Ultrasonic Nozzle Installation Manual

J D UltraSonics

sonicom™

ULTRASONIC NOZZLES & AIR ATOMISERS

DUST SUPPRESSION - HUMIDIFICATION - ATOMISING - FOGGING

General Information

Sonicom Ultrasonic Nozzles require compressed air and clean water supplied at 6 Bar (90 psi) and 2 Bar (30 psi) respectively. Control to the nozzle(s) is maintained using simple in-line pressure regulators on both supplies with an on/off valve on the air supply to activate the spray when required. The valve can be manual, however electrical actuated valving is normal practice.

Compressed Air

It is important that the nozzle receives a good air flow at the correct pressure. A drop in flow and/or pressure will result in poor atomisation and if the pressure at the nozzle drops below 3 Bar (45 psi) the nozzle could stop spraying altogether. Therefore consideration must be given to the size of air compressor and supply line when calculating the number of nozzles required it is recommended that at least an additional 20% air capacity is added to ensure starvation does not occur.

Liquid

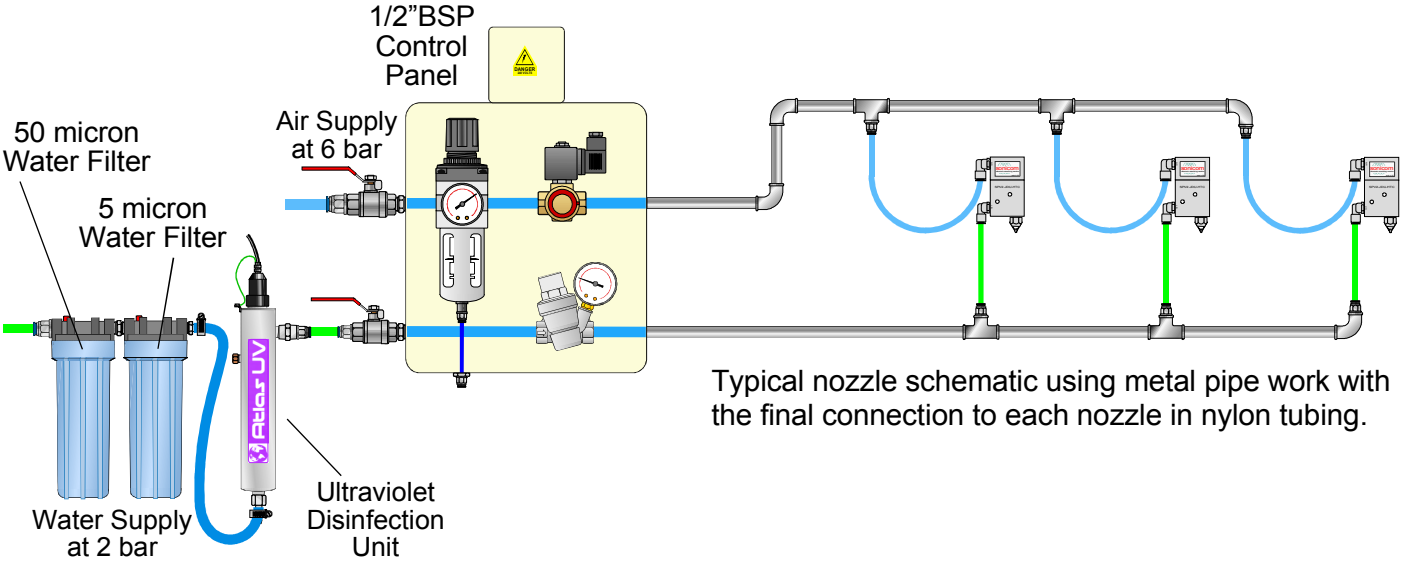
The liquid supply to the nozzles is not too critical as the low flow demands of the system are generally easy to accommodate on most applications. Flows are typically up to only 40 litres/hour per nozzle and therefore a 1/2" diameter (Ø12mm) supply pipe is sufficient.

