

Potter AquaN₂ Kit

Installation, Operation, & Service Manual



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1. Safety

Safety Guidelines

This manual contains safety information that is important to know and understand. This information is provided for the safety of installers, operators, and users of the Potter AquaN₂ Kit as well as equipment. To help recognize this information, observe the following symbols.

 **DANGER**

Danger indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

 **WARNING**

Warning indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

 **CAUTION**

Caution indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.

NOTICE

Notice indicates important information, that if not followed may cause damage to equipment or property.

Important Notice to Users

The Installation and Owner's Manual supplied with each unit must be read thoroughly and completely understood before installation and operation of the Potter AquaN₂ Kit. All appropriate safety standards for handling of gases as determined by local or national laws and regulations should be followed at all times.

Unpacking

After unpacking unit, carefully inspect all parts and equipment for any damage that may have occurred during transit. Make sure to tighten fittings, bolts, etc. before putting unit into service.

 **WARNING**

Do not operate if damage occurred during shipping, handling, or use. Contact Potter immediately.

General Safety Information

Important: Read all of the safety information in this manual before operating this equipment. Use of the equipment in a manner not specified within this manual may impair the protection provided by the generator and could result in an unplanned release of pressure, which may cause serious injury or damage. Only competent personnel, who have been trained, qualified, and approved by Potter Electric Signal Company, LLC should perform commissioning, servicing, and repair procedures.

When handling, installing, or operating this equipment, personnel must employ safe engineering practices and observe all related local regulations, health and safety procedures, and legal requirements for safety.

Ensure that the equipment is depressurized and electrically isolated before carrying out any of the scheduled maintenance instructions specified in this manual.

The warnings in this manual cover the most known potential hazards, but by definition cannot be all-inclusive. If the user employs an operating procedure, item of equipment, or a method of working that is not specifically recommended by Potter Electric Signal Company, the user must ensure that the equipment will not be damaged or become hazardous to persons or property.

