

# COMBINATION AIR VALVE WITH SURGE PROTECTION

## Super Duplex

### Model VAC-312-SP-D

BERMAD VAC-312 is a quality combination air valve for a variety of water networks and operating conditions. It evacuates air during pipeline filling, allows efficient release of air pockets from pressurized pipes, and enables large volume air intake in the event of network draining.

With its advanced aerodynamic design, double orifice and Surge Protection (Anti-slam / slow closing) device, this valve provides excellent protection against air accumulation, vacuum formation and pressure surges.

#### Features & Benefits

- Straight flow body with nominal (equal) inlet and outlet size.
- Surge Protection: the kinetic orifice is partially closed during the second stage of the air relief, preventing damage to the air valve and the system.
- Compact and simple structure with fully corrosion resistant internal parts: Lower maintenance and increased life span.
- Factory approval and Quality Control: Performance and specification tested and measured with specialized test bench, including vacuum pressure conditions.

#### Typical Applications

- Pumping stations and deep well pumps: Air relief, surge protection and vacuum prevention.
- Pipelines: Protection against air accumulation and vacuum formation at elevations, slope change points and road / river crossings.
- Water networks: Protection against vacuum formation, surge and water hammers at points likely to experience water column separation.

#### Additional Features & Accessories

- Drainage Valve.

#### Inlet and Outlet Connections

- Inlets: Stud bolts 2-4"; DN50-100, Flanged 2-8"; DN50-200
- Outlets: Mushroom

#### Operational Data

- Pressure Rating: 230 psi, 360 psi
- Minimum operating pressure: 4.5 psi
- Maximum operating pressure: 230 psi, 360 psi
- Media and operating temperature: 33-140°F

#### Materials

- Body (Barrel): Super Duplex
- Lower and Top Flanges: Super Duplex or Duplex
- Cover: Polypropylene
- Screen: Polypropylene
- Automatic Orifice: Super Duplex
- Float: Polypropylene
- Elastomers: Viton
- Bolts & Nuts: Stainless Steel 316 or Super Duplex



VAC-312-SP-D Stud bolts (code 400, 501)



VAC-312-SP-D Flanged (code 401, 505)

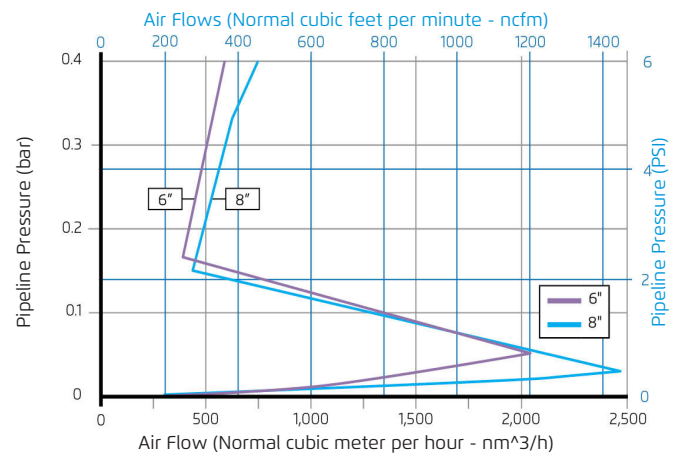
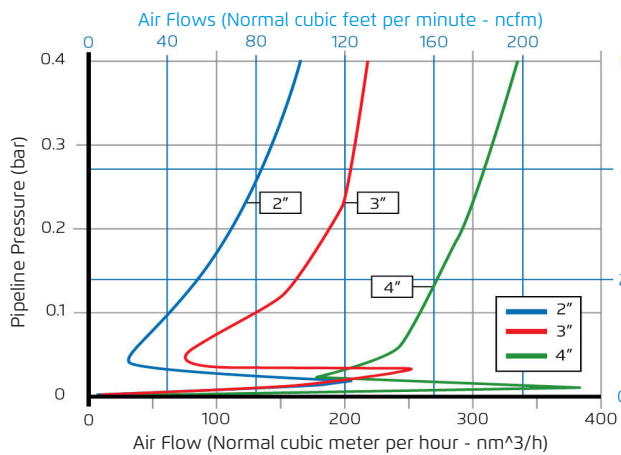


