CONTROL PILOTS
TEMPERATURE CONTROL PILOTS
LESLIE -PROPOMATIC® TYPE BP with Adjustable Proportional Band
LESLIE TYPE B with Fixed Proportional Band

TABLE OF CONTENTS

PRINCIPAL OF OPERATION FOR REVERSE ACTION

The thermostatic element of the Thermo-Pilot senses changes in temperature at the bulb and regulates an air loading pressure to a secondary device or to a final control component. As the temperature rises, the Thermo-Pilot bleeds air pressure from the following control component. As the temperature falls, the Thermo-Pilot reduces the air bleed and permits air pressure to build up on the following control component. In either case the control valve will travel to the position called for by the delivered signal. Type "BP" Thermo-Pilot is fitted with an adjustable proportional band device which may be adjusted to provide operation within a proportional band suitable to the characteristics of the system under control. Type "B" operates on a fixed, wide proportional band.

SECTION I - INSTALLATION

NOTE: Where the Thermo-Pilot is to be used with two or more following control components consult the instructions which pertain to the installation and operation of the several units.

1. Install the Thermo-Pilot (without thermostatic element) in an accessible location. See Typical Installation Figures 3 and 4. The capillary must reach from the sensing point to the Pilot.

2. Connect controlled air supply line to Thermo-Pilot as shown in Figure 2. Connect the air supply to port "D" for direct action. (Increasing output on increasing temperature) Connect the air supply to port "R" for reverse action. (Decreasing output on increasing temperature) Connect the output port "C" to the following control component. Install appropriate stop valves in the air lines.

NOTE: Use ¼", 40 schedule corrosion resistant piping or tubing and Hoke Gyrolok fittings for the air lines.

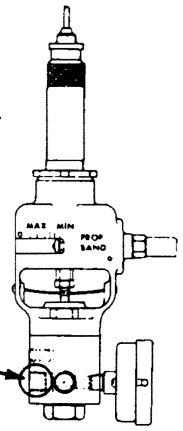


Figure 1 — Side view of "BP" Thermo-Pilot showing connection "C" which must be connected to following control element.

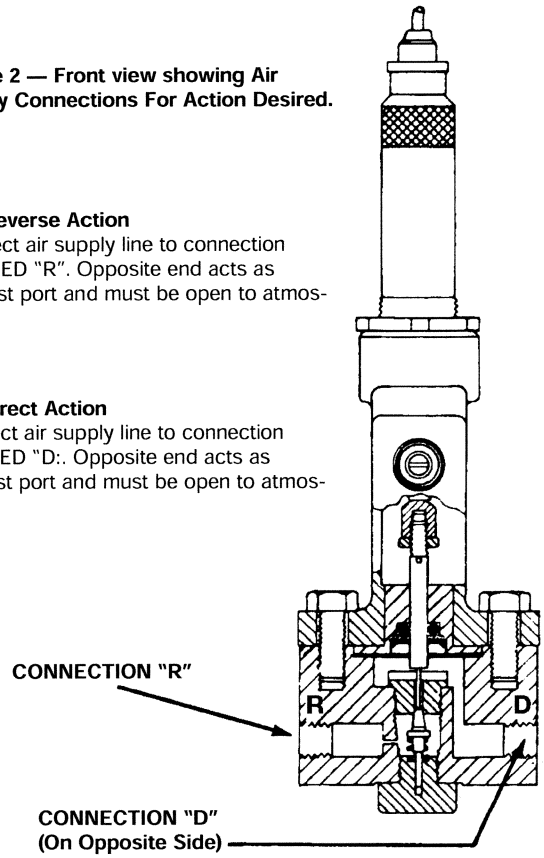


Figure 2 — Front view showing Air Supply Connections For Action Desired.

For Reverse Action
Connect air supply line to connection MARKED "R". Opposite end acts as exhaust port and must be open to atmosphere.

For Direct Action
Connect air supply line to connection MARKED "D:. Opposite end acts as exhaust port and must be open to atmosphere.

TYPICAL INSTALLATIONS
LESLIE–PROPOMATIC® TEMPERATURE PILOT TYPE BP

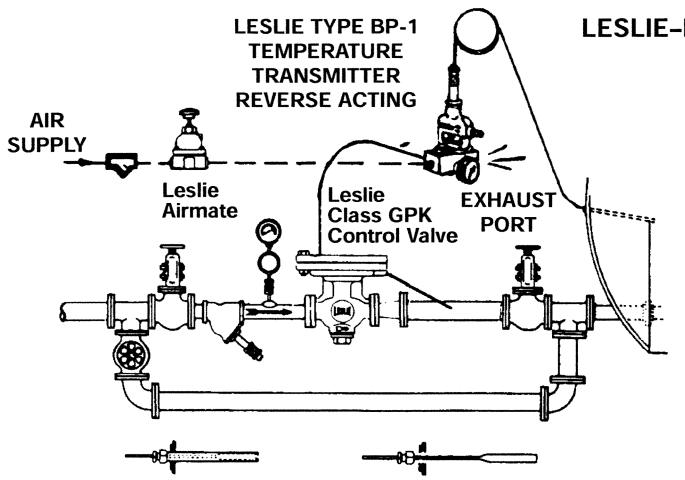


Figure 3 - Type "BP" Thermo-Pilot with Type GPK Control Valve - Delivered heating or cooling agent pressure limited by restricting air loading pressure valve

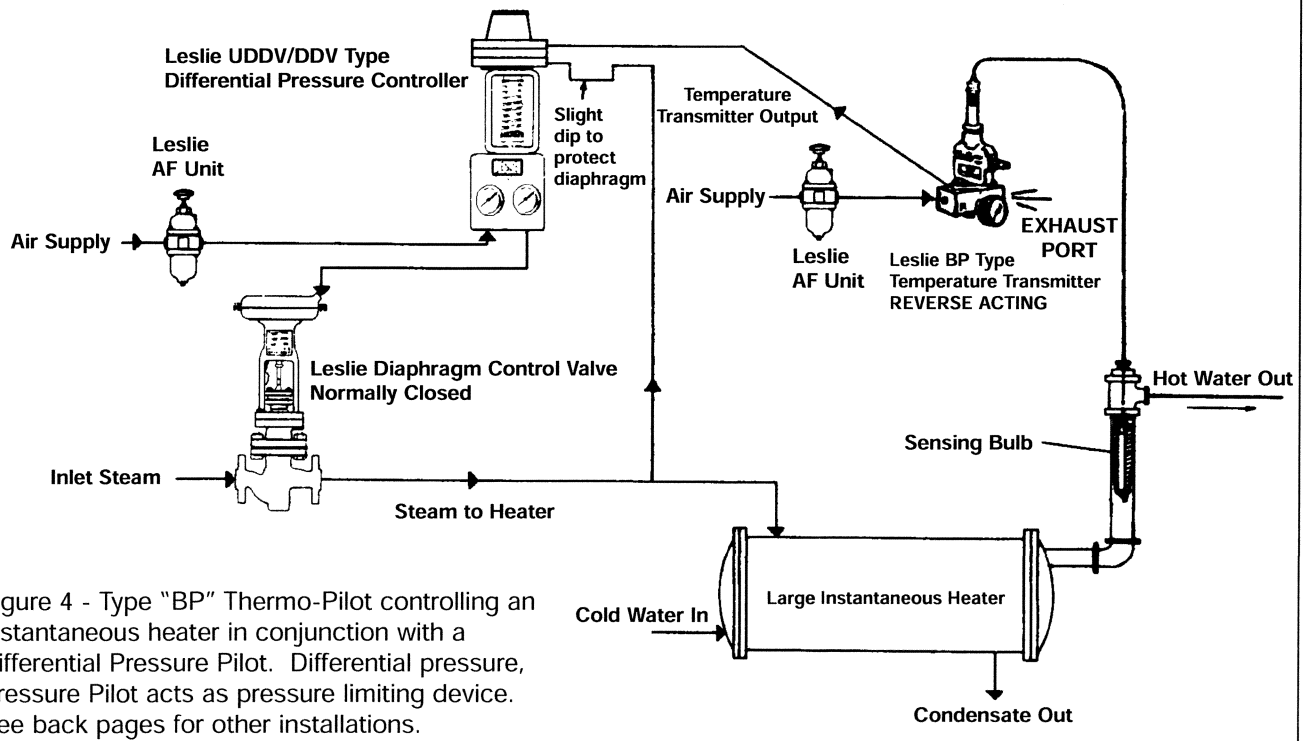


Figure 4 - Type "BP" Thermo-Pilot controlling an instantaneous heater in conjunction with a Differential Pressure Pilot. Differential pressure, Pressure Pilot acts as pressure limiting device. See back pages for other installations.

