DESIGN, INSTALLATION, MAINTENANCE & RECHARGE MANUAL

NO. 20150

AMEREX

RESTAURANT FIRE SUPPRESSION SYSTEM

TESTED AND LISTED BY
UNDERWRITERS LABORATORIES
TO UL STANDARD 300
and
UNDERWRITERS LABORATORIES OF
CANADA ULC/ORD 1254.6-1995*

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A Factory Trained and Authorized Distributor must perform the installation and service of any Amerex Restaurant Fire Suppression System in strict accordance with this manual.

* ULC Certification does not apply to the STRIKE™ or SRM.

Printed in U.S.A.

December 2008
(rev. February 14, 2019)

MM#20150-9/2014

THE NEW MANUAL – WHAT IS NEW?

This NEW Restaurant Systems Manual carries a new part number, 20150, for it is a combining of the two previous manuals, KP Manual PN 12385 rev. “A” and ZD Manual PN 16640. The combining of the two manuals does not eliminate any of the limitations of system requirements of the original two manuals, but strives to organize the information into a comprehensive order with additional informative information for greater clarity and understanding.

Some of the changes you will notice in the new manual are made to reduce cost of inventory, printing, manufacturing, ordering and returns. The first item you will notice is the change in nomenclature, **KP** 375 or **ZD** 375 Agent Cylinder Assemblies are now referred to as a **Model** 375 Agent Cylinder Assemble. Now there is only one part number per **Model** of Agent Cylinder Assembly. No longer do you have to order a different part number for a **KP** or **ZD** Agent Cylinder Assembly nor do you have to stock two cylinders the same size simply because one is for a **KP** system and one is for a **ZD** system.

Closer examination of the new manual will reveal that the original configured MRM required that you purchase a MRM and an enclosure (painted or stainless steel) separately. The new MRM II is supplied pre-installed in an enclosure (painted or stainless steel) ready to mount on the wall. The new MRM II incorporates the use of a new ratcheting take up for the automatic detection line. The original MRM used a manual take up method for the cable tensioning and was part number 11977. The original MRM version is no longer in production, however if a replacement for an existing unit is needed or if you are ordering a “Cabinet” enclosure (PN 11978) you can still order part number 11977 as a replacement or to use in the “Cabinet” enclosure. The part number now supplies a MRM II unit without the enclosure, but with the new ratcheting take up. It is 100% interchangeable with the original MRM.

The new manual will still contain service and maintenance instructions for the original style MRM. Anytime you see a heading that says MRM, it is referring to the original style unit. If the information is good for both style units it will say MRM / MRM II. The following arrangement, MRM / MRM II / PRM, indicates that the information is good for all three units.

Due to the combining of the two manuals the following substitutions should be used as follows:

KP Manual PN 12385 is superseded by Restaurant Manual PN 20150
ZD Manual PN 16640 is superseded by Restaurant Manual PN 20150
ZD 275 Agent Cyl. Asy. PN 17102 is superseded by Model 275 Agent Cyl. Asy PN 16921
ZD 375 Agent Cyl. Asy. PN 16650 is superseded by Model 375 Agent Cyl. Asy PN 13334
ZD 475 Agent Cyl. Asy. PN 17474 is superseded by Model 475 Agent Cyl. Asy PN 17397
KP/ZD 375 Mounting Bracket PN 16085 is superseded by 375 Mounting Bracket PN 17690

December 2008

LIMITED WARRANTY

Amerex warrants its Restaurant Fire Suppression Systems to be free from defects in material and workmanship for a period of three (3) years from the date of purchase. During the warranty period, any defective part will be repaired or replaced (at Amerex option). This warranty is valid only if each system is installed, serviced and maintained by an Amerex authorized distributor in strict accordance with Amerex Manual No. 20150. All work must be performed using genuine Amerex replacement parts. This Warranty does not cover defects resulting from modification, alteration, misuse, exposure to corrosive conditions or improper installation or improper maintenance. Warranties on component items not manufactured by Amerex are provided by others whose warranty, evaluation and judgment will be final.

ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF FITNESS FOR PURPOSE AND MERCHANTABILITY, ARE LIMITED TO THE TIME PERIOD AS STATED ABOVE. IN NO EVENT SHALL AMEREX CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so that the above limitations or exclusions may not apply to you.

Amerex Corporation neither assumes nor authorizes any representative or other person to assume for it any obligation or liability other than as expressly set forth herein. This Warranty gives you specific legal rights, and you may also have other rights that vary from state to state. To obtain performance of the obligation of this Warranty, write to Amerex Corporation, P. O. Box 81, Trussville, Alabama 35173-0081, USA for instructions.

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SECTION 1

GENERAL INFORMATION

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
to ULC/ORD 1254.6-1995*

December 2008

*** ULC Certification does not apply to the STRIKE™ or SRM.**

GENERAL INFORMATION

The Amerex KP / ZD Series Restaurant Wet Chemical Fire Suppression System is designed and has been tested to provide fire protection for commercial cooking operations covering the hood, ducts, plenum and appliances. Amerex Restaurant Fire Suppression Systems are a pre-engineered type as defined in NFPA 17A – Standard for Wet Chemical Extinguishing Systems. It is manufactured by the Amerex Corporation, Trussville, Alabama.

It is essential that all installations of the Amerex KP / ZD Series Systems be performed in compliance with this manual. **Those individuals responsible for the design, installation, operation and maintenance of the Amerex Restaurant Fire Suppression System must be trained by Amerex and hold a current Amerex Certificate.** All piping limitations, nozzle coverages, detector placements, etc. have been proven and established through exhaustive testing by Underwriters Laboratories, Inc. Use of components other than those referenced in this manual, or installations exceeding limitations stated in this manual will void all of the Amerex KP / ZD Series System listings.

LISTINGS:

The Amerex KP / ZD Series Fire Suppression Systems are a listed pre-engineered fire extinguishing systems. The KP & ZD systems are listed with Underwriters Laboratories, Inc. – USA per UL 300 fire test specification; Underwriters Laboratories of Canada, Inc. per ULC/ORD 1254.6 – 1995 and Loss Prevention Certification Board – UK per LPS 1223 rev. B. The use of the STRIKE™ panel and SRM releasing device is not ULC Certified. Testing required for listings under these standards involve live fire tests under specific conditions involving commercial kitchen hoods, ducts and appliances. Each test fire is allowed to reach its maximum intensity before agent is discharged. Each test was repeated using both maximum and minimum piping, variations in agent storage cylinder pressure to simulate maximum and minimum temperature ratings. Duct fire tests were extinguished with fans off and fans on; dampers open and closed. Splash tests for various appliances were conducted to assure that discharge of the agent would not cause excessive splashing of hot grease to provide greater employee safety during commercial cooking operations.

UL Standard 300 introduces a series of tests by specifically addressing the use of high efficiency fryers, ranges, woks and the unique fire extinguishing challenges that these appliances present.

DESIGN:

The Amerex KP Series Pre-Engineered Fire Suppression Systems consist of mechanical and electrical components to be installed by an Authorized Factory Trained and Certified Amerex Restaurant Fire Suppression Systems distributor. The system is composed of an Agent Cylinder/Discharge Valve charged with Amerex Kitchen Wet Chemical Agent and a Mechanical Release Module (MRM or MRM II), Pneumatic Release Module (PRM) or a STRIKE™ panel / STRIKE™ Releasing Module (SRM). The quantity of detectors, fusible links, nozzles, corner pulleys, pulley tees and manual pull stations will vary depending on kitchen 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 cooking appliances are required to be shut off immediately. Electrical shutdown devices or suitable gas valves are referenced in this manual. Other equipment such as audible/visual signaling devices can be added where required.

The Amerex Restaurant Fire Suppression System suppresses fire in commercial cooking equipment by spraying Amerex Wet Chemical Agent in a pre-determined manner onto cooking appliances and into exhaust ducts, filters and plenum areas. The primary means of fire suppression is either by saponification of surface grease or by cooling the surface of oils and hot metal surfaces with fine droplets of agent, reducing the temperature of the oil and appliance below the auto-ignition point.

Upon system discharge, the exhaust fans should be left on to aid in dispersal of the liquid suppressant that results in cooling the plenum and duct. Any integral make-up or supply air should be automatically shut off along with all cooking appliances. Some local Authorities Having Jurisdiction require exhaust fans to be shut down by the fire suppression system. Check local fire codes, AHJ and Department of Health in the specific area that the system is being installed for special installation requirements.

The Amerex Restaurant Fire Suppression System agent storage cylinders and cartridge shall not be installed in environments below 32° F or above 120° F (0° C to 49° C).

GENERAL INFORMATION – ZONE DEFENSE SYSTEM

The Amerex KP and ZD Series Pre-Engineered System consists of mechanical and electrical components to be installed by an Authorized Factory Trained and Certified Amerex Restaurant Fire Suppression Systems distributor. The system is composed of an Agent Cylinder Assembly charged with Amerex Kitchen Wet Chemical Agent and a Pneumatic Release Module (PRM) or an MRM, MRM II using a linear link detection network.

The system operates either automatically, if actuated by a rupture in the pressurized thermal responsive tubing or by the separation of a thermal link or manually if actuated by a manual pull station. Upon system operation, energy sources for the cooking appliances are required to be shut-off immediately. Electrical shutdown devices or suitable gas valves are referenced in this manual. Other equipment such as audible/visual signaling devices can be added where required.

The Amerex ZD and KP Series Systems use the same components and share the same UL Listings and limits for the protection of the exhaust duct, plenum and dedicated appliance protection. They **do not** share the same piping limitations or installation philosophy. This manual provides the unique limitations which apply to a Zone Defense Fire Suppression System.

What is the basic difference between a KP and ZD System Philosophy?

The Amerex Zone Defense System was developed for the kitchen that changes out it's cooking appliances frequently to accommodate the change in menu or cooks. The ZD System provides a detection system and protection system which allows for the moving and rearranging of appliances without changing the fire suppression piping or detection device locations. This is accomplished by using a detection network that will detect a fire no matter where it occurs under the hood and will extinguish cooking appliances located anywhere under the hood, as long as they are inside the "**Zone of Protection**". Also the appliances must be capable of being extinguished from overhead. Appliances such as upright broilers, salamanders, covered tilting skillets, chain feed pizza ovens, etc. are all appliances that cannot be extinguished from overhead, but require specific nozzles with specific aiming for the individual appliance. The use of a "**back shelf**" over appliances also will block the application of agent from overhead nozzles and therefore requires the use of "**Dedicated Appliance Protection**" for an appliance with a back shelf.

The Amerex Kitchen Protection Fire Suppression System differs from the ZD System in the manner in which it protects appliances and detects a fire under the hood. The KP System uses individual "Dedicated Appliance Protection" for each appliance under the hood requiring protection. A choice of the fire detection method may be a standard thermal link network or one of the two linear detection networks. (PRM or Linear Fusible Link).

The KP & ZD Series Systems have their distinct application use in the field of kitchen protection. They both provide superior protection from the hazards of commercial cooking.

How do I obtain MSDS Sheets?

MSDS sheets may be downloaded for the Amerex Internet Website:
http://www.amerex-fire.com/msds/msd/10

MSDS sheets may also be mailed to you by requesting them by phone or mail:
Amerex Corporation
7595 Gadsden Highway
P.O. Box 81
Trussville, AL 35173
Phone: 205/ 655-7602

DEFINITION OF TERMS

ACTUATION NETWORK: Copper tubing, piping, hose, or combination of the three that allows nitrogen to be supplied from the Mechanical Release Module or Pneumatic Release Module to the Agent Cylinder Assembly(s).

AGENT CYLINDER / DISCHARGE VALVE: Pressurized vessel with valve assembly containing Amerex Wet Chemical restaurant fire suppression agent and expellant gas (nitrogen/argon).

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 "Authority Having Jurisdiction"; at government installations, the Commanding Officer or departmental official may be the "Authority Having Jurisdiction".

AUXILIARY EQUIPMENT: Listed equipment used in conjunction with the Amerex Restaurant Fire Suppression System to shut down: power, fuel and make-up air. Auxiliary equipment also operates dampers, sound alarm signals or initiate fire alarm systems.

"**BAG 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.

BLOW-OFF CAP: A cap (made of rubber or metal with a restraining strap) that covers the nozzle tip to keep grease from plugging the orifice.

BRANCH DUCT: Ductwork for exhaust from a single hood or hazard to a common duct.

NITROGEN CYLINDER: A small, sealed steel cylinder containing nitrogen (refillable by distributor) used to actuate the agent cylinder/discharge valve(s).

CABLE: 1/16" diameter stainless steel cable (7 x 7 strand, 480# tensile strength) used to connect detectors, mechanical gas valves and manual pull stations to the MRM.

COMMON DUCT: Ductwork for exhaust from two or more separate hazards.

CONDUIT OFFSET: A factory formed section of conduit that allows the cable for manual pull stations, gas valves and detectors to make a smooth transition into the Mechanical Release Module or Pneumatic Release Module.

COOKING APPLIANCE: Includes but is not limited to ranges, fryers, griddles and charbroilers.

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.

DAMPER: A valve or plate located within a duct or its terminal equipment for controlling the flow of exhaust gases and air. Damper's may also be present on cooking appliances.

DEDICATED APPLIANCE PROTECTION NOZZLE: A nozzle dedicated to the protection of a cooking appliance with an enclosed cooking hazard, like an upright broiler, which cannot be protected with "zone of protection" nozzles. Therefore, must be protected with nozzles explicitly listed for that appliance.

DETECTOR: (NFPA 96 "Electrical, pneumatic, thermal, mechanical or optical sensing instrument or sub components of such instruments whose purpose is to cause an automatic action upon the occurrence of some pre-selected event".): MRM or MRM II: 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. PRM: A pneumatic tube that will automatically actuate the fire extinguishing system at a predetermined temperature will be used with the PRM.

DETECTION NETWORK: MRM or MRM II: A continuous cable run through EMT conduit, corner pulleys and detectors that provide a mechanical input to the mechanical release module in order to actuate the system automatically. PRM: A continuous run of pressurized thermal responsive tubing that provides a mechanical input to the pneumatic 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 consisting of supply lines, supply branch lines and nozzle branch lines that serve as a means to deliver agent from the agent cylinder/discharge valves through the nozzles.

DUCT: A continuous passageway for the transmission of air and vapors which, in addition to the containment components themselves, may include duct fittings, plenums and/or other items or air handling equipment.

ELECTRICAL CONTROL HEAD (ECH): A pneumatic assembly which, when connected to the UL Listed Amerex SR-X Releasing Control Panel (UL File S24395), will open up to ten (10) Agent Cylinder / Discharge Valves via the activation of the connected Electric Actuator.

ELECTRIC CONTROL HEAD, KP600 (P/N 26797): A mechanical device that bolts directly to the top of a KP600 agent cylinder valve that is actuated by a linear actuator from the STRIKE™ ECS.

ELECTRIC CONTROL HEAD (P/N 26127): A mechanical device that screws directly to the top of a KP275, KP375 or KP475 agent cylinder valve that is actuated by a linear actuator from the STRIKETM ECS.

FLOW POINT: The term used to describe the flow capacity of each nozzle. This information is used to determine the number of agent cylinder/discharge valves required for a specific installation.

FUSIBLE LINK: A fixed temperature heat detection device used to restrain the operation of the Mechanical Release Module until the detectors designed temperature is reached. At its designated temperature, the fusible link will separate, releasing tension on the cable, causing the system to discharge.

GAS TRIP ASSEMBLY: A pneumatic device mounted in the MRM, MRM II or PRM, which upon system actuation pulls the cable connected to the mechanical gas valve causing it to close and stop the flow of gas.

GAS VALVE: A mechanical or electrical valve used to shut off the supply of gas to the cooking appliances when the fire suppression system discharges. Such devices are required by NFPA 96 and are to be listed with the system components. Gas valves must be manually reset.

GREASE: Rendered animal fat, vegetable shortening, vegetable oils or any combination thereof, which is used for, or the result of, cooking and preparing food. Grease may be liberated and entrained in exhaust air or may be visible as a liquid or a solid.

GREASE FILTER: A component of the grease vapor removal system that deflects the air and vapors passing through it in a manner that causes the grease vapor concentration and/or condensation for the purpose of collection, leaving the exiting air with a lower amount of combustible vapor.

GREASE TIGHT: constructed and performing in such a manner as not to permit the passage of grease under normal cooking conditions.

HOOD: A device provided for a cooking appliance(s) to direct and capture grease-laden vapors and exhaust gases, and constructed within the requirements of NFPA 96.

INPUT: An event monitored by the Mechanical Release Module (MRM or MRM II) or Pneumatic Release Module, which causes a corresponding output(s). (Example: A detector senses fire [input] and the system discharges [output] and trips the gas valve [output]).

INSPECTION: A "quick check" to give reasonable assurance that the system has not been tampered with.

LINEAR ACTUATOR (P/N 24448): The Linear Actuator is a device that, when electrically activated, extends a metal shaft to mechanically open agent cylinder (with an electric actuation option) in the AMEREX® KP™ Fire Suppression System. The Linear Actuator connects to the end of an actuation circuit and is color coded yellow.

LISTED: Equipment, materials, components and parts included in a list published by an organization acceptable to the AHJ (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. The listing may not be considered valid unless so labeled.

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.

MAKE-UP AIR: Air that is brought into the hazard from outside of the area, using a dedicated fan, to aid in the exhaust of grease-laden vapors.

MANUAL PULL STATION: The device that allows the system to be manually discharged either at the hazard or from a remote location.

MECHANICAL RELEASE MODULE (MRM / MRM II): An assembly that connects and controls the actuation cartridge, the detectors, the manual pull station(s), the gas valve, the micro-switch(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.

SNAP ACTION SWITCHES: A set of dry (unpowered) electrical contacts arranged in various configurations for initiating appropriate output functions such as signal to the building fire alarm, audible/visual remote signal, electrical power shut-off, electric gas valve shut-off.

NOZZLE: The device used to deliver a specific quantity, flow and discharge pattern of fire suppression agent to a specific appliance, duct size or plenum size.

NOZZLE BRANCH LINE: All pipe and fittings leading from the supply branch tee to a system nozzle.

OUTPUT: An action that is initiated by the mechanical release module in responding to a pre-determined input. (Examples: Agent release, power shut-off, remote signal, gas valve closure)

PERIMETER INCHES: The sum of the measurement of each side of a rectangular duct opening. (Example: Duct opening measuring 18" x 9" would have 54 perimeter inches [18 + 18 + 9 + 9 = 54])

PLENUM: The space defined by the filters and the portion of the hood behind the filters.

PNEUMATIC RELEASE MODULE (PRM): This single hazard control mechanism supervises and controls one Fire Suppression System. Proven, rugged mechanical components are reliably set into motion with a simple linear pneumatic detection interface. The control mechanism interfaces with mechanical manual pull station(s), actuation networks, mechanical gas valves, and offers electrical contacts for shutdown functions. Refer to the Design and Installation Manual, P/N 16546 for further details.

PRE-ENGINEERED SYSTEM: Those systems having pre-determined flow rates, nozzle pressures and quantities of agent. These systems have the specific pipe size, maximum and minimum pipe lengths, flexible hose specifications, number or fittings and number of types 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 that can be protected by these systems are contained in the manufacturer's installation manual, which is referenced as part of the listing.

"PUFF TEST" (or "AIR TEST"): A test to determine that the distribution network piping is clear. The test is conducted by running nitrogen through the piping and confirming that all nozzles are clear.

PULLEY TEE: A device similar to a corner pulley except there is a change in direction on the cable from two manual pull stations or two mechanical gas valves. It unites either two gas valves or two manual pull stations to a single control point.

SALAMANDER BROILER: See upright broiler.

SAPONIFICATION: The reaction of fats and/or oils to alkaline materials, producing soap-like foam. Fire extinguishing agents based on sodium bicarbonate, potassium bicarbonate, potassium acetate and potassium carbonate will cause saponification when discharged onto hot grease. Rendered animal fat and oils containing high percentages of saturated fat saponify better than cooking oils containing low percentages of saturated fat.

SERIES DETECTOR: Any detector located between the Mechanical Release Module (MRM or MRM II) and the terminal detector.

STRIKE™: Electronic Control System (ECS) for use with KP™ Fire Suppression Systems. (Ref. UL File S35485)

STRIKE™ RELEASING MODULE (SRM): The STRIKE™ Releasing Module is used to actuate the agent cylinder discharge valve either automatically or manually by puncturing a nitrogen cylinder.

STRIKE™ RELEASING MODULE (SRM), OEM: The SRM, OEM lacks the stainless steel enclosure and is used in hood end cabinet or OEM installations.

SUPPLY LINE: That portion of the agent distribution network piping that runs from the agent cylinder assembly outlet or distributor block to the first tee.

SUPPLY BRANCH LINE: All pipe and fittings leaving the first tee in the system and ending with the last nozzle in the last nozzle branch line.

TERMINAL DETECTOR: 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: 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.

UPRIGHT BROILER: A cooking appliance using intense radiant heat and conductive heat with the foot and/or the radiant heat source not being limited for a horizontal mode. Most of these cooking appliances incorporate a removable drip tray and may be used specifically for holding or warming foods.

VENT CHECK: A device installed in the actuation network that is used to safely relieve pressure and to prevent a slow, unwanted build-up of pressure in the actuation network.

ZONE of PROTECTION – A horizontal foot print below and within the perimeter of the hood, in which the cooking appliances are to be positioned. The discharge nozzles within the "Zone of Protection" are spaced at pre-determined intervals to provide protection for eligible appliances within the "Zone of Protection" without the need for re-aiming or repositioning of nozzles. An exception to this practice is for dedicated appliances such as the upright broiler. Dedicated appliances require appliances specific nozzles protection, which will require further review after movement of the appliance for possible re-aiming or repositioning of nozzle(s).

Revision Record	
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SECTION 2

SYSTEM COMPONENTS

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
Effective November 21, 1994
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
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December 2008

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SYSTEM COMPONENTS

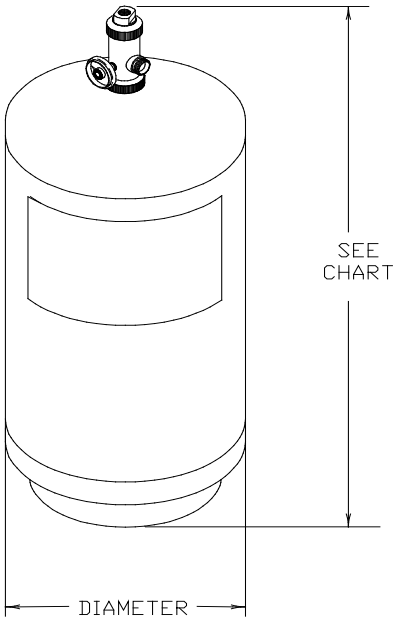
AMEREX KITCHEN WET CHEMICAL AGENT is special formulated potassium acetate based solution specifically designed for use on cooking grease and cooking oil fires. Amerex Kitchen Wet Chemical Recharge is shipped in plastic pails with each pail marked with date and batch code.

Shipping weight: **P/N 16924 2.75 Gal. Pail – 30 lbs. (13.6 kg) – CH547**
P/N 12866 3.75 Gal. Pail – 42½ lbs. (19.277 kg) – CH544
P/N 17450 4.80 Gal. Pail – 51.24 lbs. (23.24 kg) – CH656
P/N 15416 6.14 Gal. Pail – 67 lbs. (29.71 kg) – CH664

WARNING: AMEREX WET CHEMICAL AGENT IS A STRONG ALKALINE MIXTURE, SAFETY GLASSES AND GLOVES SHOULD BE WORN WHENEVER HANDLING THE AGENT. CONTACT WITH SKIN SHOULD BE AVOIDED. IN CASE OF DISCHARGE, THE SOLUTION SHOULD BE CLEANED UP PROMPTLY TO AVOID DAMAGE TO APPLIANCES, HOOD AND DUCT, ALL FOOD IN CONTACT WITH THE AGENT MUST BE DISCARDED. REFER TO THE AGENT'S MATERIAL SAFETY DATA SHEET.

AGENT CYLINDER ASY.
MODEL 275 - (P/N 16921)
MODEL 375 - (P/N 13334)
MODEL 475 - (P/N 17379)

CE MARK / EN3 - AGENT CYLINDER ASY.
MODEL 275 - (P/N 19434)
MODEL 375 - (P/N 16338)
MODEL 475 - (P/N 19435)



Model 275 -16921	U.S.	METRIC
Height	23 5/8 in	60.0 cm
Diameter	9 in	22.9 cm
Weight Full	55 ¼ lb	25.06 kg
Capacity	2.75 gal	10.41 L

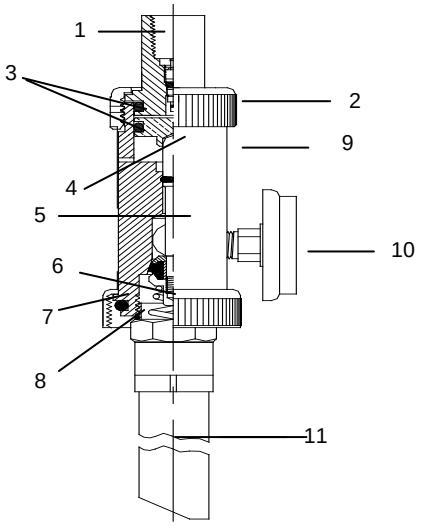
Model 375 -13334	U.S.	METRIC
Height	24-13/16 in	63.02 cm
Diameter	10 in	25.4 cm
Weight Full	64-½ lb	29.25 kg
Capacity	3.75 gal	14.2 L

Model 475 -17379	U.S.	METRIC
Height	29 13/16 in.	75.7 cm
Diameter	10 in	25.4 cm
Weight Full	80 ¼ lb	36.4 kg
Capacity	4.80 gal	18.17 L

Amerex 275 / 375 & 475 Agent Cylinder Assemblies have 2.72 / 3.75 & 4.80 gallon agent capacity respectively and are shipped factory filled with Amerex Kitchen Wet Chemical Agent. The cylinders are pressurized with dry nitrogen or argon gas to a pressure of 240 psi (1655 kPa) at 70 °F (20°C). The gas charge is the expellant gas which discharges the wet chemical agent through the distributor network.

The machined stainless steel **discharge valve** is actuated pneumatically by the Mechanical Release Module. The valve assembly has a ¼ inch NPT (female) actuation port and a discharge adapter with threads to accept a flexible discharge hose or swivel adapter.

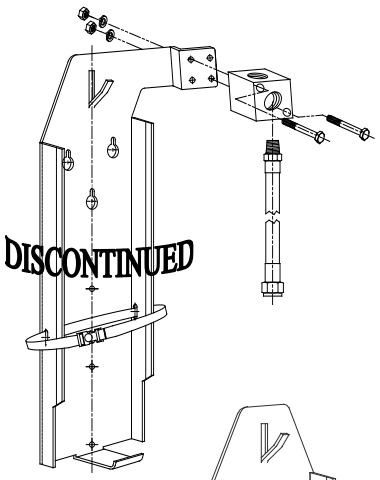
ITEM	DESCRIPTION
1	CAP W/CHECK VALVE
2	CAP NUT
3	O-RINGS (2)
4	PISTON
5	VALVE STEM ASSY
6	SPRING (S. S.)
7	RETAINER NUT
8	COLLAR O-RING
9	VALVE BODY
10	240 PSI GAUGE
11	DOWNTUBE



375 CYLINDER MOUNTING BRACKET (P/N 16085)

The mounting bracket is used to secure the KP/ZD 375 Agent Cylinder Assembly to the mounting surface and to connect the discharge valve to the distribution-piping network. The bracket consists of a formed steel assembly with vertical and horizontal supports and an integral pipe thread adapter with ½" NPT threads. The pipe thread adapter may be oriented to any convenient outlet position.

- **DISCONTINUED -**



DISTRIBUTION HOSE (P/N 13069)

The distribution hose is used to connect the agent cylinder assembly to the distributor block (P/N 13105). The supply line is connected to the distributor block (included with cylinder mounting bracket).- **DISCONTINUED -**

375 AGENT CYLINDER BRACKET (P/N 17690)

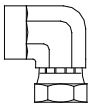
The mounting bracket is used to secure the KP/ZD 375 Agent Cylinder Assembly to the mounting surface. The bracket assembly comes with a S.S. belly strap and a swivel adapter for connection of the valve outlet to the piping network. The bracket is made from formed carbon steel metal and dry painted red. – **DISCONTINUED** -

MODELS 275 / 375 & 475 CYLINDER MOUNTING BRACKET(P/N 16920)

The 275 / 375 & 475 Mounting Bracket is used to secure the Models 275/ 375 & 475 Agent Cylinder Assembly to the mounting surface. The Cylinder Mounting Bracket is made from 1/8" thick formed steel and painted red to resist corrosion. The assembly comes with a stainless steel belly strap and a Swivel Adapter for connection to the cylinder valve outlet.

SWIVEL ADAPTER (P/N16901)

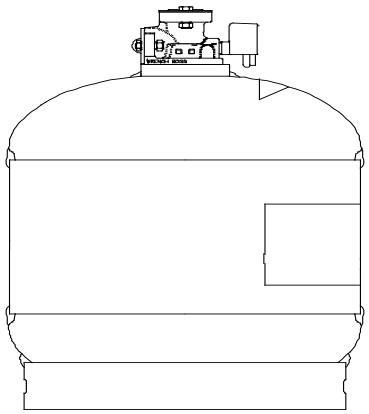
The Swivel Adapter connects the distribution piping– ½" NPT to the valve outlet.



AGENT CYLINDER ASSEMBLY

MODEL 600 (P/N 15196) CE MARK/EN3 MODEL 600 (P/N 16339)

Amerex MODEL 600 – 6.14 Gallon Capacity – Agent Cylinder Assembly is shipped factory filled with Amerex Kitchen Wet Chemical Agent. It is pressurized with dry Nitrogen or argon gas to a pressure of 240 psi (1655 kPa) at 70°F (20°C). The nitrogen charge is the expellant gas which discharges the KP agent through the distribution network. Cylinders are shipped from the factory with a shipping plate installed on the top of the valve to prevent accidental discharge and an anti-recoil plate on the valve outlet to redirect chemical flow should an accidental discharge occur. **BOTH OF THESE PLATES MUST BE REMOVED AT INSTALLATION.**

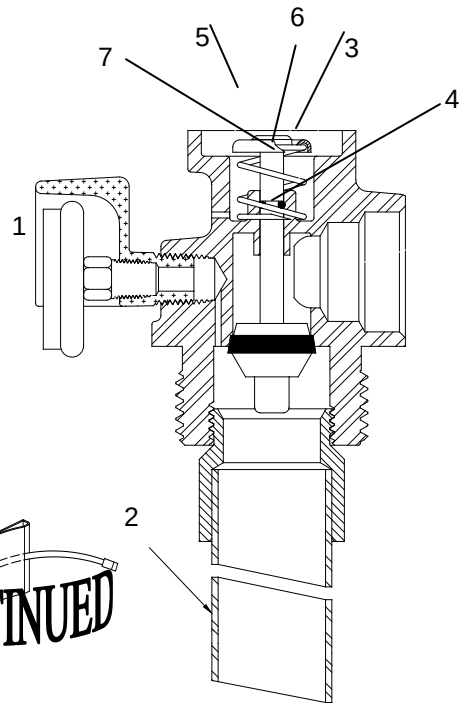


P/N 15196	U.S.	METRIC
Height	27.59 in	70.08 cm
Diameter	12 in	30.5 cm
Weight full	114 lb	51.70 kg
Capacity	6.14 gal	23.2 liter

KP600 Agent cylinders are DOT 4BW240, tested to 480 psi (3309 kPa) and require a hydrostatic test every twelve (12) years. The operating temperature of this and other listed components is 32°F to 120°F (0°C to 49°C). The machined, forged brass discharge valve is actuated via a pneumatic actuator. The Mechanical Release Module supplies the N2 required for actuation of one (1) to six (6) KP600 Agent Cylinder Assemblies.

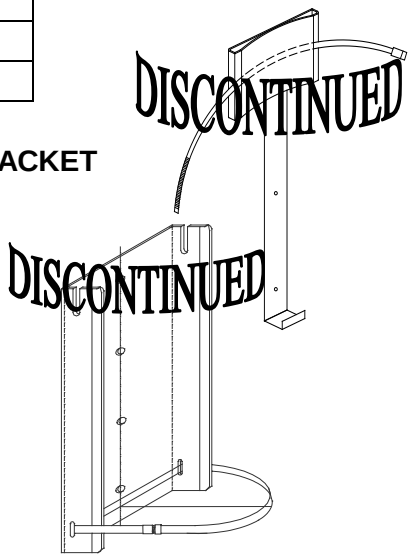
MODEL 600 CYLINDER VALVE ASSEMBLY (P/N 15060)

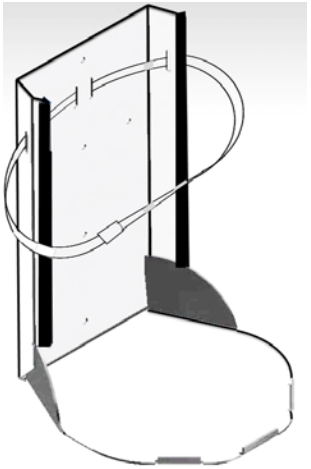
The Cylinder Valve Assembly is made with a forged brass body which has been electrolysis nickel plated. The valve stem is made of stainless steel with plated parts. The valve has a 240 psi pressure gauge protected by a plated forged brass gauge guard. The valve controls agent discharge via a spring loaded, internal sealing valve stem that must be depressed from the top of the valve to initiate agent discharge.



ITEM	DESCRIPTION	PART NO.
1	Gauge – 240 PSI	12402
2	Downtube Assembly	15195
3	Spring	10097
4	Valve Stem Assembly	15063
5	Washer – Stainless Steel	10102
6	Screw	10732
7	O-ring	10733

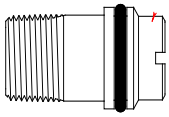
MODEL 600 CYLINDER MOUNTING BRACKET
(P/N 15166 - DISCONTINUED)
(P/N 21583 - DISCONTINUED)
(P/N 23184 – NEW)





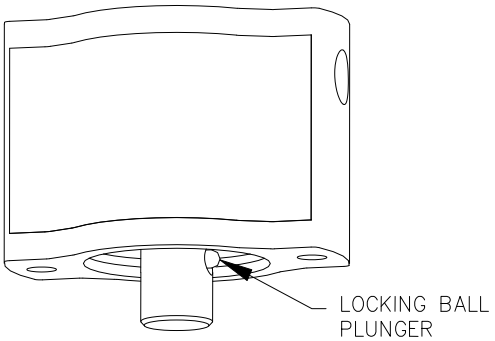
The mounting bracket is used to secure the Agent Cylinder Assembly to the mounting surface. The bracket consists of a steel mounting base and stainless steel belly strap. The base is attached to the wall by appropriate means via three holes down the spine or any combination using three holes. A stainless steel worm gear strap is provided to hold the cylinder against the back of the bracket.

DISCHARGE FITTING KIT - 10199



The discharge fitting kit consists of a brass fitting with an o-ring on one end, ¾ NPT male pipe threads on the other and a stainless steel retaining flange for locking the fitting into place. One discharge fitting kit is required for each KP600 Agent Cylinder Assembly.

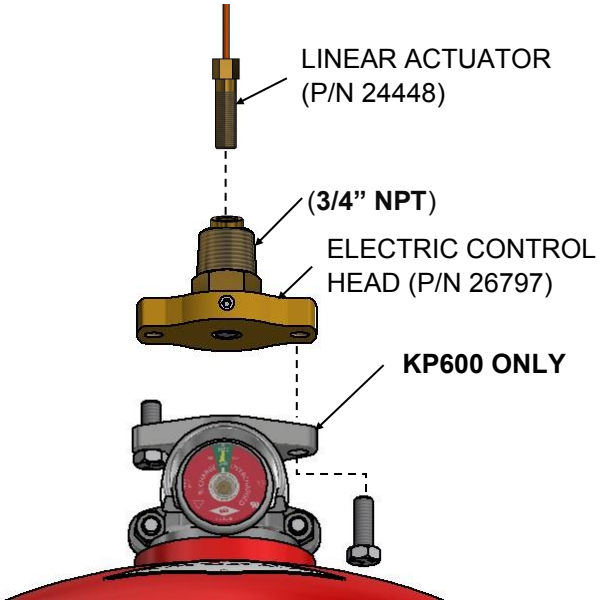
MODEL 600 PNEUMATIC ACTUATOR (P/N 10147)



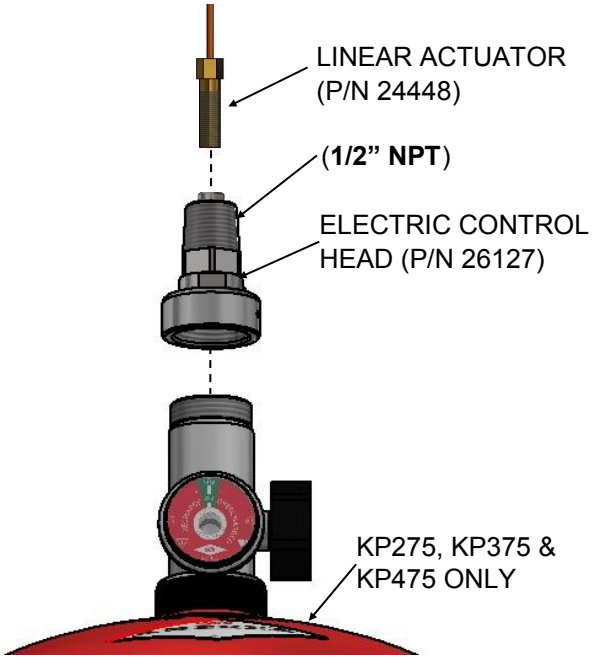
A pneumatic actuator is required for every KP600 Agent Cylinder Assembly. The actuator is bolted directly to the top of the agent cylinder discharge valve. When actuation occurs at the MRM / MRM II or PRM, the pneumatic pressure from the nitrogen cylinder enters the actuator through ¼" NPT threaded ports on either side. The actuation pressure forces the piston inside to extend and depress the valve stem of the discharge valve. The piston extends through a retainer washer which allows a spring loaded ball plunger to extend and lock the piston in its extended position. **Resetting is easier than the previous discontinued Actuator P/N15157**.

Electric Control Head, KP600 (P/N 26797)

The Electric Control Head, KP600 is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.



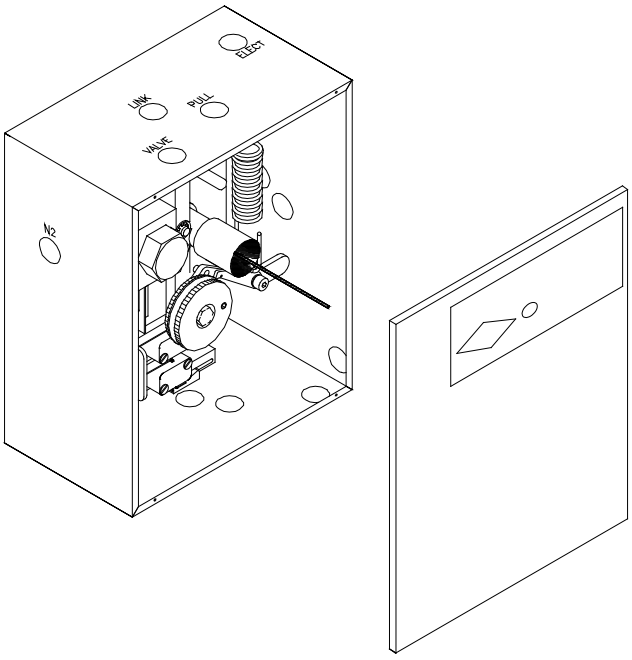
The Electric Control Head, KP600 is used with the STRIKE™ ECS for installations requiring direct actuation of a KP600 agent cylinder without the use of an SRM. This device is constructed of machined brass and bolts directly to the top of the Agent Cylinder Valve. The top of the Electric Control Head is threaded to accept a Linear Actuator (P/N 24448) and threaded for electrical conduit box mounting (3/4 NPT). The bottom plate retains the actuator piston and locking ring. The Linear Actuator, when activated from the STRIKE™ ECS, will force the piston inside the Electric Control Head down to depress the Agent Cylinder Valve stem, releasing the KP Agent. See Section 4-2a for installation instructions.



Electric Control Head (P/N 26127)

The Electric Control Head is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

The Electric Control Head, is used with the STRIKE™ ECS for installations requiring direct actuation of a KP275 / KP375 / KP475 agent cylinder without the use of an SRM. This device is constructed of machined stainless steel and is installed on the top of the Agent Cylinder Valve. The top of the Electric Control Head is threaded to accept a Linear Actuator (P/N 24448) and threaded for electrical conduit box mounting (1/2" NPT). The Linear Actuator, when activated from the STRIKE™ ECS, will force the piston inside the Valve assembly down to depress the Agent Cylinder Valve stem, releasing the KP Agent. See Section 4-2b for installation instructions.



MECHANICAL RELEASE MODULE II (MRM II)
P/N 18000: MRM II with Red-painted Steel Enclosure
P/N 18001: MRM II with Stainless Steel Enclosure

The new MRM II combines the same features and functionality as the original MRM along with increased detection capabilities and a far simpler means of setting the detection cable tension. The MRM II is available in the above configurations, now pre-installed in its own enclosure.

The method of setting the detection cable tension on the **MRM II** does not require the use of any tools (once the cable is locked down into the large, knurled wind-up spool). A large lever to the right of the spool is used to increase the cable tension. Alignment of the bottom edge of the lever with markings on a label on the mounting plate indicates when the proper tension has been achieved. In addition to being easier to set up, lowering cable tension to change out detection links is now also much simpler. The enclosure is 10" Wide x 5" Deep x 11 ¾" High.

MECHANICAL RELEASE MODULE II - (P/N 11977) WITHOUT AN ENCLOSURE

NOTE: This version of the MRM II is a direct replacement for the old style MRM. It carries the same part number as the original MRM.

The Mechanical Release Module II is used to actuate the agent cylinder discharge valve either automatically or manually by puncturing a nitrogen cylinder.

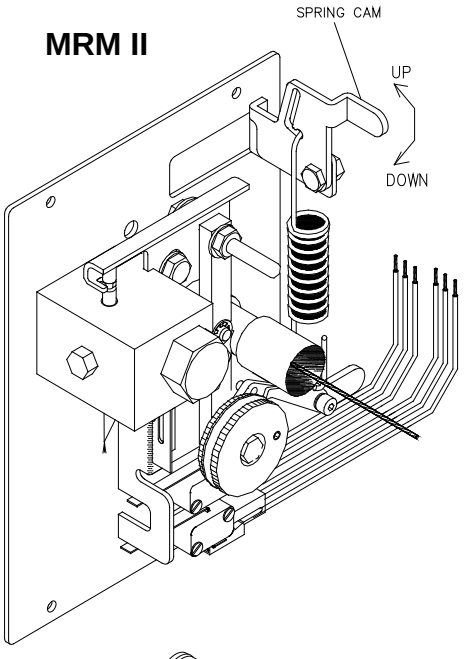
Automatic release of agent is accomplished when a fusible link detector separates during a fire condition. This causes a spring-loaded plunger to perforate the rupture disc and releases nitrogen through the actuation hose/piping network to the agent cylinder discharge valve(s).

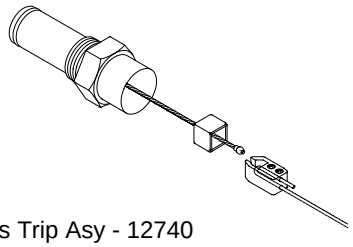
Manual release of agent is accomplished by pulling on a manual pull station which is connected to the Mechanical Release Module II by a cable.

The Mechanical Release Module II is equipped with two **snap action switches, one (P/N 12524)** for electrical signaling, power shutdown and other auxiliary functions and a second (P/N 18312) alarm initiating snap action switch for connection to a fire alarm panel. An additional two snap action switches may be added.

Operation of one or two mechanical gas valves may be accomplished by adding a **Gas Trip Assembly (P/N 12740)**.

MRM II



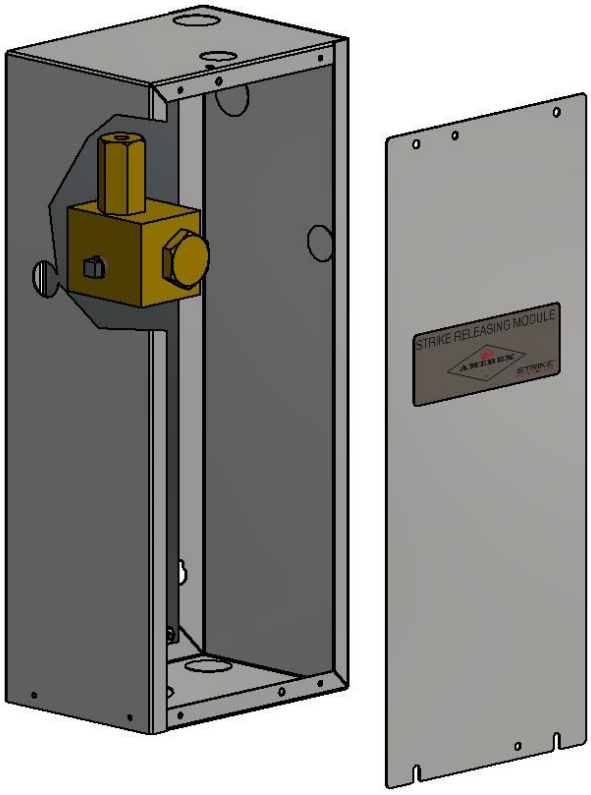


Gas Trip Asy - 12740

The cable for the gas valves, manual pull stations and detection network may be attached to the MRM II from ether of two sides (top or bottom).

STRIKE™ RELEASING MODULE (SRM)
P/N: 26607: SRM with Stainless Steel Enclosure

The SRM is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.



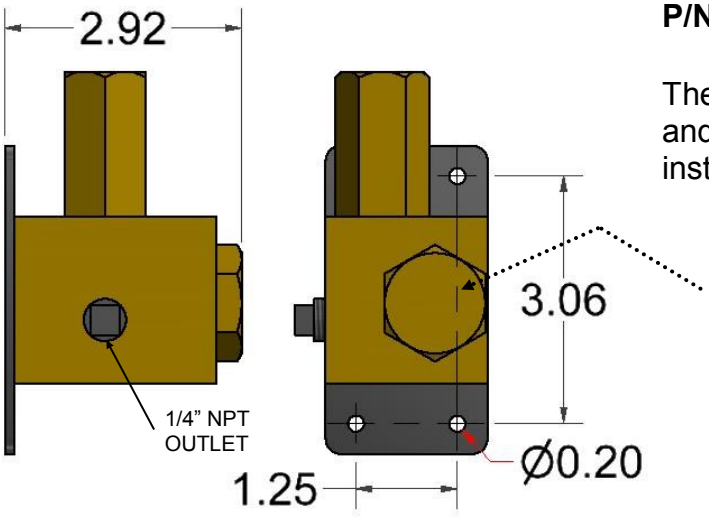
The STRIKE™ Releasing Module is used to actuate the agent cylinder discharge valve either automatically or manually by puncturing a nitrogen cylinder.

Automatic and manual release of agent is accomplished when the linear actuator receives a signal from the STRIKE™ ECS Panel. This causes a spring loaded plunger to perforate the rupture disc and releases nitrogen thought the actuation hose/piping network to the agent cylinder discharge valve(s).

Manual release of agent is accomplished in the same manor by pulling on an electric manual pull station which is connected to the STRIKE™ ECS Panel.

The SRM is designed for actuation networks with more than two agent cylinders or in installations using a mechanical gas valve. Refer to page 3-29a for limitations.

Operation of one or two mechanical gas valves may be accomplished by adding a Gas Trip Assembly (P/N 12740). The cable for the gas valves may be attached to the SRM from ether of two

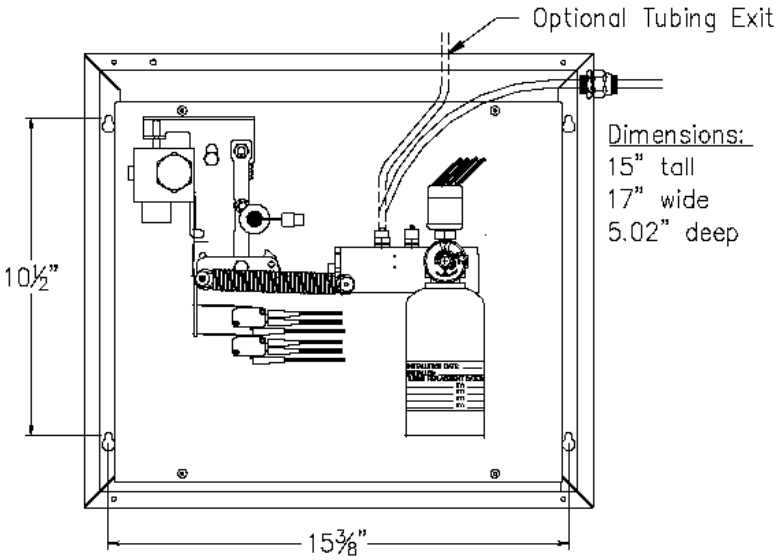


STRIKE™ RELEASING MODULE (SRM), OEM
P/N: 26577: SRM without Enclosure

The SRM, OEM lacks the stainless steel enclosure and is used in hood end cabinet or OEM installations.

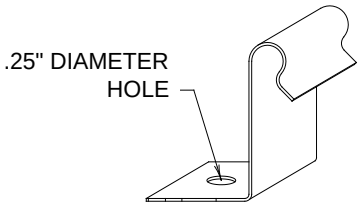
FACTORY SUPPLIED PLUG. REMOVE AND REPLACE WITH GAS TRIP ASSEMBLY (P/N 12740) WHEN A MECHANICAL GAS VALVE IS USED.

PNEUMATIC RELEASING MODULE – (PRM)
(P/N 16547 – PAINTED RED)
(P/N 16795 – STAINLESS STEEL)



This single hazard control mechanism supervises and controls a Fire suppression system. Proven, rugged mechanical components are reliably set into motion with a simple linear pneumatic detection interface. The control mechanism interfaces with mechanical manual pull station(s), actuation networks; mechanical gas valves, and offers electrical contacts for shutdown functions. A low pressure switch is provided for connection to an alarm panel and/or the optional low pressure indicator. Supplied with the PRM are an End of Line Fitting and two sealing balls.

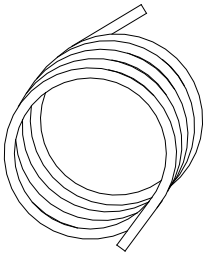
PRM TUBING SUPPORT CLIP (P/N 16501)



The Tubing Support Clip is used in the pneumatic detection network to provide a means of support for the pressurized thermal responsive tubing. A Tubing Clip is required for every 18" of tubing. A Tubing Clip is also required within one inch of the End of Line Fitting.

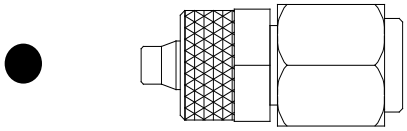
PRM DETECTION TUBING – ¼" DIAMETER

P/N 16557 - 25'
P/N 16551 - 50'
P/N 16556 – 75'
P/N 16579 - 100'
P/N 16552 – 150'
P/N 16554 – 300'



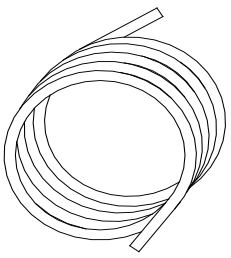
Pressurized thermal responsive tubing provides a mechanical movement via loss of pressurization anywhere along its entire length that results in system actuation.

PRM END OF LINE FITTING (P/N 16506)



The "End of Line Fitting" is installed at the end of the pneumatic detection network. The sealing ball must be installed in the tubing at the End of Line Fitting. One End of Line Fitting and two Sealing Balls are supplied with each PRM.

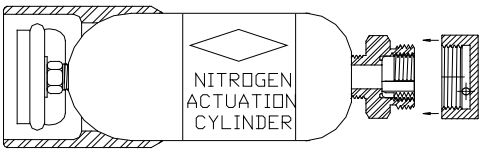
ACTUATION COPPER TUBING
(50' COIL – P/N 22278)



¼" O.D. x 0.049 wall thickness copper tubing
Use this tubing to connect the MRM or PRM to the actuation port of the agent cylinder. Fittings used with tubing are to be brass or steel compression style fittings.

NITROGEN ACTUATION CYLINDER:

10 in³ N_2 Actuation Cylinder (P/N 12856)
15 in³ N_2 Actuation Cylinder (P/N 09956)



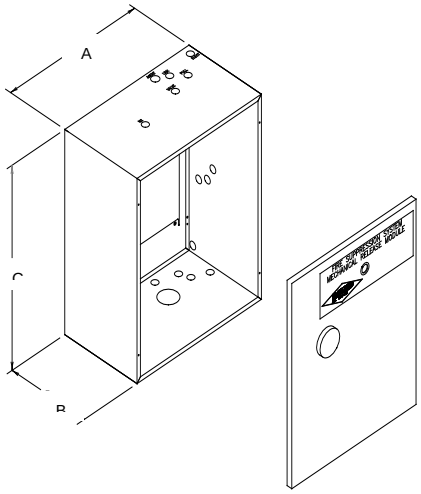
The N_2 Actuation Cylinder supplies nitrogen gas pressure to the Agent Cylinder Discharge Valve through the actuation network for the purpose of opening the Agent Cylinder.

The 10 in³ N_2 Actuation Cylinder, P/N 12856, is charged to 1800 psig (12410 KPa) at 70°F (21°C) and contains enough nitrogen to actuate up to **ten total of Models 275 / 375 / 475** Agent Cylinders Assemblies in any combination **OR** a total of **six** Model **600** Agent Cylinders Assemblies **OR** a **total of six** Agent Cylinders when the **mix contains at least one Model 600** Agent Cylinder Assemblies.

The 15 in³ N_2 Actuation Cylinder, P/N 09956, is charged to 1800 psig (12410 KPa) at 70°F (21°C) and contains enough nitrogen to actuate up to **ten total of Models 275 / 375 / 475** & **600** Agent Cylinders Assemblies in any combination.

Part No.	12856	
Diameter	1.998 in	5.07 cm
Length	6 3/8 in	16.19 cm
Pressure @ 70°F	1800 PSI	12411 kPa
Part No.	**09956**	
Diameter	1.998 in	5.07 cm
Length	9.44 in	24 cm
Pressure @ 70°F	1800 PSI	12411 kPa

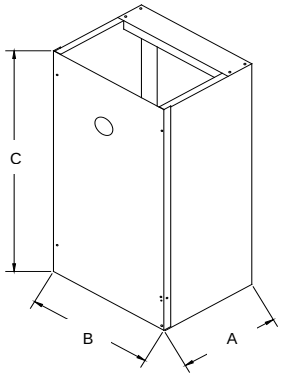
A maximum distance of 100 feet (21.3 meters) to the last control head is possible when using the specified copper tubing. Pressure is retained in the N_2 Actuation Cylinder by a gold plated rupture disc. Replacement rupture discs are available, P/N 09958. Only genuine Amerex rupture discs may be used when recharging Nitrogen Actuation Cylinders. Proper charge pressure is indicated by a pressure gauge located on the cylinder's bottom and protected by an impact resistant plastic gauge guard. The N_2 Actuation Cylinder is shipped fully charged from the Amerex factory with a protective shipping cap installed on the outlet threads. The cap must be removed at installation but must remain in place at all other times. (Retain the shipping cap to reuse when recharging the N_2 Actuation Cylinders.) Construction of the N_2 Actuation Cylinder is per DOT 3E. The cylinder is rechargeable by certified Amerex installers and does not require periodic hydro-testing. The 10 in³ Nitrogen Actuation Cylinder may be used in the MRM, MRM II or PRM. The 15 in³ Nitrogen Actuation Cylinder may be used only with the ECH.



CABINET (P/N 11978)

Stainless steel cabinets are available for single cylinder systems. The cabinet will house one model 275 or 375 Agent Cylinder Assembly, the agent cylinder mounting bracket and a Mechanical Release Module which are purchased separately.

P/N 11978	U.S.	Metric
(A) Width	20 ½"	52.07 cm
(B) Depth	10 ¾"	27.3 cm
(C) Height	26 ¼"	66.68 cm

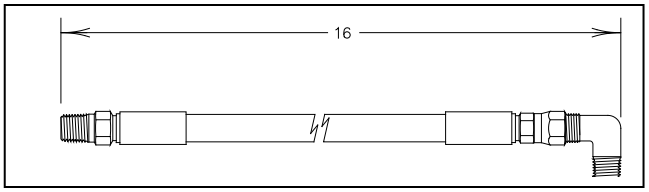


275 / 375 / 475 CYLINDER ENCLOSURE (P/N 16814)

Stainless steel enclosure is available for a single model 275 / 375 / 475 Agent Cylinder Assembly. The enclosure will house a 275 / 375 / 475 Agent Cylinder Assembly and **does not require** the use of a cylinder mounting bracket nor a distributor. The enclosure includes a swivel adapter for connection of the cylinder to the discharge piping.

P/N 16814	U.S.	Metric
(A) Width	14"	35.6 cm
(B) Depth	11"	27.9 cm
(C) Height	26 1/4"	66.68 cm

ACTUATION HOSE (P/N 12854) – 16"
ACTUATION HOSE (P/N 16448) – 32"

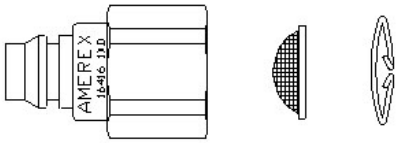


To aid in the installation of systems, an **OPTIONAL** actuation hose is available. This 16" or 32" hose connects the MRM (Mechanical Release Module), MRM II or PRM (Pneumatic Release Module) actuation port to the top of the Agent Cylinder Discharge Valve(s).

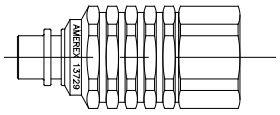
DISCHARGE NOZZLES

There are seven (7) types of nozzles listed for use with the Amerex KP/ZD Fire Suppression System. Each has a specific flow rate and discharge pattern. Correct installation, coverage and limitations of each nozzle are listed on the "Nozzle Application Chart" in Section 3, "DESIGN" of this manual.

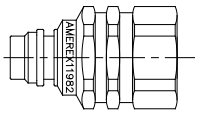
APPLIANCE TYPE	PART NO.	FLOW POINTS	MARKINGS
Fryer & Griddle	13729	2	13729 2 x FG
Appliance & Plenum	11982	1	11982 1 x 38
Solid fuel Char-broiler	11983	1.5	11983 1 x 55
Upright Broiler	11984	½ ea.	11984 .05 x 71
Range (4 Burner)	14178	2	14178 2 x R
Duct	16416	1	16416 1 x D
Back Shelf Nozzle	16853	1/3	16853 1/3xBS



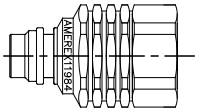
One Piece Body & Tip | Internal Filter | Snap Ring



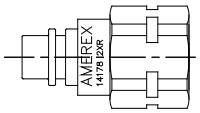
NOZZLE PN 13729
5 RINGS



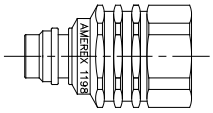
NOZZLE PN 11982
2 RINGS



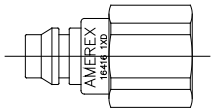
NOZZLE PN 11984
4 RINGS



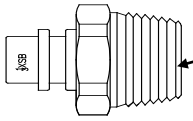
NOZZLE PN 14178
1 GROOVE



NOZZLE PN 11983
3 RINGS



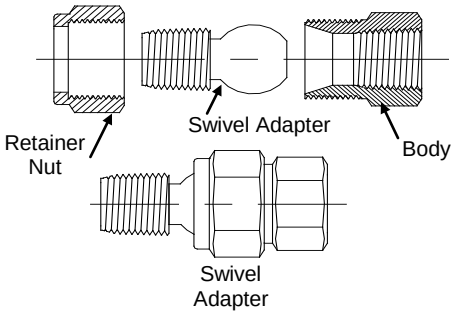
NOZZLE PN 16416
NO GROOVE & NO RINGS



Back-shelf Nozzle P/N16853
3/8 NPT

NOZZLE SWIVEL ADAPTER (P/N 16440)

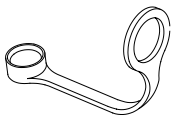
The swivel adapter (P/N 16440) is an option offered to aid the installation and aiming of the system nozzles. The adapter is composed of three parts – the body, swivel adapter, and retainer nut. All nozzles may be used with the swivel adapter without any change in the nozzle's listing.



NOZZLE CAPS

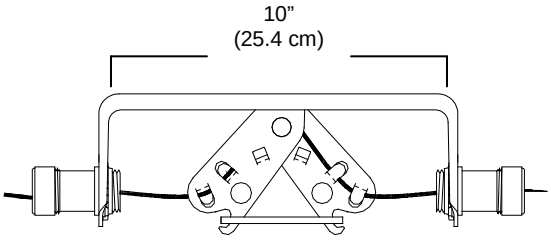
Two types of nozzle caps are available for the Amerex KP/ZD Fire Suppression Systems. The Standard Cap (P/N 12334) is provided with every nozzle assembly. This cap can be used in environments not exceeding temperatures of 350°F (176.6°C). Where exposures to temperatures exceed 350°F (176.6°C) the High Temperature Nozzle Cap must be used (P/N 12504).

High Temperature Cap
P/N 12504



Standard Cap
P/N 12334

DETECTOR BRACKET ASSEMBLY (P/N 12508)

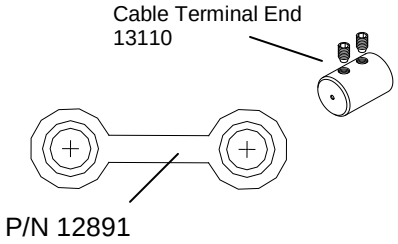


Fusible link not included with detector

Each detector bracket in the Amerex Kitchen Fire Suppression System is comprised of three parts the detector bracket, detector linkage and two EMT fittings. The fusible link is ordered separately. The bracket serves as support for the linkage and is attached to a rigid surface. The linkage supports the fusible link and a continuous cable run under tension. At a predetermined temperature the fusible link will separate, relieving tension on the cable and actuating the system.

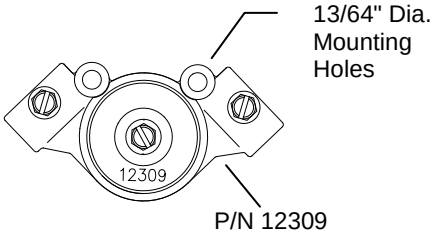
This manual will refer to series and terminal detectors. There is no difference in part numbers or dimensions between series and terminal detectors. A terminal detector is the last or only detector in the network and the cable must be "terminated" there. A series detector is any detector located between the terminal detector and the mechanical release module in the detection network.

TEST LINKS (P/N 12891)



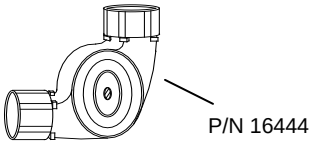
Test links are available for conducting functional tests of the detection system. This device fits the detector linkage in the same manner as the fusible link, is normally placed on the terminal detector and can be cut, simulating a fusible link separating under fire conditions.

CORNER PULLEY (P/N 12309)



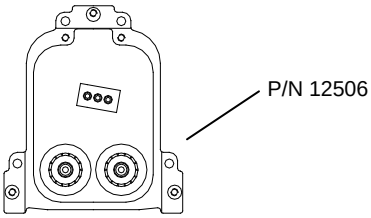
The Amerex Kitchen Fire Suppression System uses a "high temperature" corner pulley to change direction of the cable by 90°. This corner pulley may be used in environments with temperatures up to 700°F (371°C). Mounting holes are provided for anchoring the corner pulley **where allowed by local codes**.

CORNER PULLEY (P/N 16444)



The Amerex Kitchen Fire Suppression System also use a "high temperature" compression corner pulley to change direction of the cable by 90°. (This compression corner pulley [Brooks Model CP5] allows complete assembly of conduit and corner pulleys prior to installing the cable).

PULLEY TEE (P/N 12506)

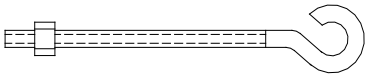


A pulley tee is used to change the direction of two cables by 90°. This device can be used with mechanical gas valves and manual pull stations but **not fusible link detectors**. It cannot be used where temperatures exceed the range of 32° - 120°F (0° - 49°C).

CABLE (P/N 12553)

Cable is used to run from the MRM, MRM II or PRM, through conduit and corner pulleys to detectors, mechanical gas valves or manual pull stations. It is 1/16 inch diameter, stainless steel (7 x 7 – 480# tensile strength) – available in 500 foot (152 m) spools (P/N 12553).

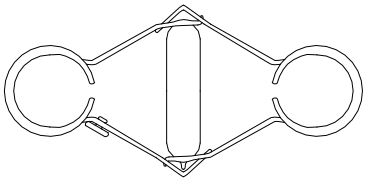
EYEBOLT SUPPORT (P/N 17520)



Eyebolt supplied with one Hex. Nut used to lock the eyebolt into finial position. Eyebolt is used to support bare cable run in plenum of the hood in a **Linear Fusible Link Detection System**.

JOB LINKS

Four temperature ratings of the Job Links are available. They are constructed of two metal struts held intension by a small, glass bulb that ruptures at the appropriate temperature rating. The detector bracket (P/N 12508) will support either the Globe Type 'K' fusible links or the Job links, and the same detector limitations apply for both types of detector.



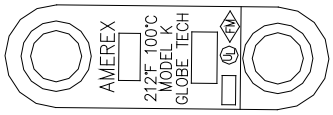
Job Quick Response Link
Load Limit: 1 to 55 lb.

Part No.	Response Type	Link Rating		Max. Ambient Temperature	
16225	Quick	200°F	93°C	150°F	66°C
16226	Quick	286°F	141°C	225°F	107°C
16227	Quick	360°F	182°C	300°F	149°C
16445	Quick	450°F	232°C	375°F	191°C
16446	Quick	500°F	260°C	425°F	218°C

FUSIBLE LINKS

Four temperature ratings of fusible links are available. They are of the electric solder type link which will melt at a predetermined temperature allowing the two halves of the link to separate.

EXPOSURE LIMIT				
Part No.	Link Rating		Max. Ambient Temperature	
12326	212°F	100°C	150°F	66°C
12327	280°F	138°C	225°F	107°C
12328	360°F	182°C	300°F	149°C
12329	450°F	232°C	375°F	191°C

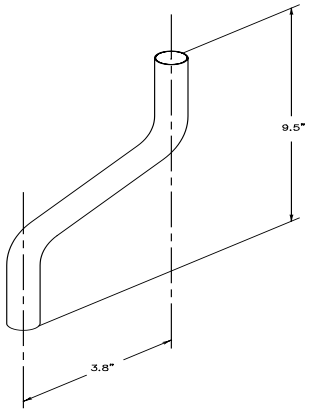


Temperature and year of manufacture are stamped on each link.

Globe Type "K"
Load Limit: Maximum Load – 50 lbs. (22.68 Kg)
Minimum Load - 3 lbs. (1.37 Kg)

CONDUIT OFFSET (P/N 12507)

The conduit offset is used to allow a smooth transition for cable runs into or out of the MRM, MRM II & PRM without using pulley elbows. It may be used with the detection network, manual pull stations or mechanical gas valve actuation network. The use of this device does not reduce the maximum number of corner pulleys allowed in the system. **THE CONDUIT OFFSET MAY ONLY BE ATTACHED TO THE ENCLOSURE OF EITHER THE MRM, MRM II OR THE PRM**.

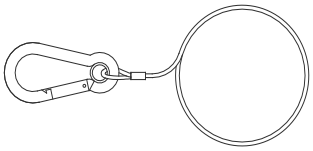


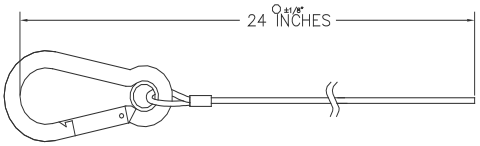
FUSIBLE LINK TERMINATION KIT (PN 17515)

The kit consists of four major components, their part numbers and quantities per kit are provided in the table. The kit contains the necessary cable segments and hardware for the beginning and end termination of the Linear Fusible Link Detection network.

QTY.	DESCRIPTION
1	EMT CONDUIT CONNECTOR 1/2"
1	CABLE SEG. – MRM TO 1ST LINK – 30 FEET
1	CABLE SEG. – LINK TO TERMINATION
1	HANDY BOX – ½ CONDUIT BOX

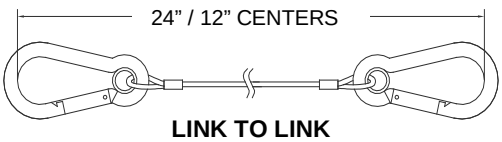
MRM TO 1ST LINK





LINK TO TERMINATION

CABLE SEGMENT – LINK TO LINK
PN17354 – 24" CENTERS
PN19155 - 12" CENTERS

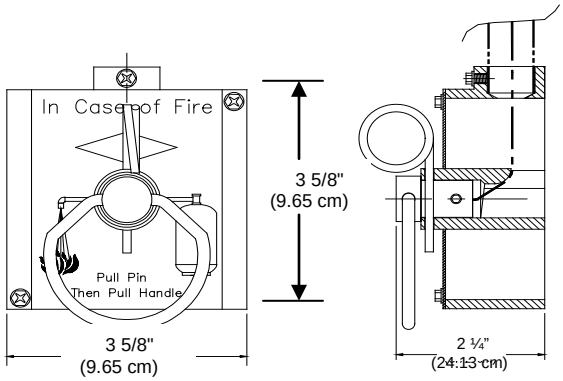


LINK TO LINK

The Link to Link cable segment PN17354 insures that the links in the linear fusible link detection system are spaced at the maximum 24" centers to center distance. The Link to Link cable segment PN19155 places links 12" apart center to center. It will assist in locating links in the hood duct opening when the two ducts are an odd distance apart.

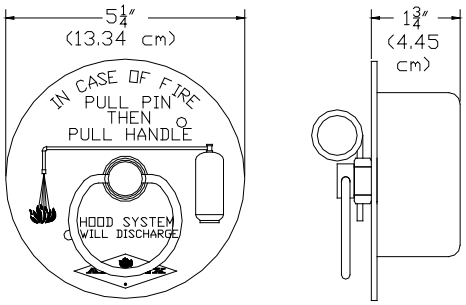
MANUAL PULL STATION (P/N 11993)

Every Amerex Kitchen Fire Suppression System must use at least one Manual Pull Station. This device provides a means of discharging the system manually. Manual Pull Stations should be located in a PATH OF EGRESS and mounted at a height conforming to the local code requirements. The Manual Pull Station may be recessed or surface mounted, see "Installation", Section 4, Page 11 for details.



