

TYPE PDAP/PRAP CONSTANT PRESSURE CONTROL PILOT WITH ADJUSTABLE PROPORTIONAL BAND

Types PDAP and PRAP

Type PDAP and PRAP Pressure Pilots have been developed to meet the need for adjustable proportional bands in pressure control systems requiring a rugged controller that is not susceptible to wear, shock and minor system disturbances.

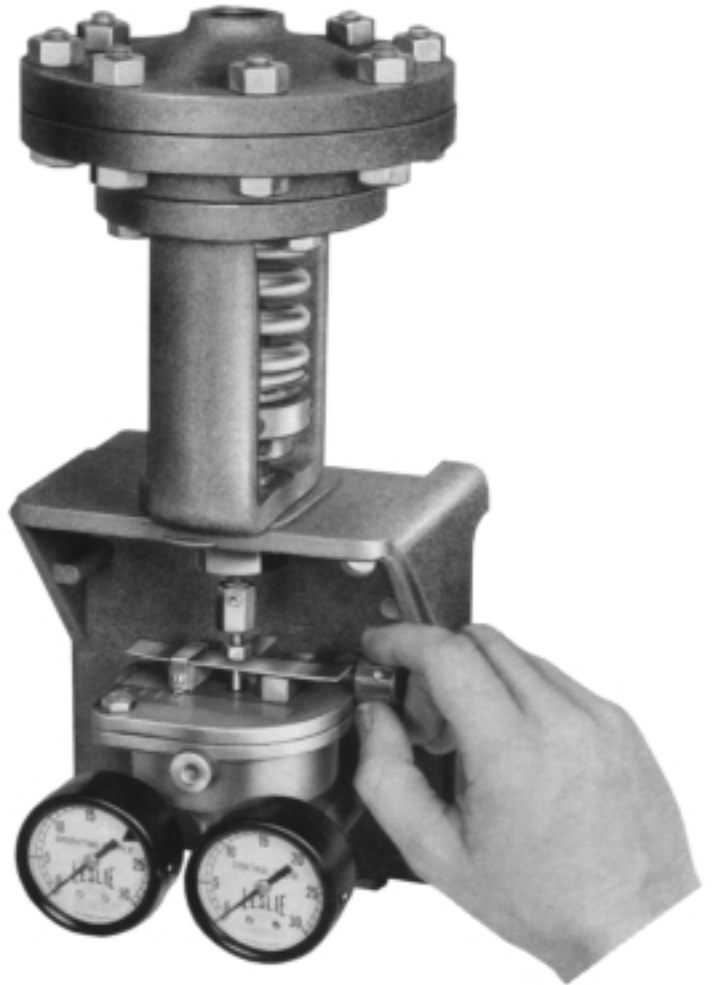
HOW IT OPERATES

Controlled pressure is applied to the top side of a spring opposed diaphragm. Variations in controlled pressure produce stem motion and nozzle disc positions which are proportionate to the pressure change. The nozzle disc position controls the bleed rate of operating air to atmosphere. Since a fixed metering orifice is used in the air supply and in series with the variable bleed orifice, the intermediate or output pressure is a function of the nozzle disc position. The pneumatic portion of the PRAP Pilot operates with a reverse acting nozzle valve to produce reverse action.

The amount of stem movement per psi of controlled pressure change (adjusting spring and blade spring) and upper diaphragm area. The diaphragm area and adjusting spring rate are fixed. The stem assembly is fitted with a blade spring which has an adjustable spring rate. The adjustment of the blade spring rate provides the means of manually setting the proportional band.

Pressure controlling stations having time lags in response to load changes because of system inertia, long distances between elements in the control loop, long impulse lines or other reasons, tend to cycle or are unstable.

Stable control is obtained in these installations by using a controller with proportional band which can be adjusted until stability is achieved. Types PDA or PRA Pressure Pilots or narrow proportional band controllers usually are unsuitable for this type of application.



PDAP and PRAP Pressure Pilots are also available for applications requiring valve positioners, volume boosting or other relays or receiver controllers with various modes of control. Both types may be used as controllers or transmitters.

TYPE PDAP/PRAP CONSTANT PRESSURE CONTROL PILOT WITH ADJUSTABLE PROPORTIONAL BAND

SPECIFICATIONS

| Adjustable Proportional Band: | | | | | | | | |
|-------------------------------|---|------|------|------|------------------|------|------|------|
| Set Point PSI | Approximate PSI Control Panel Change Required to Produce Change in Output Pressure from 3 PSI to 15 PSI | | | | | | | |
| | 5-70 PSI Range | | | | 50-800 PSI Range | | | |
| | Min. | Band | Max. | Band | Max. | Band | Max. | Band |
| | 5 | 70 | 5 | 70 | 50 | 800 | 50 | 800 |
| Air Supply Pressure PSIG | | | | | | | | |
| 17 | .5 | .9 | 4 | 5 | 6 | 8 | 20 | 27 |
| 20 | .4 | .75 | 4 | 5 | 5 | 8 | 17 | 26 |
| 30 | .3 | .6 | 3.5 | 4.5 | 3.8 | 7 | 14 | 24 |
| | Approximate PSI Control Point Change Required to Produce Change in Output Pressure from 3 PSI to 27 PSI | | | | | | | |
| 30 | .5 | 1 | 6 | 7.5 | 6.25 | 11 | 23 | 40 |

ADJUSTABLE RANGE

5 – 70 psi 50 – 800 psi

NORMAL AIR SUPPLY PRESSURE 20 psi

MAXIMUM AIR SUPPLY PRESSURE 30 psi

MAXIMUM ALLOWABLE PRESSURE ON DIAPHRAGM

5 – 70 psi range – 400 psi

50 – 800 psi range – 900 psi

MAXIMUM AIR CONSUMPTION

Supply Pressure PSI SCFM

17 .23 – .29

20 .25 – .32

30 .32 – .41

Valve Operating Speed – Average time in seconds required to provide full valve travel of a 1½" Class DL control valve with 35 Actuator (32.2 cu. in. displacement), with controlled pressure change equal to proportional band setting.

Without Positioner

18

With Positioner

5

Linearity – Since this Pilot incorporates a fixed orifice and a variable orifice, it produces an output pressure vs. measured pressure relationship similar to a conventional flapper-nozzle controller. This curve has a reasonably straight line (linear) center section and flattens out at both ends.