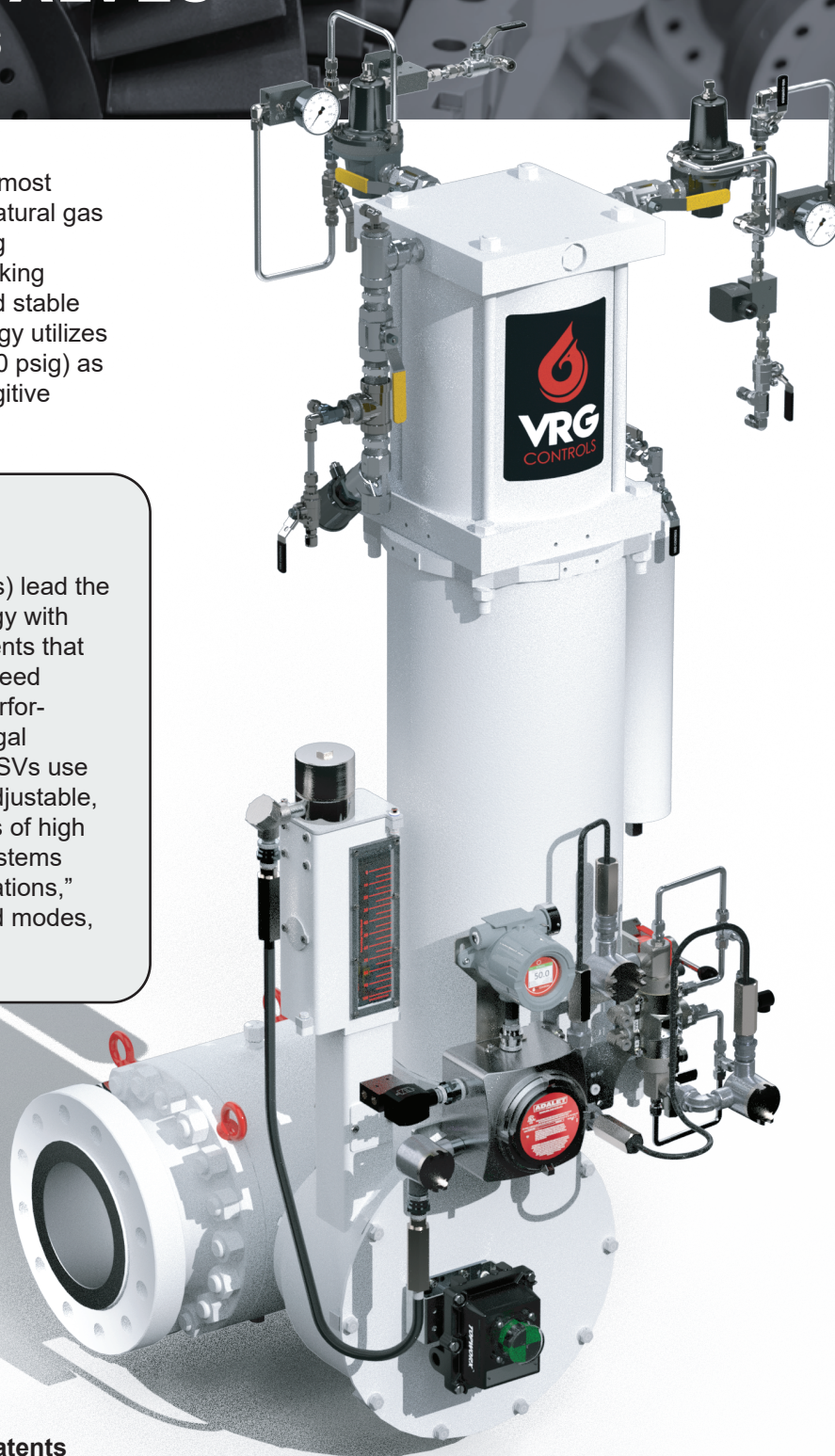


HIGH PERFORMANCE ANTI-SURGE VALVES FOR GAS PIPELINES

VRG Controls announces the industry's most advanced anti-surge valves (ASVs) for natural gas pipelines. Our dual-mode, patent-pending anti-surge valve, provides ultra-rapid stroking speed in tandem with highly accurate and stable positioning. In addition, the new technology utilizes increased pressure natural gas (up to 150 psig) as its pneumatic power and exhibits zero fugitive emissions in steady state