MANUAL PULL STATION ADAPTER KIT (P/N 14193)
(for use with manual pull station P/N 11993)

When recessing the manual pull station the adapter kit compensates for the additional wall thickness and provides an oversized cover for the wall opening.



MANUAL PULL STATIONS (OVERSIZED - P/N 14320)

This Manual Pull Station is to be recess mounted. The oversized cover is large enough to cover sheetrock access hole for the standard 4" octagonal box and remain attractive and functional. Manual Pull Stations should be located in the **path of egress** and mounted at a height conforming to the local Authority Having Jurisdiction.

MANUAL PULL STATION (COMBO PACK)
(ENG. – P/N 21481)
(ENG. / FRENCH – P/N 22117)
(ENG. / SPANISH – P/N 22116)

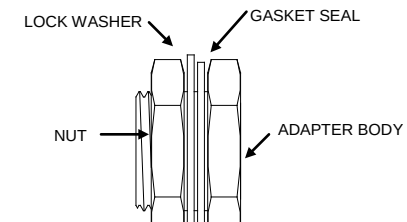
This Manual Pull Station may be either surface or recess mounted. The oversized cover is large enough to cover the sheetrock access hole for the standard 4" octagonal box and remain attractive and functional. Manual Pull Stations should be located in the **path of egress** and mounted at a height conforming to the local code requirements.


Surface Mount


Recessed Mount

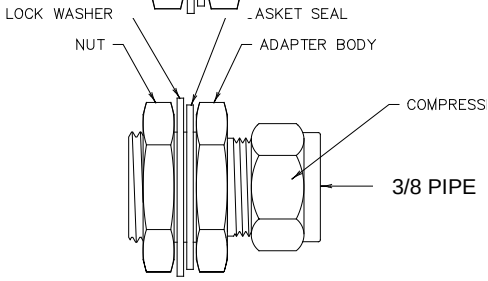
"QUICK-SEAL" ADAPTER
(3/8" pipe – P/N 12276 – HOLE SIZE 1 1/8" DIA.)
(1/2" pipe – P/N 14204 – HOLE SIZE 1 1/8" DIA.)
(1" pipe – P/N 18252 – HOLE SIZE 1 5/8" DIA.)

This listed mechanical bulkhead fitting produces a liquid tight seal around distribution piping where the piping penetrates hoods or ducts. The "quick-seal" adapter is available in 3/8" and 1/2" NPT.

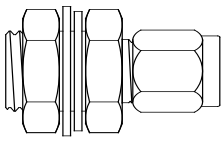


"COMPRESSION SEAL" ADAPTER
(3/8" pipe – P/N 12510 – HOLE SIZE 1 1/8" DIA.)
(1/2" EMT – P/N 12512 – HOLE SIZE 1 1/8" DIA.)

The compression seal adapter is a "listed mechanical bulkhead" fitting that produces a liquid tight seal around pipe or conduit when making penetrations in a hood or duct. Unlike the quick-seal adapter, the compression seal adapter is not threaded to accept pipe and does not require conduit or pipe to be cut or threaded. It is available in 3/8" and 1/2" sizes.

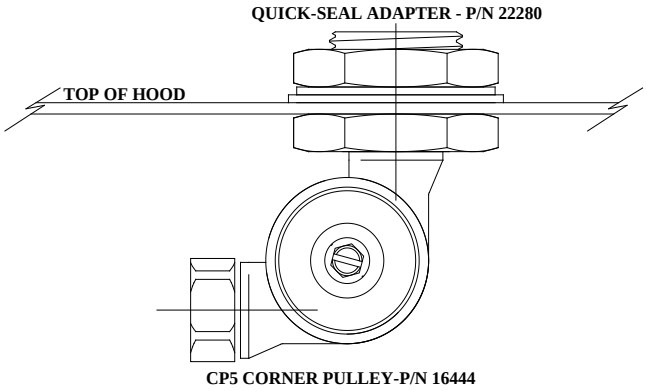


"QUICK-SEAL" COMPRESSION FITTING
(1/4" TUBING – P/N 16502 – HOLE SIZE 5/8" DIA.)



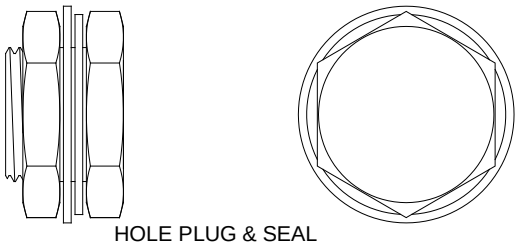
This listed mechanical bulkhead fitting produces a liquid tight seal around the detection tubing where the tubing penetrates the hoods.

"QUICK-SEAL" CORNER PULLEY ADAPTER
(EMT THREAD – P/N 22279 – HOLE SIZE 1 1/8" DIA.)



This listed mechanical bulkhead fitting provides a close connection to a CP5 corner pulley. The close coupling of the two assist in alignment of the conduit run to a detection bracket.

"QUICK-SEAL" HOLE PLUG & SEAL
(P/N 22280 – FOR HOLE SIZES 1 1/8" TO 1 3/8" DIA.)

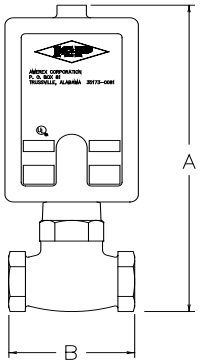


This listed mechanical bulkhead fitting is used to seal unwanted holes in the exhaust hood. Good looking and effective in preventing the loss of grease laden vapors into the kitchen.

AMEREX MECHANICAL GAS SHUT-OFF VALVE

All Amerex Kitchen Fire Suppression Systems protecting gas-fired cooking appliances must use a gas shut-off valve listed for use with the system. The Amerex Mechanical Gas Valves are held open with a latching device. Upon system discharge a piston in the MRM, MRM II or PRM will pull on a cable connected to the latch in the gas valve actuation box, releasing the latch and allowing the gas valve spring to close the valve. These valves are considered to be "Normally Closed – Held Open". The valve bodies are made of brass and threaded with female NPT threads on both ends and are UL listed for natural gas and propane in ¾", 1", 1¼", 1½", and 2" sizes. The Gas Trip Assembly PN12740 is included with all Amerex Gas Valves.

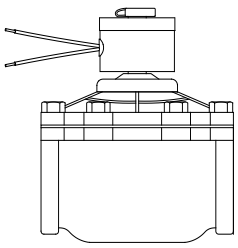
Part No.	Size	A	B	Pressure
12790	¾ in.	10 5/16 in. (26.194 cm)	3 ¾ in. (9.525 cm)	10 PSIG (69 kPa) Max.
12791	1 in.			
12792	1¼ in.	11 9/16 in. (29.369 cm)	4 7/8 in. (12.383 cm)	
12793	1 ½ in.			
12794	2 in.	12 ½ in. (31.75 cm)	6 in. (15.24 cm)	



ELECTRIC GAS SHUT-OFF VALVES

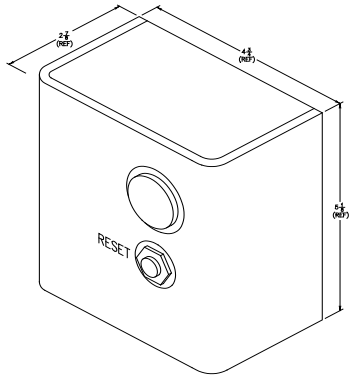
Electric gas shut-off valves operate on 110 VAC current which powers a solenoid holding the valve open against a spring. Upon system discharge current to the solenoid is interrupted by a micro switch in the MRM, MRM II or PRM causing the valve to shut. A loss of electrical power will also cause an electrical gas valve to close. A Manual Reset Relay must be used with each electric gas valves. UL listed sizes are ¾", 1", 1¼", 1½", 2", 2½", 3".

Part No.	Size	Manufacturer
12870	¾ in.	ASCO
12871	1 in.	
12872	1 ¼ in.	
12873	1 ½ in.	
12874	2 in.	
12875	2 ½ in.	
12876	3 in.	



MANUAL RESET RELAY (P/N 12526)

Anytime an electrical gas valve is connected to an Amerex Kitchen Fire Suppression System, a Manual Reset Relay must be used. After an electrical gas valve has closed (either because of system discharge or because of power failure), the gas valve cannot be opened without manually pressing the reset button on the Manual Reset Relay. This operation is to guard against a momentary loss of power closing the valve, extinguishing the pilot lights and allowing gas to escape when power is restored. The Manual Reset Relay is UL listed and has a pilot lamp to indicate its status.

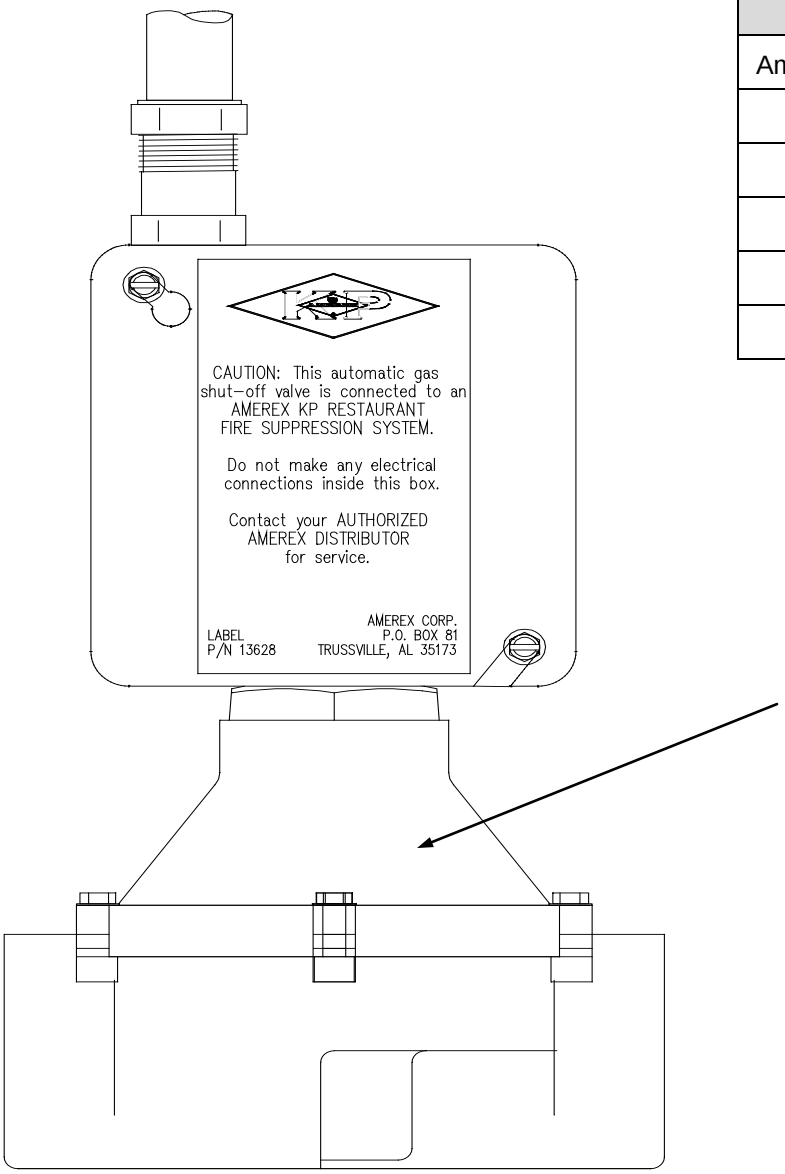


DESCRIPTION: MANUAL RESET RELAY
CONTACT CONFIGURATION: DOUBLE POLE, SINGLE THROW
MINIMUM CONTACT RATING: MTR LOAD = 8 AFL, 48 ALR, 120 VAC
RES LOAD = 8A, 120 VAC
PILOT DUTY 120 VA, 120 VAC

MECHANICAL GAS VALVE KIT (P/N 13622)

The Amerex Gas Valve Kit provides a means of converting a standard "release to close" ASCO gas shut-off valve to a "pull to close" type gas shut-off valve that has been listed with the system. The gas valve is held open by a latching device. Upon system discharge a piston in the Mechanical Release Module will pull on a cable connected to the latch on the gas valve, release the latch and allow the spring in the gas valve to close the valve. The kit must be used with the ASCO valves listed here to complete the UL listing of the Amerex Kitchen Fire Suppression system, ASCO valves are purchased separately. See Section 4, Page 17 & 18 for installation instructions.

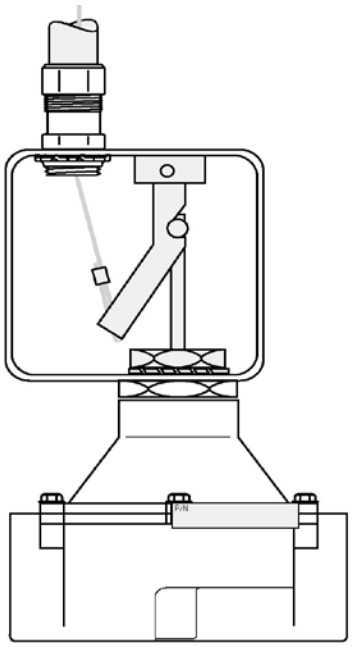
NOTE: P/N 13622 ASCO Mechanical Gas Valve Kit is sold separately from the Gas Valve. A gas trip assembly, P/N 12740, is also required when using any of these valves.



APPLICATIONS		
Amerex Part No.	ASCO Part No.	Size
13772	HV216-585-1	¾"
13773	HV216-585-2	1"
13774	HV216-585-3	1¼"
13775	HV216-585-4	1½"
13776	HV216-585-5	2"

ASCO MECHANICAL GAS VALVES

All Amerex Kitchen Fire Suppression Systems that protect any gas fired cooking appliance must use a "pull to close" type gas shut-off valve, which is listed with the system. The valve is held open with a latching device. Upon system discharge a piston in the gas trip assembly (sold separately) will pull on a cable connected to the latch on the gas valve, release the latch and allow the spring in the valve to close the valve. The ASCO gas shut-off valves approved for use with Amerex Kitchen Fire Suppression Systems are listed below with appropriate part numbers. See "Installing a Mechanical Gas Valve" in the Installation section for instruction on installation.

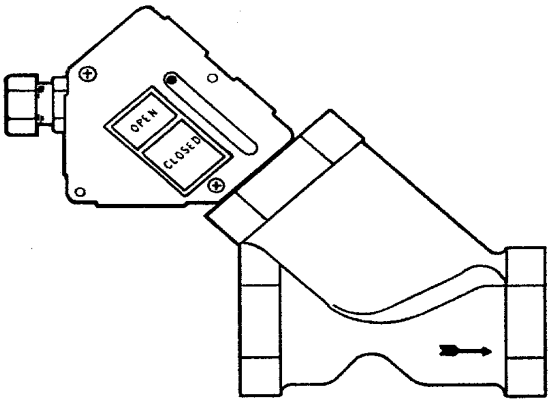


Note: P/N 12740 Gas Trip Assembly must be purchased separately.

APPLICATIONS		
Amerex Part No.	ASCO Part No.	Size
13777	JV216-587-2	¾"
13778	JV216-587-3	1"
13779	JV216-587-4	1¼"
13780	JV216-587-5	1½"
13781	JV216-587-6	2"
*13782	JV216-587-7	2½"
*13783	JV216-587-8	3"
***Item in stock at Amerex – Trussville, AL**		

ANSUL MECHANICAL GAS SHUT-OFF VALVES

All Amerex Kitchen Fire Suppression Systems that protect any gas fired cooking appliance must use a "pull to close" type gas shut-off valve. The valve is held open with a latching device. Upon system discharge a piston in the gas trip assembly will pull on a cable connected to the latch on the gas valve, release the latch and allow the spring in the valve to close the valve. Ansul's mechanical gas shut-off valves are suitable for use with Amerex Kitchen Fire Suppression Fire Suppression system. These valves, when used in conjunction with P/N 12740 Gas Trip Assembly, perform the same functions as Amerex's gas shut-off valves. The part numbers of the valves acceptable for this use are listed below. They are intended to be installed using the same installation instruction as Amerex's gas shut-off valves; see Installing a Mechanical Gas Valve in the installation section for instruction on installation.

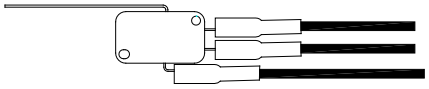


NOTE: P/N 12740 gas trip assembly must be purchased separately.

APPLICATIONS		
Ansul Part No.	Size	Max. Operating Pressure
55598	¾"	10 PSI (69 kPa)
55601	1"	
55604	1¼"	
55607	1½"	
55610	2"	

SNAP ACTION SWITCH (P/N 12524)

Snap Action Switch, designed to be mounted in the MRM / MRM II / PRM, are used to control various output functions. These output functions may involve turning off or turning on power. Examples of output functions are sounding a visual or audible alarm, operate an electrical gas valve, send a signal to an unsupervised building fire alarm system, shut off supply air fans and energize a relay to shut off electrical appliances. Two SPDT snap action switches, one PN12524 and one PN 18312, are pre-installed in the MRM, MRM II and PRM. Up to 2 additional SPDT switches may be added for a total of our configurations – SPDT, DPDT, 3PDT and 4PDT.

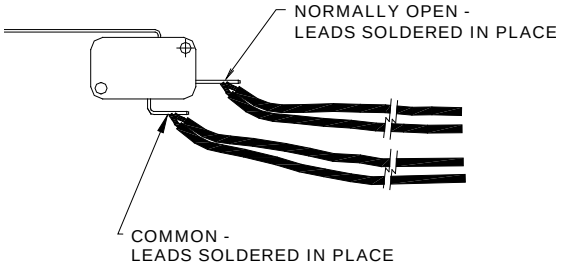


SNAP ACTION SWITCH
SINGLE POLE
DOUBLE THROW
P/N 12524

Red	**Common**	**Non Alarm Condition**
Yellow	**N.O.**	
Black	**N.C.**	

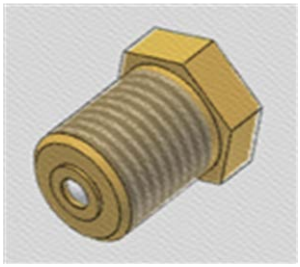
ALARM-INITIATING SNAP ACTION SWITCH (P/N 18312)

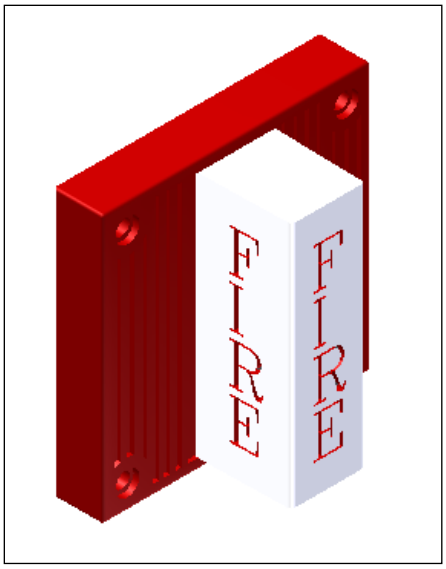
One alarm initiating Snap Action Switch, (P/N 18312), is pre-installed and is used when the system is required to be electrically connected to a fire alarm system per NFPA 17 and NFPA 72 in a supervised, four-wire manner. It is designed to be mounted in the Mechanical Release Module (MRM / MRM II) and the Pneumatic Release Module (PRM) only for the purpose of initiating an alarm in a supervised fire alarm system. All Snap Action Switch connections are to be made outside the MRM / MRM II / PRM in an approved junction box. This is a SPST; 0.25A; 30 VDC; N.O. switch.



VENT PLUG (P/N 10173)

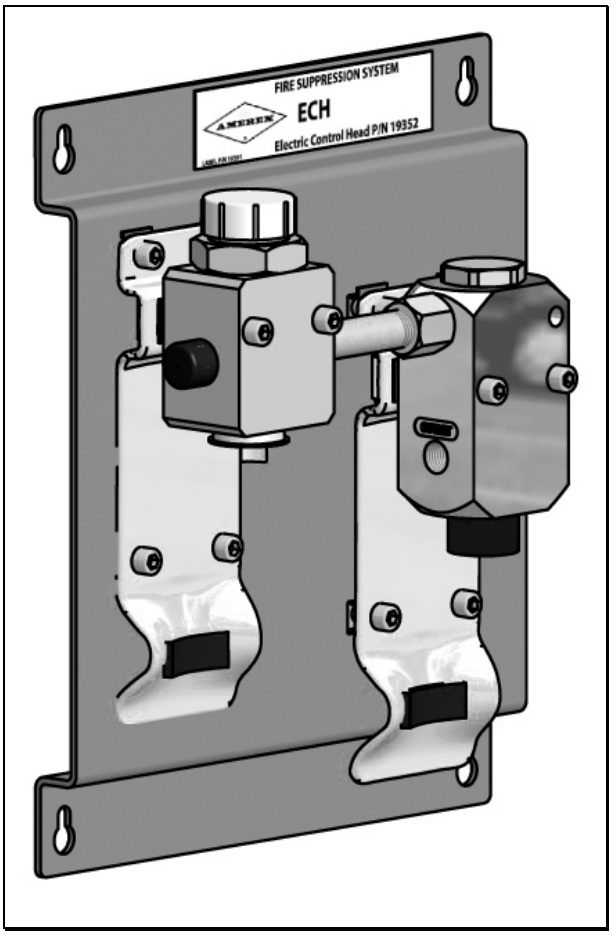
The vent plug is required in the system actuation network to allow a means of relieving pressure in the actuation piping after a system discharge, and to prevent a slow build-up of pressure in the actuation line.





120 VAC Horn & Strobe (P/N 21396)

The Horn & Strobe Assembly is provided for use when visual and sound warnings are required at system actuation. The unit requires the use of a 4" square (10.16cm sq.) x 2 1/8" (5.5cm) deep back-box with ½" conduit entrance on the top of the box. This device is to be used with 120 VAC power supply and may be used inside or outside. Refer to installation and setup instructions supplied with each unit.



ELECTRICAL CONTROL HEAD (ECH) P/N 19352

The ECH is to be used in cases where electrical detection is desired or required, due to physical hazard size or other design considerations. This control head replaces the ERM which has been discontinued. Other components that are necessary to complete an installation with the ECH are as follows (but not limited to):

P/N 19347 Nitrogen Actuation Cylinder
P/N 09956 15 in³ Nitrogen Cylinder
P/N 17014 Electric Actuator
P/N 19340 Releasing Panel, SR-X UL Listed - S24395
P/N 17001 Manual Actuation Button optional)
P/N 17839 Cap Electric Actuator (optional)

An installed ECH has the capability of pneumatically firing up to ten (10) Amerex Restaurant Agent Cylinder Assemblies. Manual actuation can be accomplished with the optional P/N 17001 Manual Actuation Button installed on top of the P/N 17014 Electric Actuator, and/or with Amerex Electric Pull Station(s) connected to the Amerex SR-X Releasing Panel.

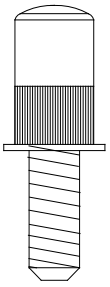
See the relevant sections of this manual for design, installation and servicing requirements. The ECH is intended for indoor use, only. Two stainless steel band clamps (not shown) are included with the ECH assembly for securing the two nitrogen cylinders to their brackets. The ECH is not supplied with an outer enclosure.

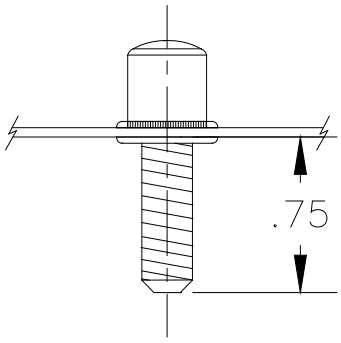
KITCHEN HOOD FASTENER

Amerex is pleased to offer two methods of fastening hardware to the underside of the hood without having access to the top of the hood. Simply drill a 25/64" Dia. hole and install the listed fastener, for use with stainless steel hood material 0.027" to 0.165" thick.

RIVET TYPE STUD (P/N 20535)

The rivet type stud is a ¼ - 20UN – 2A threaded stud with approximately 3/4" of length. This device may be used for mounting detector brackets, conduit fasteners, PRM clips, pipe hangers, etc. Attach devices to the stud using a standard ¼-20UN nut and lock washer. Rivet studs come 10 to a bag.

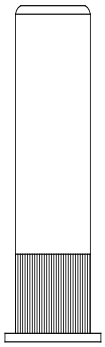


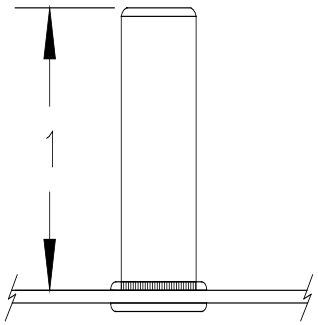


INSTALLED

RIVET TYPE NUT (P/N 20536)

The rivet type nut is tapped ¼ - 20UN – 2B with approximately 3/4" of length. This device may be used for mounting detector brackets, conduit fasteners, PRM clips, pipe hangers, etc. Attach devices to the tapped blind rivet using a standard ¼-20UN bolt or screw and lock washer. Rivet nuts come 10 to a bag.

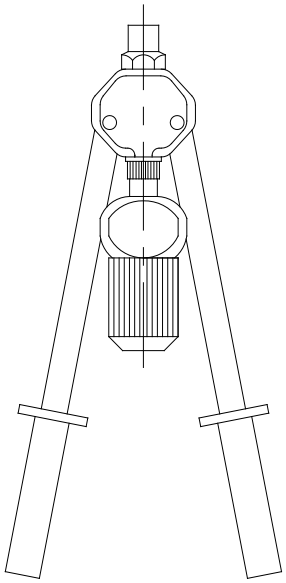


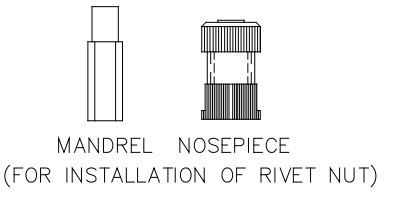


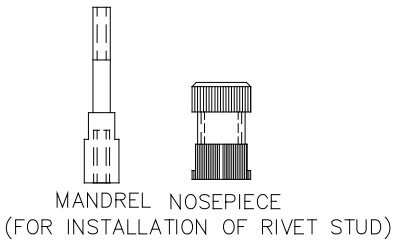
INSTALLED

RIVET INSTALLATION TOOL SET (P/N 20552)

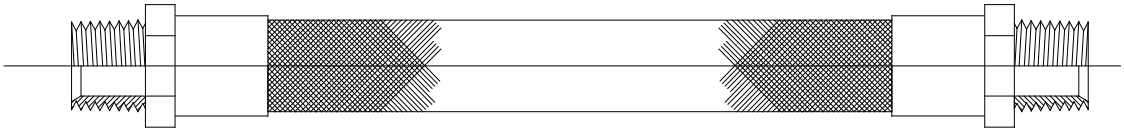
The Rivet Installation Tool Set Comes complete with mandrel and nosepiece for installing both studs and nuts. Instructions on set up and use of the tool are contained in the box with each tool.







FLEXIBLE HOSE - HAZARD AREA (PN20473)



This hose is designed to be used when a flexible movement of the nozzle branch line is desired. Such as when an appliance needs to be moved for cleaning and the nozzle protecting the appliance is fixed to the appliance. Hose length is 48" end to end and is supplied with ½" NPT ends. The flex hose is limited to use on the appliance branch line only and cannot be used on supply line or supply branch line.

The flexible hose is to be connected to the Nozzle Branch line in a manner to prevent kinking or collapsing of the hose. It is to be used to provide for movement of the appliance without the appliance protection being disconnected from the fire suppression system.

The flex hose has a minimum bend radius of 7". The piping limitations for Nozzle Branches do not change when flexible hose is used in the line. However, the flex hose takes the place of 4 feet of pipe.

A maximum of three flex hoses may be used on an agent cylinder piping network.

An appliance locating device is to be used to insure that the appliance is placed back in proper alignment after being moved for cleaning.

NO RESTRAINT CABLE IS REQUIRED

SECTION 3

DESIGN

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
To ULC/ORD 1254.6-1995*

December 2008

*** ULC Certification does not apply to the STRIKE™ or SRM.**

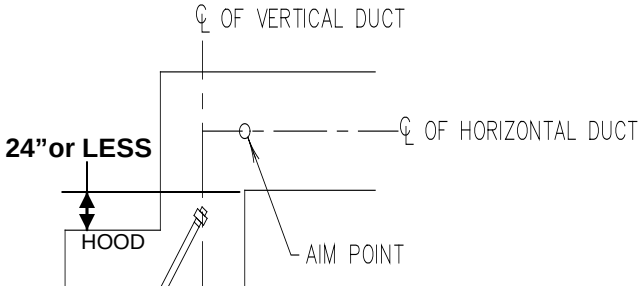
DUCT PROTECTION

***NOTE:* An Amerex KP & ZD Kitchen Fire Suppression System have the same listed criteria for the protection of the Duct and Plenum.**

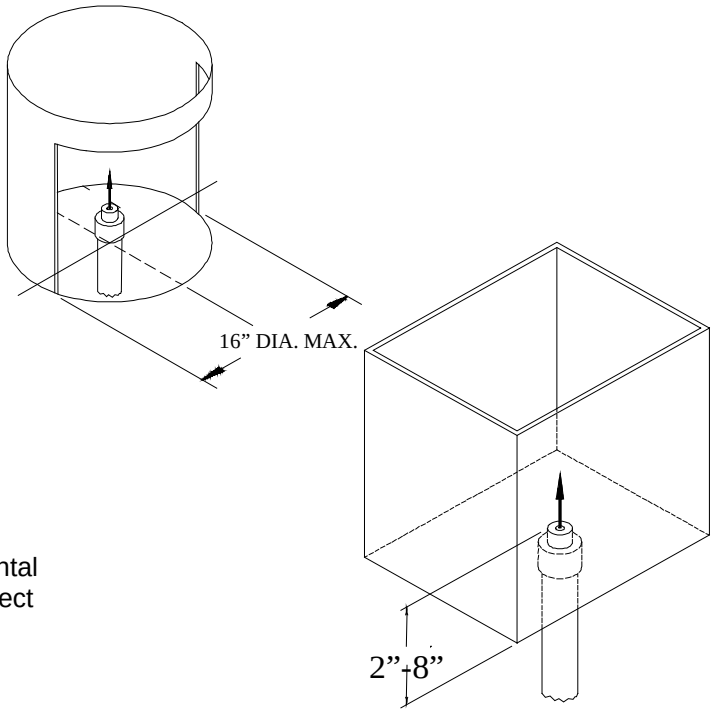
DUCT PROTECTION LIMITATIONS
SINGLE NOZZLE (P/N 16416)

The Amerex Duct Nozzle (P/N 16416) is listed to protect restaurant cooking ducts of unlimited length up to 50 perimeter inches (127 cm) or 16 diameter inches (40.6 cm) using one nozzle. The nozzle has one flow point and must be centered within the duct, placed 2 – 8 inches (5.08 – 20.32 cm) into the duct opening and aimed at the center of the cross section of the duct.

NOTE: In no case shall the diagonal dimension of the duct exceed 18.8 inches without additional duct nozzles.



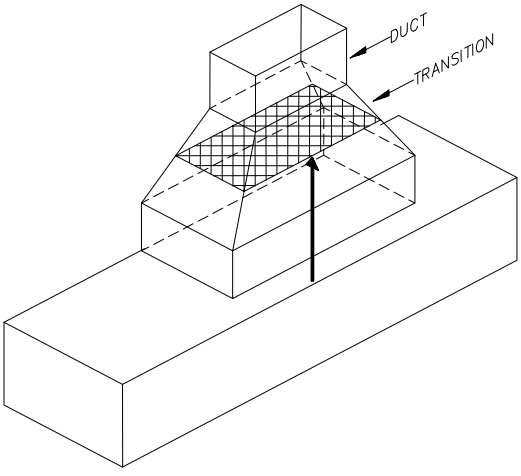
Vertical / Horizontal Transition with a rise of 24" or less.

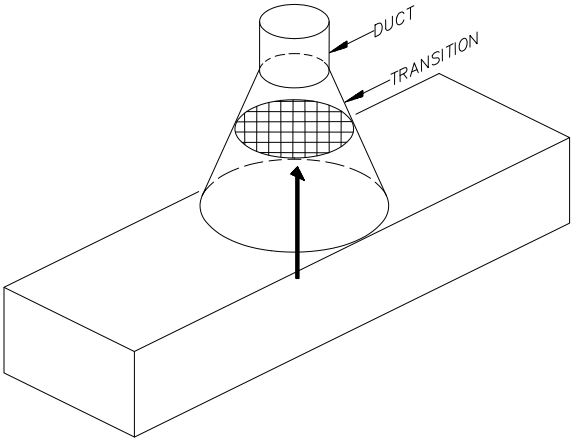


Special Note: For ducts with short vertical/horizontal transitions reference the diagram above with respect to nozzle aim.

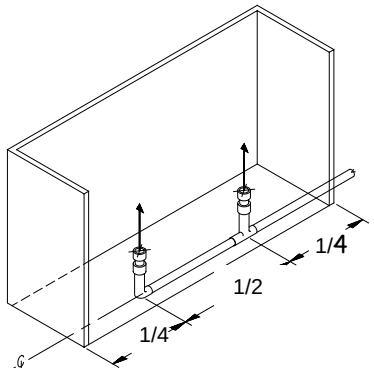
TRANSITION LIMITATIONS – SINGLE NOZZLE (P/N 16416)

A transition is a section found on some exhaust systems between the hood and the duct. One Amerex duct nozzle (P/N 16416) will protect a transition at the point where the transition is 50 perimeter inches (127 cm) or less or a diameter of 16 inches (40.6 cm) or less. The nozzle has one flow point and must be placed in the center of the opening at the point where the perimeter inches are 50 (127 cm) or less or where the diameter inches are 16 (40.6 cm) or less and aimed at the center of the cross section on the duct. Additional duct protection is not required when using this method.

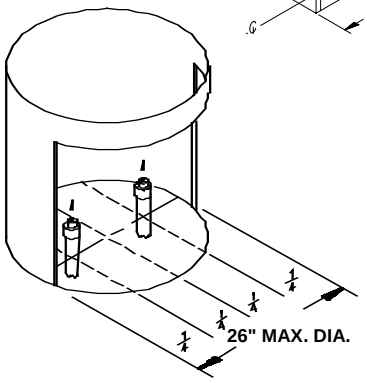




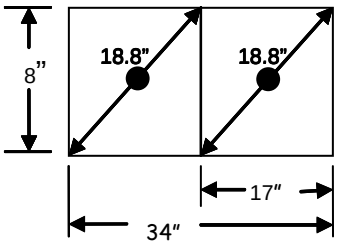
DUCT PROTECTION LIMITATIONS – TWO NOZZLES (2 x P/N 16416)



Two Amerex Duct Nozzles (P/N 16416) will protect ducts with a perimeter of 51 inches to 84 inches (129.5 – 208.3 cm) or a maximum diameter of 26 inches (66 cm). To correctly position the nozzles in a rectangular duct divide the duct along its longest side into four equal distances. A circular duct should be divided along a centerline into four equal distances. A nozzle should be placed at one quarter of the duct's width (or diameter) with both nozzles on the centerline, paced 2-8 inches (5.08 - 20.3 cm) into the duct opening and aimed at the center of the modular cross section of the duct. Each nozzle has one flow point.



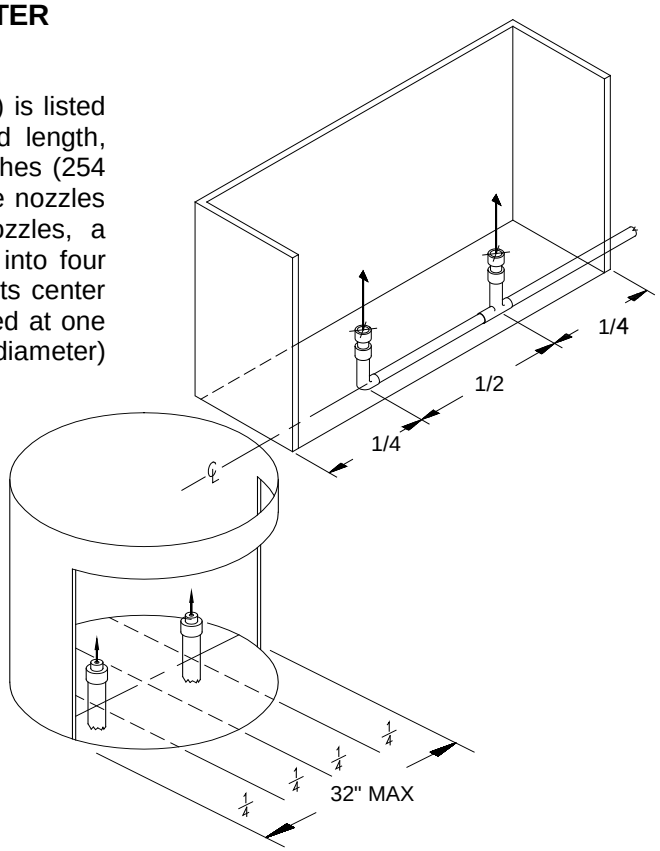
NOTE: In no case can the diagonal dimension of each **module** exceed 18.8 inches (46 cm).



DUCT PROTECTION LIMITATIONS – MULTIPLE NOZZLES (P/N 16416)

Protecting ducts larger than 84 perimeter inches (208.3 cm) utilizing the single flow point nozzle (P/N 16416). Divided the perimeter by 42 (104 cm) and round up to the next whole number. Divide the duct cross section into the same number of equally sized modules. Check the modules to insure they are equal to or less than 50 perimeter inches and have a diagonal equal to or less than 18.8 inches. If they meet the criteria then place a duct nozzle in the center of each module, 2"-8" into the hood/duct opening.

DUCT PROTECTION LIMITATIONS 100 IN. PERIMETER TWO – 1½ FLOW POINT NOZZLES (P/N 11983)



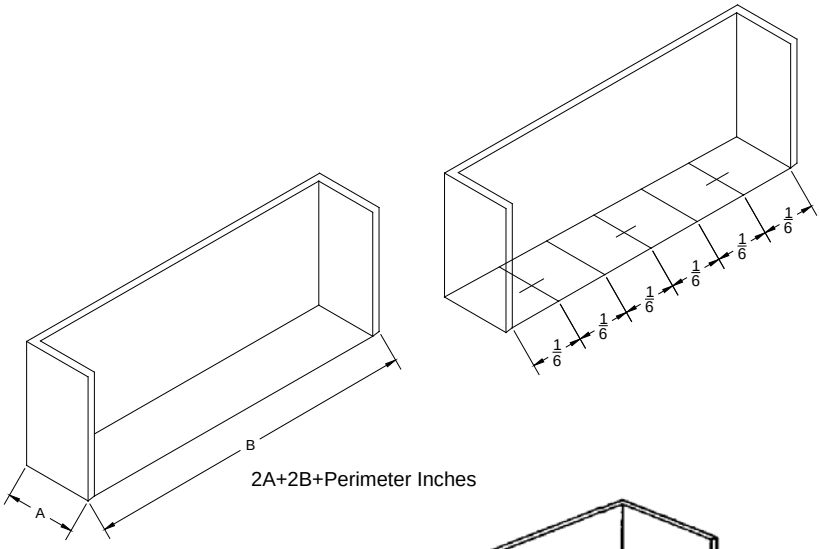
The Amerex Solid Fuel Appliance/Duct Nozzle (P/N 11983) is listed to protect a restaurant cooking exhaust duct of unlimited length, unlimited changes in direction and up to 100 perimeter inches (254 cm) or 32 inch diameter (81.2 cm) using two nozzles. The nozzles total three flow points and to properly position the nozzles, a rectangular duct should be divided along its longest side into four equal distances. A circular duct should be divided along its center line into four equal distances. The nozzles are to be placed at one quarter and three quarters position of the duct width (or diameter) with both nozzles on the center line, placed 2 - 8 inches (5.08 – 20.3 cm) into the duct opening and aimed straight up in a vertically run duct.

NOTE: In no case can the diagonal dimension of the duct exceed 37.2 inches (94.4 cm) without adding additional duct nozzles.

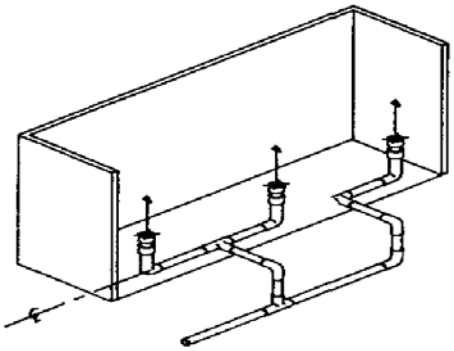
NOTE: The use of one Duct Nozzle P/N 11983 is permitted for duct 50 perimeter inches or less in the same manner as Duct Nozzle 16416.

DUCT PROTECTION LIMITATIONS 150 IN. PERIMETER THREE 1½ FLOW POINT NOZZLES (3 x P/N 11983)

The Amerex Solid Fuel Appliance/Duct Nozzle (P/N 11983) is listed to protect restaurant cooking exhaust ducts of unlimited length, unlimited changes in direction and up to 150 perimeter inches (381 cm) or 48 diameter inches (122 cm) using three nozzles. The nozzles total four and one-half flow points and to properly position the nozzles, a rectangular duct should be divided along its longest side into six equal distances. A circular duct should be divided along its center line into six equal distances. The nozzles are to be placed at one sixth, one half and five sixths positions of the duct width (or diameter) on the center line, placed 2-8 inches (5.08 – 20.3 cm) into the duct opening and aimed straight up for vertically run duct.



NOTE: In no case can the diagonal dimension of the duct exceed 55.9 inches (142 cm) without adding additional duct nozzles.



TRANSITION LIMITATIONS – TWO NOZZLES (P/N 11983)

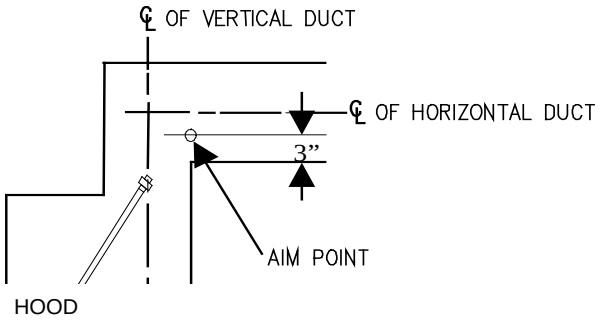
A transition is a section of some exhaust systems between the hood and the duct. Two Amerex solid fuel appliance/duct nozzles (P/N 11983) will protect a transition at the point where the transition is 100 perimeter inches (254 cm) or less or a diameter of 32 inches (94.4 cm) or less. The nozzles total three flow points and to properly position the nozzles, a rectangular duct should be divided along its longest side into four equal distances. A circular duct should be divided along its center line into four equal distances. The nozzles are to be placed at one quarter and three quarters position of the duct width (or diameter) with both nozzles on the center line, placed 2 - 8 inches (5.08 – 20.3 cm) into the duct opening and aimed straight up in a vertically run duct. Additional duct protection is not required when using this method.

NOTE: In no case can the diagonal dimension of the duct exceed 37.2 inches (94.4 cm) without adding additional duct nozzles.

(REFER TO PAGE 3-1 FOR PICTORIAL REPRESENTATION)

NOZZLE LOCATION AND AIMING FOR SHORT VERTICAL/ HORIZONTALLY TRANSITION RUN DUCTS PROTECTED BY DUCT NOZZLE 11983

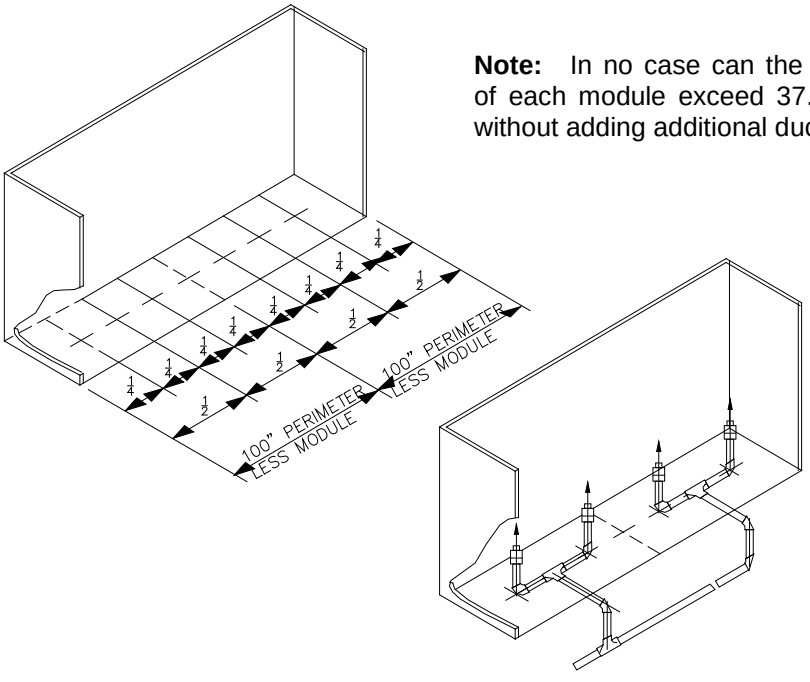
The nozzles are to be located on the centerline of the vertically run duct, 2-8 inches (5.08-20.3cm) into the hood/duct opening. The aiming point is to be a point 3 (7.6cm) inches above the base of the horizontally run duct and in the same vertical plane of the nozzle. See illustration.



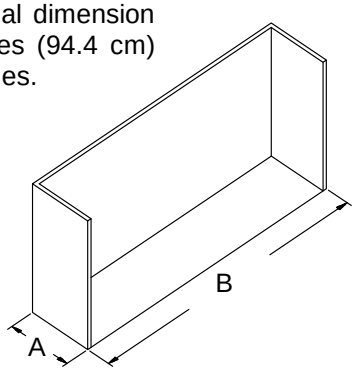
Vertical / Horizontal Transition
with a rise of 24" or less.

DUCT PROTECTION – MODULAR APPLICATION OF MULTPLE NOZZLES LISTING (P/N 11983)

Protecting ducts larger than the perimeter listed for a multiple nozzle coverage is a simple process. The following example shows how the listing for duct protecting a duct with a perimeter of 100 inches using two nozzles PN 11983 is applied to a duct with a perimeter larger than 100" but less than 166". We must first divide the cross sectional area of the duct into modules with a perimeter equal to or less than 100". Check the modules to insure they have a diagonal equal to or less than 37.2 inches. If all criteria is met, space the duct nozzles in each module in compliance with the multiple nozzle coverage listing and 2"-8" into the hood/duct opening.



Note: In no case can the diagonal dimension of each module exceed 37.2 inches (94.4 cm) without adding additional duct nozzles.



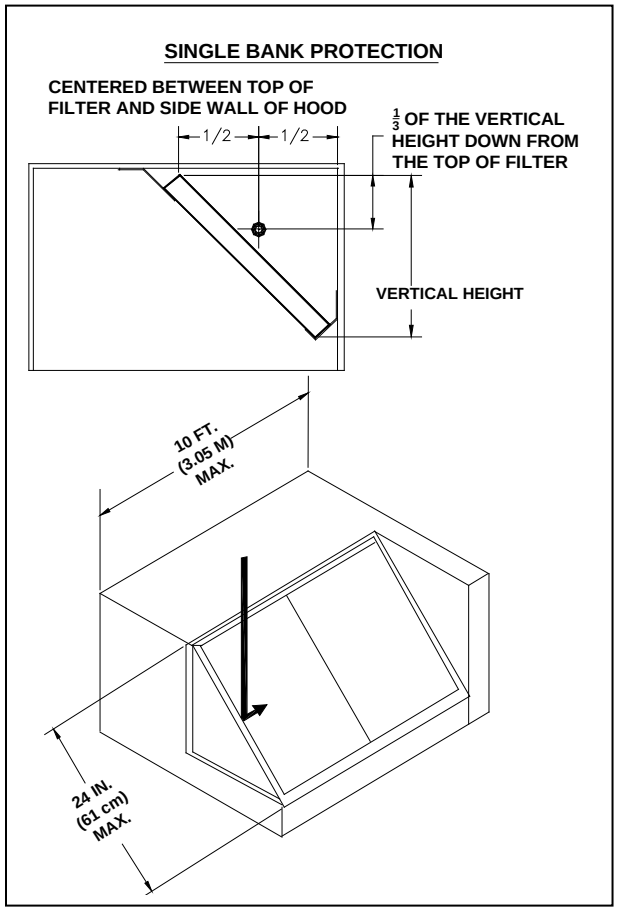
2A + 2B = PERIMETER
OR
(A + B) 2 = PERIMETER

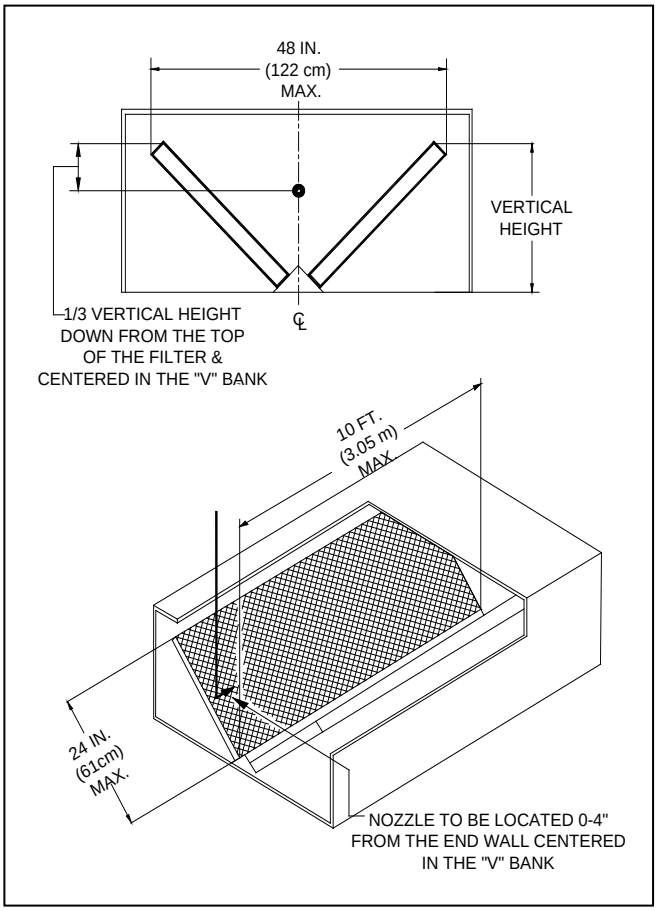
PLENUM PROTECTION

***NOTE:* An Amerex KP & ZD Kitchen Fire Suppression System have the same listed criteria for the protection of the Duct and Plenum.**

PLENUM PROTECTION LIMITATIONS – SINGLE FLOW POINT NOZZLE (P/N 11982)

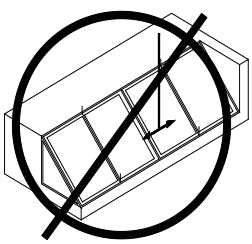
The Amerex Appliance, Plenum Nozzle (P/N 11982) is capable of protecting plenums up to 10 feet (3.048m) long with either a single inclined filter bank or a "V" bank filter arrangement. The filter height cannot exceed 24 inches (60.96 cm). Each plenum nozzle uses one flow point. The nozzle must be positioned 4 inches (10.16) maximum from the end wall of the hood, aimed horizontally and positioned down 1/3 the vertical filter height from the top of the filter. The width of a "V" bank filter arrangement is limited to a maximum of 48" (122 cm).

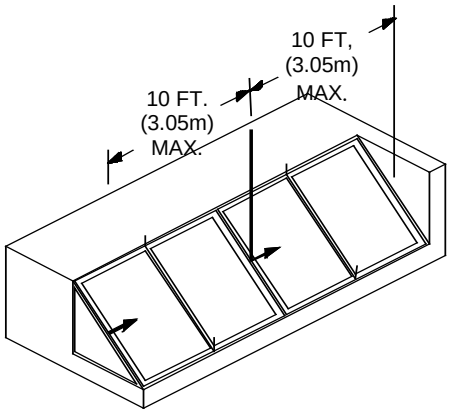




PLENUM PROTECTION – MULTIPLE NOZZLES

Plenums exceeding 10 feet (3.048 m) in length may be protected by using multiple plenum nozzles. Each nozzle must be protecting an area of no more than 10 feet in length. Nozzles may be positioned facing each other or facing the same direction as long as the entire plenum area is being covered. Nozzles may not face in opposite directions from a common tee.



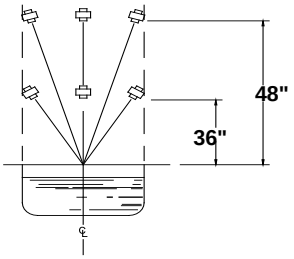


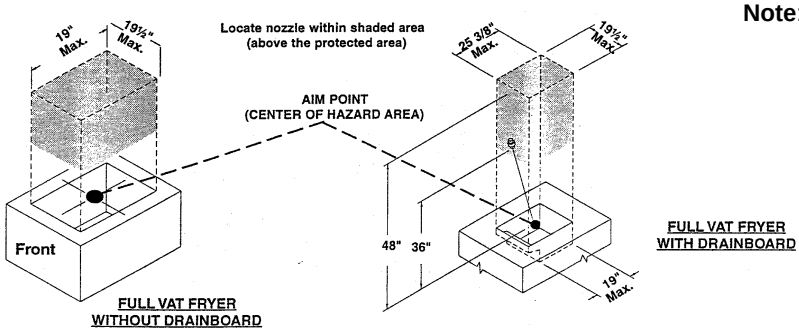
KP APPLIANCE PROTECTION

***NOTE:* The Amerex ZD Kitchen Fire Suppression System utilizes the same listed KP appliance protection criteria for "Dedicated Appliance Protection".**

FRYER PROTECTION (FULL VAT)
TWO FLOW POINT NOZZLE (P/N 13729)
MAXIMUM AREA: 19½ in. (50 cm) x 25-3/8 in. (65 cm) including drainboard interface area
19½ in. (50 cm) x 19 in. (48 cm) not including drainboard interface area

The Amerex Fryer Nozzle (P/N 13729) uses two flow points and will protect a full vat fryer. If the fryer does not include a drainboard, the maximum fryer dimensions for single nozzle coverage are 19" x 19½" (48 x 50 cm) and the maximum protected area is 2.53 ft^2 (2350 cm^2). If the fryer does contain a drainboard the maximum fryer dimensions for single nozzle coverage is 25-3/8" x 19½" (65 x 48 cm) and the maximum protected area is 3.44 ft^2 (3195 cm^2). However, the maximum hazard area must not exceed 19" x 19 ½" (48 x 50 cm). The nozzle must be located along or anywhere within the protected area. Nozzle heights must be within 36 to 48 inches (91.44 – 121.92 cm) above the appliance surface and aimed to the center of the hazard area of the appliance.

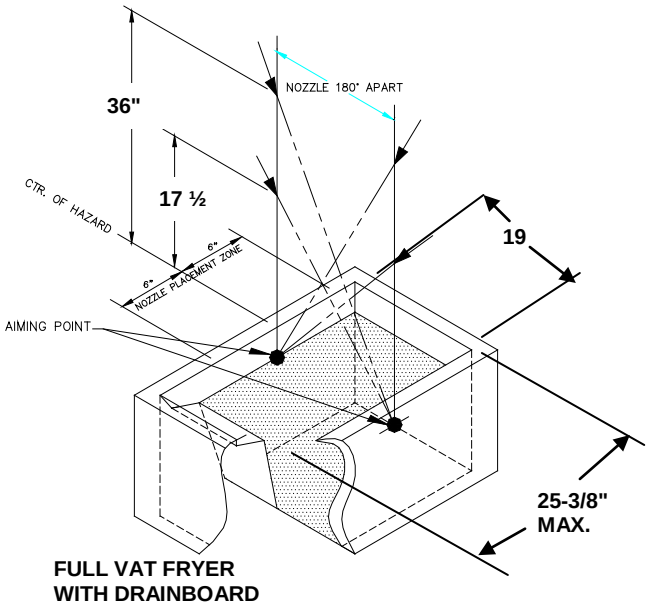




Note: Maximum & minimum heights must be measured vertically from the tip of nozzle to the top of the appliance.

LOW PROXIMITY APPLICATION
FRYER PROTECTION (FULL VAT)
TWO (2) SINGLE FLOW POINT NOZZLE (P/N 11982)
MAXIMUM AREA: 19½ in. (50 cm) X 25 3/8 in. (65 cm) (including drainboard interface area)
19½ in. (50 cm) x 19 in. (48 cm) (not including drainboard interface area)

A pair of Amerex single flow point nozzles (P/N 11982) will protect a full vat fryer. The nozzles must be used in pairs located on the perimeter of the appliance, ½" back from the inside edge of the appliance and within a zone extending 6" in both directions of the center of the hazard. The nozzles are to be located 180° apart (directly across from one another). They are to be aimed at a point 3" below the top of the appliance and directly below the opposing nozzle. If the fryer does not include a drainboard, the maximum fryer dimensions are 19½" x 19" (50 x 48 cm) and the maximum protected area is 2.53 ft^2 (2530 cm^2). If the fryer does contain a drainboard, the maximum fryer dimensions are 25 3/8" x 19 ½" (65 x 50 cm) and the maximum protected area is 3.44 ft^2 (3195 cm^2). However, the maximum hazard area must not exceed 19 ½" x 19" (50 x 48 cm). The nozzle's height must be within 17½" to 36" (45 - 92 cm) above the appliance surface.



FULL VAT FRYER WITH DRAINBOARD

FRYER PROTECTION (FULL VAT W/ 1" DRIP BOARD)
ONE – TWO FLOW POINT NOZZLE (P/N 13729)
MAXIMUM AREA: 624 sq. in. (4025.8 sq. cm) of FRY POT

The Amerex Nozzle (P/N 13729) is two flow points and will protect a full vat fryer having an area of 624 sq. in. and a longest side of 26 inches without a drip board. The nozzle must be located anywhere over the protected area and aimed at the center of the hazard. Nozzle heights must be within 36 to 50 inches (91.4 – 127 cm) above the appliance surface.

The example below illustrates how the fryer listing above can be applied to a Tilting Skillet / Brazing Pan.

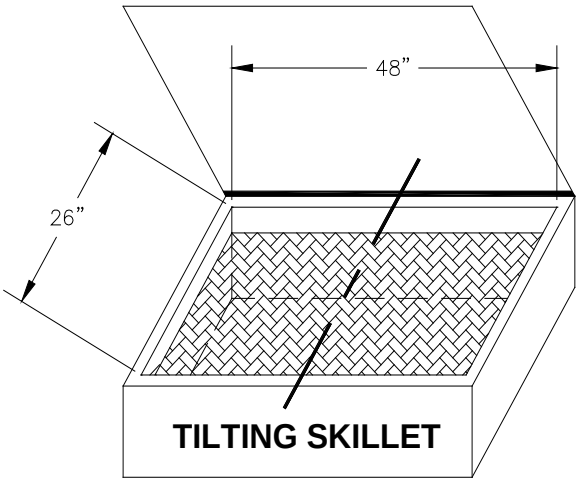


FIGURE 1

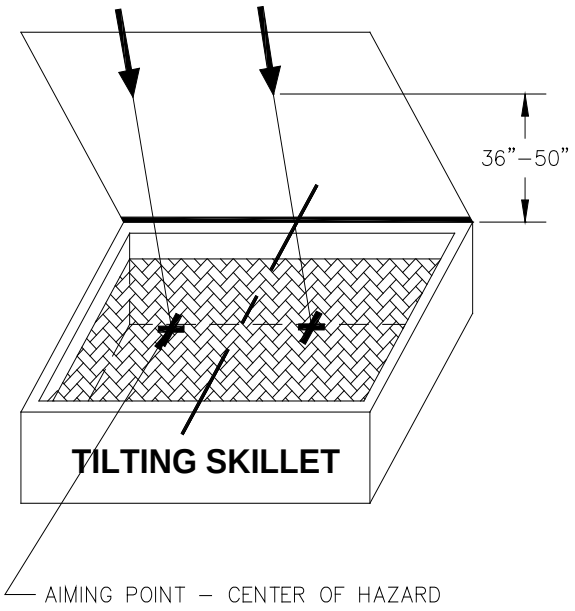


FIGURE 2

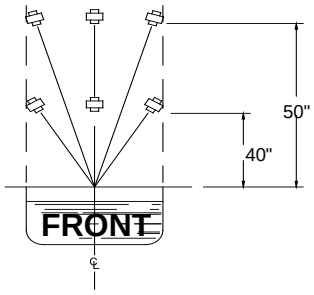
Figure 1 is an illustration of a large tilting skillet measuring 26" x 48" and the tilting skillet has no drip board. We calculate the cooking area of the tilting skillet by multiplying the width X length and the result is 1248 sq. in. We now divide the area by the listed area of 624 and the resultant is 2. Therefore, two nozzles are required to protect this appliance. (If the resultant had been greater than 2, we would have rounded up to 3.

Figure 2 shows how the hazard was divided into two equal modules 26" x 24" and each module has an area of 624 sq. in. Therefore, the use of two nozzles P/N13729 will protect this hazard. When protecting a tilting skillet with a cover or lid the nozzles must be placed to the front edge of the appliance and aimed to the center of the module.

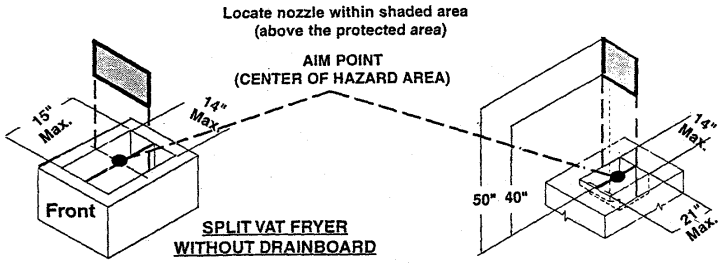
The same process is to be used to apply this listing to a large fryer except the fryer must fall within the required maximum fryer size of six square feet.

FRYER PROTECTION (SPLIT VAT)
TWO FLOW POINT NOZZLE (P/N 13729)
MAXIMUM AREA: 14 in. (35.5 cm) X 21 in. (53.5 cm) (including drainboard interface area)
14 in. (35.5 cm) x 15 in. (38.1 cm) (not including drainboard interface area)

The Amerex fryer nozzle (P/N 13729) uses two flow points and will protect a split vat fryer. If the fryer does not include a drainboard, the maximum fryer dimensions for single nozzle coverage are 15" x 14" (38.1 x 35.5 cm) and the maximum protected area is 1.46 ft^2 (1356 cm^2). If the fryer does contain a drainboard, the maximum fryer dimensions for single nozzle coverages are 21" x 14" (53.5 x 35.6 cm) and the maximum protected area is 2.0422 (1897 cm^2). However, the maximum hazard area must not exceed 15" x 14" (38.1 x 35.5 cm). The nozzle must be located within the protected area on a line perpendicular to the longest side of the fryer passing through the center of the hazard area. Nozzle heights must be within 40 to 50 inches (101.6 – 127 cm) above the appliance surface and aimed to the center of the hazard area of the appliance.



SPLIT VAT FRYER
WITH DRAINBOARD



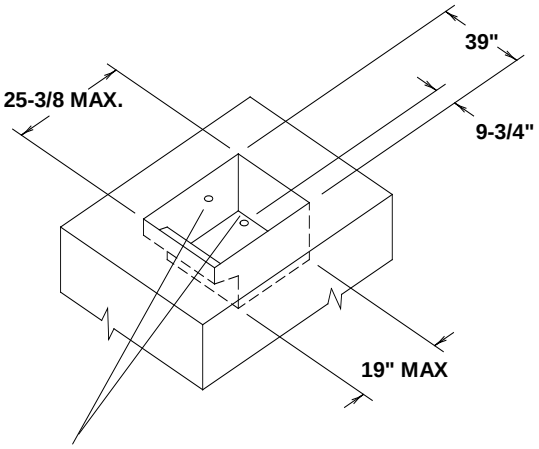
SPLIT VAT FRYER
WITHOUT DRAINBOARD

NOTE: Maximum and minimum heights must be measured vertically from the tip of nozzle to the top of the appliance.

SPLIT VAT FRYER
WITH DRAINBOARD

FRYERS EXCEEDING SINGLE NOZZLE PROTECTION:

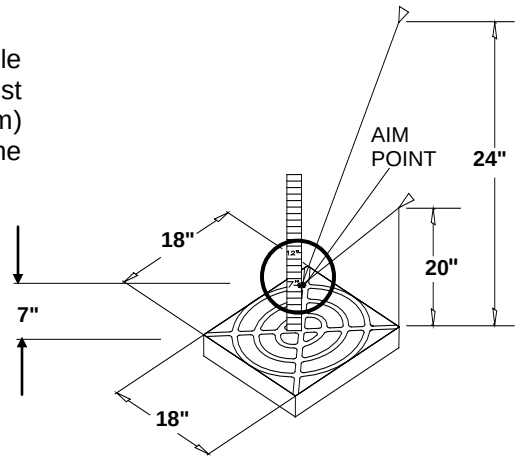
Multiple Amerex fryer nozzles (P/N 13729) may be used to protect single vat fryers with maximum protected areas exceeding single vat coverages up to a maximum protected area of 6 $ft.^2$. The fryer must be divided into modules for single nozzle coverages and the nozzle located and aimed for each module as indicated for single nozzle coverages. For modules that do not include drainboards, the maximum module dimensions for single nozzle coverages is 19 ½" x 19" (50 x 48 cm) and the maximum protected area is 2.53 ft^2 (2350 cm^2). If the module does contain a drainboard, the maximum module dimensions for single nozzle coverage is 25 3/8" x 19 ½" (65 x 50 cm) and a maximum protected area is 3.44 ft^2 (3195 cm^2). However, the maximum frying area of a module must not exceed 19 ½" x 19" (50 x 48 cm).



AIM POINTS

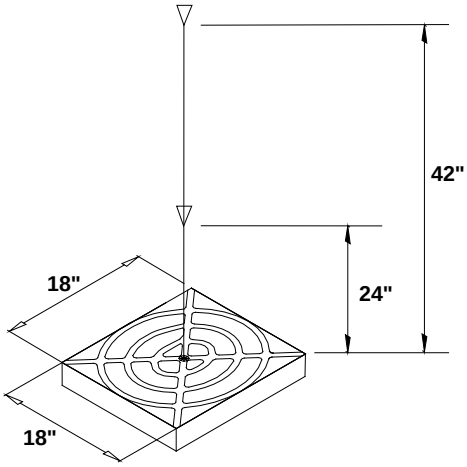
SINGLE BURNER RANGE PROTECTION
ONE – ½ FLOW POINT NOZZLE (P/N 11984)

The Amerex half (½) flow point nozzle (P/N 11984) will protect a single burner with a surface area of 18” x 18” (46 x 46 cm). The nozzles must be located on the perimeter of the burner and 20 to 24" (51 – 61 cm) above the burners surface. The nozzle is aimed at a point 7” above the center of the burner.



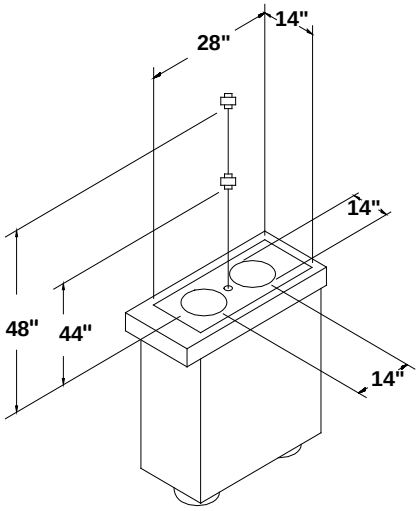
SINGLE BURNER RANGE PROTECTION – OVERHEAD
ONE – ½ FLOW POINT NOZZLE (P/N 11984)

The Amerex half (½) flow point nozzle (P/N 11984) will protect a single burner with a surface area of 18” x 18” (46 x 46 cm). The nozzles must be located directly above the center of the burner and 24 to 42" (61 - 107 cm) above the burners surface. The nozzle is aimed at the center of the burner.



TWO BURNER RANGE PROTECTION –
SINGLE FLOW POINT NOZZLE (P/N 11982)

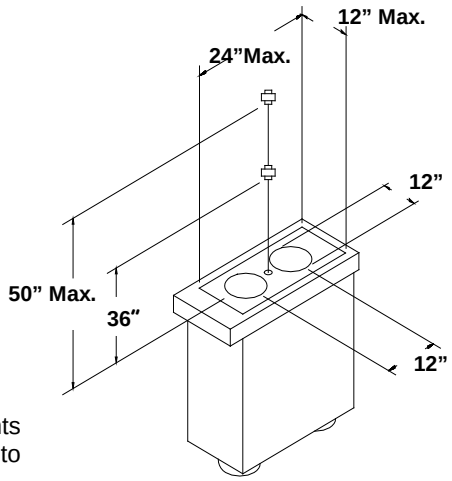
The Amerex appliance, plenum nozzle (P/N 11982) has one flow point and will protect a range surface area of 14” x 28” (36 x 71 cm). The center to center distance between burners must not exceed 14" (36 cm). The nozzle must be located 44 - 48" (112 - 122 cm) above the range surface and centered between the two burners. The range surface area is measured from the outside of the burner to the outside of the burner.



NOTE: Maximum and minimum heights must be measured from the tip of nozzle to the surface of the appliance.

RANGE PROTECTION
SINGLE FLOW POINT NOZZLE (P/N 11982)

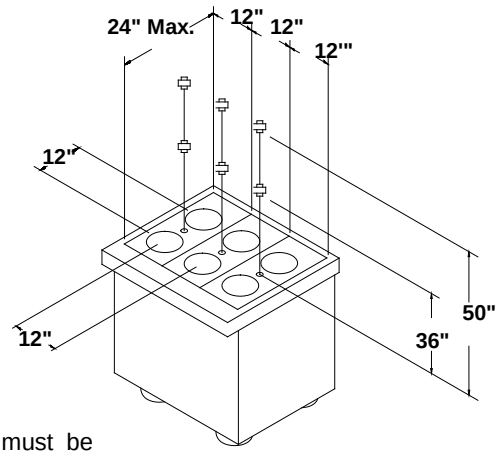
The Amerex appliance plenum nozzle (P/N 11982) has one flow point and will protect a range surface area of 12" x 24" (31 x 61 cm). The center to center distance between burners must not exceed 12" (31 cm). The nozzle must be located 36 – 50" (91 - 127 cm) above the range surface and centered between the two burners. The range surface area is measured from the outside of the burner to the outside of the burner.



Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

RANGE PROTECTION
MULTIPLE NOZZLES (P/N 11982)

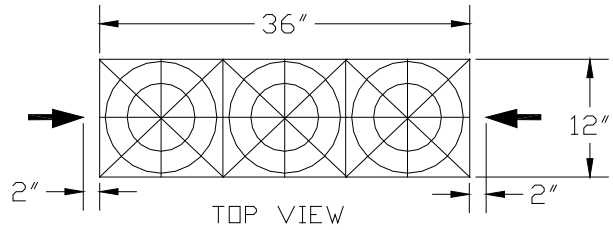
For ranges that have a surface area exceeding the capabilities of a single appliance nozzle, multiple nozzles must be used provided that the surface area of the range is divided into equally sized modules. Each module must be equal to or less than 12" x 24" (31 x 61 cm).

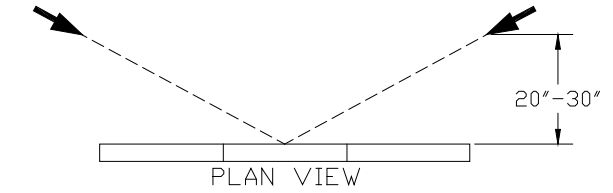


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

RANGE PROTECTION
TWO - HALF FLOW POINT NOZZLE (P/N 11984)

The Amerex appliance nozzle (P/N 11984) has one-half flow point value and when used as a pair as illustrated below will protect a range surface area of 12" x 36" (31 x 92 cm). The nozzle must be located 20 – 30" (50.8 – 76.2 cm) above the range surface, on the burner centerline, 2 inches (5 cm) outboard of the burner and aimed at the center of the hazard area. The nozzles are to be at the same height and on opposite sides of the range hazard area.



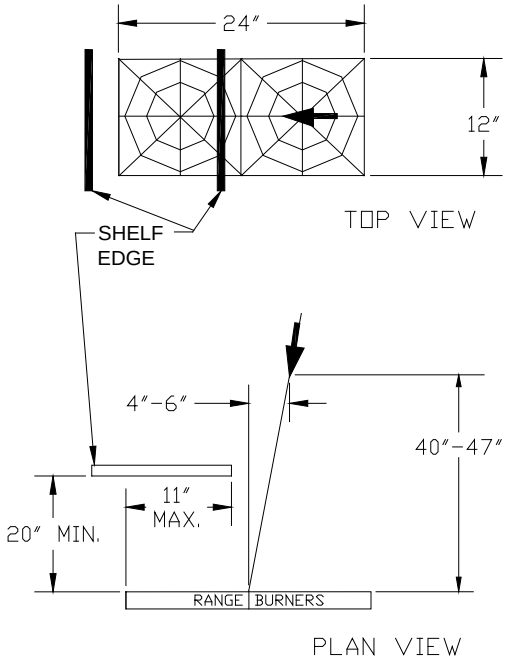


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

RANGE PLUS BACK-SHELF PROTECTION
OVERHEAD APPLIANCE NOZZLE (P/N 11982)

The Amerex appliance nozzle (P/N 11982) has a one flow point value and will protect a range burner area of 12" x 24" (31 X 61 cm) from an overhead position. The back shelf must be at least 20" high (51 cm) and must not cover more than 11" (28 cm) of the back burners. The nozzle must be located 40 – 47" (102 – 119 cm) above the range surface, on the burner centerline, 4-6 inches (10 – 15 cm) forward of the center of the two burners and aimed at the center of the hazard area.

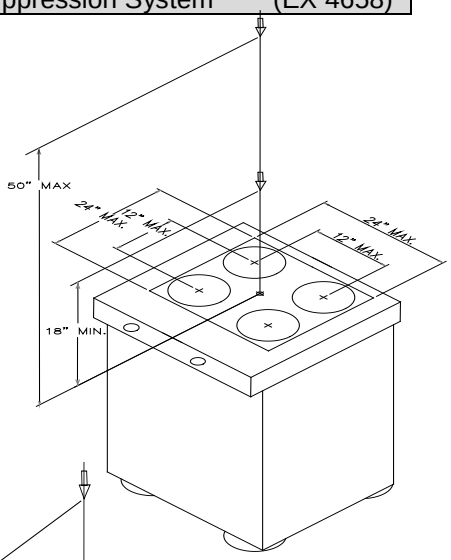
Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.



FOUR (4) BURNER RANGE PROTECTION
TWO (2) FLOW POINT NOZZLE (P/N 14178)

The Amerex 4 burner range nozzle (P/N 14178) has two (2) flow points and will protect a range surface area of 24” x 24” (61 x 61 cm). The center to center distance between burners must not exceed 12 inches. The nozzle must be located 18 – 50" (46 – 127 cm) above the range surface and centered between the burners. The nozzle is aimed straight down at the center of the appliance.

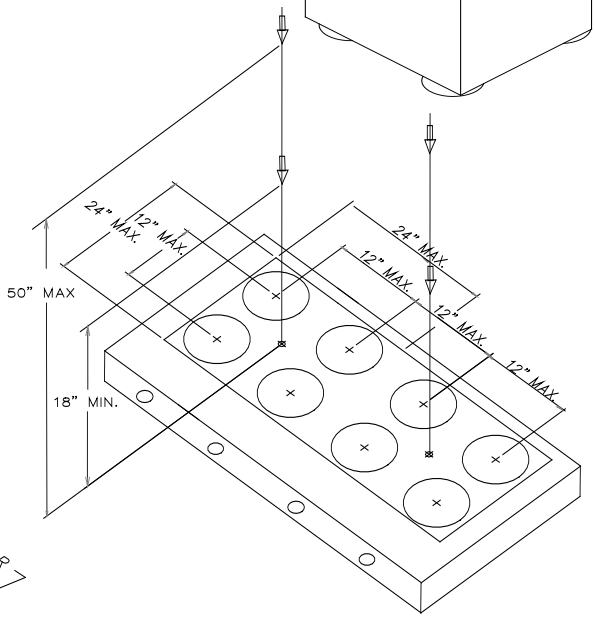
NOTE: Maximum and minimum heights must be measured from the tip of nozzle to the surface of the appliance.

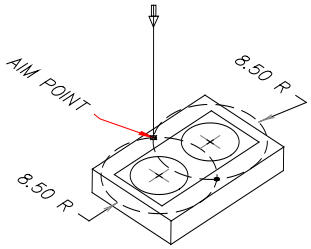


RANGE PROTECTION -
MULTIPLE NOZZLES (P/N 14178)

For ranges that have a surface area exceeding the capabilities of a single nozzle, multiple nozzles must be used provided that the surface area of the range is divided into equally sized modules. Each module must be equal to or less than 24” x 24” (61 x 61 cm).

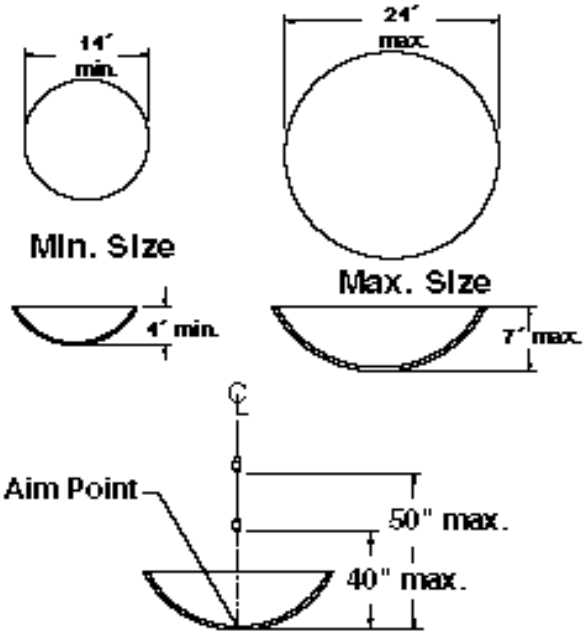
NOTE: When using this nozzle to protect a two (2) burner range the aiming point is where an 8.50” radius from the center of each burner crosses one another





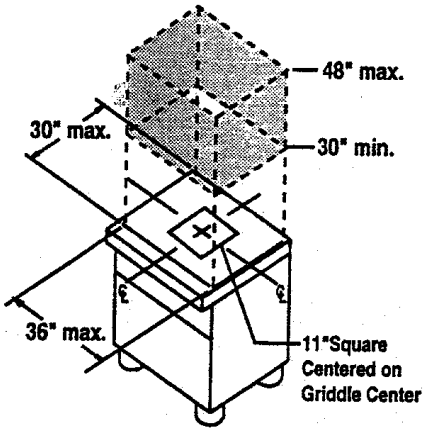
WOK PROTECTION -
SINGLE FLOW POINT NOZZLE (P/N 11982)

The Amerex appliance plenum nozzle (P/N 11982) has one flow point and will protect a wok with dimensions between a minimum diameter of 14” (36 cm) and a maximum diameter of 24” (61 cm) inclusive. The wok must have a height dimension between a minimum of 4” (10 cm) and a maximum of 7” (18 cm) inclusive. The nozzle must be centered over the center of the wok and located at a height between 40 “ (102 cm) and 50” (127 cm) from the bottom of the inside of the wok and aimed at the center of the wok.

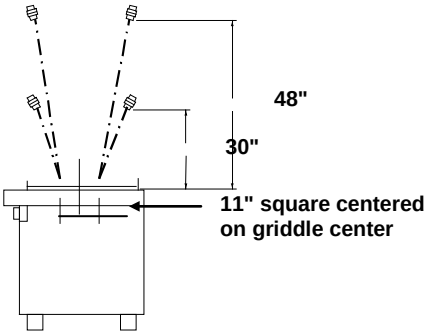


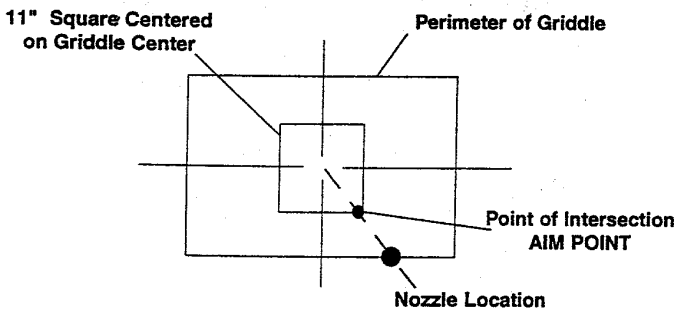
GRIDDLE PROTECTION – SINGLE FLOW POINT NOZZLE (P/N 11982)

The Amerex griddle nozzle (P/N 11982) has one flow point and will protect a griddle surface of 36 inches wide (91 cm) x 30 inches deep (76 cm). The nozzle must be located along the perimeter of the appliance and within a vertical height range from 30" to 48" (76 – 122. cm) above the surface of the appliance. The aiming point for the nozzle is the "point of intersection" of a straight line from the nozzle location to the center of the appliance, with an 11" (28 cm) square, generated about the center point of the griddle.



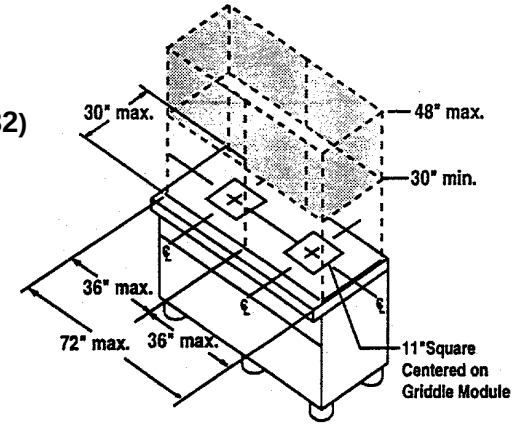
Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

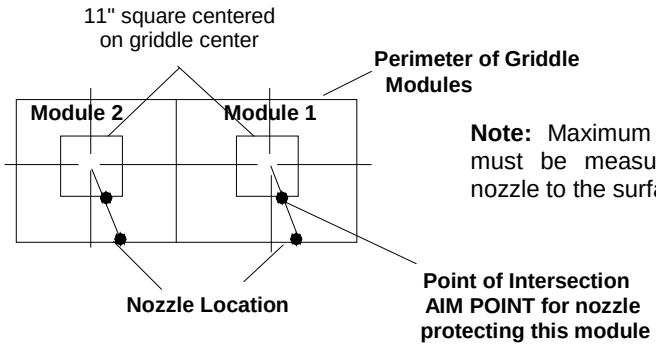




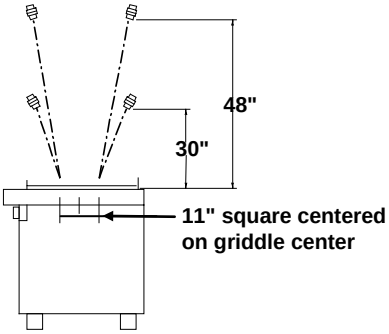
GRIDDLE PROTECTION – MULTIPLE SINGLE FLOW POINT NOZZLES (P/N 11982)

Multiple Amerex griddle nozzles (P/N 11982 – one flow point) may be used to protect a griddle surface area greater than 30 inches (76 cm) X 36 inches (91 cm). The griddle must be divided into modules for single nozzle coverage and the nozzles located and aimed for each module as indicated for single nozzle coverage.



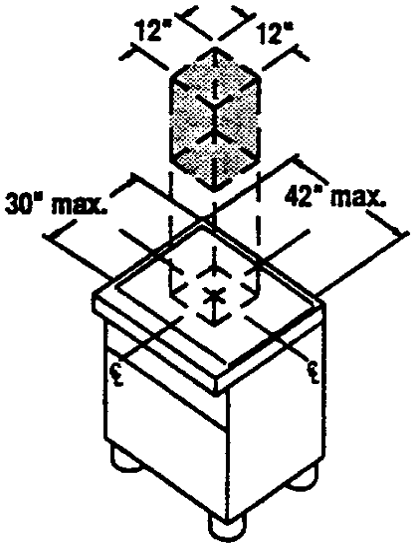


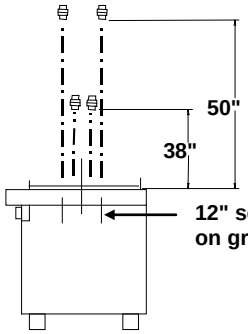
Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.



GRIDDLE PROTECTION – OVERHEAD
TWO FLOW POINT NOZZLE (P/N 13729)

The Amerex fryer and griddle nozzle (P/N 13729) has two flow points and will protect a griddle surface of 42 inches wide (107 cm) X 30 inches deep (76 cm). The nozzle must be located within 6 inches (15 cm) of either side of the appliance centerline, placed 38 inches (97 cm) to 50 inches (127 cm) above the cooking surface and aimed straight down.

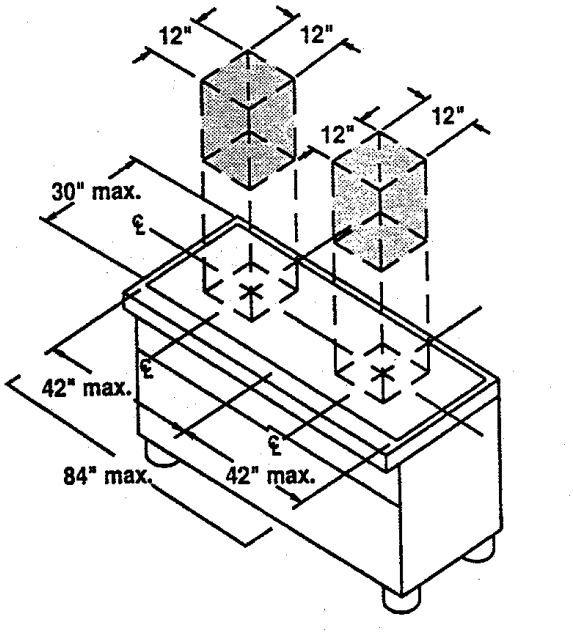


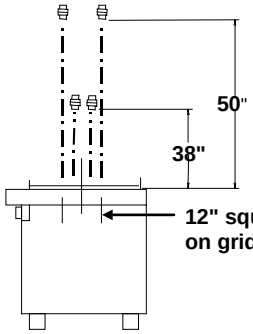


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

GRIDDLE PROTECTION – OVERHEAD
MULTIPLE TWO FLOW POINT NOZZLES (P/N 13729)

Griddles exceeding 30 inches (76 cm) X 42 inches (107 cm) may be protected using multiple two flow point nozzles by dividing the surface area into equal modules. Each module requires one nozzle and cannot exceed an area larger than 42 inches length (107 cm) X 30 inches deep (76 cm).

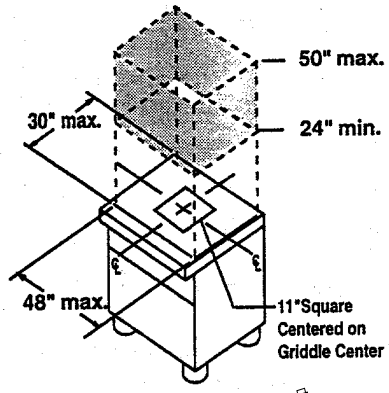


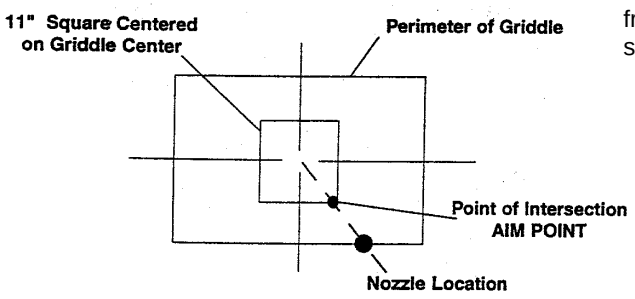


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

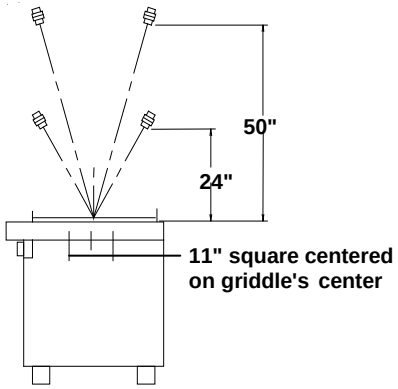
GRIDDLE PROTECTION - LARGE
TWO (2) FLOW POINT NOZZLE (P/N 14178)

The Amerex Range Nozzle (P/N: 14178) has two (2) flow points and will protect a griddle surface of 48 inches wide (122 cm) x 30 inches deep (76 cm). The nozzle must be located along the perimeter of the appliance and within a vertical height range from 24" (61 cm) to 50" (127 cm) above the surface of the appliance. The aiming point for the nozzle is the **"Point of Intersection"** of a straight line from the nozzle location to the center of the appliance, where the line crosses the outer edge of an 11 inch square (28 cm sq.), centered over the center point of the griddle.



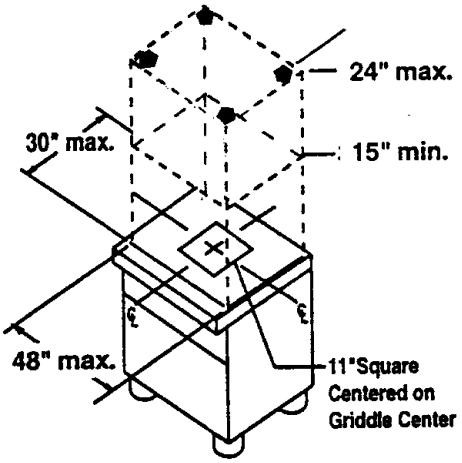


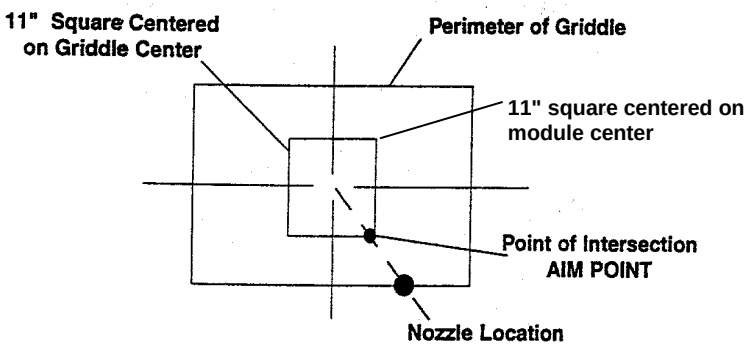
Note: maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.



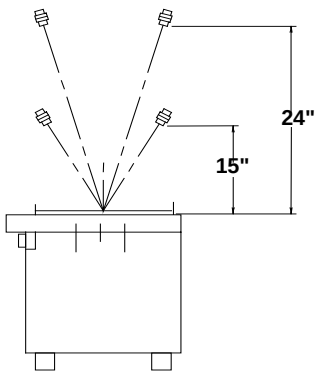
GRIDDLE PROTECTION - LOW PROXIMITY
TWO (2) FLOW POINT NOZZLE (P/N 14178)

The Amerex Range Nozzle (P/N: 14178) has two (2) flow points and will protect a griddle surface of 48 inches wide (122 cm) x 30 inches deep (76 cm). The nozzle must be located at any one of the **four corners** of the appliance and within a vertical height range from 15" (38 cm) to 24" (61 cm) above the surface of the appliance. The aiming point for the nozzle is the **"Point of Intersection"** of a straight line from the nozzle location to the center of the appliance, where the line crosses the outer edge of an 11 inch square (28 cm sq.), centered over the center point of the griddle.



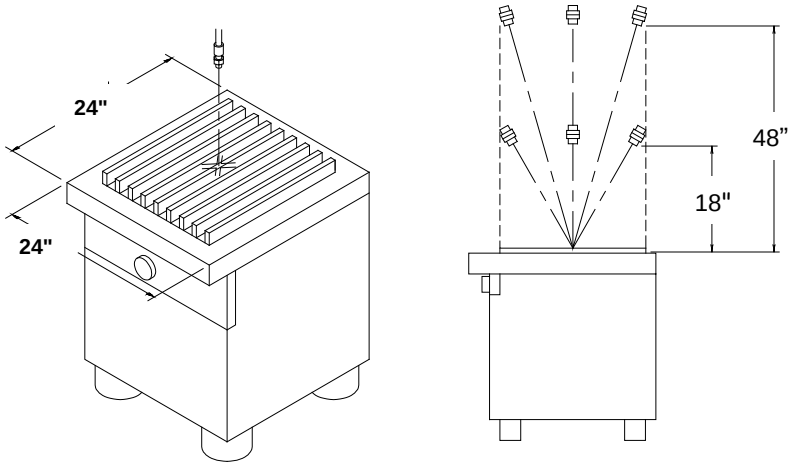


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.



GAS RADIANT CHARBROILER PROTECTION SINGLE FLOW POINT NOZZLE (P/N 11982)

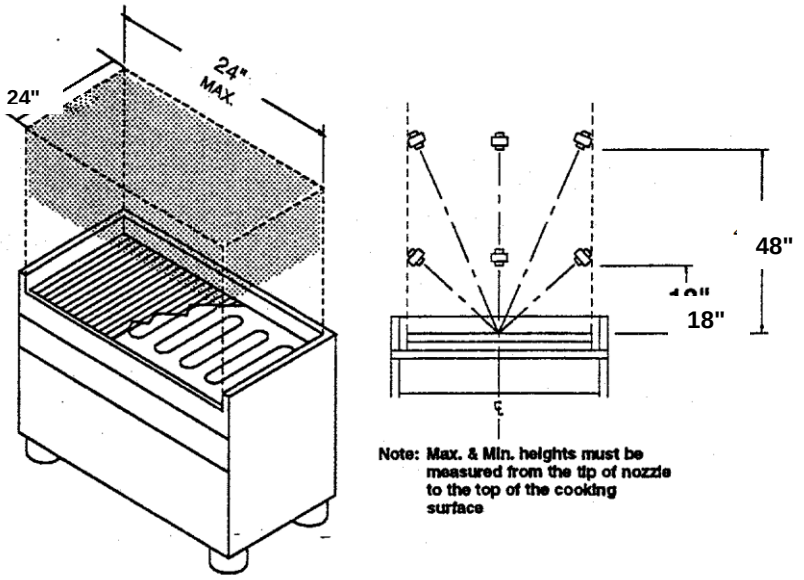
One Amerex plenum nozzle (P/N 11982) will protect a gas radiant charbroiler with a cooking surface measuring 24 inches X 24 inches (61 x 61cm) maximum. The nozzle uses one flow point. It must be located 18 to 48 inches (46 – 122 cm) above the cooking surface and anywhere along or within the perimeter aimed towards the center.



ELECTRIC RADIANT CHARBROILER PROTECTION SINGLE FLOW POINT NOZZLE (P/N 11982)

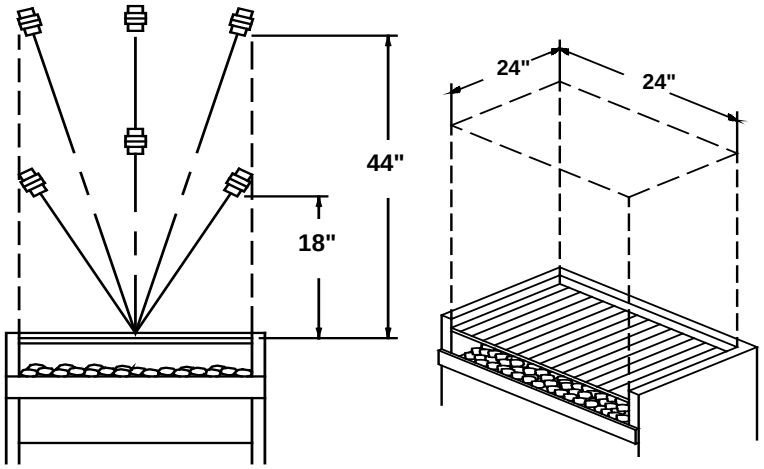
Note: Electric charbroilers with a non-grated surface or a solid ribbed surface may be protected using the same limitations as a griddle.

Electric charbroilers with an open grate may be protected with one Amerex appliance, plenum nozzle (P/N 11982) provided that the area is no larger than 24 inches X 24 inches (61 x 61 cm). The nozzle uses one flow point and must be located within 18 – 48 inches (46 – 122 cm) above the grate surface, anywhere along or within the perimeter of the protected area, aimed towards the center.



LAVA ROCK (CERAMIC/SYNTHETIC) CHARBROILER SINGLE FLOW POINT NOZZLE (P/N 11983)

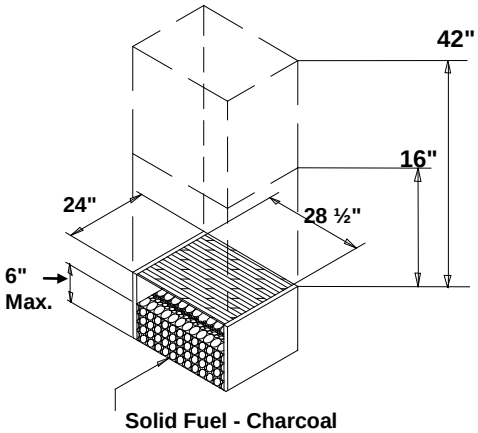
A single Amerex solid fuel appliance plenum nozzle (P/N 11983) will protect a lava rock charbroiler with a maximum cooking surface of 24 inches wide (61 cm) by 24 inches deep (61 cm). The appliance nozzle uses 1 ½ flow point and for this application must be located between 18 to 44 inches (46 to 122 cm) above the cooking surface anywhere along or within the perimeter of the appliance aimed toward the center.



SOLID FUEL APPLIANCES

NATURAL AND MESQUITE CHARCOALCHARBROILER ONE AND ONE HALF (1½) FLOW POINT NOZZLE (P/N 11983)

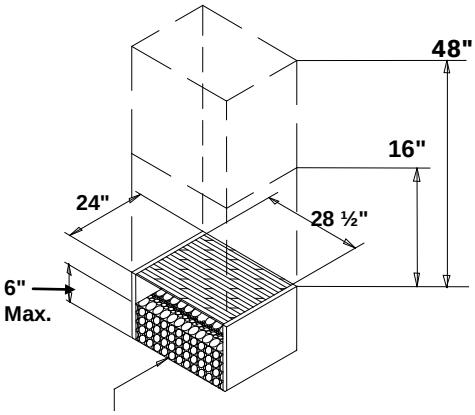
One Amerex solid fuel appliance nozzle (P/N 11983) will protect a charcoal charbroilers with a cooking surface measuring 28½ inches x 24 inches (72 cm x 61 cm) maximum. The nozzle uses one and one half flow points. It must be located 16 to 42 inches (41 cm – 107 cm) above the cooking surface and anywhere along or within the perimeter aimed at the center. The fuel depth is limited to 6 inches (15 cm) maximum.



Solid Fuel - Charcoal

MESQUITE CHIPS & CHUNKS CHARBROILER ONE AND ONE HALF (1½) FLOW POINT NOZZLE (P/N 11983)

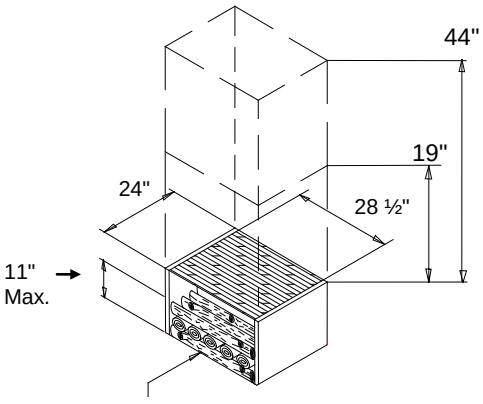
A single Amerex solid fuel appliance nozzle (P/N 11983) will protect a mesquite charbroilers with a maximum cooking surface of 28½ inches X 24 inches (72 cm X 61 cm). The nozzle uses one and one half (1½) flow points and for this application must be located between 16 to 48 inches (41 cm to 122 cm) above the cooking surface anywhere along or within the perimeter of the appliance aimed at the center of the appliance. The fuel depth is limited to 6 inches (15 cm) maximum.



Solid Fuel – Mesquite Chips & Chunks

MESQUITE LOG CHARBROILER ONE AND ONE HALF (1½) FLOW POINT NOZZLE (P/N 11983)

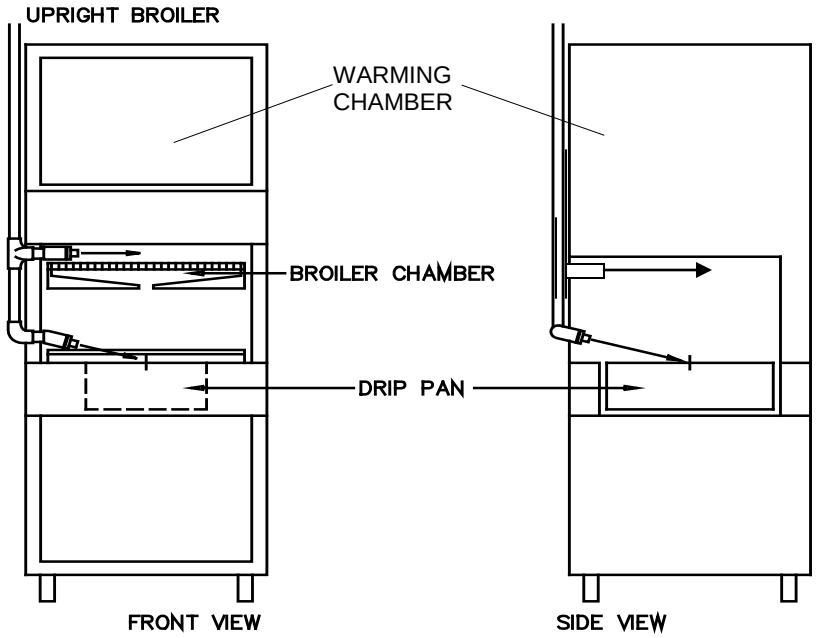
A single Amerex solid fuel appliance nozzle (P/N 11983) will protect a mesquite log charbroilers with a maximum cooking surface of 28½ inches X 24 inches (72 cm X 61 cm). The nozzle uses one and one half (1½) flow points and for this application must be located between 19 to 44 inches (48 cm to 112 cm) above the cooking surface anywhere along or within the perimeter of the appliance aimed at the center of the appliance. Solid fuel is limited to three (3) layers of logs or 11 inch (28 cm) maximum stacked height.

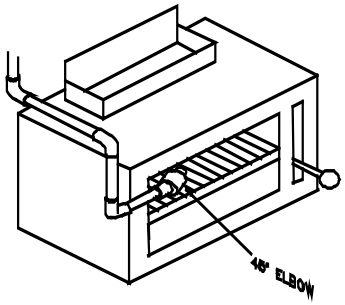


Solid Fuel – Mesquite Logs

UPRIGHT BROILER PROTECTION
TWO HALF FLOW POINT NOZZLES (P/N 11984)

Two Amerex upright broiler nozzles are required for this application. Each upright broiler nozzle (P/N 11984) equals a ½ flow point. **These nozzles must always be used in pairs equaling one flow point** and will protect an internal broiler chamber measuring 30 ½" X 28 ½" (77 x 72 cm). The nozzles must be positioned at the front opening of the broiler with the top nozzle located above the grate, aimed toward the opposite rear corner and the lower nozzle located the grate and aimed toward the center of the drip pan.



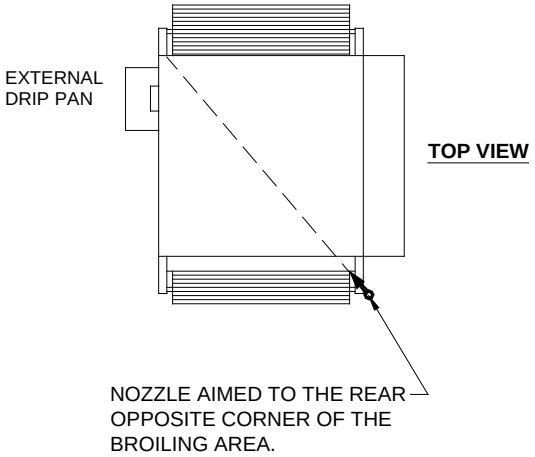


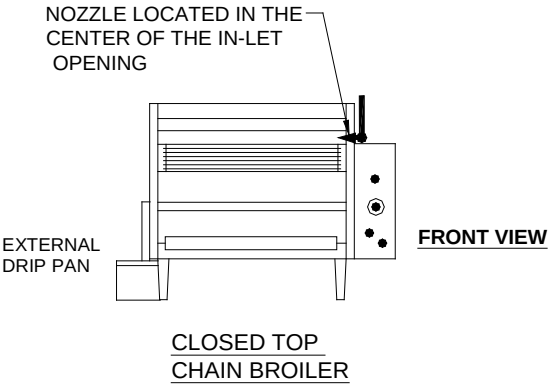
NOTE: PROTECTION FOR SALAMANDERS AND CHEESE MELTERS UP TO 38" (96.5cm) IN LENGTH SHOULD BE ACCOMPLISHED USING A SINGLE FLOW APPLIANCE NOZZLE P/N 11982 LOCATED IN THE MIDDLE OF THE OPENING AND AIMED AT THE REAR OPPOSITE CORNER.

OPTIONAL : PROTECTION MAY ALSO BE ACCOMPLISHED BY USING TWO HALF FLOW POINT NOZZLES P/N 11984 , BOTH NOZZLES LOCATED ON THE SAME SIDE OF THE SALAMANDER, POSITIONED IN THE MIDDLE OF THE UPPER AND LOWER OPENING, AIMED TO THE REAR OPPOSITE CORNER.

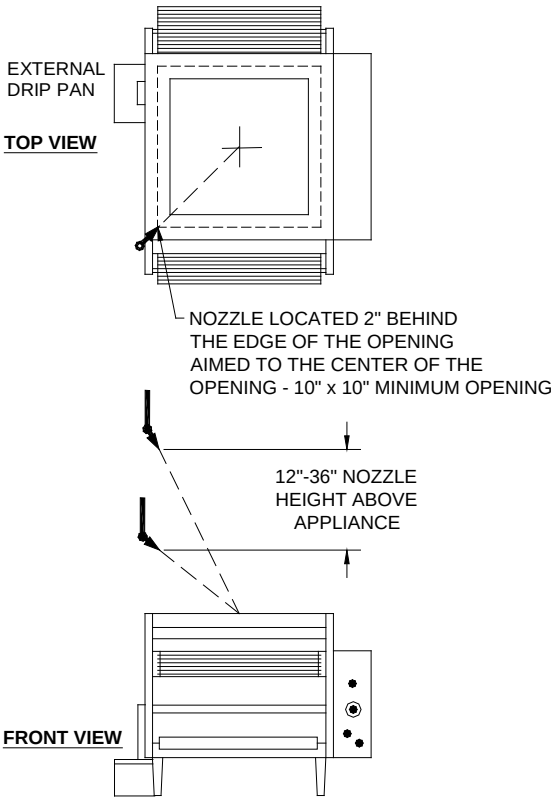
CLOSED TOP CHAIN BROILER
SINGLE FLOW POINT NOZZLE (P/N 11982)

The Amerex appliance/plenum nozzle (P/N11982) has one flow point and will protect a closed top chain broiler with a cooking area of 24 ½" x 31" (62 X 79 cm). The nozzle is to be located on the side opposite the external drip pan (when present), positioned in the middle of the inlet opening and aimed at the opposite rear corner.





CLOSED TOP
CHAIN BROILER



OPEN TOP CHAIN BROILER
TWO FLOW POINT NOZZLE (P/N 13729)

The Amerex fryer nozzle (P/N13729) has two flow points and will protect an open top chain broiler with a cooking area of 24½" x 31" (62 x 79 cm). The minimum opening is 10" x 10" (25.4 x 25.4 cm) and the nozzle is to be positioned 2" behind the edge of the opening, at a height of 12" – 36" (30.5 - 91 cm) above the appliance and aimed at the center of the opening.

Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

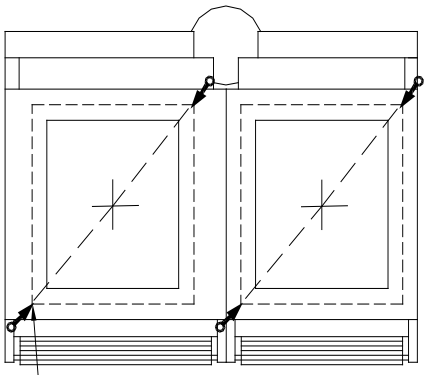
NIECO MODEL 9025 - BURGER KING CHAIN BROILER
TWO – SINGLE FLOW POINT NOZZLE (P/N 11982)

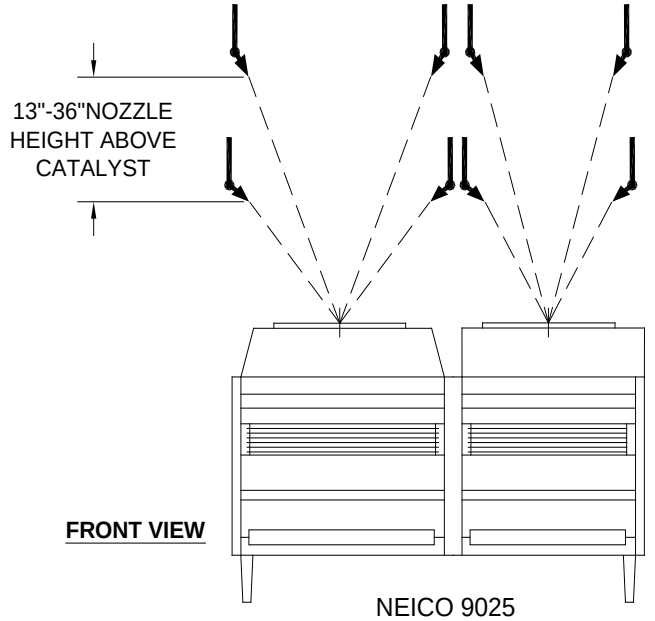
The Nieco Chain Broiler Model 9025 is a unique appliance and when fitted with two catalysts it requires the use of two Amerex nozzles (P/N11982) to protect each half of the appliance. Total appliance protection therefore, requires the use of a total of four Amerex nozzles (P/N 11982). This unique appliance is actually two chain broilers put together to accommodate the cooking of two different products at the same time. This appliance can be fitted with two catalysts (18" x 24" overall) one for each cooking side.

The protection of the appliance is accomplished by using two nozzles P/N 11982 positioned two inches outside of the catalyst perimeter aimed at the center point of the catalyst. The nozzles are to be located on opposite ends of the catalyst, 180° apart and are to be 13" to 36" above the top surface of the catalyst. This configuration is repeated for both cooking sides of the appliance. If no catalyst is used the same protection is required for the unit.

Note**: Maximum & minimum heights must be measured from the tip of nozzle to the top surface of the catalyst or appliance (if no catalyst is used).**

TOP VIEW





FRONT VIEW

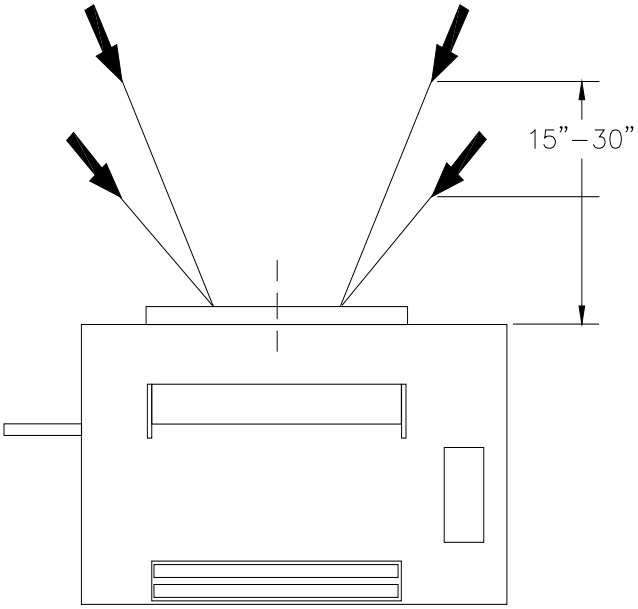
NEICO 9025
CHAIN BROILER

DUKE MODEL - BURGER KING CHAIN BROILER
TWO – TWO FLOW POINT NOZZLE (P/N 13729)

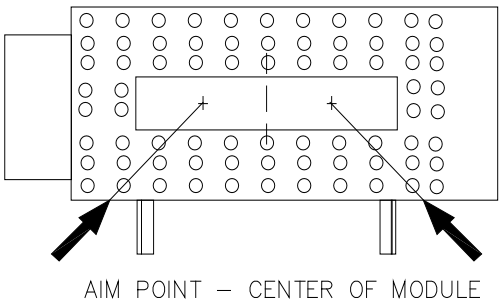
The Duke Chain Broiler is a unique appliance and is fitted with a catalyst that requires the use of two Amerex nozzles (P/N13729). This unique appliance operates at an extremely high temperature in order to cook large quantities of frozen burgers in a short span of time.

The protection of the appliance is accomplished by dividing the catalyst area into two equal modules and positioned one nozzle P/N 13729 on the perimeter of each module, aimed at the center of the module. The nozzles are to be located anywhere on the module perimeter 15" to 30" (38.1cm – 76.2cm) above the top surface of the appliance. If no catalyst is used the same protection is required. The addition of a damper on top of the catalyst does not change the protection required for the unit.

Note**: Maximum & minimum heights must be measured from the tip of nozzle to the top surface of the catalyst or appliance (if no catalyst is used).**



FRONT VIEW



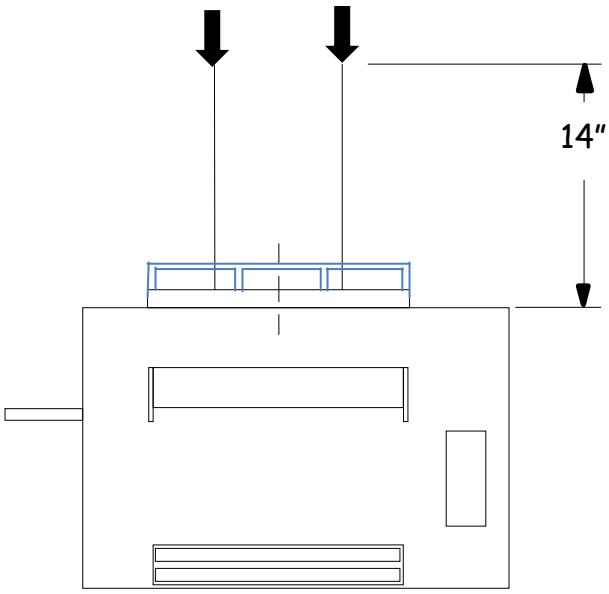
TOP VIEW

DUKE MODEL - BURGER KING CHAIN BROILER
TWO – ONE FLOW POINT NOZZLE (P/N 11982)

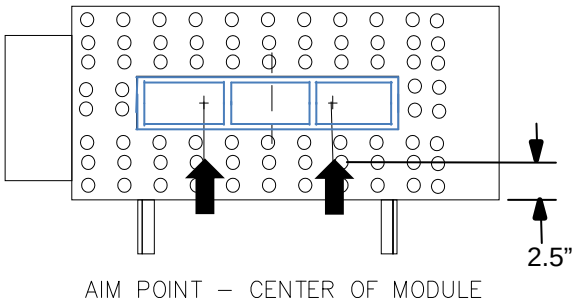
The Duke Chain Broiler is a unique appliance and is fitted with a catalyst that requires a flue guard to direct the exhaust gases. Protection is accomplished with the use of two Amerex nozzles (P/N11982). This unique appliance operates at an extremely high temperature in order to cook large quantities of frozen burgers in a short span of time.

The protection of the appliance is accomplished by dividing the catalyst area into two equal modules and positioned one nozzle P/N 11982 2.5”inboard of the edge of the appliance & aimed at the center of the module. The nozzles are to be located as illustrated below. If no catalyst is used the same protection is required. (The addition of a damper on top of the catalyst changes the protection required for appliance to that illustrated on Page 3-21.)

Note: Nozzle heights must be measured from the tip of nozzle to the top surface of the catalyst or appliance (if no catalyst is used).



FRONT VIEW



AIM POINT – CENTER OF MODULE

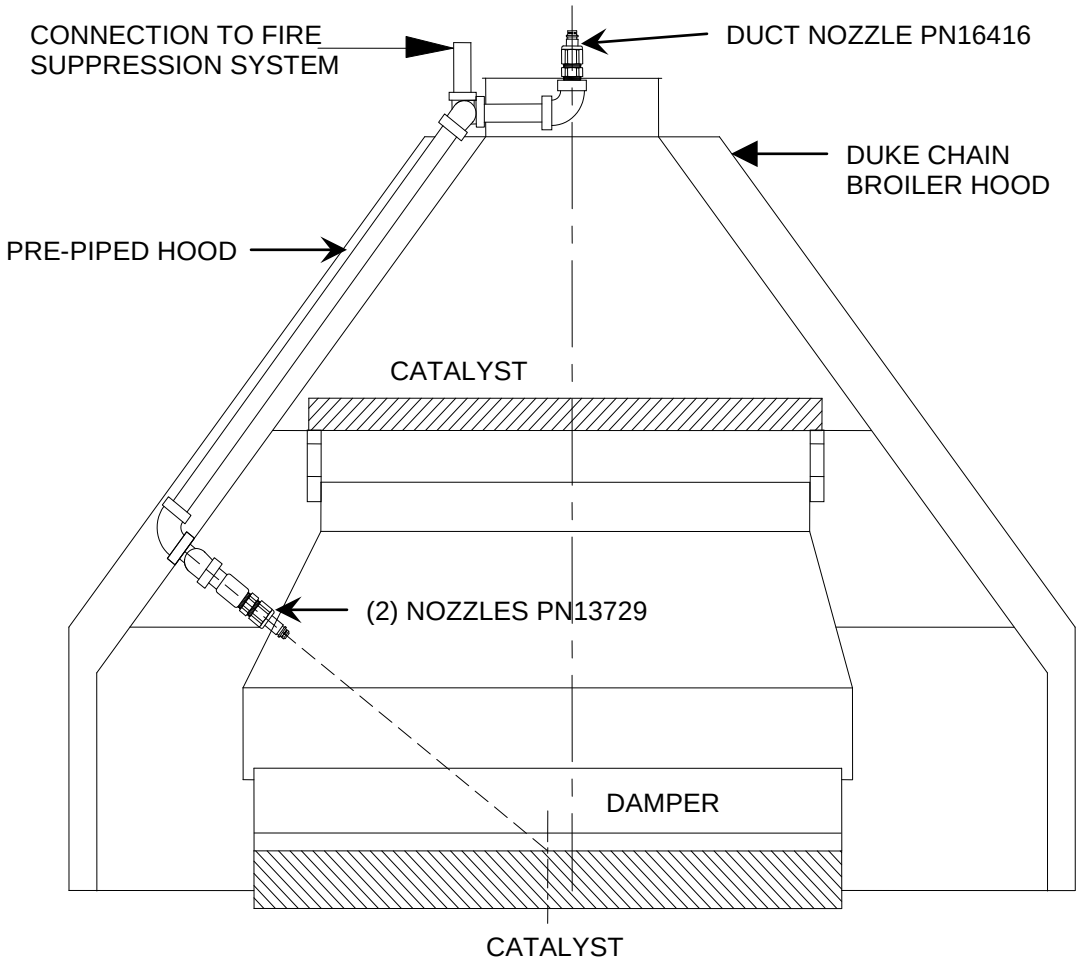
TOP VIEW

DUKE CHAIN BROILER & DUKE HOOD EXHAUST HOOD
TWO – TWO FLOW POINT NOZZLE (P/N 13729)

The Duke Chain Broiler and Hood combination is a special design just for the Duke product. The hood and broiler are each fitted with a catalyst to decrease the emission of grease laden vapors into the exhaust duct system. The hood comes pre-piped for the installation of the fire suppression nozzles. This unique appliance operates at an extremely high temperature in order to cook large quantities of frozen burgers in a short span of time.

The protection of this unit is accomplished by using two (2) Nozzles P/N 13729 installed in the piping provided so that it will spray agent into the catalyst as illustrated. A third nozzle P/N 16416 is installed for duct protection of the 8" diameter exhaust duct.

If no catalyst is used the same protection is required. The addition of a damper on top of the broiler catalyst does not change the protection required for the unit. Due to the extreme heat of the appliance close inspection of the nozzles is to be performed at each six month service interval. Nozzle replacement is required at the signs of any nozzle deterioration.

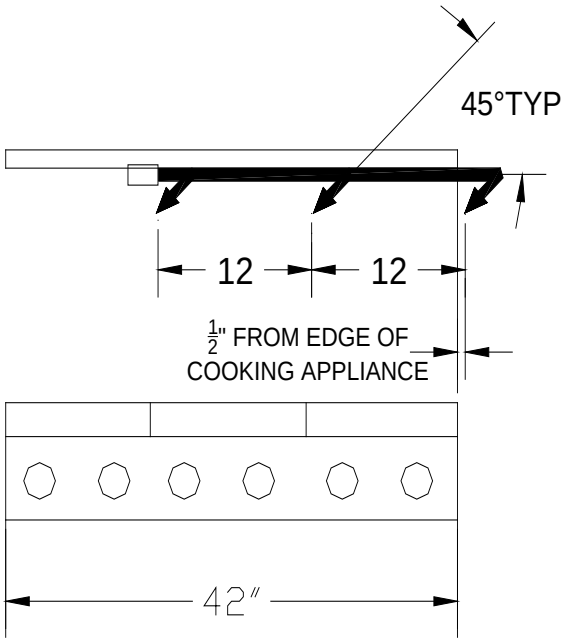


Back shelf – What to do?

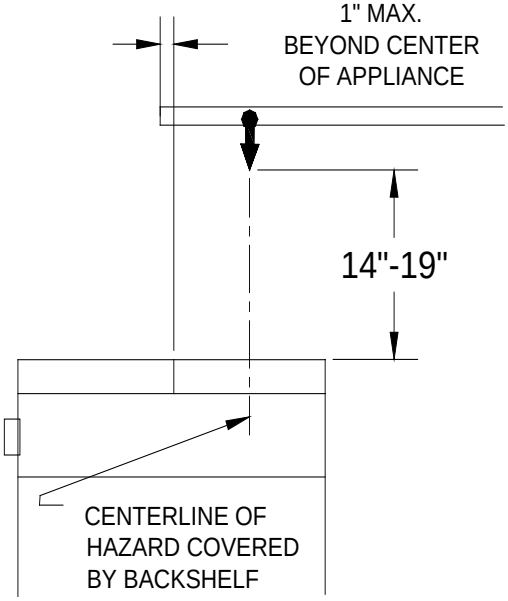
The use of a back-shelf presents a problem to the designer of a kitchen fire suppression system for it is an impediment to the delivery of the wet chemical to the potential fire hazard. The same is true for salamanders that are mounted over an appliance requiring protection. A shelf or salamander that extends over the appliance not only prevents proper delivery of wet chemical but also is a fire hazard. All too often, these shelves become storage places for items such as paper plates, doggie bags, or flammable food preparation liquids. The overhead application of the wet chemical from an Amerex Restaurant Fire Suppression System would be of help in extinguishing a fire occurring in items placed on a back-shelf, but that is not the intended hazard for which the system was designed. The shelf or salamander prevents agent, from an overhead nozzle, from reaching the actual cause of fire in the appliance.

Amerex has developed the only real world solution to this problem. When a shelf is installed over a range or a griddle, a small manifold of three special nozzles provides fire suppression protection. The BSM (back-shelf manifold) is designed to function as supplemental agent application for the area under the back-shelf. It replaces the agent lost because of the shelf. It provides an area of protection 15” deep and 42” wide when used over a range.

The back-shelf or salamander can extend 1” beyond the centerline of the appliance with the manifold nozzle tips located 14” to 19” above the appliance. The first nozzle must be placed ½” outside the edge of the hazard and on the centerline of the hazard area covered by the shelf.



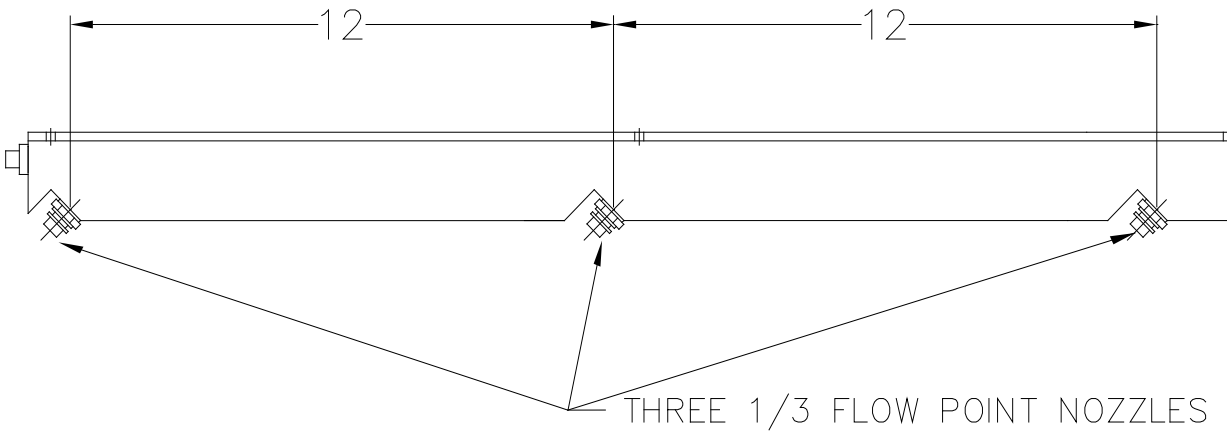
SIX BURNER RANGE - FRONT VIEW



RANGE - RIGHT SIDE VIEW

BSM: Back Shelf Manifold Asy. – (P/N 17461 with nozzles)

The BSM (P/N 17461) is comprised of three Amerex nozzles, positioned on a 45º angle and spaced 12" apart. All nozzles are in the same plane of alignment and at the same height. This is accomplished by the use of the Amerex manufactured manifold. The manifold is constructed from a custom aluminum extrusion which is machined to the precise requirements needed to maintain proper alignment of the nozzles. Connection to the nozzle branch piping may be made from either end of the assembly. The opposite end of the assembly is to be plugged with a 3/8" pipe plug. The manifold should appear as illustrated.



The BSM is to be used as an assembly of three nozzles and will carry a flow point value of one (1).

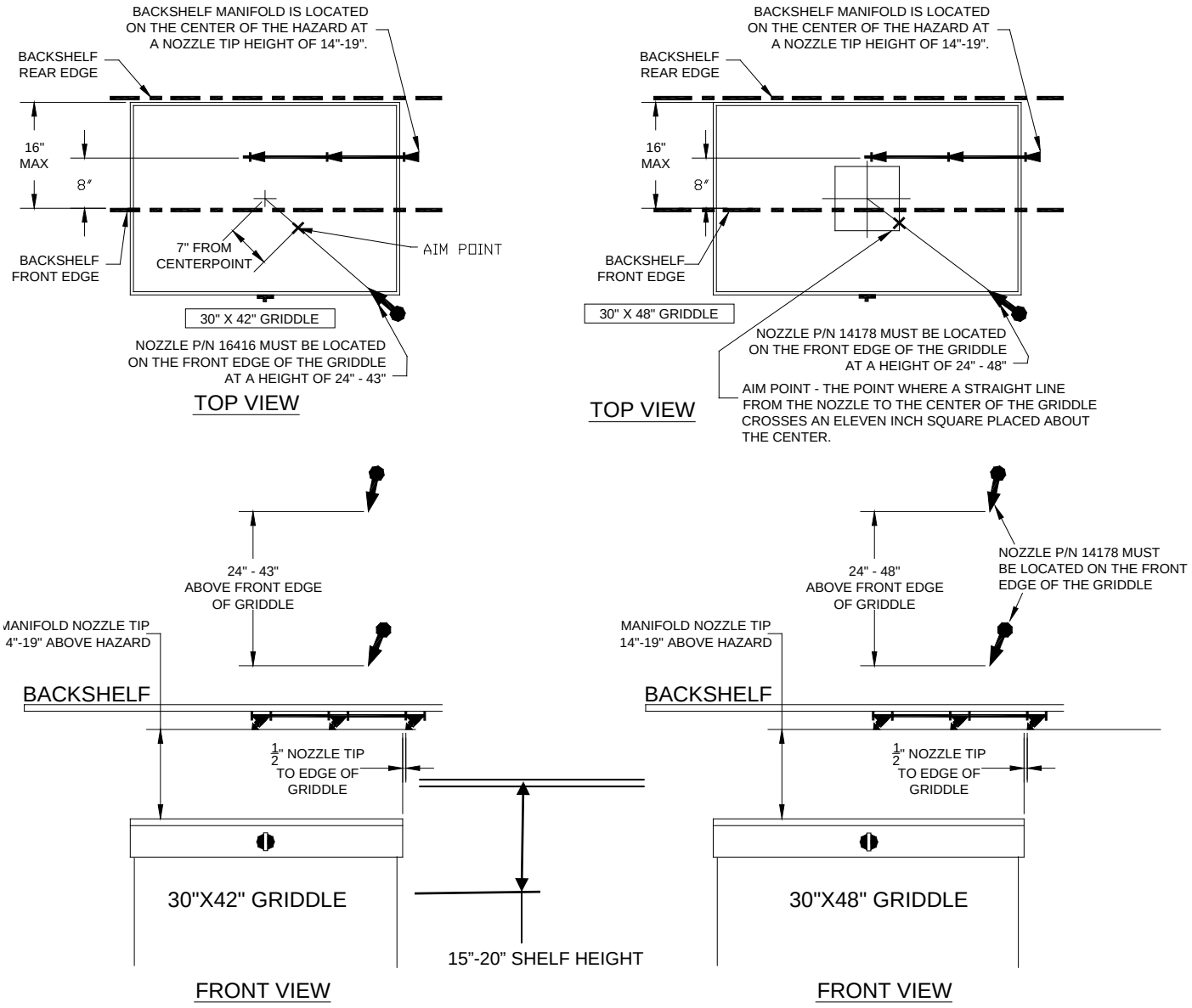
It is designed to extinguish fires located under the back shelf when they occur on the back three burners of a six-burner range (15" x 42") or the back portion of a griddle. It never takes the place of the overhead nozzle, but simply provides additional agent to extinguish any and all fires beneath the back shelf or salamander.

The same limitations apply to salamanders that are applied to back shelves.

When the BSM is used to protect a griddle positioned under a back shelf, the manifold is installed on the centerline of the portion of the griddle covered by the back shelf or salamander. The maximum amount of back shelf coverage allowed for griddles is 16". The location of the overhead nozzle is always to be to the front edge of the griddle. See required nozzle and aiming requirements on the next pages for details on griddle protection.

The following pages are examples of manifold placement under several conditions of back shelf use. The following schematics represent the only nozzle combinations permitted with a BSM.

Note: When using the BSM assembly for range protection only the Range Nozzle (14178) is permitted in the overhead protection position as indicated on the schematics.

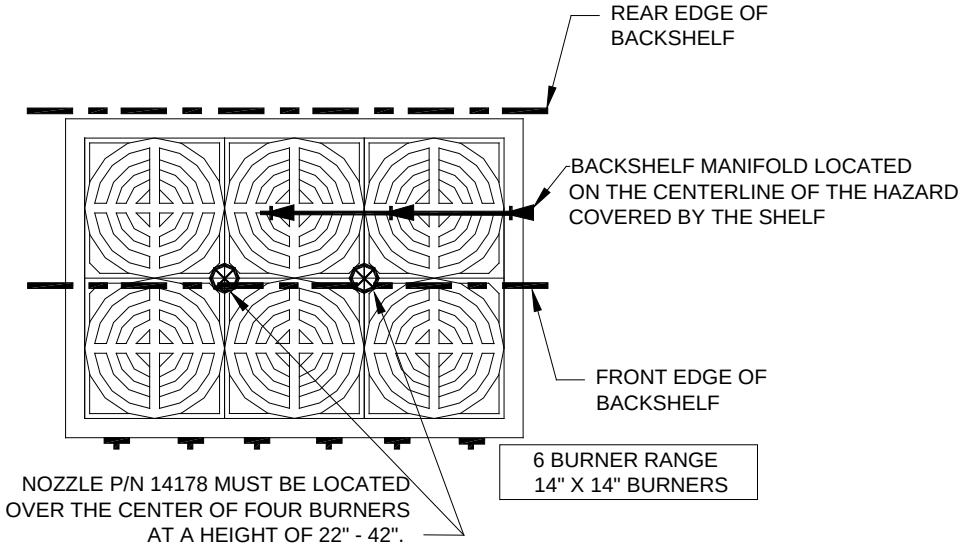


The schematic above shows the protection method on two different size griddles (30”x42” & 30”x48”) that are positioned under a back-shelf. Note that the shelf extends 1” beyond the center of the griddle (16”) and covers the entire width of the griddle, all which are within the parameters of the listing. Also, recognize that the centerlines of the manifolds are congruent with the centerline of the hazard covered by the back-shelf. Each manifold must be located on the centerline of the hazard area it is to protect.

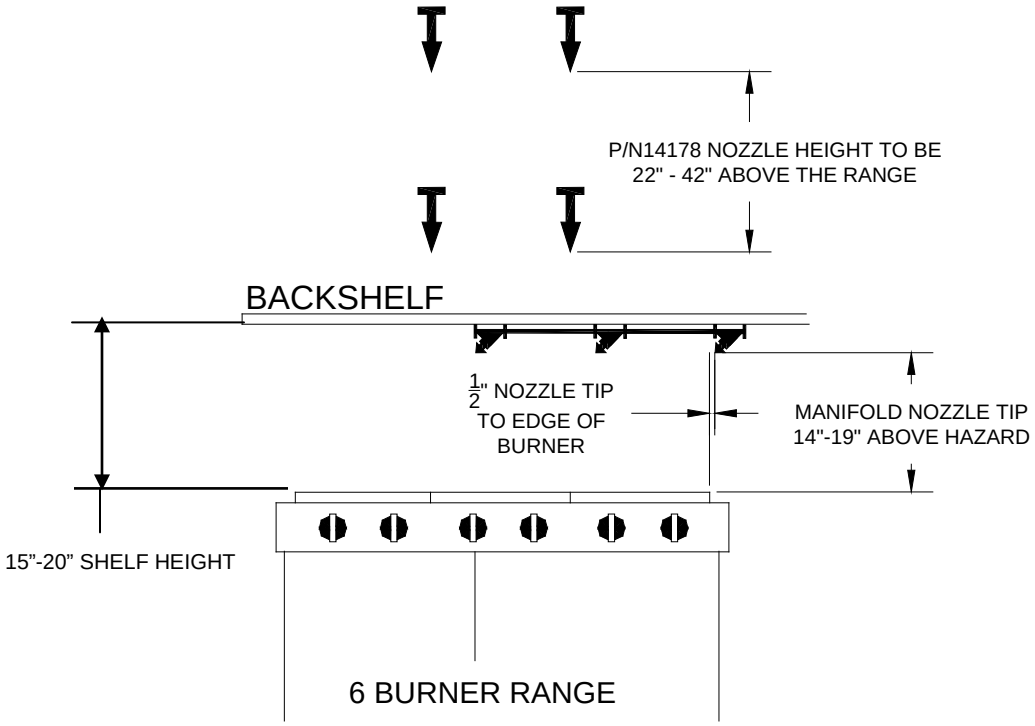
The P/N16416 nozzle plus a BSM (back-shelf manifold) will protect griddles up to 30”x42” maximum, with a back-shelf that covers no more than 16” of griddle. Total flow point value is 2 flow points. The overhead nozzle must be located on the front edge of the griddle aimed at a point 7” back from the center of the hazard area on a straight line from the nozzle to the center of the hazard.

The P/N14178 nozzle plus a BSM (back-shelf manifold) will protect griddles up to 30”x48” maximum, with a back-shelf that covers no more than 16” of griddle. Total flow point value is 3 flow points. The overhead nozzle must be located on the front edge of the griddle aimed at a point where a straight line from the nozzle to the center of the griddle crosses an 11” square placed over the center of the griddle.

The schematic below shows the protection of a six-burner range (28”x42”) that is positioned under a back-shelf. Note that the shelf extends 1” beyond the center of the range and covers 15” of the burners, all which are within the parameters of the listing. The manifold must be located on the centerline of the hazard area it is to protect. A P/N14178 nozzle is used for the protection of a group of four burners in the typical overhead position. The arrangement below places the second nozzle in the most optimum position for protection of a six-burner range.

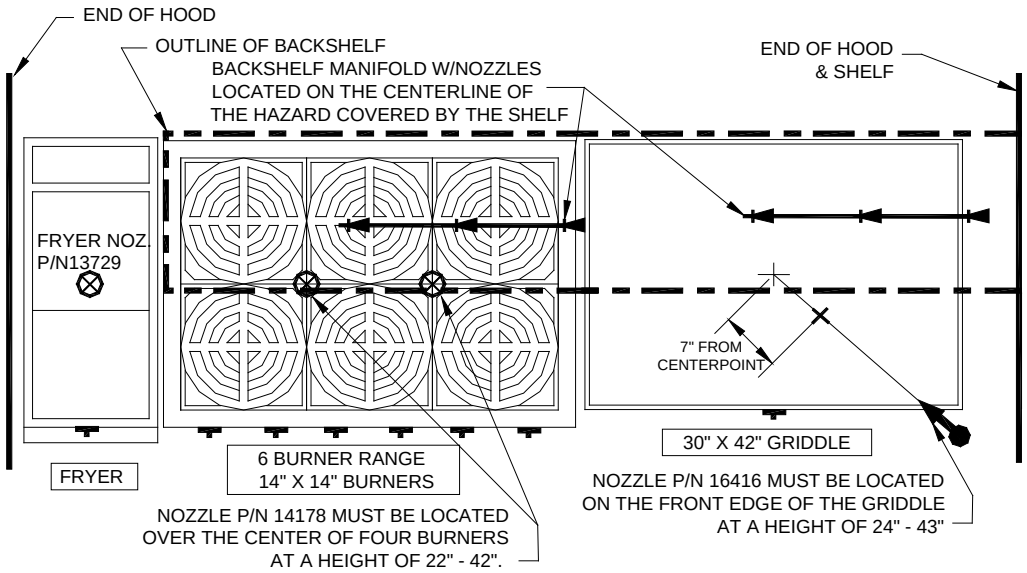


TOP VIEW

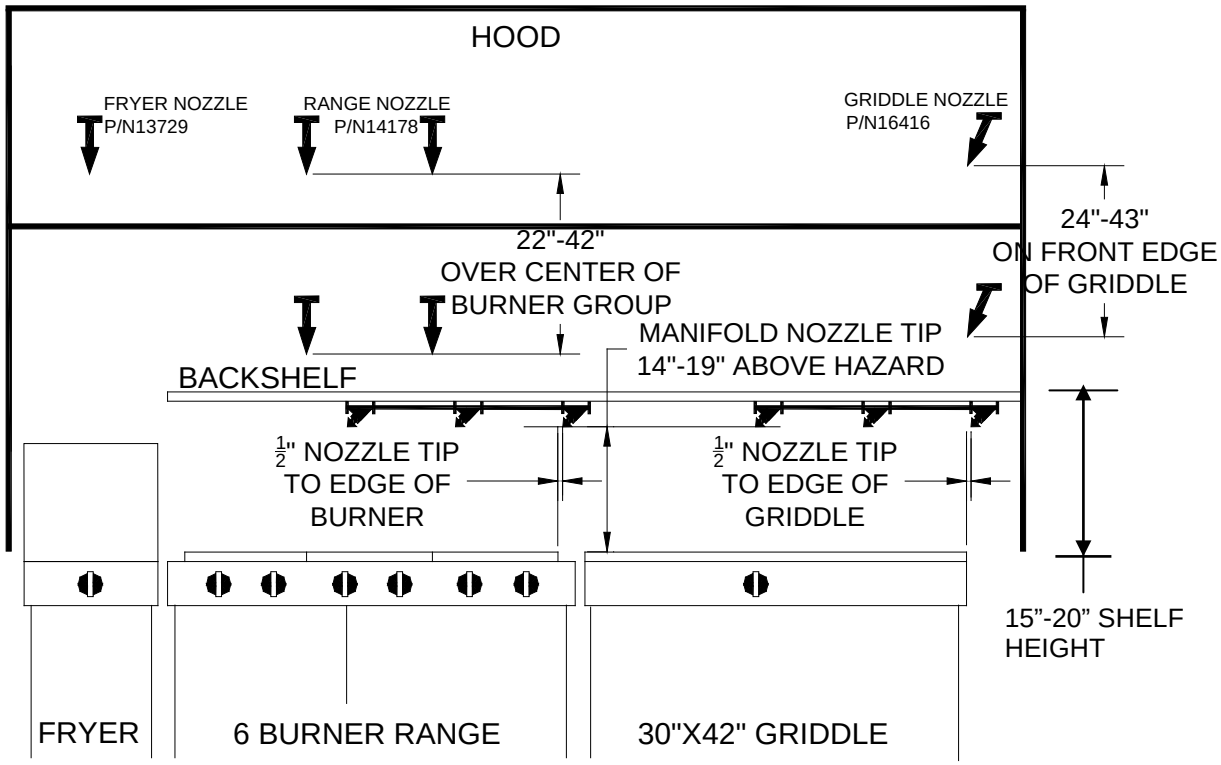


FRONT VIEW

The schematic below shows the protection of a griddle (30”x42”) & a six-burner range (12” burners) that are positioned under a back-shelf. Note that the back-shelf extends 1” beyond the center of the range and covers 16” of the griddle, all which are within the parameters of the listing. Also, recognize that the centerlines of the two manifolds are not congruent. Each manifold must be located on the centerline of the hazard area it is to protect.



