

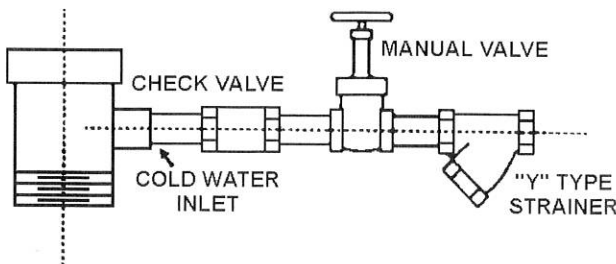
INSTALLATION AND OPERATION INSTRUCTIONS OF PENN AFTERCOOLERS

The selected Aftercooler is screwed into the drain line after the separator. The cold water inlet (C.W.I.) coupling should then be piped to the cooling water through the valve and accessories as illustrated below. The bottom of the Aftercooler is then piped to a service drain. The drain should be steel, cast iron, or concrete of the same size or larger than the Aftercooler. Drains should be sloped a minimum of 1' per 100'. More slope or larger size should be used on obstructed or angled drains. The model A5D Manual Aftercooler is now installed and ready for use. Continue below for automatic cooling Aftercoolers.

The self actuating temperature regulating valve bulb or the solenoid valve sensing element and the bi-met thermometer stem are inserted into the bulb connections on the Aftercooler in that order. If a bulb does not fit correctly into the Aftercooler, a nipple could be added to lengthen the connection. The bulbs should protect into at least the center of the Aftercooler. Instructions also accompany the temperature regulator valve or solenoid valve. The model A16DS, A18DF, or the 20AO Automatic Aftercooler is now installed and ready for use.

The model A5D, A16DS and A18DF Aftercoolers are a non-clogging fitting since the short nozzles and high velocities prohibit deposit build up and clogging which occur at high temperatures.

Shown is the A5D Manual Aftercooler with recommended piping with manual valve and accessories.

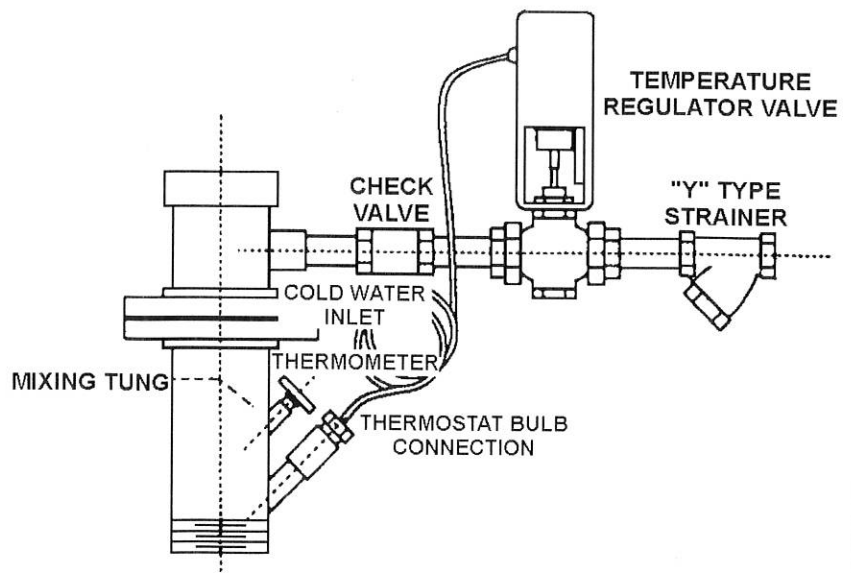


The A5D is a Manual Aftercooler. By opening the manual valve first, cooling water is added to the hot condensate stream. The check valve and strainer protect the valve. The cooling water size is determined from our selector chart B. For installations other than listed please consult the factory or representative for sizing.

Shown is the A18DF Automatic Aftercooler with recommended piping for the temperature regulator valve, piping, and accessories.

The A18DF is an Automatic Aftercooler. The self actuating valve senses the drain temperature and adds cooling water until the set temperature is met. A mixing tung is provided on 4" units and larger. The drain temperature can be continuously monitored on the bi-metal thermometer. The middle flanges permit rotation for various pipe fitting requirements and also serves as a dismantling flange.

