



Application Guide

A Division of CIRCOR International, Inc.

SPENCE ENGINEERING COMPANY, INC. 150 GOLDENHAM ROAD, WALDEN, NY 12586-2035

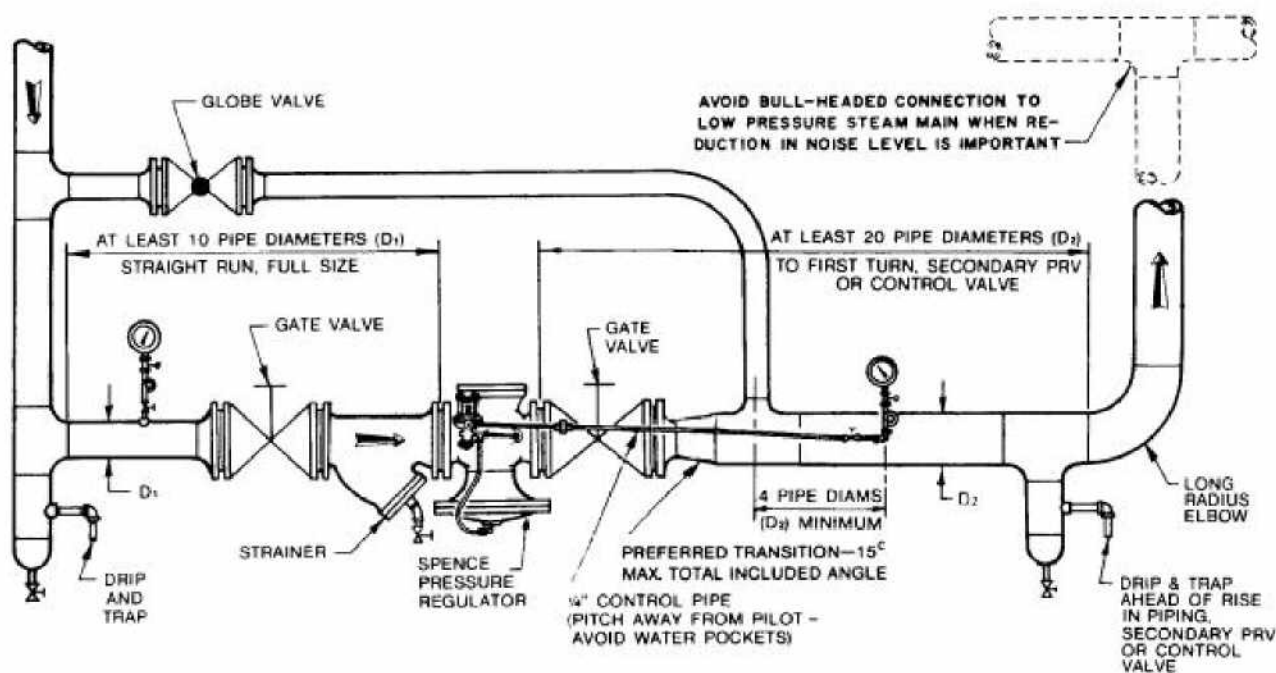
TYPE ED SINGLE STAGE PRESSURE REDUCING VALVE

APPLICATION:

To reduce a steady or varying Inlet pressure to a constant adjustable delivery pressure.

OPERATION:

Valve is operated by incoming pressure. As delivery pressure nears spring setting on pilot, valve starts to modulate and maintain set pressure.



RECOMMENDED INSTALLATION OF REGULATOR WITH STRAINER

ADVANTAGES:

- Accurate, sensitive control.
- Packless construction.
- High capacity.
- Inexpensive.



