Franklin Fueling Systems

# DEFENDER SERIES® PRESSURE/ VACUUM VENT WITH IN-LINE VAULT

## INSTALLATION GUIDE

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## Conventions used in this manual

This manual includes safety precautions and other important information presented in the following format:

**NOTE**: Provides helpful supplementary information.

**IMPORTANT**: Provides information to help avoid equipment damage or environmental hazards.

⚠ **CAUTION**: Alerts about unsafe practices and indicates potentially hazardous situations that could result in minor or moderate injury.

⚠ **WARNING**: Indicates potentially hazardous situations that could result in severe injury or death.

⚠ **DANGER**: Indicates imminently hazardous situations that will result in death.

## Operating precautions

Franklin Fueling Systems (FFS) equipment is designed to be installed in areas where volatile liquids such as gasoline and diesel fuel are present. Working in such a hazardous environment presents a risk of severe injury or death if you do not follow standard industry practices and the instructions in this manual. Before you work with or install the equipment covered in this manual, or any related equipment, read this entire manual, particularly the following precautions:

**IMPORTANT**: To help prevent spillage from an underground storage tank, make sure the delivery equipment is well-maintained, that there is a proper connection, and that the fill adaptor is tight. Delivery personnel should inspect delivery elbows and hoses for damage and missing parts.

⚠ **CAUTION**: Use only original FFS parts. Substituting non-FFS parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

⚠ **WARNING**: Follow all codes that govern how you install and service this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on while you are installing or servicing this product. Refer to this manual (and documentation for related equipment) for complete installation and safety information.

⚠ **WARNING**: Before you enter a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors can make you dizzy or unconscious, and if ignited, they can explode and cause serious injury or death. Containment sumps are designed to trap hazardous liquid spills and prevent environmental contamination, so they can accumulate dangerous amounts of hydrocarbon vapors. Check the atmosphere in the sump regularly while you are working in it. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before you resume working. Always have another person standing by for assistance.

⚠ **WARNING**: Follow all federal, state, and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A, and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination.

⚠ **WARNING**: Always secure the work area from moving vehicles. The equipment in this manual is usually mounted underground, so reduced visibility puts service personnel working on it in danger from moving vehicles that enter the work area. To help prevent this safety hazard, secure the area by using a service truck (or some other vehicle) to block access to the work area.

⚠ **DANGER**: Make sure you check the installation location for potential ignition sources such as flames, sparks, radio waves, ionizing radiation, and ultrasound sonic waves. If you identify any potential ignition sources, you must make sure safety measure are implemented.

# Introduction

The Defender Series® P/V Vent with In-Line Vault  can be mounted either at the top of the P/V vent piping or in the P/V vent enclosure located in the middle of the P/V vent piping at working height. To avoid the risk of climbing a ladder, and to maximize the simplicity of inspection and service, the preferred installation is to be mounted in-line. It can be mounted on a single riser pipe or many riser pipes manifolded to a single line. Use a support frame to mount and stabilize all P/V vent riser piping.

# Model Descriptions

## CARB/EPA Model

The Defender Series® Pressure/Vacuum (P/V) Vent is designed to meet the following performance requirements according to CARB CP-201 and EPA 40 CFR part 63 for Gasoline Dispensing Facilities:

- Positive Cracking = +2.5 to +6.0” WC
- Negative Cracking =-6.0 to-10.0” WC
- Positive Leak Rate <= 0.05 CFH @ +2.0” WC
- Negative Leak Rate <= 0.21 CFH @-4.0” WC

| PRESSURE SETTING | | LEAK RATE |
|---|---|---|
| +2.5 TO +6.0 IN. W.C. | This component was tested to and met these specifications | ≤ .05 CFH at +2 IN. W.C. |
| -6.0 TO -10.0 IN. W.C. | | ≤ .21 CFH at -4 IN. W.C. |

The leak rate performance of the Defender Series® P/V Vent with In-Line Vault allows for up to three vents to be installed for each tank venting system, in order to comply with the total vapor recovery system leak rate according to CARB CP-201.

