MINING DIVISION

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: 140º F
- Maximum intermittent temperature: 194º 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

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:

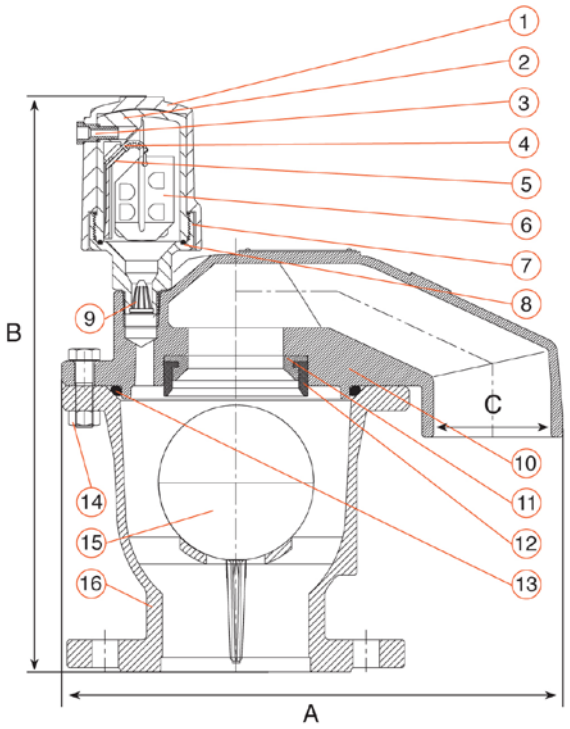
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings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

