



Application Guide

A Division of CIRCOR International, Inc.

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

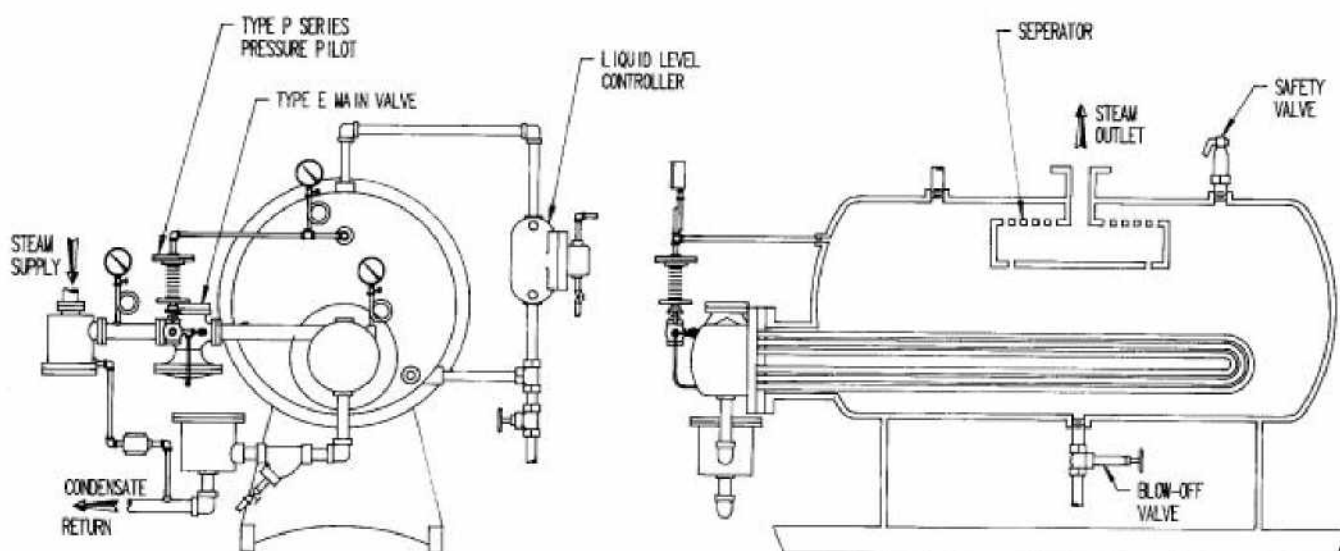
TYPE EP PRESSURE REGULATOR for SELF-CONTAINED CONTROL of an UNFIRED STEAM GENERATOR

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

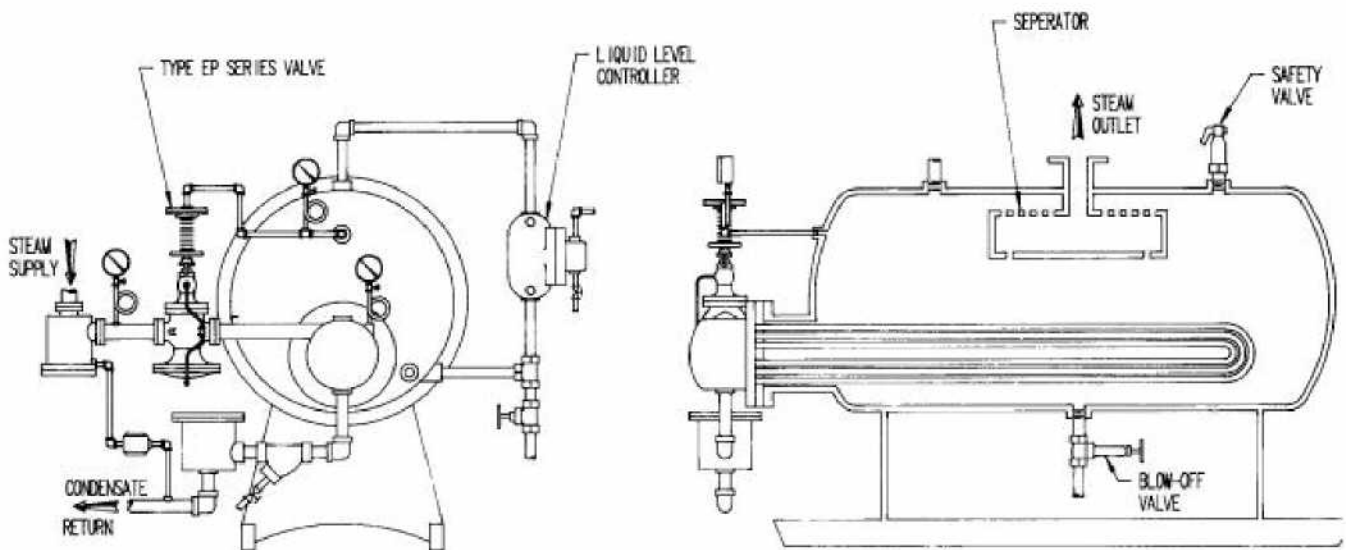
TYPE EP PRESSURE REGULATOR INTEGRALLY MOUNTED for SELF-CONTAINED CONTROL of an UNFIRED STEAM GENERATOR

