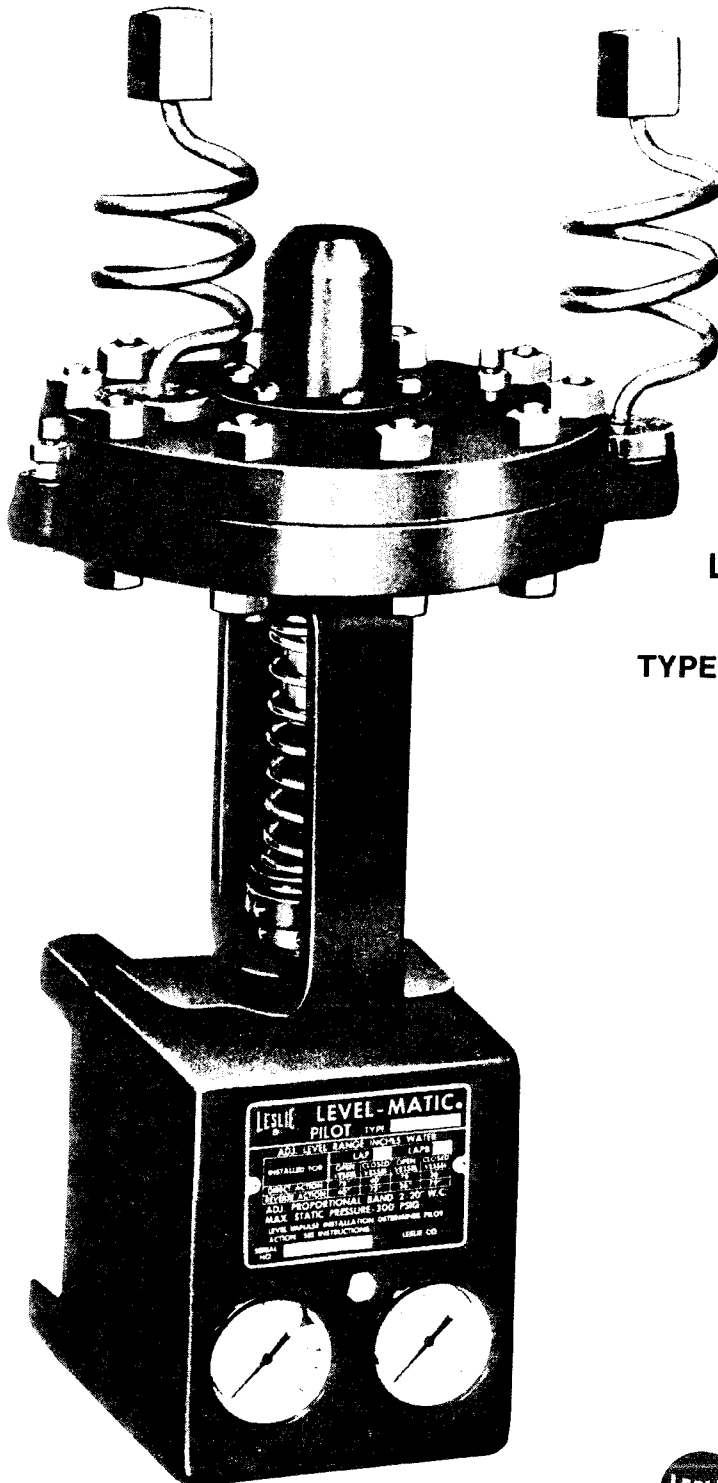


20/4.5.1



**LESLIE FLOATLESS
LEVEL CONTROL PILOT**

TYPES LAP, LAUP, LAPB, LAUPB

Instructions for:
Installation Page 1
Operation Page 7
Maintenance Page 11

LESLIE
CONTROLS, INC.

A subsidiary of CIRCOR International, Inc.
12501 Telecom Drive • Tampa, FL 33637-0906



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

Installation, Operation and Maintenance

SECTION I — INSTALLATION

Install level control pilot in a vertical position (except where space restrictions warrant inverted mounting), in an accessible location, and as close to the vessel as possible, where the ambient temperature will not exceed 140° F.

Level pilot must be below the minimum controlled level, when head pressure is to be measured directly on the diaphragm. Level pilot may be installed above the controlled level when continuous purging of the impulse pipe is used.

Where the rate of system level change is faster than the time required for the level pilot to load the actuator, a volume booster relay or a valve positioner may be necessary to speed valve action or to insure positive positioning.

IMPULSE PIPE INSTALLATION

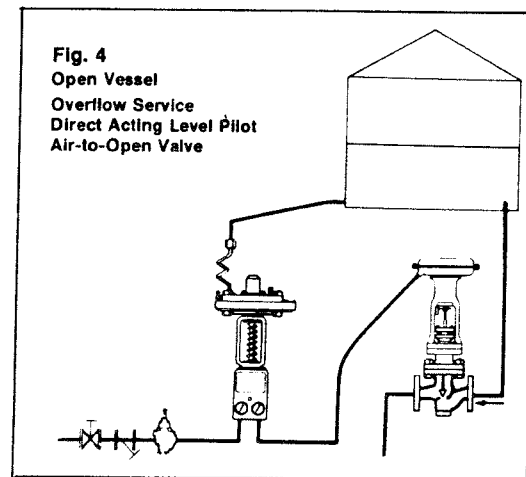
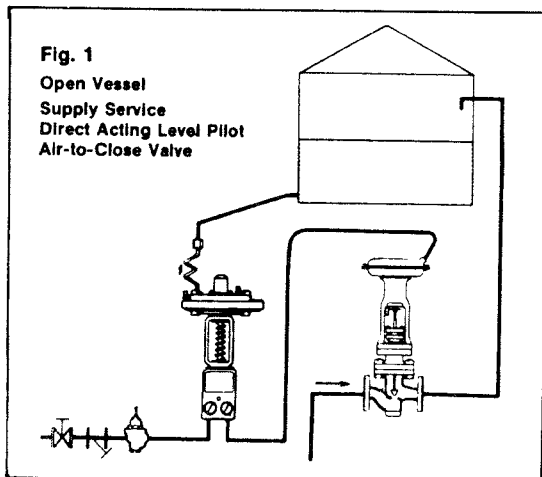
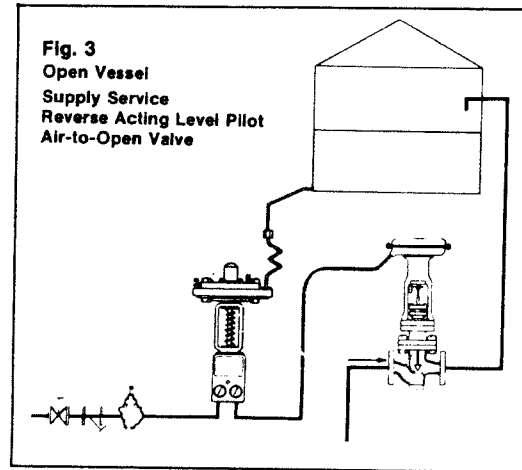
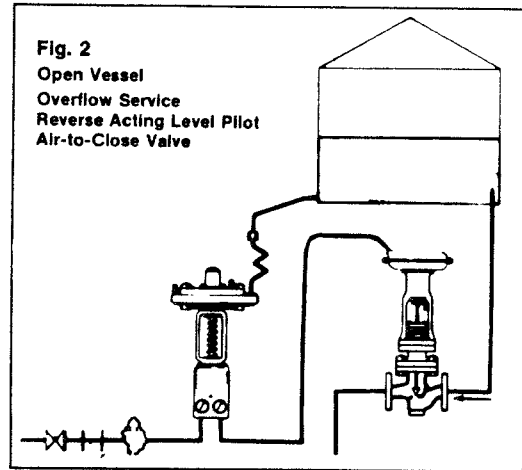
References: Fig. 19 page 5; Fig. 20 page 6; Fig. 21 page 9; Fig. 22 page 10.

