

Spring loaded section overview

Regulators

Function

Pressure regulators (reducers or controllers) control the outlet pressure over a range of varying inlet pressures and flows. Regulators are sometimes called “Forward Regulators” to limit confusion with Back Pressure Maintaining Valves.

Spring Loaded Regulators

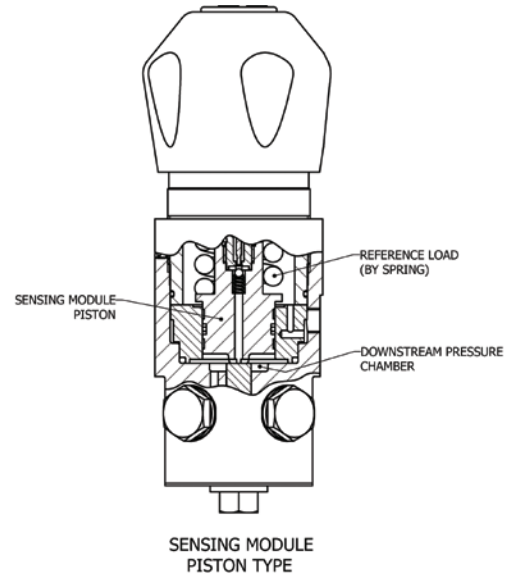
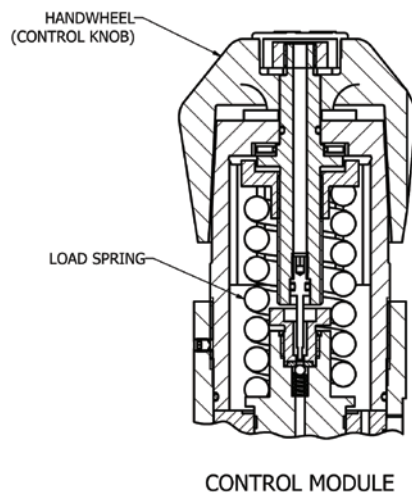
How does it work

We can divide the valve into three modules of construction.

- Control Module
- Sensing Module
- Metering Module

Control Module

With Spring Loaded Regulators the down stream pressure is set by increasing or decreasing the spring load via hand wheel (control knob).

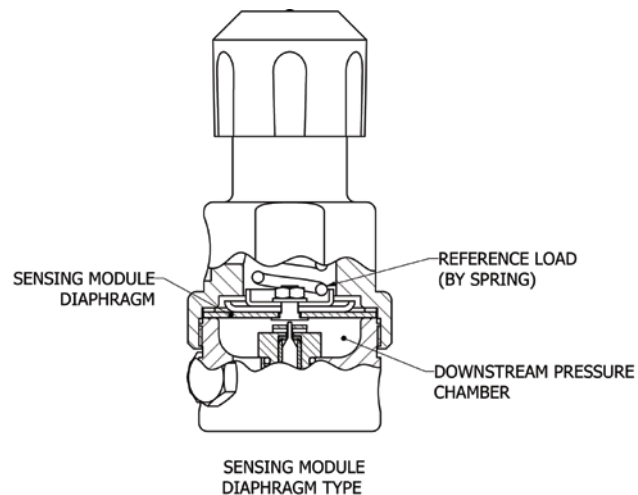


Sensing Module

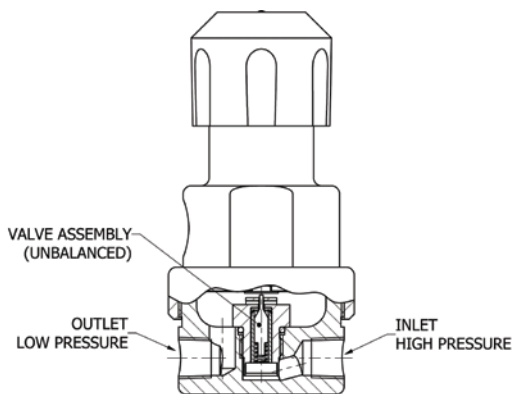
The sensing module compares the down stream pressure on one side of the module to the applied reference load on the other. By matching the forces generated on each face, it provides the mechanical link to open and close the valve. Thompson Valves use two approaches, they are

- Diaphragm–rubber (elastomer)
- Metal Piston–plastic, metal

Diaphragm sensing used in spring loaded regulators is used only for lower down stream pressures. Piston sensing is used only in high down stream pressure application.



IVP REGULATORS



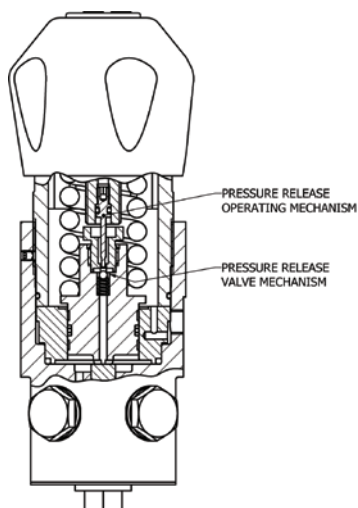
METERING MODULE

Metering Module

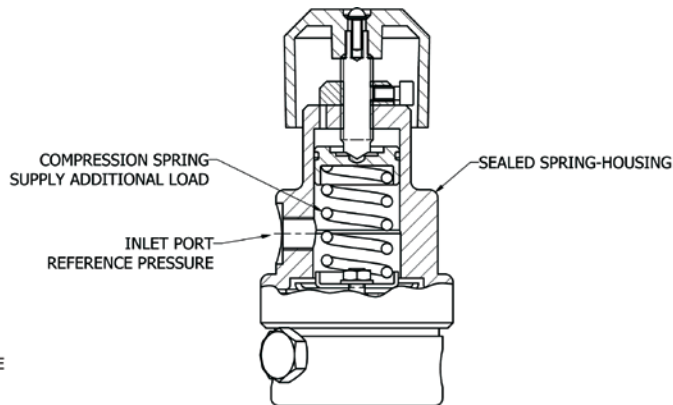
The “valve” or “poppet” controls the flow of high pressure upstream media into the low pressure (down stream) system. The valve may be balanced providing control, accuracy and repeatability under conditions of decaying up stream pressure or unbalanced which is used generally used on low pressure down stream systems requiring high flow. Unbalanced should not be used with high pressure systems where accurate control is required.

Pressure Release

The pressure release is an extra valve for venting the down stream pressure. If the outlet pressure increases above the set point, then the diaphragm or piston rises beyond the point where the main valve is closed. The release stem contacts the release valve pushing it off its seat or the main valves push rod breaks contact with the release seat. The released media is routed to a spill port. The release valve is not safety device.



PRESSURE RELEASE



DIFFERENTIAL REGULATOR

Differential Regulator

Differential regulators are available on some product types where the spring housing can be pressurised with a reference pressure. The spring load would therefore be additional to the constant pressure. The reference pressure can be supplied from the outlet or a separate source.

Back Pressure Maintaining Valves

Function

Back pressure maintaining valves regulate the inlet pressure and to keep this pressure at a constant. This means the valve will open to reduce excessive pressure in the line or close when the pressure drops below a pre-determined setting.

As with a regulator, the operating force can be supplied by a spring or by gas pressure. When the force provided by the inlet pressure acting on the operating area is greater than the operating force (spring or dome pressure), the valve opens allowing fluid to pass from inlet to outlet.