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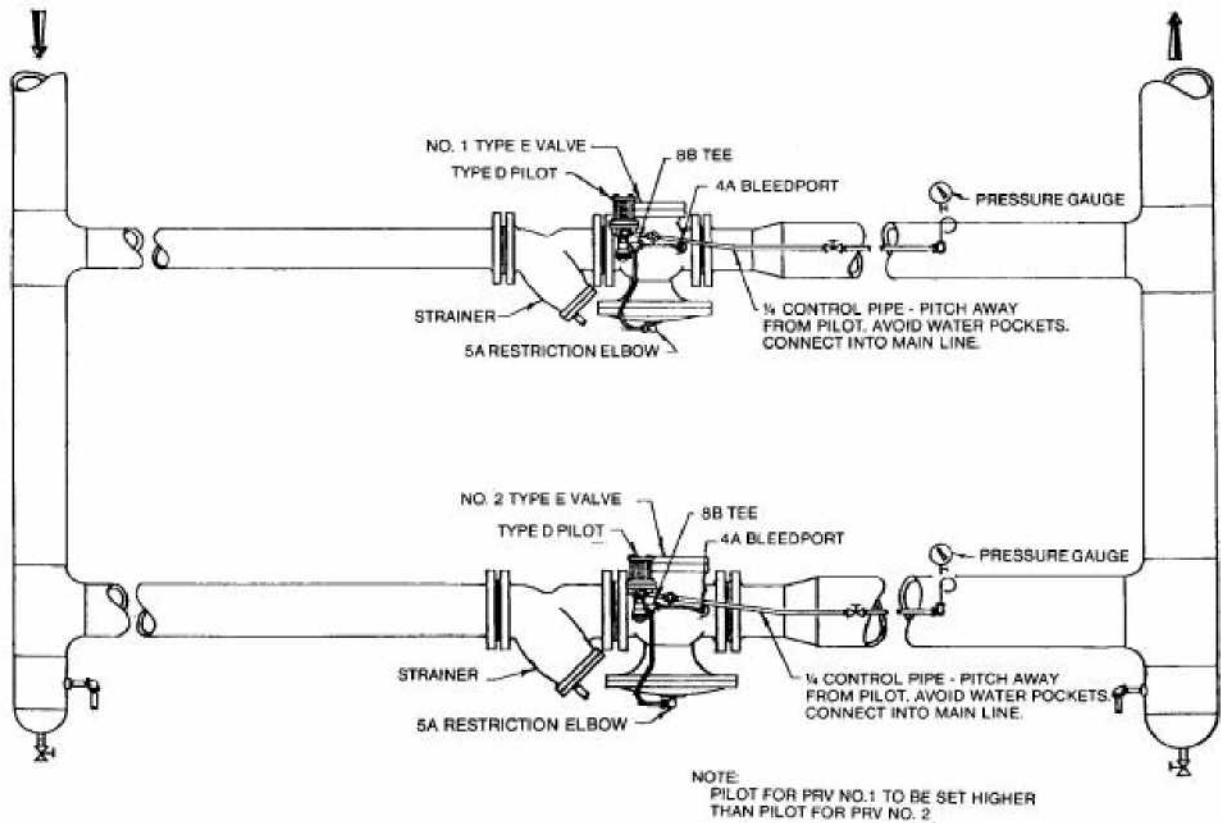
TYPE ED PARALLEL (ADDITIVE) PRESSURE REDUCING STATION

APPLICATION:

Used on widely varying flow conditions

OPERATION:

Load is typically split 1/3 - 2/3. Small valve is sized for 1/3 of load and is lead valve set for desired delivery pressure. Large valve is lag valve set 2 - 3 psig lower than delivery pressure of small valve. On low flow demand, small valve only will be flowing; as flow increases and small valve cannot handle flow, the delivery pressure drops and large valve opens.



ADVANTAGES:

- Better rangeability.
- Accurate control.

ED TWO STAGE



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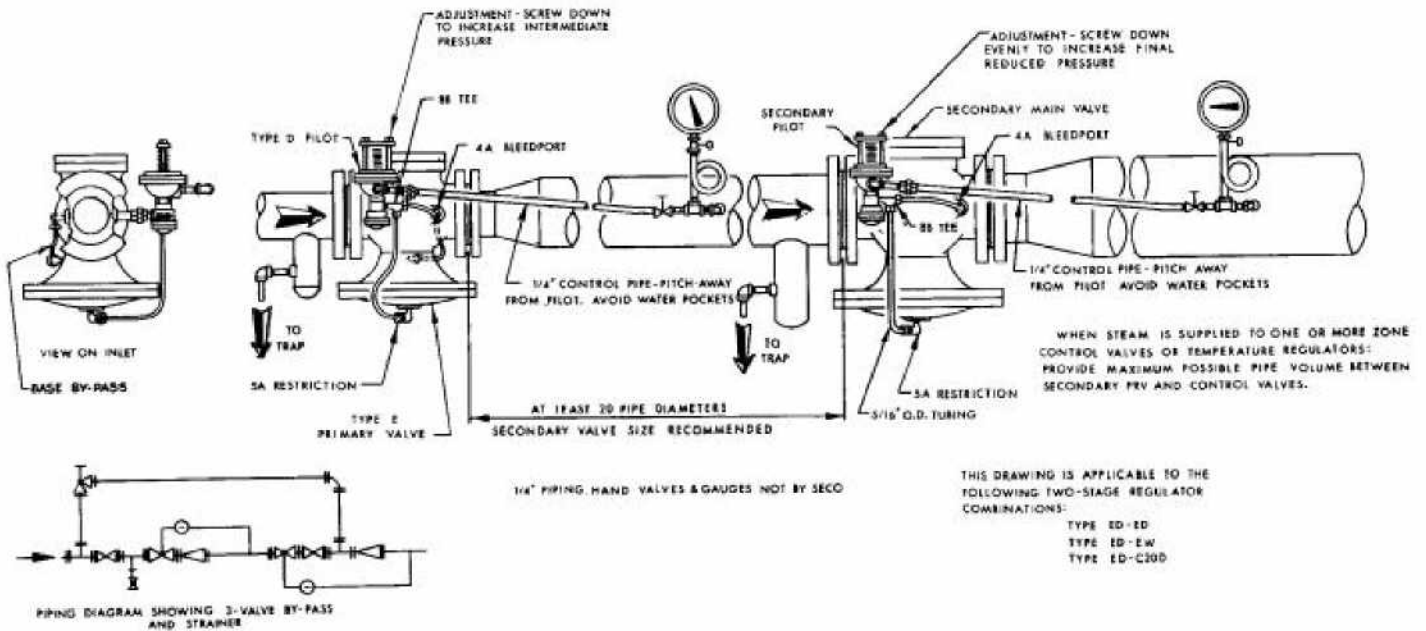
TYPE ED TWO-STAGE PRESSURE REDUCING STATION

APPLICATION:

Used when reducing from high inlet pressure to low delivery pressure.