Not shown is the 16DS Automatic Aftercooler and the 20AO spray-type Aftercooler. The 16DS Aftercooler is the same as the 18DF model without the center flanges. The 20AO Aftercooler is a jacketed-type Aftercooler required in some areas. This unit uses several cold water spray holes. It can also be used to knock down steam. The model 16DS and 20AO Aftercooler installation is the same as the 18DF model.



Warning: The surface of the Aftercooler may be hot due to the induction of hot water. Caution should be used when working around this vessel.



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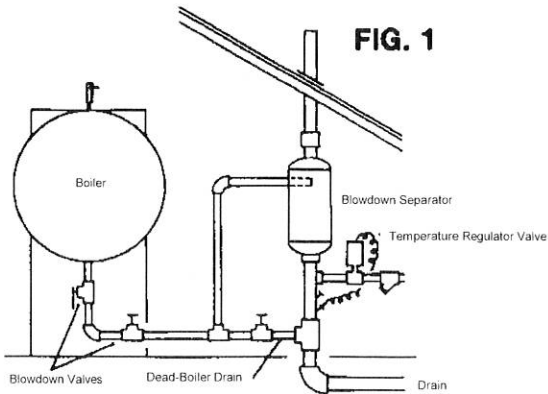
INSTALLATION INSTRUCTIONS AND SYSTEMS FOR THE PENN BLOWDOWN SEPARATOR

Installation of the Penn Blowdown Separator is not complicated. However, proper installation is necessary and the following may suggest the system to use. The boiler, blowdown valves, and piping to and from the separator is shown as an example of the installation and would be provided by others.

The inlet should be piped from the boiler blowdown valves, using sch. 80 min. code rated materials. The piping pressure rating to the inlet should be rated to the design pressure of the boiler. A dead boiler drain should be provided off the inlet piping as shown.

The Penn Separator is an instantaneous separator, therefore drainage from the unit should be as fast as the blowdown flow is separated. The floor drain should be steel, cast iron, or concrete of the same size or larger than the separator drain and aftercooler. Drains should be sloped a minimum of 1' per 100'. More slope or larger size should be used on obstructed or angled drains.

The vent should also be as direct as possible to atmosphere to limit pressure drop. The same size pipe as the separator vent should be used. The vent should be extended above buildings, work areas, and personnel to a safe point of discharge. Flashing should be used when vent is through a composition roof.

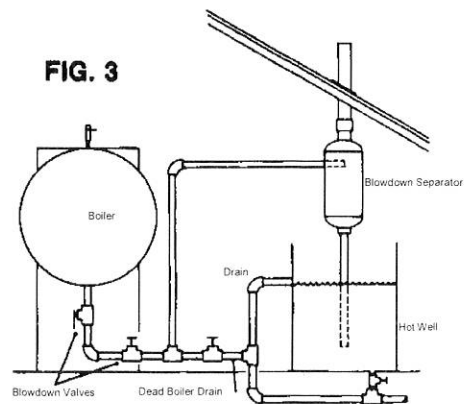
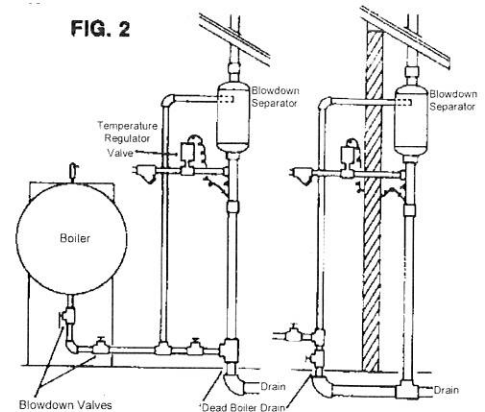


At the left shows the simplest and most practical installation since it provides ready drainage for most heating or process boilers. A dead boiler drain is also included. The boiler, piping, and blowdown valves would be provided by others.

Optional angle iron legs can be provided to support the separator off the floor. These legs vary in length depending on the size of drain and type of aftercooler used.

