Stored Pressure Vs Cartridge Operated Fire Systems

AMEREX®

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Key Points

- Speed
- Agent Contamination
- Serviceability
- Safety
- Lower Maintenance costs

Operation

Stored pressure units have the fires suppression agent and propellant already in the cylinder and ready for use. The valve is opened and the agent already fluidized and under 350 PSI of pressure discharges into the hazard area.

Cartridge Operated units store the fire suppression agent in the cylinder shell and have a separate remote propellant cartridge typically under 1800 psi of pressure. When operation is required the remote cartridge is pierced allowing the nitrogen to flow through a tubing (typically hydraulic hose) to the cylinder. The nitrogen then enters another tube in the center of the shell and the nitrogen then fluidizes the dry chemical agent . A buildup of pressure occurs and overcomes a burst disc allowing the agent to then travel to the hazard area.

To summarize, upon activation the cartridge operated unit completes a series of steps ***attempting to achieve*** the state where the ***stored pressure unit is normally*.**

What to consider

Serviceability – end user ease of use

Stored Pressure fire system cylinders have a pressure gauge which allow the end user to perform daily checks to ensure system readiness. As a redundancy feature stored pressure units can be fitted with a pressure switch which can be connected to the control panel to notify the operator that a low pressure condition exists.

Cartridge operated units do not allow the end user to quickly check the status of the fire system cylinder. Disabling the fire suppression system by removing the nitrogen cartridge from the fire system would be required. Then a calibrated scale to weigh the cartridge would be required. Followed by reinstallation.

Generally most manufacturers of cartridge operated units do not recommend that untrained personnel remove and weigh the high pressure (1800 psi) cartridges. Therefore most end users cannot tell if the fire system cylinders is operable.

Speed

Amerex Stored pressure units have an internal pressure of 350 PSI. Cartridge operated units build to an internal pressure of 220 PSI before releasing. The stored pressure approach provides a simple configuration and discharge without multiple steps. With greater cylinder pressure stored pressure units provide faster response and agent delivery.

Maintenance

National Fire Protection Association (NFPA) standard 17 requires the dry chemical condition be verified on a semi-annual basis by examination. Dry chemical that shows "caking" must be discarded. Stored pressure cylinders are not required to undergo semi-annual examination and only require examination every 6 years. Reducing the cost of maintenance.

Safety

Stored pressure system have a gauge and a pressure switch providing 2 ways for end users to ensure system readiness. Cartridge operated units have no visual indication the system is full and the cylinder is operational. Introduction of 1800 PSI nitrogen pressure into a cylinder that is compromised has the potential to be catastrophic to anyone in the area.

Agent Contamination

Moisture is the enemy of dry chemical. Even small amounts of moisture when mixed with dry chemical causes it to clump and harden like concrete. Stored pressure cylinders when pressurized prevent moisture and contamination from reaching the agents.

Cartridge operated units are not sealed and moisture can be introduced into the cylinder allowing for the dry chemical to clump and restrict or prevent the discharge.

Vibration

Dry chemical is made up of Large and small particle sizes. The agent needs to have the correct mixture of each to function properly. In stored pressure units the dry chemical particles are surrounded (enveloped) by nitrogen which keeps it fluidized and ready for action.

In Cartridge operate units the vehicle vibration causes the particles to separate causing packing of the chemical. When moisture is added to this situation it could lead to catastrophic failure.

Dry chemical cylinder family

ICS liquid cylinder family

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