

USSA — Universal Safety Shutoff Assembly

Technical Bulletin



Universal Safety Shut-off Assembly

USSA is a new design of integral shutoff, created to fulfill the requirements of the North American & associated markets. It uses well proven principles to give exceptional consistency of operation and an unrivaled insensitivity to nuisance tripping in a low-cost unit designed for high-volume production. USSA allows the use of standard orifices in regulators to achieve optimum capacities.

Application

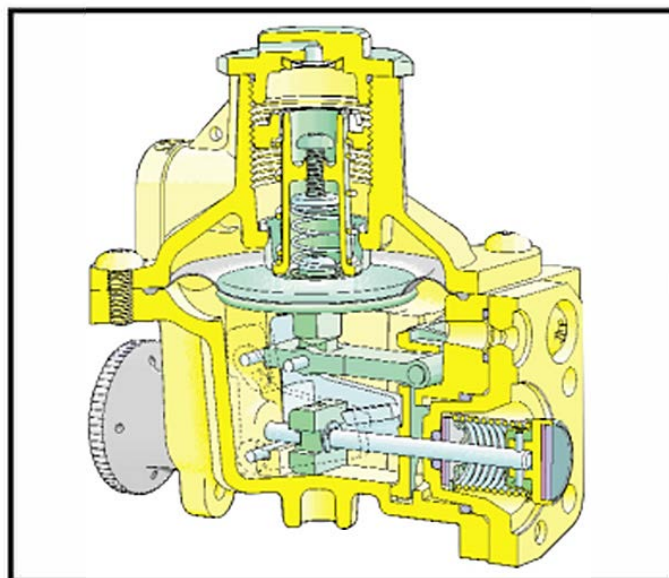
The USSA can be fitted to any group regulator with the appropriate connecting face (see connection requirements), with inlet pressures up to 125 PSIG. USSA is designed to meet the requirements of the standards in North America. The unit has the following performance features.

- **Diaphragm Burst Pressure** greater than 60 PSIG
- **Shutoff Pressure**
 - OPSS 7.5" W.C. - 7 PSIG
 - UPSS 3" W.C. - 60" W.C.
- **Repeatability**
 - OPSS within $\pm 5\%$
 - UPSS within $\pm 15\%$
- **Response Time** less than 1 second
- **Shock Insensitivity** Withstands dropping a weight of 5.5 lbs. from 3 in. 10 times without tripping, more than 3000 shut-off/reset cycle maintaining repeatability.
- **Visual trip indicator**
- **Tapped vent cover (optional)**
- **Bugshield fitted to vent (when machined)**
- **Sealing of setting and latching is available**
- **Temperature Range** -20° F to 140° F

Options

The USSA is available in three shut-off versions:

- **Over pressure only** OPSS
- **Under Pressure only** UPSS
- **Over and Under Pressure** OUPSS



Material Specification

Component	Material
Body and Top Cover	Aluminum
Diaphragm	Nitrile Rubber (Buna)
Valve Discs and "O" Rings	Nitrile
Latch Mechanism	Acetal Resin
Spindle	Stainless Steel

Material Specification

"W.C."	Part Number	Color Code
7.5 - 24	71403P020	Black
20 - 32	71403P021	Orange
24 - 44	71403P022	Red
40 - 84	71403P023	Dark Green
3 - 5 PSIG	71403P024	Yellow
4 - 7 PSIG	71403P025	White

OPSS Springs

"W.C."	Part Number	Color Code
3 - 6	71403P026	Light Blue
6 - 24	71403P027	Brown
24 - 60	71403P028	Purple

Operation

USSA is fitted to a service regulator (Series 1200B and 1800) and is designed to replace existing shutoffs. It senses the outlet pressure of the regulator through the sensing hole and, in the event of an over or under pressure condition, it operates to shutoff the inlet pressure at the inlet side of the regulator orifice.

At normal working pressures the internal mechanism is 'latched' as shown in figure 1. The lever (A) and latch (B) are engaged with the diaphragm in rest position touching the base of the opss spring holder (C). The valve and its spindle are held open by the latch holding the tripoff bushing (D) attached to the spindle.