## Orifice Specifications

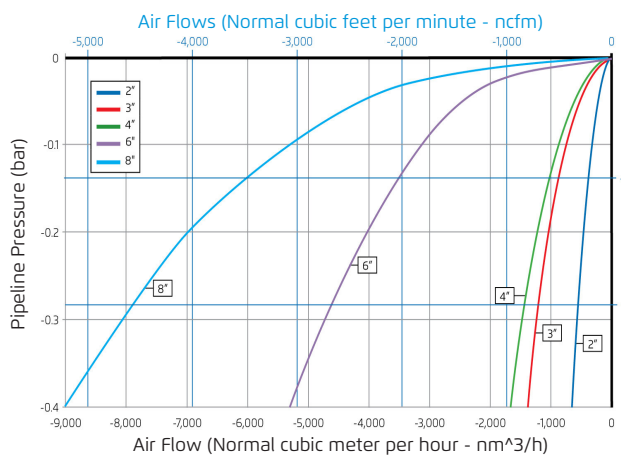
| Inlet Sizes | Automatic Orifice Area |         | Kinetic Orifice |         | Automatic Orifice |         |
|-------------|------------------------|---------|-----------------|---------|-------------------|---------|
|             | 230 psi                | 360 psi | Diameter        | Area    | Diameter          | Area    |
| Inch; mm    | Sq inch                | Sq inch | inch            | Sq inch | inch              | Sq inch |
| 2"; DN50    | 0.002                  | 0.002   | 2.0             | 3.142   | 0.354             | 0.394   |
| 3"; DN80    | 0.002                  | 0.002   | 3.0             | 7.069   | 0.472             | 0.701   |
| 4"; DN100   | 0.003                  | 0.003   | 4.0             | 12.566  | 0.669             | 1.407   |
| 6"; DN150   | 0.011                  | 0.011   | 6.0             | 28.274  | 0.984             | 3.043   |
| 8"; DN200   | 0.011                  | 0.011   | 8.0             | 50.265  | 1.339             | 5.629   |

## Air Flow Performance Charts

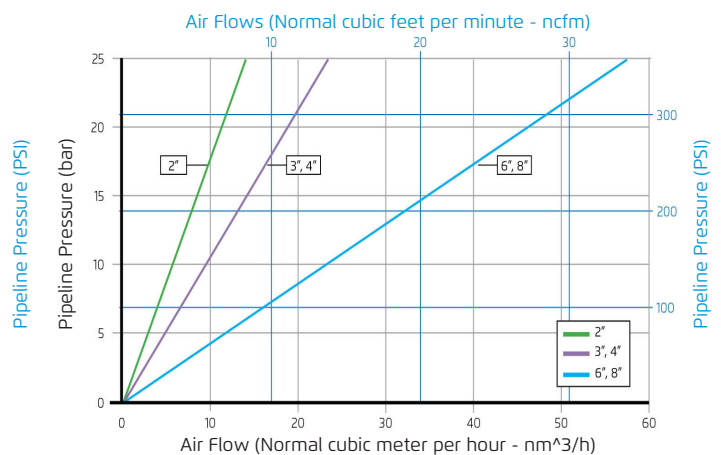
### Air Relief with Surge Protection (Pipeline Filling)



### Air Relief and Intake (Pipeline Filling, Draining and Vacuum Conditions)



### Air Release (Pressurized Operation)



- For higher automatic air release capacity, Please consult with BERMAD.
- Air relief and intake charts for inlet connections 2-8", DN50-200 are based on actual measurements, measured in Bermad Air Flow test bench, according to EN-1074-4 standard. Use Bermad Air software for optimized Sizing & Positioning of Air Valves.

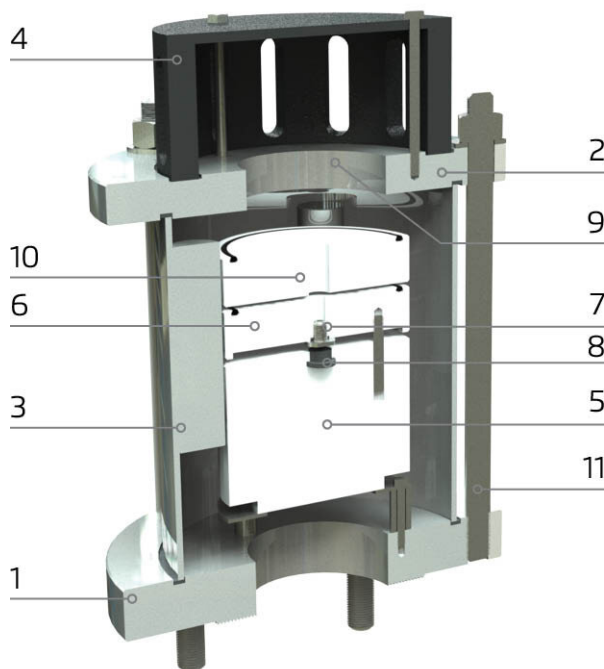


### Data for VAC-312-SP-D with Surge Protection Feature

| Inlet Sizes | VAC-312-SP<br>Switching<br>Value | VAC-312-SP<br>Air relief at 6<br>psi; 0.4 bar |
|-------------|----------------------------------|-----------------------------------------------|
|             | Mushroom<br>Outlet               | Mushroom<br>Outlet                            |
| Inch; mm    | psi                              | ncfm                                          |
| 2"; DN50    | 0.43                             | 37                                            |
| 3"; DN80    | 0.29                             | 153                                           |
| 4"; DN100   | 0.29                             | 412                                           |
| 6"; DN150   | 0.51                             | 442                                           |
| 8"; DN200   | 0.73                             | 471                                           |