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.



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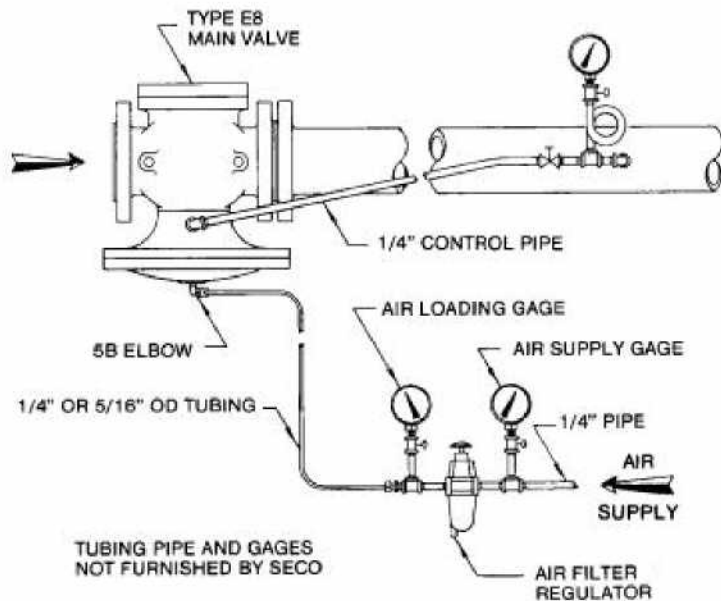
TYPE E8 AIR ADJUSTED PRESSURE REDUCING VALVE

APPLICATION:

To reduce high pressure to constant adjustable delivery pressure. Ideal for regulation when poor steam conditions exist.

OPERATION:

Valve is normally closed and is opened by air pressure under the diaphragm. The downstream pressure is on top of the diaphragm, and the required delivery pressure is obtained by adjusting the air pressure.



ADVANTAGES:

- No pilot required.
- No orifices to plug up.
- Economy and performance of E valve.



