



PolAIR® High Pressure Fog System





Intentionally Blank



Table of Contents

Table of Contents.....	3
Warranty.....	4-5
Symbols.....	6
Features and Benefits.....	7
Product Introduction.....	8
System Components.....	9
Commonly used Compression Fittings.....	10-11
Typical Compression Union Assembly.....	12
Assembly and Installation	13
Intentionally Blank.....	14
Assembly Guidelines.....	15
Suspension Cable System Installation.....	16-17
Atomization Nozzle Line (ANL) and Mainline Tubing.....	17
First Time Start-Up, Seasonal Start-Up and Winterizing Procedures	18-22
Preventative Maintenance - General.....	23
Maintenance for the BR5 and BR10 Regulators.....	24
PolAIR® Nozzle / Check Valve Assembly CARE and Cleaning.....	25-27
PMDVADJ Automatic Drain Valve.....	28
Drain Valve Line Assembly.....	29
Intentionally Blank.....	30
Appendix 1 - PMDVADJ Automatic Drain Valve Exploded Drawing and Parts List.....	31
Appendix 2 - Filter Kits Parts List.....	32
Appendix 3 - 10-30 GPM Filter Kit Exploded Drawing and Parts List.....	33
Appendix 4 - Nozzle Exploded Drawing.....	34
Appendix 5 - Nozzle Assemblies and Spare Parts List.....	35
Appendix 6 - Accessory Parts List.....	36
Appendix 7 - Control 400HC	37
Appendix 8 - PolAIR® EA-010-001 Control Exploded Drawing.....	38
Appendix 9 - VE-010-001 PolAIR® 400 HC Control Parts List.....	39
Appendix 10 - Layout Option Examples.....	40-48
Appendix 11-PolAIR® High Pressure Fog System Poultry - Design Request Sheet.....	49-50
Appendix 12-Customer Service.....	51



Warranty

VAL PRODUCTS, INC. WARRANTIES

Val-co® MANUFACTURED PRODUCTS OTHER THAN EXTENDED WARRANTY PRODUCTS

Val Products, Inc. (Val Products) warrants to the original purchaser that Val Products' manufactured products (other than the products subject to an extended warranty set forth below) will be free of defects in material and workmanship for a period of one (1) year from and after the date of original purchase and when used in a usual and customary fashion. If Val Products is notified that such a defect exists within one year of the original purchase date and, upon inspection, agrees that the product is defective, Val Products will, at its option, (a) repair or replace (FOB Val Products' plant) the defective product, or (b) refund to the original purchaser the original purchase price paid for the defective product less any installation, shipping, or other charges associated with the original purchase. All defective products must be returned to a Val Products designated location for evaluation. Val Products' determination as to whether the product is defective is final. See the General Conditions and Limitations set forth below.

NIPPLE DRINKERS EXTENDED WARRANTY

Val Products, Inc. (Val Products) agrees to the following extended warranty with respect to VR Series and VL Series Nipple Drinkers manufactured by Val Products: VR Series and VL Series Nipple Drinkers that prove to be defective in workmanship or material and become unusable within a period of five (5) years from and after the date of original purchase will be repaired or replaced, at Val Products' option, at no charge (excluding labor of removal and installation), FOB Val Products' plant. VR Series and VL Series Nipple Drinkers which prove to be defective in workmanship or material and become unusable after five (5) years but within ten (10) years of the date of original purchase will be repaired or replaced, at Val Products' option, at a pro rated cost basis (excluding labor of removal and installation) to the original purchaser, FOB Val Products' plant, on the following basis: Year six (6), customer pays 50% of the current price, year seven (7), customer pays 60% of the current price, year eight (8), customer pays 70% of the current price, year nine (9), customer pays 80% of the current price, and year ten (10), customer pays 90% of the current price. All defective Nipple Drinkers must be returned to a Val Products' designated location for evaluation. Val Products' determination as to whether the product is defective and unusable is final. See the General Conditions and Limitations set forth below.

FIBERGLASS FAN HOUSINGS EXTENDED WARRANTY

Val Products, Inc. (Val Products) agrees to the following extended warranty with respect to the fiberglass fan housings manufactured by Val Products on Val-co® PMC Power Miser 12", 16", 21", 24", 36", 48", and 50" Fiberglass Fans that prove to be defective in workmanship or material and become unusable over the life of the structure where the Val-co® Fiberglass Fan was originally installed after original purchase, provided that the fan has remained undisturbed in its original installation location, will be repaired or replaced, at Val Products' option, at no charge (excluding labor of removal and installation and shipping), FOB Val Products' plant. All defective fan housings must be returned to a Val Products' designated location for evaluation. Val Products' determination as to whether the product is defective and unusable is final. See the General Conditions and Limitations set forth below.

FIBERGLASS FAN MOTORS EXTENDED WARRANTY

Val Products, Inc. (Val Products) agrees to the following extended warranty with respect to the fiberglass fan motors included as original equipment on Val-co® PMC Power Miser 12", 16", 21", and 24" Fiberglass Fans manufactured by Val Products that prove to be defective in workmanship or material and become



Warranty - continued

un-usable within a period of two (2) years from and after the date of original purchase will be repaired or replaced, at Val Products' option, at no charge (excluding labor of removal and installation and shipping), FOB Val Products' plant. All defective fan motors must be returned to a Val Products' designated location for evaluation. Val Products' determination as to whether the product is defective and unusable is final. See the General Conditions and Limitations set forth below.

General Conditions and Limitations Applicable to All Val Products, Inc. (Val Products) Warranties, Including Extended Warranties

1. The Product must be installed and operated in accordance with instructions published by Val Products or the warranty will be void.
2. Warranty will be void if all components of the product or system are not original equipment supplied by the manufacturer.
3. Products not manufactured by Val Products and supplied by outside manufacturers (such as, but not limited to, certain electrical motors, certain controls, gas valves, etc.) are warranted separately by the respective manufacturer and only to the extent of the manufacturer's warranty.
4. Warranty applies only to products used in applications as originally intended by Val Products – other applications in industry or commerce are not covered by the Warranty. Val Products' products are expressly not designed or authorized for use in any applications where intended to Sustain or support human life or any other application where the failure of the product could result in personal injury or death.
5. Malfunctions resulting from misuse, abuse, mismanagement, negligence, alteration, accident, lack of proper maintenance, lightening strikes, electrical power surges, or electrical power interruption shall not be considered defects under the Warranty. Corrosion, material deterioration and/or equipment malfunction caused by or consistent with the excessive additions of chemicals, minerals, sediments or other foreign elements with the product shall not be considered defects under the Warranty.
6. VAL PRODUCTS WILL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE FOR ANY KIND OF SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR CONTINGENT DAMAGES INCLUDING, BUT NOT LIMITED TO, LOST OR DAMAGED PRODUCT, GOODS OR LIVESTOCK, COSTS OF TRANSPORTATION, LOST SALES, LOST ORDERS, LOST INCOME, INCREASED OVERHEAD, LABOR AND INCIDENTAL COSTS AND OPERATIONAL INEFFICIENCIES. IN NO EVENT SHALL THE WARRANTY LIABILITY EXCEED THE INVOICED PRICE OF THE PRODUCT TO THE ORIGINAL PURCHASER.
7. THE WARRANTIES SET FORTH ABOVE CONSTITUTE VAL PRODUCTS' ENTIRE AND SOLE WARRANTY. VAL PRODUCTS EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES AS TO THE MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE, DESCRIPTION OF QUALITY OF THE PRODUCT FURNISHED, AND ANY OTHER WARRANTY ARISING BY OPERATION OF LAW, CUSTOM OR USAGE.
8. Val Products denies any authorization of any distributor, dealer, agent, or employee to modify, extend, or otherwise alter the conditions of any warranty in addition to, or in lieu of, those conditions and authorized in writing by an officer of Val Products. Val Products reserves the right to change or delete models, or change specifications at any time without notice or obligation to improve previous products.



Symbols

Below are symbols used throughout the manual to draw your attention to either important information or notes on assembly instructions to aid you in the assembly process or to warn you of safety precautions. The safety warnings are a guide to help and encourage the safe operation of your equipment. However; it is your responsibility to evaluate the hazards of each operation and implement the safest method of protecting yourself as owner and/or operator.



= NOTE - take notice this may help you!



= IMPORTANT INFORMATION - be sure to read!



= CHECK - the details of all requirements, processes or procedures of instructions listed.

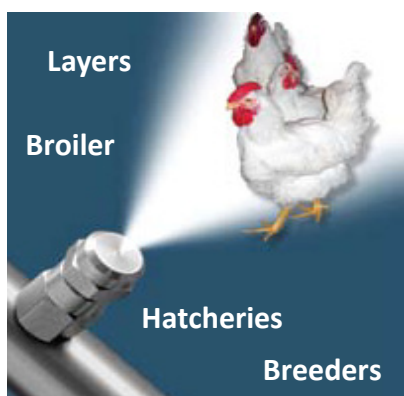


= WARNING - The safety alert symbol is always used on warning signs that involve your safety. Anytime you see this symbol heed the warning it identifies. This symbol may be used alone or in conjunction with other symbols.



= WEB-SITE HYPERLINK - When using the manual via the Val-Co® web-site, <http://www.val-co.com>, double click on these icons for informational resource.

Applications- Livestock (*hogs, horses and others not shown*)





Features and Benefits

Livestock Applications

The PolAIR® High Pressure Fog System is used in layer, broiler, breeder, hatcheries, turkey houses, hog and dairy barns, milk parlors, sheep sheds and equestrian facilities to provide temperature and humidity control during critical phases of production.

FEATURES	BENEFITS
Provides even cooling	Reduces mortality caused by heat stress in all livestock
	Increases egg mass and quantity during the summer
	Increases weight gain and shortens finishing for livestock
	Increases warm weather stocking levels
	Minimizes temperature difference between front and back of tunnel barns
Maintains humidity levels	Maintains desired humidity in hatcheries and egg rooms.
	Maintains ideal humidity range during brooding
	Provides excellent dust control
Vehicle for chemical concentrates	Can disperse disinfectant following wash down
	Reduce chick mortality through air treatments
	Neutralize odors

Additional Applications

PolAIR® High Pressure Fog Systems are used worldwide in many types of application. *(Below are just a few)*

- *Greenhouses - Cool and humidify, plus deliver chemicals*
- *Concrete curing rooms – control humidity levels*
- *Outdoor public areas & Special effects – cool open air restaurants, hotels, patios, train stations, Fun Parks*
- *Factories/Manufacturing – cool buildings and suppress airborne borne particles and exhaust stacks*
- *Co-generation – gas turbine inlet cooling*
- *Warehousing and Cold Storage rooms – (all types) for cooling and humidity control*
- *Waste Management facilities and Holding Ponds - delivery of odor control chemicals/reduces airborne particles.*
- *Food processing plants - delivery of disinfectants and sterilization agents to control or eliminate bacteria and harmful pathogens, such as Salmonella*

This manual concentrates on livestock applications



Product Introduction

The PolAIR® High Pressure Fog System is the most efficient cooling system that Val-Co® provides. With operational pressures up to 1000 to 1500 PSI, depending on the model, it atomizes water into billions of micron-sized droplets which flash evaporate upon contact with the air, allowing great temperature reductions. PolAIR® High Pressure Fog Systems are custom designed and installed with little or no structural modifications. Val-co® sales and application engineers gather the required project information and, with using a software program developed by Val-co®, perform psychrometric calculations to ensure that the proper amount of water is evaporated to achieve maximum results.

Required Project Information:

Building Type/Use/Location

Building setup: nests, cages, etc.

Building Ventilation: Natural/Mechanical
(TOTAL combined CFM)

Building Length

Building Width

Ceiling Height (highest and lowest point)

Location of Water Supply

Location of electrical supply

Electrical requirement - Voltage

Electrical requirement - Phase

Electrical requirement - Frequency

Detailed Forms are included in Appendix 11, pages 49-50

Refer to Appendix 9 on pages 42-45 for Examples of Layout Options.

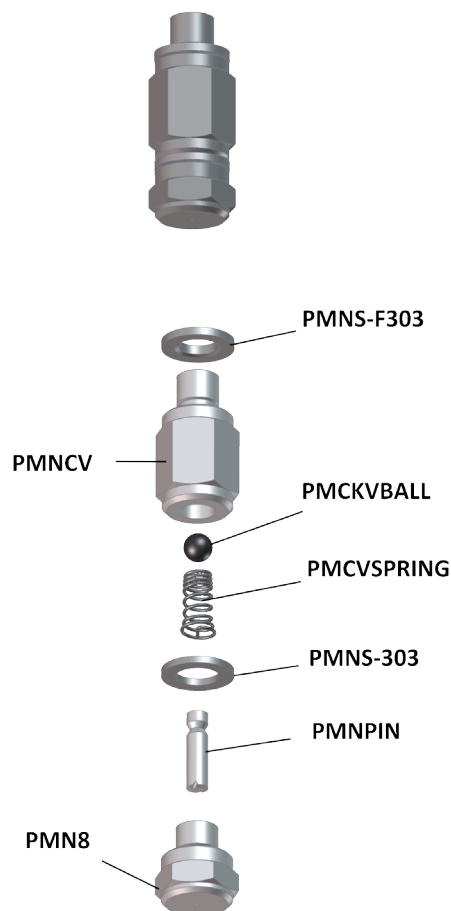
Heart of the System

The PolAIR® Stainless Steel Fog Nozzle features a unique patent-pending removable atomization pin and all metal seals. These nozzles are designed for a lifetime of use, and can be fully disassembled for cleaning (In other High Pressure Fog Systems, the internal atomization pin cannot be removed for cleaning). The nozzle also incorporates Val-co®'s unique check valve, which prevents dripping during system pressurization and depressurization. The check valve also helps keep the nozzle free and clear of interior mineral build up.

The PolAIR®'s all-metal seals provide years of trouble-free service. Designed for maximum sealing, the PolAIR® metal seal does not crack, chip or flatten out and is not effected by UV light as is the case with plastic seals used in other high pressure fog cooling systems.

Each atomization nozzle location is custom machined into Stainless Steel Tube using a unique manufacturing drilling process developed by Val-co® which allows the nozzle to be torqued directly into the thin wall stainless-steel tube. All nozzle line sections are joined together with instrument grade compression fittings for a quick, easy installation.

HIGH PRESSURE FOG NOZZLE W/CHECK VALVE





System Components

The PolAIR® High Pressure Fog System consists of the following components, which have been matched together for years of trouble-free service.

Atomization Nozzle Lines

PolAIR® high pressure stainless steel atomization nozzle lines come complete with the atomization nozzles and check valves. Each atomization nozzle line is inspected and pre-tested to ensure proper flow from the nozzles.

PolAIR® stainless steel mainline

PolAIR® stainless steel mainline is made with 316-grade stainless steel tubing.

Compression Fittings

Instrument grade compression fittings are used for weld-free, flare-free installation, *shown on next two (2) pages.*

PolAIR® high pressure pump and filtration system

Each custom-built, **PRE-TESTED** system includes the pump, motor, and optional water treatment/filtration cartridges to remove contaminants which may foul the nozzles.