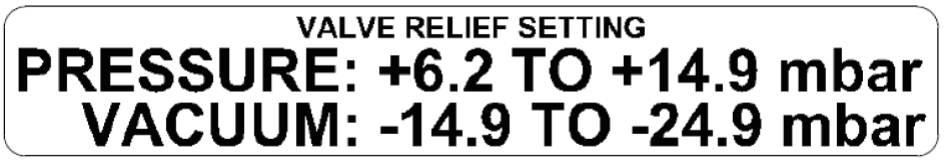
## International Models

The international models of the Defender Series® Pressure/Vacuum (P/V) Vent are designed to meet the following performance requirements according to local regulatory agencies.  All international models are compatible for use with an optional EN 16852 certified flame arrester element. (For more information, see “Installing the Defender Series® P/V Vent Flame Arrester” at the end of this manual.)

CE 0637 Ex G IIA
EN ISO 16852
IBExU20ATEX2082 X

## US/EPA

- Positive Cracking = +6.2 to +14.9 mbar
- Negative Cracking =-14.9 to-24.9 mbar

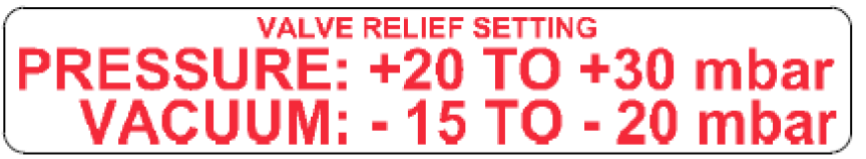



## EN/APEA "Blue Book"

- Positive Cracking = Fully open at +35 mbar
- Negative Cracking = Fully open at-2 mbar


## China

- Positive Cracking = +20 to +30 mbar
- Negative Cracking =-15 to-20 mbar




## Other Specifications (all models)

- Fuel Compatibility: Gasoline/Ethanol blends 0-85% (E0-E85) and Diesel/Biodiesel blends 0-20% (B0-B20)
- Operating temperature:- 22° F (- 30° C) to 122° F (50° C)

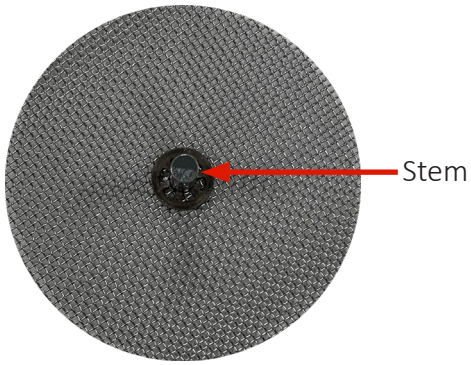
# Installation

**NOTE**: Use a thread sealant that is approved for gasoline and gasoline-ethanol blends for all tapered (NPT or BSPT) pipe fittings and plugs.

**NOTE**: You can paint the in-line vault enclosure but not the cover plate.

## Top of P/V vent piping (end-of-line) installation

1. Apply thread sealant (described above) to the 2" P/V vent pipe thread.
2. Thread the stainless steel adapter fitting onto the 2" P/V vent pipe, and then tighten until it is sealed properly.
3. Insert the inlet disc screen inside the adapter fitting with the stem oriented upwards. Make sure the O-ring is properly lubricated (with synthetic O-ring grease), and then thread the P/V vent into the Defender Series® vent stack adapter fitting until it bottoms out fully (120 in-lbs maximum torque).




**NOTE**: If you are using an existing OPW pipe adapter (2⅜"-12 straight thread with O-ring), clean and reuse the OPW debris screen. Replace the O-ring with the new one provided, and then tighten the P/V vent onto the Defender Series® vent stack adapter until it bottoms out fully (100 in-lbs maximum torque).