2. System Overview

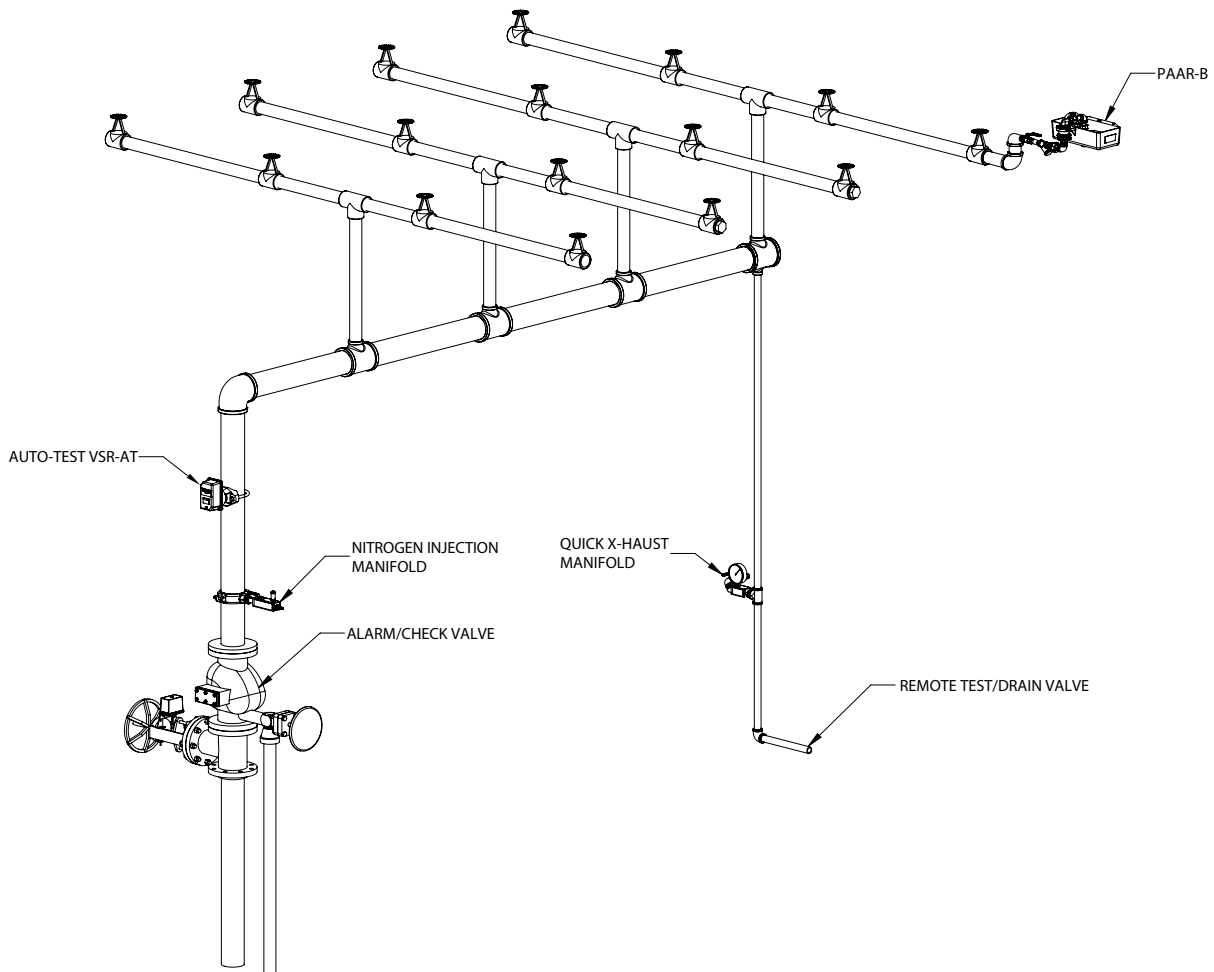
The Potter AquaN₂ Kit is designed to quickly and effectively exhaust oxygenated air from a wet fire protection system and replace it with high purity nitrogen gas. Reducing the oxygen levels in wet fire protection systems is essential in protecting the system from the effects of oxygen related corrosion often found at the air water interface in the fire sprinkler piping.

Using the AquaN₂ Kit, which includes the Nitrogen Injection Manifold (NIM) and the Quick X-Haust Manifold (QXM), in combination with a Potter Automatic Air Release (PAAR-B) or Potter Air Vent (PAV) and a nitrogen source, can easily remove up to 99.9% of oxygen from a wet system. Also, by removing as much air as possible, the fire sprinkler system will have increased performance, eliminating delayed activation or cyclic activation of vane type waterflow detectors. An outline of a typical sprinkler system with AquaN₂ Kit installed can be seen in Fig. 1.

⚠ WARNING

Not for use with plastic systems.

Figure 1: Typical AquaN₂ System Diagram



3. Before Going To The Jobsite

1. Read and understand the instructions provided before you proceed with installation. The AquaN₂ Kit and PAV/PAAR-B shall be installed in accordance with local ordinances and the applicable NFPA 13, NFPA 13D, or NFPA 13R standard.
2. Installation instructions for the PAV or PAAR-B can be found in bulletin #5401165 or bulletin #5401164 respectively.
3. The Engineer of Record should select the location of the Nitrogen Injection Manifold (NIM) and the Quick X-Haust Manifold (QXM).
4. The recommended location of the NIM is at the sprinkler riser above the alarm/check valve. See Fig. 2.
5. The recommended location of the QXM is at a connection off the remote test/drain valve at the end of the system. The QXM should be reasonably accessible by a fire sprinkler contractor for periodic operation. See Fig. 3.

WARNING

High Purity Nitrogen Gas (99.9%) will be exhausted out of the QXM. The location needs to be in a highly ventilated area to prevent asphyxiation.