PolAIR® 400 HC pump controller

The PolAIR® 400 HC pump controller can operate as a stand-alone controller or as an interface for host computer operation. The PolAIR® 400 HC Controller has the following features:

- Programmable setup and operation
- Solid state circuitry
- Control by temperature, humidity and time, or any combination of the three
- Programmable stress index monitoring (See note on last page)
- Humidity over-ride capability
- Multiple sensor inputs
- Digital readouts in Fahrenheit or Celsius
- Pre-wired to the Pump Unit and pre-tested prior to shipment



Commonly used Compression Fittings

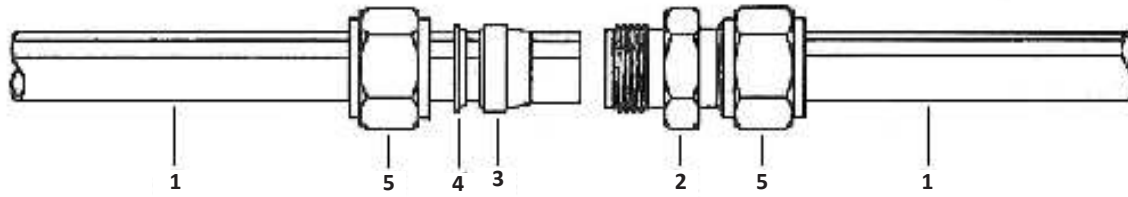
DESCRIPTION		BRASS	STAINLESS STEEL
 Union: U/Reducing Union: RU	1/2" Compression	PMCF20	PMSS8U316
	3/4" Compression	PM12UBR	PMSS12U316
	1/2" Compression x 3/4" Compression	PM12RU8	
 Union Elbow: LU	1/2" Compression	PMCF21	PMSS8LU316
	3/4" Compression	PM12LUBR	PMSS12LU316
 Union Tee: TTT	1/2" Compression	PMCF22	PMSS8TTT316
	3/4" Compression	PM12TTTBR	PMSS12TTT316
 Female Connector: CF	1/2" Compression x 1/2" FNPT	PMCF23	PMSS8CF8316
	1/2" Compression x 3/4" FNPT	PMCF8CF12BR	PMSS8CF12316
	3/4" Compression x 3/4" FNPT	PMCF12CF12BR	
	3/4" Compression x 1/2" FNPT	PM12CF8BR	

Commonly used Compression Fittings - continued

DESCRIPTION		BRASS	STAINLESS STEEL
 Male Connector: CM	1/2" Compression x 3/8" MNPT	PMCF10	PMSS8CM6316
	1/2" Compression x 1/2" MNPT	PMCF24	PMSS8CM8316
	1/2" Compression x 3/4" MNPT		
	3/4" Compression x 3/4" MNPT	PM12CM12BR	PMSS12CM12316
	3/4" Compression x 1/2" MNPT	PM12CM8BR	
 Male Branch Tee: TTM	1/2" Compression x 1/4" MNPT		PMSS8TTM4316
	1/2" Compression x 3/8" MNPT	PM8TTM6BR	PMSS8TTM6316
	1/2" Compression x 1/2" MNPT	PMCF25	PMSS8TTM8316
	3/4" Compression x 3/8" MNPT		PMSS12TTM6316
	3/4" Compression x 1/2" MNPT	PM12TTM8BR	
 Male Elbow: LM	1/2" Compression x 1/4" MNPT		PMSS8LM4316
	1/2" Compression x 3/8" MNPT	PMCF27	PMSS8LM6316
	1/2" Compression x 1/2" MNPT	PMCF26	PMSS8LM8316
	3/4" Compression x 1/2" MNPT	PM12LM8BR	PMSS12LM8316
 Cap: CP	1/2" Compression	PMCF8CPBR	PMSS8CP316
	3/4" Compression	PM12CP	



Typical Compression Union Assembly



1. Stainless Steel Tubing
2. Compression Union Body
3. Front Ferrule
4. Rear Ferrule
5. Compression Union Nut



When assembled, the two (2) Ferrules will come in contact with each other.

Assembly and Installation

It is important to read this manual before starting your installation. It will be helpful to familiarize yourself with the Compression Fittings shown on pages 10-11.



When cutting the Stainless Steel Atomization Nozzle Line and or Mainline Tubing, use a TUBE CUTTER DESIGNED TO CUT STAINLESS STEEL TUBING. DO NOT use a Hacksaw or Friction Saw to cut the Stainless Steel Tubing.



Never over tighten Compression Fittings. (more detail on Assembly guidelines are on the next page.)



Have a certified electrician connect power to the PolAIR® Controller. (Refer to the PolAIR® 400HC / PolAIR® Sequence Panel on page 34 of this manual for wiring information.)



The entire system must be flushed before being pressurized.



When pressurizing the system for the first time, the Pressure Regulator **MUST** be adjusted to set the systems maximum operational pressure. PCM Pump Units **MUST NOT** to exceed 1000-PSI. PCS Pump Units **NOT** to exceed 1500-PSI.



The Filter Cartridges used **MUST NOT** be washed and re-used. DO NOT use string wound or pleated-type Filter Cartridges.



Use **ONLY** the recommended make, grade and quantity of NON Detergent Oil.

The Pumps Crankcase Oil **MUST** be changed after the first 50 hours of operation, then every 300 hours or 3 months thereafter.

The Inlet Water Supply Filter Cartridges should be inspected regularly (changed when required) to prevent loss of inlet water supply pressure and flow. The PolAIR® System has a water safety circuit, which detects low water pressure or volume and will stop the pump system from operating, until proper flow and pressure are restored.



Intentionally Blank

Assembly Guidelines

The following guidelines should be used and closely followed when installing the High Pressure Compression Fittings shipped with your system.

All Atomization Nozzle Line and Main Line Tubing ends **MUST** be clean and undamaged to be inserted into the Compression Fittings.

1. **DO NOT** remove the Compression Fitting Nuts from the body of Compression Fitting to insert the tubing.
2. Loosen the Compression Fitting Nut a $\frac{1}{4}$ turn.
3. Firmly insert the tubing into the Compression Fitting assembly. *Proper insertion requires that the tubing be fully bottomed out in the Compression Fitting body.*



4. Hand tighten the Compression Fitting Nut.
5. With the tubing and Compression Fitting held in place, use a permanent marking pen to place a mark at and on the following locations:
 - A. On the tubing at the end of the Compression Nut. This mark is placed on the tubing so that you can be assured that the tubing has remained fully inserted during the assembly process.
 - B. On the Compression Nut.
 - C. On the Body of the Compression Fitting adjacent to the mark placed on the Compression Nut.
6. Using properly sized Open End Wrenches, further tighten the Compression Fitting Nut 1-1/4 turns using the marks placed on the Compression Fitting Nut and Body as reference. **DO NOT** over tighten Compression Fitting Nuts
7. Compression Fittings use tapered NPT (National Pipe Thread) and BSP/ISO (International Standards Organization) screw threads. **Teflon Tape is ONLY required on NPT threads.**

A list of Compression Fittings is included in this manual on pages 10-11.



Suspension Cable System Installation



A Suspension Cable System is required to support the Nozzle Line and or Main Line Tubing if the Tubing cannot be secured to a rigid surface with a Tube Strap spaced no more than every 8FT (2.4 M) apart.

Horizontal Support Cable:

Where possible (for proper drainage), a Suspension Cable System should be installed so that the Nozzle Line and Mainline Tubing is sloped (1.5" /100FT) towards the end of the Nozzle Line/s and/or Pump Unit. Be sure to take into account any built-in or natural slope of the building.

Vertical Support Cable:

The same 1/16" Stainless Steel Cable used as the Horizontal support cable is used as the Vertical support cable. When using a Horizontal support cable, the Vertical support cable is used to support the Horizontal support cable, not the Nozzle Line or Main Line Tubing.

Support Cable Installation Tools:

Cable Cutter: VC300

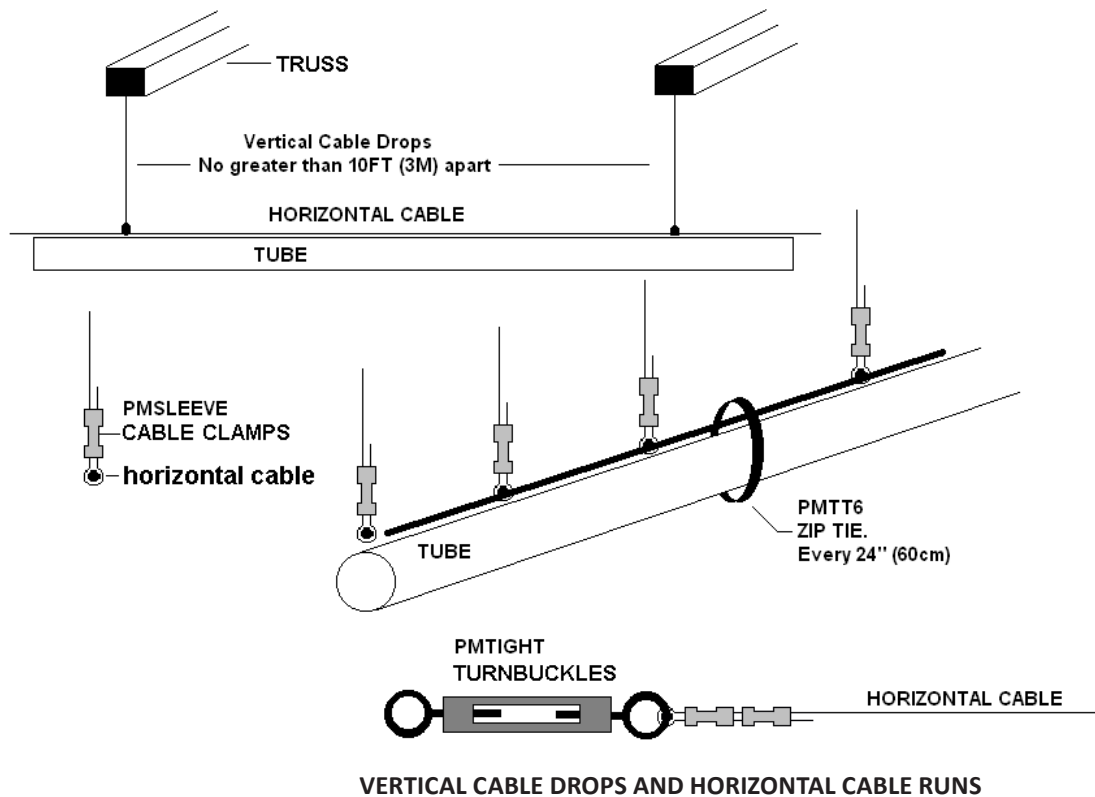


Swage Tool: PMSWAGETOOL



1. If the Atomization Nozzle Line (ANL) and or Main Line Tubing are to be secured directly to cross or vertical trusses and those trusses are 8FT (2.4 M) or less apart, then no Horizontal and or Vertical Cable Support System are required.
2. When a Horizontal Support Cable is required, the Horizontal Cable needs to be installed tight. One Cable Turnbuckle (PMTIGHT) per 100FT (30.5 M) is used in order to pull the cable tight. A Horizontal Cable is attached to the Cable Turnbuckle using (2) PMSLEEVE Cable Clamps at each end of the Horizontal Cable, *as shown in the drawing on the next page*. Vertical Support Cables require only (1) PMSLEEVE Cable Clamps on each end of the Vertical Horizontal Cable, *as shown in the drawing on the next page*.
3. If an Atomization Nozzle Line is to be installed or suspended under a flat surface, a minimum distance of 18" (45cm) must be maintained between the two, *in order to prevent condensation from forming*.

Suspension Cable System - continued



Atomization Nozzle Line (ANL) and Mainline Tubing



Prior to being shipped, red plastic caps have been placed on the ends of the ANL to prevent any dirt or debris from entering the ANL and potentially fouling the nozzles. Leave the red caps on the ends of the tubing until the sections of ANL are installed. **Failure to do so can cause severe nozzle blockage.**

During the installation, place the Tubing in a dry / clean environment.

1. Identify the difference between the ANL and Mainline Tubing.
2. Separate the ANL from the Mainline Tubing.
3. Be sure to leave all red caps on the ANL.
4. Depending upon your installation, you could have ANL that is drilled in an Alternating pattern (*nozzles on both sides of the tubing*) and/or drilled in an In-Line pattern (*nozzles only on one side of the tubing*). In both orientations, it is important to note the spacing and to be sure to match the ends of the ANL to each other that will carry on the pattern and spacing of the nozzles as you progress down the line.



First Time Start-Up, Seasonal Start-Up and Winterizing Procedures

FIRST TIME START-UP PROCEDURE:

In accordance with National and Local Electrical Codes, have a **Certified** Electrician verify and run the individual power supplies for both the motor and control voltage to the controller used on the PolAIR® Pump Unit.



Use a separate Circuit Breaker/Service Disconnect for each of the two voltages (regardless if they are the same voltage).

Motor Voltage:

L1: _____ L2: _____ L3: _____

Wire size: _____

Control Voltage:

Primary: _____ Wire size: _____

Secondary: _____

Before the System can be pressurized, the network of tubing must first be flushed out in order to remove any debris that may have entered the tubing during the installation.



1. This procedure will **ONLY** use the Incoming water supply pressure.
2. The Incoming water supply pressure **MUST** be greater than 25-PSI and **MUST NOT** exceed 65-PSI.
3. **DO NOT** run the Pump and Motor during the Flushing procedure.

1. **DO NOT** install (at this stage) any of the Automatic Drain Valve Assemblies or Flush Valve Kits on the ends of the Atomization Nozzle Lines or Mainline Tubing.
2. With the exception of **ONLY** one, close all the Isolation Ball Valves installed at the beginning of each of the Atomization Nozzle Lines.
3. Isolate the Motor voltage at the Circuit Breaker/Service Disconnect.
4. Activate the Control Circuit voltage at the Circuit Breaker/Service Disconnect.
5. Verify that **ALL** of the Filter Cartridges have been installed in the Systems Filtration Assembly.
6. Verify that the High Pressure Hose at the discharge of the Pump Unit is connected to the Main Line Tubing.
7. If the system is utilizing a 10TS Water Treatment Injection System, verify that the system is assembled and ready to be primed.
8. **SLOWLY** and **ONLY PARTIALLY OPEN** the Isolation Valve for the Incoming water supply allowing water to slowly enter the PolAIR® Filter Housing Assembly.

First Time Start-Up, Seasonal Start-Up and Winterizing Procedures - continued



Opening the Isolation Valve MUST be done SLOWLY in order to prevent an air pocket from forming within the Filter Housing Assembly.

9. The Incoming Water Supply Isolation Valve can be fully opened when the 0-100 PSI Gauges located on the PolAIR® Filter Assembly indicates that full pressure has been achieved.
10. The next step is to place the Pump Units PolAIR® Sequence Panel or 400HC in the **ON/Manual** position.
11. Without the Motor voltage supply being activated, only the Pump Units Inlet Solenoid will open allowing the Incoming Water Supply to pass through the Pump Unit and into the net work of tubing exiting out of the Nozzle Line which has its Isolation Ball Valve open.
12. As a guide line, allow the water to exit the ends of the Nozzle Lines for one minute for every 100ft of Nozzle Line.
13. If your system utilizes multiple Nozzle Lines, open the Ball Valve at the start of the next Nozzle Line and close the previous one. Repeat this procedure until ALL Nozzle Lines have been flushed out.
14. At the completion of the flushing procedure, place the Pump Units PolAIR® Sequence Panel or 400HC in the OFF position.
15. The Automatic Drain Valve(s) and if used Flush Valve Kit(s) can be installed.
16. **OPEN** all of the Isolation Ball Valves at the start of Nozzle Lines.
17. Activate the Motor Voltage at the Circuit Breaker and or Service Disconnect.
18. The next procedure is to pressurize the system to verify that all of the compression fittings are secure.
19. Place Pump Units PolAIR® Sequence Panel or 400HC in the ON/Manual position.
20. The Pump Units Inlet Solenoid will open and there will be a short delay before the Pump Units Motor will start.
21. Maximum system pressure will be achieved when ALL Automatic Drain Valve are closed



It is essential that as the system is pressurizing you closely observe the 0-2000 PSI gauge, located at or near the discharge of the High Pressure Pump, as the system is being pressurized. The system pressure MUST NOT exceed the rating of the Pump Unit.

