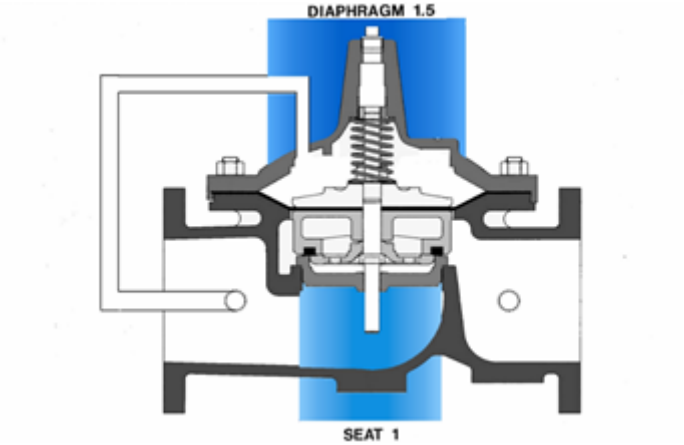
WATTS PRV

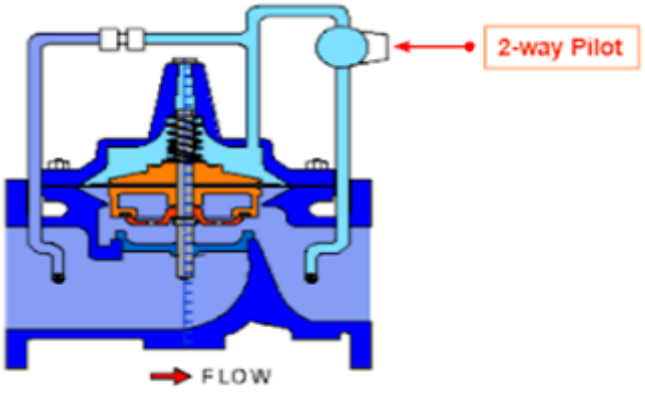
Overview

1. Theory



This PRV is hydraulically operated, this means it doesn't require any power supply to operate and relies on internal fluids to operate. The theory that drives the PRV is Pascal's principle, whereby fluid pressure is equal in all directions and that *Force = Pressure x Area* (F=P*A). The diaphragm to seat ratio of the valve is 1.5 : 1.

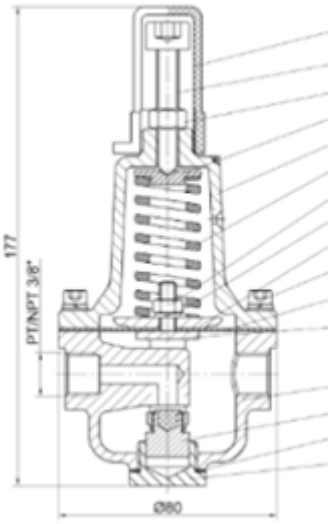
2. Operating Principle



The opening and closing of the main valve is controlled by a two-way pilot. The two-way pilot controls the amount of flow going into the top cover of the main valve. This allows us to control the amount of fluid in the top cover which pushes against the top diaphragm to control the opening of the main valve. A flow restrictor is required to avoid having a large volume of flow into the top cover and less flow going

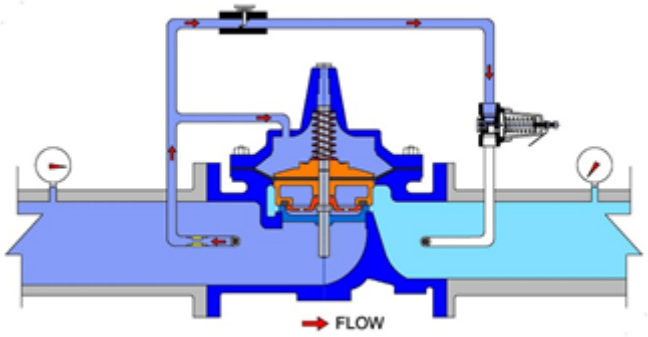
out of the valve. Usually the valve comes installed with a fixed orifice or a needle valve.

3. Pilot



The pressure of the downstream flow is regulated by adjusting this pilot. The flow through the pilot is adjusted by tightening or loosening the nut at the top. The nut is tightened when turned clockwise, the spring in the pilot is compressed, causing the pilot to open allowing more flow through; The nut is loosened when turned clockwise, the tension of the spring is decreased, causing the spring to relax, allowing the pilot to move towards closed position allowing less flow.

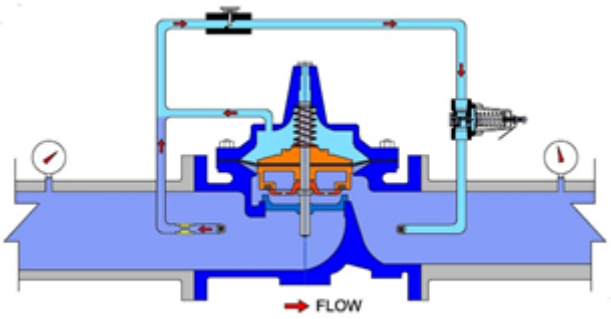
4. Closed Valve



This is when the main valve is fully closed. The nut of the pilot is fully loosened so the pilot would be in a closed state, allowing no flow through it. This causes max flow

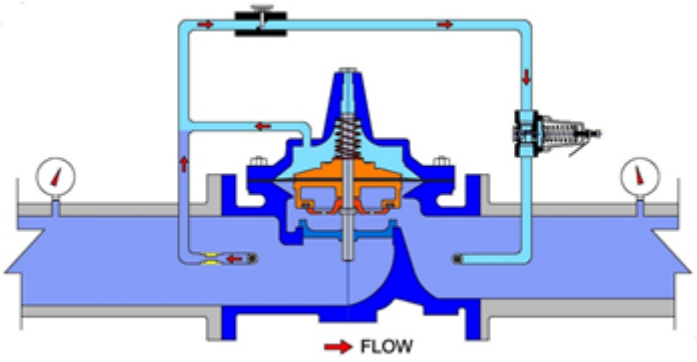
into the cover of the main valve. The pressure of the top part of the diaphragm is higher than that of the bottom part causing the main valve to fully close.

5. Low Flow Demand (Night)



At night, less people are using water, thus demand for the flow is low. This causes a pressure build-up at the downstream which will then be detected by the pilot, causing it to move towards its closed position allowing less flow through it. Which in turn will cause more flow into the cover of the main valve, making it move towards its closed position as well. Thus, this will enable the outlet flow of the main valve to decrease while still maintaining the set pressure.

6. High Flow Demand (Day)



During the day, there will be a high demand for water. This causes a pressure drop at the downstream which will then be sensed by the pilot causing its spring to compress, making it open more allowing more flow through it. Which in turn results in less fluid in the cover of the main valve making it open more as well. Thus, this increases the outlet flow while still maintaining the set pressure.