

N E T A F I M U S A



AIR VALVES FOR MINING



ABBREVIATION KEY

ABBREVIATION	DESCRIPTION
K	Air and Vacuum
D	Combination
S	Air Release
HF	Nominal Valve
HC	High Capacity
PPV	Polypropylene Body with Viton Seal
STST	Stainless Steel
NS	'Non-Slam' Valve
VB	Vacuum Breaker

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2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 580 psi

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Model K-060NS

2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 250 psi

Model K-064NS

2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 580 psi

COMBINATION AIR VALVES

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Models D-010

2", 3", 4" and 6" Sizes - Pressure Range: 3 to 250 psi

Models D-012

2", 3", 4" and 6" Sizes - Pressure Range: 3 to 360 psi



Model D-010STST

2", 3", 4" and 6" Sizes - Pressure Range: 3 to 275 psi

Models D-015 and D-015STST

2", 3", 4" and 6" Sizes - Pressure Range: 3 to 580 psi



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3" and 4" Sizes - Pressure Range: 3 to 250 psi



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2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 250 psi

Model D-062

2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 360 psi



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Model D-060NS

2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 250 psi

Model D-062NS

2", 3", 4", 6", 8" and 10" Sizes - Pressure Range: 3 to 360 psi



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Model D-065

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2", 3", 4", 6" and 8" Sizes - Pressure Range: 3 to 580 psi



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WHY USE AIR VALVES?

Entrapped air exists in all fluid transmission systems. The principal sources for this air are:

1. Incomplete filling of the line – which leaves air pockets in high places and in different accessories.
2. Air dissolved in the fluid, released when the pressure drops and/or there is a rise in temperature.
3. Vortices and turbulence, which introduce air into the system at the points from where it is pumped.
4. Air is sucked into the system through cracks and gaps in pipe accessories, fittings, seals etc.

The lack of control over the air present in a fluid system can result in damage:

1. If destructive vacuum conditions are created.
2. The presence of air can have a detrimental effect on system drainage efficiency.
3. Air pockets in the system cause a reduced-flow cross section – higher energy losses, hammer in the system and in extreme conditions, total air locking.
4. High pressure surges.
5. Metal parts in the system and system accessories corrode at higher rates.
6. Lower pumping efficiency.
7. Safety hazards: compressed air pockets, when exposed to atmospheric pressure, can cause a high energy release of air.
8. Inaccuracies in the measurement of fluid flow.
9. Accelerated wear of moving parts in water meters.
10. Cavitation damage.

CONTROL OF AIR IN WATER SUPPLY SYSTEMS USING AIR VALVES

There are three main types of air valves installed in water supply systems: air and vacuum, automatic air release and combination air valves.

1. Air and Vacuum Air Valves discharge large quantities of air from non-pressurized pipelines and are used mainly during pipe filling. Air discharge is critical for efficiently filling pipelines with liquid. Air and vacuum valves also enable the intake of large quantities of air when lines are drained, when the pressure drops suddenly and at water column separation. Air intake is essential when draining lines during maintenance and for preventing pipe collapse when vacuum conditions exist. These valves operate when the line is NOT pressurized and remain closed when the line is under pressure. When pressure drops below atmospheric pressure, the valves open.
2. Continuous Air Release Valves continuously release accumulated air entrapped in a pressurized line. This entrapped air is found mostly at the peaks of the pipeline. As air accumulates in the air release valve, water is displaced, the float lowers with the drop in the water level and air is released from the exposed orifice. As water refills the air release valve, the float rises and reseals the valve.
3. Combination Air Valves fulfill the tasks required of both types of valve – air and vacuum and automatic air release valves. They discharge large volumes of air when the system is being filling, admit large volumes of air during system drainage and continuously release entrapped air when the line is under pressure.

Recommendations for the Determination of the Required Diameter of Air & Vacuum and Combination Air Valves

To determine the diameter of air valve required, the first step is to define the task that the air valve must perform and the level of protection that the valve must provide. The principle tasks of an air valve are:

1. The controlled or free discharge of air during the line filling stage:
 - A. Controlled release – The air valve diameter is determined in order to limit flow / filling velocity.
 - B. Free release – The air valve is used to release air during line filling, but is not used to limit flow / filling velocity.
2. Intake of air to prevent vacuum conditions and/or negative surges (down-surges):

WHY USE AIR VALVES? (CONT.)

- A. When the line is drained through drainage valves with defined location and size.
- B. When the line bursts along its length; its bursting up to a pre-determined size and the free drainage of water out of the line through the burst.
- C. When there is water column separation and the consequential extreme changes in the regimen of water flow through the pipe.

The required air flow rate and the air valve diameter are determined in accordance with the objective sought when installing the air valve and as explained below:

- If the purpose of the air valve is only to limit filling velocity – the required air release velocity is equal to the filling rate (for the system), which is a function of the required filling rate.
- If the purpose of the air valve is to protect the system in the event of a burst, which splits the pipe across its entire cross section, with consequential free-flowing drainage of the line, the accepted method is to determine the required rate of air intake according to a burst analysis based on one of the flow equations.

BURST ANALYSIS

The burst analysis is based on the Hazen Williams equation:

$$1. \quad Q_B = KC_{HW} D^{2.63} \left(\frac{h_f}{L_{act}} \right)^{0.54}$$

Where, in our case:

Q_B = Air intake flow rate requirement for vacuum protection at full diameter pipe burst - ft³/s

K = Unit constant = 0.432

C_{HW} = Hazen Williams Coefficient for the pipe

D = Diameter of pipe (ft.)

h_f = Elevation change between the two ends of the pipe segment being analyzed (ft.)

L_{act} = Actual length of the pipe segment (not its horizontal projection) (ft.)

$$2. \quad L_{act} = \sqrt{h_f^2 + L_{hp}^2}$$

Where, in our case:

L_{hp} = Length of the horizontal projection of the pipe segment (ft.)

Given that the results of this analysis are sometimes extreme.

- If the purpose of the air valve is to protect the system during drainage through a defined drainage valve, it will be possible to use the drainage analysis based on the orifice equation.

DRAINAGE AND RUPTURE ANALYSIS

Air intake flow rate requirement at drainage through a drain valve or a rupture is:

$$1. \quad Q_d = \frac{C_d \pi D_d^2}{4} \sqrt{2g\Delta h}$$

For drains or ruptures whose equivalent diameters are greater than 30% of the pipe diameter:

$$2. \quad Q_d = M \frac{C_d \pi D_d^2}{4} \sqrt{2g\Delta h}$$

WHY USE AIR VALVES? (CONT.)

Where:

$$3. \quad M = \sqrt{\frac{1}{1 - \left(\frac{D_d}{D_p}\right)^4}}$$

Where:

Q_d = Air intake flow rate requirement (ft³/s.)

C_d = Orifice coefficient - 0.6 is a commonly used default value

D_d = Drain valve or rupture equivalent diameter (ft.)

g = Gravitational acceleration - 32.174 ft/sec²

Δh = Elevation difference between the air valve and the drain valve or rupture (ft.)

M = Correction factor

D_p = Diameter of the pipe (ft.)

Here the initial Q_d was calculated with no losses. After the initial calculation of Q_d , we calculate the Hazen Williams friction head loss, h_f , due to this initial Q_d .

$$4. \quad h_f = \frac{Q_d^{1.852}}{K^{1.852} C_d^{1.852} D_d^{4.87}}$$

Where:

h_f = Hazen Williams friction head loss due to initial Q_d

K = Unit constant - 0.432 for U.S. units

Now, we calculate the new Δh by subtracting h_f from the initial Δh :

$$5. \quad \text{New } \Delta h = \Delta h - h_f$$

Use this new Δh in either equation 1 or equation 2 from the bottom of page 8 (depending on the size of the drain valve or rupture, relative to the pipe diameter), and calculate the final Q_d .

Given that the air valve diameter must be calculated separately for each separate air point in the system, the scope of the calculation work required could be very considerable.

To solve this problem, a software program has been developed to determine the diameter and the location for each air valve and selects from our range of air valves the most appropriate air valve for installation at each point. Use of the program is highly recommended. For further details, please contact the Mining Division at Netafim USA.

AIR AND VACUUM VALVES

AV-010 SERIES

DESCRIPTION

The AV-010 Series Air and Vacuum Valve discharges air at high flow rates during the filling of the system and admits air at high flow rates during drainage, pump shut-off or at water column separation.

The body is made of high strength composite materials. All operating parts are made of specially selected corrosion-resistant materials.

MAIN FEATURES

- Dynamic design allows for air discharge up to 8 psi differential pressure, preventing premature closing.
- Drip-tight sealing at low pressure.
- All parts are UV-protected.
- Lightweight, small dimensions, simple and reliable construction.

SPECIFICATIONS

- Working pressure range: 3 - 150 psi
- Reinforced Nylon: Available in 2", 3" female threaded NPT
- Polypropylene: Available in 3/4", 1" male threaded NPT

OPERATION

The Air and Vacuum Valve discharges air at high flow rates during the filling of the system and admits air at high flow rates during drainage, pump shut-off or at water column separation.

High velocity air cannot blow the float shut. Water entry will cause the sealing of the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth release of air prevents pressure surges and other hydraulic disturbances.



The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

As the system starts to fill, the valve functions according to the following stages:

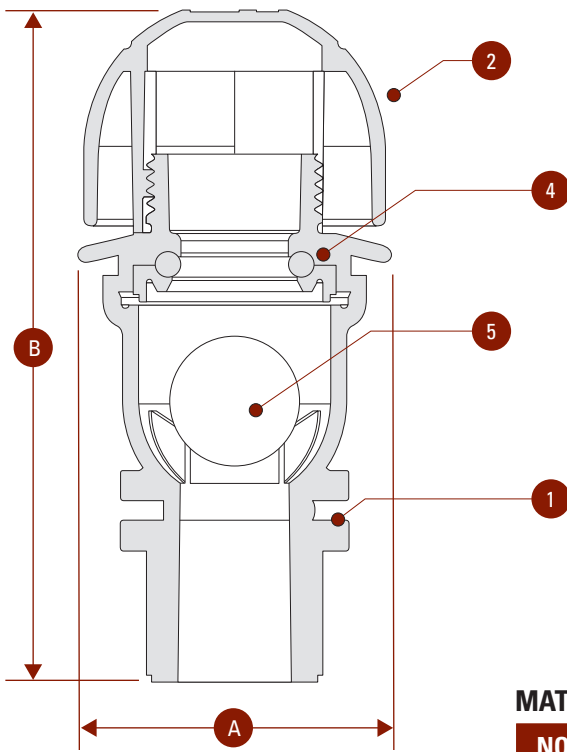
1. Air in the pipeline is discharged by the valve.
2. The liquid enters the valve, lifting the float and sealing the valve.

When internal pressure falls below atmospheric pressure (negative pressure):

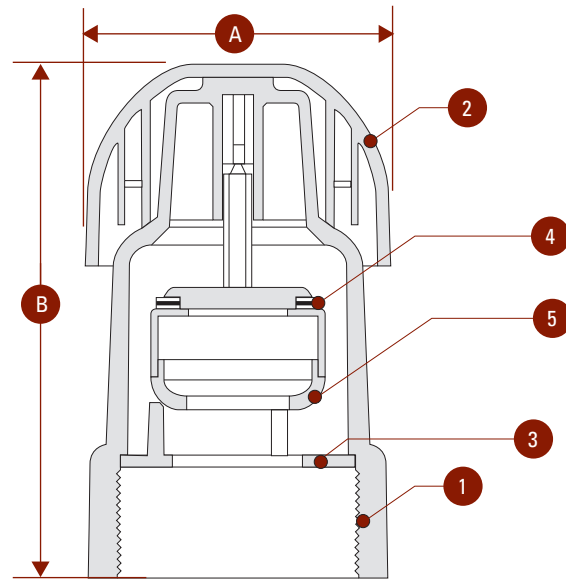
1. The float will immediately drop away from the orifice.
2. Air will enter the system.

AV-010 SERIES

3/4", 1" Models



2", 3" Models



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL 3/4", 1"	MATERIAL 2"	MATERIAL 3"
1	Body	Polypropylene	Reinforced Nylon	Reinforced Nylon
2	Cover	Polypropylene	Polypropylene	Reinforced Nylon
3	Disc	-	Reinforced Nylon	Reinforced Nylon
4	Seal	Viton	E.P.D.M.	E.P.D.M.
5	Float	Polypropylene	Reinforced Nylon	Polypropylene

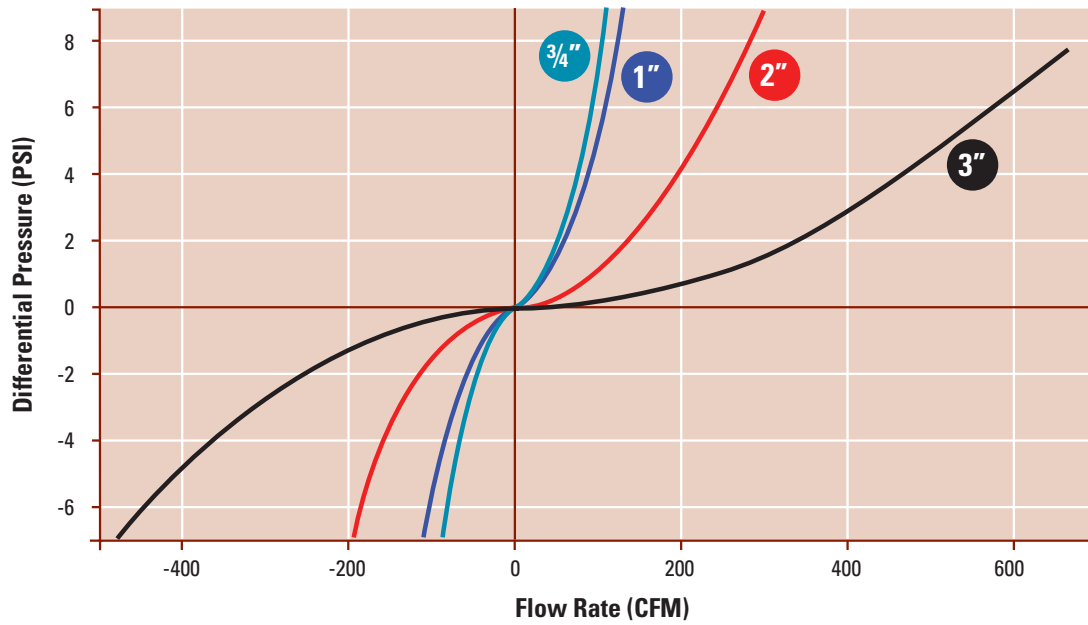
DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (lbs.)	ORIFICE AREA (in ²)
	A	B		
3/4", 1"	2 3/8	4 29/32	0.2	0.486
2"	2 7/8	4 13/19	0.4	1.24
3"	4.1	6.5	1.3	3.1

MODEL NUMBER AND CONNECTION TYPE

MODEL NUMBER	SIZE	CONNECTION	MAX. WP (PSI)
65AV0101	1"	MNPT	150
65AV0102	2"	FNPT	150
65AV0103	3"	FNPT	150
65ARI1V	1"	MNPT	150

AV-010 SERIES AIR AND VACUUM FLOW RATES



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)				
	0	2	4	6	8
3/4"	0	55	82	100	110
1"	0	60	98	112	134
2"	0	130	188	230	279
3"	0	325	460	570	690

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	-6	-5	-4	-3	-2	0
3/4"	-77	-73	-65	-50	-36	0
1"	-100	-93	-85	-75	-42	0
2"	-192	-176	-162	-135	-115	0
3"	-455	-405	-370	-315	-265	0



AIR AND VACUUM VALVES

K-01 SERIES

DESCRIPTION

The K-01 Series Air and Vacuum Valve discharges air during the filling or charging of the system and admits air into the system during system drainage, valve or pump shut-off or at water column separation.

MAIN FEATURES

- Reliable operation, reduces water hammer incidents.
- Lightweight, small dimensions, simple and reliable construction.
- Special orifice seat design: combination of a stainless steel seat and an E.P.D.M. or Viton seal assures long-term maintenance-free operation.

PRODUCT SELECTION

- Available in 2", 3", 4", and 6".
- The Air and Vacuum Valve is also available as a Combination Air Valve which includes the addition of a continuous acting Air Release Valve.
- These valves are manufactured with flanged ends to meet any required standard. The 2" valve is also available with NPT male threads.



Air and Vacuum Valve
K-01



Air and Vacuum Valve
K-01STST

SPECIFICATIONS

- Working pressure range:
K-010: 3 - 250 psi
K-010 STST: 3 - 275 psi
K-014 and K-014 STST: 3 - 580 psi
- Testing pressure: 1.5x max working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2, stainless steel optional.

K-01 SERIES

OPERATION

The Air and Vacuum Valve discharges air at high flow rates during the filling of the system and admits air at high flow rates during the drainage, pump shut-off or at water column separation.

High velocity air will not blow the float shut. Water entry will cause the sealing of the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth release of air prevents pressure surges and other hydraulic disturbances.

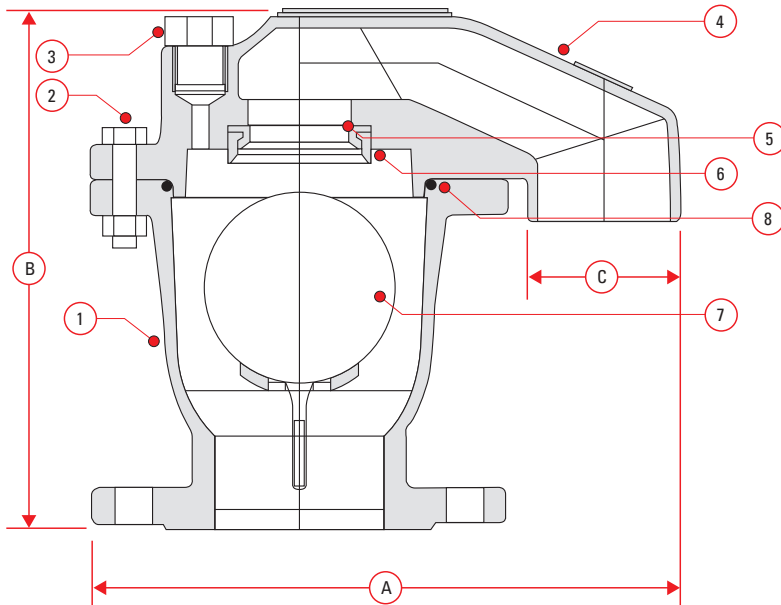
The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. The liquid enters the valve, lifting the float and sealing the valve.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The float will immediately drop away from the orifice.
2. Air will enter the system.



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Body	Ductile Iron ASTM A-536 60-40-18* Ductile Iron ASTM A-536 60-40-18* Stainless Steel SAE 316**
2	Bolt and Nut	Stainless Steel SAE 316
3	Plug	Stainless Steel SAE 316
4	Cover	Ductile Iron ASTM A-536 60-40-18* Ductile Iron ASTM A-536 60-40-18* Stainless Steel SAE 316**
5	Orifice Seat	Stainless Steel SAE 316
6	Orifice Seal	E.P.D.M.* , Viton**
7	Float	Stainless Steel SAE 316
8	O-Ring	BUNA-N* , Viton**
-	Basket (2")	Polypropylene

* 65K010, 65K014

** 65K010STST, 65K014STST

MODEL NUMBER AND FLANGE TYPE

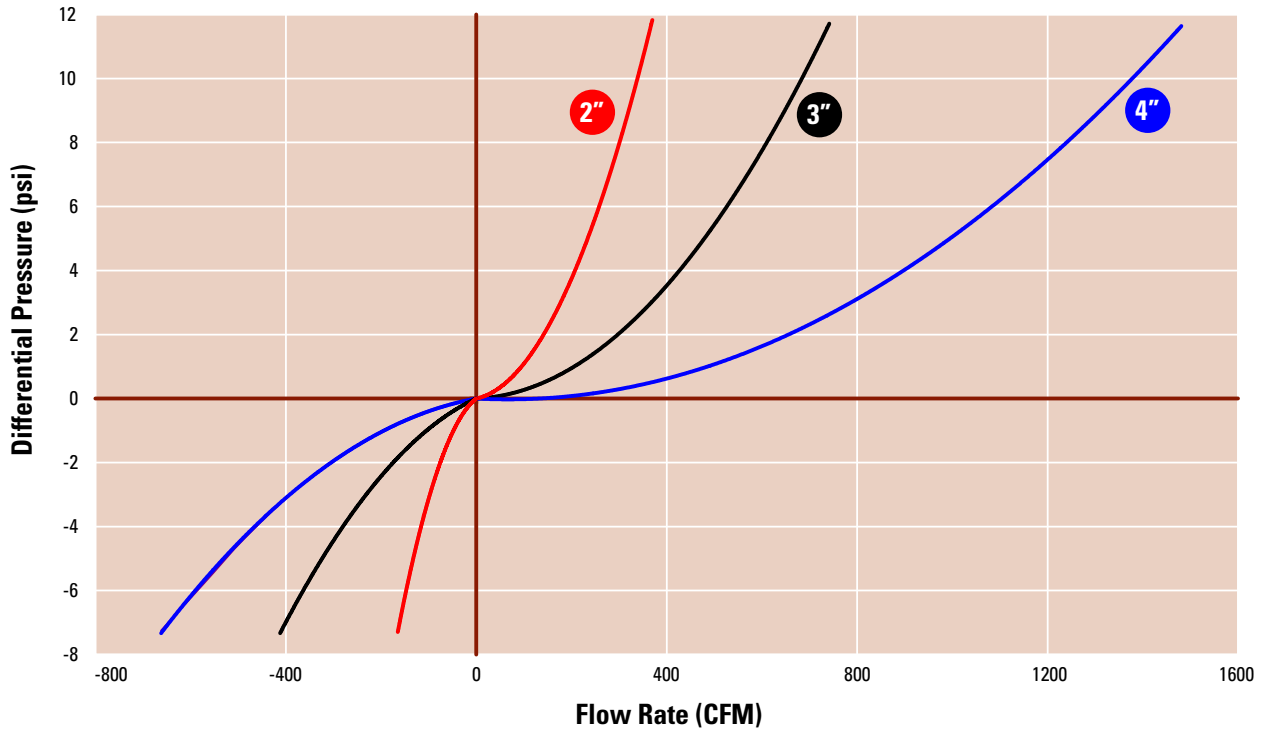
MODEL NUMBER	SIZE	CONNECTION	PSI
65K0102T	2"	MNPT	250
65K0102	2"	150 lb. Flg.	250
65K0103	3"	150 lb. Flg.	250
65K0104	4"	150 lb. Flg.	250
65K0106	6"	150 lb. Flg.	250
65K0142	2"	300 lb. Flg.	580
65K0143	3"	300 lb. Flg.	580
65K0144	4"	300 lb. Flg.	580
65K0146	6"	300 lb. Flg.	580
65K0102TSTST	2"	MNPT	275
65K0102STST	2"	150 lb. Flg.	275
65K0103STST	3"	150 lb. Flg.	275
65K0104STST	4"	150 lb. Flg.	275
65K0106STST	6"	150 lb. Flg.	275
65K0142STST	2"	300 lb. Flg.	580
65K0143STST	3"	300 lb. Flg.	580
65K0144STST	4"	300 lb. Flg.	580
65K0146STST	6"	300 lb. Flg.	580

DIMENSIONS AND WEIGHTS

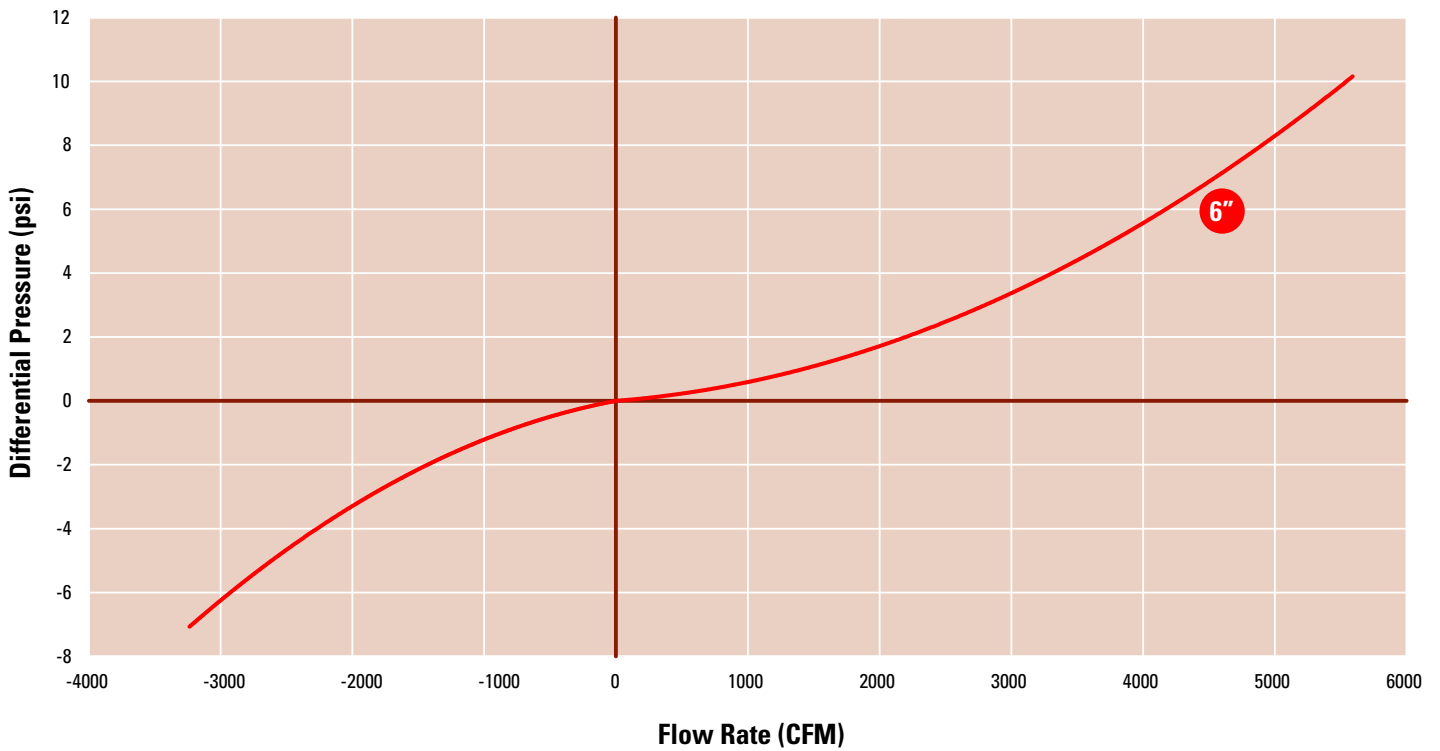
SIZE	DIMENSIONS (IN)				WEIGHT (LBS.)	ORIFICE AREA (IN ²)
	A	B	INT. C	EXT. C		
2" Threaded	6.8	8.9	1.5 BSP	-	18.5	1.23
2" Flanged	6.8	9.9	1.5 BSP	-	25.1	1.23
3"	11.3	10.0	2.5	2.9	39.0	2.8
4"	13.2	10.7	3	3.8	60.0	5.14
6"	21.7	20.9	4.1	5.6	170.0	27.0

K-01 SERIES

K-01 SERIES AIR & VACUUM FLOW RATE



K-01 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)						
	0	2	4	6	8	10	12
2"	0	140	205	255	297.5	335	368.4
3"	0	334	465	565.5	650	725	792
4"	0	650	886	1,069	1,223	1,360	1,483
6"	0	2290	3,365	4,182	4,900	5,530	6,100

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)						
	-7.5	-6	-5	-4	-3	-2	0
2"	-171	-150.2	-135	-118.2	-99.3	-77	0
3"	-400	-348	-310.3	-269	-223	-169	0
4"	-689	-600	-535	-465	-383	-290	0
6"	-3,280	-2,980	-2,300	-2,300	-1,900	-1,435	0



AIR AND VACUUM VALVES

FOR LIQUIDS WITH
SUSPENDED SOLIDS
K-020 SERIES

DESCRIPTION

The K-020 Air and Vacuum Valve discharges air during the filling or charging of the system and admits air to the system during system drainage.

The valve is specially designed to operate with liquids carrying solid particles.

The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

MAIN FEATURES

- The valve's unique design prevents any contact between liquids and the sealing mechanism by creating an air gap at the top of the valve. This air gap is guaranteed even under extreme conditions.
- Those features are achieved by:
 - The conical body shape: designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - Independent spring-guided linkage between the lower float/rod assembly and the upper float sealing mechanism: allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
 - Funnel-shaped lower body: designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.
- Flushing is possible while the valve is under pressure by opening the ball valve in the valve's lower part.
- All inner metal parts made of Stainless Steel SAE 316.



**Air and Vacuum Valve
for Liquids with Suspended Solids**

K-020



**Air and Vacuum Valve
for Liquids with Suspended Solids**

K020STST

PRODUCT SELECTION

- Available with 3" and 4" ANSI flanges
- Body made of Steel DIN 37; also available in stainless steel.

SPECIFICATIONS

- Working pressure range: 3 - 250 psi
- Testing Pressure: 360 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

K-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

OPERATION

The K-020 Air and Vacuum Valves discharge air at high flow rates during the filling of the system and admit air into the system at high flow rates during its drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

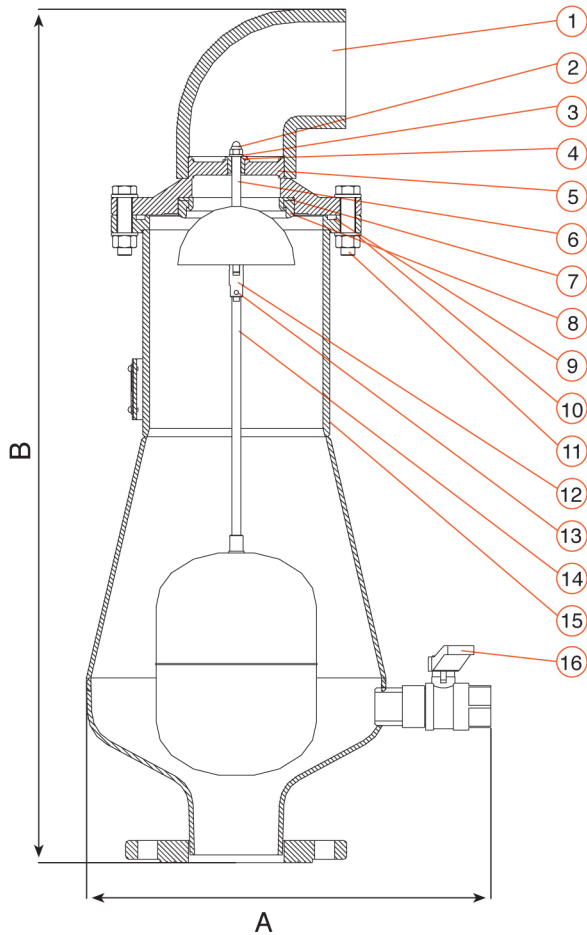
As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline discharged by the valve.
2. When the liquid level reaches the valve's lower portion, the float is lifted, pushing the sealing mechanism to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum orifice.
2. Air will enter the system.

K-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Discharge Outlet	PVC* Stainless Steel SAE 316**
2	Crown Nut	Stainless Steel SAE 316
3	Washer	Stainless Steel SAE 316
4	Bushing	Teflon
5	Cover	Cast Iron ASTM A48* Stainless Steel SAE 316**
6	Stem + Spherical Flap	Stainless Steel SAE 316
7	Orifice Seat	Stainless Steel SAE 316
8	Orifice Seal	E.P.D.M.*, Viton**
9	O-Ring	BUNA-N*, Viton**
10	Bolt	Stainless Steel SAE 316
11	Nut	Stainless Steel SAE 316
12	Joint	Stainless Steel SAE 316
13	Pin	Stainless Steel SAE 316
14	Stem + Float	Stainless Steel SAE 316
15	Body	Steel DIN St.37* Stainless Steel SAE 316**
16	Ball Valve 1"	Stainless Steel SAE 316

* 65K020

** 65K020ST

DIMENSIONS AND WEIGHTS

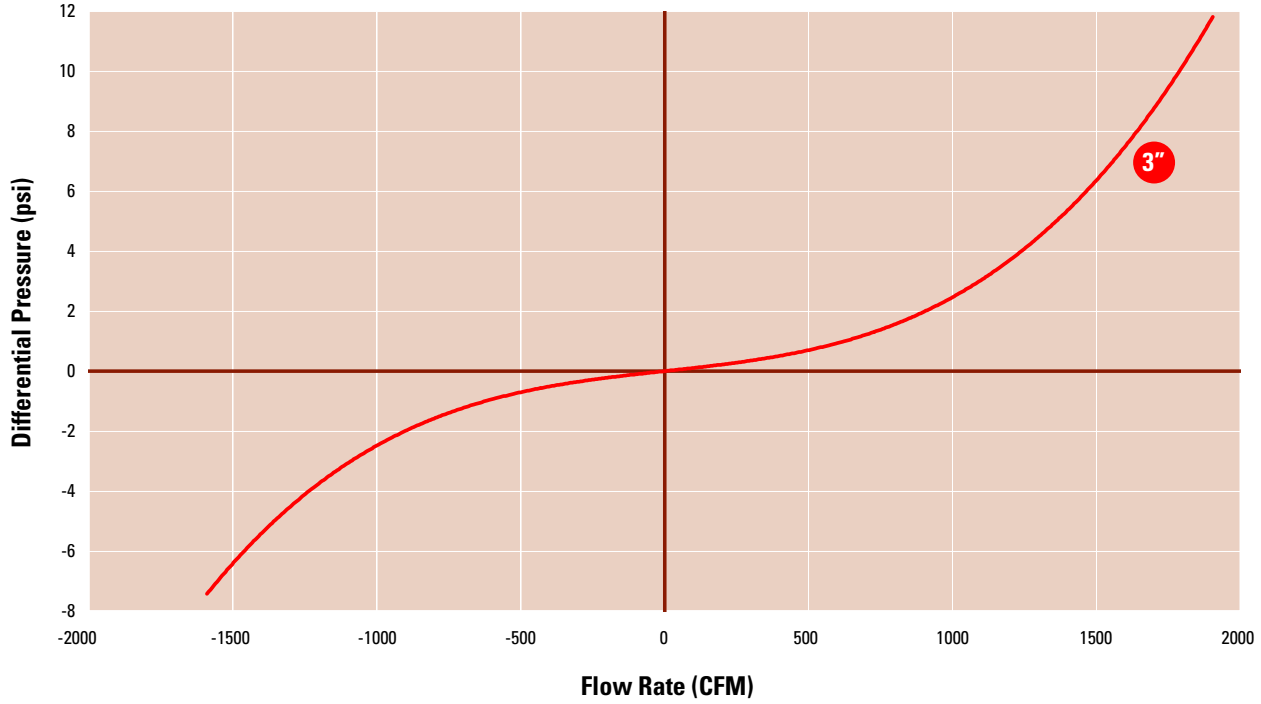
SIZE	DIMENSIONS		WEIGHT (LBS.)		ORIFICE AREA (IN ²) AIR & VACUUM
	A	B	STEEL	ST. ST	
3"	16.8	30.7	53.7	56.0	7.79
4"	16.8	30.7	57.3	59.3	7.79

MODEL NUMBER AND FLANGE TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65K0203	3"	150 lb. Flg.	250
65K0204	4"	150 lb. Flg.	250
65K0203STST	3"	150 lb. Flg.	250
65K0204STST	4"	150 lb. Flg.	250

K-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

K-020 AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)						
	0	2	4	6	8	10	12
3" & 4"	0	914	1,257	1,479	1,650	1,791	1,913

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-8	-7	-6	-5	-4	-3	-2	0
3" & 4"	-1,667	-1,574	-1,472	-1,359	-1,233	-1,085	-904	0

AIR AND VACUUM VALVES

FOR HIGH FLOW
K-06 SERIES

DESCRIPTION

The K-06 HF Series Air and Vacuum Valve discharges air during the filling or charging of the system and admits air into the system during system drainage, valve or pump shut-off or at water column separation.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- NSF 61 certified.
- Screen protected outlet upper screen is protected with a protective cover.

PRODUCT SELECTION

- Size Range: 2" - 10"
- These valves are manufactured with flanged ends to meet ASA standard (65K060 HF ASA 150, 65K064 HF ASA 300) or any requested standard.
- The 2" valve is also available with a threaded male NPT connection.
- Other coatings are available upon request.
- The 65K060HF Series Air and Vacuum Air Valve is also available as a combination air valve with the addition of an automatic air release valve.



Air and Vacuum Valve
K-06

SPECIFICATIONS

- Working pressure range:
65K060: 3 - 250 psi
65K064: 3 - 580 psi
- Testing pressure: 1.5 times working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- FBE coating, both interior & exterior, in accordance with standard DIN 30677-2

K-06 SERIES

OPERATION

The air and vacuum valve discharges air at high flow rates during the filling of the system and admits air at high flow rates during the drainage, pump shut-off or at water column separation. High velocity air will not blow the float shut. Water entry will cause the sealing of the valve. At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

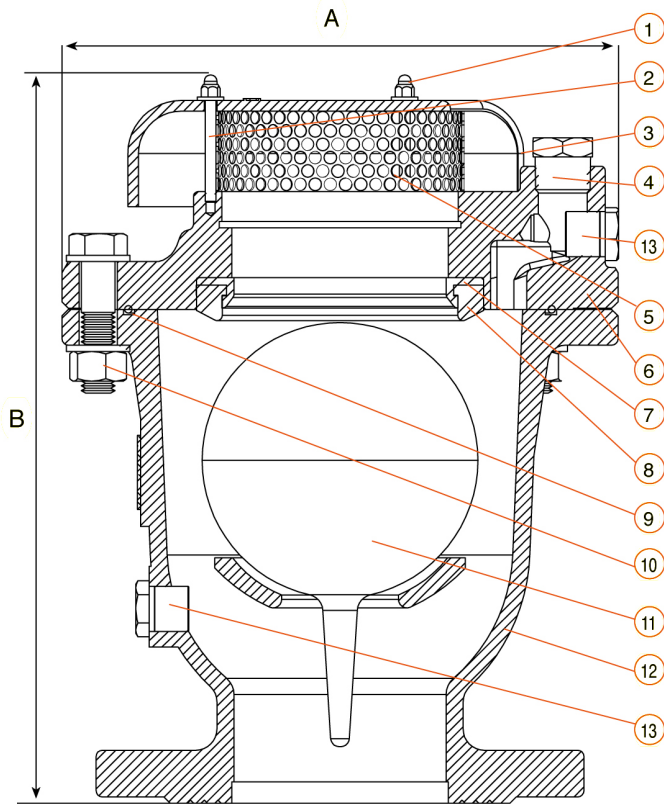
The smooth release of air reduces pressure surges and other hydraulic disturbances. The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. The liquid enters the valve, lifting the float and sealing the valve.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The float will immediately drop away from the orifice.
2. Air will enter the system.



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Nut	NSF 61 Certified STST UNS 30400
2	Bolt	NSF 61 Certified STST UNS 30400
3	Screen Cover	Cast Iron ASTM A48 CL.35B/ Resicoat RT R4
4	Plug	NSF 61 Certified STST UNS 30400
5	Screen	NSF 61 Certified STST UNS 30400
6	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
7	Orifice Seat	NSF 61 Certified STST UNS 30400
8	Orifice Seal	NSF 61 Certified E.P.D.M
9	O-Ring	NSF 61 Certified NBR 70
10	Bolt & Nut	NSF 61 Certified STST UNS 30400
11	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
12	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
13	Plug	NSF 61 Certified Reinforced Nylon

DIMENSIONS AND WEIGHTS

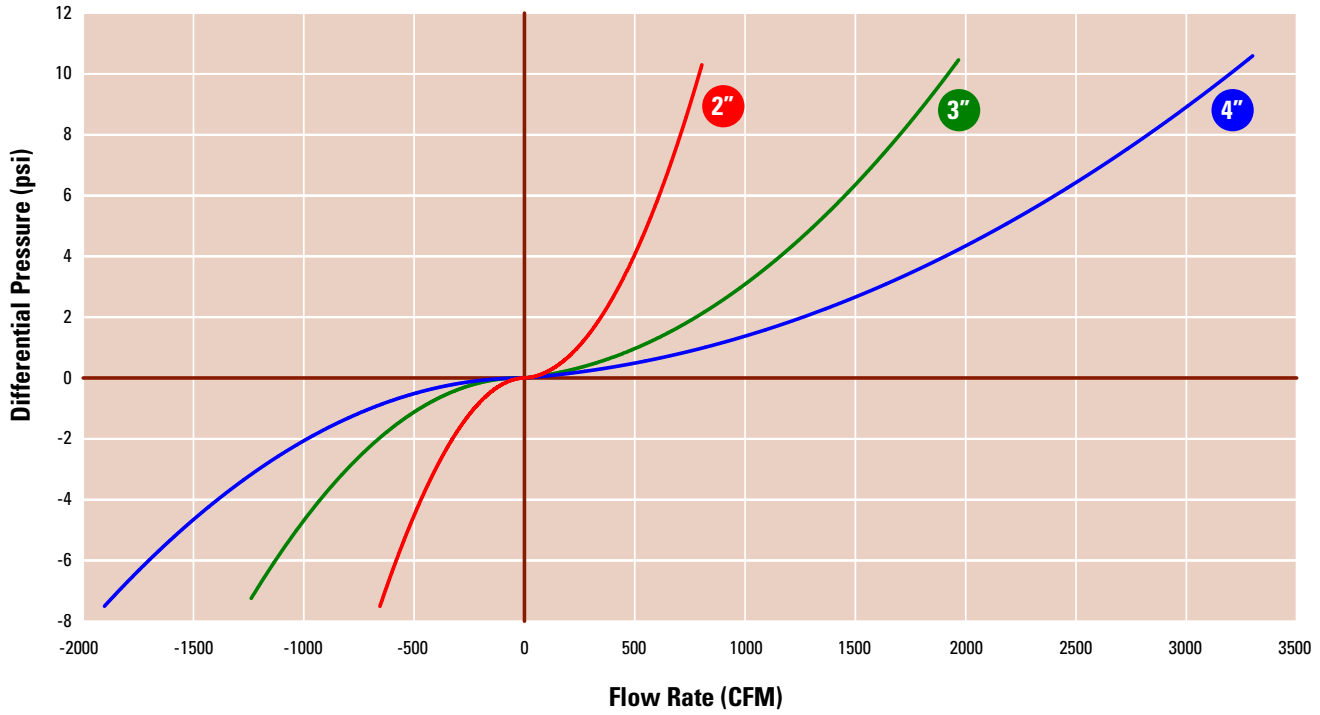
SIZE	DIMENSIONS		WEIGHT (LBS.)	ORIFICE AREA (IN ²) AIR & VACUUM
	A	B		
2" Threaded	7.6	11.3	27.3	3.038
2" Flanged	7.6	8.6	27.3	3.038
3"	8.9	14.2	42.7	7.796
4"	10.3	16.6	60.3	12.167
6"	14.7	26.4	199.2	27.376
8"	18.2	30.7	305.0	48.670
10"	23.0	36.6	676.4	76.08

MODEL NUMBER AND FLANGE TYPE

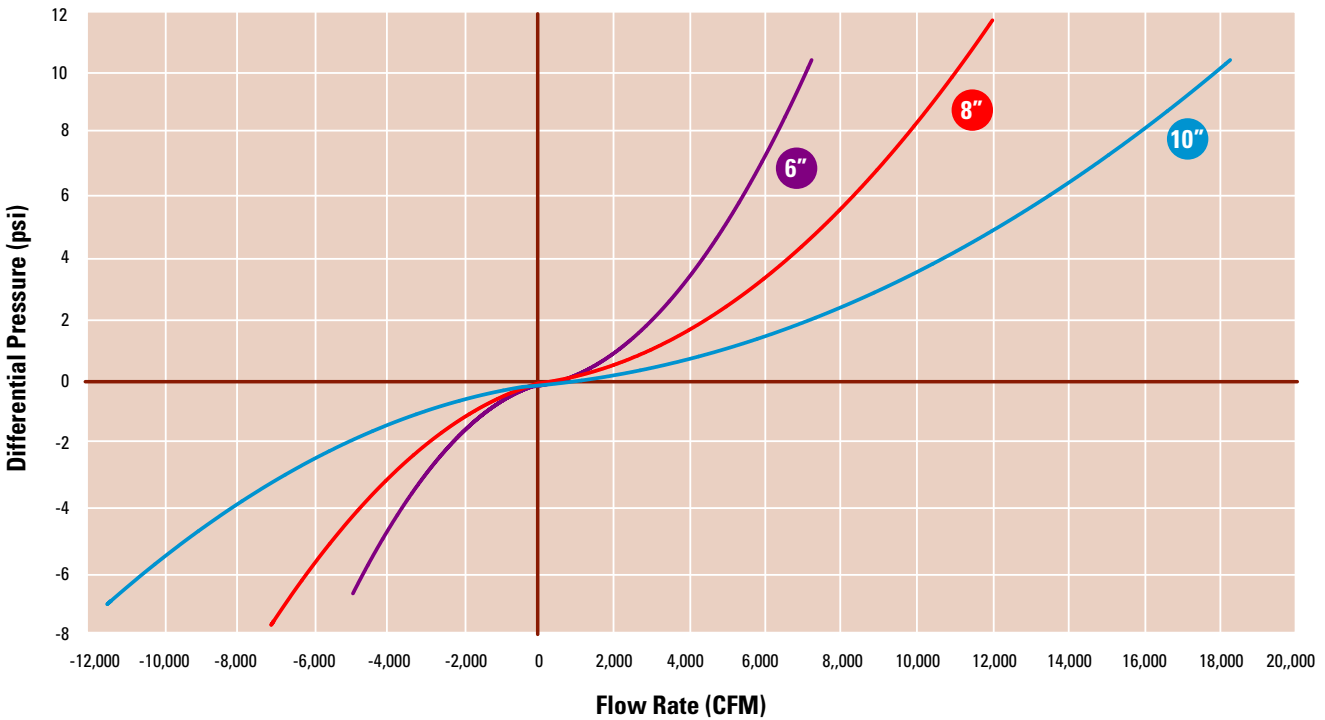
MODEL #	SIZE	CONNECTION	PSI
65K0602T	2"	MNPT	250
65K0602	2"	150 lb. Flg.	250
65K0603	3"	150 lb. Flg.	250
65K0604	4"	150 lb. Flg.	250
65K0606	6"	150 lb. Flg.	250
65K0608	8"	150 lb. Flg.	250
65K06010	10"	150 lb. Flg.	250
65K0642	2"	300 lb. Flg.	580
65K0643	3"	300 lb. Flg.	580
65K0644	4"	300 lb. Flg.	580
65K0646	6"	300 lb. Flg.	580
65K0648	8"	300 lb. Flg.	580
65K06410	10"	300 lb. Flg.	580

K-06 SERIES

K-060, K-064 AIR & VACUUM FLOW RATE



K-060, K-064 AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	4	6	8	10
2"	0	368	497	597	682	757
3"	0	750	1,155	1,465	1,730	1,965
4"	0	1,250	1,890	2,390	2,810	3,180
6"	0	2,850	4,200	5,150	6,000	6,740
8"	0	4,465	6,660	8,350	9,770	11,030
10"	0	7,820	10,890	13,410	15,880	17,950

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-8	-7	-6	-5	-4	-3	-2	0
2"	-655	-615	-571	-523	-470	-410	-340	0
3"	-1,316	-1,235	-1,146	-1,051	-945	-825	-685	0
4"	-1,998	-1,869	-1,730	-1,579	-1,412	-1,222	-1,000	0
6"	-4,920	-4,250	-3,790	-3,285	-2,720	-2,060	-1,240	0
8"	-7,360	-6,800	-6,190	-5,540	-4,810	-4,000	-3,060	0
10"	-12,100	-11,400	-10,380	-9,550	-8,570	-7,300	-6,210	0

AIR AND VACUUM VALVES

FOR HIGH FLOW
K-06NS SERIES

DESCRIPTION

The K-06NS Series Air and Vacuum Valve discharges air during the filling or charging of the system and admits air into the system during system drainage, valve or pump shut-off or at water column separation.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- NSF 61 certified.
- Screen protected outlet upper screen is protected with a protective cover.

