LEVELMATIC LIQUID LEVEL PILOT CONTROLLER

**Differential Pressure Sensing Type —
No Floats, No Linkages**

**Inexpensive to Install —
No More Than 2 Vessel Connections**

**Low Cost Operation —
No Wearing Parts**

**Stable, Reliable Control —
No Need for Continuous Adjustments**

THE INSTRUMENT FOR STABLE, ACCURATE LIQUID LEVEL CONTROL

Levelmatic responds instantly to changes in the differential pressure across the sensing diaphragm. The “frictionless”, low inertia, sensing method provides smooth modulation, stable accurate control and proportional response which is completely unaffected by surface turbulence, or vibration in the system equipment.

The Levelmatic floatless liquid level pilot controller is differential pressure sensing device that delivers a controlled pneumatic signal in response to a change in liquid level. The output air signal from the Levelmatic is applied to the control valve or other control element which adjusts the liquid flow into of the vessel to maintain the level within the proportional band.

LEVELMATICS ARE VERSATILE

Levelmatics are universally used to control level of most liquids–water, oil, gasoline, solvents, chemical solutions, acids, slurries and viscous fluids. The standard, basic Levelmatic unit is suitable for either open or closed vessels – including, boilers, feedwater heaters, evaporators, deaerators, hot wells, storage vessels, distillation columns, open or closed process vessels, etc.

They are used for control of either supply to the vessel or in unloading (or overflow) control of the vessel discharge line. Pilot controller action, (i.e., direct or reverse acting) can be changed by simply reversing the impulse connections.

By turning one single adjusting nut, the level set point can be fixed at any point over the instrument’s range, 0-36" W.C. 0-200" W.C., etc.

Levelmatics are also widely used as transmitters with other instrumentation – receiver controllers, characterized relays, alarm systems, etc.

HOW LEVELMATIC OPERATES

The Levelmatic Pilot Controller uses a fixed metering orifice to restrict the air supply. The output pressure is controlled by a simple, foolproof, nozzle and disc arrangement operated by the diaphragm-stem movement. The diaphragm-stem movement assembly is actuated by variations in head pressure as small as .1" W.C. which are directly related to the level deviation from the set point. Changing the leads permits optional direct or reverse action without any change in internal parts or mounting position.

LEVELMATIC LIQUID LEVEL PILOT CONTROLLER

HOW LEVELMATICS SAVE MONEY

Levelmatics use a single impulse connection to an open vessel, two connections to a closed vessel. Because only one or two small connections to the vessel are required. Levelmatics are fast, easy and economical to install. You can mount them in any convenient location – on the wall, on the control valve, on the vessel or at a remote point. They are also suitable for outdoor installations in most climates.

Maintenance costs are next to nothing! The simple, one-moving-part design leaves virtually nothing to get out of order. There are no pivots, pins or linkages; no torque tubes, or torque tube seals; no stuffing boxes, packed stems or float cages; no flapper nozzles; no thermo-hydraulic or electric probe sensing systems to adjust, wear, maintain or malfunction.

Levelmatics are available with a fixed proportional band, or adjustable proportional band.

PILOT CONTROLLER TYPE	MODE OF CONTROL	INSTALLATION		ADJUSTABLE LEVEL RANGE (inches W.C.)	MOUNTING POSITION	RESOLUTION SENSITIVITY INCHES W.C.	PROPOR. TIONAL BAND[2] (inches W.C.)	AVERAGE STROKING TIME (sec)		AIR CONSUMPTION SCFM
		TYPE OF VESSEL	PILOT ACTION					WITHOUT POSITIONER	WITH POSITIONS OR RELAY	
LA	Fixed Propor-tional Band	Open	Reverse	0 - 36	Upright Mount	.1	2	18 seconds Based on Average time to fully stroke a 1-1/2" Diaphragm Control Valve with a 35 Actuator, 3/4" Travel. (3-15 psi, Operating Range).	5 seconds Based on Average time to fully stroke a 1-1/2" Diaphragm Control Valve with a 35 Actuator, 3/4" Travel. (3-15 psi, Operating Range).	**Max. Consumption in steady state** 3 psi output pressure .31 SCFM 9psi output pressure .29 SCFM 15 psi output pressure .23 SCFM **Max. Average Lead Capacity** with signal change greater than Prop. band width & output change 3-15 psi. .29 SCFM **Max. Leading capacity –** fully stroked at 3 psi output. .32 SCFM
		Closed	Direct							
		Open	Direct	0 - 66						
		Closed	Reverse							
LAU		Open or Closed	Direct or Reverse	0 - 200		.35	7			
LAB		Open	Reverse	0 - 32	Inverted Mount	.1	2			
		Closed	Direct							
		Open	Direct	0 - 70						
		Closed	Reverse							
LAUB		Open or Closed	Direct or Closed	0 - 200		.35	7			
LAP	Adjust-able Propor-tional Band	Open	Reverse	0 - 40	Upright Mount	.1[1]	2-20			
		Closed	Direct							
		Open	Direct	0 - 75						
		Closed	Reverse							
LAUP		Open or Closed	Direct or Reverse	0 - 200		.35[1]	7-25			
LAPB		Open	Reverse	0 - 36	Inverted Mount	.1[1]	2-20			
		Closed	Direct							
		Open	Direct	0 - 76						
		Closed	Reverse							
LAUPB		Open or Closed	Direct or Reverse	0 - 200		.35[1]	7-25			