Electrical

Electrical consumption is minimal within the system. Solenoid valves are generally under 10 watts and UV units are under 20 watts. Various voltages can be supplied to meet with customer preferred requirements - usually 230vAC50/60Hz - 110vAC50/60Hz - 24vAC50/60Hz - 24vDC although other voltages are available on request. Explosion proof and increased safety solenoid coils can also be provided where risk of explosion is of concern.

Health & Safety

It is always important to consider health and safety in any workplace and non more so than the condition of the water supply to an atomising system. Bacteria within stagnant water supplies (ie holding tanks or low usage systems) may contain harmful pathogens which could result in serious health conditions if not dealt with at source. The fitting of an Ultraviolet Disinfection Unit within the system will ensure water passes through and is exposed to a high intensive UV light that penetrates and deactivates bacterial cells.



Typical nozzle schematic using metal pipe work with the final connection to each nozzle in nylon tubing.

Installation

When an atomisation system is required, the end user provides the compressed air and water supplies to a locally agreed point at the sizes recommended during quotation. These two pipes should be terminated with female threaded lever shut-off ball valves. When fitted for dust suppression, significant advantages are gained by ensuring that the dust source is shrouded to limit air flow and give maximum time for suppression to take place.

1. Mount the control panel on a suitable wall or fixing ensuring it is unlikely to receive physical damage and in such a position to allow the water filters and UV unit to be mounted upstream. It is always an advantage to mount the controls as close as possible to the nozzles.

2. Run large diameter pipework from the control panel outlets to the nozzle location area ensuring the best route is adopted for convenience, neatness and clearance for machinery, product and personnel. Match the pipework to the panel outlet sizes - ie 1/2” or 1”BSP.

3. Connect the electrical supply to the control cabinet terminal rail and connect the air and water from the main supplies.

4. Mount the nozzle valve blocks on suitable fixings using the swivel bracket if possible. The nozzles should be sited to provide maximum effect avoiding direct spray onto the product.

5. Using reducing outlets from the main pipework, connect to the nozzles using nylon tubing and push-in type fittings although compression fittings can be used if preferred. Generally Ø8mm tubing is used for the air connections and Ø6mm for the water: these tend to be colour coded blue and green to aid correct orientation.

6. In extremely cold applications heat trace and lagging will be advantageous around the small bore water pipe and nozzle block. This should be fitted at the discretion of the customer.

7. When all pipework is complete, disconnect the Ø8 and Ø6mm nylon tubes from the nozzles. Turn the air and water pressure regulators down and commence testing. Blow low pressure air through the system and increase to an acceptable pressure - say 2 Bar. Repeat with the water to ensure flow is achieved through every pipe. The purpose of this is to clean the new pipework to ensure any swarf or debris is flushed out of the system.

8. Reconnect the nylon tubing and commence testing with little or no liquid pressure. Build the pressures up in both media to 5 bar air and 1 bar water which are the optimum settings. Trim the spray patterns by increasing the water pressure a little until the desired spray pattern is achieved.

Fault Finding

If the nozzles fail to spray, check the following:-

1. The signal to the solenoid valve is present and has operated the valve (a click can be heard or felt when it turns on.)

2. Air and water pressures are at the optimum settings when operating.

3. All connections are free from leaks and are correctly orientated - ie water has not crossed to the air system.

4. Check there are no upstream restrictions or blockages.

5. Disconnecting the pipes at the nozzle assembly usually confirms air/water is present.

6. Ensure the compressed air supply is sufficient to match the number of nozzles in the system.

Cleaning a Blocked Nozzle

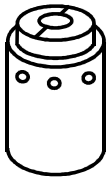
1. Remove the nozzle from it's valve or adaptor.

2. Carefully unscrew the Stem from the Housing using a good fitting spanner on the Stem flats and Housing.

3. Remove the Orifice Insert by turning the Housing upside down. If the Orifice Insert does not fall out, tap the housing down onto a firm surface and it will drop out. Be careful not to drop or lose it.

