

# INSTALLATION AND OPERATION INSTRUCTIONS

## INLINE ENTRAINMENT SEPARATORS

The Penn Inline Entrainment Separators are designed to give maximum separation of entrainment when installed in a steam, air, or gas line. For the best separation results the line on which the separator is located should be adapted to the size of the inlet and outlet on the separator. Installation and piping is simplified by the fact that Penn centrifugal separators are an inline type. It is only necessary to allow space in the line for the distance between the inlet and outlet for the specific separator being installed.

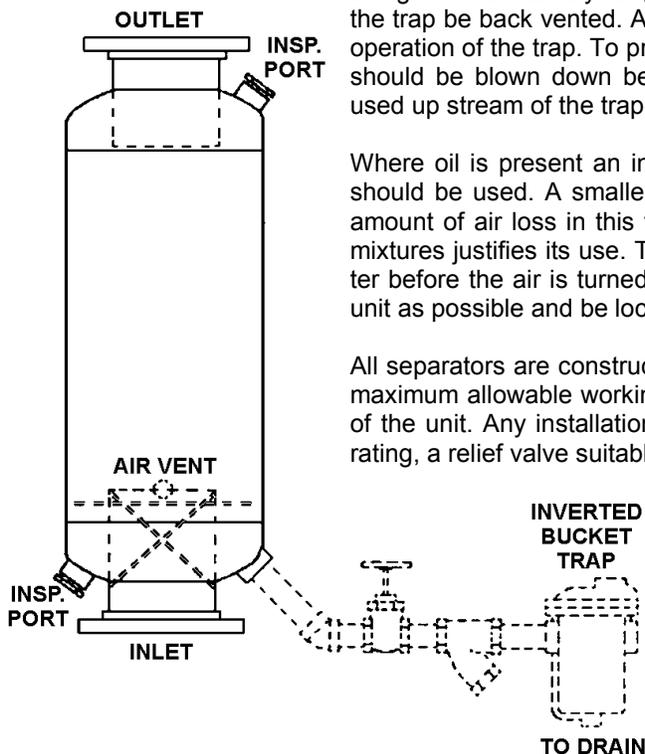
The separator works by centrifugal force. The inlet baffle throws the entrainment to the outside wall where it falls and collects in the bottom head of the separator. A drainage coupling is provided for removal of this entrainment. This spinning action also creates a low pressure vortex in the center of the separator, that the clean flow follows to the outlet of the separator.

Model **ISU** Separator **"Shown Below"**. Install as shown in the air, steam, or gas line so that the flow first enters the inlet which is stamped "I" for inlet. This inlet enters into the bottom head of the separator. The baffle is also located in the inlet which can be visually checked prior to installation. The outlet stamped "O" is located opposite the inlet in the top head of the separator. The drain from where the entrainment is removed is located in the bottom head of the separator along with the inlet. This line should be suitably trapped so that the entrainment is removed but the flowing gas remains in the system. The trap and other accessories are optional items.

Models **ISD "Not Shown"**. Orientate the separator as shown below for the ISU model. The inlet for the ISD "down-flow" models are located at the top of the separator and the outlet at the bottom. The drain is still located at the bottom head of the separator and the trap located below the drain as shown.

**TRAPPING THE SEPARATOR ON STEAM SYSTEMS**— Inverted bucket traps work very well. The trap should be adequately sized for the actual entrainment or an estimated maximum 12% entrainment in the system. The most critical point for discharging entrainment is during start up. To compensate for proper drainage a safety factor of 2-3 times should be used. Penn Brochure page C-7, D-7 shows a trap selector chart for most applications. The pressure rating on the rap should be checked to comply with the separator requirements. The trap should be located below the separator drain.

**TRAPPING THE SEPARATOR—AIR SYSTEMS "NOT SHOWN"** - Where no oil is present a ball float trap should be used for there is no air loss through this type of trap. The trap should be located as close as possible to the separator. Select the trap for air using 5% moisture by weight and a safety factor of 2-3 times. We would recommend the trap be back vented. A connection is provided for venting. This is to ensure proper operation of the trap. To protect against grit hanging up in the trap seating, all the lines should be blown down before installation of the trap. In addition, a strainer can be used up stream of the trap.



Where oil is present an inverted bucket trap such as the Armstrong No. 213BVSW should be used. A smaller trap than this would become air bound. There is a small amount of air loss in this type application, but the dependability of the trap on oil air mixtures justifies its use. The inverted bucket trap must be primed by filling it with water before the air is turned on. As above the trap should be installed as close to the unit as possible and be located below the separator drain.

All separators are constructed and stamped in accordance with the ASME Code for a maximum allowable working pressure. This information is stamped on the name plate of the unit. Any installations where the pressure could be greater than the separator rating, a relief valve suitably stamped should be used to protect the separator.

It is recommended that the piping attached to the separator be supported as close to the separator as possible. On 8" inlet and larger sizes two mounting brackets are provided to help support the weight of the separator.



Warning: Entrainment Separators can contain high pressures and hot condensate. Caution should be used when working around these vessels.