GE Oil & Gas

Mooney* Flowgrid* Slam Shut Regulator

Delivering accuracy, performance and protection

imagination at work

Industries

- Gas transmission
- Gas distribution
- Midstream gas
- Gas processing

Applications

- Gas pipelines
- High occupancy buildings
- City gate stations
- Point of receipt

Customer Benefits

- Easy maintenance with top entry design
- High accuracy and performance
- Over- or under-pressure protection
- Resistant to sticking caused by freezing or debris
- Durable, with only one wear component
- Integration with Flowgrid regulators or can stand alone
- Quick response time; fewer than 0.25 seconds
- Globally recognized; obtained EN 14382 certification from DVGW
- Latch mechanism eliminates false trips

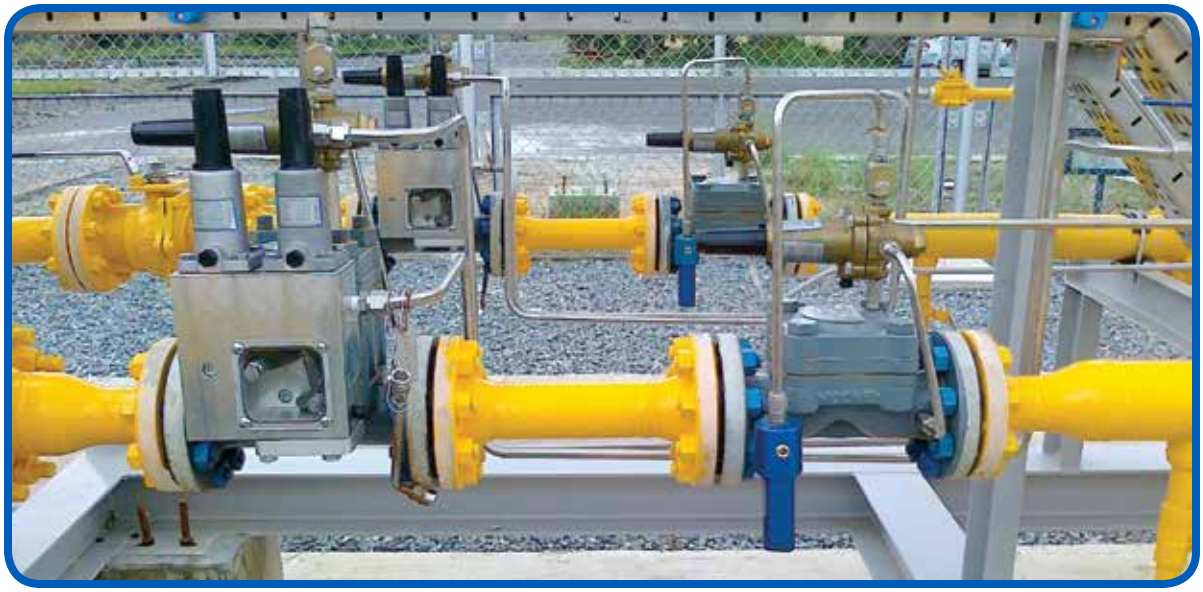
Meeting your needs for downstream pressure protection

GE Oil & Gas has drawn upon our leading product technology and application expertise to develop the Mooney Flowgrid Slam Shut regulator. The Slam Shut regulator provides accurate, reliable secondary downstream pressure protection by shutting off the flow of gas when the sense or outlet pressure in the system either exceeds or drops below the set pressure point. The device can stand alone or be integrated with a Mooney Flowgrid regulator.

With the Mooney Flowgrid Slam Shut regulator, you get even more than a quality engineered product. The Slam Shut regulator is backed by dependable technical support from GE and a free training video that covers principle of operation, installation, maintenance and troubleshooting, as well as a 3-D model library. Please contact your local representative for more information.

Because GE has an unflagging commitment to quality and safety, we have secured global PED EN 14382 certification for the Slam Shut regulator for sizes 2-4 inch. The certification was awarded by DVGW (the German Technical and Scientific Association for Gas and Water), one of the world's most recognized industry certification bodies and the largest gas and water industry certification agency in Europe. For more information about other certifications contact your local representative.