1. Minimum proportional band setting.
2. Maximum deviation from control point when slowly increasing flow through control valve from zero to rated capacity (3 - 15 psi operating range). Momentary deviation for maximum speed of response of fixed proportional band units is 200% of the band.

OPERATING SUPPLY PRESSURE - Fixed Band and Adjustable Band Types

For 3-15 psig output range 20 - 22 psig
For 6-30 psig output range 32 psig

ALLOWABLE STATIC PRESSURE ON DIAPHRAGM 0 psig to 300 psig.

LEVELMATIC LIQUID LEVEL PILOT CONTROLLER

FIXED PROPORTIONAL BAND TYPES

The basic Levelmatic pilot controller with fixed proportional band is suitable for a wide variety of level control applications. Most relatively stable, level control systems without significant system lags can be controlled by Type LA Pilot Controller with fixed proportional band.

The simple design incorporated a fixed metering orifice in series with a variable bleed orifice to control the operating air to a diaphragm control valve. Changes in differential pressure across the sensing diaphragm (proportional to changes in liquid level) produce stem motion, nozzle disc positioning and changes in the bleed rate through the nozzle. The changes in bleed rate result in changes in operating air to the control valve.

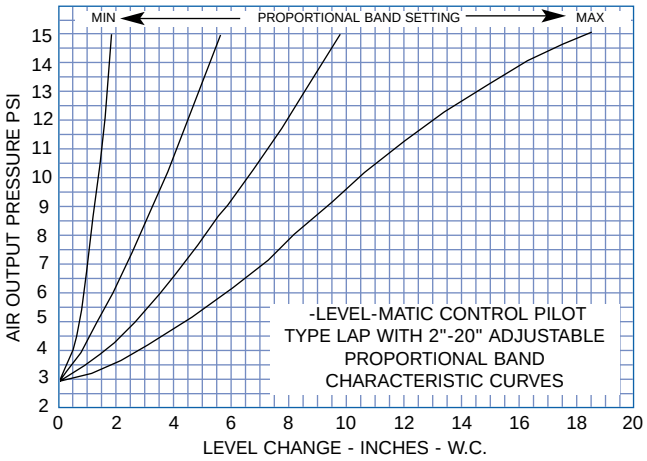
FIXED PROPORTIONAL BAND TYPES

Throttling type automatic level control systems operate on either a fixed or variable amount of change in controlled level. Since the control response or controller output is fundamentally proportional to the amount of change, the terms “throttling range” and proportional band’ are used here to refer to the amount of controlled variable level change required to provide sufficient controller output change to fully stroke the final control element.