Typical Installation Sketches: Figs. 3-20 pages 1, 2, 3 and 4.

When installing impulse pipes, installation methods and details shown in references above must be followed.

Open Tank Level Control

The level pilot requires only one level impulse, connecting head pressure (variable leg) to the large diaphragm. Connection above or below diaphragm depends on whether direct or reverse action is desired.





instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

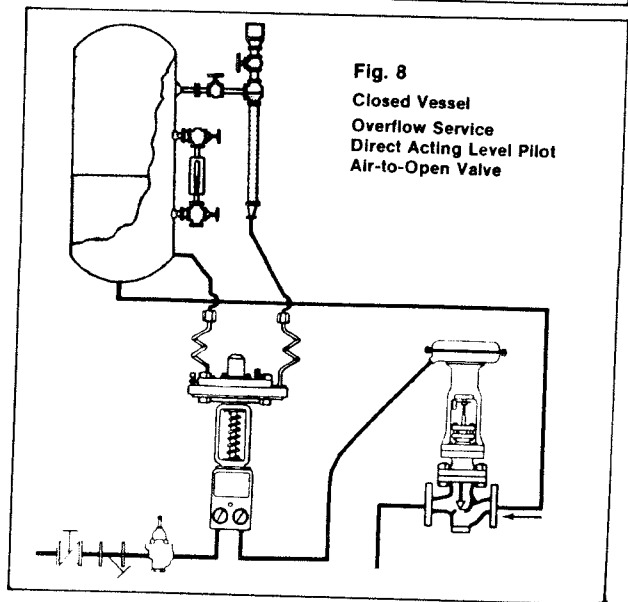
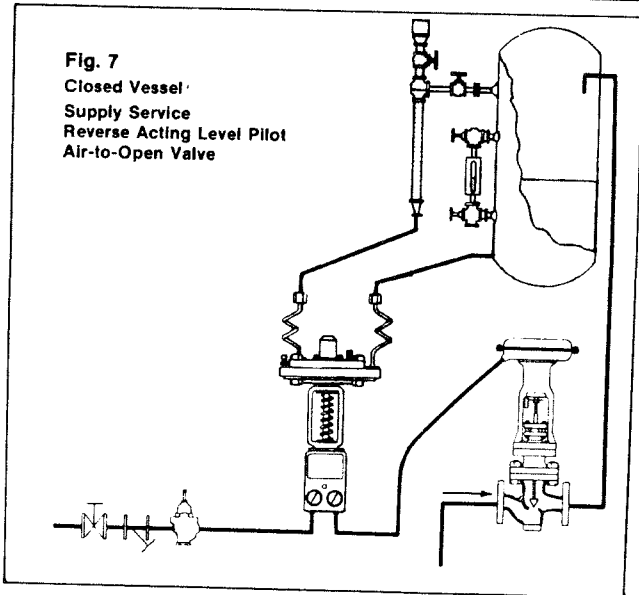
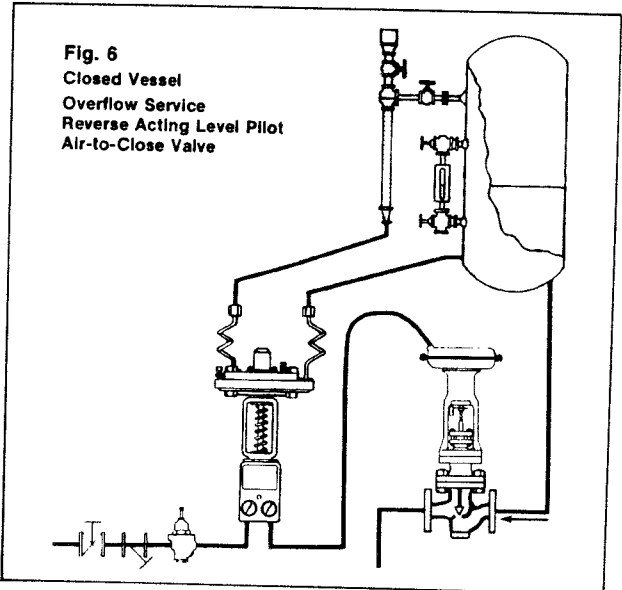
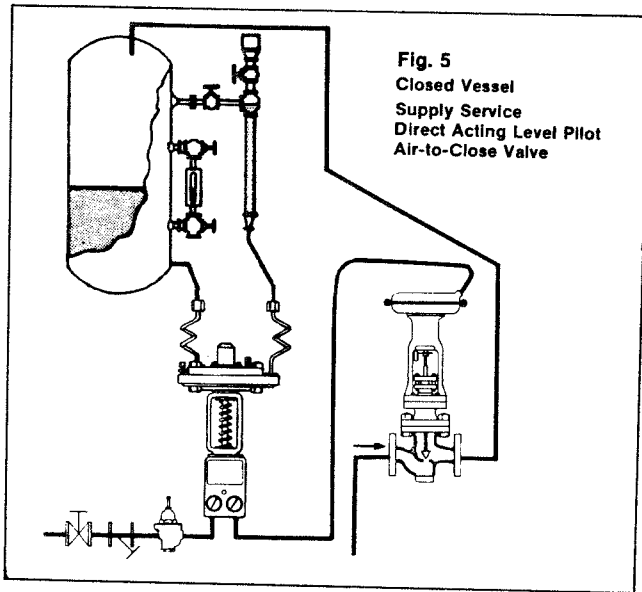
Closed Vessel Level Control

Two level impulses connected to the large diaphragm are required - one to measure variable head pressure (variable leg) and one to measure a fixed reference leg (pressure).

Connection of variable leg above or below the large diaphragm determines the action of level pilot. See

references below.

The maximum difference in elevation between the variable or controlled level in the vessel and the level in the fixed reference leg must not exceed the maximum value of the adjustable range shown in table on Dwg. Fig. 21 or Fig. 22.



IMPULSE PIPE CONNECTION DETAILS

Impulse pipes must be 1/2" Schedule 40 pipe (minimum) or tubing with equivalent Internal Diameter.