22. PolAIR® High Pressure Fog Systems are designed to operate at a specific pressure. Pump Units with models starting with PCM are not to exceed 1000-PSI. Pump Units with models starting with PCS are not to exceed 1500-PSI.
23. Required adjustments to the system pressure can be made by adjusting the brass nut on the Pump Units Pressure Regulator.
24. Before the Pump Unit is placed into Auto mode, it is important to have an Electrician verify the rotation of the Motor.



The first oil change will come after the first 50 hours of operation.



First Time Start-Up, Seasonal Start-Up and Winterizing Procedures - continued

SEASONAL START-UP PROCEDURE:

1. Before the System can be pressurized, the net work of tubing must first be flushed out in order to remove any debris/algae which may have collected in the tubing during the off season.



1. **This procedure will ONLY use the Incoming water supply pressure.**
2. **DO NOT run the Pump and Motor during the Flushing procedure.**

2. Remove all Automatic Drain Valve Assemblies or Flush Valve Kits on the ends of the Atomization Nozzle Lines or Mainline Tubing.
3. With the exception of ONLY one, close all the Isolation Ball Valves installed at the beginning of each of the Atomization Nozzle Lines.

- * Isolate the Motor voltage at the Breaker Panel and or Service Disconnect.
- * Isolate the Control Circuit voltage at the Breaker Panel and or Service Disconnect.
- * Remove and clean the Housings of the Systems Filtration Assembly.
- * Inspect the Filter Housing O-Ring. Replace when necessary.
- * Install ALL new Filter Cartridges in the Systems Filtration Assembly.
- * Change the oil in the High Pressure Pump.
- * Oil the Pressure Regulator.
- * If applicable, verify the tension of the V-Belts.

4. Verify that the High Pressure Hose at the discharge of the Pump Unit is connected to the Main Line Tubing.
5. If the system is utilizing a 10TS Water Treatment Injection System, verify that the system clean, full and ready to be primed.
6. **SLOWLY AND ONLY PARTIALLY OPEN** the Isolation Valve for the Incoming water supply allowing water to slowly enter the PolAIR® Filter Housing Assembly.



Opening the Isolation Valve MUST be done SLOWLY in order to prevent an air pocket from forming within the Filter Housing Assembly.

7. The Incoming Water Supply Isolation Valve can be fully opened when the 0-100 PSI Gauges located on the PolAIR® Filter Assembly indicates that full pressure has been achieved.
8. Activate the Control Circuit voltage at the Breaker Panel and/or Service Disconnect.

First Time Start-Up, Seasonal Start-Up and Winterizing Procedures - continued

9. The next step is to place the Pump Units PolAIR® Sequence Panel or 400HC in the ON/Manual position.
10. Without the Motor voltage supply being activated, only the Pump Units Inlet Solenoid will open allowing the Incoming Water Supply to pass through the Pump Unit and into the net work of tubing exiting out of the Nozzle Line which has its Isolation Ball Valve open.
11. As a guide line, allow the water to exit the ends of the Nozzle Lines for one minute for every 100ft of Nozzle Line.
12. If your system utilizes multiple Nozzle Lines, open the Ball Valve at the start of the next Nozzle Line and close the previous one. Repeat this procedure until ALL Nozzle Lines have been flushed out.
13. At the completion of the flushing procedure, place the Pump Units PolAIR® Sequence Panel or 400HC in the OFF position.
14. Install the Automatic Drain Valve(s) and if used Flush Valve Kit(s).
15. **OPEN** all of the Isolation Ball Valves at the start of Nozzle Lines.
16. Activate the Motor Voltage at the Circuit Breaker and or Service Disconnect.
17. The next procedure is to pressurize the system to verify that all of the compression fittings are secure.
18. Place Pump Units PolAIR® Sequence Panel or 400HC in the ON/Manual position.
19. The Pump Units Inlet Solenoid will open and there will be a short delay before the Pump Units Motor will start.
20. Maximum system pressure will be achieved when ALL Automatic Drain Valve are closed.



It is essential that as the system is pressurizing, you closely observe the 0-2000 PSI gauge located at or near the discharge of the High Pressure Pump as the system is being pressurized. The system pressure **MUST NOT exceed the rating of the Pump Unit.**

21. PolAIR® High Pressure Fog Systems are designed to operate at a specific pressure.
 1. Pump Units with models starting with PCM are not to exceed 1000-PSI.
 2. Pump Units with models starting with PCS are not to exceed 1500-PSI.
22. Required adjustments to the system pressure can be made by adjusting the brass nut on the Pump Units Pressure Regulator.
23. Verify the rotation of the Motor.



The next oil change will come after 300 hours or three months of operation.

24. Inspect all Atomization Nozzles, Automatic Drain Valves and Gauges for proper operation.
25. Verify that all related environmental Controller Sensors are clean.



First Time Start-Up, Seasonal Start-Up and Winterizing Procedures - continued

WINTERIZING PROCEDURE:

1. Place the Sequence Panel or 400HC in its **OFF** position.
2. Remove and store all Automatic Drain Valves and or Flush Valve Kits (*cleaned and protected from debris*).
3. Disconnect the High Pressure Hose at the discharge of the Pump Unit from the Stainless Steel Main Line Tubing.
4. Turn **OFF** the Isolation Valve for the Incoming water supply.
5. Remove the Filter Cartridge Housings.
6. Discard the Filter Cartridges.
7. Half fill the first Filter Housing with Anti-Freeze.
8. Re-install the Filter Cartridge Housings (**NO Cartridges**).
9. Slowly open the Isolation Valve for the Incoming water supply.
10. Turn **OFF** the Motor Voltage at the Breaker Panel and or Service Disconnect.
11. Place Pump Units PolAIR® Sequence Panel or 400HC in the **ON/Manual** position.
12. Water and Anti-Freeze will pass through the Pump Unit.
13. Turn **OFF** the Pump Unit when Anti-Freeze exits the High Pressure Hose.
14. Turn **OFF** the Isolation Valve for the Incoming water supply.
15. Remove the Filter Cartridge Housings and **discard their content**.
16. Re-install the Filter Cartridge Housings (**NO Cartridges**).
17. Turn OFF the Control Circuit Voltage at the Breaker Panel and or Service Disconnect.
18. Re-connect the High Pressure Hose at the discharge of the Pump Unit from the Stainless Steel Main Line Tubing.
19. In those locations where the network of tubing is exposed to severe winter weather conditions, all measures **MUST** be taken to **remove all free standing water from the tubing**.



Plastic Caps (part number PMVC-312-8) are available to cover the Atomization Nozzles. These will prevent dust and debris from forming over the Nozzles orifice. Contact VAL-CO® or your distributor.

Preventative Maintenance - General

ATOMIZATION NOZZLES:

Proper Nozzle performance is **critical in order to obtain maximum cooling/humidification**. A monthly observation of the nozzle operation and performance is recommended. Clean any debris build-up from around the exterior of the nozzles orifice, by using a PolAIR® Nozzle Cleaning Brush (P/N PMNOZ8BRUSH). Brushing of the Nozzles should be performed while the system is in operation.

Proper Nozzle torque is essential. Any leak must not go unattended as this can cause wear to the Nozzle/Check Valve assembly, Seals or Nozzle Line Tubing. The Nozzle/Check Valve assembly is to be torque at 30 inch pounds.

AUTOMATIC DRAIN VALVE/S:

Observe the operation of the Automatic Drain Valve/s monthly. The Automatic Drain Valve/s **should seal completely when the system is fully pressurized**. If the valve/s fails to completely close, remove the valve/s and inspect for debris caught around the spring and or under the plunger.

	Warning! Be sure all power to Pump Unit is OFF before inspecting the V-Belts. Inspect the V-Belts once a month to ensure that there is no worn, cracked or loose belts.	
---	---	---

V-BELTS: (If Applicable)

Loose belts will cause excess belt wear and result in a system pressure loss. **Correctly tightened V-Belts should flex no more than a half inch**. Over tightening can and will cause belt wear and failure of the Pump and or Motor Bearings.

FILTERS:

Filter Cartridges should be inspected every (2) weeks. Should the 0-100 PSI supply gauges show a 10-PSI differential between them, this indicates that, at a minimum, the primary filter cartridge requires changing. Dirty filter cartridges **MUST be discarded, NOT washed and re-used**. Dirty filters cartridges left unattended, can lead to plugged nozzles and cause pump cavitation, which can result in expensive pump repairs.

GAUGES:

The 0-100 PSI supply gauges and the 0-2000 PSI system gauge should be inspected monthly. These gauges are often your first indication that a problem may be occurring. For this reason, a faulty gauge should be replaced immediately.

PRESSURE REGULATOR:

The BR5 and the BR10 series Pressure Regulators are to be oiled once a month with any light weight oil. The BR5 Pressure Regulator requires (2) drops of oil in the small hole in the side of the regulator. The BR10 Pressure Regulator requires (4) drops of oil in the small hole in the side of the regulator.

PUMP OIL:

A new pump **MUST** have its crankcase oil changed at or within the first 50 hours of operation. After its initial oil change, the pumps crankcase oil **MUST** be changed every 300 hours or three months, whichever comes first.

All of the High Pressure Pumps used by Val-co® in the PolAIR® High Pressure Fog Systems **use NON DETERGENT oil**. The actual amount and grade of NON DETERGENT oil is based on the pumps make and model. Please contact Val-co® or your Val-co® Distributor for more extensive pump crankcase oil information.



Maintenance for the BR5 and BR10 Regulators

REGULATOR	DESCRIPTION	REPLACEMENT	REPAIR KIT
BR5-1	100 - 1000 PSI	PMBR5-1	PMBR5-2REB
BR5-2	750 - 2000 PSI	PMBR5-2	PMBR5-2REB
BR10-1	100 - 1000 PSI	PMBR10-1	PMBR10-2REB
BR10-2	750 - 2000 PSI	PMBR10-2	PMBR10-2REB



INSTALLATION

The BR series regulator is installed directly after the discharge of the pump. It must be installed vertically.

MAINTENANCE

Oil the regulator before being used and once a month there after. Insert the oil in the small weep hole located on the side of the regulator.

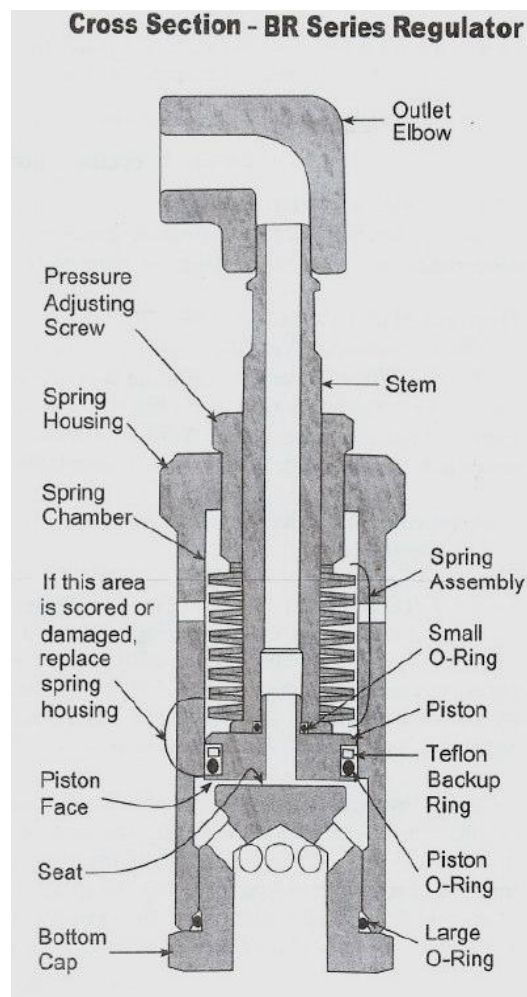
Use a light weight oil, (2) drops in the BR5 and (4) drops in the BR10 regulator.



If water is noticed coming from the small weep hole in the side of the regulator, this is an indication that one or more of the O-Rings needs to be replaced. Use the appropriate Repair Kit for your model regulator.

DISASSEMBLE

1. Turn system OFF.
2. Isolate the incoming water supply.
3. Remove the by-pass hose from the Outlet Elbow.
4. Remove the Outlet Elbow from the Stem.
5. Turn the Pressure Adjusting Screw counter clockwise until there is no resistance. If possible it is best to do this when the system is on so that the Piston and Seat are protected from damage.
6. Remove the regulator from its installed position.
7. Remove the Bottom Cap from the Spring Housing.
8. Remove the internal parts by pushing the exposed Stem towards the opening in the bottom of the valve. Take note of the spring assembly so that it can be reassembled in the same manner.
9. Remove the Piston from the Stem to expose the Small O-Ring.
10. Replace the O-Ring's and Backup Ring provided in the Repair Kit.
11. The condition of the Spring Housing where the Piston O-Ring slides is critical. If this area is scored, then the regulator will need to be replaced.
12. If all of the parts appear to be in good condition, lightly lubricate the O-Ring's and the Spring Assembly. Note the position of the Teflon Backup Ring.
13. Reverse the assembly process to reassemble. The regulator is now ready to install.
14. Start the system and adjust the Pressure Adjusting Screw clockwise to the systems operating pressure.



Included in Repair Kit

- (1) Large O-Ring
- (1) Piston O-Ring
- (1) Teflon Backup Ring
- (1) Small O-Ring



PolAIR® Nozzle / Check Valve Assembly CARE and CLEANING

Care of the systems PolAIR® Nozzle/Check Valve assemblies begins with the quality and maintenance performed on the PolAIR® Pump Unit Filtration Assembly. For continued uninterrupted system operation and performance, it is essential that condition the 5 and the 1 Micron Filter Cartridges be inspected regularly.

The 0-100 PSI oil filled pressure gauges installed on the Systems Filter Housing Assembly measure the Housing Assemblies inlet and discharge pressure. When there is a 10-PSI differential between the 0-100 PSI Gauges, then this is an indication that at a minimum, the primary 5 Micron Filter Cartridge needs to be changed. If a 10-PSI differential remains after changing the 5 Micron Filter Cartridge, replace the 1 Micron Filter Cartridge.

The Solid Bonded type Filter Cartridges supplied with the PolAIR® Fog System Filtration Assembly **MUST NOT** be washed and or re-used. We recommend using **ONLY** the same type and size Filter Cartridges which were supplied with the Val-Co® Filter Housing assembly.

Never use fabric spun woven type or pleated Filter Cartridges.

If your system utilizes a **PM3P775** Water Treatment Filter Cartridge, it should be inspected monthly.

On average, the crystals housed within this cartridge will last about three months. When the crystals have totally dissolved, then the Cartridge should be discarded and replaced.

If your system utilizes a 10TS Water Treatment Injection System, the liquid level and the operation of the Injection Pump should be inspected weekly.

