



Product Note, PN 412

Explosive Atmospheres and AP Tech Valves and Flow Devices

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Introduction

On 23 March 1994, the Directive 94/9/EC (commonly referred to as “ATEX”) of the European Parliament was issued regarding potentially explosive atmospheres. Advanced Pressure Technology (“AP Tech”) manufactures valves and flow devices that could be installed in such environments.

Why Explosion Protection for Valves and Flow Devices?

In the event of a leak in a flammable gas piping system, a potentially explosive atmosphere can envelop the component. While many existing standards and regulations concern electrical components and electrical equipment used in these applications, ATEX requires that all components and equipment be evaluated. AP Tech valves and flow devices are considered *components*. Based on the ATEX Directive, AP Tech considers the location where the components are installed to be classified Equipment-group II, Category 3 because flammable gases would only be present for a short period of time in the event of a leak. It is possible that the location could be classified Equipment-group II, Category 2 if a leak is likely to occur. Please note that the system owner, not AP Tech, is responsible for determining the classification of a particular installation.

Product Assessment

AP Tech performed a conformity assessment and risk analysis of all valves and flow devices with respect to the Essential Health and Safety Requirements in Annex II of the ATEX directive. The assessment found two potential ignition sources, one potential leak to atmosphere, and switches that require intrinsic safety barriers.

One ignition source is the ABS plastic knob used on model AP3100, AP3102, AP3260, AP3600, AP4600, and AP72600 components that could potentially build a static charge. It has not been confirmed that a static charge from the ABS plastic knob could cause an ignition. The other ignition source is from static charge build-up arising from the flowing media. To eliminate the potential ignition sources, AP3100, AP3102, AP3260, AP3600, AP4600, and AP72600 components must be ordered with the *MK* (metal knob) option. In addition, all valves and flow devices must be connected to earth ground. The components can be grounded through the mounting holes on the body (if so equipped) or the system piping can be grounded and electrical continuity verified through the component connections. Grounding of the components should follow the same requirements as for the piping system.

A potential leak to atmosphere was determined possible due to repeated cycling of diaphragm valves that might eventually lead to diaphragm fatigue failure. Customers should be aware of the expected cycle life of the valve being used for the application. In critical applications,

customers should monitor valve cycle counts and pressures, and replace the valve at an appropriate interval as part of preventive maintenance. In addition, the system should be designed to detect a leak, if one should occur, and signal an alarm.

Some pneumatic valves and manual valves have options for position indicating switches and the AP74 and AP74B flow switches have a switch incorporated into the device. These switches do not store or generate energy and therefore, can be designated “simple devices”. To protect the switches and field wiring, an intrinsic safety barrier must be installed to limit the energy supplied to the device.

The European Commission has published guidelines that state “simple” mechanical devices that do not have an “own source” of ignition except for the flowing media are outside the scope of the directive. AP Tech valves (without ABS knobs) and flow devices would fall into this category.

Product Declaration

AP Tech declares that all valve and flow device models identified below fall outside the scope of the ATEX directive because the products do not have their own source of ignition and fall under the “simple” products application of the directive.

Pneumatic valves: model AP3000, AP3113, AP3130, AP3200, AP3540, AP3550, AP3580, AP3700, AP3708, AP4540, AP4550, AP4580

Manual valves: model AP3125, AP3150, AP3157, AP3625, AP3650, AP3657, AP3800, AP3900, AP4625, AP4650, AP4657

Flow devices: model AP61, AP64, AP7, AP70, AP71, AP72 (except AP72600)

AP Tech declares that all flow devices and valve model options identified below do not require ATEX approval **when installed with ATEX approved intrinsic safety barriers**. The use of an intrinsic safety barrier would make the installation acceptable for Equipment-group II, Category 2 locations.

Pneumatic valve options: AP3000 IS, AP3113 IS, AP3130 IS, AP3200 IS, AP3550 ISC, AP3550 ISO, AP3700 ISC, AP3700 ISO, AP4550 ISC, AP4550 ISO

Manual valve options: AP3650 ISH

Flow devices: model AP74 and AP74B

AP Tech declares that all valve and flow device models identified below, **when ordered with the MK option so that the standard ABS knob is not used**, fall outside the scope of the ATEX directive because the products do not have their own source of ignition and fall under the “simple” products application of the directive.

Manual valves: model AP3100, AP3102, AP3260, AP3600, and AP4600

Flow devices: model AP72600

Conditions for use

1. The body of all components must be grounded (earthed) to prevent static charge build-up due to the flowing media.
2. The use of elevated temperature fluids that affect the surface temperature of the component is outside the scope of this declaration and is the responsibility of the user.
3. Special or custom options require a review to determine acceptability with the exception that any custom body porting, weld configuration, or port size does not affect the above declaration.
4. The use of heating systems applied to the component that affect the surface temperature of the component is outside the scope of this declaration and is the responsibility of the user.

5. The user is responsible for considering the effect of a rise in surface temperature due to adiabatic compression (rapid pressurization of the system).

Conclusion

A review of the ATEX directive has determined that AP Tech valves and flow devices fall outside the scope of the directive provided models with ABS knobs use a metal knob and models with switches are installed with intrinsic safety barriers. All components must follow the specified conditions for use.

Products that are outside of the scope of ATEX are not labeled with the CE mark unless covered by another European Directive.