

**CHAPTER 1
GENERAL INFORMATION**

Manual P/N 15040

**AMEREX
Industrial Dry Chemical
Fire Suppression System**

**Tested and Listed by
Underwriter's Laboratories and ULC
to UL Standard 1254**

February 5, 2002

GENERAL INFORMATION

The Amerex Industrial Dry Chemical Fire Suppression System is designed and has been tested to provide fire protection for industrial operations categorized as Local Application (Overhead), Tankside, Total Flooding, Vehicle Paint Spray Booth, and Open Front Paint Spray Booth hazards. It is manufactured by the Amerex Corporation of Trussville, Alabama.

Amerex Industrial Systems are a pre-engineered type as defined in NFPA 17- Standard for Dry Chemical Extinguishing Systems. The NFPA 17 definition states pre-engineered systems as "having predetermined flow rates, nozzle pressures, and quantities of dry chemical." It also states that "limitations on hazards that are permitted to be protected by these systems and piping and nozzle configurations are contained in the manufacturer's listed installation and maintenance manual, which is part of the listing of the system."

It is essential that all installations, maintenance, and inspections of the Amerex Industrial System be performed in compliance with this manual and NFPA 17. All piping limitations, nozzle coverages, detector placements, etc. have been proven and established through exhaustive testing by Underwriter's Laboratories, Inc.. Use of components other than those referenced in this manual, or installations outside the limitations stated in this manual is unacceptable.

U.L. Listing

The Amerex Industrial System is an Underwriters Laboratories and ULC Listed pre-engineered extinguishing unit. The system has been evaluated in accordance with U.L. Standard 1254. Tests required for listing under this standard involve fire tests under specific conditions involving a variety of Local Application, Total Flooding, or Screening. Each test fire was allowed to reach its maximum intensity before agent was discharged. Each test was repeated using both maximum and minimum piping, with variations in agent storage pressure to simulate maximum and minimum temperature ratings. Each test fire was extinguished without splashing of the liquid fuel.

Design

The Amerex Industrial System consists of mechanical and electrical components to be installed by an Authorized Factory Trained and Certified Amerex Industrial Systems Distributor. The system is composed of an agent cylinder / discharge valve charged with Amerex ABC Dry Chemical and either a Mechanical Release Module (MRM) or an Electrical Release Module (ERM). The quantity of detectors, fusible links, nozzles, corner pulleys, pulley tees and manual pull stations will vary depending on design.

The system operates either automatically if actuated by a detector or manually if actuated by a manual pull station. Upon system operation, energy sources for the appliances are shut off immediately. The MRM (ERM) incorporates mechanical and electrical provisions to facilitate the operation of auxilliary devices such as mechanical or electric gas valves and remote audible or visual signal devices.

Temperature Limitations:

- Local Application, Overhead: 32°F to 120°F (0°C to 49°C)
- Local Application, Tankside: -20°F to 120°F (-29°C to 49°C)
- Total Flood: -40°F to 120°F (-40°C to 49°C)
- Vehicle Paint Spray Booths: -20°F to 120°F (-29°C to 49°C)
- Open Front Paint Spray Booths: -20°F to 120°F (-29°C to 49°C)

Definition of Terms

Actuation Network

Copper tubing that allows nitrogen to be supplied from the Mechanical Release Module (or Electrical Release Module) to the Pneumatic Control Head mounted on the Agent Cylinder Valve(s).

Agent Cylinder / Discharge Valve

Pressurized vessel with the valve assembly containing Amerex dry chemical fire suppression agent and expellant gas (nitrogen).

Authority Having Jurisdiction (AHJ)

The organization, office or individual responsible for "approving" equipment, an installation or a procedure. The phrase "Authority Having Jurisdiction" is used in NFPA documents in a broad manner since jurisdiction and approval agencies vary as to their responsibilities. Where public safety is primary, the "Authority Having Jurisdiction" may be a federal, state, local, or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the AHJ. At government installations, the Commanding Officer or department official may be the AHJ.

Auxiliary Equipment

Listed auxiliary equipment, when outlined and installed per the limitations in this manual, can be used in conjunction with the Amerex Industrial System. Auxiliary equipment includes items such as mechanical or electric gas valves and remote audible or visual signal devices. The MRM has not been evaluated as an alarm initiating device and is not intended to be connected to an alarm control panel.