The crystals used in the **PM3P775** Filter Cartridge and the chemical used in the 10TS Injection System stop the formation of elements that may lead to clogged Nozzles.

There are growers that do not use their PolAIR® Fog Cooling/Humidification System during the cooler months of the year. When the system is shut down, you should remove and dispose of ALL of the Filter Cartridges from the Filter Housing Assembly. The Automatic Drain Valve(s) should also be removed to allow as much water as possible to drain from the system. During those periods of the year when the PolAIR® Fog Cooling/Humidification System is shut down, dust and debris can collect and settle on the Nozzles. This collection of dust and debris can create a hardened cap over the face/orifice of the Nozzles. At the time that the system is shut down, we encourage you to install our **PMVC-312-8** Nozzle Protection Cap. This small inexpensive re-usable plastic Protection Cap is easily installed and removed. Come time to re-activate the system, remove (if used) the **PMVC-312-8** Nozzle Protection Caps, install a new set of Filter Cartridges, flush the system and install the Automatic Drain Valve assemblies.



PolAIR® Nozzle/ Check Valve Assembly CARE & CLEANING - continued

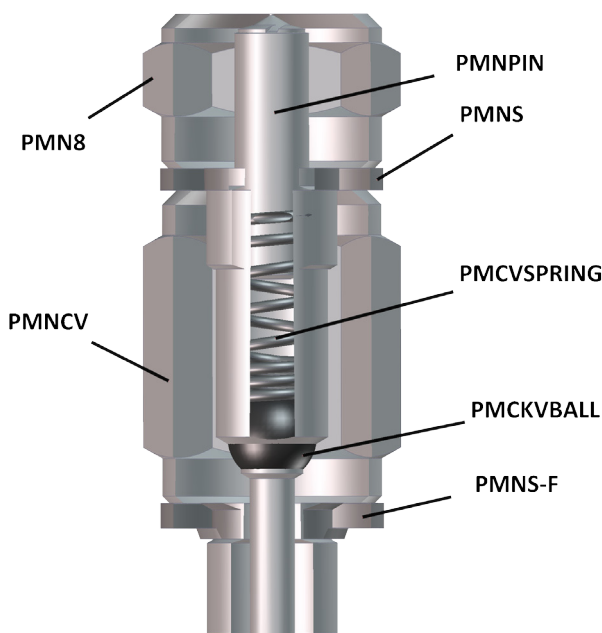
CLEANING BRUSH

Should you encounter a Nozzle that is not omitting water, or has an improper spray pattern, use the PMNOZ8BRUSH Nozzle Cleaning Brush to brush across the face of the Nozzle.



The fine stainless steel bristles on the PMNOZ8BRUSH Nozzle Cleaning Brush will not damage and or distort the Nozzle orifice. Brushing across the face of a Nozzle should be carried out while the system is running. We do this so that as the Nozzle orifice is exposed and water begins to be omitted, debris will be carried away and kept from entering the Nozzle orifice.

If after thoroughly cleaning the face of the Nozzle with the PMNOZ8BRUSH Nozzle Cleaning Brush you find that Nozzle orifice is still partially or totally plugged, turn the system off and replace the Nozzle Body and Nozzle/Check Valve assembly.



PMNOZ8	Complete Nozzle / Check Valve Assembly
PMNS	Copper Seal (FLAT) Nozzle to Check Valve
PMNS-F	Copper SEAL (FLANGED), check valve to tube.
PMNS	Nozzle (Body only)
PMNCV	Check Valve (Body only)
PMNPIN	Nozzle Atomization Pin
PMCVSPRING	Check Valve Spring
PMCKVBALL	Check Valve Ball

PolAIR® Nozzle/ Check Valve Assembly CARE & CLEANING - continued

CHEMICAL / CLEANING SOLUTION

Those Nozzles that do not work after brushing can be cleaned by immersing them in a chemical/cleaning solution.

The ONLY portion of the Nozzle/Check Valve assembly that needs to be immersed in a chemical/cleaning solution is the Nozzle Body and the Nozzle Atomization Pin.



If using a copper Flat Seal, (PMNS-F-1), it MUST be removed from the PMN8 Nozzle Body before it is immersed in any chemical/cleaning solution

There are many products that can be used as a cleaning agent. Listed below are the recommended methods.

1. **Warm Water and Vinegar** is one of the most common and readily available cleaning solutions. Mix a half mixture of water and vinegar. Place the items to be cleaned into the solution and place it over a low heat and allow it to simmer for 30-45 minutes.
2. **Ultra Sonic** cleaning is another method being used. Remove the items and thoroughly rinse them with warm water. Follow the cleaning directions supplied with the Ultra Sonic Cleaner. *These Cleaners range in size, options and price. Most are found in various industrial product catalogs and offer their own Cleaning Solutions based on the products being cleaned.*

Remove the items after cleaning is performed by any of the above methods and thoroughly rinse with warm water. Repeat cleaning methods as required.



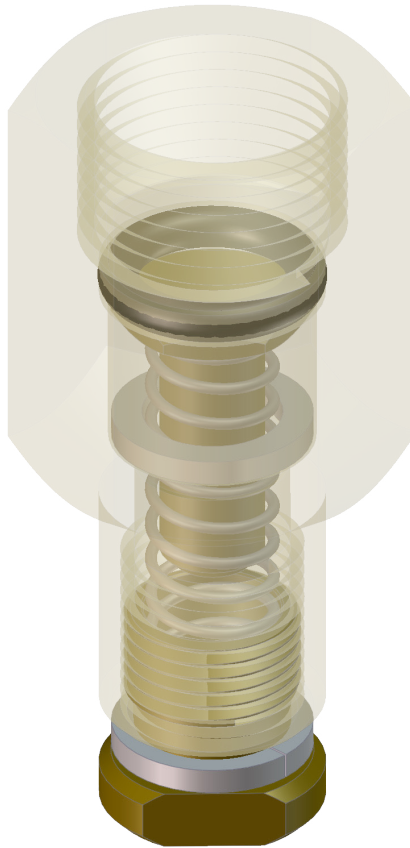
WARNING!

**Caution MUST be taken when using cleaning agents.
Take ALL necessary measures to prevent inhalation, eye or skin contact.**





PMDVADJ Automatic Drain Valve

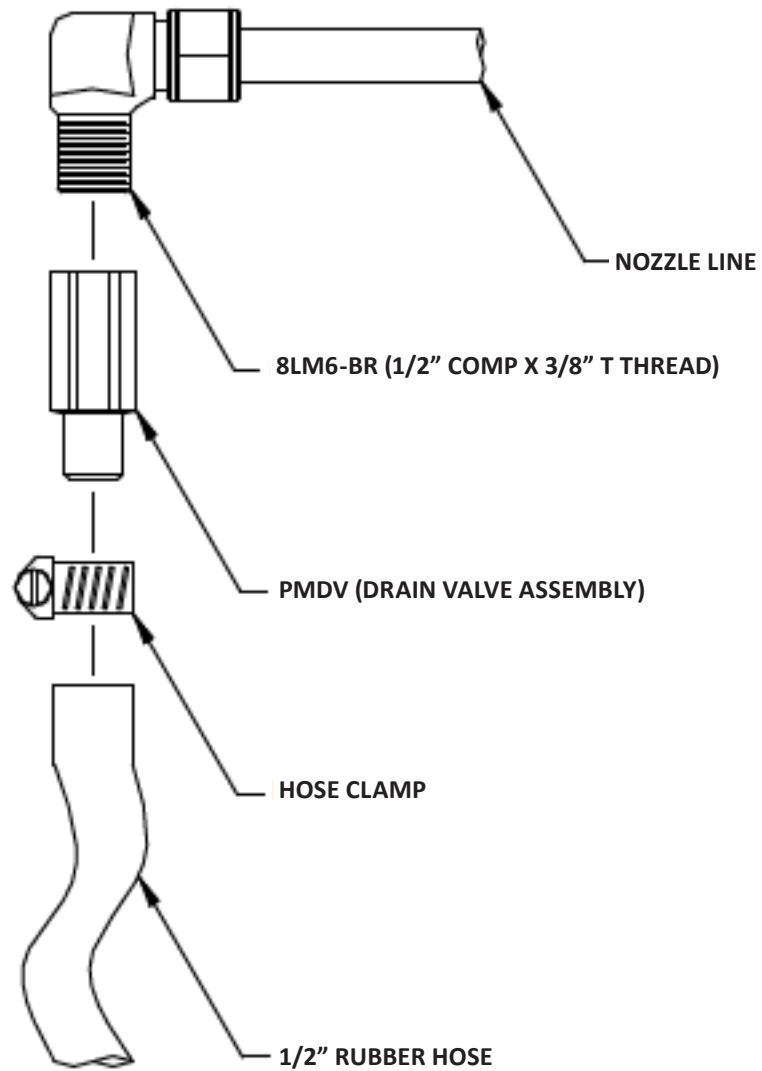


The PMDVADJ Automatic Drain Valve comes with three (3) optional PMDVWS Split Washers. The function of the Split Washer (when added) is to reduce the travel distance of the PMDVP Plunger. This increases the time it takes for the Valve to close. If the Valve does not close while the system is being pressurized, up to THREE (3) OF THE split washers can be installed.



Note: Use only the number of Split Washers required for the Valve to close. Test after you add each Split Washer.

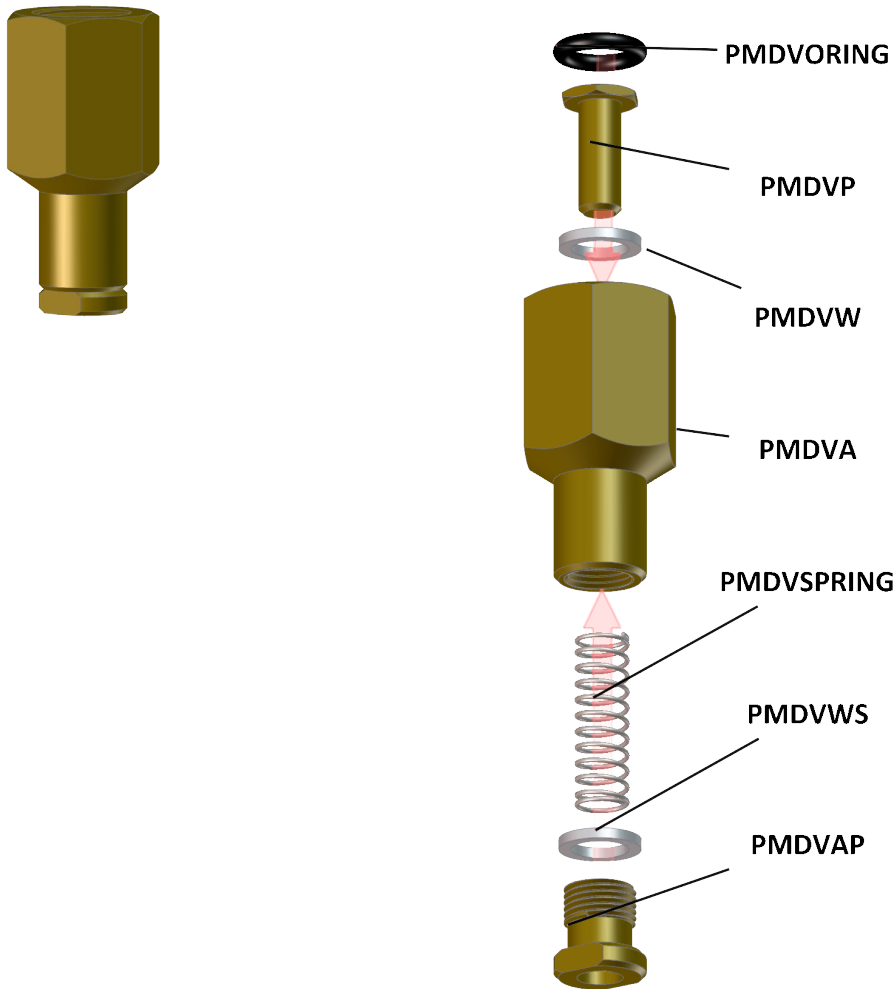
Drain Valve Line Assembly





Intentionally Blank

Appendix 1 - PMDVADJ Automatic Drain Valve Exploded Drawing and Parts List



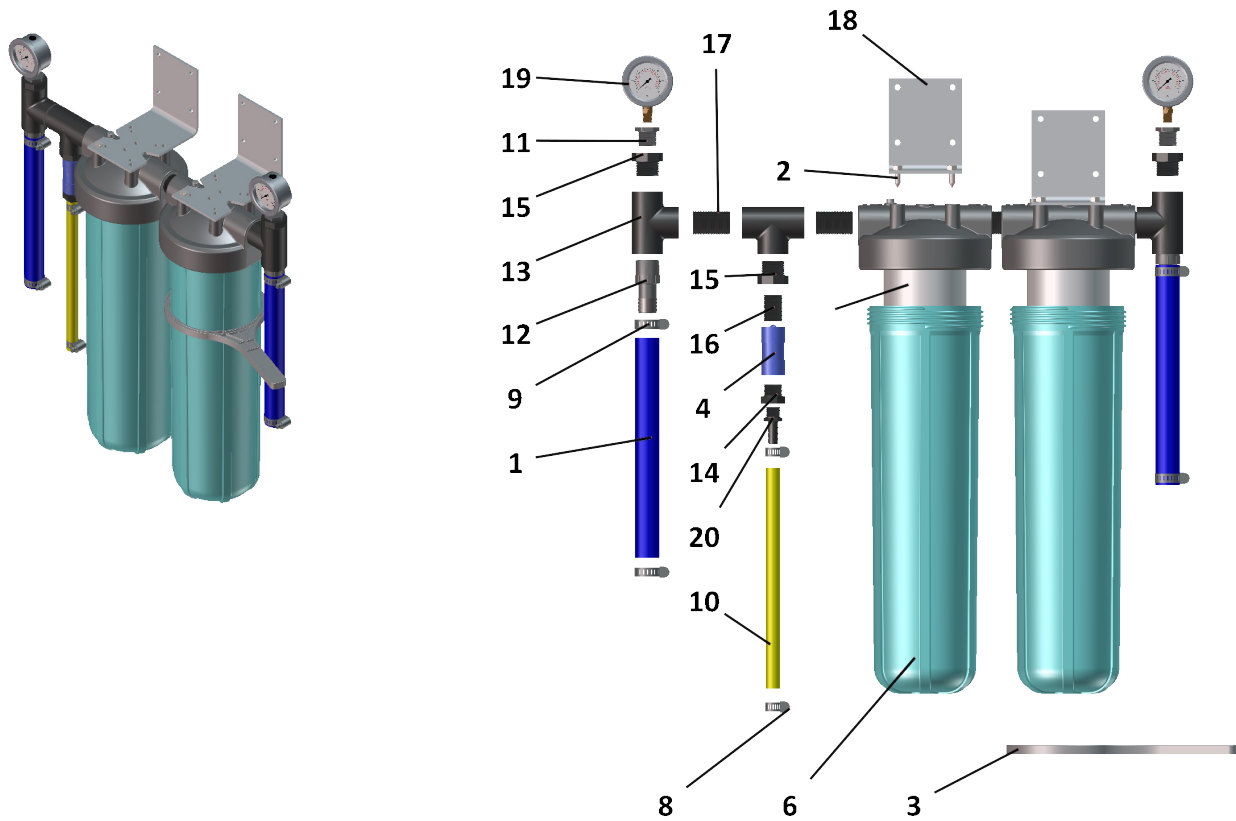
PART #	DESCRIPTION	QTY
PMDVADJ - AUTOMATIC DRAIN VALVE		
PMDV	BRASS HOUSING	1
PMDVA	DRAIN VALVE BODY ONLY, BRS, ADJUSTABLE	1
PMDVP	BRASS PLUNGER *	1
PMDVSPRING	SPRING *	1
PMDVW	WASHER *	1
PMDVORING	O-RING *	1
PMDVAP	BRASS ADJUSTMENT PLUG	1
PMDVWS	SPLIT WASHER	3
ACCESSORIES		
VRP77	1/2", YELLOW, DRAIN VALVE HOSE	1
PMHC1/2	HOSE CLAMP	1
PMDVREPAIRKIT	DRAIN VALVE REPAIR KIT (* items above are included in this kit)	1