OPERATION:

Same as single stage reduction. When delivery pressure approaches spring setting on pilot, main valve throttles to maintain setting.



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 PRESS. REDUCING-STM/GAS

ADVANTAGES:

- Less velocity noise.
- Less maintenance costs.
- Safety is increased.



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ED TURBINE EX

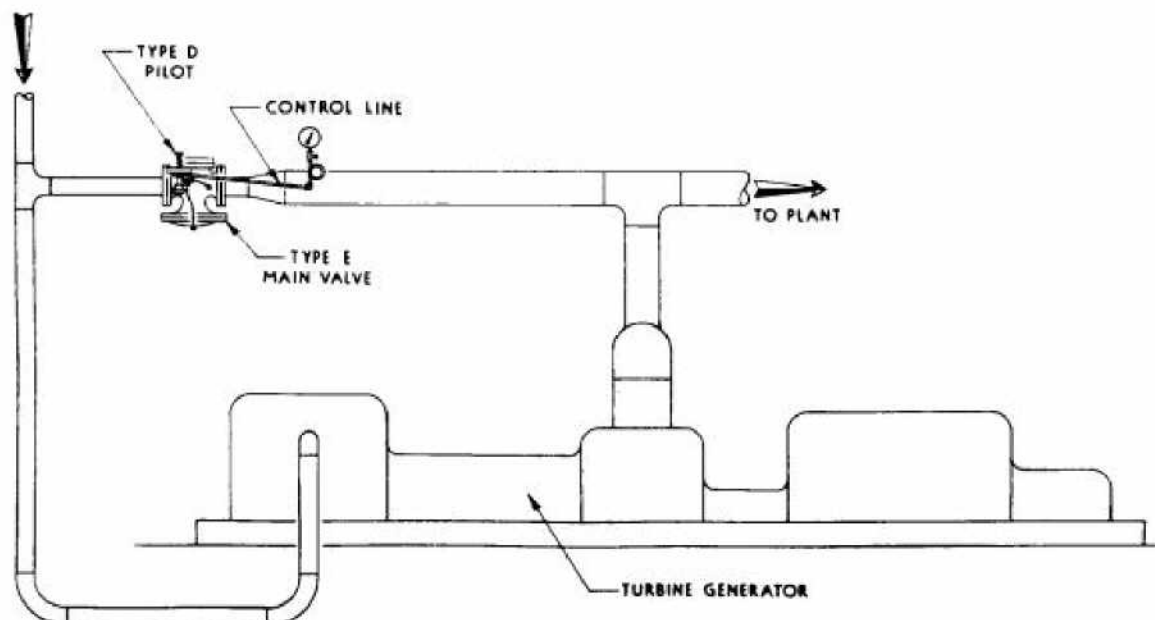
TYPE ED TURBINE EXHAUST MAKE-UP VALVE

APPLICATION:

To provide additional (make-up) steam to turbine exhaust main.

OPERATION:

When turbine load decreases and turbine exhaust is insufficient for steam load, very slight drop in exhaust pressure causes pressure regulator to feed correct amount of steam to meet demand.



ADVANTAGES:

- Pilot operated accuracy avoids undue pressure drop before makeup starts.
- Constant accurate supply to user.
- Ease of operation - "set & forget".

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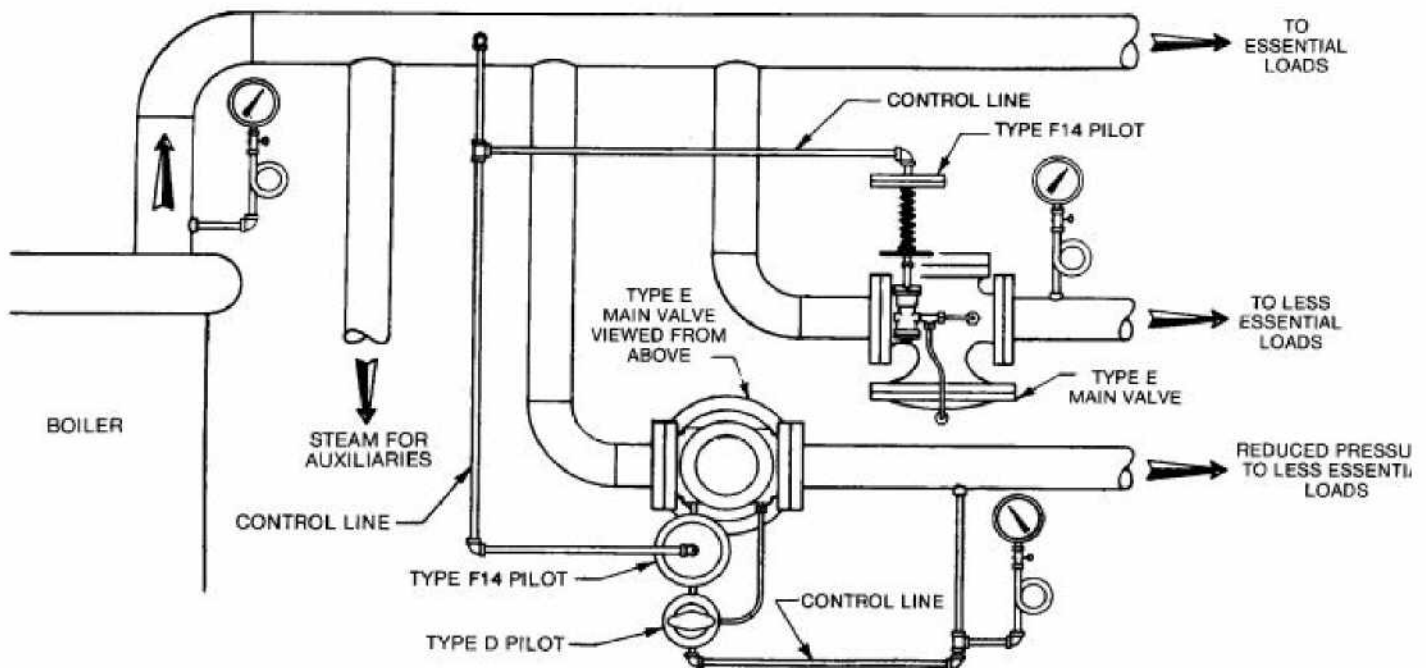
TYPE EF14 AND EF14D STEAM ALLOCATING VALVES