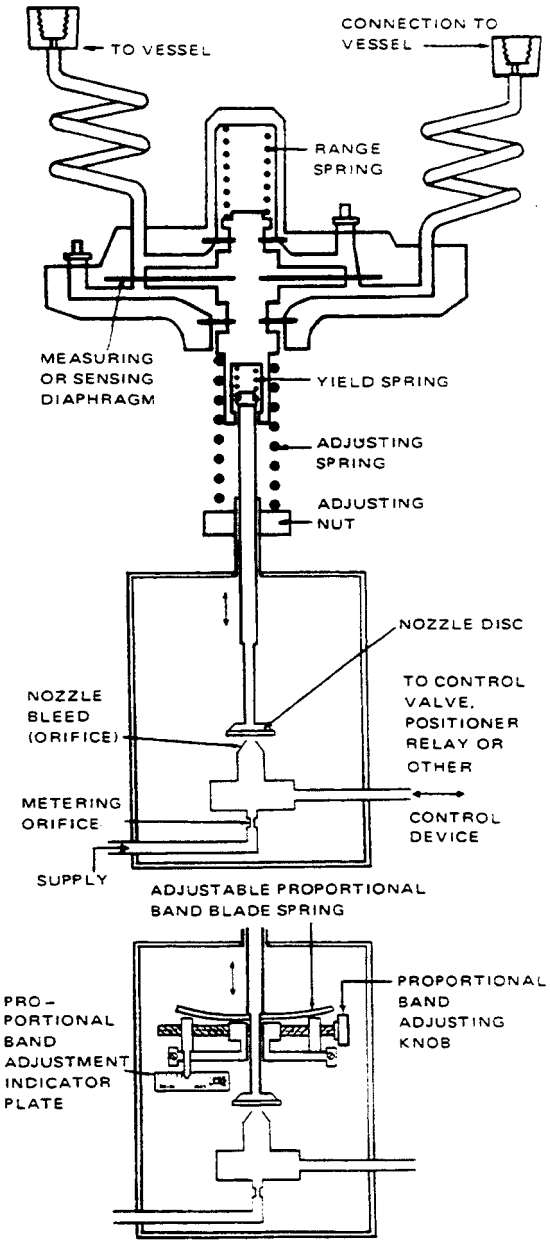
The Levelmatic pilot controller with adjustable proportional band provides for field adjustment of the pilot response characteristic by varying amount of valve stroke or travel per increment of controlled variable change to match the needs of the system and to achieve stability.

The Levelmatic pilot controller can therefore be used where the required band is unknown or does not coincide with any of the fixed band pilots available to the user.

Levelmatic PILOT CONTROLLER TYPE LAP WITH 2" - 20" W.C. ADJUSTABLE PROPORTIONAL BAND CHARACTERISTIC CURVES



SCHEMATIC VIEW OF TYPE LA Levelmatic PILOT CONTROLLER WITH ADJUSTABLE PROPORTIONAL BAND AND RESET SHOWN IN TOP VIEW, TYPE LAP SHOWN BELOW



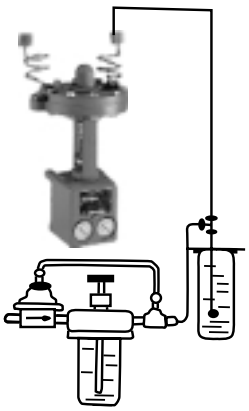
ADJUSTABLE PROPORTIONAL BAND MECHANISM

Adjustable proportional band, a means for providing added stability in sensitive systems, has been simplified in a single knob and indicator-type adjustment. Turning the knob clockwise widens the band, turning the knob counterclockwise narrows the band.

LEVELMATIC LIQUID LEVEL PILOT CONTROLLER

CONSTRUCTION FOR CORROSIVE SERVICES

Aluminum construction for wetted parts with a neoprene diaphragm is standard for general services. Teflon diaphragm facings are available at nominal cost for handling fluids where neoprene is unsuitable. Bronze, steel and stainless steel constructions are available for services compatible with these materials. Air, gas or liquid purges may be used for those services where direct head measurement is not permissible.



Exterior view Type LA. Diagrammatic sketch shows use of air purge set to protect diaphragm form highly corrosive fluids.

SPACE SAVER INVERTED MOUNTING

Where space will not permit the Levelmatic to be mounted with the sensing diaphragm at or below the liquid level an inverted mount is employed. Levelmatics equipped for inverted mounting are identified by a "B" in the type designation, i.e., LAPB, LAUPB, etc.

Levelmatic Type LAPB with space saver inverted mount

HOW TO ORDER LEVELMATICS

The following information is all that is required on orders for Levelmatics:

1. Service: Open or closed vessel.
2. Range of adjustment
   (See operating characteristics table.)
3. Minimum and maximum pressure on pilot diaphragm.
4. Operating air pressure available.
5. Distance between valve and pilot.
6. Accessories required: Airmate air filter-regulators; length of 5/16" O.D. copper tubing and compression fittings; purge sets, volume booster relays or characterized receiver controllers or relays.
7. Pilot connections, screwed (standard) or flanged for special applications.
8. Materials for corrosive service.
   If special materials for corrosive service are required, please submit details.

HOW TO SPECIFY LEVELMATIC

"Level Control" shall be of the floatless, differential diaphragm-stem assembly to control the bleed of a restricted air supply glands, plungers, torque tubes, or connecting linkages. It shall also have a simple adjusting means with sleeve and thrust bearing to permit easy change of the level set point. Adjustable proportional band units shall be equipped with a single knob adjustment for changing the proportional band.