TOP VIEW



FRONT VIEW

AMEREX KP RESTAURANT SYSTEM NOZZLE APPLICATION CHART

Appliance	Nozzle P/N	Flow Points	Width	Length	Min. Height	Max. Height
Deep Fat Fryer – without Drip Board	13729	2	19 ½ in.	19 in.	36 in.	48 in.
Deep Fat Fryer – with Drip Board	13729	2	19 ½ in.	25 3/8 in.	36 in.	48 in.
Deep Fat Fryer – without Drip Board	13729	2	26	24	36 in.	50 in.
Deep Fat Fryer – with 1” Drip Board	13729	2	26	25	36 in.	50 in.
Deep Fat Fryer – with Drip Pan Low Proximity	2-11982	2	19 ½ in.	25 3/8 in.	17 ½ in.	36 in.
Range – Single Burner	11984	½	18 in.	18 in.	20 in.	42 in.
Range – Two Burner (14” Burner)	11982	1	14 in.	28 in.	44 in.	48 in.
Range – Two Burner (12” Burner)	11982	1	12 in.	24 in.	36 in.	50 in.
Range- Two Burners w/Back Shelf (12” Burner)	11982	1	12 in.	24 in.	40 in.	47 in.
Low Back-Shelf/Salamander – BS Manifold	17461	1	14 in.	42 in.	14 in.	19 in.
Range – Three Burners (Special Aiming)	2 - 11984	1	12 in.	36 in.	20 in.	30 in.
Range – Four Burners (12” Burner)	14178	2	24 in.	24 in.	18 in.	50 in.
Wok	11982	1	14-24 dia.	4-7 depth	40 in.	50 in.
Griddle	11982	1	30 in.	36 in.	30 in.	48 in.
Griddle - Overhead Protection	13729	2	30 in.	42 in.	38 in.	50 in.
Griddle	14178	2	30 in.	48 in.	15 in.	50 in.
Upright Broiler	2-11984	1	30 ½ in.	28 ½ in.	-	-
Charbroiler (Lava Rock)	11983	1 ½	24 in.	24 in.	18 in.	44 in.
Charbroiler (Gas Radiant & Electric Radiant)	11982	1	24 in.	24 in.	18 in.	48 in.
Chain Broiler – Closed Top	11982	1	24½ in.	31 in.	-	-
Chain Broiler – Open Top	13729	2	24½ in.	31 in.	12 in.	36 in.
Chain Broiler – Nieco Model 9025 /Catalyst (2)	4 – 11982	4	18 in.	24 in.	13 in.	36 in.
Chain Broiler – Duke (with / without Catalyst or Damper)	2– 13729	4	-	-	15 in.	30 in.
Chain Broiler – Duke(with a Catalyst and Flue Guard	2- 11982	2	-	-	14 in.	-
Natural & Mesquite Charcoal Charbroiler	11983	1 ½	24 in.	28 ½ in.	16 in.	42 in.
Mesquite Chips & Chunks Charbroiler	11983	1 ½	24 in.	28 ½ in.	16 in.	48 in.
Mesquite Log Charbroiler	11983	1 ½	24 in.	28 ½ in.	19 in.	44 in.

Plenum	Nozzle P/N	Flow Points	Width	Length
Single Bank/V-Bank	11982	1	4 ft.	10 ft.

Duct	Nozzle P/N	Flow Points	Max. Perimeter	Diameter	Length	Max. Diagonal
Rectangular	16416	1	50 in.	-	Unlimited	18.8 in.
Circular	16416	1	-	16 in.	Unlimited	-
Rectangular	2-16416	2	51 to 84		Unlimited	18.8 in.
Circular	2-16416	2		26 in.	Unlimited	-
Rectangular	2-11983	3	100 in.	-	Unlimited	37.2 in.
Circular	2-11983	3	-	32 in.	Unlimited	-
Rectangular	3-11983	4 ½	150 in.	-	Unlimited	55.9 in.
Circular	3-11983	4 ½	-	48 in.	Unlimited	-

Protection is not limited to the items listed on this chart. Modulizing larger appliances are an acceptable practice.
See your Amerex KP Manual for additional information.

AGENT QUANTITY AND CYLINDER SELECTION:

After reviewing the hazards and determining the number and type of nozzles that will be required, the quantity of agent and the number and type of cylinders must be selected. Adding the number of flow points that are needed for the system will determine the agent quantity and cylinder options.

a. ONE 2.75 GALLON CYLINDER **(P/N 16921)** WILL SUPPLY SUFFICIENT AGENT FOR UP TO AND INCLUDING 8 FLOW POINTS.
b. ONE 3.75 GALLON CYLINDER **(P/N 13334)** WILL SUPPLY SUFFICIENT AGENT FOR UP TO AND INCLUDING 11 FLOW POINTS.
c. ONE 4.75 GALLON CYLINDER **(P/N 17379)** WILL SUPPLY SUFFICIENT AGENT FOR UP TO AND INCLUDING 14 FLOW POINTS.

Cylinders may be used together for multiple cylinder systems with one MRM**,** MRM II or PRM. A MAXIMUM OF 10 KP 275/375/475 AGENT CYLINDERS MAY BE USED PER MECHANICAL RELEASE MODULE OR PNEUMATIC RELEASE MODULE.

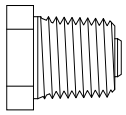
d. ONE 6.14 GALLON CYLINDER (**P/N 15196**) WILL SUPPLY SUFFICIENT AGENT FOR UP TO AND INCLUDING 18 FLOW POINTS.

A MAXIMUM OF 6 KP 600 AGENT CYLINDERS MAY BE USED PER MRM**,** MRM II or PRM. ANY COMBINATION OF CYLINDERS INVOLVING THE KP600 CYLINDER IS LIMITED TO A TOTAL OF 6 CYLINDERS PER MRM, MRM II or PRM.

ACTUATION NETWORK LIMITATIONS – MRM, MRM II OR PRM

The actuation network for the Amerex Restaurant Fire Suppression System consists of factory supplied hose; installer supplied copper tubing or pipe that connects the MRM, MRM II or PRM to each cylinder discharge valve. A single MRM, MRM II or PRM is capable of actuating up to ten (10) 2.75 / 3.75 / 4.75 gallon agent cylinder discharge valves or six (6) 6.14 gallon agent cylinder discharge valves by discharging a single 10 in^3 nitrogen cylinder (P/N 12856) through the actuation network. If the network is a combination of any of the 2.75, 3.75 and or 4.75 with a 6.14 gallon cylinder, then maximum number of cylinders is six (6).

Note: A vent plug (P/N 10173) must be placed in an accessible location anywhere in the actuation line to aid in releasing pressure after the system has discharged. See the RECHARGE Section 7.


Vent Plug P/N 10173

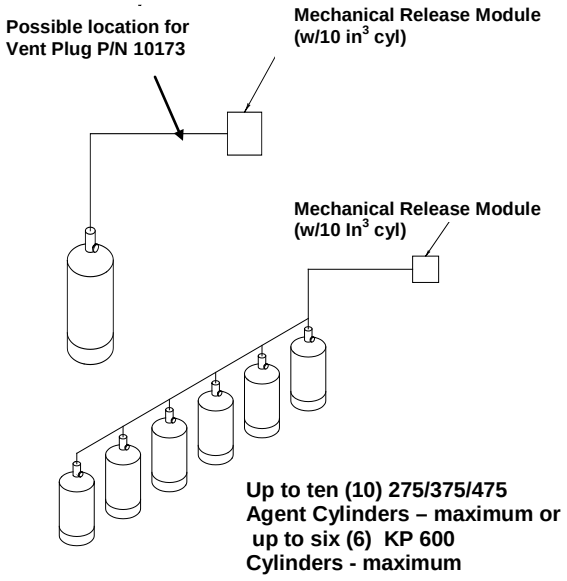
LIMITATIONS (SINGLE OR MULTIPLE CYL SYSTEMS)

Copper tubing – ¼" O.D. refrigeration type with a minimum wall thickness of .049 inches. Use with brass or steel compression style fittings (with brass or steel sleeves or ferrules). Maximum length (including all fittings) 100 feet (30.48 m)

High Pressure Hose – ¼" I.D. wire braid hose that is factory supplied. Maximum length (including all fittings) 54 feet (16.46 m) or a maximum number of 40 hose assemblies P/N 12854, 20 hose assemblies P/N 16448, or any combination that does not exceed a total of 54 feet (16.56 m)

Pipe – ¼" NPT schedule 40 made of stainless steel, galvanized, chrome plated or black iron pipe:
Maximum length – 22.2 feet (6.77m)
Maximum tees – 9
Maximum elbows – 9 (note: 2 – 45° elbows = 90°)

Note: Different methods of constructing the actuation network may be mixed provided that the shortest limitations are followed,
Example: A mix of ¼" copper tubing and ¼" high pressure hose requires that the hose limitations be followed (no more than 54 feet [16.46m]) for the complete network. A mix of ¼" high pressure hose and ¼" pipe requires that the pipe limitations be followed (no more than 22.2 feet [6.77m]) for the complete work.

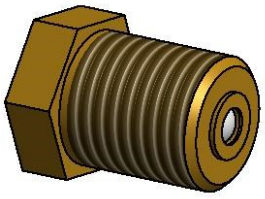


Nitrogen Cylinder	10 cu. in.	
Maximum Total Length for:	Feet	Meters
¼" Copper tubing	100	30.48
¼" ID Hose	54	16.46
¼" Schedule 40 Pipe	22.2	6.77

Actuation Network Limitations, STRIKE™ Releasing Module (SRM)

The SRM is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

The actuation network for the Amerex Restaurant Fire Suppression System consists of factory supplied hose; installer supplied copper tubing or pipe that connects the SRM to each cylinder discharge valve. A single SRM is capable of actuating up to ten (10) 2.75 / 3.75 / 4.75 gallon agent cylinder discharge valves or six (6) 6.14 gallon agent cylinder discharge valves by discharging a single 10 in^3 nitrogen cylinder (P/N 12856) through the actuation network. If the network is a combination of any of the 2.75, 3.75 and or 4.75 with a 6.14 gallon cylinder, then maximum number of cylinders is six (6).



Vent Plug P/N 10173

Note: A vent plug (P/N 10173) must be placed in an accessible location anywhere in the actuation line to aid in releasing pressure after the system has discharged. See the RECHARGE Section 7.

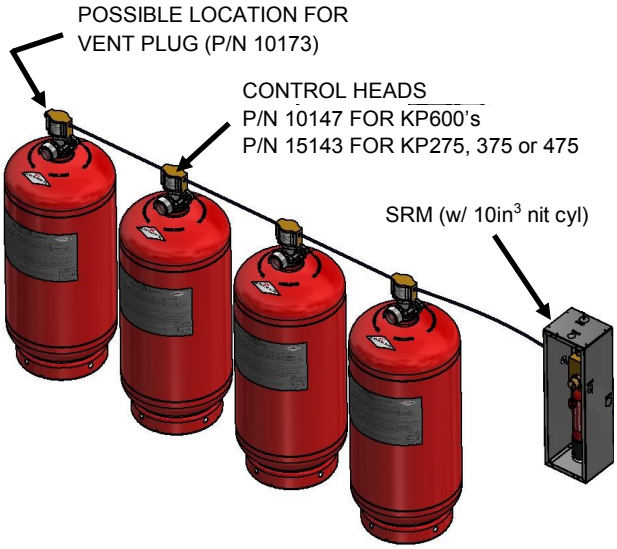
LIMITATIONS (SINGLE OR MULTIPLE CYL SYSTEMS)

Copper tubing – ¼" O.D. refrigeration type with a minimum wall thickness of .049 inches. Use with brass or steel compression style fittings (with brass or steel sleeves or ferrules). Maximum length (including all fittings) 100 feet (30.48 m)

High Pressure Hose – ¼" I.D. wire braid hose that is factory supplied. Maximum length (including all fittings) 54 feet (16.46 m) or a maximum number of 40 hose assemblies P/N 12854, 20 hose assemblies P/N 16448, or any combination that does not exceed a total of 54 feet (16.56 m)

Pipe – ¼" NPT schedule 40 made of stainless steel,
galvanized, chrome plated or black iron pipe:
Maximum length – 22.2 feet (6.77m)
Maximum tees – 9
Maximum elbows – 9 (note: 2 – 45° elbows = 90°)

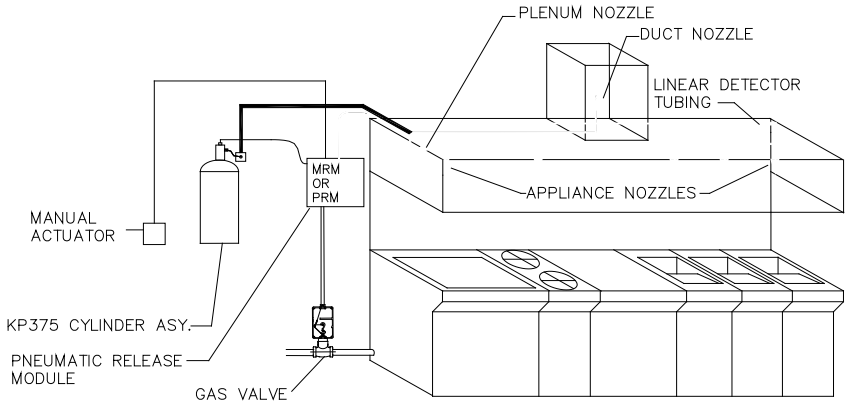
Note: Different methods of constructing the actuation network may be mixed provided that the shortest limitations are followed,
Example: A mix of ¼" copper tubing and ¼" high pressure hose requires that the hose limitations be followed (no more than 54 feet [16.46m]) for the complete network. A mix of ¼" high pressure hose and ¼" pipe requires that the pipe limitations be followed (no more than 22.2 feet [6.77m]) for the complete work.



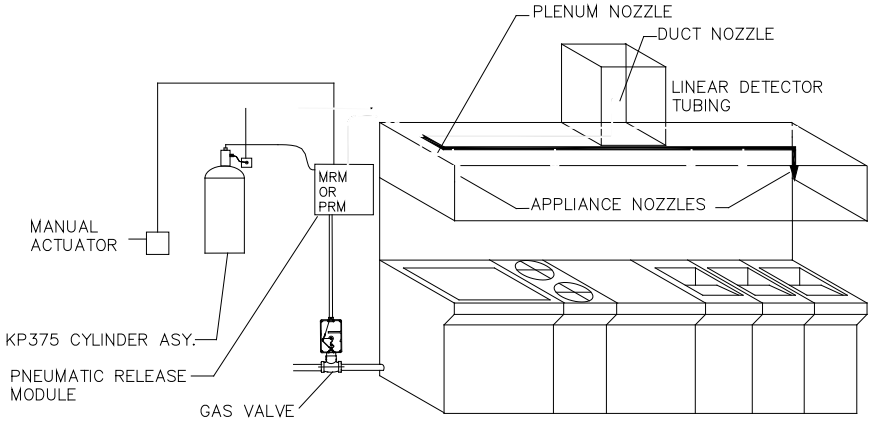
Up to ten (10) KP275/375/475 Agent Cylinders - maximum or up to six (6) KP600 Cylinders - maximum

Nitrogen Cylinder	10 Cu. In.	
Maximum Total Length for:	Feet	Meters
1/4" Copper tubing	100	30.48
1/4" ID Hose	54	16.46
1/4" Schedule 40 Pipe	22.2	6.77

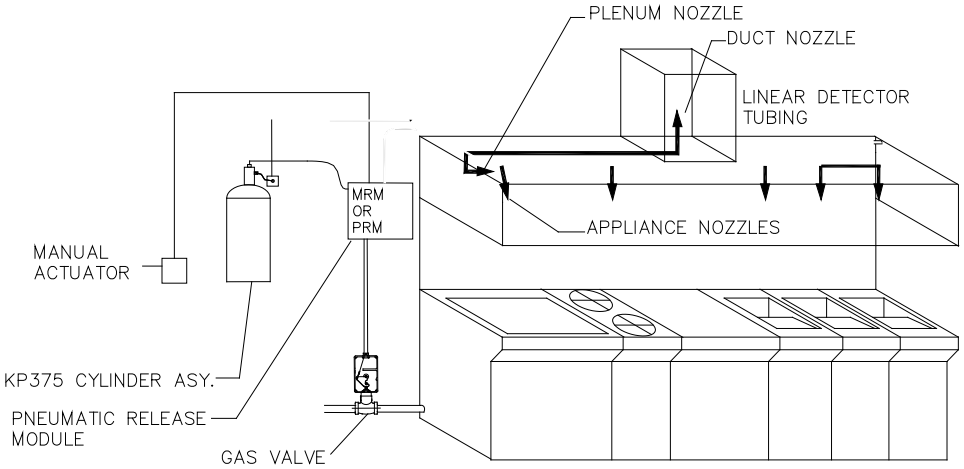
A Supply Line is the distribution piping that runs from the distributor outlet or discharge fitting to the first splitting tee.



A Supply Branch Line (including the last nozzle branch) is the distribution piping that runs from the first tee at the hood to the last nozzle in the system including all fittings used to exit the supply branch line.



A Nozzle Branch Line is the distribution piping that runs from the supply branch tee splitting to the nozzles including all fittings used to exit the supply branch line.



GENERAL PIPING REQUIREMENTS:

1. **All pipe used for the distribution network must be schedule 40 (black, chrome or stainless steel) pipe.**

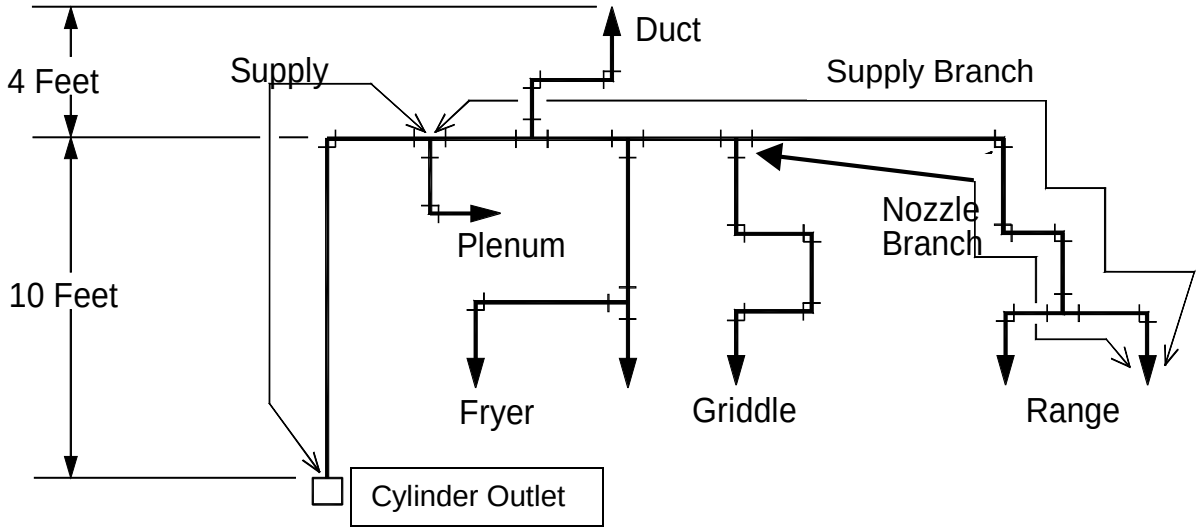
2. **Piping limitations are expressed in linear length of pipe. Linear piping is the actual length of straight pipe used throughout the system.**

WARNING: GALVANIZED PIPE IS <u>NOT</u> ALLOWED

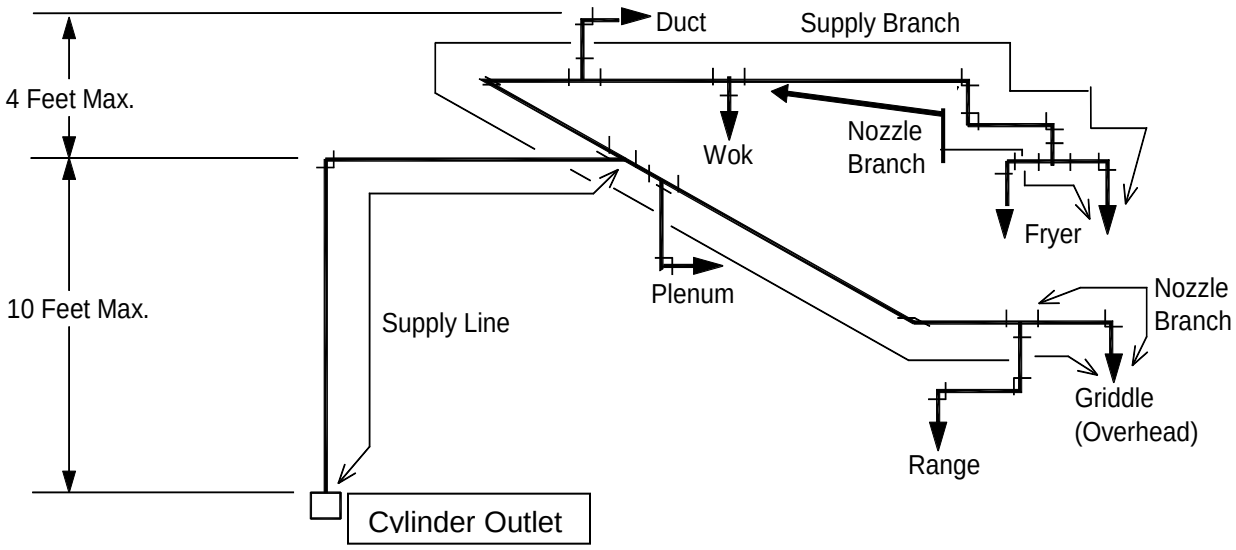
3. **Maximum flow point per cylinder:**
   Model 275 = 8 flow points
   Model 375 = 11 flow points
   Model 475 = 14 flow points
   Model 600 = 18 flow points
   Twin 375 = 22 flow points

NOTE: THESE ARE EXAMPLES ONLY – OTHER CONFIGURATIONS CAN BE DESIGNED

TYPICAL KP DISTRIBUTION NETWORK FOR SINGLE 375 CYLINDER SYSTEM



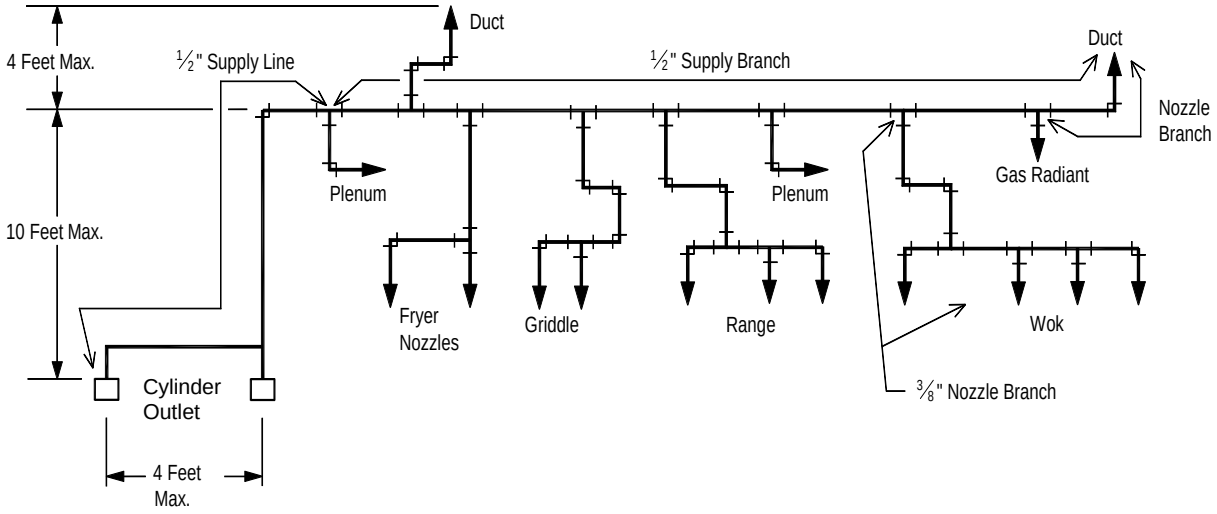
STRAIGHT PIPING SYSTEM



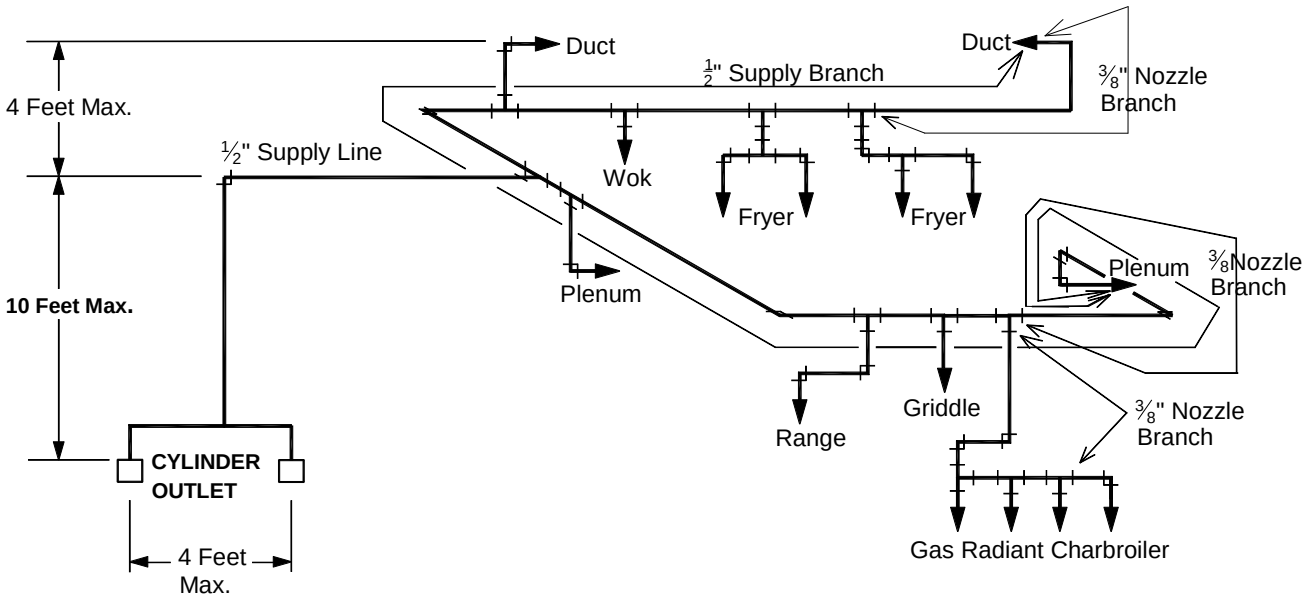
SPLIT PIPING SYSTEM

NOTE: The schematics above do not represent the only configurations possible – they are informational only.

TYPICAL KP DISTRIBUTION NETWORK FOR TWIN 375 CYLINDER SYSTEM



STRAIGHT PIPING SYSTEM



SPLIT PIPING SYSTEM

NOTE: The schematics above do not represent the only configurations possible – they are informational only.

DISTRIBUTION PIPING LIMITS for KP FIRE SUPPRESSION SYSTEM ONLY
DESIGN LIMITS FOR ALL CYLINDER SIZES

When designing a KP System to protect a kitchen containing a Fryer, Wok or Range, the following MINIMUM TOTAL SYSTEM PIPING must be used in accordance with the chart below:

	MINIMUM PIPING REQUIREMENTS		
APPLIANCE	MINIMUM LINEAR FEET	MINIMUM TOTAL EQUIVALENT FEET	MINIMUM FLOW POINTS PER SYSTEM
Fryer	6.5	10	2
Wok	9	22.1	6
Range	7	16.4	4

SUPPLY LINE LIMITATIONS:
All pipe and fittings running from the distributor block or the discharge fitting to the first tee.

CYLINDER FLOW POINTS	PIPE SIZE	MAXIMUM LINEAR FEET OF PIPE	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. QTY. BUSHINGS
275 - 8	3/8	20	1	5	0
375 - 11	3/8 OR 1/2	25	1	5	1
475 - 14	1/2	25	1	5	2
600 - 18	1/2	25	1	5	2
Two-375 – 22	1/2	30	2	7	2

NOTE: 1. Use 3/8" supply line only when all piping is to be 3/8" pipe.
2. The supply line has a maximum vertical rise above the distributor of 10 feet.

SUPPLY BRANCH LINE (including last nozzle branch) LIMITATIONS:
All pipe and fittings leaving the first splitting tee in the system and ending with the last nozzle in the last branch line. While the last nozzle branch is included in the piping limitations for the supply branch line, the limitation (pipe size and maximum length) for nozzle branch lines apply to this portion of the supply branch line.

CYLINDER FLOW POINTS	PIPE SIZE	MAX. FEET OF PIPE STRAIGHT	MAX. FEET OF PIPE SPLIT	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. QTY. REDUCING BUSHINGS
275 - 8	3/8	20	25	7	8	0
375 - 11	3/8 OR 1/2	27	30	10	8	2
475 - 14	3/8	27	30	12	8	2
600 - 18	AS NOTED	35’ OF 3/8" OR 1/2"	50’ 3/8" PIPE ONLY	14	8	2
Two-375-22	AS NOTEED	40’ of ½” (*30’ of 3/8”)	45 of ½” (*30’ of 3/8”)	18	8	0

NOTE: 1. In a single 3.75 Gallon Straight Pipe System, 5’ of pipe may be transferred from the supply line to the supply branch line.
***** 2. The use of 3/8” pipe with two manifold KP375s is only permitted when the **SUPPLY LINE** length is equal to or less than 20’.

NOZZLE BRANCH LINE LIMITATIONS:
All pipe and fittings leading from the supply branch tee to a system nozzle.

CYLINDER FLOW POINTS	PIPE SIZE	TOTAL LINEAR FEET OF PIPE	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. QTY. BUSHINGS
275 - 8	3/8	32	5	10	0
375 - 11	3/8 OR 1/2	32	8	12	11
475 - 14	3/8	32	10	15	0
600 - 18	3/8	32	11	18	15
Two-375 - 22	3/8	32	18	18	20
MAX. PER NOZZLE BRANCH		7	3	6	4

See page 3-33A for General System Limitation.

GENERAL SYSTEM LIMITATIONS:

1. No ½" pipe nozzle branches less than 12" in length are allowed.

2. There is a maximum of (4) flow points on all nozzle branch lines.

3. The types of nozzles on a nozzle branch line **may be mixed**.

4. In the case of a system piping network having all single flow point nozzles, there shall be no nozzle branch line less than 12" in length.
Example: A piping network for a Model 275 Agent Cylinder has 8 single flow point nozzles. Therefore each nozzle branch line must be at least 12" long.

5. The cylinder discharge fitting, hose and distribution block are not included in the piping calculations.

6. If a flex distribution hose is used on a nozzle branch line, then 48" of piping shall be subtracted from the overall nozzle branch piping limitations.

7. Any fitting(s) associated with the installation of a flex distribution hose shall be counted against the overall nozzle branch piping limitations.

8. No mixing of pipe sizes within a piping category (supply line, supply branch line, nozzle branch line) is allowed. (i.e. one nozzle branch line is ½" pipe – all nozzle branches are to be 1/2" pipe.

9. ½" pipe for nozzle branches is allowed only in an (11) flow point system.

10. The maximum allowable vertical rise of pipe above the supply branch line for any duct nozzle branch is 4 feet (122 cm).

SPOT DETECTION NETWORK LIMITATIONS: MRM & MRM II

Optimum fire suppression system performance relies on proper detection network design. This section discusses the type of detectors used, their selection, and placement and design limitations.

The Amerex Restaurant Fire Suppression System MRM & MRM II uses a continuous cable, corner pulleys, detector bracket, detector linkage, fusible links, conduit offset, terminal link connector and a temperature-measuring device.

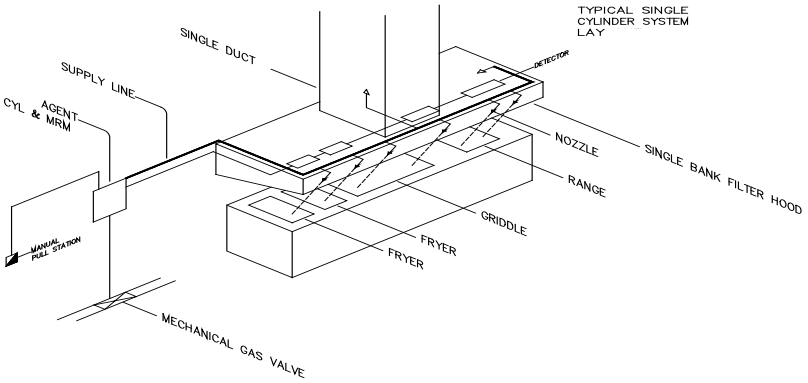
The quantity of detectors to be used in a system will depend on the number of ducts, number of appliances and the location of the appliances under the hood.

DETERMINING SPOT DETECTOR LOCATION AND NUMBER OF DETECTORS

In order to detect a fire in the duct, a detector is required to be placed within the duct opening or up to 12 inches into the duct. If it is mounted into the duct, the bracket shall not shield the fusible link from the hot vapors moving through the duct.

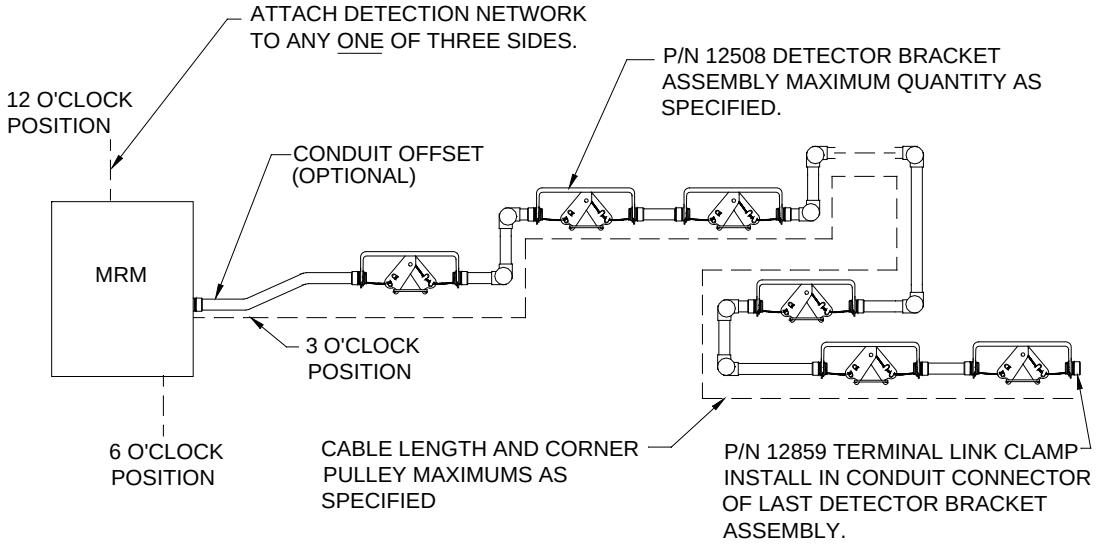
Every appliance under the hood that is being protected by the suppression system must have a detector placed over it and positioned within the path of exhaust vapors.

WARNING: DO NOT LOCATE DETECTORS DIRECTLY IN THE PATH OF GAS APPLIANCE EXHAUST FLUE GASES. DOING SO COULD RESULT IN UNNECESSARY DISCHARGE OF THE SYSTEM.



GENERAL LIMITATIONS OF DETECTION NETWORK:

Maximum of 30 corner pulleys. (either style)
Maximum of 30 detectors (any combination of temperature settings).
Maximum of 200 feet of cable on the detection network.
No pulley tees are allowed.
Remote manual pulls are not allowed on the detection network.
Maximum of 1 conduit offset (must be located at mechanical release module when chosen).



LINEAR FUSIBLE LINK DETECTION NETWORK OF SPOT DETECTORS

The standard spot detection system may be installed in a manner that will yield linear detection for the entire length of the hood without concern for where the appliance is located under the hood.

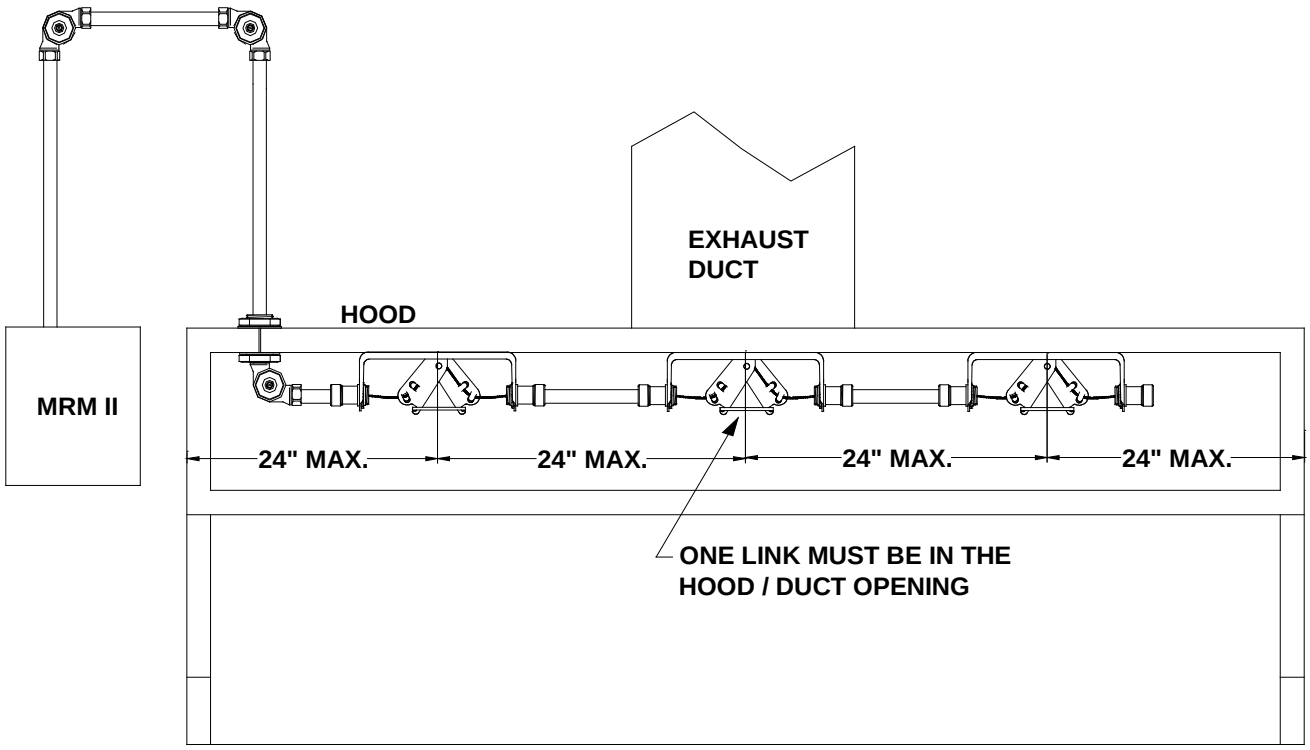
Why would I use this method over the lanyard linear fusible link system?

1. You want linear detection for the full length of hood but the limit of twenty links is not enough for the length of hood being protected.
2. You are protecting two hood and they are back to back, the lanyard system must be installed in a straight line.
3. You have two hoods that are end to end but one of the hoods only has one appliance requiring protection. The lanyard system is used for total linear detection of the entire hood. This version of detection allows you to use total linear hood detection on one hood and spot detection on the second hood.

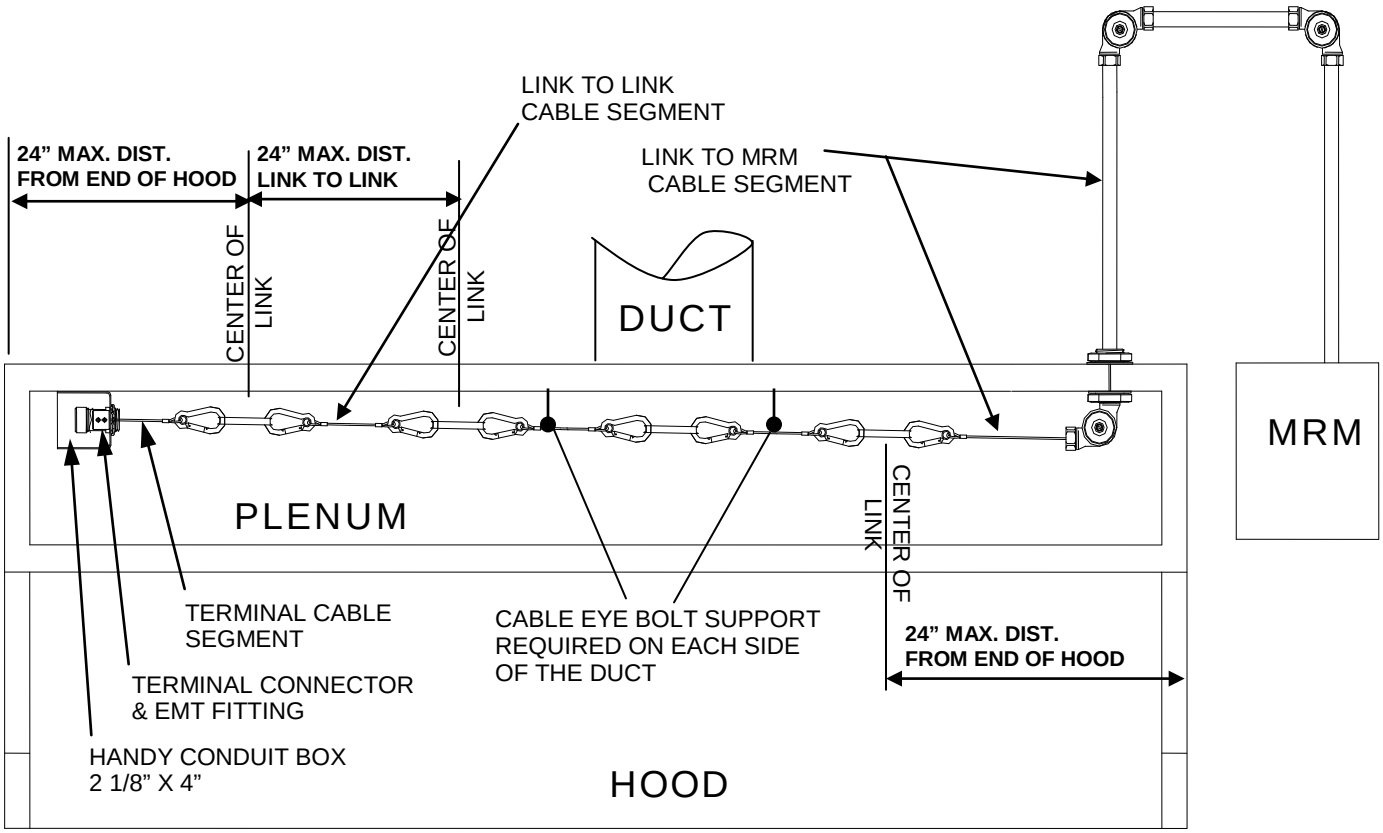
This is accomplished by installing the link brackets so that there is a link no more than 24" from each end of the hood and no more than 24" between each successive link center. You must locate one link in the hood / duct opening.

The limitations on the amount of cable and links that can be used in the system are the same as that for the standard spot detection system.

Limitations: Maximum of 30 corner pulleys. (Either style)
Maximum of 30 detectors (any combination of temperature settings)
Maximum of 200 feet of cable in the detection network.
No Tee Pulleys are allowed
Remote manual pulls are not allowed on the detection network.
Maximum of 1 conduit offset (must be located at the Mechanical Release Module)



LINEAR FUSIBLE LINK DETECTION NETWORK – LANYARD SYSTEM



The Linear Fusible Link Detection System provides complete hood fire detection by placing thermal links at maximum 24" intervals the entire length of the hood. Installing the links in this manner allows the appliances to be placed anywhere under the hood without having to locate links directly over each appliance.

A unique system of cable segments, pre-fabricated, has been developed to make the installation of this system simple and easy. It eliminates the use of conduit, link holders and mounting brackets under the hood in the plenum area.

The limitations of the Linear Fusible Link Detection System are as follows:

1. Maximum of 20 detection links and (19) Link to Link Cable Segments.
2. Maximum of 30 feet of cable used in the Link to MRM Cable Segment.
3. Maximum of 20 corner pulleys. (either style)
4. Maximum unsupported detection cable length is 8'-0".
5. Refer to Fusible Link Selection section, page 3-24 of this manual for proper selection process. The higher setting links are to be used when higher temperatures are encountered with appliances such as char-broilers.
6. The Linear Fusible Link Detection System is for use in single hood applications, or where multiple hoods are connected "end to end" only. It cann**ot** be used for "**back to back**" hood arrangements or multiple hoods that are mounted in separate locations and are part of a single Restaurant Fire Suppression System.

FUSIBLE LINK SELECTION

To assure that the appropriate temperature is selected, the temperature sensing device must be used at each detector location while the cooking line and exhaust fan is operating. Temperatures found at each detector should be recorded and placed with other documentation in the job file for future reference. Selection of fusible links should be made according to the temperature measured:

Globe Type "K" Standard Response

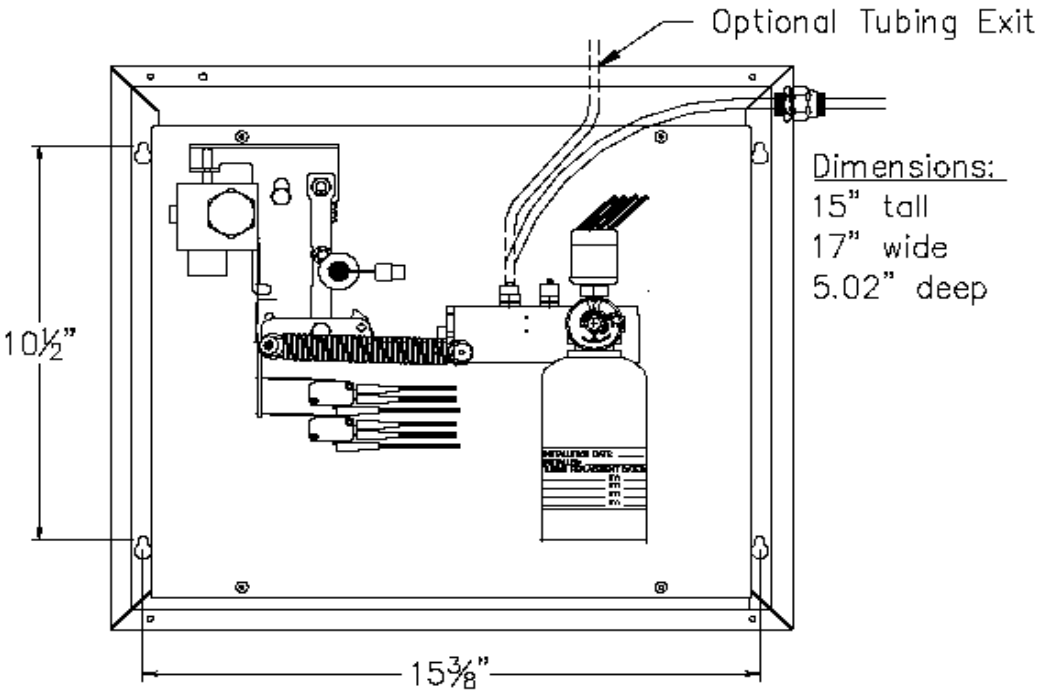
Temperature Measured	Link Rated Temp.	Part No.
70° to 150°F (21° to 65°C)	212°F (100°C)	12326
151° to 225°F (66° to 107°C)	280°F (138°C)	12327
226° to 300°F (21° to 65°C)	360°F (182°C)	12328
301° to 375°F (21° to 65°C)	450°F (232°C)	12329
376° (192°C) & above	Consult factory	Consult factory

Job Quick Response Links

Temperature Measured	Link Rated Temperature	Job Link Part Number
70° to 150°F (21° to 65°C)	200°F (93°C) Quick Response	16225
151° to 225°F (66° to 107°C)	286°F (141°C) Quick Response	16226
226° to 300°F (108° to 149°C)	360°F (182°C) Quick Response	16227

DETECTION NETWORK LIMITATIONS: PRM

Select a suitable location for the pneumatic release module (PRM) that has access for installation, service, recharge and where both the nitrogen actuation cylinder pressure gauge and the system status indicator can be viewed. The PRM has provisions for a single, continuous section of detection tubing. **"No Splicing" and "No Tee's" are allowed**. There shall be only two tubing terminations – one at the accumulator cylinder inside the PRM and the other at the opposite end of the tubing, with the use of an End of Line fitting (P/N 16506). Install in areas where the Maximum Sustained Ambient Temperature does not exceed 176°F (80°C) and the Maximum Intermittent Safe Exposure Temperature is 375°F (190.5°C).



SEE SECTION 4 "INSTALLATION" FOR ROUTING INFORMATION ON DETECTOR TUBING PAGE 4-5

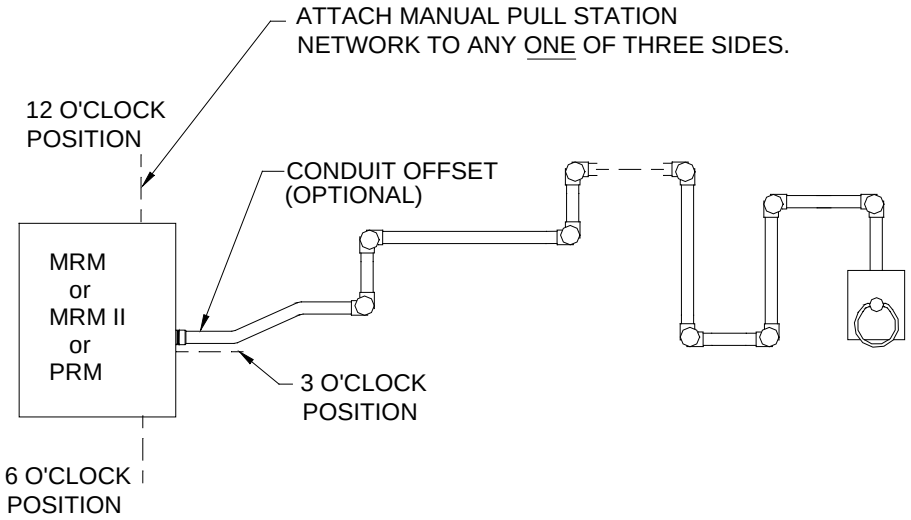
MANUAL PULL STATION NETWORK LIMITATIONS

Every Amerex Restaurant Fire Suppression System installation must have at least one manual pull station. The manual pull station network consists of cable, corner pulleys, pulley tee, manual pull station(s) and optional conduit offset.

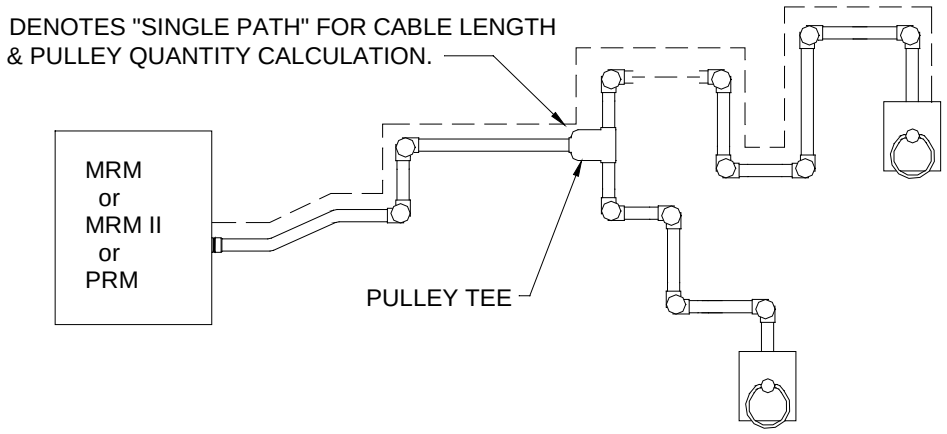
GENERAL LIMITATIONS OF MANUAL PULL STATION NETWORK

Maximum of 20 corner pulleys per manual pull station
Maximum of 130 feet of cable per manual pull station
Maximum of 1 pulley tee per network (counts as one corner pulley for each manual pull station)
Maximum of 1 conduit offset per network (must be attached to the MRM and before tee pulley when chosen)

NOTE: Manual pull stations should be installed no higher than 48 inches from the floor and must be along a path of egress. Consult the local Authority Having Jurisdiction (AHJ) for the final approval for manual pull station quantity, locations and mounting height and other considerations prior to finalizing manual pull station mounting details.



SINGLE STATION NETWORK

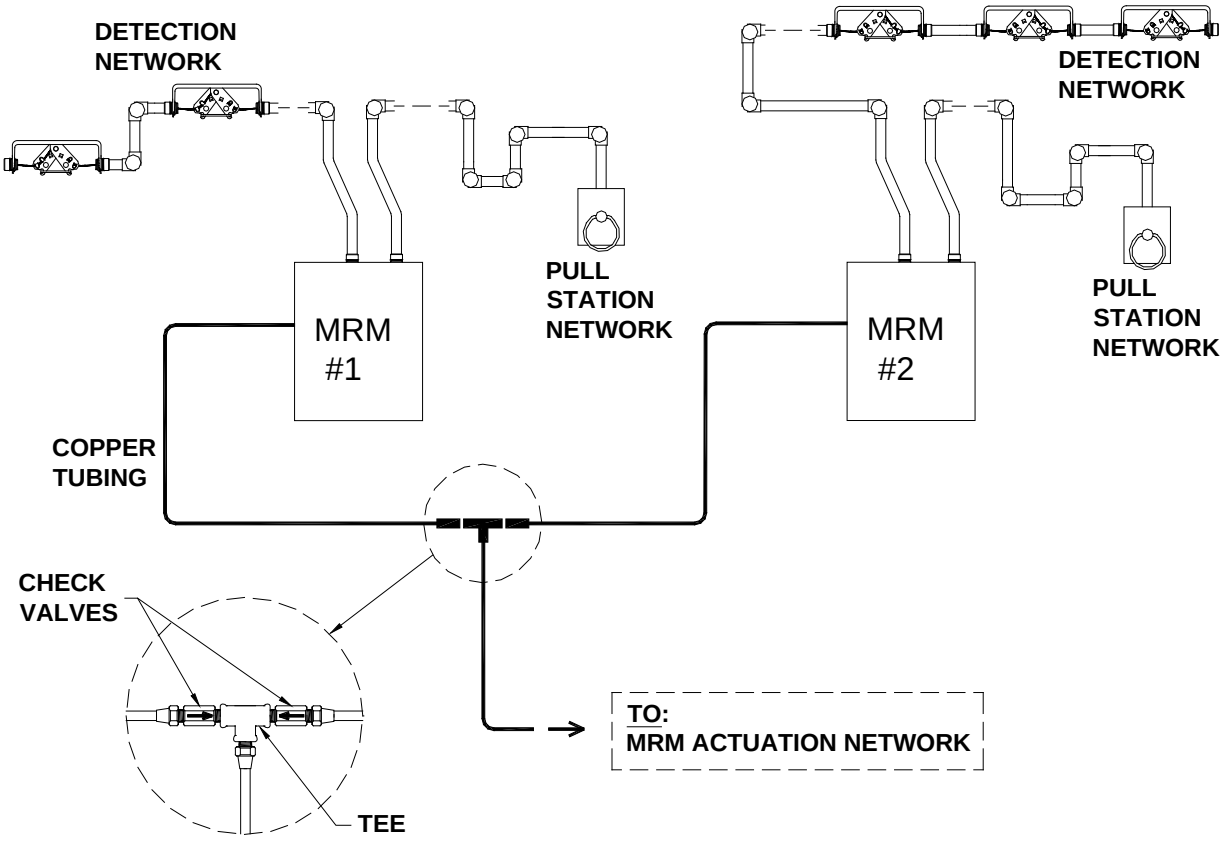


DUAL STATION NETWORK

NOTE: The manual pull station(s) are the only MANUAL means of activating the Amerex Restaurant Fire Suppression System.

Dual MRM Installations Protecting a Single Hazard:

Certain circumstances may require additional link line capability, detectors, or manual pull stations to protect a single hazard. Examples would include multiple hoods in close proximity to one another (or interconnected). It is possible to install two MRM's to protect such hazards as a single hazard zone.



Note: Ensure that the arrows on the **PN 10262** Check Valves are pointed into the Tee, as shown above. Use only two Check Valves, oriented at the Tee, as shown. The purpose of the Check Valves is to prevent one MRM from back-pressurizing the MRM that does not trip.

Limitations:

1) Adhere to the MRM actuation limitations as given on pages 3-29, 3-34 thru 3-36 & 3-39. The maximum length of tubing from the MRM to the last Agent Cylinder is determined as the direct single path from ***each*** MRM through the Tee.
2) Detection Networks are to remain independent from MRM #1 to MRM #2, and must adhere to previously stated limitations.
3) Manual Pull Networks are to remain independent from MRM #1 to MRM #2, and must adhere to previously stated limitations.
4) There is no Mechanical Gas Valve function with this installation option. Gas Valve closure is to be accomplished via a Manual Reset Relay and an Electric Gas Shut-off Valve
5) Any electrical function must be wired in either series (Normally-Closed function) or in parallel (Normally-Open function) through a micro-switch in **each** MRM. This will ensure that the firing of either MRM will facilitate the required function.
6) A clearly visible sign or placard must be placed securely adjacent to each of the two MRMs with the wording similar to the following:

"**This Releasing Control Head is One of Two Units. Both Units Must be Serviced Together, in Conjunction with the Fire Suppression System".**

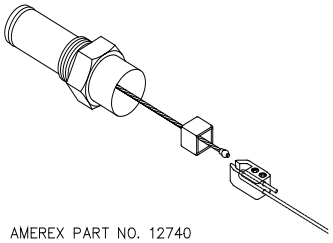
Warning: All Electrical Field Wiring should be performed by a Licensed Electrician per NFPA 70.

MECHANICAL GAS VALVE APPLICATIONS

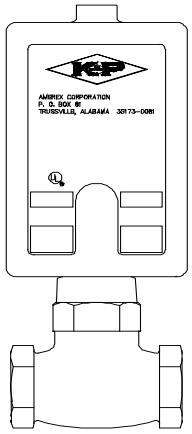
The MRM, MRM II or PRM closes the mechanical gas valve immediately upon system discharge. A pneumatic and mechanical action in the gas trip assembly pulls on a cable attached to the mechanical gas valve, unlatching the valve and allowing an internal spring within the gas valve body to provide the closing force. Connection of the cable from the gas valve to the MRM, MRM II or PRM under tension maintains the gas valve in an open position.

MECHANICAL GAS VALVE

A mechanical gas valve trip assembly must be used with any mechanical gas valve. The gas valve trip assembly (P/N 12740) is included with all Amerex manufactured gas valves but must be ordered separately for use with gas valves listed in this manual supplied by other manufacturers.



AMEREX PART NO. 12740



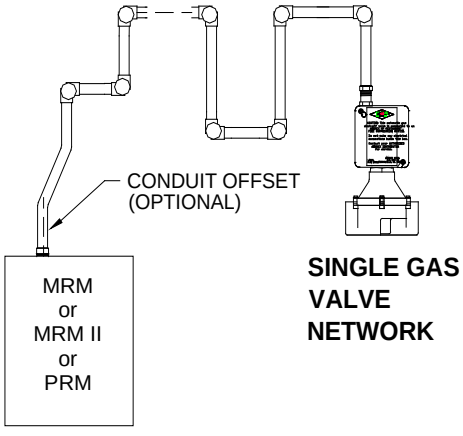
See Section 3 “System Components” for all mechanical gas valves that are suitable for use with the Amerex Restaurant Fire Suppression System. The use of any other mechanical gas valves will avoid the UL listing for the system installation. All of the listed valves have female NPT threads. The location of the gas valve should be accessible and approved by the local Authority Having Jurisdiction. A contractor licensed and qualified for such work should perform installation of the mechanical gas valve into the gas line.

MECHANICAL GAS VALVE ACTUATION NETWORK LIMITATIONS

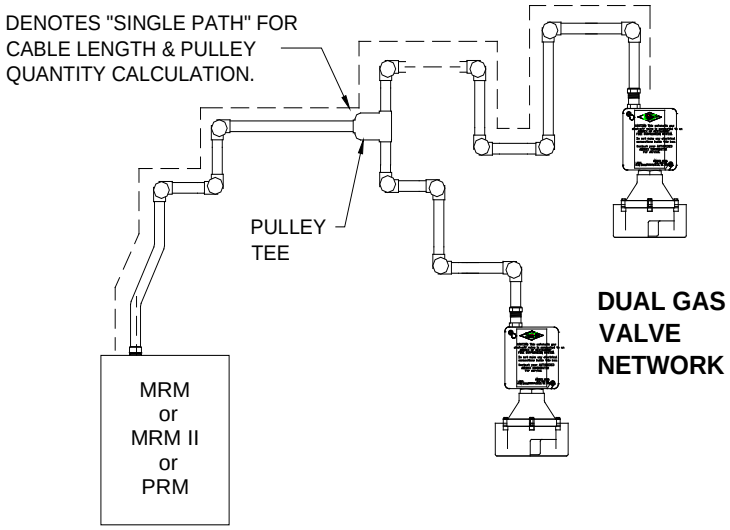
The mechanical gas valve actuation network consists of cable, corner pulleys, pulley tee, gas valve and conduit offset.

GENERAL LIMITATIONS OF MECHANICAL VALVE NETWORK

Maximum of 20 corner pulleys per mechanical gas valve of any listed type in KP Manual
Maximum of 130 feet (39.6m) of cable per mechanical gas valve of any listed type in KP Manual
Maximum of 1 pulley tee per network (counts as one corner pulley for <u>each</u> mechanical gas valve)
Maximum of 1 conduit offset per network (must be located at the releasing module and before the tee pulley when used)



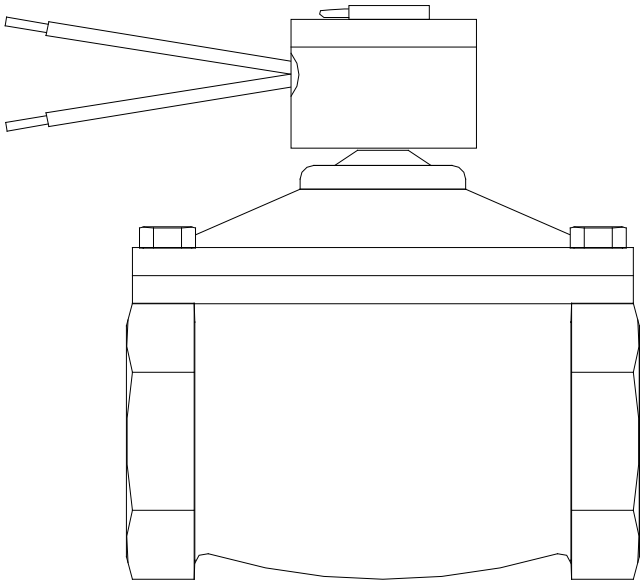
SINGLE GAS VALVE NETWORK



DUAL GAS VALVE NETWORK

ELECTRICAL GAS VALVE APPLICATIONS

110 VAC electrical gas valves may be used in place of the mechanical gas valves. The electric shut-off valve used with the Amerex Restaurant Fire Suppression System must be UL listed for use with natural gas or propane, be held open by energizing an electric solenoid and be wired through a snap action switch and manual release relay. A qualified electrician must do any field wiring and connections involving the shut-down of electrical cooking equipment or an electric gas valve.



P/N	Size	Manufacturer
12870	¾”	**Asco**
12871	1”	
12872	1¼”	
12873	1½”	
12874	2”	
12875	2 ½”	
12876	3”	

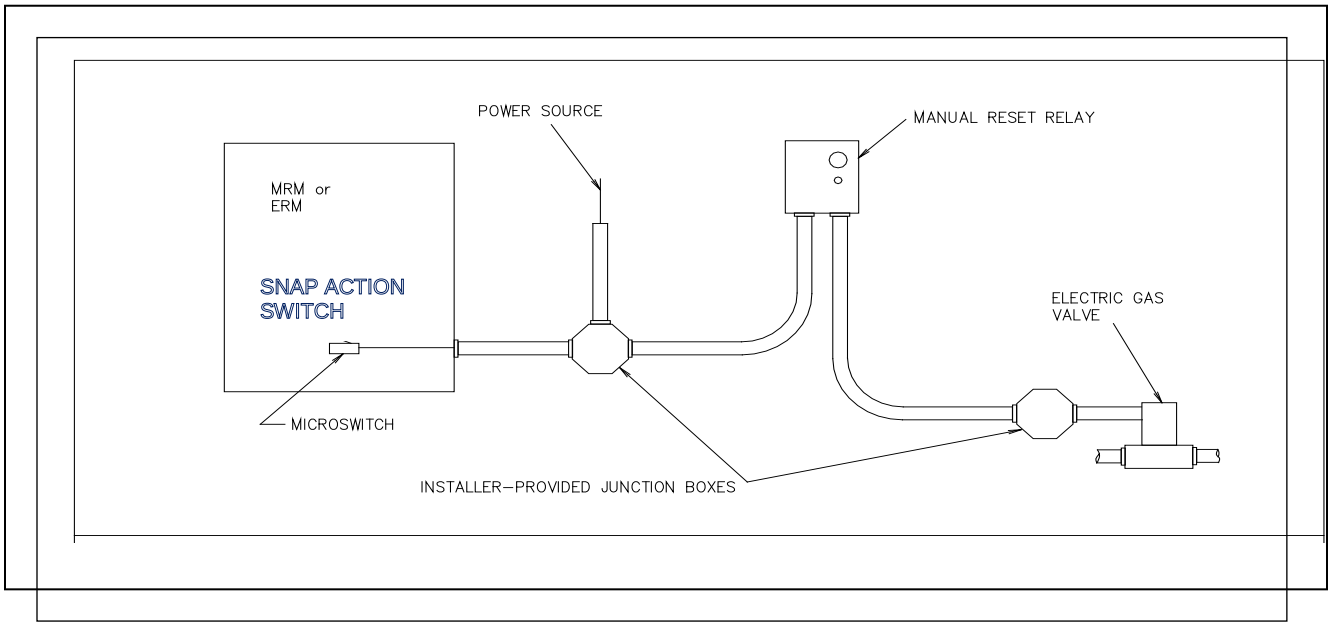
ELECTRIC GAS VALVE OPERATION

Power to the electric gas valve is run through the normally closed contact on a micro-switch located in the Pneumatic Release Module (PRM) or Mechanical Release Module (MRM & MRM II) to the Manual Reset Relay and from the Manual Reset Relay to the electric gas valve. In a normal (non fire) condition, current is allowed to flow to the solenoid on the electric gas valve, holding the valve open. In a fire condition, when the release module actuates the suppression system, the micro-switch contacts will transfer, opening the normally closed contacts in the manual reset relay, interrupting current to the gas valve and cause it to close.

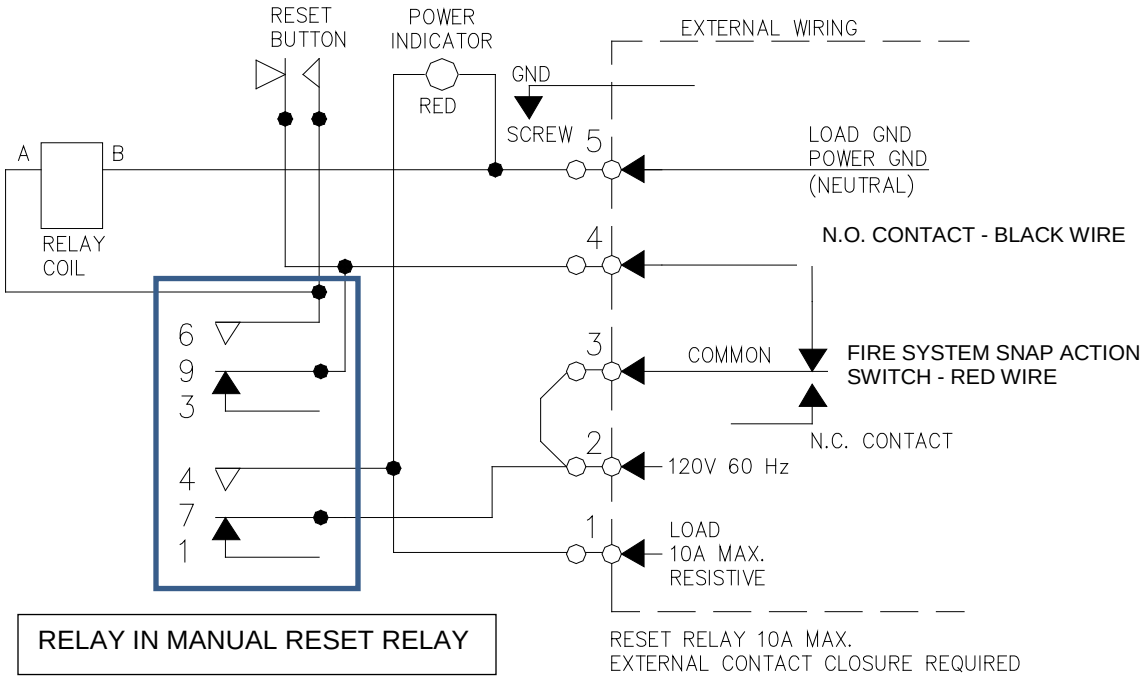
Resetting the MRM, MRM II or PRM and transferring the contacts back to a normal (normally closed) position will not cause the electrical gas valve to open. The manual reset relay must be reset before current will flow to the valve and cause it to open. A loss in electrical power, even temporary or momentary, will require someone to manually reset the relay before the electrical gas valve will open again.

