Product Note PN 410, Revision 9
Explosive Atmospheres and AP Tech Pressure Regulators

January 29, 2021

Introduction

On 29 March 2014, the Directive 2014/34/EU (commonly referred to as “ATEX”) of the European Parliament was issued regarding potentially explosive atmospheres. Advanced Pressure Technology (“AP Tech”) manufactures pressure regulators that could be installed in such environments.

Why Explosion Protection for Pressure Regulators?

In the event of a leak in a flammable gas piping system, a potentially explosive atmosphere can envelop the pressure regulator. 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 pressure regulators are considered *components*. Based on the ATEX Directive, AP Tech considers the location where the pressure regulators 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 its pressure regulator models and their common options, with respect to the Essential Health and Safety Requirements in Annex II of the ATEX directive. The details of the assessment in terms of the individual Essential Health and Safety Requirements are listed in Appendix A. The tables in Appendix B list all of the models and options that were evaluated and along with their evaluation. The first table in Appendix B is for diaphragm regulators. The second table is for piston regulators. Models and options not listed in Appendix B should be assumed to not have been evaluated and therefore should not be selected for use in a potentially explosive environment until they have been evaluated.

Standard default options for each listed model were evaluated even if they were not explicitly listed as a separate option in the table. For example, the standard seat material for an AP1500 model regulator is PCTFE, and as a result the PCTFE seat was evaluated for this model even though PCTFE was not listed as a seat material option in the table. Not all options listed in the tables are available to all models listed in the tables.

When specifying a regulator that is to be used in a potentially explosive environment one must review the evaluations in Appendix B for the specific model and each and every option that is being specified, in order to determine the complete assessment for the regulator.

A summary of the models and options found to have an impact on ATEX assessment due to potential ignition sources or other concerns from the ATEX Essential Health and Safety Requirements, are listed below.

1. The plastic Nylon 6, 30-33% glass filled knob used as standard on models AP1000/AK1000/AZ1000, AK1000T, AP1100/AK1100/AZ1100, AP1200/AK1200/AZ1200, AP1300/AK1300/AZ1300, AP1400T/AK1400T/AZ1400T, AP1500/AK1500/AZ1500, AP1600, AP1700/AK1700, AP1900, AP2700, AK100, AP500, AK8000, AZ9200, BP1000, KT8, KT9, SL5400, SL5500, and SL5800, has been tested in accordance with IEC:2004 60079-0 Section 26.14 and confirmed to not be an ignition source due to static build up. To eliminate the plastic knob, the machined knob (MK) option, the pneumatic actuator (PA), and the preset outlet pressure options are available for most models.

2. The pressure gauges offered as options on most of the regulator models and as standard components for crossover regulator manifold models, use a plastic polycarbonate window that is a potential ignition source due to static electricity discharge. To demonstrate that the gauges are not a potential source of ignition, the gauges would need to be tested to determine if a transferred charge is below the acceptable values in IEC 60079-0 Section 26.14 or the pressure gauge supplier must provide documentation indicating the gauge is compliant with the ATEX Directive (See items 26, 27, and 28 in Appendix A). Until compliance is determined, regulators should not be ordered with pressure gauges for use in potentially explosive environments.

3. AP M60/AK M60, AP M66/AK M66, and AK M80 crossover manifold models are only offered from the factory with pressure gauges. Since the compliance of pressure gauges is undetermined at this time (see item 2 above), the AP M60/AK M60, AP M66/AK M66, and AK M80 models should not be specified for use in potentially explosive environments.

4. Tied diaphragm regulators with outlet ranges greater than 100 psig should be preset to minimize the risk that improper operation might lead to an outboard leak and a potentially explosive atmosphere (See item 6 in Appendix A).

5. KT9, KT10, and KT12 regulators must be ordered with the non-relieving option (instead of the self relieving option) if the process gas they are to be used with is hazardous (flammable, toxic, etc.). The self-relieving option vents process gas through the regulator cap directly into the atmosphere while the non-relieving option does not. Using a KT9, KT10, or KT12 with the self-relieving option in a flammable gas system could create an explosive atmosphere in the vicinity of the regulator.

6. Regulators with customer supplied parts are assumed to not have been evaluated in regard to ATEX and thus are not to be used in a potentially explosive environment unless a documented evaluation for the specific customer supplied parts in question has been made. Refer to Appendix B for all models and options that have been evaluated.

Product Usage

A summary of ATEX related usage issues that were found in the assessment are listed below.