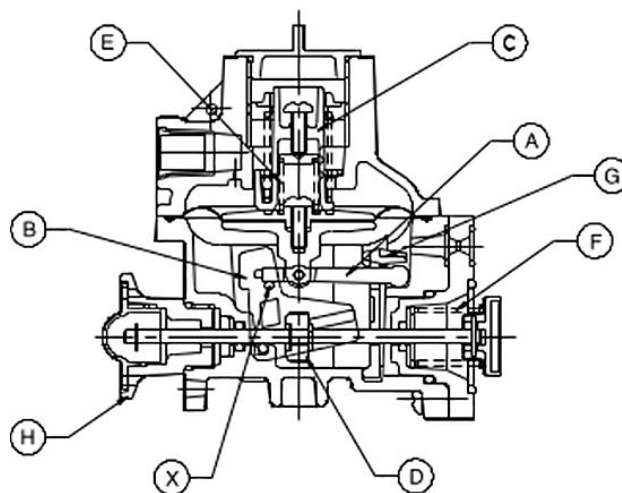


Figure 1 - Latched position

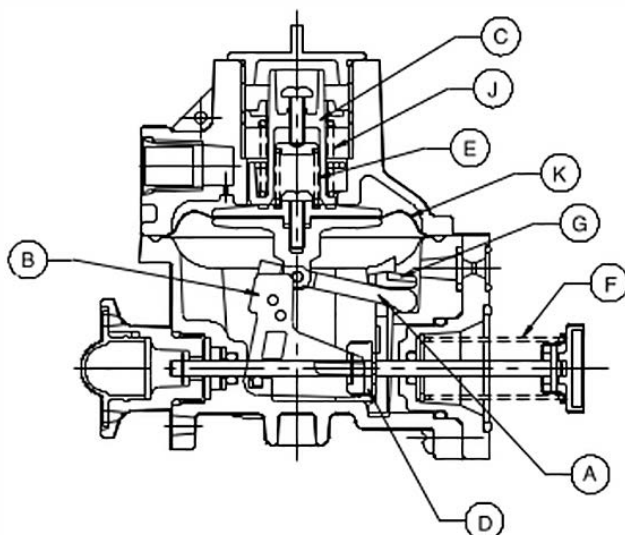


Figure 2 - Overpressure shut-off activated

Overpressure Shutoff

When the outlet pressure increases above about 90% of the overpressure set by the overpressure (opss) spring (J). The diaphragm (K) begins to move upwards against the opss spring and its holder (C). The underpressure (upss) spring (E) is inactive now. The moving diaphragm pulls the lever (A) upwards with it across the face of the latch (B). The lever is pivoted at its end, held by the lever retaining plate (G). If the outlet pressure reaches the trip pressure, the lever is pulled off the latch. The latch pivots under the action of the force provided by the valve actuating spring (F). This allows the tripoff bushing (D) on the spindle to disengage from the latch allowing the spindle to move and the valve to close onto the orifice (see figure 2).

Underpressure Shutoff

When the outlet pressure reduces to about 120% of the underpressure set by the underpressure (upss) spring (E), the diaphragm (K) moves downwards under the action of the smaller upss spring. The opss spring (J) is inactive as the opss spring holder (C) is held at the base of the turret. The diaphragm pulls the lever (A) downwards with it across the face of the latch (B). If the outlet pressure falls to the trip pressure, the lever is pulled off the latch. The latch pivots under the action of the force provided by the valve actuating spring (F). This allows the tripoff bushing (D) on the spindle to disengage from the latch allowing the spindle to move and the valve to close onto the orifice (see figure 3).

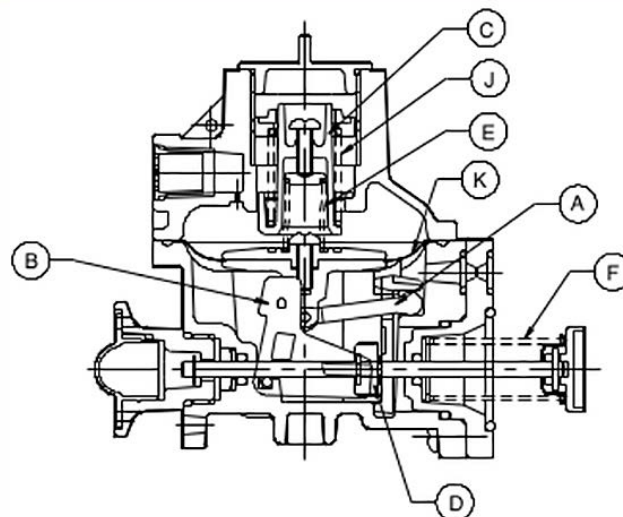


Figure 3 - Underpressure shut-off activated