Piping or tubing must be arranged to avoid

restrictions and to be self-venting in order to prevent trapping of air or vapor.

Line up impulse pipes carefully both horizontally and vertically with the level pilot so that the coils



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

connecting the impulse pipes to diaphragm assembly will not be crushed, bent or stressed. Be sure to maintain gradual slope of the connecting coils.

FOR CLOSED VESSELS

Impulse pipe for fixed reference leg must be arranged to keep the head of liquid at constant level. Continuous filling of reference leg may be provided, where necessary, as shown in Figs. 16, 17, 18.

Provide filling connection and stop valve at the top of the fixed reference leg reservoir. Reservoir should be constructed of 2" Schedule 40 pipe (minimum) and connected as shown in Detail Sketch, LPI Fig. 20. For high vacuum vessels, use one of the methods for continuous filling of the fixed reference leg shown in Sketches 16, 17, 18.

PURGE METHOD

If air or gas purged impulse pipes are used, the maximum difference in elevation, between the variable level in the vessel and the lower end of the submerged purge tube must not exceed the maximum value of the adjustable range. Purge systems must be arranged so that purge pressures measured by level control pilot are true measures of the vessel pressures.

Where Purge Method of level sensing is used, impulse pipes may be purged with air, gas or suitable liquid. See Fig. 9, 10, 12.

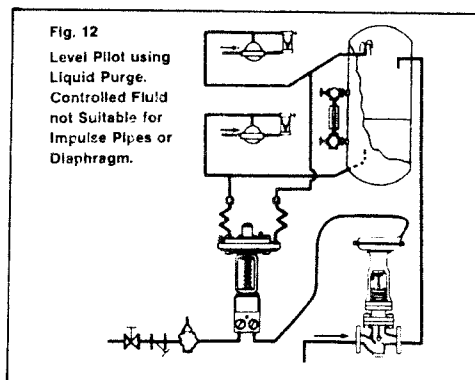
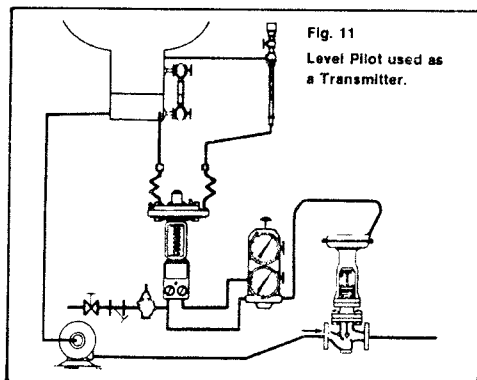
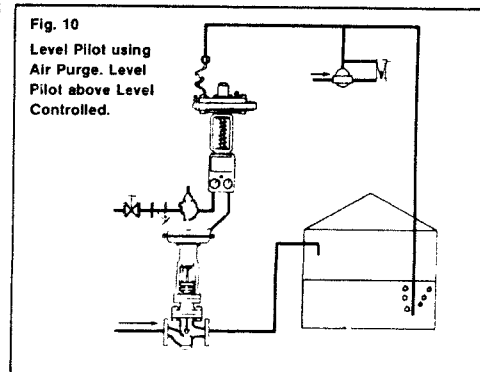
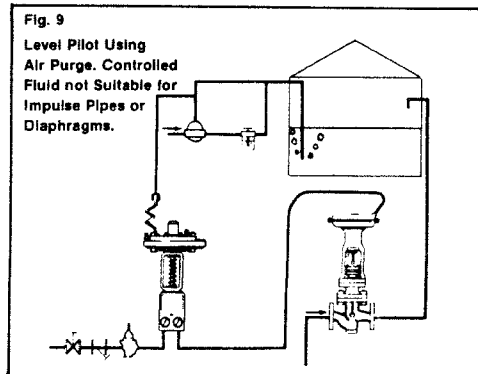
Level Control Pilots may be used as level transmitters where 3-15 psig or 6-30 psig transmitted air signals are suitable. The air output within these ranges permits the units to be used with receiver controllers incorporating various modes of control. Install as shown in Sketch Fig. 11.

Install receiver controller according to manufacturer's recommendations.

INSTALLING OPERATING AIR CONNECTION

Install a 1/4" strainer and pressure reducing valve in the air supply line after a 1/4" stop valve. Connect air supply directly under the gauge marked "Operation Supply". Use corrosion resistant pipe or suitable tubing throughout. Internal diameters should be equivalent to that of 5/16" O.D. tubing.

Connect 5/16" O.D. to the base of the level control pilot, directly under the gauge marked "Control Valve," to the control valve or to the volume booster relay or positioner if one is in use.



