Marine INERGEN® 150-BAR And 200-BAR Fire Suppression Systems

Product Name

INERGEN® Fire Suppression System

Environmental Impact

INERGEN agent is a mixture of three naturally occurring gases: nitrogen, argon, and carbon dioxide. As INERGEN agent is derived from gases present in the earth's atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmospheric lifetimes. Because INERGEN agent is composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternative agents.

Product Description

The INERGEN Fire Suppression System is an engineered system utilizing a fixed nozzle agent distribution network. The systems are designed and are to be installed in accordance with the International Maritime Organization (IMO) International Convention for the Safety of Life at Sea (SOLAS), and the marine chapter of National Fire Protection Association (NFPA) Standard 2001, ''Clean Agent Fire Extinguishing Systems.'' When properly designed, the INERGEN system will extinguish surface burning fire in Class A, B, and C hazards by lowering the oxygen content below the level that supports combustion.

INERGEN agent has also been tested by FM for inerting capabilities. Those tests have shown that INERGEN agent, at design concentrations between 40% and 50%, has successfully inerted mixtures of propane/air, and methane/air.

The system may be actuated manually by either pneumatic or mechanical means from both local and remote locations. Automatic release may also be permitted under certain restrictions as defined by the marine chapter of NFPA Standard 2001, and the specific requirements of various marine classification societies. Pneumatic pressure switches are available to provide ventilation shut down, fuel shut off, operation of dampers, annunciation, or other auxiliary shutdown functions.

When INERGEN agent is discharged into an area, it introduces the proper mixture of gases that will allow a person to breathe in a reduced oxygen atmosphere.

A system installation and maintenance manual is available containing information on system components and procedures concerning design, operation, inspection, maintenance, and recharge.

The system is installed and serviced by authorized distributors that are trained by the manufacturer.

Basic Use – The INERGEN system is particularly useful for suppressing fires in hazards where an electrically non-conductive medium is essential or desirable; where clean-up of other agents presents a problem; or where the hazard is normally occupied and requires a non-toxic agent.

The following are typical marine hazards protected by INERGEN systems:

- Machinery Spaces
- Pump Rooms
- Control Rooms
- Bosun's Store Rooms
- Emergency Generator Rooms
- Purifier Rooms
- Paint Lockers
- Radio Rooms
- All normally occupied or unoccupied electronic areas where equipment is either very sensitive or irreplaceable

Composition and Materials – The basic system consists of extinguishing agent stored in high strength alloy steel cylinders. Various types of actuators, either manual or automatic, are available for release of the agent into the hazard area. The agent is distributed and discharged into the hazard area through a network of piping and nozzles. Each nozzle is drilled with a fixed orifice designed to deliver a uniform discharge to the protected area. On large hazards, a screwed or welded pipe manifold assembly is employed. The cylinder(s) is connected to the distribution piping or the manifold by means of a flexible discharge bend and check valve assembly.

INERGEN Agent – INERGEN agent is a mixture of three inerting (oxygen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide. INERGEN gas extinguishes fire by lowering the oxygen content below the level that supports combustion. When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that still allow a person to breathe in a reduced oxygen atmosphere. It actually enhances the body's ability to assimilate oxygen. The normal atmosphere in a room contains 21% oxygen and less than 1% carbon dioxide. If the oxygen content is reduced below 15%, most ordinary combustibles will cease to burn. INERGEN agent will reduce the oxygen content to approximately 12.5% while increasing the carbon dioxide content to about 3%. The increase in the carbon dioxide content increases a person's respiration rate and the body's ability to absorb oxygen. Simply stated, the human body is stimulated by the carbon dioxide to breathe more deeply and rapidly to compensate for the lower oxygen content of the atmosphere.

Cylinders – The cylinders are constructed, tested, and marked in accordance with applicable Dept. of Transportation (DOT) and the U.S. Bureau of Explosives specifications. As a minimum, 150-bar cylinders must meet the requirements of DOT 3AA2300 or 3AA2015+. As a minimum, 200-bar cylinders must meet the requirements of DOT 3AA3000.

Cylinder Assembly – The cylinder assembly is of steel construction with a red marine approved finish. Each is equipped with a pressure seat-type valve equipped with gauge. The valve is constructed of forged brass and is attached to the cylinder providing a leak tight seal. The valve also includes a safety pressure relief device which provides relief at 2900-3300 psi (207-232 bar).

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Product Description (Continued)

Cylinder charging pressure is 2175 psi at 70 °F (150-bar at 21 °C) for 150-bar cylinders and 2900 psi at 70 °F (200-bar at 21°C) for 200-bar cylinders.The cylinders are shipped with a maintenance record card and shipping cap attached. The cap is attached to the threaded collar on the neck of each cylinder to protect the valve while in transit. The cylinder serial number and date of manufacture are stamped near the neck of each cylinder.

Manual or Pneumatic Actuators – Two means of actuation are available: manual and pneumatic. Manual actuation is accomplished by pulling the hand lever on the actuator. The lever design contains a forged mechanical detent which secures the lever in the open position when actuated. A pilot port is available on the cylinder valve for pneumatic actuation.

Nozzles – Nozzles are designed to direct the discharge of INERGEN agent using the stored pressure from the cylinders. Ten sizes of nozzles are available. The system design specifies the nozzle and orifice size to be used for proper flow rate and distribution pattern. The nozzle selection depends on the hazard and location to be protected. Nozzles are available in either 180° or 360° discharge patterns.

Pressure Reducer – The pressure reducer is required in the distribution piping to restrict the flow of INERGEN agent, thus reducing the agent pressure down stream. The component contains a stainless steel orifice plate which is drilled to the specific size hole required based on the hydraulic calculation. The orifice plate provides readily visible orifice identification. The pressure reducer is available in eight sizes: 1/2 in., 3/4 in., 1 in., 1 1/4 in., 1 1/2 in., 2 in., 2 1/2 in. and 3 in. NPT.

Pipe and Fittings – Because of the typical marine environment, all pipe and fittings must be protected from corrosion. See appropriate design manual(s) for complete details on the approved type of pipe and fittings.

Additional Equipment – Releasing devices, remote manual pull stations, remote manual pneumatic stations, corner pulleys, pressure trips, pneumatic switches, selector valves, sirens, and signage. All or some are required when designing a total system.

Limitations – The INERGEN system must be designed and installed within the guidelines of the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual. The ambient temperature limitations are 32 °F to 130 °F (0 °C to 54 °C).

Technical Data

Applicable Standards: The INERGEN system complies with the IMO International Convention for the Safety of Life at Sea (SOLAS), NFPA Standard 2001, "Standard for Clean Agent Fire Extinguishing Systems," and EPA Program SNAP (Significant New Alternatives Policy).

INERGEN systems are listed and approved by the U.S. Coast Guard, several marine classification societies (consult Johnson Controls), Underwriters Laboratories, Inc. (UL) and Factory Mutual (FM).

Installations

All system components and accessories must be installed by personnel trained by the manufacturer. All installations must be performed according to the guidelines stated in the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual.

Availability

Availability – INERGEN systems are available, and may be installed and serviced through authorized distribution networks located throughout the United States and in most countries throughout the world.

Cost – Cost varies with type of system specified, size, and design.

Maintenance

Maintenance is a vital step in the performance of a fire suppression system. As such, it must be performed by an authorized ANSUL® distributor in accordance with NFPA 2001 and the manufacturer's design, installation, recharge, and maintenance manual. When replacing components on the ANSUL system, use only ANSUL approved parts.

Note: The converted metric values in this document are for dimensional reference only and do not reflect an actual measurement.