for air release, or at anticipated pipeline vacuum occurrence locations. Install Series 33A at regular intervals (approximately 1/2 mile) along uniform grade line pipe. Mount the unit in the vertical position on top of the pipeline, and include an isolation/shutoff valve.

Series 33A is often installed upstream of check valves in pump discharges to vent air during start-up and to allow air reentry when the pump stops.

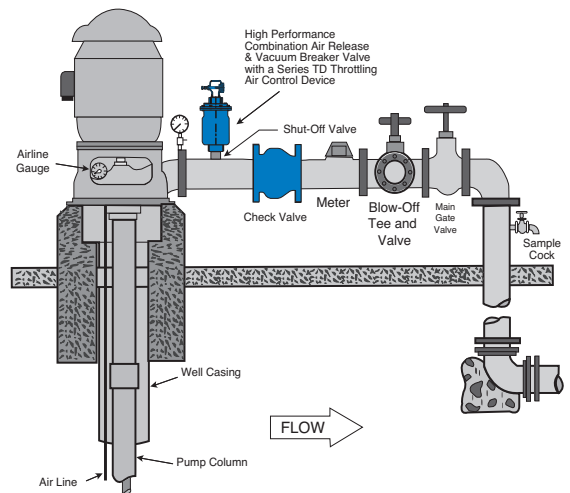
### Operation

#### Air Release Mode—Valve is normally open.

When line is filled or pump started, air is exhausted through the normally open 33A valve. As liquid fills the valve, float ball rises to form a drip-tight closure and remaining air is exhausted through small orifice.

**Vacuum Prevent Mode** When line pressure drops below positive pressure and the liquid level lowers, the float drops, unseating the valve and allowing air into the line, thus preventing a vacuum.

**Note:** Available for Sea Water Service See Material Specifications



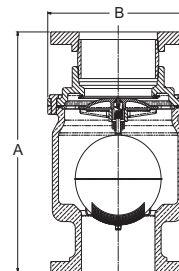
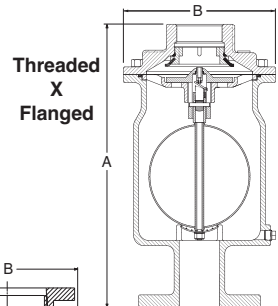
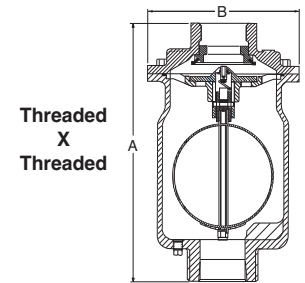


Valve Size	33A Pressure Class 300 Lb Threaded X Threaded				33A Pressure Class 150 Lb Threaded X Flanged				33A Pressure Class 150 Lb Flanged X Flanged			
	1"	2"	3"	4"	2"	3"	4"	6"	6"	8"	10"	12"
A	9.10	12.44	12.75	12.75	13.88	15.56	15.75	16.38	19.14	17.06	19.87	19.93
B	6.25	7.50	9.00	9.00	7.50	9.25	9.25	11.00	11.00	13.50	16.00	19.00
C	—	—	—	—	.62	.75	.94	1.00	1.06	1.19	1.25	1.31
Inlet (ANSI)	1" NPT	2" NPT	3" NPT	4" NPT	2"	3"	4"	6"	6"	8"	10"	12"
Outlet (NPT)	1" NPT	2" NPT	3" NPT	4" NPT	2" NPT	3" NPT	4" NPT	6" NPT	6"	8"	10"	12"
Number of Holes	—	—	—	—	4	4	8	8	8	8	12	12
Diameter of Bolts	—	—	—	—	.63	.63	.75	.75	.75	.75	.88	.88
Shipping Wt. (Lb.)	25	29	38	40	39	48	50	70	75	139	206	250