The Flowgrid Slam Shut regulator has earned the trust of our customers around the world. This advanced technology provides the reliability and security that is necessary for success in this industry. Because the product's top entry design allows for easy maintenance, users can be more productive, which lowers overall costs and yields sustainable energy savings.



1-inch Flowgrid Slam Shut regulator

The 1-inch Slam Shut is a safety shutoff regulator that closes with a linearly acting plug. The device has bubble-tight shutoff under all rated conditions and requires no minimum differential for full shutoff. Set points are adjustable and repeatable regardless of flow rate, inlet pressure, and temperature variations.

Features

- Easy to maintain; only two bolts required to remove the entire Slam Shut assembly
- Resistant to sticking caused by freezing water or debris in pipeline
- Well-contained moving mechanical parts, which are resistant to vibration effects
- Excellent performance and accuracy across a large pressure range by changing only the spring
- External visual indicator to show when the unit is tripped
- Easy to reset; only three caps need to be removed for complete reset
- High cycle applications; only one wear component
- No pressure differential requirements for full shutoff

Figure 1 - One inch Mooney Flowgrid Slam Shut

Figure 2 - Two inch Mooney Flowgrid Slam Shut regulator with over or under pressure protection.

2-inch to 4-inch Flowgrid Slam Shut regulator

The controller assembly for the Slam Shut can be supplied with either over- or under-pressure shutoff protection in three basic interchangeable configurations:

1. Series 50 single function controller (Figure 2), which provides either over- or under-pressure shutoff protection.
2. Series 50D dual function controller (Figure 3), where each function provides either over- or under-pressure shutoff protection and both functions are controlled by a common sense port
3. Series 50DS dual function controller (Figure 3 and 4), where each function is controlled by an independent sense port. This allows two independent locations to be monitored for an over- or under-pressure condition, each with its own set point.

A stand alone Slam Shut consists of a Flowgrid body with valve module and cover mounted on top. The pressure controller is mounted on the side of the valve module.

Features

- Virtually eliminates nuisance trips caused by vibration and sense pressure variation
- Retrofitable to existing 2-inch to 4-inch Flowgrid regulators
- Pneumatically actuated latch mechanism
- Bubble-tight shutoff with floating flapper design
- Over- or under-pressure protection, or both
- Water tight for below-grade vault installations
- Stand alone or integrated into a Flowgrid regulator
- Simple reset from front or back without removing covers
- Easy maintenance with a top entry design
- High accuracy
- Proximity Switch signals the open/closed position of the valve for remote indication (optional feature)

Figure 3 - Two inch Mooney Flowgrid Slam Shut regulator with over and/or under pressure protection. A second sense port is optional.

Figure 4 - Four inch Mooney Flowgrid Slam Shut regulator with over and/or under pressure protection. A second sense port is optional.

Table 1 - Specifications

	Imperial	Metric
Sizes	1-inch NPT & SWE 1.25-inch NPT & SWE 2-inch, 3-inch, 4-inch	DN 25, DN 32, DN 50, DN 80, DN 100
Types	Stand alone or integrated into Flowgrid regulator	
Pressure Protection	Standard: Over Optional: Over and/or under	
Temperature[1]	-20°F to 150°F	-29°C to 65°C
Maximum Operating Inlet Pressure	740 psig	50 bar
Operating Sense Pressure **1-inch** **2-4 inch**	 5 to 450 psig 10 psig to 50 psig	 0.35 bar to 31 bar 0.69 bar to 31 bar
Response Time	<0 .25 seconds	

[1] EN14382 restricts the minimum temperature to -4° F (-20° C).

Principle of Operation for 1-inch Slam Shut

This valve has four critical elements:

1. Closing Element
2. Force Reduction Element
3. Tripping Element
4. Sensing Element

The sensing diaphragm will move the trip shaft when the line pressure goes too high or too low. At that point, the trip shaft will disengage the force reduction element, which allows the rotating shaft to rotate and the spring to push the plug to the seat, causing full shutoff.

