

AirMax™

Operation and Installation Guide

An Intake Relief Valve with Performance and Precision



The NFPA #1901 requirement for a suction side intake relief valve can be met with either a preset relief valve or remote actuated adjustable relief valve. Today's fire pump operator needs Precise Control of both intake and discharge pressures to properly protect firefighters, conserve precious water, avoid relieving excess water to the ground – especially in freezing environments, and protecting the fire apparatus plumbing system.

The unique features of AirMax provide for both high relief water flow and quick and precise adjustment by the pump operator. Since it is air operated using regulated air pressure from chassis air brake system, AirMax is highly reliable with little maintenance required.

Competitive remote controlled relief valves use water pressure to operate. This requires small water filled control lines, debris strainers, needle valves, etc. which are subject to maintenance, freezing, and a more labor intensive installation.

Preset relief valves depend on a mechanical spring that produces an increasing force as it opens resulting in minimal relief water flow and hence less pressure control throughout the operating range.

Preset intake relief valves are usually hidden in a pump enclosure and inaccessible for easy adjustment.

The AirMax gives the pump operator Precise Control of intake pressures using a regulator and pressure gauge which can be located on the pump panel.

In addition, the AirMax can be quickly set at relief pressure settings from 50 to 300 PSI.

Trident's AirMax is the safest, most versatile and most economical intake relief valve device available to meet and exceed NFPA standards!



World Class

Fire Apparatus Plumbing and Hardware Products

Contents

AirMax™ Benefits..... 2

AirMax™ Features..... 2

AirMax™ - How It Works..... 3

AirMax™ Installation Procedure..... 4

AirMax™ Installation Procedure..... 5

Operations, Testing and Training..... 6

Trouble Shooting Guide..... 7

Repair/Replacement Parts 8



AirMax Intake Relief Valves can be used for both New and Retrofit installations.

AirMax™ Benefits

- Control can be located on Pump panel to easily vary intake pressures.
- Pressure gauge on panel control allows pump operator to instantly know the relief pressure setting.
- Operator can limit wasteful dumping of water resources to the ground.
- Operator can control or eliminate water dumped to ground in freezing conditions.
- NO water controlled pilot lines which can freeze or break or clog.
- NO needle valve or water debris strainer.
- Lowest cost remote controlled intake relief valve in industry.
- Control air supply can be from the same air tank, PPV, and piping being utilized for an AirPrime™ Priming System.
- Quick installation (Under 30 minutes labor time) using air brake hose and fittings.
- Retrofit existing apparatus that do not have intake relief valves or replace the old style non-adjustable types.
- Can be used with either pressure governors or discharge side relief valves.

AirMax™ Features

- Air operated remote location regulator for adjustable water discharge pressure range from 50 to 300 PSI (3 to 20 Bar) and relief water flows up to 750 GPM (2800LPM) using air supply from chassis air brake system.
- The only intake relief valve available with an integral set-pressure indicating pressure gauge. NOW, the pump operator can instantly see and adjust the relief valve dump pressure setting as desired.
- All bronze and stainless steel corrosion resistant construction. Air regulator control, pump panel label, air fittings, regulator nut and gauge supplied as standard.
- Exceeds all applicable NFPA standards.
- 5 Year Warranty.
- Self-draining, excellent for locations with freezing temperatures.
- Available with 4-bolt mounting flange and 2½" (65mm) Vic or 2½" NPT outlet.