**Pressure Ratings**

Size	Orifice Dia.	Std Max. Pressure	Materials of Construction
1"	.076"	300 psi	<ul style="list-style-type: none"> <li>Epoxy Coated Ductile Iron ASTM A536 65-45-12</li> <li>Epoxy Coated Cast Steel ASTM A 216WCB</li> <li>ASTM B61 Naval Bronze</li> <li>ASTM B 148 NI Aluminum Bronze</li> <li>316 Stainless Steel</li> <li>Duplex Stainless Steel</li> <li>Super Duplex Stainless Steel</li> </ul>
2"	.076"	500 psi	
3" & 4"	.076"	300 psi	
3" & 4"	Optional upon request: .125"	300 psi	
6"	.076"	300 psi	
8"	.078"	300 psi	<ul style="list-style-type: none"> <li>Bronze</li> </ul>
10"	.078"	300 psi	
12"	.078"	300 psi	

**Note:** Higher Pressures Available upon Request for sizes 3" & 4"



**Specifications**

**Standard Internals**

Float: Stainless Steel 304SS Standard, T316 or Monel optional (extra cost)

Balance internals parts Stainless Steel and Delrin

Seals Nitrile Rubber or Viton® (extra cost)

**Temperature Range**

Water to 180° F

**Optional:**

- Well Service Throttling Device - Model TD

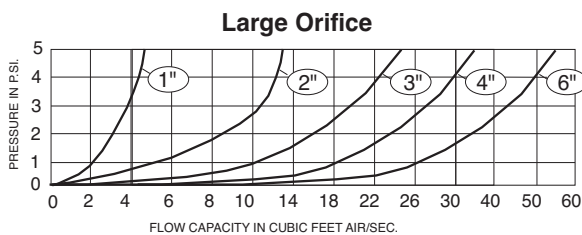
**When Ordering, Specify:**

- Catalog #
- Valve Size
- Pressure Rating.
- Materials

**Valve Sizing Selection**

**Large Orifice Air-Vacuum Capacity**

Determine anticipated water flow and allowable pressure differential for the pipeline application. Select valve from chart to exhaust or admit air at the same rate as water filling or draining (in CFS). For larger flows, two or more Model 33A's may be installed in parallel

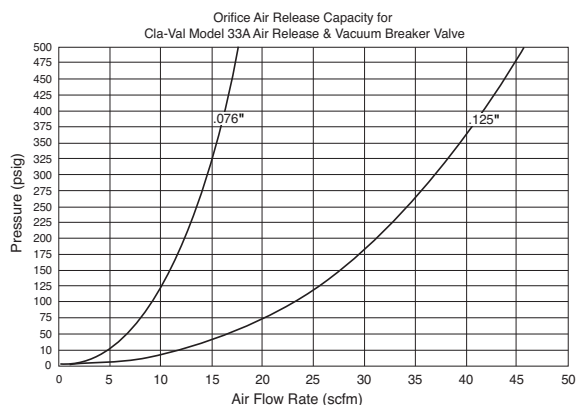


Cla-Val Selector Slide Rule available upon request.

Consult factory for flow capacity data on sizes 8 thru 12"

**Small Orifice Capacity**

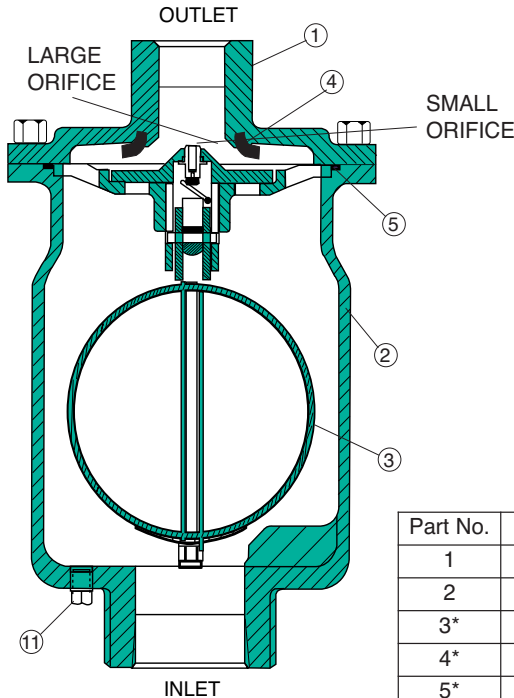
During pressurized pipeline operation, small pockets of entrapped air will be released through the float actuated 0.076 or .125 inch orifice. Use chart to determine discharge capacity.





