2000A Series Emergency Pressure Relief Vents (ATEX Approved)

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WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Anderson Greenwood Emergency Pressure Relief Vent must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. (Emerson) instructions .

Failure to correct trouble could result in a hazardous condition. Call a qualified service person to service the unit. Installation, operation and maintenance procedures performed by unqualified person may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the emergency pressure relief vent.

Introduction

Scope of the Manual

This Instruction Manual provides instructions for installation and maintenance for the 2000A Series Emergency Pressure Relief Vent (EPRV).

P1888

Figure 1. *2000A Series Emergency Pressure Relief Vent*

Figure 2. *2000A Series with Smart Wireless Monitoring*

Product Description

Emergency pressure relief vents are designed to provide an emergency pressure relief opening for storage tanks when exposed to overpressures that are not handled by standard tank vents.

The 2000A Series Emergency Pressure Relief Vent (EPRV) provides pressure relief only. Properly-sized 2000A Series meet the API standard 2000 for emergency venting due to fire exposure. This vents provide quick easy access for tank inspection and maintenance.

Outside North America Only

Specifications

The Specifications section lists the specifications for the 2000A Series. Specification is stamped on the nameplate attached to the emergency relief vent. Refer to Product Identification and Marking section for the nameplate details.

Connection Sizes Available
See Table 1

Pressure Ranges[1]
2.0 to 46.4 oz./sq. in.
(0.5 oz./sq. in. increments)
3.5 to 80.0 in. w.c.
(1.0 in. w.c. increments)
8.6 to 200 mbar
(2.2 mbar increments)

Construction Materials

Base and Arm
Carbon Steel, 304 Stainless steel and
316L Stainless steel

Disk and Seal Support
Aluminum, 304 Stainless steel and 316L Stainless steel

Seal
Buna-N, FEP Teflon® and Viton®

Certification
EN IEC 60079-0:2018
EN IEC 60079-11:2012
EN ISO 80079-36:2016
EN ISO 80079-37:2016

1. The pressure limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

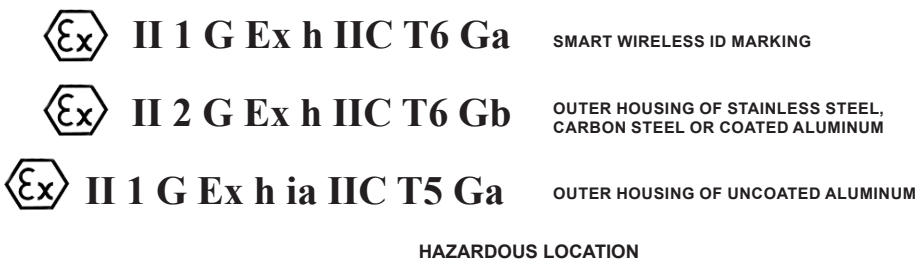

Figure 3. *Product Identification and Marking*

Table 1. *Connection sizes and Model Number*

SERIES	MODEL	CONNECTION SIZE	
		ANSI	API
2000A Series Emergency Pressure Relief - For Pressure Relief Only	2020	20 in.	20 in.
	2024	24 in.	24 in.