APPLICATION:

To provide for distribution of steam from an occasionally overloaded boiler to most essential services first.

OPERATION:

With boiler operating within rated load and at rated pressure, F14 pilots (set slightly lower) are wide open and main valves are either wide open or under control of alternate pilots and delivering all the steam each line requires. Then, when load increases beyond boiler capacity and boiler pressure drops, the F14 pilots will throttle the main valves, restricting the flow to the less vital processes and permitting the others to function at rating.



ADVANTAGES:

Less expensive than separate back pressure valve (when combined with pressure, temperature or other regulating valves).

Can frequently postpone necessity of buying larger boiler.

Provides assurance against loss of steam to boiler auxiliaries.



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ED REMOTE

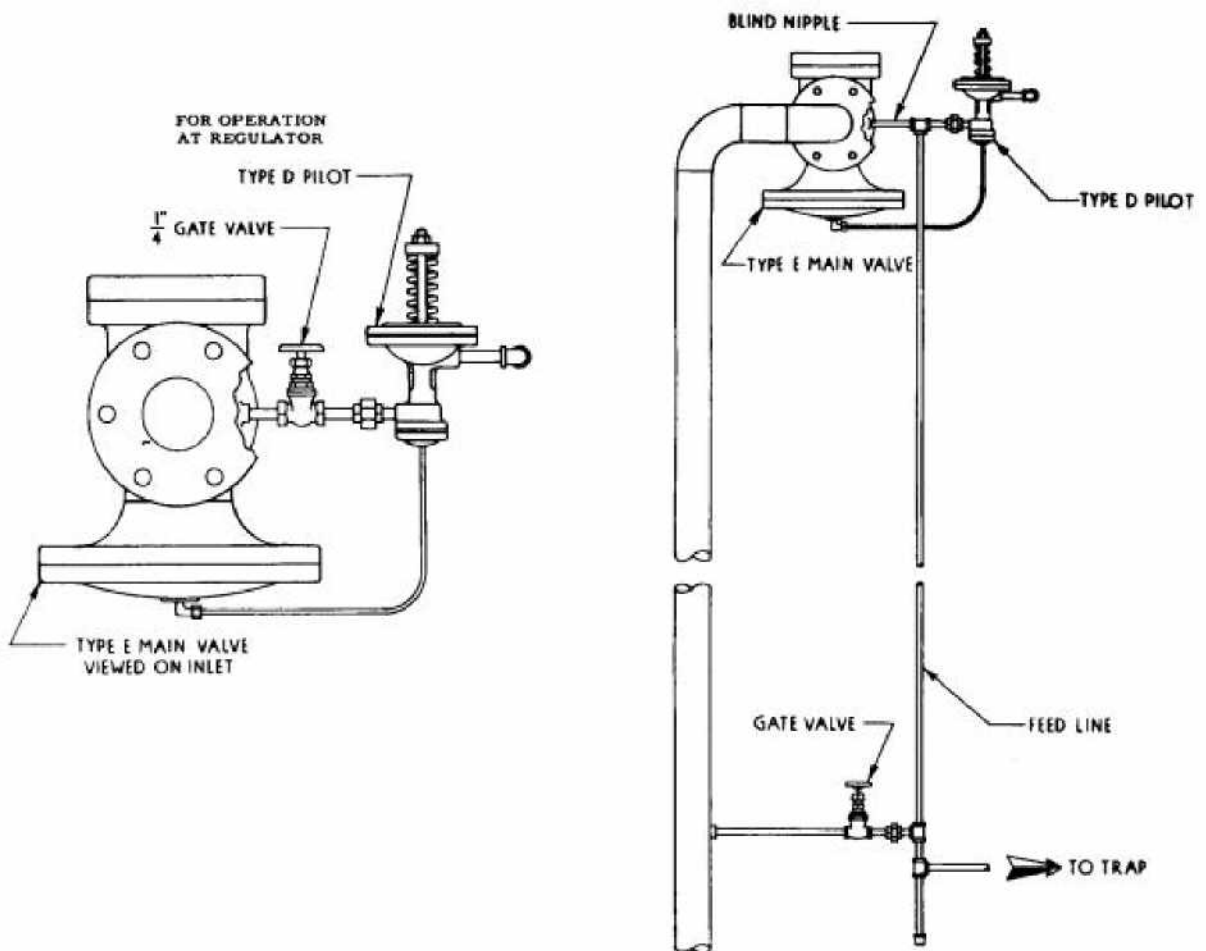
TYPE ED REMOTE SHUT OFF

APPLICATION:

Provides easy shut-down on a process where frequent shut-down is required.

