

READ & SAVE THESE INSTRUCTIONS

Dual Pneumatic Atomizing System

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IMPORTANT

It is of vital importance that the procedures outlined in this booklet be followed completely. All foreign matter must be flushed from air and water lines supplying the atomizing heads before the head valves are opened and heads used. If foreign matter reaches the interior of the heads, each head must be disassembled and thoroughly cleaned - a very tedious and time-consuming process.

DON'T TAKE SHORTCUTS!

Properly installed and maintained, this system will provide for years of trouble-free service with minimal attention. Following the steps in the Maintenance section will ensure this. Please read and understand this section. The system is designed for direct humidification of an area. DO NOT install in duct or air handling systems. Contact TRION for information on our Herrmidicool system if direct humidification is not possible.

I. WARRANTY

Limited 2-Year Warranty

1. TRION warrants to the buyer or any user during the duration of the Warranty that the TRION/HERRMIDIFIER humidifier described in this manual will be free from defects of material and workmanship for a period of two (2) years.
2. For this Warranty to be effective, this humidifier must be installed, operated and maintained in accordance with the Installation Instructions, Operations and Service Manual(s) supplied with the humidifier.
3. In the event of a defect or malfunction in this product during the Warranty Period, user may contact their TRION/HERRMIDIFIER Representative or TRION Customer Service Department for a Return Material Authorization number. Items tagged with this number may be returned to the TRION Factory Repair Department for complete reconditioning without charge to the user for parts or labor. Incidental expenses such as cost of transporting the part/unit to TRION shall be borne by the user. Upon completion of the reconditioning, the humidifier will be returned at no cost to the user. In an effort to keep equipment on line, TRION may elect to send items out and use the RMA to return alleged defective parts for examination. Credit consideration will be given upon return and confirmation of improper performance. In either case, items returned without an RMA number will not be accepted!
4. This Warranty does not cover field labor for repairs to this humidifier or any special, indirect or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.
5. If, after a reasonable number of attempts to do so, TRION is unable to remedy any defects or malfunctions in this humidifier, then the user may elect either a replacement of such product or part which may be defective without charge or a refund at the buyer's original purchase price.
6. This Warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

II. SYSTEM OPERATION

The Dual Pneumatic atomizing system operates with air and water under pressure - air at approximately 30 psi and water at approximately 32 - 38 psi. Air consumption is figured at .12 SCFM per lbs. of water atomized per hour. A safety factor of 20% should be added for any potential line losses.

Operation is fully automatic and controlled by humidistats. When the relative humidity (RH) level drops below the setting on the control humidistat, the contacts on the control humidistat close the circuit, opening the solenoid valve on the air control section. As soon as pressure builds up sufficiently to atomize, the air pressure switch closes the circuit to the water solenoid valve, starting water flow. Water can not flow without adequate air pressure. All valves close if there is a power failure. The water solenoid will close if there is an air compressor failure.

When the desired level of RH is reached, the humidistat breaks the circuit, and all solenoid valves close, shutting off flow of air and water to the heads. The three-way water solenoid bleeds off the water pressure instantly, allowing the water valve seat in the head to close immediately, preventing any chance of dripping or spitting. At the end of each cycle, the air pressure is allowed to fall gradually to zero through the heads, blowing all water from the mixing chamber of the heads. The stainless steel cleaning needle connected to the diaphragm cleans the water orifice of the heads at the end of each ON cycle. By completely drying the mixing chamber of each head, mineral build-up is prevented. This cleaning is so effective that YEARLY maintenance is typically all that is required!

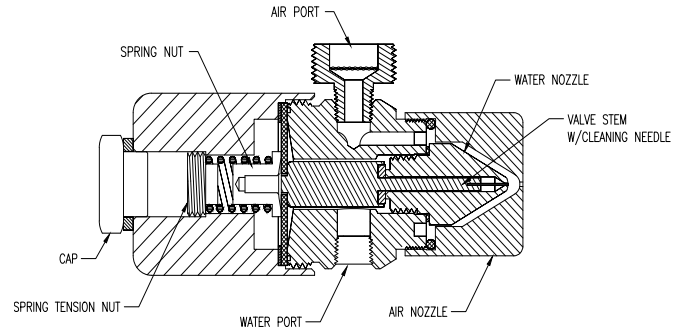
III. SYSTEM COMPONENTS

A Dual Pneumatic atomizing system consists of atomizing nozzles, control sections, humidistats, and an adequate air and water supply.

Atomizing Heads

Atomizing heads are available in capacities of 6, 8, 10, 12, or 15 lbs. of water per hour.

The proper head capacity for a given project is selected on the basis of installed height of the head above the floor, clear area available for spray patterns to evaporate, and conditions to be maintained in the humidified space.



Atomizing head assemblies are available in three versions.

The **A-17 assembly** (Figure 1) consists of two identical capacity heads spraying in opposite directions and is used when areas are clear of obstacles in both directions and where distances shown in installation section can be observed.

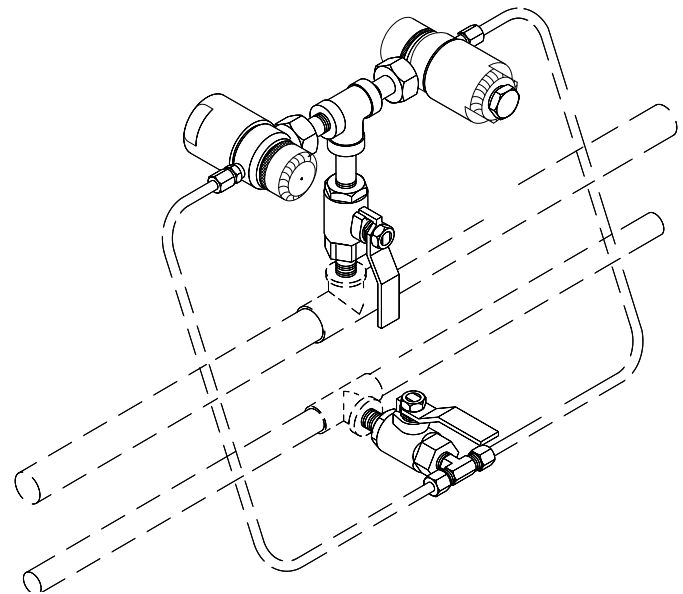


Figure 1. A-17 Head Assembly

The **B-13 assembly** (Figure 2) consists of two identical capacity head assemblies discharging in the variable directions of discharge.

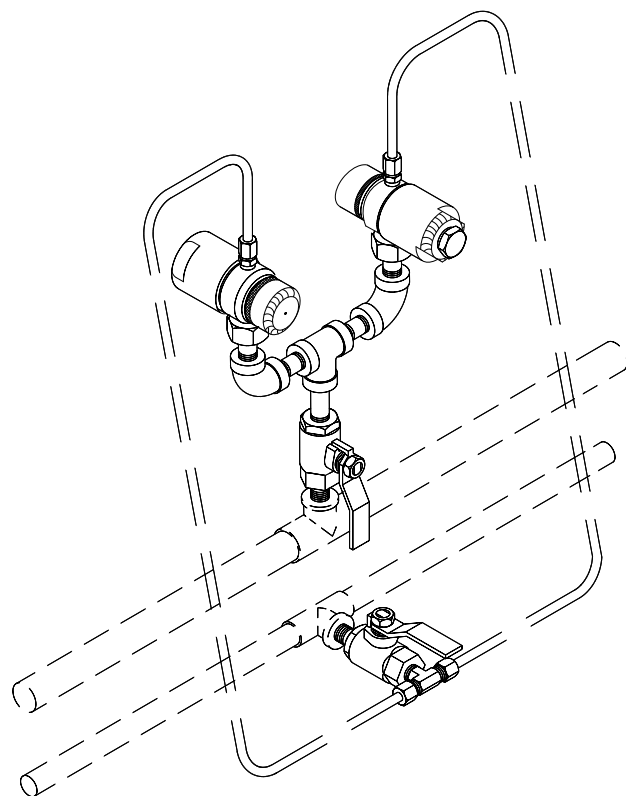


Figure 2. B-13 Head Assembly

The A-33 assembly (Figure 3) is a single head assembly for use in restricted areas.