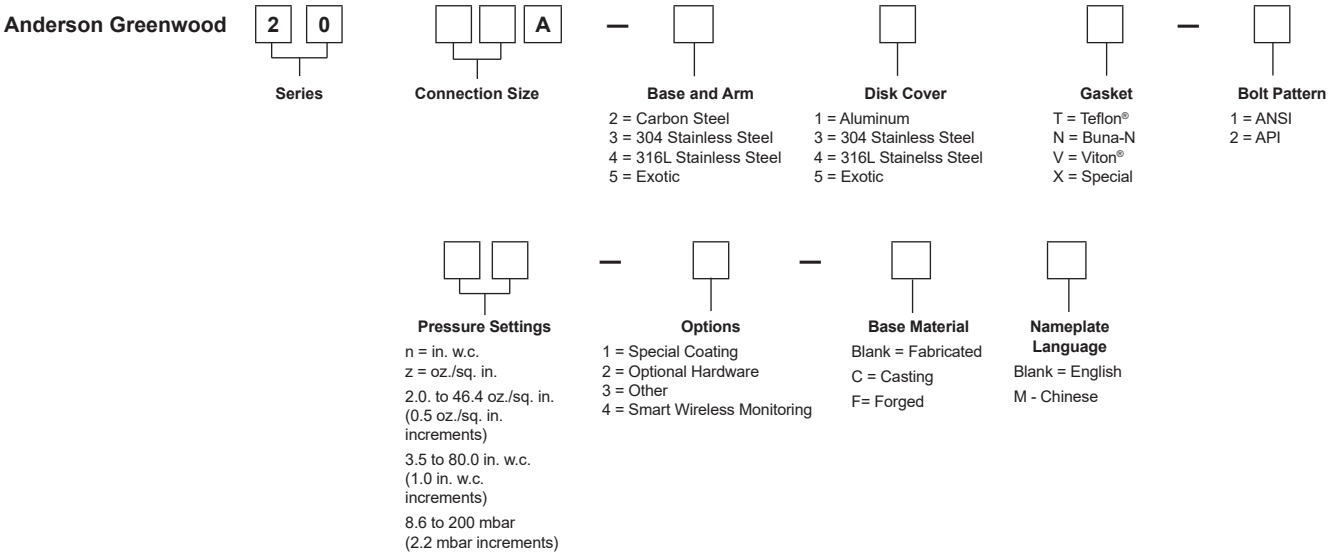

Figure 4. *Emergency Pressure Relief Vent Model Number*

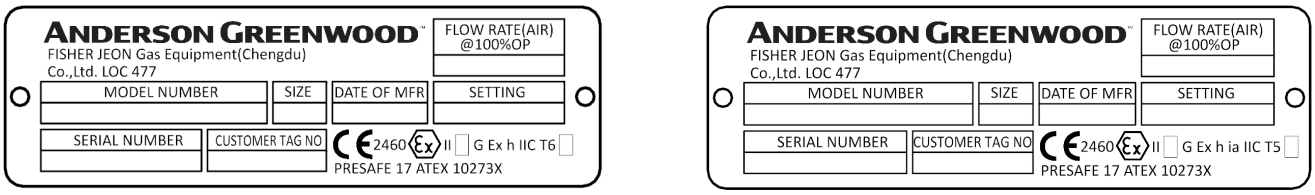

Figure 5. *Nameplate*

Remote Monitoring Option

The Smart Wireless monitoring option is available with the 2000A Series. It allows the detection of the Open or Closed position of the emergency vent from a remote site. Under normal conditions, the emergency vent should be Closed. An Open indication can alert personnel that there is a potential safety or emissions issue that should be further investigated.

Product Identification and Marking

Hazardous Locations

Emergency Pressure Relief Vents are available with outer housings of carbon steel, stainless steel or aluminum as indicated in Figure 3.

Nameplate

A nameplate is attached to the vent and contains the following information:

- **Model Number** – Ex. 2024A-21T-1
- **Connection Flange Size** – 24 in.
- **Serial Numbe**r
- **Tag Number** (Optional)
- **Notified Body Number** – Ex. 2460
- **Cat. No.** (Category Number)
  - Category 1 – Stainless steel, Carbon steel or Coated aluminum vents
  - Category 2 – uncoated aluminum vents
- **Date** – date of manufacture
- **Certificate** – Ex. PRESAFE 17 ATEX 10273X
- **Pressure Setting and Flow Rate**
  - **Setting** – Ex. Z4.0
  - **Flow Rate SCFH (Air)** – Ex. 00000