4. Check there is nothing blocking the Stem and that the Housing is also clear.

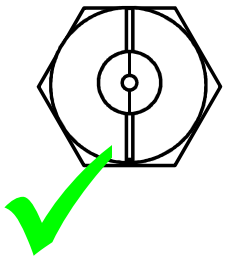
5. Using a fine wire, gently poke out all of the liquid holes at the front of the Orifice Insert and also ensure the centre hole is clear. Blowing the Insert clean and double checking the liquid ports will help.



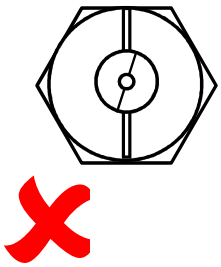
6. Reassemble the nozzle by dropping the Orifice insert into the Housing. Screw the Stem into the Housing by hand until it tightens. **Important** -Turn the nozzle over and align the score mark on the front of the Orifice Insert slightly out of line with the wire ie. '5 past 7 position'. If not slacken and tighten the Stem until this approximate position is achieved. Finally tighten with a spanner and check that the Orifice Insert is now aligned. Please note this may take several attempts.

7. It is always worthwhile replacing the two Viton O-rings whenever nozzles are cleaned to ensure the air and water paths remain separated during operation.

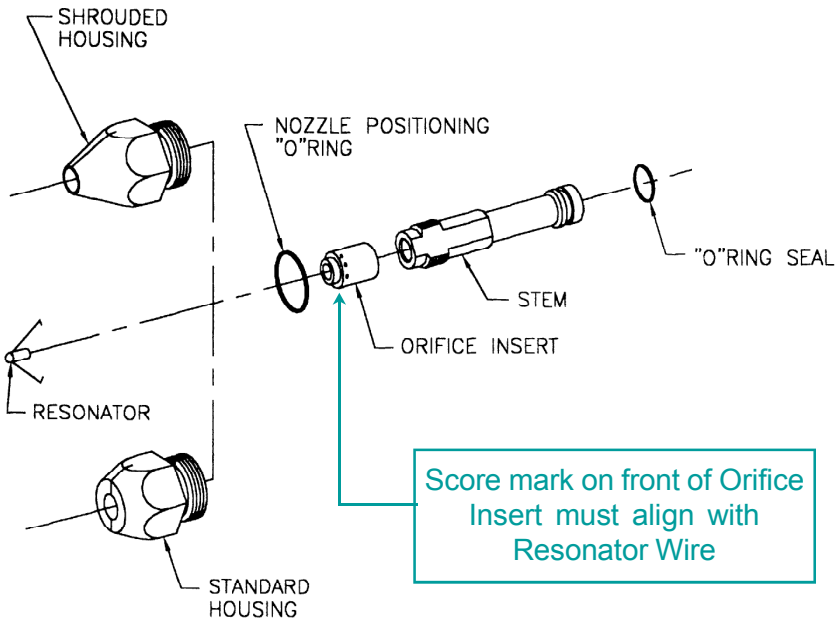
8. If the nozzle has suffered from calcium build-up over the months due to hard water, soaking the parts for 30 minutes in lime scale remover will help to remove and loosen the salts.



