



Application Guide

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

TYPE ET14 & ET14D TEMPERATURE REGULATOR

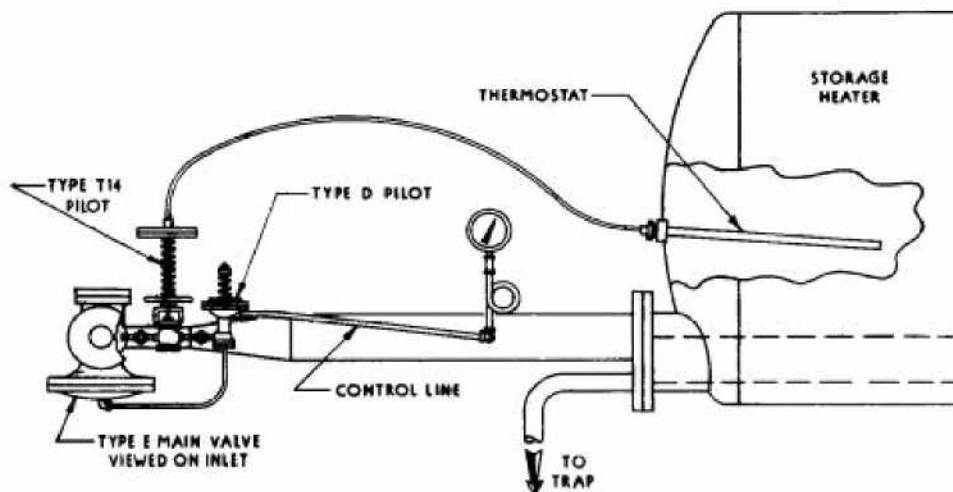
ET14/ET14D FOR
STORAGE HEATER

APPLICATION:

To provide temperature control in a storage water heater.

OPERATION:

Steam flowing through the main valve is controlled by the T14 pilot. Variations in temperature at the thermostat opens and closes T14 pilot, which operates the valve. If pressure control is needed to protect heater coils, the D pilot is used.



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ADVANTAGES:

- Pilot operated accuracy.
- No separate PRV required.
- Many temperature ranges available.
- All packless construction.



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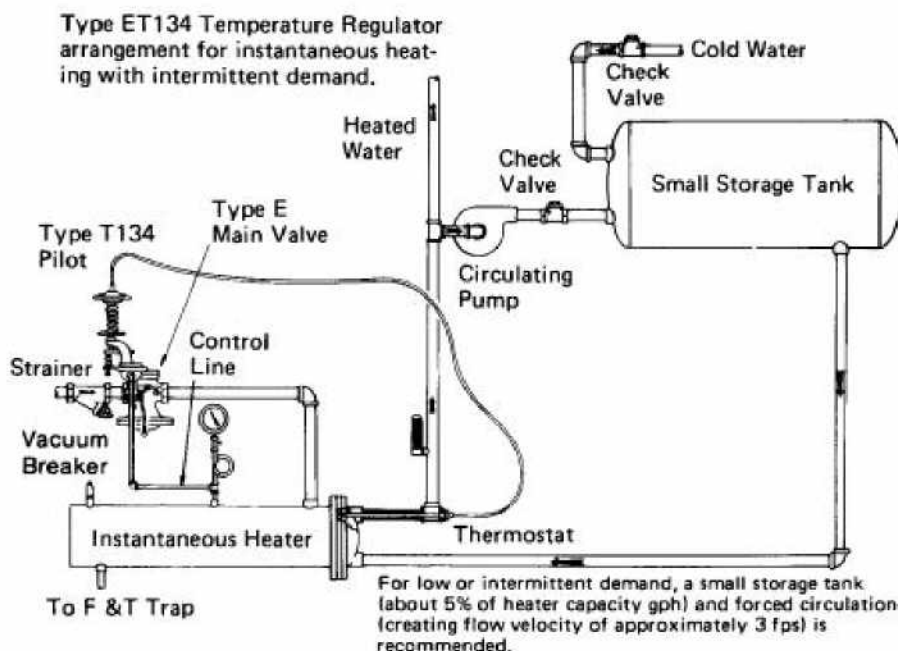
TYPE ET124 & ET134 TEMPERATURE REGULATOR

APPLICATION:

To provide temperature control in a converter or instantaneous heater.

OPERATION:

Steam flowing through the main valve is controlled by T124 or T134 pilot. Steam pressure in the heater is modulated in proportion to temperature and load variations.



ADVANTAGES:

No separate PRV required.

Pressure sensing anticipates load changes before thermostat sees temperature change.

Standard stock valves.