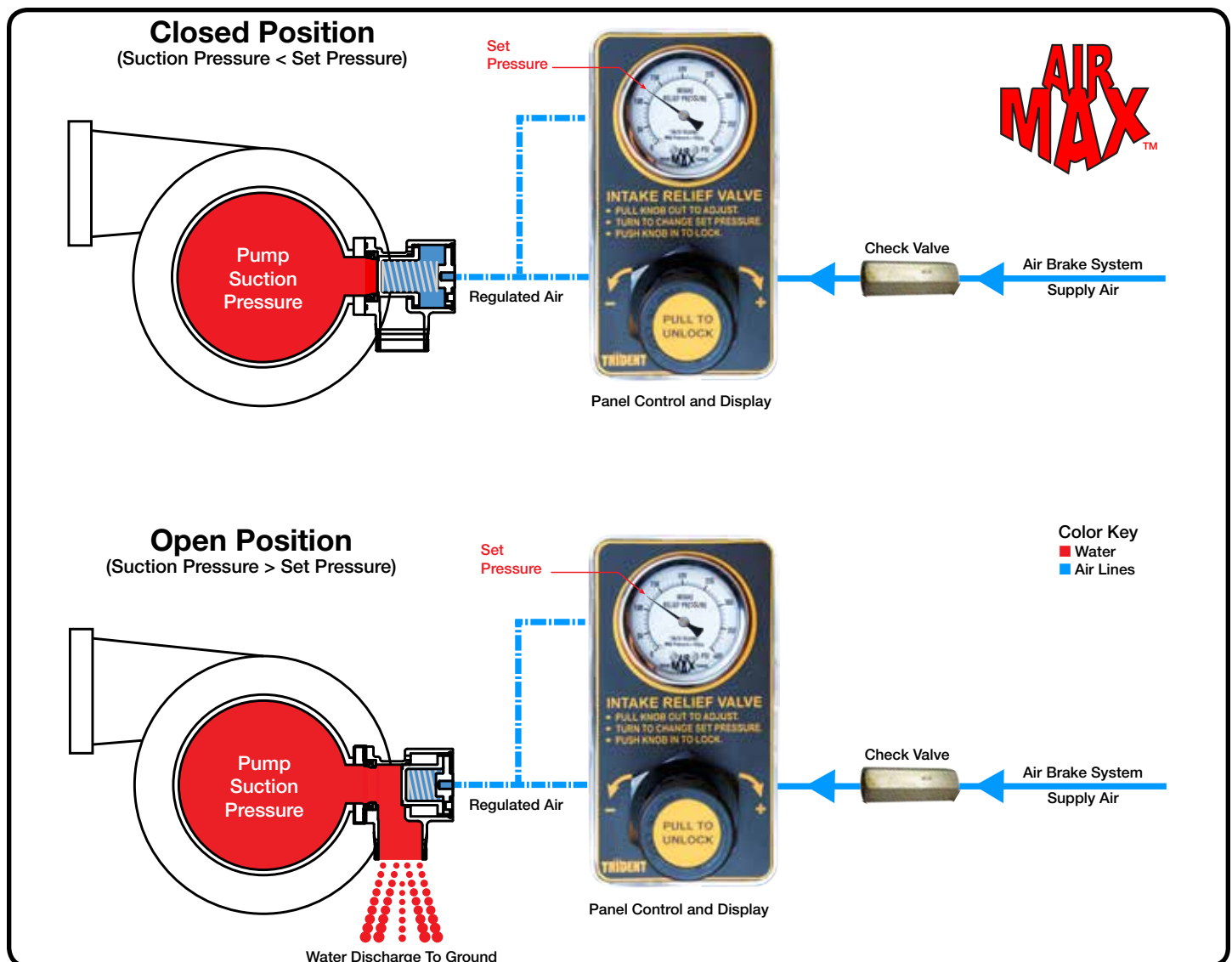
AirMax™ - How It Works

The Diagrams shown in Figure 1 below depict the AirMax Relief Valve (RV) in both the CLOSED and OPEN positions:

In the CLOSED position diagram; Air-brake pressure (as shown in solid blue) comes into the panel Regulator control after passing through the check valve shown. The regulator is adjustable but will maintain a constant pressure to the gauge and relief valve (as shown in the dotted blue lines). This pressure acts on the Relief Valve (RV) piston as shown in blue. The area of the RV piston is exactly 2.5 times the area of the seal seat. The suction or pump intake water pressure (as shown in red) acts on the seal seat. As long as the intake water pressure is less than 2.5 times the regulated air pressure the relief valve will remain closed. The panel gauge face actually READS 2.5 times the air pressure, so the gauge is telling you the precise intake water pressure setting where the RV will open and dump water to the ground.