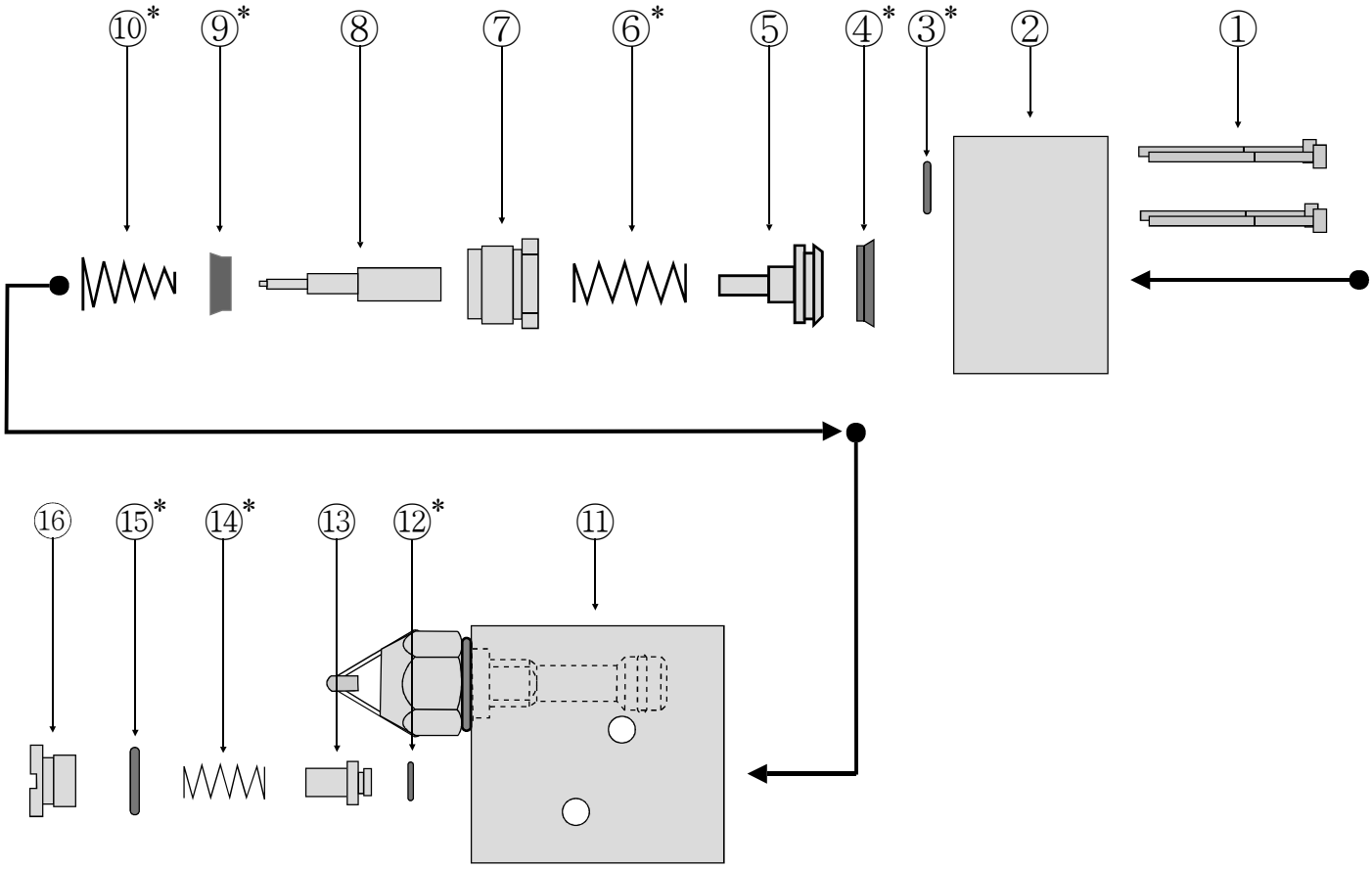
Correct
Score Mark inline with wires



Incorrect
Score Mark out-of-line with wires



Non-Drip Water Valve Internal Parts



1	Stainless Steel Screws (4)
2	Valve Top
3*	O-Ring
4*	Large U-Cup Seal
5	Piston
6*	Light Spring
7	Guide Bush
8	Spindle
9*	Small U-Cup Seal
10*	Conical Spring
11	Valve Bottom
12*	Poppet Seat
13	Poppet
14*	Heavy Spring
15*	O-Ring
16	Screwed Plug

* included in the standard valve repair kit