NOTE: SEE WIRING SCHEMATIC ON THE NEXT PAGE – A WIRING SCHEMATIC IS PACKED WITH EACH MANUAL RESET RELAY.

WIRING DIAGRAM FOR THE MANUAL RESET RELAY



INTERNAL WIRING & EXTERNAL CONNECTIONS AS SHOWN (or equivalent):

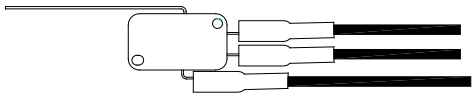


NOTE: DO NOT USE YELLOW WIRE ON SNAP ACTION SWITCH INSTALLATION. YELLOW WITE IS TO BE USED ONLY FOR EXTRANEOUS ALARM, LIGHT CIRCUITS, ETC.

SNAP ACTION SWITCH APPLICATIONS

One **Snap Action Switches, P/N 12524** is pre-installed in the Mechanical Release Module (MRM / MRM II) or Pneumatic Release Module (PRM). Up to a total of four snap action switches may be installed.

Part No.	Contacts	Rating
12524	SPDT	21 Amps 125, 250 or 277 VAC
	Single Pole	1 HP 125, 250 or 277 VAC
	Double Throw	2 HP 250, 277 VAC



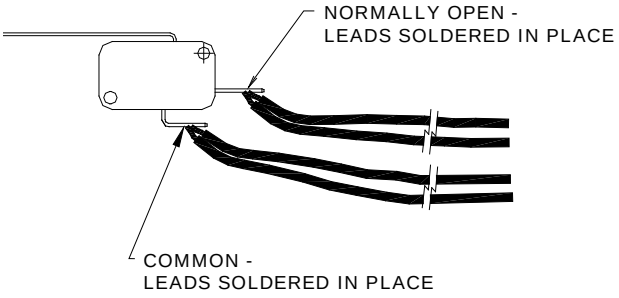
Red	Common	Non Alarm Condition
Yellow	N.O.	
Black	N.C.	

Snap Action Switches may be used to perform a variety of output functions such as sounding an auxiliary audible or visual alarm signaling device, sending a signal to an unsupervised building fire alarm system (a requirement per NFPA 96 if the building is equipped with a fire alarm system), shutting down electric cooking appliances, or disrupting power to an electrical gas valve.

WARNING: POWER TO COOKING APPLIANCES SHOULD NEVER BE RUN THROUGH THE SNAP ACTION SWITCH, THE SWITCH SHOULD BE USED TO OPERATE A SEPARATE, CONTRACTOR SUPPLIED, ELECTRICAL CONTACTOR OR MAGNETIC SWITCH OF SUFFICIENT RATING TO HANDLE THE POWER REQUIREMENTS OF THE ASSOCIATED COOKING APPLIANCES. A LICENSED ELECTRICIAN SHOULD PERFORM ALL ELECTRICAL FIELD WIRING.

WARNING: ELECTRICAL CONNECTIONS SHALL NOT BE MADE INSIDE THE MRM / MRM II OR PRM ENCLOSURE. ROUTE THE LEADS FROM THE SNAP ACTION SWITCH THROUGH THE APPROPRIATE KNOCK-OUT TO AN ATTACHED, LISTED ELECTRICAL JUNCTION BOX (DISTRIBUTOR SUPPLIED).

One alarm signaling **Snap Action Switch, P/N 18312,** is pre-installed in the MRM / MRM II / PRM and is to be used when the system is required to be electrically connected to a fire alarm system per NFPA 17 and NFPA 72 in a supervised, four-wire manner. It is designed to be mounted in the Mechanical Release Module (MRM / MRM II) and the Pneumatic Release Module (PRM) **only** for the purpose of initiating an alarm in a fire alarm system. All Snap Action Switch connections are to be made outside the MRM / MRM II / PRM in an approved junction box.



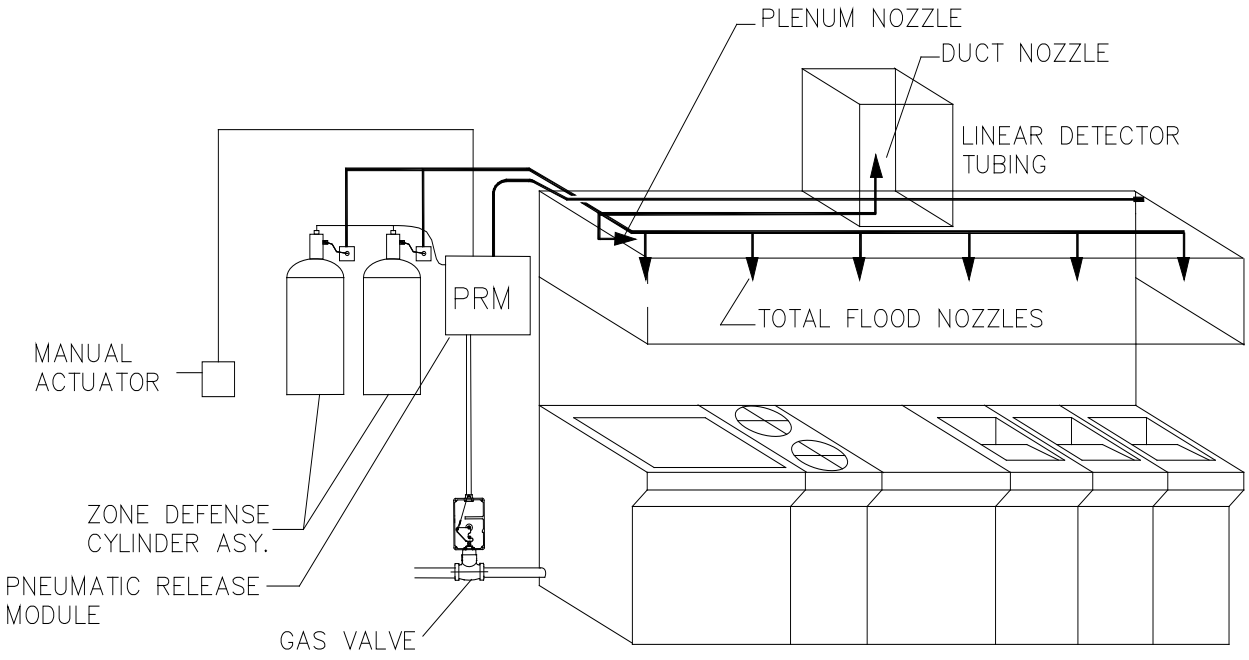
Part No.	Contacts	Rating
18312	SPST	0.25A, 30 VDC

ZONE DEFENSE DESIGN

THOSE INDIVIDUALS RESPONSIBLE FOR THE DESIGN & INSTALLATION OF THE AMEREX "ZONE DEFENSE" RESTAURANT FIRE SUPPRESSION SYSTEM MUST BE TRAINED BY AMEREX AND HOLD A CURRENT AMEREX CERTIFICATE OF TRAINING.

SYSTEM DESIGN

It is essential that any pre-engineered restaurant fire suppression system be properly designed, sized and installed. This section covers the design aspects unique to the Amerex "Zone Defense" Restaurant Fire Suppression System. The sketch below shows a typical Zone Defense System installed.



EXHAUST DUCT PROTECTION

The criteria for duct protection in a ZD System are the same as that for the KP System found in the first half of this section.

PLENUM PROTECTION

The criteria for plenum protection in a ZD System are the same as that for the KP System found in first half of this section.

DEDICATED APPLIANCE PROTECTION

When a ZD System includes protection for an appliance which **cannot** be protected by the ZD Nozzles creating the "zone of defense", that appliance is to be protected using Dedicated Appliance Protection. The Dedicated Appliance Protection is found in the preceding portion of this section.

ZONE DEFENSE APPLIANCE PROTECTION

ZONE OF PROTECTION

NFPA 96 – 10.1.1: "Cooking equipment that produces grease-laden vapors and that might be a source of ignition of grease in the hood, grease removal device, or duct shall be protected by fire-extinguishing equipment."

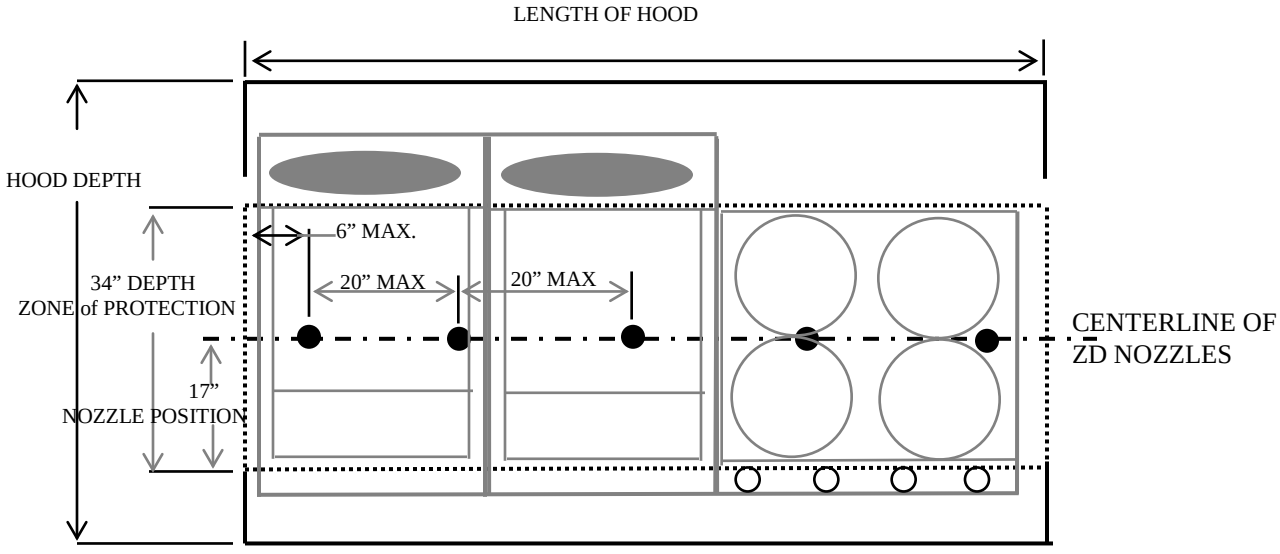
The Amerex "Zone Defense" Fire Suppression System has been approved and tested in compliance with the requirements of NFPA 96 – "Standard for Ventilation Control & Fire Protection of Commercial Cooking Operations, NFPA 17A – "Standard for Wet Chemical Extinguishing System" and UL-300 – "Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas". The Amerex "Zone Defense" System provides two types of appliance protection; "Zone of Protection" and "Dedicated Appliance Protection." The following is a list of eligible cooking appliances and their maximum cooking hazard size that may be protected with the "zone of protection" nozzle coverage.

Appliance Type	Maximum Cooking Hazard
Fryer	34 in. deep x (5.6 Sq. Ft. total)
Range	34 in. deep x Unlimited Length
Wok – maximum	26 in. Diameter x 7 in. Deep
Wok – minimum	14 in. Diameter x 4 in. Deep
Griddle	30 in. deep x Unlimited Length
Lava Rock Char-broiler	24 in. deep x Unlimited Length
Gas or Electric Radiant Char-broiler	24 in. deep x Unlimited Length
Mesquite Charcoal (Solid Fuel) Char-broiler	28.5 in. deep x Unlimited Length (6 in. Maximum Fuel Depth)
Mesquite Chips & Chunks Char-broiler	28.5 in. deep x Unlimited Length (6 in. Maximum Fuel Depth)
Mesquite Logs Char-broiler	28.5 in. deep x Unlimited Length (11 in. Maximum Fuel Depth)

ZONE OF PROTECTION – DEFINED

The "Zone of Protection" is a rectangular area 34" deep X the length of the hood in which an eligible cooking appliance can be placed and be protection. The appliance may be moved to any location within the "Zone of Protection" and be protected without any nozzles being moved or re-aimed.

The "Zone of Protection" is created by the use of overlapping spray from multiple nozzles creating an area that is soaked by wet chemical agent. This is accomplished by placing Amerex ZD nozzles, part number 14178, in a straight line from one end of the hood to the opposite end. The nozzles are to be a maximum of 20 inches (50.8cm) apart on center and must start and end at a point no greater than 6 inches (15.2cm) from the end of the hood. The nozzles are to be located 46 to 51 inches above the top surface of the appliances and aimed straight down. The resulting "Zone of Protection" is a rectangular area 34" (86.4cm) deep x length of hood with its front and rear edges 17" (43.2cm) from the centerline of the nozzles.

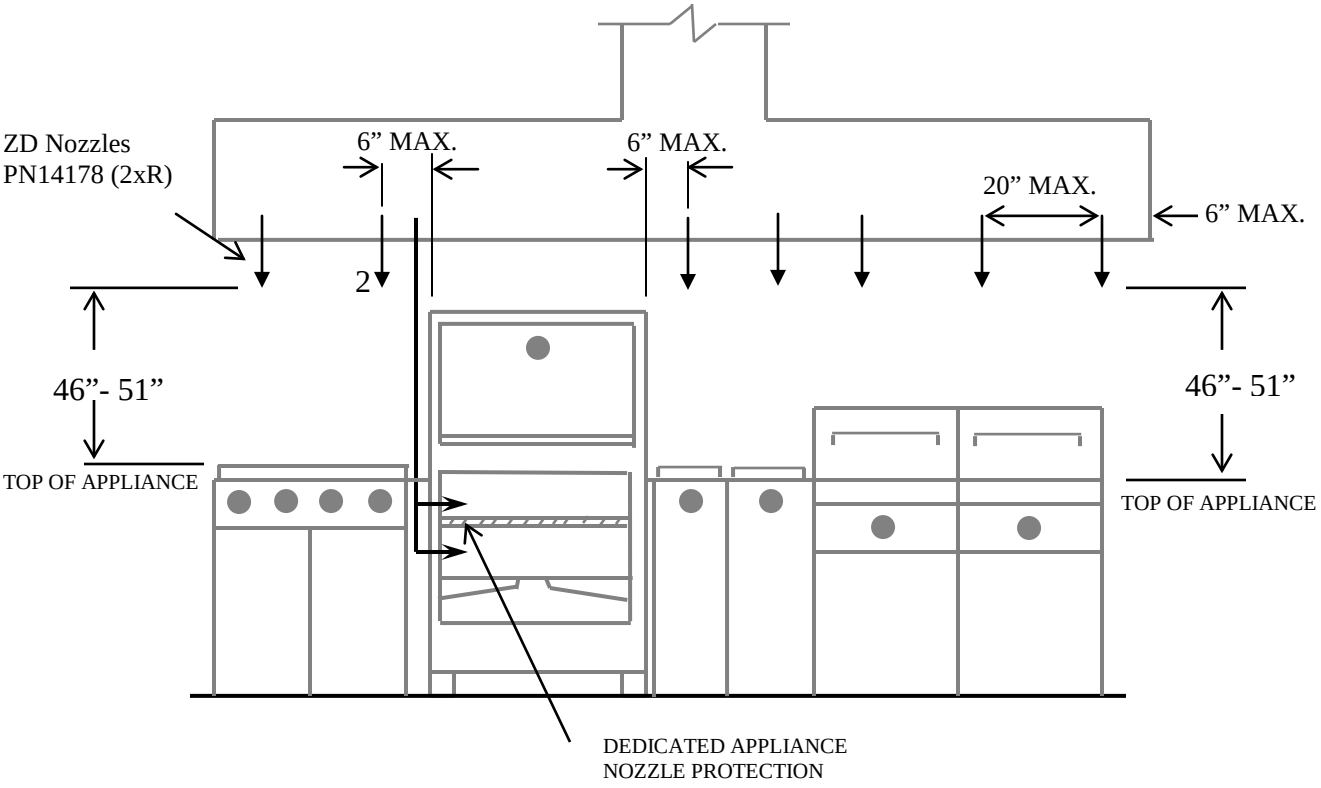


ZONE OF PROTECTION – CON'T.

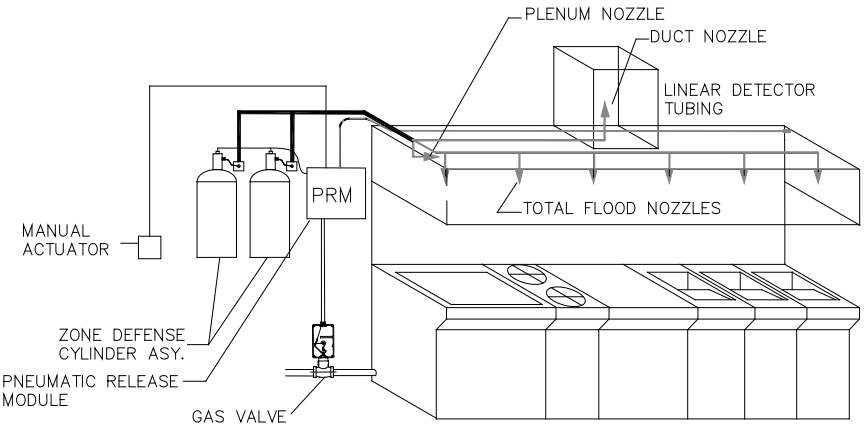
The "Zone of Protection" requires that the nozzles be placed at 46 to 51 inches above the top surface of the appliance, all ZD nozzles are to be placed at the same elevation and the nozzles are to be aimed straight down. No additional aiming is required because the eligible appliances are protected no matter where they are located within the "Zone of Protection". Therefore, **the spray is not to be impeded in any manner**.

When an appliance such as an upright broiler or salamander is part of the cooking appliance lineup, a dedicated appliance nozzle must be used to protect it. The ZD nozzles cannot protect cooking appliances with an enclosed cooking area such as an upright broiler or salamander. **No ZD nozzles are required above the upright broiler protected by a dedicated nozzle, however the ZD nozzle located to the right and left of the appliance must be no more than 6 inches from the edge of the appliance.** The illustration below reflects the situation described above. The location of the upright broiler is now fixed and the appliance must remain in this location.

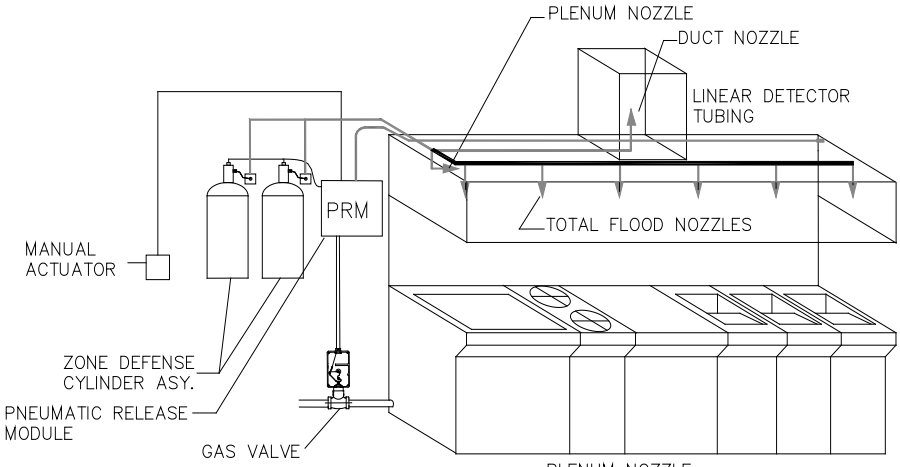
Dedicated appliance protection of salamanders, cheese melters, chain broiler or a range with a back-shelf is always in **addition** to the zone defense nozzles located overhead.



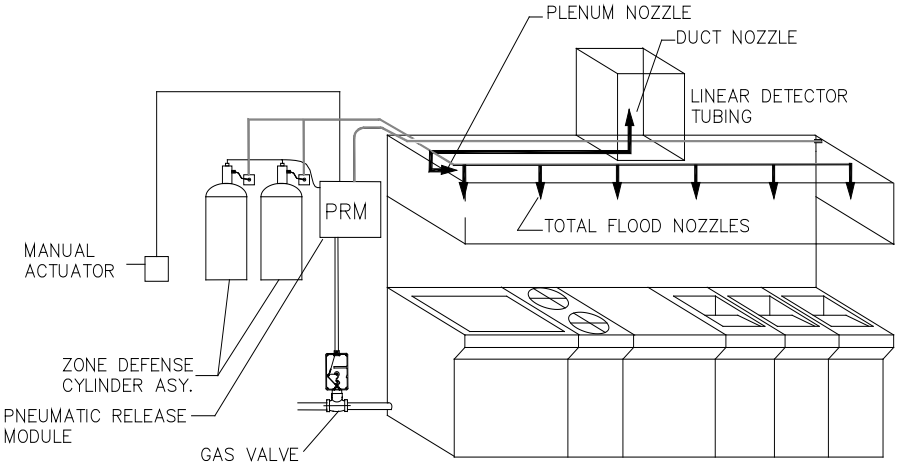
A **Supply Line** is the distribution piping that runs from the distributor outlet or discharge fitting to the first splitting tee.



A **Supply Branch Line** (including the last nozzle branch) is the distribution piping that runs from the first splitting tee at the hood to the last nozzle in the system including all fittings used to exit the supply branch line.



A **Nozzle Branch Line** is the distribution piping that runs from the supply branch tee or elbow to the nozzles including all fittings.



GENERAL PIPING REQUIREMENTS:

1. **All pipe used for the distribution network must be schedule 40 (black, chrome or stainless steel) pipe. Stainless steel tubing for dedicated appliance protection branches is permitted in accordance with limitations on page 3-16.**

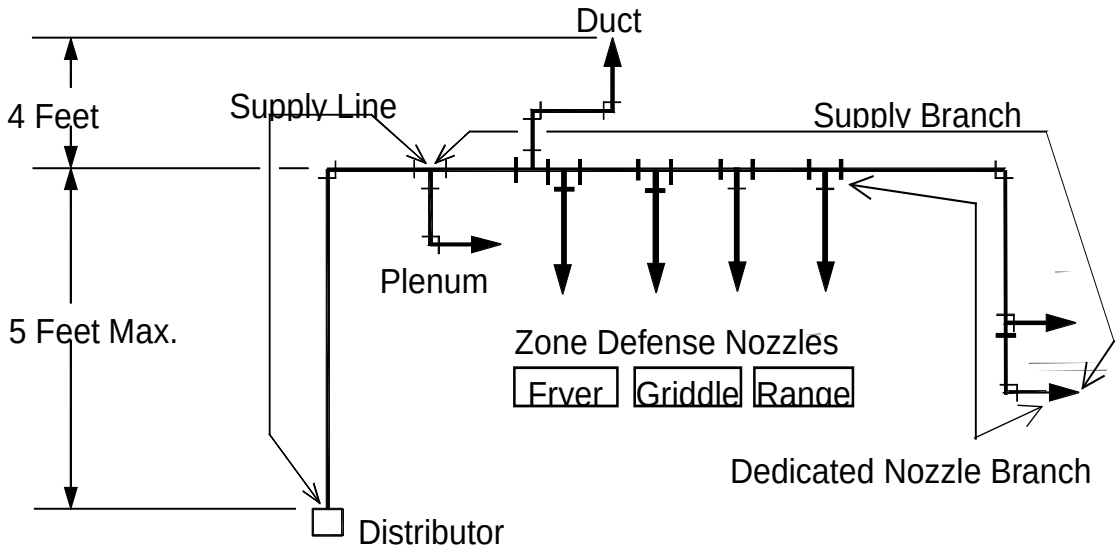
2. **Piping limitations are expressed in linear length of pipe. Linear piping is the actual length of straight pipe used throughout the system.**

WARNING: GALVANIZED PIPE IS <u>NOT</u> ALLOWED

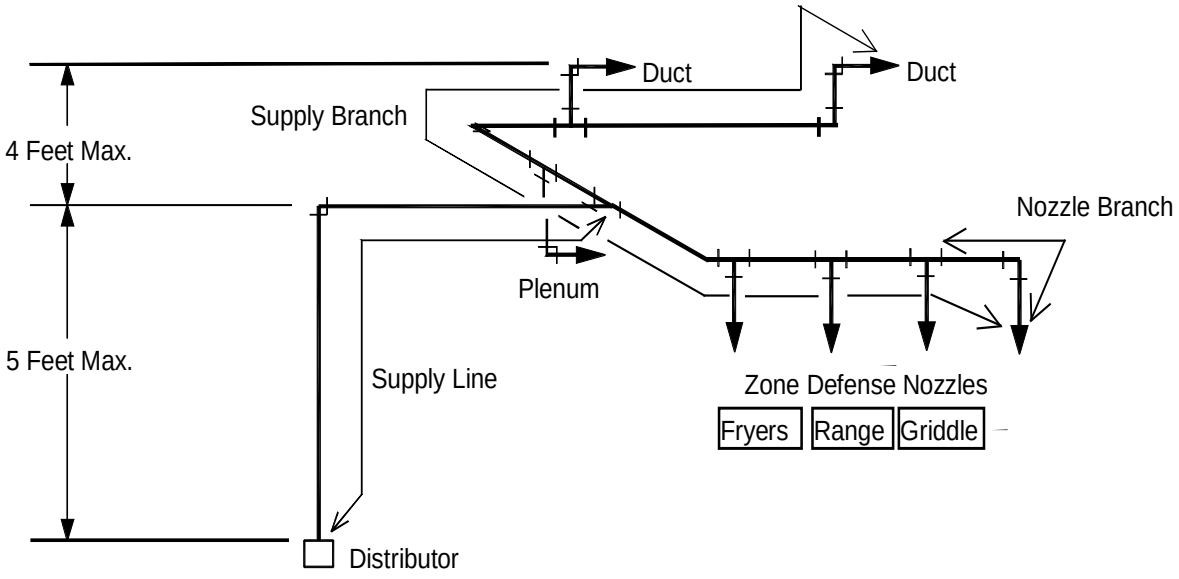
3. **Maximum flow point per cylinder:** **275 = 8 flow points**
   375 = 11 flow points
   475 = 14 flow points
   Twin 375 = 22 flow points

NOTE: THESE ARE EXAMPLES ONLY – OTHER CONFIGURATIONS CAN BE DESIGNED

TYPICAL DISTRIBUTION NETWORK FOR ZD SINGLE 375 CYLINDER SYSTEM



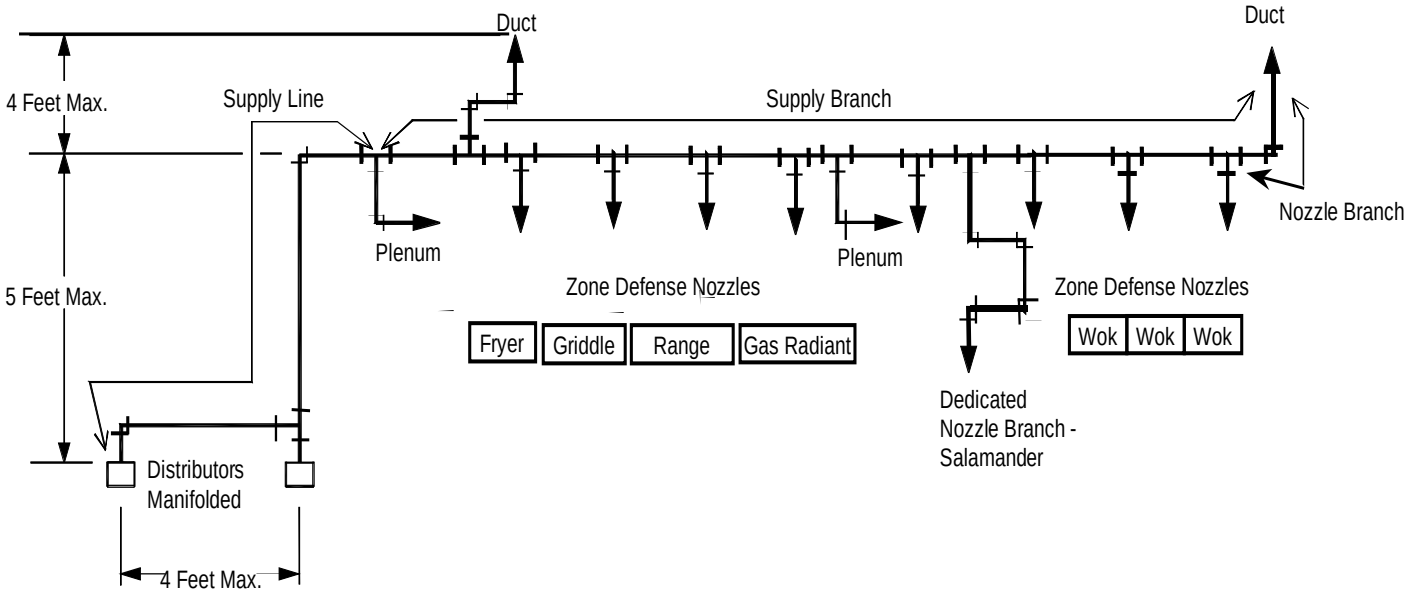
STRAIGHT PIPING SYSTEM



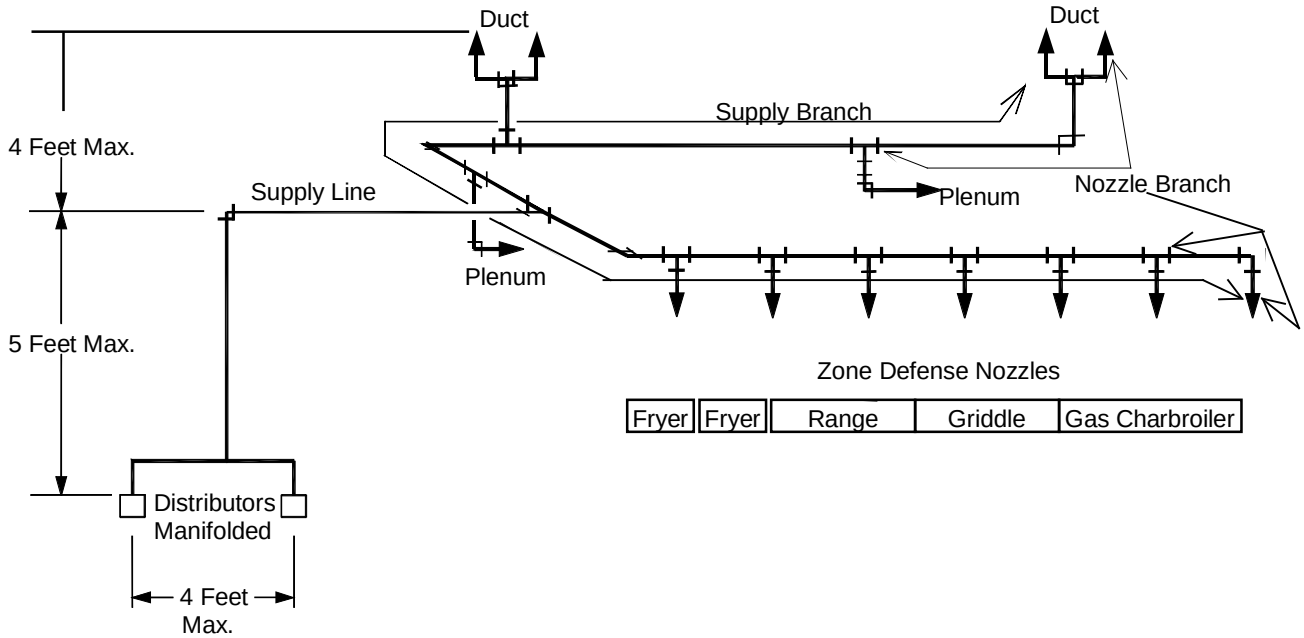
SPLIT PIPING SYSTEM

NOTE: The schematics above do not represent the only configurations possible – they are informational only.

TYPICAL DISTRIBUTION NETWORK FOR TWIN ZD CYLINDER SYSTEM



STRAIGHT PIPING SYSTEM



SPLIT PIPING SYSTEM

NOTE: The schematics above do not represent the only configurations possible – they are informational only.

ZD DISTRIBUTION PIPING DESIGN LIMITS FOR SINGLE CYLINDER OR TWIN CYLINDER MANIFOLDED SYSTEMS

When designing a "Zone Defense" system to protect a kitchen containing a Fryer, Wok or Range, the following **MINIMUM TOTAL SYSTEM PIPING** must be used in accordance with the chart below:

APPLIANCE	MINIMUM PIPING REQUIREMENTS MINIMUM LINEAR FEET	MINIMUM TOTAL EQUIVALENT FEET	MINIMUM FLOW POINTS PER SYSTEM
Fryer, Wok or Range	8'-2"	10	4

SUPPLY LINE LIMITATIONS:

All pipe and fittings running from the distributor block or the discharge fitting to the first splitting tee. (includes first tee)

CYLINDER FLOW POINTS	PIPE SIZE	MAXIMUM LINEAR FEET OF PIPE	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. QTY. BUSHINGS
275 = 8	3/8	20	1	5	0
375 = 11	3/8	20	1	5	1
475 = 14	1/2	20	1	5	2
2-375 = 22	1/2	20	2	6	2

NOTE: 1. The supply line has a **maximum vertical rise** above the distributor of **5 feet**.

SUPPLY BRANCH LINE (including last nozzle branch) LIMITATIONS:

All pipe and fittings leaving the first/splitting tee in the system and ending with the last nozzle in the last branch line. While the last nozzle branch is included in the piping limitations for the supply branch line, the limitation (pipe size and maximum length) for nozzle branch lines apply to this portion of the supply branch line.

CYLINDER FLOW POINTS	PIPE SIZE	MAX. FEET OF PIPE STRAIGHT OR SPLIT	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. QTY. REDUCING BUSHINGS
275 = 8	3/8"	20/25	7	8	0
375 = 11		22	6	8	2
475 = 14		27	12	8	2
2-375 = 22		32	14	9	2

NOZZLE BRANCH LINE LIMITATIONS:

All pipe and fittings leading from the supply branch tee to a system nozzle.

CYLINDER FLOW POINTS	PIPE SIZE	TOTAL LINEAR FEET OF PIPE	MAX. QTY. TEES	MAX. QTY. ELBOWS	MAX. FLOW POINTS PER BRANCH
275 = 8	3/8	32	5	10	
375 = 11		22	4	12	
475 = 14		32	10	15	
2-375 = 22		32	6	22	
TOTAL FLOOD NOZZLE BRANCH MAX.		3	0	6	2
DUCT NOZZLE BRANCH MAX.		6	2	4	3
DEDICATED NOZZLE BRANCH LINE		7	1	6	2

NOTE: 1. The Duct Nozzle Branch has a **maximum vertical rise** above the supply branch line of **4 feet**.

STAINLESS STEEL TUBING NOZZLE BRANCH LIMITATIONS:

All tubing and fittings leading from the supply branch tee to a dedicated appliance nozzle. One S.S. tubing nozzle branch is allowed per cylinder. Example: If two cylinders are manifold together, then the use of two S.S. tubing nozzle branches is permitted within that system.

MAX. FLOW POINTS PER BRANCH	PIPE SIZE	TOTAL LINEAR FEET OF PIPE	MAX. QTY. TEES	MAX. QTY. ELBOWS
2	3/8	10	1	6

NOTE: 1. The tubing is to be 3/8" O.D. x 0.335" I.D. x 0.02 Thk. Wall annealed Stainless Steel Type 304.
2. The use of steel or stainless steel Bite-Seal compression fittings is required for use with S.S. tubing.
3. No tube bending allowed.

GENERAL SYSTEM LIMITATIONS:

1. Nozzle types may not be mixed on ZD nozzle branch lines.
2. The discharge fitting, distributor and distribution hose are not to be included in any calculations.
3. Duct nozzle has a **maximum vertical rise** above the supply branch line of **4'-0".**
4. Maximum cylinder centerline to cylinder centerline distance for manifold cylinders is to be 4 feet.
5. The supply line has a **maximum vertical rise** above the distributor of **5 feet for the Model 375 Agent Cylinder and 10 feet for the Models 275 & 475 Agent Cylinders.**

DETECTION NETWORK LIMITATIONS:

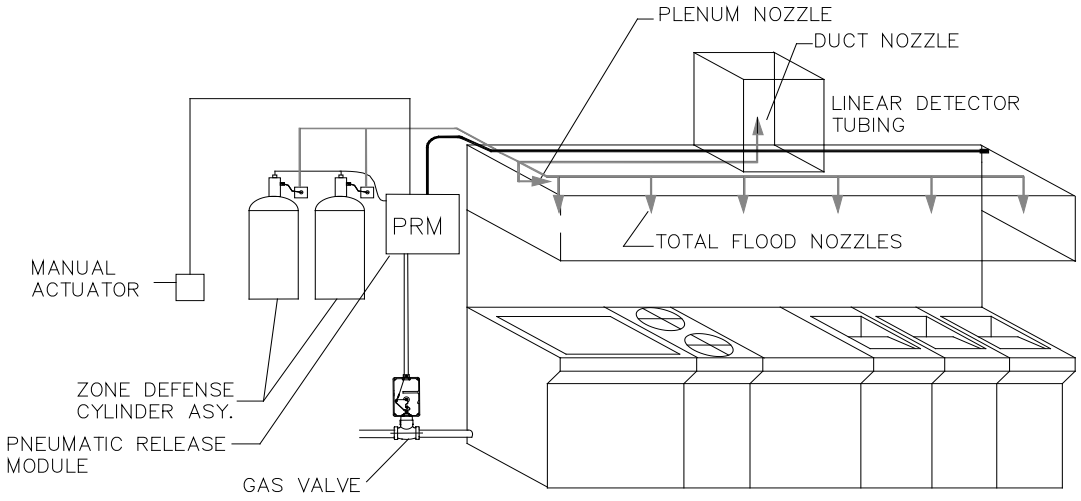
PRM DETECTION

Optimum fire suppression system performance relies on proper detection network design. This section discusses the location, design and installation limitations.

The Amerex Zone Defense Fire Suppression System may use one of two detection methods. The first is a PRM that uses a continuous piece of pressurized thermal sensitive tubing to provide the ultimate in dependable fire detection. **No** cable, **No** corner pulleys, **No** detector bracket, **No** link holders, **No** fusible links, **No** conduit offset, or terminal link connector to install. Simply run the pressurized thermal sensitive tubing through the plenum of the hood and across the center of the hood duct opening. Fasten the tubing securely every 18 inches (45.7cm) and you have provided protection the entire length of the hood. No matter where the appliance is located under the hood, it is being watched by the PRM (Pneumatic Release Module).

In order to detect a fire in the duct, the tubing is required to be placed across the center of the hood / duct opening or three sides of the hood duct opening. See page 4-5 of the manual for tubing routing and see PRM Design & Installation Manual Part No. 16546, dated, March 2006, for installation instructions.

WARNING: DO NOT LOCATE TUBING DIRECTLY IN THE PATH OF GAS APPLIANCE EXHAUST FLUE GASES. DOING SO COULD RESULT IN AN UNNECESSARY DISCHARGE OF THE SYSTEM.



MRM & LINEAR FUSIBLE LINK DETECTION

The second detection method is the use of a MRM or MRM II in conjunction with the Linear Fusible Link Detection network. Due to the arrangement of the fusible links in the hood it is considered to cover the full length of the hood, no matter where the fire may occur. This system is explained in Section 3, page 3-35 & 3-36 of this manual.

SYSTEM INSTALLATION, TESTING, MAINTENANCE & RECHARGE

The installation of all components are outlined in Section 4, system testing is outlined in Section 5, system maintenance is outlined in Section 6 and reset / recharge are outlined in Section 7 of this manual.

SECTION 4

SYSTEM INSTALLATION

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
to UL/ORD 1254.6-1995*

December 2008

*** ULC Certification does not apply to the STRIKE™ or SRM.**

SYSTEM INSTALLATION

GENERAL:

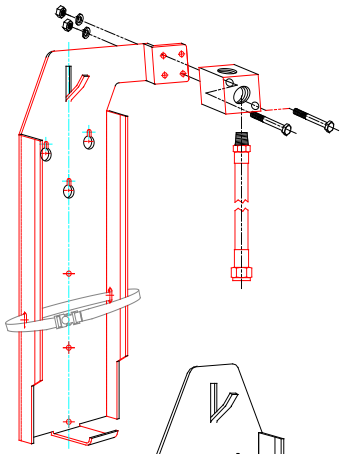
Before starting the installation of a system, a complete analysis of the hazards, a system design and drawing of the proposed system layout shall be accomplished. The design, drawings and bill of materials shall be compared with conditions found at the jobsite and discrepancies noted before proceeding. Always contact the local AHJ (Authority Having Jurisdiction) for fire codes and Health Inspectors for special requirements in the specific area that the system is being installed.

Material such as pipe, fittings, EMT conduit, fasteners, mounting and securing hardware for pipe and conduit are not supplied by Amerex with the KP system. These items are chosen and supplied by the installer.

All components must be installed in an environment that does not exceed the systems temperature range listing of 32°F – 120°F (0°C – 49°C). All Agent Cylinder Models are to be installed in the vertical up-right position.

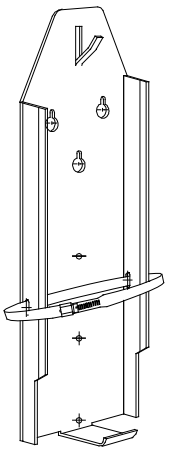
All system components – release module, cylinder assembly, mounting brackets, detectors, fusible links, pneumatic detection tubing, agent, nozzles, manual pull stations, gas shut off devices, corner pulleys, pulley tee, nitrogen cylinders, etc. – must be UL listed for use with the Amerex Restaurant Fire Suppression System. Use of components that are not listed for use in this system will void the warranty and may affect system performance.

INSTALLING THE 375 AGENT CYLINDER BRACKET (P/N 16085) - DISCONTINUED



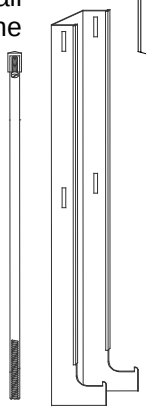
Choose an appropriate location for the agent cylinder assembly where the pressure gauge can be read, the cylinder safely accessed for recharge and service, is acceptable to the AHJ and has a sufficient structure to accept the weight. Using the bracket as a template, mark the top two holes for mounting, secure the bracket loosely with appropriate fasteners, adjust for level and plumb, mark the remaining holes and fasten securely. The bracket is equipped with a distributor to receive both the hose from the cylinder discharge outlet and the discharge piping. The distribution network piping can be installed without the agent cylinder assembly in the bracket. A minimum of three holes shall be used to mount the bracket in any situation. The two slotted holes and a hole in the center of the vertical strap shall be used.

INSTALLING THE NEW 375 AGENT CYLINDER BRACKET (P/N 17690)



Choose an appropriate location for the agent cylinder assembly where the pressure gauge can be easily read and the cylinder safely accessed for recharge and service. The location should be acceptable to the AHJ and have sufficient structure to accept the weight of the agent cylinder. Using the bracket as a template, mark the top two holes for mounting, secure the bracket loosely with appropriate fasteners, adjust for level and plumb, mark the remaining holes and fasten securely. The distribution network piping is attached to the cylinder valve outlet via a swivel fitting. A minimum of three holes shall be used to mount the bracket in any situation. The two slotted holes and a hole in the center of the vertical strap shall be used.

INSTALLING THE 275/375/475 AGENT CYLINDER BRACKET (P/N 16920)



Choose an appropriate location for the agent cylinder assembly where the pressure gauge can be read, the cylinder safely accessed for recharge and service, is acceptable to the AHJ and has a sufficient structure to accept the weight. Using the bracket as a template, mark the top hole, secure the bracket loosely with appropriate fasteners, adjust for level and plumb, mark the remaining holes and fasten securely.

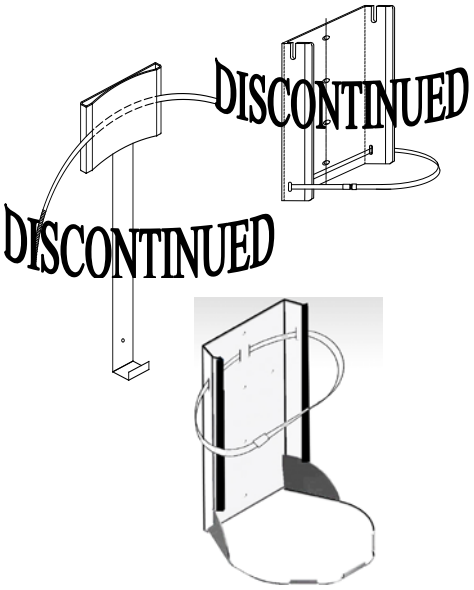
INSTALLING THE 375 AGENT CYLINDER ASSEMBLY (P/N 13334) TO P/N 16085 OR P/N 17690 BRACKET ASY.

Insert the cylinder onto the hanger to rest on the bottom support. Buckle up belly strap and tighten to aid in support. Insure proper fit of bracket to cylinder loop. Attach distribution piping to valve outlet via swivel adapter.

INSTALLING THE 275 / 375 / 475 AGENT CYLINDER ASSEMBLY (P/N 13334, 16921, or 17379) TO P/N 16920 BRACKET ASY.

Place the cylinder so that it rest on the bottom support of the bracket. Install stainless steel belly strap and tighten against the cylinder to aid in support. Attach distribution piping to swivel fitting and then tighten swivel to cylinder valve outlet.

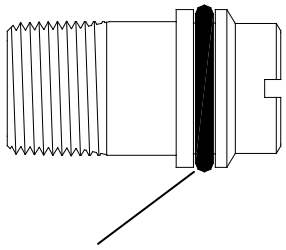
INSTALLING THE MODEL 600 AGENT CYLINDER BRACKET (P/N 15166 - DISCONTINUED) (P/N 21583 - DISCONTINUED) (P/N 23184 – NEW)



Choose an appropriate location for the Agent Cylinder valve assembly where the pressure gauge can be read, the cylinder can be safely assessed for recharge and service, is acceptable to the AHJ and has sufficient structure to accept the weight. Using the bracket as a template, mark the mounting holes. Use at least three holes for mounting, secure the bracket loosely with appropriate fasteners, adjust for level and plumb and fasten securely. The bracket is supplied with a stainless steel strap to hold the cylinder against the back of the bracket. **A minimum of three holes, should be used to mount the bracket in any situation.**

INSTALLING THE MODEL 600 DISCHARGE FITTING KIT (P/N 10199)

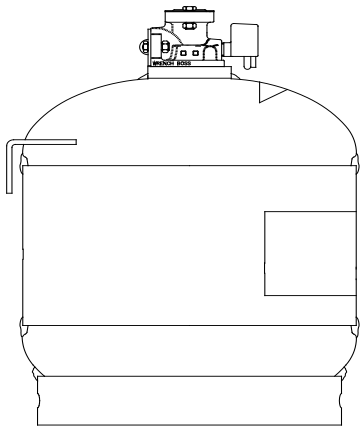
The discharge fitting kit consists of a brass fitting with an o-ring on one end and ¾ NPT male threads on the other, and a stainless steel flange for locking the fitting in place. The discharge fitting should be inserted into the outlet of the agent cylinder outlet **carefully**, to insure that the o-ring is not damaged – the o-ring forms the seal between the cylinder and the discharge piping. The stainless steel flange is then bolted in place to secure the fitting to the valve outlet.



O-Ring
P/N 10140

INSTALLING THE MODEL 600 AGENT CYLINDER (P/N 15196) – DISCONTINUED CONFIGURATION

The KP600 agent cylinder assembly is fitted with an attachment bracket that is a component welded to the cylinder assembly. The attachment bracket is used to attach the cylinder assembly to the cylinder mounting bracket. The cylinder attachment bracket fits easily into the upper slotted portion of the mounting bracket. Once inserted into the slot, it is locked in place by two notched areas in the attachment bracket. This will prevent cylinder movement from side to side. Once this is accomplished, the installer's hands are free to attach the stainless steel strap to secure the cylinder against the bracket.

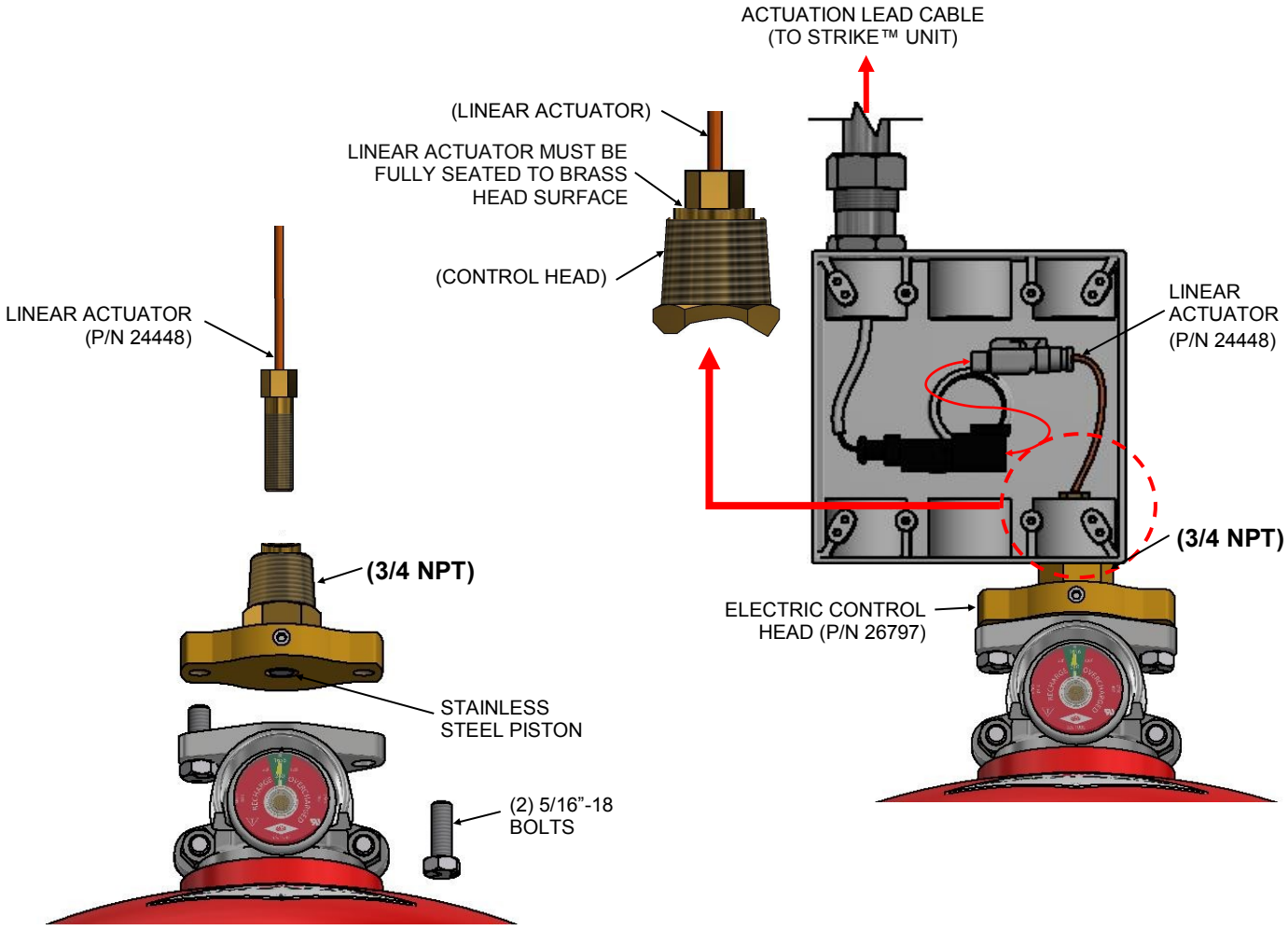


NOTE: BOTH THE SHIPPING PLATE AND THE ANTI-RECOIL PLATE MUST BE REMOVED AT THE TIME OF INSTALLATION.

Installing the Electric Control Head, KP600 (P/N 26797)
The Electric Control Head, KP600 is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Installation:

1. Remove Shipping Plate (P/N 10099) from top of Agent Cylinder Valve. Retain the (2) 5/16”-18 bolts.
2. Verify that the tapered end of the stainless steel piston is loosely captive at bottom of Electric Control Head.
3. Locate Electric Control Head on top of Agent Cylinder Valve as shown.
4. Install (2) bolts retained from step 1 as shown. Use medium grade thread locking compound and torque to 10 ft-lbs.
5. Install Linear Actuator (P/N 24448) and tighten hand tight. **Do not over tighten. Do not use PTFE thread tape. Ensure Linear Actuator body makes full contact with control head. The Linear Actuator will be connected to the STRIKE ECS Panel (See STRIKE™ ECS Installation, Operation and Maintenance Manual P/N 26692, or Appendix C).**
6. A 3/4” junction box must be attached to the Electric Control Head (3/4” NPT) to house the Actuation Lead Cable connection and Linear Actuator, with conduit protecting the Actuation Lead Cable back to the STRIKE™ Unit. OEM or end cabinet installations housing both the KP cylinders and STRIKE™ ECS do not require conduit.



Installing the Electric Control Head (P/N 26127)

The Electric Control Head is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Installation:

1. Remove Shipping Cap (P/N 12862) & Cap Asy (P/N 15143) from top of Agent Cylinder Valve. These parts will not be used (See Figure 1).
2. Verify that the tapered end of the stainless steel piston is loosely captive at bottom of Electric Control Head.
3. Slide Retainer Nut (P/N 13595) over Electric Control Head & secure on top of Agent Cylinder Valve as shown and tighten fully.
4. Install Linear Actuator (P/N 24448) and tighten hand tight. Do not over tighten. **Do not use PTFE thread tape. Ensure Linear Actuator body makes full contact with control head. The Linear Actuator will be connected to the STRIKE ECS Panel (See STRIKE ECS Installation, Operation and Maintenance Manual P/N 26692, or Appendix C).**
5. A 1/2" junction box must be attached to the Electric Control Head (1/2" NPT) to house the Actuation Lead Cable connection and Linear Actuator, with conduit protecting the Actuation Lead Cable back to the STRIKE™ Unit. OEM or end cabinet installations housing both the KP cylinders and STRIKE™ ECS do not require conduit.

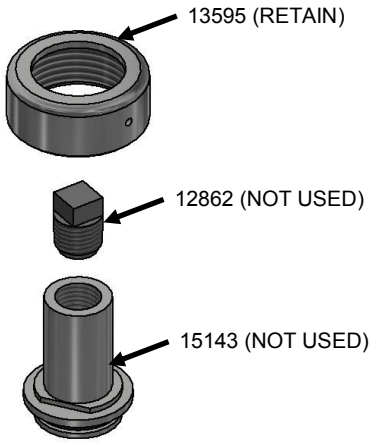
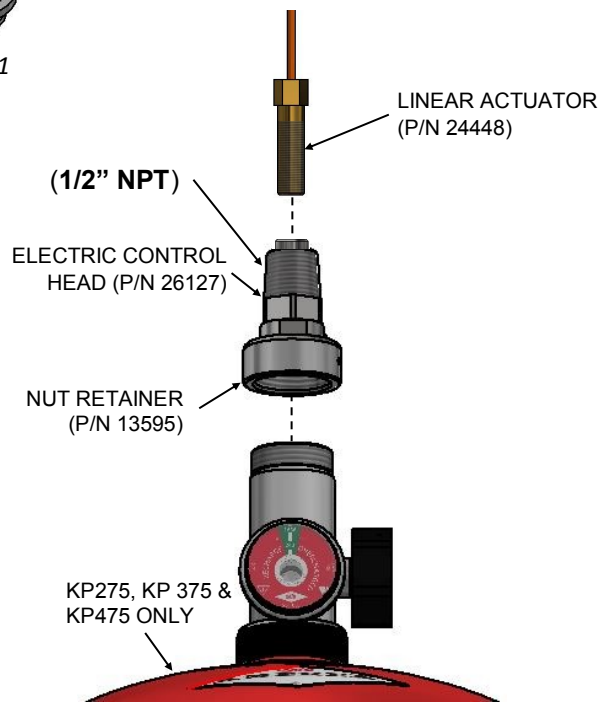
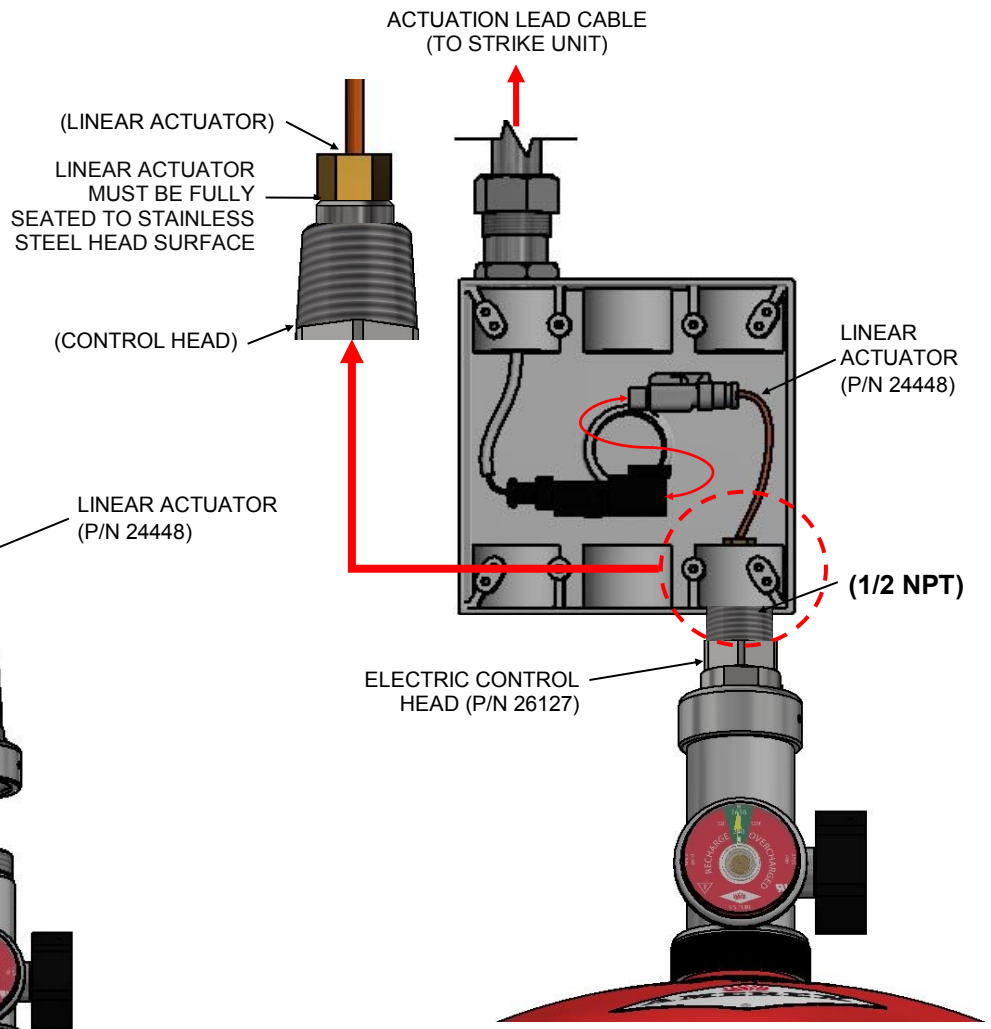
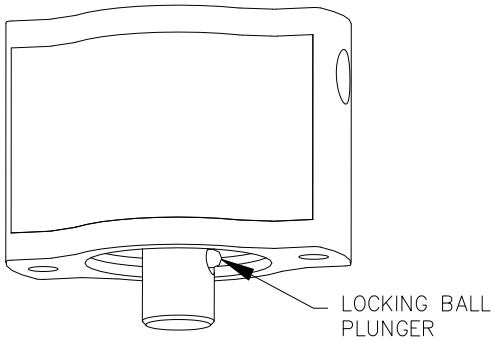


Figure 1





INSTALLING THE MODEL 600 PNEUMATIC ACTUATOR (P/N10147)



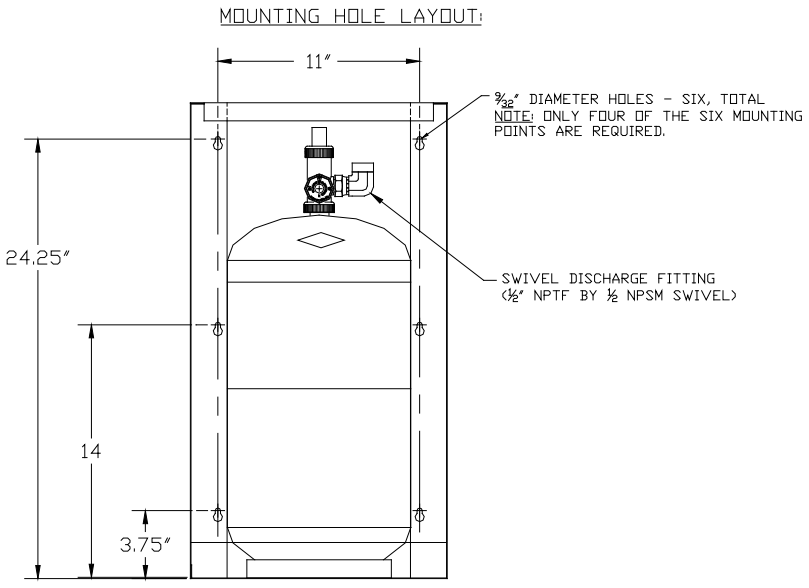
A pneumatic actuator is required for every KP600 agent cylinder assembly. The actuator is bolted directly to the top of the agent cylinder discharge valve. When actuation occurs at the MRM or PRM, the pneumatic pressure from the nitrogen cylinder enters the actuator through ¼" NPT threaded ports on either side. The actuation pressure forces the piston inside to extend and depress the valve stem of the discharge valve. The piston extends through a retainer plate and the ball plunger locks the piston in its extended position.

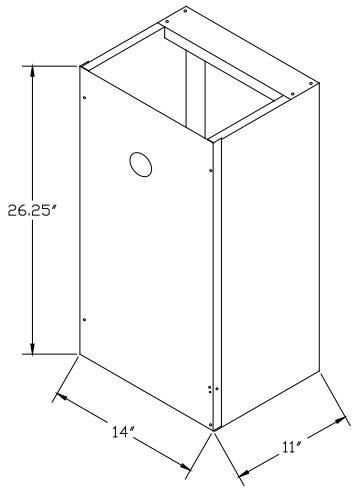
NOTE: WHEN INSTALLING ONLY ONE CYLINDER, THE ACTUATION LINE WOULD COME IN ON ONE SIDE OF THE ACTUATOR AND THE OTHER SIDE WOULD BE PLUGGED USING A ¼" NPT BRASS PIPE PLUG. IF YOU ARE INSTALLING MORE THAN ONE CYLINDER THE SECOND PORT IS USED TO TRANSFER PRESSURE TO THE NEXT CYLINDER AND SO ON, UNTIL YOU REACH THE LAST CYLINDER AND THE OUTLET/TRANSFER PORT IS PLUGGED.

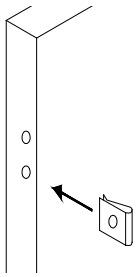
INSTALLING THE AGENT CYLINDER ENCLOSURE (P/N 16814) STAINLESS STEEL

The Cylinder enclosure (P/N16814) is designed to contain one Amerex 275 / 375 or 475 agent cylinder (P/N 16921, 13334 or 17379). The enclosure has been designed and tested to support the weight of the cylinder resting on the bottom of the enclosure. **NO MOUNTING BRACKET REQUIRED.** A swivel fitting, p/n 16901, is provided for attaching the piping network to the discharge outlet of the agent cylinder valve. Use an appropriate reducing bushing if 3/8" supply line pipe is used. Install as follows:

1) Locate and anchor the enclosure with appropriate fasteners using a minimum of four of the six available mounting holes, see hole spacing below.







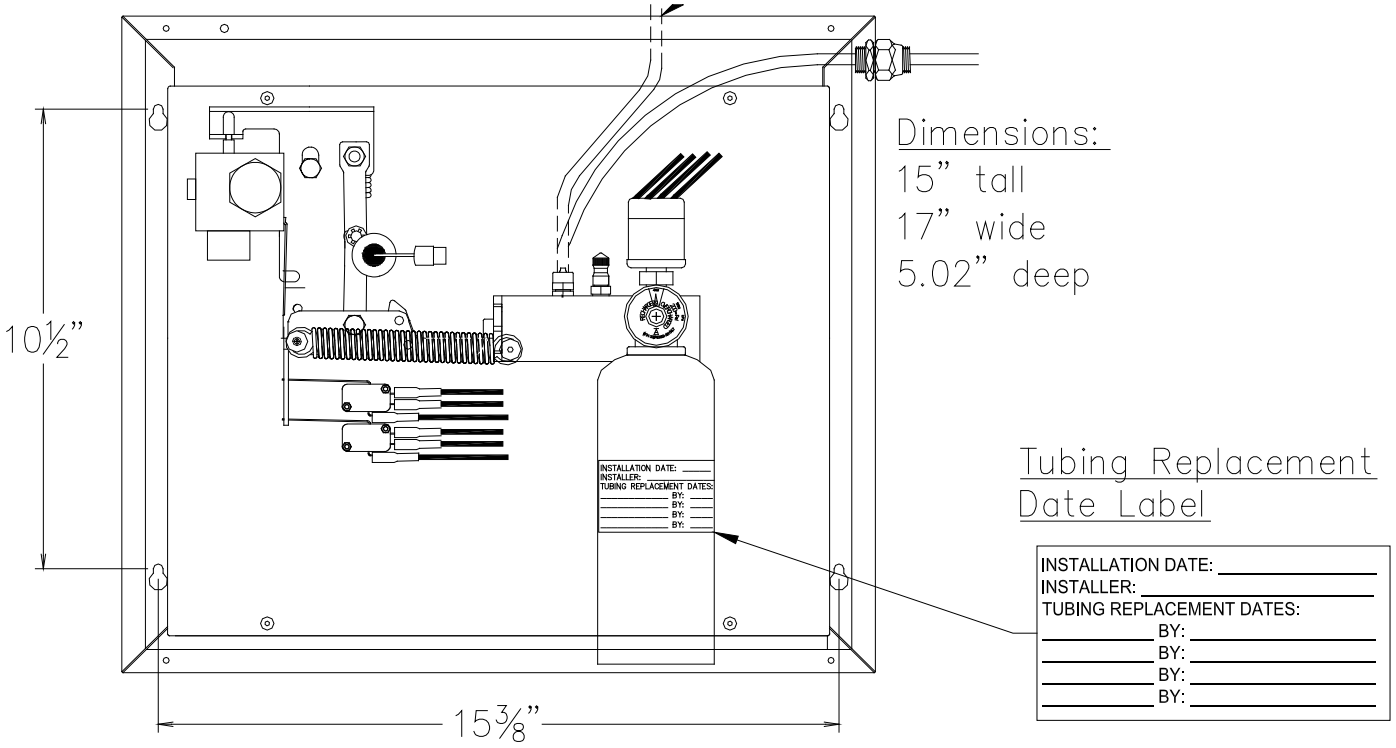
2) Place the cylinder inside the enclosure; attach the swivel discharge fitting to the discharge piping network and attach to the valve outlet last. **CAUTION:** Keep the anti-recoil cap (P/N 13219) on the cylinder discharge port at all times except when attached to the discharge piping.
3) Push the four black "U-nuts" onto the enclosure flange and align them over the cover mounting holes. The cover is oriented properly when the pressure gauge view port is "up".
4) Install the two tamper seals through the cover and enclosure holes (upper left / lower right corner).

INSTALLING THE PNEUMATIC RELEASE MODULE (PRM):

Select a suitable location for the pneumatic release module (PRM) that has access for installation, service, recharge and where both the nitrogen actuation cylinder pressure gauge and the system status indicator can be viewed. The PRM must be fastened to a surface that has sufficient structure to support the loads anticipated. Knockouts are provided on three sides of the enclosure and each cable run may enter the enclosure from any of the three sides (top, bottom or right).

Using the enclosure as a template, mark the top two holes for mounting and anchor the enclosure loosely, adjust to level and mark bottom holes, anchor loosely using appropriate fasteners.

All installation wiring shall adhere to NFPA 70 (NEC) and all State and Local codes. Terminations of the snap action switch are to be made outside the PRM Enclosure in an appropriate electrical junction box. Do not install nitrogen actuation cylinder at this time or system may accidentally actuate.

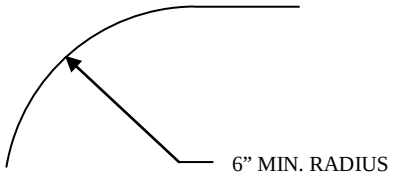


INSTALLATION OF DETECTION NETWORK - PRM

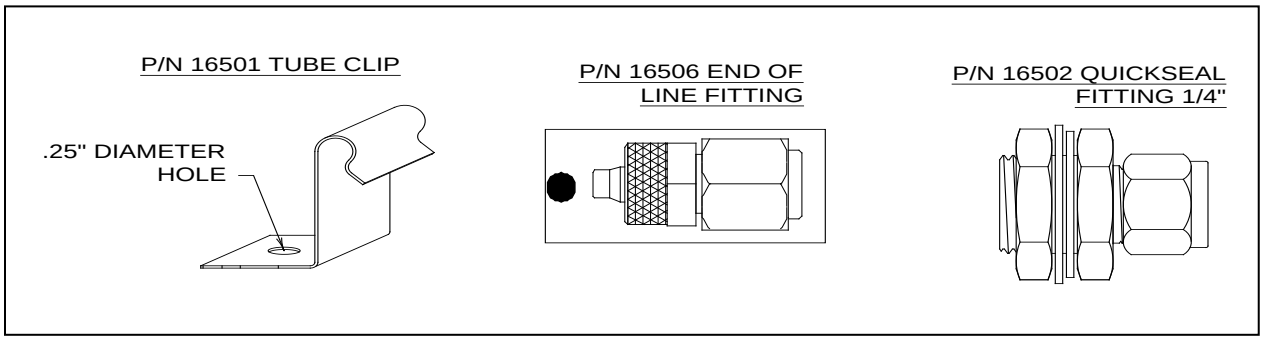
The PRM has provisions for a single, continuous section of detection tubing. No splicing or "tee's" allowed. There shall be only two tubing terminations: one at the accumulator cylinder inside the PRM, and the other at the opposite end of the tubing, with the use of an End of Line Fitting (p/n 16506).

