



## TECHNICAL DATA

### AUTOMATIC AIR/VACUUM VENT - MODEL AV-1 ESFR COLD STORAGE SYSTEM

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

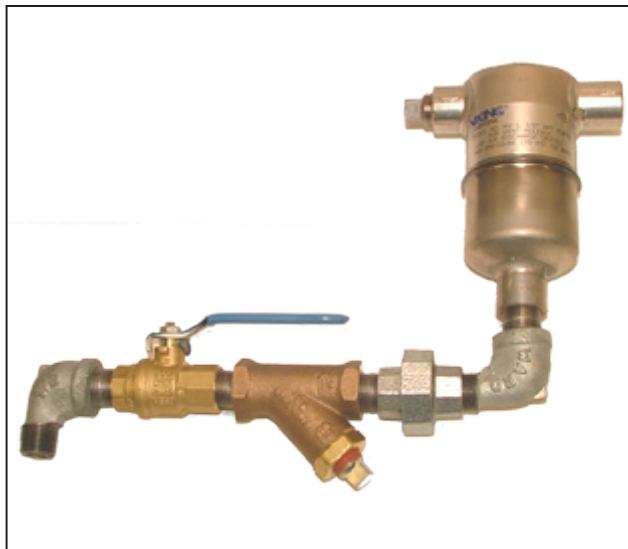
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

#### 1. DESCRIPTION

The Viking Model AV-1 Automatic Air/Vacuum Vent was developed for application in wet pipe or preaction sprinkler systems that contain both water and antifreeze solution. This device eliminates the requirement for manual venting from sprinklers or the need to add high-point bleed valves. The AV-1 is required to be installed at all high points of the sprinkler system piping, including branch lines and main feed lines.

#### FEATURES

The stainless steel construction provides both corrosion resistance and high or low temperature operation in sprinkler system environments. The low profile allows for installation at the top location of the branch pipe or supply mains of ceiling sprinkler piping. An additional outlet is provided for possible antifreeze sampling or back flushing to remove debris from the seat area. The AV-1 with Trim Kit includes the Model AV-1 Automatic Air/Vacuum Vent, Isolation Ball Valve and Strainer to protect the orifice and seat as well as allow isolation for possible replacement or maintenance of the AV-1 valve. The Model AV-1 Automatic Air/Vacuum Vent device is non-repairable and can only be flushed for cleaning. (If replacement of the valve is required, refer to Part Number 13494.)



#### 2. LISTINGS AND APPROVALS:

**NOTE: The Viking Model AV-1 Automatic Air/Vacuum Vent Valve carries no listings or approvals.**

#### 3. TECHNICAL DATA

##### Specifications

Rated pressure: to 175 psi (12.1 bar) water working pressure.

Factory tested: hydrostatically to 350 psi (24.1 bar).

Dimensions: Refer to Figures 1 & 2.

Connection Size: 1/2" NPT (Inlet at bottom and 2 outlets at top location.)

Discharge Venting Orifice: 1/8" (3.2 mm)

##### Material Standards

Body: Stainless Steel UNS-S30400

Float: Stainless Steel UNS-S30400

Seat: 17-4 Stainless Steel

Linkage Components: Stainless Steel UNS-S30400

##### Ordering Information

Model AV-1 Valve and Trim Kit: Part Number 13495

Model AV-1 Vent Valve Only: Part Number 13494

Available since 2005.

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikingcorp.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.

#### 4. INSTALLATION

1. The AV-1 Assembly must be installed on top of the highest point of each branch line and/or supply main pipe.
2. In order to install the AV-1 assembly in the space from the ceiling to the sprinkler, the isolation ball valve and strainer must be installed in the horizontal position as illustrated in Figure 2 and the AV-1 must be installed with the (2) outlet connections at the top location. This position is critical in order to allow the float within the device to operate properly.
3. The outlet connection needs to be piped using 3/8" (9.5 mm) outside diameter plastic or copper tubing unrestricted downward and away from protected product below. This is due to possible small amounts of moisture that could spurt out during venting of the system. Copper is recommended in order to function during and after fire situations and long-lasting durability. Attach to the 1/2" NPT vent connection as shown in Figure 3.

#### 5. OPERATION

The Viking AV-1 device is a float operated automatic air vent that is installed at high points of the sprinkler system where air pockets can accumulate. As the system fills, air is automatically vented through the orifice of the vent valve. When the system is full, the water

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or antifreeze solution raises the float due to buoyancy and shuts off the outlet orifice. As air throughout the system accumulates at the high points of system piping, it will be automatically expelled to provide air-free system piping.

