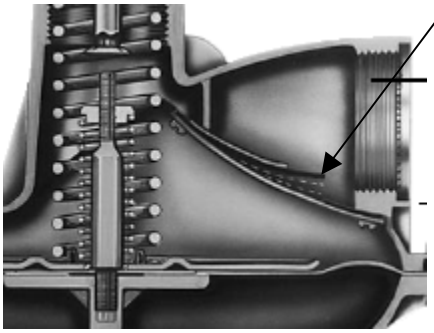
Technical Note

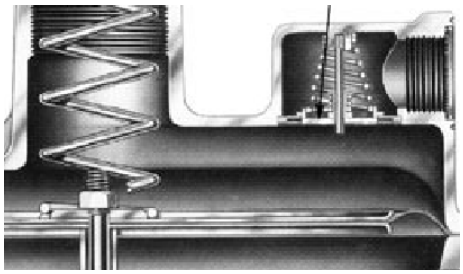
FOLLIN FLO ► CONTROLS
a division of BIG WAVE inc

Regulator vents and effects on fast on/off loads

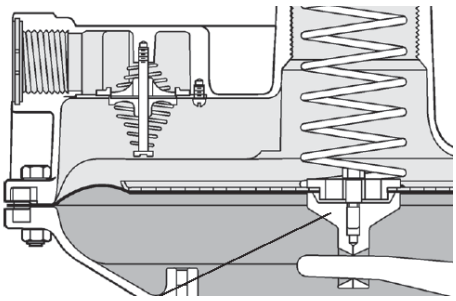
Vent design and vent piping can have a dramatic effect on regulator performance.
On ***fast on*** loads, the regulator diaphragm drops in conjunction with the drop in pressure in the downstream piping as the appliance turns on and consumes gas. As the diaphragm moves downward, air must move into the upper diaphragm case and is pulled through the vent. The vent is normally associated with the internal relief valve, but under normal operation the regulator breaths through the vent as the diaphragm moves up and down responding to pressure and flow fluctuations. Most regulators have a relatively large vent that is sized for the internal relief valve. Normal breathing however requires fairly little surface area so a flapper is employed to keep debris out of the regulator and provide a certain degree of dampening. If the vent flapper is completely removed the regulator may become unstable and pulsate. If the vent flapper is held in place (either by debris or ice) the regulator becomes sluggish and slow to respond. Each manufacture employs a slightly different design to permit the optimal combination of breathing, dampening and relief capacity.



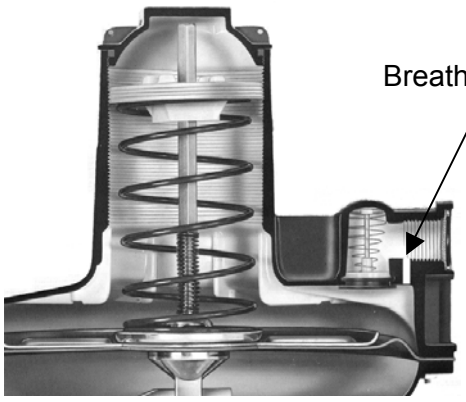
The American meter 1800 series employs a large square rubber flapper that is hinged on the top side and held in place with a relatively stiff wire clip. It has a large surface area for relief. Breathing-in during fast on operation is accomplished by air simply being drawn past the edges of the flapper.



The Sensus/Invensys/Equimeter/Rockwell 243 series uses a round 2 way vent valve, the flapper disc is held in place with a set of light springs and rides on a stainless steel shaft. The two way design permits fast response to rapid changing loads.



Fisher 200 series
The Fisher 200 series employs a round stabilizer vent with a set of opposing springs riding on a stainless steel shaft. This design permits bi-direction dampened breathing.



The Sprague/Schlumberger/Actaris B34 and B38 series uses a round plastic vent disc that is held in place with a conical vent spring and rides on a stainless steel shaft. 2 different vent springs (standard and extra heavy) are available to permit different degrees of dampening. On the 34 series (SR, R and IM) a #10 breathing hole is drilled through the vent into the upper diaphragm case (pictured to right). Inserts (#32, #44 and solid) permit this hole to be reduced for dampening effect. On the 38 series the breathing #10 hole is actually drilled in the vent disc. Both regulators also have a loading ring in the body of the regulator. The load ring can also be used to increase speed of response (for fast on loads) or reduce the sensitivity of the regulator (in the event of pulsations).