1. Pressure regulators must be grounded (earthed) to prevent static charge build-up due to the flowing media. The regulator can be grounded through the mounting holes on the bottom of the body or the system piping can be grounded and electrical continuity verified through the body metal face seal connections. Grounding of the regulator should follow the same requirements for the piping system. Also see item 30 in Appendix A.

2. The system designer and users must take precautions to prevent rapid system pressurization which may raise surface temperatures of system components and tubing due to adiabatic compression of the system gas.

3. Heating systems installed by the user could possibly increase the surface temperature and must be evaluated by the user for compliance with the ATEX Directive. User installation of heating systems applied to the regulator body or system piping that affects the surface temperature of the pressure regulator is outside the scope of this declaration and is the responsibility of the user.

4. The Joule-Thomson effect may cause process gases to rise in temperature as they expand going through a regulator. This could raise the external surface temperature of the regulator body and downstream piping creating a potential source of ignition. Whether the Joule-Thomson effect leads to heating or cooling of the process gas depends on the process gas and the inlet and outlet pressures. The system designer is responsible for determining whether the process gas temperature may rise under any operating conditions. If a process gas temperature rise is possible under operating conditions, then the system designer must investigate whether the regulator body and downstream piping may increase in temperature enough to create a potential source of ignition.

   The process gas expansion is typically modeled as a constant enthalpy throttling process for determining the temperature change. A Mollier diagram (Pressure – Enthalpy diagram with constant temperature, density, & entropy contours) or a Temperature – Entropy diagram with constant enthalpy lines, for the process gas, can be used to determine the temperature change. Helium and hydrogen are two gases that typically increase in temperature when expanding across a regulator. Other gases may increase in temperature at sufficiently high pressures.

If the above issues are addressed by selecting options that do not have potential sources of ignition, avoiding options that have not been assessed, and by taking the proper usage issue precautions, then the AP Tech regulator can be considered to be a mechanical device that does not have its own source of ignition and thus falls outside the scope of the ATEX directive.

Product Declaration

AP Tech declares that the

AP20, AP9000, AP9100, and SL5200

regulator models when specified without gauges, without options considered to have a potential source of ignition, and without unevaluated options, fall outside the scope of the ATEX directive because the products do not have their own potential source of ignition.

AP Tech declares that the

AP1000/AK1000/AZ1000, AK1000T, AP1100/AK1100/AZ1100, AP1200/AK1200/AZ1200, AP1300/AK1300/AZ1300, AP1400T/AK1400T/AZ1400T, AP1500/AK1500/AZ1500, AP1600, AP1700/AK1700, AP1900, AP2700, AK100, AP500, AK8000, AZ9200/AK9200, BP1000, KT8, SL5400, SL5500, and SL5800

regulator models, when specified without gauges, without options considered to have a potential source of ignition, and without unevaluated options, fall outside the scope of the ATEX directive because the products do not have their own potential source of ignition. The

AP1200/AK1200/AZ1200, AP1400T/AK1400T/AZ1400T, AP1500/AK1500/AZ1500, AP1700/AK1700, AP1900, AP2700, AZ9200, SL5400, SL5500, and SL5800

tied diaphragm models should be specified with the preset option for outlet pressures ranges greater than 100 psig.

AP Tech declares that the

KT9, KT10, and KT12

regulator models, **when ordered with the non-relieving option or used with a non-hazardous process gas,** without gauges, and without any options considered to have a potential ignition source, fall outside the scope of the ATEX directive because the products do not have their own potential source of ignition.

AP Tech declares that the

AP M60, AP M66, AK M80, AK M60, and AK M66

crossover regulator models are not to be used in a potentially explosive environment since they are only offered from the factory with pressure gauges which have not been evaluated to determine compliance with the ATEX directive.

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

Refer to Appendix B for the complete list of models and option AP Tech has evaluated.

Conditions for use

The product usage issues listed above in the Product Usage section of this report should be addressed for all regulators installed in potentially explosive environments.

