Technical Information Leaflet

MA Series Ultrasonic Atomisers

Advantages of Ultrasonic Atomisers:

1. Self-cleaning as sound waves keep the tip clean
2. Infinite turndown ration
3. Can't dribble as even the finest drop is atomized
4. Extremely large orifice, so won’t clog
5. Very effective for dust suppression
6. Are excellent for use as burners – eg. For tar or oil burning
7. Excellent for use for flame or flue gas quenching before air goes to bag filters
8. Greatest advantage is their ability to provide a consistent quality of atomization over a wide flow range.

General Notes on PNR Nozzles – Types MAD & MAL
(Refer pages 1-5 of Air Atomising Catalogue)

A. Spray pattern – 25 Deg. (MAD) or 40 Deg. (MAL), full cone spray

B. Consumption Range – Water: 0.02 to 2.87 LPM (1.2 to 172.2 LPM)
                         – Air: 2.08 to 36.19 Ncm/H (1.22 to 21.3 scfm)

C. Also called whistling nozzles, because of the noise they make.

D. Droplet size can vary from coarse – 200 to 600 microns – to an ultra-fine fog of 1 to 20 microns simply by controlling air pressure. Turndown ratios of 30:1 are normal.

E. Materials – Brass or 303 Stainless Steel
Operating Principle (ref PNR)

These devices provide liquid atomisation through a two-step process.

1. Liquid is ejected through a number of orifices into the nozzle outlet channel, where a high velocity air stream provides for the first liquid breakup through shear action.

2. The air stream, carrying the droplets, collides with a resonator placed in front of the nozzle outlet channel and generates a field of high frequency sound waves.

   On their path through the sound waves field, the droplets undergo an additional breakup.

   Ultrasonic atomisers produce very fine droplets, with a limited mean diameter range, and flow rates ranging up to 100 Lph.

   The operational noise restricts their use to areas where the noise level limits can be exceeded because there is no direct personnel exposure.

Operating Principle

The 'MA' nozzle is an air driven acoustic oscillator for atomising liquids by passing them through a field of high frequency sound waves.

Air accelerates through a converge section and expands through a diverge section into the resonator cavity, and then reflected back to complement and amplify the primary shock wave.

This creates a powerful standing sonic shock wave. Water delivered to the sonic area is shattered into fine droplets.

Air by-passing the resonator carries the atomised droplets downstream in a soft, low velocity spray.

Large orifice and low pressure virtually eliminate wear and prevent deterioration of atomisation quality while greatly extending useful nozzle life.

Uses:
Dust suppression, evaporative cooling/conditioning of hot gases, re-moisturising of paper, humidification, burning of fuel oils, tar etc.