In the OPEN position diagram; the intake water pressure has exceeded 2.5 times the regulated air pressure. The RV remains OPEN, dumping water to the ground, until either the intake water pressure is reduced or the regulated air pressure is adjusted higher.

A single AirMax control can be used with more than one (1) relief valve as shown in Figure 8 on Page 5 for Multi Location control.



AirMax™ Installation Procedure

1. Install the AirMax intake relief valve body to the fire pump suction or suction plumbing with the outlet aimed downward. The proper mounting pad for the AirMax is shown in **Figure 2**. This is the typical 4-bolt pattern and flange size found on Hale and Waterous pumps. The relief valve outlet is either 2½" Vic or 2½" MNPT which should have a pipe or hose connected to direct the water discharge to safe location away from the pump operator location. Some trucks are built with additional plumbing on the relief valve outlet to terminate with a hose connection at the side of the truck, allowing for connection of a hose to direct water even further from the apparatus. The relief valve body uses an O-Ring seal (Provided with the product) on the mounting flange.
2. Cut the panel with six holes as shown in **Figure 3**. This can be located at any height or location but is recommended to be near the engine throttle or governor. The pressure gauge should be easily visible from the panel mounting location selected. Next, mount the label plate (See **Figure 3a**) to the panel using the counter-sunk bolts and nuts provided. After tightening the 4 bolts, carefully attach the black adhesive label to the label plate.
3. Next attach the ¼" push-to-connect swivel elbow provided to the back of the pressure gauge as shown in **Figure 4** BEFORE mounting the gauge in the panel. This can be seen in **Figure 6** on the next page. Then install the gauge in the panel using the bracket and screws provided.
4. Attach the fittings provided to the back of the regulator before mounting the regulator in the panel placard. The ¼" NPT x ¼" NPT elbow must be installed into the regulator port marked with the embossed arrow Air IN as shown in yellow **Figure 6**. After that elbow is installed, the supplied check valve should be connected to the other side of it with attention given to the arrows located on the side of the check valve to ensure proper direction of flow. **Note:** Be SURE the direction of the stamped arrows (<<) on the check valve are pointing INTO the regulator. Next, make sure the regulator port opposite (on top) of the Air IN port is plugged as shown in **Figure 6**. Next, attach the ¼" push-to-connect swivel elbow provided to the port shown for connecting an air line to the pressure gauge. Finally insert a fitting of your choice (not provided) to the Air OUT port to connect a ¼" air-brake line over to the center hole on the relief valve cover. Now you can install the regulator into the panel placard from the back and attach the black panel hex nut to secure. Ensure that the round hole (circled in yellow) shown in **Figure 5a** located just behind the adjustment knob is pointing down. **Note:** You will have to pull the regulator knob off (Pull the knob shown in the left side of **Figure 5** straight out) before it will fit through the panel placard. Reattach the knob by pressing firmly and place the yellow (PULL TO UNLOCK) adhesive decal into the center of the regulator knob.
5. Attach the ¼" hose provided between the push-to-connect fittings on the gauge and regulator as shown in **Figure 6** on next page.