ET124/ET134 EOP

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TYPE C34T52 COOLING REGULATOR

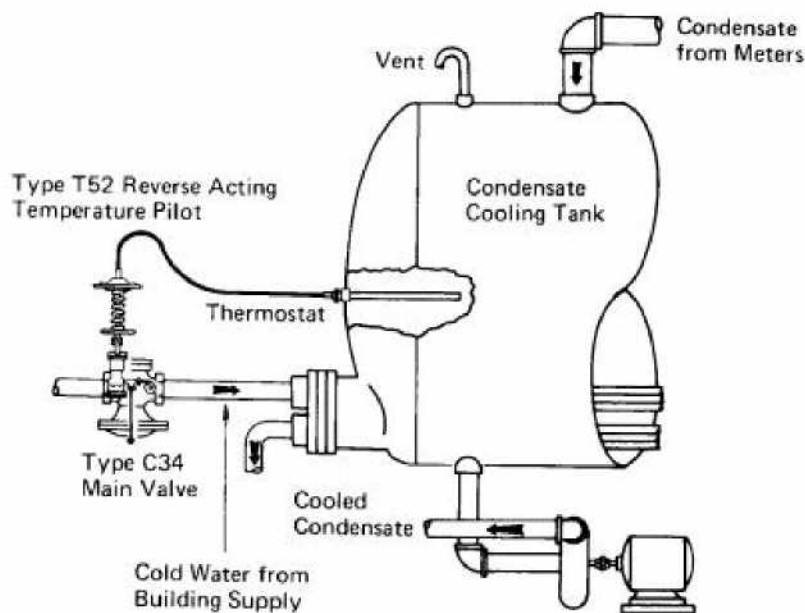
C34T52 FOR
COOLING

APPLICATION:

To provide temperature control for refrigeration condensers, lube oil coolers, process coolers and water cooled heat exchangers.

OPERATION:

The main valve and pilot are normally closed. When the temperature at the thermostat bulb increases above its set point, the valve opens and flows cooling water to maintain temperature setting.



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ADVANTAGES:

- Self contained.
- Balanced construction for greater stability.
- Can be furnished with pressure limit pilot.
- Tight shut-off.



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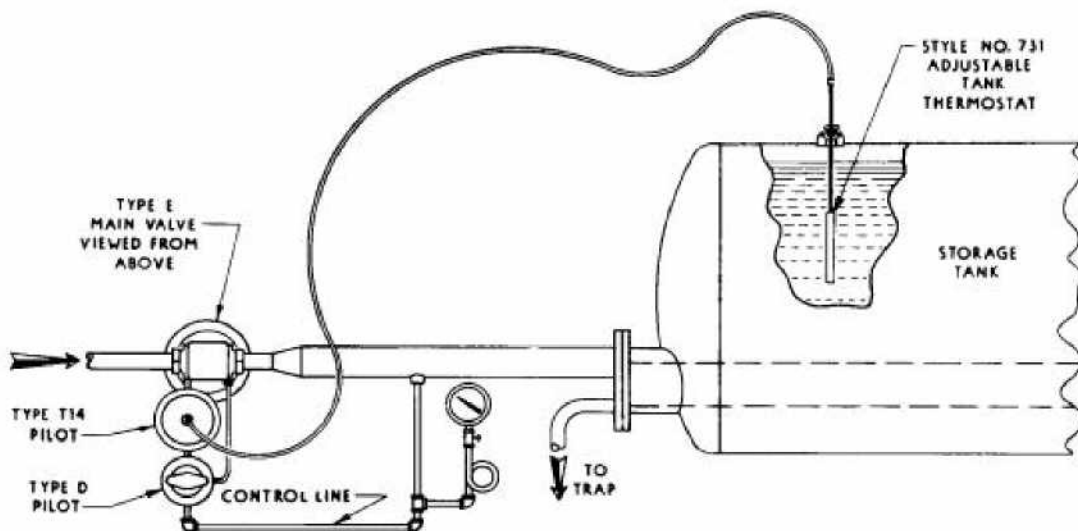
TYPE ET14D TEMPERATURE REGULATOR

APPLICATION:

To control fuel oil temperature in a storage tank.

OPERATION:

The T14 pilot opens and closes the main valve with slight variations in stored-oil temperature. The D pilot "takes over" to control coil pressure when the T14 pilot opens wide. The thermostat bulb can be raised or lowered by loosening the packing nut and sliding the bulb extension through the packing.



ADVANTAGES:

- Permits top-insertion. Bulb can be removed even when tank is full.
- Permits adjusting bulb location for best efficiency, as tank level varies.
- Minimizes oil carbonation through pressure control.
- Combining pressure and temperature regulation in same valve reduces maintenance.
- Smaller high pressure line can be used for steam transmission to tank.