3. **THERMAL BULB LOCATION**

3a. Instantaneous Heaters (Shell and Tube Heaters)

In an instantaneous type heater, place the thermal bulb in the heated fluid outlet line, as close to the heater as possible, but not in the heater, unless the heater has been designed and constructed with special fittings for correct temperature sensing.

3b. **Hot Water Reserve Tanks and Process Vessels**

Place the thermal bulb at about the centerline and toward the side of the vessel. Position bulb at least six inches from the nearest heating coil. Where direct injection method of heating or cooling is being used, DO NOT place thermal bulb in direct path of heating or cooling medium.

4. Install stuffing box or bulb casing as shown in Figures 5 or 6.

5. Remove adjusting sleeve (2) from Thermo-Pilot. Slide internal threaded end over bellows of thermostatic element and screw on to threads of swivel nut until end of adjusting sleeve rests on swivel nut face. Tighten swivel nut firmly against adjusting sleeve.

NOTE: These parts must be kept tightly joined together so that whenever an adjustment for temperature setting is made the adjusting sleeve and bellows will move as a unit, thereby maintaining their relative positions.

Replace adjusting sleeve (with thermostatic element attached) in pilot housing and screw a few turns into housing threads.

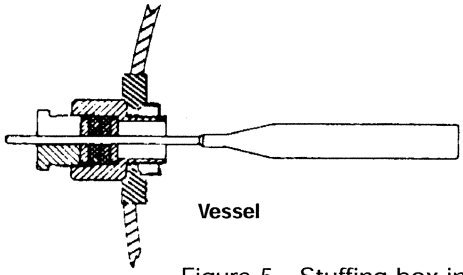


Figure 5 - Stuffing box installation

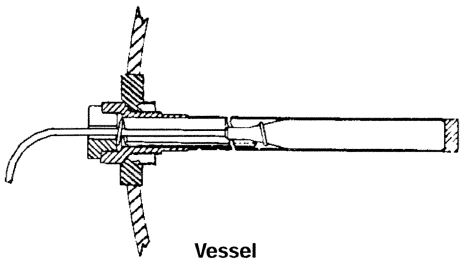


Figure 6 - Bulb casing installation

6. Insert thermostatic bulb and spring in bulb casing as shown in Figure 6. Assemble bulb casing nut to bulb casing and tighten in place.

For Stuffing Box Installations

Disassemble stuffing box assembly by removing stuffing box nut, top split washer, the two pieces of packing and the bottom split washer.

Insert thermal bulb into vessel through the stuffing box, making sure that the capillary tubing is straight in the area of the stuffing box and that it is positioned in the center of the box so that parts may be assembled freely.

Spread one split washer and assemble it around the capillary tubing. Push split washer into stuffing box until it rests on bottom of box. Follow with the two packing rings (with openings on opposite sides) and the second split washer. Position stuffing box nut on capillary tubing. Insert threaded end into stuffing box and tighten firmly down against the packing.

NOTE: Handle capillary tubing carefully and arrange its location for maximum protection. Thermometer should be located in the same area as the thermal bulb in order to obtain an accurate check of control action.

CONTROL VALVE OR SECONDARY COMPONENTS

For installation and piping details of the control valve or a secondary control component (where used) consult the instructions which pertain to those particular units.

SECTION II - OPERATION

1. Supply required air supply pressure to the Thermo-Pilot and to the secondary control component if one is in use. See Note 1.

2. Start a reasonably small flow of fluid (temperature of which is to be controlled) through the vessel. Supply sufficient heating or cooling agent to the vessel (either through by-pass or through control valve, using partially open stop valves) to bring the fluid temperature to a value approximating final operating temperature.

3. Loosen locknut (8) and turn adjusting sleeve (2) until air just begins to bleed through Thermo-Pilot.

An increase in temperature of the controlled fluid will cause an increase in air bleed; a decrease in temperature of the controlled fluid will cause a decrease in air bleed. Variation in air bleed through Thermo-Pilot will operate the control valve directly or through the secondary control component (where used) to position it in accord with need for heating or cooling medium flow.

4. TO INCREASE TEMPERATURE OF CONTROLLED FLUID turn adjusting sleeve slowly out of pilot housing until desired temperature is reached.

TO DECREASE TEMPERATURE OF CONTROLLED FLUID turn adjusting sleeve slowly into pilot housing until desired temperature is reached.

5. With Type "BP" initial start-up should be made with proportional band at minimum setting unless instability appears in the system or experience with particular type systems dictate otherwise. Minimum Band Position will produce the narrowest throttling range, therefore the greatest output of heating or cooling medium per °F change at thermal bulb insertion point. To widen proportional band follow procedure described in Note 2.

NOTE 1: REQUIRED AIR SUPPLY PRESSURES

Value of air supply pressure required for the Thermo-Pilot depends upon the signal or operating pressure necessary for the correct operation of the component to which it delivers the signal. Information regarding required air operating pressures for control valves will be found on their data plates or in the instructions pertaining to the particular valves; for Receiver Controllers this information can be found in applicable instructions.

NOTE 2: PROCEDURE FOR WIDENING PROPORTIONAL BAND.

The purpose of the adjustable proportional band device is to provide a means of coordinating control response with system needs, in order to obtain maximum stability of operation, regardless of normal operating condition. Requirements may vary with different systems. Where the resulting system operation indicates a need for wider proportional band than that obtainable from Setting on Minimum band proceed as follows:

a. Loosen slider screw nut (37) . Turn slider screw (38) slowly clockwise to move indicator pointer toward maximum band setting. Move slider screw only a distance sufficient to obtain stability. Retighten slider nut.

b. Changing proportional band may affect initial setpoint adjustment to some extent. If so, readjust the adjusting sleeve to return system to desired temperature setting as described under "OPERATION"

6. ADJUSTMENTS FOR COMBINED OPERATION OF A THERMO-PILOT IN CONJUNCTION WITH A DIFFERENTIAL PRESSURE PILOT AND A CONTROL VALVE.

a. Supply 20-22 psig air pressure to inlet of differential pressure pilot.

b. Raise temperature at the bulb until it is slightly above minimum °F of the thermostatic element range.

c. Supply sufficient air pressure to the inlet of the Thermo-Pilot to provide 12 psig loading pressure to the top of the differential pressure pilot diaphragm plus a slight bleed through the "BP" Thermo-Pilot.