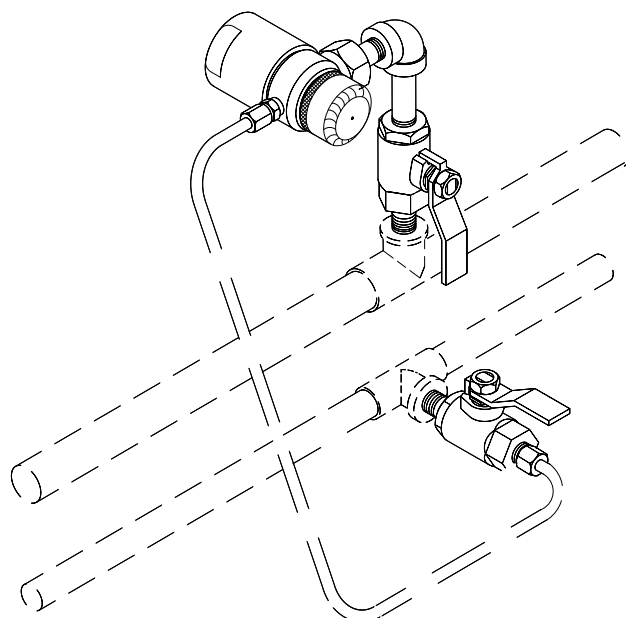


Figure 3. A-33 Head Assembly

Control Sections

The control sections provide the following features:

- Regulate plant air and water to desired operating pressures
- Monitor the flow of air and water to the heads via solenoid valves

- Air pressure switch prevents flow of water to heads until there is sufficient air pressure for atomization
- Dripless operation and automatic purging of minerals from heads during system cycling

The standard air control sections are available in two different sizes, and the water control section is available in one size (see pages 6-7).

			Minimum Pipe Size to Heads		
Size	Pipe Connections	Max. Capacity	Air	Water	Water Drain
1/2"	1/2" FPT	240 lbs/hr	3/4"	1/2"	1/2"
3/4"	3/4" FPT Air 1/2" FPT Water	500 lbs/hr	3/4"	1/2"	1/2"

Controls

The standard Dual Pneumatic atomizing system requires ON-OFF humidistats for operation. Controls may be provided by others, in which case, consultation with TRION is essential to ensure proper operation.

Several control options are available from TRION. The standard system consists of a control humidistat and high-limit (safety) humidistat. (A hygrometer is optional with any Dual Pneumatic system.)

For critical applications where extreme tolerances or temperature and humidity requirement demand it, an electronic humidistat may be required.

Air Supply

Plant air can be used if supply is adequate. All heads use 12 SCFM of air per 100 pounds of atomized water delivered. However, a safety factor of 20% should be added for line losses.

Air should run through a minimum of a cyclone type moisture separator and a 0.5 micron coalescing filter (supplied by others) to ensure that it is dry and oil-free before it reached the air control section and the heads.

An air compressor used only for humidification can be operated at 60-70 psi. No need to run at 125-150 psi, as this would waste energy.

Water Supply

With any air/water atomization system, any solids in the water will be distributed into the air during atomization. Always check the water quality before installing an air/water atomization system. TRION, or your local lab, can perform this test for you. The Dual Pneumatic atomizing system is available for raw and demineralized water supplies. With your water analysis, you and your TRION/HERRMIDIFIER representative can determine what, if any, water treatment is required.

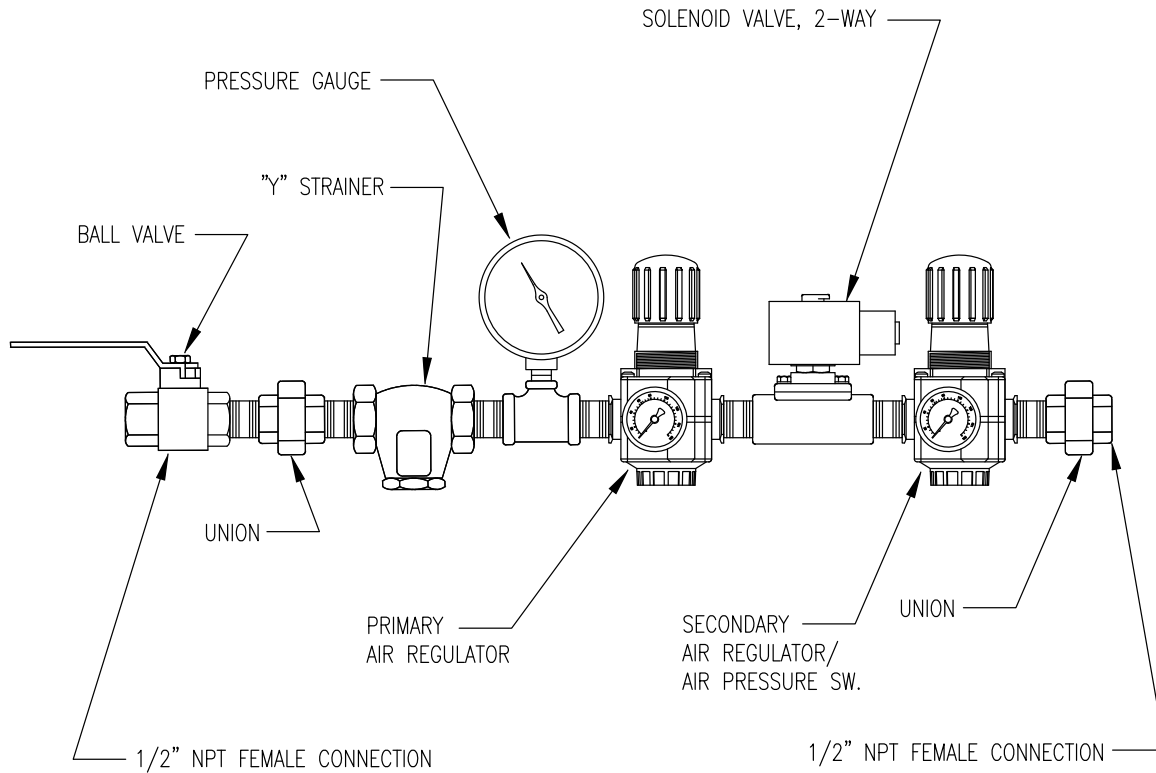


Figure 4. AH-1020 - Air Control Section
For System Capacities up to 240 lbs./hr.
Approximate Measurements: 23" L x 6" H

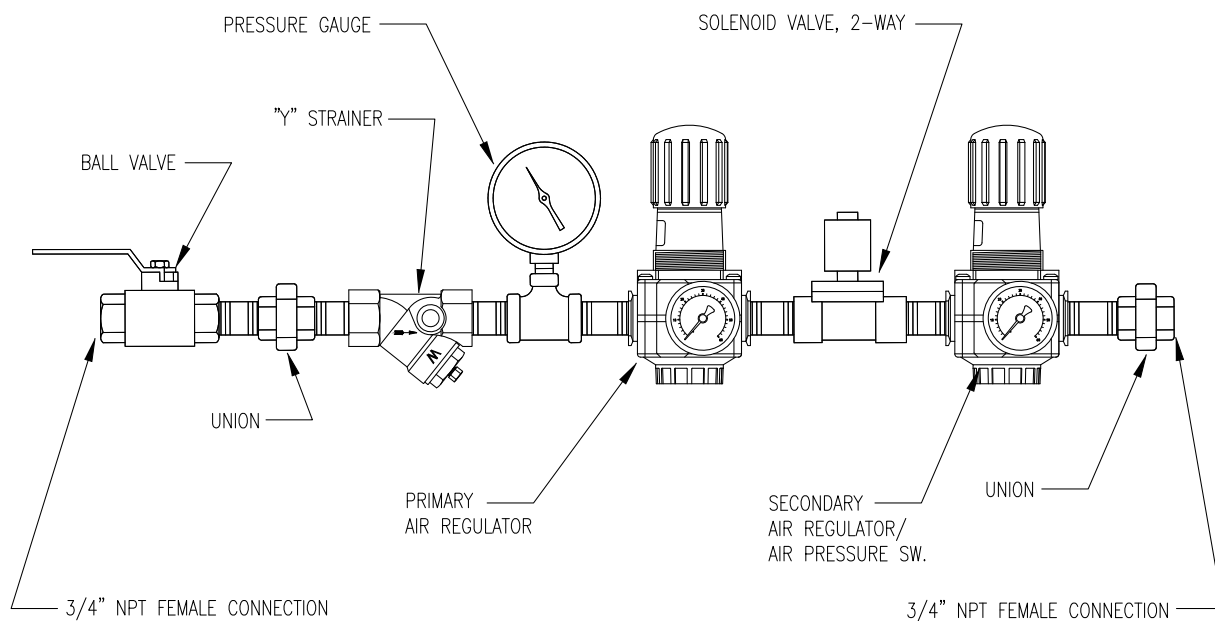


Figure 5. AH-1050 - Air Control Section
For System Capacities up to 500 lbs./hr.
Approximate Measurements: 32" L x 10" H

