

# ADVANCED FIRE SUPPRESSION TECHNOLOGIES

## STORED PRESSURE SYSTEM





## **General Information**

Stored foam suppression systems are ideal for multi risk situations where both class A combustible materials and class B flammable liquid risk are likely to be found, or where class B risks represent a direct hazard. Stored foam suppression systems are especially suitable for class B fires involving flammable liquids such as oils, spirits, fats and certain plastics.

The blanketing effects of foam spray gives a rapid knock down which smothers the flame and prevents re-ignition of flammable vapors by sealing the surface of the solution.

Stored foam suppression systems are designed for use in industrial, mining and commercial applications. This type of system requires regular maintenance by a competent person. The capacities are 65lt, 45lt, 35lt, 25lt. These products can be supplied either empty, or filled and pressurized ready for use.

The Advanced Stored Pressure system utilizes an agent storage tank(s) that contain a mixture between water and AFFF chemical solution. The Advanced stored pressure system is a pre-engineered, fixed nozzle system design to be used either as a stand alone system or work in tangent with another system i.e Asex these two systems will act as the primary suppression system. The dry chemical/liquid agent twin agent system is for the protection of large, off-road type vehicles and non-vehicle construction and mining equipment such as large excavators/shovels, draglines, haul trucks, wheel loaders. Speciality vehicles such as slag, pot, slab carriers, tunnel boring machines, waste management equipment and forestry vehicles. These type of equipment have large volumes of oils, fuels and hydraulic fluids under pressure.

With a break in large pressurized hydraulic line, fuel can spray onto many surfaces some possibly hot enough to cause ignition.

The AFFF chemical solution can flow into hard to reach areas where flammable fuels may have also flowed.

The dry chemical portion of the twin agent system is primarily responsible for fire suppression. Although the AFFF wet chemical solution is primarily intended for cooling, it can also aid in suppression by two means.

- The water content of the solution cools the fuel and the surface surrounding surface areas. Cooling the surrounding surface areas minimizes the chance of a reflash.
- Forming a film over the fuel, which will aid in securing against reflash.



**Specification Chart**

<b>MODEL</b>	<b>Part Number</b>	<b>Capacity</b>	<b>Shipping Weight</b>	<b>Dimesions</b>	<b>Actuation</b>
<b>F-25 Tank, Bracket &amp; Valve Complete</b>	ADVS-001	23Lt 6% AFFF Wet Chemical Agent	42.8Kg With Bracket	520mm x 500mm x 307mm	Electric Detection With Pneumatic Actuation. Manual or remote actuators
<b>F-35 Tank, Bracket &amp; Valve Complete</b>	ADVS-002	33Lt 6% AFFF Wet Chemical Agent	47.6Kg With Bracket	695mm x 500mm x 307mm	Electric Detection With Pneumatic Actuation. Manual or remote actuators
<b>F-45 Tank, Bracket &amp; Valve Complete</b>	ADVS-003	42Lt 6% AFFF Wet Chemical Agent	49.5Kg With Bracket	791mm x 500mm x 307mm	Electric Detection With Pneumatic Actuation. Manual or remote actuators
<b>F-65 Tank, Bracket &amp; Valve Complete</b>	ADVS-004	63Lt 6% AFFF Wet Chemical Agent	62.3Kg With Bracket	1000mm x 500mm x 307mm	Electric Detection With Pneumatic Actuation. Manual or remote actuators

**Specifications Continued..**

The Advanced Stored pressure system is a pre-engineered stored pressure type system. The system incorporates automatic detection with engine shutdown capabilities (connection done by others) The Design of the system (specific hose sizes, maximum and minimum lengths, fittings, nozzles and qty of foam.) Will provide protection for the hazard.

Installation will be in accordance with the approved design. Maintenance will be done according to maintenance procedures. Installation and services will conform to NFPA Standard 11, “Wet Chemical Extinguishing System”, And NFPA standard 121, “ Mobile Surface Mining Equipment.”.

### **Agent Storage Tank**

The Agent storage tank(s) consist of a welded stainless steel tank, gas tube, nickel plated valve, agent outlet and instruction nameplate. The tank is painted with a red enamel paint, agent storage tanks are available in four sizes: 25lt, 35lt, 45lt and 65lt. Cylinders to be charged at a preferred 2000KPA, but 1620KPA will also be compatible.

F25 Shell And Label Only, P/N: ADVS-009

F35 Shell And Label Only, P/N: ADVS-010

F45 Shell And Label Only, P/N: ADVS-011

F65 Shell And Label Only, P/N: ADVS-012



### **Actuation Cartridge**

The actuation gas cartridge LT-10-R(P/N:423423) or refurbished LT-10-R(P/N: REC-010) is used in the Advanced Stored Pressure Systems remote activation, either manual or automatic. The cartridge is sealed pressure vessel containing nitrogen gas under pressure. When the pin in the remote manual or pneumatic actuator punctures the cartridge, the gas flows to the actuator head on the agent tank(s), causing the actuator to release the stored agent in the agent tank(s).