PRODUCT SELECTION

- Size Range: 2" - 10"
- These valves are manufactured with flanged ends to meet ASA standard (65K060 NS ASA 150, 65K064 NS ASA 300) or any requested standard.
- The 2" valve is also available with a threaded male NPT connection.
- Other coatings are available upon request.
- The 65K060NS Series Air and Vacuum Air Valve is also available as a combination air valve with the addition of an automatic air release valve.



Air and Vacuum Valve
K-06NS

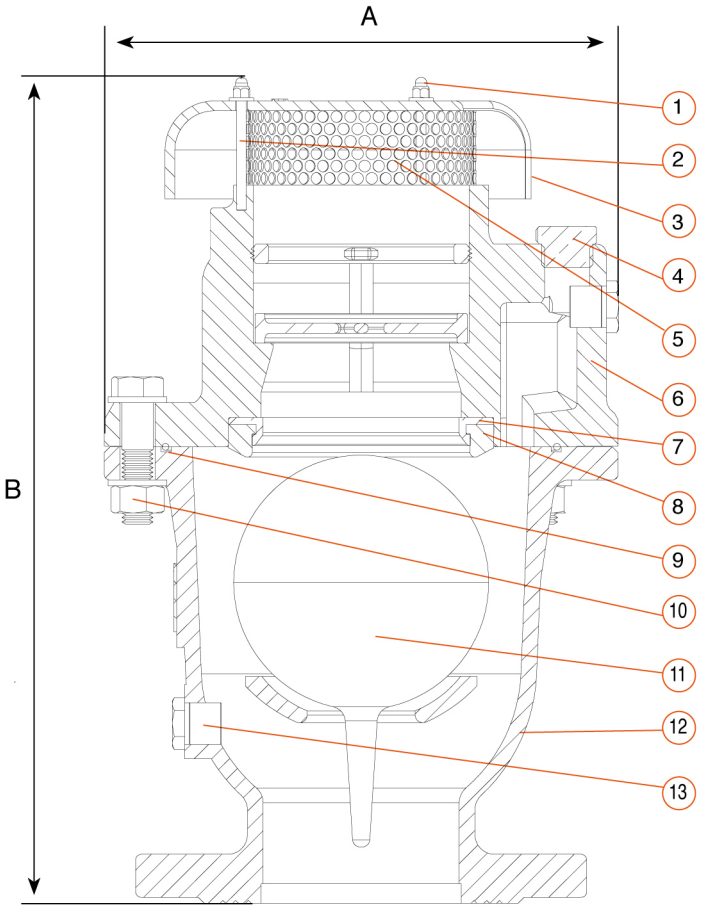
SPECIFICATIONS

- Working pressure range:
65K060NS: 3 - 250 psi
65K064NS: 3 - 580 psi
- Testing pressure: 1.5 times working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- FBE coating, both interior & exterior, in accordance with standard DIN 30677-2

K-06NS SERIES

OPERATION

The 65K060 NS Series Combination Non-Slam Air Valve is a surge-dampening, slam-preventing, 3 stage combination air valve. The air valve provides high capacity vacuum protection and, at the same time, efficient surge suppression. At sudden drainage and/or water column separation (sudden pump trips or valve closure for instance) the air and vacuum orifice admits air at high flow rates, thus preventing vacuum. As the water column and/or pressure wave returns, large volumes of air are discharged at high velocities, raising the non-slam disc, partially closing the air and vacuum orifice and allowing air to exhaust slowly through the smaller orifice of the non-slam disc. This slowly exhausting air pocket dampens the slam of the returning water column, thus suppressing the pressure surge. As the water flow arrives at a much slower rate, dampened by the slower air discharge, it buoys up the main float, gently closing the air and vacuum component of the air valve .



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Nut	NSF 61 Certified STST UNS 30400
2	Bolt	NSF 61 Certified STST UNS 30400
3	Screen Cover	Cast Iron ASTM A48 CL35B/ Resicoat RT R4
4	Plug	NSF 61 Certified STST UNS 30400
5	Screen	NSF 61 Certified STST UNS 30400
6	Cover	Cast Iron ASTM A48 CL35B/ Resicoat RT R4
7	Orifice Seat	NSF 61 Certified STST UNS 30400
8	Orifice Seal	NSF 61 Certified E.P.D.M
9	O-Ring	NSF 61 Certified NBR 70
10	Bolt & Nut	NSF 61 Certified STST UNS 30400
11	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
12	Body	Cast Iron ASTM A48 CL35B/ Resicoat RT R4
13	Plug	NSF 61 Certified Reinforced Nylon

DIMENSIONS AND WEIGHTS

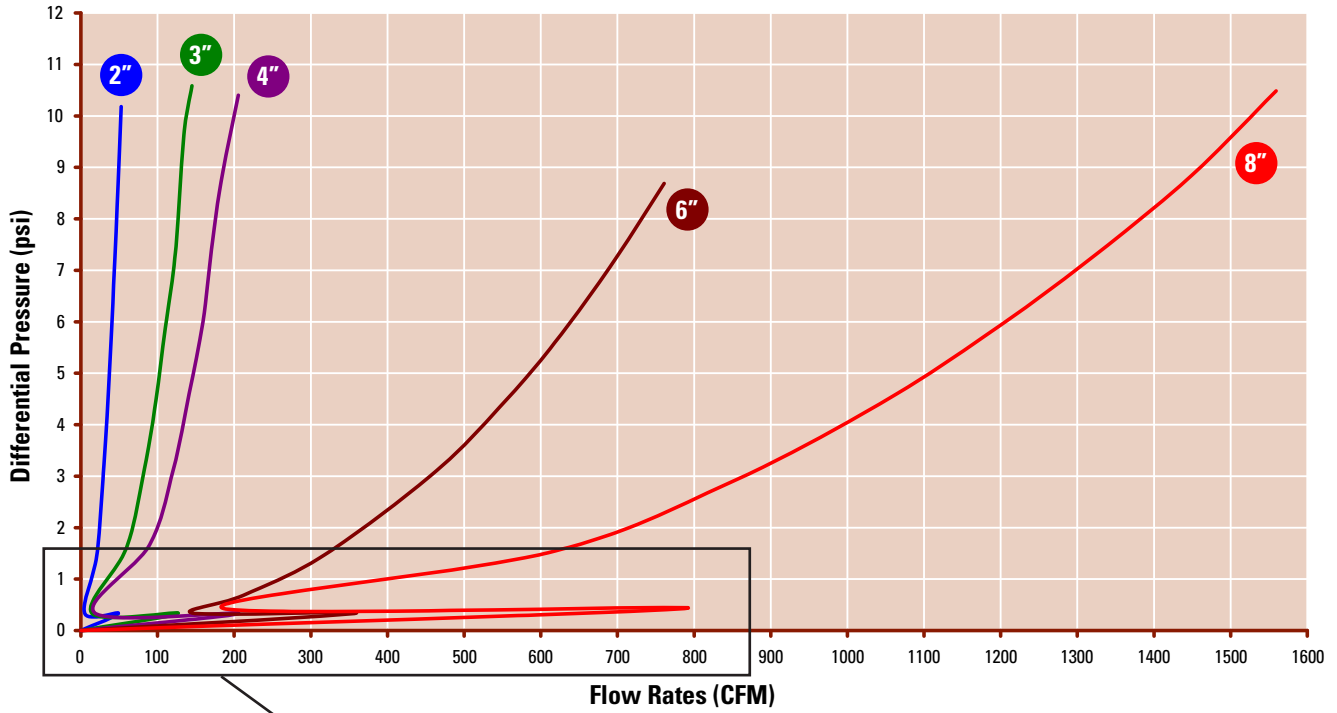
SIZE	DIMENSIONS		WEIGHT (LBS.)	ORIFICE AREA (IN ²) AIR & VACUUM
	A	B		
2" Threaded	7.6	11.3	27.3	3.038
2" Flanged	7.6	8.6	27.3	3.038
3"	8.9	14.2	42.7	7.796
4"	10.3	16.6	60.3	12.167
6"	14.7	26.4	199.2	27.376
8"	18.2	30.7	305.0	48.670
10"	23.0	36.6	676.4	76.08

MODEL NUMBER AND FLANGE TYPE

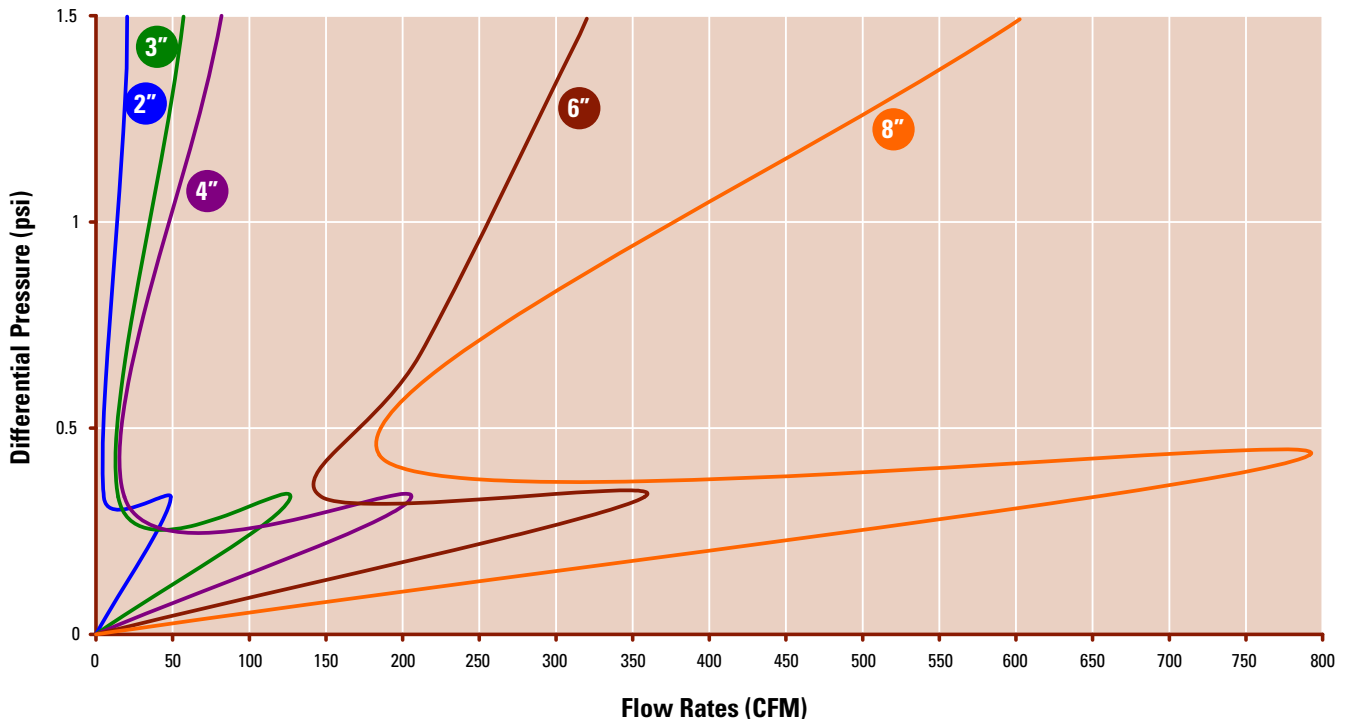
MODEL #	SIZE	CONNECTION	PSI
65K0602TNS	2"	MNPT	250
65K0602NS	2"	150 lb. Flg.	250
65K0603NS	3"	150 lb. Flg.	250
65K0604NS	4"	150 lb. Flg.	250
65K0606NS	6"	150 lb. Flg.	250
65K0608NS	8"	150 lb. Flg.	250
65K06010NS	10"	150 lb. Flg.	250
65K0642NS	2"	300 lb. Flg.	580
65K0643NS	3"	300 lb. Flg.	580
65K0644NS	4"	300 lb. Flg.	580
65K0646NS	6"	300 lb. Flg.	580
65K0648NS	8"	300 lb. Flg.	580
65K06410NS	10"	300 lb. Flg.	580

K-06NS SERIES

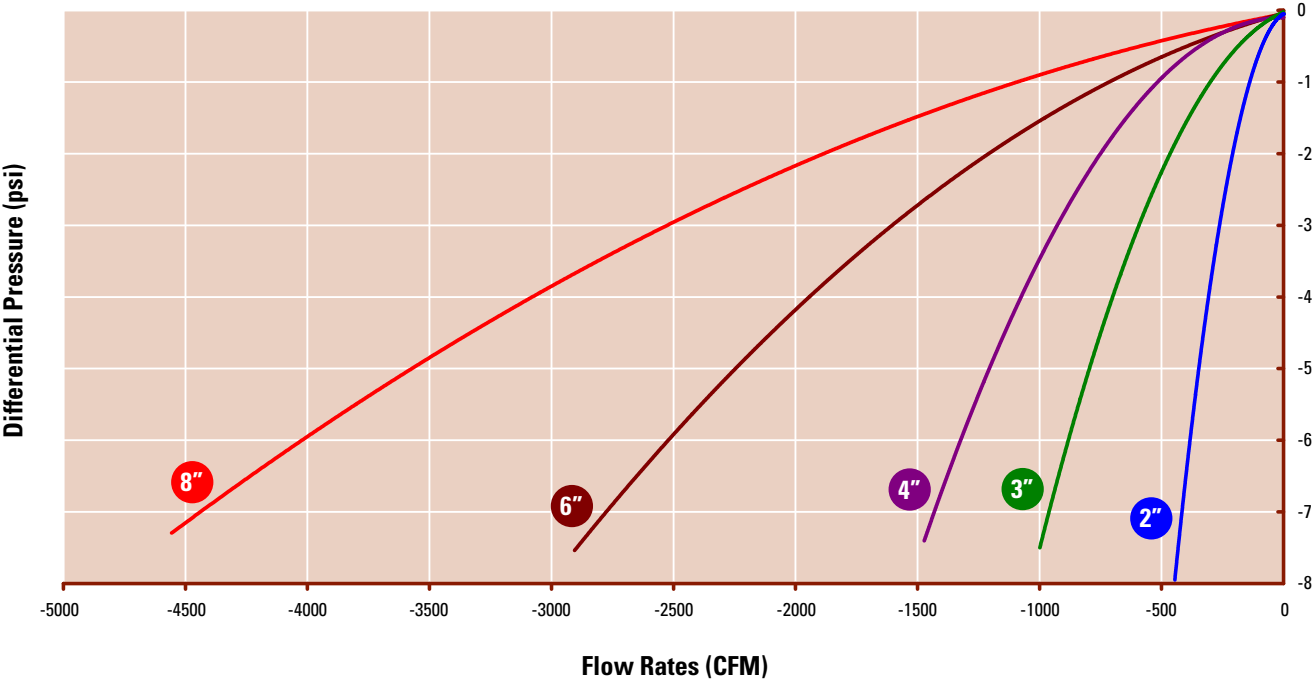
K-060NS K-064NS 2" - 8"
DISCHARGE FLOW RATE



ENLARGED SECTION FROM ABOVE CHART
K-060 HF NS AIR DISCHARGE SWITCHING REGION



K-060, K-064 HF NS INTAKE FLOW RATES



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	4	6	8	10
2"	0	24	34	41	47	52
3"	0	68	93	111	127	137
4"	0	100	133	159	175	200
6"	0	370	525	640	730	823
8"	0	710	1,000	1210	1,385	1,530

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-7.5	-7	-6	-5	-4	-3	-2	0
2"	-428	-418	-382	-348	-310	-270	-210	0
3"	-1,020	-965	-890	-795	-705	-592	-495	0
4"	-1,490	-1,435	-1,320	-1,205	-1,080	-935	-780	0
6"	-2,900	-2,790	-2,520	-2,280	-1,960	-1,585	-1,205	0
8"	-4,610	-4,450	-4,035	-3,580	-3,100	-2,590	-1,850	0

COMBINATION AIR VALVES

D-01 SERIES

DESCRIPTION

The D-01 Series Combination Air Valve has the features of both a continuous acting air release valve and an air and vacuum valve.

The air release component is designed to continuously release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air and vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

It is specially designed to operate under pressures ranging up to up to 580 psi.

MAIN FEATURES

AIR AND VACUUM COMPONENT

- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: combination of stainless steel seat and an E.P.D.M. or Viton rubber seal assures long-term maintenance-free operation.

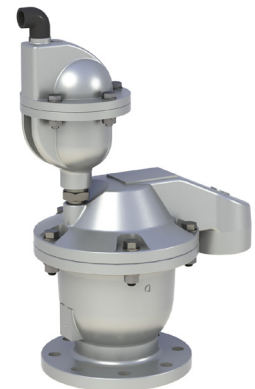
AIR RELEASE COMPONENT

- Body made of high strength materials.
- All operating parts are made of specially selected corrosion-resistant polymer materials.
- Large orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Releases air at high flow rates.
 - One size orifice for a wide pressure range (up to 580 psi) achieved by a patented rolling real mechanism.
- Stainless steel float and inner parts made of corrosion-resistant materials.



Combination Air Valve for High Pressure

D-01



Combination Air Valve for High Pressure

D-01 STST

PRODUCT SELECTION

- Available in 2" - 6".
- The air release component and the air and vacuum component are available as separate units.
- These valves are manufactured with flanged ends to meet any requested standard.
- Valves may be adapted to various types of liquid upon request.
- For installation, please refer to Recommendations for Air Valves.

SPECIFICATIONS

- Working pressure range:
 - D-010: 3 - 250 psi (ASA 150 + 2" NPT)
 - D-012: 3 - 360 psi (ASA 300)
 - D-010STST: 3 - 285 psi (ASA 150 + 2" NPT)
 - D-015 and D-015STST: 3 - 580 psi (ASA 300 + 2" NPT 3 - 360 psi)
- Testing pressure: 1.5 times maximum working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

D-01 SERIES

OPERATION

The air and vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air reduces pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the valve functions according to the following stages:

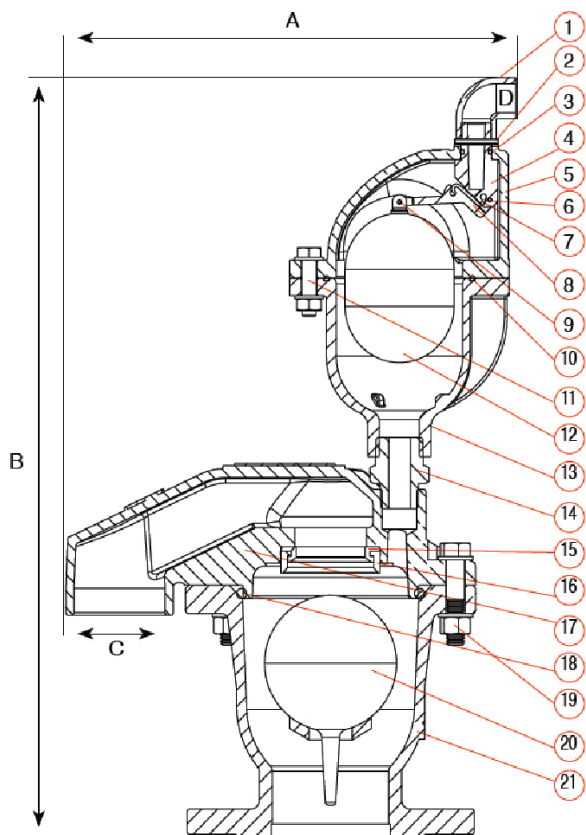
1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float drops down, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the air release and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

MODEL NUMBER AND FLANGE TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65D0102	2"	150 lb. Flg.	250
65D0103	3"	150 lb. Flg.	250
65D0104	4"	150 lb. Flg.	250
65D0106	6"	150 lb. Flg.	250
65D0122	2"	300 lb. Flg.	360
65D0123	3"	300 lb. Flg.	360
65D0124	4"	300 lb. Flg.	360
65D0126	6"	300 lb. Flg.	360
65D0152	2"	300 lb. Flg.	580
65D0153	3"	300 lb. Flg.	580
65D0154	4"	300 lb. Flg.	580
65D0156	6"	300 lb. Flg.	580
65D0102STST	2"	150 lb. Flg.	285
65D0103STST	3"	150 lb. Flg.	285
65D0104STST	4"	150 lb. Flg.	285
65D0106STST	6"	150 lb. Flg.	285
65D0152STST	2"	300 lb. Flg.	580
65D0153STST	3"	300 lb. Flg.	580
65D0154STST	4"	300 lb. Flg.	580
65D015STST	6"	300 lb. Flg.	580



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Discharge Outlet	PVC
2	Pin	Stainless Steel SAE 304
3	O-Ring	Buna-N*, Viton**
4	Orifice	Reinforced Nylon*, Polypropylene**
5	Cover	Ductile Iron ASTM A536 60-40-18* Stainless Steel SAE 316**
6	Pin	Stainless Steel SAE 304
7	Rolling Seal	EPDM*, Viton**
8	Lever	Reinforced Nylon*, Polypropylene**
9	Pin	Stainless Steel SAE 304
10	O-Ring	Buna-N*, Viton**
11	Bolt, Nut and Washer	Steel, Zinc Cobalt Plated*, Stainless Steel SAE 316**
12	Float	Stainless Steel SAE 316
13	Body	Ductile Iron ASTM A536 60-40-18* Stainless Steel SAE 316**
14	Adapter	Brass ASTM B124*, Stainless Steel SAE 316**
15	Orifice Seat	Bronze ASTM B-62 B271 C83600*, Stainless Steel SAE 316**
16	Orifice Seal	EPDM*, Viton**
17	Cover	Ductile Iron ASTM A536 60-40-18* Stainless Steel SAE 316**
18	O-Ring	Buna-N*, Viton**
19	Bolt, Nut and Washer	Steel, Zinc Cobalt Plated*, Stainless Steel SAE 316**
20	Float	Stainless Steel SAE316
21	Body	Ductile Iron ASTM A536 60-40-18* Stainless Steel SAE 316**

* D-015

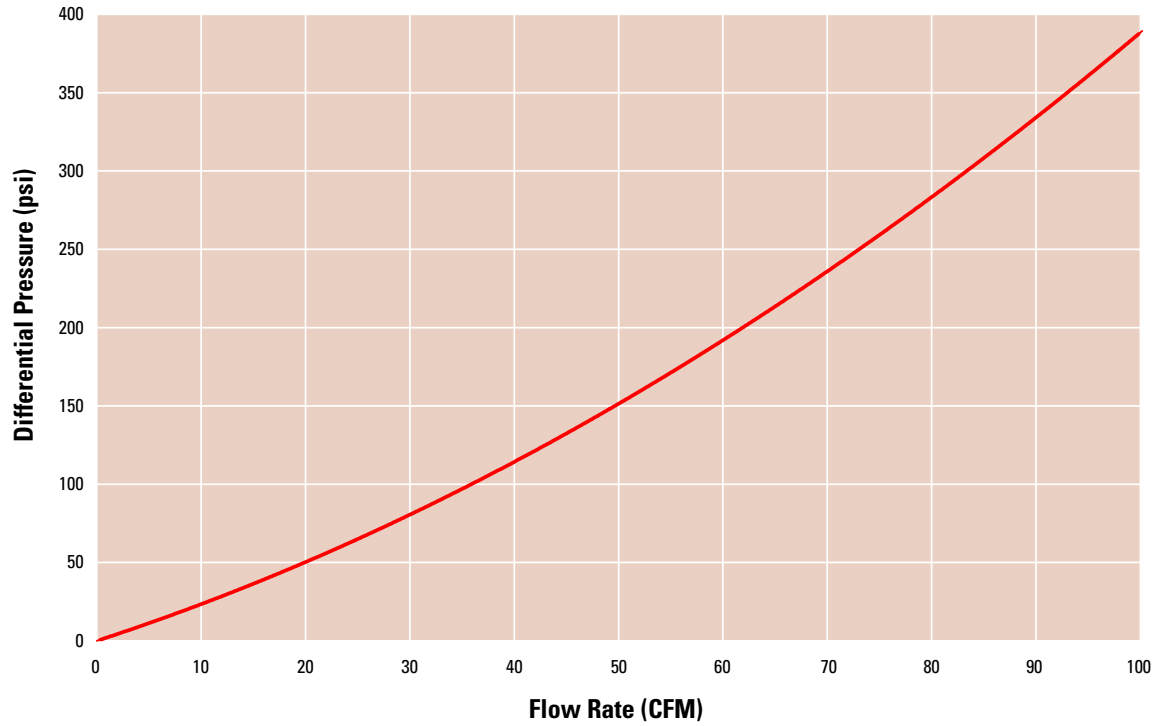
** D-015STST, D010STST

DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)		ORIFICE AREA (IN ²)	DRAINAGE OUTLET (IN)	
	A	B	150 LB FLG	300 LB FLG		INTERNAL (C)	EXTERNAL (D)
2"	13	17.9	37	53.8	1.23	1.5	-
3"	13	19.8	42.6	84.7	2.80	2.5	2.9
4"	15.1	20.2	60.4	117.7	5.10	3.1	3.8
6"	22.7	28.7	174	215	27.4	4.9	5.5

D-01 SERIES

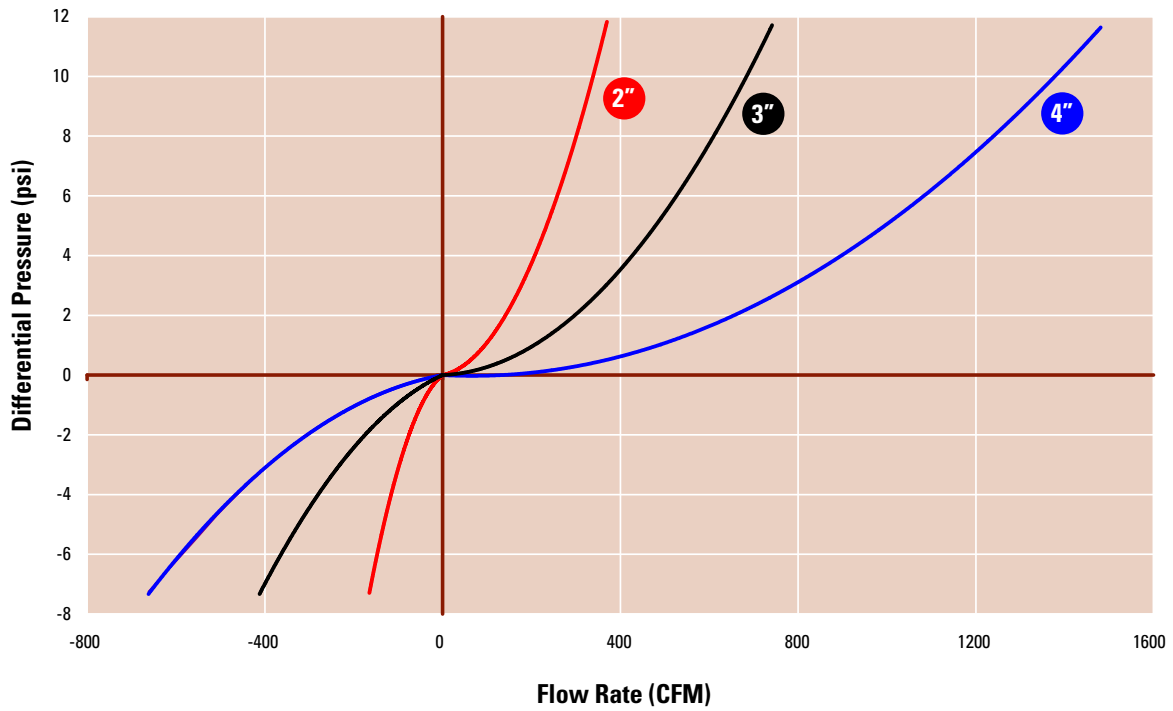
D-01 SERIES AIR RELEASE FLOW RATE



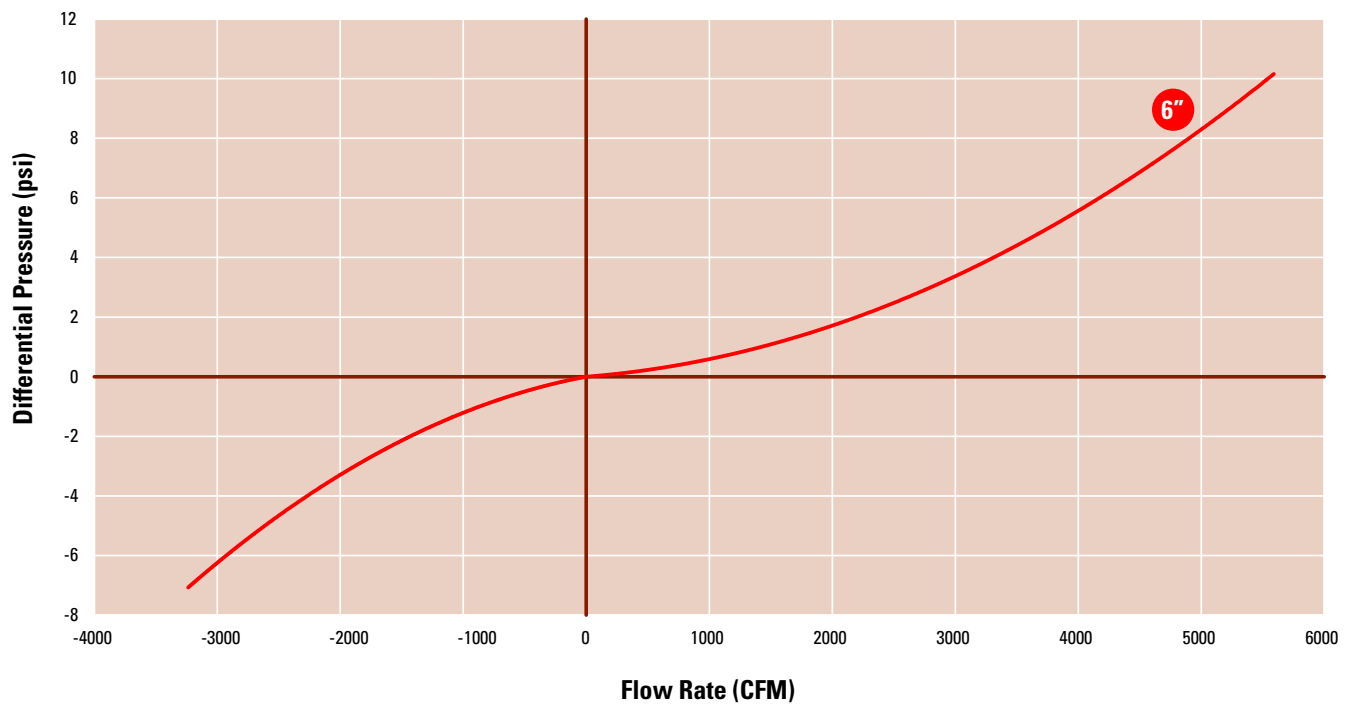
AIR RELEASE FLOW RATE

	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
FLOW RATE (CFM)	0	20	36	49.7	62	73.1	83.4	93.1	97.7

D-01 SERIES AIR & VACUUM FLOW RATE



D-01 SERIES 6" AIR & VACUUM FLOW RATE



D-01 SERIES

DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)						
	0	2	4	6	8	10	12
2"	0	140	205	255	297.5	335	335
3"	0	334	465	565.5	650	725	725
4"	0	650	886	1,069	1,223	1,360	1,360
6"	0	2,290	3,365	4,182	4,900	5,530	5,530

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)						
	-7.5	-6	-5	-4	-3	-2	0
2"	-171	-150.2	-135	-118.2	-99.2	-77	0
3"	-400	-348	-310	-269	-223	-169	0
4"	-689	-600	-535	-465	-383	-290	0
6"	-3,280	-2,655	-2,655	-2,300	-1,900	-1,435	0

COMBINATION AIR VALVES

FOR LIQUIDS WITH
SUSPENDED SOLIDS
D-020 SERIES

DESCRIPTION

The D-020 Combination Air Valve combines an air and vacuum orifice and an continuous acting air release orifice in a single body. The valve is specially designed to operate with liquids carrying solid particles.

The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being drained and continuously releases accumulated air (gases) from the system while it is under pressure and operating. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

PRODUCT ADVANTAGES

- The unique design of the valve prevents contact between the liquid and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
 - The conical body shape: Designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - Independent spring-guided linkage between the lower float/rod assembly and the upper float sealing mechanism: Allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
 - The Rolling Seal Mechanism: Less sensitive to pressure differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 250 psi).
 - Funnel-shaped lower body: designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.



Combination Air Valve
Liquids with Suspended Solids
D-020



Combination Air Valve
Liquids with Suspended Solids
D-020STST

- All inner metal parts made of stainless steel.
- Body - cast metal with a Fusion-bonded epoxy coating, stainless steel optional.
- 1½" threaded drainage outlet enables removal of excess fluids.
- The valve prevents premature closing and allows for air discharge at high velocities.
- A threaded drainage outlet enables removal of excess fluids (1½").

D-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

PRODUCT SELECTION

- Available with 2" male NPT connections, or flanged 2", 3", 4" and 6" sizes
- Also available with a stainless steel body.
- Vacuum Guard "air out only" attachment only allows for air discharge and does not permit air intake.
- Vacuum Breaker, "air in only" attachment only allows for air intake and does not permit air discharge.
- Non-Slam, discharge-throttling attachment allows free air intake, but throttles air discharge.
- For best suitability, it is recommended to send the fluid chemical properties along with other requirements.

SPECIFICATIONS

- Operating pressure range: 3 - 250 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

OPERATION

The air and vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

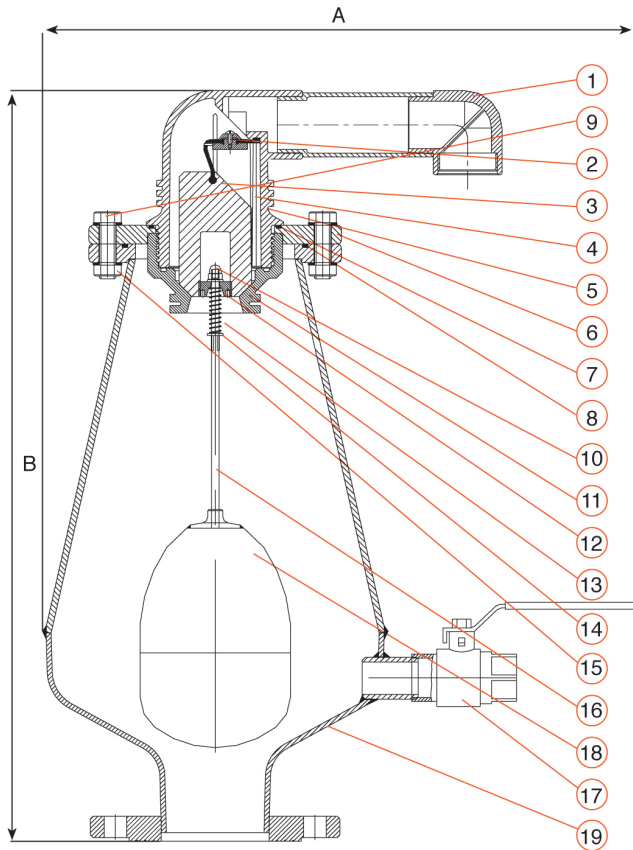
As the system starts to fill, the combination wastewater valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks and along the system, rises to the top of the valve, and displaces the liquid in the valve's body.
6. When the liquid level is lowered to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the liquid from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

D-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Discharge Outlet	Polypropylene
2	Rolling Seal Assembly	Reinforced Nylon + E.P.D.M + St.St.* PP + Viton + St.St.**
3	Float	Foamed Polypropylene
4	Clamping Stem	Reinforced Nylon*, Polypropylene**
5	Body	Reinforced Nylon*, St.St. SAE 316**
6	Cover	Reinforced Nylon*, St.St. SAE 316**
7	O-Ring	BUNA-N*, Viton**
8	O-Ring	BUNA-N*, Viton**
9	Bolt	Stainless Steel SAE 316
10	Crown Nut	Stainless Steel SAE 316
11	Base	Reinforced Nylon* Stainless Steel SAE 316**
12	Stopper	Acetal*, Polypropylene**
13	Spring	Stainless Steel SAE 316
14	Washer	Stainless Steel SAE 316
15	Nut	Stainless Steel SAE 316
16	Stem	Stainless Steel SAE 316
17	Ball Valve (1")	Stainless Steel
18	Float Stainless	Steel SAE 304L
19	Body	Steel DIN St.37* Stainless Steel SAE 316**

* D-020

** D-020STST

DIMENSIONS AND WEIGHTS

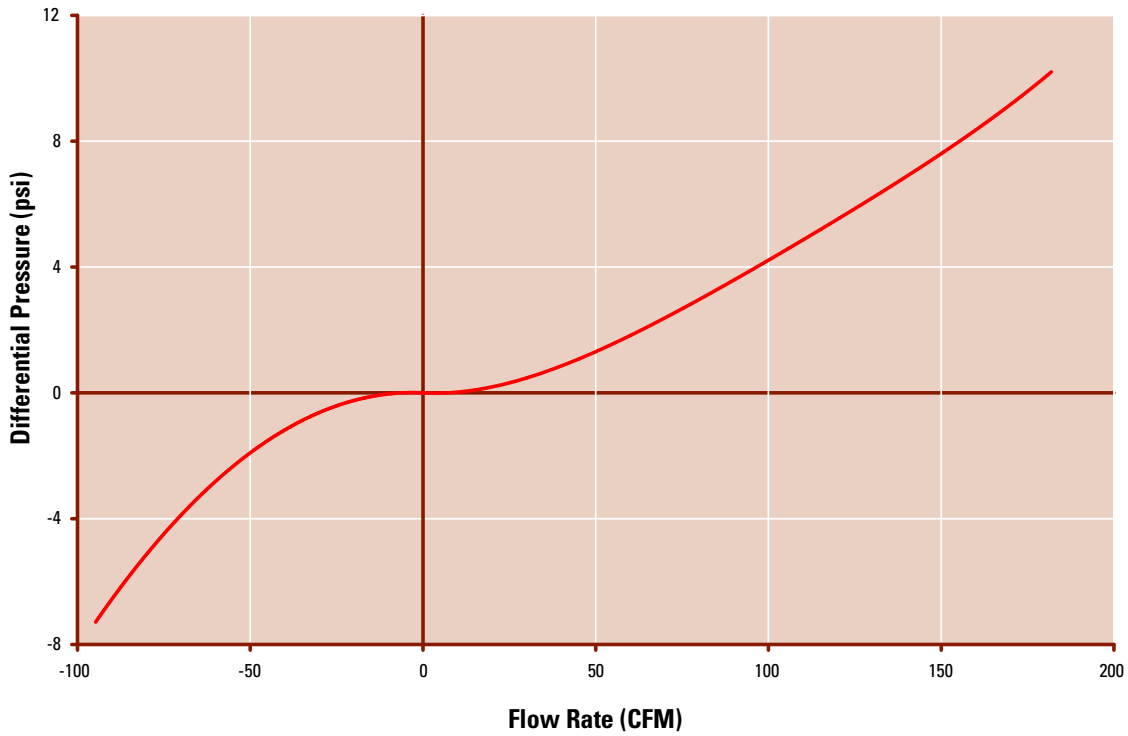
SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B		AIR & VAC	AUTO
2" Threaded	16.8	25.3	36.3	1.246	0.018
2" Flanged	16.8	23.8	38.5	1.246	0.018
3"	16.8	23.8	40.7	1.246	0.018
4"	16.8	23.8	42.9	1.246	0.018
6"	16.8	24.0	46.2	1.246	0.018

MODEL NUMBER AND FLANGE TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65D0202T	2"	MNPT	250
65D0202	2"	150 lb. Flg.	250
65D0203	3"	150 lb. Flg.	250
65D0204	4"	150 lb. Flg.	250
65D0202TSTST	2"	MNPT	250
65K0102STST	2"	150 lb. Flg.	250
65D0203STST	3"	150 lb. Flg.	250
65D0204STST	4"	150 lb. Flg.	250

D-020 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

D-020 SERIES AIR & VACUUM FLOW RATE



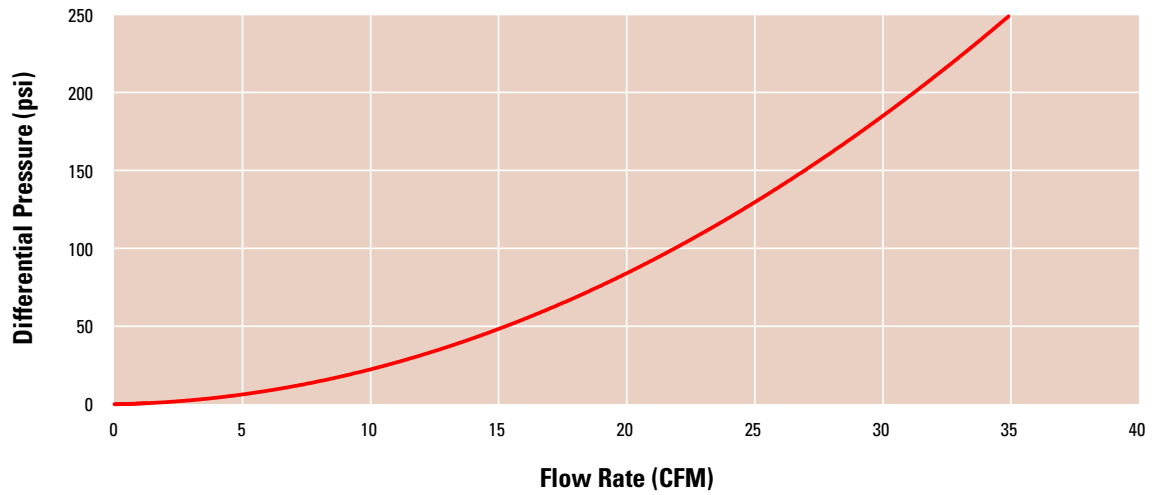
DISCHARGE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)					
	0	2	4	6	8	10
FLOW RATE (CFM)	0	61	97	125	157	188

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)								
	-8	-7	-6	-5	-4	-3	-2	-1	0
FLOW RATE (CFM)	101.3	94.5	87	79.5	70	61	49	33.5	0

D-020 SERIES AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)										
	0	25	50	75	100	125	150	175	200	225	250
FLOW RATE (CFM)	0	10.6	15.3	19	22	24.5	27	29	31	33	35

COMBINATION AIR VALVES

**FOR LIQUIDS WITH
SUSPENDED SOLIDS
D-023 SERIES**

DESCRIPTION

The D-023 Combination Air Valve combines an air and vacuum orifice and an continuous acting air release orifice in a single body.