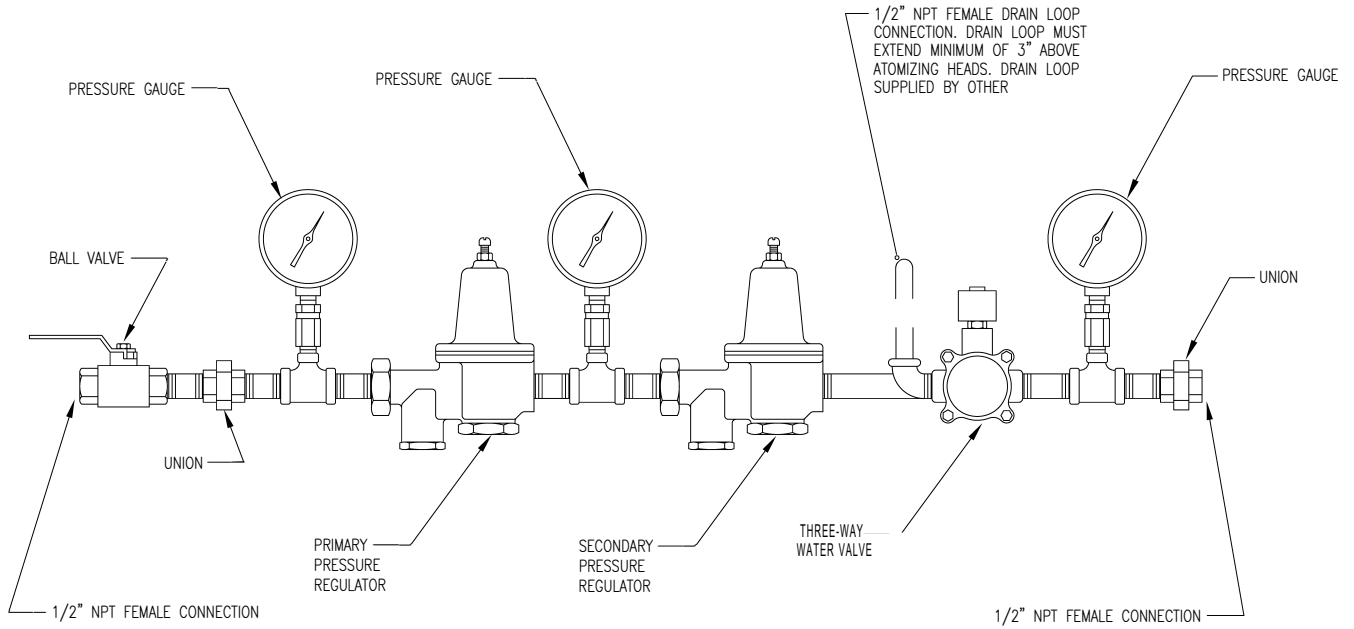


Figure 6. AH-1021 - Water Control Section
To be Used with AH-1020 or AH-1050 Air Control Sections
Approximate Measurements: 33" L x 8" H

IV. SYSTEM LAYOUT AND INSTALLATION

Be sure all parts are used in the system in their proper order and direction of flow. DO NOT leave out any parts because they have a different function in the operating system.

Layout of Head Assemblies

1. Be sure all fittings are in their proper place in all head assemblies. (Reference drawings on the next page). Do not add parts to these assemblies without permission from TRION. Head assemblies for systems using demineralized water supplies will have the same components as shown on this page. However, their materials may be different, e.g. PVC or stainless steel.
2. The smallest spray pattern is experienced at low levels of relative humidity and high temperatures, and the largest pattern at the high levels of relative humidity and low temperatures. If the head discharges directly into a warm air stream that is moving in the same direction as the head spray discharge, any size head can be used. (This is found when heads are located at discharge grilles of an air handling system.) The chart below is a good guide to follow in selecting proper head capacity.

				Spray Visible to This Point from Hd in Med		
Head Cap.	Inst. Hgt.	Use w/ RH Lvl's	Max. Spray Dia.	Low (<45%) RH	Med (45-60%) RH	High (>60%) RH
6 lbs/hr	Any	Any	2.5 ft	10 ft	13 ft	16 ft
8 lbs/hr	12 ft+	Any	2.5 ft	10 ft	13 ft	16 ft
10 lbs/hr	14 ft+	Up to 85%	3 ft	11 ft	14 ft	17 ft
12 lbs/hr	16 ft+	Up to 75%	3.5 ft	12 ft	15 ft	18 ft
15 lbs/hr	18 ft+	Up to 65%	4 ft	13 ft	17 ft	21 ft

Note: The above table applies to installations at normal temperatures (68°-75° F) and with no forced air movement in the area.

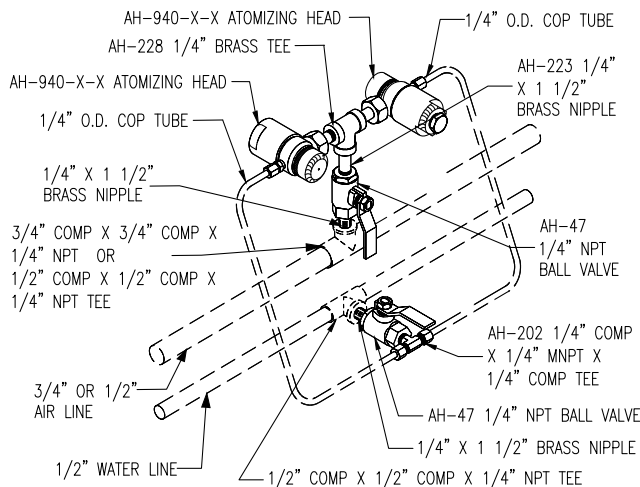
For temperatures 50°-67° F, use first smaller head size. For temperatures 32°-49° F, use second smaller head size. For example:

*18 ft installed height @ 70° - 65% RH: Select 15 lb/hr head
 @ 55° - 65% RH: Select 12 lb/hr head
 @ 36° - 65% RH: Select 10 lb/hr head*

Important: Obstructions such as columns, stacks of materials, etc. may indicate that even a lower capacity head might be preferred. Good air movement in the space results in more rapid evaporation of the atomized water into the vapor state with shorter spray patterns being visible. However, very high air movement can carry droplets causing them to impinge on objects - especially at high levels of RH.

