GAS CONTROL NEWS

QUALITY – RELIABILITY – SAFETY SEMICON WEST 2005 EDITION

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LOTO Finally Meets ½ Inch Valves

The AP 3900 is our latest safety innovation. It combines a pull then twist to open operational safety feature with an integrated Lock Out / Tag Out (LOTO) capability to the AP 3800 series valve. The AP 3900 is a blend of the field proven AP 3800 series with the AP 3657 style actuating mechanism. This new valve eliminates the need for clumsy clamshell locking devices traditionally used with such bulk valves. It has no loose parts or special tools required as the locking mechanism is fully integrated into the valve itself.

To open the AP 3900 from the fully closed position, the knob must first be pulled upward away from the valve body. Once lifted, the knob can only then be rotated to the open position. This feature provides operational safety in that the valve cannot be bumped or opened inadvertently. One must think, and then act lifting the knob, to open the valve.

The pull then twist to open feature enables the integrated LOTO feature because the knob drops into a slot in the fully closed position. A hub in the center of the knob accepts a lock hasp. The hasp can only be installed with the valve in the closed position. Once in place, the hasp prevents one from pulling the knob upward effectively locking the valve closed. The hub swivels to enable locking access in most all installations.

The AP 3900 is an industry first, as it is the only ½ inch diaphragm valve that doesn't require extraneous parts for a locking mechanism. ❖

BSGS Hot Topic

The current trend towards bulk delivery of specialty gases coupled with the voracious appetite of 300 mm tools for chemicals are creating new frontiers in specialty gas flow demands. Flow rates today at both source and point of use far exceed those of the not so distant past and they are ever increasing. The flow demands are pushing technology and presenting new hurdles to overcome.

Bulk specialty gas systems, BSGS, are challenged with significant cooling effects due to the pressure drop in the system as the gas steps down from source pressure to a lower operating pressure combined with high flow rates. Component selection and system design are the keys to success. AP Tech has created some useful tools to assist in meeting the challenges.

Technical Bulletin #208 is a recommendation guide for BSGS component selection. It provides for various gases, suggested regulators and valves for both source and point of use applications that typically will work up to the indicated flow rate. In addition, the need for heating or two stage pressure reduction are also noted.

Product Note #407 is an overview of the cooling effect and how to apply heat to counter it for BSGS. How much heat and where to apply are common questions which are both addressed in the document.

Product Note #403 explains specific issues related to supply pressure effect in BSGS. High flow regulators often have a supply pressure effect of several psi which must be accounted for in high pressure BSGS with varying source pressure.

These documents are available soft copy online and in hard copy upon request. To access directly online, the path is http://www.aptech-online.com/techbriefs.asp or you can simply click on the Tech Brief button on the AP Tech tool bar. ❖

New Highs for AP 1200

The venerable AP 1200 series pressure regulator has new options for high pressure inlet rating and delivery. The HR option brings the supply pressure rating to a full 3,000 psig (207 bar) from the standard rating of 1,700 psig (117 bar). The outlet pressure is available to 250 psig (17 bar) with the AP 1225. This regulator is preset at the factory to 250 psig (17 bar) delivery at 800 psig (55 bar) inlet pressure. Preset means the regulator doesn't have an adjustment knob but may be adjusted using wrenches by a qualified person.

The HR option addresses the need for high inlet pressure such as bulk H2 delivery. The AP 1225 option is the perfect choice for the upstream regulator of a two stage delivery system (two regulators in series) such as is often required for bulk delivery of liquefied gases like HCl and N2O.

An AP 1225 with the HR option is also available. It must be noted though, that due to the supply pressure effect of 3.5 psig (0.23 bar) per 100 psig (7 bar) source pressure drop, the maximum outlet pressure is 175 psig (12 bar) at 3,000 psig (207 bar) inlet pressure. The 250 psig (17 bar) outlet pressure is set at 800 psig (55 bar) inlet, even with the HR option. ❖