With the Viking AV-1 device, air is allowed to enter the piping system for quick and complete drainage of the system piping. Airflow during venting is restricted due to differential pressure across vent orifice. It is recommended to slow fill the system initially to minimize the buildup of air in the system. After the system is completely filled with liquid, then increase the pressure to the desired operating static state. See Table 1 for air flow capacity at various differential pressures.

Having the AV-1 installed on the end of each high-point branch line and/or main provides quicker and more complete drainage of system piping. This is because during drainage of system piping, the AV-1 will open and allow air to enter and break the vacuum inside the piping.

## 6. INSPECTIONS, TESTS AND MAINTENANCE

1. The top inlet connection can be used as a sampling discharge connection that can be piped to a floor level location, or attach a manual bleed valve to take sample antifreeze from desired locations. If this connection is not being used, then it must be plugged with the pipe plug furnished with product.
2. Regular inspection for leakage from the discharge outlet and plugging of the strainer is recommended. By shutting off the isolation valve, open strainer screen plug, drain liquid from the assembly, the float should open. Check the strainer for debris, clean, and reassemble. Open the isolation valve slowly and make sure the AV-1 vents and shuts off when filling with liquid. Opening the isolation valve slowly will prevent the alarm system from operating due to fast liquid flow past the sprinkler system alarm valve.
3. When using the outlet connection as a sample point for the antifreeze system, allow to flow long enough to obtain solution sample from the branch pipe area and not from the drop leg of the sample tube.
4. It is normal on hydronic systems to have no discharge from the auto vent valves.
5. During routine maintenance of the unit, observe air flow from the vent during recharge of the AV-1. During proper operation, air will flow from outlet followed by a small amount of liquid, then shut off.
6. If debris is collected on the seat, liquid leakage will occur. Isolate with the ball valve. Remove the AV-1 and back flush using clean water through the outlet vent connection to flush out scale and debris. Re-check operation before reinstallation. If there is still improper function, replacement of the AV-1 valve is required.

## 7. AVAILABILITY

The Viking Model AV-1 Automatic Air/Vacuum Vent is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

## 8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.



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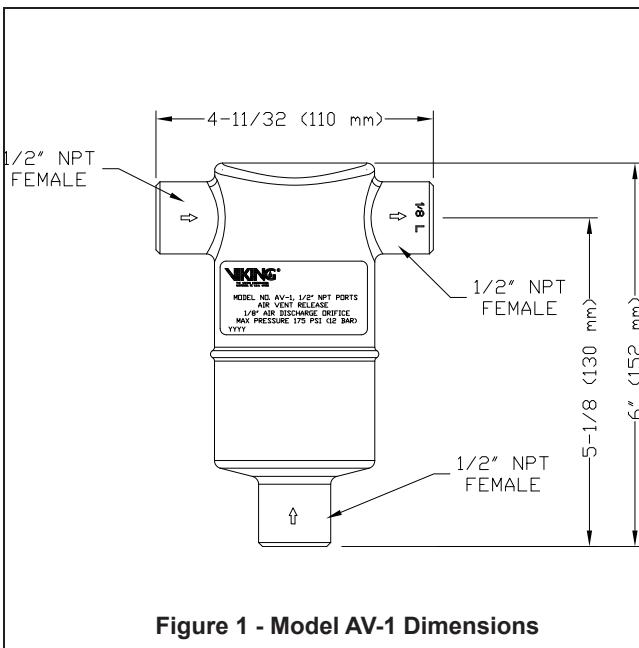
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**Table 1 - Discharge of Air Through an Orifice at Standard Atmospheric Pressure of 14.7 psia and 70 Deg. F**