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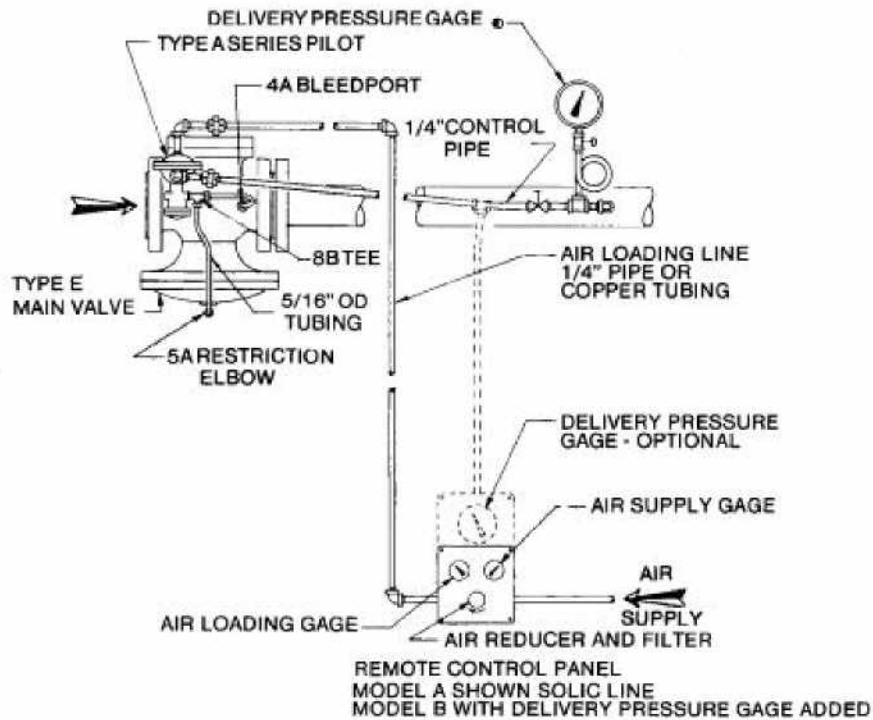
EA SERIES AIR ADJUSTED PRESSURE REGULATOR

APPLICATION:

To provide simple accurate control when varying delivery pressures are required. Ideal for tire moulding, laminate presses and drum dryers.

OPERATION:

Delivery pressure is remotely adjusted by changing air pressure to pilots.



ADVANTAGES:

- Ease of adjustment.
- Operator control.
- Many air adjusted Pilots available.

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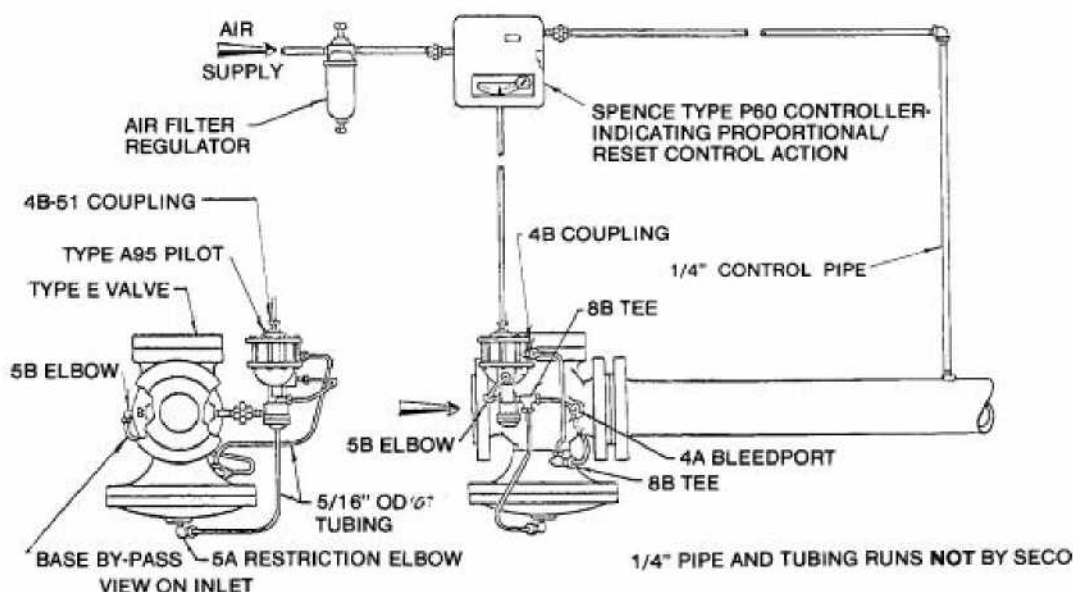
EA95P60 PNEUMATICALLY CONTROLLED PRESSURE REGULATOR

APPLICATION:

Provides control valve accuracy on jobs demanding close regulation. Ideal for process applications requiring fast load changes and varying outlet pressures.

OPERATION:

A controller out-put air signal, covering a span of 12 psig, will fully stroke the main valve. An out-put signal of 3 psig will start the main valve opening and at 15 psig main valve is fully open.