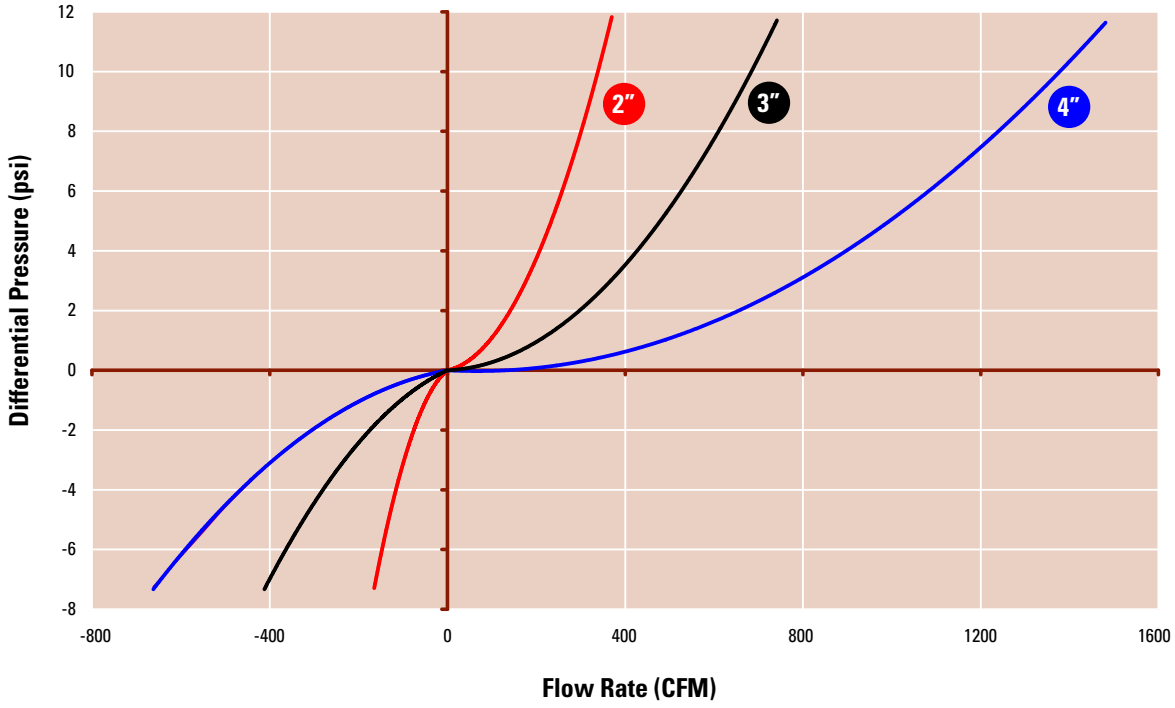
DIMENSIONS AND WEIGHTS

SIZE	DIMENSIONS (IN) A	B	WEIGHT (LBS.)	ORIFICE AREA (IN^2) 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

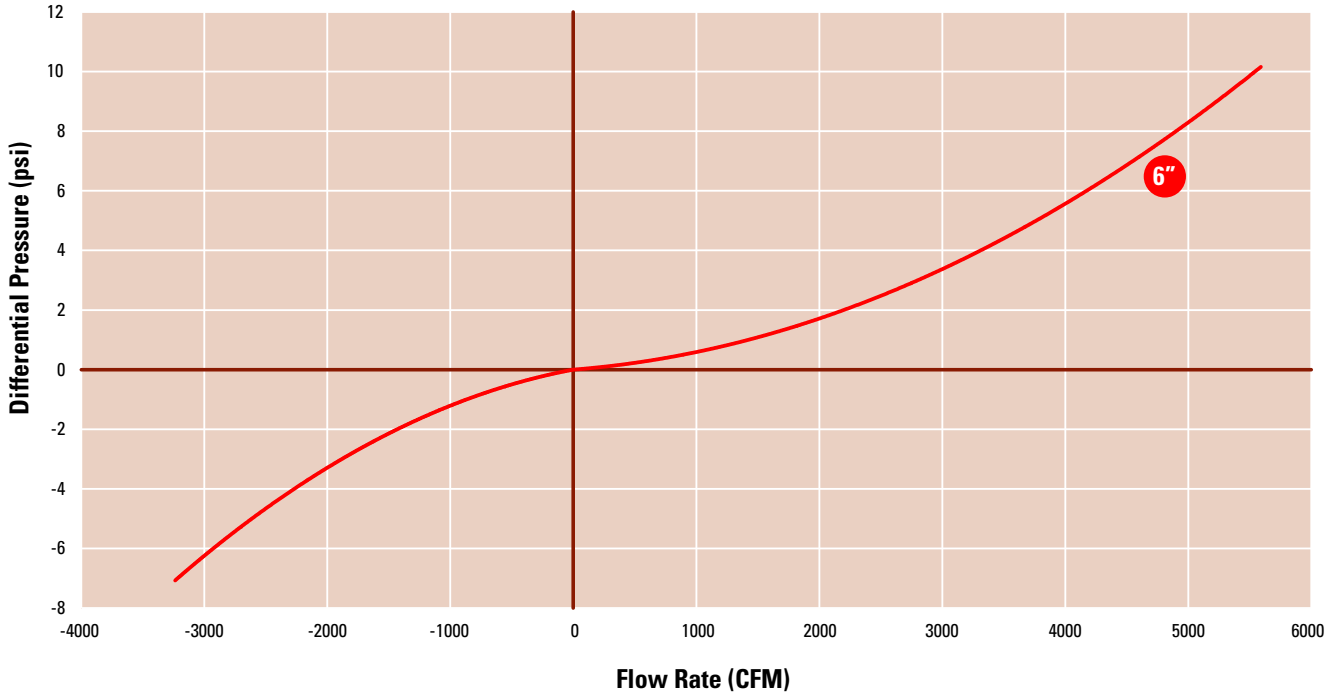
MODEL NUMBER AND FLANGE TYPE

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 AIR & VACUUM FLOW RATE



D-05 SERIES AIR & VACUUM FLOW RATE



DISCHARGE FLOW RATE (CFM)