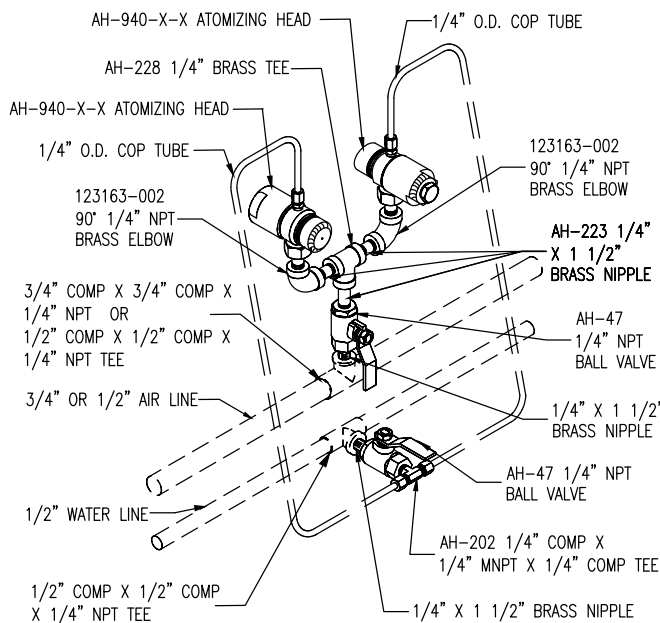
3. The number of head assemblies required should be calculated and then properly arranged to provide uniform coverage.
4. Do not locate heads in a manner where the spray will contact a wall, machine, unit heater, pipes, columns, conveyer, lights, wires, or obstructions. Distance from such obstructions should not be less than the maximum visible spray pattern length. (See chart above.)
5. Heads should be located so that the discharge is away from personnel to ensure that droplets and evaporative cooling will not cause discomfort.
6. Do not locate heads in such a manner that they discharge directly towards one another, unless they are further apart than twice the maximum distance the spray pattern is visible. (See chart above.)
7. In all cases, the heads can be further apart than the maximum visible spray pattern. Due to Dalton's Law of Partial Pressures, the water vapor travels throughout the area very rapidly, and a uniform level of relative humidity will be attained and maintained automatically.
8. Pipe runs should be kept as short as possible.
9. Head assemblies must have less than 100 feet of pipe run between the control section and the farthest head assembly.
10. Head assemblies A-17 and A-33 should be a minimum of 4 ft. apart on air and water pipes. Head assembly B-13 should be mounted a minimum of 8 ft. apart.
11. It is recommended that the heads be located above the air and water lines. However, if this is not practical for installation or aesthetic reasons, the heads may be hung below the air and water lines. In this case, the 3/4" air lines should be run on the bottom and the 1/2" water line run on top. Air and water takeoffs must always come off the top of the lines regardless of the position of the heads. The heads may NEVER be positioned more than 18" vertically from the air and water lines.
12. Heads installed near a wall with the spray directed away from the wall should be kept at least one foot away (from the wall) to allow for start-up adjustment on the heads.
13. Use ONLY copper or plastic air and water lines. DO NOT USE IRON, STEEL, OR GALVANIZED PIPE, as these types are especially susceptible to scaling and flaking, which can cause jamming of the head mechanism. If iron, steel, or galvanized piping must be used before the system, a filter MUST be installed at the transition.
14. Air and water lines MUST be located so that a straight level run can be maintained from the control section to the heads. Avoid excessive curves and NEVER allow loops in the piping, as these will trap air and debris. ALL HEADS MUST BE LEVEL AND AT THE SAME ELEVATION. If loops are unavoidable in routing piping, air vents must be installed at the high point of the vertical drop.
15. Hose bibs, supplied by others, must be used on the ends of ALL water and air lines for each in maintaining the system.

A-17 HEAD ASSY



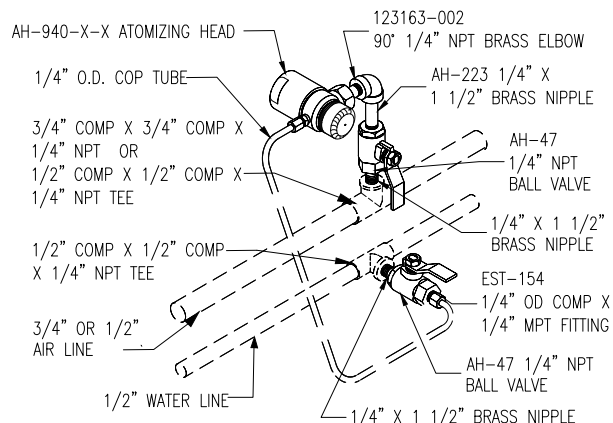
NOTE: ALL PARTS SHOWN WITH SOLID LINES ARE SUPPLIED LOOSE BY HERRMIDIFIER FOR FIELD ASSEMBLY. ALL OTHER PARTS SHOWN WITH DASHED LINES ARE SUPPLIED BY OTHER.

B-13 HEAD ASSY



NOTE: ALL PARTS SHOWN WITH SOLID LINES ARE SUPPLIED LOOSE BY HERRMIDIFIER FOR FIELD ASSEMBLY. ALL OTHER PARTS SHOWN WITH DASHED LINES ARE SUPPLIED BY OTHER.

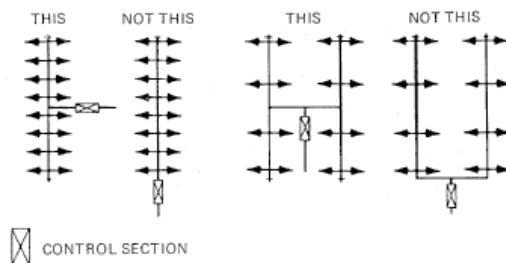
A-33 HEAD ASSY



NOTE: ALL PARTS SHOWN WITH SOLID LINES ARE SUPPLIED LOOSE BY HERRMIDIFIER FOR FIELD ASSEMBLY. ALL OTHER PARTS SHOWN WITH DASHED LINES ARE SUPPLIED BY OTHER.

Control Sections

- Control sections should be placed where they are easily accessible and protected from traffic damage.
- Control sections should be located level with or below air and water lines, never above. Where heads are located high, it is advisable to locate the control section at a height that is accessible with a small ladder. The 1/2" and 3/4" control sections can be mounted a maximum of 30' below the height of the heads. If the control sections are mounted at a level different from the heads, it is recommended that air and water gauges be placed on the lines at the height of the heads because the pressure readings at the control sections and heads will differ.
- Always be sure the drain from the 3-way solenoid extends a minimum of 3" above the heads, pipe run, or control sections. It is advisable to place a union on the drain line near the control section. If the drain loop is not used, water will siphon out of the system and allow air into the water lines causing system malfunction.
- Feed lines from the control section to heads should be placed at the midpoint of the pipe run to equalize pressure and flow in the system.



Control Location

Humidistats are to be at a protected location, on a column or inside wall. They should be located so they are not affected by the discharge from the heads, heaters, or air conditioners, and they should be protected from direct sunlight. There must, however, be sufficient clearance around the humidistats

to properly sense the relative humidity of the surrounding air.
(See Wiring Diagram on page 17.)

Other Considerations

1. Air must be free of oil and water. It is wise to place filters on both the air and water feed lines ahead of the control sections. TRION recommends the use of a moisture separator and trap and a coalescing filter on the air line.
2. To prevent condensation on uncovered cold water pipes in the system, it is advisable to consider using aftercooler water from the air compressor in the humidification system. If this is not practical, a heater for the system's water supply may be used.
3. If the water supply pressure fluctuates and doesn't maintain 50 psi at the highest level of a head assembly, it will be necessary to supply a water pressure booster pump or bladder tank for the system. Consult TRION for assistance in sizing pump and tank.
4. With extremely large systems, supply piping should be sized as follows:

System Cap. - Water	MIN. Water	System Req. - Air	Min. Air
Up to 1,000 lbs/hr	1/2"	10 - 24 CFM	3/4"
1,000 to 2,000 lbs/hr	3/4"	24 - 45 CFM	1"
2,000 - 3,000 lbs/hr	1"	45 - 70 CFM	1 1/4"
Over 3,000 lbs/hr	1 1/4"	70 - 100 CFM	1 1/2"

Supply piping should be sized to control sections so as to minimize pressure drop in accordance with table below.