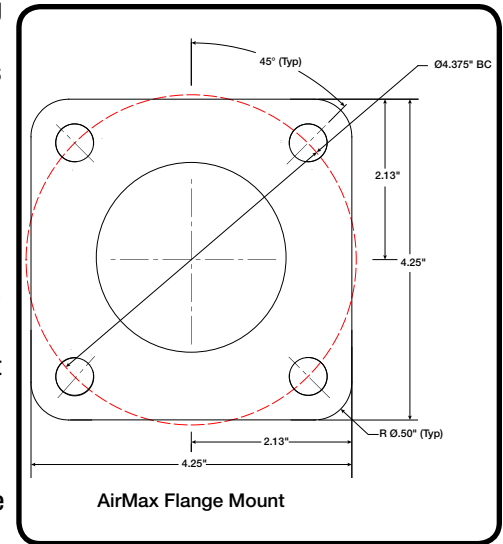


Figure 2

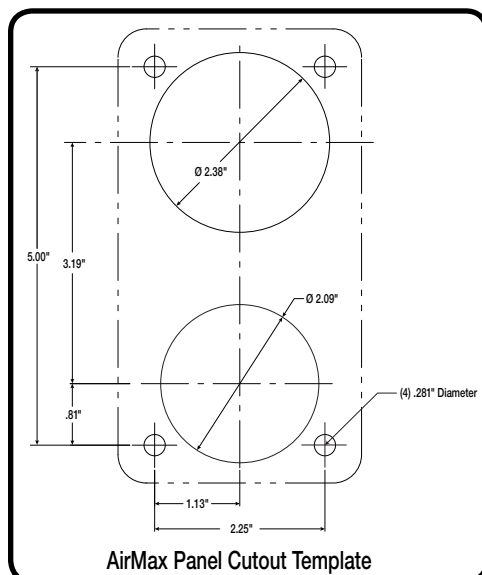


Figure 3



Figure 3a



Figure 4



Figure 5



Figure 5a

AirMax™ Installation Procedure

6. Connect a ¼" airline from the regulator Air OUT port to the center hole on the relief valve.
7. Connect another ¼" air line from a pressure protection valve (PPV) on one of the air-brake tanks to the Air-IN (Check valve) on the back of the regulator as shown in Figure 6. The schematic for a typical air-brake system is shown in Figure 7. If you do not have any other air accessories on the truck and need to purchase a pressure protection valve, you can order one through Trident as Part # 30.053.0. See item 4 in Figure 7 for correct positioning of the PPV.

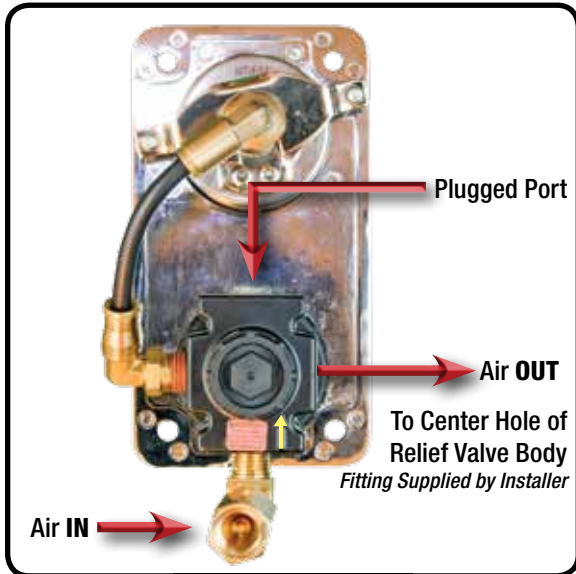


Figure 6

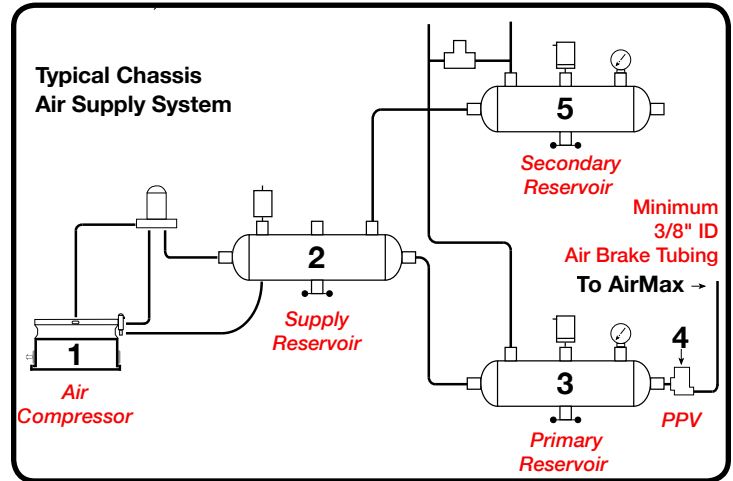


Figure 7

8. Multiple Location AirMax relief valves can be utilized using a single panel control for many relief valves in various locations on the truck. These are mounted as described in Step 1 on the previous page and have the control lines daisy-chained as shown in Figure 8 below.