To adjust Thermo-Pilot for slight bleed turn adjusting sleeve (2) into Thermo-Pilot housing until slight bleed occurs.

d. Adjust differential pressure pilot adjusting spring to cause pilot to supply 3 psig operating pressure to control valve. At this point an approximate 10 psig differential will have been set between the spring compression force and the air loading pressure on top of the pilot diaphragm. This setting will maintain a constant differential relationship between the air loading pressure and the pressure of the heating or cooling agent delivered to the vessel.

Differentials higher than 10 psig may be obtained by increasing the pilot adjusting spring compression relative to a higher loading pressure. Differential value must be kept within the pilot range.

Increase air supply pressure to the Thermo-Pilot to the value necessary to produce maximum required pressure of the heating or cooling agent delivered to the heater.

DISASSEMBLING SPRING/STEM CARTRIDGE ASSEMBLY

Remove the cotter pin (12) from bellows stem (11). Disassemble bottom spring seat (10) and bellows spring (9) from bellows stem (11). Place end of bellows stem in a protected jaw vise. Insert pin in hole in bellows stem, press top spring seat (3) downward to compress springs and remove stem screw (4). Disassemble top spring seat (3), yielding springs (5/6) and intermediate spring seat (7) from bellows stem.

TO REASSEMBLE SPRING/STEM CARTRIDGE ASSEMBLY

Place bellows stem (with pin though hole) in a vise as described above. Position intermediate spring seat (7) and yielding springs (5/6) on bellows stem. Place top spring seat (3) on springs (deep recess upward). Insert stem screw (4) in top spring seat. Press top spring seat downward sufficiently to compress springs and to move spring seat along bellows stem until stem screw threads can be easily engaged with threads in stem. Screw the stem screw all the way in until it shoulders on bellows stem. Then tighten.

Reassemble bellows springs (9), bottom spring seat (10) and hair cotter pin (12) to stem.

REPLACING PILOT STEM SEAL

To replace pilot stem seal remove pilot stem assembly, and pilot stem guide (51). Clean all parts. DO NOT use abrasives. DO NOT disturb the adjustment of the pilot stem head (13) and nut .

Replace "O" ring seal as described on Page 8.

REASSEMBLING

MAIN BODY ASSEMBLY

1. Place pilot valve spring (32) and pilot valve (24) on pilot valve plug (34). Assemble to main body making sure stem of pilot valve enters orifice of pilot seat. Tighten carefully.

2. Reassemble pilot stem guide/pilot stem assembly to pilot housing (18). Place gasket (20) in recess of main body. Position pilot housing with assembled parts (levers, etc., if these parts have been removed for cleaning reassemble them to housing). Insert capscrews through housing into main body. Tighten.

3. Reassemble spring/stem cartridge assembly to pilot housing making sure bottom spring seat raised face enters recess in housing. Assemble adjusting sleeve (2) with locknut (8) and thermostatic element (1). Readjust as described under "OPERATION".

   Assemble primary lever (48) with pin (50) to upper side of pilot housing. Assemble secondary lever (49) with pin (50) to lower side of pilot housing. Screw slider (38) all the way into pilot housing and assemble slider screw nut (37) to threaded end. Insert pilot stem spring (15) into housing and stem. Replace screws (16).

SECTION III - MAINTENANCE

Refer to Proper Drawing For Parts Lists and Piece Numbers

Loosen locknut (8). Remove adjusting sleeve (2) along with thermostatic element (1) from pilot housing (18) (BP) or bonnet (55 "B"). If swivel nut on thermostatic element does not turn freely, oil lightly at clip spring. Leave adjusting sleeve assembled to element as a protection for bellows, until bellows is to be examined.

NOTE: If thermal bulb is in heated fluid move adjusting sleeve slowly to prevent sudden stressing of bellows.

TYPE "BP" THERMO-PILOT -

(See Figure 7)

DISMANTLING

1. Remove capscrews (41). Lift pilot housing (18), and assembled parts and gasket (20) from main body (22). Unscrew pilot valve plug (34). As pilot valve plug is unscrewed from main body, pilot valve (24) and spring (32) will follow. Clean all parts thoroughly. DO NOT use abrasives. To remove seat ring (23) (if replacement is necessary) insert piece of flat stock or end of large screwdriver in slot, loosen and unscrew from main body. Replace with new seat ring.

PILOT HOUSING ASSEMBLY - ADJUSTABLE PROPORTIONAL BAND PARTS.

2. DO NOT dismantle the pilot housing assembly or proportional band parts as long as the parts are reasonably clean and in good repair. Normal cleaning may be done, without disassembling, in the following manner:

a. Remove adjusting sleeve with thermostatic element as a unit.

b. Take pilot housing assembly off main body. Wash it in solvent. Blow assembly out thoroughly with air after washing. No solvent residual should remain.

DISMANTLING PILOT HOUSING ASSEMBLY

Where it is found necessary to dismantle the pilot housing assembly, proceed as follows:

1. Lift spring/stem cartridge assembly from the pilot housing (18). Remove screws (16). Take out pilot stem spring (15). Remove the following parts from the pilot housing as a unit - pilot stem (21), pilot stem guide (51), nut (14) and pilot stem head (13). DO NOT disturb nut (14) or change position of pilot stem head on pilot stem unless replacement of one of these parts is absolutely necessary.

   To disassemble primary lever (48), secondary lever (49) and proportioning slider (38) from pilot housing, remove pins (50), take out levers, remove slider screw nut (37) and screw proportioning slider clockwise until it is free of pilot housing threads and can be removed from housing.

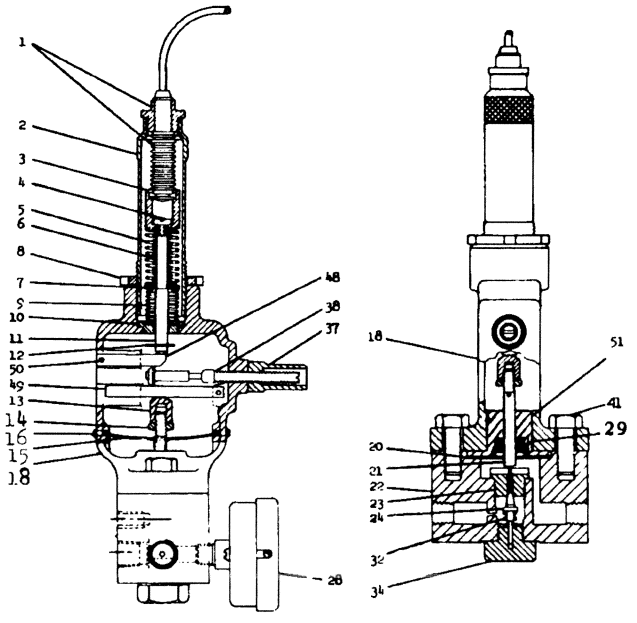


Figure 7 - Ieslie-Propomatic "BP" Type Thermo-Pilot

MAKING PILOT STEM HEAD AND LEVER ADJUSTMENTS

(See Figure 8)

As noted in "MAINTENANCE," adjustment of pilot stem head (13) and jam nut (14) on pilot stem (21) should never be disturbed during maintenance work unless it is absolutely essential in order to replace a worn or damaged part.

Proper operation of the adjustable proportional band mechanism depends upon correct adjustment of these parts.

If calibration is found to be necessary, readjustment can be made as follows:

1. Re-assemble regulator as described under "MAINTENANCE".

2. Back off adjusting sleeve (2) and thermostatic element (1) as a unit to free primary lever (48).

3. Loosen slider locknut (37) and turn proportioning slider (38) until its pointer is at "Minimum" proportional band setting. Loosen jam nut (14).