Loss of Air Pressure Due to Friction
in psi per 1000 ft of pipe at 100 PSIG

Cu. Ft. Free Air per Min.	Pipe Size					
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
10	6.50	0.99	0.28	-	-	-
20	23.90	3.90	1.31	0.25	0.11	-
30	58.50	9.01	2.51	0.57	0.26	-
40	-	16.00	4.45	1.03	0.46	-
50	-	25.10	6.96	1.61	0.71	0.19
60	-	36.20	10.00	2.32	1.02	0.28
70	-	49.30	13.70	3.16	1.40	0.37
80	-	64.50	17.80	4.14	1.83	0.49
90	-	82.80	22.00	5.23	2.32	0.62
100	-	-	27.90	6.47	2.86	0.77
125	-	-	48.60	10.20	4.49	1.19
150	-	-	62.80	14.20	6.43	1.72
175	-	-	-	19.80	8.72	2.38
200	-	-	-	25.80	11.40	3.06
250	-	-	-	40.40	17.90	4.78
300	-	-	-	58.20	25.80	6.85
350	-	-	-	-	35.10	9.36
400	-	-	-	-	45.80	12.10
450	-	-	-	-	58.00	15.40
500	-	-	-	-	71.60	19.20

Loss of Water Pressure Due to Friction
in psi per 100 ft. of Type "K" copper tube at 60 PSIG

Flow Gals. per Min.	Pipe Size					
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
1	1.30	0.25	0.05	-	-	-
2	4.50	0.85	0.23	0.07	-	-
3	9.00	1.70	0.45	0.15	0.063	-
4	15.00	2.80	0.75	0.25	0.10	-
5	22.00	4.20	1.10	0.36	0.16	0.042
6	31.00	5.80	1.50	0.50	0.22	0.058
7	40.00	7.50	2.00	0.65	0.28	0.073

For longer or shorter lengths of pipe, the friction loss is proportional to the length.

*Example: AIR LINE 500 ft. One half of the above
 4,000 ft. Four times the above
 WATER LINE 50 ft. One half the above
 400 ft. Four times the above*

5. Follow start-up procedure EXACTLY. Repeat the start-up procedure every time the system is drained or cleaned.

V. START-UP PROCEDURES

1. **CHECK INSTALLATION WITH THE LAYOUT DRAWING.** Be sure that the equipment has been installed exactly as laid out on the system drawing - location of head assemblies, control sections, humidistats, etc. and that the proper size pipe has been used on all air and water supply lines as well as drain lines. (Frictional losses and pressure drops were considered in making the layout.)
2. **CLOSE ALL AIR AND WATER VALVES AT EACH HEAD ASSEMBLY.** It is vitally important that no foreign matter in the supply lines - air and water - gets into the heads.
3. **CLEAN MAIN SUPPLY LINES TO CONTROL SECTIONS.** Close air and water valves on the incoming side of all control sections. Start the air compressor. Open the main valves at the air compressor and water source. Break the unions just ahead of the incoming air and water pressure gauges of the control sections. **AIR MAIN LINE:** Put on safety glasses. Place a cloth over the open air line to catch any flying debris. Place a bucket over the end of the air line. Slowly open the valve and let the air line blow until clean. **DO NOT LOOK INTO THE BUCKET WHILE THE AIR IS BLOWING.** Close the valve and retighten the union securely. **WATER MAIN LINE:** Repeat the above procedure for the water line. Clean lines to all control sections as described above.
4. **CHECK ELECTRICAL WIRING OF CONTROLS.** Set the SAFETY humidistat to maximum. Set the CONTROL humidistat to 20%. NOTE: If only one humidistat is used, set to 20% or switch it to OFF. Open air valve ONLY to feed air to control section. Do NOT open water valve.

Adjust air pressure regulator of control section to 30 psi. Slowly move the CONTROL humidistat to a higher RH until you hear a "click" indicating the 2-way solenoid valve on the air control section has opened. NOTE: If only one humidistat is used, follow above procedure slowly raising RH setting, or if switch is used, turn to ON. Reduce the setting on the SAFETY humidistat until you hear a click indicating the 3-way solenoid on the water line has closed. (If no safety humidistat is used, skip this step.) Open the AIR valve ONLY on one pair of heads. There should be a constant flow of air from the heads with no flow of water. This will indicate that the controls for the control section are properly wired. Make any corrections needed. Close the air valve after determining wiring is correct. Repeat the above at each control section in the system.

5. **CLEAN DISTRIBUTION LINES FROM CONTROL SECTIONS TO HEAD ASSEMBLIES.** IMPORTANT: Be sure all air and water valves at head assemblies are closed (Step 2). AIR LINES: Put on safety glasses. With CONTROL humidistat ON and air valve at control section open, place bucket and cloth over hose bib at end of each air line and slowly open the hose bib and allow line to blow clean. DO NOT LOOK INTO BUCKET WHILE AIR IS BLOWING. Close hose bib. Repeat on all air lines from each control section. WATER LINES: (Air valve at control section should be open.) Set SAFETY humidistat at maximum and CONTROL humidistat ON. Open water valve at control section. Place bucket or hose on ends of water lines and slowly open hose bibs. Allow water to flow until clean. Throttle valve to avoid splashing. Close hose bib. Close air and water valves at control section. Repeat on all water lines from each control section.

6. **STARTING THE SYSTEM.** Close air and water valves at all control sections. Open air valves only at all head assemblies. Set humidistats high enough to assure system operation. Open AIR valve at control section. With air flowing through heads, adjust primary air pressure regulator (or compressor) to maintain 55 psi. Adjust control section air pressure regulator to 30 psi. With water valve open at water source, open the control section water valve and the water valve of the ONE head assembly located the GREATEST distance from the control section. Adjust the primary water pressure reducer to provide 45-50 psi to the control section. Adjust control section water valve to provide 32-38 psi to heads. Open the water valve at each head assembly, checking and correcting for air and water leaks as you go. CAUTION: Never let water pressure get below air pressure as air will then get into water lines and necessitate bleeding of lines. Repeat procedure on all control sections and primary reducers. Normally, with all heads operating, it will be necessary to again adjust the primary water pressure reducer to 45-50 psi and control section water pressure regulator to 32-38 psi. Tighten the locknut on all WATER pressure regulators - primary and control section. All further adjustments will be made on air controls and at heads. With the entire system in full operation, check for leaks in all air and water lines,

fittings, connections, valves, control sections, and head assemblies. Correct as required.

7. **FINAL ADJUSTMENTS TO HEADS.** Remove cap (253206-00X) of each head. This cap is at the non-discharge end of the head and covers the head adjusting "spring tension nut" (253207-00X). Slowly turn this adjusting nut in a clockwise direction until no water is discharged by the head. Use care to avoid damage to the valve seat. Then, back off this adjusting nut TWO full turns counter clockwise. This may result in an excessively heavy spray, but this will be adjusted later in the control section. Replace cap. Repeat this operation on every head on the system. NOTE: Maintain air pressure at 30 psi and water pressure at 32 - 38 psi. Do NOT let air pressure exceed water pressure.
8. **BALANCING THE SYSTEM.** The final and most important adjustment will be made at the air pressure regulator of each control section. Adjust the air regulator to 30 psi; adjust water pressure for proper head capacity. Increasing the air pressure to the heads results in smaller droplet size in discharge pattern - and vice versa. Spray pattern should be visible to at least 10' from the head to assure rated capacity. With the system in full operation, adjust the safety humidistat to 10% above the desired level. Remove the cover of this humidistat and set the low and high limit stops to the RH setting so the setting cannot be changed. Replace cover. Move the CONTROL humidistat setting alternately lower and higher to cycle the system OFF and ON several times until all gauges become repetitive in action and readings.

Water Pressure Settings

Head Capacity	Water Pressure Setting (PSI)
6	32
8	38
10	33
12	35
15	37

Note: A new system may require some adjustment until all parts are properly seated during break-in. This period may last about two weeks. After that, adjustments may not be required but should be checked on a regular schedule. Set the humidistat at the desired level.

CAUTION:

1. Do not balance the system by adjusting individual heads. Each head has been adjusted to provide its design capacity.
2. Do not throttle any valves at control sections or head assemblies to get final adjustment.

VI. OPERATING INSTRUCTIONS

The Dual Pneumatic Atomizing System utilizes air and water under pressure to atomize the water into tiny droplets (2-15 microns with an average of 7.5). These droplets rapidly evaporate to a gaseous state to raise the level of relative humidity.

Each Dual Pneumatic Atomizing System is custom designed for each application to maintain the level of relative humidity desired under the conditions to be maintained with the equipment as it exists in the area at the time. If ANY conditions change, the demand load for humidification can be affected.

Once the system is installed, checked out, and started in accordance with the instructions contained in this manual, operation is completely automatic to maintain the level of relative humidity. With air and water supplied to the equipment, the system cycles ON and OFF as needed.