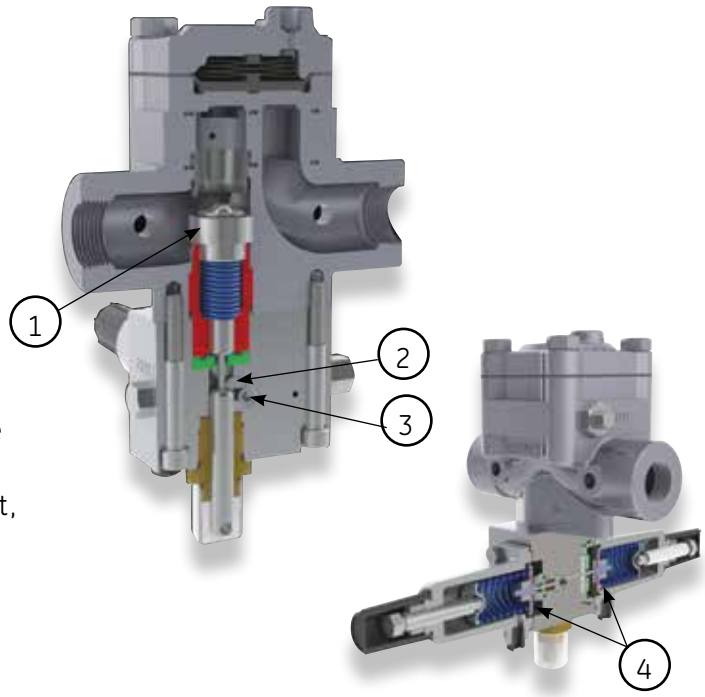


Table 2 - Set Point Ranges for 1-inch Slam Shut

Spring Color	Spring Range		Accuracy (% of Set Point)[2]	
	psig	Bar	Over Pressure	Under Pressure
Red	5 - 10	0.35 - 0.7	10	2.5
Plated	10 - 40	0.7 - 3	5	2.5
Blue	40 - 90	3 - 6	2.5	2.5
Purple	90 - 175	6 - 12	2.5	1.0
Black	175 - 250	12 - 17	2.5	1.0
White/Green	250 - 450	17 - 31	2.5	1.0

[2] Preliminary AG Data, Testing per EN 14382

Table 3 - Set Point Ranges for 2-4 inch Slam Shut

Spring Color	Spring Range		Accuracy (% of Set Point)[2]	
	psig	Bar	Over Pressure	Under Pressure
Plated	10 – 40	0.7 – 3	5	5
Blue	40 - 90	3 – 6	2.5	2.5
Purple	90 - 175	6 – 12	2.5	2.5
Black	175 - 250	12 – 17	2.5	2.5
White/Green	250 -450	17 – 31	2.5	2.5

[2] Preliminary AG Data, Testing per EN 14382

Principle of Operation for 2-4 inch Slam Shut

During normal operation the latch mechanism holds the closure element (flapper) open as shown in Figure 5. The sense or downstream pressure is monitored by the over-pressure and under-pressure controller diaphragms, which convert the sense pressure into a force proportional to the pressure. The force is counter-balanced by the set point adjustment spring located in the spring case. The adjusting screw is used to vary the spring force and control the over-pressure set point or the optional under-pressure set point.

When the downstream pressure either exceeds or is less than the pressure set point, the controller diaphragm and spring move, opening a valve. The open valve allows inlet pressure to flow to the actuator diaphragm, (see Figure 6). The pressure acts on the diaphragm, which pushes on the pin. The pin moves the "L"-shaped pawl lever and releases the flapper lever. When the flapper lever is released, a set of springs pushes the flapper valve closed and provides the initial force to seal the valve.

Once the flapper valve closes the inlet pressure is cut off as shown in Figure 7. To return the system to operation the technician closes the upstream and downstream block valves to isolate the system and bleeds off the isolated section. Repairs are then made as required to correct the cause of the over- or under-pressure condition. A ½-inch (13 mm) hex on the back side of the valve and front of the controller allows Slam Shut to be reset without removing covers. The Slam Shut is reset by rotating the flapper valve open and holding it momentarily while the actuation pressure bleeds off and the latch engages.