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TYPE ET14T14 TEMPERATURE REGULATOR

ET14T14 FOR
HEATING COILS

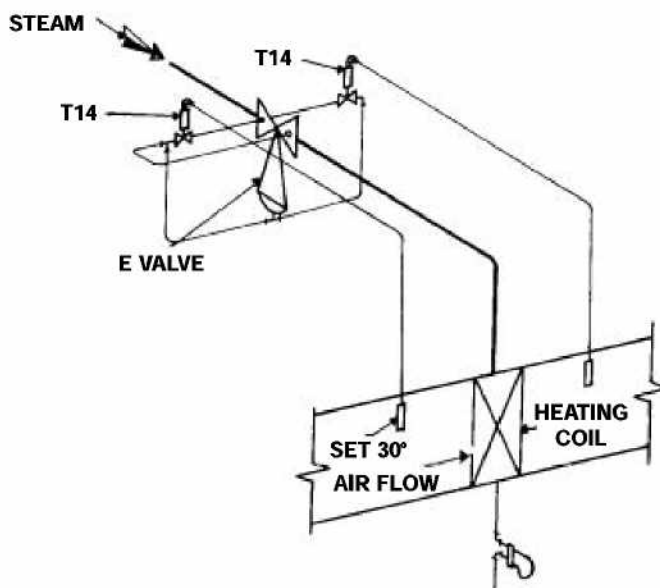
APPLICATION:

To provide temperature control of heating coils and prevent freeze-up, if outside temperature drops below freezing.

OPERATION:

When outside temperature is above freezing, the pilot sensing that temperature is off and the valve is controlled by the pilot sensing inside temperature. If outside temperature drops below freezing, the pilot sensing outside temperature will open the valve regardless of inside temperature.

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ADVANTAGES:

- One pilot will over-ride other.
- Pilot operated accuracy.
- Self contained.



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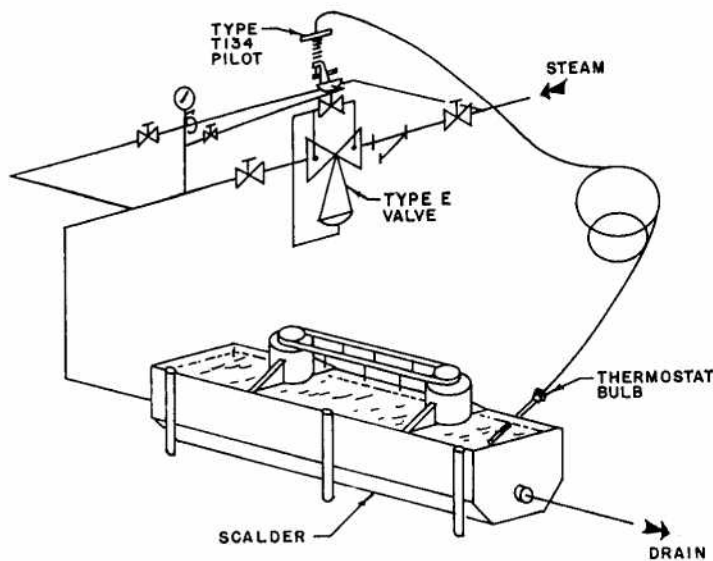
TYPE ET134 TEMPERATURE REGULATOR FOR POULTRY SCALDER

APPLICATION:

To provide self-contained pressure reduction, temperature and pressure control to a Poultry Scalding.

OPERATION:

A Poultry Scalding is essentially an open topped multi-nozzle steam injection heater custom fabricated to suit the customer's requirements. Steam flowing through the Type E Main Valve is controlled by the Type T134 Pilot. Steam pressure to the injection nozzles is modulated, within the pre-set range of the T134's pressure limit spring, in proportion to temperature, typically 140° F., and process variations.



ADVANTAGES:

Self-contained, packless construction.

Provides pressure reduction, temperature and pressure control in a single unit.

Adaptable to existing scalders utilizing Pneumatic Temperature Controllers by substituting the appropriate Type T134 Pilot in place of the Type A Pilot.

ET134 EQP

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TYPE C34T52 TEMPERATURE REGULATOR for CHILLED WATER SYSTEM

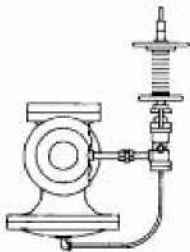
APPLICATION:

To provide self-contained temperature control of a chilled water system.