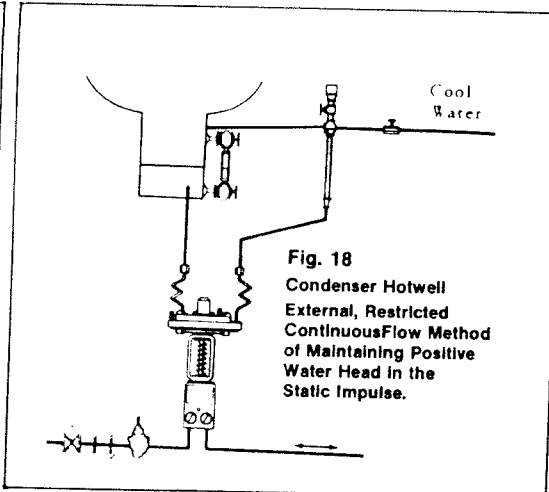
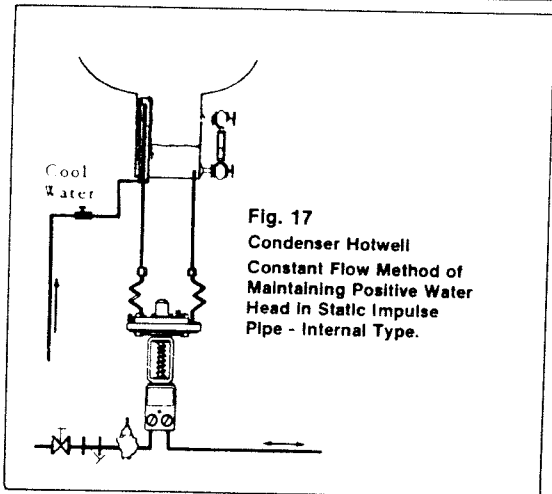
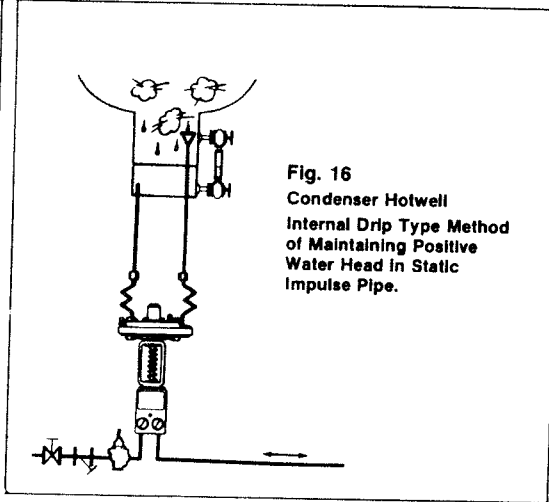
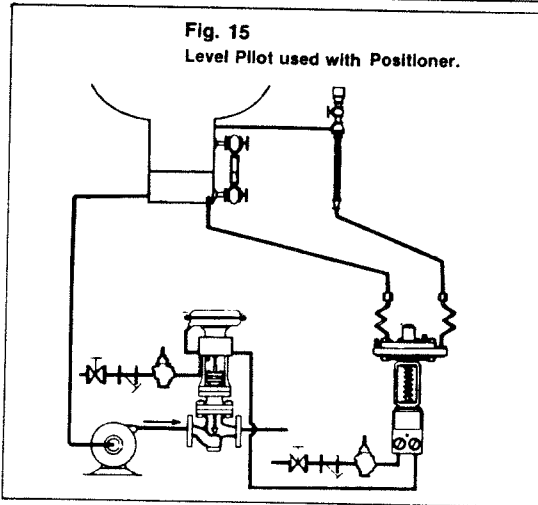
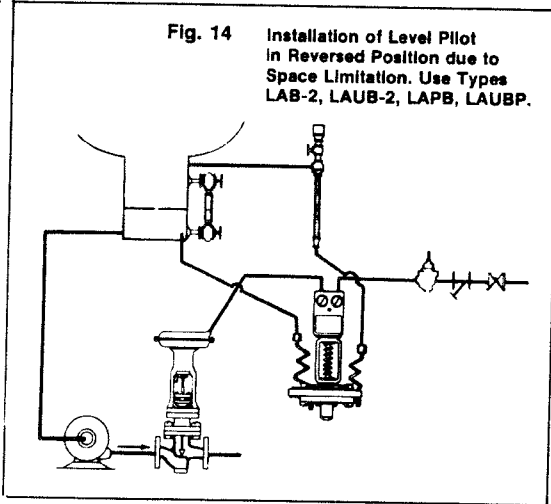
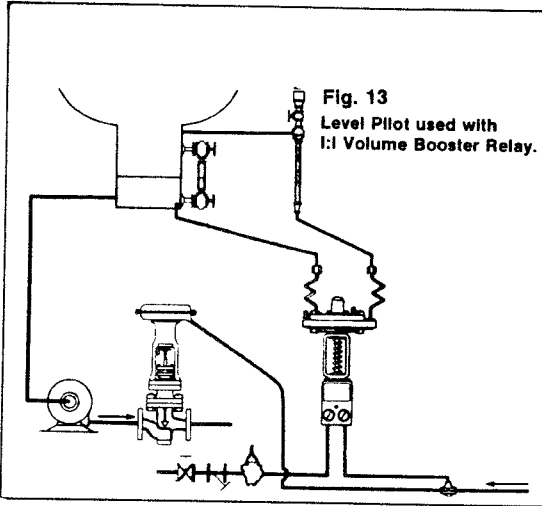


instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

TYPICAL INSTALLATIONS



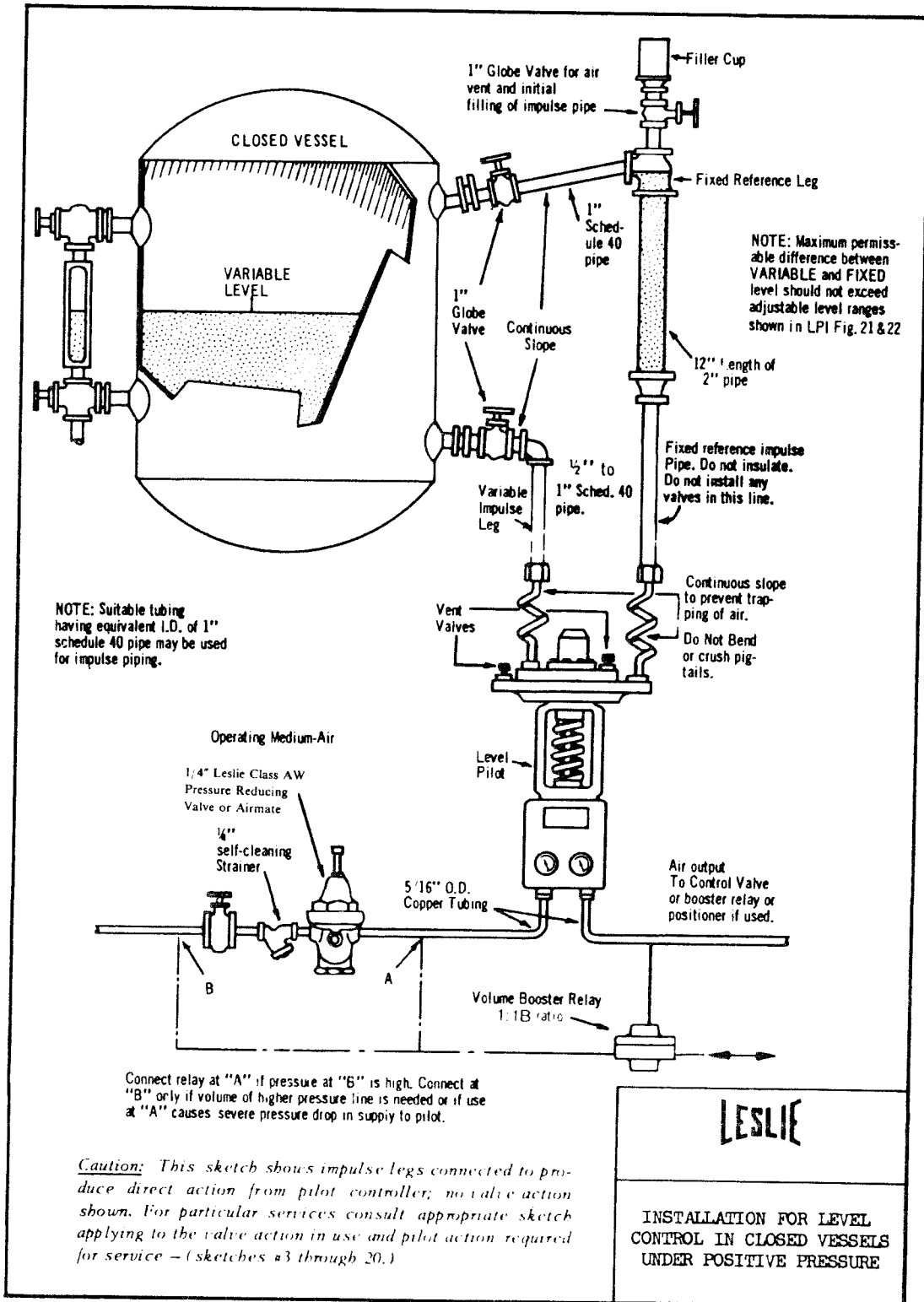


instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

Fig. 19 - Installation Details for Level Control in Closed Vessels Under Positive Pressure