— MODEL — **33A**

# High Performance Combination Air Release & Vacuum Valve



1" 33A

### INTRODUCTION

Cla-Val Combination Air Valves have been designed with stainless steel trim to give years of trouble-free service. Combination Air Valves are typically installed at high points of a water piping system. They perform both functions of air release valve and air/vacuum valve in one body.

Combination Air Valves automatically vent pockets of air from high points while the system is pressurized. The valve will also vent and admit large volumes of air while or draining the system or during emergency power failure conditions. Both air release and air/vacuum functions are essential to maintain pipeline efficiency and protection from adverse pressure conditions.

### RECEIVING AND STORAGE

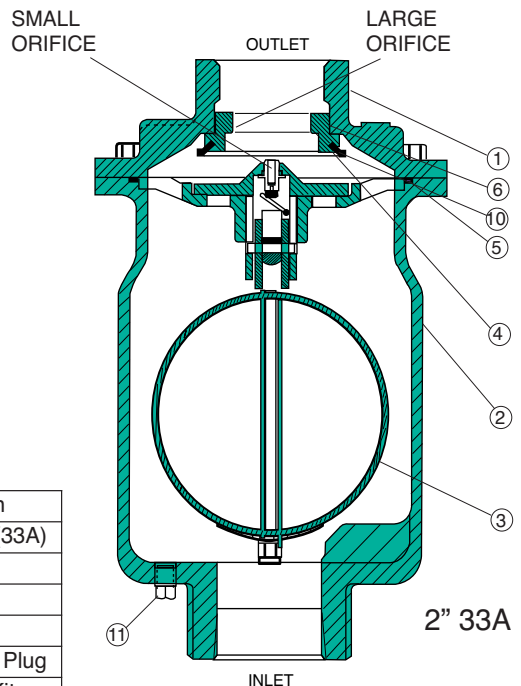
Inspect valves for damage upon receipt. Valves should remain boxed and stored in doors until installed to prevent weather related damage

Part No.	Qty.	Description	Part No.	Qty.	Description
1	1	1" Cover (33A)	7	8	Bolt Hex Nut (33A)
2	1	1" Body (33A)	8	2	Screw Drive
3*	1	1" Float Ball Assembly	9	1	Nameplate
4*	1	1" Seal Rign	10	1	O-Ring
5*	1	O-Ring (33A)	11	1	1/4" NPT Drain Plug
6*	1	1" Seat (33A)	*Recommended Spare Parts Kit		

### DESCRIPTION OF OPERATION

Combination Air Valves are fully automatic and designed to continuously remove pockets of air from high points in a piping system. They also vent and admit large volumes of air during filling or draining of the pipeline or tank. These are a normally open air valves that function in three ways:

1. During System start-up, the large open orifice exhausts large volumes of air until fluid enters the valve. Then the float rises to shut both the large orifice seat and the small orifice seat. Pressure within the valve will force the float tightly against both the seat orifices.
2. As air accumulates at the high points of the piping system, (where the valve is installed) air displacing the fluid, the float lowers with the fluid and breaks contact with the small orifice seat. Accumulated air in the valve, is then vented through the small orifice. As air is vented, the floats raise again and closes the small orifice. This sequence repeats automatically as air accumulates in the air valve.



2" 33A

Part No.	Qty.	Description	Part No.	Qty.	Description
1	1	2" Cover (33A)	7	8	Bolt Hex Nut (33A)
2	1	2" Body (33A)	8	2	Screw Drive
3*	1	2" Float Ball Assembly	9	1	Nameplate
4*	1	2" Seal Rign	10	1	O-Ring
5*	1	O-Ring (33A)	11	1	1/4" NPT Drain Plug
6*	1	2" Seat (33A)	*Recommended Spare Parts Kit		