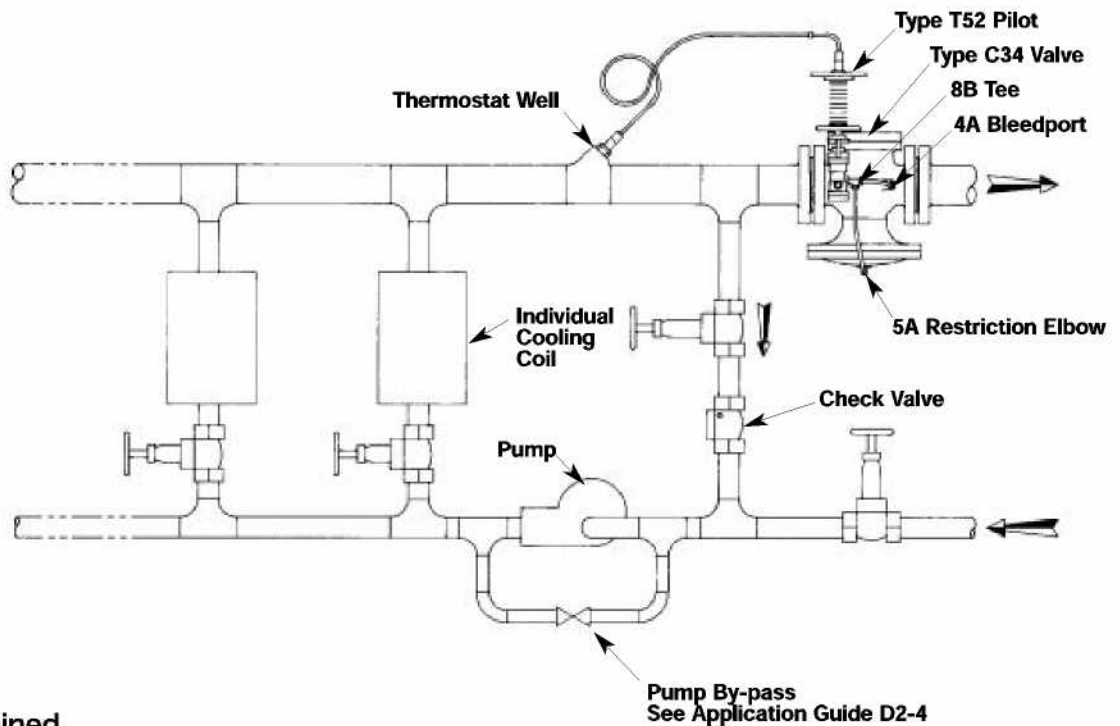
OPERATION:

The Spence Type C34T52 Temperature Regulator controls the chilled water return by not allowing water to return to its source until the set point of the T52 pilot has been reached.

C34T52 FOR
CHILLED WATER



View on inlet
of C34 Valve



ADVANTAGES:

- Self-contained.
- Tight shut-off.
- Pilot operated accurate temperature control.
- Economical, chilled water only returned when set point temperature is reached.
- System stability is maintained with variations in chilled water supply temperature.

NOTES:

1. For large high-rise buildings, a desired head pressure may need to be maintained. To accomplish this, an appropriate F Series pilot may be added to the C34T52.
2. If the chilled water return must not exceed a desired pressure, an appropriate D pilot may be added to the C34T52.

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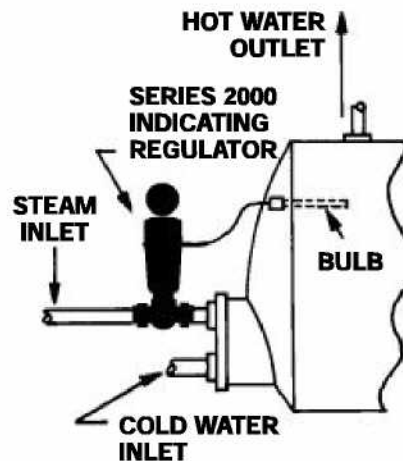
SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for STORAGE HEATER

APPLICATION:

To provide economical temperature control of a storage heater.

OPERATION:

Steam (or other heating medium) is supplied to the Series 2000 valve body. Variations in temperature at the bulb opens and closes the valve thus maintaining the desired temperature..



ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Ideal when load fluctuations are minimal
- Self-contained



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SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for PLATE HEATER

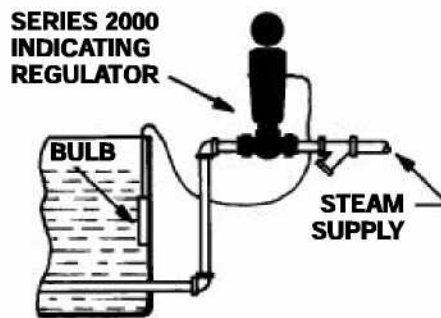
SERIES 2000
PLATING TANK

APPLICATION:

To provide economical temperature control of an open topped tank heater (ie: plating tank).