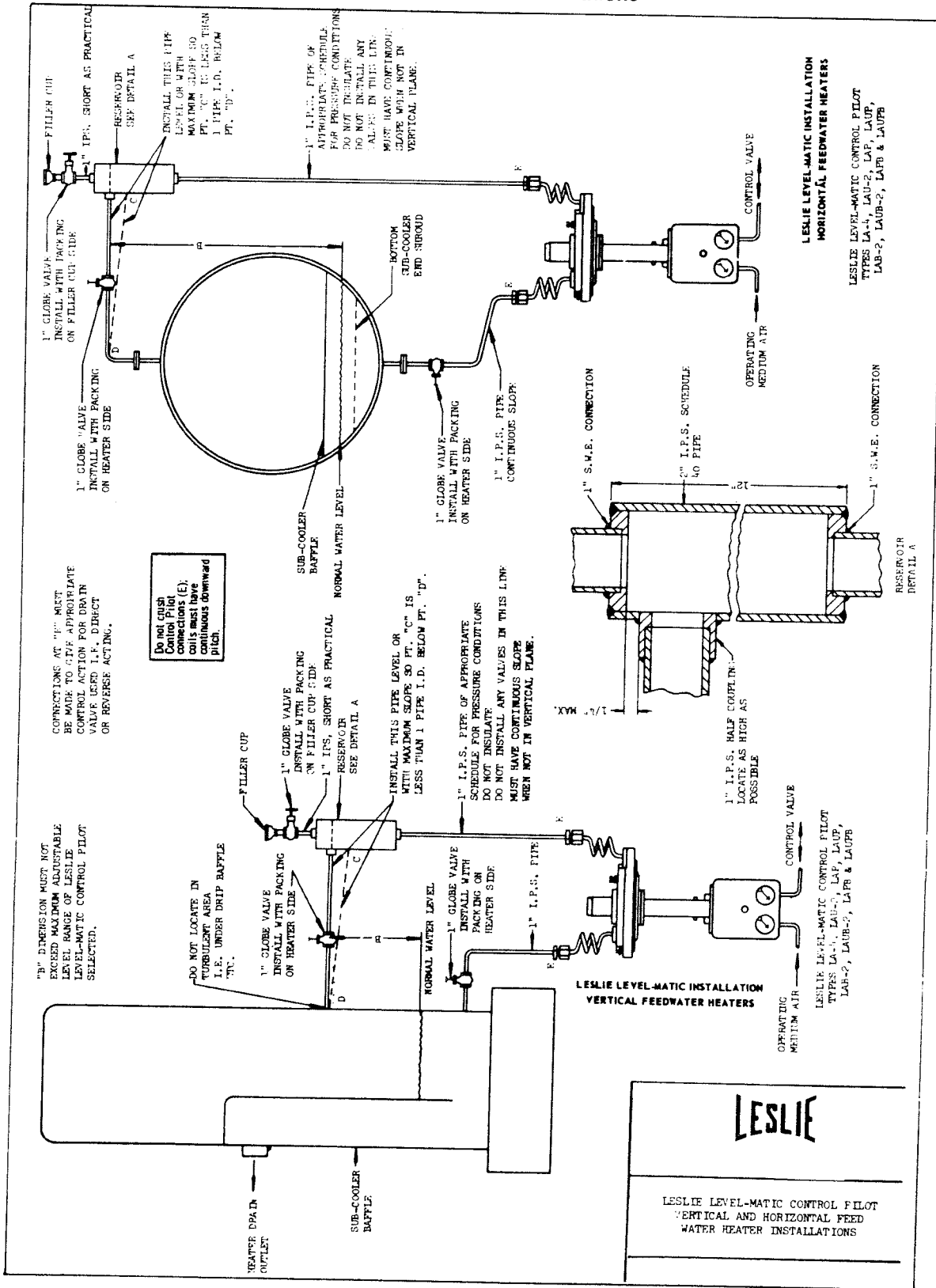


instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

Fig. 20 - Installation Details for Feed Water Heater Installations



LESLIE

LESLIE LEVEL-MATIC CONTROL PILOT
VERTICAL AND HORIZONTAL FEED
WATER HEATER INSTALLATIONS



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LABP, LAUPB

SECTION II — OPERATION

Follow initial startup procedure, outlined below, as a general method for putting a level pilot and control valve into operation. Details pertaining to specific systems are contained in notes following the general procedure. (See pages 7 and 8)

Notes are called to the Operator's attention in the order in which they apply. No internal adjustment is needed in level pilots with fixed proportional band, for pilots with adjustable proportional band, see N-3 "Proportional Band Adjustments". (See page 8)

Procedure (Refer to notes N-1 to N-4, page 7, 8)

1. Close inlet and outlet stop valves for control valve.
2. Establish level in vessel to be controlled.
3. Open stop valve in variable impulse pipe to level pilot.
4. Fill impulse pipes with liquid and remove all entrained air from diaphragm head and impulse pipes. For vessels under vacuum see N-1. This step does not apply where air or gas purges are used. See note N-1.
5. Open stop valve in air supply line and adjust pressure reducing valve to provide 20/22 psig on "Operating Supply" gauge of level pilot.
6. Adjust compression on level pilot adjusting spring by turning adjusting nut until control valve assumes one of the following positions:
 - a. Nearly closed - this will assure a restricted flow to vessel when stop valves are opened in Step 7.
 - b. Nearly wide open - this will assure a full flow to the vessel when stop valves are opened in Step 7.
 - c. About one-half open (see travel indicator); this will assure an intermediate flow to the vessel when stop valves are opened in Step 7.

For raising or lowering level see note N-2. For proportional Band Adjustment see note N-3 and N-4. (Page 8)

7. Open inlet stop valve for control valve.
8. Slowly open outlet stop valve for control valve, putting system into operation.
9. To widen proportional band or improve stability, see note N-3, N-4. (Page 8)
10. To raise or lower operating level see note N-2. (Page 8)

See detailed operating instructions on pages 7 and 8.

DETAILED NOTES— INSTRUCTIONS

NOTE N-1 — LIQUID FILLING OF IMPULSE PIPES AND DIAPHRAGM HEAD — REMOVAL OF AIR

FOR INSTALLATIONS EMPLOYING THE FILLER CUP METHOD FOR FILLING FIXED REFERENCE LEGS

Filling Variable Leg

Open vent valve which vents the side of the diaphragm to which the variable leg is connected. Allow liquid to flow from vent valve until impulse leg and diaphragm area are completely filled with liquid and free of air. This will be indicated by a clear stream of liquid containing no air bubbles, flowing from the vent valve. When air-free liquid filling is insured, close the vent valve.

Filling Fixed Reference Leg

Close stop valve in impulse pipe between vessel and reservoir.

Open vent valve which vents the side of the diaphragm to which the fixed reference leg is connected.

