

1. GENERAL SPECIFICATION

- 1.1 A pre-engineered, flexible hose, automatic dry chemical fire suppression system shall be provided and installed for the hazard including engine compartment, hydraulic areas, disc type brakes, fuel lines and reservoirs, pumps, battery compartments, and sources of ignition.
- 1.2 The system shall be Kidde Dry Chemical, Model KVS manufactured by Kidde Fire Systems, 400 Main Street, Ashland, MA or approved equal. The manufacturer shall be ISO 9001:2000 certified.

2. CODES/STANDARDS COMPLIANCE

- 2.1 The system shall conform to and be in accordance with the following:
 - A. UL 1254, with an effective date of September 29, 1998, Underwriters Laboratories Standard for Fire Extinguishing Systems for Protection of Industrial Hazards
 - B. Factory Mutual Approvals
 - C. NFPA 17, Standard on Dry Chemical Extinguishing Systems
 - D. NFPA 120, Standard for Fire Prevention and Control in Coal Mines
 - E. NFPA 122, Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities
 - F. MSHA requirements
 - G. Kidde Model KVS Instruction Manual and all applicable addenda
 - H. All applicable insurance company requirements
 - I. All applicable local and state codes and standards
 - J. NFPA 70 – National Electrical Code (NEC)
 - K. NFPA 72 – National Fire Alarm Code
 - L. Requirements of the Local Authorities Having Jurisdiction (AHJ).

2.2 The fire suppression system must have the following listings and approvals:

- A. The manufacturer shall meet ISO 9001 requirements for the design, production and distribution of the KVS Dry Chemical fire suppression systems.
- B. The supplied fire suppression system shall be FM approved for use on vehicle applications.

3. SYSTEM DESCRIPTION

3.1 All Vehicular Dry Chemical fire suppression equipment, control and detection equipment, and accessories must be manufactured and/or supplied by:

Kidde Fire Systems
400 Main Street
Ashland, MA 01721
U.S.A.

Phone: (508) 881-2000

URL: <http://www.kiddefiresystems.com>

3.2 The manufacturer shall warrant all KVS fire suppression system products for eighteen (18) months from the date of purchase, or one (1) full year from the date of installation.

3.3 The system shall be supplied and installed by a factory-authorized, Kidde Fire Systems distributor. The organization and Installer shall be trained by the manufacturer to calculate and design, install, test and maintain the KVS Dry Chemical Fire suppression system and shall be able to produce a certificate stating such on request.

3.4 The systems design shall be of a pre-engineered, modular type.

3.5 The system shall consist of Kidde Dry Chemical storage Cylinder(s), Kidde actuation hardware and Kidde agent distribution nozzles attached to a hose network.

3.6 Agents

The system shall use Kidde "ABC" (monoammonium phosphate) dry chemical agent.

4. COMPONENTS

4.1 KVS Cylinder and Valve Assembly

- A. The Kidde dry chemical agent shall be contained in one or more stored pressure DOT rated steel cylinder and valve assemblies. Cylinders requiring an external source to pressurize the agent shall not be acceptable. The cylinder and valve assemblies shall have the following features:
1. The Kidde Model KVS cylinder(s) shall be of type and size as required by the Kidde Instruction Manuals.
 2. The cylinder(s) shall have a tin-nickel alloy plated brass valve, with pressure gauge. Agent cylinders without pressure gauges shall not be acceptable. The valve shall contain a check stem that is operated by the action of the actuating assembly. Agent cylinders utilizing a burst disc as a means of sealing the discharge outlet will not be acceptable.
 3. The cylinder and valve assemblies shall be pressurized to 360 PSIG (24.8 bar) with dry nitrogen. The cylinder and valve assemblies shall be capable of being stored and operated at temperatures between -65°F (-54°C) and 200°F (93°C).
 4. The cylinder shall have a shield to protect the gauge. The shield shall be a separate assembly from that of the gauge, and shall be separately mounted.
- B. Sufficient cylinder and valve assemblies shall be provided to protect the entire hazard area. Listed bracketing shall be provided to mount the cylinder securely to the intended mounting surface.

4.2 System Control Panel

- A. The system control panel shall be capable of all functions associated with automatically and manually discharging the dry chemical agent from all cylinder and valve assemblies, including automatic shutdown of the heat source and/or fuel and electrical power to all protected areas upon system discharge.
- B. The control panel shall have RFI protection built into the circuitry, and shall be capable of field settable programming. External connections that are part of the control panel shall be mounted directly to the circuit board to maintain integrity.
- C. The control panel shall be expandable through a listed expansion module. The expansion module shall be capable of field settable programming, and shall contain two (2) detection circuits and two (2) agent-releasing circuits.

- D. The control panel and expansion module(s) shall accept dual spectrum infrared (IR) detectors, watertight heat detectors, and linear heat cable, and any combination of the three.
- E. All detection and releasing circuits shall be supervised and the system shall provide for a 24-hour secondary power supply in the event of primary power loss.

4.3 Actuation

- A. Agent Storage Cylinder Actuation shall have two (2) options
 - 1. Electric actuation shall consist of a protractor device that directly actuates the agent storage cylinder valve. Up to five (5) in series shall be approved for each releasing circuit.
 - 2. Pneumatic actuation shall consist of a squib device to open a nitrogen cylinder. Agent storage cylinders will be actuated through pressure-operated actuators at each cylinder.

4.4 Automatic Detection

- A. Infrared detectors shall be a dual spectrum type, where both spectrums must be visible in order for the detector to alarm. One of the spectrums shall be in the range(s) specific to hydrocarbon fires, ensuring false alarm immunity.
- B. Heat detectors shall be rate compensated for rapid detection with resistance to false alarms. They shall include weather-tight vehicular connectors and a pass-through conductor to allow for use of IR detectors in series. Heat detectors shall be chosen with a temperature rating suitable to their expected normal exposure temperature.

4.5 Distribution Nozzles

- A. Nozzles shall be located to protect the engine compartment and all other areas requiring protection. Nozzle choice, coverage, and location shall be per the applicable Kidde FM approved instruction manual.
- B. All nozzles shall be equipped with caps to prevent the ingress of grease and other foreign matter into the nozzles and distribution hoses. Nozzle caps shall remain covering the nozzle during vibration and cleaning, and shall be of a material suitable for exposure to petroleum based fuels, oils, and cleaners.

4.6 Distribution System

- A. The distribution system shall be red fire protection hose with MSHA rated flame resistance that meets SAE100R1 pressure ratings. The phrase "Do Not Remove" shall be clearly indicated on the hose.
- B. Changes in direction may be accomplished through the use of standard weight pipe fittings.

5. SYSTEM INSTALLATION AND COMMISSIONING

5.1 KVS Fire Suppression System Equipment

The installer shall install the system in accordance with the manufacturer's installation, operation and maintenance manual.

5.2 Training Requirements

The installer shall be certified and trained by the manufacturer on installation, design and maintenance of the Kidde KVS fire suppression system.

5.3 Routine Maintenance

Routine maintenance shall be performed as recommended by the manufacturer's Design, Installation, Operation and Maintenance manual, NFPA 17, NFPA 120, NFPA 122, MSHA regulations, and other appropriate standards.