ADVANTAGES:

- Packless Construction.
- Parabolic Disc available for greater rangeability.
- Valve closes on loss of air.
- Required Balanced Main Valve



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EA93 AUTOMATIC

EA93 AUTOMATIC TRANSFER PRESSURE REDUCING STATION

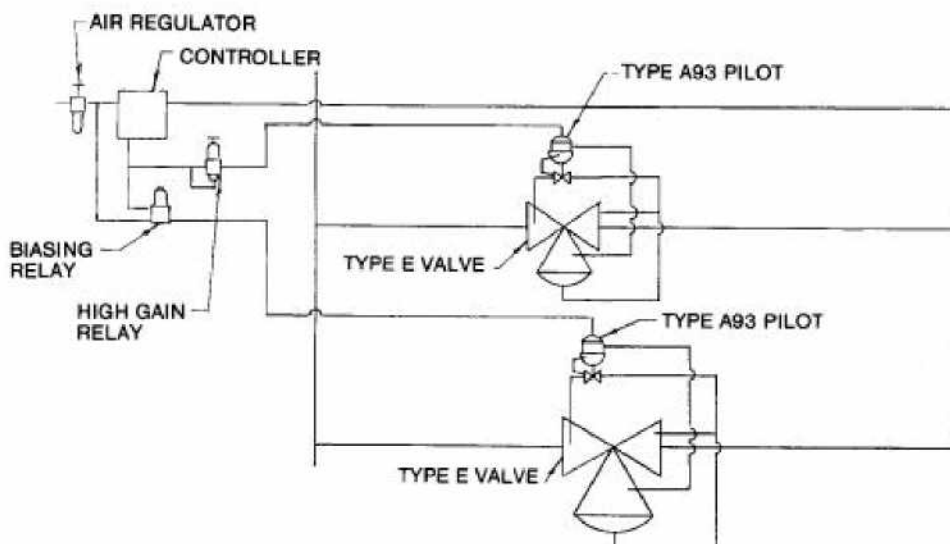
APPLICATION:

The Spence Type EA93 Automatic Transfer Station is designed to provide accurate and stable control of reduced pressure throughout an exceptionally wide range of flow conditions. This design maximizes the rangeability of the station, while minimizing the extreme throttling encountered in single valve stations operating under the identical conditions. Balanced construction insures stability of regulator.

OPERATION:

The Type EA93 Automatic Transfer Station consists of two pressure reducing valves installed in parallel. The larger of these valves is sized for 100% of the required load. The smaller valve is sized for a fraction (typically 15% to 25%) of the required load. Both valves are operated in a predetermined sequence by a pneumatic controller. An interlocking system of pneumatic relays provided the logic to sequence the operation of the station.

Under low flow conditions, the smaller valve will handle the demands on the station; the larger valve will be shut. As demand increases, the smaller valve will gradually open until it reaches the full open position. Upon further increases in demand, the larger valve will open and, simultaneously, the smaller valve will shut. The larger valve will then carry the higher loads on its own. Should demand drop, this sequence reverses: control of the flow is transferred back to the smaller valve and, simultaneously, the larger valve closes.



ADVANTAGES:

- Greater rangeability than single valve.
- Pressure switches can be adapted to system for additional safety.
- Standard stock valves can be used.