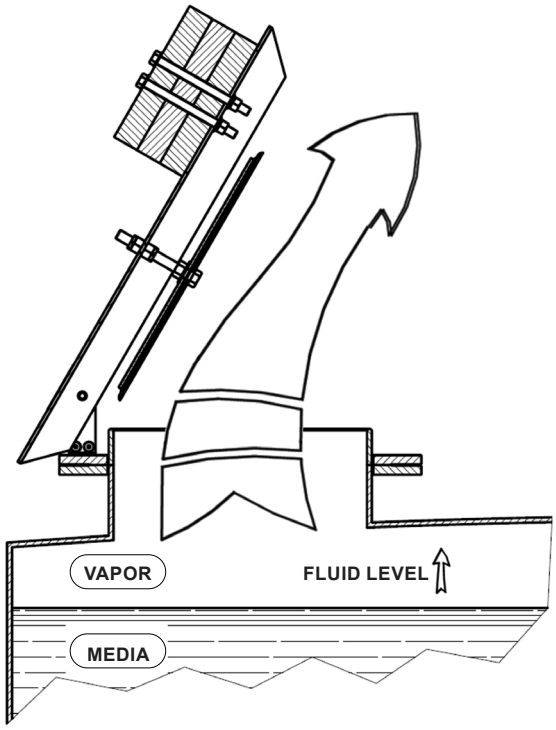

Figure 6. *Pressure Flow*

Principle of Operation (Figure 6)

The 2000A Series maintain a tight seal until system pressure exceeds the set pressure of the vent. To adjust the set pressure, a series of weights may be stacked onto the lid assembly. When overpressure occurs, the weighted lid assembly lifts, breaking the seal between the seat and seal portion of the lid assembly. This allows vapors to pass through the vent orifice and relieve pressure build up. The vent reseals upon relief and remains sealed.

Note

Relieving vapors near the set pressure in a continuous manner may cause the lid assembly to flutter or oscillate. This is a common occurrence in products of this type in the industry. Operating the vent with flutter or oscillation over time may cause premature vent damage or wear. Contact your local Sales Office for additional assistance.

Remote Monitoring Option

The Smart Wireless option for the 2000A Series consists of the EPRV, a proximity sensor, and a wireless transmitter. The built-in proximity sensor detects the open or closed position using a magnetic target located on the arm assembly on the hinged end. A signal is sent to the wireless transmitter, which can then be sent to a control room via any WirelessHART® Gateway. This wireless sensor networking technology is based on the Highly Addressable Remote Transducer (HART®) protocol. It is the most widely used wireless networking standard used today and, for this reason, the 2000A Series has been designed to integrate with it. As long as the wireless gateway is WirelessHART®, it will receive the Open or Closed signal from the device. The WirelessHART® gateway will then send the information to a control room which can make use of any number of software integration packages.