4. Subject thermostatic bulb to desired set point temperature. Supply required air pressure to the temperature control pilot. Turn adjusting sleeve until pilot valve (24) is just closed and no air flows through temperature pilot.

5. Move proportioning slider (38) to "Maximum" band position. If pilot valve opens to permit air flow, re-adjust pilot stem head (13) until pilot valve (24) is just closed and air flow ceases. The adjustment is completed, if pilot valve remains just closed for any proportional band setting between "Minimum " and "Maximum".

6. Hold pilot stem head (13) rigidly, with wrench across the flats, then tighten jam nut (14). Tighten slider locknut (37).

   Check lower gap "D", (see Figure 8).

TYPE "B" THERMO-PILOT -

(See Figure 9)

DISMANTLING

1. Disassemble adjusting sleeve and element from Thermo-Pilot and remove from line. Place the pilot body in a protected jaw vise. Loosen and unscrew bottom plug (34) from main body. Pilot valve spring (32) and pilot valve (24) will follow. If maintenance work is not necessary on bonnet assembly parts just loosen bonnet at joint, unscrew and remove from main body as a unit. If work is necessary on these parts or if stem seal must be changed dismantle as described in Step 2. Then follow reassembly Steps 3 and 4.

2. Place pin through hole in valve stem (54) to hold it from turning. Press top spring seat (3) downward to compress springs and remove valve stem screw (4). Loosen packing gland (17) and disassemble all parts from bonnet including packing. Clean parts thoroughly. Clean valve stem. DO NOT use abrasives. To replace seat ring (23), follow steps described in Type "BP".

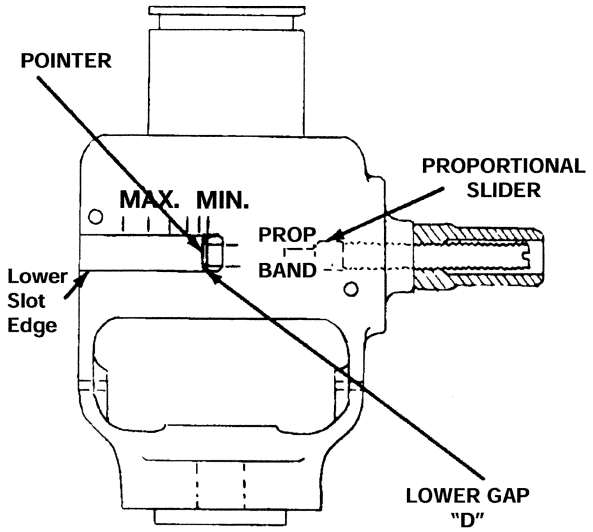


Figure 8 - *Pilot Housing view showing lower slot edge and lower gap "D" - minimum clearance should be 1/32".

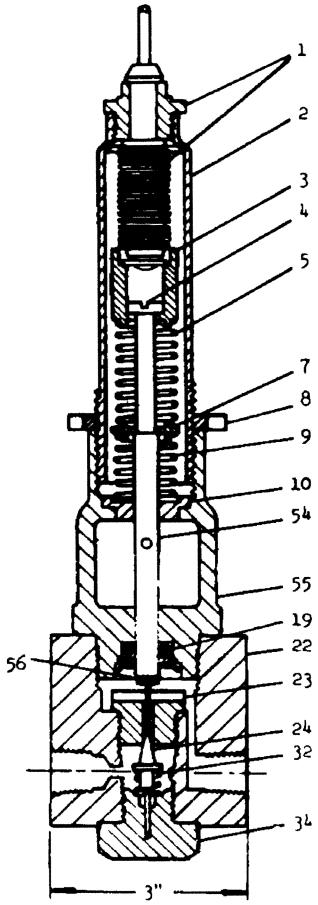


Figure 9 - "B" Thermo-Pilot

REASSEMBLY

1. Place pilot valve spring (32) and pilot valve (24) on bottom plug (34). Assemble bottom plug to main body making sure that stem of pilot valve enters orifice of seat.

2. Insert valve stem (54) in bonnet (55) (through bottom end of the bonnet with stem threads upward).

REPLACING STEM SEAL

(See Figure 10)

To remove "O" Ring Stem Seal (19), take out lockring and gland ring, then "O" ring.

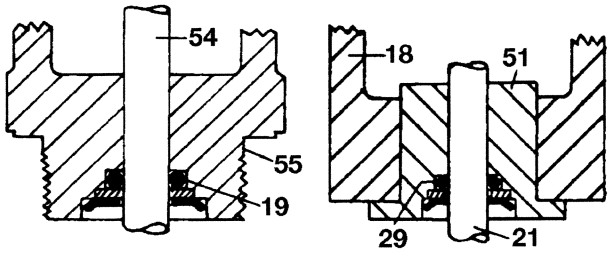


Figure 10 - Replacing "O" Ring Seal

To install "O" Ring Stem Seal - Moisten "O" ring with lubricant and place in counterbore in bonnet. Insert gland ring in its recess in bonnet, then press lockring in place firmly against gland ring with prongs positioned as shown.

Place bottom spring seat (10) in bonnet with it's raised face in recess. Position the shoes valve spring (9) on bottom spring seat. Assemble intermediate spring seat (7), yielding spring (5) and top spring seat (3) with deep recess upward to valve stem. Insert valve stem screw (4) in top spring seat. Insert pin in hole in valve stem. Press top spring seat downward sufficiently to compress springs and to move spring seat along valve stem until valve stem screw threads can be easily engaged with threads in stem. Turn screw all the way in until it shoulders on valve stem. Tighten. Reinstall the unit in line. Reassemble thermostatic element, adjusting sleeve and locknut to bonnet. Readjust for temperature as described under "OPERATION".

CALIBRATED DIAL ASSEMBLIES

THERMO-PILOTS containing "C" in their class designations are fitted with calibrated dials which allow changing temperature settings at will. Instructions follow:

ADJUSTING FOR TEMPERATURE SETTING AND OPERATING RANGE OF THE CALIBRATED DIAL

(See Figure 11)

1. Loosen indicator set screw and dial set screw with Allen head set screw wrench.

2. Move indicator to position convenient to read and tighten indicator set screw.

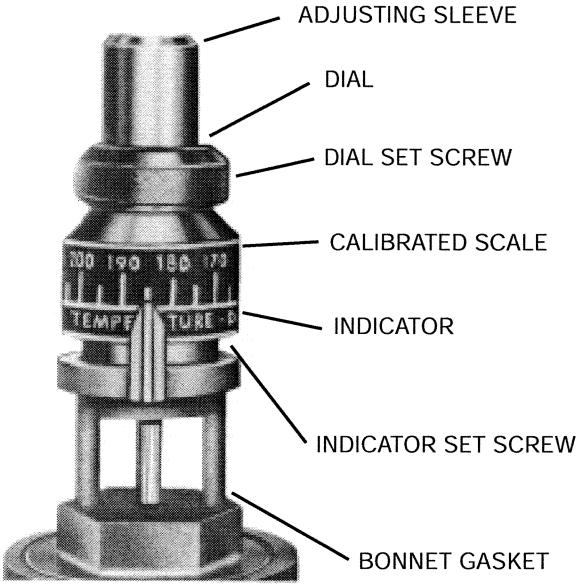


Figure 11

3. Turn adjusting sleeve counter-clockwise several turns. Install bellows of thermostatic element in adjusting sleeve and tighten swivel nut. Install bulb into bulb casing or stuffing box where temperature is to be controlled. Heat or cool system to temperature within range of element. Measure temperature at bulb location with an accurate thermometer.