The valve is specially designed to operate with liquids carrying solid particles.

The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being drained and continuously releases accumulated air (gases) from the system while it is under pressure and operating.

The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

MAIN FEATURES

The unique design of the valve prevents contact between the liquid and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:

- The conical body shape and the external lever: Designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
- Independent spring-guided linkage between the lower float/rod assembly and the upper float sealing mechanism: Allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
- Funnel-shaped lower body: Designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.
- FSpray Guard®: minimizes liquid spray discharge from the air valve outlet, mainly during rapid pipeline filling conditions.
- All inner parts are made of specially selected corrosion-resistant materials.
- Unique design of external lever prevents contact between the liquid and the sealing mechanism, prevents clogging by floating solids and ensures drip-tight sealing.



Combination Air Valve
Liquids with Suspended Solids
D-023



Combination Air Valve
Liquids with Suspended Solids
D-023 STST

- The D-023's orifice plug-disc linkage assembly is external, keeping the levers and pins outside the air valve body and its corrosive atmosphere.

PRODUCT SELECTION

- Available with flanged 3" and 4", ANSI standard.
- Vacuum guard, out-only attachment, which only allows air discharge, not allowing air intake.
- Vacuum breaker, in-only attachment, which only allows air intake, not allowing air discharge.
- Non-slam, discharge-throttling attachment, which allows free air intake, but throttles air discharge.
- For best suitability, discharge-throttling attachment, which allows free air intake, but throttles air discharge.

SPECIFICATIONS

- Working pressure range: 3 - 250 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion- bonded epoxy in accordance with standard DIN 30677-2

D-023 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

OPERATION

The air and vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

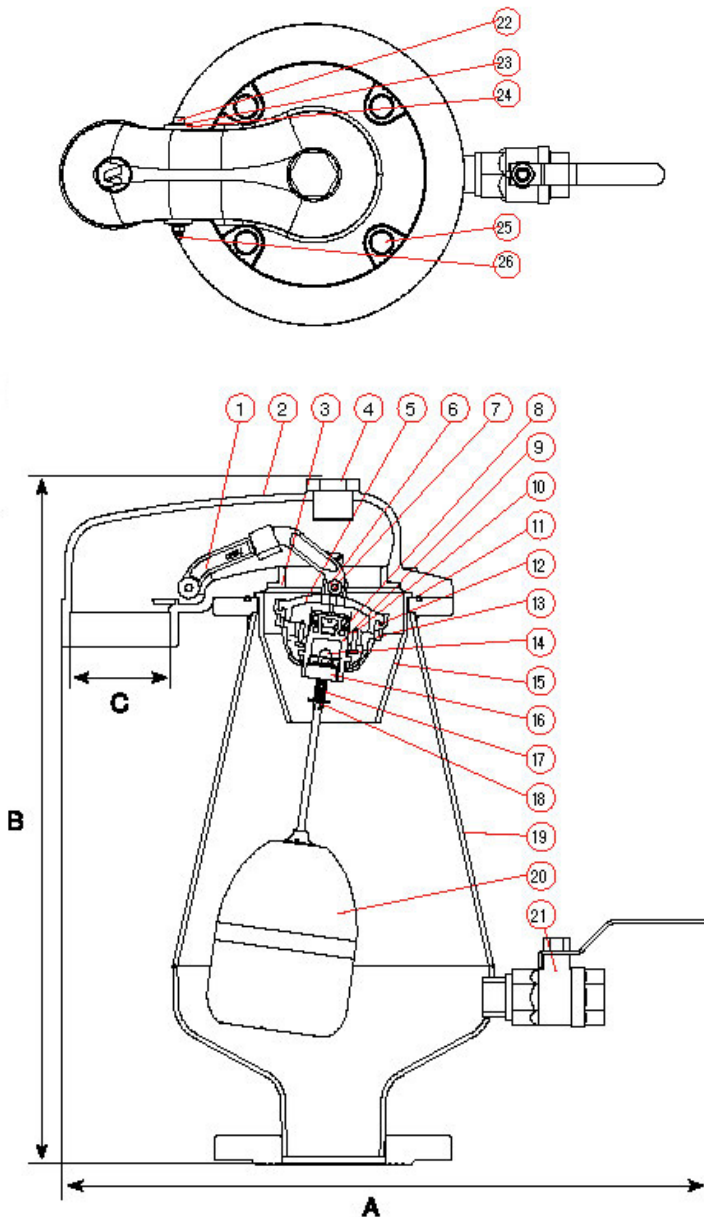
As the system starts to fill, the combination wastewater valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks and along the system, rises to the top of the valve, and displaces the liquid in the valve's body.
6. When the liquid level is lowered to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the liquid from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

D-023 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Disc Arm Assembly	Stainless Steel SAE 316
2	Cover	Ductile Iron*
		Stainless Steel SAE 316**
3	Orifice Seat	Stainless Steel SAE 316
4	Plug	Polypropylene
5	Air & Vacuum Disc	Reinforced Nylon*
		Stainless Steel SAE 316**
6	Washer	Stainless Steel SAE 316
7	Rivet	Stainless Steel SAE 316
8	Air Release Disc Seal	E.P.D.M.*, Viton**
9	Air Release Disc	Reinforced Nylon *
		Polypropylene **
10	Bolt	Stainless Steel SAE 316
11	O-Ring	BUNA-N*, Viton **
12	Air & Vacuum Disc Seal	EPDM*, Viton **
13	Air & Vacuum Disc Seal Lock	Reinforced Nylon*, Polypropylene**
14	Domed Nut & Washer	Stainless Steel SAE 304
15	Spray Guard®	Polypropylene
16	Stopper	Polypropylene
17	Spring	Stainless Steel SAE 316
18	Washer	Stainless Steel SAE 316
19	Body	Steel A216 WCB*, Stainless Steel SAE 316**
20	Float Assembly	Stainless Steel SAE 316
21	Ball Valve	Stainless Steel SAE 316
22	Bolt	Stainless Steel SAE 316
23	Washer	Stainless Steel SAE 316
24	Bushing	Acetal
25	Bolt, Nut, Washer	Stainless Steel SAE 316
26	Domed Nut	Stainless Steel SAE 316

* D-023

** D-023STST

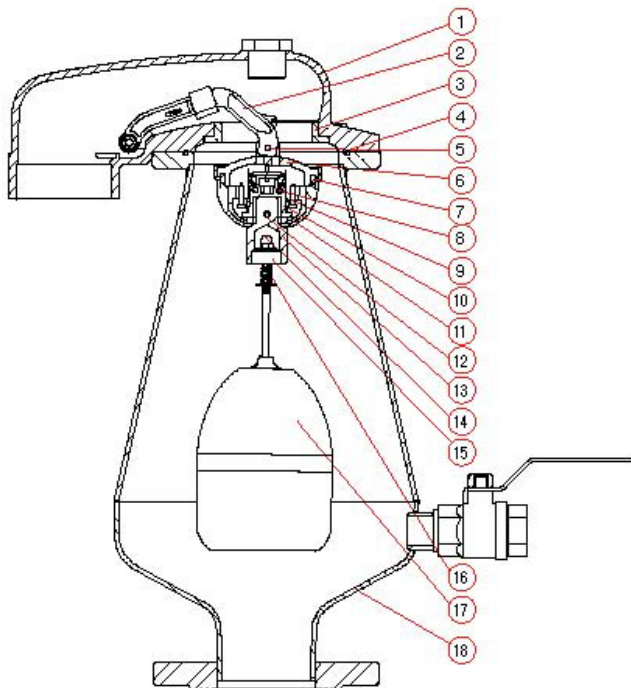
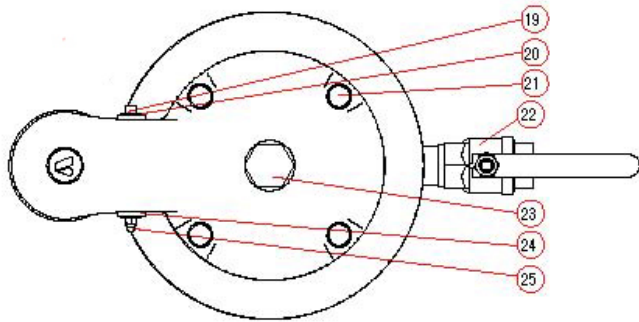
DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)				WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B	INT. C	EXT. C		AUTO	KIN
3", 4"	12.9	22.3	3	3.86	48.5	0.024	7.79

MODEL NUMBER AND FLANGE TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65D0233	3"	150 lb. Flg.	250
65D0234	4"	150 lb. Flg.	250
65D0233STST	3"	150 lb. Flg.	250
65D0234STST	4"	150 lb. Flg.	250

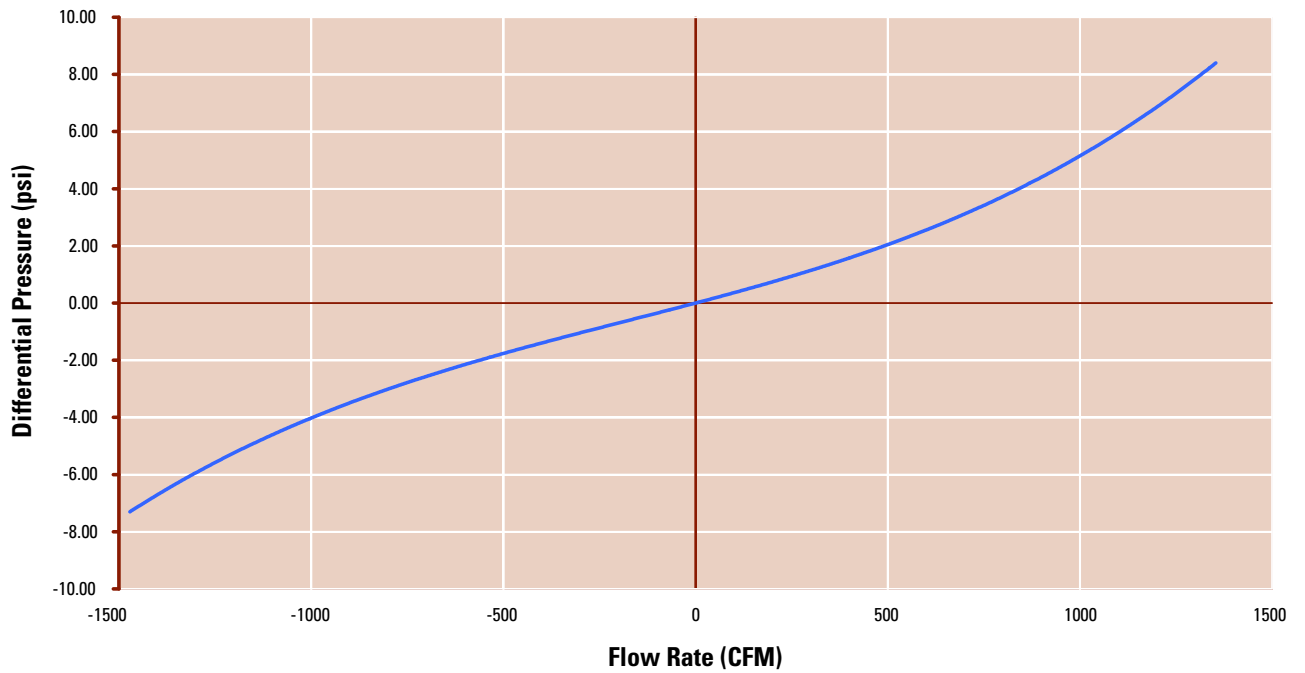
D-023 DUPLEX SERIES



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Cover	Duplex
2	Arm Stopper	E.P.D.M.
3	Disk Arm Assembly	Duplex ASTM 995 5A
4	O-Ring	Viton
5	Rivet	Monel
6	Air & Vacuum Disc	PVDF
7	Air & Vacuum Disc Seal	Stainless Steel SAE 316 with Cataphoretic Coating
8	Air Release Disc Seal	Viton
9	Bolt (Screw)	Stainless Steel SAE 316 with Cataphoretic Coating
10	Air Release Disc	PVDF
11	Air Release Disc Cover	PVDF
12	Pin	Titanium
13	Rod Adapter	Polypropylene
14	Nut	Duplex
15	Stopper	Polypropylene
16	Spring	Hastelloy
17	Float Assembly	Polypropylene and Titanium and Duplex
18	Body	Duplex ASTM 995 5A
19	Bolt	Duplex
20	Washer	Stainless Steel SAE 316
21	Bolt, Nut, Washer	Stainless Steel SAE 316
22	Ball Valve 1"	PVC
23	Plug	Polypropylene
24	Bushing	Polypropylene
25	Domed Nut	Stainless Steel SAE 316

D-023 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATES

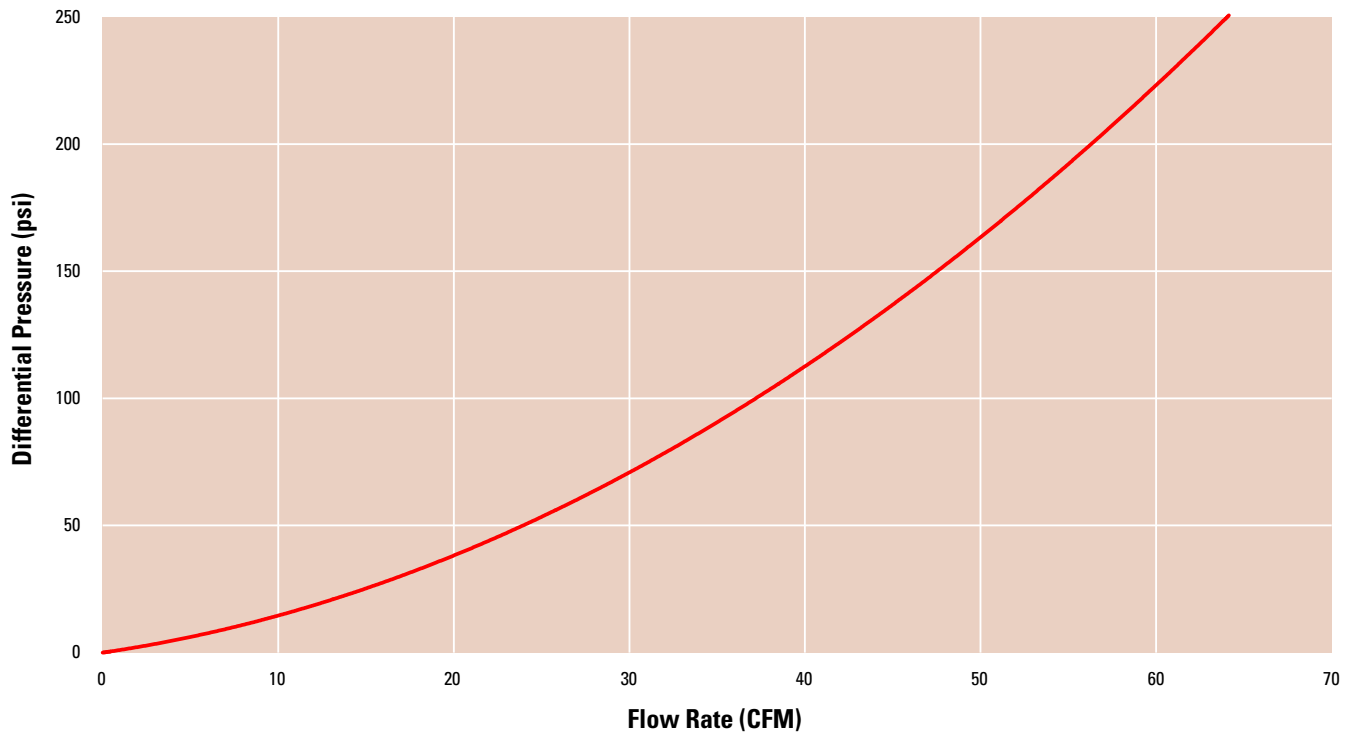
	DIFFERENTIAL PRESSURE (psi)				
	0	2	4	6	8
FLOW RATE (CFM)	0	485	835	1098	1311

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)				
	-8	-6	-4	-2	0
FLOW RATE (CFM)	-1566	-1319	-1000	-560	0

D-023 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

D-023 SERIES AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)										
	0	25	50	75	100	125	150	175	200	225	250
FLOW RATE (CFM)	0	15	24	31	37	43	48	52	56	60	64

COMBINATION AIR VALVES

FOR LIQUIDS WITH
SUSPENDED SOLIDS
D-025 SERIES

DESCRIPTION

The D-025 Combination Air Valve combines an air and vacuum orifice and an continuous acting air release orifice in a single body. The valve is specially designed to operate with liquids carrying solid particles.

The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being drained and continuously releases accumulated air (gases) from the system while it is under pressure and operating. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

MAIN FEATURES

- The unique design of the valve prevents contact between the liquid and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
 - The conical body shape: Designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - Independent spring-guided linkage between the lower float/rod assembly and the upper float sealing mechanism: Allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
 - The Rolling Seal Mechanism: Less sensitive to pressure differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 250 psi).
 - Funnel-shaped lower body: Designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel. Float made of foamed polypropylene.



Combination Air Valve
Liquids with Suspended Solids
D-025



Combination Air Valve
Liquids with Suspended Solids
D-025STST

- 1½" threaded drainage outlet enables removal of excess fluids.
- The valve prevents premature closure and allows for air discharge at high velocities.

PRODUCT SELECTION

- These valves are available in reinforced nylon in sizes 2", 3", 4", male NPT connections, or flanged. Available in stainless steel flanged sizes 2", 3", 4" and MNPT size 2".
- With a vacuum guard, out-only attachment, which only allows air discharge, not allowing air intake.
- With a vacuum breaker, in-only attachment, which only allows air intake, not allowing air discharge.
- With a non-slam, discharge-throttling attachment, which allows free air intake, but throttles air discharge.
- For best suitability it is recommended to send the fluids chemical properties along with other requirements.

SPECIFICATIONS

- Working pressure range: 3 - 150 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F

D-025 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

OPERATION

The air and vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

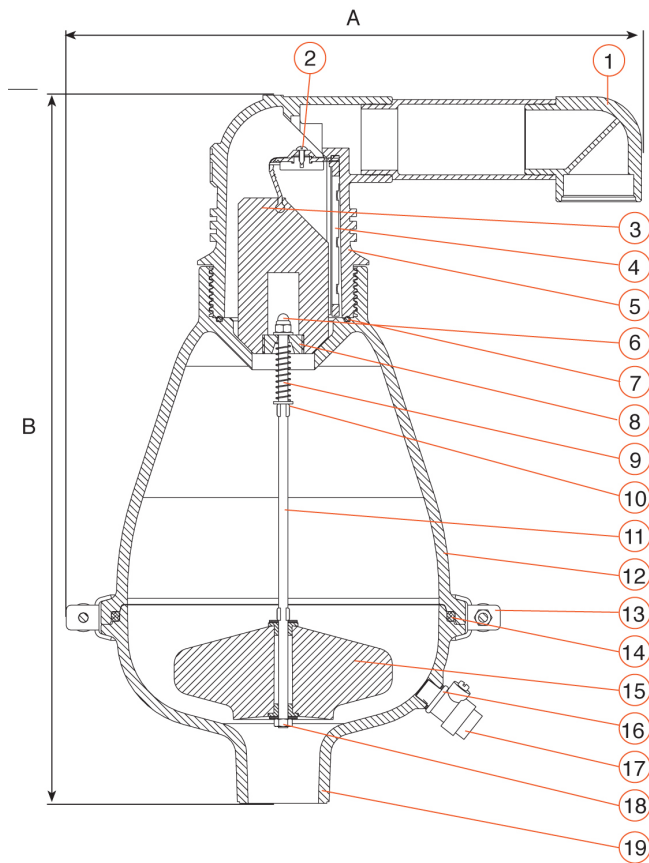
As the system starts to fill, the combination wastewater valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks and along the system, rises to the top of the valve, and displaces the liquid in the valve's body.
6. When the liquid level is lowered to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the liquid from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

D-025 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Discharge Outlet	Polypropylene
2	Rolling Seal Assembly	Reinforced Nylon + E.P.D.M + St. St.* PP + Viton + St. St.**
3	Float	Foamed Polypropylene
4	Clamping Stem	Reinforced Nylon* Polypropylene**
5	Body	Reinforced Nylon* Stainless Steel SAE 316**
6	Crown Nut	Stainless Steel SAE 316
7	O-Ring	BUNA-N*, Viton**
8	Stopper	Acetal* Polypropylene**
9	Spring	Stainless Steel SAE 316
10	Washer	Stainless Steel SAE 316
11	Stem	Stainless Steel SAE 316
12	Body	Reinforced Nylon* Stainless Steel SAE 316**
13	Clamp	Reinforced Nylon* Stainless Steel SAE 316**
14	O-Ring	BUNA-N*, Viton**
15	Float	Foamed Polypropylene
16	Seal	Fiber
17	Tap	Stainless Steel**/Chrome Plated Brass*
18	Washer	Stainless Steel SAE 316
19	Base	Reinforced Nylon* Stainless Steel SAE 316**

* D-025
** D-025STST

D-025 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

DIMENSIONS AND WEIGHTS

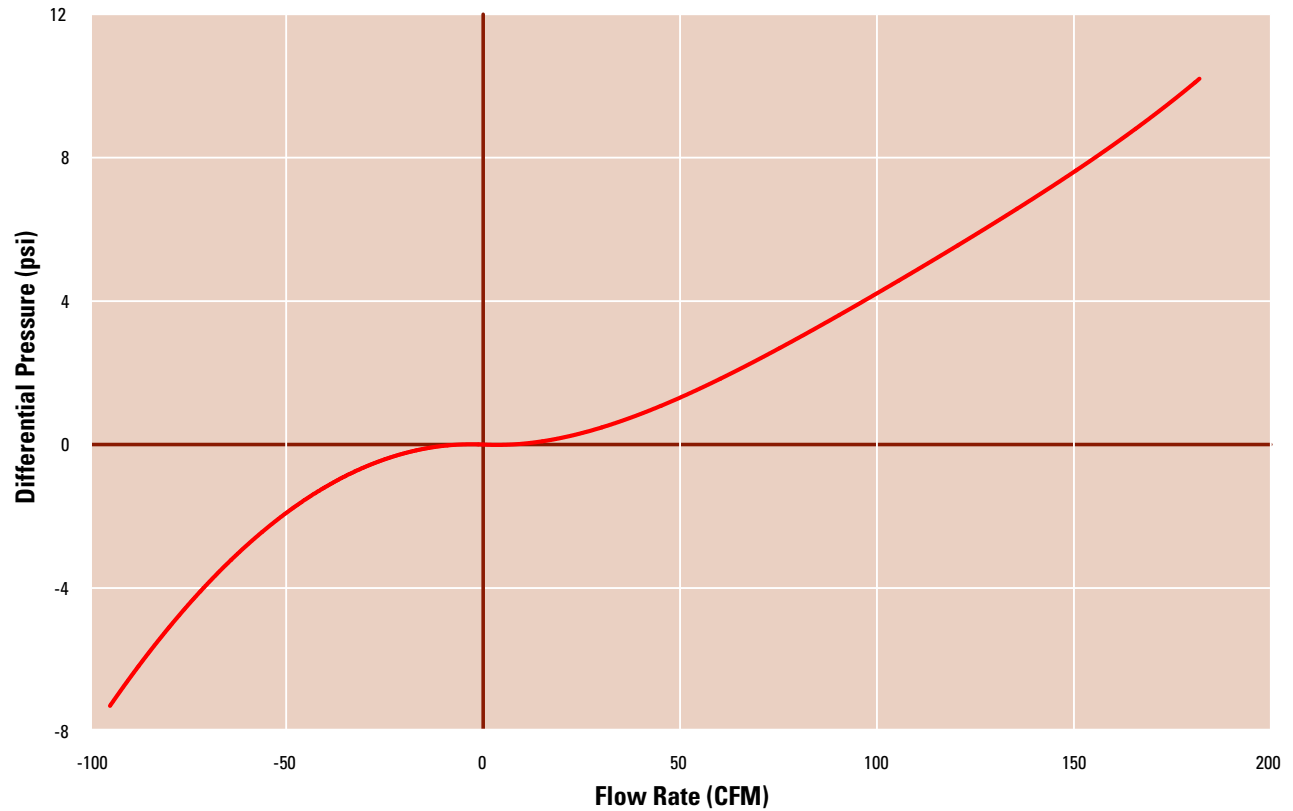
SIZE	DIMENSIONS (IN)		WEIGHT NYLON (LBS.)	WEIGHT ST. ST. (LBS.)	ORIFICE AREA (IN ²)	
	A	B			AIR & VAC	AUTO
2" Threaded	9.5	18.1	8.4	31.7	0.018	1.246
2" Flanged	9.5	18.1	9.3	35.7	0.018	1.246
3" Threaded	9.5	18.1	8.4	—	0.018	1.246
3" Flanged	9.5	18.1	11.9	36.4	0.018	1.246
4" Threaded	9.5	18.1	8.6	—	0.018	1.246
4" Flanged	9.5	18.1	13.2	40.5	0.018	1.246

MODEL NUMBER AND FLANGE TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65D0252T	2"	MNPT	150
65D0252	2"	150 lb. Flg.	150
65D0253T	3"	MNPT	150
65D0253	3"	150 lb. Flg.	150
65D0254T	4"	MNPT	150
65D0254	4"	150 lb. Flg.	150
65D0252TSTST	2"	MNPT	150
65K0152STST	2"	150 lb. Flg.	150
65D0253STST	3"	150 lb. Flg.	150
65D0254STST	4"	150 lb. Flg.	150

D-025 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

D-025 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATES

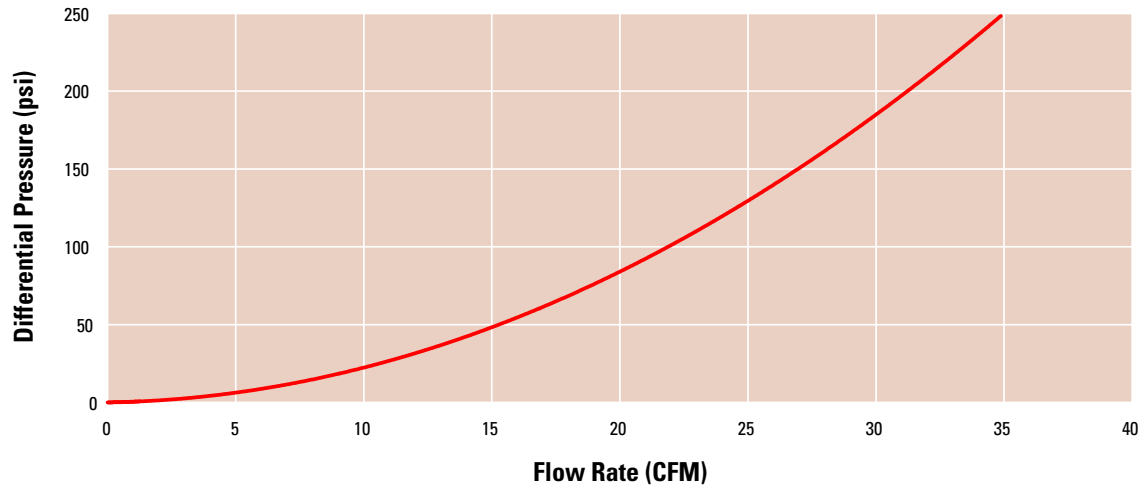
	DIFFERENTIAL PRESSURE (psi)					
	0	2	4	6	8	10
FLOW RATE (CFM)	0	61	97	125	157	188

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)								
	-8	-7	-6	-5	-4	-3	-2	-1	0
FLOW RATE (CFM)	101.3	94.5	87	79.5	70	61	49	33.5	0

D-025 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

D-025 SERIES AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)										
	0	25	50	75	100	125	150	175	200	225	250
FLOW RATE (CFM)	0	10.6	15.3	19	22	24.5	27	29	31	33	35

COMBINATION AIR VALVES

FOR LIQUIDS WITH
SUSPENDED SOLIDS
D-026 SERIES

DESCRIPTION

The D-026 Combination Air Valve combines an air and vacuum orifice and an continuous acting air release orifice in a single body. The valve is specially designed to operate with liquids carrying solid particles.

The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being drained and continuously releases accumulated air (gases) from the system while it is under pressure and operating. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

MAIN FEATURES

- The unique design of the valve prevents contact between the liquid and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
 - The conical body shape: Designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - Independent spring-guided linkage between the lower float/rod assembly and the upper float sealing mechanism: Allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
 - Funnel-shaped lower body: Designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel. Float made of foamed polypropylene.
- Unique design of external lever prevents contact between the liquid and the sealing mechanism, prevents clogging by floating solids and ensures drip-tight sealing.
- Discharge outlet enables connection to a vent hose/ pipe.



Combination Air Valve
Liquids with Suspended Solids
D-026



Combination Air Valve
Liquids with Suspended Solids
D-026STST

PRODUCT SELECTION

- Available size: 6" with flanged connection.
- Standard with Stainless Steel body, also available with a cast ductile body and polyethylene cover.
- An optional non-slam discharge-throttling attachment allows for free air intake, throttles air discharge.

SPECIFICATIONS

- Working pressure range: 3 - 250 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F

D-026 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

OPERATION

The air and vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the combination wastewater valve functions according to the following stages:

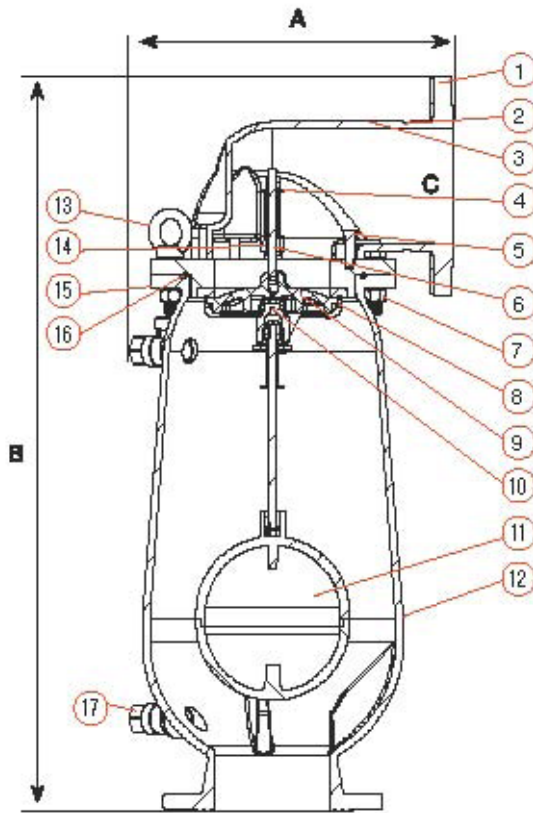
1. Air in the pipeline is discharged by the valve
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks and along the system, rises to the top of the valve, and displaces the liquid in the valve's body.
6. When the liquid level is lowered to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the liquid from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

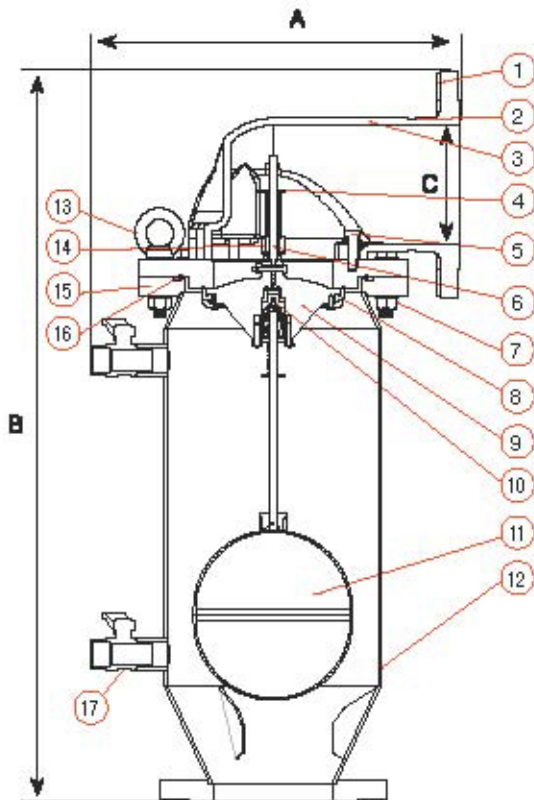
D-026 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

MATERIAL SPECIFICATIONS - D026



NO.	PART	MATERIAL
1	Flange Supports	Stainless Steel SAE 304
2	Victaulic Connection	
3	Elbow Drainage Outlet	Polyethylene
4	Spring, Washer, Nut	Stainless Steel SAE 316 & 304
5	Nut, Spring Washer, and Washer	Stainless Steel SAE 316
6	Sealing Assembly	Stainless Steel SAE 316
7	Guide Rod	
8	Bolt, Washer, Nut	Stainless Steel SAE 316
9	Air & Vacuum Seat	Stainless Steel SAE 316
10	Air & Vacuum Sealing Assembly	RN, Stainless Steel SAE 316 and EPDM
11	Air Release Sealing Assembly	RN, Stainless Steel SAE 316 and EPDM
12	Float Assembly	Polycarbonate/Stainless Steel SAE 316 and Stainless Steel 316
13	Body	Ductile Iron ASTM A-536-60-40-18
14	Lifting Ring	Stainless Steel SAE 316
15	Bridge Assembly	Stainless Steel SAE 316, Aucolon
16	Cover	Ductile Iron ASTM A-536-60-40-18
17	O-Ring	BUNA-N
17	Ball Valve (1")	Stainless Steel SAE 316

MATERIAL SPECIFICATIONS - D026STST



NO.	PART	MATERIAL
1	Flange Supports	Stainless Steel SAE 304
2	Victaulic Connection	
3	Elbow Drainage Outlet	Polyethylene
4	Spring, Washer, Nut	Stainless Steel SAE 316 & 304
5	Nut, Spring Washer, and Washer	Stainless Steel SAE 316
6	Sealing Assembly	Stainless Steel SAE 316
7	Guide Rod	
8	Bolt, Washer, Nut	Stainless Steel SAE 316
9	Air & Vacuum Seat	Stainless Steel SAE 316
10	Air & Vacuum Sealing Assembly	RN, Stainless Steel SAE 316 and EPDM/Viton
11	Air Release Sealing Assembly	RN, Stainless Steel SAE 316 and EPDM/Viton
12	Float Assembly	Polycarbonate/Stainless Steel SAE 316 and Stainless Steel 316
13	Body	Stainless Steel SAE 316
14	Lifting Ring	Stainless Steel SAE 316
15	Bridge Assembly	Stainless Steel SAE 316, Aucolon
16	Cover	Stainless Steel SAE 316
17	O-Ring	BUNA-N
17	Ball Valve (1")	Stainless Steel SAE 316

D-026 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

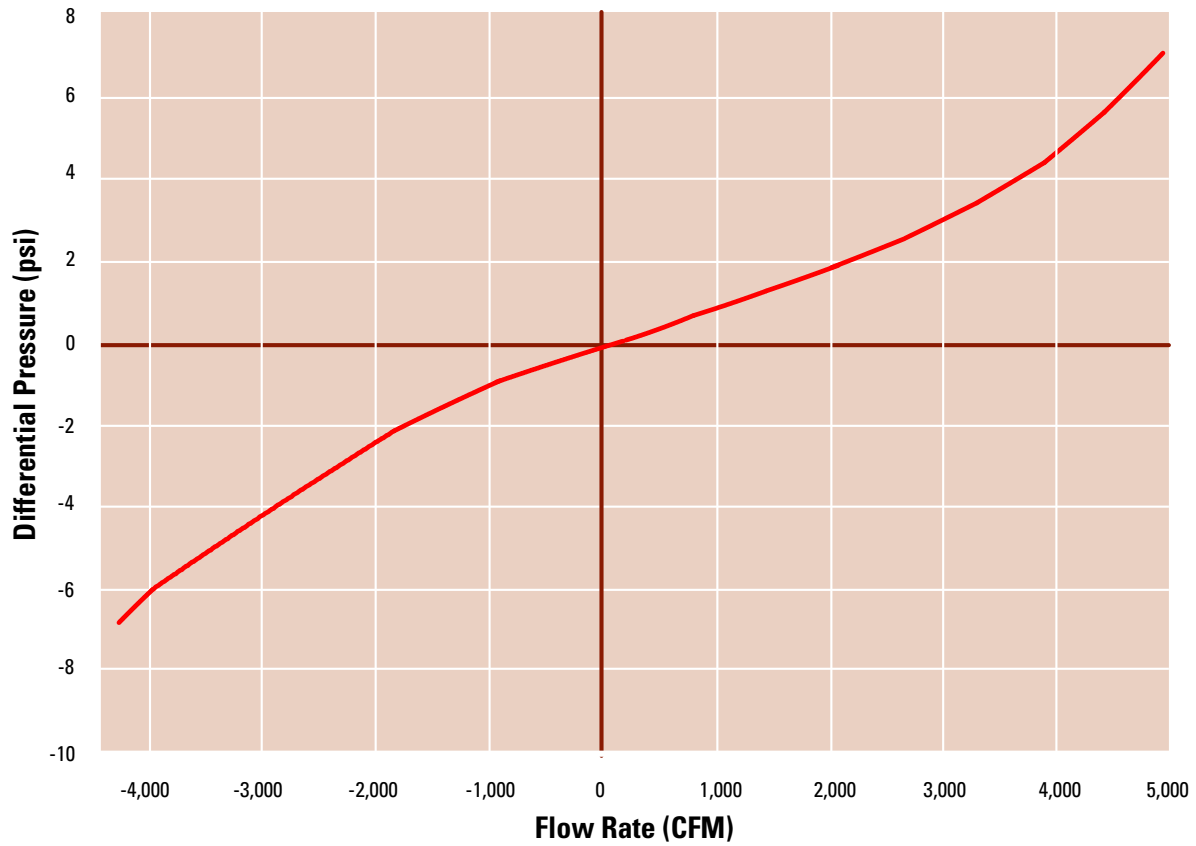
DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B		AIR & VAC	AUTO
6" Flanged	17.6	37.7	184.3	0.0496	27.38

MODEL NUMBERS

MODEL NUMBER	SIZE	CONNECTION	PSI
65D0266	6"	150 lb. Flg.	250
65D026STST	6"	150 lb. Flg.	250

D-026 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATES

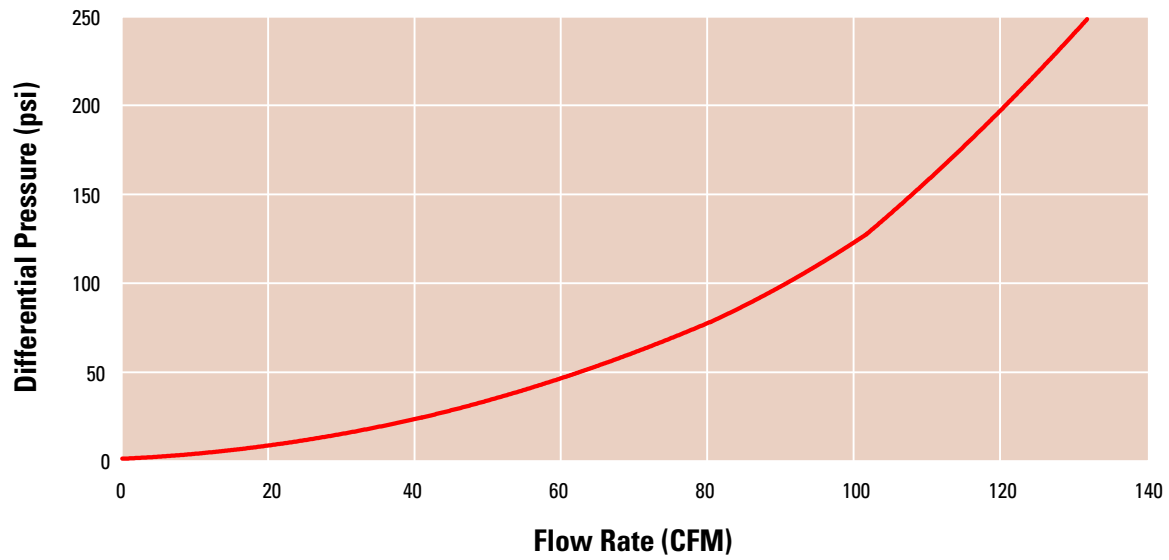
	DIFFERENTIAL PRESSURE (psi)				
	0	2	4	6	7
FLOW RATE (CFM)	0	2,200	3,675	4,740	4,915

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)				
	-7	-6	-4	-2	0
FLOW RATE (CFM)	-4,290	-3,975	-3,130	-1,920	0

D-026 SERIES FOR LIQUIDS WITH SUSPENDED SOLIDS

D-026 SERIES AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)										
	0	25	50	75	100	125	150	175	200	225	250
FLOW RATE (CFM)	0	37	63.5	79	91	100.8	108.4	121.8	127.2	132.9	

COMBINATION AIR VALVES

D-04 SERIES

DESCRIPTION

The D-04 Series Combination Air Valve has the features of both an air release valve and an air and vacuum valve.

The continuous acting air release component is designed to continuously release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air and vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

PRODUCT ADVANTAGES

- Lightweight, small dimensions, simple and reliable construction.
- The large size of the continuous acting air release orifice relative to the air valve body:
 - Releases air at high flow rates.
 - Reduces the danger of obstruction by debris.
 - Enables the usage of the patented rolling seal mechanism, making it less sensitive to pressure differential than a direct float seal.
- Reliable operation reduces water hammer incidents.
- A threaded discharge outlet enables removal of excess fluids (1½").

VALVE SELECTION

The D-04 Series Air Valve is available with:

- 2" male BSPT or 2" male NPT connections, as requested.
- Vacuum Guard, Out-only attachment, which only allows air discharge, not allowing air intake.
- Vacuum Breaker, In-only attachment, which only allows air intake, not allowing air discharge.
- Non-Slam, discharge-throttling attachment, which allows free air intake, but throttles air discharge.



