

Explosion Suppression



CONCEPT

When a sensor detects a pressure increase from a deflagration, either in an associated vessel or connecting ductwork, it analyses the signal, determines if it fits the parameters associated with an explosion, and sends a signal to the system controller. Depending on the system design the unit can wait for a confirming signal, or require three sensors to vote, thus increasing system reliability.

The controller provides the system power and control integration functions. On receiving an activation signal, the unit can activate the Dry Chemical Suppressors, integrate process control, and notify operations personnel of the event. The RS232 optional modem interface will provide real time communications with ATEX factory technicians for programming diagnostics.

BENEFITS

Analogue response for false alarm prevention

Simplified programming software

Single, "AND" or voting logic levels for increased performance and reliability

CONTROL SYSTEM

The ATEX Detection and Control System is the next generation of reliable explosion detection systems designed to analyse and respond to the dynamic effects of an explosion while eliminating the unwanted false activations caused by process interrupts.



Static Pressure Detectors have been successfully detecting explosions and protecting industry for many years. But often they could not distinguish actual explosion pressure rises and normal process upsets.

The first generation ATEX analogue system provide differential benefits in a single unit. The next challenge was to protect against product impingement alarms and system releases. The ATEX system provides a unitised programmable sensor in a single cost effective package, to further protect processes from false alarms due to product impact.

The simplified User analysis software makes system maintenance and operation possible for qualified technicians with the minimum of computer experience. The ATEX hand held analyser, optional with each system, is an operational cost saving measure for system users, eliminating the need for expensive notebook computers in an unfriendly environment.

DESCRIPTION

Sensors placed into the vessel and/or ductwork sense an explosion by analysing the pressure created by the deflagration. The ATEX detectors provide programmable pressure sensor response for each protected area on an individual basis, depending on process operation needs. The unit is fully programmable for rate of explosion increase with a fixed setting in each sensor element.

The ability to sense a growing deflagration, provides increased speed of response to an actual event while limiting the units desire to respond to a false, slow, pressure excursions.

Also during an event the sensor memory records the pressure history for review. This valuable tool can pinpoint the sequence of events leading up to the problem, saving the User cost and downtime.

Up to the development of analogue sensor technology an event was something of a mystery. Now, technology pinpoints the cause of an activation saving the User cost if a system component malfunctions.

After detection of a deflagration, a signal is sent to the system controller for processing. The ATEX controllers are multifunctional devices designed to meet the needs of small as well as large protection systems.

Optionally the controller can be programmed to function on an individual basis, in an "AND" configuration for protection against false process conditions, or in a voting mode to provide increase reliability while offering protection against process upsets.

For instance in a dust collector with suppression, the unit may be programmed to require two sensors for response, to verify decision making by the system.

In a spray dryer, where volumes can be very large, the units can be programmed to vote on response, providing increase reliability and verification on a simultaneous basis.

The ATEX system meets the most rigid protection demands while providing a cost effective system, easily maintained by plant personnel, thus increasing productivity and lowering downtime. International codes require multiple system inspections per year. The ATEX Detection and Control System provides RS 232 communications for system service.

DRY CHEMICAL SUPPRESSION

The ATEX High Rate Discharge (HRD) Dry Chemical Suppressor System is the next generation of revolutionary, reliable and cost effective chemical suppressors. ATEX defined two basic principals by which to design the suppressor.

First, it needed to be reliable and second it must be cost effective. An analysis of existing products found them to be either reliable or cost effective but not both. They knew the valve had to be totally different than the existing designs. What was designed was a simple mechanical valve with redundant firing, requiring minimal part replacement after activation and major advances in cost control for initial and operational costs.

The final benefit is that it is compatible with old style detonator, single release systems. It can replace Halon 1011 or Halon 1301 systems and sometimes use the existing HRD connections, saving major retrofit costs.

The ATEX Dry Chemical HRD is designed to use the minimum of parts for valve opening, to achieve the maximum speed of operation. The valve uses natural geometric shapes that enhance the speed of operation. A mechanical flap is held in place by a release pin. When a signal is sent to the valve from the control panel, two gas generator cartridges pressurise a uniquely designed release mechanism to release the pin and activate the suppressor.

While other suppressors have redundant electrical solenoid coils they do not have total redundancy. The ATEX HRD uses two redundant gas generators to move the single release pin and open the valve eliminating linkage.

A simple reliable valve with true fail safe redundant design. When the suppressor valve opens, pre-pressurized dry chemical agent releases into the protected area using the unique ATEX discharge nozzles.

BENEFITS

Suppresses flame and pressure propagation

Does not release combustion or toxic dust particles into the air

Can be used inside all plant areas

Reduces maintenance and operational costs

True redundant release for system reliability

Does not require explosive permits and licenses



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