The Amerex part numbers for tubing lengths are:

P/N	Length	P/N	Length
16557	25'	16579	100'
16551	50'	16552	150'
16556	75'	16554	300'



Tubing may be cut down to the required length with the use of Cutting Tool P/N 16860, or be coiled up and secured with wire ties outside the hazard area. Cuts must be square and clean. The minimum bend radius is 6 inches (15.2cm). Do not crimp or crush the tubing in the course of handling or installation. A Tubing Clip (PN 16501) is to be use to secure the tubing every 18" (45.7cm). A Tubing Clip is also required within one inch of the End of Line Fitting. The tubing can exit the enclosure either through the 5/8" hole at the upper right hand corner of the enclosure (where a strain relief fitting is installed at factory), or it can exit through the 5/8" hole at the top right of the enclosure. If it is desired to route it through the top, switch the strain relief fitting with the snap-in plug.



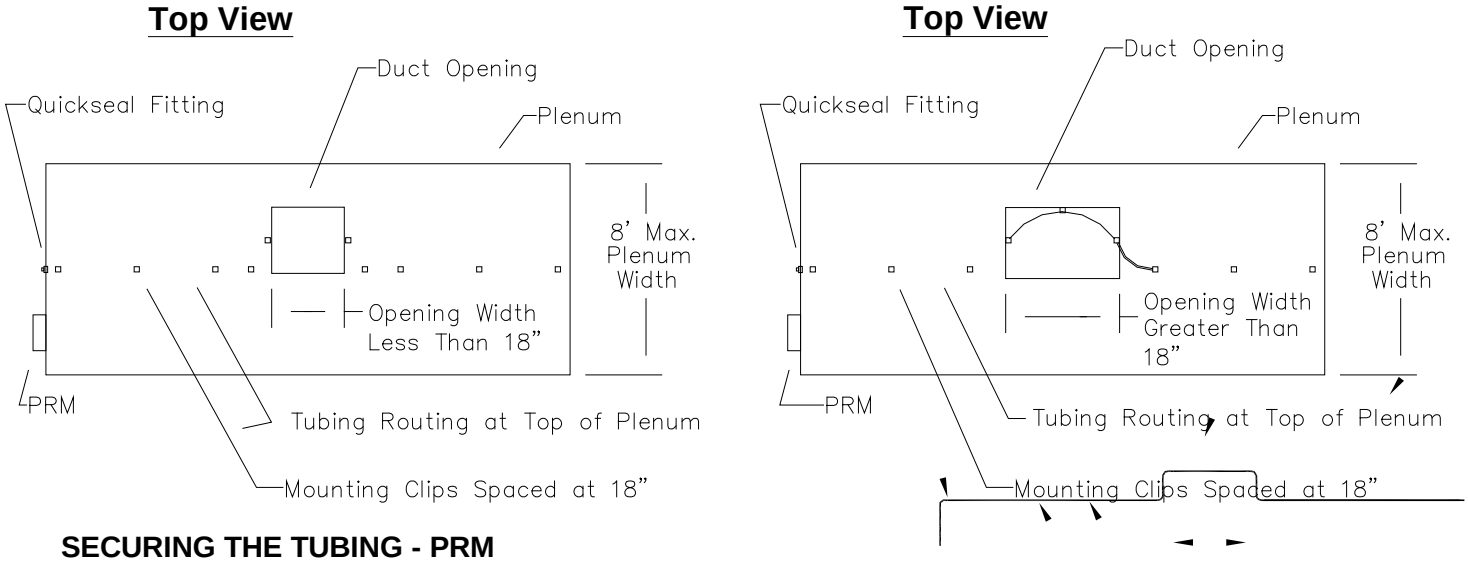
The PN16502 Quick-seal Compression Fitting is required for kitchen hood and other penetrations requiring a UL-listed sealing device.

Warning: When tightening the nut on the PN 16502 Compression Fitting, use a MAXIMUM of ½ turn past hand tight. Wrenching the nut past ½ turn can begin to collapse the detection tubing.

TUBING SPACING & ROUTING - PRM

The detection tubing is to be run at the top of the plenum, behind the filters from one end of the plenum to the opposite end to ensure total detection coverage. Ensure that the tubing is routed in such a way as not to interfere with any moving parts or access openings. Tubing must not be obscured by structural or support structures, and should be fully exposed to any rising hot gasses from the cooking media, to ensure rapid detection response. Terminate the tubing within 6" (15.2cm) of the end of the plenum. Refer to page 4-7 for proper end of line installation. The tubing is never to be routed in the path of hot flue gases from a gas fired appliance for this can result in a unwanted discharge. Never locate the tubing where the daily removal of the filters will result in scraping or damaging the tubing surface for this too will result in an unwanted discharge.

Additionally, the detection tubing is to cross over the hood / duct opening in compliance with NFPA – 17A. When the opening width exceeds the 18" (45.7cm) maximum mounting clip spacing, the tubing is to be installed along at least three of the four sides of the hood / duct opening. See figure below:



SECURING THE TUBING - PRM

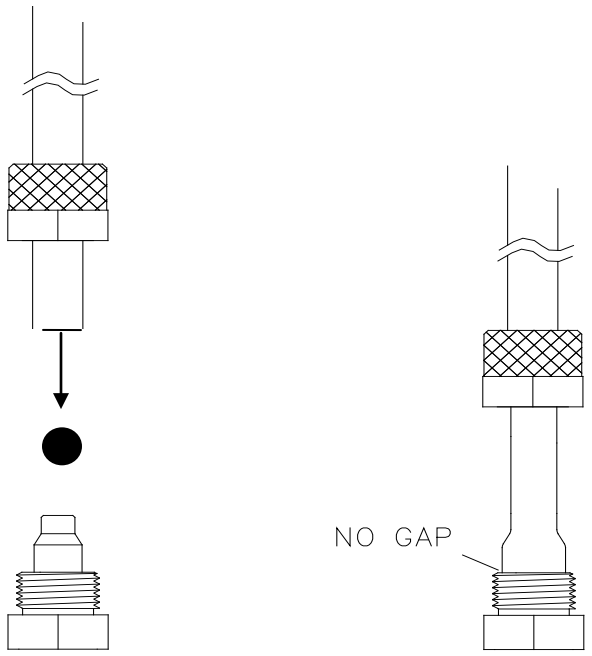
The tubing must be secured at a distance not to exceed 18" with PN16501 Tubing Clip. A Tubing Clip is also required within one inch of the End of Line Fitting. Since the tubing snaps into the clip, it is recommended that the clips be installed first, then the tubing. Ensure that the tubing is routed in such a way as not to interfere with any moving parts or access openings. Tubing must not be obscured by structural or support structures, and should be fully exposed to any rising hot gasses, to ensure rapid detection response. Never take up slack by pulling the tubing through a series of clips, this action could damage the tubing and shorten its useful life.

TUBING TERMINATION - PRM

Care must be taken when terminating the start and end of the tubing to ensure leak proof connections. Below are the instructions for termination:

1. Remove knurled nut from plated tube fitting and slide over end of tubing. The end of the tubing must be cut square and clean. **DO NOT** use pliers or wire cutters for cutting the tube. These tools will collapse the end of the tubing and could create a leak point. The use of a sharp utility knife is suggested, while rolling the tubing on a flat surface. Do not use any sealants on the connection.

2. Firmly push the end of the tube down over the end of the fitting. It may require working the tubing around until it goes on (see following figure). It is important that the end of the tubing be inserted **ALL** the way over the tip of the fitting. Hold the tubing in place **firmly** in one hand while tightening the nut with the other. Use a 12mm wrench (or adjustable) to tighten the nut. Resistance will be felt when the nut bottoms out. Do not over tighten. The procedure is the same for both the accumulator cylinder fitting and the End of Line Fitting. It may be helpful to place the End of Line Fitting in a small vise while terminating the tubing to it.



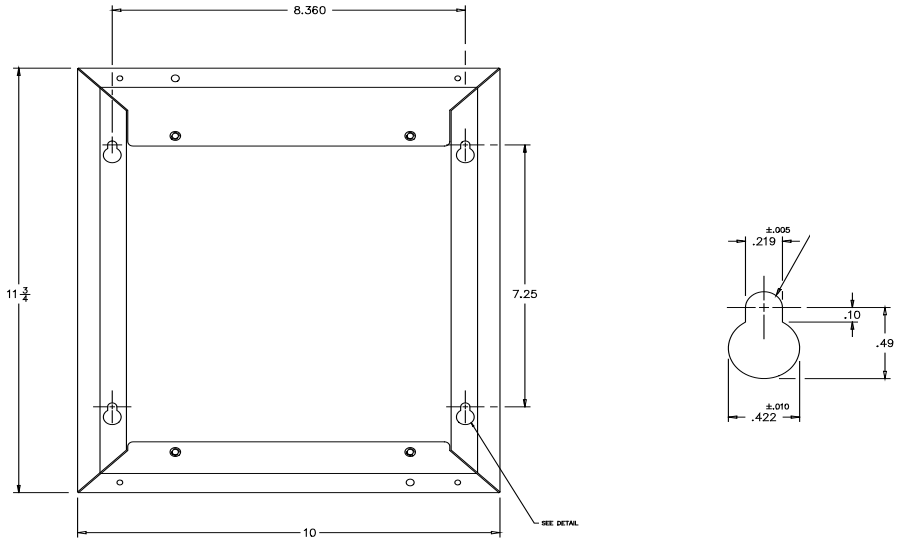
3. Once the system is pressurized and put into service (see below), both connections should be thoroughly leak checked with leak check fluid or soapy water.

4. Record the date of tubing installation on the tubing replacement label and affix the label to the detection accumulator cylinder.

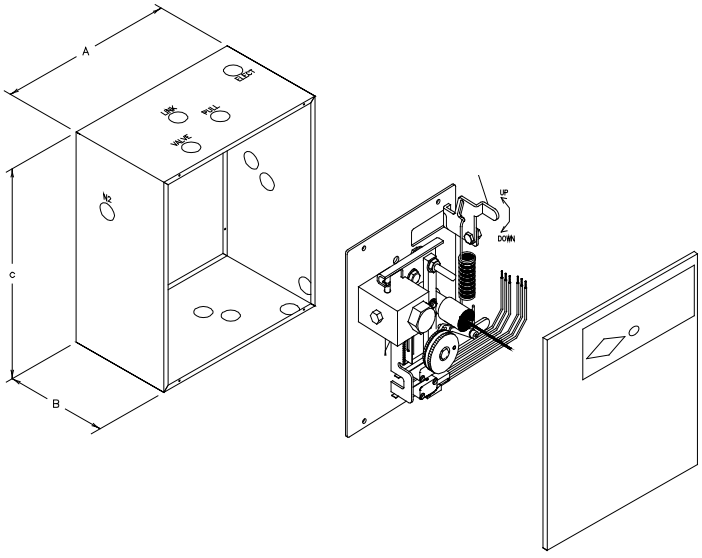
INSTALLING THE MECHANICAL RELEASE MODULE (MRM):

Select a suitable location for the mechanical release module that has access for installation, service, recharge and where both the nitrogen actuation cylinder pressure gauge and the system status indicator can be viewed. The MRM must be fastened to a surface that has sufficient structure to support the loads anticipated. Knockouts are provided on three sides of the two available enclosures (painted or stainless steel) and each cable run may enter the enclosure from any of the three sides (top, bottom or right).

Using the enclosure as a template, mark the top two holes for mounting and anchor the enclosure loosely, adjust to level and mark bottom holes, anchor loosely using appropriate fasteners.



Once the enclosure is loosely attached to the mounting surface the MRM plate can be installed into the enclosure stand offs using the four machine screws provided with the MRM. **Do not install nitrogen actuation cylinder at this time or system may accidentally actuate.** After the MRM plate is installed tighten fasteners anchoring the MRM enclosure to the wall.



P/N 12853 P/N 13393	U.S.	Metric
(A) Width	10 in.	25.4 cm
(B) Depth	5 in.	12.7 cm
(C) Height	11 ¾ in.	51.5 cm

Special Note:
When the MRM plate is installed in the "optional" P/N 11978 S/S Cabinet remove (unscrew) the factory installed "Status Indicator" from the MRM and install the extended (longer) "Status Indicator" packaged with the Stainless Steel Cabinet

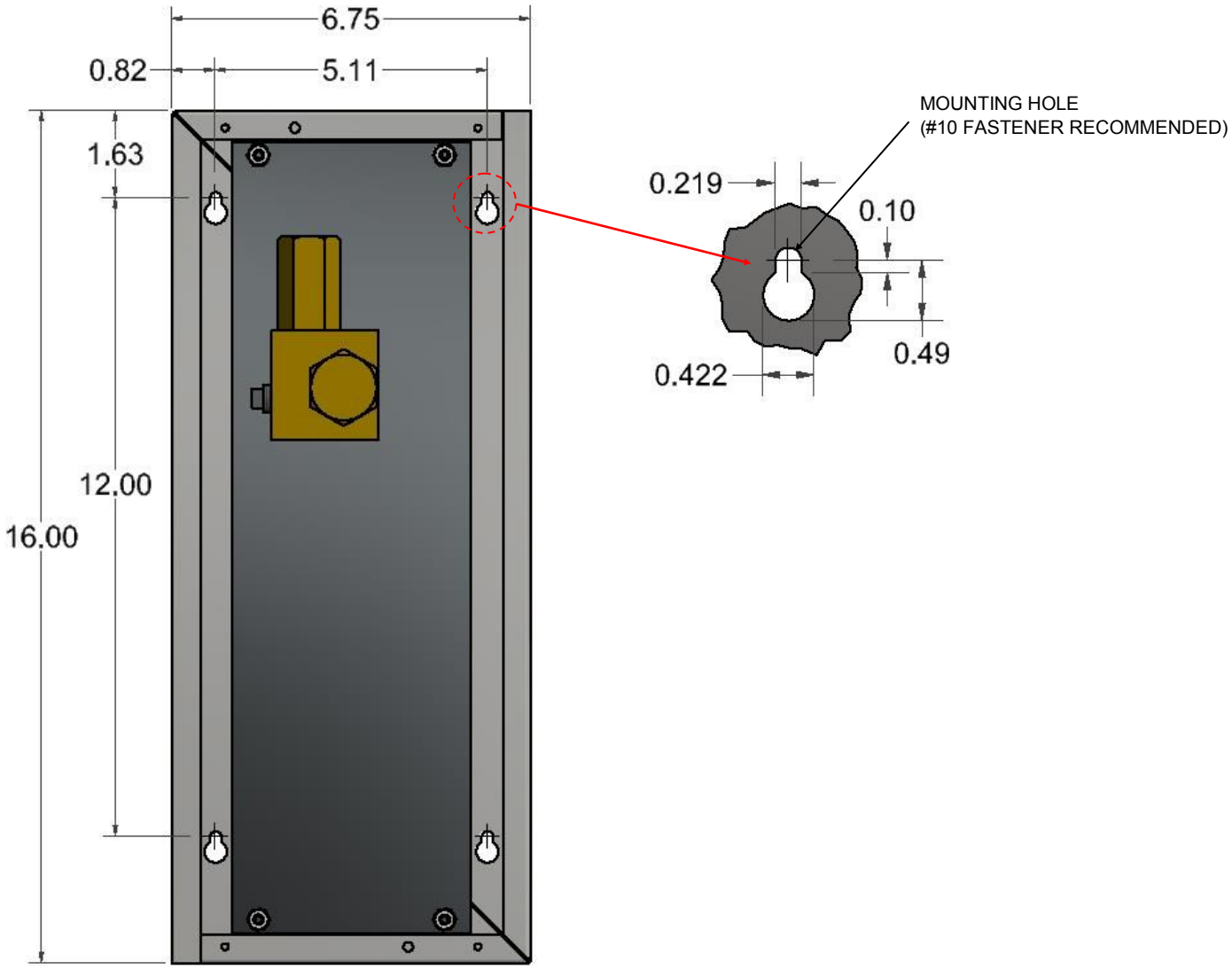
Installing the STRIKE™ Releasing Module (SRM) Enclosure (P/N 26607).

The SRM is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Consider the most convenient wire routing path of all external devices when determining the best mounting location for the SRM Enclosure. Electrical knockouts (3/4", "ELECT") are provided on the top, right side and bottom of the enclosure which are used for all field wiring entering the enclosure. Install the SRM Enclosure per the following instructions:

1. The SRM Enclosure contains (4) mounting holes as detailed below.
2. Use the dimensions shown or use the enclosure as a template to mark then drill the top two holes in the selected mounting surface.
3. Loosely assemble the enclosure to the mounting surface using appropriate hardware (#10 fasteners are recommended). Level the enclosure and match drill the remaining two lower holes.
4. Finish the installation by securely attaching the enclosure using appropriate hardware.

Do not install the nitrogen actuation cylinder at this time or system may accidentally actuate.

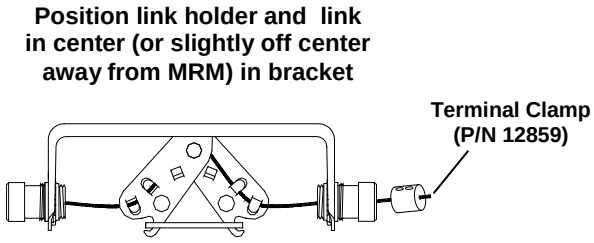


INSTALLING THE DETECTION NETWORK – MRM or MRM II

Refer to the system design section for Detector Network limitations. There is only one type of detector bracket and linkage used with this system. There are, however, two names for detectors in the network – series and terminal. The terminal detector is the detector located at the end of the cable run, furthest away from the MRM or MRM II. A series detector is any detector located in between the MRM or MRM II and the terminal detector in the network.

Starting at one of the corresponding knock-out found on one of the two available sides (top or bottom) of the MRM or MRM II. Install ½" EMT conduit running from the MRM or MRM II to each detector location, using a corner pulley at every change in direction. Each detector must be securely fastened to a rigid surface, located over each protected appliance and in the hood / duct opening. Refer to the Design section for limitations and cautions regarding detector placement.

To install the cable, start at the terminal detector, affix the Cable with a terminal clamp (P/N 12859 provided with the MRM & MRM II) leaving a minimum of 6 inches between the end of the cable and the terminal clamp. From the terminal detector, continue to feed the cable through each corner pulley, detector and length of EMT conduit back to the MRM.



INSTALLING THE DETECTION NETWORK – MRM II

Setting Detection Cable Tension, New MRM II (P/N 18000 and 18001):
Refer to the following images in this section for properly setting the detection cable tension:

1) To set the tension on the cable, first make sure that the tension bar in the MRM II is in the "down" position and that the spring is relaxed. Lower the top hook of the blue spring into the bottom of the tension bar slot.

Warning: Do NOT attempt to set the tension bar in the "up" position (spring stretched) without having a fusible link line installed and secured or the MRM will fire. Take additional caution; DO NOT install the Nitrogen Actuation Cylinder at this time.

2) Feed the cable end into the small hole in the side of the ratchet pulley. The end of the cable must be cleanly cut. Push the cable into the hole until the end is visible at the head of the central hex-bolt. Securely tighten the Allen-head set screw onto the cable. Aside from the use of the cocking tool, no further tools should be used to set the mechanism. (The cable may be routed from either the bottom or the top of the MRM II; the ratchet pulley will always turn counter-clockwise to remove cable slack. – See illustration on Page 4-9A)

3) Spool up the excess cable slack by turning the ratchet pulley counter-clockwise by hand. Continue to hold the ratchet pulley while proceeding to the next step.

4) While maintaining the position of the ratchet pulley with your left hand, press down on the engagement pawl and the linkage bar with your index and middle fingers of your right hand in order to begin the final tensioning process. You will feel and hear the pawl click several times as tension is taken up.

5) Inspect your progress by pulling the upper hook of the blue spring into the top notch of the tension bar; then raise the tension bar. Refer to the illustrations on the following page for proper setting**.** Repeat steps 1-5 until the bottom of the linkage bar is essentially horizontal, and is aligned within the gray "pie" zone of the indicator label (see Figure B). Lower tension bar until system is ready to test**.**

To test the Detection Network, refer to Chapter 5, "Testing and Commissioning".

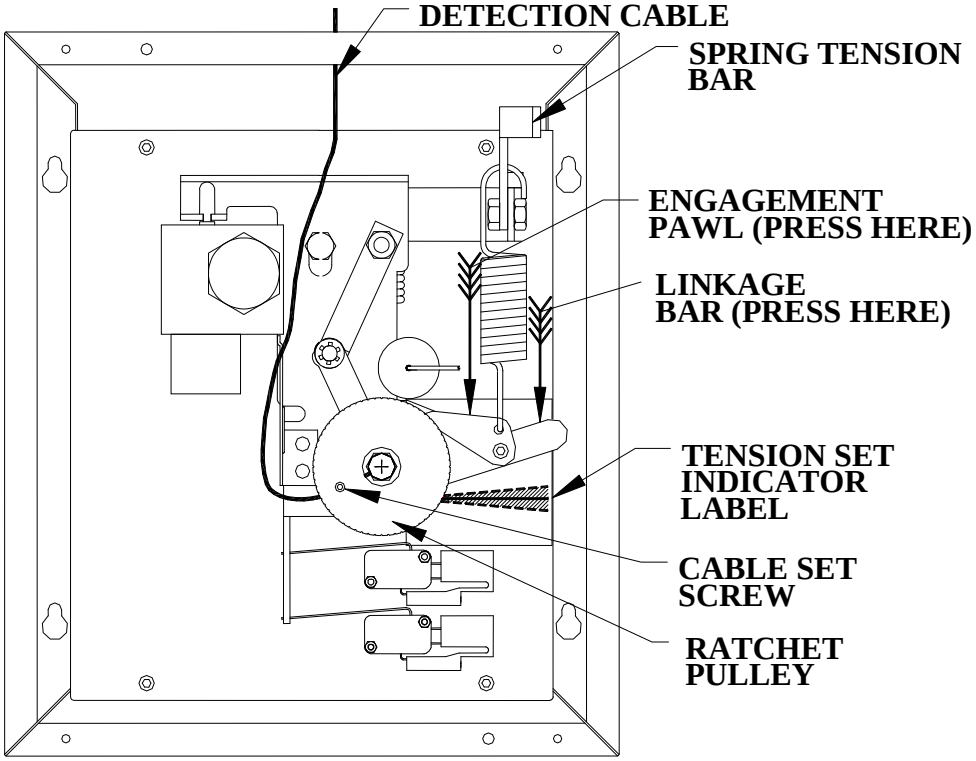
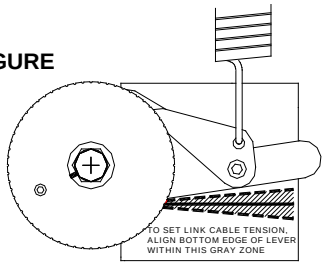
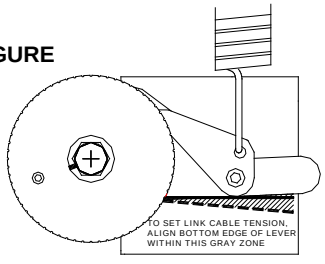


FIGURE A)



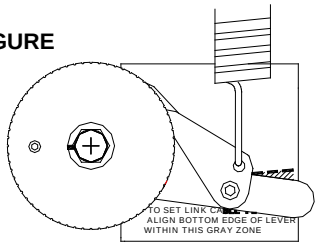
Not enough cable tension.
Lower spring tension bar. The lever and pawl must be pulled downward while the ratchet pulley is prevented from rotating. Approximately 2-4 more clicks are required from this position; then raise spring tension bar and re-examine results.
Caution: The MRM may inadvertantly cause system discharge if left in this position.

FIGURE B)



Proper Cable Tension. Correct Detection Cable tension is obtained when the bottom edge of the linkage bar is aligned within the gray "pie" region of the indicator label, with the spring tension bar in the "up" position. Stand directly in front of the MRM while viewing. The lower edge of the linkage bar will essentially be horizontal.

FIGURE C)



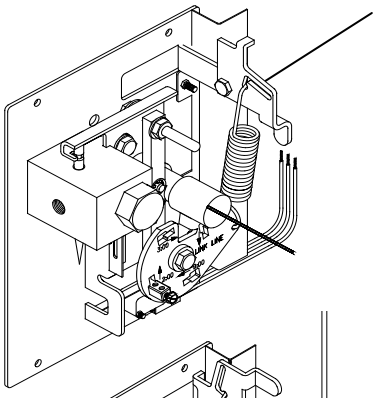
Too Much Cable Tension.
Lower spring tension bar and unhook the blue spring from the tension bar, releasing all tension. Repeat the process until Figure B is achieved. Caution: damage to the MRM can result from careless over-tensioning of the assembly.

INSTALLING THE DETECTION NETWORK – MRM

To install the detector linkage, place a weighted object on the cable at the MRM, allowing a minimum of 3 inches of extra cable length for every detector in the network. Starting at the terminal detector, place the linkage upside-down on the cable, run the cable over the rivet and through each of the four tabs as shown above, insert the appropriate fusible link (see the design section for proper selection of fusible links) and turn upright. Repeat these steps for each detector.

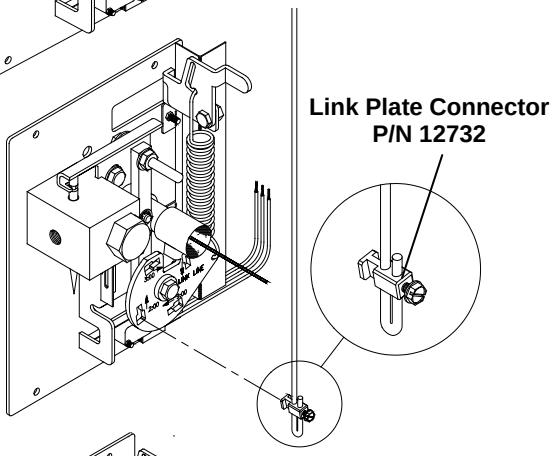
Each link and link holder, once assembled and placed on the cable, should be positioned in the bracket on center or slightly off center away from the MRM.

To set the tension on the cable, first make sure that the tension bar in the MRM is in the "down" position and that the spring is relaxed.



WARNING: **DO NOT ATTEMPT TO SET THE TENSION BAR IN THE UP POSITION (SPRING STRETCHED) WITHOUT HAVING A FUSIBLE LINK LINE INSTALLED AND SECURED OR THE MRM WILL FIRE**.

WARNING: **CONDUIT MUST BE SECURED WITH APPROPRIATE ANCHORS AT DISTANCES NOT TO EXCEED 3 FEET. FAILURE TO SECURE CONDUIT PROPERLY MAY CAUSE SYSTEM FAILURE**.

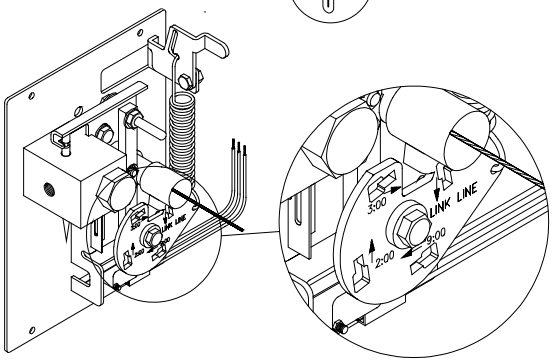


Attach the cable to the link plate connector, do **not** clamp tightly (slack must be taken up in a later step). Insert the connector into the slot on the link plate that corresponds with the direction of pull on the cable. The link plate is marked with clock positions (6:00 and 12:00).

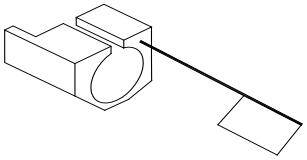
Note: Early models also had a 3:00 and 9:00 position which CANNOT be used.

Insert the connector at 12:00 if the cable enters the MRM at the TOP or 6:00 if it enters at the BOTTOM.

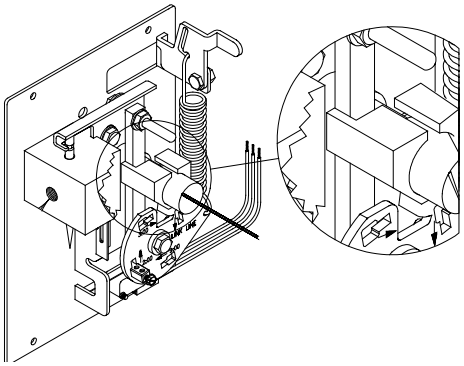
NOTE: Any excess cable must be secured out of the way of any parts in the MRM. We suggest taping it to the link line cable.



Slip the set-up/lock-out tool (P/N 12738) over the manual pull cam housing until it rests against the outside edge of



the collapsible linkage. (See adjacent illustration) Draw tension on to the cable through the connector until the link plate is drawn against the set-up tool, then tighten the set screw on the connector.



Remove the set-up tool and raise the tension bar to test cable run. Lower tension bar until system is ready to test. To test the detection network, refer to the testing and commissioning section.

INSTALLING THE LINEAR FUSIBLE LINK DETECTION NETWORK – MRM, MRM II

Refer to the system design section for Linear Fusible Link Detection Network limitations. This network uses no detector brackets and is limited to use in hoods 42' long or less. The terminal connector is located at the end of the cable run. The fusible links and factory fabricated cable segments are supported every eight feet maximum by the use of support eyebolts **PN17520**. Eyebolts must also be located on each side of the hood-duct opening to support the cable crossing the opening.

Starting at any of two sides (top or bottom) of the MRM or MRM II at the corresponding knock-out, install ½" EMT conduit running from the MRM, MRM II to the hood, a maximum distance of thirty feet. This run of conduit may also incorporate the use of a maximum of twenty corner pulleys at every change in direction and conduit must be firmly secured every 36 inches. This portion of the network uses Cable Segment **PN17356 (Part of Purchased Kit 17515)** which consists of one link hook and thirty feet of stainless steel cable. No field fabrication of any Cable Segments is allowed.

The first fusible link must be located within 24 inches of the end of the hood. Each fusible link from this point on must be on maximum 24" centers, which is accomplished by the use of Cable Segment **PN17354** which consist of two link hooks and stainless steel cable the proper length for the maximum 24" spacing. No field fabrication of any Cable Segments is allowed.

The last fusible link in the line must be within 24" of the end of the hood and is terminated by the use of cable segment **PN17355 (Part of Purchased Kit 17515)** which consist of one link hook and 24" of stainless steel cable**.** No field fabrication of any Cable Segments is allowed. The end of the cable segment is terminated at a conduit handy box by the use of the terminal clamp **PN12859** (provided with the MRM & MRM II). Refer to the Design section for limitations and cautions regarding fusible link placements. The network is to be run in the plenum in a manner that will place a fusible link in the "hood-duct" opening. All cable and links in the plenum are to be in a straight line and supported by eye bolts a maximum of every eight feet. Support eye bolts are to be located in the middle of cable segment runs to allow for the required cable movement.

NOTE: WHEN POSITIONING THE LINKS IN THE PLENUM SO THAT A LINK IS IN THE HOOD-DUCT OPENING IT MAY BE NECESSARY TO LOCATE THE END LINKS AT LESS THAN THE MAXIMUM 24" FROM THE END OF THE HOOD.

To install the linear fusible link network, first measure the distance from the far end of the hood to the middle of the hood/duct opening in inches. Divide this distance by 24 and you will know the number of "Links to Link" Segments (PN17354) required to run from the end of the hood to the middle of the hood/duct opening. You will also require one "Link to Termination" Segment **PN17355 (Part of Purchased Kit 17515).**

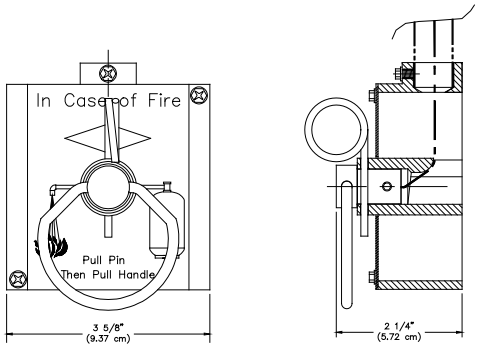
Next measure from the center of the "hood/duct opening to the opposite end of the hood and repeat the process above to determine the balance of "Link to Link" Segments (PN17354) required. You will also require one "MRM to 1st Link" Segment **PN17356 (Part of Purchased Kit 17515)**.

Tension adjustment for the linear fusible link network is to be performed in the same manner described for the standard detection network on page 4-9 and 4-10 of this manual.

INSTALLING THE MANUAL PULL STATION(S) – MRM, MRM II OR PRM

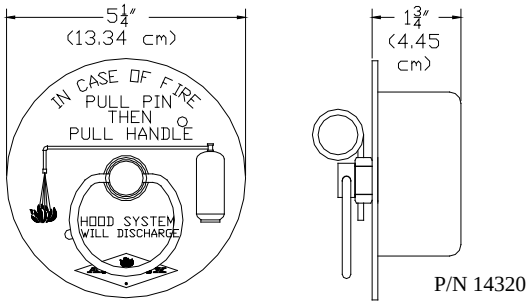
To install the manual pull station(s) first confirm that the set-up/lock-out tool is in place, that the tension bar is down and that an actuation nitrogen cylinder is not installed. **Failure to confirm these conditions could result in the discharge of the system.**

Refer to the design section for manual pull station limitations and suggested locations. The local AHJ should have the final approval for manual pull station location and mounting heights.



P/N 11993

The MRM, MRM II or PRM allows the cable for the manual pull station(s) to enter from any of the two sides (TOP or BOTTOM). Once a location for the pull station has been established, ½" EMT conduit is run from the module (using whichever exit side is most convenient) through corner pulleys to the pull station. The manual pull station may be mounted to the wall in any orientation necessary for surface mounting. The conduit and pulley elbows must be mounted and securely anchored and then the cable can be fed from the manual pull station back to the MRM, MRM II or PRM.



P/N 14320

RECESSED INSTALLATION OF MANUAL REMOTE PULL STATION MRM OR PRM

When installing the Manual Pull Station in a recess configuration, utilize the adapter kit (P/N 14193). The Manual Pull Station Adapter Kit includes an oversized cover plate to cover the hole cut in the sheetrock and/or tile wall. A pull handle extension collar to compensate for the thickness of the wall and two longer attachment screws for the cover plate are also enclosed.

Using the Manual Pull Station Adapter Kit (P/N 14193)

1. Drill 5/32" diameter mounting holes as shown in Figure 1. Holes are located in the side of the box that will be mounted to the stud. Holes may be enlarged to accommodate the mounting screws.

2. Mount box to the wall stud so that the front edge of the box is flush with the front edge of the stud. Attach the box to the stud with two suitable screws.

3. Complete the installation by running ½" conduit with the corner pulleys back to the MRM, MRM II or PRM.

4. Install the "adapter" provided to compensate for the wall thickness. Orient the adapter so that the securing screw falls directly over the pull pin hole of the Manual Pull Station. Tighten the set screw firmly in place.

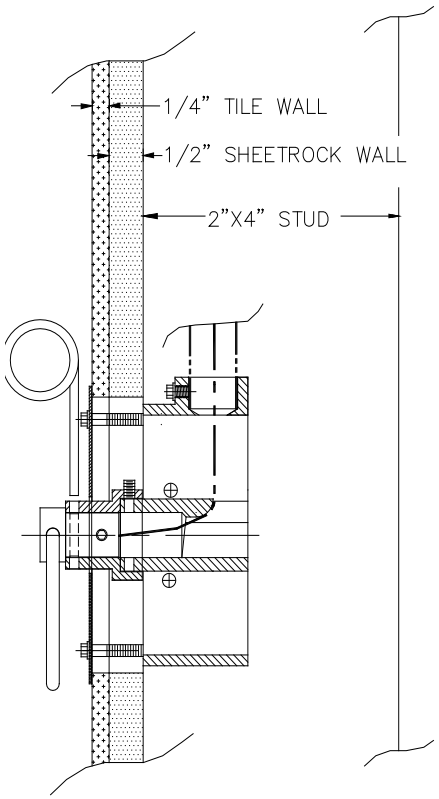
5. Run the cable from the remote manual pull to the MRM, MRM II or PRM.

6. Install the cover plate on the remote manual pull using the two longer screws provided.

7. Install the pull handle by attaching the cable to the pull handle end – secure cable with the setscrew.

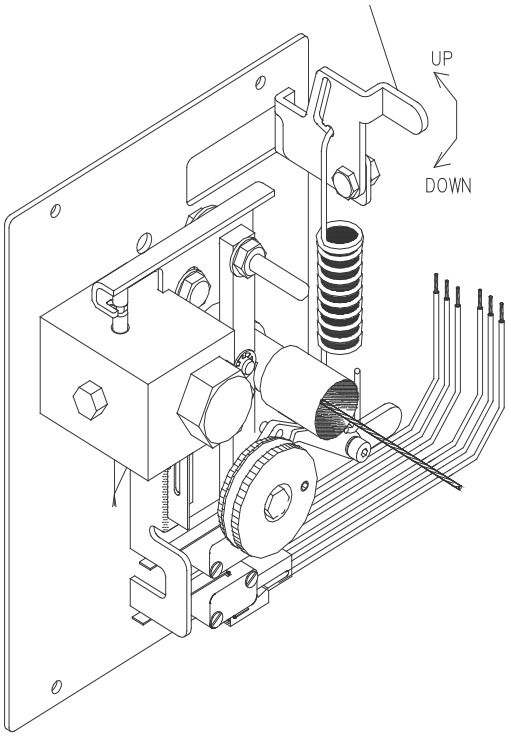
8. Insert the handle and secure with the pull pin.

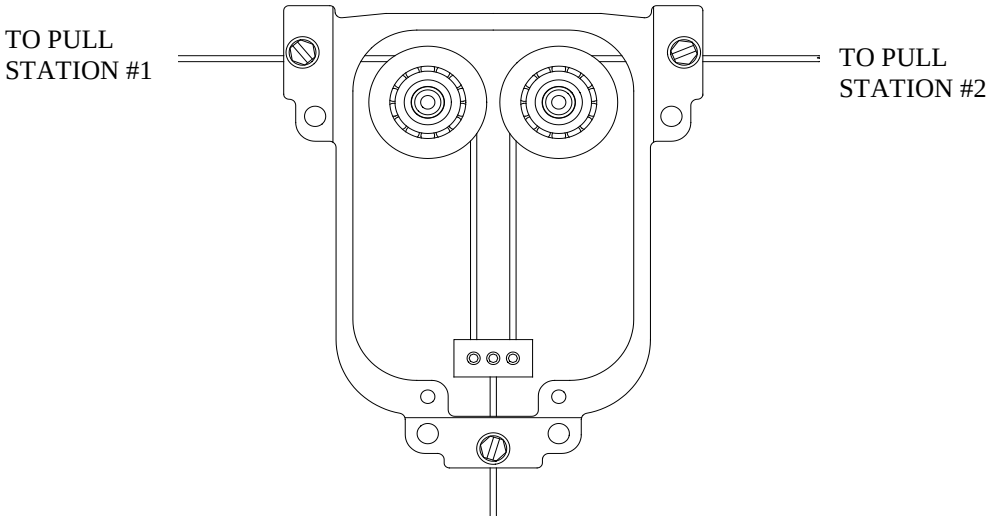
9. Complete the installation at the MRM, MRM II or PRM as outlined in the preceding pages.



The cable attaches to the manual pull at the handle by using set screws. At the MRM, MRM II or PRM the cable attaches to a cable clamp that is inserted into the fastener on the end of the manual pull cam. Excess cable must be secured out of the way of any parts in the module. We suggest taping it to the manual pull cable.

NOTE: The manual pull cam requires a travel distance of ¾" to actuate the system. It is not necessary to leave excess slack in the cable when installing the manual pull station. Any splices used in the cable must be located at least 12 inches from the pulley tee or any pulley. **The connector in the pulley tee should be located as far toward the MRM, MRM II or PRM as possible**.





INSTALLING THE ACTUATION NETWORK

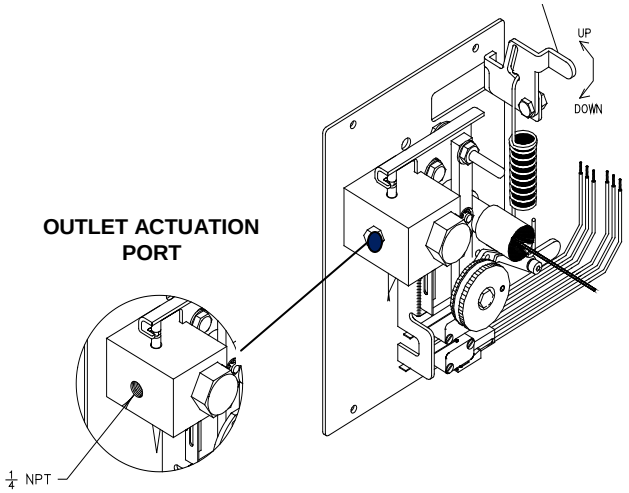
Refer to the Design section for limitations of the Actuation Network. Piping for the actuation network can be ¼" black, chrome plated, galvanized schedule 40 pipe, copper tubing or hose. The network originates at the pipe outlet of the MRM, MRM II or PRM and continues to the top of each cylinder and valve assembly. The protective plug on each cylinder valve and the MRM, MRM II or PRM must be removed. All pipe used for the actuation network must be reamed and blown clear, mounted to a sufficient structure, adjusted for level and plumb and fastened in an appropriate manner. Pipe must be fitted **tight (three turns past hand tight recommended). All threaded connections in the actuation network must be sealed with Teflon tape (applied to male threads only). Starting with the third thread from the pipe opening, wrap the Teflon tape clockwise around the threads moving away from the pipe opening. Make certain that tape does not extend past the end of the pipe – it could dislodge and possibly block the actuation network.**

CAUTION: Do not over tighten the pipe or pipe fittings into the pipe threads on the MRM. Over tightening can cause the MRM to malfunction.

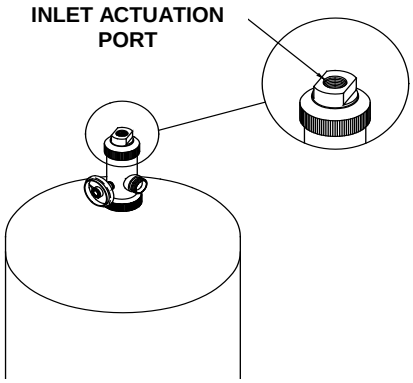
A single MRM, MRM II or PRM will actuate a maximum of ten (10) agent cylinders. The ten cylinder may be any combination of 275, or 375, or 475 Agent Cylinders. When a 600 is included in the mix of agent cylinders the total maximum allowable agent cylinders is lowered to six (6). Outlined below are the maximum amounts of pipe, hose or tubing allowed in the actuation network. When a network consists of more than one of the media listed, the total allowable footage is equal to the smallest of the two media limits.

EXAMPLE: An actuation system made up of black pipe and hose would limit the total footage of pipe plus hose to 22.2 feet.

ACTUATION NETWORK OUTLET

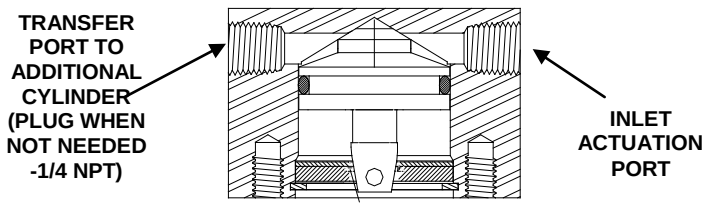


ACTUATION INLET FOR Models 275, 375 & 475 AGENT CYLINDER



Note: A vent plug (P/N 10173) must be used and placed in an accessible location anywhere in the actuation network to aid in relieving pressure after system discharge, and to keep pressure from building slowly in the network.
See RECHARGE Section 7.

ACTUATION INLET FOR 600 AGENT CYLINDER



P/N 10147

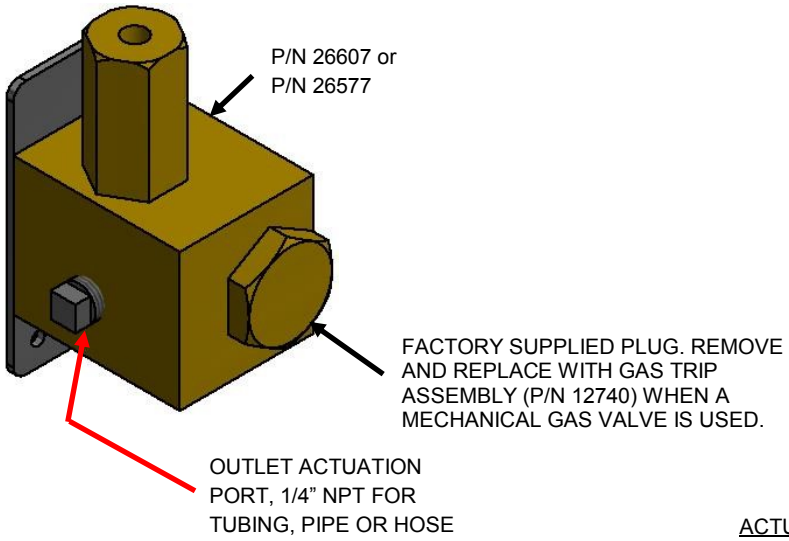
INSTALLING THE ACTUATION NETWORK, STRIKE™ Releasing Module (SRM)

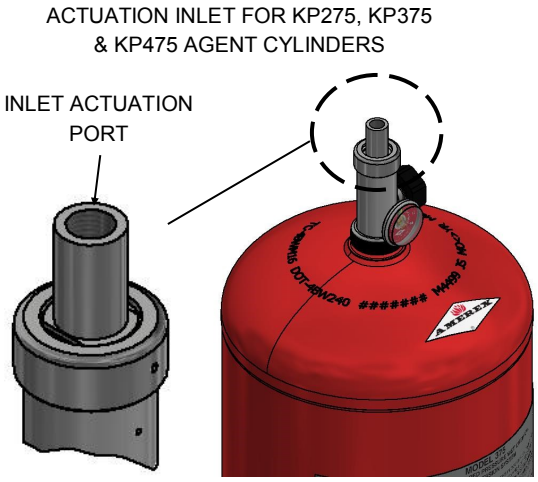
The SRM is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Refer to the Design section for limitations of the Actuation Network. Piping for the actuation network can be ¼" black, chrome plated, galvanized schedule 40 pipe, copper tubing or hose. The network originates at the pipe outlet of the SRM and continues to the top of each cylinder and valve assembly. The protective plug on each cylinder valve must be removed. All pipe used for the actuation network must be reamed and blown clear, mounted to a sufficient structure, adjusted for level and plumb and fastened in an appropriate manner. Pipe must be fitted **tight (three turns past hand tight recommended). All threaded connections in the actuation network must be sealed with Teflon tape (applied to male threads only). Starting with the third thread from the pipe opening, wrap the Teflon tape clockwise around the threads moving away from the pipe opening. Make certain that tape does not extend past the end of the pipe – it could dislodge and possibly block the actuation network.**

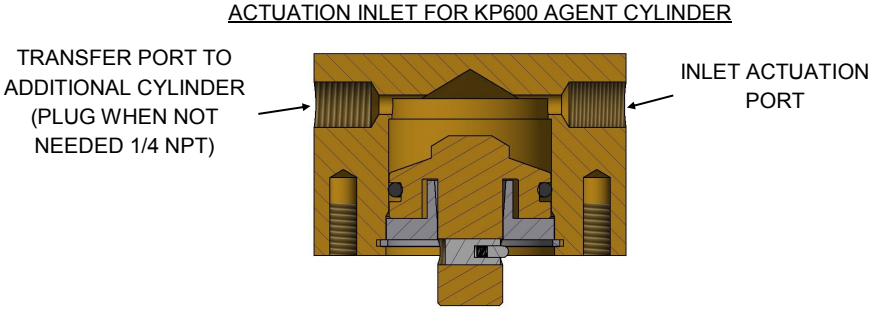
CAUTION: Do not over tighten the pipe or pipe fittings into the pipe threads on the SRM. Over tightening can cause the SRM to malfunction.

A single SRM will actuate a maximum of ten (10) agent cylinders. The ten cylinders may be any combination of 275, or 375, or 475 Agent Cylinders. When a 600 is included in the mix of agent cylinders the total maximum allowable agent cylinders is lowered to six (6). Outlined on page 3-29a are the maximum amounts of pipe, hose or tubing allowed in the actuation network. When a network consists of more than one of the media listed, the total allowable footage is equal to the smallest of the two media limits.
EXAMPLE: An actuation system made up of black pipe and hose would limit the total footage of pipe plus hose to 22.2 feet.





Note: A vent plug (P/N 10173) must be used and placed in an accessible location anywhere in the actuation network to aid in relieving pressure after system discharge, and to keep pressure from building slowly in the network.



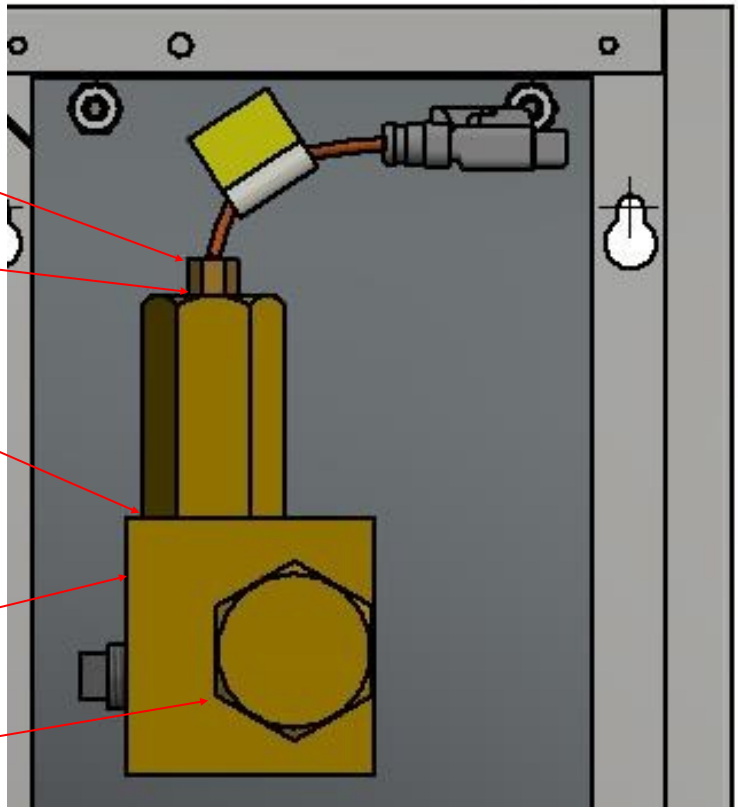
See RECHARGE Section 7.

Linear Actuator Installation

The Linear Actuator is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Linear Actuators (P/N 24448) are used for actuation of an STRIKE™ Releasing Module. The STRIKE™ ECS supports up to two actuation circuits and therefore up to two Linear Actuators. All Linear Actuators must be installed in accordance with the following instructions. **Do NOT connect any field wiring to installed Linear Actuators until directed to do so in the STRIKE™ ECS Installation, Operation and Maintenance Manual P/N 26692, or Appendix C.**

Thread the Linear Actuator into the top of the SRM assembly. **Hand tighten only and ensure that the brass hex portion of the Linear Actuator is fully bottomed against the SRM assembly actuator assembly. Do not over tighten. Do not use PTFE thread tape.**



LIMITATIONS (SINGLE OR MULTIPLE AGENT CYLINDER ACTUATION NETWORK)

Copper Tubing – ¼" O.D. Refrigeration Type (minimum wall thickness of .049 inch). Use with brass or steel compression style fittings (with brass or steel sleeves or ferrules) or SAE 45° flared tube fittings. Maximum length (including all fittings) – 100 Feet (30.48 m)

High Pressure Hose – ¼" I.D. wire braid hose that is factory supplied in 16" and 32" lengths.
Maximum length (including all fittings) –
54 feet (16.46 m) or a maximum of 40 hose assemblies P/N 12854 or a maximum of 20 hose assemblies P/N 16448.

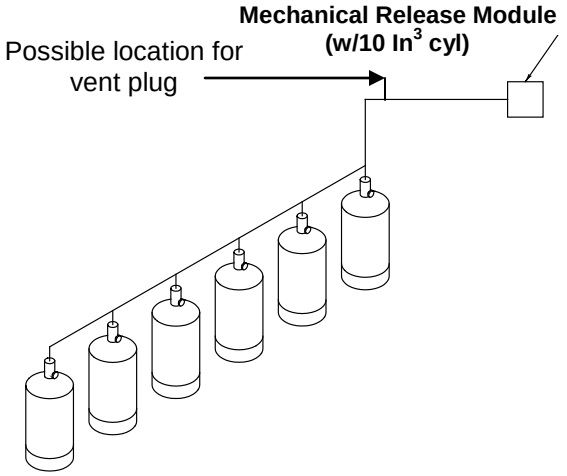
Pipe – ¼" NPT Schedule 40 made of stainless steel, chrome plated pipe or black iron pipe.
Maximum length – 22.2 feet (6.77 m)
Maximum tees – 9
Maximum elbows – 9

NOTE: 2 – 45° elbows = 1 – 90° elbow

NOTE: Different methods of constructing the actuation network may be mixed provided that the shortest limitations are followed,

Example: A mix of ¼" copper tubing and ¼" high pressure hose requires that the hose limitations be followed (no more than 54 feet [16.46m]) for the complete network. A mix of ¼" high pressure hose and ¼" pipe requires that the pipe limitations be followed (no more than 22.2 feet [6.77m]) for the complete work.

Nitrogen Cylinder	**10 cu. in.**	
Maximum Total Length for:	Feet	Meters
¼" Copper Tubing	100	30.48
¼" ID Hose	54	16.45
¼" Schedule 40 Pipe	22.2	6.77



INSTALLING THE DISTRIBUTION PIPING NETWORK:

GENERAL

For distribution piping network limitations please refer to the design section.

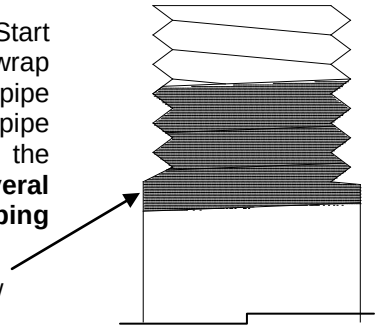
ONLY SCHEDULE 40, BLACK, CHROME PLATED OR STAINLESS STEEL PIPE CAN BE USED FOR THE DISTRIBUTION NETWORK. GALVANIZED PIPE IS NOT ALLOWED.

ALL PIPES MUST BE REAMED AND BLOWN CLEAR. DIRT AND/OR CUTTING OIL MUST BE REMOVED FROM THE INSIDE OF ALL PIPE AND FITTINGS BEFORE ASSEMBLY.

All piping must be securely bracketed to a rigid surface using appropriate hangers and/or clamps.

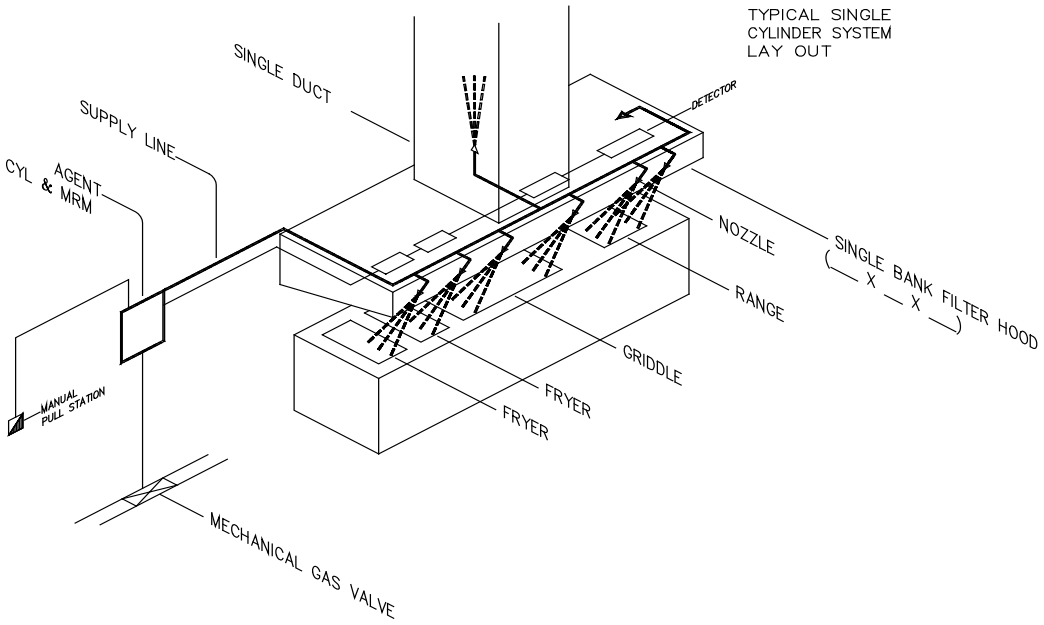
All distribution network pipe and fittings are to be assembled tight (**3 turns past hand tight is recommended). THE USE OF TEFLON TAPE IS NOT RECOMMENDED. JOINT SEALANT OR PIPE COMPOUND MAY NOT BE USED UNDER ANY CIRCUMSTANCES. THE USE OF TEFLON TAPE IS TO COMPLY WITH THE MANUFACTURERS RECOMMENDATIONS.**

When using Teflon tape it is to be applied to male threads only. Start installing tape with the third thread from the end of the pipe opening, wrap the Teflon tape clockwise around the threads moving away from the pipe opening. Make certain that tape does not extend past the end of the pipe because it could dislodge and travel to the nozzle filter and block the agent discharge. **NOTE: Blow out distribution piping system several times to insure that no loose pieces of Teflon tape exist inside piping network.**



The Amerex Restaurant Fire Suppression System does not require balanced piping. All distribution network piping shall be run in as direct a manner as possible throughout the hazard. The distribution network piping, once installed, shall be compared with the design drawing or sketch, **any changes or deviations shall be noted for use in preparing an "as-built" drawing or sketch for the permanent job file.**

Piping installation shall start at the cylinder bracket and continue through the hazard with tees installed at the beginning of each branch line location. Branch lines shall then be installed taking care to assure that each nozzle is located properly and that no design limitations have been exceeded. **NOZZLE LOCATION AND ORIENTATION ARE CRITICAL TO ACHIEVING PROPER SYSTEM PERFORMANCE.**



TO INSTALL HIGH TEMPERATURE BLOW OFF CAPS:

Standard Nozzle: **Remove standard blow off cap – thread the loop of the high temp. cap onto the base of the male threads on the nozzle. Install o-ring on nozzle tip, place cap on nozzle tip.**

Swivel Adapter: **Remove standard blow off cap – thread the loop of the high temp. cap onto the supply pipe before installing the nozzle body. Install o-ring on nozzle tip, place the cap on nozzle tip.**

INSTALLING A MECHANICAL GAS VALVE MRM, MRM II OR PRM:

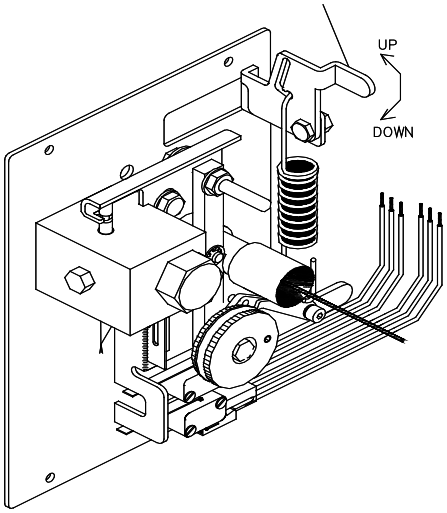
Refer to the design section for limitations regarding mechanical gas valve installations.

WARNING: CONFIRM THAT THE GAS IS SHUT OFF AT THE SOURCE OF SUPPLY BEFORE ATTEMPTING TO INSTALL THE MECHANICAL GAS VALVE. A QUALIFIED, LICENSED CONTRACTOR SHOULD PERFORM INSTALLATION OF THE GAS VALVE INTO THE GAS LINE.

The mechanical gas valve shall be located where it can be accessed for resetting, maintenance, service and where the status indicator may be viewed. The listed temperature range for the mechanical gas valves is 32°F – 120°F (0°C – 49°C).

Before beginning installation of the mechanical gas valve, associated cable, conduit and fittings, confirm that:

1. The MRM/PRM has the set-up/lock-out tool installed.
2. The tension bar is in the “down” (relaxed) position.
3. The nitrogen actuation cylinder has not been installed.

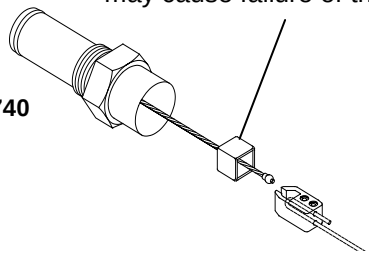


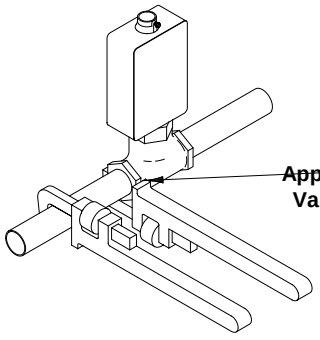
Remove the protective plug from the MRM / MRM II or PRM and install the gas valve trip assembly (P/N 12740). The gas valve trip assembly must be purchased separately for use with ASCO and Ansul gas valves

.

Improper installation of the Red Vinyl Cap may cause failure of the gas valve to close.

AMEREX P/N 12740



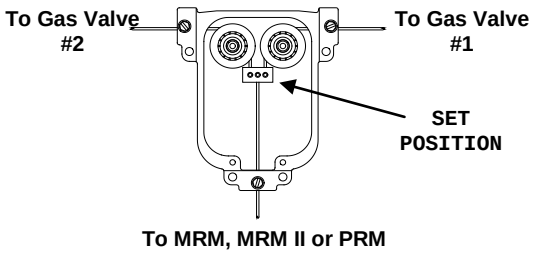


Install the gas valve into the gas line. If any strainers are to be used they shall be placed upstream of the gas valve. Confirm that the valve is installed with the correct gas flow direction as indicated by the arrow on the gas valve body. Wrenches must be placed on the valve at the point closest to the connection being tightened and a “hold” must be placed on the valve when fitting pipe downstream of the valve body.
DO NOT USE THE GAS VALVE AS A LEVER FOR TIGHTENING PIPE.

If pipe joint compound is used, it must be applied sparingly to the back male threads. **Pipe joint compound entering the gas valve and collecting on the valve seat will cause the valve to fail.**
Test the gas valve and connections for leaks using a soapy solution.

Install necessary ½" EMT conduit, cable, tee pulley (if required) and corner pulleys, connecting the MRM, MRM II or PRM to the mechanical gas valve. Confirm that limitations as shown in the design section have not been exceeded.

Note: The cable for the mechanical gas valve may enter the MRM, MRM II or PRM enclosure from two sides (top or bottom).

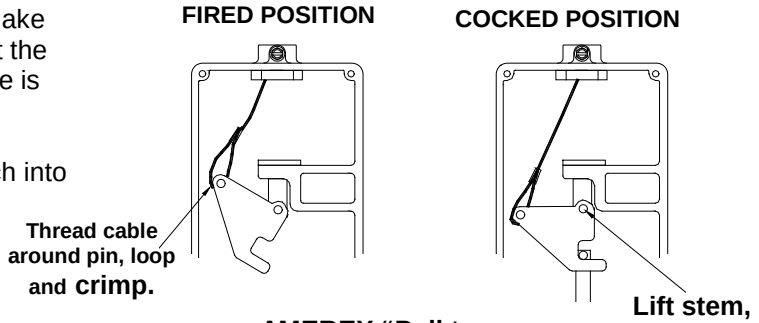


AT THE MECHANICAL GAS VALVE

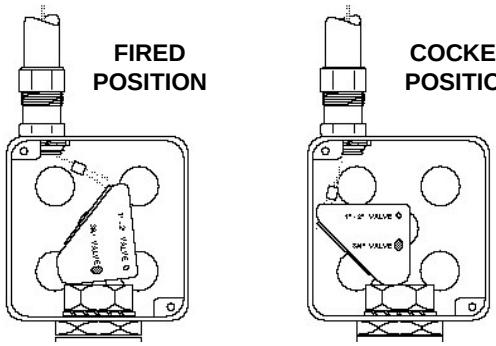
1. Connect the cable to the latching lever in the gas valve actuator housing by threading it around the pin in the latch (Amerex actuator) or through the hole in the latch (all others). Secure it with a loop and crimp.

   NOTE: When using an Ansul Gas Valve make certain that the loop is large enough so that the crimp is inside of the conduit when the valve is cocked.

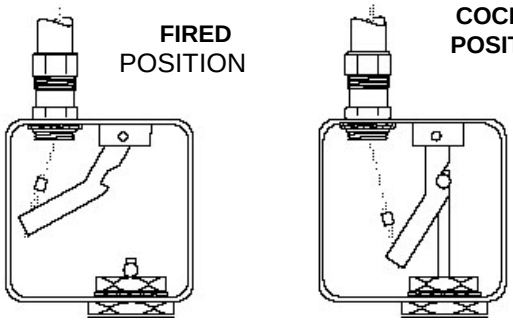
2. Lift the gas valve stem up and slide the latch into the engaged position.



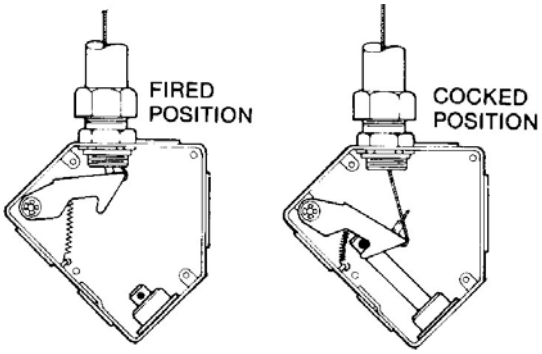
AMEREX "Pull to Release" Gas Valve



ASCO Gas Valve With Amerex Actuator Kit



ASCO "Pull to Release" Gas Valve Actuator



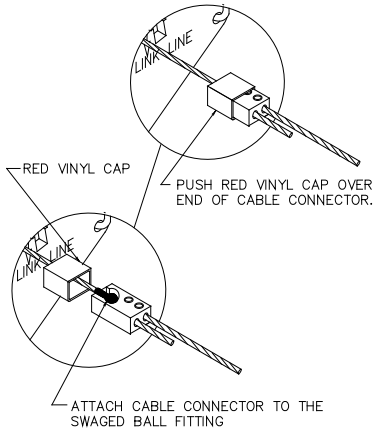
ANSUL "Pull to release" Gas Valve Actuator

NOTE:
AMEREX MECHANICAL GAS VALVES SIZES ¾" & 1" MAYBE INSTALLED VERTICALLY OR HORIZONTALLY – ALL OTHER SIZES MUST BE INSTALLED HORIZONTALLY.

FOR ALL OTHER MECHANICAL AND ELECTRICAL GAS VALVES CONTACT THE MANUFACTURER FOR INSTALLATION ORIENTATION.

AT THE MRM / MRM II / PRM

1. Confirm that the cable is moving freely in the corner pulleys and the valve is in the cocked position.
2. Thread the activation cable through the cable connector (provided with the gas valve trip assembly).
3. Install the red vinyl cap above the swaged ball fitting of the gas valve trip assembly by threading the swaged ball fitting through the small ¼" diameter hole in the rear of the vinyl cap.
4. Join the swaged ball fitting of the gas valve trip assembly to the cable connector. Once attached, push the red vinyl cap over the end of the cable connector as illustrated.



WARNING: IMPROPER INSTALLATION OF THE RED VINYL CAP MAY CAUSE FAILURE OF THE GAS VALVE TO CLOSE.

5. Draw the slack out of the cable. **Make certain that the piston component of the gas valve trip assembly is pulled forward to its fully extended position.**
6. When all of the slack is drawn out of the cable, secure it with the set screws.
7. Test the valve by pulling on the cable inside the MRM / MRM II / PRM until tension is relieved. Confirm that the gas valve has closed.
8. Secure all excess cable so that it is out of the way of any parts in the MRM / MRM II / PRM. We suggest taping it to the gas valve cable.

TO TEST THE OPERATION OF THE GAS VALVE:

1. a Disconnect and plug the actuation hose or piping
   b. Insert an Amerex P/N 12856 nitrogen cylinder or adapter fitting tool P/N 10895 and outside regulated source of nitrogen into the MRM or PRM
   c. Pull on the manual pull station
   d. Confirm that the gas valve has closed

WARNING: ACTUATION NETWORK IS UNDER PRESSURE – PROCEED WITH CAUTION

2. **Relieve pressure in actuation network by using the vent check**. After all pressure is blown off, slowly remove the nitrogen cylinder or turn off regulated N_2 supply.
3. Reset the MRM or PRM
4. Reset all accessory items.
5. Install a fully charged nitrogen cylinder.
6. Securely connect actuation hose or piping. **Do not over tighten pipe or pipe fittings into the MRM or PRM pipe threads. Over tightening could cause the MRM or PRM to malfunction**.
7. Reset the Mechanical Gas Valve.
8. Remove all set-up tools from the MRM or PRM.
9. Replace and seal the enclosure cover on the MRM or PRM.
10. Replace and seal the cover on the mechanical gas valve.

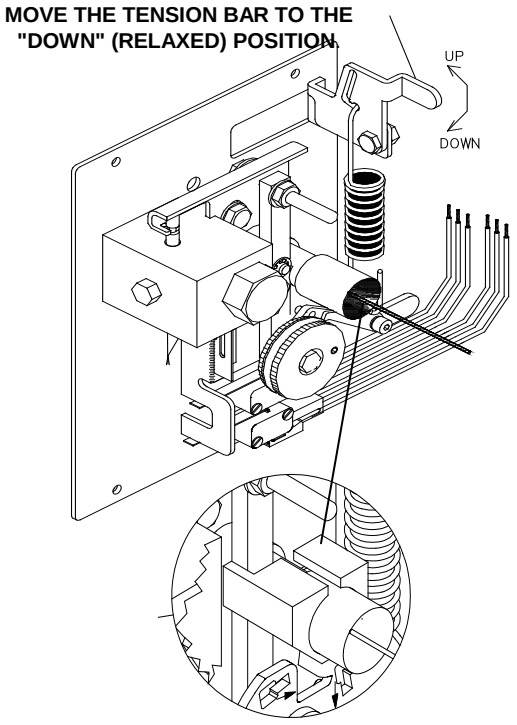
WARNING: THE MECHANICAL GAS VALVE AND ASSOCIATED COMPONENTS SHOULD BE TESTED AND EXERCISED EVERY TIME THAT SYSTEM MAINTENANCE IS PERFORMED. MAINTENANCE SHOULD BE PERFORMED AT INTERVALS NOT EXCEEDING SIX MONTHS. FAILURE TO TEST THE MECHANICAL GAS VALVE AND RELATED COMPONENTS COULD RESULT IN A TOTAL SYSTEM FAILURE DURING A FIRE INCIDENT.