Manual Vacuum Module

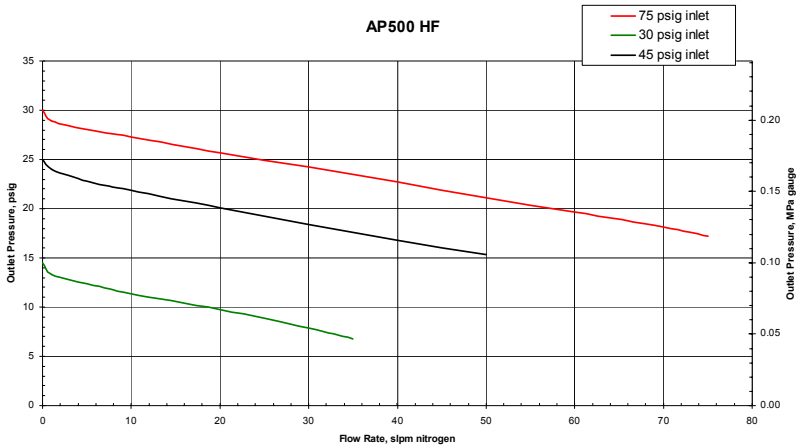
The AP 72 is a new bigger brother to the AP 71. It, too, combines the functions of check valve, N2 shut off valve and vacuum venturi into one compact module. The AP 72 was created to meet the need for a compact manual vacuum venturi for applications without pneumatics or controls, such as manual VMB's (valve manifold box) and manual purge manifolds. The AP 72 incorporates a standard AP 3 series ¼ inch diaphragm valve in a custom body that also houses a vacuum venturi and check valve. It is available with a variety of actuators, manual and pneumatic, just like any AP 3 series valve.

By comparison the AP 71 is smaller than the AP 72. The AP 71 is limited to only pneumatic actuation and has O-ring seals to atmosphere, whereas the AP 72 is available with manual or pneumatic actuation and has all metal to metal seals to atmosphere.

A full range of constant bleed options, porting configurations and actuating mechanisms enable the AP 72 to be tailored to most individual needs. ❖

Mini Absolute and High Flow

The AP 500 mini regulator has two newly released options, high flow and absolute. The HF designator increases the regulator flow capacity from 15 slpm to 50 slpm. As with other series, the HF entails a slightly larger orifice and poppet angle to achieve the higher flow capacity. This coupled with some other subtle enhancements enable the whopping 50 slpm delivery from this tiny, mini regulator.



An absolute version now allows sub-atmospheric gas delivery from 100 mm Hg absolute to 10 psig (0.7 bar). A bias spring is employed to counter the effects of downstream vacuum on the diaphragm, enabling pressure control to vacuum. This option is designated with an "A" after the material / finish designators in the part number. ❖

Two Stage Hi PSI / Hi Flow

The AP 2700 series is a newly released high flow two stage pressure regulator. The AP 2700 is comprised of an AP 1900 HF first stage and an AP 1400T series second stage built into a common body. It is intended for mid flow capacity BSGS delivery of non-liquefied compressed gases such as NF3, H2 and SiH4. The two stage design eliminates supply pressure effect which is the rise in outlet pressure as the source pressure decays. In high flow single stage regulators this effect can be up to 3.5 psi (0.23 bar) or more per 100 psi (7 bar) drop in source pressure. This equates to a 35 psi (2.3 bar) increase for a 1,000 psi (70 bar) drop in supply pressure.

The AP 2700 can deliver up to 150 slpm of NF3, 900 slpm of H2 and 250 slpm of N2.

The AP 2700 also helps mitigate the heat build up due to adiabatic compression. The first stage is open, set to 200 psig (14 bar) upon pressurization. The heating effect due to compression (pressurizing to cylinder pressure) concentrates at the point where flow stops. At the second stage inlet, compression is from initial pressure to 200 psig. At the first stage inlet, the gas from initial pressure to 200 psig is actually cooled due to expansion across the cylinder valve and the compression is then from 200 psig to full cylinder pressure. This is an important feature for NF3 where the combination of a strong oxidizer, low ignition temperature seat materials and high temperatures from adiabatic compression can lead to fires.

Please refer to Product Note PN 409 on our web site in the Tech Brief section for further explanation of two stage benefits and cautionary notes. The product note can be directly accessed http://www.aptech-online.com/techbriefs.asp or found by clicking the Tech Brief button on the AP Tech tool bar. ❖