Combination Air Valve
D-040



Combination Air Valve
D-040STST



Combination Air Valve
D-040PPV

SPECIFICATIONS

- Working pressure range:
D-040PPV: 3 - 150 psi
D-040 and D-040STST: 3 - 250 psi
- Testing pressure:
D-040PPV: 250 psi
D-040 and D-040STST: 360 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Body: made of high-strength composite materials or stainless steel, and all operating parts are made of specially selected corrosion-resistant materials

D-04 SERIES

OPERATION

The air and vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float, which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float which pushes the sealing mechanism to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The float will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

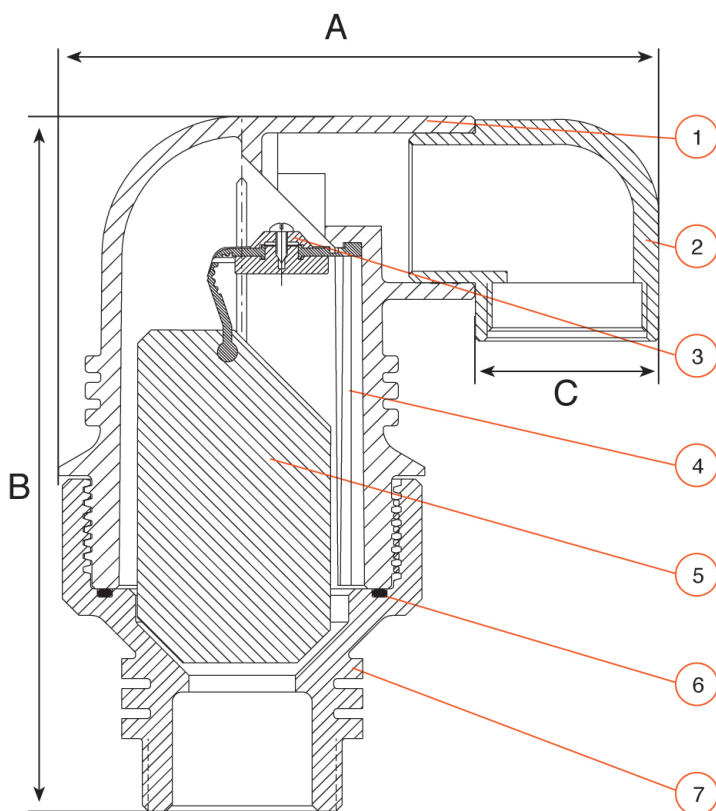
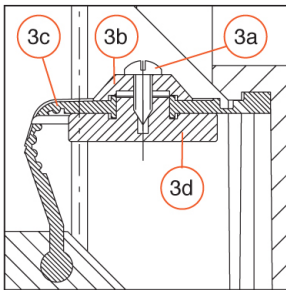
MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Body	Reinforced Nylon# Polypropylene* Stainless Steel SAE 316†
2	Discharge Outlet	Polypropylene
3	Rolling Seal Assembly	
3a	Screws	Stainless Steel
3b	Plug Cover	Polypropylene
3c	Rolling Seal	E.P.D.M. Viton**
3d	Plug	Polypropylene
4	Clamping Stem	Polypropylene
5	Float	Foamed Polypropylene
6	O - Ring	E.P.D.M. Viton**
7	Base	Reinforced Nylon# Polypropylene* Stainless Steel SAE 316†

- * D-040PPV
- ** D-040PPV & D-040STST
- † D-040STST
- # D-040

MODEL NUMBER AND CONNECTION TYPE

MODEL NUMBER	SIZE	CONNECTION	PSI
65ARIB2PPV	2"	MNPT	150
65ARIB2	2"	MNPT	250
65ARIB2STST	2"	MNPT	250

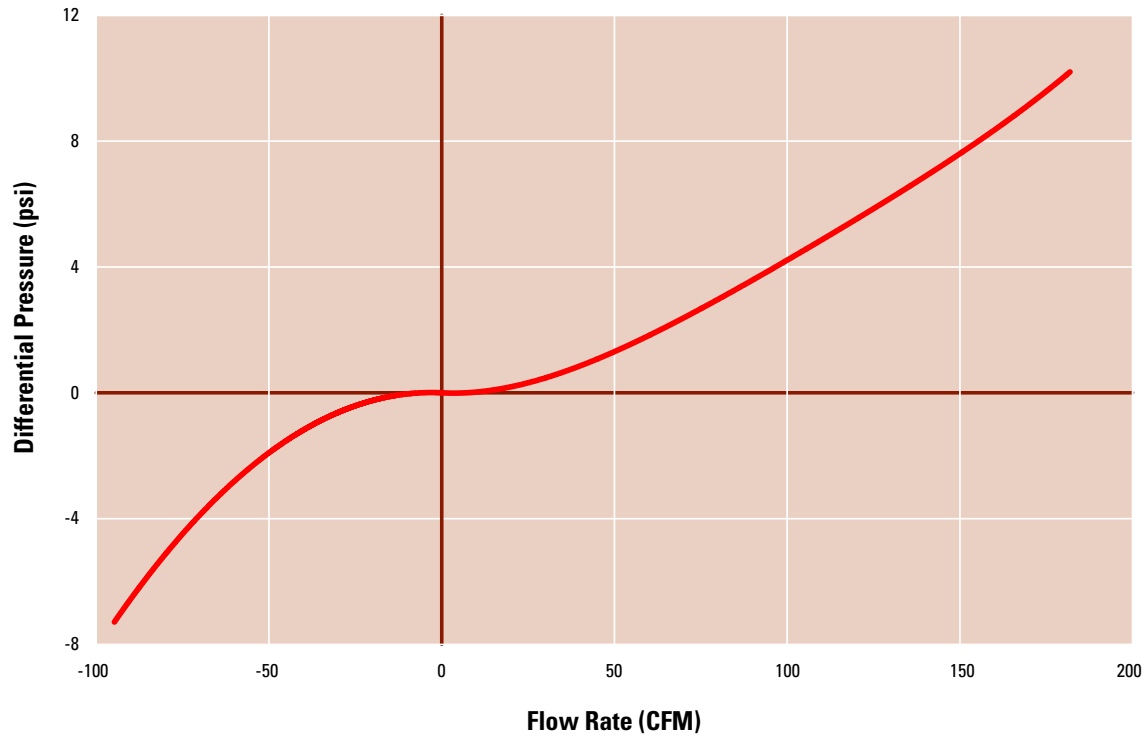


DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)			WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B	C		AIR & VAC	AUTO
2" Stainless Steel	7.0	8.2	1.5	8.96	1.246	0.0186
2" Composite Material	7.0	8.2	1.5	2.35	1.246	0.0186

D-04 SERIES

D-040 SERIES AIR & VACUUM FLOW RATE



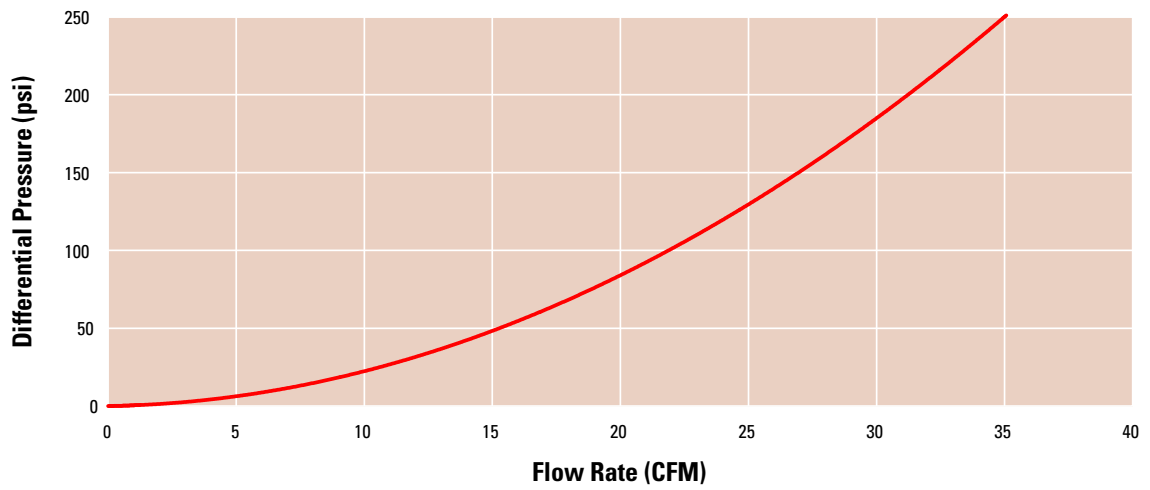
DISCHARGE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)					
	0	2	4	6	8	10
FLOW RATE (CFM)	0	61	97	125	157	188

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)								
	-8	-7	-6	-5	-4	-3	-2	-1	0
FLOW RATE (CFM)	101.3	94.5	87	79.5	70	61	49	33.5	0

D-040 SERIES AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)										
	0	25	50	75	100	125	150	175	200	225	250
FLOW RATE (CFM)	0	10.6	15.3	19	22	24.5	27	29	31	33	35

COMBINATION AIR VALVES

FOR LIQUIDS WITH
SUSPENDED SOLIDS
D-040 LONG SERIES

DESCRIPTION

The D-040 Long and D-040 Long AR (Acid Resistant) family of Combination Air Valves combine an air and vacuum orifice and a continuous-acting air release orifice in a single body. The valve is specifically designed to operate with liquids carrying solid particles.

The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being drained and continuously releases accumulated air (gases) from the system while it is operating under pressure.

The valve's unique design enables the separation of the liquid from the sealing mechanism to ensure reliable, long-term, superior performance.



Combination Air Valve
D-040 LONG
& D-040 LONG AR

PRODUCT ADVANTAGES

- Lightweight and compact; fits precisely on UR well heads and on heap leach submains.
- The only product of its size that maintains an air gap between the liquid in the valve and the sealing mechanism. This prevents clogging, plugging and leaking common with other air valves.
- The air valve is a combination air valve which provides the added features of an air and vacuum valve to those of an air release valve. Many competing air valves are only air release valves.
- Large orifice provides better air release.
- The rolling seal mechanism provides high capacity air release and a self-cleaning capability not found on 'seal and lever' mechanism air valves. The D-040 is far less susceptible to leaking and maintenance problems.
- Easy-to-replace rolling seal (when maintenance is required). No tools are required or long downtimes.
- Built-in Shrader valve is standard on the D-040 Long. It allows for pressure checks at the well head using one pressure gauge, eliminating the need for individual pressure gauges at each well site.
- Air valve body is made of high strength composite materials and all operating parts are made of specially selected corrosion-resistant materials.

VALVE SELECTION

- D-040 Long AR (Acid Resistant) for submains and lateral lines on heap leach pads and in situ leaching.
- D-040 Long for UR injection wells.

SPECIFICATIONS

- Working pressure range: 3 - 150 psi
- Testing pressure: 250 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Size: 1/2", 3/4", 2" MPT inlet with 3/8" FPT discharge outlet.
1" MPT inlet available by special order.

D-040 LONG SERIES

OPERATION

The air and vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float, which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

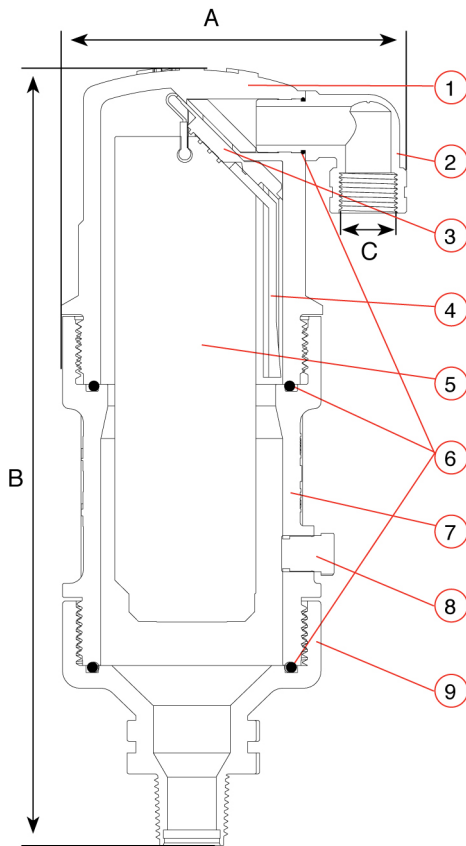
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float which pushes the sealing mechanism to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

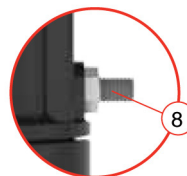
1. The float will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.



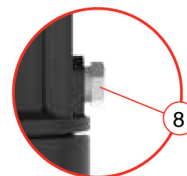
MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Body	Polypropylene
2	Discharge Outlet	Polypropylene
3	Rolling Seal	E.P.D.M./Viton
4	Clamping Stem	Polypropylene
5	Float	Foamed Polypropylene
6	O - Ring	BUNA-N/Viton
7	Extension	Polypropylene
8	Shrader Valve *	Nickel Coated Brass
9	Plug	Stainless Steel
	Base	Polypropylene

* Only available with 65D040L50T



Shrader Valve



Plug

MODEL NUMBER AND CONNECTION TYPE

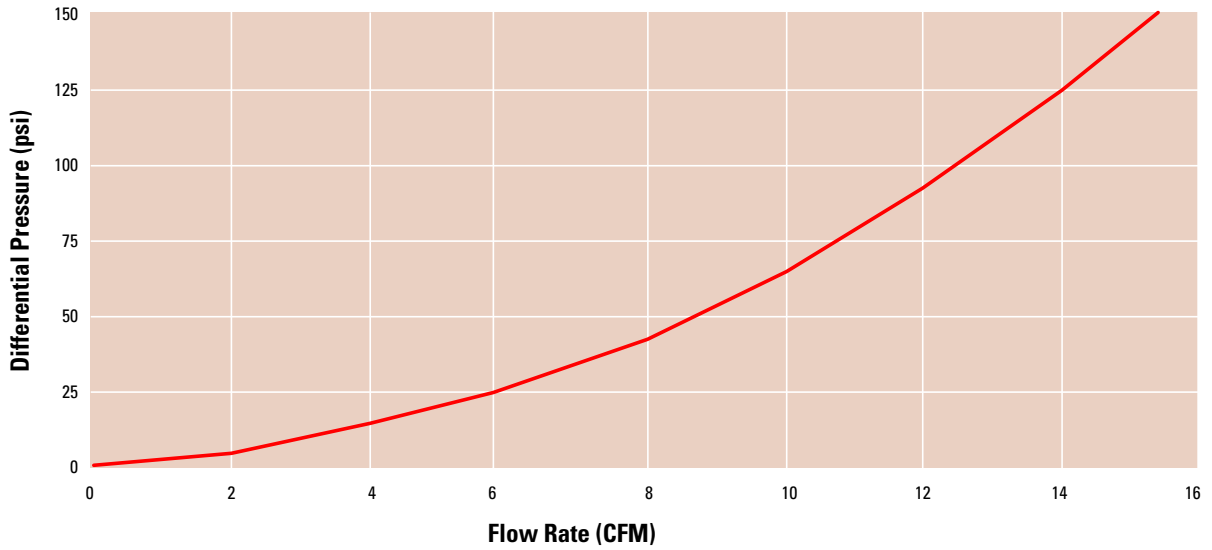
MODEL NUMBER	SIZE	CONNECTION	PSI	USED FOR
65D040-AR	1/2", 3/4"	MNPT	150	COPPER, GOLD, SILVER
65D040L50T	1/2"	MNPT	150	URANIUM
65D040L2	2"	MNPT	150	COPPER, GOLD, SILVER

DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)			WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B	C		AIR & VAC	AUTO
1/2", 3/4"	4	8 5/8	3/8 Female	0.75	0.155	0.012
2"	7.2	13.6	1 1/2 Female	4.4	1.246	0.018

D-040 LONG SERIES

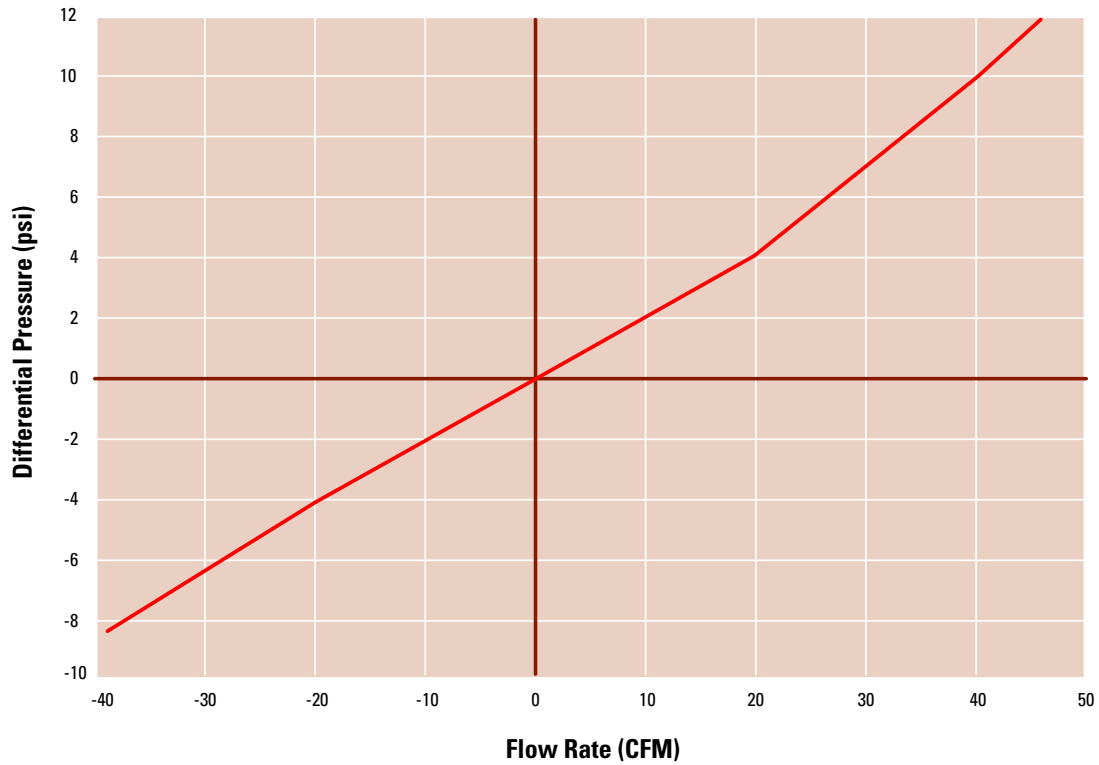
D-040 LONG SERIES AIR RELEASE FLOW RATE (1/2" and 3/4")



AIR RELEASE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)						
	0	25	50	75	100	125	150
FLOW RATE (CFM)	0	6.0	9.0	11.1	12.1	14.1	15.8

D-040 LONG AIR & VACUUM FLOW RATE (1/2" and 3/4")



DISCHARGE FLOW RATES

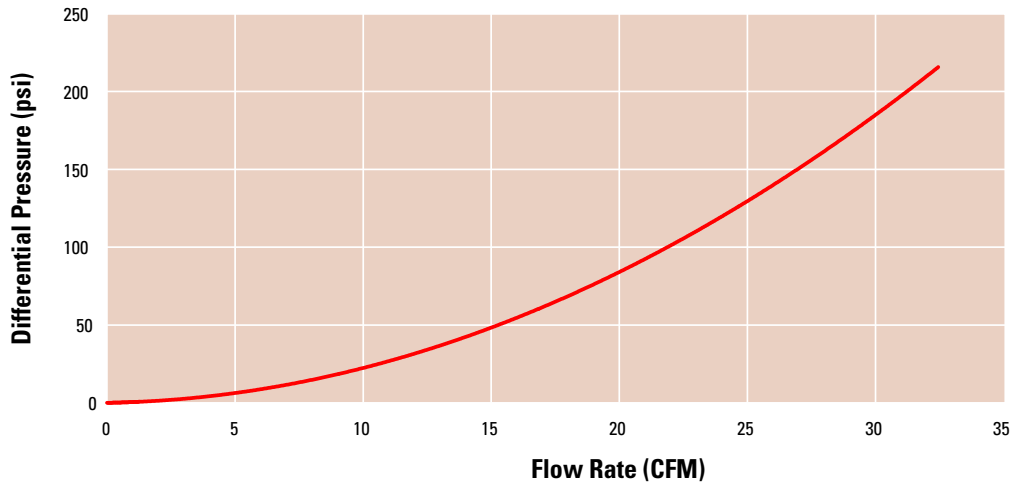
	DIFFERENTIAL PRESSURE (psi)					
	0	2	4	6	8	10
FLOW RATE (CFM)	0	10	20	26.5	33.5	40

INTAKE FLOW RATES

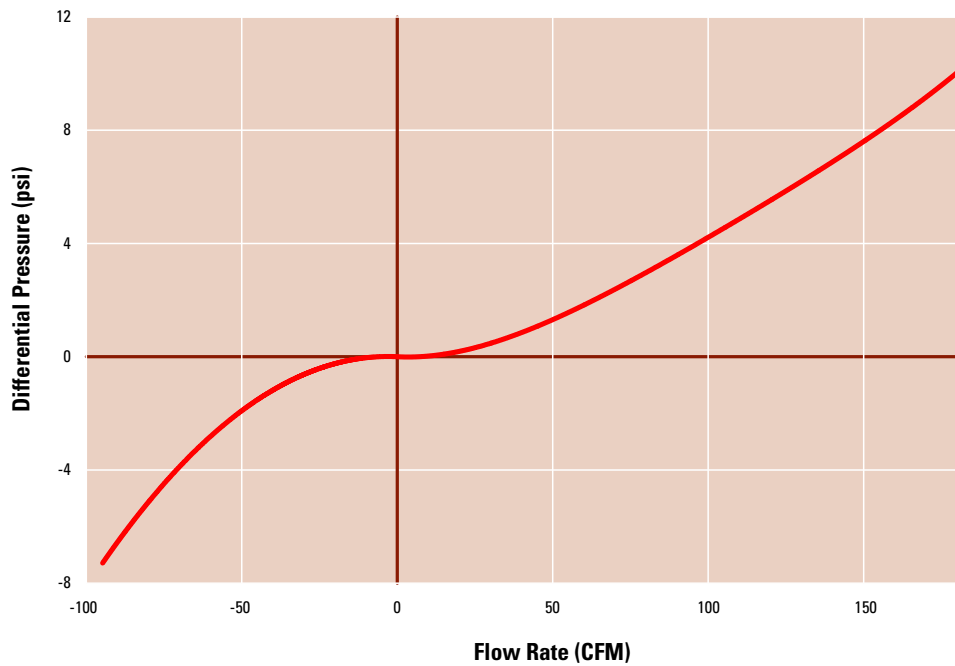
	DIFFERENTIAL PRESSURE (psi)				
	-8	-6	-4	-2	0
FLOW RATE (CFM)	-37.5	-28.5	-20	-10	0

D-040 LONG SERIES

D-040 LONG AIR RELEASE FLOW RATE (2")



D-040 LONG AIR & VACUUM FLOW RATE (2")



DISCHARGE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)					
	0	2	4	6	8	10
FLOW RATE (CFM)	0	68	100	125	155	180

INTAKE FLOW RATES

	DIFFERENTIAL PRESSURE (psi)				
	-8	-6	-4	-2	0
FLOW RATE (CFM)	-100	-88	-75	-50	0

COMBINATION AIR VALVES

D-05 SERIES

DESCRIPTION

The D05 Series Combination Air Valve has the features of both a continuous acting air release valve and an air & vacuum valve. The air release component is designed to continuously release to the atmosphere small pockets of air as they accumulate at local high points along a pipeline when the pipeline or piping system is full and operating under pressure. The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.



Combination Air Valve
D-050-C

PRODUCT ADVANTAGES

- Reliable operation reduces water hammer incidents.
- Dynamic design allows high velocity air discharge, preventing premature closing.
- Lightweight, small dimensions, simple and reliable construction.
- Special orifice seat design: Combination of St.St. and E.P.D.M. rubber, assures long-term maintenance free operation.
- The drainage outlet enables removal of excess fluids.

AIR RELEASE COMPONENT

- Large sized air release orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Releases air at high flow rates.
 - One size orifice for a wide pressure range (up to 360 psi), achieved by the patented rolling seal mechanism.
- Body made of high strength materials.
- All operating parts are made of specially selected corrosion-resistant polymer materials.

SPECIFICATIONS

- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Working pressure range: 3 - 250 psi
Model D-052 range: 3 - 360 psi
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

D-05 SERIES

OPERATION

The air & vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve. At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other destructive phenomena. The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

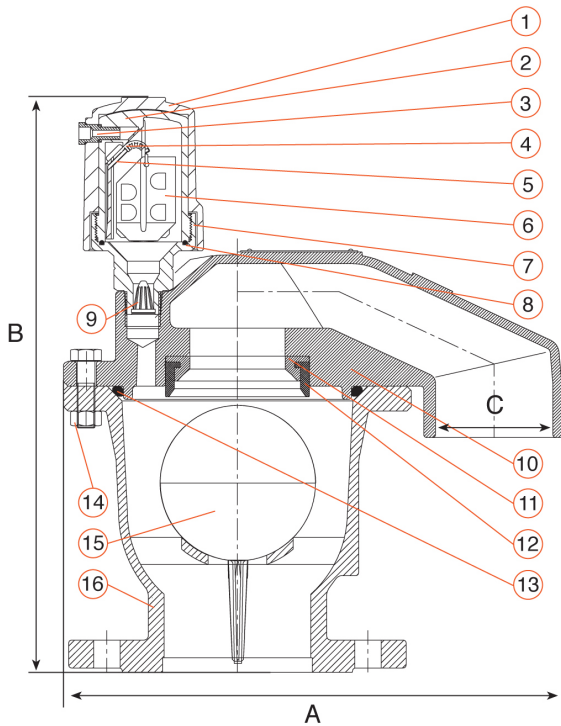
As the system starts to fill, the valve functions according

to the following stages:

1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air & vacuum and air release orifices.
2. Air will enter the system.



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Shell	Ductile Iron ASTM A-536-60-40-18* Cast Iron ASTM A-48 CL35B**
2	Body	Reinforced Nylon
3	Discharge Outlet	Stainless Steel SAE 316
4	Rolling Seal	Rubber E.P.D.M
5	Clamping Stem	Reinforced Nylon
6	Float	Foamed Polypropylene
7	Base	Stainless Steel SAE 316
8	O-Ring	BUNA-N
9	Strainer	Nylon
10	Cover	Ductile Iron ASTM A-536-60-40-18
11	Orifice Seat	Stainless Steel SAE 316
12	Orifice Seal	Rubber E.P.D.M
13	O-Ring	BUNA-N
14	Bolt and Nut	Stainless Steel SAE 316
15	Float	Stainless Steel 304L
16	Body	Ductile Iron ASTM A-536-60-40-18

* D-052 360 psi

** D-050-C 250 psi

DIMENSIONS AND WEIGHTS

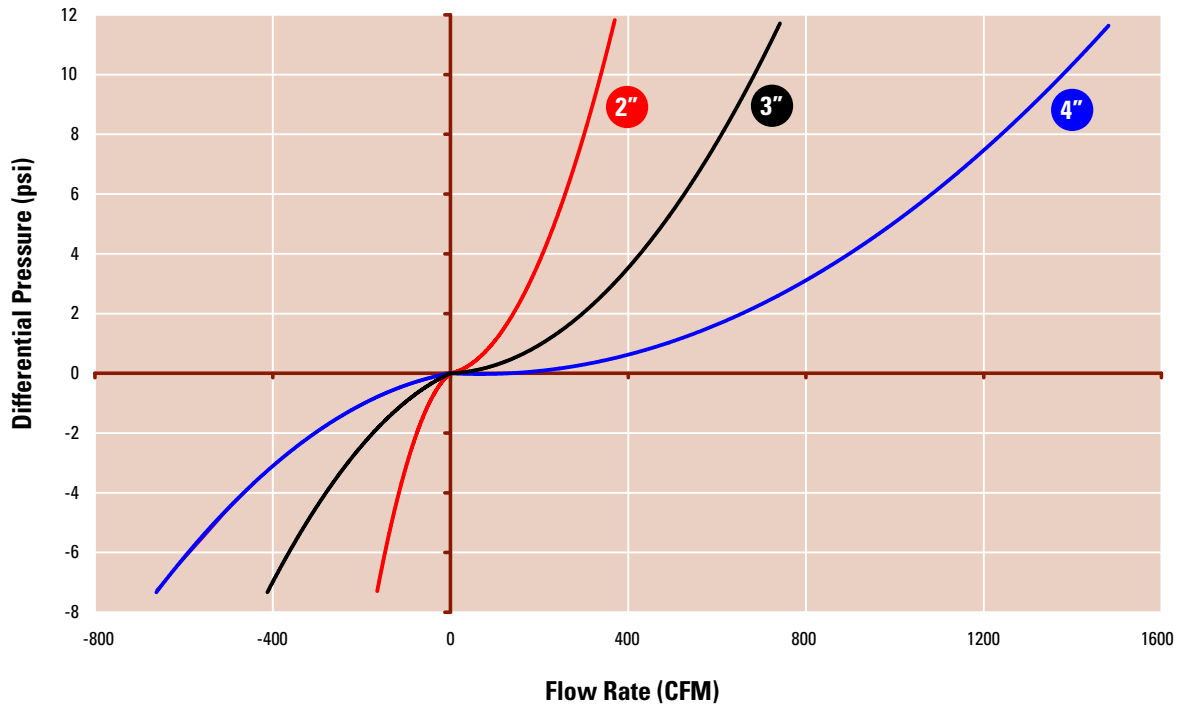
SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B		AIR-VAC	AUTO
2" Threaded	6 ^{13/16}	13 ^{13/32}	20.7	1.23	0.0186
2" Flanged	6 ^{13/16}	13 ^{5/8}	26.4	1.23	0.0186
3"	11 ^{9/32}	14 ^{1/2}	40.5	2.8	0.0186
4"	13 ^{15/32}	15 ^{15/32}	58.2	5.14	0.0186
6"	21 ^{25/32}	21 ^{15/16}	171.0	27.37	0.0186

MODEL NUMBER AND FLANGE TYPE

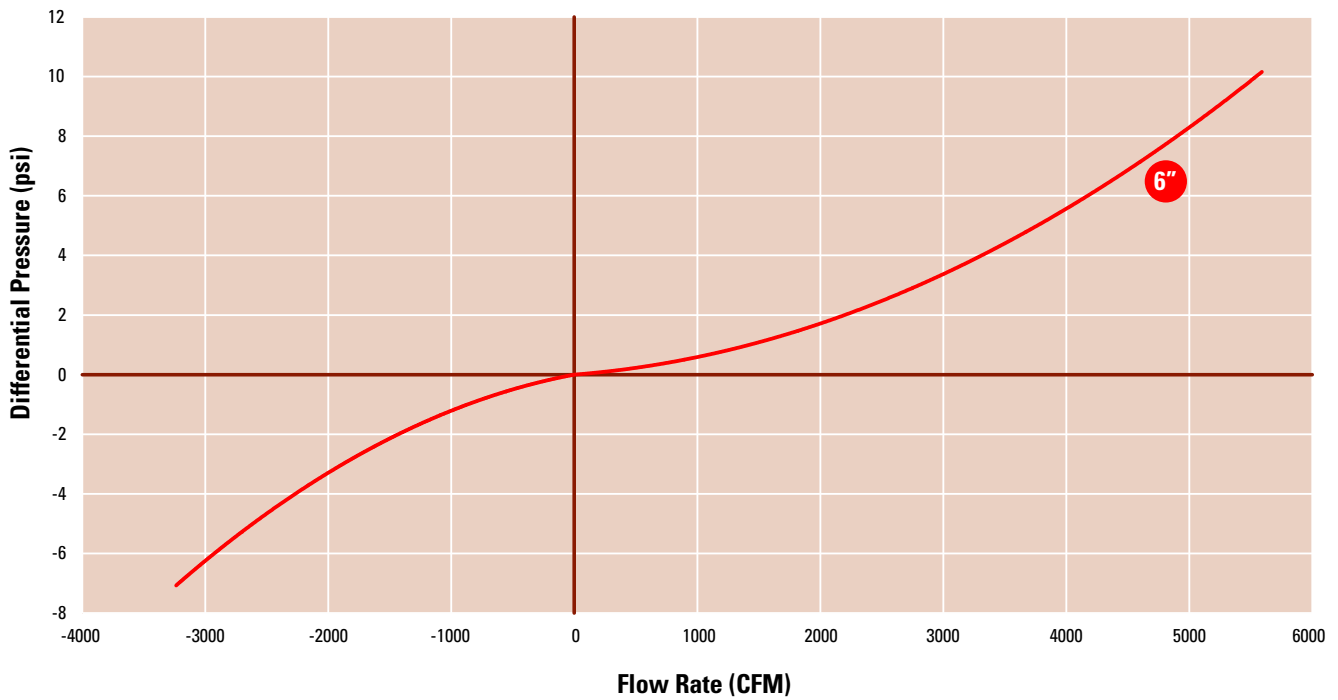
MODEL NUMBER	SIZE	CONNECTION	PSI
65D050C2T	2"	MNPT	250
65D0502C	2"	150 lb. Flg.	250
65D0503C	3"	150 lb. Flg.	250
65D0504C	4"	150 lb. Flg.	250
65D0506C	6"	150 lb. Flg.	250
65D0522	2"	300 lb. Flg.	360
65D0523	3"	300 lb. Flg.	360
65D0524	4"	300 lb. Flg.	360
65D0526	6"	300 lb. Flg.	360

D-05 SERIES

D-05 SERIES AIR & VACUUM FLOW RATE



D-05 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

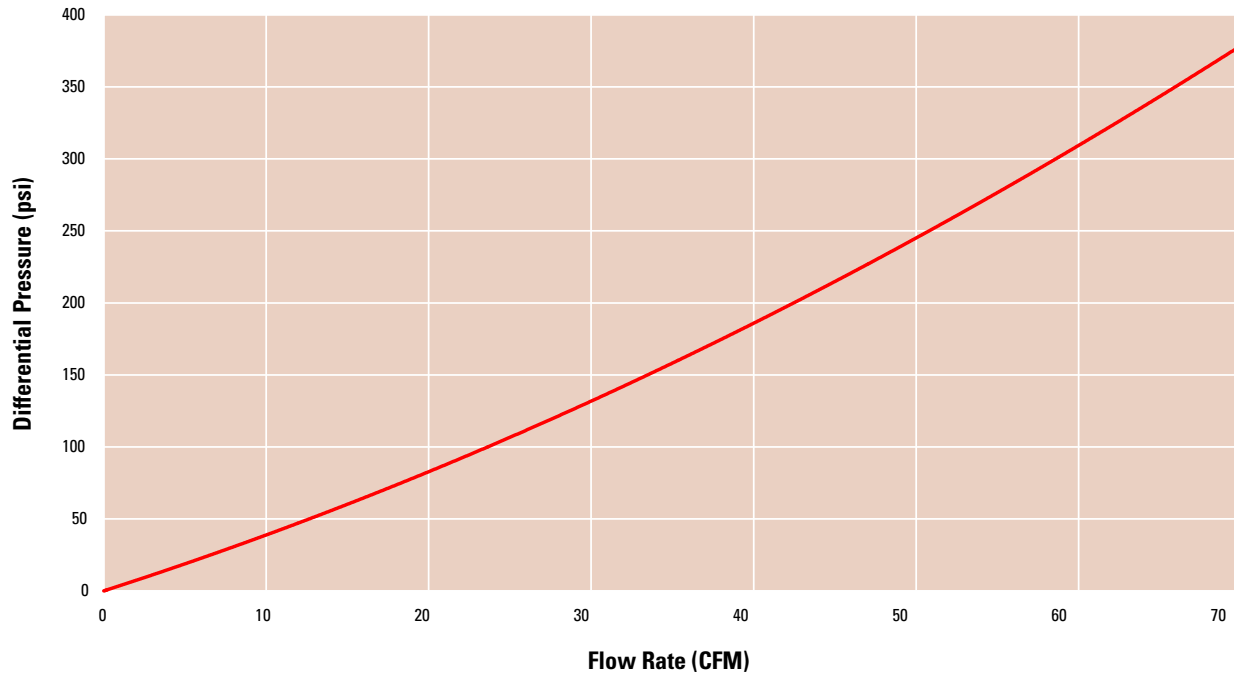
SIZE	DIFFERENTIAL PRESSURE (PSI)						
	0	2	4	6	8	10	12
2"	0	140	205	255	297.5	335	368.4
3"	0	334	465	565.5	650	725	792
4"	0	650	886	1,069	1,223	1,360	1,483
6"	0	2,290	3,365	4,182	4,900	5,530	6,100

INTAKE FLOW RATE (CFM)

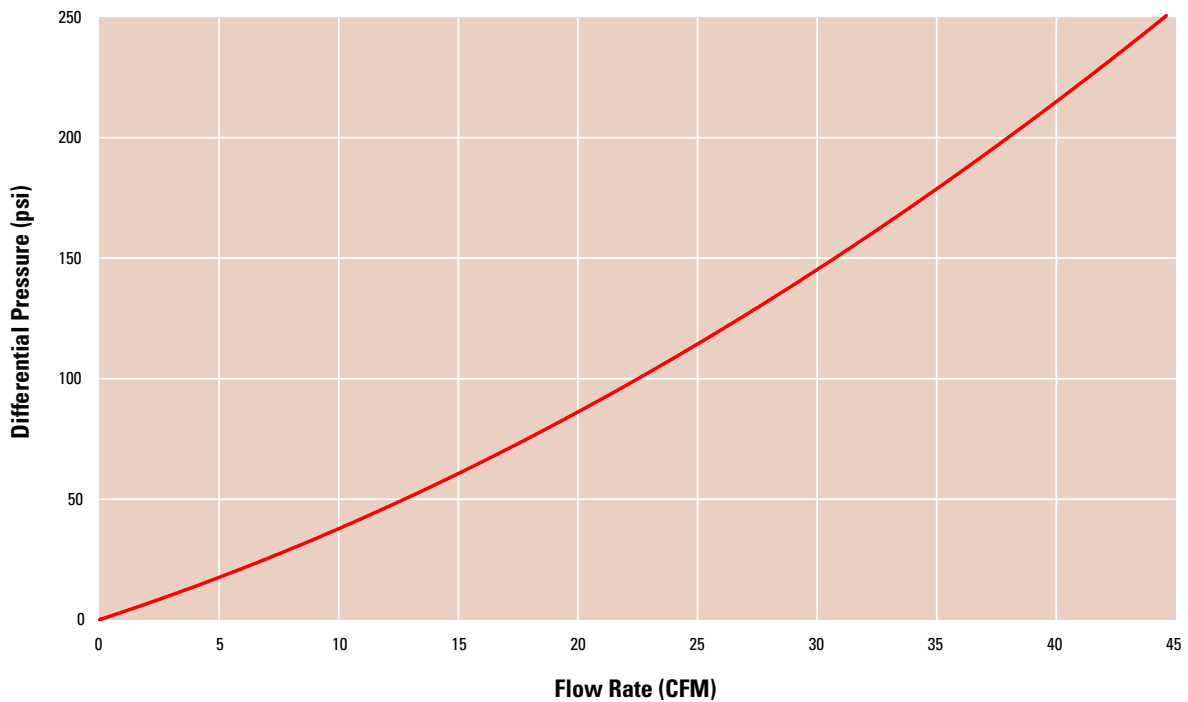
SIZE	DIFFERENTIAL PRESSURE (PSI)						
	-7.5	-6	-5	-4	-3	-2	0
2"	-171	-150.2	-135	-118.2	-99.2	-77	0
3"	-400	-348	-310	-269	-223	-169	0
4"	-689	-600	-535	-465	-383	-290	0
6"	-3,280	-2,980	-2,655	-2,300	-1,900	-1,435	0

D-05 SERIES

D-052 AIR RELEASE FLOW RATE



D-050-C AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
D-050-C	0	12.8	22.5	30.7	38	44.5	-	-	-
D-052	0	12.7	24	33.5	42.5	51	58.6	66	69.5

COMBINATION AIR VALVES

D-06 SERIES

DESCRIPTION

The D-06 Series Combination Air Valve has the features of both an air release valve and an air & vacuum valve.

The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless Steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- Lightweight, small dimensions, simple and reliable construction.
- NSF 61 certified.
- Screen-protected outlet - upper screen is protected with a protective cover.



Combination Air Valve
D-06

AIR RELEASE COMPONENT

- Body made of high strength materials.
- All operating parts are made of specially selected corrosion- resistant polymer materials.
- Large size air release orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Discharges high air flow rates.
 - One size orifice for a wide pressure range, achieved by a patented rolling seal mechanism.

SPECIFICATIONS

- Working pressure range:
 - D-060-C: 3 - 250 psi.
 - D-062: 3 - 360 psi.
- Testing pressure for the air valve: 1.5 times its working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F

D-06 SERIES

VALVE SELECTION

- Size Range: 2" - 10"
- These valves are manufactured with flanged ends to meet ASA standard (D060-C HF ASA 150, D062 HF ASA 300) or any requested standard.
- The 2" valve is also available with a threaded NPT male connection.
- Valve coating: FBE coating in accordance with standard DIN 30677-2. Other coatings are available upon request.
- The air release component and the air & vacuum component are available as separate units.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.

OPERATION

The air and vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.

- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the valve functions according to the following stages:

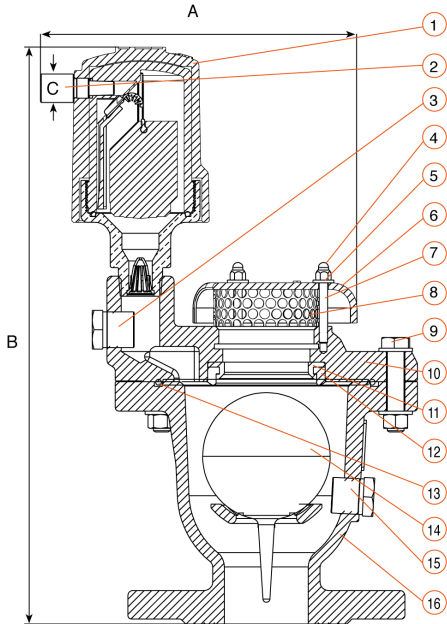
1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

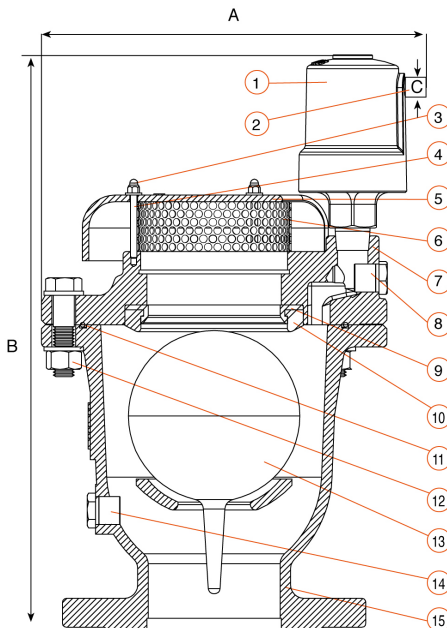
MODEL NUMBER AND FLANGE TYPE

MODEL #	SIZE	CONNECTION	PSI
65D060C2T	2"	MNPT	250
65D0602C	2"	150 lb. Flg.	250
65D0603C	3"	150 lb. Flg.	250
65D0604C	4"	150 lb. Flg.	250
65D0606C	6"	150 lb. Flg.	250
65D0608C	8"	150 lb. Flg.	250
65D0610C	10"	150 lb. Flg.	250
65D0622	2"	300 lb. Flg.	360
65D0623	3"	300 lb. Flg.	360
65D0624	4"	300 lb. Flg.	360
65D0626	6"	300 lb. Flg.	360
65D0628	8"	300 lb. Flg.	360
65D06210	10"	300 lb. Flg.	360



MATERIAL SPECIFICATIONS FOR 2"

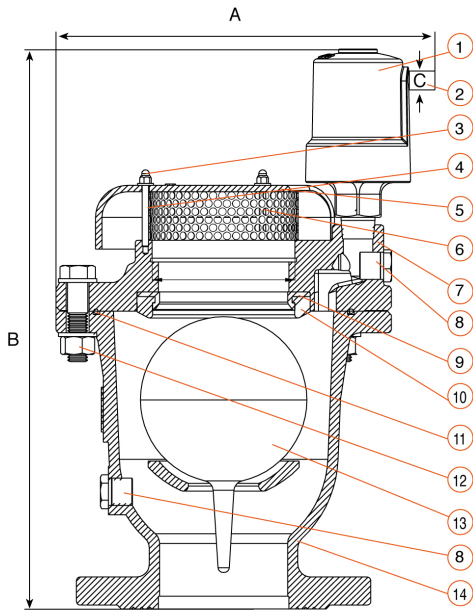
NO.	PART	MATERIAL
1	S-050-C S-052	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4 Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut & Washer	NSF 61 Certified STST UNS 30400
4	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
5	Bolt	NSF 61 Certified STST UNS 30400
6	Screen	NSF 61 Certified STST UNS 30400
7	Non-Slam Disc	NSF 61 Certified STST UNS 31600
8	Ring	NSF 61 Certified STST UNS 31600
9	Bolt & Nut	NSF 61 Certified STST UNS 30400
10	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
11	Orifice Seat	NSF 61 Certified STST UNS 31600
12	Orifice Seal	NSF 61 Certified E.P.D.M.
13	O-Ring	NSF 61 Certified NBR 70
14	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
15	Plug	NSF 61 Certified Reinforced Nylon
16	Body	Ductile Iron ASTM A-536 60-40-18 Resicoat RT R460-40-18 / Resicoat RT R4



MATERIAL SPECIFICATIONS FOR 3"

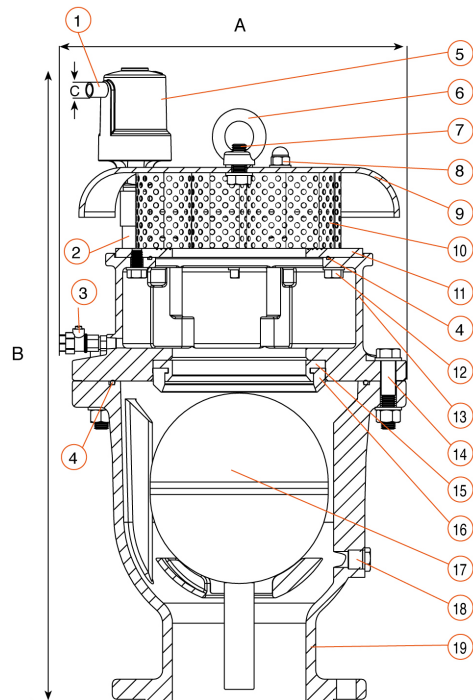
NO.	PART	MATERIAL
1	S-050-C S-052	Cast Iron ASTM A48 CL.35B / Resicoat RT R4 Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut	NSF 61 Certified STST UNS 30400
4	Bolt	NSF 61 Certified STST UNS 30400
5	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
6	Screen	NSF 61 Certified STST UNS 30400
7	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
8	Plug	NSF 61 Certified Reinforced Nylon
9	Orifice Seat	NSF 61 Certified STST UNS 30400
10	Orifice Seal	NSF 61 Certified E.P.D.M
11	O-Ring	NSF 61 Certified NBR 70
12	Bolt & Nut	NSF 61 Certified STST UNS 30400
13	Float	NSF 61 Certified STST UNS 31600 NSF 61 Certified Polycarbonate
14	Plug	NSF 61 Certified Reinforced Nylon
15	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

D-06 SERIES



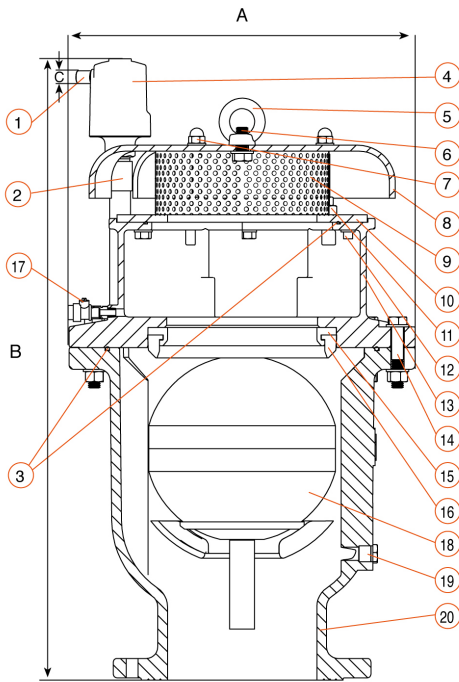
MATERIAL SPECIFICATIONS FOR 4"

NO.	PART	MATERIAL
1	S-050-C S-052	Cast Iron ASTM A48 CL.35B / Resicoat RT R4 Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut & Washer	NSF 61 Certified STST UNS 30400
4	Bolt	NSF 61 Certified STST UNS 30400
5	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
6	Screen	NSF 61 Certified STST UNS 30400
7	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
8	Plug	NSF 61 Certified Reinforced Nylon
9	Orifice Seat	NSF 61 Certified STST UNS 30400
10	Orifice Seal	NSF 61 Certified E.P.D.M
11	O-Ring	NSF 61 Certified NBR 70
12	Bolt & Nut	NSF 61 Certified STST UNS 30400
13	Float	NSF 61 Certified STST UNS 31600 NSF 61 Certified Polycarbonate
14	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4



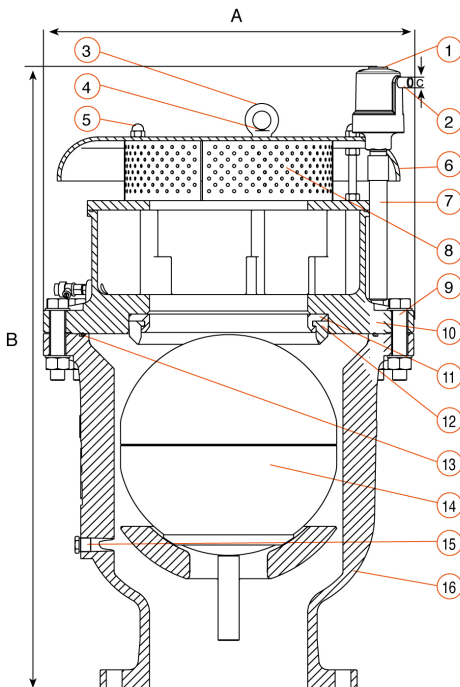
MATERIAL SPECIFICATIONS FOR 6"

NO.	PART	MATERIAL
1	Discharge Outlet	NSF 61 Certified STST UNS 31600
2	Nipple & Coupling	NSF 61 Certified STST UNS 30400
3	Test Cock & Adaptor	NSF 61 Certified STST UNS 31600
4	O-Ring	NSF 61 Certified NBR 70
5	S-050-C S-052	Cast Iron ASTM A48 CL.35B / Resicoat RT R4 Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
6	Lifting Ring	Carbon Steel
7	Bolt & Washer	NSF 61 Certified STST UNS 30400
8	Nut	NSF 61 Certified STST UNS 30400
9	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
10	Screen	NSF 61 Certified STST UNS 30400
11	Ring	Steel Din St.37
12	Bolt & Washer	NSF 61 Certified STST UNS 30400
13	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
14	Bolt	NSF 61 Certified STST UNS 30400
15	Orifice Seat	NSF 61 Certified STST UNS 30400
16	Orifice Seal	NSF 61 Certified E.P.D.M
17	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
18	Plug	NSF 61 Certified Reinforced Nylon
19	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4



MATERIAL SPECIFICATIONS FOR 8"

NO.	PART	MATERIAL
1	Discharge Outlet	NSF 61 Certified STST UNS 31600
2	Nipple & Coupling	NSF 61 Certified STST UNS 30400
3	O-Ring	NSF 61 Certified NBR 70
4	S-050-C	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
5	Lifting Ring	Carbon Steel
6	Bolt & Washer	NSF 61 Certified STST UNS 30400
7	Nut	NSF 61 Certified STST UNS 30400
8	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
9	Screen	NSF 61 Certified STST UNS 30400
10	Ring	Steel Din St.37
11	Bolt & Washer	NSF 61 Certified STST UNS 30400
12	Bolt & Washer	NSF 61 Certified STST UNS 30400
13	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
14	Bolt	NSF 61 Certified STST UNS 30400
15	Orifice Seat	NSF 61 Certified STST UNS 30400
16	Orifice Seal	NSF 61 Certified E.P.D.M
17	Test Cock + Adaptor	NSF 61 Certified STST UNS 31600
18	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
19	Plug	NSF 61 Certified Reinforced Nylon
20	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R46 60-40-18 / Resicoat RT R4

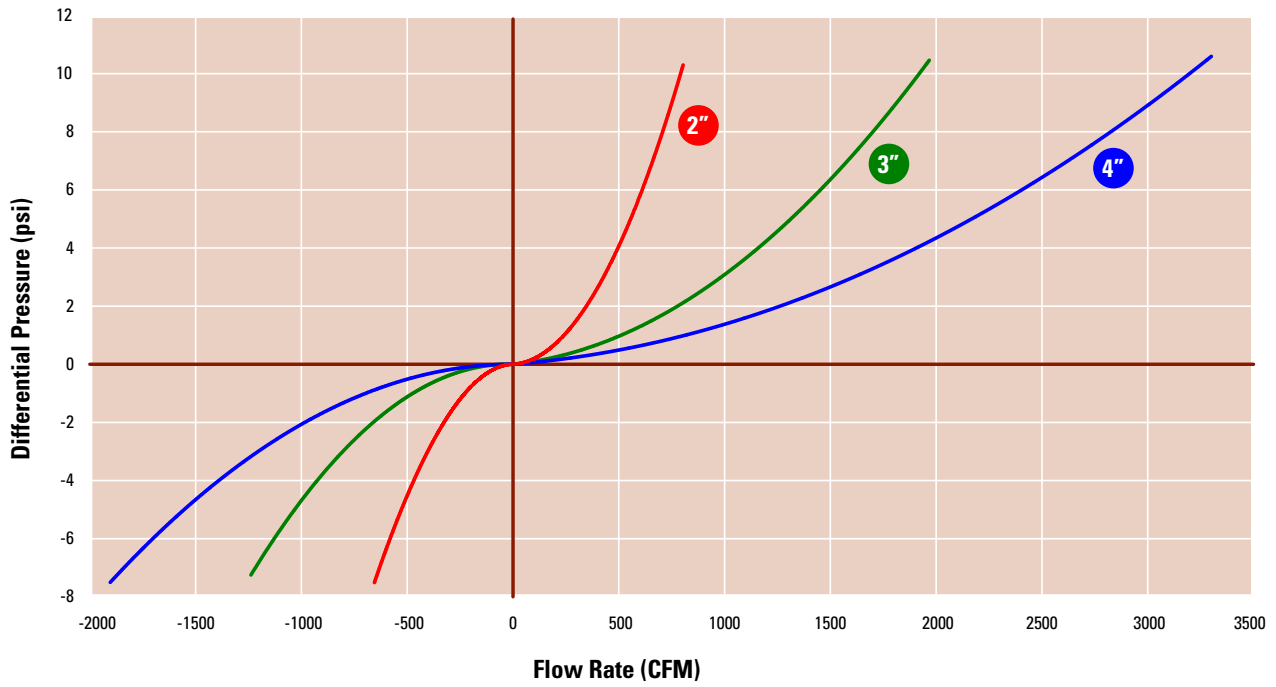


MATERIAL SPECIFICATIONS FOR 10"

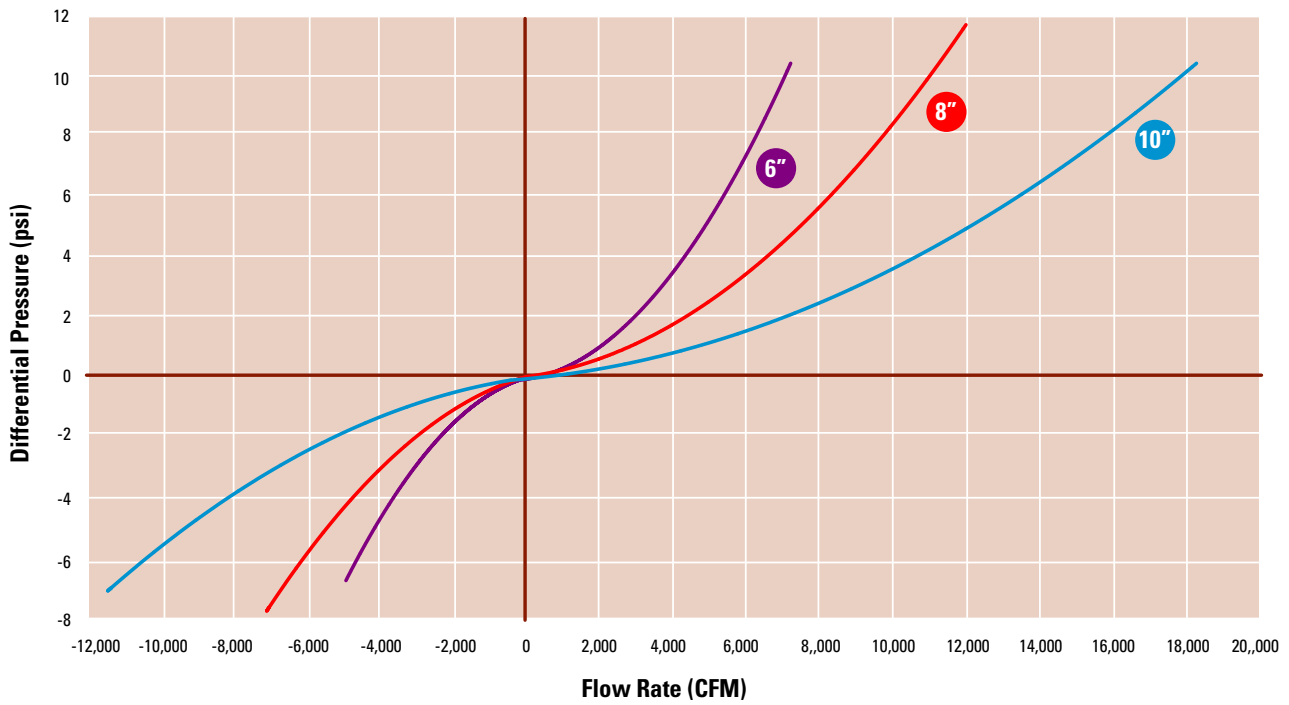
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
	S-052-C	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Lifting Ring	Carbon Steel
4	Bolt & Washer	NSF 61 Certified STST UNS 30400
5	Nut	NSF 61 Certified STST UNS 30400
6	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
7	Nipple & Coupling	NSF 61 Certified STST UNS 30400
8	Screen	NSF 61 Certified STST UNS 30400
9	Bolt & Nut	NSF 61 Certified STST UNS 30400
10	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
11	Orifice Seat	Stainless Steel SAE 304 / UNS 30400
12	Orifice Seal	NSF 61 Certified E.P.D.M
13	O-Ring	NSF 61 Certified NBR 70
14	Float	Stainless Steel SAE 316L / UNS 31600 / NSF 61 Certified Polycarbonate
15	Plug	NSF 61 Certified Reinforced Nylon
16	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

D-06 SERIES

D-060, D-062 HF AIR & VACUUM FLOW RATE



D-060, D-062 AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	4	6	8	10
2"	0	368	497	597	682	757
3"	0	750	1,155	1,465	1,730	1,965
4"	0	1,250	1,890	2,390	2,810	3,180
6"	0	2,850	4,200	5,150	6,000	6,740
8"	0	4,465	6,660	8,350	9,770	11,030
10"	0	7,820	10,890	13,410	15,880	17,950

INTAKE FLOW RATE (CFM)

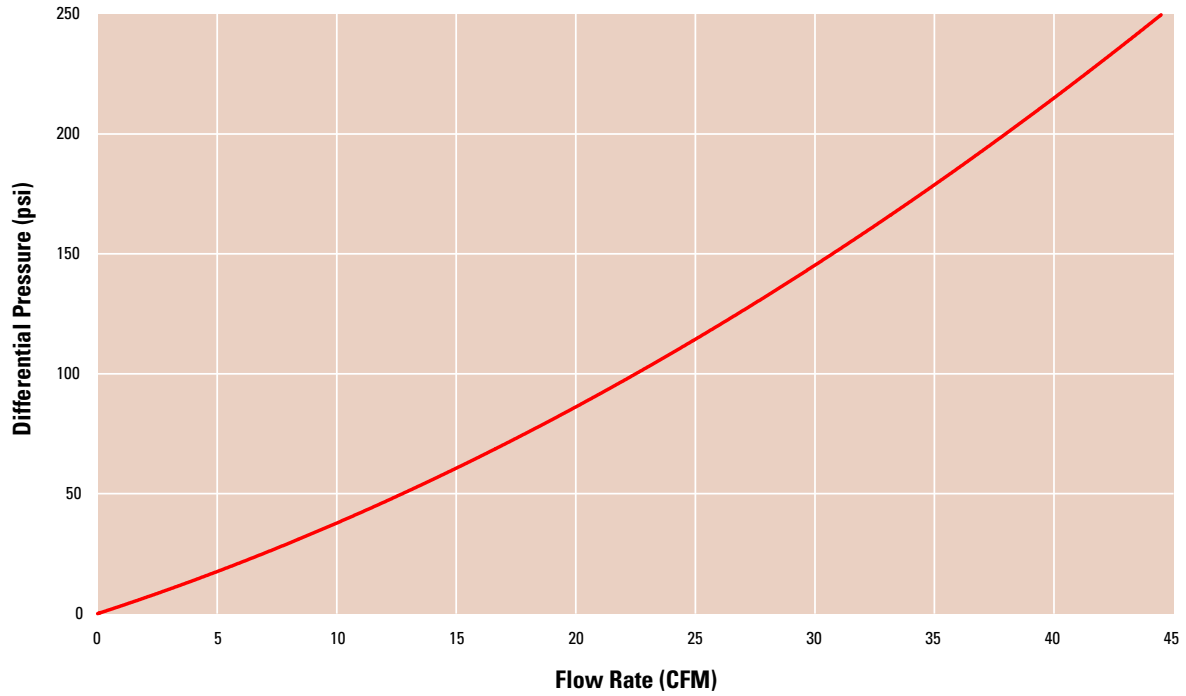
SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-8	-7	-6	-5	-4	-3	-2	0
2"	-655	-615	-571	-523	-470	-410	-340	0
3"	-1,316	-1,235	-1,146	-1,051	-945	-825	-685	0
4"	-1,998	-1,869	-1,730	-1,579	-1,412	-1,222	-1,000	0
6"	-4,920	-4,250	-3,790	-3,285	-2,720	-2,060	-1,240	0
8"	-7,360	-6,800	-6,190	-5,540	-4,810	-4,000	-3,060	0
10"	-12,100	-11,400	-10,380	-9,550	-8,570	-7,300	-6,210	0

DIMENSIONS AND WEIGHTS

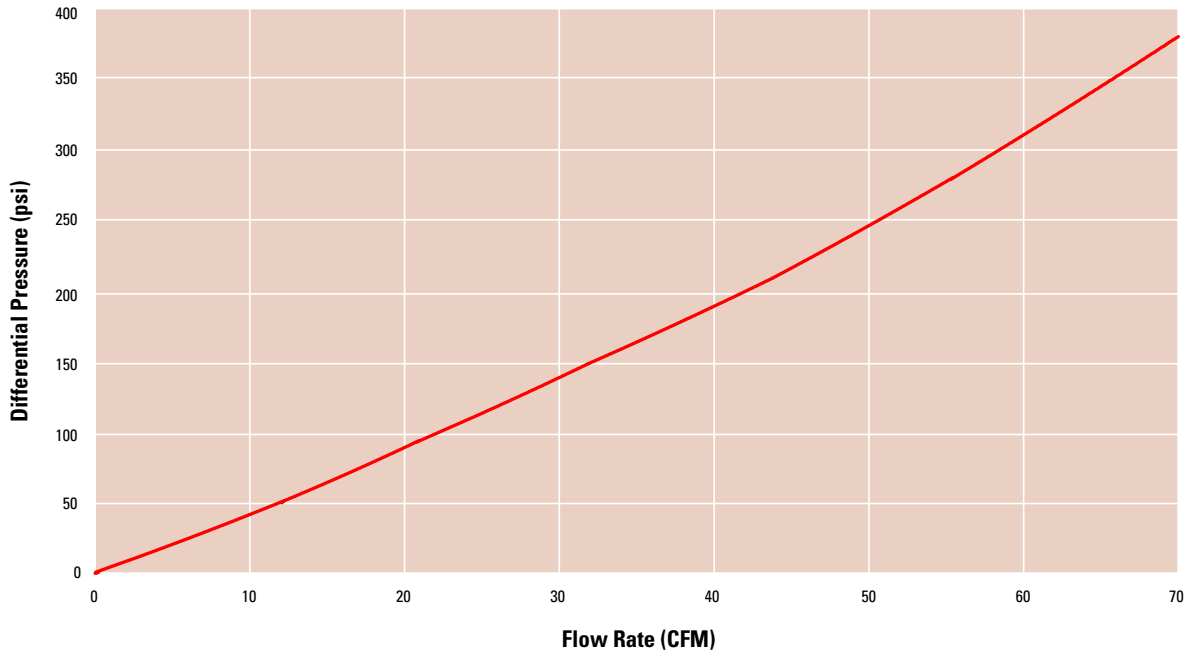
SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)		
	A	B		AIR-VAC	AUTO (D060)	AUTO (D062)
2" Threaded	8 ¹³ / ₁₆	13 ¹³ / ₃₂	24.7	3.04	0.0186	0.014
2" Flanged	8 ¹³ / ₁₆	12 ¹³ / ₁₆	26.7	3.04	0.0186	0.014
3"	9 ⁹ / ₃₂	15 ½	43.2	7.79	0.0186	0.014
4"	11	17 ¹⁵ / ₃₂	62.2	12.16	0.0186	0.014
6"	14 ¹³ / ₁₆	25	173.3	27.37	0.0186	0.014
8"	18 ¹ / ₃	28 ½	260.1	48.67	0.0186	0.014
10"	23	38 ¹⁵ / ₁₆	584	76.08	0.0186	0.014

D-06 SERIES

D-060-C AIR RELEASE FLOW RATE



D-062 AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATE (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
D-060-C	0	12.8	22.5	30.7	38.0	44.5	-	-	-
D-062-C	0	12.7	24	33.5	42.5	51	58.6	66	69.5

COMBINATION AIR VALVE

FOR HIGH FLOW
D-06NS SERIES

DESCRIPTION

The D-06NS Series Combination Air Valve has the features of both an air release valve and an air & vacuum valve.

The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless Steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- NSF 61 certified.
- Screen protected outlet - upper screen is protected with a protective cover.

AIR RELEASE COMPONENT

- Body made of high strength materials.
- All operating parts are made of specially selected corrosion-resistant polymer materials.



**Combination Air Valve
for High Flow - Non Slam**

D-06NS

- Large sized air release orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Discharges high air flow rates.
 - One size orifice for a wide pressure range, achieved by a patented rolling seal mechanism.

VALVE SELECTION

- Size Range: 2" - 10"
- These valves are manufactured with flanged ends to meet ASA standard (D060 NS ASA 150, D062 NS ASA 300) or any requested standard.
- The 2" valve is also available with a threaded NPT male connection.
- The automatic air release component and the air & vacuum component are available as separate units.

When ordering, please specify: model, size, working pressure, threads standard and type of liquid.

D-06NS SERIES

SPECIFICATIONS

- Working pressure range:
D-060 NS: 3 - 250 psi.
D-062 NS: 3 - 360 psi
- Testing pressure for the air valve: 1.5 times its working pressure.
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- FBE coating, both interior & exterior, in accordance with standard DIN 30677-2.

OPERATION

The 65D060-C HF NS Series Combination Non-Slam Air Valve is a surge-dampening, slam-preventing, 3-stage combination air valve. The air valve provides high capacity vacuum protection and, at the same time, efficient surge suppression. At sudden drainage and/or water column separation (sudden pump trips or valve closure, for instance), the air & vacuum orifice admits air at high flow rates, thus preventing vacuum. As the water column and/or pressure wave returns, large volumes of air are discharged at high velocities, raising the non-slam disc, partially closing the air & vacuum orifice and allowing air to exhaust slowly through the smaller orifice of the non-slam disc. This slowly exhausting air pocket dampens the slam of the returning water column, thus suppressing the pressure surge. As the water flow arrives at a much slower rate, dampened by the slower air discharge, it buoys up the main float, gently closing the air & vacuum component of the air valve.

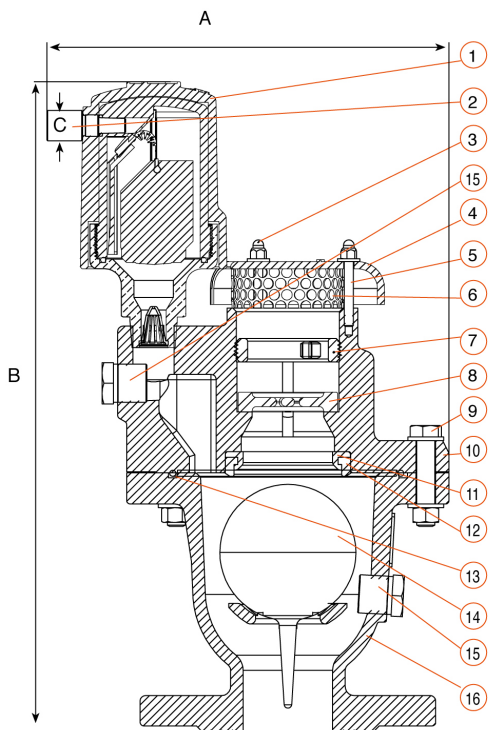
The air release component continues releasing air while the pipeline and the air valve are pressurized.

MODEL NUMBER AND FLANGE TYPE

MODEL #	SIZE	CONNECTION	PSI
65D060C2TNS	2"	MNPT	250
65D0602CNS	2"	150 lb. Flg.	250
65D0603CNS	3"	150 lb. Flg.	250
65D0604CNS	4"	150 lb. Flg.	250
65D0606CNS	6"	150 lb. Flg.	250
65D0608CNS	8"	150 lb. Flg.	250
65D0610CNS	10"	150 lb. Flg.	250
65D0622NS	2"	300 lb. Flg.	360
65D0623NS	3"	300 lb. Flg.	360
65D0624NS	4"	300 lb. Flg.	360
65D0626NS	6"	300 lb. Flg.	360
65D0628NS	8"	300 lb. Flg.	360
65D06210NS	10"	300 lb. Flg.	360

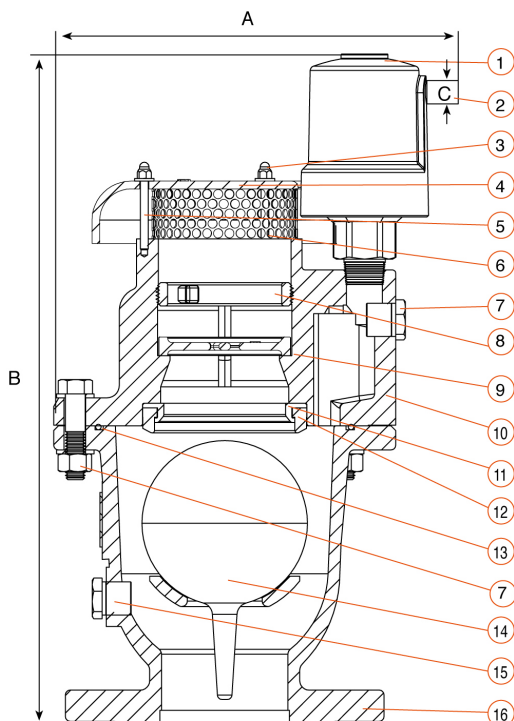
DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)		
	A	B		AIR-VAC	AUTO (D060NS)	AUTO (D062NS)
2" Threaded	8 ¹³ / ₁₆	14 ¹³ / ₁₆	30.9	3.04	0.0186	0.014
2" Flanged	8 ¹³ / ₁₆	14 ¹ / ₈	30.9	3.04	0.0186	0.014
3"	9 ⁹ / ₃₂	17	46.3	7.79	0.0186	0.014
4"	11	18 ¹³ / ₁₆	63.9	12.16	0.0186	0.014
6"	14 ¹³ / ₁₆	28 ¹ / ₂	202.8	27.37	0.0186	0.014
8"	18 ¹ / ₃	33 ¹³ / ₁₆	308.6	48.67	0.0186	0.014
10"	23	39 ¹ / ₈	680	76.08	0.0186	0.014



MATERIAL SPECIFICATIONS FOR 2"

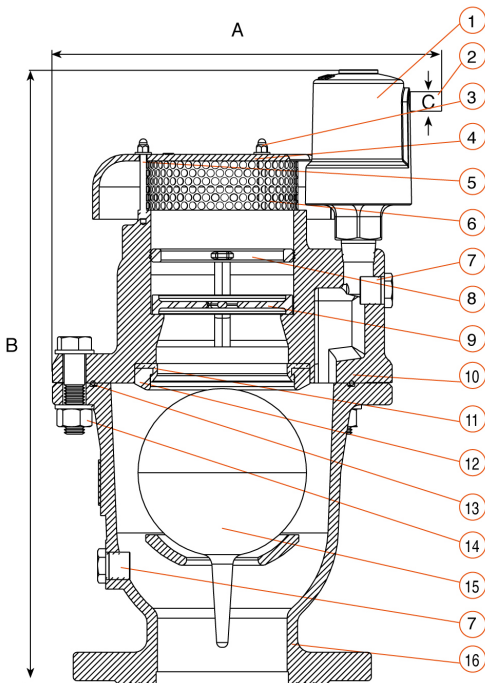
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut & Washer	NSF 61 Certified STST UNS 30400
4	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
5	Bolt	NSF 61 Certified STST UNS 30400
6	Screen	NSF 61 Certified STST UNS 30400
7	Non-Slam Disc	NSF 61 Certified STST UNS 31600
8	Ring	NSF 61 Certified STST UNS 31600
9	Bolt & Nut	NSF 61 Certified STST UNS 30400
10	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
11	Orifice Seat	NSF 61 Certified STST UNS 31600
12	Orifice Seal	NSF 61 Certified E.P.D.M.
13	O-Ring	NSF 61 Certified NBR 70
14	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
15	Plug	NSF 61 Certified Reinforced Nylon
16	Body	Ductile Iron ASTM A-536 60-40-18 Resicoat RT R460-40-18 / Resicoat RT R4



MATERIAL SPECIFICATIONS FOR 3"

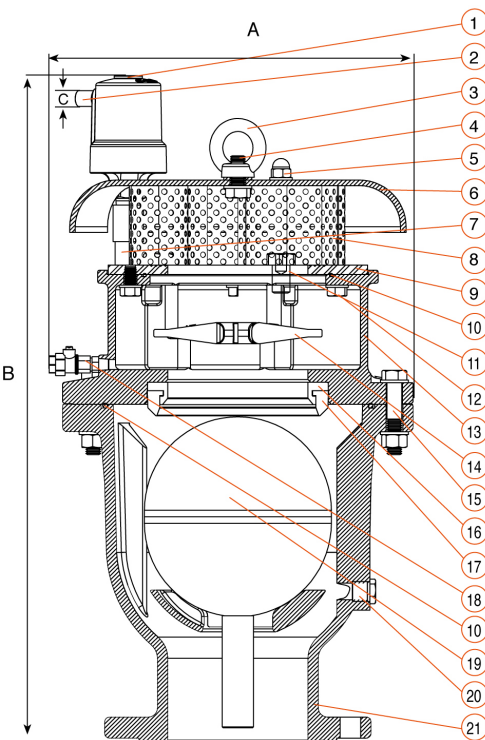
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut & Washer	NSF 61 Certified STST UNS 30400
4	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
5	Bolt	NSF 61 Certified STST UNS 30400
6	Screen	NSF 61 Certified STST UNS 30400
7	Plug	NSF 61 Certified Reinforced Nylon
8	Non-Slam Disc	NSF 61 Certified STST UNS 31600
9	Ring	NSF 61 Certified STST UNS 31600
10	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
11	Orifice Seat	NSF 61 Certified STST UNS 31600
12	Orifice Seal	NSF 61 Certified E.P.D.M.
13	O-Ring	NSF 61 Certified NBR 70
14	Bolt & Nut	NSF 61 Certified STST UNS 30400
15	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
16	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

D-06NS SERIES



MATERIAL SPECIFICATIONS FOR 4"

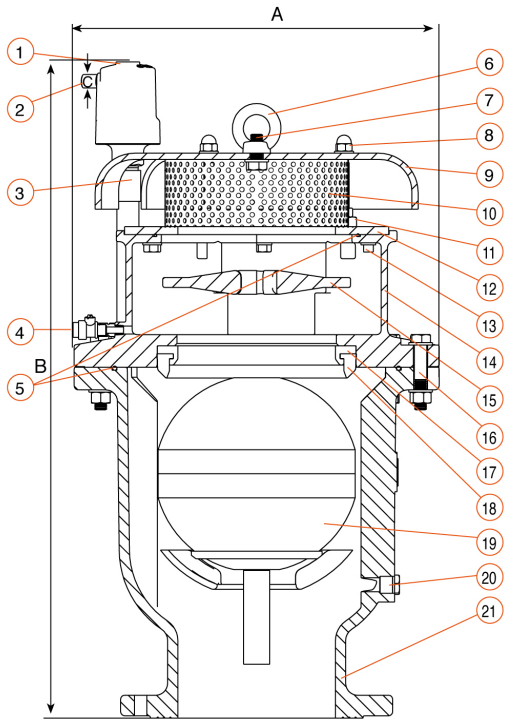
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nut	NSF 61 Certified STST UNS 30400
4	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
5	Bolt	NSF 61 Certified STST UNS 30400
6	Screen	NSF 61 Certified STST UNS 30400
7	Plug	NSF 61 Certified Reinforced Nylon
8	Ring	NSF 61 Certified STST UNS 31600
9	Non-Slam Disc	NSF 61 Certified STST UNS 31600
10	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
11	Orifice Seat	Stainless Steel DIN 7981 C A2
12	Orifice Seal	NSF 61 Certified E.P.D.M.
13	O-Ring	NSF 61 Certified NBR 70
14	Bolt & Nut	NSF 61 Certified STST UNS 30400
15	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
16	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4



MATERIAL SPECIFICATIONS FOR 6"

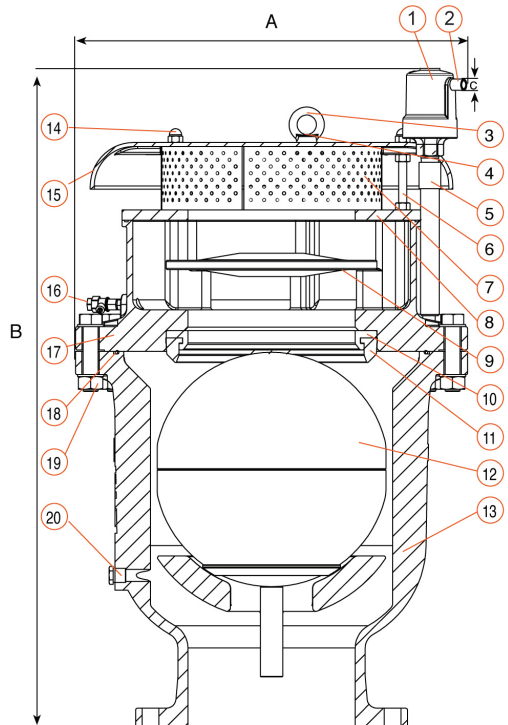
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Lifting Ring	Carbon Steel
4	Bolt & Washer	NSF 61 Certified STST UNS 30400
5	Nut & Washer	NSF 61 Certified STST UNS 30400
6	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
7	Nipple & Coupling	NSF 61 Certified STST UNS 30400
8	Screen	NSF 61 Certified STST UNS 30400
9	Ring	NSF 61 Certified STST UNS 31600
10	O-Ring	NSF 61 Certified NBR 70
11	Bolt	NSF 61 Certified STST UNS 30400
12	Bolt & Nut	NSF 61 Certified STST UNS 30400
13	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
14	Non-Slam Disc	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
15	Bolt & Nut	NSF 61 Certified STST UNS 30400
16	Orifice Seat	Stainless Steel DIN 7981 C A2
17	Orifice Seal	NSF 61 Certified E.P.D.M.
18	Test Cock + Adaptor	NSF 61 Certified STST UNS 31600
19	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
20	Plug	NSF 61 Certified Reinforced Nylon
21	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

MATERIAL SPECIFICATIONS FOR 8"



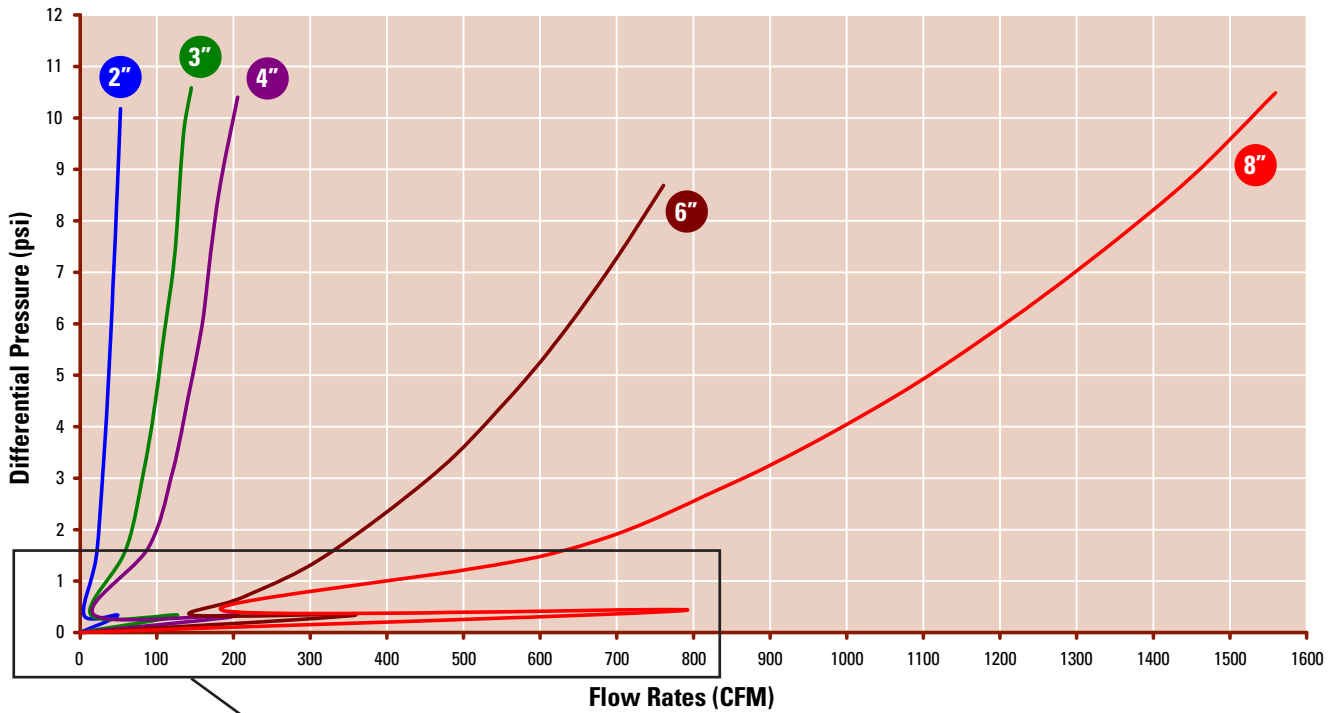
NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Nipple & Coupling	NSF 61 Certified STST UNS 30400
4	Test Cock + Adaptor	NSF 61 Certified STST UNS 31600
5	O-Ring	NSF 61 Certified NBR 70
6	Lifting Ring	Carbon Steel
7	Bolt & Washer	NSF 61 Certified STST UNS 30400
8	Nut & Washer	NSF 61 Certified STST UNS 30400
9	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
10	Screen	NSF 61 Certified STST UNS 30400
11	Bolt	NSF 61 Certified STST UNS 30400
12	Ring	NSF 61 Certified STST UNS 31600
13	Bolt & Washer	NSF 61 Certified STST UNS 30400
14	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
15	Non-Slam Disc	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
16	Bolt & Nut	NSF 61 Certified STST UNS 30400
17	Orifice Seat	Stainless Steel DIN 7981 C A2
18	Orifice Seal	NSF 61 Certified E.P.D.M.
19	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
20	Plug	NSF 61 Certified Reinforced Nylon
21	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

MATERIAL SPECIFICATIONS FOR 10"

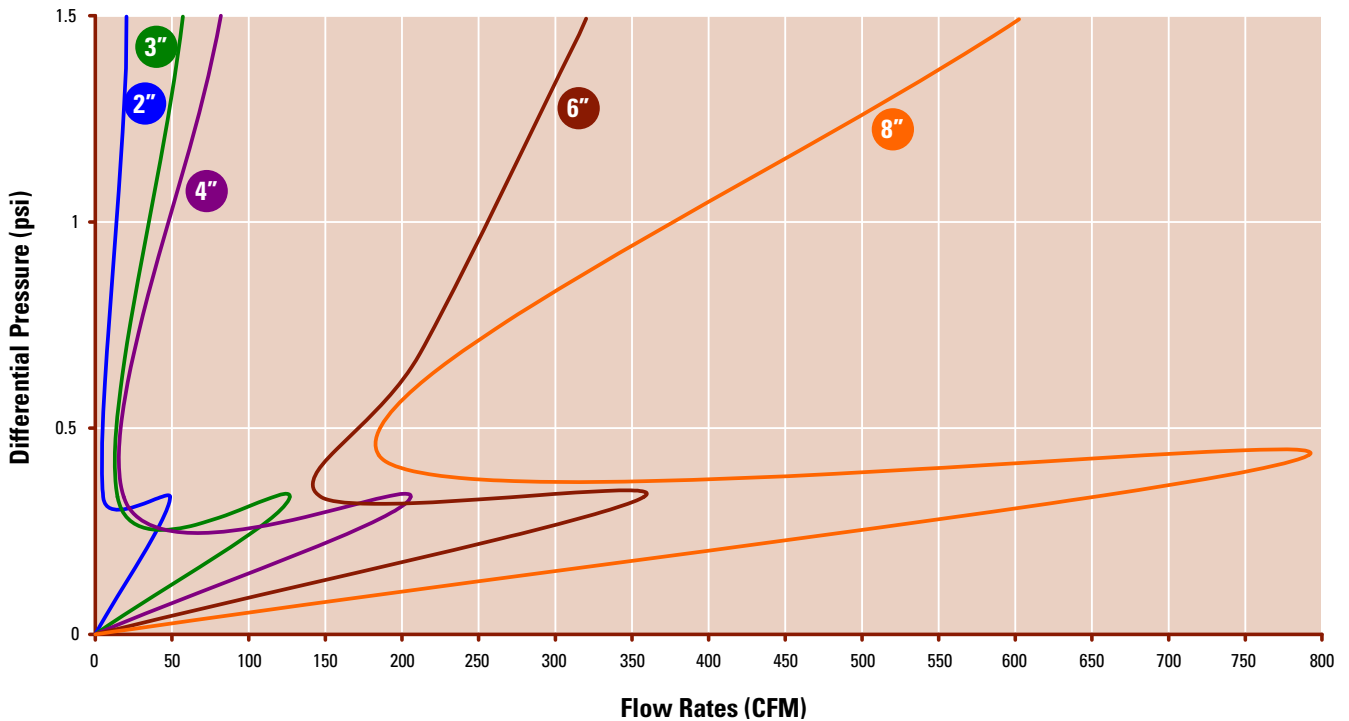


NO.	PART	MATERIAL
1	S-050-C	Cast Iron ASTM A-48 CL.35B / Resicoat RT R4
	S-052	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
2	Discharge Outlet	NSF 61 Certified STST UNS 31600
3	Lifting Ring	Carbon Steel
4	Bolt & Washer	NSF 61 Certified STST UNS 30400
5	Nipple & Coupling	NSF 61 Certified STST UNS 30400
6	Bolt	NSF 61 Certified STST UNS 30400
7	Screen	NSF 61 Certified STST UNS 30400
8	Ring	NSF 61 Certified STST UNS 31600
9	Non-Slam Disc	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
10	Orifice Seat	Stainless Steel DIN 7981 C A2
11	Orifice Seal	NSF 61 Certified E.P.D.M.
12	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
13	Body	Ductile Iron ASTM A-536 60-40-18
14	Nut & Washer	NSF 61 Certified STST UNS 30400
15	Screen Cover	Cast Iron ASTM A48 CL.35B / Resicoat RT R4
16	Test Cock & Adaptor	NSF 61 Certified STST UNS 31600
17	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
18	O-Ring	NSF 61 Certified NBR 70
19	Bolt & Nut	NSF 61 Certified STST UNS 30400
20	Plug	NSF 61 Certified Reinforced Nylon