Figure 2: Recommended NIM Location

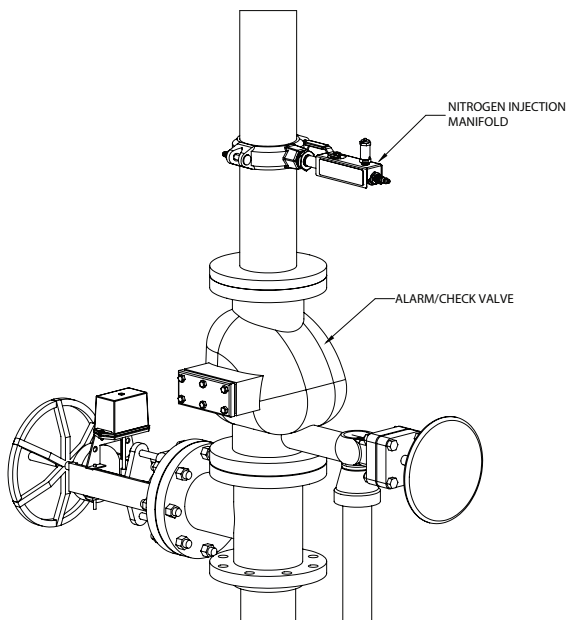
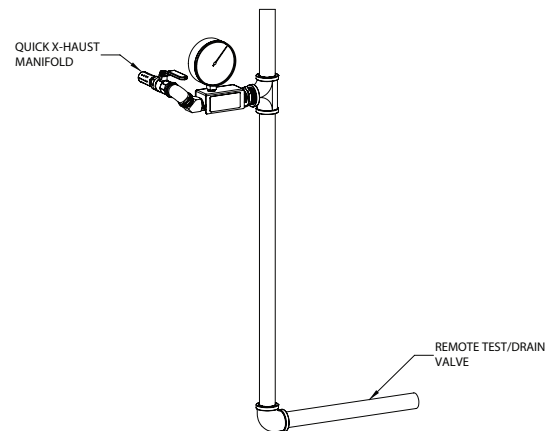


Figure 3: Recommended QXM Location



Manual: AquaN₂ Kit

Required Components

AquaN₂ Kit: (1) Kit required per riser

Nitrogen Injection Manifold



Quick X-Haust Manifold



MFG# 1119500

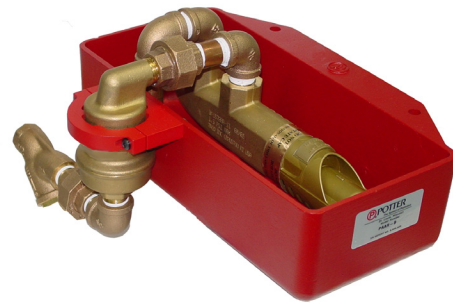
(1) Air Vent required per riser

PAV - Potter Air Vent



MFG# 1119720

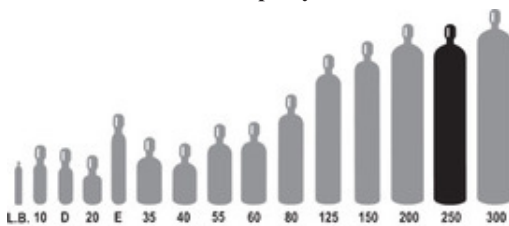
PAAR-B - Potter Automatic Air Release with secondary shut off valve



MFG# 1030001

OR

N₂ Cylinder with female CGA-580 connection to be purchased from third party.



- Industrial Grade Nitrogen
- Size 250 High Pressure Industrial Cylinder
- DOT Specification: 3AA-2265 - Canada 3AA-M174
- Water Volume: 2624 Cubic Inches - 43 ltrs
- Airco/BOC = S
- Praxair = K
- Air Products = B
- AirGas = 250

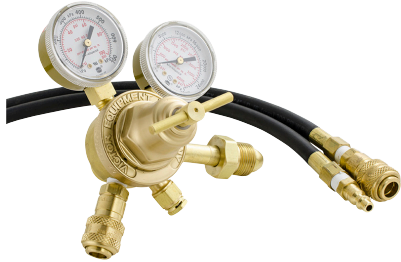
NOTE: One 250 high pressure industrial cylinder can inert 250 gallons of sprinkler capacity.

