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Clean Agent System with DuPont™ FM-200® or 3M™ Novec™ 1230 Fire Protection Fluid

Specifications

Utilizing the industry recognized DuPont™ FM-200® and 3M™ Novec™ 1230 Fire Protection Fluid, Amerex has developed an affordable pre-engineered clean agent fire suppression system to protect areas with sensitive electrical equipment and valuable data. As an industry leader in innovative design of products that provide the quality and performance you expect, Amerex has developed the CPS system to be the most cost efficient clean agent system available. The modular design incorporates pre-assembled wiring harnesses and keyed locking connectors on all electrical components to assist you in a simple and confident installation. Agent tanks are available in two sizes having a diameter of ten inches making tank location in confined spaces less stressful. Tanks are charged in increments of two pounds in a small tank or three pounds in a larger tank for a custom installation without unnecessary expense. Electrical actuators are used for system actuation and can be reset reducing the number of components to be replaced during service after discharge. The CPS system is designed to use schedule 40 pipe giving you easy access to the materials you need to complete the installation. Nozzles are available in three designs; corner, side wall, and center room for flexibility in system installation to protect those “challenging” areas. The Amerex CPS is monitored by an electrical control panel that has a battery back-up for 24 hour protection during power failure. Photoelectric smoke detectors are used for detection and are cross zoned to reduce the potential for unwanted system discharge. A bell and horn strobe device alarm when fire conditions are present. All electrical circuits are supervised and factory terminated.

Agent:

The extinguishing agents used in the Amerex CPS is DuPont™ FM-200® or 3M™ Novec™ 1230 Fire Protection Fluid. The chemical name for DuPont™ FM-200® is Heptafluoropropane (CF₃CH₂FCF₃), identified in NFPA 2001 as HFC-227ea. This agent was developed as an environmentally safe alternative to Halon 1301 and is intended to prevent business interruption due to the risks of fire and to prevent the loss of irreplaceable, high value assets from fire.

HFC-227ea is on the U.S. Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) Program list as acceptable for use in occupied spaces. HFC-227ea is included in NFPA 2001, Standard on Clean Agent Fires Extinguishing Systems with exposure limits of five minutes for design concentrations up to 10.5%.

The primary extinguishing mechanism of HFC-227ea is heat absorption. It absorbs heat at the molecular level faster than the amount of heat generated by the combustion reaction and essentially ceases the combustion reaction since it cannot sustain itself. Although the physical mechanism of heat removal is the predominant mechanism of flame extinguishment, there is a chemical contribution to flame extinguishment which arises from the thermal decomposition of small amounts of HFC-227ea in the flame.

For an automatically operated fire suppression system protecting Class A hazards a minimum design concentration of 7.0% by volume is recommended. For systems protecting Class A hazards that are manually operated a minimum design concentration of 7.6% by volume is required. Typically, Class B hazards have higher extinguishing concentrations and all Class B systems are designed with a 30% safety factor.

Agent Tanks:

Available in two sizes, each having a diameter of ten inches. Tanks are charged with DuPont™ FM-200® or 3M™ Novec™ 1230 Fire Protection Fluid in increments of two pounds in a small tank or three pounds in the larger tank. The tanks are pressurized to 360 psi @ 70°F and available in agent weights of 16 to 44 lbs. or 46 to 130 lbs., respectively. Agent tanks are constructed of low carbon steel and have an epoxy primer and polyurethane paint finish. Discharge valve assembly consists of brass and stainless steel components with rubber seals. System utilizes Mechanical and Electrical actuators for system discharge. Up to five additional agents tanks can be actuated using pneumatic actuators for a total of six simultaneously discharged tanks. Each agent tank includes a factory installed low pressure switch to monitor the tank's condition and signal the releasing panel if pressure drops below 285 psi. A unique dual-outlet valve provides capability to protect two rooms of different sizes, or a room and under floor with one tank.

Electric Releasing Control Panel:

Provides supervised circuit monitoring and contains a back-up battery providing 24 hour protection during power failure.