## Middle of P/V vent piping (in-line) mounting installations

1. Apply thread sealant (described above) to the lower 2" P/V vent pipe, thread on the in-line vault enclosure, and then tighten until it is properly sealed.
2. Apply thread sealant (described above) to the upper 2" P/V vent pipe, thread it into the in-line vault, and then tighten until it is properly sealed.
3. Install the P/V vent cap on the top of the upper pipe, and tighten the screw to secure it.

# Testing

Compliance testing of the Defender Series® P/V Vent with In-Line Vault , if required by the local air quality district, shall be conducted in accordance with California Air Resources Board (CARB) test procedure as defined by CARB CP-201.

# Annual inspections

## End-of-line installation

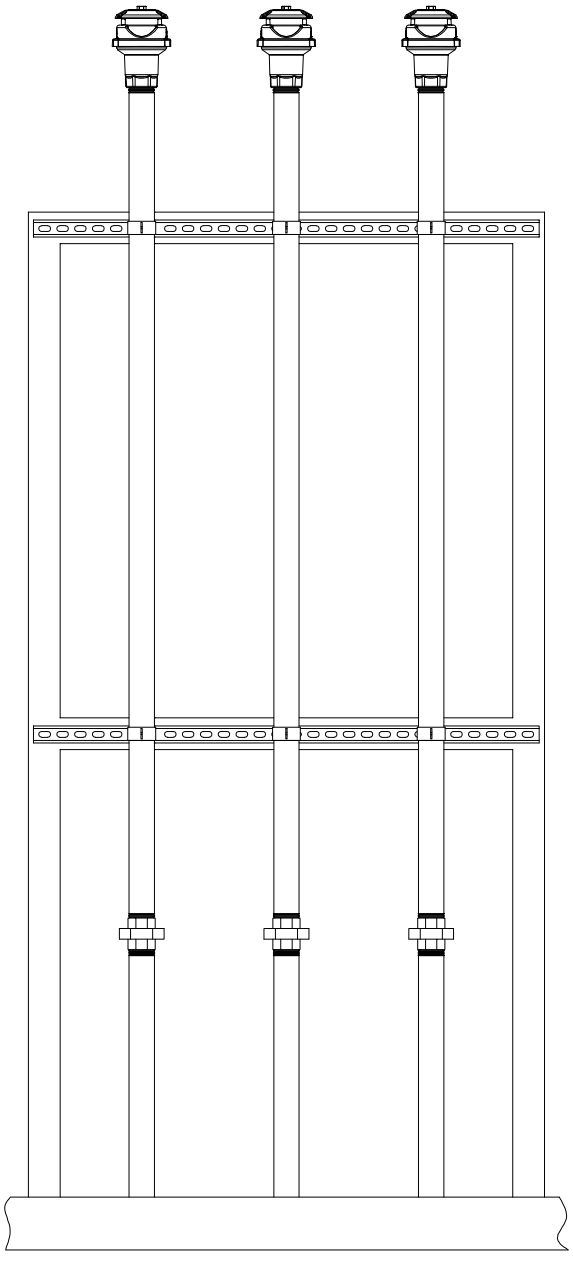
1. Apply a ¾" wrench or socket in the top of the P/V vent, and then unthread the P/V vent from the Defender Series® vent stack adapter.
2. Inspect the outside of the P/V vent. This includes the O-ring and screen (available in the Maintenance Kit, part number 804110901). Clean or replace as necessary.
3. Remove the inlet disc screen from the adapter and inspect for debris. Clean or replace as necessary.
4. Reinstall the inlet disc screen and P/V vent according to previous instructions.