## Specifications

### MODEL 33A - 1",2",3" and 4" SIZES Single Body Combination Air Vacuum Air Release Valve

#### Pressure Ratings

500 psi Ductile Iron  
Body and Cover

500 psi Stainless Steel  
Body and Cover

600 psi Cast Steel  
Body and Cover

#### Materials

Body and Cover:  
Ductile Iron

ASTM A536 65-45-12

Body and Cover  
Stainless Steel T303

Body and Cover  
Cast Steel ASTM A 216 WCB

#### Note:

Readily available for seawater service and other corrosive fluids applications Made of:  
Monel - Bronze's - Stainless Steel

#### Standard Internals

Float: Stainless Steel T304

Balance internals parts Stainless Steel and Delrin  
Seals Nitrile Rubber or Viton (extra cost)

#### Temperature Range

Water to 180° F

#### Optional:

1. Fusion epoxy lined and coated at extra cost
2. For Well Service Install Throttling Device on the Outlet

#### PROBLEMS / SOLUTIONS

##### 1. Leakage at Inlet Connection:

Tighten valve threaded connection. If leaks persist, remove valve and seals threads with pipe sealant or tape.

##### 2. Leakage at Cover/Body joint:

Tighten bolts per Table 2, replace gasket.

##### 3. Small or Large Orifice Leakage:

Flush valve to remove debris. Disassemble and inspect both seat, orifices and float for wear or damage. Replace as needed with a float kit or seat kit

##### 4. Small Orifice not Releasing Air Under Pressure:

Check that operating pressure does not exceed Working Pressure on nameplate. Perform inspection step 3 and disassemble valve if problem persists.

#### DISASSEMBLY

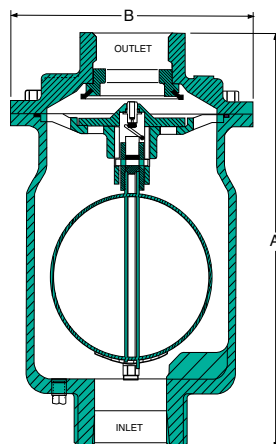
The valve can be disassembled without removing it from the pipeline, or it may be removed from the line. All work on the valve should be performed by a skilled mechanic. Special tools are NOT required.

**CAUTION:** Drain the vale and de-pressurized before removing the cover or pressure may causing injury.

1. Close inlet shut-off valve. Slowly open drain valve or remove drain plug. Remove the covers bolts slowly.
2. Pry cover loose and lift off valve body.
3. Remove entire seat & float assemblies inspect for damage or wear
4. Clean and inspect parts. Note: Shake float & if water inside float replace it and worn parts as necessary.

**NOTE:** Float Kit & Seat Kit includes cover gasket

Valve Size	1"	2"	3"	4"
A	9.10	12.44	12.75	12.75
B	6.25	7.50	9.00	9.00
Inlet (NPT)	1" NPT	2" NPT	3" NPT	4" NPT
Outlet (NPT)	1" NPT	2" NPT	4" NPT	4" NPT
Shipping Wt. (Lbs.)*	25	29	38	40
Max. Operating PSI (Std. Orifice)	300	500	300	300
Max. Operating PSI (with .076 Orifice)	300	500	450	450



\* Approximate

Available Flanged

#### REASSEMBLY

1. All parts must be cleaned and gaskets surfaces cleaned with a stiff wire brush in the direction of the serration or machine marks. Worn parts, gaskets and seal should be replaced during reassembly.
2. Apply Loctite or similar Compound to threaded Connections
3. Stand valve body vertically. Insert entire delrin frame, seat & float assembly into register. Move float up/down to insure concentricity and no binding.
4. Lay new cover gasket on clean surface and apply a gasket compound such as Permatex #80065 to both surfaces. Assemble gasket and cover over bolt holes in body.
5. Insert lubricated bolts and tighten to the torques listed in Table 2.
6. Place valve back in service. Refer to the installation instruction. Slowly open inlet isolation valve.

TABLE 2. VALVE COVER BOLT TORQUES

BOLT SIZE	TORQUE (FT. LBS.)
1/4"-20	6
5/16"-18	11
3/8"-24	19
7/16"-32	30

#### PARTS AND SERVICE

Parts and service are available from your local representative or the factory. Make note of the valve Model No. and Working Pressure located on the valve nameplate.