Appendix 2 - Filter Kit Parts List

PART #	DESCRIPTION	QTY
FILTER CARTRIDGES		
PMCLR-5-10	5 MICRON FILTER CARTRIDGE, 10" 2-1/2" DIA	1
PMCLR1-10	1 MICRON FILTER CARTRIDGE, 10" 2-1/2" DIA	1
PM3P775	SCALE INHIBITOR FILTER CARTRIDGE, 10" 2-1/2" DIA	1
PMFILT5MBIGBLUE	5 MICRON BIG BLUE FILTER CARTRIDGE, 20" 4-1/2" DIA	1
PMFILT1MBIGBLUE	1 MICRON BIG BLUE FILTER CARTRIDGE, 20" 4-1/2" DIA	1
PMCLR-1-20	1 MICRON FILTER CARTRIDGE, 20" 2-1/2" DIA	1
PMCLR-5-20	5 MICRON FILTER CARTRIDGE, 20" 2-1/2" DIA	1
VAL-CO® 10" YELLOW FILTER HOUSING:		
VF129	VAL FILTER HOUSING LID, 1" FNPT PORTS	1
VF123	VAL FILTER HOUSING BOTTOM	1
VF126	VAL FILTER HOUSING O-RING	1
PMBIGBLUEWRENCH	FILTER HOUSING WRENCH	1
VF128	FILTER HOUSING MOUNTING BRACKET	1
VRP05	HEX HD LAG SCREWS (used to attach Mounting Bracket to Filter Housing Lid)	1
PMSCH80850002	HEX HEAD PVC PLUG, 1/4" MNPT (used on Filter Housing Lid)	1
PMSCH80850007	HEX HEAD PVC PLUG, 3/4" MNPT (used on Filter Housing Bottom)	1
STANDARD - 10" BLUE FILTER HOUSING:		
PM10FILTERHOUSE	STANDARD FILTER HOUSING, 10", 3/4" FNPT Ports	1
PMFILTORING4	STANDARD FILTER HOUSING O-RING	1
PMFILTERWRENCH	STANDARD FILTER HOUSING WRENCH	1
VF128-PM20	STANDARD FILTER HOUSING MOUNTING BRACKET	1
VRP05	HEX HD SCREWS (used to attach Mounting Bracket to Filter Housing Lid)	1
STANDARD - 20" BLUE FILTER HOUSING:		
PM20FILTERHOUSE	STANDARD FILTER HOUSING, 20", 3/4" FNPT Ports	1
PMFILTORING4	STANDARD FILTER HOUSING O-RING	1
PMFILTERWRENCH	STANDARD FILTER HOUSING WRENCH	1
VF128-PM20	FILTER HOUSING MOUNTING BRACKET	1
VRP05	HEX HD SCREWS (used to attach Mounting Bracket to Filter Housing Lid)	1
BIG BLUE 20" FILTER HOUSING:		
PMFILT50GPM	BIG BLUE FILTER HOUSING ASSEMBLY, 20", 1" FNPT Ports	1
PMFILTORING6	BIG BLUE FILTER HOUSING O-RING	1
PMBIGBLUEWRENCH	BIG BLUE FILTER HOUSING WRENCH	1
VF128	FILTER HOUSING MOUNTING BRACKET	1
PM5/16x1Lag	HEX HD LAG SCREWS (used to attach Mounting Bracket to Filter Housing Lid)	1

Appendix 3 - 10-30 GPM Filter Kit Exploded drawing and Parts List

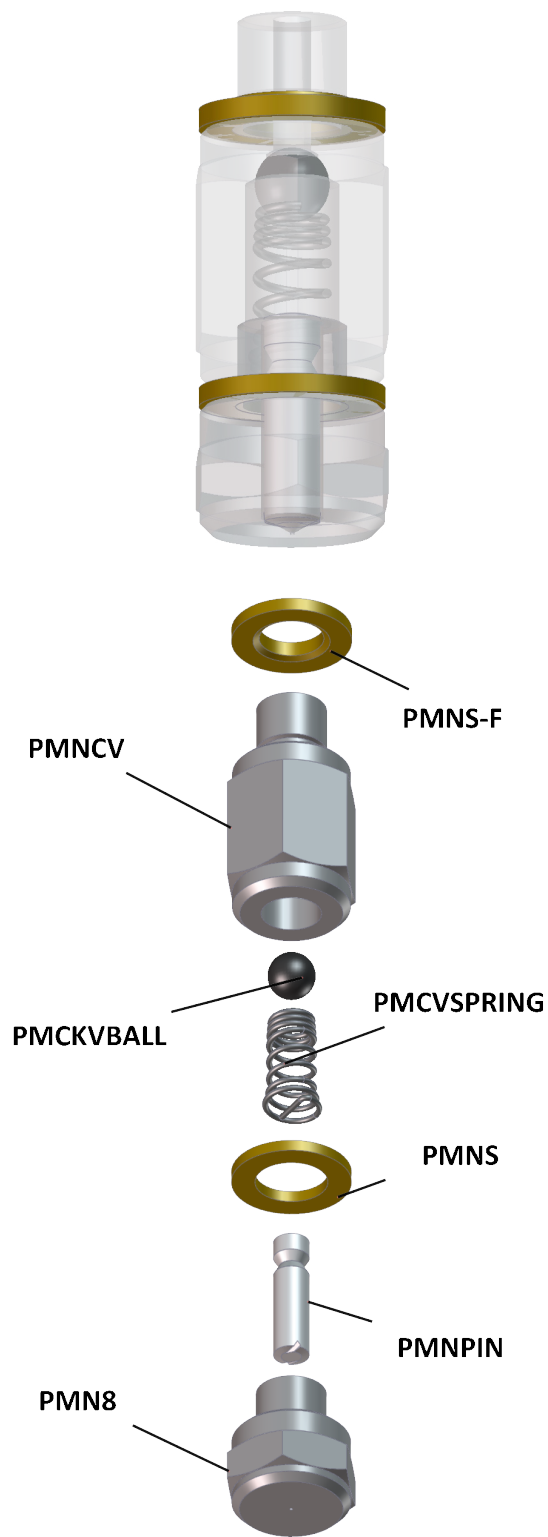


KEY	PART NUMBER	DESCRIPTION	QTY
10-30 GPM FILTER KIT			
1	PM200PSIHOSE1	HOSE, 1" ID, BLUE, PVC 200 PSI W/VAL LAYLINE ON HOSE	20
2	PM5-16X1LAG	5/16" X 1" LAG SCREW	8
3	PMBIGBLUEWRENCH	WRENCH FOR BIG BLUE HOUSING USE WITH # PMFILT50GPM	1
4	PMCKVALVE	3/4" PVC VALVE	1
5	PMFILT1MBIGBLUE	1 MICRON FILTER CARTRIDGE 4.5" O.D. X 20" LONG X 1" I.D.	1
6	PMFILT50GPM	FILTER - 50 GPM	2
7	PMFILT5MBIGBLUE	5 MICRON FILTER CART 20"x4 1/2 FOR 40/50 GPM FILTER HOUSING	1
8	PMHC1-2	TRIDON HOSE CLAMP 3/8" - 7/8"	2
9	PMHC3-4	TRIDON HOSE CLAMP 3/4"	4
10	PMLPHOSE300PSI	1/2" ID HOSE 300PSI AT 70 DEG F BYPASS HOSE-KURI TEC YELL- 500'	10
11	PMSCH803-4REDBUSHING	3/4" MNPT X 1/4" FNPT RED BUSHING SCH 80	2
12	PMSCH80350410	1" HOSE BARB X MNPT SCHEDULE 80	2
13	PMSCH80805010	1" FNPT X 1" FNPT X 1" FNPT TEE	3
14	PMSCH80839101	3/4" MNPT X 1/2" FNPT RED BUSHING	1
15	PMSCH80839131	1" MNPT X 3/4" FNPT REDUCING BUSHING	3
16	PMSCH80861104	3/4" X CLOSE NIPPLE, SCH 80	1
17	PMSCH80861134	1" x 2" CLOSE NIPPLE	4
18	VF128	FILTER BRACKET (ALUMINUM)	2
19	VG100	OIL FILLED PRESSURE GUAGE (0-100 PSI/BAR), 2 1/2" SS CASE	2
20	VRP71	1/2" THREADED MALE HOSE CONNECTOR (1/2" BARB)	1

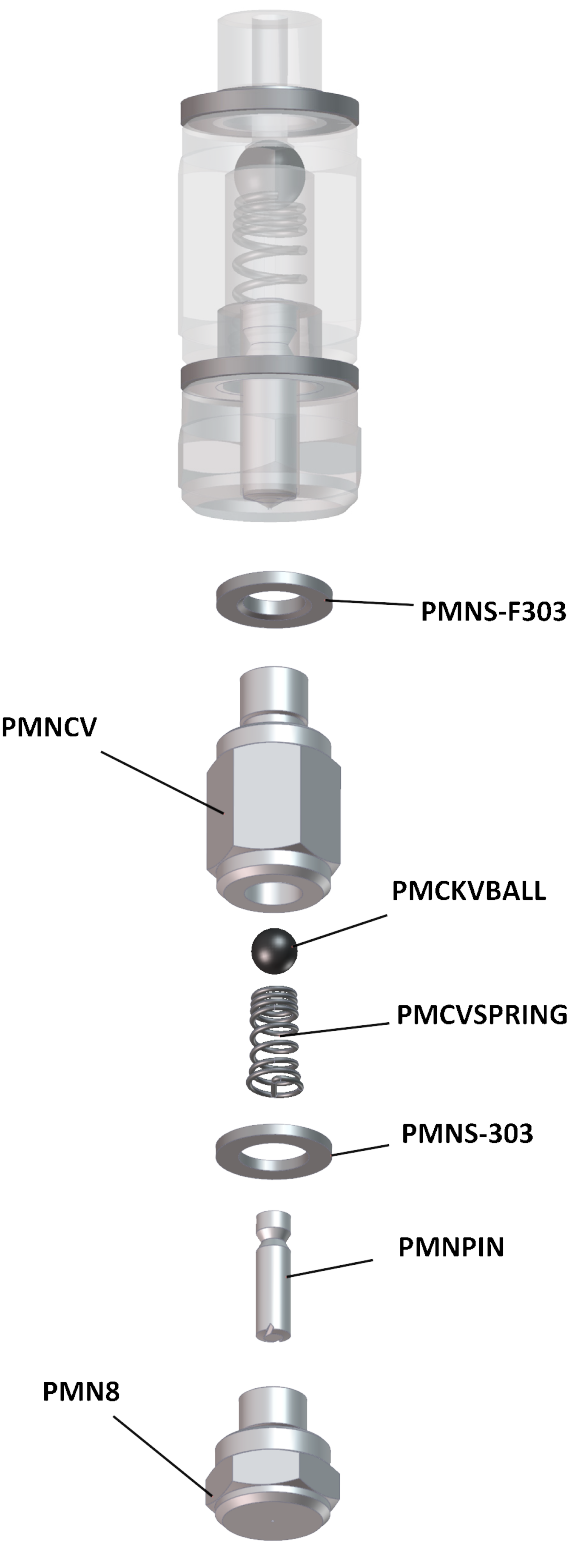


Appendix 4 - Nozzle Exploded Drawing

PMNOZ8



PM303NOZ8303SS



Appendix 5 - Nozzle Assemblies and Spare Parts List

PART #	DESCRIPTION	QTY
NOZZLE LINE		
PMNOZ8	NOZZLE / CHECK VALVE ASSEMBLY, 303 S/S <i>(This assembly uses Copper Seals)</i>	1
PMNOZ8FCFC	NOZZLE ASSY W/CHECK VALVE	1
PM303NOZ8303SS	NOZZLE ASSEMBLY, 303SS W/CHECK VALVE W/303SS SEALS	1
PM316NOZ8CG316SS	NOZZLE ASSY, 316SS GROOVED W/CHECK VALVE AND 316SS SEALS	1
PMPLUG	NOZZLE PLUG, 303 S/S <i>(uses (1) PMNS-F Copper Seal)</i>	1
PMPLUGX	NOZZLE PLUG, 303 S/S <i>(NO Seal included)</i>	1
PMN8	NOZZLE BODY ONLY. 303 S/S	1
PMNCV	CHECK VALVE BODY ONLY, 303 S/S	1
PMNS	SEAL, FLAT - COPPER	1
PMNS303	SEAL, FLAT – 303 STAINLESS STEEL	1
PMNS-F	SEAL, FLANGED - COPPER	1
PMNS-F303	SEAL, FLANGED – 303 STAINLESS STEEL	1
PMNPIN	NOZZLE ATOMIZATION PIN, 303 S/S	1
PMCVSPRING	CHECK VALVE SPRING, 316 S/S	1
PMCKVBALL	CHECK VALVE BALL, 1/8" Dia, 70 DURO BUNA-NITRILE	1
PMNOZ8BRUSH	NOZZLE CLEANING BRUSH	1
PMVC-312-8	PM8 NOZZLE / CHECK VALVE PROTECTION CAP	1