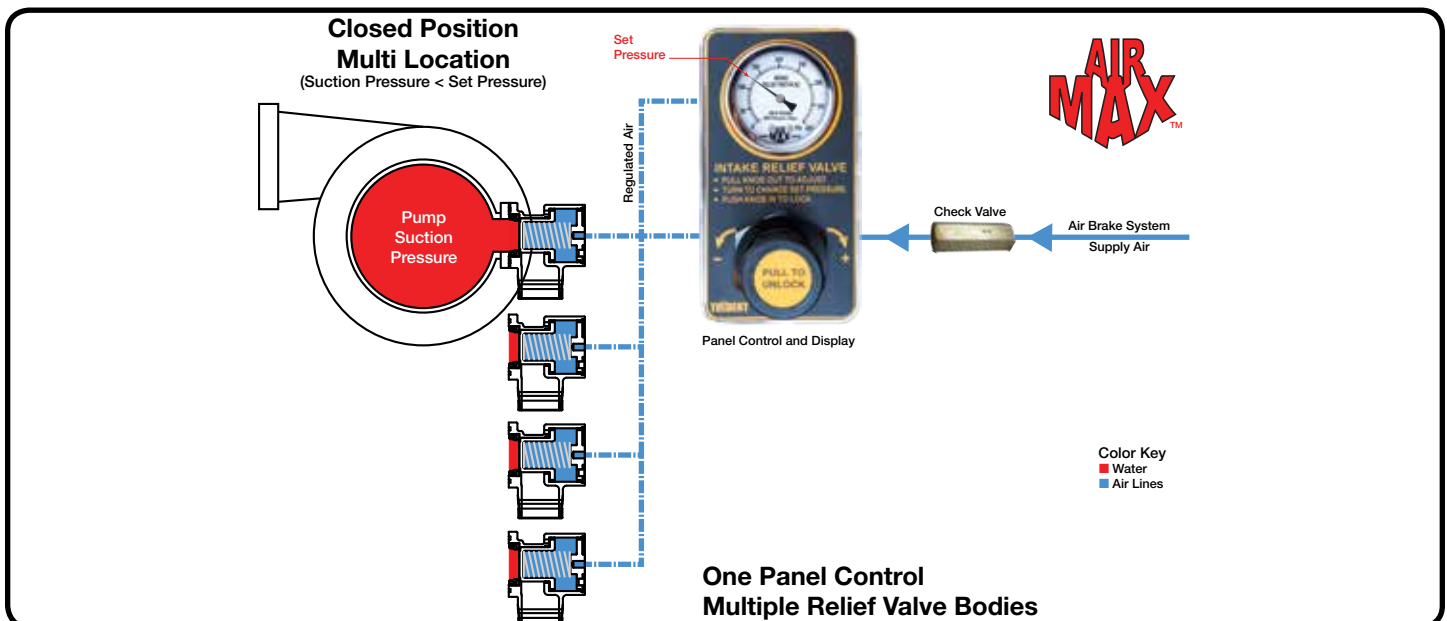


Figure 8

Operations, Testing and Training

Normal Operating Instructions

1. During initial fire pump training exercises, determine the best pressure relief “setting” for the AirMax intake relief valve. This could be determined by the highest static pressure on your fire hydrant system, your LDH hose maximum operating pressure rating or slightly above the normal intake pressures encountered in pump relay operations.
2. Normally this would be in the 125 PSI to 175 PSI range.

Setting Relief Valve for Normal Operations

To adjust the opening pressure of the intake relief valve, Pull Out the control knob to unlock. See Figure 1 on Page 3.