CAUTION

- Always use in accordance with the Material Safety Data Sheet (MSDS)
- Cylinder must be stored and used in an upright, secured position in a well-ventilated or monitored area.
- Always follow local fire code requirements when storing gas cylinders.

Optional Components

Nitrogen Cylinder Pressure Regulator with Hose - Brass 0-80 PSI Nitrogen Pressure Regulator, 10 FT rubber hose with quick connect.



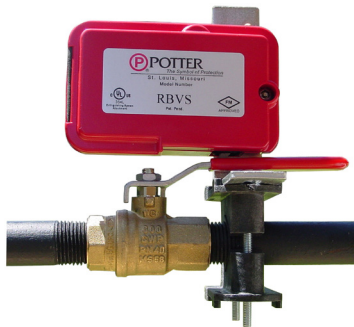
MFG# 1119501

Potter Nitrogen Analyzer - Purity Measuring Nitrogen Analyzer



MFG# 1119504

Retrofit Ball Valve Switch with Cover Tamper - To monitor Quick X-Haust Manifold N/O Dry Contacts, Cover Tamper.



MFG# 1000035

Auto-Test VSR (VSR-AT)
Automatic Test Flow Switch

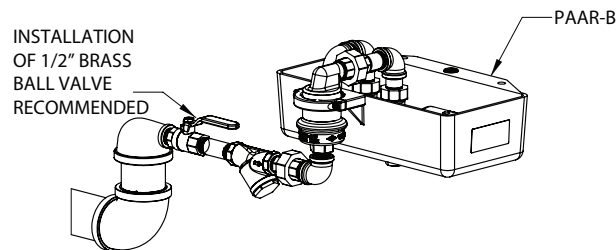


Ordering Information For VSR-AT			
Nominal Pipe Size		Model	Part #
2"	DN50	VSR-AT-2	1116102
2 1/2"	DN65	VSR-AT-2 1/2	1116125
3"	DN80	VSR-AT-3	1116103
3 1/2"	-	VSR-AT-3 1/2	1116135
4"	DN100	VSR-AT-4	1116104
5"	-	VSR-AT-5	1116105
6"	DN150	VSR-AT-6	1116106
8"	DN200	VSR-AT-8	1116108

4. Installation of AquaN₂ Kit

1. Before installing the Nitrogen Injection Manifold (NIM), Quick X-Haust Manifold (QXM) and Air Vent (PAV or PAAR-B), completely drain the fire sprinkler system.
2. Install the PAV or PAAR-B at a point most remote from the riser. It shall be installed on the top of the sprinkler piping connection - horizontal and level. See Fig. 4.

Figure 4: PAV/PAAR-B Installation



3. If a ball valve is used to isolate the Air Vent from the sprinkler system ensure that it is open.
4. For full installation guidelines use PAV bulletin #5401165 or PAAR-B bulletin #5401164.
5. Install the NIM at the sprinkler riser above the alarm/check valve by attaching the 1" male NPT bushing nipple to a 1" female NPT connection. See Fig. 2 on Page 6.
6. Close the ball valve on the NIM.
7. Install the QXM at the remote test/drain valve at the end of the sprinkler system. If there is no remote remote test/drain valve, either install the QXM off the end of the main, or drop 1" steel piping off the main to a location that is easily accessible by the contractor. See Fig. 3 on Page 6.
8. Drain any water from remote test/drain valve or added drop to ensure that the water escapes during nitrogen fill.

WARNING

This location shall be in a well ventilated area. Exhaust gas is high purity nitrogen.