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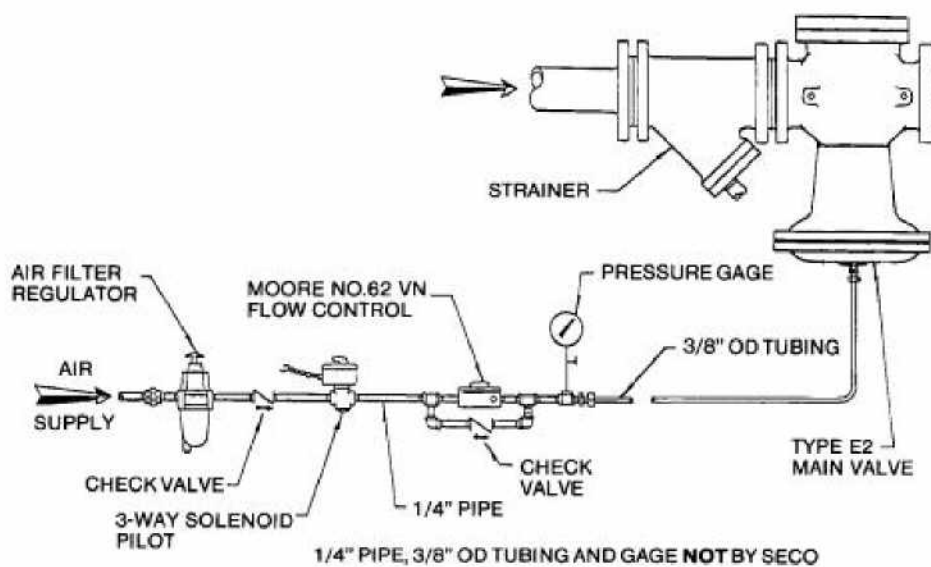
TYPE E2 SLOW OPENING VALVE

APPLICATION:

When slow opening is required on a low pressure steam system, the E2 can be slowly opened by using a low volume flow control valve.

OPERATION:

System is turned on by activating solenoid, and supplying air to flow control, which sends air loading pressure to diaphragm of E2 valve. Opening time is regulated by adjusting needle valve on flow control. When solenoid is shut off, it bleeds loading air from diaphragm of the E2 valve allowing it to close.



ADVANTAGES:

- Low cost.
- Closes on loss of air.
- Remote controlled.



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EA FOR GAYLORD

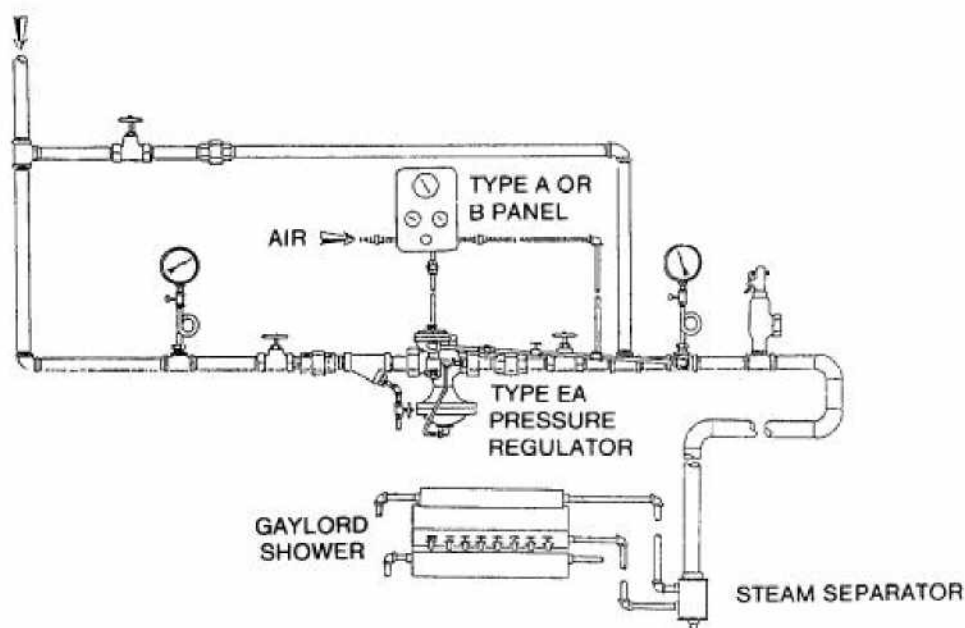
TYPE EA PRESSURE REGULATOR with TYPE B PANEL for GAYLORD SHOWER CONTROL

APPLICATION:

To improve paper conditioning and reduce steam consumption by utilizing reduced pressure saturated steam instead of high pressure dry steam at the Gaylord Shower.

OPERATION:

A Spence Type EA Pressure Regulator supplied by a Type B Panel is installed in the steam supply line to the Gaylord Shower and Steamer Pipe (if used) to reduce the steam pressure used. When high pressure saturated steam is reduced in a single step to 0 psi, the quality of the steam may be so enhanced as to introduce a certain degree of superheat. By comparison to low pressure saturated steam, low pressure superheated steam is a rather inefficient transmitter of heat and moisture to paper.