Set the desired level of RH on the control humidistat, 10% more on the safety humidistat, and you can walk away and forget it.

If there is a POWER FAILURE, the system automatically shuts off.

If there is an AIR COMPRESSOR FAILURE, the system automatically shuts off.

If there is a FAILURE OF THE WATER SUPPLY, the heads will blow air.

If the water supply PRESSURE is lost or reduced, the heads will "sputter".

If the CONTROL humidistat fails to shut off the system, the SAFETY humidistat will shut off the water to the heads at 10% above the desired level of RH. You cannot over-humidify to any greater extent than the 10%.

The atomizing heads operate drip free and are self-cleaning and self-purging at the end of every ON cycle. The system is designed to go ON and OFF. Without this cycling, the cleaning and purging action is lost.

The system can be started and stopped by merely operating the control humidistat.

All humidification equipment needs periodic maintenance. The procedure for the Dual Pneumatic System is spelled out in that section of this manual. Otherwise, the operation is fool-proof and dependable.

VII. MAINTENANCE INSTRUCTIONS

The Dual Pneumatic Atomizing System requires little maintenance to keep it operating properly. In hard water areas and dusty atmospheres, more frequent attention will be required.

NORMAL MAINTENANCE required is as follows.

- **AIR COMPRESSOR:** Follow the air compressor manufacturer's instructions.
- **ATOMIZING HEADS:** Clean dust and debris from the

OUTSIDE of the heads as required to keep the spray pattern adequate. At least ONCE A YEAR, remove the atomizer nozzles (AH-941-X-X). Clean these nozzles in a weak acid solution. Do NOT use a wire or other object that will score the nozzle or its orifice.

- **AIR & WATER LINES:** Blow out all supply lines at least ONCE A YEAR using the procedures covered under start-up of the system in this manual. Check all joists and valves for leaks ONCE A YEAR.
- **STRAINERS:** Strainers on air and water controls (both primary regulators and control section regulators) should be cleaned ONCE A YEAR and replaced as required. Strainer screens (AH-21) in the strainer union assembly (AH-17) of each head should be cleaned ONCE A YEAR. If air strainers are dirty or oily, it may be necessary to install an air dryer or after cooler on the compressor or a separator on the air line.
- **HUMIDISTATS:** Calibration should be checked with a dependable psychrometer at least ONCE A YEAR and adjusted as needed.
- **HYGROMETERS:** (RH indicators) Use psychrometer to check for accuracy.
- **PRESSURE REGULATORS:** Air and water (primary and control sections) - check operation at least ONCE A YEAR to be sure regulation to desired pressures is being maintained properly.
- **SOLENOID VALVES:** Air and water (control sections) - check operation at least ONCE A YEAR to be sure their operation is proper and valves do not leak.

After the removal and re-installation of heads and control sections, ALWAYS follow the start-up procedure to be sure all foreign matter is flushed from the lines and none reaches the heads.

Your system will last indefinitely if properly maintained.

VIII. TROUBLESHOOTING

HEAVY SPRAY PATTERN (Droplets too large)

ALL HEADS served by one control section: either this is caused by too low a setting on the air pressure regulator of the air control section, which calls for slightly increasing the air pressure - or too high a setting on the water regulator of the water control section, which requires decreasing the water setting slightly.

NEVER LET AIR PRESSURE EXCEED WATER PRESSURE.

INDIVIDUAL HEADS: These heads are not getting enough air.

1. Foreign matter may be clogging the screen (AH-21) in the air strainer union (AH-17) of the head.
2. One or more heads served by the same control section may have been IMPROPERLY ADJUSTED by throttling the valves at the head assembly. No valves should ever be throttled!
3. Water nozzle (AH-942-X) orifice may have been enlarged due to bent cleaning needle on diaphragm (AH-10).

Replace parts as required.

4. Atomizer nozzle (AH-941-X-X) orifice may have been enlarged due to improper cleaning or dirty air. (See Maintenance section.) Replace parts as required.

SPRAY PATTERN TOO LIGHT

ALL HEADS served by one control section: either this is caused by too high a setting on the air pressure regulator of the air control section, which calls for slightly decreasing the air pressure - or too low a setting on the water regulator of the water control section, which requires increasing the water setting slightly.

INDIVIDUAL HEADS: Heads are not getting enough water.

1. Water valve at head may have been throttled. No valves should ever be throttled! Adjust head and shown in Step 7 of start-up procedure.
2. Foreign matter may be restricting water flow in the water nozzle (AH-942-X). Shut off air and water valves at head assembly. Remove atomizer nozzle (AH-941-X-X) and water nozzle (AH-942-X) with wrench. DO NOT use wire or hard object that will score inside.

SPUTTERING HEADS

ALL HEADS served by one control section: air pressure at heads exceeds water pressure at heads.

- Adjust air and/or water pressure at control section so that air pressure is about 2 psi lower than water pressure.
- Three-way solenoid on water control section may be malfunctioning to allow water to leak down drain port when system is operating. This may be caused by dirt under the drain valve seat or a bad valve seat on the drain side of the three-way solenoid. NOTE: The drain side of the three-way solenoid should open only when the system shuts off. Approximately one cup of water should be drained from the system between cycles. A greater amount may be a sign of air trapped in the water line. Review start up procedure.

INDIVIDUAL HEADS:

1. Water valve supplying head assembly has been throttled. No valves should ever be throttled.
2. Head improperly adjusted. Follow Step 7 of start-up procedure.
3. Part malfunctioning inside head. Check diaphragm (AH-10), spring (AH-8), and valve disk (AH-16). Correct as required.

INOPERATIVE HEADS (No air or water)

ALL HEADS served by one control section:

1. These heads shut down because control humidistat is satisfied.
2. If proper RH level has not been attained, check calibration of the control humidistat and adjust if required. Use a dependable psychrometer.
3. Air and water valves serving the control section are not open.
4. Electric current not flowing to central section. Check

wiring and supply lines.

5. Compressed air is not reaching the control section. Possible compressor failure.

INDIVIDUAL HEADS:

1. Be sure air and water valves at head assembly are fully open.
2. Indicates diaphragm (AH-10) may be ruptured or leaking OR water and air ports clogged. Close air and water valves at head assembly. Remove rear part of head (Bonnet, 253209-00X) with a wrench. Examine the diaphragm (AH-10), spring (AH-7), and valve disc (AH-16). Replace any bad parts. If these parts are OK, reassemble the head. CAUTION: Use care in reassembling so that cleaning needle is not damaged. Remove atomizer nozzle (AH-941-X-X) and water nozzle (AH-942-X). Clean these nozzle ports with air pressure or as recommended under maintenance. DO NOT use a wire or any object that will score the inside or port of the nozzles. Reassemble the head, open the air valve of the head assembly, then the water valve of the head assembly and adjust spray pattern. (See Step 7 of the start-up procedure.)

AIR WITHOUT WATER

ALL HEADS served by one control section: be sure water valve at control section is open. RH exceeds that set on the SAFETY humidistat. This shuts off water to all heads but allows air to flow. Correct this condition by:

1. Set SAFETY humidistat higher than CONTROL humidistat.
2. Make sure CONTROL humidistat is functioning to start and stop system.
3. Check calibration of BOTH humidistats with a dependable psychrometer.
4. Check the setting on the air pressure switch and be sure that the switch is cutting in at 26 psi and out at 20 psi of air pressure. Adjust accordingly by setting high end first at 26 psi and then turning low end up against it.

INDIVIDUAL HEADS:

1. Water cut-off at valve at head assembly.
2. Water nozzle (AH-942-X) plugged with foreign matter. Correct as above under "Spray Pattern Too Light".

HUMIDITY LEVEL TOO LOW

1. Be sure CONTROL humidistat is set at desired RH.
2. Check calibration of CONTROL humidistat and HUMIDITY INDICATOR with dependable psychrometer and adjust as required.
3. Be sure humidistat is not being "influenced" by the spray pattern of a head coming too close to it. Correct as required.
4. Be sure humidistat is not being "influenced" by a cold air stream blowing directly on it. Correct as required.
5. The temperature of the air in the area being humidified may be different for than that for which the system was designed. If so, AND this changed temperature will now

be maintained, additional humidification equipment will now be required. Call your TRION/HERRMIDIFIER representative.