NOTE: The QXM can be piped outside with removal of 1/2" muffler.

9. Close the ball valve on the QXM. The pressure gauge should read zero.
10. After installing the Air Vent, NIM, and QXM, the system is ready for purging.

5. Nitrogen Filling Procedure

1. Go to the system riser where the NIM is located.
2. Attach the Nitrogen Cylinder Pressure Regulator to the nitrogen cylinder.
3. Open nitrogen cylinder fully.
4. Adjust the Nitrogen Cylinder Pressure Regulator to 40 PSI.
5. Using the supplied hose with quick connects, connect the nitrogen cylinder to the NIM.
6. Open the ball valve on the NIM. Nitrogen gas should be entering the fire sprinkler system.
7. After ensuring that nitrogen gas is entering the system walk to the QXM that is installed at the remote test/drain valve.

NOTE: In systems that are larger than 250 gallons the nitrogen cylinder can become depleted of nitrogen gas. It may be necessary to change the nitrogen cylinder.

8. Check the pressure gauge on the QXM. The pressure in the system should be rising. This may take a few minutes to see any change in the pressure.
9. Once the pressure gauge has reached 40 PSI, open the ball valve on the QXM. It can take anywhere from 15 minutes for a small 250 gallon system to reach 40 PSI, or up to several hours for large multiple thousand gallon systems.
10. You will hear nitrogen gas escaping through the muffler on the QXM. Also, if the system is not fully drained, water may escape from the manifold.

WARNING

High purity nitrogen is being exhausted. Ensure that you are in a ventilated area where the gas can escape. If you are in a small enclosed room, turn the ball valve off and re-pipe the system for proper ventilation.

11. When the pressure gauge drops below 5 PSI, close the ball valve on the QXM.
12. Allow pressure to reach 40 PSI in the fire sprinkler system again.
13. Once the pressure reaches 40 PSI, open the QXM.
14. Sample the exhaust gas leaving the QXM muffler with the Potter Nitrogen Analyzer. The nitrogen level should be 98% concentration or greater.
15. Once the pressure gauge drops below 5 PSI, close the ball valve on the QXM.

CAUTION

Not closing the ball valve will lead to water escaping the QXM when the system is filled with water.

16. Return to the system riser and close the NIM ball valve.

17. Fully close and disconnect the nitrogen cylinder.
18. The system is now full of high purity nitrogen.
19. Return the system to operation by filling with water.
20. The Air Vent will automatically exhaust the majority of gas in the system to minimize trapped gas. Any residual trapped gas pockets are now high purity nitrogen.
21. Attach AquaN₂ blue arrow label to the wet sprinkler riser. Write company contact information on space provided.
22. The system is now protected.

6. Draining and Testing of an Inerted Wet System

Normal testing of the fire sprinkler system (ex. quarterly flow tests) can be performed on the fire sprinkler system without the need to drain and refill the system with nitrogen, though addition of oxygenated water can increase corrosion rates. Using the Auto-Test VSR-AT flowswitch improves the corrosion control of a wet fire sprinkler system by eliminating the need to flow water into the sprinkler system.

When doing service work where the system becomes completely drained, applying nitrogen while draining can be used to prevent oxygen from re-entering in the sprinkler system. Follow the procedure below to prevent oxygen from entering the system.

1. To drain the system, attach a nitrogen cylinder to the NIM.
2. Fully open nitrogen cylinder.
3. Adjust the pressure to 40 PSI on the Nitrogen Cylinder Pressure Regulator.
4. Open the ball valve on the NIM.
5. Drain the system of water through the main drain.
6. Once all the water has been drained, close the NIM and nitrogen cylinder and disconnect the nitrogen cylinder.
7. The system retains 98% + nitrogen. When putting the system back into operation, perform the normal water filling procedure.

NOTE: If pipe is replaced, or heads are moved it is recommended to refill the system with nitrogen. Follow the Nitrogen Filling Procedure on Page 10.