OPERATION:

Operation: Steam (or other heating medium) is supplied to the Series 2000 valve body. The bulb is suspended over the top of and into the tank. Variations in temperature at the bulb opens and closes the valve thus maintaining the desired temperature in the tank.



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ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Self-contained



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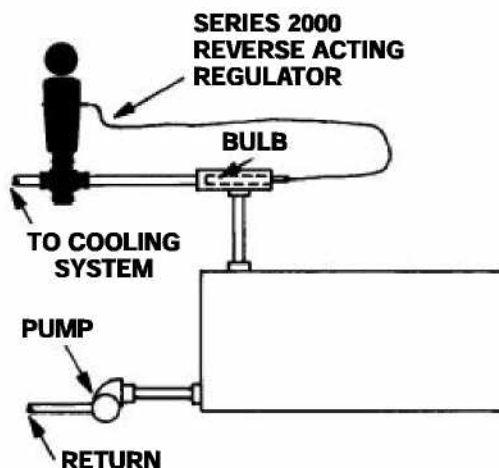
SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for ENGINE JACKET COOLING

APPLICATION:

To provide engine jacket cooling.

OPERATION:

Reverse acting Series 2000 is installed in the engine's cooling system as indicated in the diagram. The bulb senses the engine's coolant temperature and, when the coolant temperature reaches the Series 2000's set point, the valve opens and modulates to maintain the desired coolant temperature.



ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Self-contained

SERIES 2000 ENGINE

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SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for LIQUID COOLING TANK

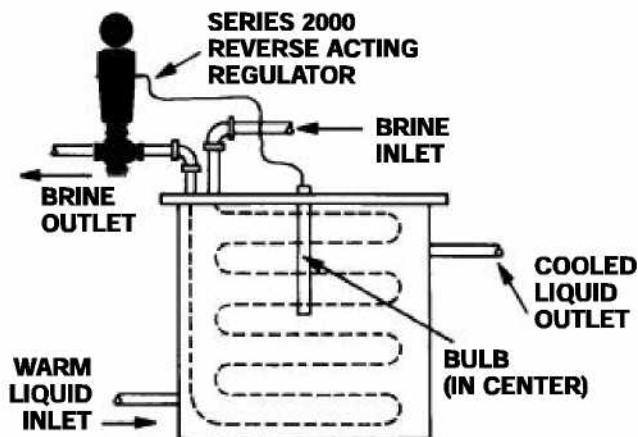
SERIES 2000
LIQUID COOLER

APPLICATION:

To operate a liquid cooling tank.

OPERATION:

As the warm liquid to be cooled reaches the Series 2000's bulb, the valve opens the by admitting coolant (brine) into the coolers coils. The Series 2000 modulates about its set point, thereby controlling the temperature of the cooled liquid.



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ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Self-contained



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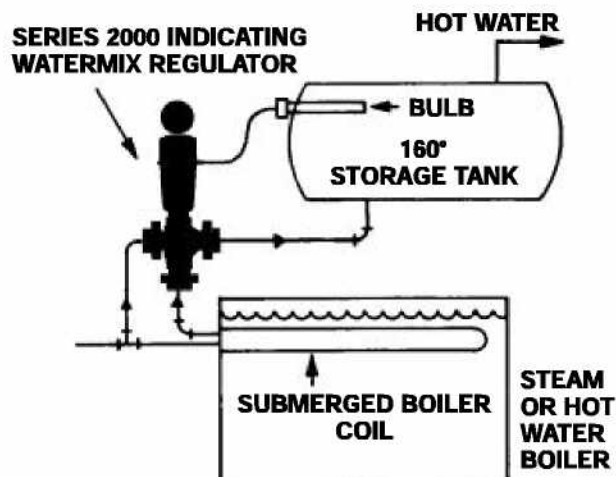
SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for THREE-WAY BLENDING/MIXING

APPLICATION:

To operate as a 3-way blending / mixing valve.

OPERATION:

The Series 2000 Three Way valve is installed as indicated in the diagram. In this case, cold water enters the valve from the left while the heated boiler water enters from the bottom. The bulb senses the temperature in the storage tank and modulates the amounts of cold and hot water blended (mixed) to maintain the desired temperature of the water in the storage tank.



ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Self-contained

SERIES 2000

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SERIES 2000 DIRECT OPERATED TEMPERATURE REGULATOR for THREE-WAY DIVERTING

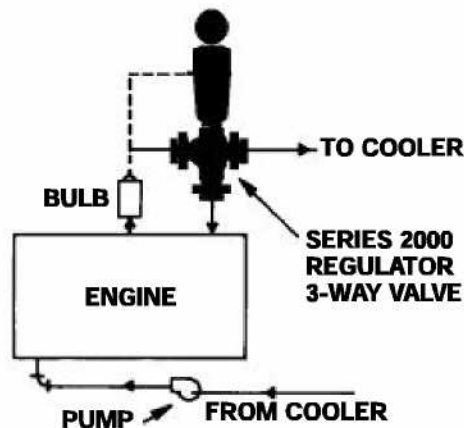
SERIES 2000
DIVERTING

APPLICATION:

To operate as a 3-way diverting valve.

OPERATION:

Engine coolant is supplied to the left, bottom discharge is returning to the engine and right discharge is to cooler. Engine coolant is returned to the engine until it reaches the valve's set point. At that point, the valve starts modulating between returning engine coolant to the engine and discharging to the cooler to maintain the desired temperature.



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ADVANTAGES:

- Inexpensive.
- Uncomplicated
- Self-contained



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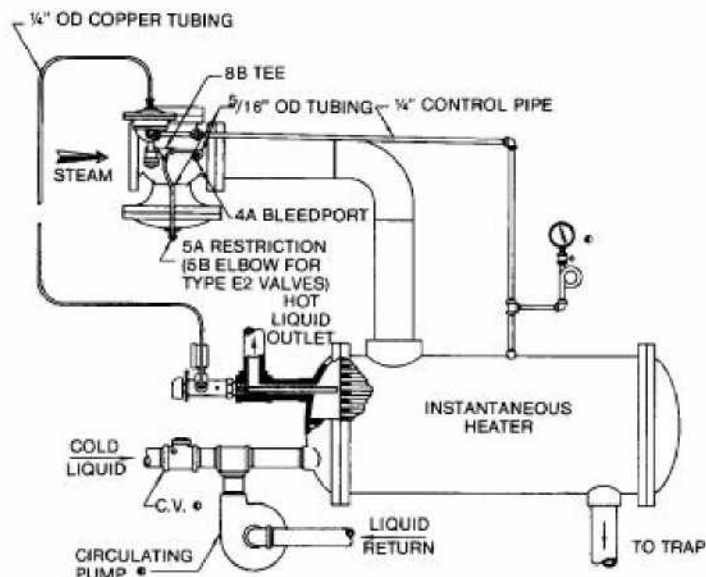
TYPE EAT61 AIR CONTROLLED TEMPERATURE REGULATOR

APPLICATION:

To provide fast accurate control on instantaneous heaters and difficult process applications.

OPERATION:

Temperature variations at thermostat bulb of T61 pilot changes its output air signal going to A series pilot. The changing air signal positions the A pilot and main valve to maintain temperature setting.



ADVANTAGES:

- T61 and A pilot combine for cascade type control.
- Accurate sensitive bi-metallic thermostat.
- Low air consumption.

EAT61 AID

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TYPE EA TEMPERATURE REGULATOR for REMOTE THERMOSTAT CONTROL

EA W/REMOTE
THERMOSTAT

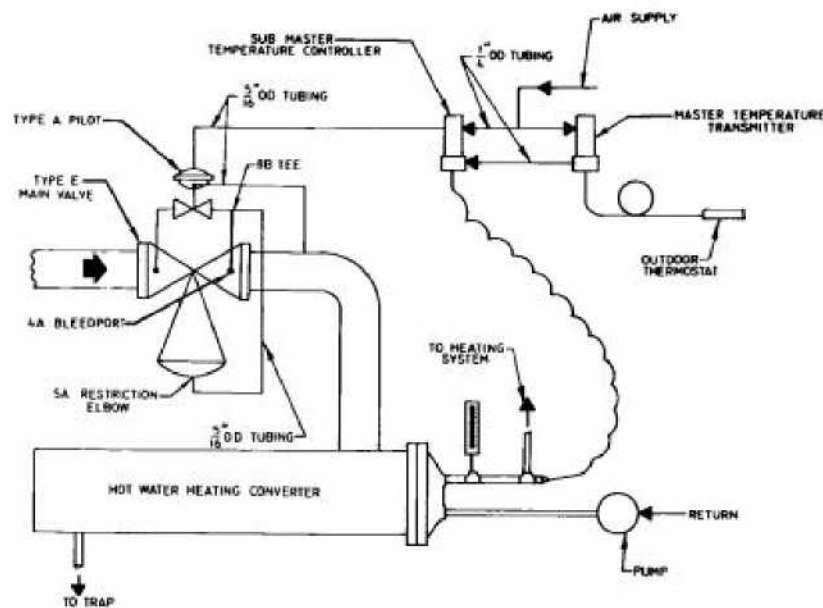
APPLICATION:

To provide indoor-outdoor temperature control of hot water temperatures in a heating system.