Conclusion

To determine the ATEX evaluation for a regulator with a particular configuration, the specific model and options for that regulator must be reviewed in Appendix B. If the model and options are selected such that there are no potential sources of ignition or venting of flammable gases, and the usage issues listed in the Product Usage section above are addressed, then the regulator falls outside of the scope of ATEX and may be used in a potentially explosive environment. Any options that create a potential ignition source or that could create an explosive atmosphere are not to be selected for a regulator that will be used in a potentially explosive environment. Products that are outside of the scope of ATEX are not labeled with the CE mark unless covered by another European Directive.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Principles of integrated explosion safety: prevent formation of explosive atmospheres (Annex II Section 1.0.1)	Yes	**1.** AP Tech regulators are designed for very low outboard leakage. All regulators are leak tested prior to shipment. **2.** AP Tech recommends tied diaphragm regulators for high pressure flammable gases. Tied diaphragm regulators have been proven in the field and laboratory testing to reduce the risk of overpressure conditions on the low pressure side of the regulator caused by contamination at the regulating seat. Reducing overpressure conditions can reduce the risk of diaphragm failure resulting in outboard leaks. **3.** KT9, KT10 and KT12 regulators must be ordered with the non-relieving option (instead of the self relieving option) if the process gas they are to be used with is hazardous (flammable, toxic, etc.). The self-relieving option vents process gas through the regulator cap directly into the atmosphere while the non-relieving option does not. Using a KT9, KT10, or KT12 with the self-relieving option in a flammable gas system could create an explosive atmosphere in the vicinity of the regulator.
Principles of integrated explosion safety: prevent ignition of explosive atmospheres (Annex II Section 1.0.1)	Yes	**4.** See items 21 through 35 in this table regarding various potential ignition sources.
Principles of integrated explosion safety: halt or limit explosion flames or pressures ignition of explosive atmospheres (Annex II Section 1.0.1)	Not applicable	**5.** This feature would be incorporated into the gas delivery system equipment in which the pressure regulator is installed. An example of such equipment is a source gas cylinder cabinet. AP Tech does not manufacture gas delivery systems.
Analysis of operating faults (Annex II Section 1.0.2)	Yes	**6.** Closing the regulator without proper venting of downstream pressure can cause damage to high outlet pressure regulators. The operation manual cautions users on this issue. Tied diaphragm, adjustable, regulators with outlet pressure ranges above 100 psig should not be used to minimize the risk.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Checking and maintenance conditions (Annex II Section 1.0.3)	Yes	**7.** System operator should periodically monitor the regulator outlet pressure to verify that regulator is operating correctly. Automated monitoring with an alarm for high outlet pressure is recommended.
Surrounding area conditions (Annex II Section 1.0.4)	Yes	**8.** AP Tech pressure regulators evaluated are designed for use in ambient conditions. **9.** Regulators are sometimes heated by customers to prevent Joule Thomson effects from causing icing or other conditions. Heating systems installed by customers must consider all ATEX requirements and are the customer responsibility.
Marking (Annex II Section 1.0.5)	Not applicable. Components are not marked per Chapter II, Article 8, Section 3.	**10.** Certificate is required that declares conformity with the provisions of the ATEX Directive and stating product characteristics and how product must be incorporated into the equipment. Product Note PN 410 was created to cover this requirement.
Instructions (Annex II Section 1.0.6)	Yes	**11.** AP Tech has operating manuals and component data sheets on website. **12.** Repair instructions are available, but AP Tech recommends regulators be sent to the factory for repair.
Material selection (Annex II Section 1.1)	Yes	**13.** AP Tech pressure regulators evaluated are made from materials that are considered compatible with gases listed in the Regulator Selection Guide. Materials of construction that contact the process gas are identified in the component data sheet. There are no predictable changes to the materials of construction while the regulator is in service that would increase the risk of an explosion.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Design and construction (Annex II Section 1.2)	Yes	**14.** AP Tech pressure regulators evaluated are designed for very low outboard leakage. All regulators are leak tested prior to shipment. **15.** Enclosed structures are the responsibility of the user. **16.** Dust deposits on external surfaces would not cause ignition if used within operating temperature limits and regulator surfaces can be easily cleaned. **17.** Safe opening is not applicable to pressure regulators. **18.** Protection against other hazards is not applicable. **19.** Overloading of equipment is not applicable. **20.** Flameproof enclosures are not applicable.