**P/N: 423423**

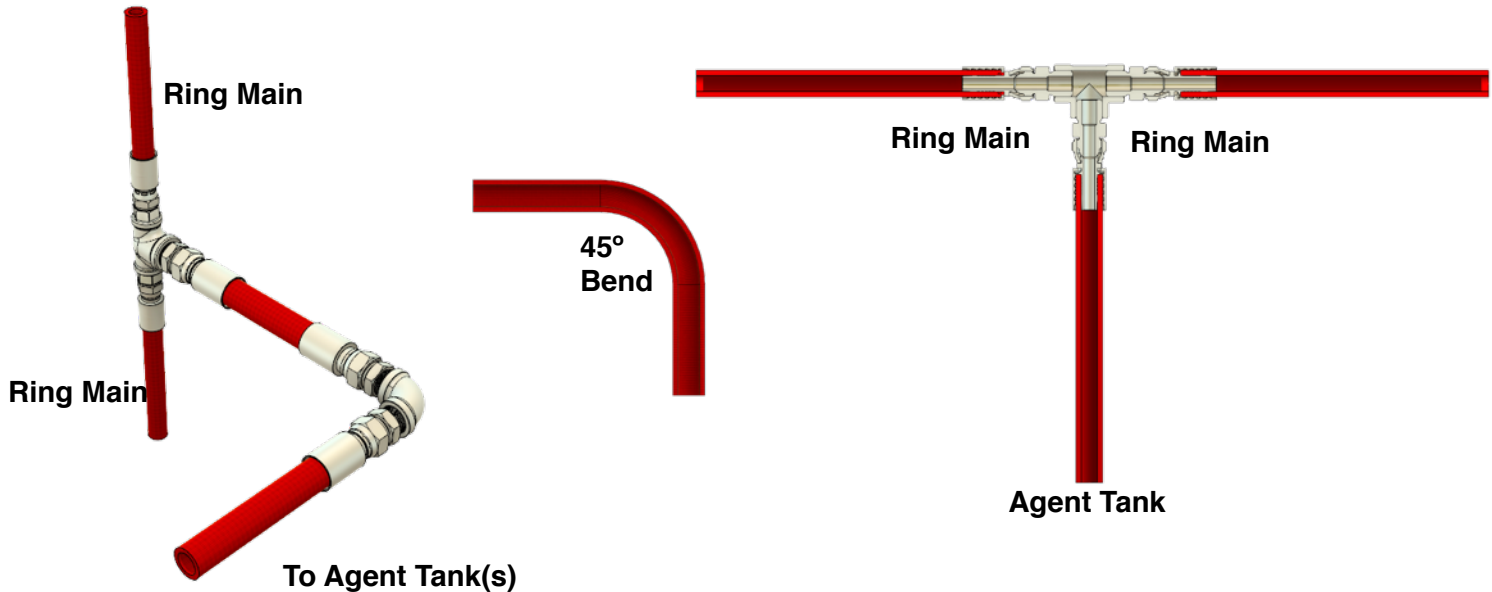
### **Design Parameters**

When used in conjunction with a dry chemical system (twin agent concept), the dry chemical system can be designed as either a standard discharge system or an extended system. An automatic detection system will be required. The twin agent fire suppression system should automatically perform the following functions- Engine shutdown, pressurized hydraulic tank and fuel tank if possible and a fuel shut off.

As part of the total fire suppression system package, training for the personal and machine(s) operators must be conducted and documented. A maintenance contract allowing periodic service and maintenance at scheduled intervals should be included.

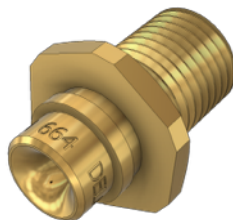
## **Distribution Hose And Nozzles**

The distribution piping network is designed to properly distribute the AFFF agent to the foam nozzles. To survive the vibration found on mobile equipment, hose is used to distribute the agent. In the Advanced stored pressure system, hose sizes, maximum and minimum lengths, number of nozzles are all predetermined in the calculation phase. Blow off caps are supplied to be placed over the nozzle to prevent any grease and dirt that may block the nozzle or affect the nozzle spray pattern.



## **Nozzle (P/N: KIDDE-55216)**

The nozzle is a non-aspirating full cone agent discharge nozzle. A 45° barstock (P/N:KIDDE-55211) allows for a maximum area coverage of 1.5ft(0.5m) per nozzle at a range of 2ft(0.6m) or a diameter of 3ft(0.9m) per nozzle at a range of 4ft(1.2m). Nozzle(s) are available as a single nozzle with blow off cap. Blow off cap P/N:77695.