4. Adjust regulator as follows:

   Heating Service

   Turn adjusting sleeve clockwise until regulator cuts off flow of heating medium. Then turn adjusting sleeve back just far enough to start a slight flow.

   Cool Service

   Turn adjusting sleeve clockwise until regulator just starts to pass cooling medium.

5. Calibrate regulator by turning calibrated dial so that scale reading at indicator corresponds to thermometer temperature. Tighten calibrated dial set screw.

6. Dial adjustment is now set for use at any temperature on the scale. Turn dial to desired temperature.

7. To increase temperature setting gradually turn adjusting sleeve out of bonnet until regulator maintains desired temperature. To decrease temperature turn adjusting sleeve into bonnet.

NOTE: When turning adjusting sleeve always make sure that swivel nut turns freely so that thermostatic element will not be twisted. Oil swivel nut if necessary.

As the dial is turned it will be noted that a certain amount of drag is present. Drag is provided by use of a dry "O" ring. Its purpose is to prevent shifting of adjusting sleeve if equipment is subject to vibration. DO NOT lubricate "O" ring.

FIELD CONVERSION FROM PLAIN ADJUSTING SLEEVE TO CALIBRATED DIAL TYPE

Dismantle pilot housing assembly as described under "MAINTENANCE". Reassemble using calibrated dial type housing and parts. Insert "O" ring in slot in O.D. of pilot housing.

Assemble indicator with setscrew to pilot housing. Assemble dial and calibrated dial to adjusting sleeve. Screw adjusting sleeve on swivel nut of thermostatic element and install the indicator onto pilot housing. Adjust as described above.

The Following Calibrated Dials are available.

Temperature Range	*Ref. Number*
20-120°F	A21932 (*2)
50-150°F	A21933
50-250°F	A20724 (*1)
-49-104°C	A20724 (*1)
120-270°F	A22788
50-250°F	A20302 (*1)
-10-120°C	A20302 (*1)
170-220°F	A22789
170-270°F	A21934
220-270°F	A20303
20-70°F	A45422
30-230°F	A46489
70-120°F	A40285
70-170°F	A34931
-7-49°C	A50260 (*2)

Note (*1): Dual Calibrated

Note (*2): Equivalent

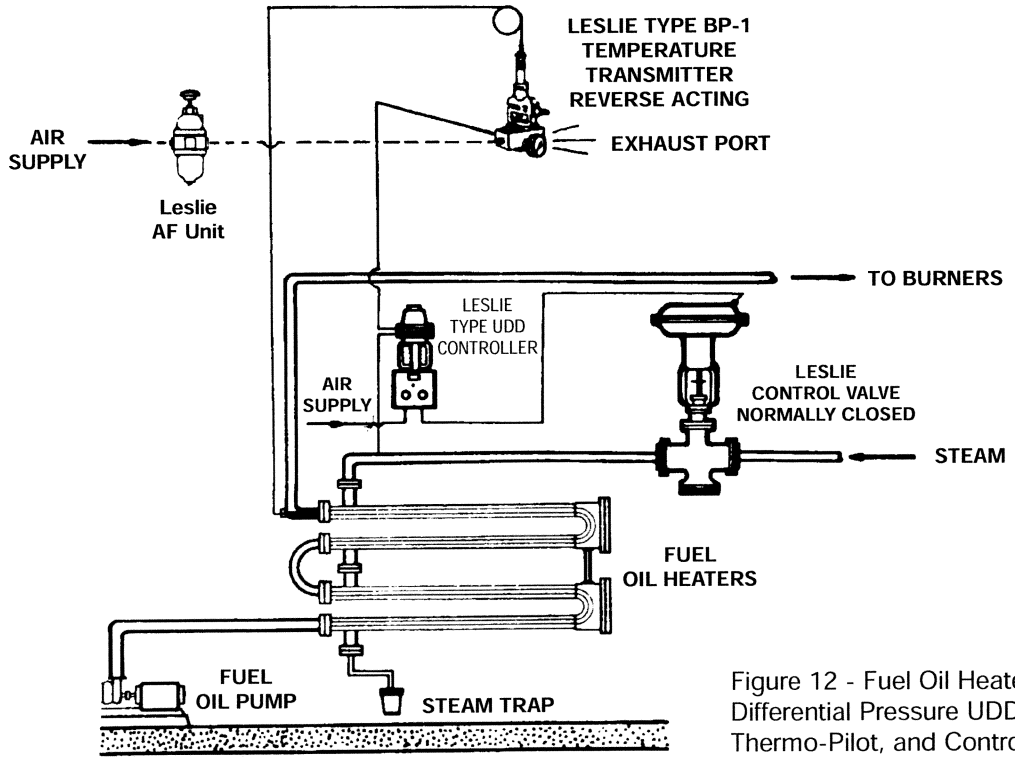


Figure 12 - Fuel Oil Heater Control - Using Differential Pressure UDD Control Pilot, BP-1 Thermo-Pilot, and Control valve

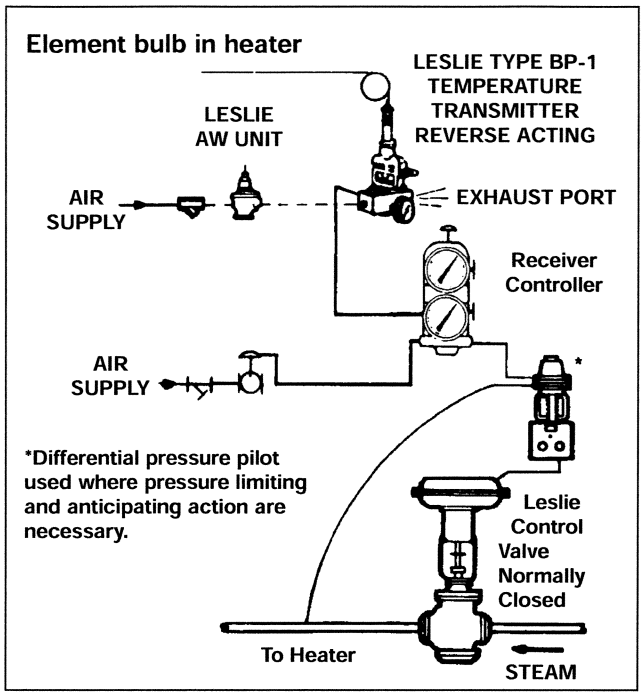


Figure 13 - Temperature Control System using BP-1 Thermo-Pilot and Air Temperature Transmitter

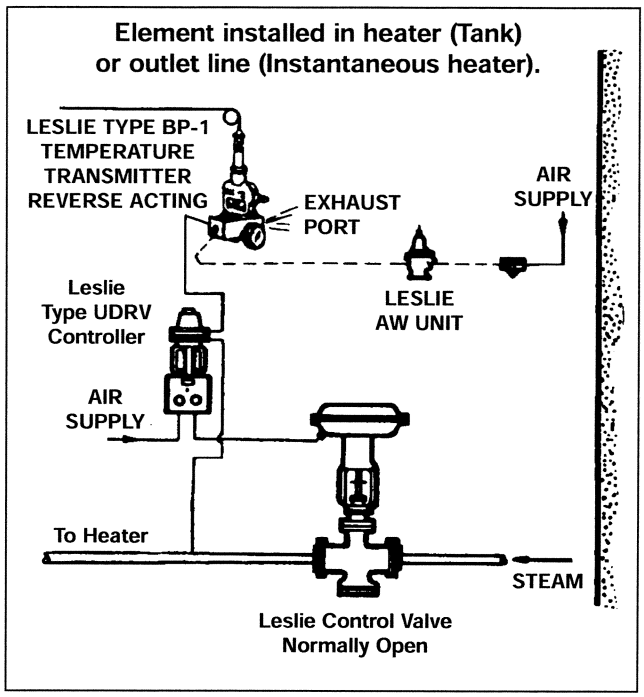


Figure 14 - Control Combination using BP-1 Thermo-Pilot, UDRV Differential Pressure Pilot and Control Valve