Potential ignition sources	**Depends on source**	**See below discussion of each source.**
Hazards from different ignition sources (Annex II Section 1.3.1)	Not applicable	**21.** There are no sparks, flames, electric arcs, acoustic energy, optical radiation, or electromagnetic waves in AP Tech pressure regulators evaluated. **22.** High surface temperatures are possible if the user has installed heating equipment– appropriate heating equipment and proper operation is the user's responsibility. **23.** High surface temperatures are possible due to adiabatic compression caused by rapid system pressurization – the user should operate the system properly to control this ignition source. **24.** High surface temperatures of both the regulator and the downstream piping are possible due to the expanding process gas heating up as a result of the Joule-Thomson effect. Whether the Joule-Thomson effect leads to heating or cooling of the process gas depends on the process gas and the inlet and outlet pressures. It is the system designer's responsibility to determine whether Joule-Thomson heating will occur under any operating conditions. If heating does occur, the system designer must determine whether this could raise the surface temperature enough to create a potential ignition source.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Hazards from static electricity (Annex II Section 1.3.2)	Yes	**25.** Some regulator models use a Nylon 6 30-33% glass filled plastic knob. The knob has been tested in accordance with IEC:2004 60079-0 section 26.14 and confirmed to not build sufficient static charge to cause ignition. The total exposed knob surface area is approx 25.4 in^2 (16400 mm^2). **26.** There are pressure gauge options that use a polycarbonate window. The total exposed polycarbonate window surface area is 7.25 in^2 (4700 mm^2). **27.** Per IEC 60079 Section 7.3, the maximum allowable surface area considered to not be an ignition source without testing is 2000 mm^2 for Group II, Zone 1 or 2. Larger areas must be tested to determine if a transferred charge is below the acceptable values in IEC 60079-0 Section 26.14. **28.** The regulator gauge polycarbonate window has been used extensively in flammable gas systems for years, but should not be used in a potentially explosive environment until tested to verify conformance to IEC 60079 Section 7.3 or certified by supplier. **29.** Process gas flow through a regulator could potentially cause static charge build-up. To prevent this, pressure regulators must be grounded (earthed). A regulator can be grounded through the mounting holes on the bottom of the body or the system piping can be grounded and electrical continuity verified through the body metal face seal connections. Grounding of a regulator should follow the same requirements for the piping system. **30.** Based upon the "European ATEX Guidelines for the Valve Industry", CEIR, July 2006, statement in section B.1), that "Electrostatic charges caused by the flow-through of the fluid are not to be considered as own ignition sources," AP Tech did not consider this potential ignition source to be a potential ignition source of the evaluated regulators themselves.
Hazards from stray electric and leakage currents (Annex II Section 1.3.3)	Yes	**31.** AP Tech pressure regulators evaluated do not have electrical components. **32.** Optional pressure switches and transmitters contain electrical parts. These parts have not been evaluated by the supplier and therefore should not be used in a potentially explosive atmosphere.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Hazards from overheating (Annex II Section 1.3.4)	No	**33.** AP Tech pressure regulators evaluated are adjusted slowly by hand and with low friction loads so that heat buildup is virtually impossible.
Hazards from pressure compensation operations (Annex II Section 1.3.5)	No	**34.** Operation of AP Tech regulators does not cause shock waves or compressions that could ignite an explosive atmosphere outside the regulator.
Hazards arising from external effects (Annex II Section 1.4)	Yes	**35.** AP Tech pressure regulators evaluated are designed to withstand the intended application.
Requirements of safety related devices (Annex II Section 1.5)	Not applicable.	
Integration of safety requirements related to the system (Annex II Section 1.6)	Not applicable.	
Requirements of category M equipment (Annex II Section 2.0)	Not applicable	**36.** AP Tech pressure regulators evaluated are installed in Group II, category 2 or Group II, category 3 locations.
Requirements of category 1, Group II equipment (Annex II Section 2.1)	Not applicable	**37.** AP Tech pressure regulators evaluated are installed in Group II, category 2 or Group II, category 3 locations.
Requirements of category 2, Group II equipment (Annex II Section 2.2.1)	Yes	**38.** Potential ignition sources are addressed in items 21 through 35 above. No additional ignition sources that could be caused by frequently occurring disturbances or faults were identified. **39.** Potential causes of increased surface temperature are addressed in items 22 through 24 above. **40.** Opening of parts is not applicable to components.
Requirements of category 2, Group II equipment (Annex II Section 2.2.2)	No	**41.** AP Tech pressure regulators evaluated are not intended for installation in air/dust mixtures.