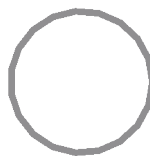
Appendix 6 - Accessory Parts List



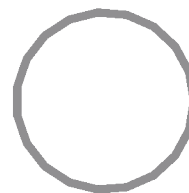
3/8" TUBING



1/2" TUBING



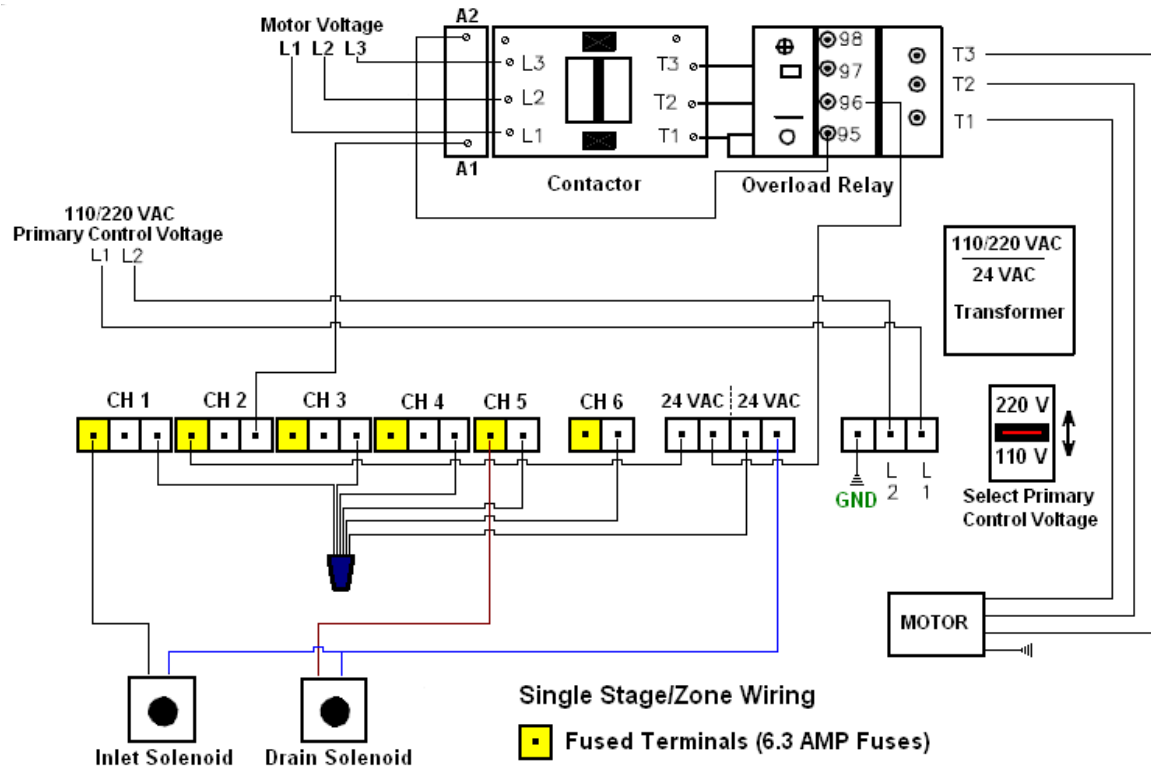
3/4" TUBING



1" TUBING

PART #	DESCRIPTION	QTY
TUBING (* Sold by piece)		
PMST1010	1" OD 316 GRADE SS Tube 10 ft length	*
PMST1210	1/2" OD 316 GRADE SS TUBE 10 ft length	*
PMST3410	3/4" OD 316 GRADE SS TUBE, .035" WALL 10 ft length	*
PMST3420	3/4" OD 316 SS TUBE, .035" WALL, 20' ft length	*
PMST3810	3/8" OD 316 GRADE SS TUBE, .028" WALL, 10 ft length	*
PMST3810M	3/8" OD 316 GRADE SS TUBE, .028" WALL, 4 METER PCS ONLY	
PMST3820	3/8" OD 316 GRADE SS TUBE, .028" WALL, 20 Ft sections	*
CABLE		
PMCABL1000SS	1/16" STAINLESS STEEL CABLE, 1000 FT. ROLL	1
PMCABL500SS	1/16" STAINLESS STEEL CABLE, 500 FT ROLL	1
PMTIGHT	9" CABLE TIGHTNERS FOR STAINLESS STEEL CABLE	1
PMSLEEVE	ALUMINUM CABLE SLEEVE FOR STAINLESS STEEL CABLE	1
TOOLS		
VC300	CABLE CUTTER 3/16" MAX	1
PMPIPCUTTER	SS PIPE CUTTER FOR HIGH PRESSURE MIST SYSTEM	1
PMSWAGETOOL	1/16" HAND SWAGE TOOL	1

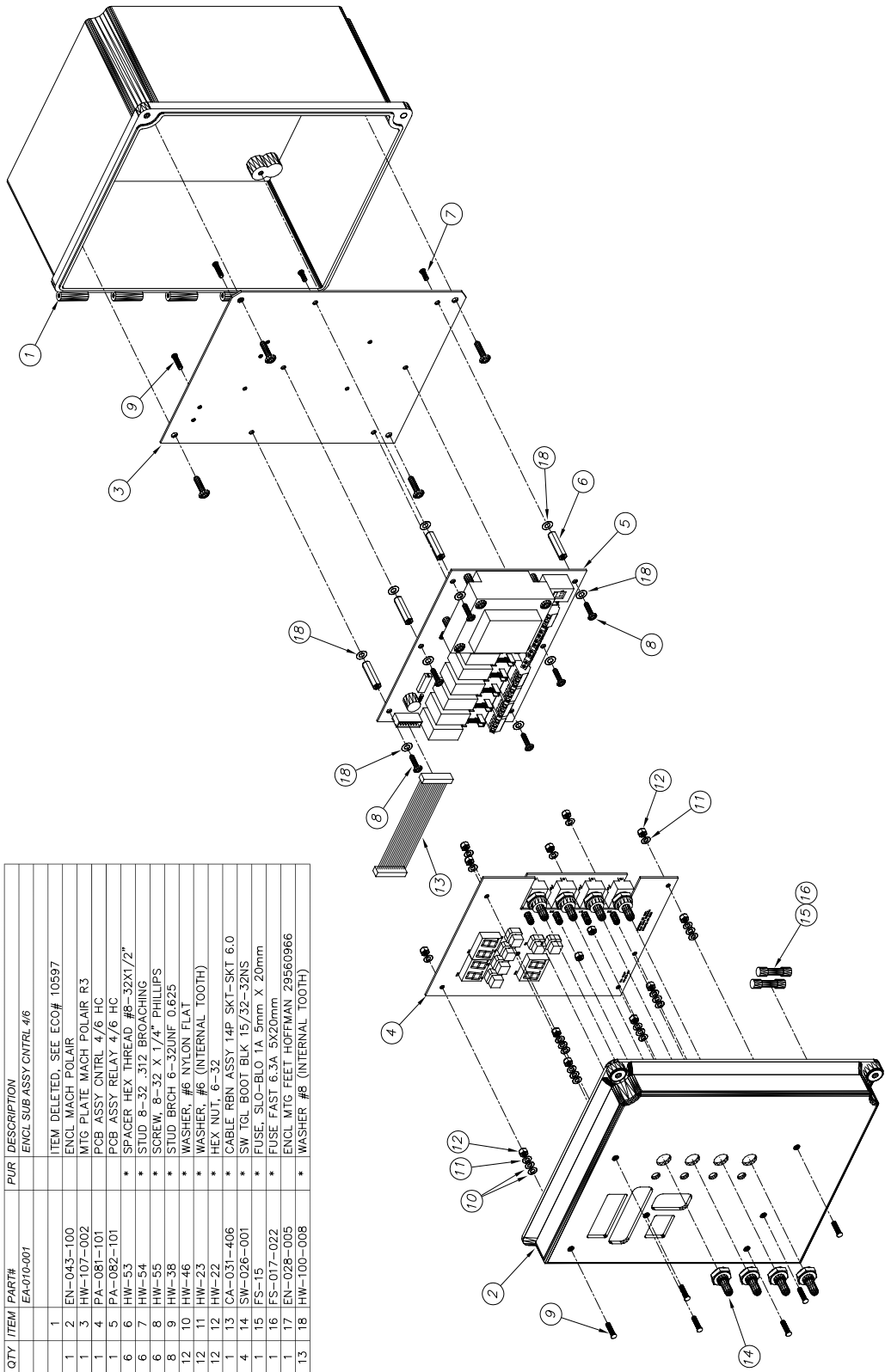
Appendix 7 - PolAIR® Control 400HC



- Channel 1 - Inlet Solenoid
- Channel 2 - A1 Contactor Coil
- Channel 3 - Stage / Zone One
- Channel 4 - Stage / Zone Two
- Channel 5 - Drain Solenoid (State / Zone one)
- Channel 6 - Drain Solenoid (Stage / Zone Two)



Appendix 8 - PolAIR® EA-010-001 Control Drawing



QTY	ITEM	PART#	PUR	DESCRIPTION
		EA-010-001		ENCL SUB ASSY CNTRL 4/6
1				ITEM DELETED, SEE ECO# 10597
1	2	EN-043-100		ENCL MACH POLAIR
1	3	HW-107-002		MTG PLATE MACH POLAIR R3
1	4	PA-081-101		PGB ASSY CNTRL 4/6 HC
1	5	PA-082-101		PGB ASSY RELAY 4/6 HC
6	6	HW-53	*	SPACER HEX THREAD #8-32X1/2"
6	7	HW-54	*	SCREW 8-32 X 1/4" PHILLIPS
8	8	HW-38	*	STUD BRCH 6-32UNF 0.625
12	9	HW-46	*	WASHER, #6 NYLON FLAT
12	10	HW-23	*	WASHER, #6 (INTERNAL TOOTH)
12	11	HW-22	*	HEX NUT, 6-32
1	12	CA-031-406	*	CABLE RBN ASSY 14P SKT-SKT 6.0
4	13	SW-026-001	*	SW TGL BOOT BLK 15/32-32NS
1	14	FS-15	*	FUSE, SLO-BLO 1A 5mm X 20mm
1	15	FS-017-022	*	FUSE FAST 6.3A 5X20mm
1	16	EN-028-005	*	ENCL MTG FEET HOFFMAN 29560966
13	17	EN-100-008	*	WASHER #8 (INTERNAL TOOTH)

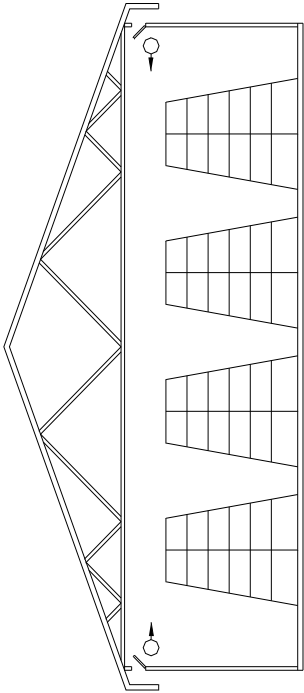
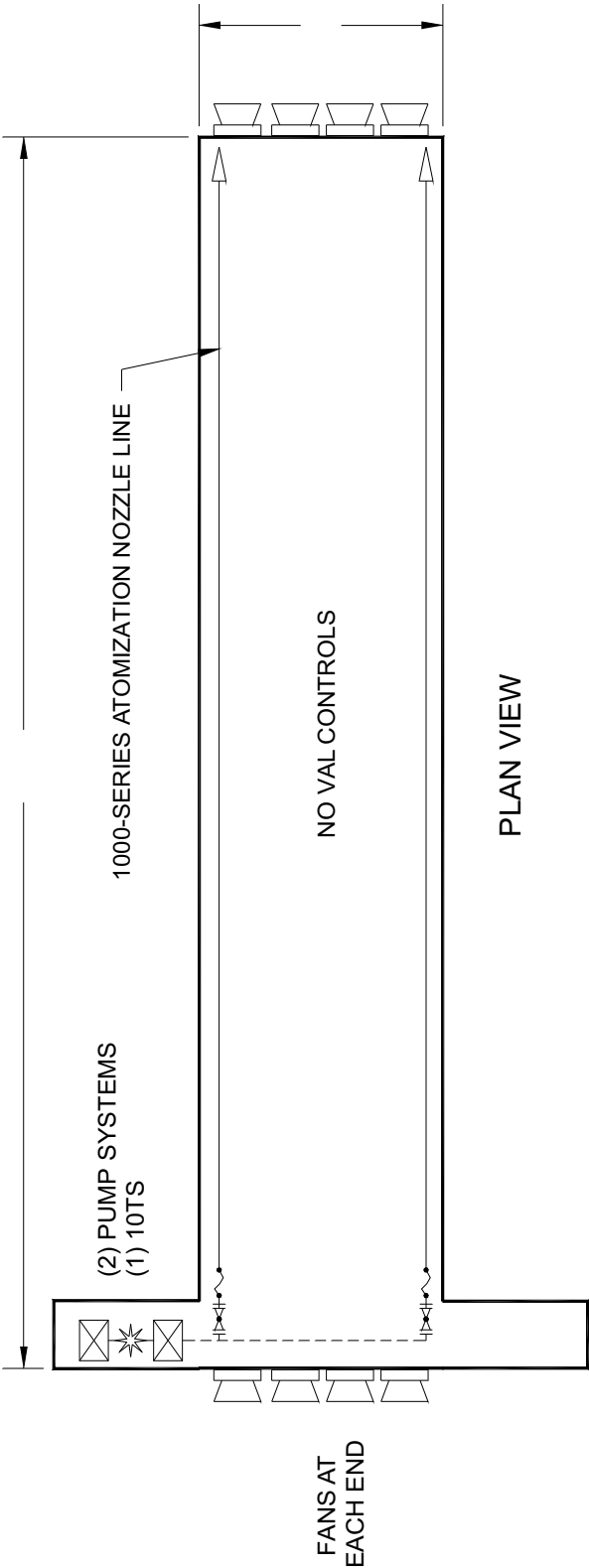
Appendix 9 - VE-010-001 POLAIR® 400 HC CONTROL PARTS LIST

PART #	DESCRIPTION	QTY
VE-010-001 - POLAIR® 400HC CONTROL		
EA-010-001	ENCL SUB ASSY CNTRL 4/6 HC	1
CA-031-406	CABLE RBN ASSY 14P SKT-SKT 6.0	1
EN-043-100	ENCL MACH POLAIR	1
FS-017-022	FUSE FAST 6.3A 5X20MM	1
FS-15	FUSE SLO-BLO 1A 5MM X 20MM	1
HW-100-008	#8 INTERNAL TOOTH WASHER	13
HW-107-002	MTG PLATE MACH POLAIR R3	1
HW-142-001	5/16-18X1 MACHINE PHD SS SCREW	1
HW-143-001	5/16-18 NYLON NUT	1
HW-22	HEX NUT/#6-32	12
HW-23	#6 INTERNAL TOOTH WASHER	12
HW-38	5/8" STUD BROACH 6-32 UNF	8
HW-46	#6 NYLON FLAT WASHER	12
HW-53	SPACERS/#8-32X1/2" HEX	6
HW-54	#8-32X.312 BROACHING STUD	6
HW-55	#8-32x1/4" PH HD	6
PA-081-101	PCB ASSY CNTRL 4/6 HC	1
PA-082-101	PCB ASSY RELAY 4/6 HC	1
SW-026-002	SW TGL BOOT GY SILICONE	4
HW-22	HEX NUT/#6-32	2
HW-23	#6 INTERNAL TOOTH WASHER	2
LD-117-001	DECAL POLAIR 400HC	1
LD-117-003	DECAL MENU SET POLAIR 400HC	1
PM-063-003	MANUAL	1
RY-010-004	CONTACTOR 3 POLE 23A 50/60 HZ	1
RY-011-204	RELAY MTR OVERLOAD 5.4-27A 3	1
SW-026-002	SW TGL BOOT GY SILICONE	4
WS-038-018	WIRE STRD UL1015 PVC 18AWG BLK	2.77