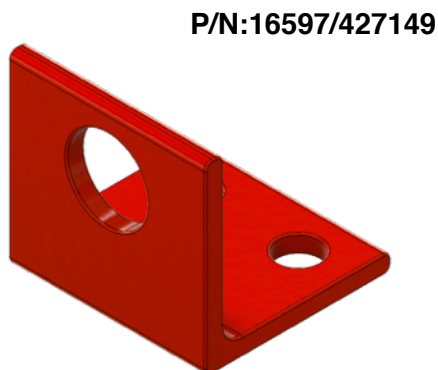
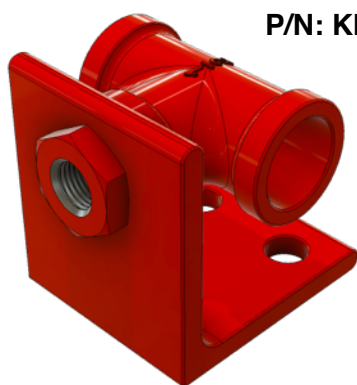
**P/N: KIDDE-55216**

### **Nozzle Bracket**

Two types of nozzle bracket(s) are available for the Advanced Stored Pressure System(s). Bracket, Nozzle[AFFF], P/N: KIDDE-55210 and bracket nozzle [F1/2 & C1/2] P/N: 16597/427149.

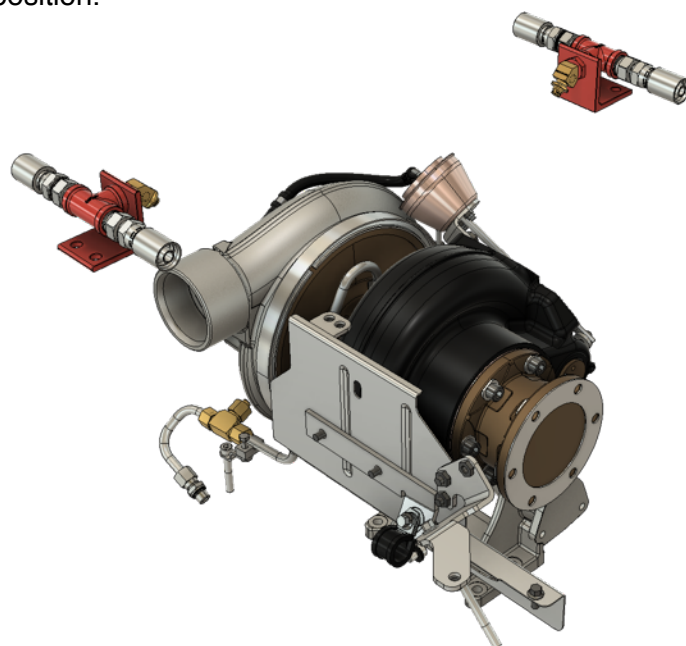
**Note:** P/N: 16597 requires a reducing socket from 1/2" to 1/4".

Each style bracket is constructed of unpainted 1/4"(6.4mm) steel. They contain pre-punctured holes for the nozzle and pre-drilled holes for mounting.



### **Wet Chemical Coverage**

When cooling turbochargers, a minimum of two (2) nozzles must ALWAYS be used for each turbo. In addition all other areas that can become superheated with temperatures close to or in excess of 850°F (454°C) must also be considered for additional nozzles. Nozzles should be positioned to discharge the agent directly onto the hazard area, with little or no obstructions to interfere with the discharge of the agent. The nozzles should be mounted no less than 45° from the horizontal position.



## **Safety Relief Valve**

A spring loaded pressure relief valve is used to prevent excessive pressure from building up in the actuation line. The valve is set to relieve pressure at 265PSI(18.3Bar). After a system discharge all pressure in the actuation line can be relieved by pulling the ring on the safety relief valve. Please wear all necessary safety equipment when releasing excessive gas in actuating lines.



## **Hazard Analysis**

The final system design must consider all potential ignition and fuel source(s) in the area being protected. This means pre-installation in depth analysis of all likely areas of probable fire incidents must be performed.

## **Hazards**

Fire hazard areas exist when a fuel source can come in contact with an ignition source. This may be due to the close proximity of the fuel of the machine that may allow running or spraying fuel to come in contact with an ignition source. A hazard analysis of the equipment should determine which of the components would require protection. A hazard analysis should also determine any other areas not listed below, that may potentially be considered a hazard and may require requiring protection.

The following are generally considered to be a fire hazard areas that may require cooling.