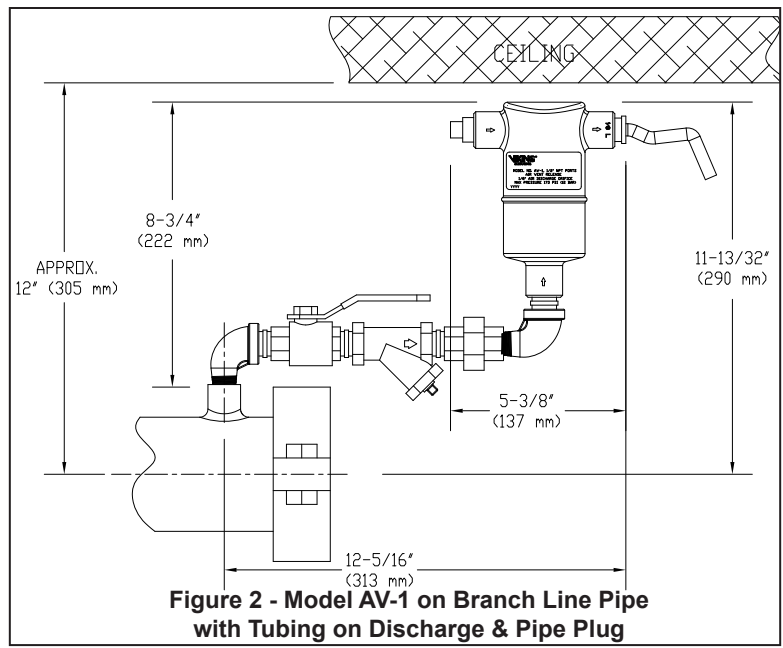
Pressure PSI (bar)	5 (0.34)	20 (1.38)	40 (2.76)	50 (3.45)	60 (4.14)	70 (4.83)	80 (5.52)	90 (6.21)	100 (6.90)	110 (7.59)	125 (8.62)	150 (10.34)	175 (12.07)
Air flow SCFM (L/sec)	2.58 (1.22)	4.99 (2.36)	7.71 (3.64)	9.24 (4.36)	10.80 (5.10)	12.30 (5.81)	13.80 (6.51)	15.30 (7.22)	16.70 (7.88)	18.20 (8.59)	20.50 (9.68)	24.20 (11.42)	27.90 (13.17)

$$SCFM = (CFM \text{ or } ACFM) \times \frac{(14.7+p)}{14.7} \times \frac{520}{(460+t)}$$

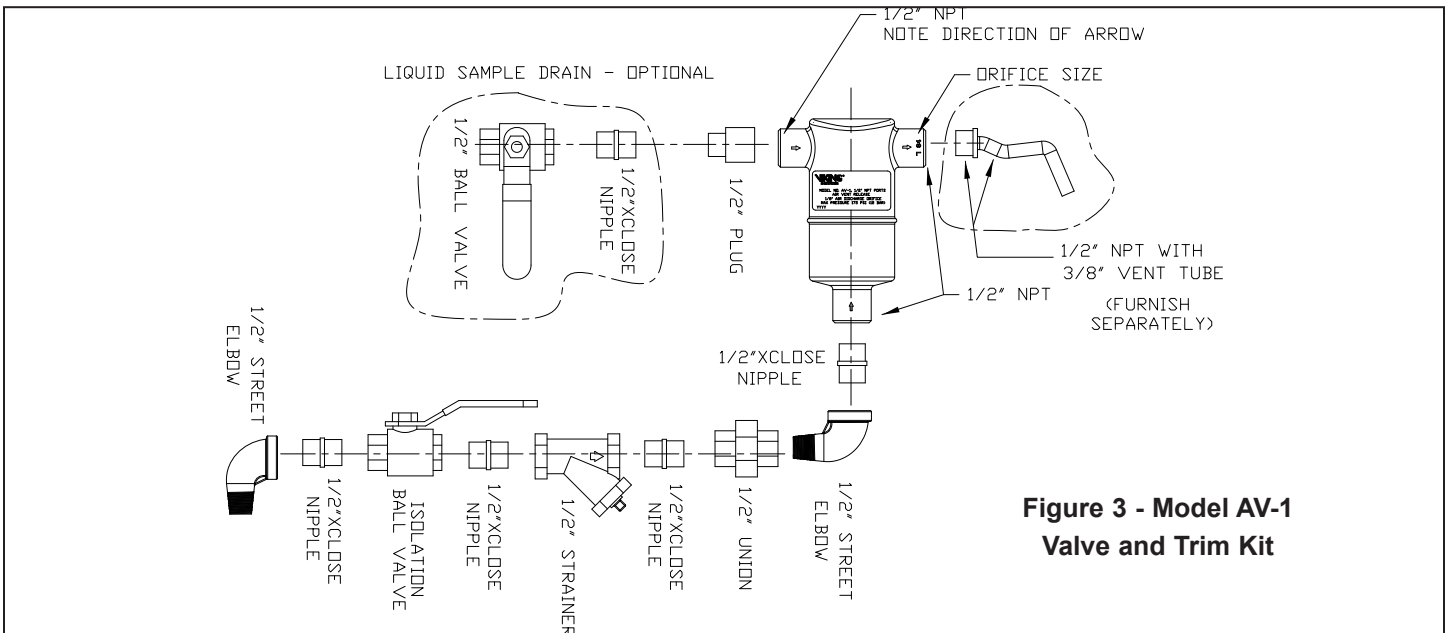
Where: p = gauge pressure of gas or vapor (psig)  
t = temperature of gas or vapor (°F)



**Figure 1 - Model AV-1 Dimensions**



**Figure 2 - Model AV-1 on Branch Line Pipe with Tubing on Discharge & Pipe Plug**



**Figure 3 - Model AV-1 Valve and Trim Kit**

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