OPERATION:

Same as standard ED, except, closing 1/4" gate valve denies steam to the pilot and shuts main valve.



ADVANTAGES:

- Easier and much faster than opening and closing the larger gate valve in main.
- Reduces maintenance on the gate valve in the main line.
- Self contained.

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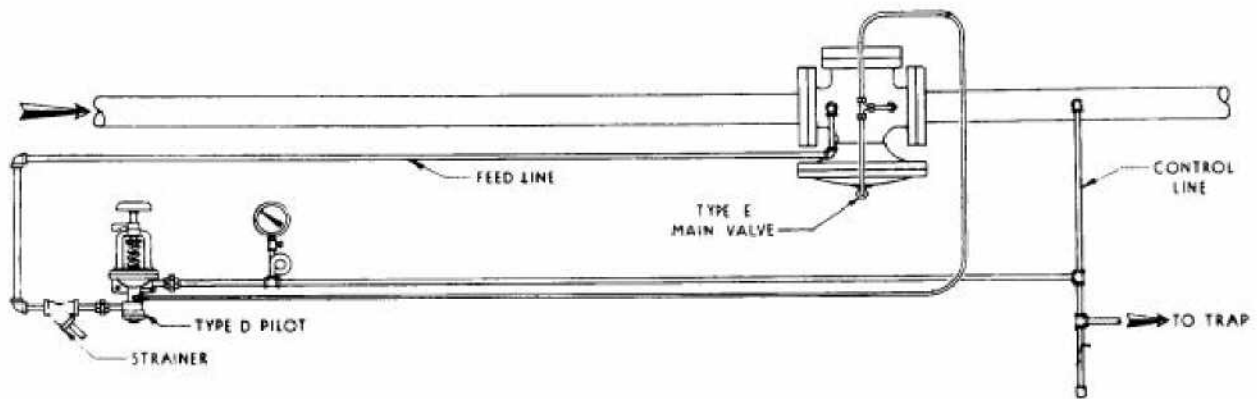
TYPE ED REMOTE MOUNTED PILOT

APPLICATION:

Provides remote location of pilot to area where pressure can be easily adjusted.

OPERATION:

Standard ED operation.



ADVANTAGES:

Least expensive of remote-adjusting arrangements (less than special extra equipment or re-routing main piping).

Maintenance personnel, who understand operation of standard mounted regulator, have nothing new to learn.

Can be applied to existing regulators by merely extending connections.

Can be furnished with panel board and gages.



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EP125 TRIP VALVE

TYPE EP125 TRIP VALVE

APPLICATION:

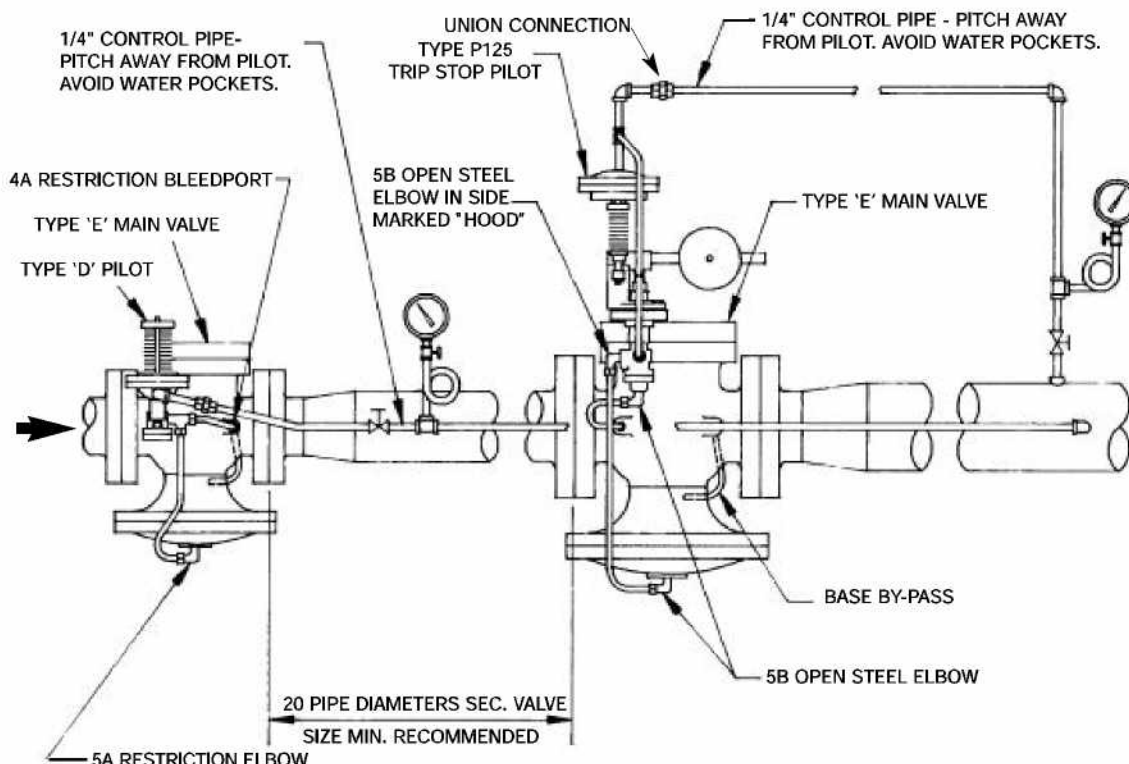
In some district heating and steam distribution systems, the use of relief valves and vent piping may not be feasible, because of building height. Where such a condition exists, and the system steam pressure does not exceed 400 psi, ANSI B31.1-1977, Paragraph 102.2.5 permits the use of a pressure reducing valve and a trip stop valve in series to provide over-pressure protection.