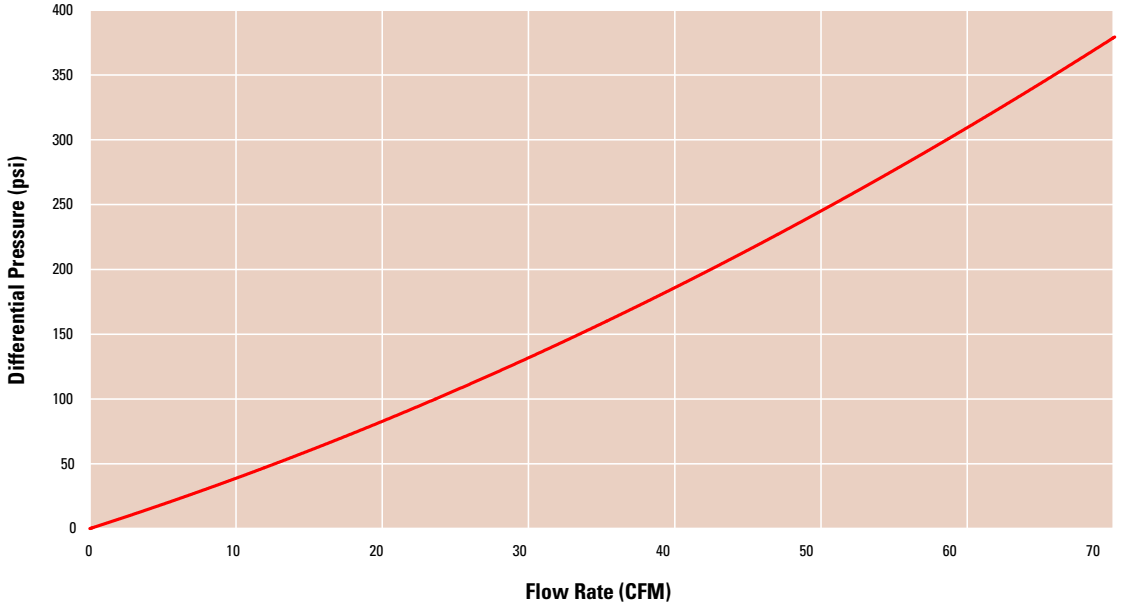
SIZE	DIFFERENTIAL PRESSURE (PSI)						
	0	2	4	6	8	10	12
2″	0	140	205	255	297.5	335	368.4
3″	0	334	465	565.5	650	725	792
4″	0	650	886	1,069	1,223	1,360	1,483
6″	0	2,290	3,365	4,182	4,900	5,530	6,100

INTAKE FLOW RATE (CFM)

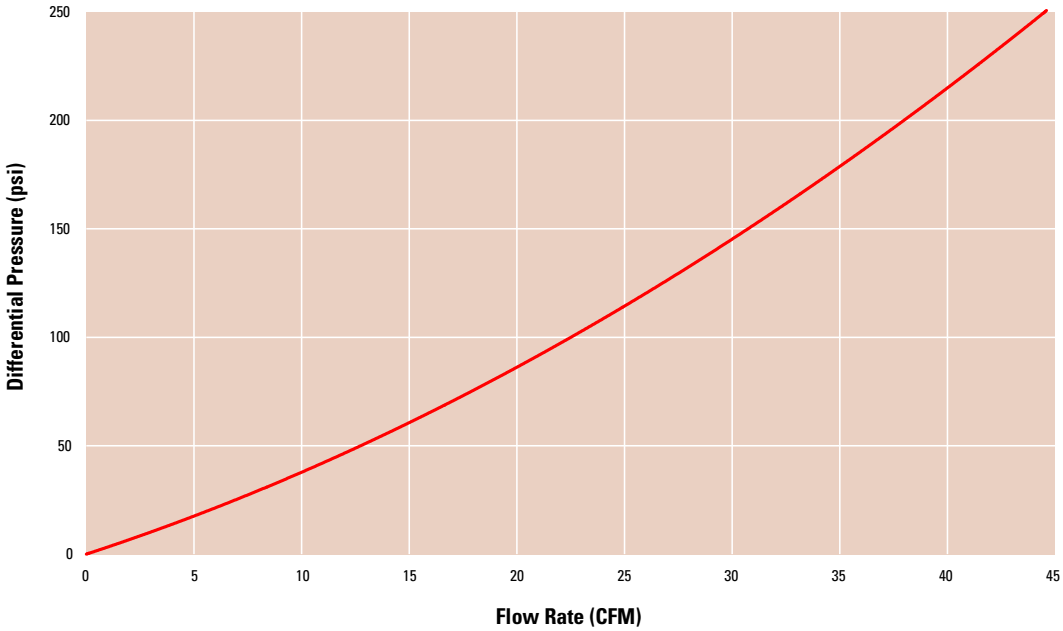
SIZE	DIFFERENTIAL PRESSURE (PSI)						
	-7.5	-6	-5	-4	-3	-2	0
2″	-171	-150.2	-135	-118.2	-99.2	-77	0
3″	-400	-348	-310	-269	-223	-169	0
4″	-689	-600	-535	-465	-383	-290	0
6″	-3,280	-2,980	-2,655	-2,300	-1,900	-1,435	0

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

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