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ADVANTAGES:

- Reduced steam consumption.
- Improved paper conditioning.
- Self-contained, packless construction.
- Reduced pressure relatively unaffected by varying supply pressures.
- B Panel may be remotely located.



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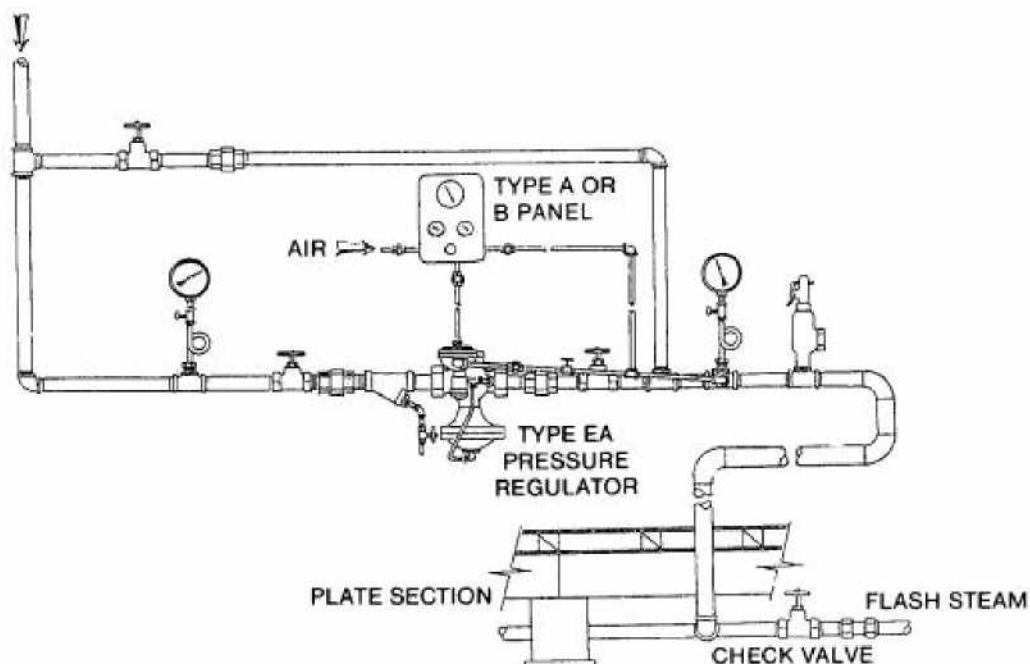
TYPE EA PRESSURE REGULATOR with TYPE B PANEL for CONTROL of the PLATE SECTIONS of a CORRUGATOR

APPLICATION:

When corrugator process speed is increased to the point that the flash steam available to the plate sections is insufficient, high pressure steam is admitted to the plate sections to permit increased process speed.

OPERATION:

A spence Type EA Pressure Regulator is installed between a high pressure steam main and the flash steam supplied to the plate section. The Type B Panel is used to supply the air loading pressure to the Type A Pilot to establish the minimum steam pressure in the plate section. When insufficient flash steam is available to maintain the pressure desired, the Type EA opens and admits sufficient steam to maintain the set pressure.



ADVANTAGES:

- Increased process speed may be possible.
- Self-contained, packless construction.
- B Panel may be remotely located.
- Fast response to process variables.