Fill filler cup with liquid and continue to add liquid while opening stop valve under filler cup.

Continue to pour liquid into filler cup (without entraining air) and allow it to flow out of vent valve until fixed reference leg is completely filled with liquid and free of air. This will be indicated by a clear stream of liquid, free of air bubbles, flowing from the vent valve.

When air-free liquid filling is insured, close vent valve first and then stop valve under filler cup.

Open stop valve between vessel and reservoir.

FILLING VARIABLE AND FIXED REFERENCE LEG WITH EXTERNAL LIQUID SOURCE.

In these installations filler lines supplying suitable liquid are connected to the level pilot diaphragm head in place of the vent valves. Where this method is used, supply line stop valves must be of positive closing type.

Open impulse line stop valves.

Partially open filler line stop valves and permit liquid to flow slowly through diaphragm head and through impulse pipes until air-free liquid is insured.

Close filler line stop valves tightly, except in high vacuum installations where a small continuous flow of liquid is employed to maintain a positive liquid head in the fixed reference leg.



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

FOR VESSELS UNDER VACUUM (Using Direct Liquid Head Measurement Method)

Particular care should be taken to eliminate all air from impulse pipes and diaphragm heads of level control pilots controlling vessels under vacuum. With such vessels filling of impulse pipes and diaphragm heads and removal of air should only be done when the system is not under vacuum. Proceed as shown for the particular system.

NOTE N-2 — RAISING OR LOWERING LEVEL IN THE VESSEL

TO RAISE LEVEL IN THE VESSEL

With Pilot connected for direct action Figs. 1, 4, 5, 8. Increase compression on adjusting Spring.
With Pilot connected for Reverse action Figs. 2, 3, 7, 8. Decrease compression on adjusting Spring.

TO LOWER LEVEL IN THE VESSEL

With Pilot connected for direct action Figs. 1, 4, 5, 8. Decrease compression on adjusting Spring.
With Pilot connected for Reverse action Figs. 2, 3, 7, 8. Increase compression on adjusting Spring.

NOTE N-3

Adjustable Proportional Bands

LAP, LABP, LAUP and LAUBP level control pilots are adjustable proportional band types which may be adjusted for proportional band response within the ranges noted on Fig. 22, (2-20"; 7-25").

To widen proportional band turn knob (79) clockwise. To narrow proportional band turn knob counterclockwise.

Initial Setting of Proportional Band

Where an application requires proportional band adjustment, the exact width of band necessary is usually determined by operating conditions. For initial adjustment, unless a specific width of band is desired, turn knob (79) to set indicator at "Minimum Band" on scale.

For procedure to widen proportional band to increase stability, see Note-4.

NOTE N-4

PROCEDURE FOR WIDENING PROPORTIONAL BAND TO INCREASE STABILITY OF SYSTEM

Turn knob (79) clockwise to widen band until system stabilizes. Then turn knob counterclockwise until instability just begins to re-appear. Then slowly widen band again until system just reaches stability. Make a final adjustment of band slightly wider than exact amount required to attain stability.

"DRY RUN" SETTING OF LEVEL PILOT BEFORE INITIAL START-UP

Where pre-setting of a level pilot is desired prior to system operation, connect two pieces of flexible tubing (minimum ¼" O.D.) fitted with filler cups, to the connections at the top end of the coiled impulse connections on the pilot. The two pieces of tubing should be of sufficient length to simulate actual impulse piping.

PROCEDURE FOR SETTING LEVEL PILOT

Connect air lines (as shown under "Installation 4") to level pilot and to control valve.

Fill both flexible tubings with liquid to top, venting any entrained air. Adjust relative heights of tubing to correspond to difference in height between level in fixed reference leg and the desired level in the vessel.

Adjust level pilot as shown under "Operation", Step 5 and 6. Level change may be made by lowering or raising variable leg tube. Level pilot will then operate through complete range and vary its air output pressure sufficiently to stroke control valve within the proportional band of the pilot (fixed) or its setting (adjustable proportional type).