Turn the knob counter-clockwise (Towards left) to Lower the pressure rating of the relief valve setting to Below your desired Set Pressure on the pressure gauge Figure 1.

Turn the control knob clockwise (Towards right) until the gauge points to the desired Set Pressure.

Finally, depress the control knob to lock in the desired Pressure Setting.

Freezing temperature operations: Due to the normal hazards of freezing water around a fire apparatus; it is highly recommended that a hose be attached to the discharge piping of the intake pressure relief valve and piped away from the apparatus. This hose should be secured to a fixed object to prevent injury to personnel.

Off road or dirt/gravel road operations: If the relief valve discharge is NOT piped to the side of the apparatus, the high pressure water flow and discharge pressure could erode the ground under the apparatus during relief valve operations. If the increased intake water pressure does not pose any safety concerns the AirMax set pressure can be INCREASED until no water is being discharged to ground to avoid any chance of freezing water around the fire apparatus.

Changing elevation operations: Many municipalities have water supplies located at the highest elevation. These are generally designed for good pressure at the top of the hill, but may have excessive pressure at the bottom of the hill. The AirMax can be adjusted to utilize the higher intake pressures rather than dumping water on the ground. But, when the engine RPM is reduced to idle and the discharge pressure still exceeds a safe value you will have no choice but to gate the suction and/or dump water to the ground with the AirMax relief valve.

Testing

1. Start engine, allow enough time for air brake pressure to reach normal level (110 – 120 PSIG) as indicated in cab.
2. Attach a positive pressure intake source to the apparatus. Use a minimum of one (1) 2½" hose line and open the gated intake line.
3. Operate the fire pump and pressure control device in normal mode. It is not necessary to discharge water.
4. Adjust the AirMax pressure regulator knob on the panel, counter-clockwise, until the AirMax gauge shows a lower value than the intake pressure. Check to see that the relief valve is opening and safely dumping water to the ground.
5. Adjust the AirMax pressure regulator knob on the panel, clockwise, until the AirMax gauge reads about 10-PSIG ABOVE the intake pressure. Check to see that the valve is closed and not dumping water to the ground.
6. If the OEM or fire department has another pumper supplying the apparatus, the intake pressure could be varied from 50 PSI to 300 PSI to assure the AirMax is properly operating at various desired pressures for training and testing purposes.
7. Should the AirMax not respond as expected, consult the trouble-shooting guide below.

Training

Make sure all pump operators are properly trained on the following AirMax features:

1. Operation including adjustment procedures and water conversation methods. Training on the function of Intake Relief Valves is an important process during pump operator or engineer training.
2. Maintenance and exercise during apparatus and pump test checks.
3. Train all operators on department SOP for relief valve standard setting and Maximum safe setting to keep hoses and equipment from use beyond their intended limits.



Warning - User Responsibilities

The customer, installer, and end-user shall assume sole responsibility in making the final selection of products and accessories. Furthermore, these parties shall hold TRIDENT harmless for all liability, claims, suits, and expenses incurred. These parties shall ensure maintenance, safety precautions and warnings regarding the application are enforced at all times. TRIDENT is not responsible for use of products in excess of rated and recommended capacities, design functions, or abnormal conditions.

Warning - Follow Instructions

The customer, installer, and end users shall ensure that all potential users of these products receive continual training and access to all relevant product manuals and safety instructions. This information should be thoroughly reviewed prior to installation, stored and reviewed continually during use of the product. TRIDENT assumes no responsibility for fitness of installation and continued use in specific applications.