7. Technical Specifications

Maximum Nitrogen Fill Pressure: Up to 40 PSIG

Operating Temperature Range: 40°F - 120°F

Figure 5: Nitrogen Injection Manifold Dimensions

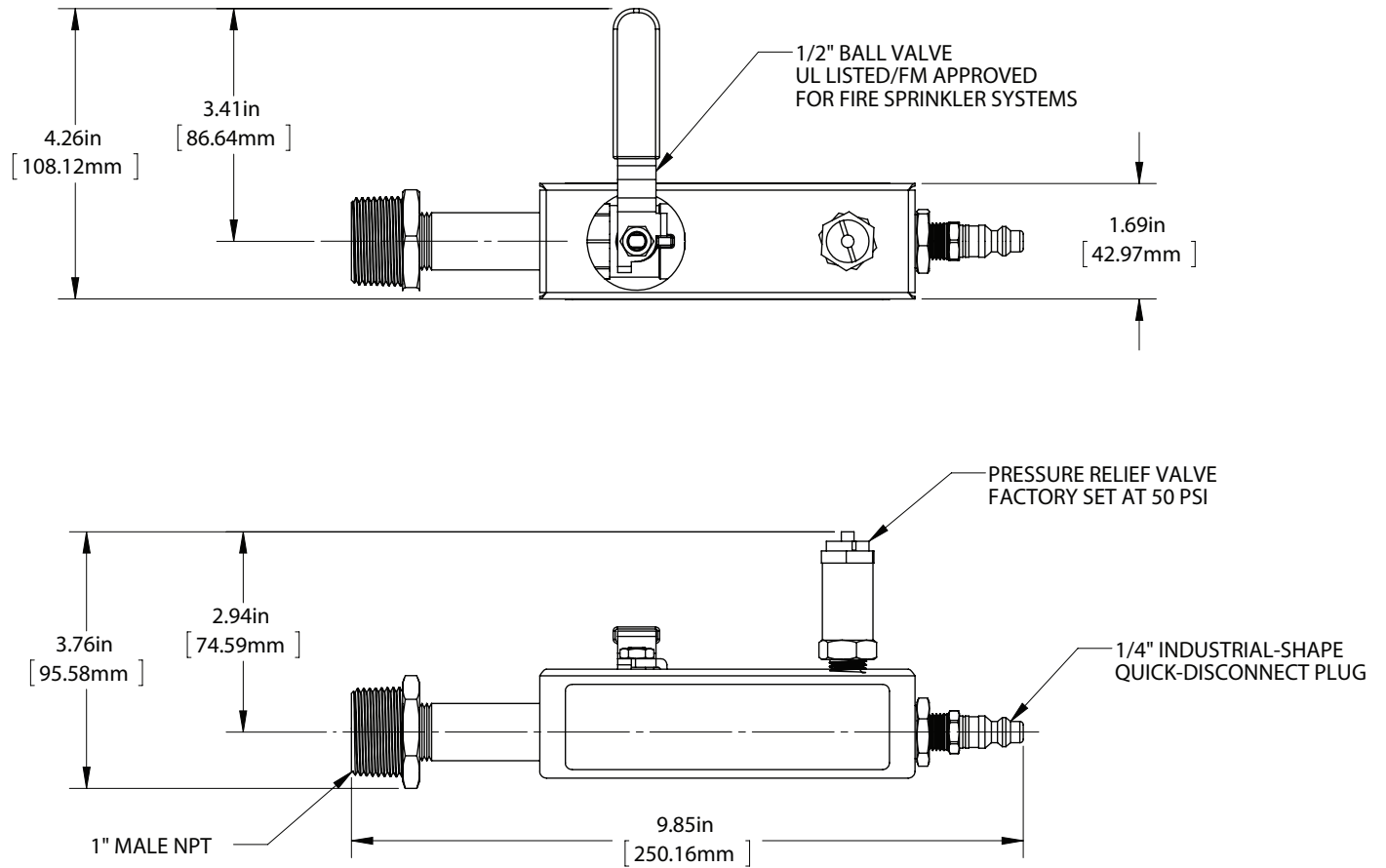
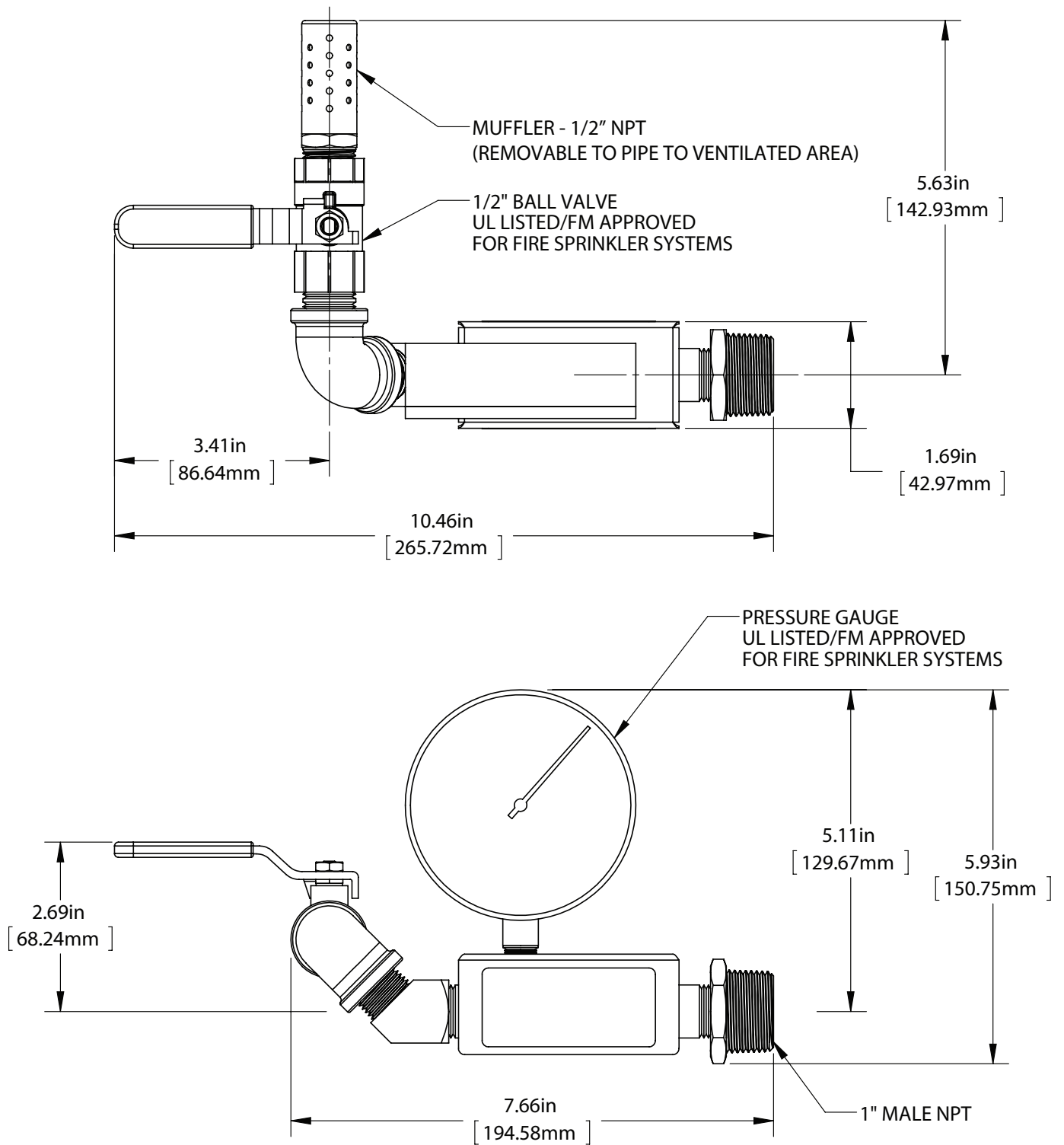