- Engine (the engine consists of various components that contain or transfer fuels, components involved with lubrication and electrical contacts and controls as well as components that generate heat.)
- Protection may include but not limited to the following components:
  - Exhaust manifolds
  - Turbochargers
  - Heat Exchangers
  - Engine Block
  - Electrical Equipment
  - Exhaust Systems
  - Hydraulic Pumps
  - Transmission / Gear Reduction boxes
  - Brakes and Break Valves
  - Drive Train Bearings
  - Swing Gear Motors And Travel Clutches
  - Large Electrical Generators and Motors(de-energized)

## **Actuation System Requirements**

The following requirements must be followed:

- Any combination of dry wet systems the maximum number of pneumatic actuators is ten.
- All remote manual/automatic actuators must use the LT-10-R P/N:423423 cartridge.
- Maximum length of 1/4" actuation hose must not exceed 100ft(30.5m).

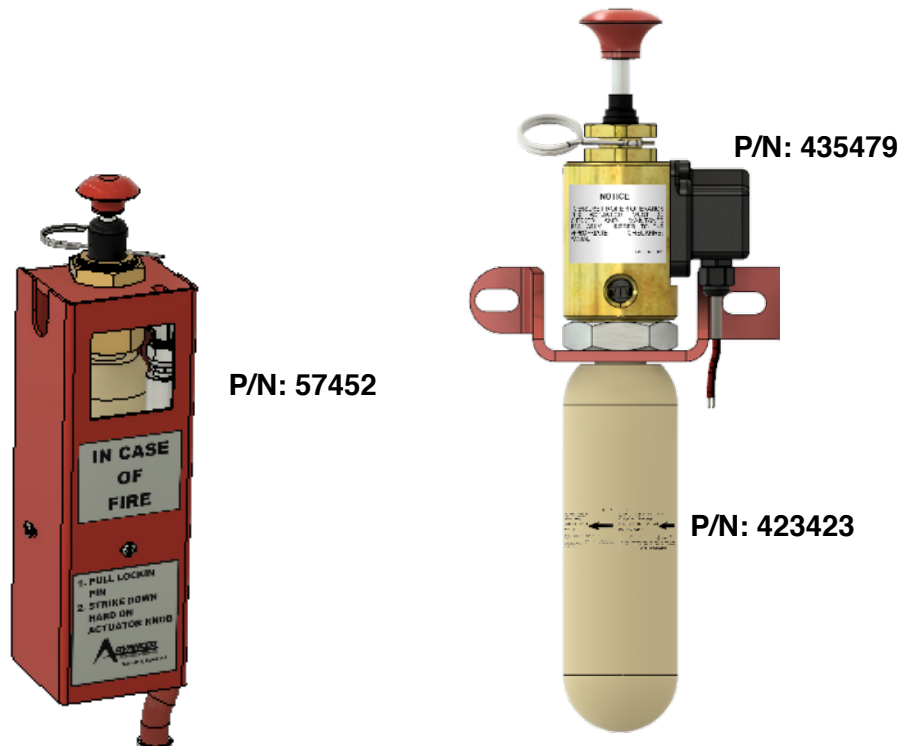
**Note:** When calculating maximum hose lengths, the maximum length must include all hoses that are pressurized from the actuator cartridge, including pneumatically operated auxiliary devices such as pressure switches, shutdown valves etc.

## **Remote Actuator Bracket**

A remote manual actuator must be located in the drivers cab/ compartment within reach of the operator, and a remote manual actuator should be located at a point on the vehicle accessible from ground level. When mounting any actuator, make certain the length of hose between the actuator and the tank or remote excellent gas cartridge does not exceed 100ft(30.5m) for LT-10-R cartridges. Also, make certain there is enough room for cartridge removal.

**Note:** The actuator must be located in an area that will not exceed temperature limitations or be subjected to fire damage. Try to avoid mounting actuator near engine compartment.

- Choose a suitable mounting location and weld or bolt each actuator bracket in place. If bolting the bracket(s), use M10 bolts. If welding, to prevent welded surface corrosion, paint welded surface.



### Manual Actuator Continued..

The manual actuator is designed with a red palm button (P/N: 16470) which is attached to a cartridge seal piercing pin (P/N: 74837) and a ring pin (P/N: 0507) to guard against accidentally piercing the cartridge seal. To initiate agent release, the operator must pull out the ring pin and strike the red palm button. The manual actuator must be located near the operators control station.



### Check Valve

The 1/4" check valve (P/N: 53051) is installed in the actuation line between the manual/automatic actuator and the pneumatic actuator on the connected fire suppression system. This check valve allows actuation pressure to flow to the fire suppression system, but does not allow pressure from other actuation devices to back up into the manual automatic actuator.