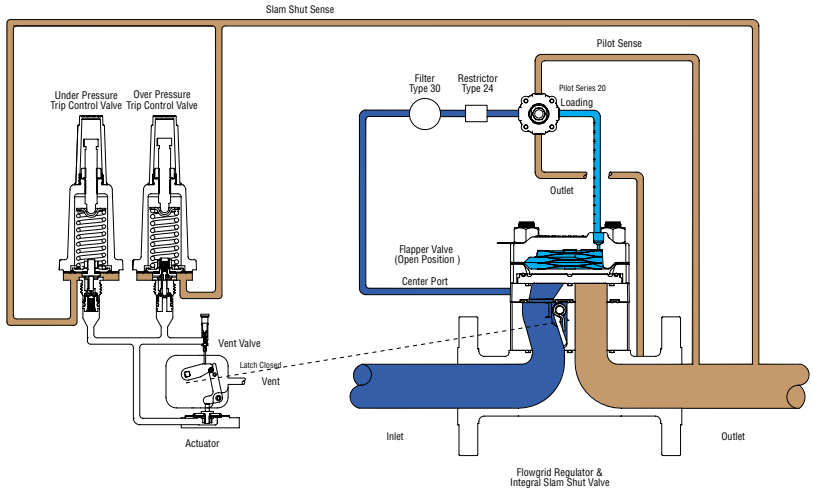


Figure 5 – Valve, Actuator & Latch Mechanism Open

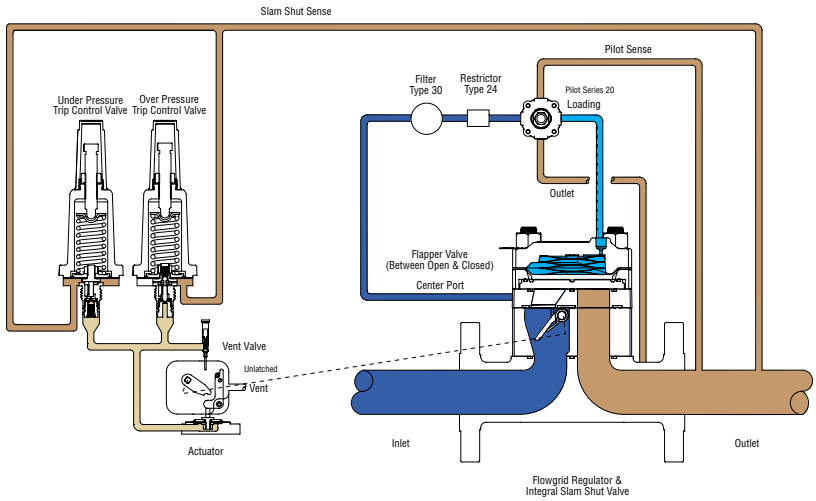


Figure 6 – Valve, Actuator & Latch Mechanism Midway

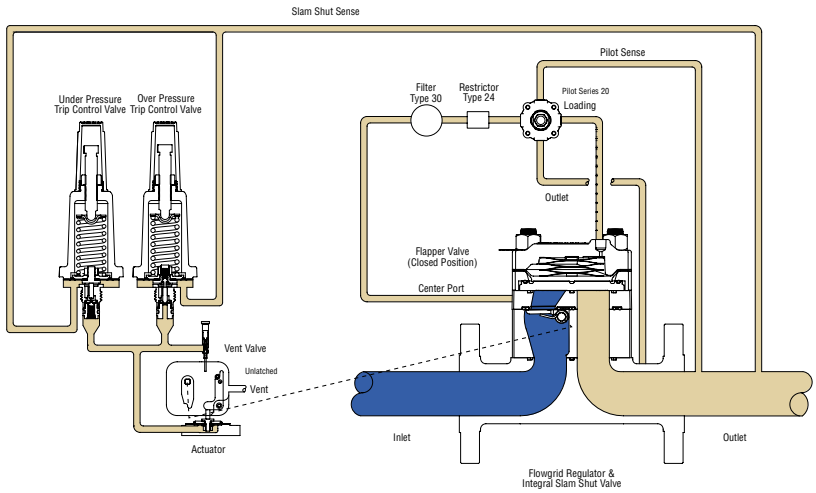


Figure 7 – Valve, Actuator & Latch Mechanism Closed

GE Oil & Gas
2822 S. 1030 West
Salt Lake City, UT 84119
T: +1 801.487.2225
F: +1 801.487.2587

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