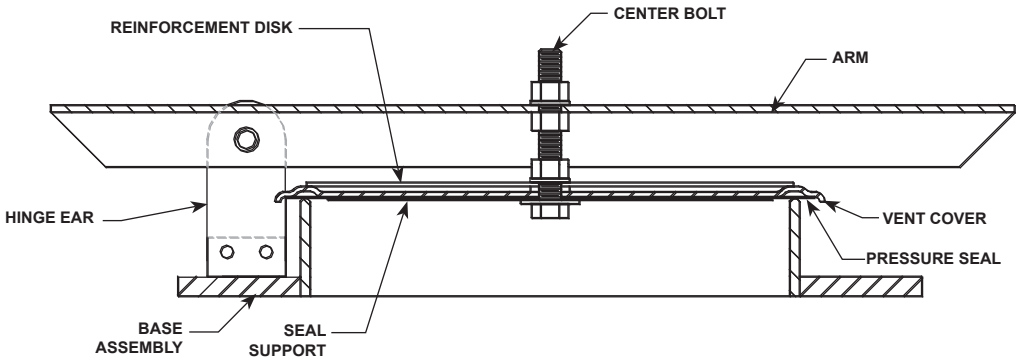

Figure 7. *2000A Series Assembly Drawing*

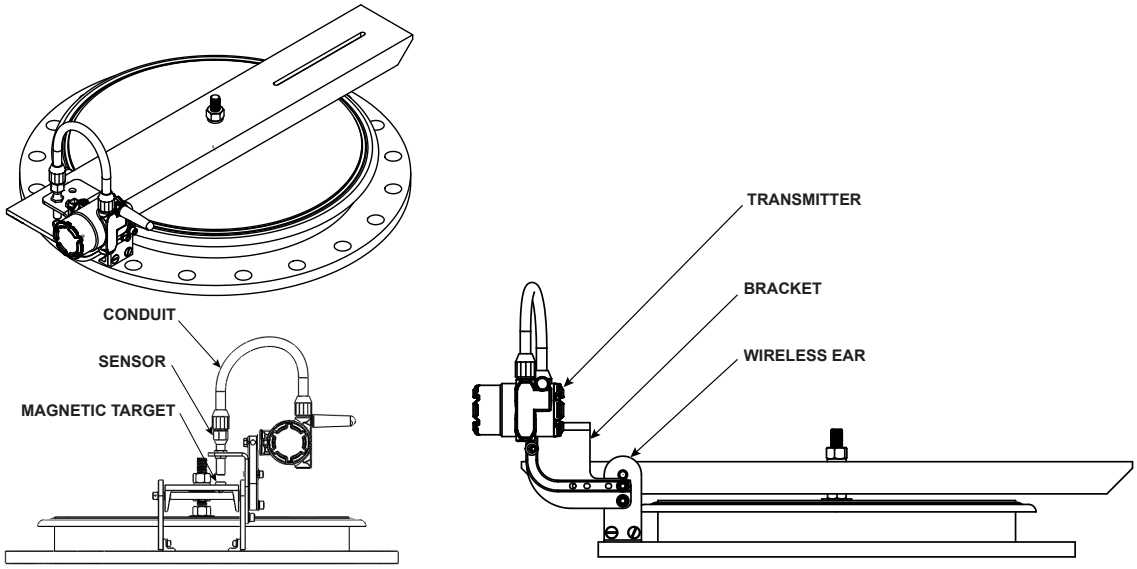

Figure 8. *2000A Series with Smart Wireless Monitoring Option*

Installation

⚠ WARNING

Wear protective gloves and clothing to prevent skin contact when handling lead weights. Wear eye protection. Avoid breathing dust/fumes/ mist/vapors/spray. Do not eat, drink or smoke while using the product. Avoid release to the environment. Wash hands with soap and water after handling. Keep away from excessive heat and open flames.

Make sure line is free of hazardous vapors before installing or servicing the valve.

The EPRV Series is shipped with its lid held partially open. The lid assembly has attached weights and is heavy. Use caution when removing the shipping blocks and metal bands to avoid injury to fingers and hands.

Before installing the relief vent, remove the unit from its crate and discard any protective coverings. Follow the instruction below for the installation of the 2000A Series.

Install the 2000A Series on the flange bolt patterns that match with bolt pattern of the vent. The attachment flange base should be at level surface.

1. Carefully remove the 2000A Series from its crate. The seal portion of the vents is delicate, protect this surface while handling the unit.
2. Place the appropriate gasket on the level attachment flange and center the vent into place.
3. Insert the appropriate number of bolts and make sure the vent is fastened securely. Installed bolts should be clear of the lid assembly when it is in the full open position.
4. Inspect the installed unit from items that would keep it from working properly. The sealing area should be free of any debris that would cause leakage. The arm of the vent should be able to fully open.

Maintenance

⚠ WARNING

Always make sure that the tank is at atmospheric pressure before opening. Pressure build-up inside the tank can cause a spray to be emitted from the vent if opened under pressure.

An opened EPRV, where the EPRV arm and cover have rotated away from contacting the base, contains a large amount of potential energy. Always use appropriate lifting equipment when installing or maintaining the EPRV to avoid the risk of serious injury if the EPRV closes rapidly.

Follow the instruction below for the preventive maintenance of the 2000A Series.