As an option water tempering may be added to the separator as shown. Our water tempering aftercooler package includes Aftercooler fitting, temperature regulator valve, strainer and bi-metal thermometer. A check valve and pressure reducing valve, "not shown" could also be provided as an option. Cooling water pressure to the valve should be limited to 60 psig. See our additional instructions B-2 for the aftercooler fitting installation and PS Series brochure for temperature regulator valve.

Elevated installations, right may be used where boiler room floor space is at a premium. Another space saving installation would be an outside installation. This has become a more popular installation because "under roof" space is not consumed. The installation can be off the ground as shown above or an elevated installation show to the right. Being a self-draining separator there is not chance of freezing. The temperature regulator valve should be located indoors and the bulb and capillary protected from freezing. Wall mounting brackets can be supplied as an option for wall mounted installations.



Localities requiring storage tempering may use a blowdown separator only if discharged to a holding device such as an open, closed but vented, slotted or grid top receiver. The receiver should be capable of holding accumulation of two blowdowns. Manual drain or a siphon drain may be used on the receiver. The siphon drain turn should be located at the top of the first blowdown level. The separator should be located at a sufficient height so that additional blowdown mixes well with the cooled blowdown being held in the receiver. A manual drain should always be provided on the receiver for periodic cleaning.

Local regulations prevail at all times. Check for local regulations and your insurance agency concerning the use and installation of Blowdown Separators for additional requirements. Welding on an ASME Code pressure vessel require a certified welder who carries the appropriate stamp required for the procedure. These separators handle hot steam and condensate. Caution should be used when working on or around these pressure vessels. Should there be additional questions concerning blowdown separator systems or installation, either our sales representative or the factory would be pleased to help. Please provide a sketch when submitting problems.

OPERATION and MAINTENANCE INSTRUCTIONS PENN BLOWDOWN SEPARATORS

The Penn Separator is an integrally welded unit with no removable or replaceable parts. The only maintenance required on the separator would be to keep the vessel exterior clean and free of rust.

Normal Boiler Blowdown procedures as recommended by the boiler manufacture should be used as the operating procedure for the separator.

To minimize shock and water hammer when opening the blowdown valve the first time it should be opened slowly to allow the blowdown line and separator to warm. This can also help cooling water mixing to start.

Refer to Page B-2 Installation and Operation Instructions for Penn Aftercoolers for separators with drain water cooling accessories.

Since the Separator is self-draining - self-drying there are no other instructions - Just the normal Boiler Blowdown procedure.

PS Temperature Regulator Valve: Installation, Operation & Maintenance

Application Overview

The PS Series temperature-actuated water-regulating valves are used for water-cooled condensers, bypass service on refrigeration systems, engine cooling, and various industrial applications.

IMPORTANT: All PS Series valves are designed for use only as operating devices. Where system closure, improper flow, or loss of pressure due to valve failure can result in personal injury and/or loss of property, a separate pressure relief or safety shutoff valve (as applicable) must be added by the user.

Installation

To provide satisfactory operation, always install valve with bellows down and spring cage up. Capillary end of temperature bulb should always be higher than plugged-end of bulb, or if horizontal, the word TOP should be at the top or uppermost surface of bulb.

Adjustments

To raise the valve opening point on direct-acting valves, turn the adjusting screw counter-clockwise. To lower the valve opening point, turn the range adjusting screw clockwise. See Figure 2. The closing point of the valve is not adjustable. Temperature-actuated valves close approximately 3 to 5 degrees Fahrenheit (1.7 to 2.8C) below the opening point.

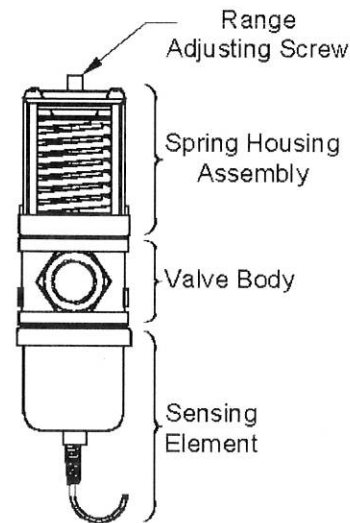


Figure 2: Valve Components



CAUTION: Equipment Damage Hazard.