Appendix 10 - Layout Option Examples

SINGLE STAGE COOLING SYSTEM LAYER HOUSE INTERNAL NOZZLE LINE

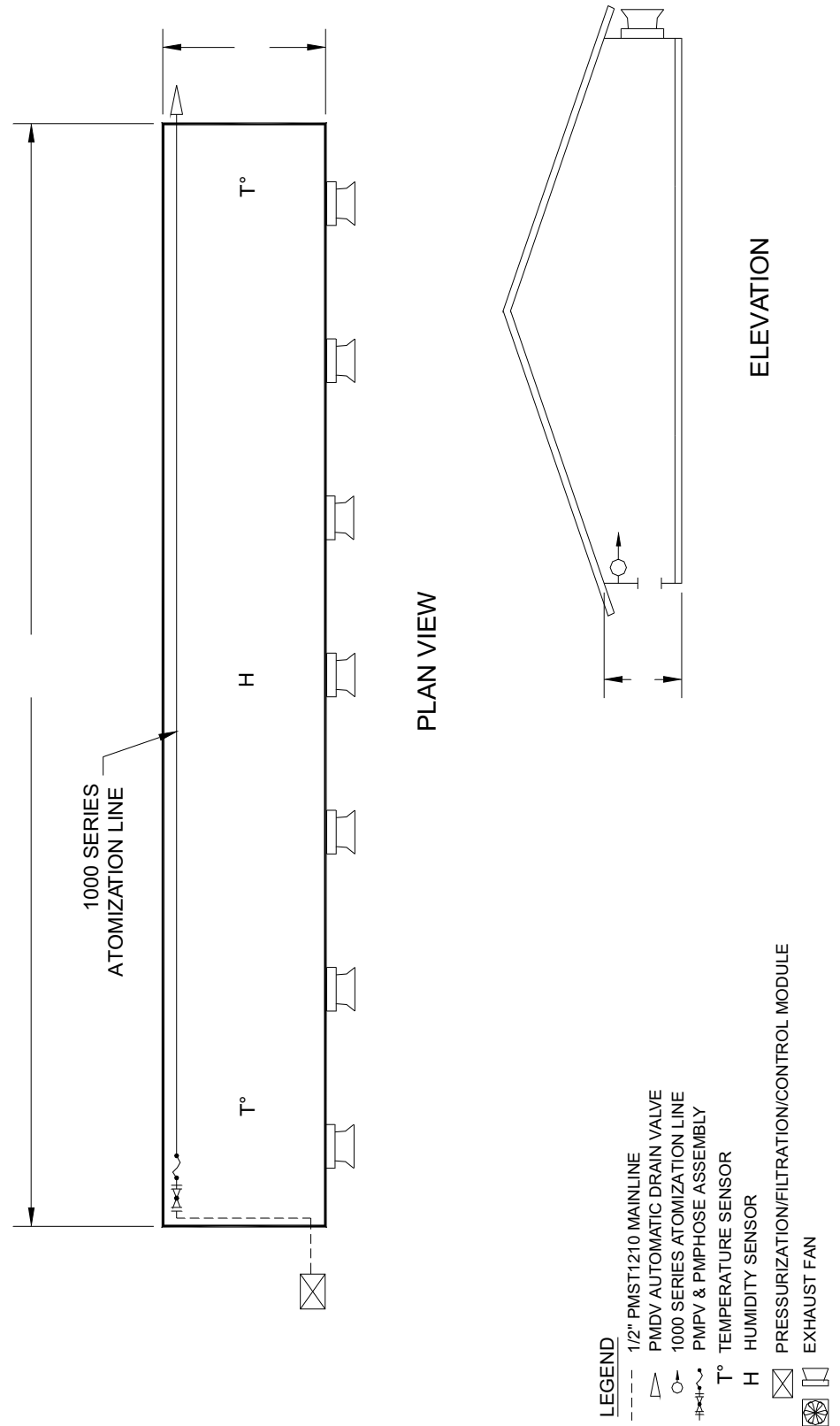


LEGEND

- 1/2" PMST1210 MAINLINE
- △ PMDV AUTOMATIC DRAIN VALVE
- 1000-SERIES ATOMIZATION LINE
- ~ PMPV & PMPHOSE ASSEMBLY
- ✱ 10TS WATER TREATMENT SYSTEM
- ☒ PRESSURIZATION/FILTRATION/CONTROL MODULE

Appendix 10 - Layout Option Examples - continued

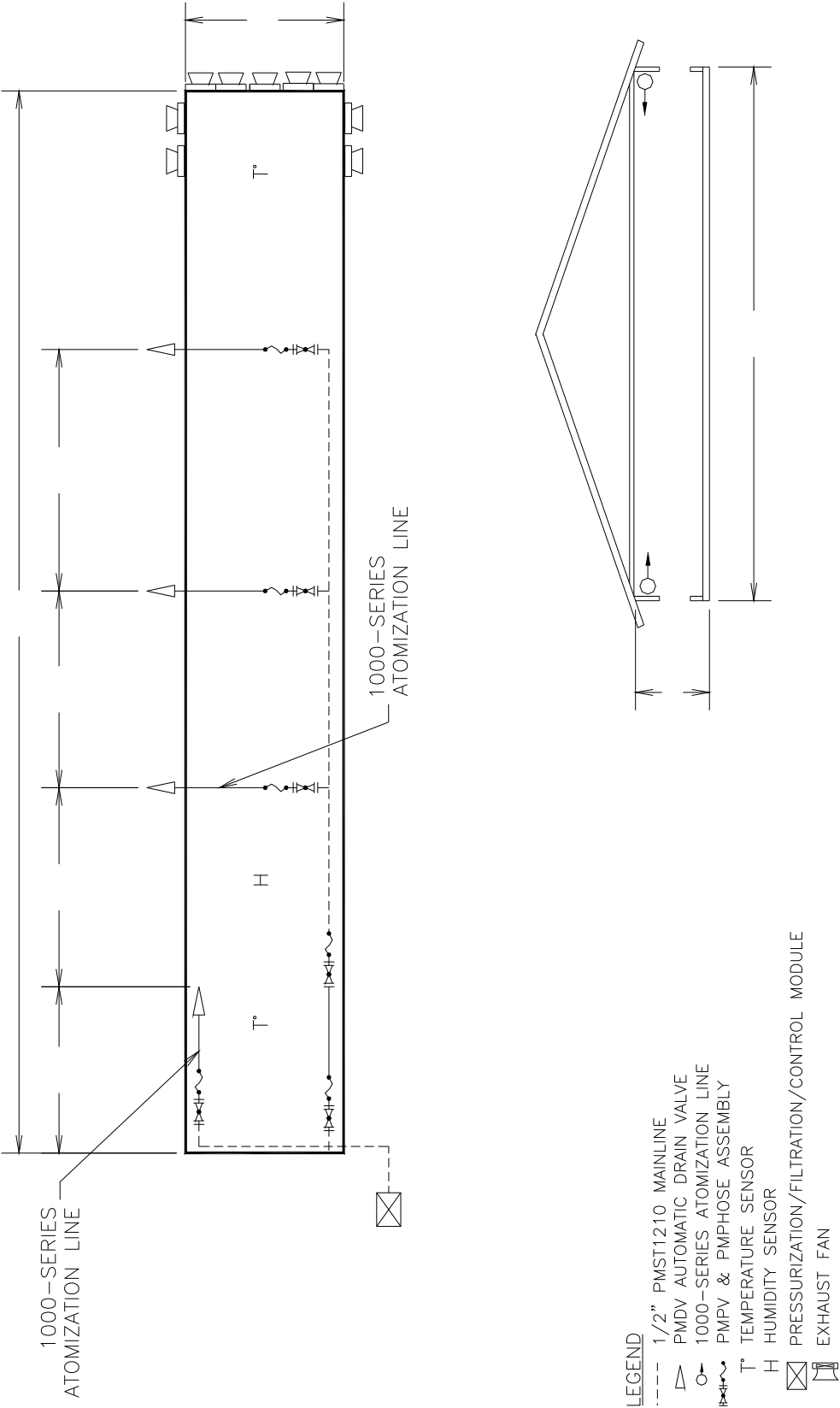
SINGLE STAGE COOLING SYSTEM BROILER HOUSE CROSS FLOW VENTILATION





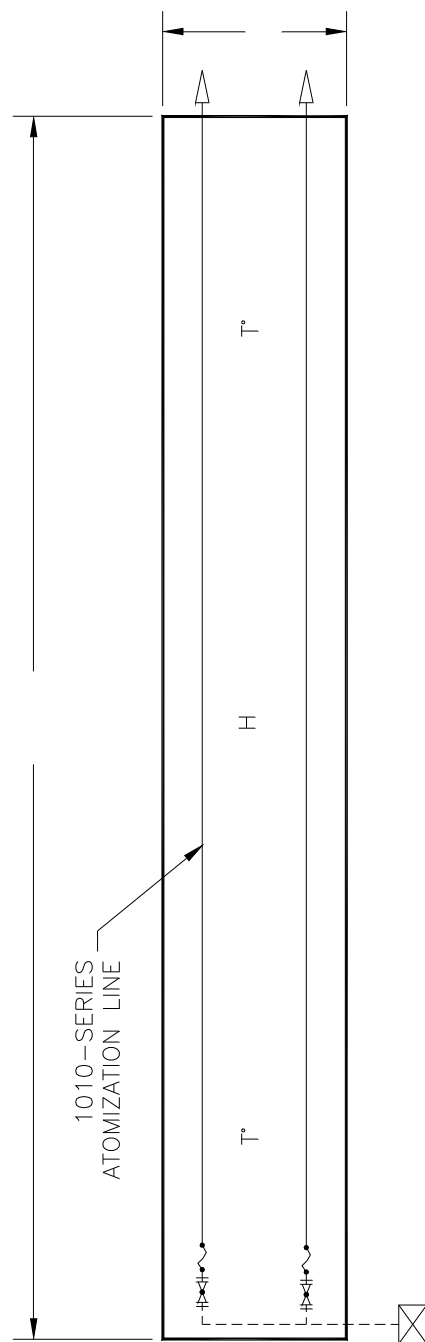
Appendix 10 - Layout Option Examples - continued

SINGLE STAGE COOLING SYSTEM TUNNEL HOUSE

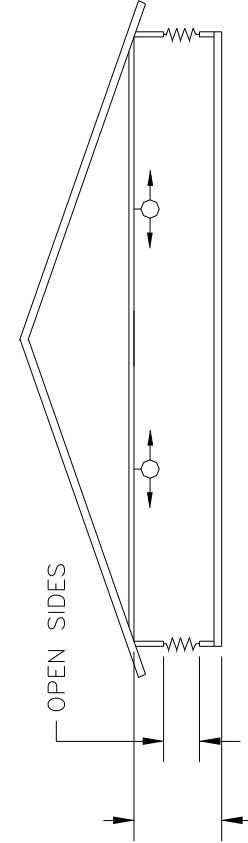


Appendix 10 - Layout Option Examples - continued

SINGLE STAGE COOLING SYSTEM BROILER HOUSE NATURAL VENTILATION (NO FANS)



PLAN VIEW



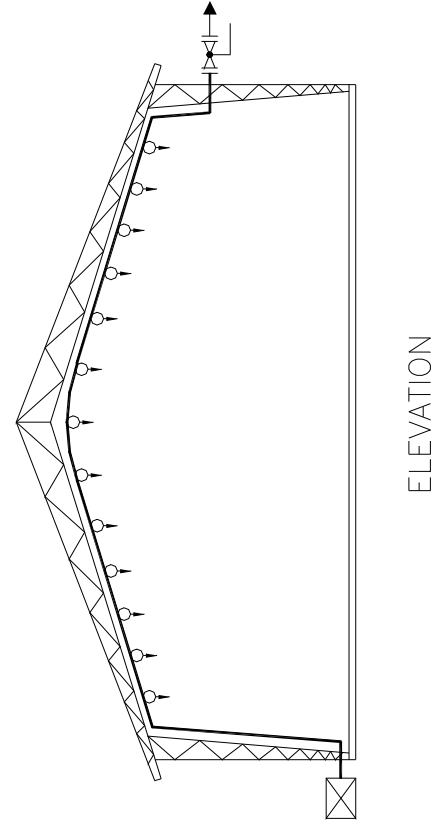
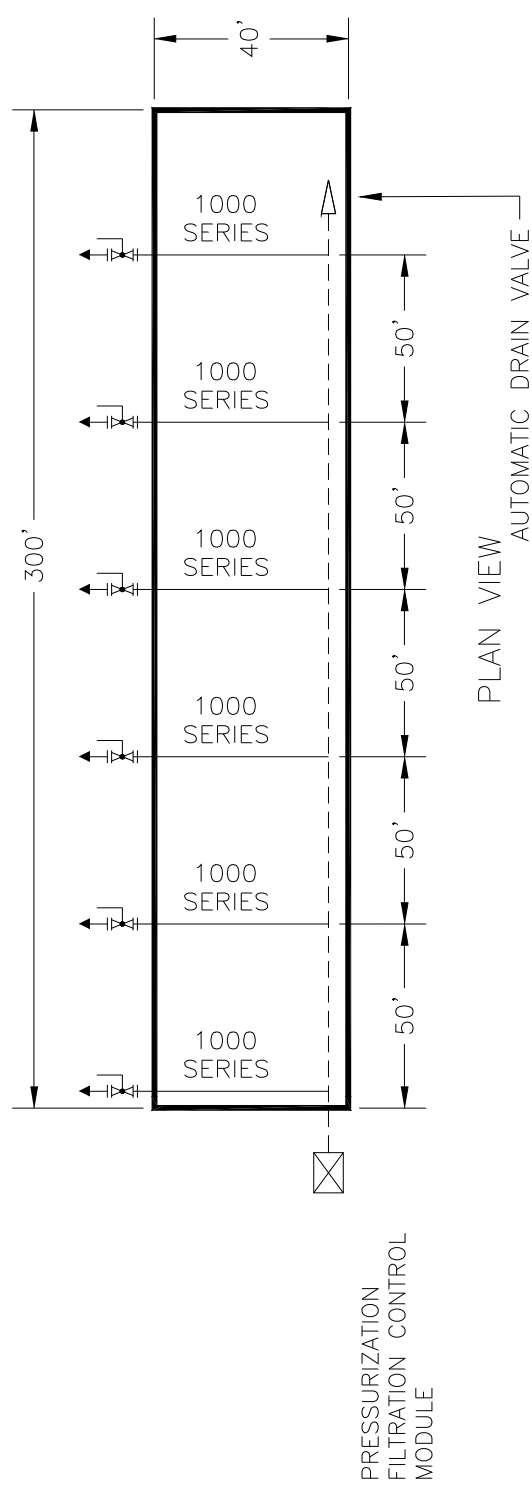
ELEVATION

- LEGEND**
- 1/2" PMST1210 MAINLINE
 - △ PMDV AUTOMATIC DRAIN VALVE
 - 1010-SERIES ATOMIZATION LINE
 - ⊕ PMBV & PMPHOSE ASSEMBLY
 - T° TEMPERATURE SENSOR
 - H HUMIDITY SENSOR
 - ⊗ PRESSURIZATION/FILTRATION/CONTROL MODULE