Appendix A

Table 1. Assessment of AP Tech regulators in terms of the individual ATEX Essential Health and Safety Requirements		
Essential Health & Safety Requirement, Annex II	**Applicable to AP Tech Regulators?**	**Evaluation Item**
Requirements of category 3, Group II equipment (Annex II Section 2.3.1)	Yes	**42.** Potential ignition sources are addressed in items 21 through 35 above. **43.** Potential causes of increased surface temperature are addressed in items 22 through 24 above.
Requirements of category 2, Group II equipment (Annex II Section 2.3.2)	No	**44.** AP Tech pressure regulators evaluated are not intended for installation in air/dust mixtures.
Requirements for protective systems (Annex II Section 3)	Not applicable.	

Appendix B

Table 2. Diaphragm Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Model	AP1000/AK1000/AZ1000 AK1000T AP1100/AK1100/AZ1100 AP1200/AK1200/AZ1200 AP1300/AK1300/AZ1300 AP1400T/AK1400T/AZ1400T AP1500/AK1500/AZ1500 AP1600 AP1700/AK1700 AP1900 AP2700 AK100 AP500 AK8000 AZ9200/AK9200 BP1000 KT8 SL5400 SL5500 SL5800	AP10/AK10/AZ10 AK10__T AP11/AK11/AZ11 AP12/AK12/AZ12 AP13/AK13/AZ13 AP14__T/AK14__T/AZ14__T AP15/AK15/AZ15 AP16 AP17/AK17 AP19 AP27 AK1 AP5 AK80 AZ92/AK92 BP1000 KT8 SL54 SL55 SL58	**45.** Users who prefer to eliminate the plastic knob may order the machined metal knob (MK), preset (PS), or pneumatic actuation (PA) option, if available.
	AP20 AP9000/AP9100 SL5200	AP20 AP90/AP91 SL52	**46.** These models have a metal knob as standard.
	AP M60/AK M60 AP M66/AK M66 AK M80	AP M60/AK M60 AP M66/AK M66 AK M80	**47.** These models are only sold with pressure gauges included and therefore are not to be used in potentially explosive environments. See items 26,27, and 28 in Appendix A.

Appendix B

Table 2. Diaphragm Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Maximum Outlet Pressure Rating	10 psig 30 psig 60 psig 100 psig	01 02 06 10	**48.** Does not affect ATEX evaluation.
	120 psig 150 psig 200 psig 250 psig 300 psig 500 psig 1500 psig	12 15 20 25 30 50 or F J	**49.** The preset outlet pressure option (PS) is recommended for maximum outlet pressure ratings greater than 100 psig to help prevent improper operation that could damage the diaphragm and cause an outboard leak. See item 2 in Appendix A. This does not apply to free poppet and BP1000 regulators.
Body Material	Stainless Hastelloy C-22 Brass	S H B	**50.** Does not affect ATEX evaluation.
Surface Finish	10 Ra 7 Ra 5 Ra	M V X	**51.** Does not affect ATEX evaluation.
Hastelloy Internal Parts	Hastelloy C-22 Poppet Hastelloy C-22 Poppet & Diaphragm Hastelloy C-22 Nozzle, Poppet, & Diaphragm Hastelloy Diaphragm	H HP H HD	**52.** Does not affect ATEX evaluation.
Absolute Inlet Pressure	Absolute Inlet Pressure	A	**53.** Does not affect ATEX evaluation.
Left Hand Inlet	Left Hand Inlet	L	**54.** Does not affect ATEX evaluation.

Appendix B

Table 2. Diaphragm Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Porting Configuration		2PW, 2PWA, 2PWC 3PW, 3PWJ 4PW, 4PWA, 4PWC, 4PWK, 4PWL, 4PWN, 4PW6 5PW, 5PWC, 5PWCS, 5PW6	**55.** Does not affect ATEX evaluation.
Fittings/Ports	Male Face Seal Fittings Female Face Seal Fittings Tube Stubs Internal Face Seal Fittings Face Seal Fitting Elbows O-ring Face Seal Fittings NPT Ports Tube Compression Fittings	MV4, MV6, MV8, MV12, MV16 FV4, FV6, FV8, FV12, FV16 TW4, TW8, TW12, TW16 IV4 MVE4, FVE4 MC4, MC6, FC4, FC6 4, 6, 8, 12, 16 4T, 6T, 6MT	**56.** Does not affect ATEX evaluation.
CGA Fittings	Inlet Port Gas Cylinder Fittings	CGA 170/180/296/300/320/326/330/346/350/510/540/580/590/632/634/638/640/642/660/670/678/679/705/712/716/718/720/724/728	**57.** Does not affect ATEX evaluation.