Detection / Manual Actuation:

Photoelectric smoke detectors are cross zoned to reduce potentially unwanted discharge. Detectors are provided with keyed locking connectors. Wiring harnesses are factory assembled in predetermined lengths and are equipped with matching keyed locking connectors. The manual pull stations, used to release the system, are double action. A combination pull station/abort is available that includes an abort switch.

Alarming Device:

A bell and horn/strobe design give both audible and visual indication that fire conditions are present. An alarm bell rings when smoke is detected and the horn/strobe operates to signal the start of the release time delay.

System Components:**Cable:**

Cable assemblies used on all circuits except the release circuit are 4-conductor plenum rated cable type CMP complying with NFPA 70 (National Electrical Code) Article 760 for use on power limited fire alarm circuits. Each of the four conductors is stranded 18 AWG copper with extruded insulation. An aluminum shield covers the four conductors with a white mylar outer jacket. The release circuit is non-power limited and the cable assembly is type NPLF complying with NFPA 70 (National Electrical Code) Article 760 for use on non-power limited fire alarm circuits. This 2-conductor cable assembly is rated for 600 volts. Each conductor is stranded 18 AWG copper with flame retardant PVC insulation and an aluminum/polyester shield covers the pair. The outer jacket is black, flame retardant, low temperature with a temperature rating of 90°C. Single four conductor cable assemblies and single two conductor release cable assemblies can be pulled through 1/2" conduit feeding/ pulling the receptacle end through, multiple cable assemblies run in conduit should use 3/4" or larger conduit. Since the release circuit is non-power limited the release circuit cable must run in its own conduit or raceway. Each device and each cable assembly include four position, keyed, locking connectors. The connectors are Molex® brand Mini-Fit Jr. ® model. The plug and receptacle housings have a UL flammability rating of 94V-0. The terminals are gold plated to reduce oxidation contamination and provide good electrical connections for the low voltage and low current circuits of the releasing panel.

Discharge Pressure Switch:

The discharge pressure switch is used to send a signal to the releasing panel when the valve has been opened. In addition to sending a positive signal of automatic actuation it also serves as an initiating device sending a signal to secure the protected room if the valve has been operated manually by the manual local actuator. Amerex provides this discharge pressure switch with a pre-installed wire harness for connection to the panel using a junction box harness and cable assemblies.

Nozzles:

Brass discharge nozzles are available in three configurations: a 90° one-orifice nozzle for corner of room locations, a 180° two-orifice nozzle for side wall locations, and a 360° four-orifice nozzle for center of room locations. Two and four-orifice nozzles have their orifices on 90 degree centers.

Potential Applications:**Data Processing:**

- Server Rooms
- Electronic Data/Tape Storage
- UPS Rooms

TELCO:

- PBX & IDF Rooms
- Cell Sites
- Microwave Relay Towers

Industrial:

- Process Control Rooms
- Laboratories
- Engine Test Cells
- Flammable Liquid Storage Rooms

Broadcasting:

- Radio & TV Stations
- Electronic Control Rooms
- UPS Rooms
- Media Storage
- Historic Record Storage

Health-care:

- Medical Record Storage
- CT/CAT Scan & MRI Control Rooms

Cultural:

- Museums
- Libraries
- Personal/Corporate Collections

Miscellaneous:

- Bank Vaults
- Cash/Security Departments
- Precious Inventory

System Coverage Overview:

- Maximum of 22,000 ft³ using multiple cylinders (approximately 3,700 ft³ per cylinder)
- One nozzle per cylinder
- Each nozzle covers a 44 ft. radius
- Two cylinder sizes with multiple options on agent fill weight

Approvals and Standards:

- Underwriters' Laboratories, Inc. (UL)
- Underwriters' Laboratories of Canada (ULC)
- Factory Mutual (FM)
- NFPA 2001 Clean Agent Fire Extinguishing Systems
- ISO-14520 Gaseous Fire Extinguishing Systems
- EPA SNAP Program