To decrease the pressure in the sensing element on PS valves, cool the bulb by submerging it in ice water. Do not remove the bulb from the ice water until the element is rein-

Manual Flushing

To clear any sediment that may accumulate, valves may be manually flushed by inserting screwdrivers under both sides of the main spring and lifting upwards to flush the valve. Manual flushing does not affect valve adjustments.

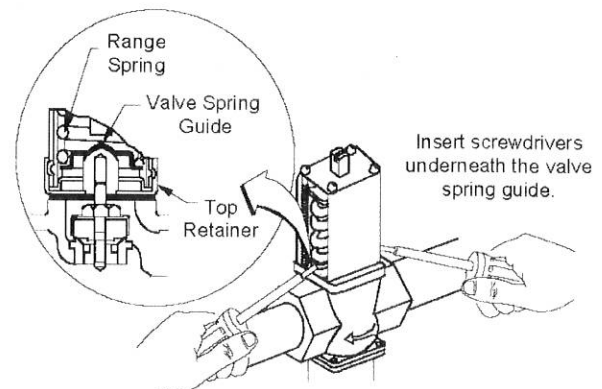




Figure 1: Manual Flushing

Service

After long periods of operation, the valve seat and rubber disc may become worn, pitted, or wire drawn, preventing the valve from completely closing off when the temperature is below the set point.

 **WARNING: Personal Injury Hazard.**
Contents of liquid lines could be under pressure. Avoid possible personal injury by shutting off the liquid supply and relieving the pressure before servicing the valve.

 **WARNING: Personal Injury Hazard**
The housing contains a co pressed spring. Disassembly could cause the spring to fly out resulting in personal injury or damage. For valve sizes 1 in. and larger, do not remove the two screws on the sides of the spring housing.

1. Decrease the compression on the main spring by turning the range adjusting screw clockwise until it stops. Using excessive force to turn the screw beyond the stop point will strip the thread.
2. Remove the four screws holding the spring housing and remove the entire housing assembly. See Figure 2.
3. To improve the performance on 3/8 in. direct acting valves, install the ISO-loss washer that is supplied with the 3/8 in. valve repair kit as follows:

Note: Reverse-acting 3/8 in. valves do not require the ISO-loss washer:

- a. Slightly squeeze the spring housing assembly to remove the spring housing.
 - b. Remove the range adjusting screw, spring, and valve spring guide (Figure 4).
 - c. Clean off any excess grease on the valve spring guide.
 - d. Place the new ISO-loss washer over the guide plate.
 - e. Replace the valve spring guide, spring, range adjusting screw, and spring housing.
4. Remove the valve assembly screw (Figure 3).
 5. Remove the guide post and old diaphragms (Figure 3).
 6. Remove the sensing element and the diaphragms between it and the valve body (Figure 3).

