Why do you need a Moisture Separator? How do you know a plant needs a moisture separator? When a plant experiences reduced heat exchanger efficiency, erosion at pipe directional changes, erosion to in-line equipment and water hammer, the installation of a separator is a must. All are possible indicators that the presence of entrained condensate particles and the accumulation of condensate exists in the flow of steam.

Moisture separators remove the moisture that remains suspended in the steam flow, which cannot be removed by either drainage or steam trapping. The separator is designed to work in-line and removes approximately 95 - 98% of the entrained condensate particles.

Water drops have more mass and therefore more inertia than steam. (Water hammer is caused because of this same reason, as, at bends the steam passes easily, but the water slug crahes into the bend causing damage.)

Working Principle. In the ARI Armaturen Steamline plate type moisture separator (as shown on the right), we take advantage of this inertia difference between water and steam. The Msep contains intercepting plates in its body. The steam + water mix has to change direction a number of times to go through.

What happens? First, the separator has a larger cross-section than the pipe. As the steam, with the entrained condensate particles, enters the chamber of the separator it suddenly and momentarily looses some of its velocity due to the sudden enlargement of the separator chamber. Some drops just fall to the bottom of the separator as condensate. The mass of most condensate particles propels them forward into the impingement baffles. These drops have too much inertia and mass to change direction when they hit the plates, so they just collect on them or the outer perimeter wall of the separator chamber and collect at a low point in the separator. The dry steam flows around the intercepting plates and comes out on the other side.

The MSep is fitted with a suitable steam trap module from the bottom to ensure the efficient removal of condensate, without the loss of live steam. There are other types of separators in use like the cyclonic and coalescence types of separator, but the plate-type has an acceptable efficiency for steam velocities which are typically in the range of 10 m/s to 30 m/s.

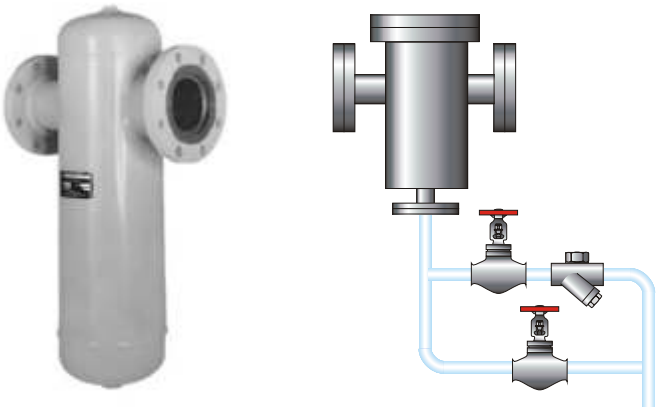


Fig. 1: Moisture Separator with a trap assembly for draining out condensate

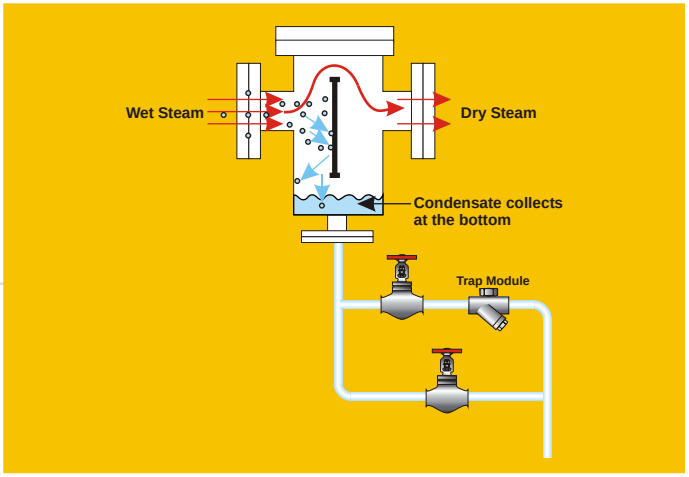
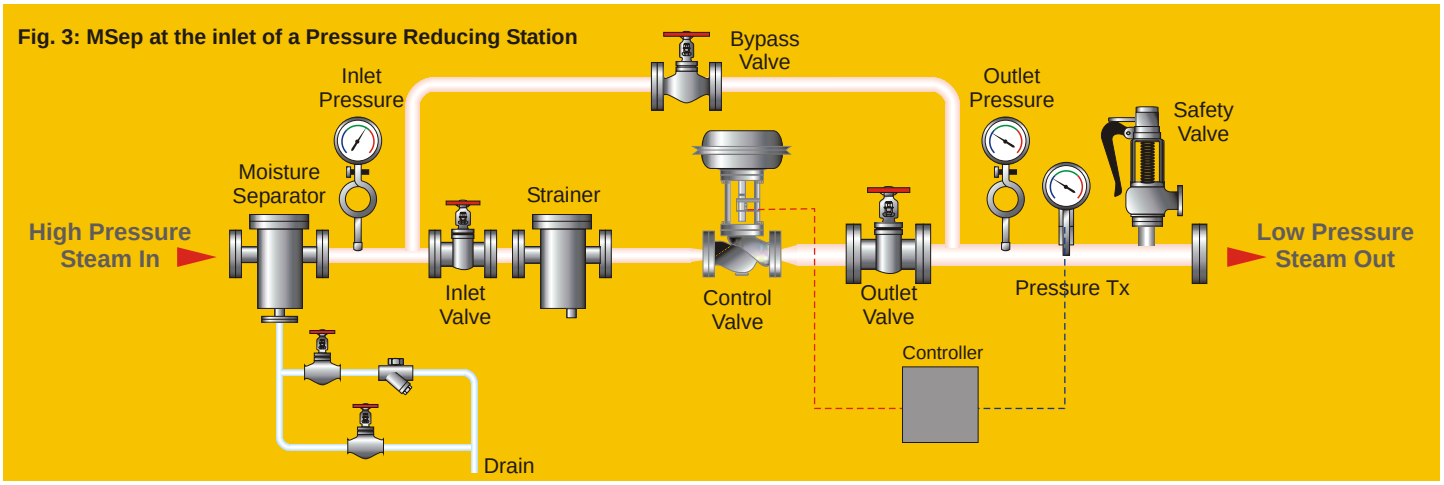


Fig. 2: Moisture Separator - Working Principle



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