

APTech

GAS CONTROL NEWS

QUALITY – RELIABILITY – SAFETY

SUMMER 2010

IN THIS ISSUE:

AZ 9200.	2
Regulator Seat ... Abrasion	2

Two Step Valve, Something to Dance About

A new series of valves provide dual mode, two step actuation – metered flow and full open. The new AP 3571 and 4571 series combine an adjustable metered flow from 10 to 350* slpm at 80 psig of N₂ with full flow capacity, Cv, of the valve. Two separate actuation ports enable one to actuate the valve to either metered or full open condition. Selecting full open port overrides the metered port, always taking the valve wide open. The normally closed (NC) valves are rated to 125 psig (8.6 bar) operating pressure and have Cv's of 0.29 and 0.5 respectively. Metered flow rate is preset at the factory and is also user adjustable (protective cap hides adjustment point).

The AP 3571 and 4571 should be considered 'soft start' valves, enabling one to begin flow at a lesser, metered rate prior to full flow. A common application is vacuum chamber venting (pressurization), where rapid pressurization causes particle disturbing turbulence. Utilizing a low flow for initial pressurization minimizes turbulence. The new series replaces the common practice of two valves in parallel, one with restrictive orifice for

metered flow and one without restriction, providing a more cost effective solution.

Another application is constant bleed where a low flow of gas is required to keep a line inert while in standby mode and a full flow is also needed. This valve provides both functions in one compact valve, replacing two valves in parallel as described above.

The new series is simply a new actuator for existing valves. The wetted parts of the valve are same field proven ones as used for all AP 3 and 4 series 1/4 and 3/8 inch valves. ❖

*AP 3571 metered flow range is 10 to 200 slpm



Corporate Office:

687 Technology Way
Napa, California 94558
Ph: 1-707-259-0102
Fax: 1-707-259-0117

www.aptech-online.com

AZ 9200 – a new 1 inch connection

The AZ 9200 series is a high flow pressure regulator for $\frac{3}{4}$ and 1 inch line sizes. It is a line regulator capable of delivering flow rates to 2,000 slpm. With a source pressure rating of 300 psig (21 bar) and flow coefficient (C_v) of 1.6, the AZ 9200 is a great choice for $\frac{3}{4}$ and 1 inch line, point of use applications and moderately high flow requirements.

The new AZ 9200 is available with 2 or 3 ports, $\frac{3}{4}$ or 1 inch size and face seal, sanitary flange or tube stub connections. In the spirit of cost containment, it has limited options, such as only 10 Ra surface finish, no Hastelloy internal options and only one seat material, PFA.

Soon there will be another family member, the AK 9200. As you may have guessed, it provides the same basic features for the process industry with $\frac{3}{4}$ inch NPT connections.

The AZ 9200 is the new regulator of choice for point of use delivery of medium to high flow rates of gases in $\frac{3}{4}$ and 1 inch lines. The applications include bulk and specialty gas delivery for industries ranging from semiconductor, to solar, to flat panel display, to bio-pharmaceutical and other clean industries. ❖



Regulator Seat Abrasion – a new rub to consider

There is an application specific failure mode primarily related to pressure regulators residing within process tools. The PCTFE seat material in certain applications abrades over time resulting in an across the seat leak. The abrasion occurs as a result of flow cycling – either on / off or varying flow. It is related to the stroke (travel) of the poppet and also low internal (piping) volume between the regulator and the valve downstream being cycled. The symptoms generally only occur at flow rates above 1 slpm and tend to worsen with increased flows and on tools with fast cycle rates.

Seat abrasion has only been observed at final point of use. It is especially prone to occur in integrated gas systems (IGS) common to wafer process tools today. It is interesting that two of the same regulators on a common line, one in the tool and the other in the distribution box upstream, see the same flow cycling but it is only the regulator within the tool that fails.

AP Tech launched an extensive investigation of seat abrasion and possible remedies. After lengthy testing and evaluation some conclusions were finally drawn. Product Note PN 421 posted in the Tech Briefs section of our web site presents an overview of the evaluation and our findings.

The bottom line is that PTFE seat material is the solution and what is now recommended for on tool pressure regulator applications. PTFE may be used in place of both PCTFE and Vespel® for most all current on tool gas delivery requirements. ❖