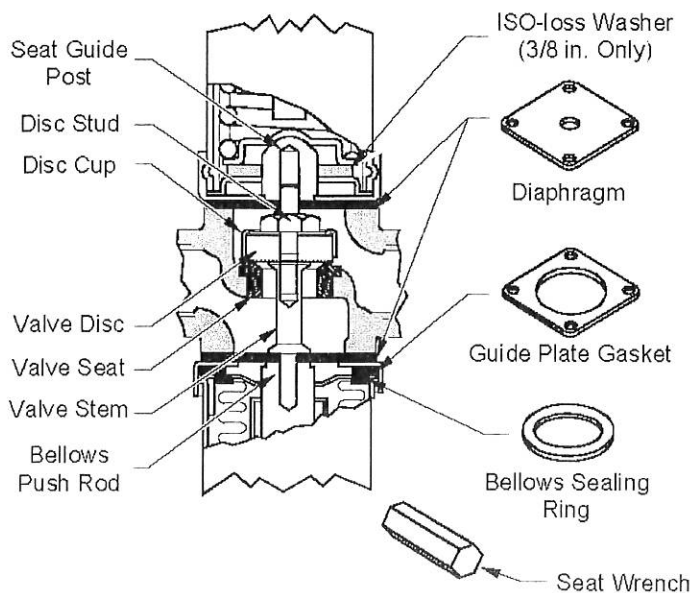


Figure 3: Diagram of 3/8" through 1-1/2" Valve

7. Pull the disc, disc retainer, and extension sleeve assembly from the valve (Figure 3).
8. Using the seat wrench supplied with the kit, remove old valve seat and replace with the new valve seat (Figure 3). (Seat wrench not provided for 2 and 2-1/2 in. valves, use 1-15/16 in. hex stock, respectively.)
9. Replace the diaphragms between the sensing element and valve body (Figure 5). Use two diaphragms on 3/8 in., 1/2 in., and 3/4 in. valves and three diaphragms on 1 in. and larger valves.
10. On 1 in. and larger pressure valves and all temperature valves, replace the guide plate gasket and bellows sealing ring (Figure 5).
11. Assemble the sensing element to the valve body with the bellows push rod, new diaphragms, guide plate gasket, and bellows sealing ring in place.
12. Assemble the new disc, disc retainer, and extension sleeve and place into the valve body.
13. Place two new diaphragms on the spring housing end of the valve body.
14. Screw the valve assembly screw through the guide post and into the bellows push rod (Figure 3).
15. Place the spring housing assembly over the guide post and secure in place with the four housing screws.
16. Adjust the valve to desired opening point. Then Manually flush the valve. See the Manual Flushing Section.
17. Before leaving the installation, run the system through at least one complete operating cycle to be sure the valve is operating correctly.

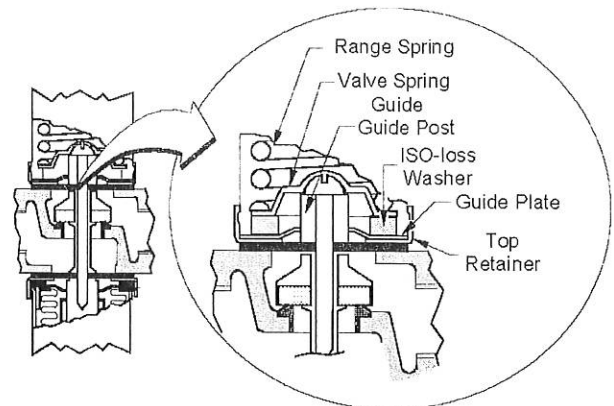


Figure 4: ISO-Loss Washer

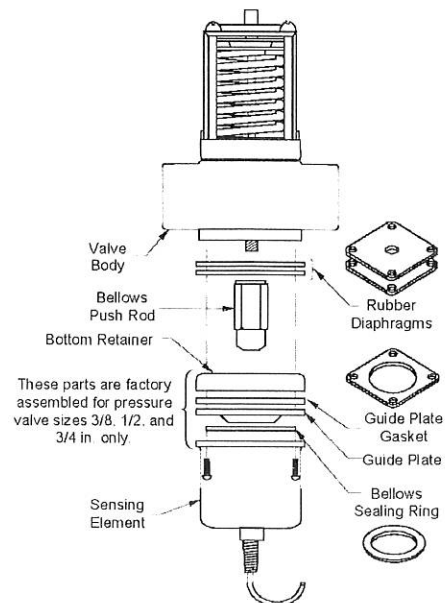


Figure 5: Guide Plate Gasket and Bellows Sealing Ring Identifications

ADJUSTMENTS AND SERVICING

***STERLCO 56-T* Temperature Actuated Regulating Valve**

To decrease flow or raise temperature (reduce water consumption) turn adjusting cup clockwise. To increase flow or lower temperature turn adjusting cup counterclockwise . After making adjustments give the regulator time to adjust itself against temperature change.

To remove adjusting cup remove retainer ring.

The Type 56-T valve may be flushed manually after installation to remove dirt and grit from the line. To flush valve, place sturdy a screwdriver on top of push plate and spring assembly. (Opening in lower housing provides ample room to insert screwdriver). Compress and release spring assembly several times.