NOTES



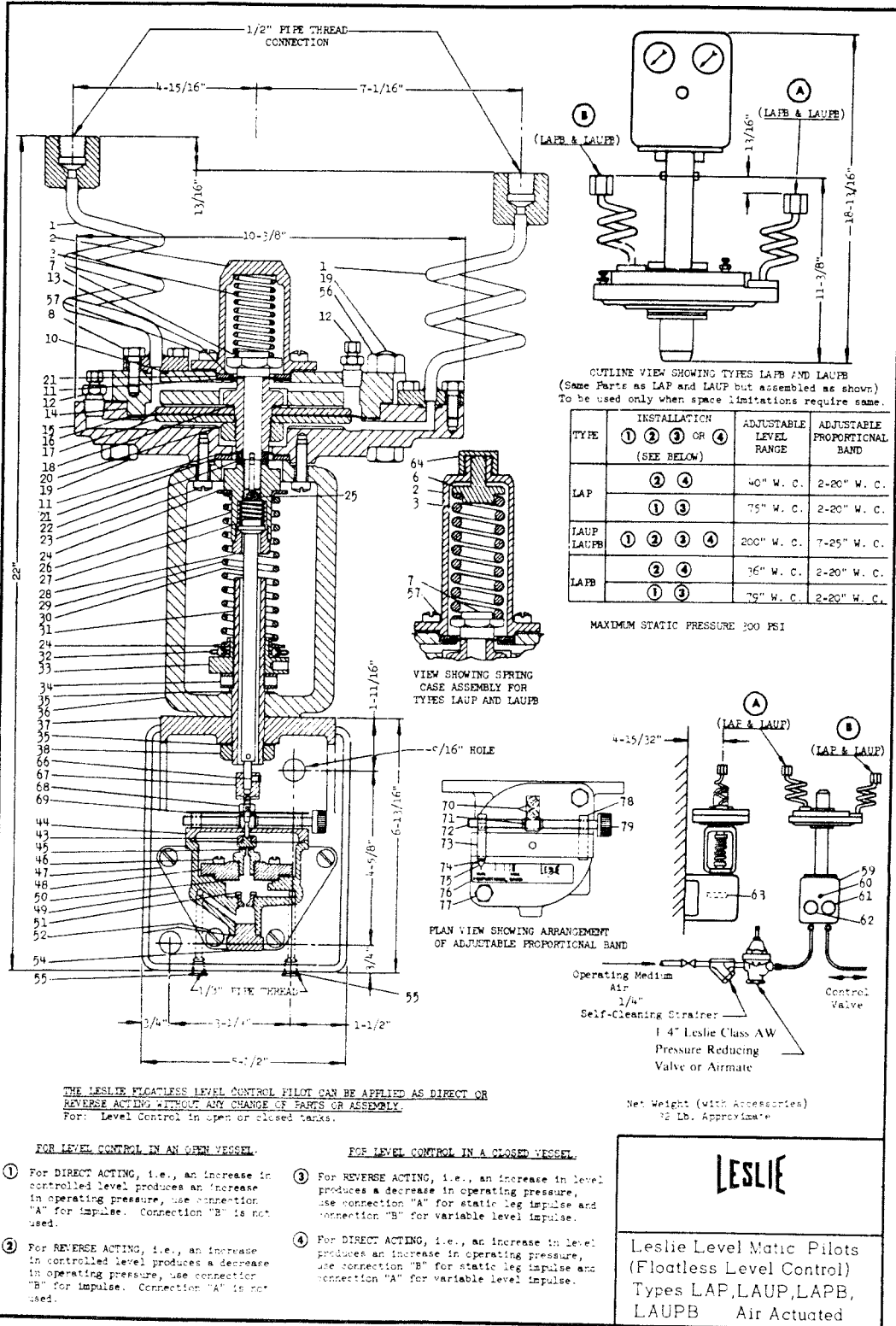


instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

LPI Fig. 22





instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

SECTION III — MAINTENANCE

A. PILOT BODY ASSEMBLY

DISMANTLING, CLEANING AND REASSEMBLING

REFER TO PROPER LEVEL PILOT DRAWING

NOTE: By-pass the control valve, if it is necessary to maintain the system under operation during maintenance work. Close impulse pipe and control valve stop valves. Disconnect impulse pipes at flange connection at diaphragm head. Shut off air supply.

DISMANTLING PILOT BODY ASSEMBLY

Proceed as shown below for the particular level pilot.

For LAP, LAPB, LAUP, LAUPB Level Pilots
See Fig. 22, 23 & 24.

1. Remove cover screw (60) and cover (59). Take out bottom plug (54) and gasket (53). Take out pilot body screws (52). Slide pilot body, with assembled parts, off base (37) in a downward direction away from adjusting pin (67).
2. Remove capscrews (77) and lift diaphragm plate (44) from body. **Do not disturb proportional band parts on the diaphragm plate, unless work is required on them.** Take out flange ring screws (46), flange ring (48) and gasket (50).

CLEANING PARTS

Clean all parts including nozzle disc and nozzle. Make sure that ports in the pilot body, nozzle and the orifice are free and clear. Open air supply line stop valve and blow out inlet port in level pilot base.

NOTE: If maintenance work is to be performed on the Superstructure Assembly, it may be done at this point as shown under Section B.

REASSEMBLING PILOT BODY ASSEMBLY

For LAP, LAUP, LAPB, LAUPB Level Pilots

1. Place gasket (53) on bottom plug (54) and screw bottom plug into body. Tighten.



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

2. Replace gasket (50) in body. Position flange ring (48) on gasket with nozzle upward. Insert flange ring screws (46). Tighten evenly and with sufficient firmness to seal air. Insert diaphragm nozzle disc complete (43) in body with disc end toward nozzle. Replace diaphragm plate (44), with proportional band parts attached, on body. Insert capscrews (77) and tighten firmly.
3. Use new "O" Rings (47) if necessary. Replace the reassembled pilot body assembly and "O" Rings on base (37) in the following manner:
Place "O" Ring (47) in recesses in pilot body. Slide pilot body assembly upward on base so that the adjusting pin (67) passes smoothly through the proportional band blade spring. Insert screws (52) and tighten firmly. Readjust for desired proportional band, if necessary. Reassemble cover (59) to base (37). Insert cover screw (60) and tighten.

B. SUPERSTRUCTURE ASSEMBLY

DISMANTLING, CLEANING, RENEWING DIAPHRAGMS AND REASSEMBLING

Note: If maintenance work is to be performed on the Superstructure Assembly during complete overhaul of the level pilot, detailed instructions itemized in this section should be followed, prior to reassembling pilot valve body to base, as described in Section A.

If maintenance work is to be done on the Superstructure alone: - In ADJUSTABLE PROPORTIONAL BAND PILOTS remove adjusting pin and body assembly (See Step 1, Page 11, DISMANTLING LAP, LAPB, etc.). To remove adjusting pin in any of these classes (LAP, LAPB etc.) insert pin in hole in stem complete to prevent it from turning. Loosen setscrew (66) and unscrew adjusting pin (67) from stem complete (30). Do not remove bottom plug or bottom plug gasket in either case.

DISMANTLING SUPERSTRUCTURE ASSEMBLY REFER TO PROPER LEVEL PILOT DRAWING

For LAP, LAPB, LAUP, LAUPB Level Pilots, See Fig. 22.

Proceed as follows for all types.

1. Remove compression from adjusting spring (29). Take out spring case screws (57). Lift off spring case (2) and preloading spring (3).

Note: In the case of LAUP and LAUPB remove top spring seat upper (6) also. Do not disturb spring cap (64).

2. Loosen diaphragm cover bolts (19). Remove yoke screws (23) and lift diaphragm cover assembly out of yoke with stem attached.
3. Hold diaphragm cover assembly rigidly on hex of connector bolt (7). Loosen and unscrew stem nut (28), yielding spring (27) and stem complete (30) from top spring seat (26). Insert hex setscrew wrench through top spring seat into head of setscrew (25). Remove setscrew. Loosen and remove top spring seat (26) from connector bolt (7). Lift out diaphragm washer complete (22), diaphragm plate (21) and diaphragm small (11). Lift connector bolt (7) out of assembly along with the other diaphragm plate (21) and diaphragm small (11).
4. Remove cover bolts (19) and separate diaphragm base (15), diaphragm cover (14) and the diaphragm disc assembly. Hold diaphragm disc bolt (13) rigidly and remove diaphragm nut large (20) and gasket (18). Separate diaphragm discs (17) and diaphragm large (16).

CLEANING PARTS

Clean all parts including diaphragm base and cover. Use an approved solvent and crocus cloth, if necessary. Make sure that all ports, including those in vent valves are free and clear. Clean diaphragm seating faces. Replace all worn or damaged parts including gasket (18) and diaphragms.

REASSEMBLING

1. Reassemble diaphragm disc assembly using new diaphragms (16). Renew gasket (18) if necessary. Hold hex of diaphragm disc bolt (14) rigidly and tighten diaphragm nut large (20).
2. Place diaphragm disc assembly in base (15) with diaphragm nut (20) in center of recess in base. Assemble diaphragm cover (14) on diaphragm base (15). Insert bolts (19). Attach nuts and tighten finger tight.
3. Insert diaphragm small (11) and diaphragm plate (21) in recess in diaphragm cover (14). Insert connector bolt (7) through assembly. Reverse entire assembly and grasp hex of connector bolt (7), holding it rigidly.
4. Place diaphragm small (11) and diaphragm plate (21) over threaded end of connector bolt (7) and move them downward until they rest evenly in the recess in diaphragm base (15). Assemble diaphragm washer complete (22) to connector bolt (7), making sure that pin goes smoothly into slot in connector bolt.