INSTALLING AN ELECTRICAL GAS VALVE MRM, MRM II OR PRM

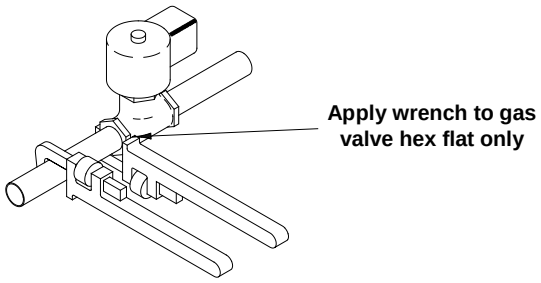
WARNING: CONFIRM THAT THE GAS HAS BEEN SHUT OFF AT THE SOURCE OF SUPPLY AND THAT THE ELECTRICAL POWER HAS BEEN TURNED OFF BEFORE ATTEMPTING TO INSTALL THE ELECTRIC GAS VALVE IN THE GAS LINE OR DO ANY WORK ON ELECTRICAL WIRING. A QUALIFIED, LICENSED CONTRACTOR SHOULD PERFORM INSTALLATION OF THE VALVE INTO THE GAS LINE. ALL ELECTRICAL INSTALLATION SHOULD BE PERFORMED BY A QUALIFIED ELECTRICIAN ACCORDING TO THE INSTRUCTIONS PROVIDED BY THE GAS VALVE MANUFACTURER. ALL WIRES SHOULD BE CLEARLY TAGGED, THE SCHEMATIC NOTED FOR FUTURE REFERENCE IN THE PERMANENT JOB FILE AND ALL DISCONNECTED WIRES MUST BE TAPED OR HAVE WIRE NUTS INSTALLED.

Before beginning the installation of an electric gas valve:

1. Confirm that the gas has been shut off at the supply.
2. The tension bar in the MRM, MRM II or PRM is in the “down” (relaxed) position.
3. The set up/lock out tool has been installed and that the nitrogen actuation cylinder is not in place.
4. Install the gas valve into the gas line. If any strainers are to be used, they shall be placed upstream of the gas valve. Confirm that the valve is installed with the correct gas flow direction as indicated by the arrow on the gas valve body. Wrenches must be placed on the valve at the point closest to the connection being tightened and a “hold” must be placed on the valve when fitting pipe downstream of the valve body. **DO NOT USE THE GAS VALVE AS A LEVER FOR TIGHTENING PIPE**. If pipe joint compound is used it must be applied sparingly to the back male threads. Pipe joint compound entering the gas valve could cause the valve to fail.
5. Test the gas valve and connections for leaks using a soapy solution.
6. Install necessary EMT conduit for connecting the MRM / MRM II or PRM to an electrical gas shut-off valve.
7. See Section 3 for wiring schematic.



For installation of the snap action switch see section labeled “Snap Action Switch Installation”. The electric gas valve has specific limitations regarding its orientation on the gas line – **please refer to the manufacturer’s instructions**. Confirm that the valve is installed in the proper direction of flow according to the arrow on the valve body and that wrenches are used in the proper manner.



INSTALLING A MECHANICAL GAS VALVE KIT MRM, MRM II OR PRM

The gas shut off valve to be converted to a "pull to close" type should be located where it can be easily accessed for resetting, maintenance and service.

This kit is designed to allow certain specified gas shut-off valves to be interconnected to an Amerex Restaurant System. It is not intended for repair of damage or inoperable gas shut-off valves or to be used with restaurant systems other than an Amerex restaurant system.

1. Insure that the MRM / MRM II / PRM have been locked out properly, refer to the Installation Section.
   WARNING: VERIFY THAT THE MAIN GAS SUPPLY HAS BEEN SHUT OFF PRIOR TO INSTALLING THE GAS SHUT OFF VALVE. GAS VALVE INSTALLATION SHOULD BE PERFORMED BY A QUALIFIED, LICENSED CONTRACTOR.

2. Visually inspect the gas shut-off valve stem for cleanliness and damage. Replace the gas shut-off valve if the stem appears damaged or if it will not operate properly.

3. Install the conduit connector as shown in figure 1.

4. Install the outlet box (P/N 13626) using the jam nut (P/N 13625) and the washer (P/N 13624).

5. Install the cotter pin (P/N 08292) through the gas shut-off valve stem and hole that corresponds to the size of the valve (refer to figures 1). Bend the tabs of the cotter pin over to secure it in place. Be sure that the tabs do not interfere with the operation of the holder.
6. Install the necessary ½" EMT conduit, corner pulleys (P/N 12309 or 16444), tee pulleys (P/N 12506) and cable (P/N 12553) to connect the shut off valve to the MRM. For gas shut off valve cable limitations and installation instructions see the Design and Installation sections.

7. Insert one end of the cable through the crimp, through the hole in the rear of the holder then back through the crimp and compress the crimp to secure it in place.

8. To install, set and test the piston assembly at the other end of the cable, refer to the Installation and Testing and Commissioning sections under "Installing a Mechanical Gas Valve".

9. After testing the actuation of the gas shut off valve, insure that all components of the system are reset. Place the cover on the outlet box and secure it in place.

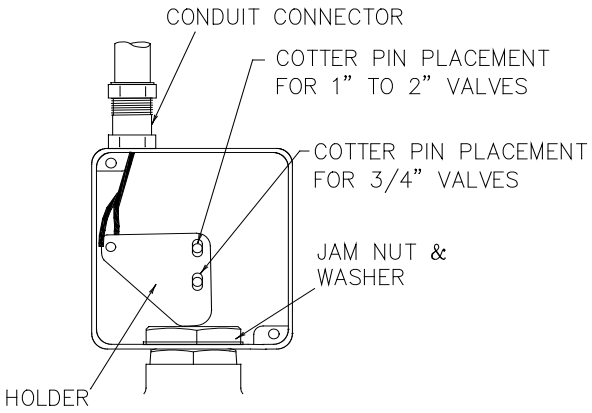
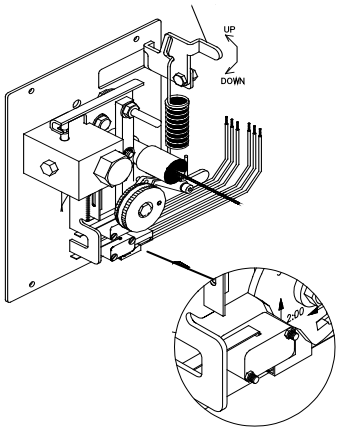


FIGURE 1

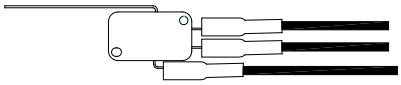
SNAP ACTION SWITCH INSTALLATION MRM, MRM II or PRM



Two SPDT switches are pre-installed in the MRM, MRM II or PRM. Before beginning the installation of any additional snap action switch, confirm that the tension bar is in the "down" (relaxed) position, that the set-up/lock-out tool is in place and that the nitrogen actuation cylinder has not been installed. The SPDT switch is mounted with two screws that attach to the plate on the module (screws are provided with the MRM). An additional two SPDT switches may be mounted above and on top of the original set for a total of four switches. A self adhesive wire tie is provided with the module to assure a neat and orderly installation.

Auxiliary connection can now be made to perform required output functions.

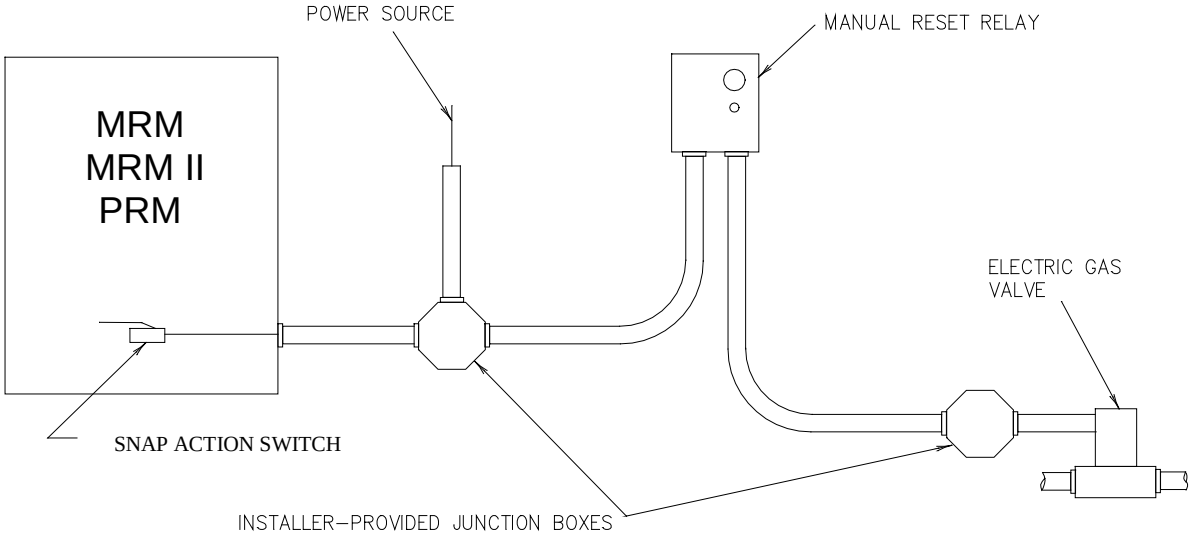
Part No.	Contacts	Rating
12524	SPDT Single Pole Double-Throw	21 Amps 125, 250 or 277 VAC 1 HP 125, 250 or 277 VAC 2 HP 250, 277 VAC



SNAP ACTION SWITCH P/N 12524

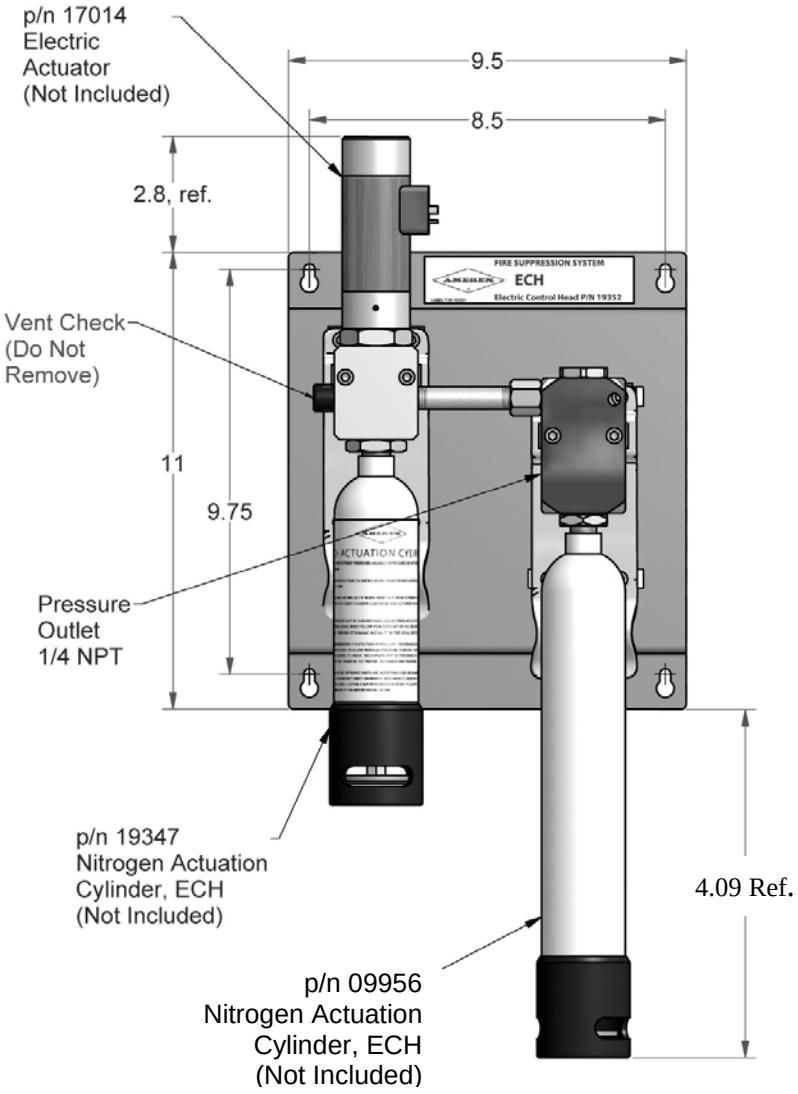
CAUTION: ELECTRICAL CONNECTIONS SHALL NOT BE MADE IN THE MRM, MRM II OR PRM ENCLOSURE. ROUTE THE LEADS FROM THE SNAP ACTION SWITCH THROUGH THE APPROPRIATE KNOCKOUT TO AN ATTACHED, LISTED ELECTRICAL JUNCTION BOX (DISTRIBUTOR SUPPLIED).

CAUTION: POWER TO COOKING APPLIANCES SHOULD NEVER BE RUN THROUGH THE SNAP ACTION SWITCH. THE SWITCH SHOULD BE USED TO OPERATE A SEPARATE, CONTRACTOR SUPPLIED, ELECTRICAL CONTACTOR OR MAGNETIC SWITCH OF SUFFICIENT RATING TO HANDLE THE POWER REQUIREMENTS OF THE ASSOCIATED COOKING APPLIANCES. A LICENSED ELECTRICIAN SHOULD PERFORM ALL ELECTRICAL FIELD WIRING.



INSTALLING THE ELECTRIC CONTROL HEAD (ECH):

Select a suitable location for the Electric Control Head that allows access for installation, service, recharge and where both pressure gauges of the Nitrogen Actuation Cylinder and the 15 in^3 N_2 Actuation Cylinder can be viewed. The ECH must be fastened to a surface which has sufficient structure to support the loads anticipated. Using the backplate as a template, mark the top two holes for mounting and anchor the module loosely, adjust to level and mark bottom holes, anchor securely using appropriate fasteners. **Do not install the Nitrogen Cylinders at this time.** The ECH requires the following components for completion of the control equipment: P/N 19347 Actuation Cylinder, P/N 09956 15 in^3 Nitrogen Actuation Cylinder, and the P/N 17014 Electric Actuator. The Electric Actuators of the ECH, and all other electrical components, must be connected to the Amerex-supplied Releasing Control Panel, P/N 19340, Model designation: SR-X.



INSTALLING THE ACTUATION NETWORK

Refer to the Design Section 3, Page 3-29 for limitations of the Actuation Network. The network originates at the pipe outlet of the MRM / PRM / ECH and continues to each Agent Cylinder Valve assembly. The protective plug at the port on the MRM / ERM / ECH must be removed. All threaded connections in the Actuation Network must be sealed with Teflon tape per page 4-16.

Installation of Nut Style Rivet

Install using AA480 DOUBLE ACTION LEVER TOOL
Instruction Sheet for AK, AL, AH, AO, Series™ and RN Series® Product supplied with each tool.
Please refer to Amerex Restaurant Fire Suppression Manual to obtain proper thread adaptation kit part numbers and size/tool capabilities.

Tool Set-Up Instructions
Installing thread adaptation kit:
1. Remove tool nose housing (C) from tool. Loosen mandrel lock nut (F) one rotation from tool.
2. Thread mandrel (D) fully onto threaded shaft (E) and tighten mandrel lock nut (F) against mandrel (D) with wrenches included.
3. Replace tool nose housing (C) onto tool and tighten.
4. Turn knurled lockdown ring (B) forward to front of nose piece (A).
5. Thread nose piece (A) into tool nose housing (C) approximately two full rotations.
6. Adjust stroke of tool.

The AA480 Tool will need to be adjusted to provide the proper stroke to install the AL product.
To calculate the stroke requirement use the following formula and chart.
(MG-MT) + PF = Stroke Setting
MG = Max grip of the AVK Product. Refer to AVK Engineering Catalog for the appropriate grip specifications.
MT =The thickness of the material you will install the product into.
PF = The pull-up factor. This is the amount by which the overall length of the AVK product is shortened during installation into a parent material of maximum grip thickness. They are as follows.
Thread: ¼-20UN
Size Series: 1/4, M6 .065 .090 .080 .095
Note: Each horizontal mark on the Gauge (G) equals one millimeter or .040" of stroke. Each 1/2 turn of the knob (I) equals .8 millimeter or .032" of stroke.
7. Set tool stroke using stroke adjustment knob
    (1). Confirm stroke setting on stroke indicator gauge (G). Make sure the detent (H) is extended into the lobe on the adjustment knob (1).
8. Open tool handle fully and turn nose piece (A) into tool so that the length of exposed mandrel (D) is equal to the overall length of the product being installed.
9. Tighten the knurled lock down ring (B) against the tool nose housing (C).

Tool Operation:
1 . Open tool handles.
2. Thread product fully onto tool mandrel (D).
3. Place exposed product into the hole in your parent material. Drill hole 25/64 Dia.
4. Squeeze tool handles together fully.
5. Spin removal knob (J) counter-clockwise removing mandrel/tool from installed product.
6. Measure the AVK product's installed length dimension. Make minor stroke adjustments if necessary. One full rotation of the stroke adjustment knob (H) equals 1 .6mm or .064". 1/2 rotation equals .8mm or .032". Be sure the detent (H) is extended into the lobe on the adjustment knob (1).
7. Perform steps 8 and 9 of the Tool Set-Up Instructions if necessary.

Installation of Stud Style Rivet

Installation using AA480 DOUBLE ACTION LEVER TOOL
Instruction Sheet for AS Series ™ Studs supplied with each tool.
Please refer to Amerex Restaurant Fire Suppression Manual to obtain proper thread adaptation kit part numbers and size/tool capabilities.

Tool Set-Up Instructions
Installing thread adaptation kit:
1. Remove tool nose housing (C) from tool. Loosen mandrel Jock nut (F) one rotation from tool.
2. Thread stud mandrel (D) fully onto threaded shaft (E) and tighten mandrel Jock nut (F) against stud mandrel (D).
3. Replace tool nose housing (C) onto tool and tighten.
4. Turn knurled lockdown ring (B) forward to front of nose piece (A).
5. Thread nose piece (A) into tool nose housing (C) approximately two full rotations.
6. Adjust stroke of tool. The AA480 Tool will need to be adjusted to provide the proper stroke to install the Stud Style Rivet.
To calculate the stroke requirement use the following formula and chart.
(MG-MT) + PF = Stroke Setting
MG ~ Max grip of the AVK Product, refer to AVK Engineering Catalog for the appropriate grip specifications.
MT ~The thickness of the material you will install the product into.
PF ~ The pull-up factor. This is the amount by which the overall length of the product is shortened during
installation into a parent material of maximum grip thickness.
They are as follows.
Thread AS Series
Size Product : 1/4, M6 .065
Note: Each horizontal mark on the Gauge (G) equals one millimeter or .040" of stroke. Each 1/2 turn of the knob (I) equals .B millimeter or .032" of stroke.
7. Open tool handle fully and set stroke of tool using stroke adjustment knob (I). Make sure the detent (H) is extended into the lobe on the adjustment knob
(1). Confirm stroke setting on stroke indicator gauge (G).
8. Turn nose piece (A) into tool nose housing (C) so that the AS Series"' stud can be threaded a minimum of four full rotations into the stud mandrel.
9. Tighten the knurled lockdown ring (B) against the tool nose housing (C).

Tool Operation:
1. Open tool handles.
2. Thread AS Series"' stud fully onto tool nose (A).
3. Place exposed tail of stud into the hole in your parent material. Drill hole 25/64 Dia.
4. Squeeze tool handles together fully.
5. Spin removal knob (J) counter clockwise removing tool from installed stud.
6. Measure the AVK Stud's installed length dimension (IL dimension in catalog) make minor stroke adjustments if necessary. One full rotation of the stroke adjustment knob (H) equals 1.6mm or .064". 1/2 rotation equals .8mm or .032". Be sure that the detent (H) is extended into the lobe on the adjustment knob {1).
7. Perform steps 8 and 9 of the Tool Set-Up Instructions if necessary.

FLEXIBLE NOZZLE BRANCH HOSE (PN20473)

This hose is designed to be used when a flexible movement of the nozzle branch line is desired. Such as when an appliance needs to be moved for cleaning and the nozzle protecting the appliance is fixed to the appliance. Hose length is 48" end to end and is supplied with ½" NPT ends. **THE FLEX HOSE IS LIMITED TO USE ON THE NOZZLE BRANCH LINE ONLY AND CANNOT BE USED ON SUPPLY LINE OR SUPPLY BRANCH LINE.**

When installing the flexible hose the use of an elbow on the stationary piping at the appliance is helpful in reducing stress on the hose when the appliance is in its cooking position. The nozzle branch drop should be located in a manner that will provide the maximum movement of the appliance without causing the flexible hose to kink or collapse. In some installation this may be directly over the fixed piping and in other installations it may be out board of the fixed nozzle.

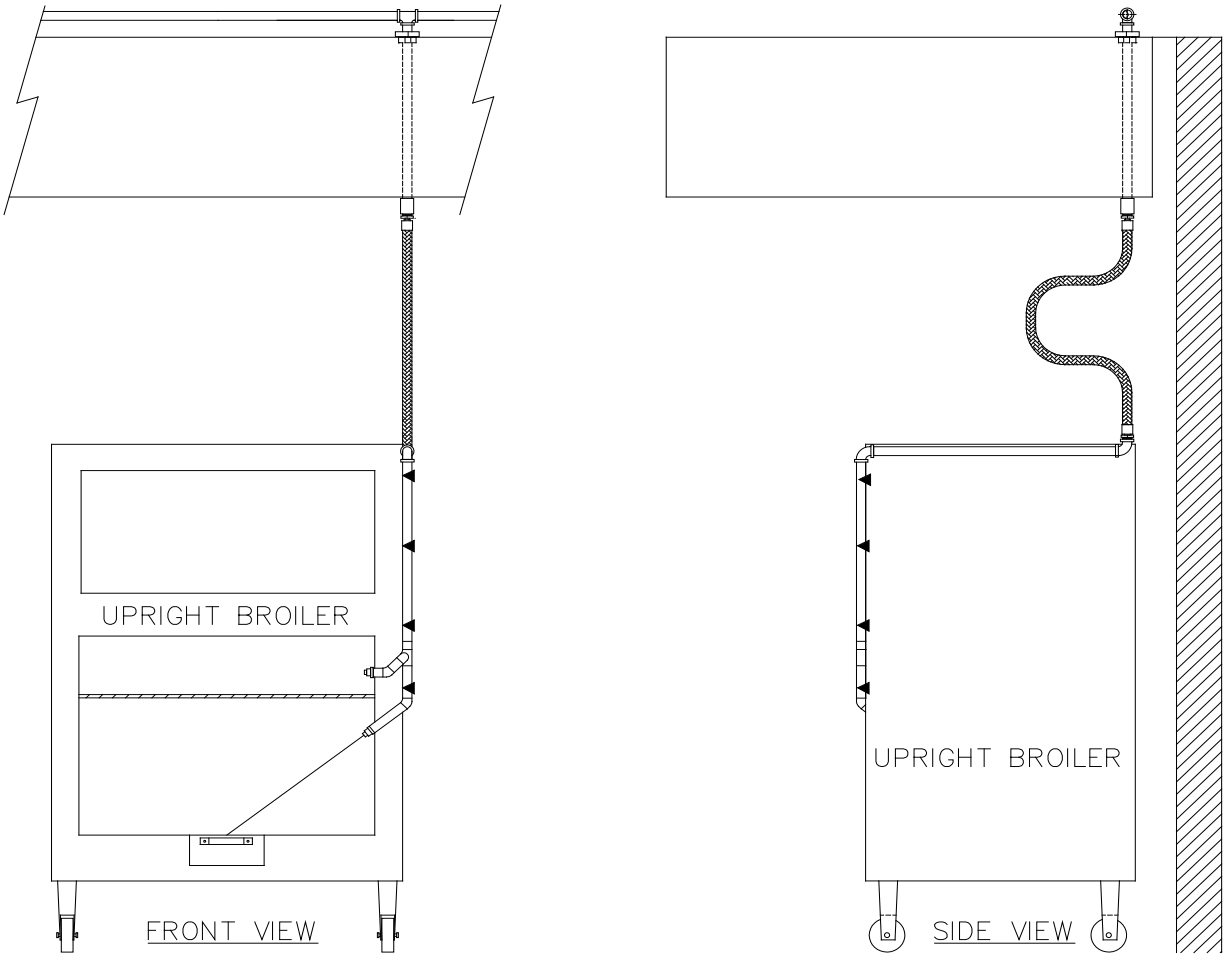
Never locate the flexible hose where it is exposed directly to hot exhaust gases. Example: Over the top of an open top char-broiler. The flex hose is never to be installed behind an obstruction or wall.

Only one flex hose is to be used on an individual nozzle branch line. A maximum of three hoses may be used on an agent cylinder piping network. The minimum bend radius of the flex hose is 7" (17.8 cm).

The castered appliance must be furnished with an appliance locating device. This will assure the appliance is returned to the required position after being moved for cleaning.

When attaching the flexible hose to a 3/8" pipe drop, a ½" coupling with a reducing busing may be used to transition from the pipe to the hose.

When a system discharge occurs the hose is to be cleaned and drained of any agent remaining in loops.



NOTE: The illustration above does not represent the only configuration possible – it is for information only.

SECTION 5

SYSTEM
TESTING & COMMISSIONING

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
to UL/ORD 1254.6-1995*

December 2008

*** ULC Certification does not apply to the STRIKE™ or SRM.**

TESTING & COMMISSIONING

Testing and commissioning shall be performed by a trained and certified Amerex restaurant distributor in accordance with NFPA 96, NFPA 17A and local code requirements.

Once the Amerex Restaurant Fire Suppression System has been completely installed, two sets of tests must be conducted prior to placing the system in service. The detection network, using any fusible link style or the pneumatic tubing, must be tested for functionality along with the manual pull station(s), gas valve(s) and other interlocks. Once this is accomplished and confirmed the action network must be tested using a nitrogen actuation cartridge. Recharging of the nitrogen cartridge can be accomplished by following the instructions on Page 7-6 and 7-7.

TESTING THE DETECTION NETWORK – MRM or MRM II

The **terminal detector** must have a test link (P/N 12891) installed in place of the fusible link. With the nitrogen actuation cartridge removed from the release module; the release mechanism cocked; the tension bar in the "up" (tension) position and the set-up/lock-out tool removed; cut the test link with a pair of dikes or similar device. **The MRM must actuate at this time.**

If the MRM did actuate, follow the reset instructions, place the proper fusible link on the terminal detector and continue with the system test.

If the MRM did not actuate, check to see if:

- the detectors are installed properly,
- that the cable is not binding at any point in the conduit or corner pulley(s),
- that the cable is connected to the link plate properly,
- that the tension bar is in the "up" position and that the set-up/lock-out tool is not in place
- that the conduit is rigidly fastened in place
- that the proper tension exists on the link line

Once these items have been investigated and resolved, **RETEST**.

TESTING THE DETECTION NETWORK - PRM

When first placing the system into service, following system actuation, or at the six month servicing interval, the detection network shall be tested prior to conducting an actuation network test:

1. **Insure removal of the Nitrogen Actuation Cylinder.**
2. Slowly release the detection pressure until the panel actuates by performing either of the following:
   - a Depress the Schrader valve on the detection accumulator cylinder. Replace Schrader cap following actuation and re-pressurization.
   - b Slowly loosen the knurled nut on the end and check for leaks of line fitting. Re-tighten the nut following actuation and thoroughly leak check the entire PRM assembly and tubing following re-pressurization.

If the PRM did actuate, follow reset instructions and continue with the system test.

If the PRM did not actuate, check to see if:

- that the PRM was properly cocked
- that the "End of Line Fitting" did properly vent the pressure from the accumulator
- that the accumulator pressure reading dropped to zero
- that the set-up/lock-out tool is not in place
- that the slide plate and puncture pin are free to function
- that the trip plunger is free to move without resistance

Once these items have been investigated and resolved, **RETEST**.

TESTING THE MANUAL PULL STATION – MRM, MRM II OR PRM

After the detection network has been tested and **before inserting the nitrogen actuation cylinder** the manual pull station(s) must be tested. We recommend having an employee of the restaurant remove the pull pin on each manual pull station, grab the handle and pull away from the mounting surface. Confirm that each manual station did not require a pull force in excess of 40 lbs. and that the handle did not require pulling a distance of more than 14 inches. **The MRM, MRM II or PRM must actuate at this time**.

If the MRM or PRM did actuate, for each station, replace the pull pin, attach a tamper seal and follow the reset instructions.

If the MRM or PRM did not actuate:

- the pull station is installed properly,
- the cable is not binding anywhere in the conduit, corner pulley(s) or pulley tee,
- the cable is connected properly to the manual pull cam in the MRM or PRM,
- the set-up/lock-out tool is not in place.
- The MRM is properly set and cocked.

Once these items have been investigated and resolved, **RETEST**.

TESTING THE MECHANICAL GAS VALVE – MRM, MRM II OR PRM

With the gas on and appliances working, pull on the cable leading to the gas valve where it connects to the piston plug/gas trip assembly in the MRM or PRM. A ½ inch cable movement will be sufficient to close the gas valve. **The gas valve(s) must release at this time**.

If the gas valve(s) do release, follow the reset instructions and continue with the test.

If the gas valve(s) do not release, check to see if**:**

- it has been installed properly,
- it is fitted tightly into the gas line,
- the cable is not binding in the conduit or in a corner pulley(s),
- it has been connected to the release module properly and that the cable has been secured properly to the gas valve trip mechanism. Insure that the red vinyl cap is properly installed.

Once these items have been investigated and resolved, reset.

TESTING THE ACTUATION NETWORK AND MECHANICAL GAS VALVE WITH A NITROGEN ACTUATION CYLINDER

After performing the mechanical gas valve test above, then you MUST test the actuation network and gas valve together using a NITROGEN ACTUATION CYLINDER. Before inserting the NITROGEN ACTUATION CYLINDER insure that all fittings on the actuation line are tight and secure. This test can be done in conjunction with the “puff or air test” or alone.

If testing with a “Puff” test:
Confirm that all components of the system are properly installed and the test cylinders are connected and charged with compressed air or nitrogen – no fire suppression agent. Either the pull station is pulled or a test link is cut to actuate the system. All system functions should occur at this time. Confirm that the gas valve closed, the actuation line was tight and secure, the agent cylinders valves opened and the pipe and nozzles are clear.

If there is no need to perform a “Puff” test:
You can simply connect a valve assembly removed from a cylinder or pneumatic actuator disconnected from the cylinder to the actuation line. Pull the pull station or cut a test link to actuate the system and confirm total system functioning. Insure that the discharge valve is being opened, the actuation line has no leaks, and gas valve(s) closed properly.

TESTING THE DISTRIBUTION PIPING NETWORK

The Amerex Restaurant Fire Suppression System is a wet chemical suppression system using pre-engineered piping limitations that do not require balancing. As long as the design limitations for the distribution piping network as stated in the design section have **NOT** been exceeded, there should be no concern regarding proper distribution of agent at each discharge nozzle. "Bag Tests" or discharge tests are not considered necessary.

"PUFF" TEST

To confirm that the distribution network piping is clear and intact, a "Puff Test" or "Air Test" may be performed. This test may be performed as an individual test or as part of a functional test.

When performing a "Puff Test" as part of a functional test, all other components of the system are installed, including the nitrogen actuation cylinder and an agent cylinder assembly charged with **compressed air or nitrogen only to 100 psi (689.48 kPa) – no fire suppression agent**.

Either a manual pull station is activated or a test link is cut and all system functions, including auxiliary outputs and discharge of air or nitrogen through the distribution piping, should occur at this time. All functions are confirmed and documented and the system is recharged and reset.

To perform the "Puff Test" as an individual test:

- Replace agent cylinder(s) with test cylinder(s) and actuate the system.
- Confirm that each nozzle is clear and continue testing.

TESTING THE ELECTRICAL GAS VALVE – MRM, MRM II or PRM

With the gas valve and the appliances working follow the procedure for testing the manual pull station. When the manual pull station(s) is activated and the MRM/PRM actuates, the snap action switch(es) must transfer contacts cutting off current to the electric gas valve. The Manual Reset Relay shall show an "off" condition. If this does not happen, turn the power to the relay and electric gas valve off and check all electrical connections **RETEST**.

TESTING COMPLETED

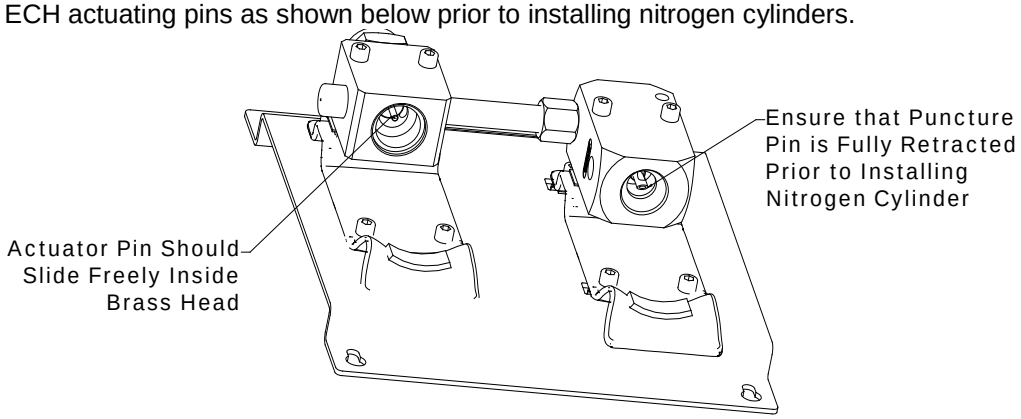
After all testing has been completed, follow reset instructions and put the system on line, including the nitrogen actuation cylinder and all tamper seals. The testing procedures and results should be documented in written form with copies left for the owner/manager, Local AHJ (if required) and a copy put into the **permanent** job file. Amerex P/N 13023 "Commissioning Checklist" or similar form shall be used.

A short instruction period on the operation of the system and procedures to use during a fire incident shall be given to the owner or owner's agent and appropriate employees. A copy of Amerex P/N 12386 "Owner's Manual" must be given to the owner along with a Material Safety Data Sheet on the Amerex Kitchen Wet Chemical Agent. Review the "Owner's Manual" with the owner or owners agent.

Any discrepancies found between the finished installation and the design sketches or drawings should be noted and an "as-built" drawing prepared for the permanent job file.

ELECTRIC CONTROL HEAD (ECH) SYSTEMS

With the P/N 17014 Electric Actuator removed from the ECH assembly, successively apply heat, from a heat gun, to each thermostat. Each time, the pin at the base of the Electric Actuator should extend with an audible 'click'. Use the back of a writing pen (or similar) to manually push the pin back up into the Electric Actuator after firing. Reset the Amerex SR-X Releasing Panel upon completion of testing. Inspect the status of the two ECH actuating pins as shown below prior to installing nitrogen cylinders.



TESTING THE MANUAL PULL STATION OF THE ELECTRIC CONTROL HEAD (ECH) SYSTEM

After the Detection Network has been tested and BEFORE RE-INSTALLING THE ELECTRIC ACTUATOR AND NITROGEN ACTUATION CYLINDERS, the Manual Pull Station must be tested: Pull the FIRE handle on the Manual Electric Pull Station. The pin of the Electric Actuator must extend at this time with an audible 'click'. Use the back of a writing pen (or similar object) to manually push the pin back up into the Electric Actuator after firing. Reset the Amerex SR-X Releasing Panel upon completion of testing. Re-install the Electric Actuator onto the ECH.

Warning: Failure to reset the Electric Actuator prior to re-installation will result in system actuation.

SECTION 6

SYSTEM MAINTENANCE

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

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to UL Standard 300
EX 4658

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December 2008

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MAINTENANCE

THE AMEREX RESTAURANT FIRE SUPPRESSION SYSTEM MUST BE PROPERLY MAINTAINED AT INTERVALS NOT EXCEEDING SIX (6) MONTHS IN ORDER TO ASSURE PROPER OPERATION.

MAINTENANCE SHALL BE PERFORMED BY AN AMEREX RESTAURANT FIRE SUPPRESSION SYSTEMS TRAINED AND CERTIFIED DISTRIBUTOR IN ACCORDANCE WITH NFPA 96, NFPA 17A AND LOCAL CODE REQUIREMENTS.

A complete functional test of the system as described in the "Testing and Commissioning" section of this manual shall be performed at every maintenance interval along with the following:

1. Prior to performing any maintenance, remove the cover of the MRM or PRM, install the set-up/lock-out tool and remove the nitrogen actuation cylinder.

2. Compare the number, type and location of each appliance with the "as-built" drawings or the previous system service. Note any changes in writing to the owner or the owner's agent and put a copy of the notification in the permanent job file. **CHANGES IN THE COOKING LINE WILL HAVE A MAJOR EFFECT ON THE SYSTEM DESIGN AND PERFORMANCE.** If appliances have been added or changed the system may have to be redesigned.

3. Note the condition of the hood and duct, including grease build up and code violations (both local codes and NFPA 96 and NFPA 17A). **Notify the owner or owner's agent of any problems or code violations – in writing with a copy to be placed in the permanent job file**.

4. Check the entire distribution network piping, nozzles and caps to verify that they have not been altered or damaged. Perform "puff test" or "air test" in accordance with "Testing and Commissioning" instructions using a **NITROGEN ACTUATION CARTRIDGE**.

   CAUTION: SOME HOOD AND DUCT CLEANING PROCEDURES MAY DAMAGE THE DETECTION NETWORK OR LEAVE DETECTORS IN A CONDITION WHERE THEY MAY NOT OPERATE. AMEREX RECOMMENDS THAT THE SYSTEM BE SERVICED AFTER EACH CLEANING BY AN AUTHORIZED AMEREX RESTAURANT SYSTEMS DISTRIBUTOR.

5. **Amerex requires that all fusible links be replaced in intervals not to exceed 6 months.** Links that do not need replacing must be thoroughly cleaned before being put back into service. Any fusible link found to be damaged, painted or having excessive grease must be replaced regardless of age. The links that are removed shall be destroyed. Any link exposed to excessive heat or flame shall be removed from service and destroyed.

6. A system using the PRM requires that the tubing be replaced at intervals not to exceed (3) years. Record the installation date and the date of replacement on the tubing replacement label on the Detection Accumulator Cylinder. The entire length of tubing must be replaced, either at the three year interval or following a fire incident. If grease or coating build-up is excessive, a more frequent replacement interval will be required. At a minimum, excessive build-up is defined as when material completely encircles the tube at ***any*** point along its length. Cleaning the tube is acceptable, provided that no abrasives are used, and that the text on the outside of the tubing is still legible when completed. **Use only a soft cloth with mild detergents and warm water. If the tubing appears brittle or charred REPLACE it. "When in Doubt, Take it OUT". Corrective action should be taken to re-evaluate the environment where the tubing is installed, or a more frequent tubing inspection and/or replacement interval must be used.** The End of Line Fitting Assembly (P/N 16506) must be replaced when the tubing is replaced. Do not attempt to re-use the Fitting or the Sealing Ball. Thoroughly leak check the tubing terminations following re-installation and re-pressurization.

7. The Pneumatic Release Module (PRM) o-ring (P/N 17692) on the brass actuation piston must be replaced every six months.

    a. Materials required: 1 1/8" open-end wrench, 5/32" Allen wrench, clean, lint-free shop towels, o-ring (P/N 17692), and Visilox lubricant (available as p/n 06247 in a 5 oz. tube).
    b. Remove the cover of the PRM and make sure the nitrogen actuation cylinder is removed. Remove the screw anchoring the spring to the brass block with a 5/32" Allen wrench. The silver lever should now swing down away from the brass block.
    c. Unscrew the cap off of the Schrader valve and bleed the pressure off of the accumulator cylinder. Confirm that the pressure gauge reads zero.
    d. With the 1 1/8" open-end wrench, loosen and remove the brass hex nut that retains the piston spring and piton inside the brass block. A shop towel may be required to grip the end of the brass piston for extraction from the block. Take care to use only your hands to remove the piston. **VERY IMPORTANT: DO NOT use pliers or tools to remove the piston from the bore or the o-ring from the piston groove. Scratches will cause system leaks and unwanted system discharges.**
    e. With a clean shop towel, wipe out all the old grease from the inside the cylindrical bore at the deepest point inside the brass block. Using the Visilox V-711 lubricant, **thoroughly and completely** wipe the internal bore in a circular motion with a clean finger. Make sure that you reach all the way to the rear of the bore with the lubricant.
    f. Clean off the old grease from the piston o-ring. Using a dry shop towel, 'pinch' the o-ring until it can be slipped over the end of the piston by hand. **DO NOT** use a sharp instrument to remove or cut the old o-ring off of the piston – scratches on the brass will create a leak point. Clean the groove of the piston prior to installing the new o-ring. Liberally lubricate the o-ring on the piston with Visilox before inserting into the brass block.
    g. **VERY IMPORTANT – Lubricate both the o-ring and the internal bore! Use NO TOOLS to remove the old o-ring.**
    h. After inserting the new piston all the way into the bore, slide the spring over the end and re-tighten the brass hex retaining nut until resistance is felt. Do not over-tighten, as spring tension will present the nut from backing out.
    i. Temporarily pressurize accumulator through the Schrader valve with approximately 40-50 psi. Re-attach the screw which retains the lever spring to the corner of the brass block. Tighten securely. Latch the tip of the actuation lever under the exposed tip of the piston.
    j. Apply the lube totally around the perimeter of the exposed brass piston tip of the trip mechanism. Work the piston in and out several times to distribute the lube. Additionally, place some lube on the tip of the spring-loaded lever where it contacts the underside of the piston tip.
    k. Re-pressurize to 70 psi and leak check all fittings. Perform a full function test of the PRM at this time, as well as the remainder of the six month maintenance.

8. Use the digital thermometer to record the temperatures found at each detector location (with appliances running) and compare with those temperatures found at the same location during the last system maintenance. Insufficient air movement, excessive grease build up and appliance changes can cause temperatures to elevate even to the point of system discharge without a fire occurring. **INCREASING THE TEMPERATURE SETTING OF THE FUSIBLE LINK IS NOT AN ACCEPTABLE SOLUTION TO THIS PROBLEM**.

9. The agent cylinder assembly and nitrogen actuation cylinder must be checked for proper pressure (within the green pie **OPERABLE RANGE** on pressure gauges).

10. The agent cylinder and all hose assemblies must be hydrostatically tested at a minimum of every 12 years.
    a Agent Cylinder – test to 480 psi (3309 kPa)
    b Actuation Hose (if used) – test to 3500 psi (24131 kPa)
    c Distribution Hose – Test to 480 psi (3309 kPa)

    If the agent cylinder or hose assemblies have been subjected to physical damage, excessive heat or corrosion they should be hydrostatically tested or replaced regardless of their age.

11. Replace nitrogen actuation cylinder, REMOVE SET UP/LOCK OUT TOOL, replace the MRM cover and install new tamper seals.

12. After performing a complete functional test of the system the owner or owner's agent shall receive some documentation on the maintenance performed (with a copy to be placed in the permanent job file) and instruction on how the system and related hand portable fire extinguishers work, including procedures for incidents.

13. Note date of service on Inspection/Maintenance tag to attach to the system.

SECTION 7

SYSTEM RESET & RECHARGE

MANUAL P/N 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

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December 2008

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RESET AND RECHARGE

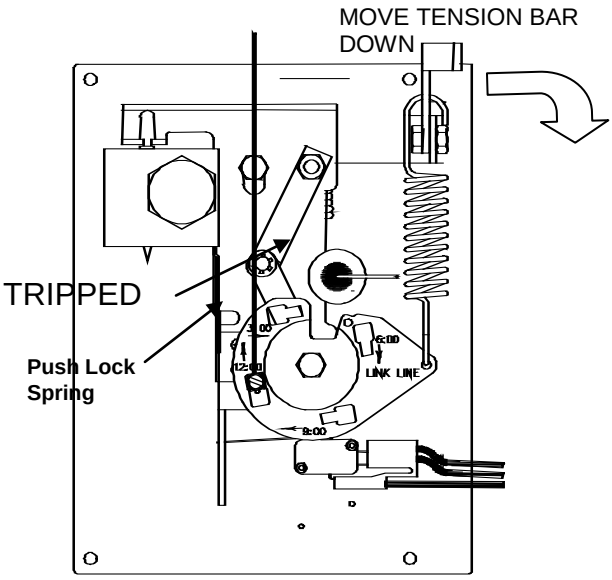
RESET PROCEDURES – MRM & MRM II

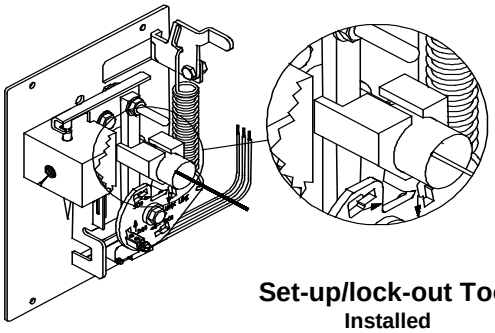
Each time the MRM is fired the following procedures must be performed to accomplish reset:

1. Remove cover of the MRM / MRM II and move the tension bar to the “down" (relaxed) position. Move the upper end of the blue spring into the lower end of the spring slot.

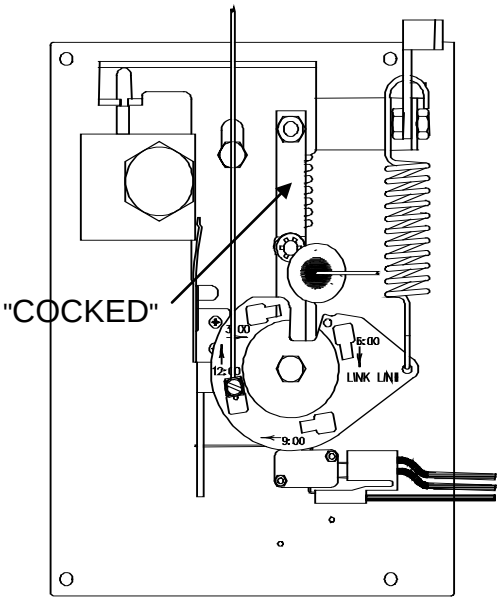
2. Cock the MRM by simultaneously pushing in on the lock spring and turning the “Cocking Tool” counterclockwise. The mechanical pull piston must be pushed in all the way.

3. Insert the set-up/lock-out tool after cocking.





Set-up/lock-out Tool Installed



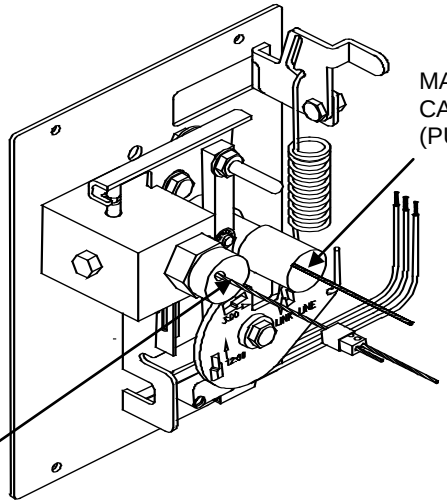
4. If a nitrogen actuation cylinder was expelled, relieve pressure from the actuation network by either loosening a fitting or depressing the ball in the vent check. Remove the nitrogen actuation cylinder.

5. Confirm that all detectors are assembled and fusible links are properly installed.

6. Leave the set-up/lock-out tool in place and verify that the cable for the detection network is properly attached to the link plate.
   NOTE: Refer to page 4-8 for MRM II Detection Cable Adjustment.

7. Confirm that the manual stations have pull pins inserted and tamper seals installed.

8. Check to see that the manual pull cam in the MRM is pushed in all the way and the cable to the pull station is properly attached.



MECHANICAL GAS VALVES – DO ALL EXCEPT STEP 12
ELECTRICAL GAS VALVES – SKIP STEPS 9 THROUGH 11

10. To reset the mechanical gas valve, disconnect the cable for the mechanical gas valve where it attaches to the connector on the piston plug/gas trip assembly.
11. Go to the mechanical gas valve location, remove the cover, lift the valve stem and latch it open, reattach the cable in the MRM / MRM II to the piston plug/gas trip assembly. Replace the cover.
12. To reset an electrical gas valve, the microswitches will transfer the contacts back to normal position when the MRM / MRM II is cocked. The manual reset relay must be reset in order to open the electrical gas valve.
13. To reset other auxiliary electrical functions, the same procedure as used for the electrical gas valve must be followed.
14. Any alarm signals that are connected to a building fire alarm system can be cleared after cocking the MRM / MRM II and resetting the building fire alarm panel.
15. After all input and output functions have been restored or reset, insert a fully charged nitrogen actuation cylinder, REMOVE THE SET-UP/LOCK-OUT TOOL, replace the MRM / MRM II cover and install two new
9. Confirm that the swaged ball fitting of the gas valve trip assembly is pulled all the way out and that the cable connected to the gas valve is properly attached using the cable connector and secured by the red vinyl cap.

WARNING: IS THE SET-UP/LOCK-OUT TOOL IN YOUR POCKET OR IN YOUR TOOL BOX? THE SYSTEM WILL NOT FIRE IF IT IS STILL INSTALLED IN THE MRM!

RESET PROCEDURES – PRM

Each time the PRM is fired the following procedures must be performed to accomplish reset:

1. Pressurize the Accumulator Cylinder to approximately 45 PSI (241 kPa)with compressed air through the Schrader Valve. The Trip Plunger should extend.
2. Rotate the Spring Loaded Lever clockwise ("1" in Figure A), until its tip is latched under the Trip Plunger. Resume pressurization of the Accumulator Cylinder to 80 PSI at 70°F (552 kPa at 21ºC). Leaks check the fittings at both ends of the tubing. Re-make tubing terminations, if necessary.
3. Using the Amerex Cocking Tool, p/n 13341 in conjunction with a 3/8" drive socket wrench and extension, re-cock the Collapsible Column ("2" in Figure A). This is accomplished by simultaneously pushing in on the Lock Spring while turning the Cocking Tool counterclockwise. The mechanism should now appear as depicted in Figure B.
4. Replace the Nitrogen Actuation Cylinder (P/N 12856).

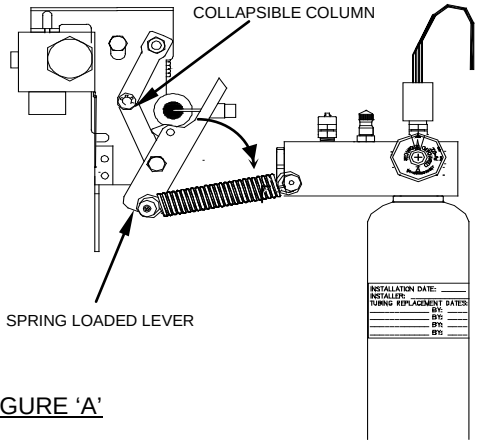


FIGURE 'A'

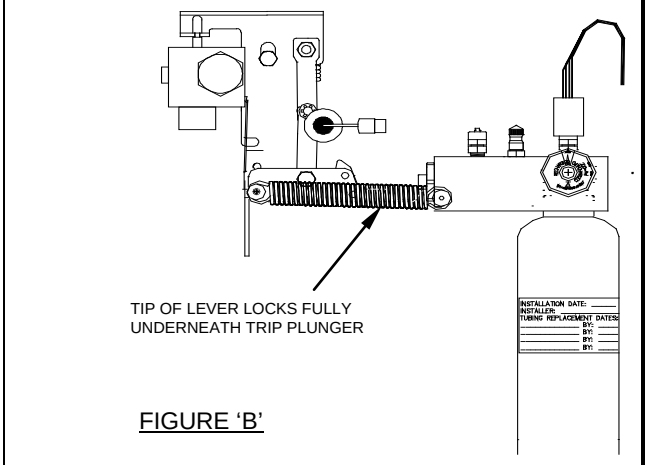


FIGURE 'B'

RESET PROCEDURE - SRM

The SRM is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

Actuator Disassembly (See Figure 1):

1. Using 1 1/8” wrench, remove empty Nitrogen Cartridge (P/N 12856) from bottom of SRM Assembly.
2. Remove (unscrew) spent Linear Actuator (P/N 24448) from top of SRM Assembly.
3. Using a 1” wrench, remove hex Body (P/N 26780) from top of the SRM Assembly.
4. Locate and discard the small brass disc which was displaced from the end of the Linear Actuator upon actuation. It is normally found on top of the hex Puncture Stem Cap.

Actuator Inspection (See Figure 1):

5. Inspect the upper SRM assembly (Puncture Stem, Stem Cap & Spring) for any damage or foreign debris. If any damage has occurred to SRM, replace the SRM.
6. Verify that the Puncture Stem Assembly is in working order by pressing the hex Puncture Stem Cap down and observing full travel of the Puncture Stem (fully compressed spring). Verify that the spring returns the stem to the raised position.
7. Inspect and clean the Gasket (P/N 07247) on the bottom of the SRM. Replace if damaged.

Actuator Reassembly (See Figure 1):

8. Replace the hex Body (P/N 26780), Ensure the Body is fully bottomed against the SRM block. Snug gently using a 1” wrench. Do not overtighten. Install new Linear Actuator and Nitrogen Cartridge as instructed in Chapter 4.

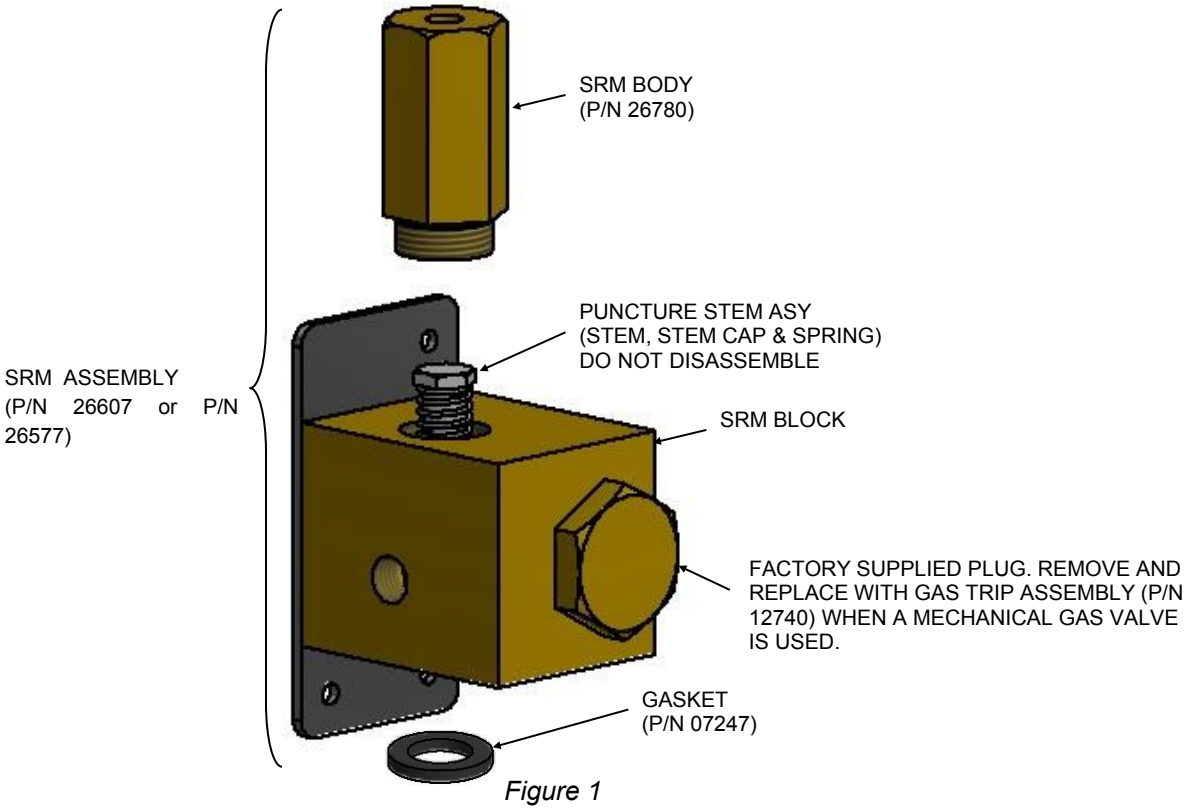


Figure 1

RESET PROCEDURE - Electric Control Head, KP600 (P/N 26797)

The Electric Control Head, KP600 is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

For systems using an Electric Control Head, KP600 (P/N 26797), perform the following steps. The control head must be disassembled, cleaned, and reassembled after each use.

Control Head Removal (See Figure 1):

1. Unplug Linear Actuator (P/N 24448) from Linear Actuator circuit and unscrew Linear Actuator from Control Head Body.
2. Carefully remove Electric Control Head from Agent Cylinder Valve by removing (2) 5/16”-18 bolts.
3. Install Shipping Plate (P/N 10099) in place of Electric Control Head.

Control Head Disassembly (See Figure 1):

4. Remove the Set Screw (P/N 14038) from the Base (P/N 14034) using a 1/8” Allen Head wrench.
5. Unscrew the Body (P/N 26426) from the Base (P/N 14034).
6. Remove the Piston (P/N 14035) and Retaining Ring (P/N 14037). Remove the Retaining Ring from the Piston groove.

Control Head Cleaning (See Figure 1):

7. Inspect and clean all components of the Control Head. If any scarring or damage has occurred, replace the component. Small brass disc punched from spent Linear Actuator (P/N 24448) must always be removed in the event of an actuation.
8. Replace Piston (P/N 14035) and Retaining Ring (P/N 14037) with new parts. These are included in the Actuator Rebuild Kit (P/N 26795).

Control Head Reassembly (See Figure 1):

9. Place Retaining Ring (P/N 14037) into Base (P/N 14034), followed by the Piston (P/N 14035) in orientation shown.
10. Before adding any thread lock, screw the Body (P/N 26426) into the Base and test the assembly by using a Phillips head screwdriver inserted through the Linear Actuator port to force the Piston through the Retaining Ring. Verify the Retaining Ring locks into the Piston groove.
11. After testing the control head, disassemble the components by repeating steps 5 and 6. Repeat step 9.
12. Apply one drop of medium grade thread lock to threads of the Body (P/N 26426). Torque Body into Base to 200 in-lb (17 ft-lb) [23 Nm].
13. Apply one drop of medium grade thread lock to threads of the Set Screw (P/N 14038). Thread screw into Base until resistance is met. Do not over-tighten!
14. Invert assembly and confirm that the piston floats freely within the assembly. Ensure the Retaining Ring (P/N 14037) is not pinched between the Body and Base.

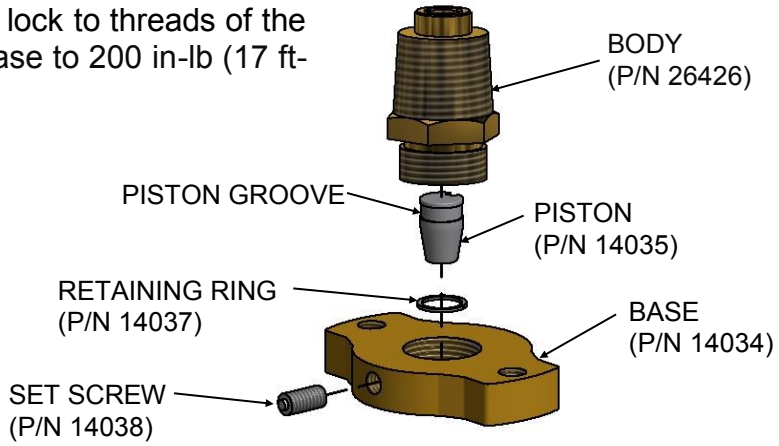


Figure 1

RESET PROCEDURE - Electric Control Head (P/N 26127)

The Electric Control Head, is used in conjunction with the STRIKE™ ECS and is for UL Certification only and cannot be considered for or used in installations of KP/ZD systems in Canada.

For systems using an Electric Control Head (P/N 26127), perform the following steps. The control head must be disassembled, cleaned, and reassembled after each use.

Control Head Removal (See Figure 1):

1. Unplug Linear Actuator (P/N 24448) from Linear Actuator circuit and unscrew Linear Actuator from Control Head Body.
2. Carefully remove Electric Control Head from Agent Cylinder Valve by removing Retainer Nut (P/N 13595) from valve assembly.

Control Head Disassembly (See Figure 1):

3. Remove the Set Screw (P/N 26617) from the Base (P/N 26129) using a 1/16" Allen Head wrench.
4. Unscrew the Body (P/N 26128) from the Base (P/N 26129).
5. Remove the Piston (P/N 14035) and Retaining Ring (P/N 14037). Remove the Retaining Ring from the Piston groove.

Control Head Cleaning (See Figure 1):

6. Inspect and clean all components of the Control Head. If any scarring or damage has occurred, replace the component. Small brass disc punched from spent Linear Actuator (P/N 24448) must always be removed in the event of an actuation.
7. Replace Piston (P/N 14035) and Retaining Ring (P/N 14037) with new parts. These are included in the Actuator Rebuild Kit (P/N 26795).

Control Head Reassembly (See Figure 1):

8. Place Retaining Ring (P/N 14037) into Base (P/N 26129), followed by the Piston (P/N 14035) in orientation shown.
9. Before adding any thread lock, screw the Body (P/N 26128) into the Base and test the assembly by using a Phillips head screwdriver inserted through the Linear Actuator port to force the Piston through the Retaining Ring. Verify the Retaining Ring locks into the Piston groove.
10. After testing the control head, disassemble the components by repeating steps 4 and 5. Repeat step 8.
11. Torque Body (P/N 26128) into Base to 200 in-lb (17 ft-lb) [23 Nm].
12. Thread Set Screw (P/N 26617) into Base until resistance is met. Do not over-tighten!
13. Invert assembly and confirm that the piston floats freely within the assembly. Ensure the Retaining Ring (P/N 14037) is not pinched between the Body and Base.

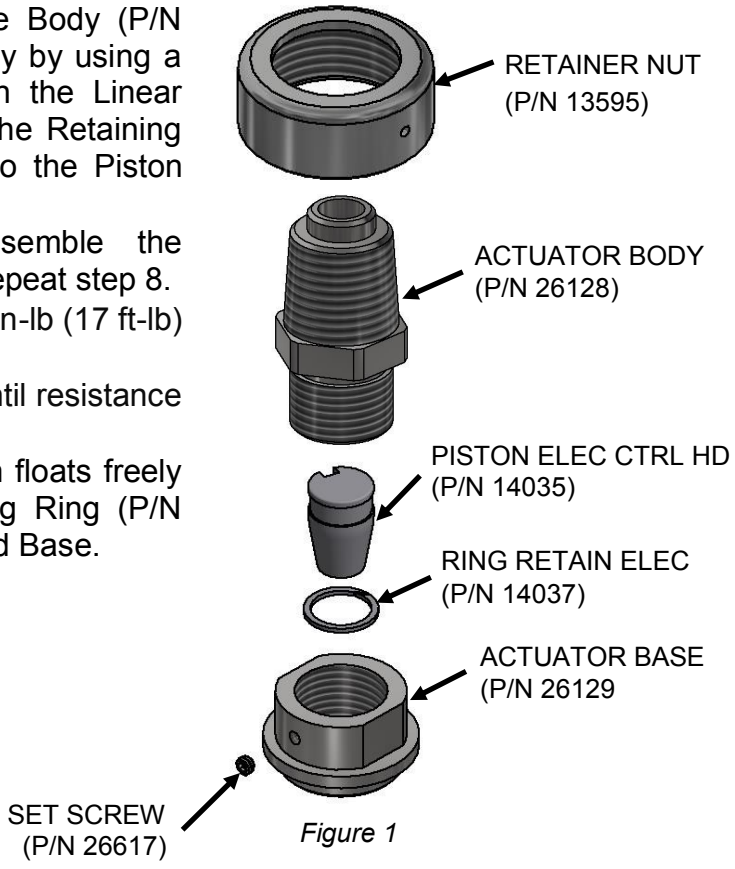


Figure 1

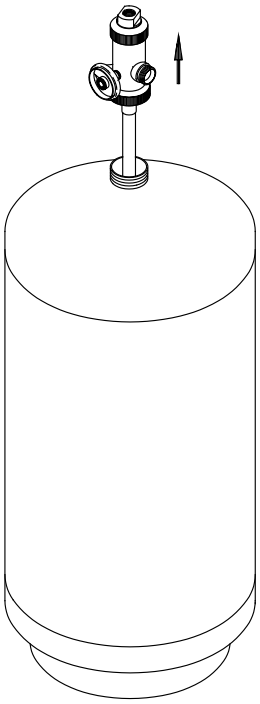
RECHARGE PROCEDURES (275, 375 & 475 CYLINDER)

WARNING:

BEFORE ATTEMPTING ANY RECHARGE PROCEDURES, FIRST CONFIRM THE REASON FOR THE DISCHARGE AND CORRECT ANY CONDITIONS THAT CAUSED THE SYSTEM TO DISCHARGE. THE AMEREX KP RESTAURANT FIRE SUPPRESSION SYSTEM MUST BE RECHARGED IMMEDIATELY AFTER ANY DISCHARGE REGARDLESS OF THE CAUSE FOR DISCHARGE. IF RECHARGE CANNOT BE ACCOMPLISHED IMMEDIATELY – DO NOT LEAVE THE SYSTEM INCAPACITATED FOR ANY REASON WITHOUT GIVING WRITTEN NOTIFICATION TO THE OWNER, OWNER'S AGENT, LOCAL AHJ AND DOCUMENTING THE INCIDENT IN THE PERMANENT JOB FILE. ANY SYSTEM COMPONENTS SUBJECTED TO FIRE OR OVERHEATING CONDITIONS MUST BE REPLACED, INCLUDING BUT NOT LIMITED TO CYLINDERS, BRACKETS, DETECTORS, NOZZLES, PIPING, CONDUIT CABLE.

1. Relieve all pressure in the actuation line by depressing the ball check in the vent check or loosening a fitting.

   <u>WARNING: ENSURE THAT ALL PRESSURE HAS BEEN RELIEVED FROM CYLINDER BEFORE PROCEEDING.</u>

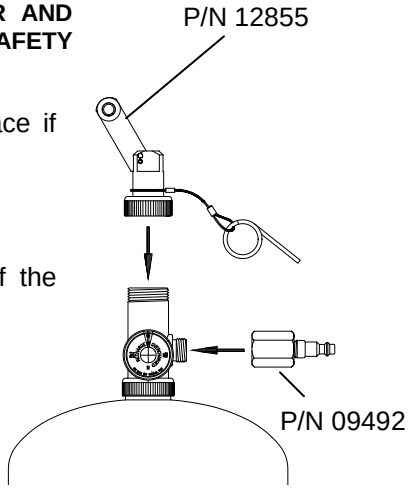


2. Vent trapped actuation pressure in discharge valve by depressing the stem of the Schrader valve located in the top of the valve cap of the discharge valve.
3. Slowly remove agent cylinder assembly from the mounting bracket.
4. Remove discharge valve from the agent cylinder assembly, clean and examine all valve parts thoroughly and apply Amerex P/N 06247 Visilox lubricant to the collar o-ring.
5. Empty the agent cylinder of all remaining agent. Inspect the interior of the cylinder for residue (clean if necessary). Inspect cylinder threads for evidence of damage.
6. Fill the cylinder with proper charge of Amerex Kitchen Wet Chemical Agent:
   Use Amerex P/N 16924 – 2.72 Gallon Recharge for 275 Agent Cyl.
   Use Amerex P/N 12866 – 3.75 Gallon Recharge for 375 Agent Cyl.
   Use Amerex P/N 17450 – 4.80 Gallon Recharge for 475 Agent Cyl.

   WARNING:

   RUBBER GLOVES AND SAFETY GLASSES SHALL BE WORN WHENEVER HANDLING AMEREX KP EXTINGUISHING AGENT. AVOID SKIN CONTACT. FLUSH WITH WATER FOR 15 MINUTES IF CONTACT OCCURS. DO NOT INGEST. IF AGENT IS INGESTED, DILUTE WITH MILK OR WATER AND CONTACT A PHYSICIAN IMMEDIATELY. CONSULT THE MATERIAL SAFETY DATA SHEET.

7. Inspect valve and stem assembly for deterioration or wear. Replace if required. Install valve assembly and downtube into the cylinder.
8. Attach the recharge adapter (P/N 09492) to the valve discharge port.
9. Attach the "T" handle recharge adapter (P/N 12855) to the top of the discharge valve.



RECHARGE PROCEDURES (Model 600 CYLINDER)

WARNING:

BEFORE ATTEMPTING ANY RECHARGE PROCEDURES, FIRST CONFIRM THE REASON FOR THE DISCHARGE AND CORRECT ANY CONDITIONS THAT CAUSED THE SYSTEM TO DISCHARGE. THE AMEREX KP RESTAURANT FIRE SUPPRESSION SYSTEM MUST BE RECHARGED IMMEDIATELY AFTER ANY DISCHARGE REGARDLESS OF THE CAUSE FOR DISCHARGE. IF RECHARGE CANNOT BE ACCOMPLISHED IMMEDIATELY DO NOT LEAVE THE SYSTEM INCAPACITATED FOR ANY REASON WITHOUT GIVING WRITTEN NOTIFICATION TO THE OWNER, OWNER'S AGENT, LOCAL AHJ AND DOCUMENTING THE INCIDENT IN THE PERMANENT JOB FILE. ANY SYSTEM COMPONENTS SUBJECTED TO FIRE OR OVERHEATING CONDITIONS MUST BE REPLACED, INCLUDING BUT NOT LIMITED TO CYLINDERS, BRACKETS, DETECTORS, NOZZLES, PIPING, CONDUIT CABLE.

1. Relieve all pressure in the actuation line by depressing the ball check in the vent check or loosening a fitting.

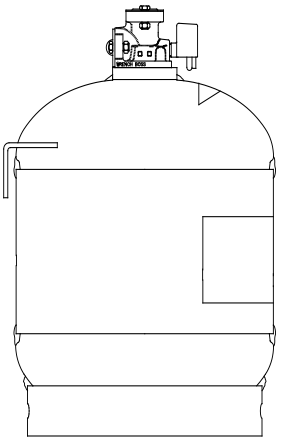
   WARNING: ENSURE THAT ALL PRESSURE HAS BEEN RELIEVED FROM CYLINDER BEFORE PROCEEDING.

2. Slowly remove pneumatic actuator assembly from the agent cylinder valve assembly.

3. Remove discharge valve from the agent cylinder, clean and examine all valve parts thoroughly and apply Amerex P/N 06247 Visilox lubricant to the collar o-ring. Replace worn or suspect parts. Replace valve stem o-rings.

4. Empty the agent cylinder of all remaining agent. Inspect the interior of the cylinder for residue (clean if necessary).Inspect cylinder threads for evidence of damage.

5. Fill the cylinder with proper charge of Amerex Kitchen Wet Chemical Agent. Use Amerex P/N 15416 – 6.14 Gal. Recharge (model 664).