## In-line installation

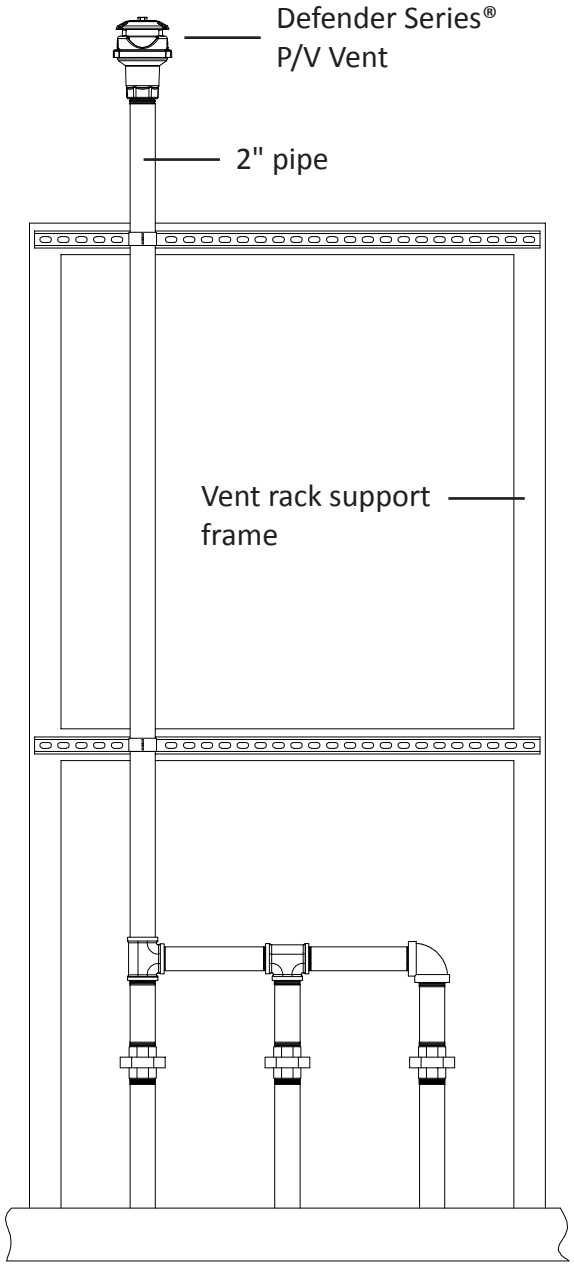
1. Use a T-40 tamper-resistant Torx® tool to remove the eight 5/16"- 18 Torx® tamper-resistant bolts from the cover. Allow the cover to rotate and hang from the lower pin. Do not remove the pin.
2. Use a ¾" wrench or socket in the top of the P/V vent, and unthread the P/V vent from the Defender Series® vent stack adapter.
3. Inspect the outside of the P/V vent, including the O-ring (available in the Maintenance Kit, part number 804110901). Clean or replace as necessary.
4. Remove the inlet disc screen from the adapter and inspect for debris. Clean or replace as necessary.
5. Reinstall the inlet disc screen with the stem oriented upwards.
6. Make sure the O-ring is properly lubricated with synthetic O-ring grease, and thread the P/V vent into the in-line vault until it bottoms out (120 in-lbs maximum torque).
7. Make sure the O-ring is fully seated in the channel on the face of the in-line vault flange.
8. Close the cover, reinstall the eight tamper-resistant bolts, and torque to 120–144 in-lbs.
9. From ground level, visually inspect the rain cap for signs of bird nests or insect activity.