Appendix 10 - Layout Option Examples - continued

SINGLE STAGE RAINBOW COOLING (40' X 300') NATURAL VENTILATION W/CIRCULATION FANS

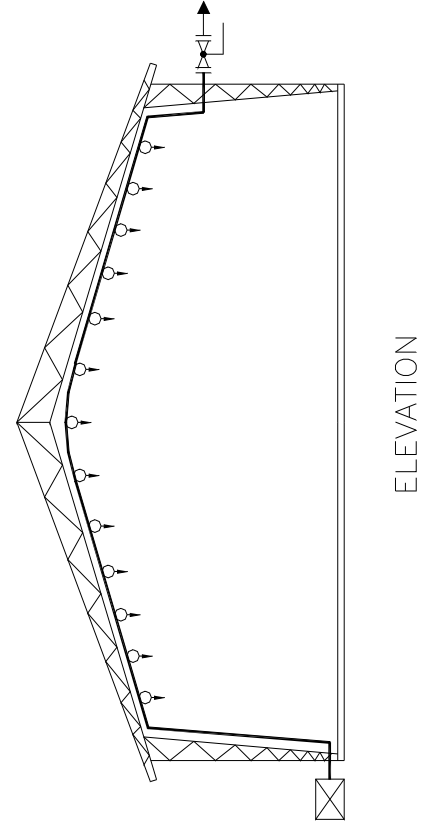
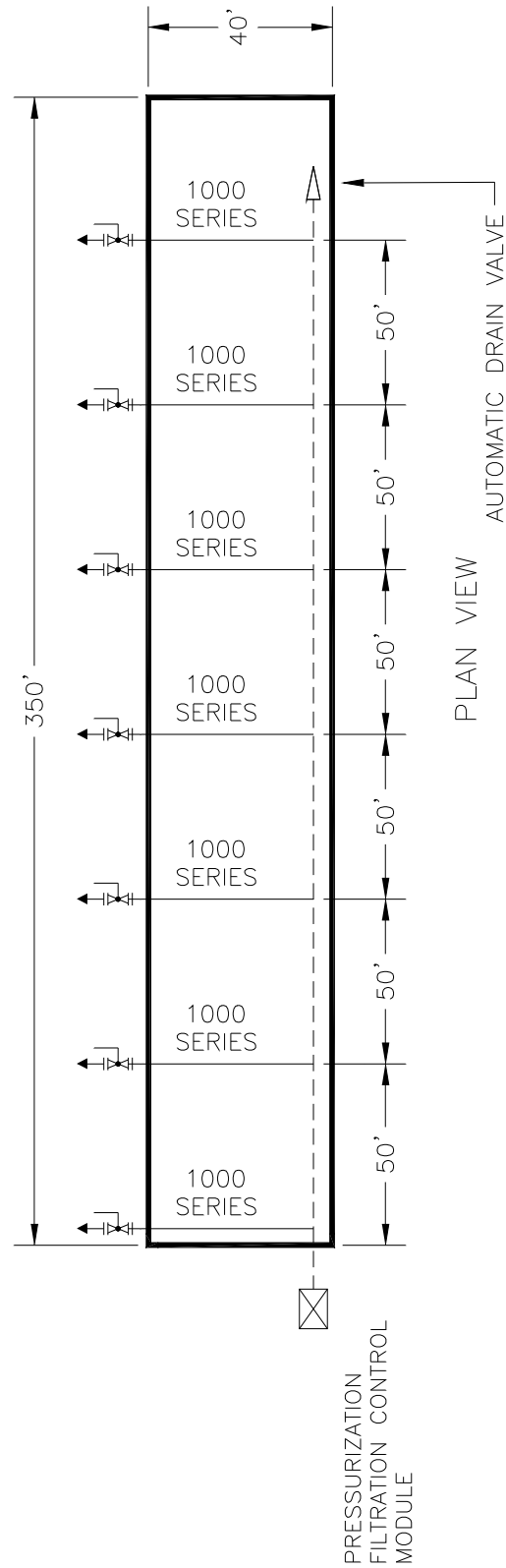


(6) RAINBOW LINES
SPACED @ 50'

- LEGEND**
- MANUAL FLUSH & DRAIN VALVE
 - 1/2" PMST1210 MAINLINE
 - PMDV AUTOMATIC DRAIN VALVE
 - 1000 SERIES ATOMIZATION LINE
 - PMPV & PMPHASE ASSEMBLY
 - TEMPERATURE SENSOR
 - HUMIDITY SENSOR
 - PRESSURIZATION/FILTRATION/CONTROL MODULE

Appendix 10 - Layout Option Examples - continued

SINGLE STAGE RAINBOW COOLING (40' X 350') NATURAL VENTILATION W/CIRCULATION FANS



(7) RAINBOW LINES
SPACED @ 50'

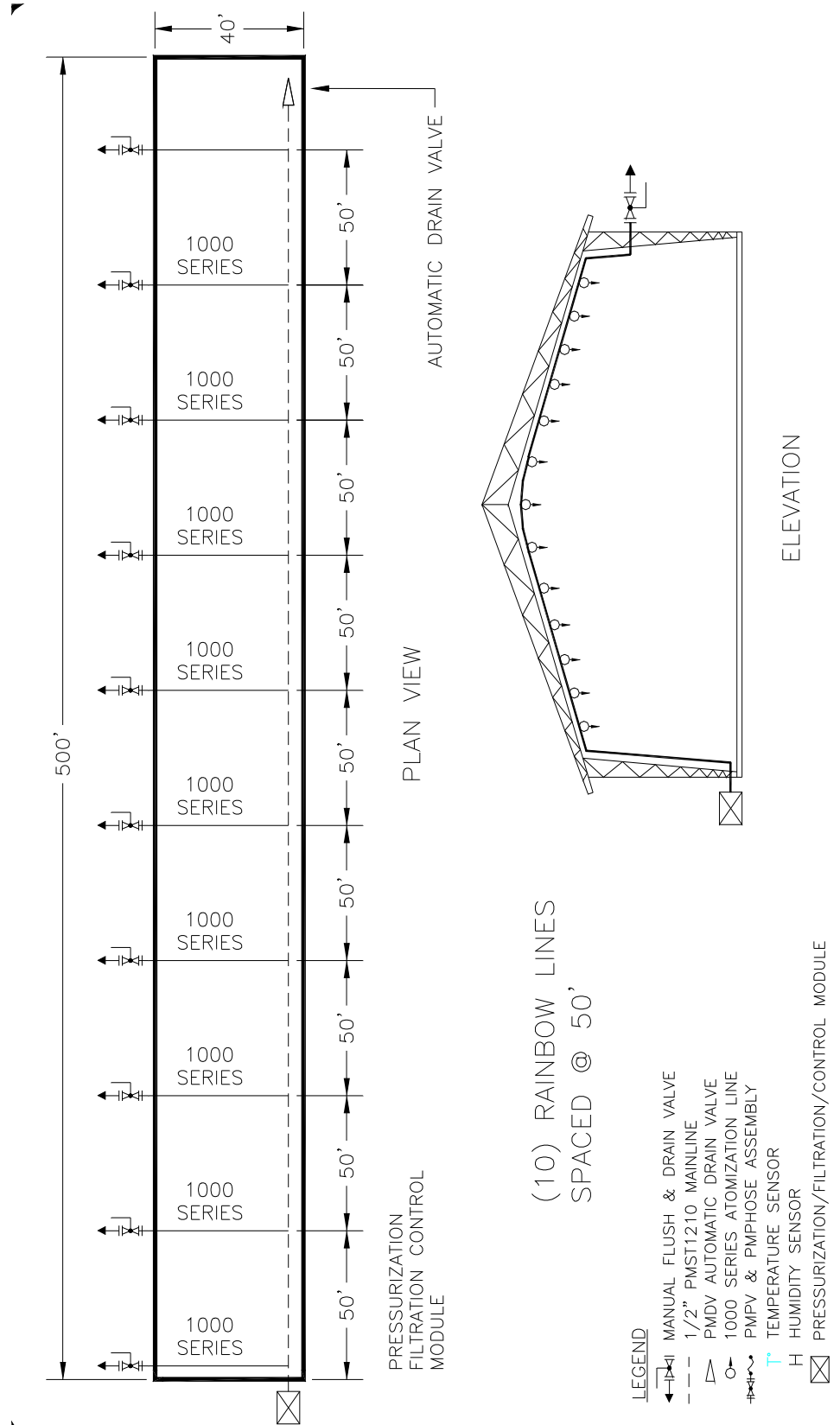
LEGEND

- MANUAL FLUSH & DRAIN VALVE
- 1/2" PMST1210 MAINLINE
- PMDV AUTOMATIC DRAIN VALVE
- 1000 SERIES ATOMIZATION LINE
- PMFV & PMPHOSE ASSEMBLY
- T° TEMPERATURE SENSOR
- H° HUMIDITY SENSOR
- PRESSURIZATION/FILTRATION/CONTROL MODULE



Appendix 10 - Layout Option Examples - continued

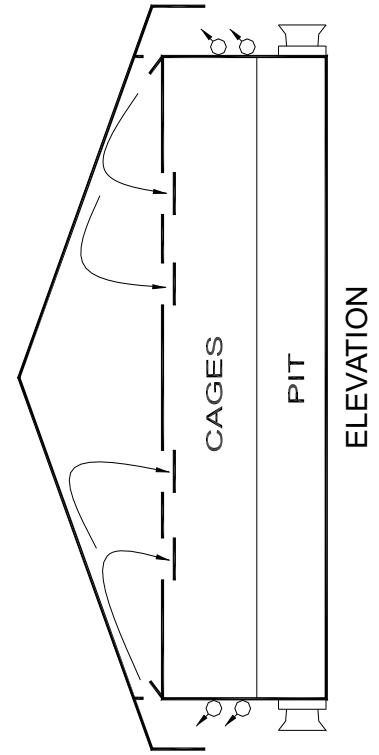
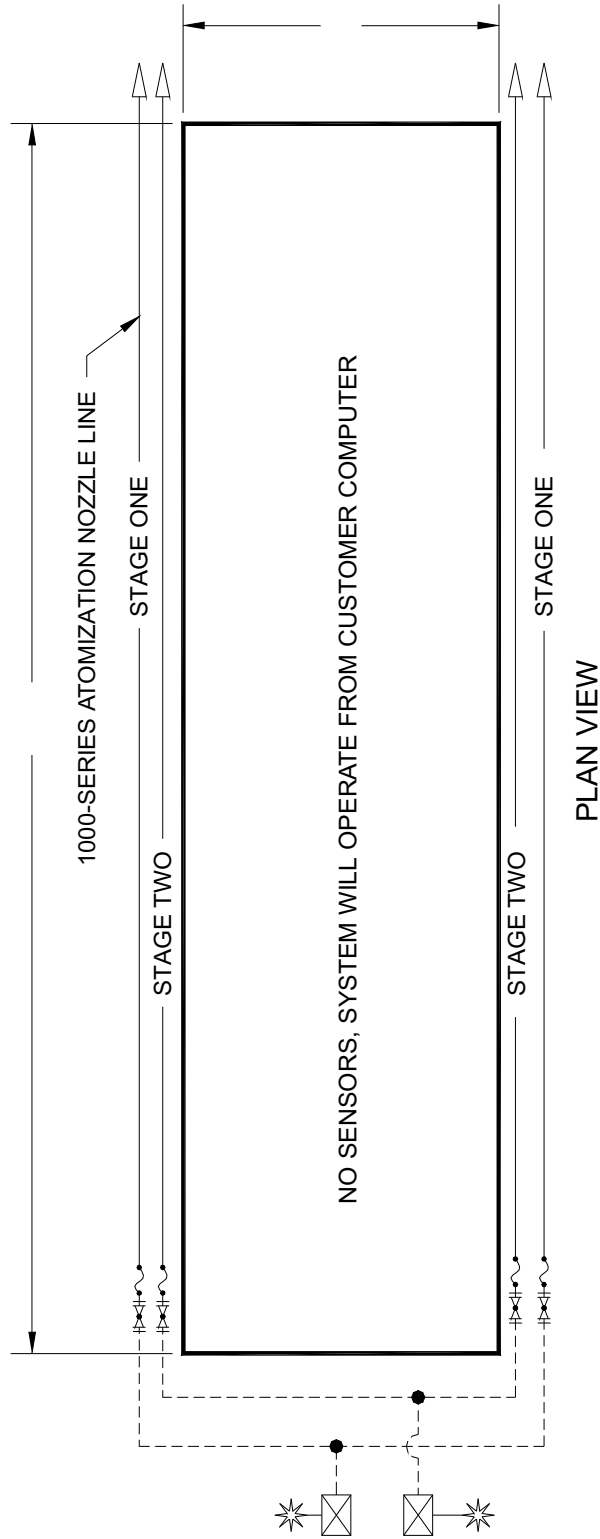
SINGLE STAGE RAINBOW COOLING (40' X 500') NATURAL VENTILATION W/CIRCULATION FANS





Appendix 10 - Layout Option Examples - continued

TWO STAGE COOLING SYSTEM LAYER HOUSE W/COOLING CORRIDOR



LEGEND

- * 10TS WATER TREATMENT SYSTEM
- EXHAUST FAN
- 1/2" PMST1210 MAINLINE
- PMDV AUTOMATIC DRAIN VALVE
- 1000-SERIES ATOMIZATION LINE
- PMPV & PMPHOSE ASSEMBLY
- PRESSURIZATION/FILTRATION/CONTROL MODULE

Appendix 11 - Fog System Design Request Sheet

POLAIR HIGH PRESSURE FOG SYSTEM POULTRY - DESIGN REQUEST SHEET		
VAL-CO Salesman		Name
VAL-CO Distributor		Company
		Contact
		Phone
		Fax
		E-Mail
End User		Company
		Contact
		Phone
		Fax
		E-Mail
Structure Location		City
		State
		Country
BASIC STRUCTURE INFORMATION		
Length		
Width		
Side Wall Height		
Peak Height		
Closed Ceiling		
	Ceiling Height from floor	
Open Ceiling		
	Insulated Ceiling	
	Distance between Cross Trusses	
	Cross Truss height from floor	

UTILITIES INFORMATION							
Electric				Water Supply			
Hertz	50						City
	60						Well
Available Three (3) Phase Power		Available Single (1) Phase Power				Pond	
200	415	100	200			Brackish	
208	440	110	208			RO	
220	460	115	220			Other	
230	480	120	230				
240	575	127	240			Water Pressure	
380	600		Other			PSI	
400	Other					kPa	
Three (3) Phase NOT Available						Bar	



Appendix 11 - Fog System Design Request Sheet - continued

VENTILATION INFORMATION							
Natural Ventilation				Mechanical Ventilation			
	Ridge Vent				Total Number of Exhaust Fans		
	Side Wall Curtain				TOTAL Combined CFM of Exhaust Fans		
		Height					
		Length			Tunnel Ventilated		
		Raises to open			Side Wall Construction		
		Lowers to open				Solid	
						Curtain	
	Stir Fans				Air Inlets	Quantity	
		Size				Height of each	
		Quantity				Length of each	
TOTAL Combined CFM							
					Cross Ventilated		
					Air Inlets	Quantity	
						Height of each	
						Length of each	
					High Rise Lay House		
					Exterior Cooling Corridor/Chamber		
						Height	
						Width	
						Length	
						Quantity	

TYPE OF PRODUCTION							
LAYER		BROILER		TURKEY		Pullets	
						Breeder's	
Caged		Number of Birds			Cage Free	Number of Birds	
		White or Brown				White or Brown	
		Cage Length			Nest	Length	
		# of Cage Rows				# of Rows	
		# of Cage Tiers				Conventional	
		Cage Type	A - Frame			Community Side Belt	
			Stacked			Community Center Belt	
* Distance between the TOP of the Cage and the Ceiling or Cross Truss Use additional page (if needed) to best show in detail with measurements: * An over view of the structure. * A cross section of the structure. * The desired location of the PolAir Fog System Pump Unit/s. * Air inlets locations.							



Appendix 12 - Customer Service

My dealer's name:

Street / PO Box _____

How to contact my dealer:

City _____

State / Province _____

Customer Service

210 E. Main Street
P. O. Box 117
Coldwater, OH 45828
800.998.2526

Zip / Postal _____

Phone _____

Fax _____

E-mail _____

Web site _____



North America:

Phone: 800.99VALCO (800.998.2526)

Fax: 419.678.2200

Email: sales@val-co.com

International:

Phone: (+1) 419.678-88731

Fax: 419.678.2200

Email: intl.sales@val-co.com