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

5. Screw top spring seat (26) on connector bolt (7). Tighten down firmly against diaphragm washer complete (22). Insert setscrew (25) into top spring seat (26). Screw setscrew in tightly with hex wrench. Assemble yielding spring (27) and stem nut (28) to top spring seat (26). Tighten stem and nut.
6. Reassemble spring upper (3). "O" Rings (where used) (58) and spring case (2) to diaphragm cover (14). Insert screws (57) and screw in far enough to hold parts in place.

Note: In the case of LAU-2, LAUB-2, LAUP or LAUPB replace top spring seat upper (6) also. (Diaphragm cover bolts and spring case screws may be tightened at this point if a suitable holding device is available.)

7. Reassemble diaphragm cover assembly to yoke (36) taking care that diaphragm small (11), diaphragm plate (21) and diaphragm washer complete (22) are in their proper positions and that impulse connections are on the correct sides. Insert yoke screws (23) through yoke (36) and into diaphragm base (15). Tighten screws evenly and firmly.

NOTE: When screws are tightened a slight gap will remain between yoke and diaphragm base.

Do Not Attempt To Tighten Screws Enough to Close This Gap.

Tighten diaphragm cover bolts (19) and screws (57).

Extension Pin Type Assembly

Return extension pin (40) assembled with adjusting pin (67) to stem complete (30). Line up holes in extension pin and stem clamp insert screw (39) and tighten firmly.

For LAP, LABP, LAUP, LAUPB Level Pilots, See Fig. 22.

Reassemble adjusting pin (67) to stem (30). Replace pilot body assembly on base (37). Readjust stem length as shown under Section C.

Readjust level pilot for desired level as shown under "Operation". On Adjustable Proportional Band level pilots adjust for desired width of band.

10. Reconnect impulse pipes. Open impulse pipe stop valves. Refill impulse pipes and diaphragm head with liquid and remove air as shown under "Operation". Readjust level pilot for desired level as shown under "Operation". Check adjustable proportional band level pilots for response to desired level change. Readjust as shown in Section D, if necessary. Replace cover (59) and cover screw (60). Tighten.

C. BALANCING OUT SENSING DIAPHRAGM BY MEANS OF STEM LENGTH ADJUSTMENT

PROCEDURE

Proper operation of a level pilot, without disturbance from static pressure changes, will be obtained only if the diaphragm large (sensing diaphragm) is operating at or near its mean position, i.e. halfway between its top and bottom limit stops. Balance of diaphragm is obtained by means of stem length adjustment described below.

Stem length adjustment is factory set and should not be disturbed, unless necessary during maintenance work. If the original adjustment must be changed, re-adjustment can be made as shown in the procedure pertaining to the particular level pilot.

Compress adjusting spring (29) to set diaphragm large (16) against its top limit stop. Adjusting spring must be compressed enough to overcome downward force of upper spring (3) and existing head pressure. Relieve liquid head (or purge pressure) from top side of diaphragm, if necessary. Supply 21 psig air pressure to the level pilot.



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

For LAP, LAPB, LAUP, LAUPB Level Pilots — Adjustable Proportional Band Types

Static pressure changes in a closed vessel (e.g. change in steam pressure but not level) should not affect pilot air output pressure. If they do, readjust adjusting pin as shown below until air output pressure is not affected by static pressure changes. Move adjusting pin in very small increments ($1/16''$ or less). Never turn pin indiscriminately either way to a point where pilot will not respond to level changes.

First move proportional band nut upward on adjusting pin threads sufficiently to keep nut from touching blade spring during balancing of diaphragms.

1. If an increase in static pressure causes an increase in air output pressure, screw adjusting pin toward diaphragm large and away from pilot body.
2. If an increase in static pressure causes a decrease in air output pressure, screw adjusting pin away from diaphragm large and toward pilot body.

After completing adjustment, readjust proportional band.

D. RE-ENGAGEMENT OF PROPORTIONAL BAND MECHANISM

1. Follow initial startup procedure described under "Operation" Page 7 or "Dry Run" testing procedure described on Page 8.
2. Engage proportional band mechanism in the following manner:
 - a. Supply 21 psig air pressure to the level pilot.
 - b. Remove all adjusting spring compression from the level pilot by backing off adjusting nut (33) completely. Control valve gauge should then show 21 psig.
 - c. Move nut (68) completely out of contact with blade spring (69).

- d. Turn knob (79) clockwise until sliders (73/78) are $13/16''$ apart. Make sure that nut (68) is not touching blade spring (69). Hold adjusting pin (67) steady and slowly turn nut (68) toward blade spring (69) until air output pressure falls from 21 psig to a value between 10 and 15 psig (approx. 12 psig). Proportional band mechanism will then be engaged.
- e. Turn knob (79) counterclockwise until sliders are between $1-1/32''$ and $1-1/16''$ apart. Proportional band mechanism adjustment to this setting will produce (approximately) a 20" band. Minor readjustment of knob (79) (either side of this point) will produce an exact 20" band, if such is necessary.

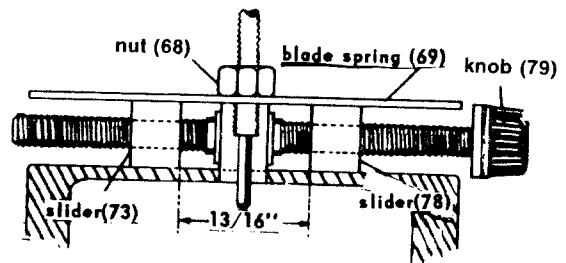


Fig. 25 — Position of sliders for nut/blade spring adjustment.

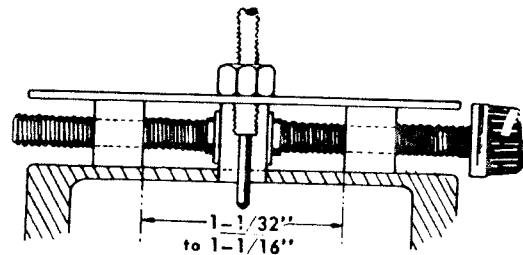


Fig. 26 — Position of sliders for an approximate 20" band setting.

- f. Checking proportional Band Response: — Compress adjusting spring (29) until air output is 3 psig. Vary level in vessel until air output pressure increases from 3 to 25 psig. Change in air output pressure should be obtained within the level changes listed in table.

Level Pilot Type	Level change required for 3 psig to 15 psig air output change	Maximum Variation
LAPB	20"	2"
LAUPB	25"	-1"



instructions for

LESLIE FLOATLESS LEVEL CONTROL PILOT

Types LAP, LAUP, LAPB, LAUPB

If, after making adjustments in "e", the level change required to produce a 3-15 psig air output change does not correspond to figures shown in table, and response closer to figures is necessary, readjust knob (79) in minor increments until exact band is obtained. To widen band turn knob clockwise; to narrow band turn band counterclockwise. Minimum band of 2" is obtained when knob is turned counterclockwise until nut (68) is out of contact with blade spring.

Note: If it ever should prove necessary, during maintenance work, to disassemble proportional band parts, be sure to reassemble blade spring with side marked "upward" toward the adjusting pin nut (68).



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