The P125 trip pilot is a self-operated device intended to be used in conjunction with a normally-closed Spence main valve, providing a trip stop valve, as cited in previous paragraph.

OPERATION:

During normal operation, the P125 pilot holds its main valve in the open position. Reduced pressure is under control of primary P.R.V.

If reduced pressure rises to the set point of P125 (generally 5 psig over controlled pressure), it will shut and lock closed. This action closes its main valve and shuts system off.



ADVANTAGES:

- Trip valve has to be manually reset.
- Less expensive than relief valve.
- Control accuracy of ED.

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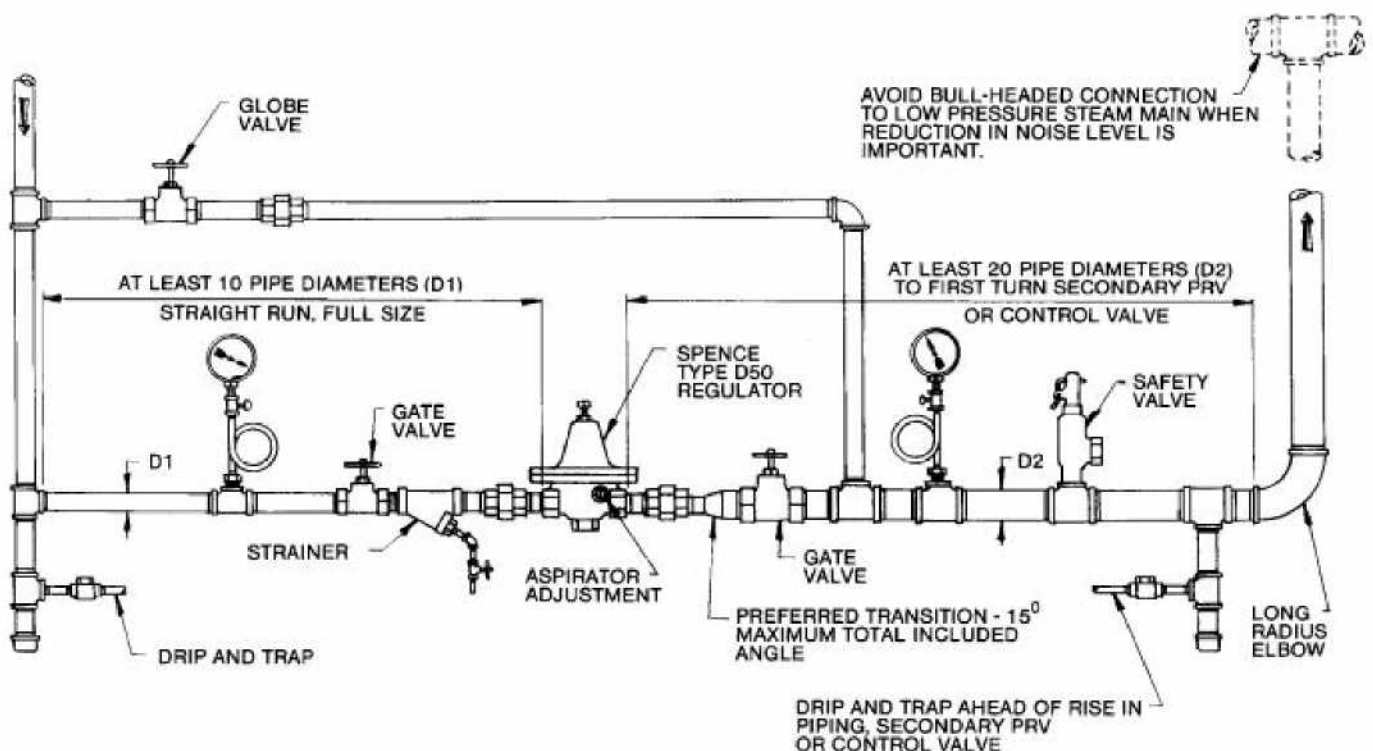
TYPE D50 DIRECT OPERATED PRESSURE REDUCING VALVE

APPLICATION:

To reduce a steady or varying inlet pressure to a constant adjustable delivery pressure. Ideal for small flows such as unit heaters and sterilizers.