Blow-Off Cap

A plastic cap which covers the nozzle tip to keep grease, dirt, or foreign material from plugging the orifice.

Cable

1/16" diameter Stainless Steel cable (7x7 strand, 480# tensile strength) used to connect Detectors, Mechanical Gas Valves and Manual Pull Stations to the MRM. It is also used to connect Mechanical Gas Valves to the ERM.

Conduit Offset

A factory formed section of conduit, which allows the Cable for Manual Pull Stations, Gas Valves, and Detectors to make a smooth transition into the Mechanical Release Module. It is also used to connect Mechanical Gas Valves to the ERM.

Corner Pulley

A device used with the Detection Network, Mechanical Gas Valve, and Manual Pull Station, which allows the Cable to change direction 90° and still move freely for system operation.

Detector

For our purpose, this is a thermal-mechanical device consisting of a Detector Bracket, Detector Linkage, and Fusible Link, which will automatically actuate the fire extinguishing system at a predetermined temperature. (Electric Thermal Detectors are used with the ERM.)

Detection Network (MRM)

A continuous Cable run through EMT conduit, Corner Pulleys, and Detectors which provides a mechanical input to the Mechanical Release Module in order to actuate the system automatically.

Detector Linkage

The device that supports the Fusible Link on the Cable.

Distribution Network

The piping network which serves as a means to deliver agent from the Agent Cylinder / Discharge Valves through the Nozzles.

Distribution Test

A means of testing agent distribution piping to guarantee that each nozzle is discharging equal or proper amounts of agent. Upon completion of a system installation, bags are placed over each nozzle and the system is fully discharged. These bags are then weighed and compared for proper agent distribution according to the system design.

Electrical Release Module (ERM)

An assembly which connects and controls the Nitrogen Actuation Cylinder, the Detectors, the Manual Electric Pull Station(s), the Gas Valve, the Microswitch(es), and the Agent Cylinder / Discharge Valve(s). It receives Inputs and activates appropriate Outputs – including agent release, auxiliary signals and power or gas shut-off. The ERM and Microswitches are intended for indoor use only. All electronic components are supervised. The module is designed to contain back-up batteries for 24 hours in standby and 5 minutes of alarm. Refer to the separate Installation, Operation and Maintenance Manual, p/n 15827, for more information on the ERM.

Fusible Link

A fixed temperature heat detection device used to restrain the operation of the Mechanical Release Module until the Detector's design temperature is reached. At its designated temperature, the Fusible Link will separate, releasing tension in the Cable, causing the system to discharge.

Gas Valve

A mechanical or electrical valve used to shut off the supply of gas to an appliance when the fire suppression system discharges. Gas Valves must be UL listed for use with the Amerex Industrial System. Gas Valves must be manually reset.

Inspection

A "quick check" to give reasonable assurance that the system has not been tampered with and is in a charged, operable condition.

Listed

Equipment, materials, components, and parts included in a list published by an organization acceptable to the Authority Having Jurisdiction and concerned with product evaluation, which maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for its use in the specified manner.

Local Application

A Local Application hazard is one involving flammable or combustible liquids, gases, and shallow solids where the hazard is not enclosed or where the enclosure does not conform to the requirements for Total Flooding.

Maintenance

A "thorough check" to give maximum assurance that the extinguishing system will operate as intended. Design parameters should be closely examined for hazard changes since the last inspection; parts and components should be closely examined and tested or replaced if necessary.

Manual Pull Station

The device which allows the system to be manually discharged either at the hazard or from a remote location. The MRM uses a mechanical version, while the ERM uses an electrical version.

Manual Reset Relay

A device used to manually reset (open) an Electric Gas Valve following a system discharge or a momentary loss of electrical power. This safeguards against an unwanted build up of gas when the electrical power is restored.

Mechanical Release Module (MRM)

An assembly which connects and controls the Nitrogen Actuation Cylinder, the Detectors, the Manual Pull Station(s), the Gas Valve, the Microswitch(es), and the Agent Cylinder / Discharge Valve(s). It receives Inputs and activates appropriate Outputs – including agent release, auxiliary signals and power or gas shut-off. The MRM and Microswitches are intended for indoor use only.