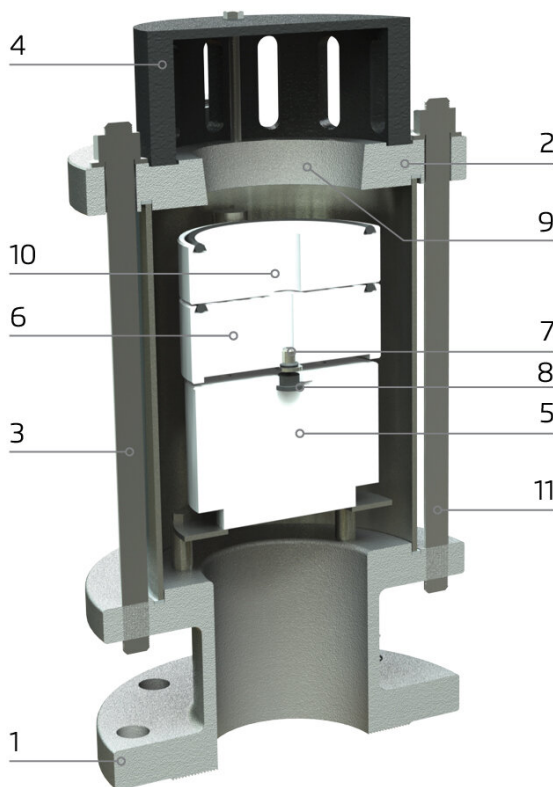


### Cutaway - stud bolts connection



- [1] Lower Flange
- [2] Upper Flange
- [3] Body (Barrel)
- [4] Cover
- [5] Float
- [6] Auto Orifice Disc
- [7] Auto Orifice
- [8] Auto Orifice Seal
- [9] Kinetic Orifice
- [10] Surge Protection Disc
- [11] Tie Rod

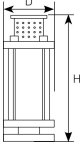
### Cutaway - flanged connection



- [1] Lower Flange
- [2] Upper Flange
- [3] Body (Barrel)
- [4] Cover
- [5] Float
- [6] Auto Orifice Disc
- [7] Auto Orifice
- [8] Auto Orifice Seal
- [9] Kinetic Orifice
- [10] Surge Protection Disc
- [11] Tie Rod



## Dimensions & Weights

|  |            |  |            |        |  |            |        |
|-----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|------------|--------|------------------------------------------------------------------------------------|------------|--------|
|                                                                                   |            | Stud bolts (code 400, 501)                                                        |            |        | Flanged (code 401, 505)                                                            |            |        |
| Inlet Sizes                                                                       | Connection | Width (D)                                                                         | Height (H) | Weight | Width (D)                                                                          | Height (H) | Weight |
| in; mm                                                                            |            | in                                                                                | in         | lbs    | in                                                                                 | in         | lbs    |
| 2"; DN50                                                                          | Stud bolts | 6.89                                                                              | 11.34      | 24.47  | ---                                                                                | ---        | ---    |
| 3"; DN80                                                                          | Stud bolts | 8.27                                                                              | 12.4       | 36.38  | ---                                                                                | ---        | ---    |
| 4"; DN100                                                                         | Stud bolts | 9.06                                                                              | 13.5       | 52.02  | ---                                                                                | ---        | ---    |
| 2"; DN50                                                                          | Flanged    | ---                                                                               | ---        | ---    | 6.89                                                                               | 14.17      | 26.46  |
| 3"; DN80                                                                          | Flanged    | ---                                                                               | ---        | ---    | 8.46                                                                               | 16.34      | 44.09  |
| 4"; DN100                                                                         | Flanged    | ---                                                                               | ---        | ---    | 9.65                                                                               | 16.93      | 55.12  |
| 6"; DN150                                                                         | Flanged    | ---                                                                               | ---        | ---    | 13.98                                                                              | 24.80      | 165.35 |
| 8"; DN200                                                                         | Flanged    | ---                                                                               | ---        | ---    | 16.34                                                                              | 27.17      | 264.55 |