Figure 6: Quick X-Haust Manifold Dimensions



8. Warranty

GENERAL PROVISIONS & LIMITATIONS

Potter Electric Signal Company, LLC (the “Company”) warrants to each original purchaser (“Purchaser”) of its new products from the Company or its Authorized Distributor that such products are, at the time of delivery to the Purchaser, made with good materials and workmanship. No warranty is made with respect to:

1. Any product, which has been repaired or altered in such a way, in the Companies judgment, as to affect the product adversely.
2. Any product, which has, in the Companies judgment been subjected to negligence, accident, improper storage, improper installation or application.
3. Any product, which has not been operated or maintained in accordance with the recommendations of the Company.
4. Components or accessories manufactured, warranted and serviced by others.
5. Any reconditioned or prior owned product.

Claims for items described in 4 above should be submitted directly to the manufacturer.

WARRANTY PERIOD

The Company’s obligation under this Warranty is limited to repair or, at its option, replacing during normal business hours at the designated facility of the Company, any part that in its judgment proved not to be as warranted within the applicable Warranty Period as follows.

COMPONENTS

All non-consumable components are warranted for 12 months from the date of purchase. Consumable are not covered under warranty. The unit must have been installed by either a factory authorized distributor or agent in accordance with the factory recommendations taking into account all other local site conditions not originally noted to the factory. The unit must be operated and maintained in accordance with the Factory recommendations and original design conditions. Failure to provide such proof of the above may void warranty.

LABOR TRANSPORTATION & INSPECTION

The Company will repair or replace any product or part thereof which in the Companies judgment is proved to be not as warranted. Labor costs are not covered under warranty.

All costs of transportation of product, labor or parts claimed not to be as warranted and, of repaired or replaced parts to or from factory shall be borne by purchaser. The Company may require the return of any part claimed not to be as warranted to one of its facilities as designated by the Company, transportation prepaid by Purchaser, to establish a claim under this warranty.

Replacement parts provided under the terms of the warranty are warranted for the remainder of the Warranty Period of the product upon which installed to the same extent as if such parts were original components.

DISCLAIMER

THE FOREGOING WARRANTY IS EXCLUSIVE AND IT IS EXPRESSLY AGREED THAT, EXCEPT AS TO TITLE, THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OR MERCHANTABILITY.

THE REMEDY PROVIDED UNDER THIS WARRANTY SHALL BE THE SOLE, EXCLUSIVE AND ONLY REMEDY AVAILABLE TO THE PURCHASER AND IN NO CASE SHALL THE COMPANY BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES. UNDER NO CIRCUMSTANCES SHALL THE COMPANY BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EXPENSES, LOSSES OR DELAYS HOWSOEVER CAUSED.

No statement, representation, agreement, or understanding, oral or written, made by any agent, distributor, representative or employee of the Company which is not contained in this Warranty will be binding upon the company unless made in writing and executed by an officer of the Company.

This warranty shall not be effective as to any claim which is not presented within 30 days after the date upon which the product is claimed not to have been as warranted. Any action for breach of this warranty must be commenced within one year after the date upon which the cause of action occurred.

Any adjustment made pursuant to this warranty shall not be construed as an admission by the Company that any product was not as warranted.

PROMPT DISPOSITION

The Company will make a good faith effort for prompt correction or other adjustment with respect to any product, which proves to be defective within the warranty period. Before returning any product, write or call the distributor, agent or authorized company from which the product was purchased, describing defect and giving date and number of original invoice, as well as proof of Factory supplied consumable and proof of scheduled maintenance. Title and risk of loss pass to buyer upon delivery to the common carrier.

PRODUCT SUITABILITY

Many States, Localities and Countries have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Potter attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.