OPERATION:

The remote bulb thermostat on the master controller provides a pneumatic feed-back based on outside air temperature. The pneumatic feed-back from the master controller raises or lowers the set point of the sub-master controller, which puts out a varying signal to the Spence EA regulator to maintain proper water temperature.

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ADVANTAGES:

- Accurate temperature control.
- Economical, water heated only when needed.
- Standard valve and pilot.



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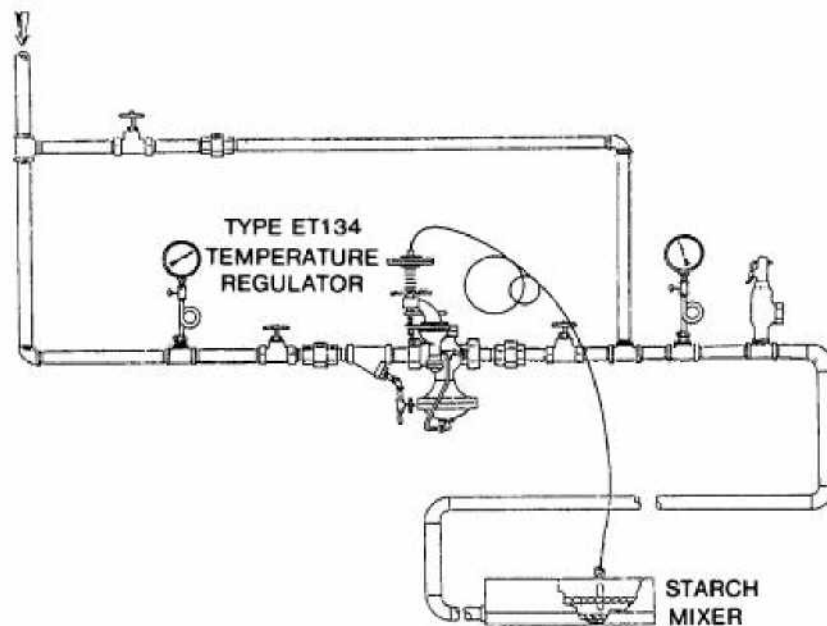
TYPE ET134 SELF-CONTAINED TEMPERATURE REGULATOR for STARCH MIXER

APPLICATION:

To provide accurate temperature control with pressure limitation in a Starch Mixer for corrugated adhesive usage.

OPERATION:

A Starch Mixer is essentially an open topped, agitated sparge tube storage heater, in which the adhesive is prepared before being placed in storage. The temperature probe of a Type T134 Temperature Pilot is placed in an active area of the Starch Mixer. Once activated, the ET134 flows steam to the heater until either the proper temperature or pressure limit is reached, then the ET134 closes, opens or throttles to maintain its preset temperature or pressure limit.



ADVANTAGES:

Self-contained packless construction.

If electronic activation of a remotely located regulator is needed, a Type M Pilot can be added, making an EMT134

No separate PRV needed



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TYPE EAT60 TEMPERATURE REGULATOR for WAX APPLICATION CONTROL

EAT60 FOR WAX
APPLICATION

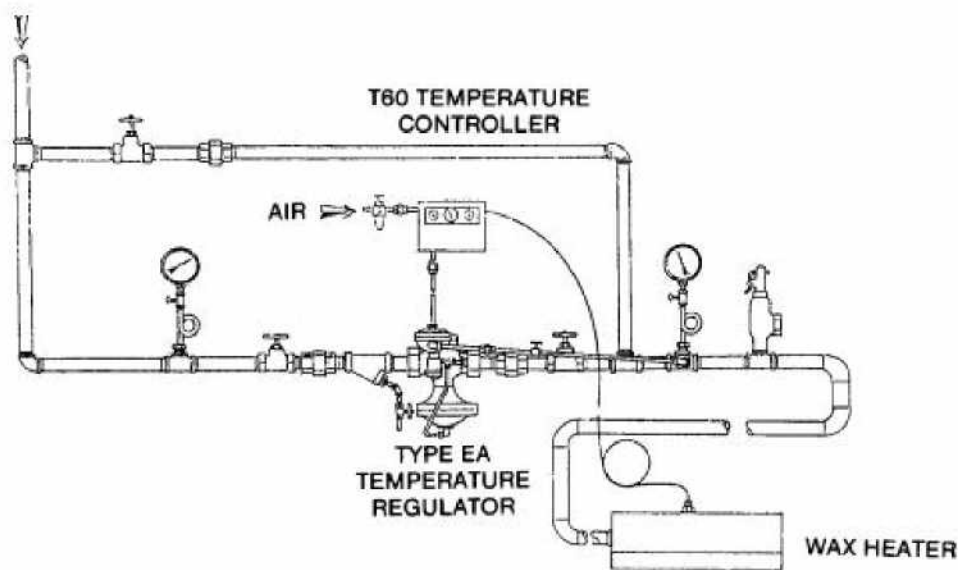
APPLICATION:

To provide fast accurate control of the wax temperature in order to assure the proper coating of the product.