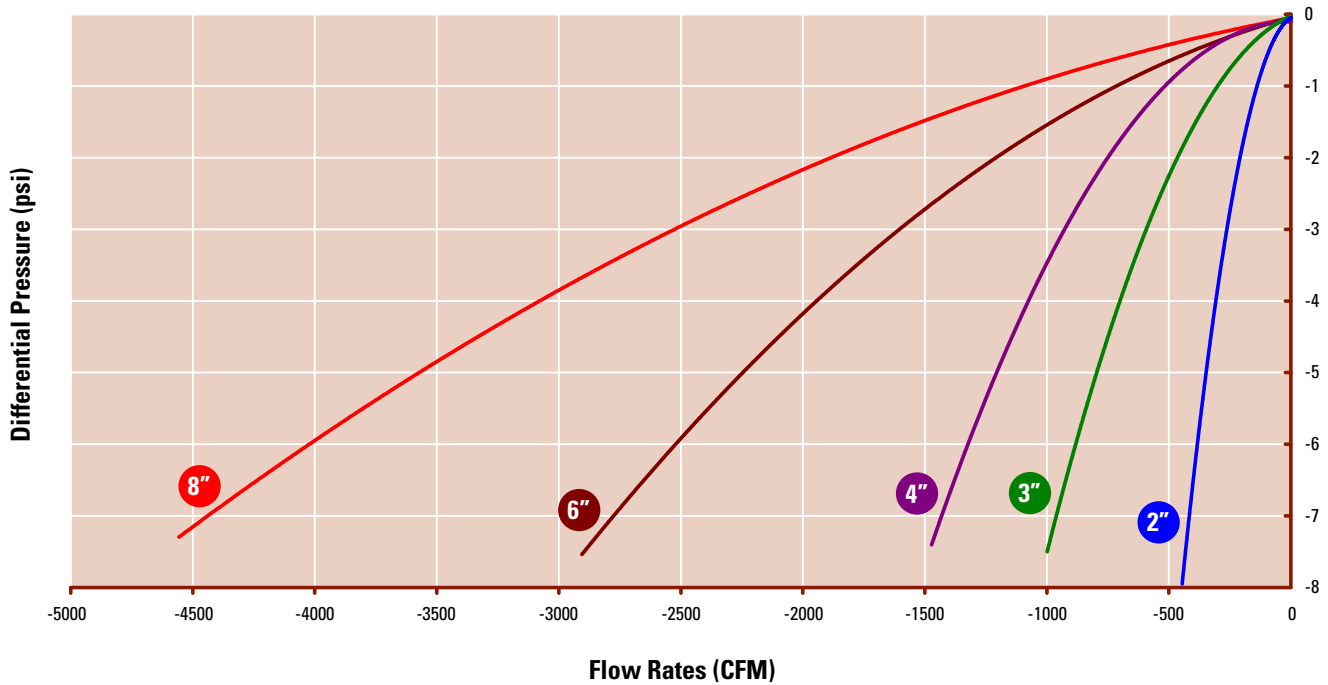
**D-060 D-062 NS 2" - 8"
DISCHARGE FLOW RATE**



**ENLARGED SECTION FROM ABOVE CHART
D-060 HF NS AIR DISCHARGE SWITCHING REGION**



D-060, D-062 HF NS INTAKE FLOW RATES



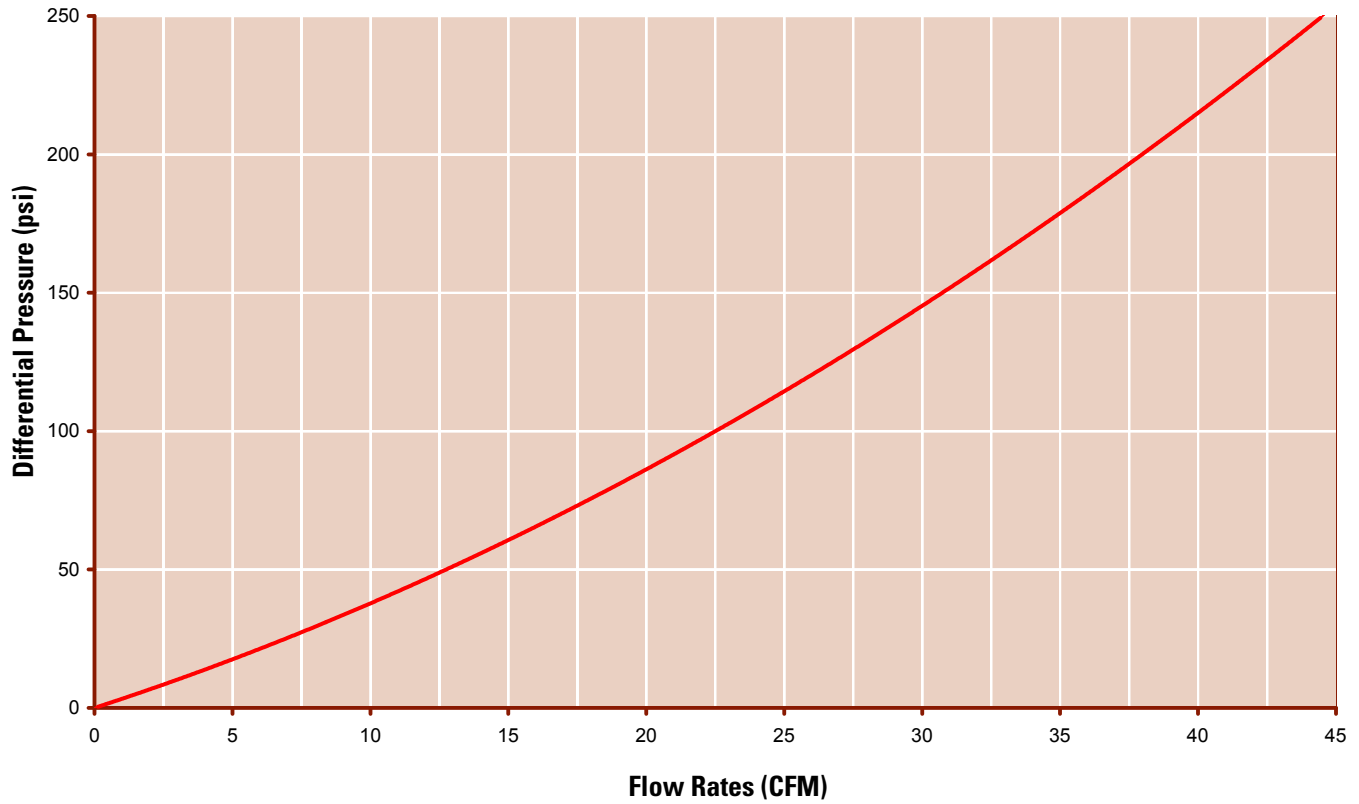
DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	4	6	8	10
2"	0	24	34	41	47	52
3"	0	68	93	111	127	137
4"	0	100	133	159	175	200
6"	0	370	525	640	730	823
8"	0	710	1,000	1210	1,385	1,530

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-7.5	-7	-6	-5	-4	-3	-2	0
2"	-428	-418	-382	-348	-310	-270	-210	0
3"	-1,020	-965	-890	-795	-705	-592	-495	0
4"	-1,490	-1,435	-1,320	-1,205	-1,080	-935	-780	0
6"	-2,900	-2,790	-2,520	-2,280	-1,960	-1,585	-1,205	0
8"	-4,610	-4,450	-4,035	-3,580	-3,100	-2,590	-1,850	0

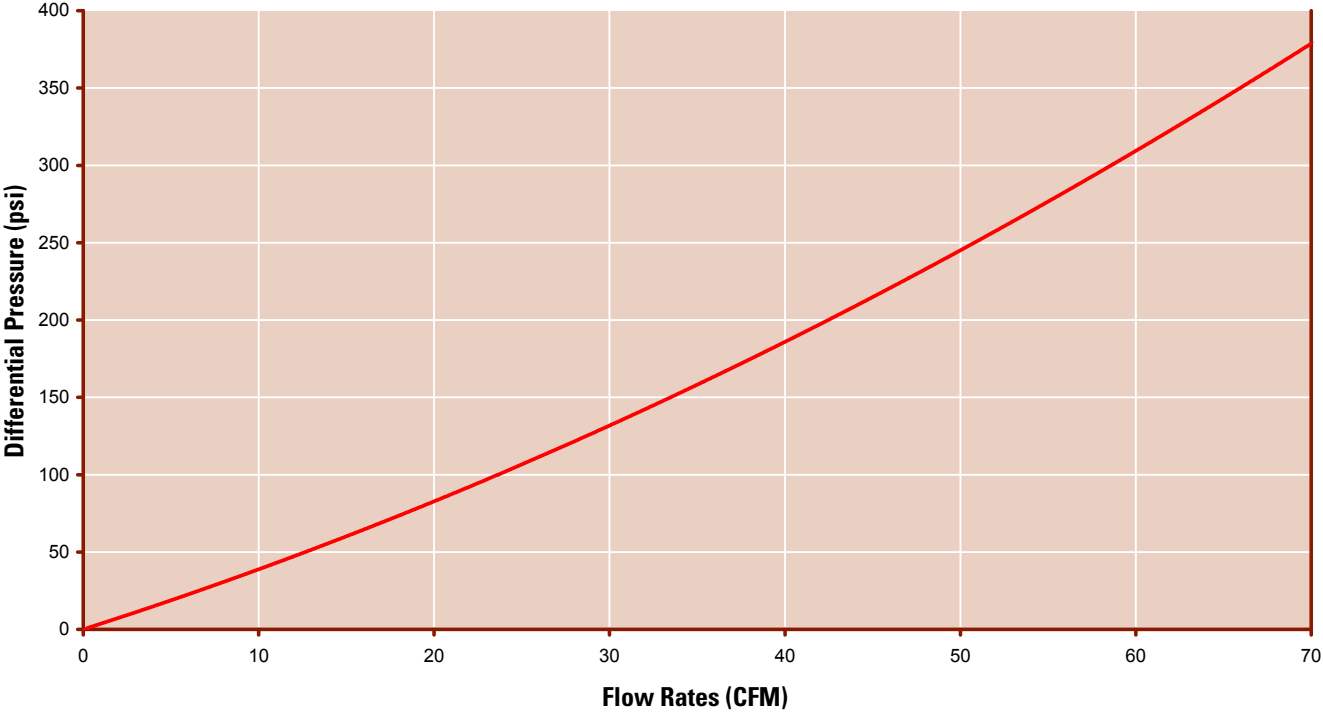
D-060 NS AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATE

	DIFFERENTIAL PRESSURE (psi)					
	0	50	100	150	200	250
FLOW RATE (CFM)	0	12.8	22.5	30.7	38.0	44.5

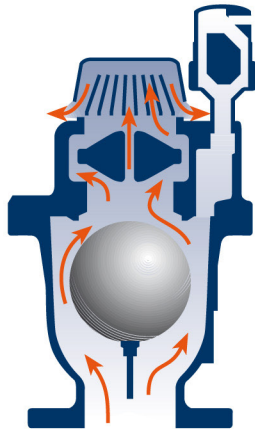
D-062 NS AIR RELEASE FLOW RATE



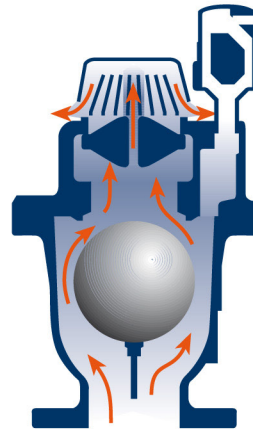
AIR RELEASE FLOW RATE

	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
FLOW RATE (CFM)	0	12.7	24	33.5	42.5	51	58.6	66	69.5

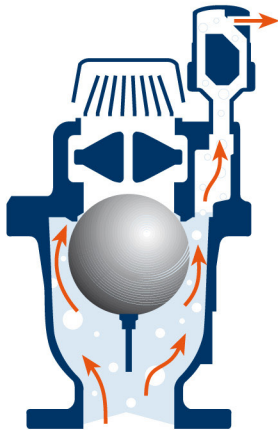
D-06NS SERIES



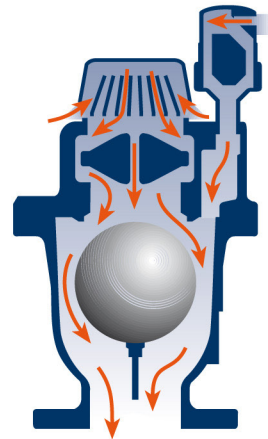
1. When water, rapidly filling the pipe line, pushes the air out through the air valve, a differential air pressure is created across the valve orifice.



2. When this differential pressure reaches a prefixed level (usually it will be prefixed at 0.72 psi) the non-slam disc will close.
3. Air will continue to come out through the small orifice disc - until all the air will be exhausted and water will reach the air & vacuum float. This double stage air & vacuum air discharge prevents the slam effect and therefore suppresses water hammer.



4. When water reaches the air & vacuum float, it lifts it up, closing the air & vacuum orifice and completing the air & vacuum cycle.
5. The non-slam disc will come back to its normal open position.



6. When water is drained out of the pipe line, the resulting pressure drop lets the air & vacuum float fall down, opening the orifice fully for intake of high volume of air into the line.

COMBINATION AIR VALVE

FOR HIGH FLOW
D-065 SERIES

DESCRIPTION

The D-065 Series Combination Air Valve has the features of both an air release valve and an air & vacuum valve.

The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless Steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- NSF 61 certified.
- Lightweight, small dimensions, simple and reliable construction.
- Screen-protected outlet - upper screen is protected with a protective cover.



Combination Air Valve
D-065

AIR RELEASE COMPONENT

- Body made of high strength materials.
- All operating parts are made of specially selected corrosion- resistant polymer materials.
- Large size air release orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Discharges high air flow rates.
 - One size orifice for a wide pressure range, achieved by a patented rolling seal mechanism.

SPECIFICATIONS

- Working pressure range: 3 - 580 psi
- Testing pressure for the air valve: 1.5 times its working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F

D-065 SERIES

VALVE SELECTION

- Size Range: 2" - 8"
- These valves are manufactured with flanged ends to meet ASA standard (D060-C HF ASA 150, D062 HF ASA 300) or any requested standard.
- Valve coating: FBE coating in accordance with standard DIN 30677-2. Other coatings are available upon request.
- The air release component and the air & vacuum component are available as separate units.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.

OPERATION

The air and vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system.

The smooth discharge of air prevents pressure surges and other hydraulic disturbances.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.

The air release component continuously releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.

- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

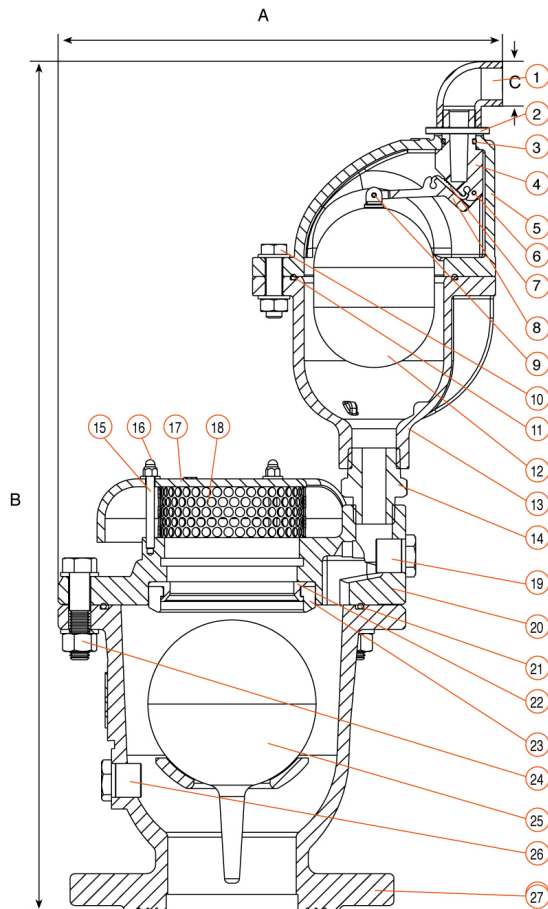
As the system starts to fill, the valve functions according to the following stages:

1. Air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air and vacuum and air release orifices.
2. Air will enter the system.

MATERIAL SPECIFICATIONS FOR 2", 3" AND 4"



NO.	PART	MATERIAL
1	Discharge Outlet	NSF 61 Certified STST UNS 31600
2	Rollpin	Stainless Steel SAE 304
3	O-Ring	BUNA-N
4	Orifice	Reinforced Nylon
5	Cover	Ductile Iron ASTM A-536 60-40-18
6	Rollpin	Stainless Steel SAE 304
7	Rolling Seal	E.P.D.M.
8	Lever	Reinforced Nylon
9	Rollpin	Stainless Steel SAE 304
10	Bolts, Nut and Washer	Steel Zinc Cobalt Coated
11	O-Ring	BUNA-N
12	Float	NSF 61 Certified Polycarbonate
13	Body	Ductile Iron ASTM A-536 60-40-18
14	Adapter	NSF 61 Certified STST UNS 30400
15	Nut	NSF 61 Certified STST UNS 30400
16	Bolt	NSF 61 Certified STST UNS 30400
17	Screen Cover	Cast Iron ASTM A48 CL35B / Resicoat RT R4
18	Screen	NSF 61 Certified STST UNS 30400
19	Plug	NSF 61 Certified STST UNS 30400
20	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
21	O-Ring	NSF 61 Certified NBR 70
22	Orifice Seat	NSF 61 Certified STST UNS 30400
23	Orifice Seal	NSF 61 Certified E.P.D.M.
24	Bolt & Nut	NSF 61 Certified STST UNS 30400
25	Float	NSF 61 Certified STST UNS 31600 NSF 61 Certified Polycarbonate
26	Plug	NSF 61 Certified Reinforced Nylon
27	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4

DIMENSIONS AND WEIGHTS

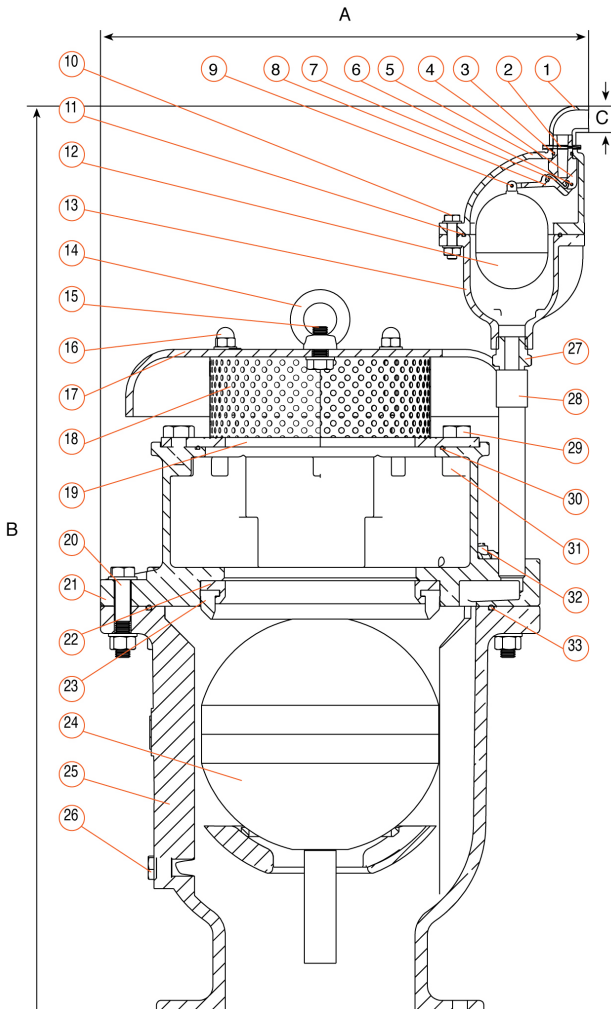
SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B		AIR & VAC	AUTO
2"	9 13/16	19 3/16	34.7	3.03	0.0235
3"	11	21 1/16	50.2	7.79	0.0235
4"	12 1/2	22 1/4	65.2	12.16	0.0235
6"	15 3/16	30 1/2	72.2	27.37	0.0235
8"	20 3/16	23 3/8	268.4	48.67	0.0235

MODEL NUMBER AND FLANGE TYPE

MODEL #	SIZE	CONNECTION	PSI
65D0652	2"	300 lb. Flg.	580
65D0653	3"	300 lb. Flg.	580
65D0654	4"	300 lb. Flg.	580
65D0656	6"	300 lb. Flg.	580
65D0658	8"	300 lb. Flg.	580

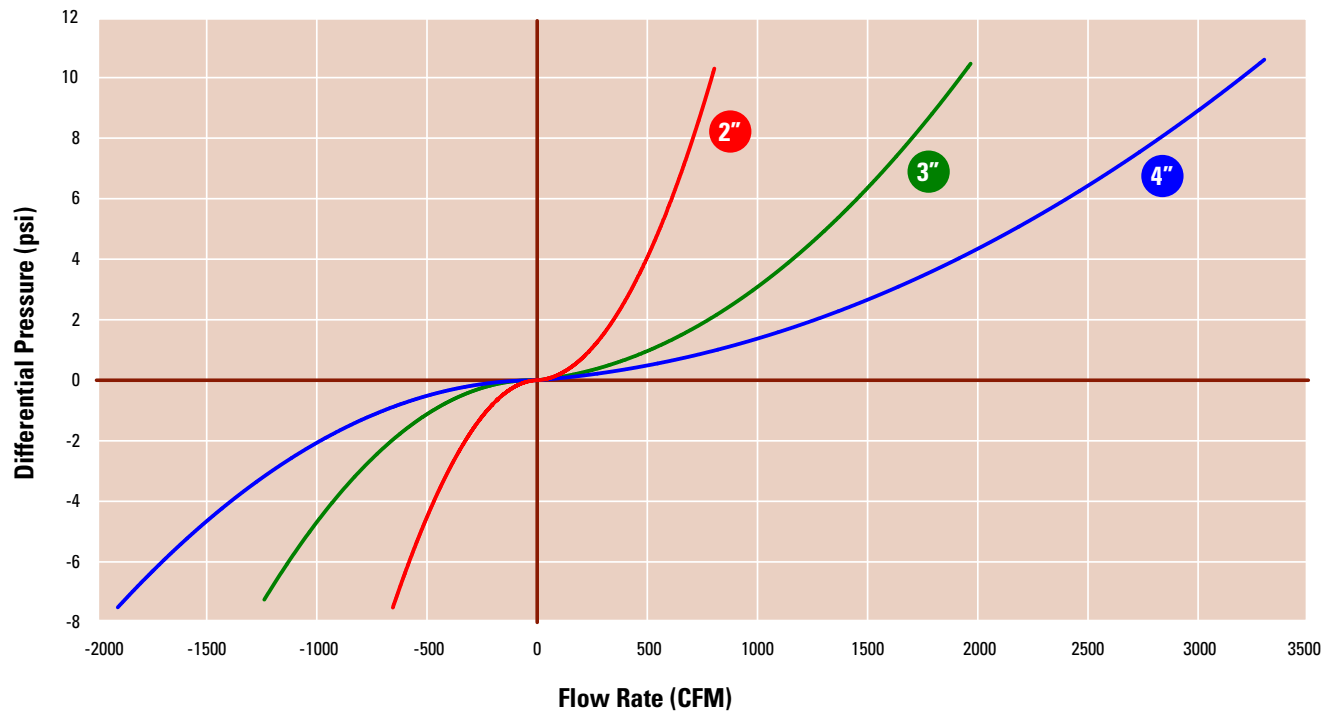
D-065 SERIES

MATERIAL SPECIFICATIONS FOR 6" AND 8"

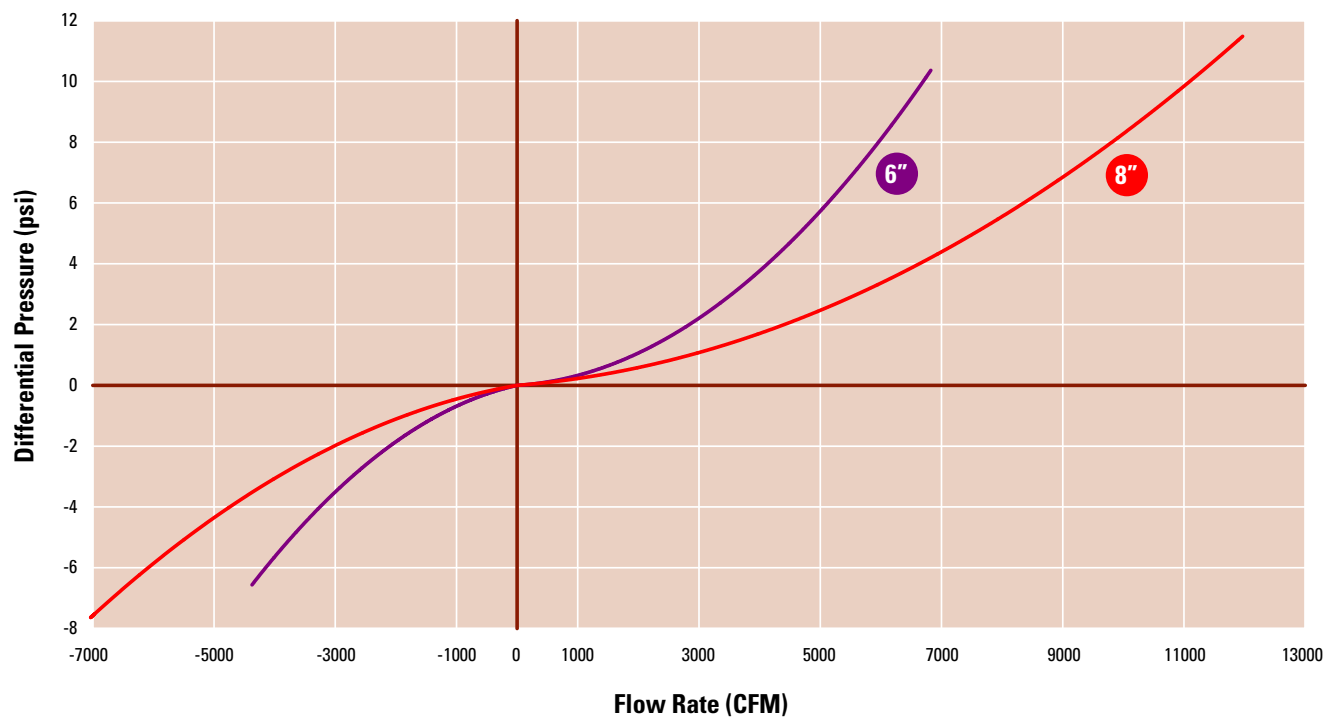


NO.	PART	MATERIAL
1	Discharge Outlet	PVC
2	Rollpin	Stainless Steel SAE 304
3	O-Ring	BUNA-N
4	Orifice	Reinforced Nylon
5	Cover	Ductile Iron ASTM A-536 60-40-18
6	Rollpin	Stainless Steel SAE 304
7	Rolling Seal	E.P.D.M.
8	Lever	Reinforced Nylon
9	Rollpin	Stainless Steel SAE 304
10	Bolts, Nut and Washer	Steel Zinc Cobalt Coated
11	O-Ring	BUNA-N
12	Float	NSF 61 Certified Polycarbonate
13	Body	Ductile Iron ASTM A-536 60-40-18
14	Lifting Ring	Carbon Steel
15	Bolt & Washer	NSF 61 Certified STST UNS 30400
16	Nut	NSF 61 Certified STST UNS 30400
17	Screen Cover	Cast Iron ASTM A48 CL35B / Resicoat RT R4
18	Screen	NSF 61 Certified STST UNS 30400
19	Ring	Steel Din. St. 37
20	Bolt	NSF 61 Certified STST UNS 30400
21	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
21	O-Ring	NSF 61 Certified NBR 70
22	Orifice Seat	NSF 61 Certified STST UNS 30400
23	Orifice Seal	NSF 61 Certified E.P.D.M.
24	Float	NSF 61 Certified STST UNS 31600
25	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
26	Plug	NSF 61 Certified Reinforced Nylon
27	Adapter	NSF 61 Certified STST UNS 30400
28	Nipple & Coupler	NSF 61 Certified STST UNS 30400
29	Bolt & Washer	NSF 61 Certified STST UNS 30400
30	O-Ring	NSF 61 Certified NBR 70
31	Bolt & Washer	NSF 61 Certified STST UNS 30400
32	Test Cock & Adapter	NSF 61 Certified STST UNS 31600
33	O-Ring	NSF 61 Certified NBR 70

D-065 HF AIR & VACUUM FLOW RATE



D-065 HF AIR & VACUUM FLOW RATE



D-065 SERIES

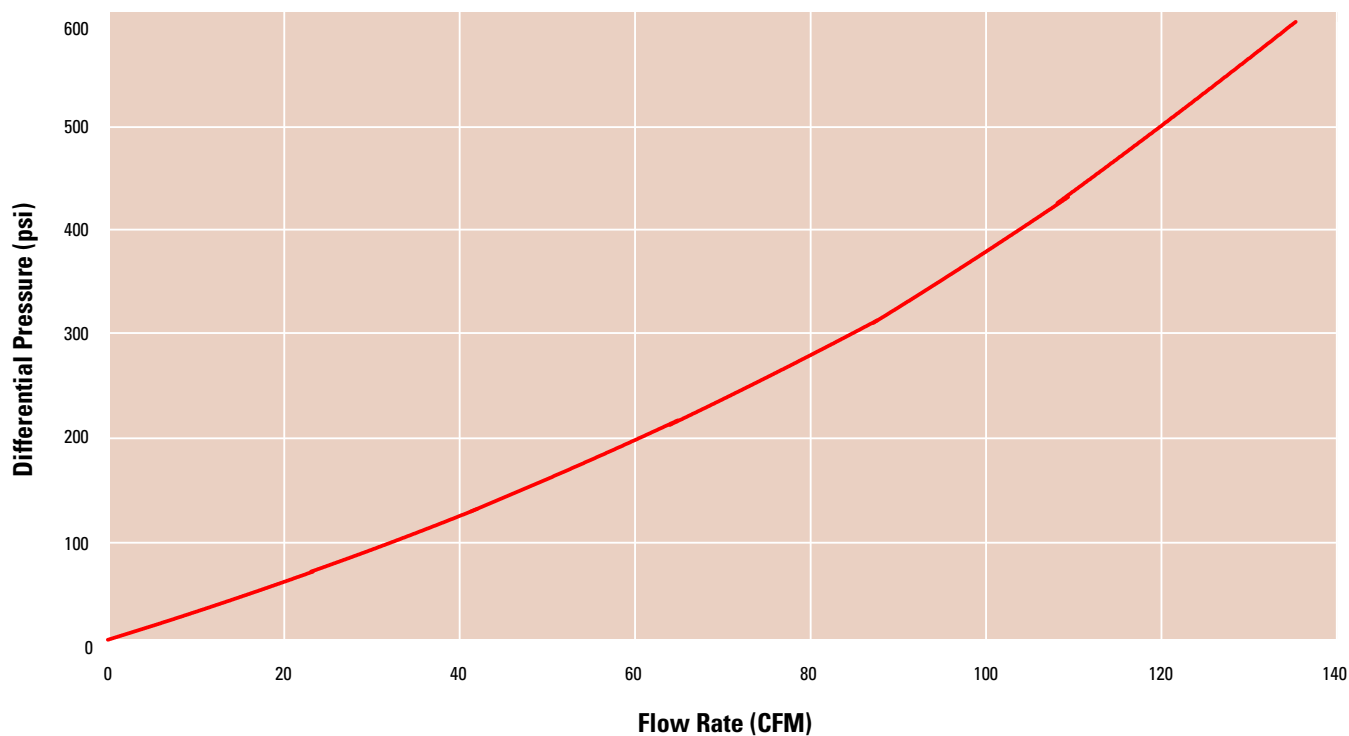
DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	4	6	8	10
2"	0	368	497	597	682	757
3"	0	750	1,155	1,465	1,731	1,965
4"	0	1,250	1,890	2,390	2,810	3,180
6"	0	2,850	4,200	5,150	6,000	6,740
8"	0	4,465	6,660	8,350	9,770	11,030

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-8	-7	-6	-5	-4	-3	-2	0
2"	-655	-615	-571	-523	-470	-410	-340	0
3"	-1,316	-1,235	-1,146	-1,051	-945	-825	-685	0
4"	-1,998	-1,869	-1,730	-1,579	-1,412	-1,222	-1,000	0
6"	-4,920	-4,250	-3,790	-3,285	-2,720	-2,060	-1,240	0
8"	-7,360	-6,800	-6,190	-5,540	-4,810	-4,000	-3,060	0

D-065 AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATE

	DIFFERENTIAL PRESSURE (psi)						
	0	100	200	300	400	500	580
FLOW RATE (CFM)	0	36	62	83.4	102.5	119	131.5

COMBINATION AIR VALVE

FOR HIGH FLOW
D-065NS SERIES

DESCRIPTION

The D-065NS Series Combination Air Valve has the features of both an air release valve and an air & vacuum valve.

The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

MAIN FEATURES

- All main flow cross-sections are equal or greater than the nominal port area.
- Two additional NPT ports for the connection to gauges, testing and draining.
- Aerodynamic design enables high flow rates of air both at intake and at discharge.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Special orifice seat design: Stainless Steel and E.P.D.M. rubber assures long-term maintenance-free operation.
- Screen protected outlet - upper screen is protected with a protective cover.

AIR RELEASE COMPONENT

- Body made of high strength materials.
- All operating parts are made of specially selected corrosion-resistant polymer materials.



Combination Air Valve
for High Flow - Non Slam

D-065NS

- Large sized air release orifice:
 - Dramatically reduces the possibility of obstruction by debris.
 - Discharges high air flow rates.
 - One size orifice for a wide pressure range, achieved by a patented rolling seal mechanism.

VALVE SELECTION

- Size Range: 2" - 8"
- These valves are manufactured with flanged ends to meet ASA standard (D060 NS ASA 150, D062 NS ASA 300) or any requested standard.
- The automatic air release component and the air & vacuum component are available as separate units.

When ordering, please specify: model, size, working pressure, threads standard and type of liquid.

D-065NS SERIES

SPECIFICATIONS

- Working pressure range: 3 - 580 psi
- Testing pressure for the air valve: 1.5 times its working pressure.
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- FBE coating, both interior & exterior, in accordance with standard DIN 30677-2.

OPERATION

The 65D065 HF NS Series Combination Non-Slam Air Valve is a surge-dampening, slam-preventing, 3-stage combination air valve. The air valve provides high capacity vacuum protection and, at the same time, efficient surge suppression. At sudden drainage and/or water column separation (sudden pump trips or valve closure, for instance), the air & vacuum orifice admits air at high flow rates, thus preventing vacuum. As the water column and/or pressure wave returns, large volumes of air are discharged at high velocities, raising the non-slam disc, partially closing the air & vacuum orifice and allowing air to exhaust slowly through the smaller orifice of the non-slam disc. This slowly exhausting air pocket dampens the slam of the returning water column, thus suppressing the pressure surge. As the water flow arrives at a much slower rate, dampened by the slower air discharge, it buoys up the main float, gently closing the air & vacuum component of the air valve.

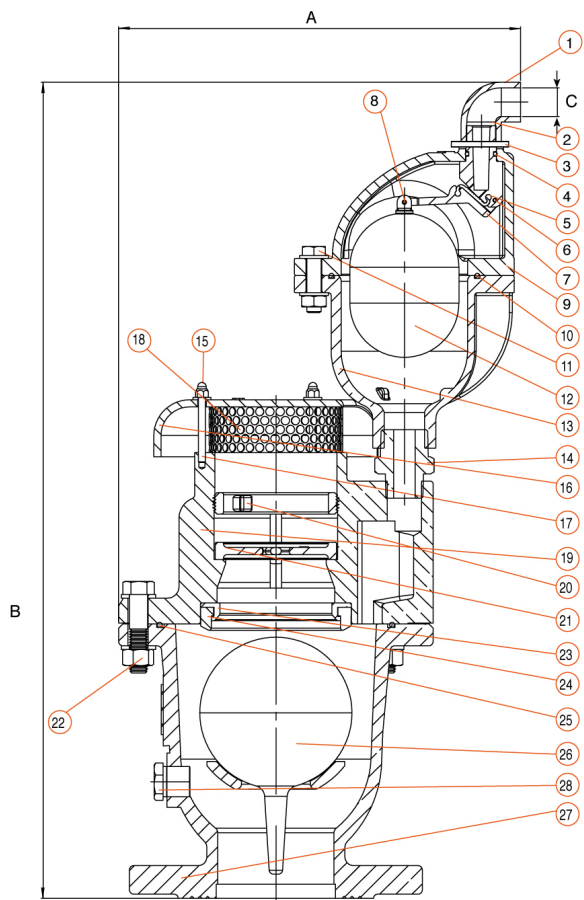
The air release component continues releasing air while the pipeline and the air valve are pressurized.

DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)	
	A	B		AIR & VAC	AUTO
2"	10 ³ / ₁₆	20 ³ / ₁₆	39.4	3.03	0.0235
3"	11	22 ½	54.8	7.79	0.0235
4"	12 ½	24 ³ / ₁₆	72.4	12.16	0.0235
6"	15 ³ / ₁₆	30 ½	211.3	27.37	0.0235
8"	20 ³ / ₁₆	23 ³ / ₈	317.1	48.67	0.0235

MODEL NUMBER AND FLANGE TYPE

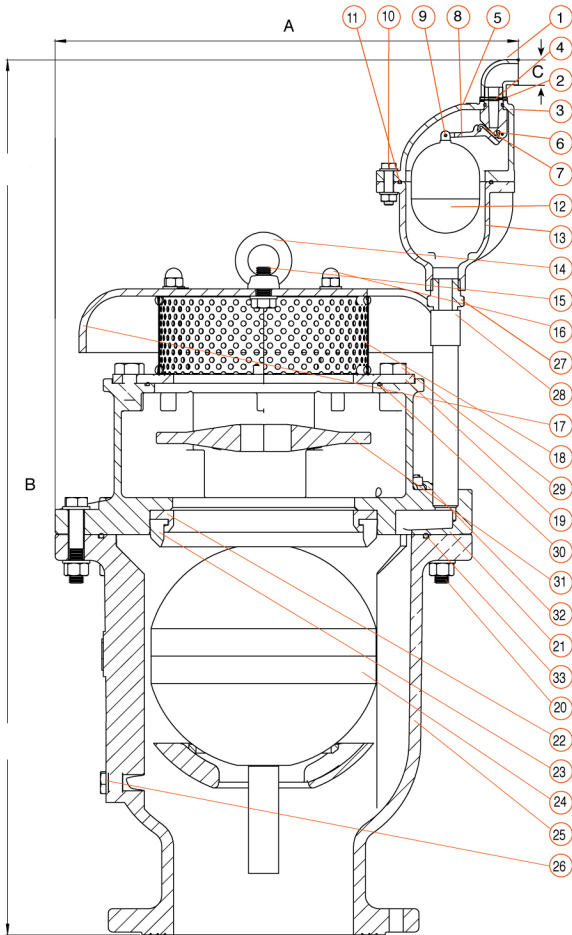
MODEL #	SIZE	CONNECTION	PSI
65D0652	2"	300 lb. Flg.	580
65D0653	3"	300 lb. Flg.	580
65D0654	4"	300 lb. Flg.	580
65D0656	6"	300 lb. Flg.	580
65D0658	8"	300 lb. Flg.	580



MATERIAL SPECIFICATIONS FOR 2", 3" AND 4"

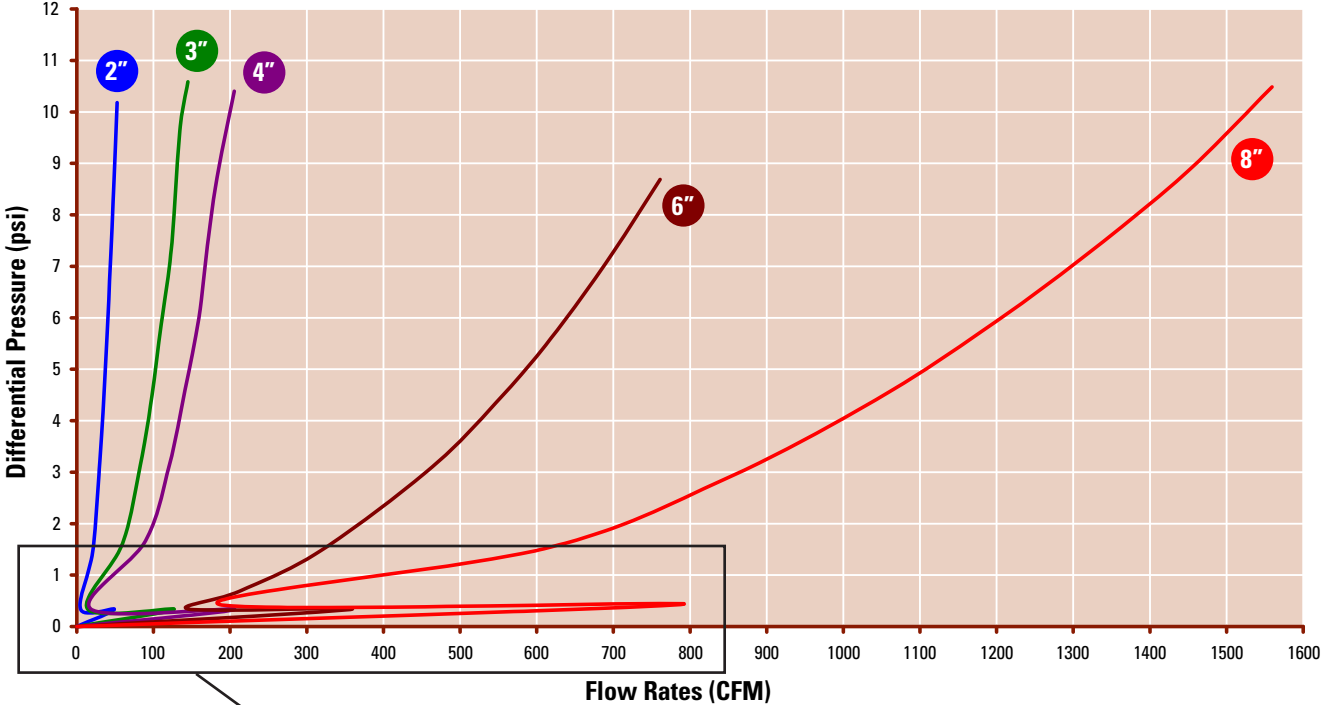
NO.	PART	MATERIAL
1	Discharge Outlet	NSF 61 Certified STST UNS 31600
2	Orifice	NSF 61 Certified Reinforced Nylon
3	Rollpin	NSF 61 Certified STST UNS 30400
4	O-Ring	NSF 61 Certified NBR 70
5	Rolling Seal	E.P.D.M.
6	Rollpin	NSF 61 Certified STST UNS 30400
7	Lever	NSF 61 Certified Reinforced Nylon
8	Rollpin	NSF 61 Certified STST UNS 30400
9	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
10	O-Ring	NSF 61 Certified NBR 70
11	Bolts, Nut and Washer	Steel Zinc Cobalt Coated
12	Float	NSF 61 Certified Polycarbonate
13	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
14	Adapter	NSF 61 Certified STST UNS 30400
15	Domed Nut and Washer	NSF 61 Certified STST UNS 30400
16	Screen Cover	Cast Iron ASTM A48 CL35B / Resicoat RT R4
17	Threaded Rod	NSF 61 Certified STST UNS 30400
18	Screen	NSF 61 Certified STST UNS 30400
19	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
20	Ring	NSF 61 Certified STST UNS 31600
21	Non-Slam Disc	NSF 61 Certified STST UNS 31600
22	Bolts, Nut and Washer	Steel Zinc Cobalt Coated
23	Orifice Seat	NSF 61 Certified STST UNS 30400
24	Orifice Seal	NSF 61 Certified E.P.D.M.
25	O-Ring	NSF 61 Certified NBR 70
26	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
27	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
27	Plug	NSF 61 Certified Reinforced Nylon

MATERIAL SPECIFICATIONS FOR 6" AND 8"

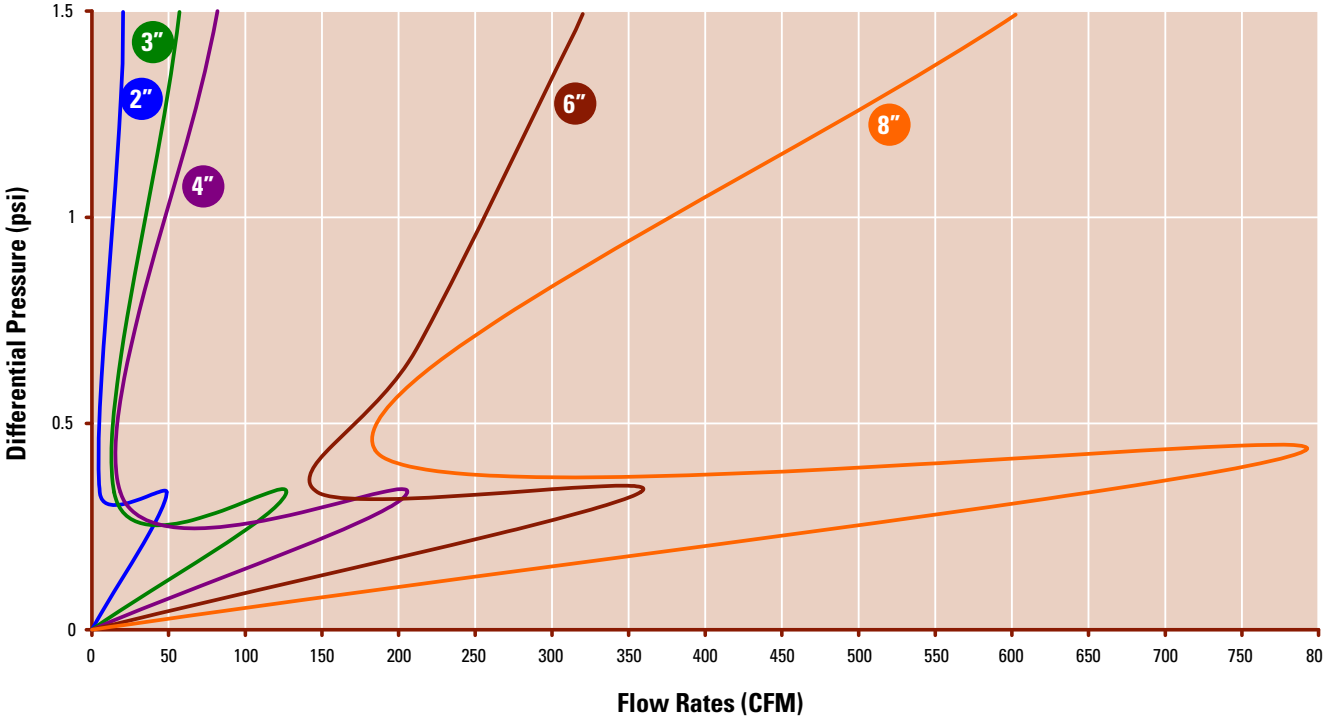


NO.	PART	MATERIAL
1	Discharge Outlet	NSF 61 Certified STST UNS 31600
2	Rollpin	NSF 61 Certified STST UNS 30400
3	O-Ring	NSF 61 Certified NBR 70
4	Orifice	NSF 61 Certified Reinforced Nylon
5	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
6	Rollpin	NSF 61 Certified STST UNS 30400
7	Rolling Seal	E.P.D.M.
8	Lever	NSF 61 Certified Reinforced Nylon
9	Rollpin	NSF 61 Certified STST UNS 30400
10	Bolts, Nut & Washer	Steel Zinc Cobalt Coated
11	O-Ring	NSF 61 Certified NBR 70
12	Float	NSF 61 Certified Polycarbonate
13	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
14	Lifting Ring	Carbon Steel
15	Bolt & Washer	NSF 61 Certified STST UNS 30400
16	Nut	NSF 61 Certified STST UNS 30400
17	Screen Cover	Cast Iron ASTM A48 CL35B / Resicoat RT R4
18	Screen	NSF 61 Certified STST UNS 30400
19	Ring	NSF 61 Certified STST UNS 31600
20	Bolt	NSF 61 Certified STST UNS 30400
21	Cover	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
22	Orifice Seat	NSF 61 Certified STST UNS 30400
23	Orifice Seal	NSF 61 Certified E.P.D.M.22
24	Float	NSF 61 Certified STST UNS 31600 / NSF 61 Certified Polycarbonate
25	Body	Ductile Iron ASTM A-536 60-40-18 / Resicoat RT R4
26	Plug	NSF 61 Certified Reinforced Nylon
27	Adapter	NSF 61 Certified STST UNS 30400
28	Nipple & Coupler	NSF 61 Certified STST UNS 30400
29	Bolt & Washer	NSF 61 Certified STST UNS 30400
30	O-Ring	NSF 61 Certified NBR 70
31	Non-Slam Disc	Cast Iron ASTM A48 CL 35B / Resicoat RT R4
32	Test Cock + Adapter	NSF61 Certified STST UNS 31600
33	O-Ring	NSF 61 Certified NBR 70

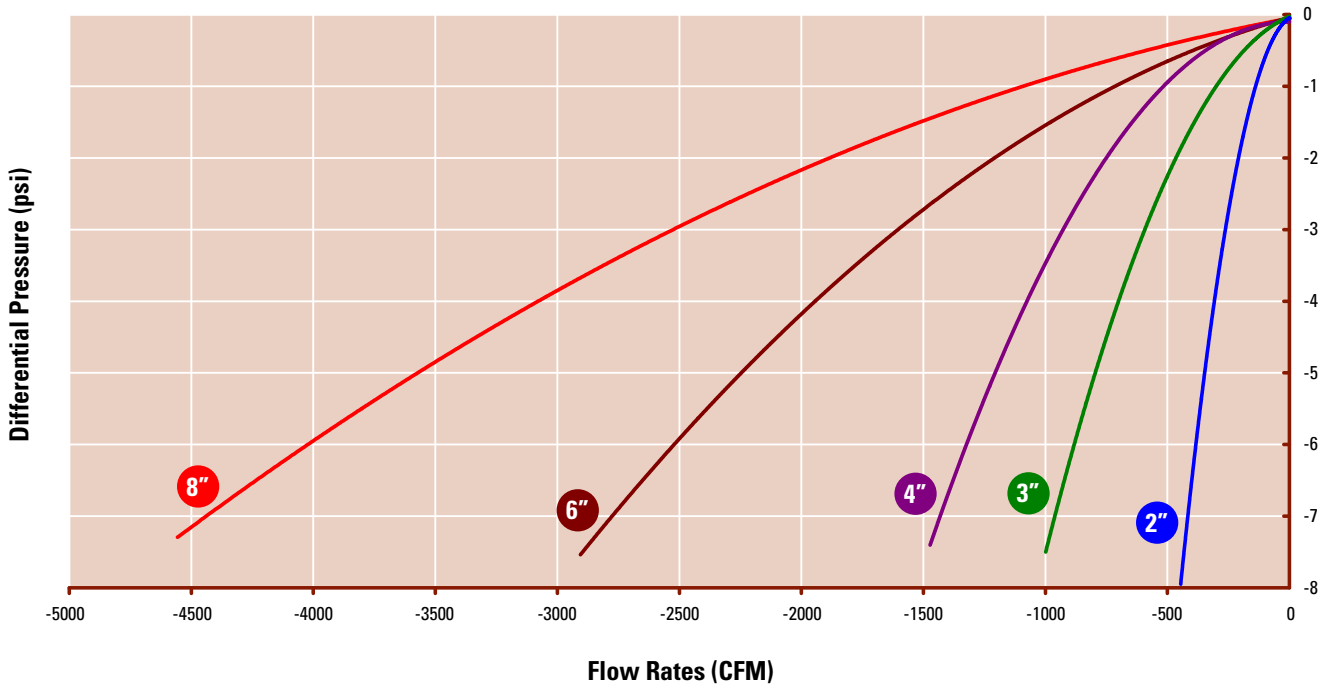
D-065 NS 2" - 8"
DISCHARGE FLOW RATE



ENLARGED SECTION FROM ABOVE CHART
D-065 HF NS AIR DISCHARGE SWITCHING REGION



D-065 HF NS INTAKE FLOW RATES



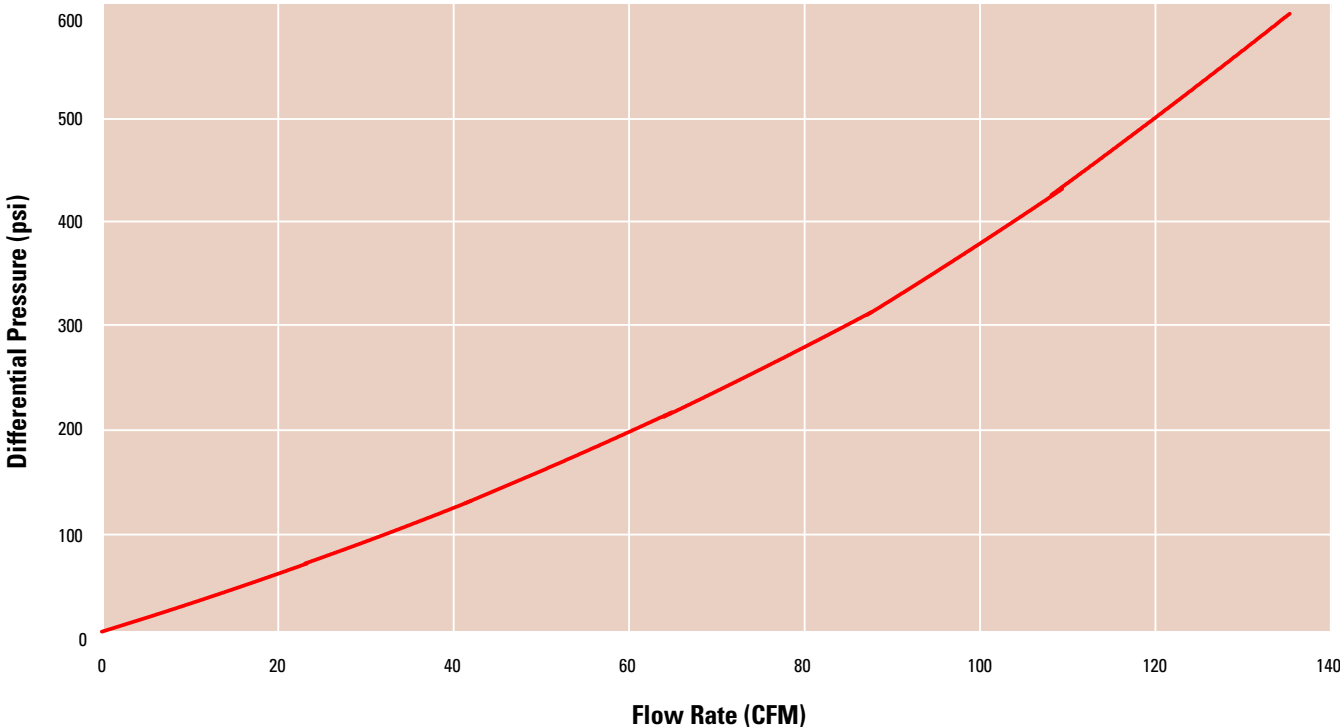
DISCHARGE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)					
	0	2	434	6	8	10
2"	0	24	34	41	47	52
3"	0	68	93	111	127	137
4"	0	100	133	159	176	200
6"	0	370	525	640	730	823
8"	0	710	1,000	1,210	1,385	1,530

INTAKE FLOW RATE (CFM)

SIZE	DIFFERENTIAL PRESSURE (PSI)							
	-7.5	-7	-6	-5	-4	-3	-2	0
2"	-428	-418	-382	-348	-310	-270	-210	0
3"	-1,020	-965	-890	-795	-705	-592	-495	0
4"	-1,490	-1,435	-1,320	-1,205	-1,080	-935	-780	0
6"	-2,900	-2,790	-2,520	-2,280	-1,960	-1,585	-1,205	0
8"	-4,610	-4,450	-4,035	-3,580	-3,100	-2,590	-1,850	0

D-065 NS AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATE

	DIFFERENTIAL PRESSURE (psi)						
	0	100	200	300	400	500	580
FLOW RATE (CFM)	0	36	62	83.4	102.5	119	131.5

AIR RELEASE VALVE

FOR HIGH PRESSURE SYSTEMS
S-01 SERIES

DESCRIPTION

The S-01 Series Automatic Air Release Valve releases accumulated air from the system while it is under pressure. The presence of air in a water system can reduce the effective cross sectional flow area resulting in increased head loss and decreased flow. Unwanted air may also cause water hammer and metering inaccuracies, while hastening corrosion.

MAIN FEATURES

- Lightweight, small dimensions, simple and reliable construction.
- Patented Rolling Seal Mechanism:
 - Dramatically reduces the possibility of obstruction by debris.
 - Releases air at high flow rates up to 452 CFM.
 - One size orifice for a wide pressure range up to 940 psi (orifice size differs for 1,400 psi).
 - Self cleaning mechanism.
- All operating parts are made of specially selected corrosion-resistant materials.

VALVE SELECTION

- Available in 3/4", 1", male threaded NPT.

SPECIFICATIONS

- Working pressure range: 3 - 940 psi
 - S-015: 580 psi
 - S-014 (cast steel body) and S-014 STST: 580 psi
 - S-016 and S-016 STST: 940 psi
- Valve Coating - Fusion-bonded epoxy in accordance within standard DIN 30677-2
- Available in stainless steel



Automatic Air Release Valve

S-01



Automatic Air Release Valve

S-01STST

S-01 SERIES

OPERATION

The continuous acting air release valve continuously releases entrapped air from pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

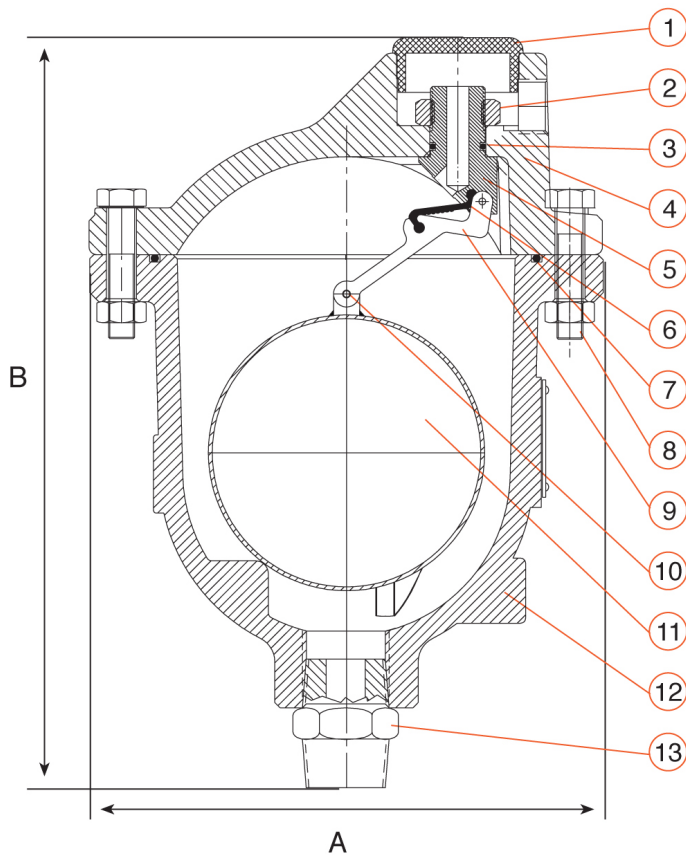
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

The valve functions while the system is under pressure, according to the following stages:

1. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
2. The float descends, unsealing the rolling seal. The automatic air release orifice opens and the accumulated air is released.
3. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

Note: Automatic air release valves are designed to release air as it accumulates at peaks in pressurized systems. They are not normally recommended for vacuum protection or for discharging large volumes of air, because of their inherently small orifices. For this purpose, air and vacuum valves are recommended as they have much larger orifices.

However, air release valves will permit air to enter the system under vacuum conditions. If this is not desirable, specify the one way out check valve.



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Orifice Cover	Polypropylene
2	Washer	Stainless Steel SAE 316
3	O-Ring	BUNA-N*, Viton**
4	Cover	Cast Steel ASTM A216 WCB * Stainless Steel SAE 316**
5	Orifice	S-014/S-016 Nylon* Polypropylene**
6	Rolling Seal	Rubber E.P.D.M*, Viton**
7	O-Ring	BUNA-N*, Viton**
8	Bolt and Nut	Steel Zinc Cobalt Plated* Stainless Steel SAE 316**
9	Lever	Nylon*, Polypropylene**
10	Pin	Stainless Steel SAE 303* Stainless Steel SAE 316**
11	Float	Stainless Steel SAE 316L
12	Body	Cast Steel ASTM A216 WCB * Stainless Steel SAE 316**
13	Male Adaptor	Stainless Steel SAE 316

* S-014, S-016

** S-014STST, S-016STST

DIMENSIONS AND WEIGHTS

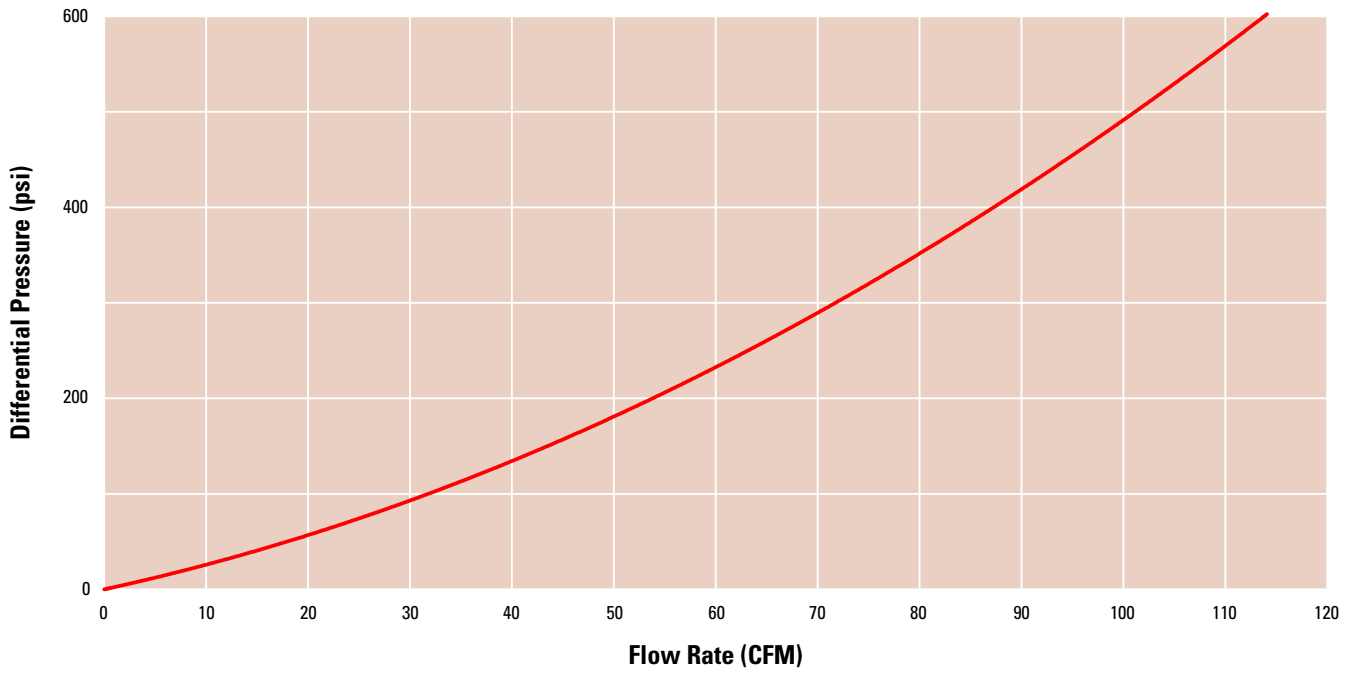
MODEL	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)
	A	B		
S-014/S-016	7¾	11 ⁵ / ₈	28.6	0.0232
S-015	6¼	11½	11.9	0.0235

MODEL NUMBER AND CONNECTION TYPE

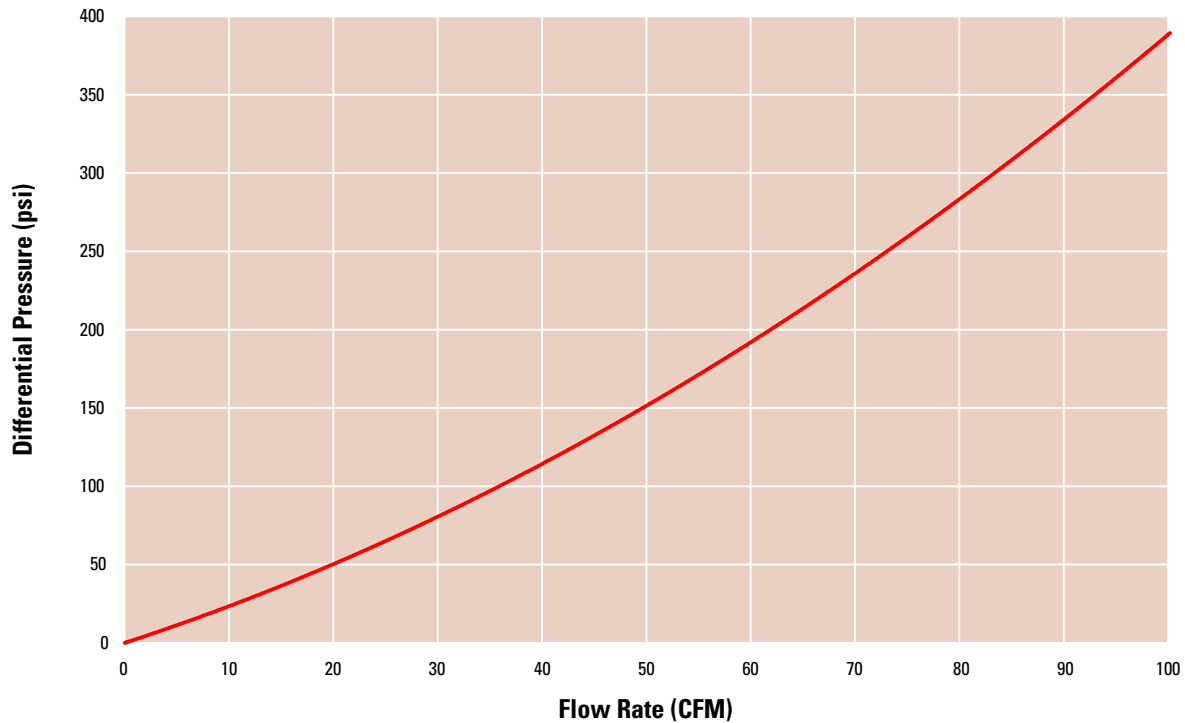
MODEL NUMBER	SIZE	CONNECTION	PSI
65S0141	1"	MNPT	580
65S0151	1"	MNPT	580
65S0161	1"	MNPT	940
65S0141STST	1"	MNPT	580
65S0151STST	1"	MNPT	580
65S0161STST	1"	MNPT	940

S-01 SERIES

S-014, S-016 SERIES AIR RELEASE FLOW RATE



S-015 AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)						
	0	100	200	300	400	500	580
S-014, S-016	0	31.8	53.8	71.8	87.3	101.2	110
S-015	0	36	62	83.4	102.5	119	131.5

AIR RELEASE VALVE

S-02 SERIES

DESCRIPTION

The S-02 Series Automatic Air Release Valve releases accumulated air from the system while it is under pressure. The presence of air in a water system can reduce the effective cross sectional flow area resulting in increased head loss and decreased flow. Unwanted air may also cause water hammer and metering inaccuracies, while hastening corrosion.

MAIN FEATURES

- The unique design of the valve prevents contact between the liquid and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
 - The conical body shape: Designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - Independent spring-guided linkage between the lower float/rod assembly and the upper sealing mechanism: Allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper sealing mechanism.



Automatic Air Release Valve
S-020 and S-022

Automatic Air Release Valve
High Capacity
S-020HC, S-022HC and
S-020HCVB, S-022HCVB

- The Rolling Seal Mechanism: Less sensitive to pressure differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 580 psi).
- Funnel-shaped lower body: Designed to ensure that residue matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel. Float made of foamed polypropylene.

VALVE SELECTION

- Available sizes: 2" male NPT connections; 2", 3" and 4" flanged connections.
- All models also available with a stainless steel body.
- For best suitability, it is recommended to send the fluid chemical properties along with other requirements.

S-02 SERIES

SPECIFICATIONS

- Working pressure range:
 - S-020, S-020HC and S-020HCVB: 3 - 250 psi
 - S-022: 3 - 360 psi
 - S-022HC and S-022HCVB: 3 - 580 psi
- Testing pressure for the air valve: 1.5 times its working pressure
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

OPERATION

The continuous acting air release valve continuously releases entrapped air from pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

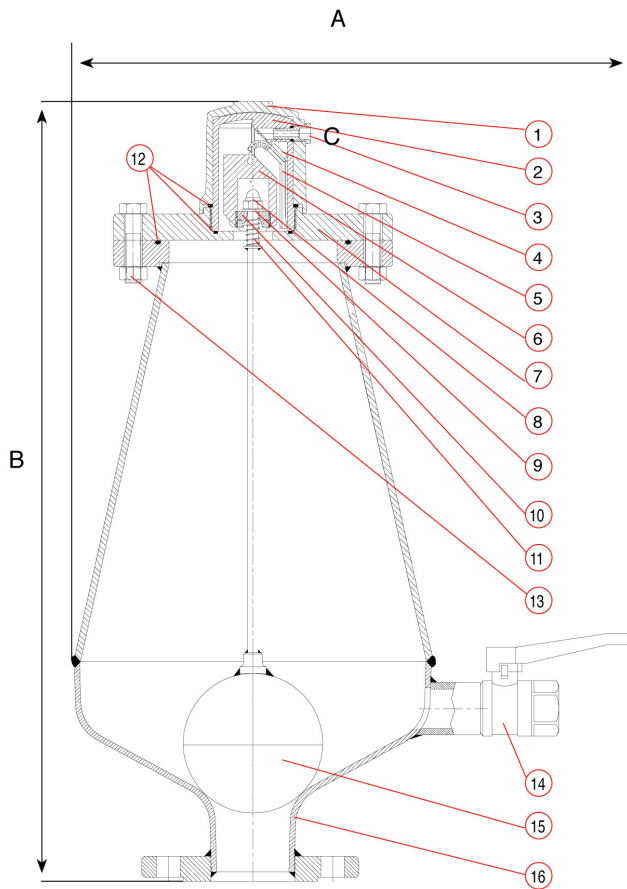
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

The valve functions while the system is under pressure, according to the following stages:

1. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
2. The float descends, unsealing the rolling seal. The automatic air release orifice opens and the accumulated air is released.
3. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

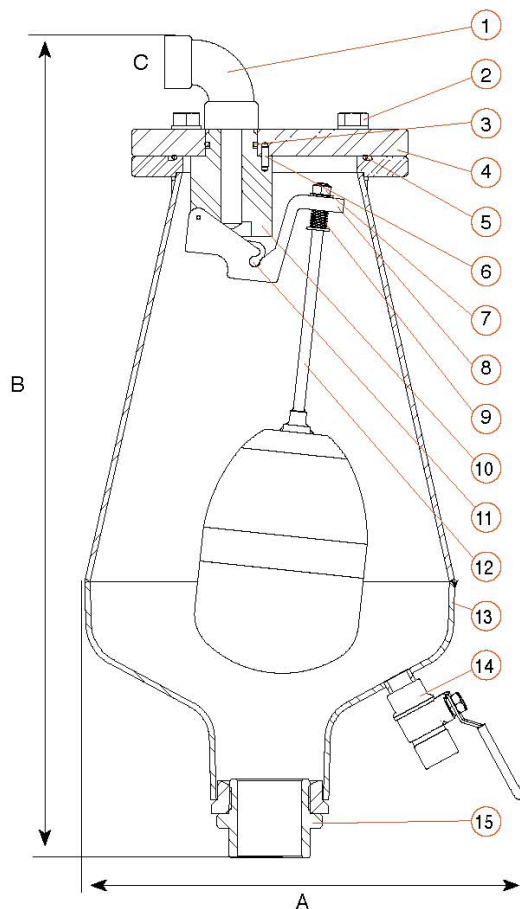
Note: Automatic air release valves are designed to release air as it accumulates at peaks in pressurized systems. They are not normally recommended for vacuum protection or for discharging large volumes of air, because of their inherently small orifices. For this purpose, air and vacuum valves are recommended as they have much larger orifices.

However, air release valves will permit air to enter the system under vacuum conditions. If this is not desirable, specify the one way out check valve.



MATERIAL SPECIFICATIONS - S-020 AND S-022

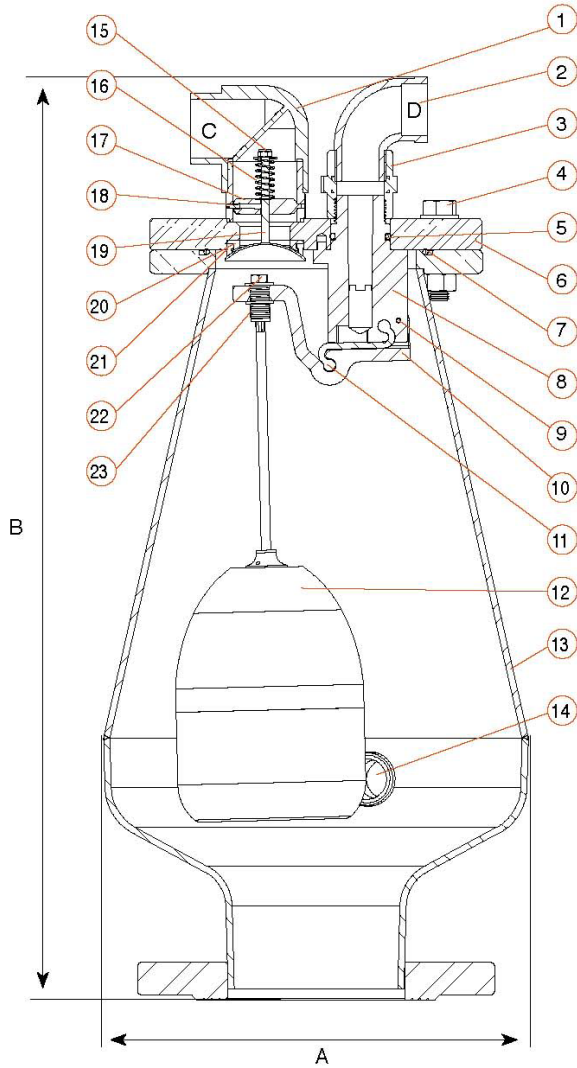
NO.	PART	MATERIAL
1	Shell	Ductile Iron
2	Body	Reinforced Nylon
3	Discharge Outlet	Stainless Steel SAE 316
4	Rolling Seal	Rubber E.P.D.M
5	Clamping Stem	Reinforced Nylon
6	Float	Foamed Polypropylene
7	Cover	Steel DIN ST 38
8	Domed Nut	Stainless Steel SAE 304
9	Washer	Stainless Steel SAE 316
10	Stopper	Polypropylene
11	Spring	Stainless Steel SAE 316
12	O-Ring	BUNA-N
13	Bolt, Nut and Washer	Stainless Steel SAE 316
14	Ball Valve 1"	Stainless Steel SAE 316
15	Float Assembly	Polycarbonate / Stainless Steel SAE 316 / 317
16	Body	2"-4" Steel DIN ST 37 / Stainless Steel SAE 316



MATERIAL SPECIFICATIONS - S-020HC AND S-022HC

NO.	PART	MATERIAL
1	Drainage Elbow	Polyethylene
2	Bolt, Nut, Washer	Steel, Zinc cobalt coated
3	O-Ring	BUNA-N
4	Cover S-020HC Cover S-022HC	Reinforced Nylon Steel DIN ST 37
5	O-Ring	BUNA-N
6	Pin	Stainless Steel SAE 304
7	Nut & Washer	Stainless Steel SAE 304
8	Lever	Reinforced Nylon
9	Spring	Stainless Steel SAE 302
10	Nozzle	Reinforced Nylon
11	Lever Seal	Viton
12	Float Assembly	Polycarbonate, Rod - Stainless Steel SAE316
13	Body	Steel DIN ST 37, FBE Coated SST
14	Ball Valve 1"	Bronze, Nickel Coated
15	Adapter	Stainless Steel SAE 316
16	Flange Option	Steel DIN ST 37 FBE Coated SST

S-02 SERIES



MATERIAL SPECIFICATIONS - S-020HCVB, S-022HCVB

NO.	PART	MATERIAL
1	VB Outlet Elbow	Polypropylene
2	ARV Outlet Elbow	Polypropylene
3	Coupling	Polypropylene
4	Bolt, Nut and Washer	Steel, Zinc Cobalt Coated
5	O-Ring	BUNA-N
6	Cover	Steel DIN ST 37
7	O-Ring	BUNA-N
8	Orifice	Reinforced Nylon
9	Spring Pin	Stainless Steel SAE 304
10	Lever	Reinforced Nylon
11	Rolling Seal	Viton
12	Float Assembly	Polycarbonate
13	Body	Steel ASTM A216 WCB
14	Ball Valve 1"	Stainless Steel SAE 316
15	Nut and Washer	Stainless Steel SAE 304
16	Spring	Stainless Steel SAE 302
17	Guide	Stainless Steel SAE 316
18	Safety Bolt	Stainless Steel SAE 304
19	Disc	Stainless Steel SAE 316
20	Orifice Seat	Stainless Steel SAE 316
21	Orifice Seal	Viton
22	Nut and Washer	Stainless Steel SAE 304
23	Spring	Stainless Steel SAE 304

DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)
	A	B		
S-020, S-022 - 2" Threaded	16 ¹³ / ₁₆	23 ³ / ₈	37.5	0.014
S-020HC, S-022HC - 2" Threaded	10 ¹⁵ / ₁₆	24 ¹ / ₈	34.5	0.062
S-020HCVB, S-022HCVB - 2" Threaded	10 ¹ / ₄	23	38.1	0.062*
S-020, S-022 - 2" Flanged	16 ¹³ / ₁₆	23 ³ / ₈	39.7	0.014
S-020HC, S-022HC - 2" Flanged	10 ¹⁵ / ₁₆	24 ¹ / ₈	35.5	0.062
S-020HCVB, S-022HCVB - 2" Flanged	10 ¹ / ₄	23	40.3	0.062*
S-020, S-022 - 3" Flanged	16 ¹³ / ₁₆	23 ³ / ₈	41.9	0.014
S-020HC, S-022HC - 3" Flanged	10 ¹⁵ / ₁₆	24 ¹ / ₈	37.0	0.062
S-020HCVB, S-022HCVB - 3" Flanged	10 ¹ / ₄	23	42.5	0.062*
S-020, S-022 - 4" Flanged	16 ¹³ / ₁₆	23 ³ / ₈	44.1	0.014
S-020HC, S-022HC - 4" Flanged	10 ¹⁵ / ₁₆	24 ¹ / ₈	38.5	0.062
S-020HCVB, S-022HCVB - 4" Flanged	10 ¹ / ₄	23	44.1	0.062*

* ARV Outlet Orifice Area - 1.8 In²

VB Outlet Dimension: 1 ¹/₂"

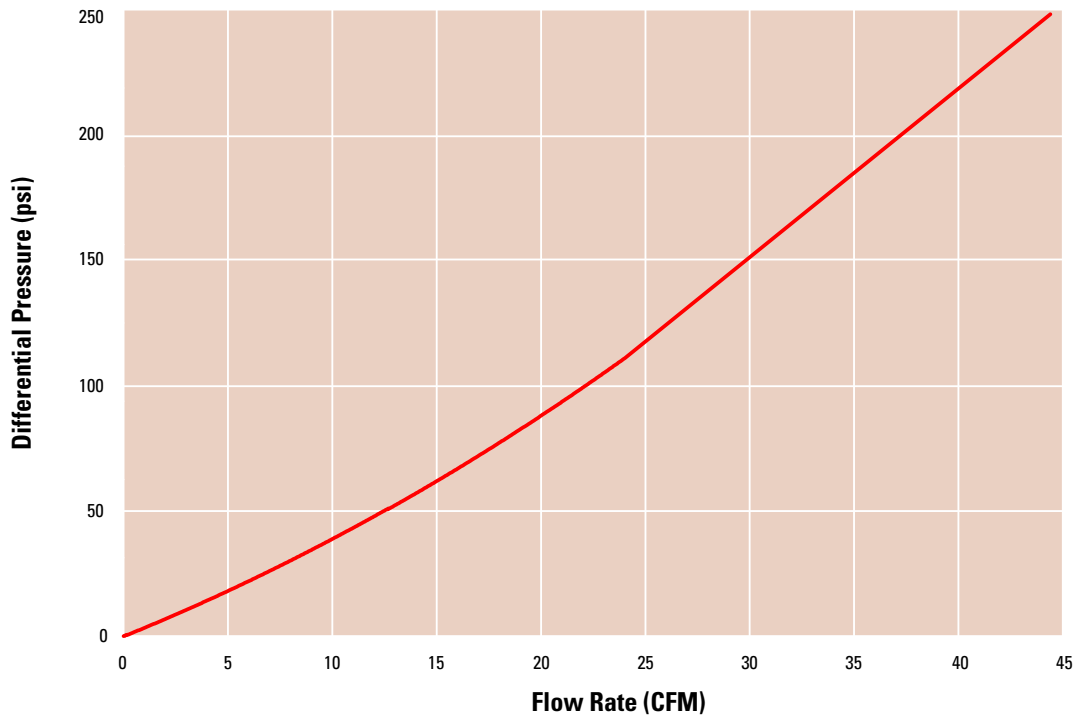
ARV Outlet Dimension: 1"

MODEL NUMBER AND FLANGE TYPE

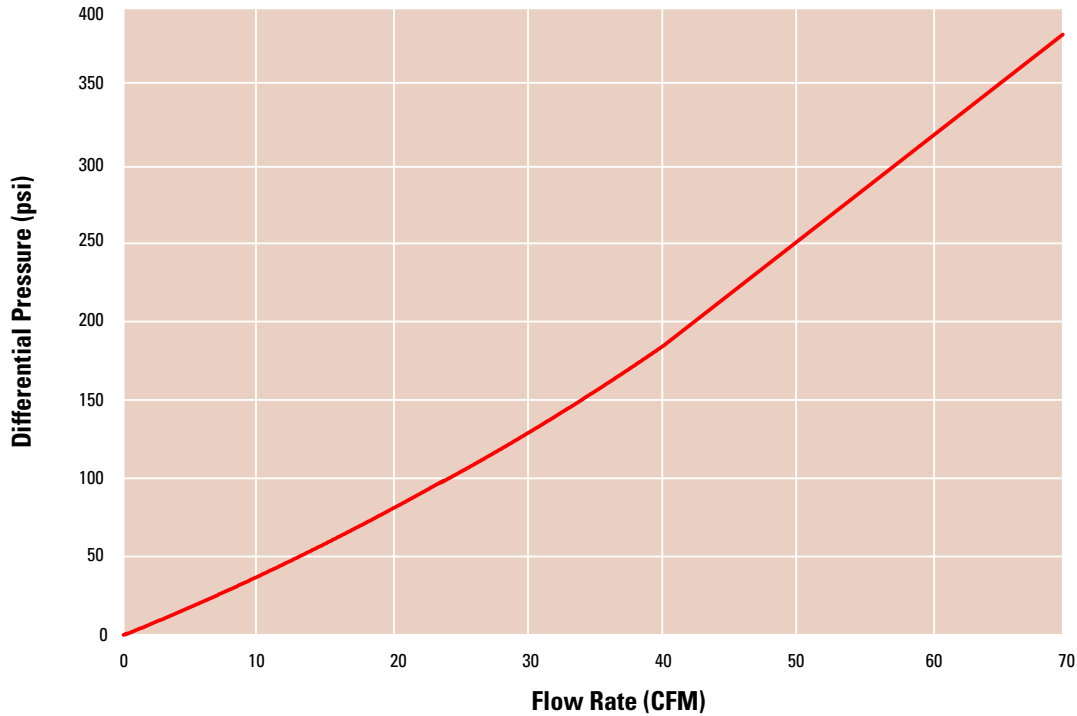
MODEL #	SIZE	CONNECTION	PSI
65S0202T	2"	MNPT	250
65S0202	2"	150 lb. Flg.	250
65S0203	3"	150 lb. Flg.	250
65S0204	4"	150 lb. Flg.	250
65S0222	2"	300 lb. Flg.	360
65S0223	3"	300 lb. Flg.	360
65S0224	4"	300 lb. Flg.	360
65S0202THC	2"	MNPT	250
65S0202HC	2"	150 lb. Flg.	250
65S0203HC	3"	150 lb. Flg.	250
65S0204HC	4"	150 lb. Flg.	250
65S0222THC	2"	MNPT	580
65S0222HC	2"	300 lb. Flg.	580
65S0223HC	3"	300 lb. Flg.	580
65S0224HC	4"	300 lb. Flg.	580
65S0202THCVB	2"	MNPT	250
65S0202HCVB	2"	150 lb. Flg.	250
65S0203HCVB	3"	150 lb. Flg.	250
65S0204HCVB	4"	150 lb. Flg.	250
65S0222THCVB	2"	MNPT	580
65S0222HCVB	2"	300 lb. Flg.	580
65S0223HCVB	3"	300 lb. Flg.	580
65S0224HCVB	4"	300 lb. Flg.	580

S-02 SERIES

S-020 AIR RELEASE FLOW RATE



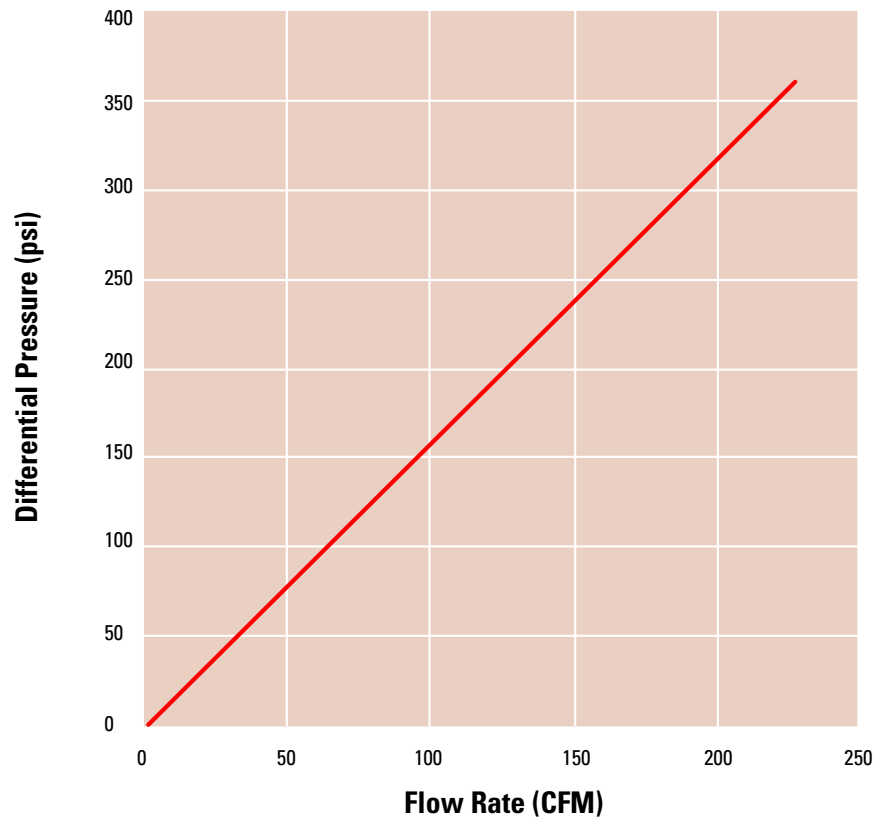
S-022 AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATE (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
S-020	0	12.8	22.5	30.7	38.0	44.5	-	-	-
S-022	0	12.7	24	33.5	42.5	51	58.6	66	69.5