1. Rotate arm. Inspect and make sure the open and close without block.
2. Inspect seat and seal whether they are damaged. Clear away any debris or buildup that may cause the vent to become lodged or impede air flow through the unit. Clean the internal components with a suitable solvent and non-abrasive cloth.
3. Close the arm slowly. Inspect the close without block.
4. Clear away any debris or buildup on the unit surface that may cause the vent to become lodged, impede air flow or add weight to the lid assembly (added weight will adjust the pressure setting of the vent).

Remote Monitoring Maintenance

1. Maintain 2000A Series EPRV with Smart Wireless Monitoring option in the same way as all standard EPRV.
2. Take certain precautions when cleaning the transmitter. The surface resistivity of the antenna assembly is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.

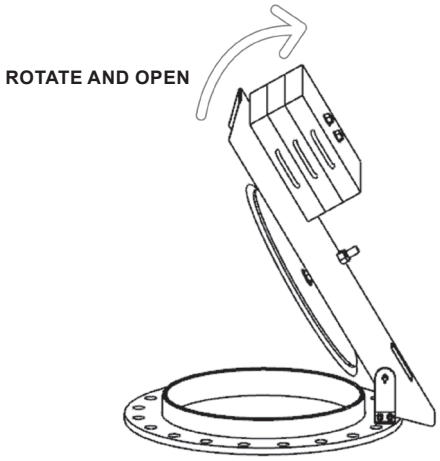

***Figure 9**. Rotating and Opening the Arm*

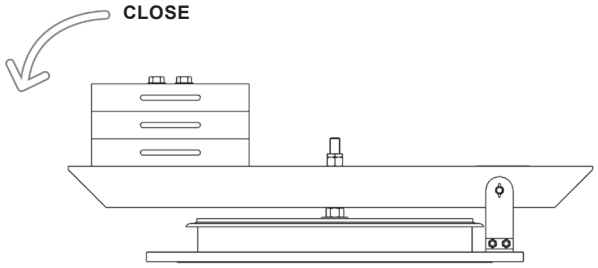

***Figure 10**. Closing the Arm*

Pressure Setting Information

The 2000A Series can reach various pressure settings in units of ounces, inches of water, millimeter of water or kPa column. The minimum pressure setting that each vent can achieve depends on the individual vent size and material. Minimum settings are reached when the unit is installed by itself. However, when weights are added to the arm of the unit, elevated pressures can be reached. These elevated settings are preset at the factory and should never be field adjusted.

Table 2. *Torque Specifications - Raised Face Flange, Steel only*

NOMINAL PIPE DIAMETER	# BOLTS	BOLT DIAMETER, IN.	TORQUE, FT-LBS.
20	20	1.13	214
24	24	1.25	253

Assumptions:
Use of SAE grade 5 bolts or studs or stronger
No lubricant
Compressed mineral fiber material or similar

Notes:
If lubricant is used on bolts, apply torque reduction factor listed in Lubricant Table.
For best results hardened steel washers should be used on all cast flange bolted connections.

Table 3. *Torque Specifications - Flat Face Flange, Steel or Aluminum*

NOMINAL PIPE DIAMETER	# BOLTS	BOLT DIAMETER, IN.	TORQUE, FT-LBS.
20	20	1.13	135
24	24	1.25	156
20 API	16	0.63	75
24 API	20	0.63	75

Assumptions:
Use of SAE grade 5 bolts or studs or stronger
No lubricant
Elastomer <70 Durometer Shore A

Notes:
Flat faced flanges should never be mated to a raised face flange for installation.
If lubricant is used on bolts, apply torque reduction factor listed in Lubricant Table.
For best results hardened steel washers should be used on all cast flange bolted connections.

Table 4. *Torque Reduction Factor per Lubricant*

DESCRIPTION	COEFFICIENT OF FRICTION	MULTIPLY TORQUE VALUE IN TABLE BY
Machine Oil	f = 0.15	0.75
API SA2 Grease	f = 0.12	0.60
Nickel-based Lubricant	f = 0.11	0.55
Copper-based Lubricant	f = 0.10	0.50
Heavy-duty Lubricating Paste	f = 0.06	0.30

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