Trouble Shooting Guide

Problem	Likely Cause	Corrective Action
No Pressure Reading on Panel Gauge.	Check Valve Installed Backwards.	Verify check valve flow into regulator. See directional arrow on valve body.
	Defective Pressure Gauge.	Replace pressure gauge.
	Defective PPV.	Try by-passing the pressure protection valve, replace as required.
	Defective Regulator.	Replace regulator.
	Kinked Supply Line.	Check supply line from air tank for kinks or breaks.
Pressure Gauge Not Responsive to Regulator Adjustment.	Defective Pressure Gauge.	Replace pressure gauge.
	Defective Regulator.	Replace regulator.
Relief Valve Not Opening With Excessive Pressure.	Kinked Air Line To Relief Valve.	Check air line from regulator to relief valve.
	Clogged Relief Valve Filter.	Remove and clean mesh filter in center hole of relief valve.
	Defective Regulator.	Replace regulator.
	Defective Pressure Gauge.	Replace pressure gauge.
Relief Valve Not Closing After Opening.	Defective Regulator.	Replace regulator.
Relief Valve Leaking Water.	Debris Caught.	Clean seat and remove debris
	Valve Seat Seal Worn.	Replace valve seat seal. See Seal Kit (#10) on Page 8.
	Flange O-Ring Leaking.	Check mounting bolts for tightness. Replace O-Ring.
Relief Valve Leaking Air.	Cover O-Ring Leaking.	Replace O-Ring. See Seal Kit (#10) on Page 8.
	Piston O-Ring Leaking.	Replace O-Ring. See Seal Kit (#10) on Page 8.
Regulator Leaking Air.	Regulator Body Nut Is Loose.	Remove regulator from panel. Check tightness of large nut located behind the adjusting knob.

5 Year Warranty

For five years after the date of purchase, Trident Emergency Products, LLC warrants its products to be free from defects in materials and workmanship when properly installed, operated, and maintained.



If during the warranty period, a product is discovered to be defective, Trident will, at its option, replace or repair the warranted product or grant the purchaser a credit for the product claimed to be defective. Trident will have the sole discretion to determine whether the product was defective.

This warranty is null and void if the product is damaged due to abuse, misuse, negligence or accidental causes.

No warranty of merchantability or fitness for a particular purpose, nor any warranty, express or implied, is made by Trident. The foregoing states Trident Emergency Products, LLC's entire and exclusive liability and buyer's exclusive remedy for any claim or damages in connection with the sale of its products. In no event shall Trident be liable for any special incidental, or consequential damages whatsoever.



Ordering
Please use Trident part numbers and descriptions when placing orders. All orders must be written, E-Mail (sales@tridentdirect.com) or faxed to 215-293-0701 or placed online at www.tridentdirect.com. All orders will be acknowledged by Trident within 2-days and shall become final after acknowledgment, if not challenged.
No verbal orders will be accepted.

Terms
1%10-NET30 days on approved credit, or with MC/Visa credit card. Service charge 1.5% on past due accounts.



Terms

Freight

F.O.B. Hatboro, PA, USA. Our responsibility ceases upon delivery to common carrier. Consignee must file claim for storage and damaged freight with the carrier.

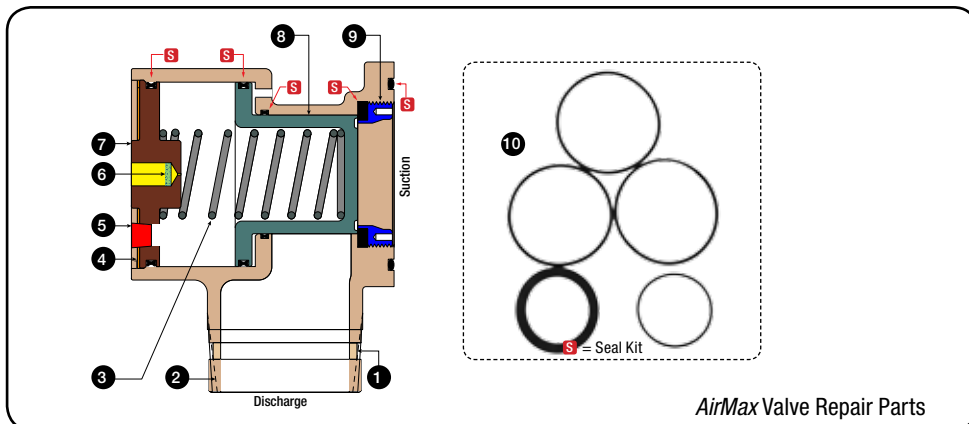
Delivery

Most standard items are shipped in five business days or less. Consult with customer service for availability, special threads, or special order products.