# Drawings

## End-of-line

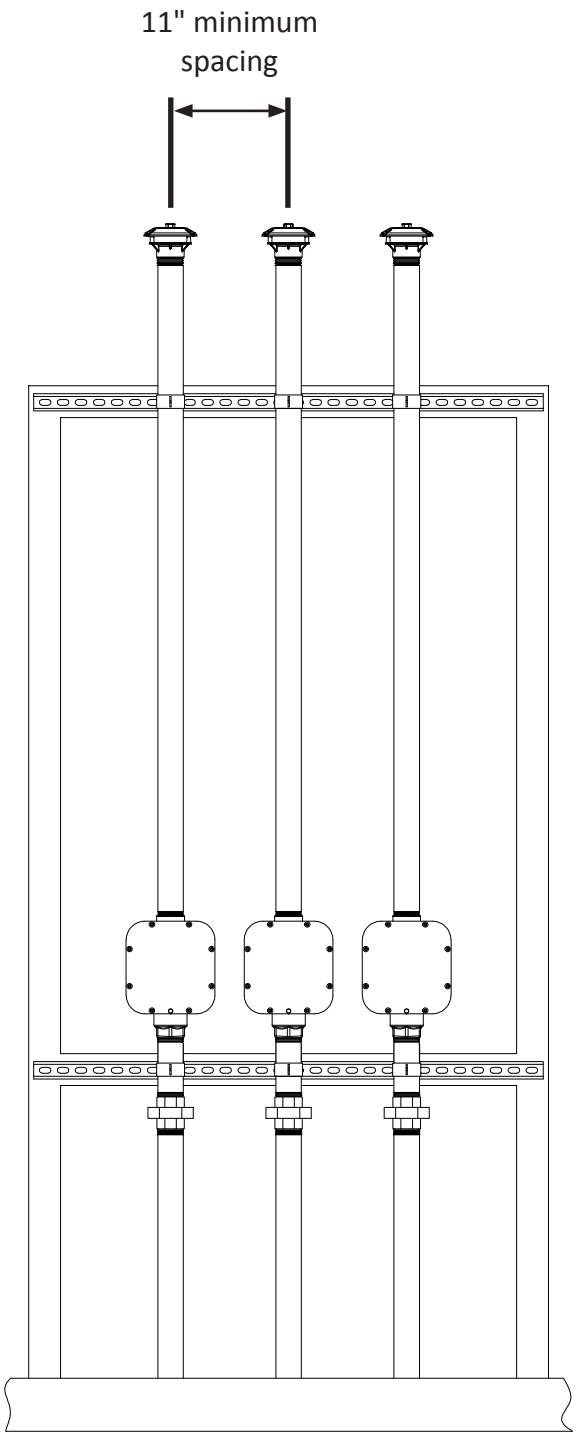


**Individual P/V Vent lines**

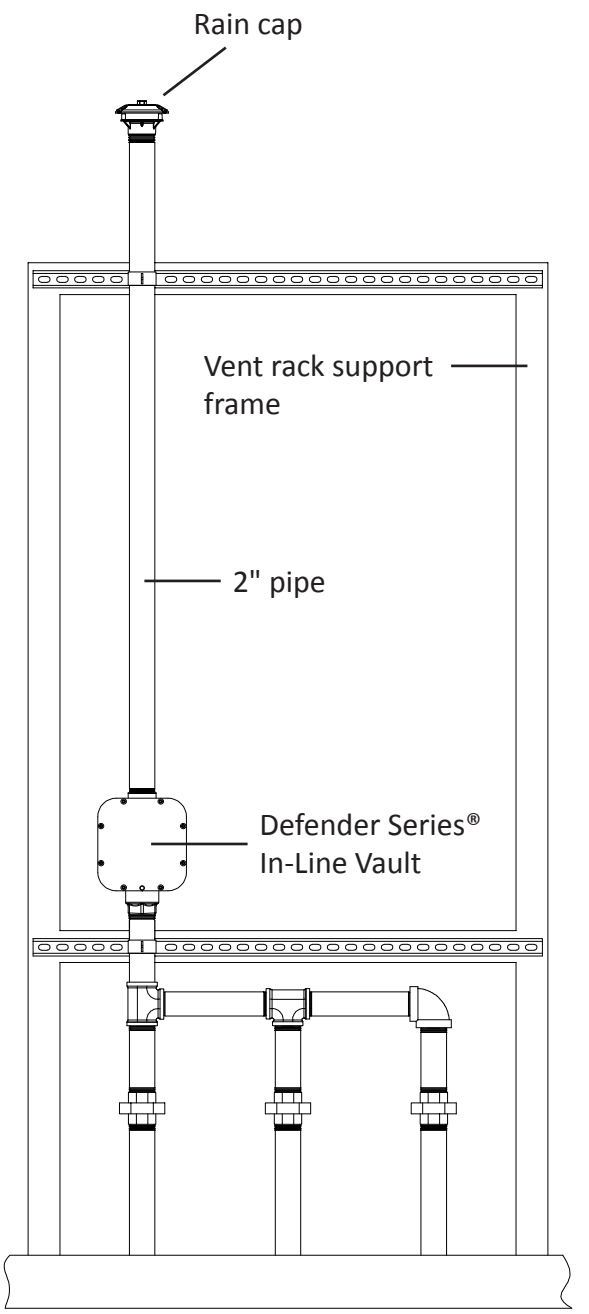



**Manifolded P/V Vent lines**

## In-line

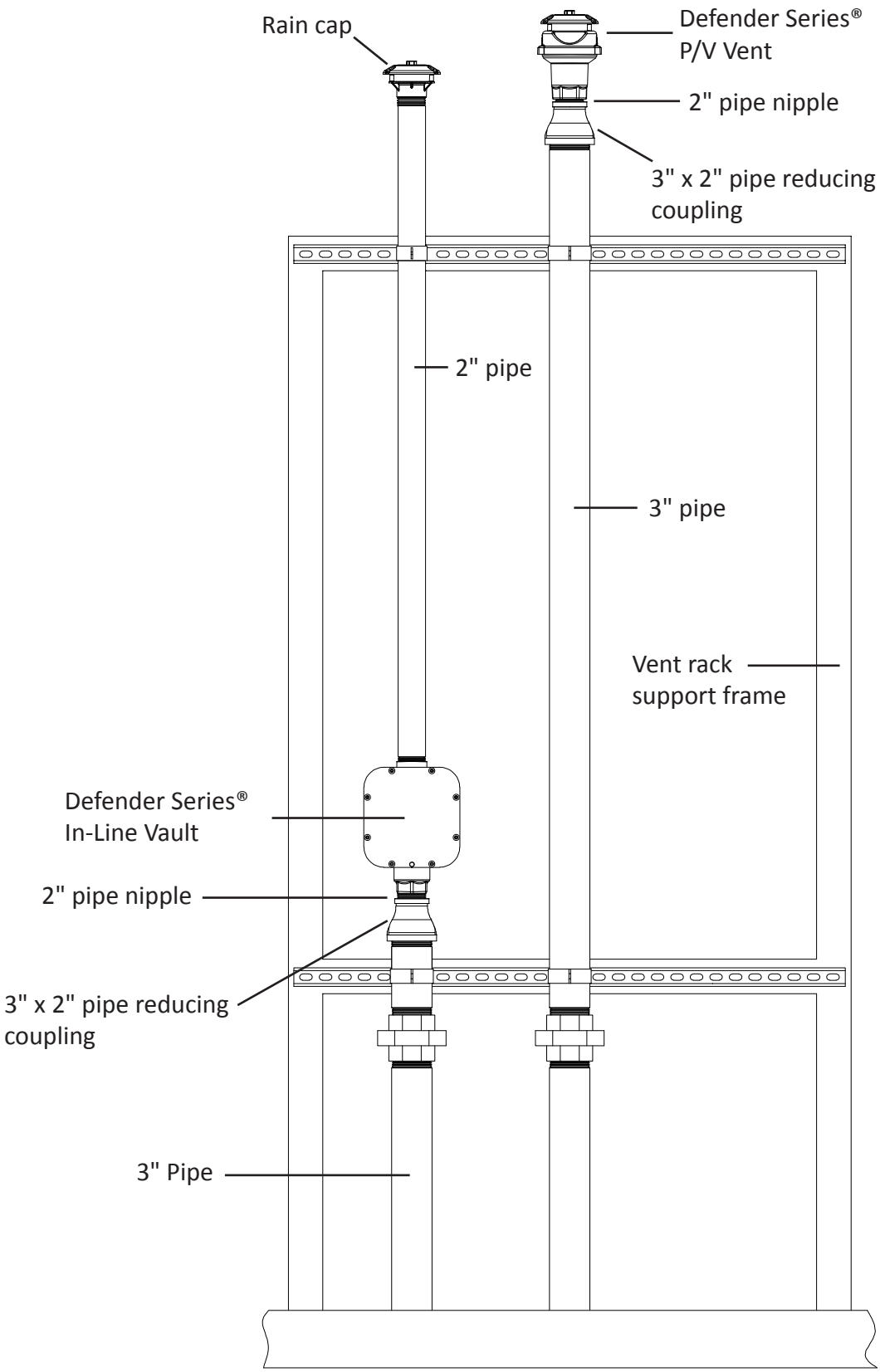



**Individual P/V Vent lines**




**Manifolded P/V Vent lines**

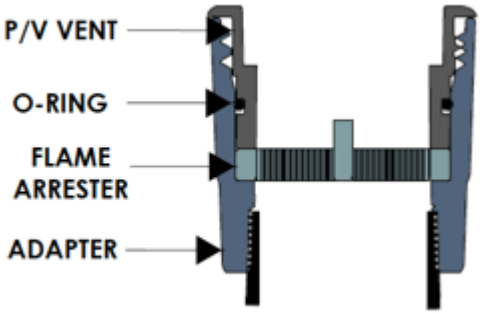
# 3" P/V vent lines

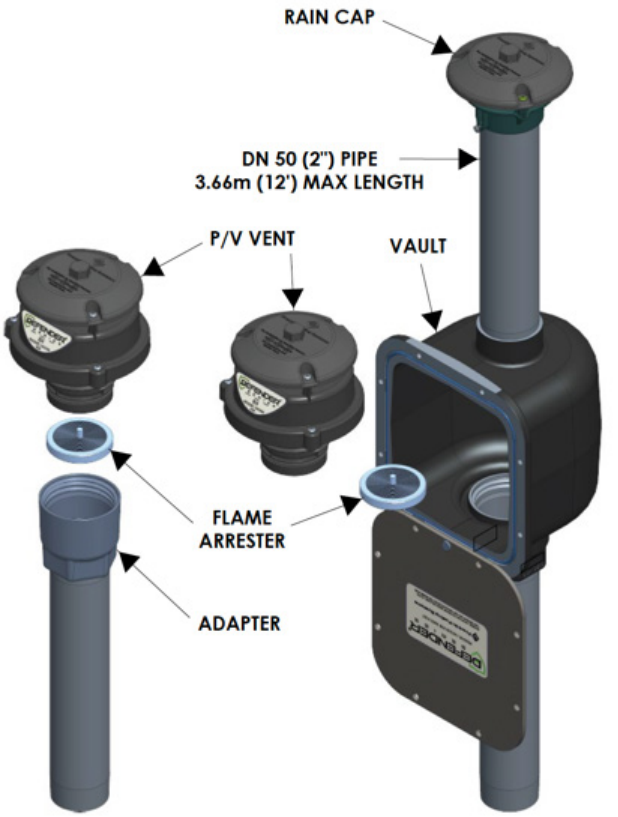


# INSTALLING THE DEFENDER SERIES® P/V VENT FLAME ARRESTER

## PROCEDURE

1. Insert the flame arrester into the adapter/vault.
2. Thread the P/V vent into the adapter/vault until it fully bottoms out against the flame arrester.
3. Torque the vent to 10.8-13.6 N-m (96-120 in-lbs).




**NOTE**: The flame arrester element is ATEX approved when it is installed with the ATEX marked Defender Series® P/V Vent.

**NOTE**: Do not use the mesh screen disc if you are installing the flame arrester.

**NOTE**: Every year, visually inspect the flame arrester element for contamination, damage, and corrosion. Clean or replace as necessary. Use only original FFS parts. Substituting non-Franklin Fueling Systems (FFS) parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

## ATEX MARK

CE Ex G IIA
0637 EN ISO 16852
IBExU20ATEX2082 X

Intentionally Blank


DEFENDER SERIES

A Franklin Fueling Systems Brand

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