Appendix B

Table 2. Diaphragm Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Gauges	30”-0 psig/bar 30”-0-15 psig/bar 30”-0-30 psig/bar 30”-0-60 psig/bar 30”-0-100 psig/bar 30”-0-160 psig/bar 30”-0-200 psig/bar 30”-0-300 psig/bar 0-15 psig/bar 0-30 psig/bar 0-60 psig/bar 0-100 psig/bar 0-160 psig/bar 0-200 psig/bar 0-400 psig/bar 0-600 psig/bar 0-1000 psig/bar 0-2000 psig/bar 0-3000 psig/bar 0-4000 psig/bar	V V15 V3 L 1 H V2 D X15 VX LX 1X G 2 4 K 10 20 30 40	**58.** Pressure gauges are not to be selected as options on components for use in potentially explosive environments. See items 26, 27, and 28 in Appendix A.
Cap or Plug	Cap or Plug on Ports/Fittings	C	**59.** Does not affect ATEX evaluation.
Seat Material (excluding BP1000)	Teflon PFA Teflon PTFE Vespel SP-1 Kynar Peek	PF TF VS KN PK	**60.** Does not affect ATEX evaluation.
Seat Material (BP1000 only)	Kalrez Teflon PTFE	KZ TF	**61.** Does not affect ATEX evaluation.
High Flow	High Flow Seat & Poppet	HF	**62.** Does not affect ATEX evaluation.
Inlet Filter	No Filter Under Poppet	NF	**63.** Does not affect ATEX evaluation.

Appendix B

Table 2. Diaphragm Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Knob	Metal Knob	MK	**64.** This option replaces the plastic Nylon 6 30-33% glass filled knob with a conductive, machined, metal knob.
Cap Options	Short Cap Panel Mount	SC P	**65.** Does not affect ATEX evaluation.
	Preset Outlet Pressure	PS	**66.** This option is recommended for outlet pressures ratings greater than 100 psig (excluding BP1000 models) to help prevent improper operation that could damage the diaphragm and cause an outboard leak. **67.** This option eliminates the knob.
	Force Compensator	FC	**68.** Does not affect ATEX evaluation.
	Pneumatic Actuator	PA	**69.** This option eliminates the knob.
High Inlet Pressure Rating	High Inlet Pressure Rating	HR	**70.** Does not affect ATEX evaluation.
Customer Supplied Parts	Customer Supplied Parts	CSP	**71.** Customer supplied parts should be assumed to have not been evaluated by AP Tech in regard to ATEX unless AP Tech has explicitly made an evaluation for the specific parts.

Appendix B

Piston Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Models	KT9 KT10 KT12	KT9 KT10 KT12	**72.** Plastic Nylon 6 30-33% knob is standard **73.** These models have a metal knob as standard.
Maximum Outlet Pressure Rating	120 psig 200 psig 500 psig 600 psig 800 psig 1000 psig 1500 psig 2500 psig 4000 psig 6000 psig 10 000 psig	B D F G H I J L N P R	**74.** Does not affect ATEX evaluation.
Cap Assembly	Non-Self Relieving Pneumatic Actuation (Non-Self Relieving)	0 2	**75.** KT9, KT10, and KT12 regulators must be ordered with one of these two options if the process gas is hazardous (toxic, flammable, etc.). Item 3 in Appendix A. (KT9 not available with pneumatic actuation.)
	Self Relieving	1	**76.** KT9, KT10, and KT12 regulators must **not** be ordered with this option if the process gas is hazardous (toxic, flammable, etc.)
Body Material	303/304 Stainless Brass 316 Stainless (Welded Fittings)	C B S	**77.** Does not affect ATEX evaluation.

Appendix B

Piston Regulator Options Evaluated in Regard to ATEX			
Option Category	**Option**	**Designator**	**Evaluation Item**
Porting Configuration	Porting Configuration	2P 4P 4PN 4PQ 4PW	**78.** Does not affect ATEX evaluation.
Ports/Fittings	NPT Ports MS33649 Boss Fittings Face Seal Fittings	4, 6, 8, 12 4B MV4, FV4	**79.** Does not affect ATEX evaluation.
Gauges	600 psig 1000 psig 2000 psig 4000 psig 6000 psig 10 000 psig	6 10 20 40 60 Q	**80.** Pressure gauges should not be selected as options on components for use in potentially explosive environments. See items 26, 27, and 28 in Appendix A.
High Flow	High Flow Capacity	HF	**81.** Does not affect ATEX evaluation.
Seat Material	PEEK Seat	PK	**82.** Does not affect ATEX evaluation.
O-ring Material	Polyurethane Buna-N Ethylene Propylene	UE BN EP	**83.** Does not affect ATEX evaluation.
Panel Mount	Panel Mount	P	**84.** Does not affect ATEX evaluation.