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E8 EPC ELECTRO-PNEUMATICALLY CONTROLLED PRESSURE REDUCING VALVE

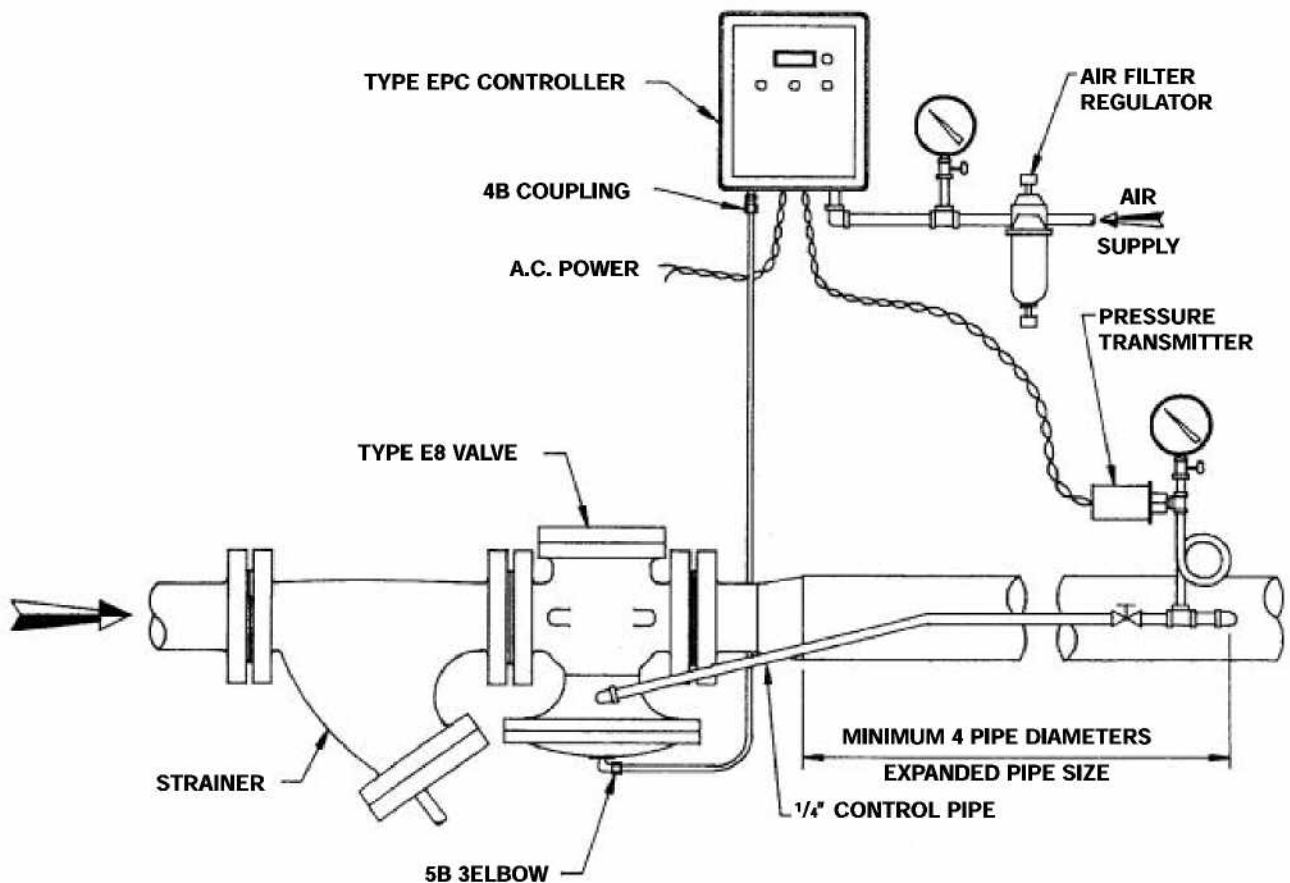
TYPE E8 EPC ELECTRO-PNEUMATICALLY CONTROLLED PRESSURE REDUCING VALVE

APPLICATION:

To reduce a high pressure to a constant, adjustable delivery pressure. Ideally suited for accurate control when poor steam conditions exist.

OPERATION:

The Type E8 Main Valve is normally closed. The Type EPC Electro-Pneumatic Controller provides 24VDC power to a pressure transmitter installed in the E8's control pipe. The EPC compares the 4-20mA pressure transmitter's signal to the setpoint. Using a series of short pneumatic pulses to the E8's diaphragm, the EPC either opens or closes the E8 to maintain the desired pressure.



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ADVANTAGES:

- Utilizes standard plant air up to 100 psig.
- Easy to install, operate and maintain. Packless main valve construction.
- Enhanced accuracy over self-contained regulator.