Return Policy

No material will be accepted for return without authorization by the factory, and a return goods authorization number assigned. Materials must be returned prepaid. A 20% restocking fee normally applies. No material will be accepted for a credit after one year from the date of purchase..

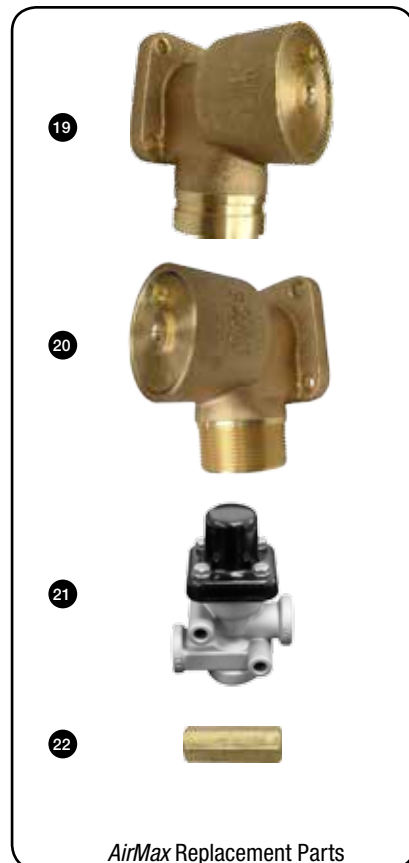
Repair/Replacement Parts



AirMax Valve Repair Parts



AirMax Control Replacement Parts



AirMax Replacement Parts

REF #	DESCRIPTION	PART #
1	AirMax, 2.5" Vic Valve Body	07.008.1
2	AirMax, 2.5" NPT Valve Body	07.008.0
3	Spring, Internal	20.004.0
4	Retaining Ring on Cover	04.013.2
5	Plug, Threaded	09.005.0
6	Filter, Air Inlet	21.002.0
7	Cover	08.007.0
8	Piston	11.003.0
9	Seal Retainer	04.017.0
10	Seal Replacement Kit	27.007.1
11	Bezel, Replacement	02.009.3

REF #	DESCRIPTION	PART #
12	Label, Bezel	02.009.4
13	Pressure Gauge, Replacement	14.002.1
14	Regulator Hex Nut, Replacement	04.024.0
15	Label, Regulator	02.009.5
16	Fittings, Replacement (Hose Elbows, Hose, Threaded Pipe Elbow, Screws)	27.017.0
17	Regulator, AirMax Control	14.001.0
18	Control Kit (Contains Parts 11 through 17)	27.006.0
19	AirMax Valve Assembly, Vic, 2.5" Discharge Connection	30.004.10
20	AirMax Valve Assembly, NPT, 2.5" Discharge Threads	30.004.11
21	Pressure Protection Valve (PPV)	30.053.0
22	Check Valve	30.012.0

AirMax Models - NPT Thread	PART #
AirMax Kit, NPT Threads, Single Location	30.004.5
AirMax Kit, NPT Threads, Two Location	30.004.12
AirMax Kit, NPT Threads, Three Location	30.004.13
AirMax Kit, NPT Threads, Four Location	30.004.14

AirMax Models - Vic Connection	PART #
AirMax Kit, Vic Connection, Single Location	30.004.6
AirMax Kit, Vic Connection, Two Location	30.004.9
AirMax Kit, Vic Connection, Three Location	30.004.15
AirMax Kit, Vic Connection, Four Location	30.004.16



Note: All designs, specifications, and dimensional data contained in this catalog are subject to change without notice. No additional warranties, express or implied, including warranties of merchantability for fitness for a particular purpose, are created by the descriptions and depictions of the products on or in this catalog. Not responsible for typographical errors.



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