6. Exhaust, make-up air, or cooling equipment may have been added to the area since the system was designed. These add to the maximum demand load, and additional humidification equipment will now be required. Call your TRION/HERRMIDIFIER representative.

HUMIDITY LEVEL TOO HIGH

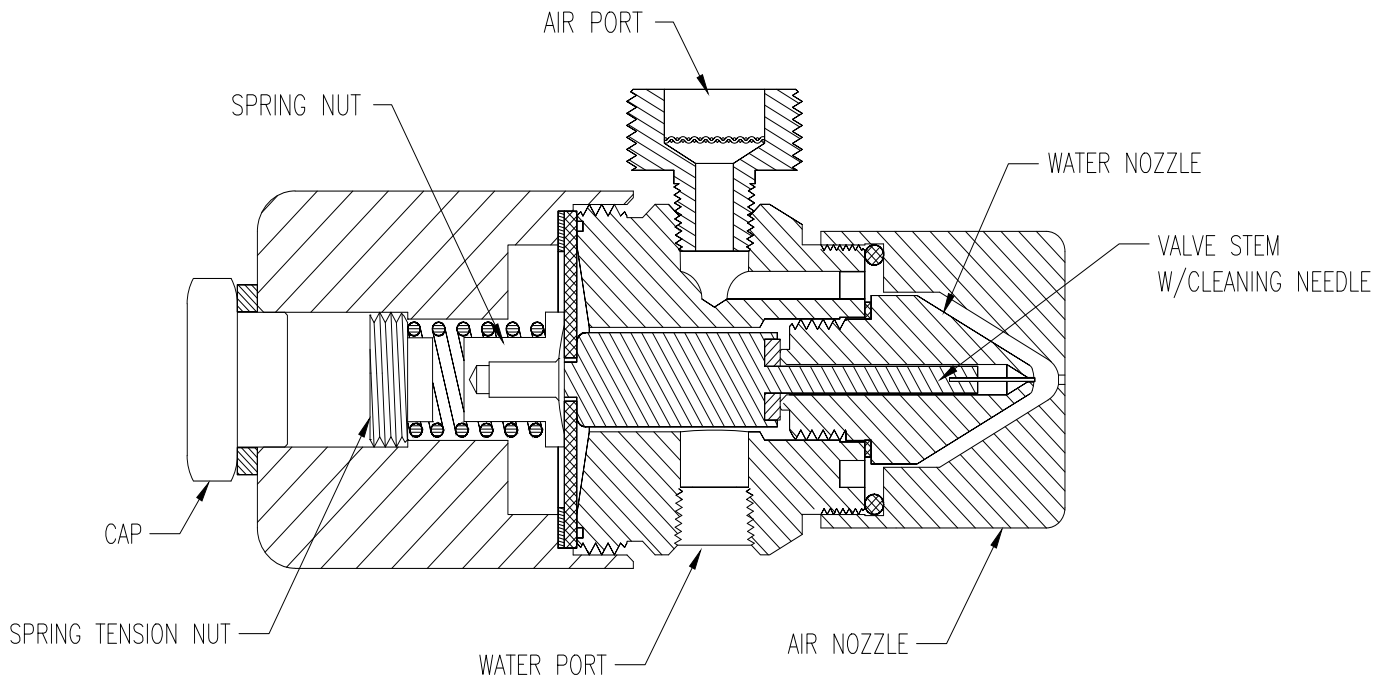
1. Be sure CONTROL humidistat is set at desired RH (and SAFETY humidistat about 10% higher than control).
2. Check calibration of CONTROL and SAFETY humidistats as well as the RH indicator with a dependable psychrometer and adjust as required.
3. Be sure humidistat is not being "influenced" by a hot air stream blowing directly on it. Correct as required.

EXCESSIVE AIR CONSUMPTION

Dual Pneumatic Atomizing Systems consume a maximum of 12 CFM of free air delivery per 100 lbs. of water atomized per hour.

1. Check ALL air line joints, valves, and valve stems throughout entire compressed air system (not just the Dual Pneumatic system) for leaks and correct as required.
2. Air compressor may not be delivering rated capacity because of maintenance work needed.
3. Other air operated equipment in plant may be consuming more air than it should because of maintenance work needed.
4. Air operated equipment may have been added to the plant which caused the total air consumption needed to exceed rated capacity of the air compressor.

IX. PARTS LIST

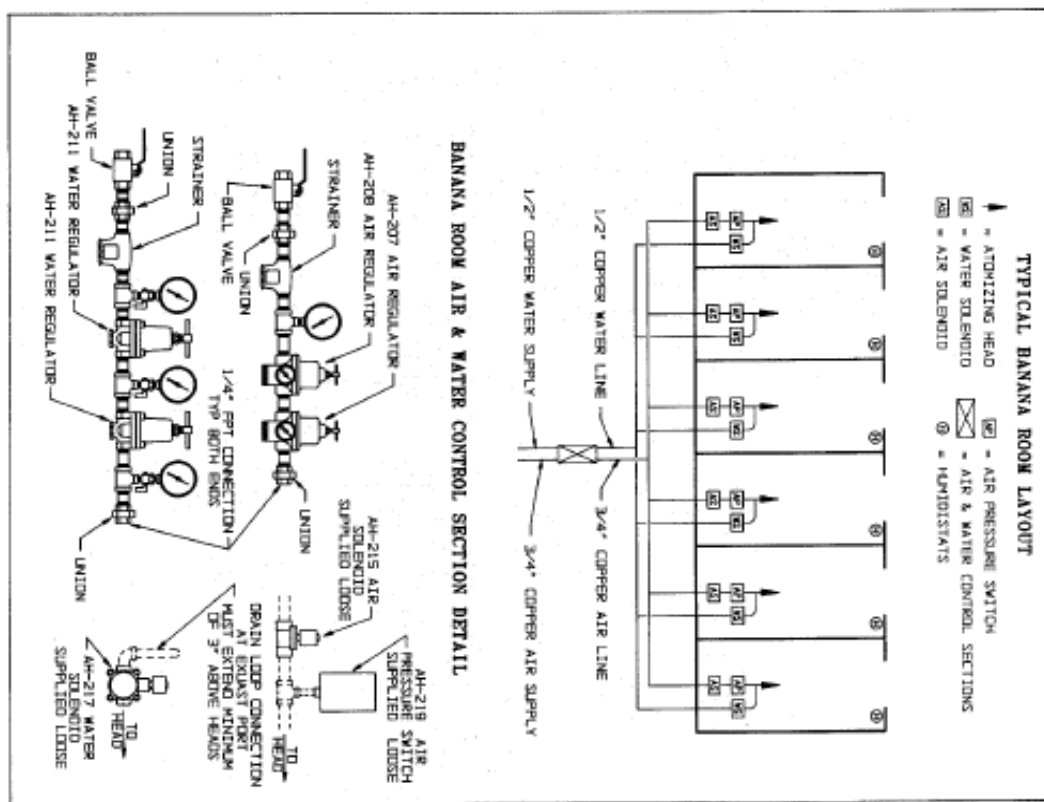
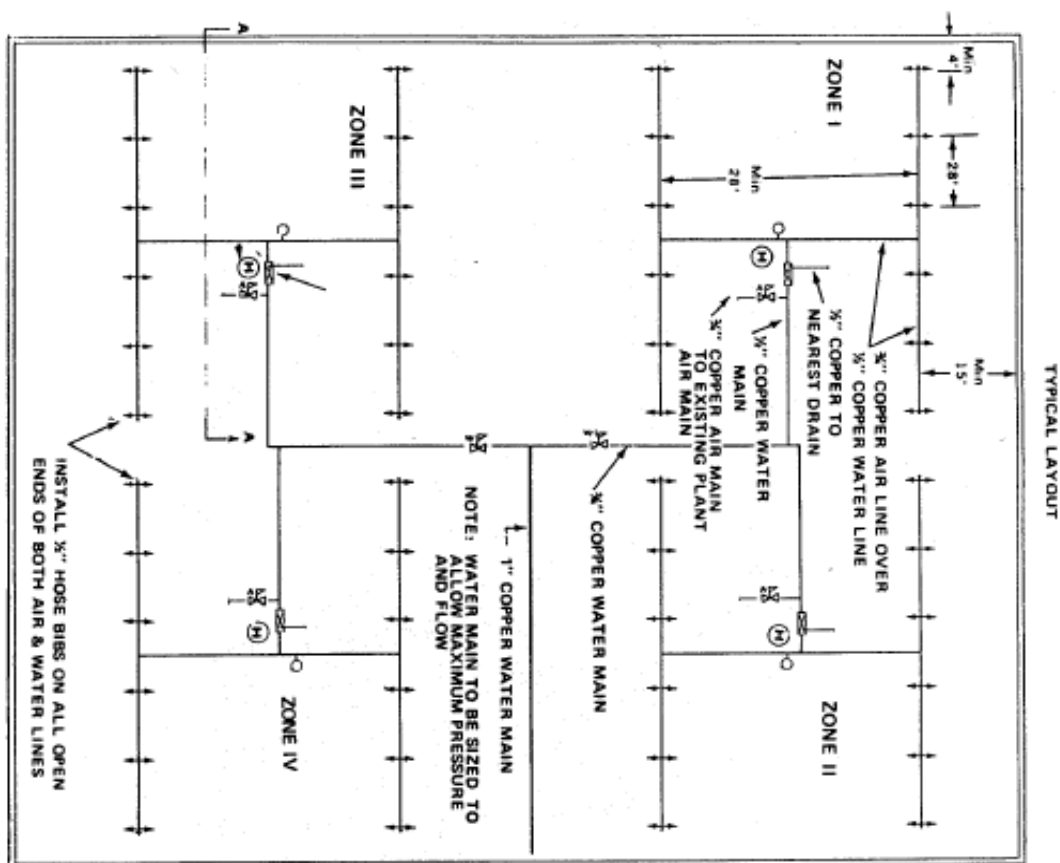