NEXT GENERATION

Our Red Circle Valve Controllers (RCVCs) lead the industry in emissions-reduction technology with performance and operational advancements that stand apart from the competition and exceed industry standards with regard to ASV performance criteria, as set by leading centrifugal compressor manufacturers. Traditional ASVs use a single-mode system consisting of an adjustable, electro-pneumatic positioner and a series of high capacity, quick exhaust valves. These systems achieve fast stroking times in "surge situations," but sacrifice precision during lower speed modes, like recycle and start-up



PATENT: www.vrgcontrols.com/our-patents

VRG Controls Red Circle Valve Controllers offer:

- ✓ Anti-surge protection with highly accurate control
- ✓ Minimal ASV valve overshoot
- ✓ Extremely fast response—less than 500 milliseconds
- ✓ Zero steady-state emissions control instrumentation
- ✓ Potential cost savings, due to less energy use
- ✓ Less system maintenance and lower down time



At VRG Controls, we understand that control valve performance is critical to reducing down-time and protecting the compressors from damage due to surge. So we developed the next generation in ASV technology that meets customer requirements for precision during all modes of operation. Our dual-mode instrumentation opens the anti-surge valve in less than 500 milliseconds, while providing stable and accurate valve positioning with minimal overshoot during recycle mode or compressor start up. In the VRG Controls system, the control loop utilizes a digital positioner (RCVC) with a programmable surge-mode feature that activates a high-capacity solenoid to engage rapid valve response during compressor surge.

ENHANCED EFFICIENCIES

Our anti-surge valves are unique in that they use natural gas, rather than compressed air, to drive the control valve actuator. Compressed air (plant air) is typically limited to 90 psi. By comparison, natural gas supply pressures use elevated pressures of 150 psig, or greater, allowing for the use of small actuator sizes. Actuators that use compressed air fail prematurely, due to degradation of the internal actuator seals—because compressed air media dries out the actuator seals, causing failure. This problem is also overcome by using natural gas for the actuator supply. As a result, the ASVs from VRG Controls minimize seal failure rates, eliminate air compressors and associated energy waste, reduce maintenance, and provide operators with a means to manage expenses.

ASV Valve Performance: Acceptable Positioning at Maximum Recovery Time

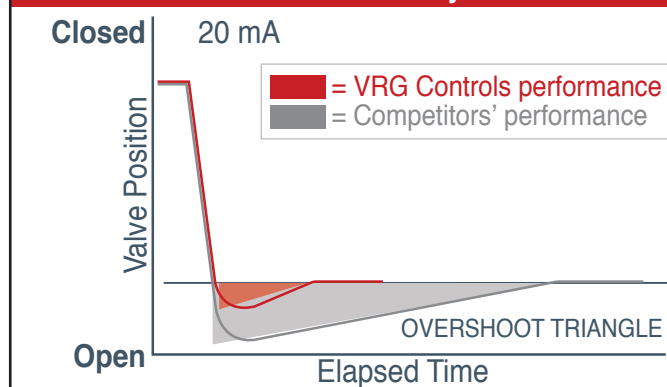


Figure 1.0 – VRG Controls ASV Control System Provides Reduced “Overshoot Triangle”

VRG Controls Diagnostic Test Results – 8.0 in ASV

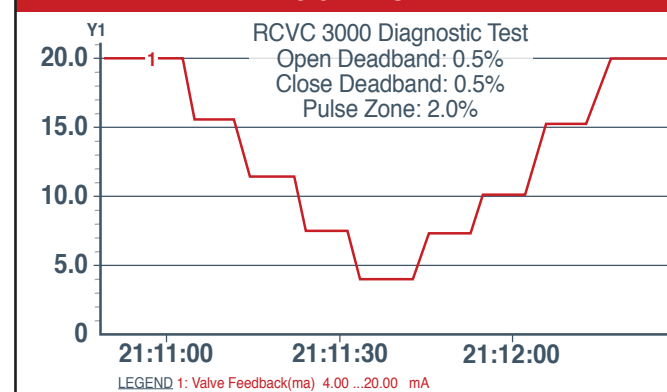


Figure 2.0 – VRG Controls ASV Control System Ensures Accurate Positioning



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