Mechanical Time Delay (for use with the MRM)

An assembly which is used with the MRM when a 15 second discharge time delay is required (by UL 1254, in certain instances). It is installed in the nitrogen outlet port of the MRM, and then the Actuation Tubing is installed into the outlet port of the Time Delay. In this manner, any exhaust fan and electrical appliance (if connected to the Microswitch(es)) will be shut down in advance of the distribution of Dry Chemical through the Discharge Nozzles.

Microswitches

A set of dry (unpowered) electrical contacts arranged in various configurations for initiating appropriate Output functions such as: audible/visual remote signal, electrical power shut-off, electric gas valve shut-off. Microswitches are intended for indoor use only.

Nitrogen Cylinder

A small, sealed, steel cylinder containing nitrogen (refillable by Distributor) used to actuate the Agent Cylinder Valve via the Pneumatic Control Head.

Nozzle

The device used to deliver a specific quantity, flow and discharge pattern of fire suppression agent to a specific hazard.

Open Front Paint Spray Booth

An assembly of volumes or enclosures constructed for the purpose of painting or coating equipment or components. The general configuration of an Open Front Booth is a Work Area that is not enclosed on the front. A filter bank at the rear separates the Work Area from the Plenum. The Amerex Industrial Dry Chemical System meets the requirements of UL 1254 for protection of the various Work Area, Plenum, and Duct sizes and configurations commonly found in the marketplace.

Output

An action that is initiated by the Mechanical Release Module or Electrical Release Module in response to a pre-determined Input. (Examples: agent release, power shut-off, remote signal, Gas Valve closure).

Piston Plug / Gas Trip

A pneumatic device mounted in the MRM (ERM) which upon system actuation, pulls the Cable connected to the Gas Valve causing it to close and stop the flow of gas.

Pneumatic Control Head

An actuating device bolted to the Agent Cylinder Discharge Valve which receives high pressure nitrogen from the Nitrogen Actuation Cylinder.

Pre-Engineered System

A system having pre-determined flow-rates, nozzle pressures and quantities of agent. These systems have the specific pipe size, maximum and minimum pipe lengths, number of fittings and number and type of nozzles prescribed by a testing laboratory. The hazards protected by Pre-Engineered Systems are specifically limited as to type and size by a testing laboratory based on actual fire tests. Limitations on hazards which can be protected by these systems are contained in the manufacturer's installation manual, which is referenced as part of the listing.

Pulley Tee

A device similar to a Corner Pulley except there is a change in direction on the Cable from two Manual (mechanical) Pull Stations or two Mechanical Gas Valves. It unites either two Gas Valves or two Manual Pull Stations to a single control point.

Remote Nitrogen Actuator

An assembly designed to operate as a 'slave' actuation device, controlled by the nitrogen cylinder output of either the MRM or ERM. When the Remote Nitrogen Actuator is used, it can operate a total of twenty (20) agent cylinders. Up to two Remote Nitrogen Actuators can be installed on a given system.

Series Detector (MRM)

Any Detector located between the Mechanical Release Module and the Terminal Detector.

Terminal Detector (MRM)

The last Detector (or only Detector) in the Detection Network. It is at this point that the Cable for the Detection Network ends or is terminated.

Test Link (MRM)

This device is used in place of a Fusible Link in order to easily test the Detection Network. The Test Link is easily cut, simulating a Fusible Link separating under fire conditions. It is usually located on the Terminal Detector and is used solely for test purposes.

Total Flood

A Total Flooding hazard involves a permanent enclosure surrounding the hazard that adequately enables the required concentration to be built up. The Amerex Industrial Dry Chemical Total Flood System has been evaluated with a total area of uncloseable opening of 5% of the sides, top, and bottom of the enclosure.

Vehicle Paint Spray Booth

An assembly of volumes or enclosures constructed for the purpose of painting or coating automobiles or mobile equipment of any type. The Amerex Industrial Dry Chemical System meets the requirements of UL 1254 for protection of the various Work Area, Plenum, and Duct sizes and configurations commonly found in the marketplace.

Vent Check

A device installed on the last (or only) Pneumatic Actuator, which allows the escape of any slowly built-up pressure in the actuation line. Also can be used to manually bleed off pressure in the actuation line following a system discharge.