OPERATION:

The Spence Type EAT60 utilizes cascade control, whereby a pneumatic Temperature Controller, sensing wax temperature, is used to reset a pneumatically adjusted pressure regulator sensing the steam pressure in the heater. Any change in demand on the heater causes a change in the steam pressure in the heater, and the EA Pressure Regulator responds to it immediately, maintaining a given pressure in the heater. When a change in wax temperature is sensed by the T60 Temperature Controller, it resets the EA Pressure Regulator to a new pressure, thus maintaining a fixed wax temperature.

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ADVANTAGES:

- Fast accurate control of wax temperature
- Packless construction
- Pressure sensing anticipates load changes before thermostat sees temperature change (cascade control).
- No separate PRV needed.



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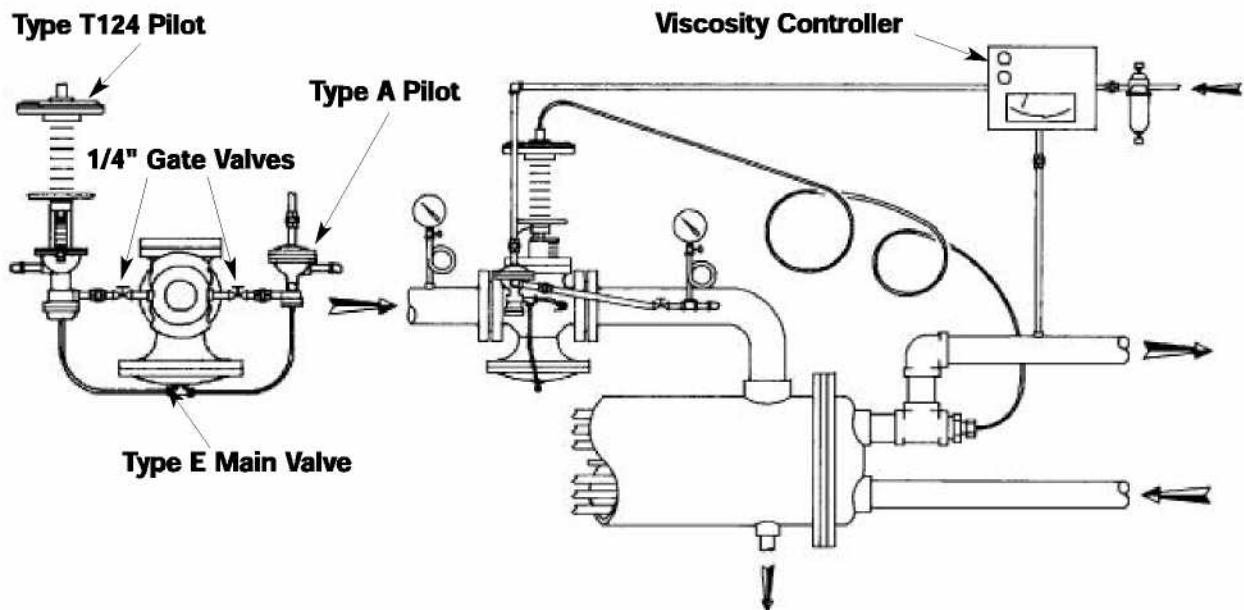
TYPE ET124A VISCOSITY/TEMPERATURE REGULATOR

APPLICATION:

To provide increased economy by controlling the viscosity of the fuel oil to a burner unit while, at the same time, retaining conventional self-contained temperature regulation for emergency use in the event of pneumatic system failure.

OPERATION:

In normal operation the 1/4" gate valve supplying the Type T124 Pilot is closed, the 1/4" gate valve supplying the Type A Pilot is open. The Norcross Viscosity Meter samples the viscosity of the fuel oil discharge of the fuel oil heater and adjusts the 3 to 15 psi air loading signal to the Type EA Regulator. The correct steam pressure and flow is supplied to the fuel oil heater to optimize fuel oil viscosity for burner unit efficiency. In the event of a pneumatic system failure, closing the 1/4" gate valve supplying the Type A Pilot and opening the 1/4" gate valve supplying the Type T124 Pilot provides conventional temperature control by a Type ET124 Temperature Regulator. (see Application Guide C1-2)



ADVANTAGES:

- Increased fuel oil economy
- Self-contained Temperature Regulator available for stand-by service