THE ATEX DIRECTIVE AND VORTEX® VALVES

ATEX Information and Considerations

The ATEX Directive, 94/9/EC, gives essential safety requirements to be fulfilled by all equipment, both electrical and non-electrical, installed anywhere in hazardous areas within the EU. Protection is also ensured by Directive 1999/92/EC (ATEX 137), regarding protection of workers potentially at risk from explosive atmospheres. The Directive is named after the French "ATmospheres EXplosives".

Compliance with the ATEX Directive means new essential requirements:

- Reinforced safety aspects
- Safer design, not only for normal operations but also in starting conditions
- More demanding testing procedures
- Specific quality assurance for the design and the manufacturing process

Vortex® products are ATEX approved for Group II, Category 2 - zones 1 and 21 and Group II, Category 3 - zones 2 and 22. Vortex® also offers ATEX approved accessories and control packages for these Group II categories and applications.

ATEX Zone Descriptions

ATEX Directive 99/92/EC (also known as 'USE' or ATEX 137) refers to the safety and health protection of workers potentially at risk from explosive atmospheres. The directive highlights what the employer must do to prevent and protect against explosions as well as classifies hazardous areas into zones, as defined below:

Gas, Mists or Vapors

Zone 0: *An atmosphere where a mixture of air and flammable substances in the form of gas, vapor or mist is present frequently, continuously or for long periods.*

Zone 1: *An atmosphere where a mixture of air and flammable substances in the form of gas, vapor or mist is likely to occur in normal operation occasionally.*

Zone 2: *An atmosphere where a mixture of air and flammable substances in the form of gas, vapor or mist is not likely to occur in normal operation but, if it does occur, will persist for only a short period.*

Dusts

Zone 20: *An atmosphere where a cloud of combustible dust in the air is present frequently, continuously or for long periods.*

Zone 21: *An atmosphere where a cloud of combustible dust in the air is likely to occur in normal operation occasionally.*

Zone 22: *An atmosphere where a cloud of combustible dust in the air is not likely to occur in normal operation but, if it does occur, will persist for only a short period.*

Application Zone of Use

ATEX Group II Categories and Applications				
Category	**Design of Safety**	**Design Requirements**	**Application**	**Zone of Use**
1	Very high level of safety	Two independent means of protection or safe with two separate faults	Where explosive atmospheres are present continuously or for lengthy periods	Zone 0 Zone 20
2	High level of safety	Safe with frequently occurring disturbances or with an operating fault	Where explosive atmospheres are likely to occur	Zone 1 Zone 21
3	Normal level of safety	Safe in normal operation	Where explosive atmospheres are likely to occur infrequently and be of short duration	Zone 2 Zone 22

Vortex® Valves: Application Considerations for ATEX Zone 0 and Zone 20

The device is not rated for an ATEX environment (explosive atmosphere) inside the pneumatic conveying or process line of “zone 0” or “zone 20”. In case that inside the pneumatic conveying or process line the pressure is smaller than 0.8 bar or bigger than 1.1 bar, the ATEX Directive 4/9/EC does not apply anyway. However, in case the pressure inside the line is bigger than 0.8 bar, but smaller than 1.1 bar and there is also a zone 0 or zone 20 inside that line, the device is not rated for this special case.

Components

All components used in conjunction with Vortex® ATEX compliant valves are required to have at least the same level of ATEX protection. If the customer wants to paint the devices by himself, the operating manual contains the information that it must be ensured, that the coat of paint on the device is <0.2mm thick (including primer) for use in very dangerous gas atmosphere, such as H2 or C2H2 and <2mm thick for use in other gas-atmospheres.

Grounding Requirements for Explosive Environments (ATEX Rated Valves Only)

The blade of each Vortex® Valve is directly connected to the air cylinder or actuator clevis. The clevis of the air cylinder or actuator is directly connected to the air cylinder or actuator. All of these parts are made out of metal and are well grounded, as each ATEX rated valve is offered with a grounding lug. As a consequence, electrostatic discharges of the blade are not possible.

Vortex® Valves: Temperature Considerations

Allowed ambient internal working temperatures:
20°F (6°C) < Tamb internal < 180°F (82°C) continuous
20°F (6°C) < Tamb internal < 250°F (121°C) intermittent, 10 min maximum
20°F (6°C) < Tamb internal < 400°F (204°C) only special executions

Allowed ambient external working temperatures:
-20°F (-29°C) < Tamb external < 104°F (40°C)

Requirements for Valves that Contain Painted Parts in Explosive Environments

The requirements for ATEX Group II equipment apply. Carbon steel valves usually maintain painted surfaces, which includes the valve body and transitions. The thickness of the painting is less than 0.2 millimeters (including primer) for use in dangerous gas atmospheres, such as H_2 or C_2H_2, and less than 0.2 millimeters (including primer) for use in other gas atmospheres. If the customer decides to paint the valve or its components, it must be ensured that the coat of paint on any surface is less than 0.2 millimeters (including primer) for use in dangerous gas atmospheres, such as H_2 or C_2H_2, and less than 0.2 millimeters (including primer) for use in other gas atmospheres.

External Cleaning

When using actuators in an ATEX environment, periodic cleaning must be performed. Cleaning is to be done either with a vacuum cleaner approved for use in explosive zones, or with a damp cloth. Solvents or dry wool cloths must never be used for cleaning purposes.