Brass Nozzle Consists of:		SS Nozzle Consists of:	
Part #	Description	Part #	Description
253205-001	Nozzle Body	253205-002	Nozzle Body
253209-001	Bonnet	253209-002	Bonnet
AH-941-1-"X"	Air Nozzle	AH-941-2-"X"	Air Nozzle
AH-942-1(R)	Water Nozzle	AH-942-2(R)	Water Nozzle
253206-001	Cap	253206-002	Cap
253207-001	Spring Tension Nut	253207-002	Spring Tension Nut
253208-001	Spring Nut	253208-002	Spring Nut
AH-12(R)	Valve Stem w/ Needle	AH-12(R)-SS	Valve Stem w/ Needle
AH-19A	Air Port	AH-19ASS	Air Port
AH-18A	Union Tail Piece	AH-18ASS	Union Tail Piece
AH-20	Union Nut	AH-20SS	Union Nut
AH-1RK (Note 1)	Rebuild Kit	AH-1RK	Rebuild Kit

"X" Denotes nozzle rating in pounds/hour (6, 8, 10, 12 or 15 lb/hr).

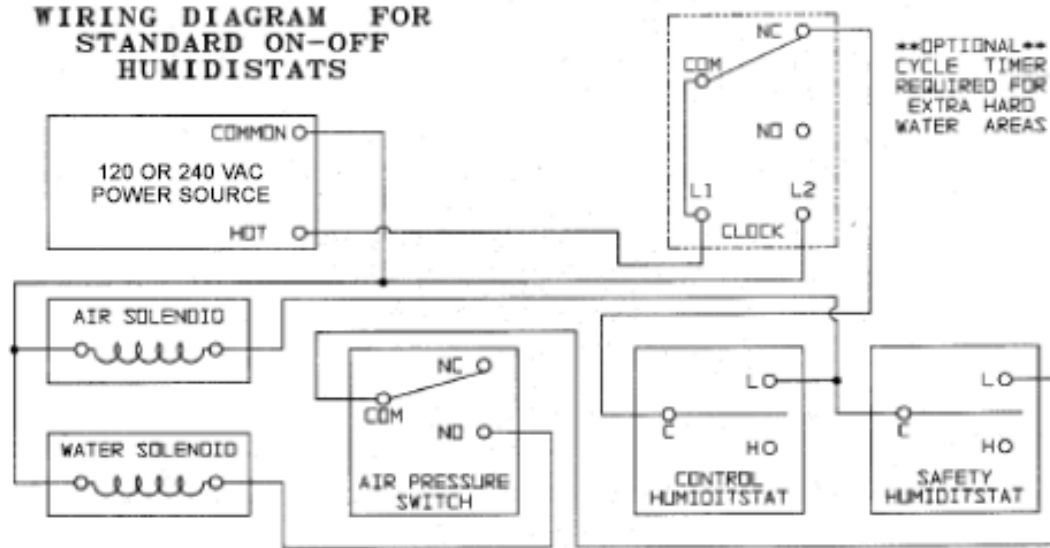
Notes:

1. AH-1RK Kit includes: Diaphragm, AH-122 "O" Ring, AH-14 Air Nozzle Gasket, AH-15 Water Nozzle Gasket, AH-16 Valve Disk, AH-21 Strainer Screen, AH-23 Diaphragm Washer, AH-8 Spring, FV-17-1 Union Washer
2. Always specify nozzle rating in lbs/hr on any nozzle parts order.
3. The notation for (R) is used when capacity of head is 6 or 8 lbs/hr.



XI. WIRING DIAGRAMS

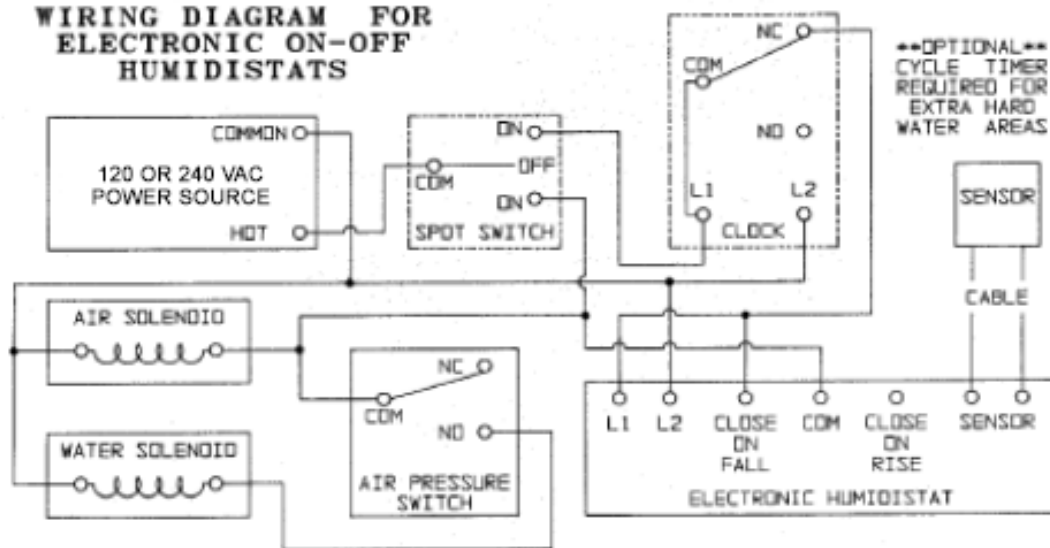
**WIRING DIAGRAM FOR
STANDARD ON-OFF
HUMIDISTATS**



NOTES:

1. ALL WIRING TO BE DONE IN ACCORDANCE WITH ALL LOCAL & NATIONAL ELECTRICAL CODES.
2. MOUNT HUMIDISTATS APPROX. 5' 6" FROM FLOOR ON INSIDE WALL OR COLUMN.
3. DASHED LINE INDICATES: SUPPLIED BY OTHER

**WIRING DIAGRAM FOR
ELECTRONIC ON-OFF
HUMIDISTATS**



NOTES:

1. ALL WIRING TO BE DONE IN ACCORDANCE WITH ALL LOCAL & NATIONAL ELECTRICAL CODES.
2. MOUNT HUMIDISTATS APPROX. 5' 6" FROM FLOOR ON INSIDE WALL OR COLUMN.
3. DASHED LINE INDICATES: SUPPLIED BY OTHER



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