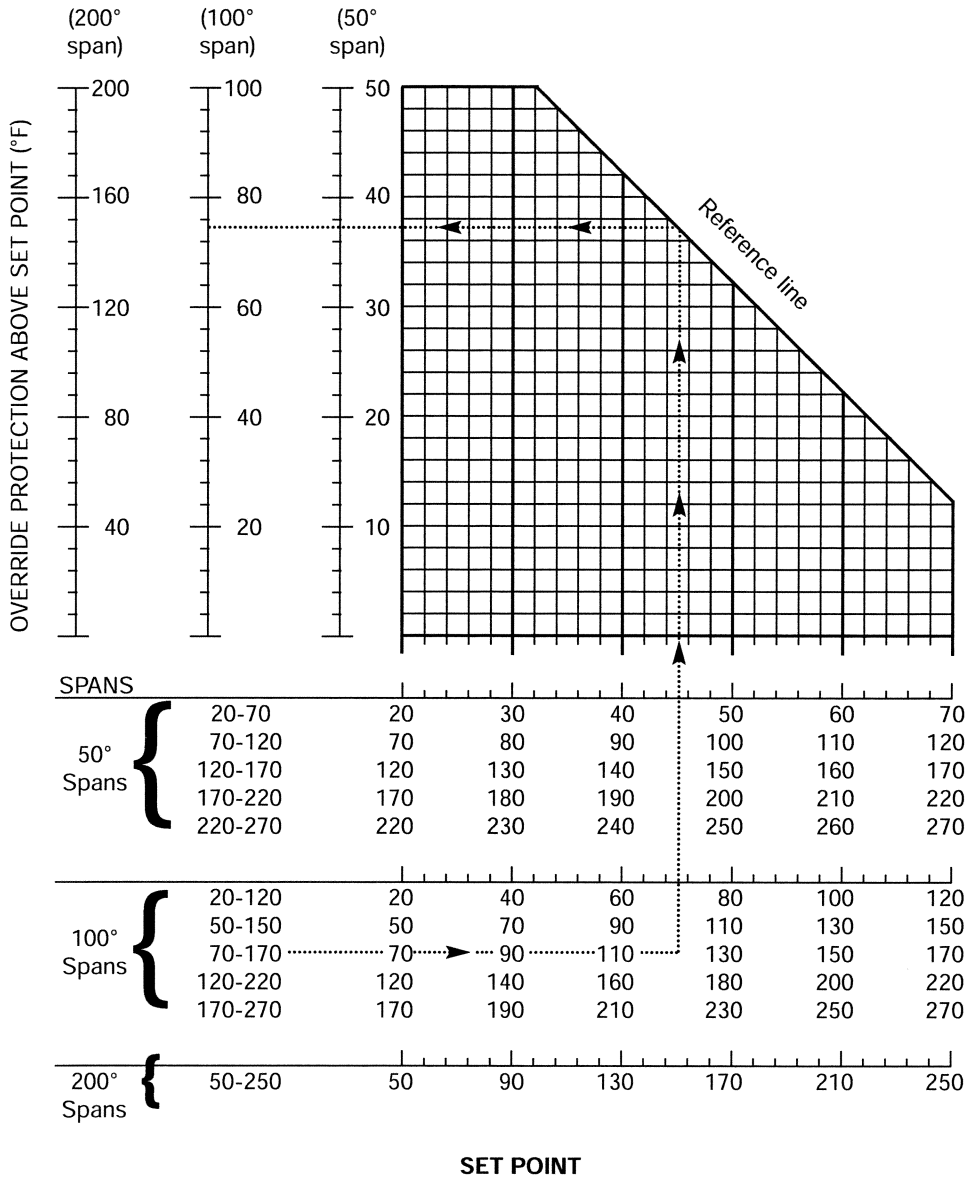
SECTION IV — OVERRIDE PROTECTION LIQUID FILLED THERMO-ELEMENTS

Liquid filled thermo-elements are not suitable for adjustment and operation at temperatures above the top limit of their range. There is, however, override protection so that if the temperature applied to the bulb is increased by heat from a source other than through the regulator, the thermo-element will not be damaged. The amount of override permitted depends upon the span of the element and the temperature setting.

EXAMPLE: What is override protection for 70-170° element set at 120° ?

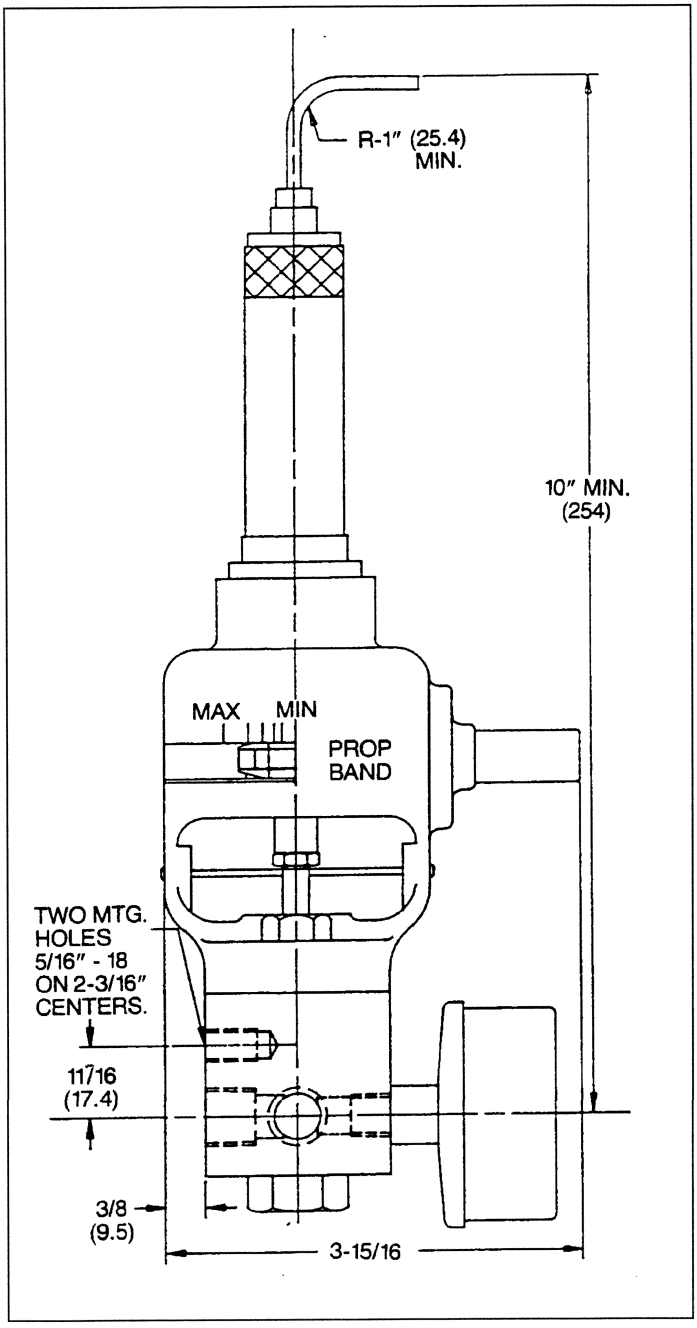
ANSWER: Enter 70-170° span over to 120° set point. Read vertically to reference line then horizontally to scale for 100° span to obtain °F Protection above set point.