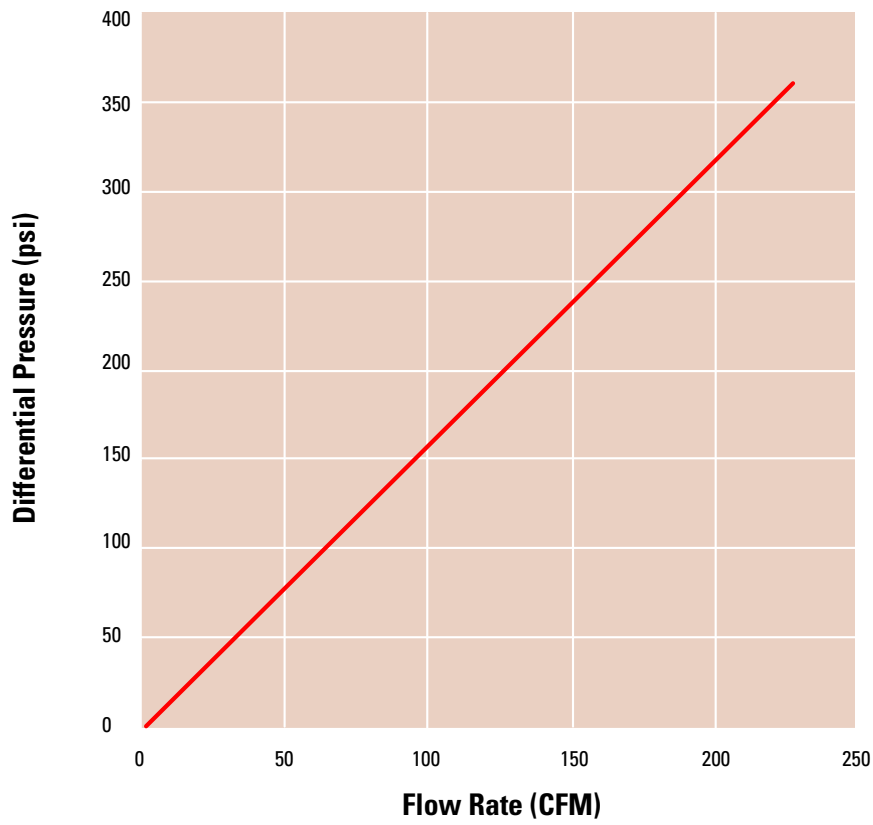
S-020HC AND S-022HC AIR RELEASE FLOW RATE



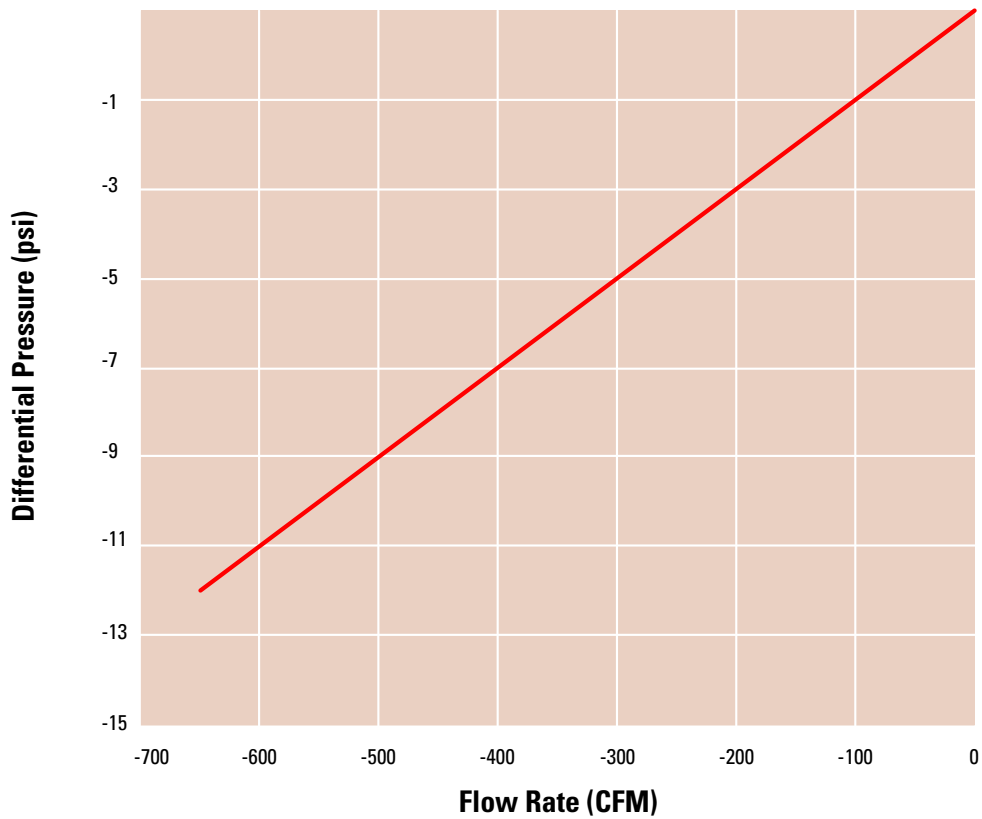
AIR RELEASE FLOW RATE (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
S-020HC	0	31	60	90	120	155	180	214	226
S-022HC	0	31	60	90	120	155	180	214	226

S-020HCVB, S-022HCVB AIR RELEASE FLOW RATE



S-020HCVB AND S-022HCVB INTAKE FLOW RATE



AIR RELEASE FLOW RATE (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
S-020HCVB	0	31	60	90	120	155	180	214	226
S-022HCVB	0	31	60	90	120	155	180	214	226

INTAKE FLOW RATE (CFM)

MODEL	DIFFERENTIAL PRESSURE (psi)						
	-12	-10	-8	-6	-4	-2	0
S-020HCVB	-652	-555	-435	-327	-141	-103	0
S-022HCVB	-652	-555	-435	-327	-141	-103	0

AIR RELEASE VALVE

S-05 SERIES

DESCRIPTION

The S-05 Series Air Release Valve continuously releases accumulated air from the system while it is under pressure. The presence of air in a water system can reduce the effective cross sectional flow area resulting in increased head loss and decreased flow. Unwanted air may also cause water hammer and metering inaccuracies, while hastening corrosion.

In spite of its compact and light weight structure, the S-050 Series Air Release Valve has a 0.014 in² orifice that enables it to release air at high flow rates and is not exposed to obstruction by debris.

MAIN FEATURES

- The larger than usual orifice enables it to continuously release air at higher flow rates than other continuous acting air release valves of its kind.
- The enlarged orifice is not exposed to obstruction by debris.
- The valve's rolling seal mechanism design is less sensitive to different pressures than a direct float seal, thus enabling a one size orifice for a wide pressure range (from 3 up to 360 psi).
- Lightweight, simple and reliable structure.
- The body is made of high strength composite materials and all operating parts are made of specially selected corrosion-resistant materials.
- A drainage outlet enables removal of excess fluids.

VALVE SELECTION

- Available in male threaded size: 1" - NPT
- Vacuum check valve - The valve is available as a valve that will only release air from the system and will not admit air to the system when negative pressure conditions occur. This feature is accomplished by adding a check valve to the air outlet.



Automatic Air Release Valve
S-050-C
S-052

SPECIFICATIONS

- Operating pressure ranges:
S-050-C: 3 - 250 psi, S-052: 3 - 360 psi
- Testing pressures: S-050-C: 360 psi, S-052: 580 psi
- Maximum working temperature: 140° F
- Maximum intermittent temperature: 194° F
- Valve coating: Fusion-bonded epoxy in accordance with standard DIN 30677-2

S-05 SERIES

Operation

The Automatic Continuous Acting Air Release valve releases entrapped air from pressurized systems.

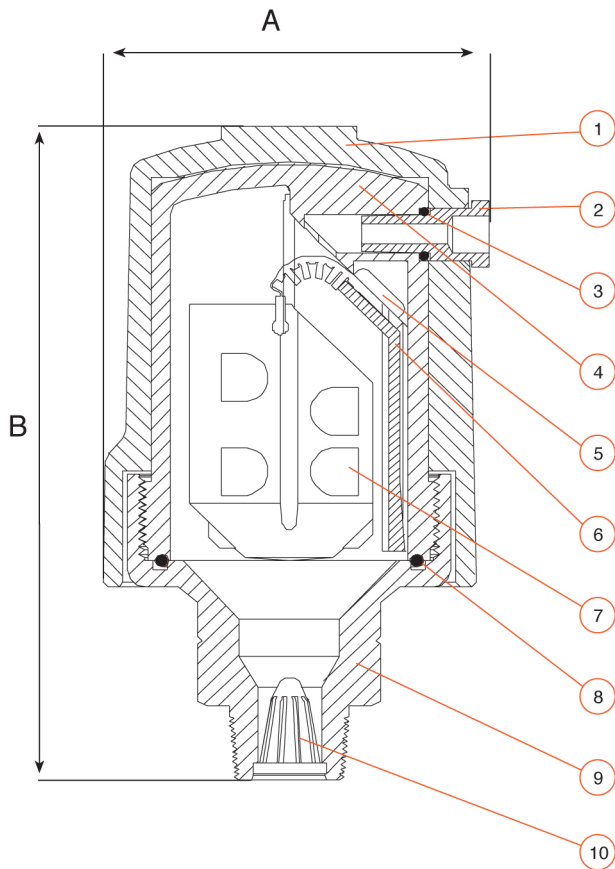
Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

The valve operates while the system is under pressure, according to the following stages:

1. Liquid enters the valve, lifting the float which pushes the sealing mechanism to its sealing position.
2. Entrapped air, which accumulates at peaks along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
3. The float descends, peels the rolling seal, the orifice opens, and the accumulated air is released.
4. Liquid enters the valve and the float rises, rolling the rubber sealing band to its sealing position.

NOTE: Automatic Continuous Acting Air Release valves are designed to release air as it accumulates at peaks of pressurized systems. They are not normally recommended for vacuum protection to admit large volumes of air, because of the inherently small orifices. For this purpose kinetic air valves have much larger orifices. However, Automatic Continuous Acting valves will permit air to enter under vacuum conditions. If this is not desirable, specify vacuum check valves to be added.



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL
1	Shell S-50-C S-052	Cast Iron ASTM A48 CL.35B Ductile Iron ASTM A-536 60-40-18
2	Discharge Outlet	Stainless Steel
3	O-Ring	BUNA-N
4	Body	Reinforced Nylon
5	Rolling Seal	E.P.D.M.
6	Clamping Stem	Reinforced Nylon
7	Float	Foamed Polypropylene
8	O-Ring	BUNA-N
9	Base	Stainless Steel SAE 316
10	Strainer	Nylon

DIMENSIONS AND WEIGHTS

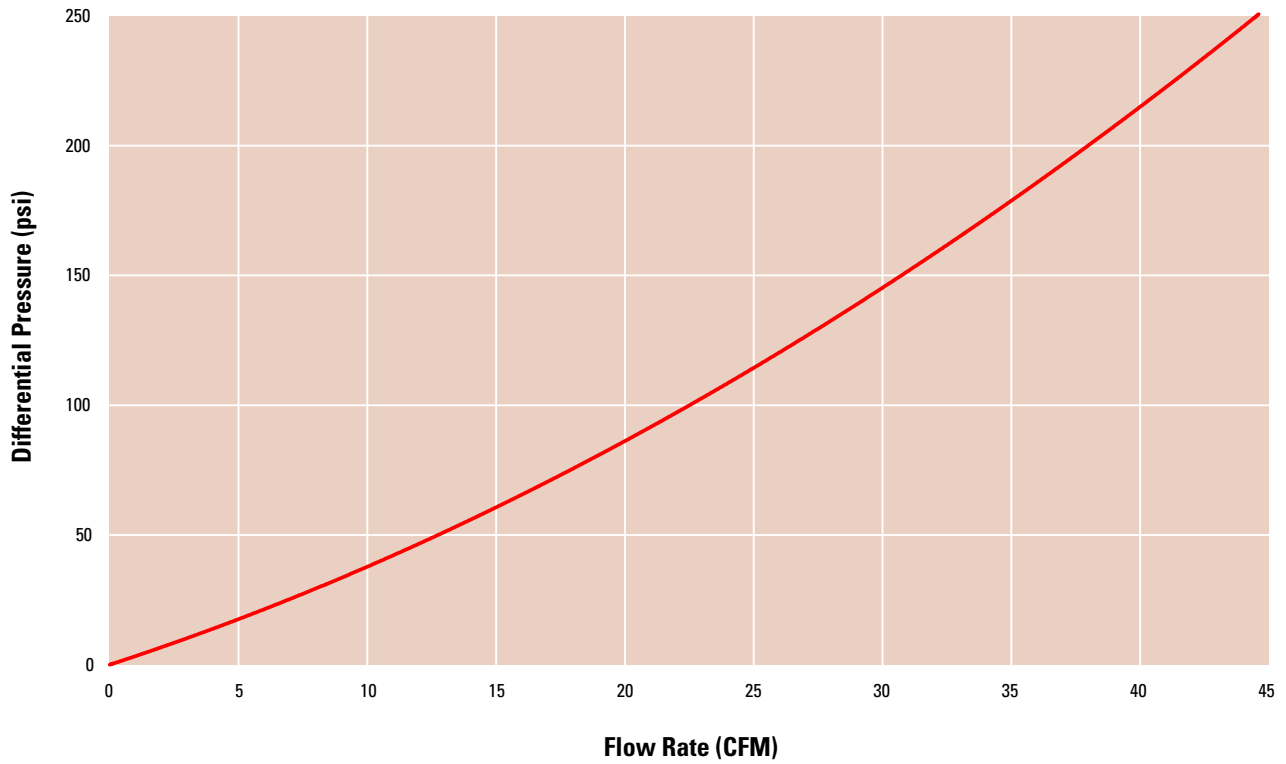
MODEL	DIMENSIONS (IN)		WEIGHT (LBS.)	ORIFICE AREA (IN ²)
	A	B		
S-050-C	3.3	5.8	3.6	0.0186
S-052	3.3	5.8	3.6	0.014

MODEL NUMBER AND CONNECTION TYPE

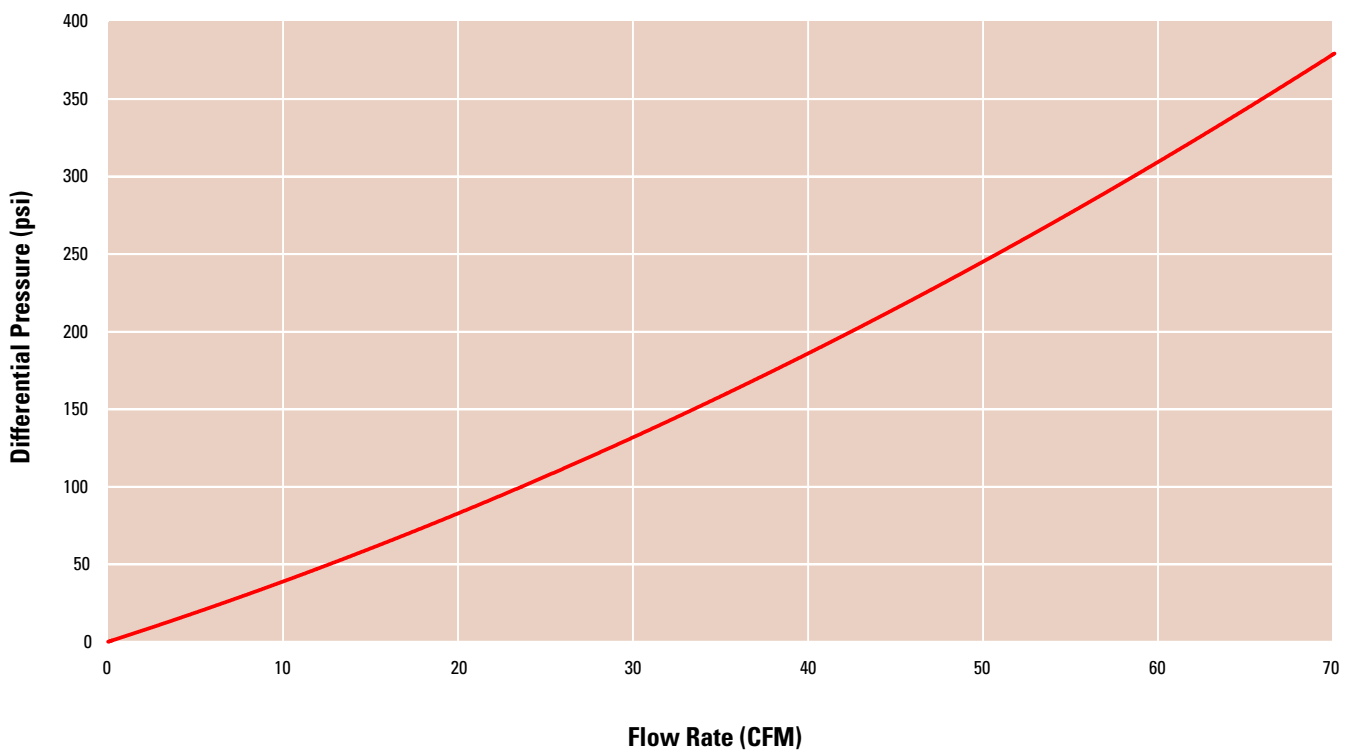
MODEL NUMBER	SIZE	CONNECTION	PSI
65S050C1	1"	MNPT	250
65S0521	1"	MNPT	360

S-05 SERIES

S-050-C AIR RELEASE FLOW RATE



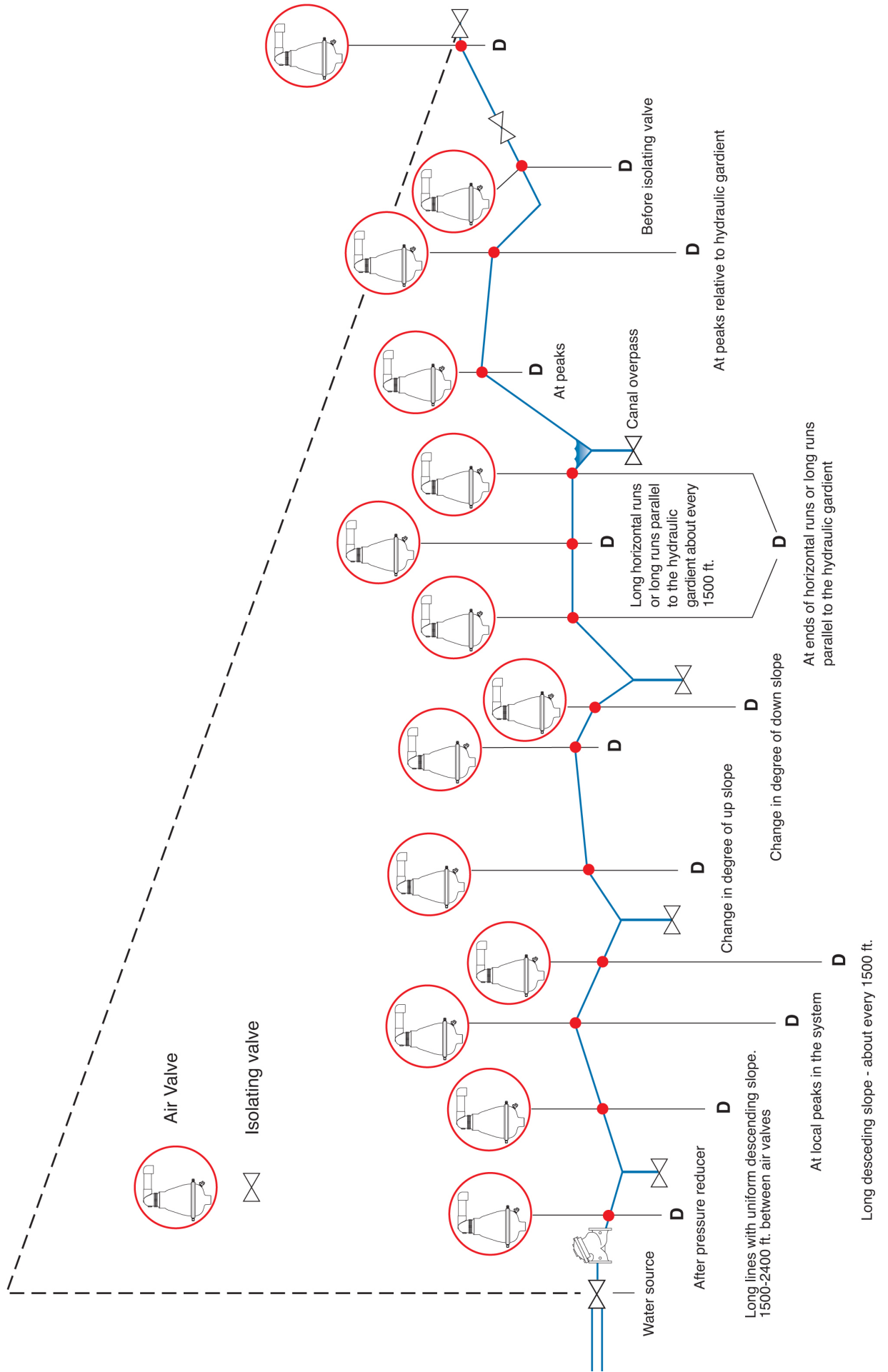
S-052 AIR RELEASE FLOW RATE



AIR RELEASE FLOW RATES

MODEL	DIFFERENTIAL PRESSURE (psi)								
	0	50	100	150	200	250	300	350	375
S-050-C	0	12.8	22.5	30.7	38	44.5	-	-	-
S-052	0	12.7	24	33.5	42.5	51	58.6	66	69.5

LOCATION OF AIR VALVES ACCORDING TO PIPE PROFILE AND DIAMETER



INSTALLATION GUIDE

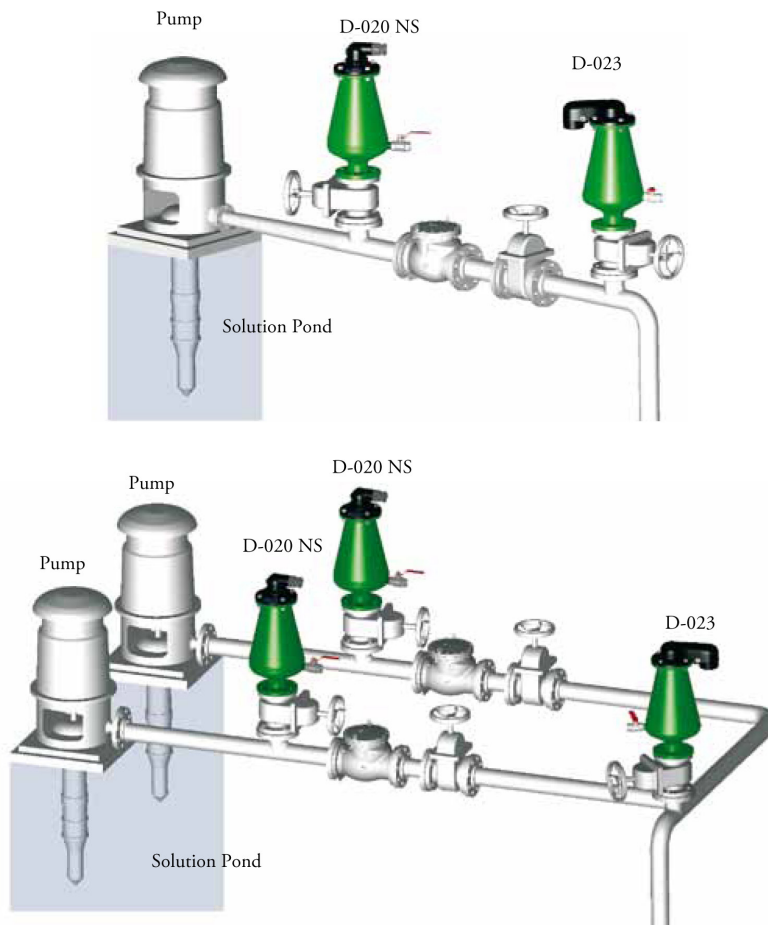
Characteristics of Water Systems:

- High frequency changes in flow characteristics.
- Water treatment in the field (filtration).
- Chemicals are injected into the pipeline system.
- Often necessary to use fragile and often complex equipment and instrumentation.
- Large differences in the characteristics and materials used in pipes, connectors and accessories.

INSTALLATION AT PUMPS

Install a non-slam combination air valve directly after the pump and before the pump check valve. Water pumped from an independent supply such as a well, pond or reservoir requires the admission of air into the pump and suction pipes. This air will continue to disperse in the system during pump operation.

Mode of Operation: When the pump begins operating, large volumes of air are discharged through the air & vacuum orifice of the air valve. The water flow raises the float, closes the orifice and opens the check valve. When the pump is shut down or ceases to operate for any other reason, air, admitted through the air & vacuum orifice, acts as a vacuum breaker and protects the pump, connectors, accessories and seals from damage caused by sub-atmospheric (negative) pressure. The air release valve continues to release air while the pump is working and the line is pressurized. At its location before the check valve, it protects the sealing face of the check valve from cavitation damage caused by the presence of small air bubbles in the water. Install an air release valve on the pump to provide pump protection. Install a combination air valve after the pump check valve when the pipeline upstream of this point remains level or drops below ground level. This air valve will allow for the intake of air (at water column separation) when the pump is shut down and the check valve closes. It also will release air when the water column returns.



INSTALLATION GUIDE

INSTALLATION IN LOCATIONS WITH CHANGING PRESSURES

Install a combination air valve in areas with fluctuating pressure - pressure regulation valves, pressure release valves and at changes in pipe diameter. These are the areas where air pockets form and are released into the line. As the pipe is filled, these areas can become problematic if not provided with an adequate air release system.

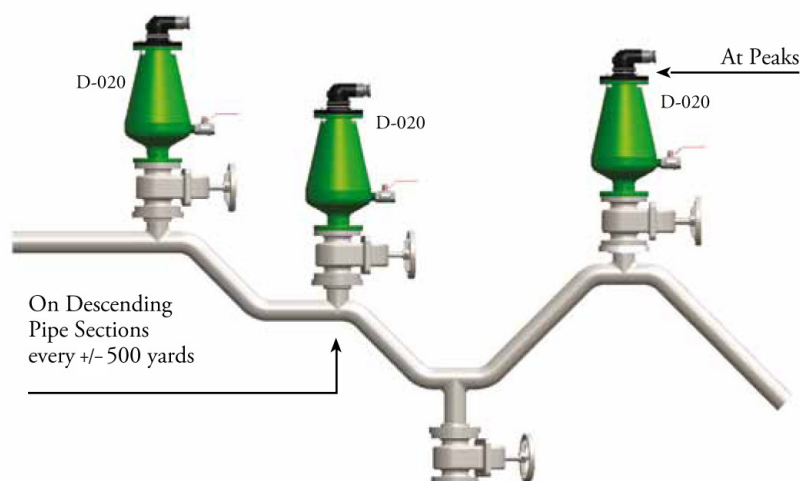


INSTALLATION AT LINE PEAKS AND DOWN SLOPES

Install a combination air valve at all the highest points in each line where flow velocities drop below the critical velocity for air movement and at degree changes on a down slope.

The air and vacuum component, installed at line high-points, discharges air as the line is filled and admits air during line draining, regardless of whether the process is controlled or not (pipe burst or collapse).

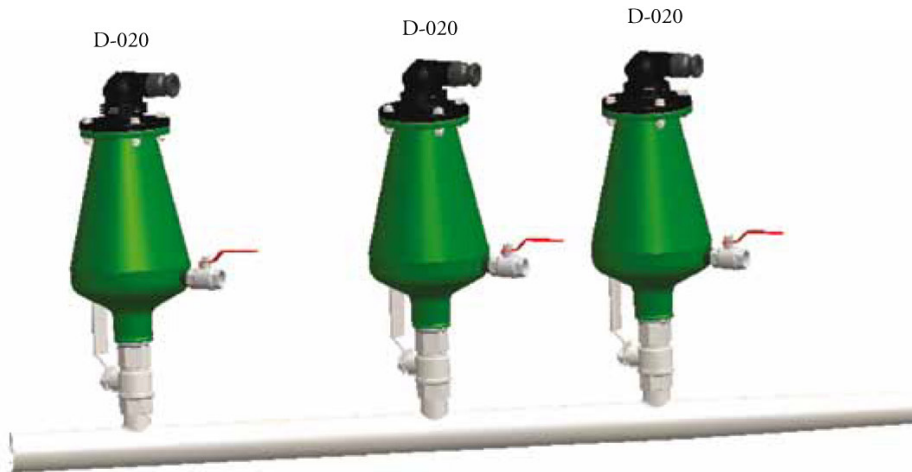
The air release component releases air accumulating at high points when the line is pressurized during regular operations.



INSTALLATION GUIDE

INSTALLATION ON LONG LINES

On long lines, install a combination air valve every 500 to 800 yards to prevent air locking. Also install a combination air valve on both sides of long sections of horizontal pipe.



INSTALLATION CLOSE TO A MAIN LINE VALVE

When the line is pressurized and an isolating valve is closed, install an air valve before the isolating valve in order to release air. Installation of the air valve will protect the valve plate against cavitation damage caused by small air bubbles. During line fill, if a valve at the end of the line is closed, slowing down the filling process, install an air valve before the isolating valve on lines with large diameters and high flow rates.

The installation of a combination air valve after an isolating valve will also protect the line from negative pressure (vacuum) conditions caused when the valve is closed suddenly and assist in controlling the filling process when the isolating valve is open.

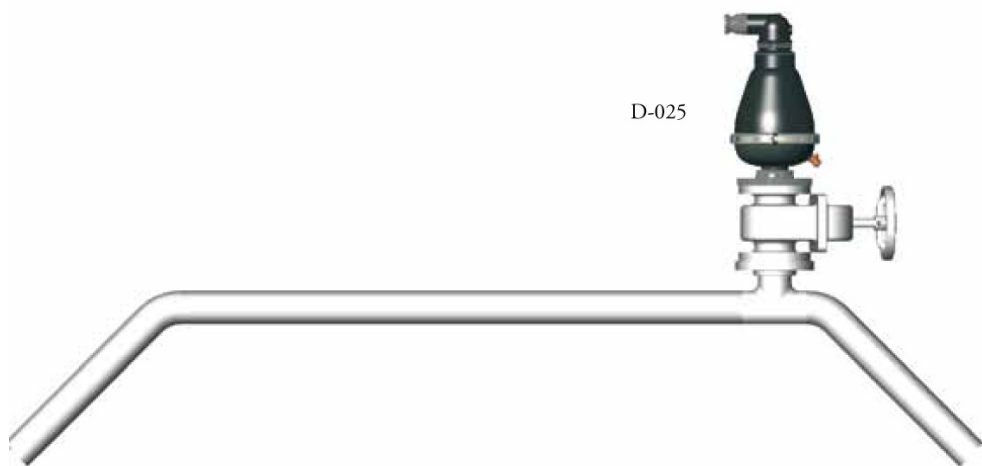
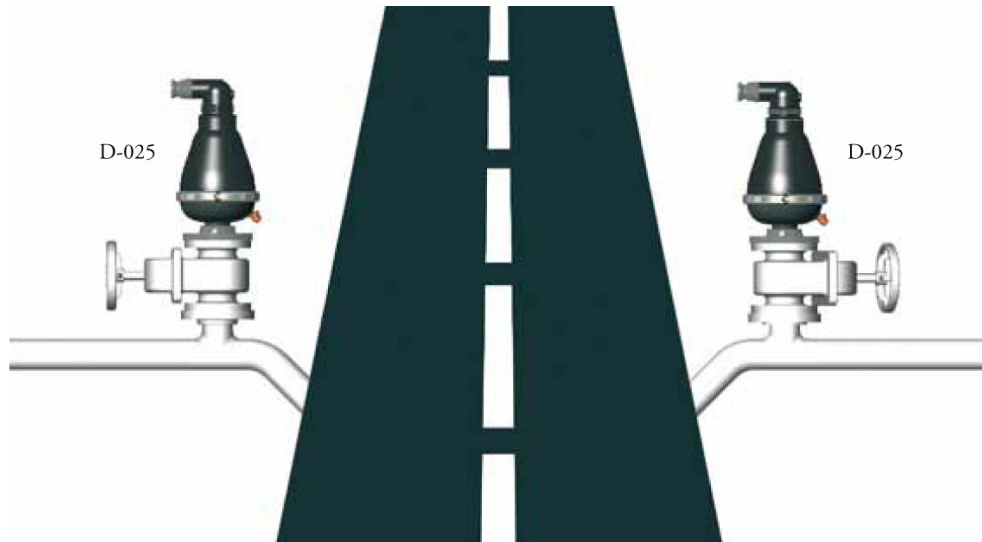


INSTALLATION GUIDE

INSTALLATION WHERE A LINE CROSSES UNDER OR OVER A ROAD OR DITCH

Install a combination air valve wherever a large diameter pipe, with sharp upward or downward angle changes, crosses under or over a road or ditch.

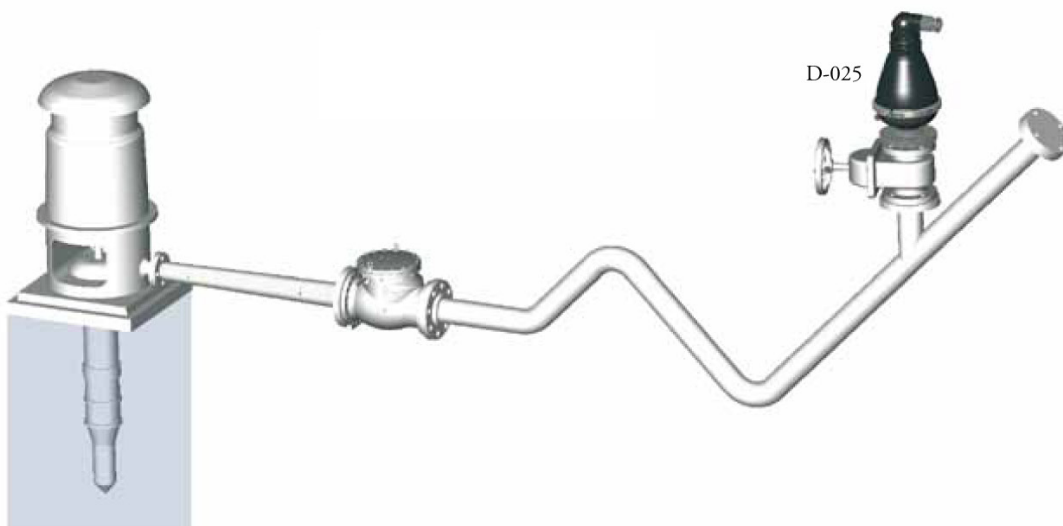
When the crossing point is wide and/or deep, install the air valves at the uppermost point of the angle change on both sides of the road.



INSTALLATION GUIDE

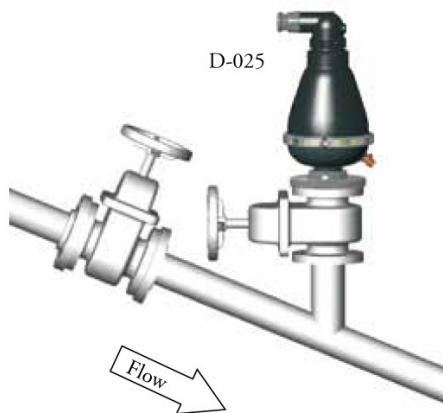
INSTALLATION AT PIPE ENDS

Install a combination air valve at the end of each line before the main or sub main valve.



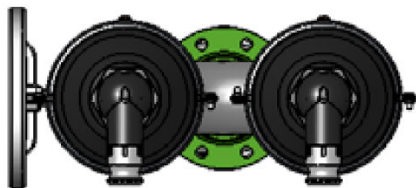
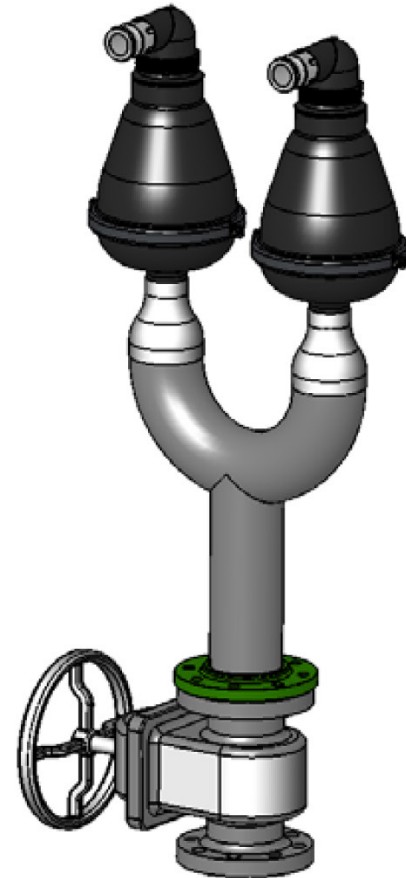
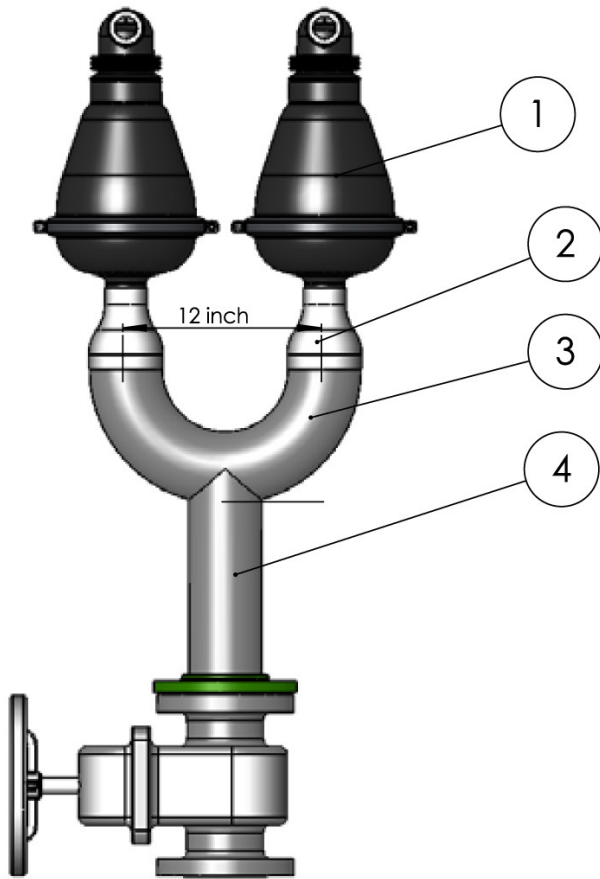
INSTALLATION AT THE MAIN LINE VALVE AND ON SLOPES BEFORE AN ISOLATING VALVE

Install a combination air valve directly on the vertical pipe at the main line control system and before an isolating valve on a sloping pipeline. This will ensure control of air in the water supply and protection for the other accessories in the control system and protection of the water meters farther downstream.



INSTALLATION GUIDE

RECOMMENDED MANIFOLD INSTALLATION



PART NAMES AND QUANTITIES

NUMBER	PART NAME	QTY
1	D-025 2" NPT	2
2	CONCENTRIC REDUCER 4" X 2"	2
3	180 RETURN BEND 4"	1
4	PIPE 4"	1

SAMPLE AIR VALVE SET-UP ON RISERS

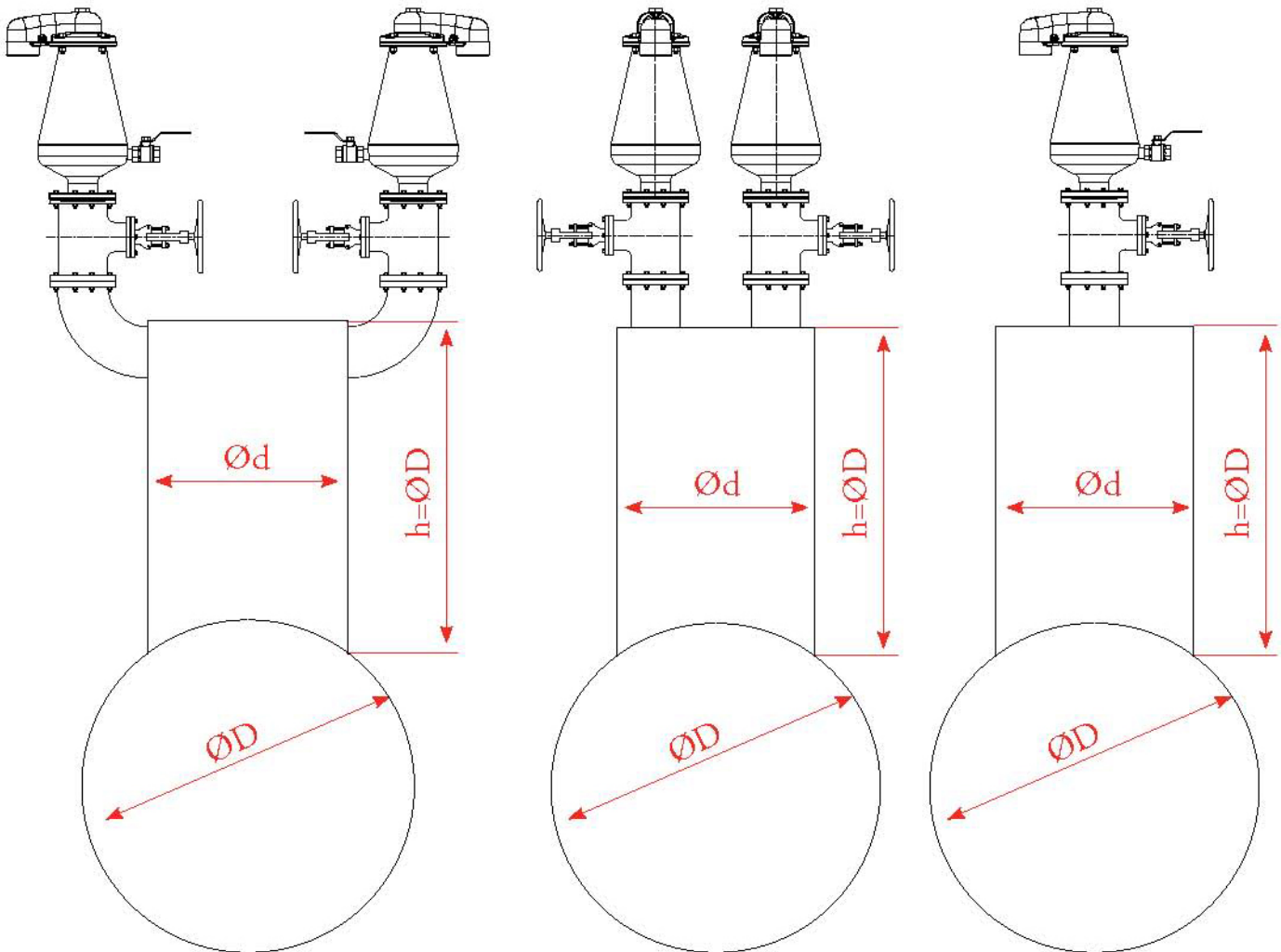
Recommendations for Riser Dimensions

$d = D$ for $D \leq 11.8''$

$d = 0.6D$ for $11.8'' < D \leq 59''$

$d \geq 0.35 D$ for $D > 59''$

$h \geq D$ and $h \geq 5.9''$





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