OPERATION:

Valve is operated by incoming pressure. As delivery pressure nears spring setting on pilot, valve starts to modulate and maintain set pressure.



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ADVANTAGES:

- Accurate control.
- Available in Cast Iron, Bronze and Stainless Steel.
- Aspirator adjustment for greater sensitivity.



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ED5, EOP

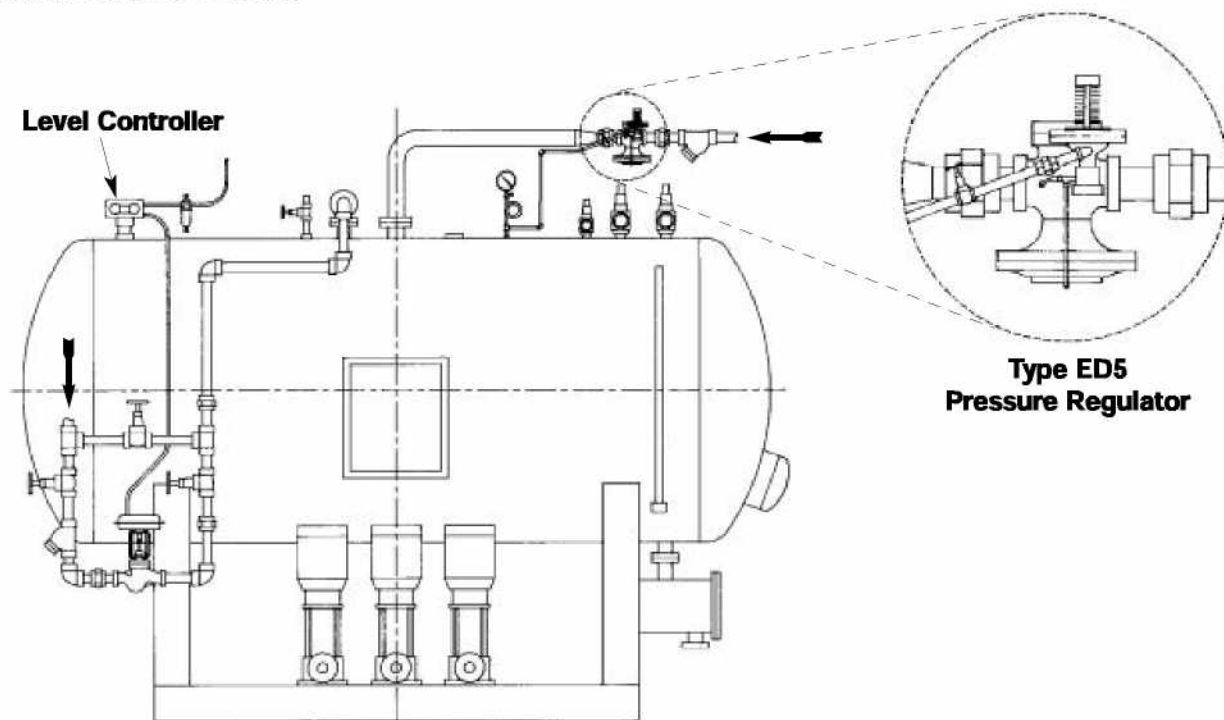
TYPE ED5 PRESSURE REGULATOR for ACCURATE CONTROL of a DEAERATOR

APPLICATION:

To enhance the deaeration of boiler feedwater by accurately controlling the steam pressure and temperature in a deaerator.

OPERATION:

The Type ED5 Pressure Regulator is connected to the Deaerator as shown, *with the Type D5 Pilot's Sensing Line connected to the Deaerator*. Operation is identical to the Type ED except delivery pressure is sensed in the Deaerator, not the steam piping. The larger, more sensitive diaphragm of the Type D5 Pilot (1 to 25 psig delivery pressure) has twice the accuracy ($\pm 1/2$ psig) of the Type D Pilot (± 1 psig). With the Type D5 Pilot typically set at 5 psig, temperature variation inside the Deaerator is held to $\pm 1^\circ\text{F}$.



ADVANTAGES:

Self-contained, packless regulator

Increased accuracy for better deaeration

Type E2 substituted if initial steam pressure is between 9 and 15 psig

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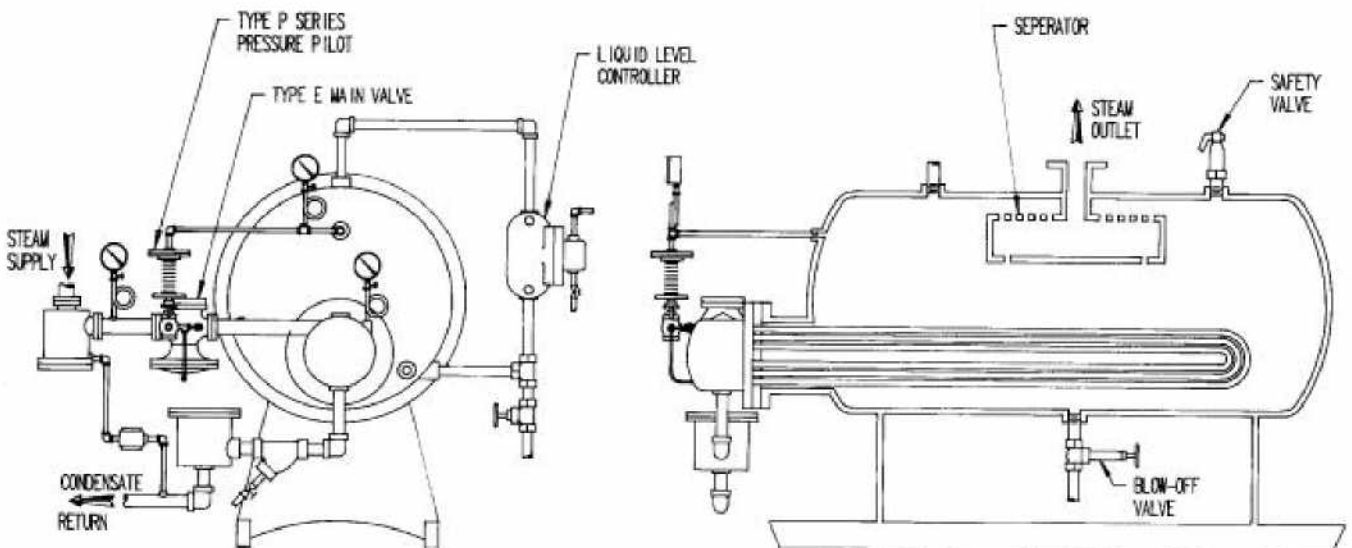
TYPE EP PRESSURE REGULATOR for SELF-CONTAINED CONTROL of an UNFIRED STEAM GENERATOR

APPLICATION:

To provide self-contained control of an Unfired Steam Generator.

OPERATION:

The Spence Type EP Pressure Regulator controls the steam supply to the Unfired Steam Generator and maintains a constant, average, adjustable steam outlet pressure of the Unfired Steam Generator regardless of changes in load.



ADVANTAGES:

Can eliminate the need for a Pneumatic Control Valve, Positioner and Pressure Controller.

When additionally equipped with a Type D Pressure Pilot, making a Spence Type EPD Pressure Regulator, the need for a separate Pressure Reducing Valve may be eliminated.



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EP FOR UNFIRED

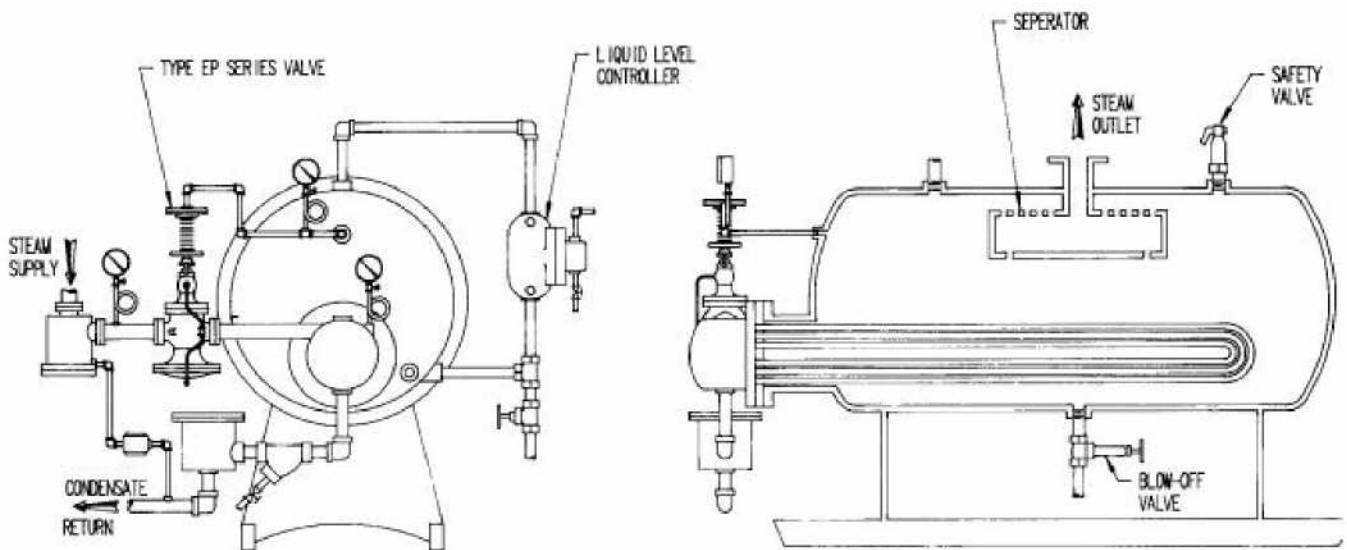
TYPE EP PRESSURE REGULATOR INTEGRALLY MOUNTED for SELF-CONTAINED CONTROL of an UNFIRED STEAM GENERATOR

APPLICATION:

To provide self-contained control of an Unfired Steam Generator with Integrally Mounted Pilot option for increased rigidity.

OPERATION:

The Spence Type EP Pressure Regulator controls the steam supply to the Unfired Steam Generator and maintains a constant, average, adjustable steam outlet pressure of the Unfired Steam Generator regardless of changes in load.



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ADVANTAGES:

Can eliminate the need for a Pneumatic Control Valve, Positioner and Pressure Controller.

Integrally Mounted Pilot option increases the rigidity of the Pilot for O.E.M. installation on skid mounted equipment.