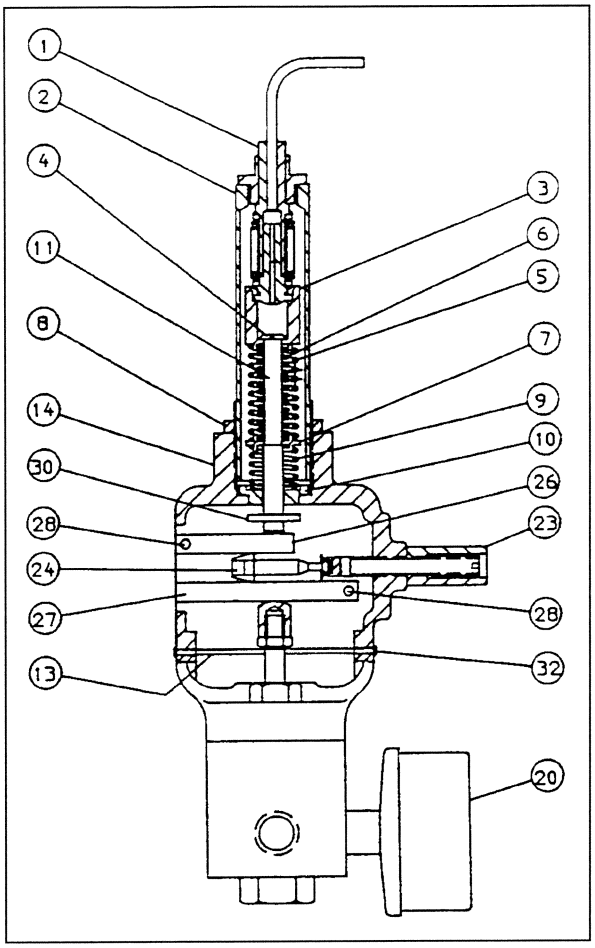
(**ANSWER:** -75°F above set point.)



SECTION V — PARTS LIST

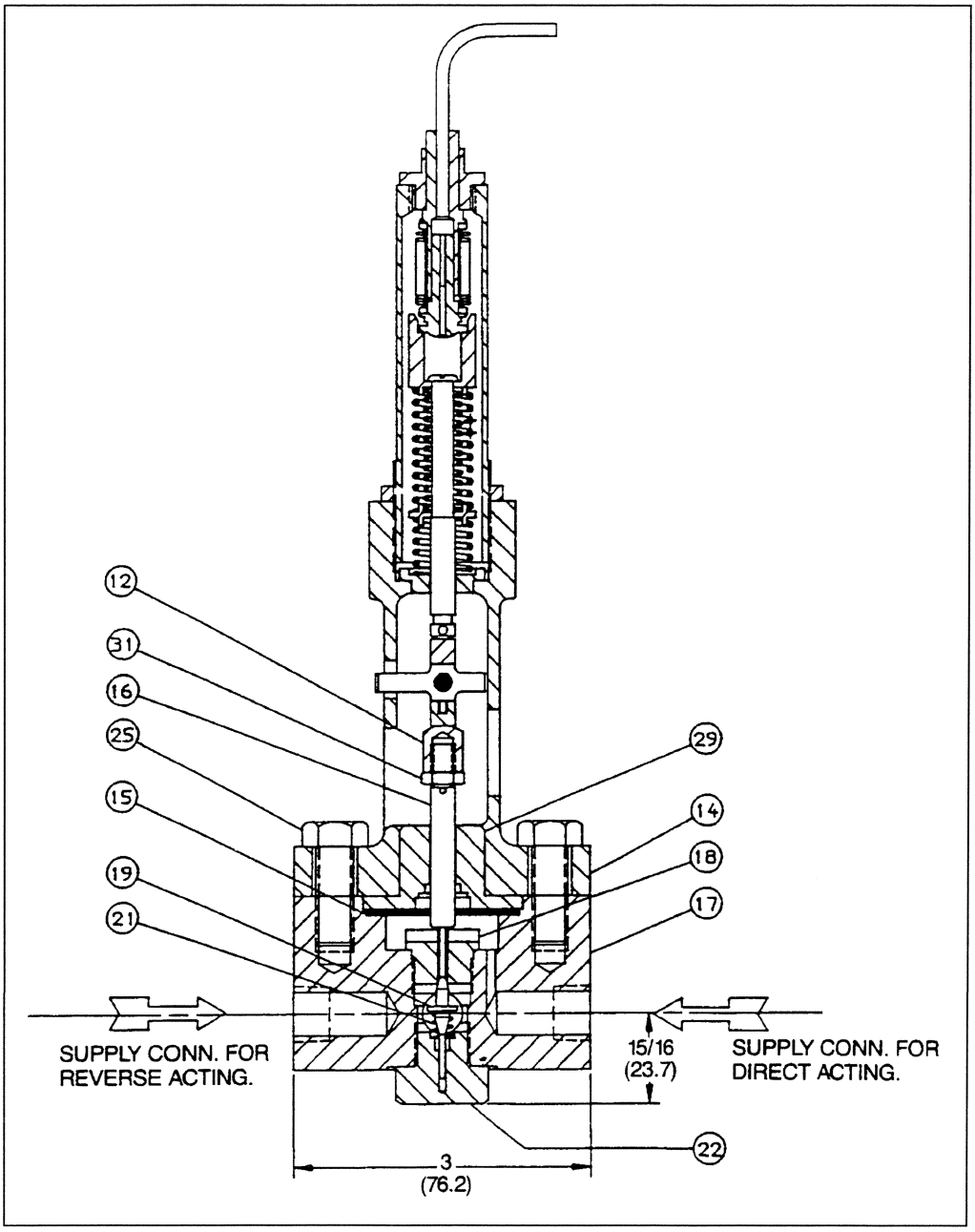
LESLIE PROPO-MATIC®
TEMPERATURE CONTROL PILOT
WITH ADJUSTABLE PROPORTIONAL BAND, ¼" TYPE BP-2





ALL CONNECTIONS ARE 1/4" NPT.
APPROXIMATE NET WEIGHT = 4 LBS.
ALL DIMENSIONS ARE IN INCHES / (MILLIMETERS).

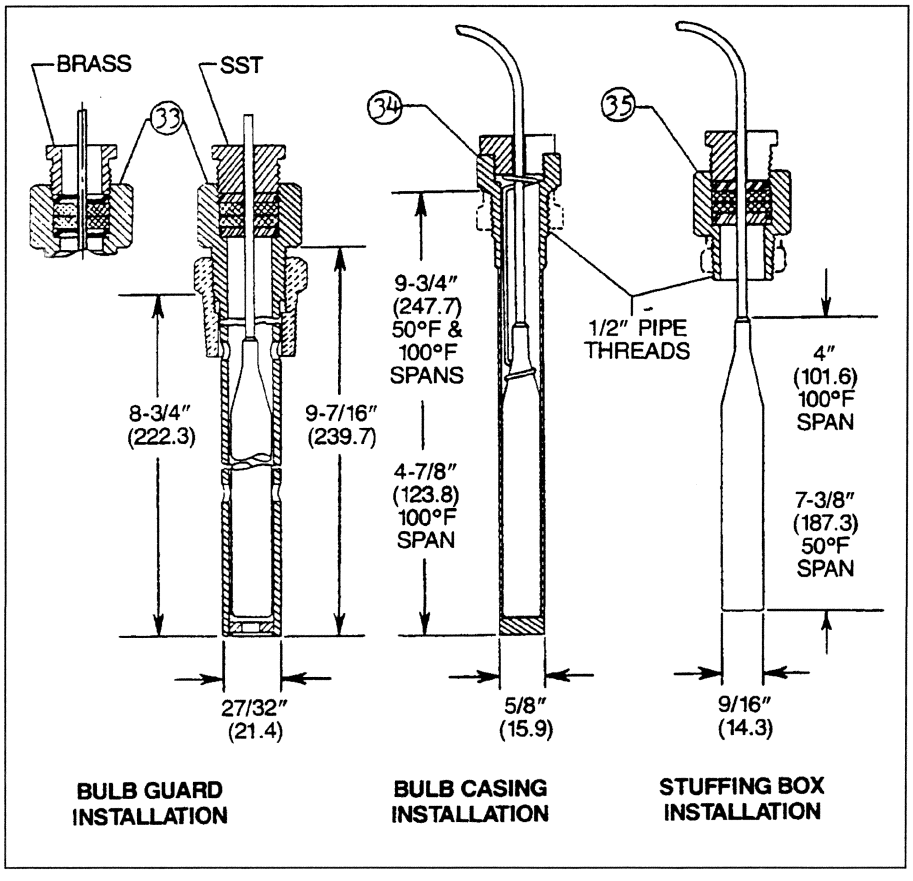
LESLIE PROPO-MATIC®
TEMPERATURE CONTROL PILOT
WITH ADJUSTABLE PROPORTIONAL BAND, ¼" TYPE BP-2



LESLIE PROPO-MATIC®
TEMPERATURE CONTROL PILOT
WITH ADJUSTABLE PROPORTIONAL BAND, ¼" TYPE BP-2

SUPPLY PRESSURE 200 PSI MAX.					
		REVERSE ACTING		DIRECT ACTING	
SUPPY PRESS. PSI	MAX. AIR CONSUMPTION CFM	MIN. (1) BAND TO DROP TO 2 PSI °F.	MAX. (2) BAND TO DROP TO 2 PSI °F.	MIN. BAND TO INCREASE OUTPUT TO MAX. PSI °F. (1)	MAX. BAND TO INCREASE OUTPUT TO MAX. PSI °F. (2)
15	.23 - .28	7	28	7.2	28.8
20	.25 - .32	9	35	8.2	32.8
30	.32 - .41	11	44	9.5	38.
40	.39 - .50	14	56	11.	44.
60	.54 - .68	16	64	14.1	56.4
90	.75 - .96	18	72	16.4	65.6

(1) In narrowest Band position with 100° Range Element.
(2) In widest Band position with 100° Range Element.



LESLIE PROPO-MATIC®
TEMPERATURE CONTROL PILOT
WITH ADJUSTABLE PROPORTIONAL BAND, ¼" TYPE BP-2

PARTS LIST, BP-2
WHEN ORDERING PARTS, GIVE SIZE, CLASS, PART NAME, AND REFERENCE NUMBER FROM TABLE BELOW.
USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	MATERIAL SPECIFICATION	QTY.	REFERENCE NUMBER
1	THERMO -ELEMENT	(NOTE 1)	(NOTE 1)	1	(NOTE 1)
2	ADJUSTING SLEEVE	STAINLESS STEEL	AISI TYPE 303	1	13340
3	TOP SPRING SEAT	BRASS	ASTM-B124, ALLOY 3	1	13351
4	BELLOWS STEM SCREW	BRASS	ASTM-B16	1	13354
5	YIELDING SPRING, OUTER	STEEL, NICKEL PLATED	COMMERCIAL	1	13356
6	YIELDING SPRING, INNER	STEEL, NICKEL PLATED	COMMERCIAL	1	13357
7	INTERMEDIATE SPRING SEAT	BRASS	ASTM-B16	1	13350
8	LOCK NUT	BRASS	ASTM-B21	1	29375
9	BELLOWS SPRING	STEEL, NICKEL PLATED	COMMERIAL	1	35889
10	BOTTOM SPRING SEAT	ALUMINUM	ASTM-B211, ALLOY 2024	1	29374
11	BELLOWS STEM	STAINLESS STEEL	AISI TYPE 303	1	35881
12	PILOT STEM HEAD	BRASS	COMMERCIAL	1	35887
13	PILOT STEM SPRING	STEEL, CADMIUM PLATED	COMMERCIAL	1	35888
14	PILOT HOUSING	ALUMINUM	ASTM-B26, ALLOY 356-T6	1	48227
15	PILOT HOUSING GASKET	SHEET PACKING	COMMERCIAL	1	48880-67
16	PILOT STEM	STAINLESS STEEL	AISI TYPE 316	1	49021
17	MAIN BODY	ALUMINUM	ASTM-B211, ALLOY 2017/2024	1	49011
18	SEAT RING	NYLON	COMMERCIAL	1	44069
19	PILOT VALVE COMPLETE	STAINLESS STEEL	AISI TYPE 302	1	11312
20	GAGE, 0-100 PSIG RANGE	STEEL CASE WITH CLEARLOCK CRYSTAL	COMMERCIAL	1	20862
21	PILOT VALVE SPRING	STAINLESS STEEL	AISI TYPE 420	1	33666
22	PILOT VALVE PLUG	ALUMINUM	ASTM-B211, ALLOY 2017/2024	1	49023
23	SLIDER SCREW-NUT	ALUMINUM	ASTM-B211, ALLOY 2017/2024	1	35872
24	PROPORTIONING SLIDER	STAINLESS STEEL	AISI TYPE 302/303	1	69085
25	CAP SCREW	STEEL, CADIMIUM PLATED	ASTM-A193, GR. B7	2	43560
26	PRIMARY LEVER	STAINLESS STEEL	AISI TYPE 302	1	35877
27	SECONDARY LEVER	STAINLESS STEEL	AISI TYPE 303	1	35878
28	DRIVE PIN	STEEL	COMMERCIAL	2	48294
29	PILOT STEM GUIDE (NOTE 2)	ALUMINUM	ASTM-B2, ALLOY 2017/2024	1	49020
30	COTTER PINSPRING	STEEL	ASTM-A228	1	48296
31	NUT STAINLESS	STEEL	AISI TYPE 302	1	51517
32	SCREW	STEEL, CADMIUM PLATED	COMMERCIAL	2	35901
33	BULB GUARD COMPLETE	(NOTE 3)	(NOTE 3)	1	(NOTE 3)
34	BULB CASING COMPLETE	(NOTE 4)	(NOTE 4)	1	(NOTE 4)
35	STUFFING BOX COMPLETE	(NOTE 5)	(NOTE 5)	1	(NOTE 5)

NOTES:

NOTE 1: SEE ENGINEERING DATA SHEETS 60/0.3.6 & 60/0.3.7 FOR AVAILABLE THERMO-ELEMENTS SPECIFY RANGE, MATERIAL, COATING, AND LENGTH OF TUBING.

NOTE 2: PILOT STEM GUIDE CONSISTS OF STEM SEAL ASSEMBLY.

NOTE 3: SEE DRAWING 60/0.4.1.1 FOR AVAILABILITY, PARTS LISTS, & DIMENSIONS.

NOTE 4: SEE ENGINEERING DATA SHEETS 60/0.3.6 & 60/0.3.7 AND DRAWING 60/0.4.1.2 FOR AVAILABILITY, PARTS LIST, & DIMEN SIONS.

NOTE 5: SEE DRAWING 60/0.4.1.3 FOR AVAILABILITY AND PARTS LIST.

NOTE 6: FOR UNITS HAVING CALIBRATED DAILS (BPC-2), SEE DRAWING 60/0.4.2.

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