WARNING:

RUBBER GLOVES AND SAFETY GLASSES SHALL BE WORN WHENEVER HANDLING AMEREX KP EXTINGUISHING AGENT. AVOID SKIN CONTACT. FLUSH WITH WATER FOR 15 MINUTES IF CONTACT OCCURS. DO NOT INGEST. IF AGENT IS INGESTED DILUTE WITH MILK OR WATER AND CONTACT A PHYSICIAN IMMEDIATELY. CONSULT THE MATERIAL SAFETY DATA SHEET.

6. Install valve assembly and downtube into the cylinder.
7. Attach the recharge adapter (P/N 10136) to the valve discharge port.
8. Attach the "T" handle recharge adapter (P/N 10134) to the top of the discharge valve.
9. Connect the recharge adapter to a regulated source of nitrogen, set at 240 +25 psi (1655 kPa) and pressurize the cylinder using the "T" handle adapter to depress the valve stem. When the agent cylinder is pressurized to 240 psi @70°F (1655 kPa @21°C), agitate the cylinder for a period of one minute and check the pressure gauge, add more nitrogen if necessary. Confirm proper pressurization by using a calibrated gauge at the low pressure side of the regulator.
10. Remove the recharge adapter and "T" handle adapter.
11. a) **275 / 375 / 475** Agent Cylinder – attach the actuation port connection
12. b) **600** – install pneumatic actuator.

Note: Reset Pneumatic Actuator P/N 15157 before installation. - **DISCONTINUED**

i. Remove the large retaining ring from the bottom of the Control Head (Figure 1).
ii. With a 5/32" Allen wrench (or smaller) inserted through the cross-drilled hole in the tapered piston, pull the piston assembly out of the control head body (Figure 1).
iii. The thin circular disk and the small spiral retaining ring (replacement p/n 14037) must be removed from the piston assembly. To do this, with the Allen wrench, unscrew the small tapered piston from the large brass piece (Figure 2). Do not use a vise, as this could damage the part.
iv. Once the small tapered piston is removed, simply slip the thin circular disk and the small spiral retaining ring off the back end (Figure 2).
v. Re-assemble the Control Head, as shown in Figure 3. First, tighten the small tapered piston back onto the large brass piece. Make sure that it bottoms onto the brass part, and is hand-tight with the Allen wrench. The piston assembly is to be pushed all the way into the control head body.
vi. Hold the thick circular disk with the groove facing up (Figure 3). Drop the small spiral retaining ring into the groove.
vii. The thin circular disk is to be placed over the thick circular disk, and the three components are to be inserted over the piston assembly (by holding the control head body inverted, as shown, it is easier to insert the parts) (Figure 3).
viii. With all of the components in place, and the small spiral retaining ring visible and loosely held between the two plates, reinstall the large retaining ring to hold the assembly together (Figure 3)

Figure 1

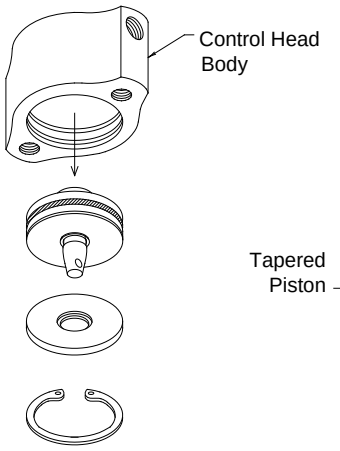


Figure 2

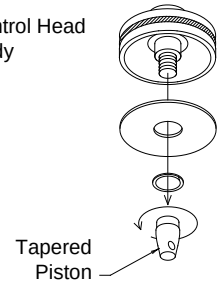
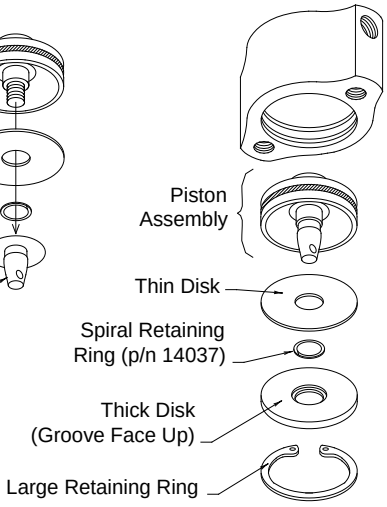
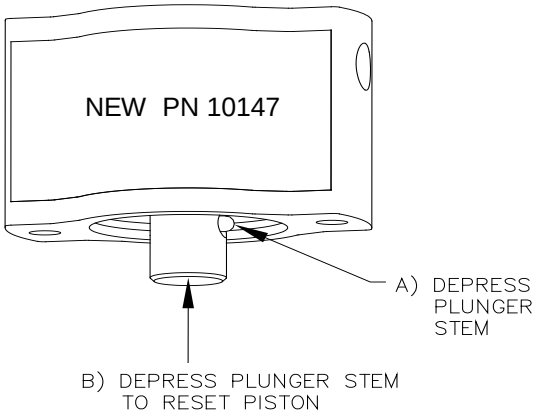


Figure 3





. **OLD STYLE PNEUMATIC ACTUATIOR PN 15157**

Note: Reset Pneumatic Actuator P/N 10147 before installation.

i. Unbolt the Pneumatic Control Head from the Agent Cylinder Discharge Valve.
ii. The piston of the control head will be locked in the "fired" position, and it must be reset.
iii. To reset the control head, use a small flat tool to depress the small plunger ball on the side of the extended brass piston while simultaneously pushing the piston back into the head.
iv. Do not attempt to unscrew the small plunger from the brass piston.
v. The piston should be pushed back into the fully retracted position while depressing the plunger ball. See the following image:

13. Check the valve outlet, top chamber and collar for leaks using a leak detection fluid (soapy water). Bubbles may take sever minutes to appear. Blow dry and clean all surfaces and orifices following leak detection.

14. If the agent cylinder assembly is **not** going to be placed into the bracket immediately or is going to be transported, **make sure that the anti-recoil and safety plates are in place and required labeling and securement is used.**

15. Follow all reset procedures and conduct a full functional test of the system.

16. If the discharge was caused by a fire incident, replace **ALL** of the fusible links in the detection network.

17. Remove all nozzles from the distribution piping network and clean thoroughly with warm soapy water, making sure that each nozzle is returned to its proper location. Replace any nozzles that appear to be damaged.

18. Flush the distribution piping network with water and blow clean using a regulated source of nitrogen connected to the distributor network test adapter. Set regulator for 150 PSI (10.342 bar). Secure the nitrogen cylinder when performing this test to prevent damage occurring to the cylinder, valve or regulator.

19. Install a full charged nitrogen actuation cylinder**. See below**.

20. After all functional testing, reset procedures, nozzle and blow off caps are replaced (if high temperature caps are used – replace nozzle tip o-rings if necessary), connect the actuation piping to the port(s) on top of the valve(s), install all new tamper seals and record all procedures in the permanent job file.

NITROGEN CYLINDER RECHARGE:

If you prefer to shop or field recharge Amerex nitrogen cylinders, either one of the two cylinder restraining devices pictured on Page 7 – 7 are recommended.

WARNING: NITROGEN ACTUATION CYLINDERS OPERATE AT EXTREMELY HIGH (1800 PSI) PRESSURES. HANDLE WITH CAUTION. PERFORM ALL RECHARGING WITH CYLINDERS RESTRAINED BY AN AMEREX APPROVED SUITABLE SAFETY SECURING DEVICE.

1. Remove nitrogen cylinder from MRM or PRM. Install shipping cap on N_2 cylinder.

   CAUTION: UNSCREW THE NITROGEN CYLINDER SLOWLY TO ALLOW ANY RESIDUAL PRESSURE TO ESCAPE.

2. Clean the cylinder exterior to remove dire, grease and foreign material. Check to make sure that the nameplate is in place and fully legible. Inspect cylinder for corrosion, abrasion or dents. If integrity of the cylinder has been compromised, make sure all pressure has been relieved and destroy.

   NOTE: When cleaning N_2 cylinders, avoid use of solvents. Solvents could seriously damage the gauge face, the gauge guard or the nameplate.

3. Remove old rupture disc assembly:
   a. Remove shipping cap and install cylinder in a P/N 10270 or 13430 N_2 Cylinder Recharge Adapter.
   b. Hold cylinder in place using a 1-1/8 inch wrench on the hex portion of the N_2 cylinder fitting.
   c. Loosen the rupture disc fitting by turning the Recharge Adapter Wrench ¼ turn.
   d. If cylinder contains an unruptured disc, allow residual pressure to escape.
   e. Unscrew cylinder from recharge adapter.
   f. Unscrew old rupture disc assembly and DISCARD.

WARNING: NEVER REUSE A RUPTURE DISC, EVEN IF IT IS UNDAMAGED – DESTROY & DISCARD

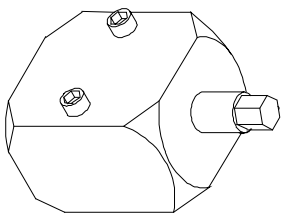
4. Inspect sealing seat on rupture disc fitting. Discard N_2 cylinder if the seat is damaged.
5. Install new rupture disc assembly (replace only with Amerex P/N 09958 rupture disc assembly – use of substitute parts will void the manufacturer's warranty).
    a. Wipe sealing seat on N_2 cylinder rupture disc fitting and copper gasket on new rupture disc with a clean damp cloth.
    b. Apply one drop of light machine oil to copper gasket on new safety disc and spread across entire gasket.
    c. Screw disc assembly into fitting hand tight.
6. Pressurize the N_2 cylinder
    a. Install cylinder in P/N 10270 N_2 Cylinder Recharge Adapter.
    b. Tighten cylinder by hand 1 to 1½ turns past contact with the sealing gasket.
    c. Hold cylinder in place using a 1-1/8 inch wrench on the hex portion of the N_2 cylinder fitting.
    d. Loosen the rupture disc 1/8 turn.
    e. Connect a REGULATED nitrogen supply to the N_2 cylinder recharge adapter.

    NOTE: High pressure regulators are available from Getz Manufacturing, 1525 SW Adams Street, Peoria, IL 61602-1709. Phone (309) 674-1723 Fax: (800) 473-6088

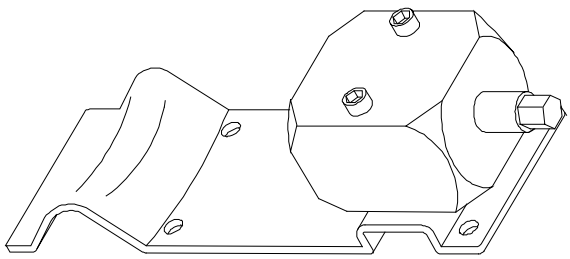
    f. Slowly pressurize the N_2 cylinder to 1800 psi at 70°F.

NOTE: The nitrogen may experience a significant temperature rise as it compresses into the cylinder. The temperature rise must be compensated for by pressurizing to the valve corresponding to 1800 psi at the higher temperature. The best method to properly pressurize is to attach a commercially available magnetic base thermometer to the side of the N_2 cylinder. Pressurize and hold the cylinder at 1800 psi. (Make sure that there are no leaks in the nitrogen supply plumbing.) Let the apparatus sit undisturbed for 2 minutes minimum to allow the temperature to stabilize. Read the temperature on the thermometer. Refer to Temperature/Pressure chart on Page 7-8. Locate the temperature on the "Cylinder Temperature" (horizontal) axis of the graph. Draw a line vertically upward from that temperature until it crosses the "Nominal Pressure" line. Draw a second line horizontally from the point of intersection to the "Charge Pressure" (vertical) axis of the graph. Increase the pressure from the regulated nitrogen supply to match the valve read from the "Charge Pressure" axis of graph. Use only DRY nitrogen for pressurizing with a dew point of –70°F (-57°C) or lower.

    g. When the proper pressure is reached:
        i. Tighten the rupture disc by applying a torque wrench to the recharge adapter and tighten (clockwise) to 40 foot pounds.
        ii. Shut off nitrogen supply.
        iii. Bleed and disconnect the supply hose.
        iv. Remove nitrogen cylinder from the recharge adapter.
    h. Check for leaks using leak detect fluid (soapy water) to the rupture disc, the threads on the rupture disc fitting where it joins the cylinder and the pressure gauge threads. Bubbles may take several minutes to appear. Blow dry fluid from all surfaces and inside of the rupture disc following leak detect. Install shipping cap.



P/N 10270
Nitrogen Cylinder Recharge Adapter



P/N 13430
Nitrogen Cylinder Recharge Adapter with Restraining Bracket (Vehicle or shop installation- either wall or bench)

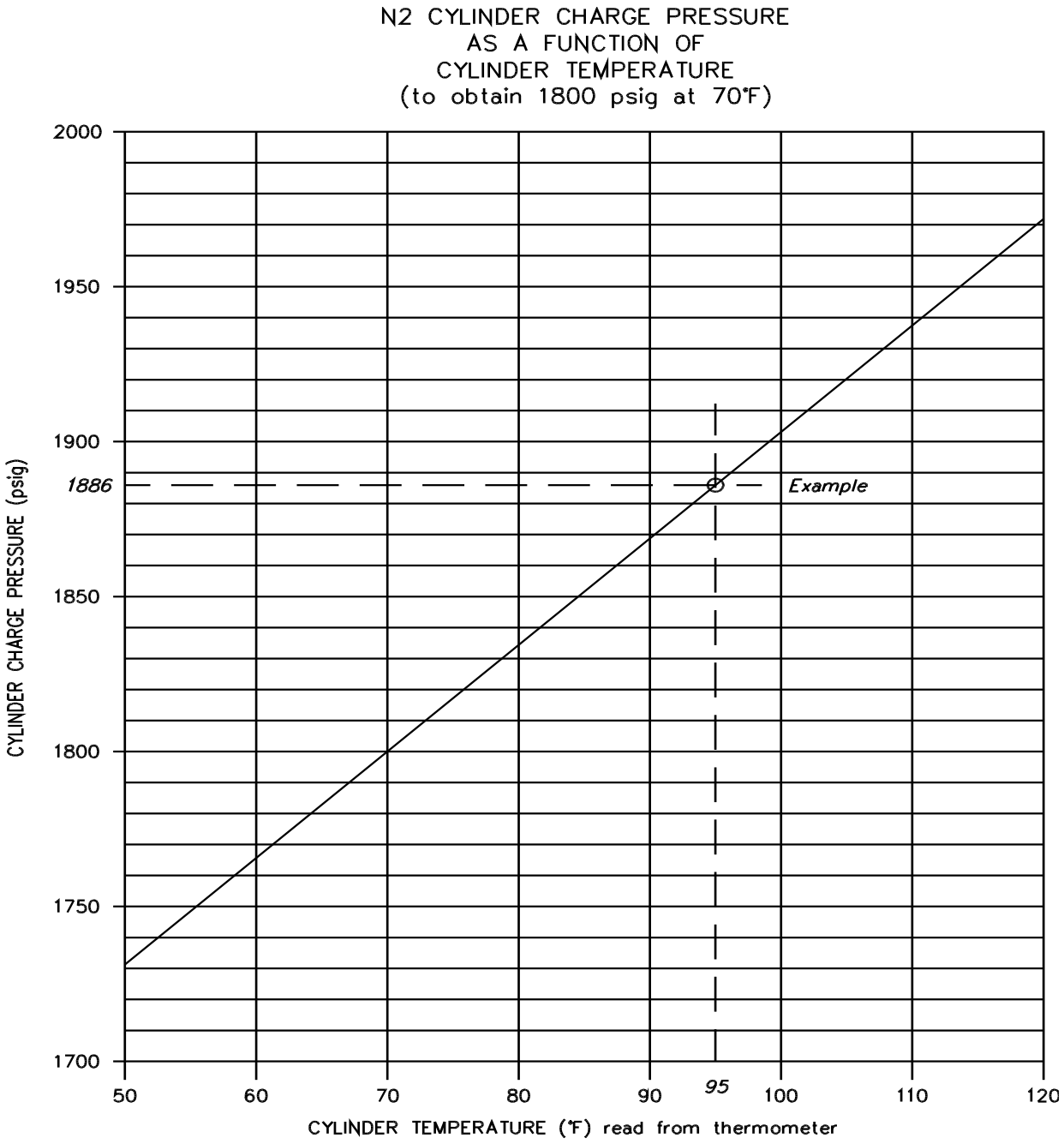
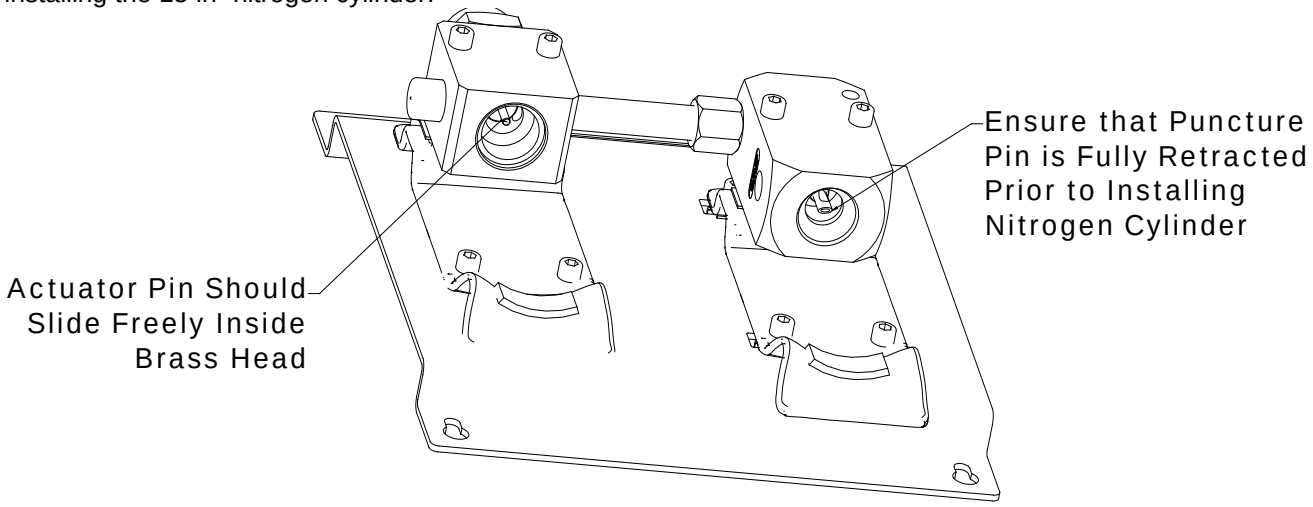

N2 CYLINDER CHARGE PRESSURE
AS A FUNCTION OF
CYLINDER TEMPERATURE
(to obtain 1800 psig at 70°F)
CYLINDER CHARGE PRESSURE (psig)
2000
1950
1900
1886
1850
1800
1750
1700
Example
50
60
70
80
90
95
100
110
120
CYLINDER TEMPERATURE (°F) read from thermometer

FIGURE 9.1

RESET PROCEDURES (ECH)

Each time the ECH is fired, the nitrogen cylinders must be removed and re-pressurized. Disconnect power source (panel wiring) before attempting to manually reset the ECH. The electric actuator (P/N 17014) must be manually reset by pushing up the small pin until an audible click is heard. A blunt instrument, such as the back of a writing pen, may be used to reset the pin. When the nitrogen cartridges are removed, ensure that the smaller, sliding pin on the left of the assembly does not become dislodged. It must also remain free-sliding in the brass block. The puncture pin on the right side of the assembly must be fully retracted prior to re-installing the 15 in^3 nitrogen cylinder.



MSDA SHEET

KITCHEN WET CHEMICAL AGENT

FOR

AMEREX RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
EX 4658

Tested and Listed by
Underwriters Laboratories of Canada
to UL/ORD 1254.6-1995*

December 2008

*** ULC Certification does not apply to the STRIKE™ or SRM.**

MATERIAL SAFETY DATA SHEET

Section 1. Chemical product and company identification

Product Name:	KP SYSTEM WET CHEMICAL AGENT (CH547, CH656, CH664 and CH 544)
Manufacturer:	AMEREX CORPORATION
Internet Address:	www.amerex-fire.com
Address:	7595 Gadsden Highway P.O. Box 81 Trussville, AL 35173-0081
Telephone:	(205) 655-3271
Emergency Contacts:	Chemtrec 1(800) 424-9300 or (703) 527–3887
Revised:	March, 2006

Section 2. Hazard identification and emergency overview

Emergency overview: Reddish colored liquid.

Adverse health effects and symptoms: Mildly irritating to the eyes, skin, and respiratory system. Symptoms may include coughing, shortness of breath, and eye and skin irritation. Ingestion, although unlikely, may cause gastrointestinal disturbance.

Exposure guidelines:

Ingredients	OSHA PEL	ACGIH TLV	DFG MAK *
Water	NR**	NR	NR
Potassium acetate	NR	NR	NR
Potassium citrate	NR	NR	NR
Proprietary organic phosphate esters	NR	NR	NR
Example: Phosphoric acid tributyl ester	5 mg/m^3	2.2 mg/m^3	NR
Pink pigment	NR	NR	NR

*German regulatory limits ** NR = Not Regulated

Hazard symbols: WHMIS (Canadian workplace hazardous materials identification system)

D2B – Product may irritate skin or mucous membranes

Section 3. Composition/information on ingredients

Name/Compound	Weight %	CAS #
Water	< 50	7732-18-5
Potassium acetate	< 50	127-98-2
Potassium citrate	< 5	866-84-2
Organic phosphate esters Example: Phosphoric acid tributyl ester	< 5	68130-47-2 126-23-8
Pink pigment, mono azo dyes	<1	3520-42-1 4478-76-6 6844-74-2

Section 4. First Aid Measures

Eye Exposure: Irrigate eyes at eye wash station for 15 minutes and repeat until pain free. Seek medical attention if irritation develops or persists, or if vision changes occur.

Skin Exposure: In case of contact, wash with plenty of soap and water. Seek medical attention if irritation develops or persists.

Inhalation: If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-3 glasses of water to drink and on the advice of medical personnel induce vomiting. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.

Medical conditions possibly aggravated by exposure: Skin contact may aggravate existing skin disease. Chronic overexposure may affect blood cholinesterase levels and the central nervous system.

Section 5. Fire fighting measures

Extinguishing media: non combustible and non flammable – product is an extinguishing agent

Unusual fire/explosion hazards: in a fire this material may decompose, releasing oxides of phosphorus, carbon, and acetic acid (see Section 10).

Insensitive to mechanical impact or static discharge.

HMIS hazard ranking: health 1, flammability 0, reactivity 0, personal protective equipment: eye protection, gloves and appropriate skin protection (see Section 8)

Section 6. Accidental release measures

Large spills (one drum or more) should be addressed by hazardous materials technicians following a site-specific emergency response plan and trained in the appropriate use of PPE. Clean up released material using sorbent socks for containment, followed by sorbent material inside containment. If deemed necessary, wear full face APR or PAPR with organic vapor cartridges (Section 8). Bag and drum for disposal. If product is used and/or contaminated, for example if mixed with kitchen grease, use PPE and containment appropriate to the nature of the mixture. Handle and dispose of as a hazardous waste unless testing indicates otherwise. Decontaminate with detergent and water.

Section 7. Handling and storage

Avoid skin, eye, or respiratory exposure. Use appropriate PPE when handling or maintaining equipment, and wash thoroughly after handling (see Section 8). Keep product in original container or extinguisher. Contents may be under pressure – inspect for extinguisher rust periodically to insure container integrity. Do not mix with other extinguishing agents.

Section 8. Exposure controls/ personal protection

During the application of this product against fires, exhaust gases and the products of incomplete combustion (PICs) are the principal respiratory hazards. In the manufacture of extinguishers, automated systems and point source ventilation controls sufficiently minimize respiratory exposure. Employers and employees must use their collective judgment in determining occupational settings where the use of a respirator is prudent. The need for respiratory protection is not likely for short-term use in well ventilated areas.

Respiratory protection: use air-purifying respirator (APR) or powered air-purifying respirator (PAPR) with organic vapor cartridges/canisters for short term exposure, and supplied air/SCBA for high concentration or prolonged exposure.

Eye protection: wear chemical goggles.

Skin protection: use nitrile, latex, or similar gloves and coveralls. Good personal hygiene practices essential, such as avoiding food, tobacco products, or other hand-to-mouth contact when handling. Wash thoroughly after handling.

Section 9. Physical and chemical properties

Appearance: reddish colored liquid
Specific gravity: ~ 1.3
Solubility: soluble in water
Non –flammable
Flash point: none
Vapor pressure: < 10 mm Hg at room temperature
pH: approximately 8.5

Boiling point: ~ 300^{o} F
No explosive or oxidizing properties

Section 10. Stability and reactivity

Stability: stable

Incompatibles: strong acids, strong oxidizers such as sodium hypochlorite (bleach), aluminum, polyurethane, and any wet, reactive material.

Decomposition products: heat of fire may release carbon dioxide, phosphorus oxide, and acetic acid.

Possibility of hazardous reactions: none

Section 11. Toxicological information

Acute toxicity: Potassium acetate LD_{50} oral rat: 3250 mg/kg body weight
Phosphoric acid tributyl ester LD_{50} oral rat: >1400 mg/kg body weight
Target organs in man: respiratory system, eyes, skin. This product is a mild irritant to epithelial tissue, and may aggravate dermatitis. Ingestion may cause gastrointestinal injury. No information was found indicating the product causes sensitization.

Chronic toxicity: This product's ingredients are not considered as "probable" or "suspected" carcinogens by OSHA, IARC, or ACGIH.

Reproductive toxicity: This product's ingredients are not known to have reproductive or teratogenic effects.

Section 12. Ecological information

Ecotoxicity: weak environmental toxin, specific negative effects unknown.

Persistence/ Degradability: moderate biodegradation in soil, rapid photolytic degradation in air

Bioaccummulation: extent unknown

Mobility in soil: water soluble, slow to evaporate, may reach groundwater

---

Section 13. Disposal considerations

This product is not a RCRA characteristically hazardous or listed hazardous waste. Dispose of according to state or local laws, which may be more restrictive than federal laws or regulations. Used product may be altered or contaminated, creating different disposal considerations.

Section 14. Transportation information

This product is not a hazardous material under U.S. Department of Transportation (DOT) 49 CFR 172, and is not regulated by the DOT.

Section 15. Regulatory information

International Inventory Status
Some ingredients are on the following inventories

Country(ies)	Agency	Status
United States of America	TSCA	Yes
Canada	DSL	Yes
Europe	EINECS/ELINCS	Yes
Australia	AICS	Yes
Japan	MITI	Yes
South Korea	KECL	Yes

European Risk and Safety phrases:

EU Classification:	Xi.	Irritant
R Phrases:	36	Irritating to eyes.
S Phrases:	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	36	Wear suitable protective clothing.

U.S. federal regulatory information:

None of the chemicals in this product are under SARA reporting requirements or have SARA threshold planning quantities (TPQs) or CERCLA reportable quantities (RQs).

State regulatory information:

Chemicals in this product are not covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: None
California – Permissible Exposure Limits for Chemical Contaminants: None
Florida – Substance List: None
Illinois – Toxic Substance List: None
Kansas – Section 302/303 List: None
Massachusetts – Substance List: None
Minnesota – List of Hazardous Substances: None
Missouri – Employer Information/Toxic Substance List: None
New Jersey – Right to Know Hazardous Substance List: None
North Dakota – List of Hazardous Chemicals, Reportable Quantities: None
Pennsylvania – Hazardous Substance List: None
Rhode Island – Hazardous Substance List: None
Texas – Hazardous Substance List: No
West Virginia – Hazardous Substance List: None
Wisconsin – Toxic and Hazardous Substances: None

California Proposition 65: No component is listed on the California Proposition 65 lists.

Section 16. Other information

This MSDS conforms to requirements under U.S., U.K., Canadian, Australian, and EU regulations or standards, and conforms to the proposed 2003 ANSI Z400.1 format.

The information herein is given in good faith but no warranty, expressed or implied, is made.

The information herein is given in good faith but no warranty, expressed or implied, is made. Updated by Lindsay R. Hill, CIH.

APPENDIX A

MANUAL P/N: 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Tested and Listed By
The Loss Prevention Certification Board

LPCB
LOSS PREVENTION
CERTIFICATION BOARD
Approved to LPS 1223
LPCB Ref. No. 407a/01

December 2008

Statements on this page are not UL or ULC Listed.

Appendix A Special Application Guidelines

The information contained in this Section is exclusively for use in the protection of risks for which a **L**oss **P**revention **C**ertification **B**oard System Approval Label is required.

Appendix A1:

The installation of a Deep Fat Fryer Nozzle PN13729 at a height lower than its listed minimum is only permitted if provisions are made to accommodate the resultant splashing of grease. This need may occur due to the low height of the hood provided over the appliance. In the event of such a situation precautions must be taken to prevent the splashing of the hot grease onto persons or flammable material located adjacent to the appliance. Any opening that would allow this to happen must be closed off by the installation of a guard of sufficient size to prevent the splashing. The required guard height above the appliance is limited to the size of the opening or 18" whichever is less. A guard higher than 18" is permitted but not required. This provision will then allow the nozzles to be located at a height less than the listed minimum. The lowest nozzle height is limited to 16" above the liquid level of the grease.

Extinguishment at this lower height is enhanced due to the increase of agent being applied directly to the burning grease and none being allowed to spray outside the appliance. A high degree of fire safety is achieved and public safety is preserved.

Appendix A2:

The term "Commercial" is used interchangeably with "Industrial" as it applies to cooking appliances. Both refer to the preparation of food for sale, with the primary difference being the quantity of food cooked and to whom the consumer is. None of those considerations are of any importance when it comes to fire suppression and safety

APPENDIX B

MANUAL P/N: 20150

AMEREX
RESTAURANT
FIRE SUPPRESSION SYSTEM

Certified to meet SOLAS 74 by DNV
Compliance Tested to ISO-15371

December 2008

Statements on this page are not UL or ULC Listed.

Appendix B Special Application Guidelines

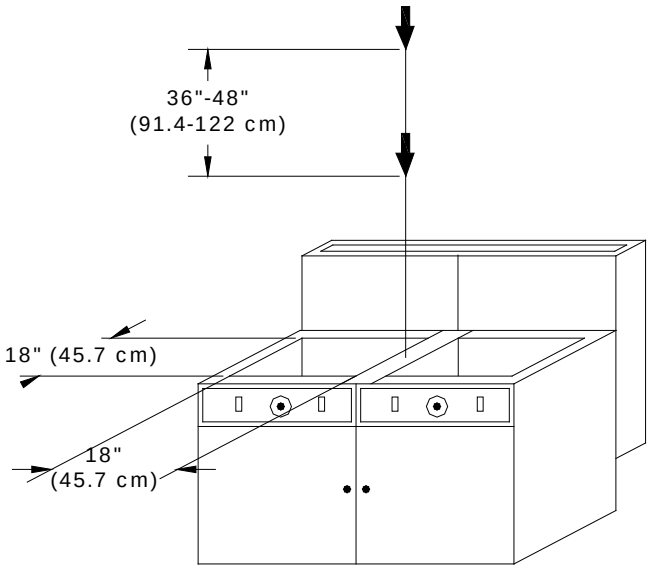
The information contained in this Section is exclusive to the fire extinguishing system for the protection of galley deep fat fryers, located on board ships requiring DNV certification of a SOLAS 74 approved system tested in compliance with ISO – 15371 Fire Test Specification.

Appendix B1:

The installation of a Deep Fat Fryer Nozzle PN13729 at a height 36”- 48” located anywhere over the appliance and aimed at the center of the hazard will protect a Full Vat Deep Fat Fryer with a cooking area equal to the listing found on page 3-6 of the Amerex – “Design, Installation, Maintenance & Recharge Manual”, Part No. 20150.

Appendix B2:

The installation of a Deep Fat Fryer Nozzle PN13729 at a height 36”- 48” located anywhere over the appliance and aimed at the center of the hazard will protect a Split Vat Deep Fat Fryer with two cooking areas equal to 18” x 18”each. Refer to the drawing below for the optima positioning of the nozzles.



Distribution piping is to be stainless steel tubing. The following equivalent sizes are to be used in place of the standard pipe sizes:

3/8”pipe = 10mm minimum S.S. tubing with min. wall of 1.0mm

½” pipe = 16 mm minimum S.S. tubing with min. wall of 1.0mm

All other piping limitations, appliances, ducts and plenum coverage are contained within the body of the Amerex “Design, Installation, Maintenance & Recharge Manual”, Part No. 20150. Compliance with these limitations is required to provide a compliant fire extinguishment system.

APPENDIX C

MANUAL P/N: 26692

AMEREX
STRIKE™ ECS INSTALLATION, OPERATION & MAINTENANCE MANUAL

February 2019

COVER SHEET

DO NOT PRINT THIS PAGE FOR ACTUAL MANUAL. INTERNAL USE ONLY.

PART NUMBER	TITLE	DATE CREATED	CREATED BY	REV.	CK'D
26692	MANUAL STRIKE™ KP™	02/01/2019	JV	-	

#	NOTES
1	**THIS COVERSHEET IS FOR INFORMATIONAL PURPOSES ONLY - DO NOT PRINT THIS PAGE FOR ACTUAL MANUAL.**
2	INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR STRIKE™ SYSTEM ELECTRONICS
3	**<u>THIS MANUAL IS TO BE ORDERED ONE OF TWO WAYS:</u>** **1. ORDERED WITH AND INCLUDED (BOUND) AT THE END OF KP™ MANUAL (P/N 20150) AS AN APPENDIX C.** **2. ORDERED AS A STAND ALONE MANUAL: 20# BOND PAPER, BOUND LEFT EDGE & 3 HOLE PUNCHED. COVER IS VIA COVER 80#, COLOR: DARK ORANGE**
4	TOTAL OF 81 PRINTED PAGES.
5	COLOR INK ON WHITE PAPER
6	
7	
8	

REV	DRAWING CHANGE	BY	ECN#	DATE
-	INITIAL RELEASE	JV	B000947	02/01/2019

STRIKE™ ELECTRONIC CONTROL SYSTEM (ECS) FOR USE WITH KP™ FIRE SUPPRESION SYSTEMS

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

Appendix C to KP™ Design, Installation, Maintenance & Recharge Manual (P/N 20150)

AMEREX STRIKE™ ELECTRONIC CONTROL SYSTEM

AMEREX KITCHEN PROTECTION

Quality is Behind the Diamond

AMEREX® CORPORATION
P.O. Box 81
7595 Gadsden Highway
Trussville, AL 35173
www.amerex-fire.com

Customer Service:
Phone: (205) 655-3271
customer.service@amerex-fire.com

Technical Service:
Phone: (205) 655-3271
tech.services@amerex-fire.com

Revision Record			
Revision	**Revision Date**	**Page**	**Description**

Table of Contents:

Chapter 1: General Information

This document must be used in conjunction with the following standards:

1. NFPA 17A — Wet Chemical Extinguishing Systems, NFPA 72 — National Fire Alarm Code, and NFPA 70 — National Electrical Code.
2. All other standards or laws deemed applicable to an installation by local authorities having jurisdiction (AHJ).

The information and components included in this manual have been evaluated by UL LLC (UL).

⚠ **AMEREX® STRIKE™ ELECTRONIC UNITS ARE TO BE USED ONLY WITH THE AMEREX® KP™ WET CHEMICAL EXTINGUISHING SYSTEM UNITS AND THE QUALIFIED COMPONENTS AND CABLES THEREOF. USE OF EQUIPMENT OR COMPONENTS NOT SPECIFICALLY REFERENCED IN THE AMEREX® KP™ MANUAL (P/N 20150) IS NOT PERMITTED AND WILL VOID THE AMEREX® WARRANTY. IT IS THE RESPONSIBILITY OF INDIVIDUALS WHO INSTALL, OPERATE, INSPECT, RECHARGE AND /OR MAINTAIN THESE SYSTEMS TO READ THIS ENTIRE MANUAL. SUCH INDIVIDUALS MUST BE TRAINED BY AMEREX® AND HOLD A CURRENT AMEREX® CERTIFICATE.**

Updated Installation, Operation, and Maintenance Manuals and Technical Bulletins will be available online at www.amerex-fire.com. It is important that these updates and additions be added to this manual according to the instructions that will accompany them.

The applications and use of the AMEREX® STRIKE™ Electronic Control System (ECS) are limited to the applications and uses described in this manual. Technical data contained herein is based on controlled laboratory testing deemed appropriate by UL LLC (UL) and other listing agencies, and is intended for informational purposes only. The data presented is accurate for the testing performed, but is published with no guarantee relative to a given hazard where factors are different from those encountered during actual tests. AMEREX® disclaims any liability for any use of the data and information contained herein by any and all other parties. Please direct questions concerning information in this manual to:

AMEREX® CORPORATION

Restaurant Systems Customer Support Group

P.O. Box 81 Trussville, AL 35173-0081

Phone: (205) 655-3271

Fax: (205) 655-3279

Email: sales@amerex-fire.com

1.1 Introduction

The AMEREX® STRIKE™ Electronic Control System (ECS) is an electronic system which is designed specifically for use as an automatic detection and actuation control for the UL Listed AMEREX® KP™ wet chemical extinguishing system for the protection of commercial cooking equipment including hoods, ducts, plenums and appliances. The STRIKE™ ECS is designed for the most rugged kitchen environments and includes circuits for two zones of detection (Class B), manual release (Class B) and two zones of actuation, all supervised by the central STRIKE™ Fire Suppression Control Unit mounted within a protective and lockable stainless steel enclosure. Auxiliary relay module and FACP communication circuits are also provided. The STRIKE™ ECS offers flexible options to meet the needs of modern restaurant and kitchen fire protection.

The STRIKE™ ECS is capable of operating using a preprogrammed configuration of default sensor alarm and actuation settings. For the advanced user requiring a custom configuration with additional system flexibility, the STRIKE™ ECS may be programmed via a laptop computer or PC. Once accessed, easy to use Windows based pull-down menu screens allow for application specific programming.

Benefits and Features of the STRIKE™ ECS:

- Internal, extended-life lithium batteries for power source with no external power requirements. Primary and Secondary batteries (supervised) provide continuous, uninterrupted fire detection and fire suppression system actuation.
- Central STRIKE™ Control Unit with system status indication and troubleshooting via LED indicators and audible alarm. Configurable wiring options include the following (All Circuits are Power Limited):
  - (2) Detection zone circuits, Class B, Style B with 470kΩ EOL (supervised)
  - (2) Actuation (release) zone circuits (supervised)
  - Manual pull station circuit, Class B, Style B with 470kΩ EOL (supervised)
  - Auxiliary Fire Alarm Control Panel (FACP) outputs
  - (3) Relay outputs for use with Relay Modules for gas valve or external device control
- Protective stainless steel, lockable enclosure used to house STRIKE™ Control Unit, batteries, and wiring terminations
- Ground fault monitoring, 0 Ohms
- Modular ‘plug and play’ connectors for all field wiring outside STRIKE™ Control Unit enclosure
- Event Data Recording with time and date stamp for up to 100 fault or alarm events
- STRIKE™ Control Unit temperature rating from 32ºF to 120°F (0ºC to 49ºC)
- Simple programming features for design installation flexibility
- Multiple Class B detection input types:
  - Spot Heat Sensors (SHD)
  - Linear Heat Detection (LHD)
- Dual actuation/release zones provide simultaneous actuation of multiple KP™ extinguishing systems as required
- ‘System Reset’/output signal override button and audible ‘Alarm Silence’ button
- Low battery warning and LED indicator

1.2 What Can Be Protected

A complete hazard analysis must be performed for each piece of kitchen equipment requiring protection to determine the areas that would require fire detection and suppression. Protection capabilities, in conjunction with an AMEREX® KP™ Fire Suppression System, may include but are not limited to the following equipment and associated hood system:

- Fryers
- Ranges
- Woks
- Griddles
- Char-broilers
- Upright Broilers
- Salamanders
- Exhaust Plenums
- Exhaust Ducts

Chapter 2: Component Description

This Chapter describes the various components available for use with the AMEREX® STRIKE™ Electronic Control System (ECS). These include the central STRIKE™ Control Unit, detection sensors, cables and other components that comprise a complete electrical system. A simple STRIKE™ ECS diagram is given below, which shows available circuits and components (See Figure 2). All available components, including additional components not shown in this diagram are detailed in the following sections. For information on the wet chemical extinguishing system, reference the latest revision of the AMEREX® KP™ Fire Suppression System Installation, Operation and Maintenance Manual (P/N 20150). Item numbers shown in brackets in the following section titles (**[ITEM X]**) correspond to the item numbers from the Parts List (See Section 2.12).

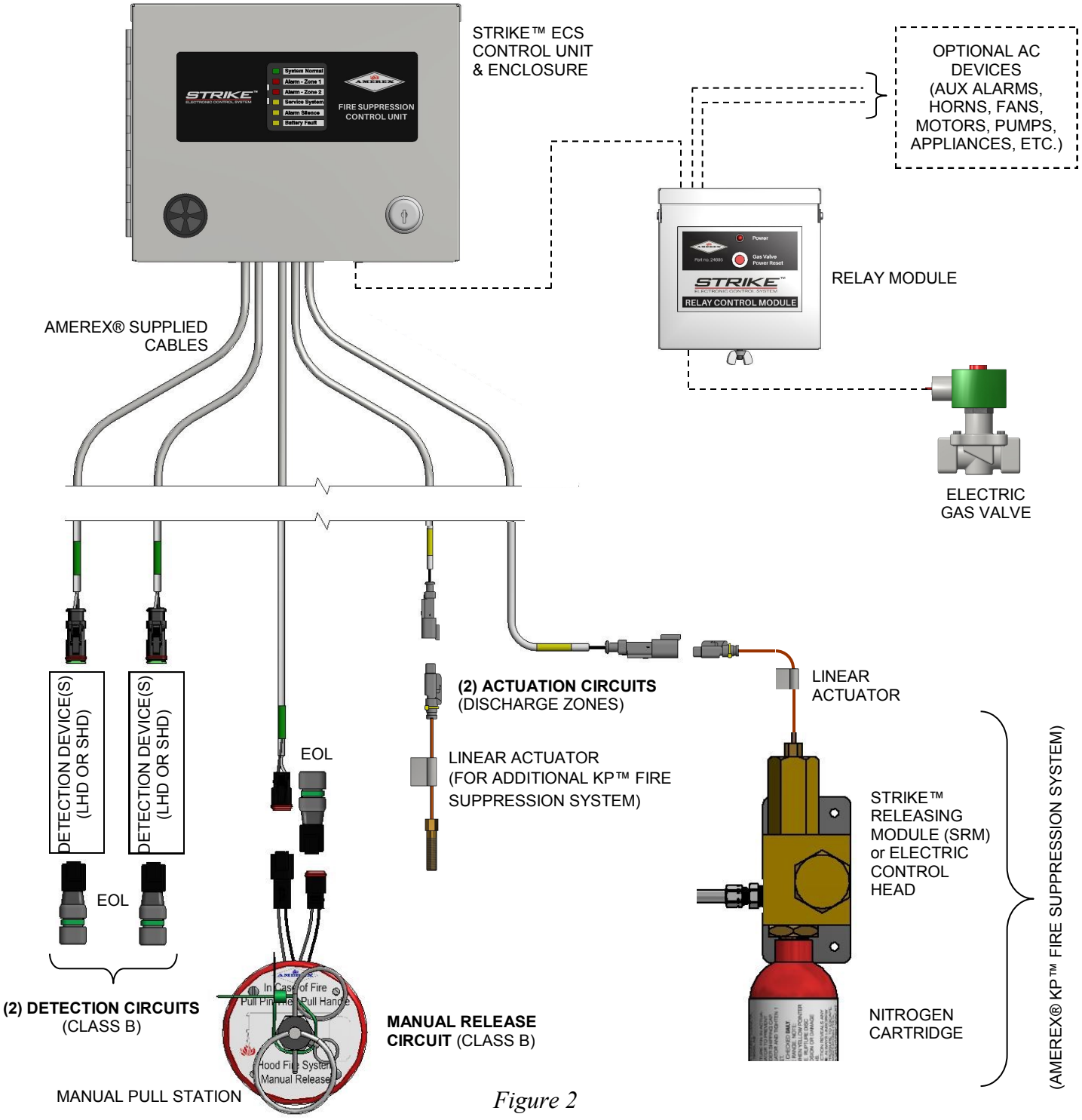


Figure 2

2.1 STRIKE™ Control Unit & Enclosure (P/N 23826) [ITEM 1]

The AMEREX® STRIKE™ ECS Control Unit is an alarm initiating and release unit designed to function without external power. The Control Unit utilizes two non-rechargeable batteries (provided separately as (2) P/N 24903) as a primary and secondary (backup) power supply and will sustain itself for up to six months. The Control Unit and batteries are housed within a protective stainless steel enclosure that can be surface mounted to a wall or other surface. The enclosure features a hinged, lockable door for internal access. All field wiring enters the enclosure through electrical knockouts and terminates to the labeled terminal boards on the Control Unit. Enclosure dimensions and features are shown below (See Figure 2.1a), along with an open enclosure (See Figure 2.1b). Control Unit front face indicators and features are also shown on the following page (See Figure 2.1c/Table 2.1a & 2.1b). All dimensions are in inches [mm].

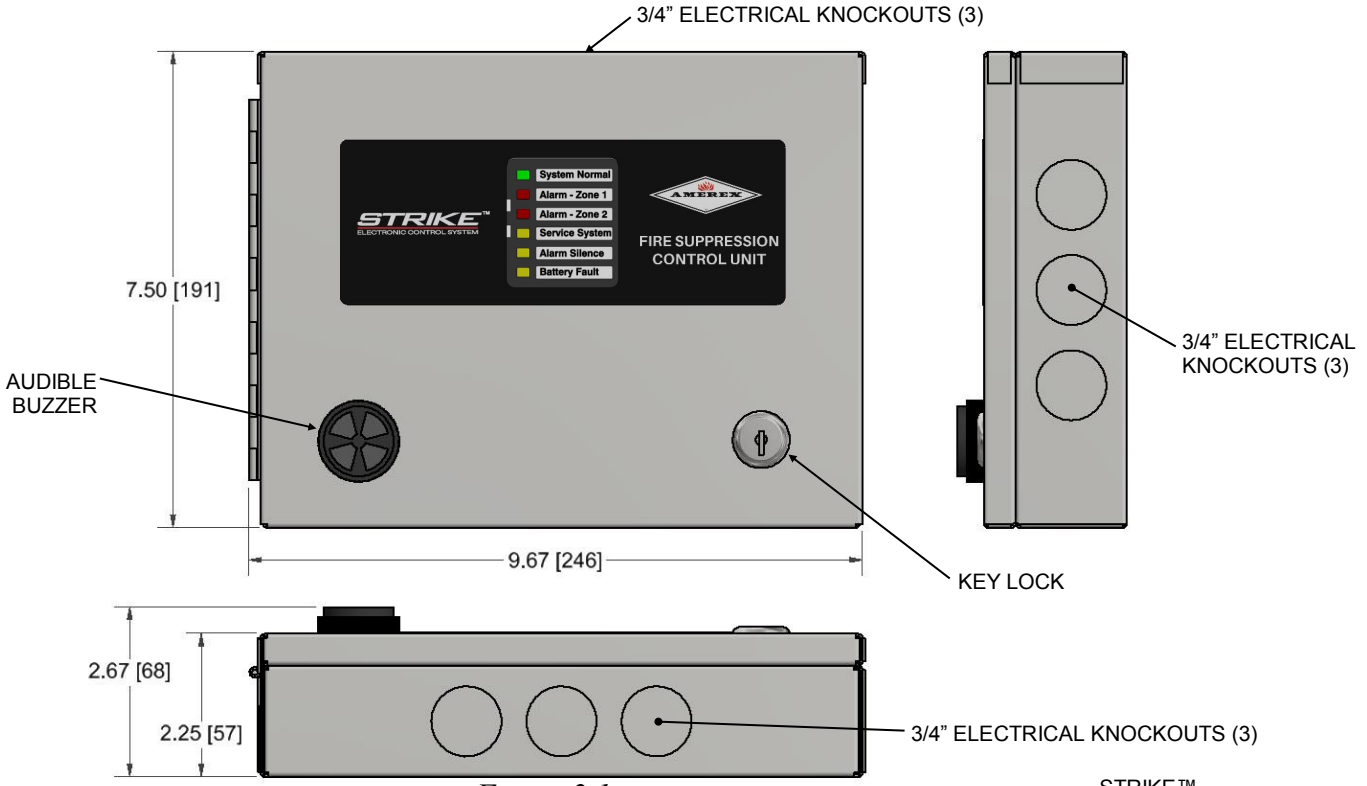


Figure 2.1a

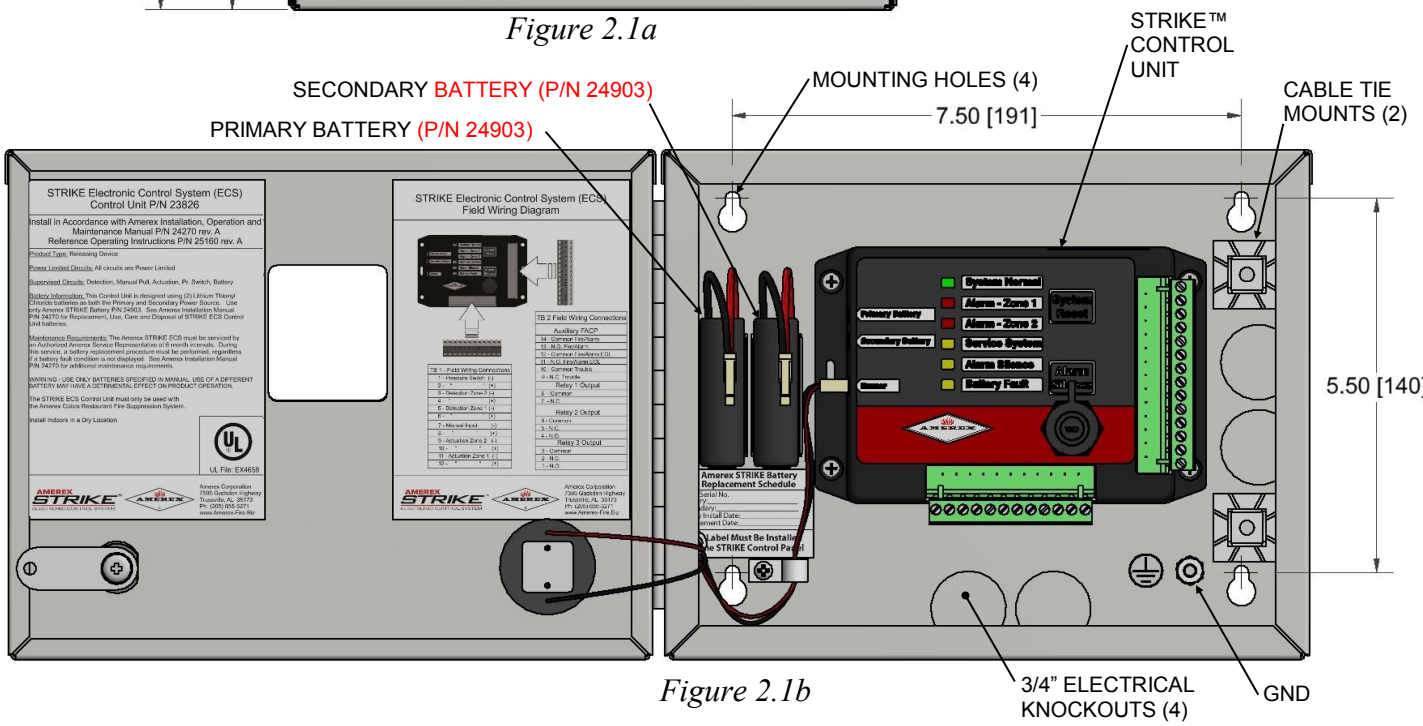


Figure 2.1b

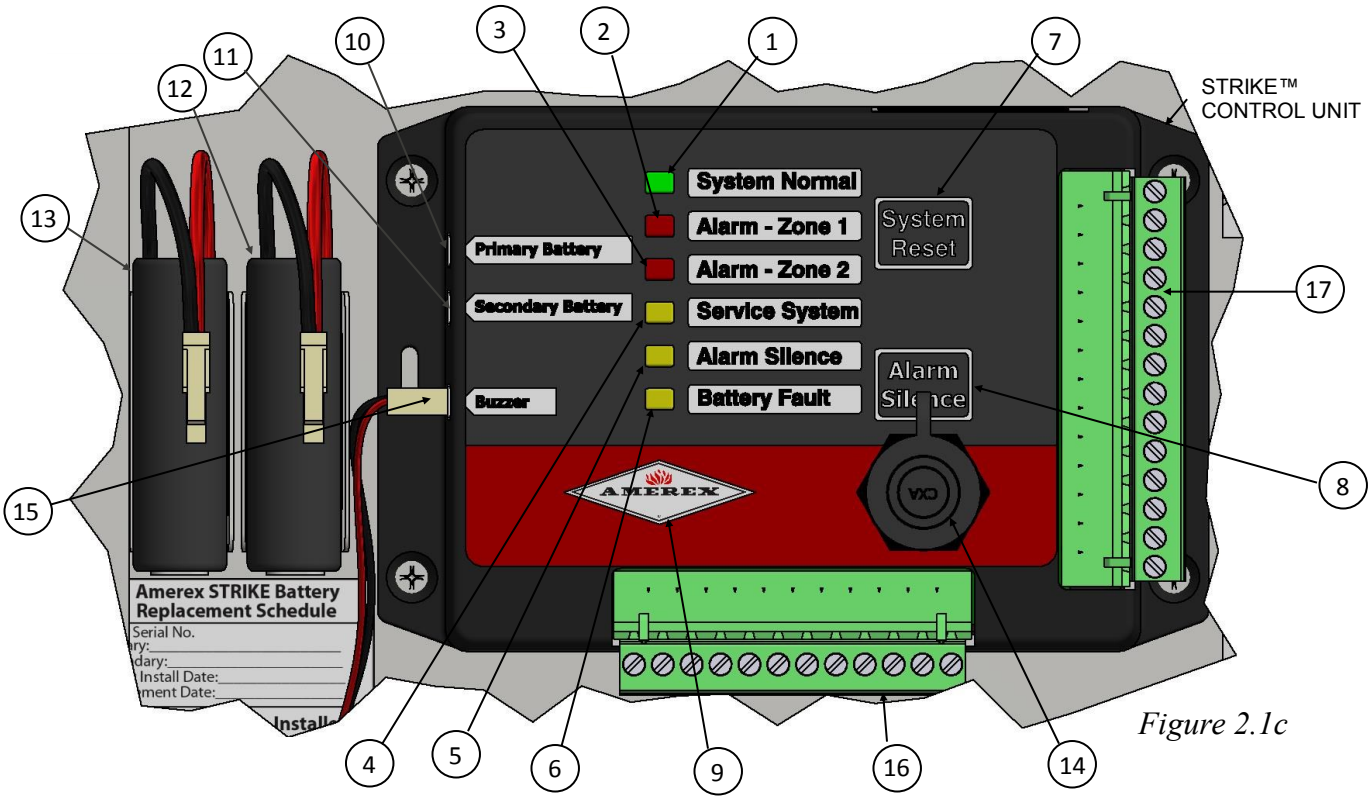


Figure 2.1c

Table 2.1a

STRIKE™ Control Unit Indicators/Features			
1	System Normal LED	**10**	Primary Battery Connection
2	System Alarm - Actuation Zone 1 LED	**11**	Secondary Battery Connection
3	System Alarm - Actuation Zone 2 LED	**12**	Secondary Battery (P/N 24903)
4	Service System (Fault) LED	**13**	Primary Battery (P/N 24903)
5	Alarm Silence LED	**14**	Computer Interface Port
6	Battery Fault LED	**15**	Alarm Buzzer Connection
7	System Reset Button	**16**	Terminal Board 1 (TB1): Detection, Release, Manual Pull & Pressure Switch Circuits
8	Alarm Silence Button		
9	Push To Test Button (AMEREX® logo)	**17**	Terminal Board 2 (TB2): Aux. FACP & Alarm Outputs

Table 2.1b

Control Unit Features/Specs	Notes
Power Input	Internal Lithium Batteries (Primary and Secondary; 2 x P/N 24903)
(2) Detection Circuits, Class B	Terminated with 470kΩ End of Line Device (EOL)
(1) Manual Pull Circuit, Class B	Terminated with 470kΩ End of Line Device (EOL)
(2) Actuation Circuits	Can be mapped to individual or both detection circuits
(1) Pressure Switch Circuit, (Not currently available with KP)	Terminated to NC Pressure Switch (closed under pressure)
(1) PC Interface Circuit	Used for STRIKE™ Control Unit programming, Monitor Mode, or Event Log
Auxiliary FACP Interface Outputs with programmable delay (Common)	Alarm (NO), Fault (NC) & COM contacts; FACP EOL resistor inputs NO rated for 1A @ 30 VDC; NC rated for 0.5A @ 30 VDC (Power Factor 1.0) Alarm: 0 second delay (default); Programmable delay 0 – 30 seconds Fault: 5 second delay (default); Programmable delay 5 – 30 seconds
(3) Alarm Outputs with programmable delay (Common)	For use with Relay Modules (P/N 24694 / 24695): (1) Output with NC, COM contacts for Gas Valve operation (2) Outputs with NO, NC, & COM contacts for optional device operation NO rated for 1A @ 30 VDC; NC rated for 0.5A @ 30 VDC (Power Factor 1.0) 0 second delay (default); Programmable delay 0 – 30 seconds
Weight	4.12 lb (1.87 kg)

2.2 Detection Devices

AMEREX® offers a two options of Class B heat detection devices for use with the STRIKE™ ECS for automatically detecting fire and overheat conditions. These include Spot Heat Detectors (SHD) and a Linear Heat Detector (LHD). A hazard analysis must be performed to identify proper selection and required quantity of heat detection devices.

2.2.1 Spot Heat Detectors (SHD), 350ºF (P/N 24944); 485ºF (P/N 24514) [ITEM 2]

Spot Heat Detectors (SHD) are normally open, self resetting contact closure devices. These devices are configured with four wires allowing supervision of series connected circuitry. The internal contacts of the devices will close upon reaching designed temperature set point parameters. Both SHDs are identical, except P/N 24944 has a set point of 350ºF (177ºC) as indicated by a red set point ID color, while P/N 24514 has a set point of 485ºF (252ºC) as indicated by a green set point ID color. Color coding (green) can be found on each connector. SHDs feature a bulkhead (Quik-Seal) mounting style with an included seal washer and jam nut.

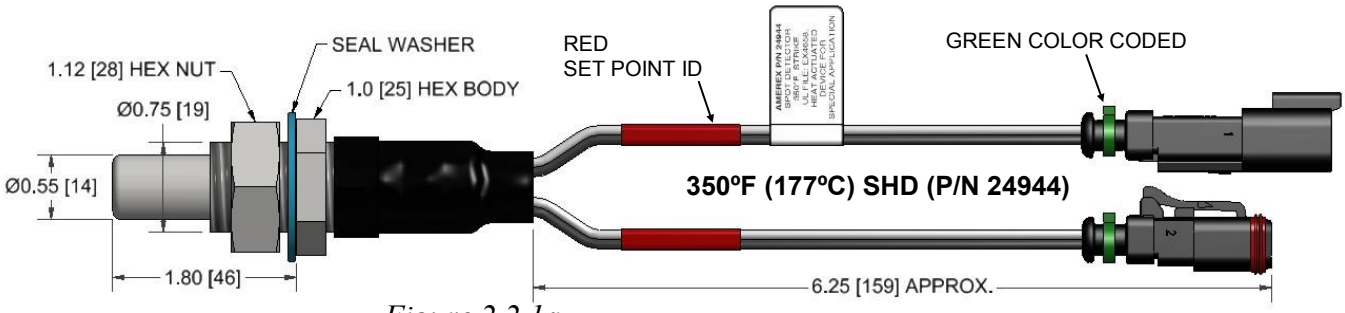


Figure 2.2.1a

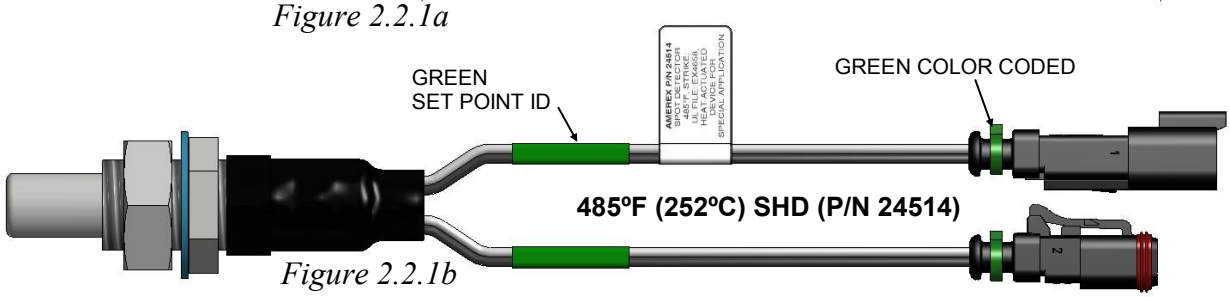


Figure 2.2.1b

2.2.2 Linear Heat Detector (LHD) (P/N 24744-XX) [ITEM 3]

A Linear Heat Detector (LHD) is a normally open device that closes when subjected to heat. The device is comprised of two internal coiled spring loaded conductors that make contact in the event of an overheat or fire condition. LHDs are color coded (green) and have a temperature set point of 356°F (180ºC). LHDs must be replaced once they detect an overheat condition. Various lengths of the LHD are available and shown in the Parts List (See Section 2.12). The LHD is supplied with an uninstalled connector and connector lock on one end to facilitate installation through an LHD Bulkhead Quik-Seal.

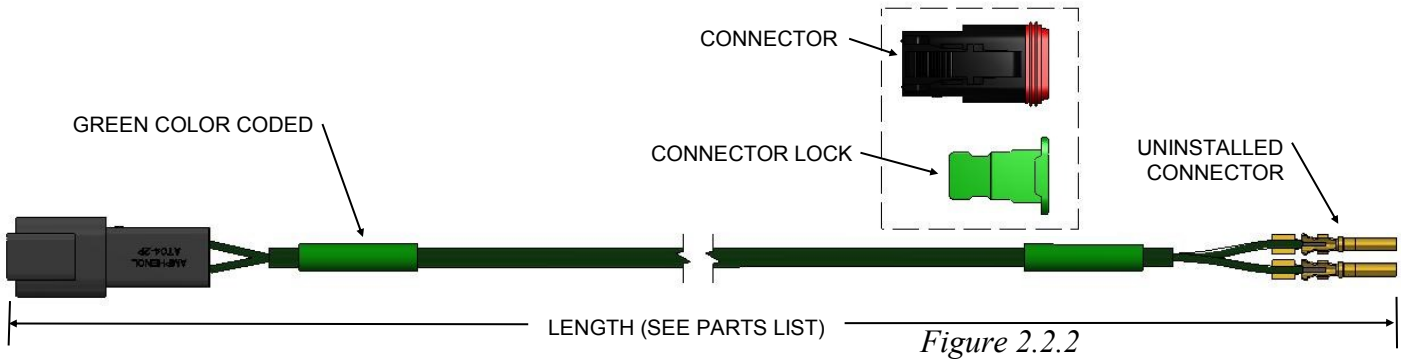


Figure 2.2.2

2.3 Manual Pull Stations, Flush Mount (P/N 24168); Surface Mount (P/N 24290) [ITEM 4]

AMEREX® offers two Manual Pull Stations for use with the STRIKE™ ECS. Manual Pull Stations are used to manually activate the STRIKE™ Control Unit from a remote location when a fire condition is observed. The Manual Pull Station contains a normally open internal switch that closes and locks when pulled. A Lock Pin and Tamper Seal are provided and prevent accidental pulling of the station. Two versions of the Manual Pull Station are available depending on the mounting configuration desired. A flush mount option (P/N 24168) is recessed into the mounting wall and features a red cover plate (See Figure 2.3a). A surface mount option (P/N 24290) features a red cover cup (See Figure 2.3b). Both versions utilize an included octagonal outlet/conduit box to house the Manual Pull Station electrical connectors. All dimensions are in inches [mm].

FLUSH MOUNT (P/N 24168)

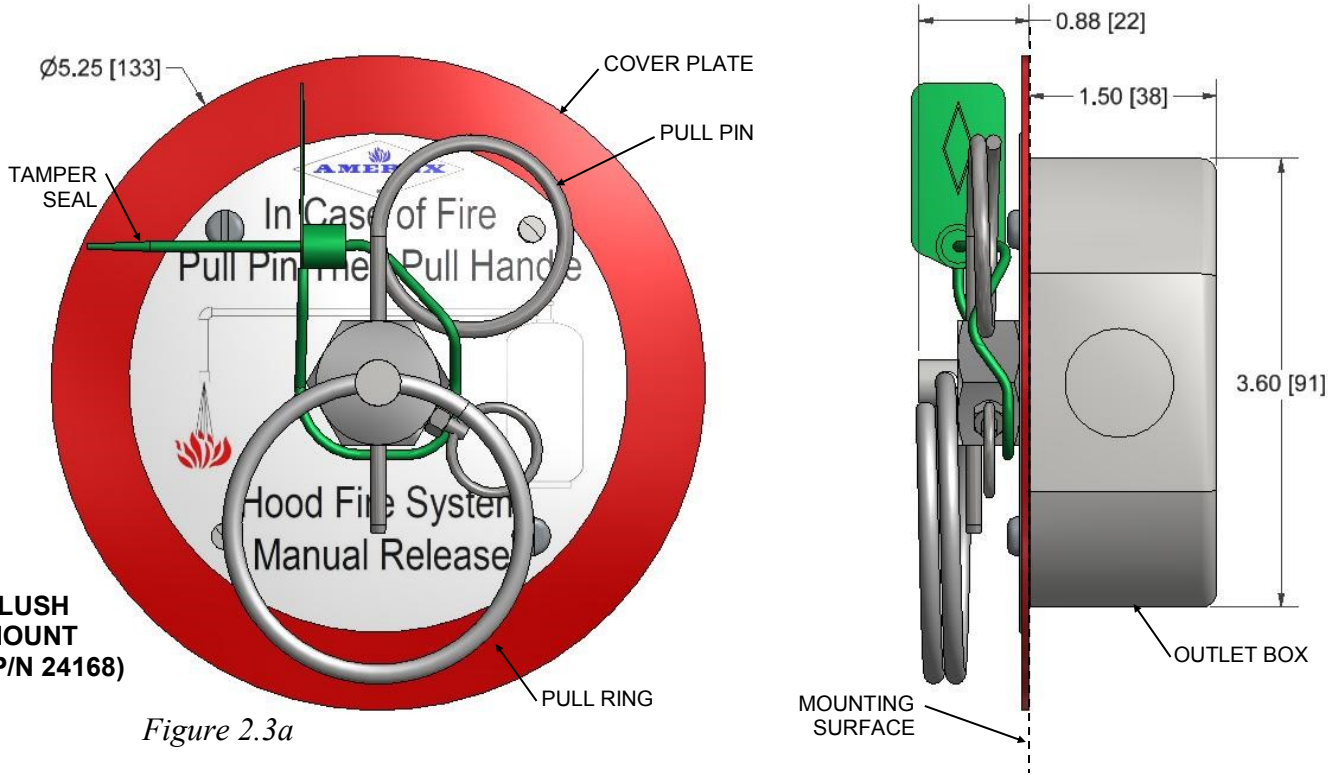


Figure 2.3a

SURFACE MOUNT (P/N 24290)

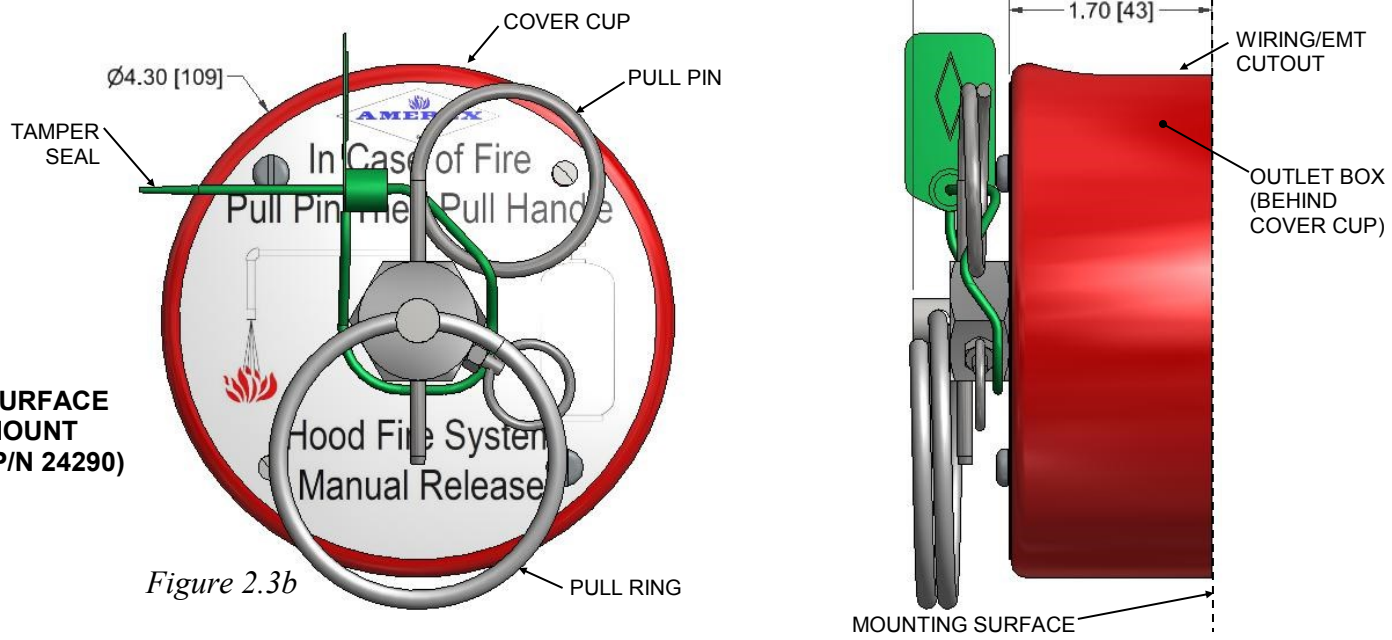


Figure 2.3b

2.4 Field Wiring Cables

AMEREX® offers pre-assembled modular cables for use with the STRIKE™ ECS. These cables are pre-terminated with connectors and color coded to allow easy installation and troubleshooting. These cables are divided into two groups: lead and extension cables. Lead cables feature blunt cut wires on one end for connection to the terminal strip (TB1) on the STRIKE™ Control Unit and a connector on the opposite end that mates with an external device, such as a detection device, Manual Pull Station, Linear Actuator, etc. Extension cables feature connectors on both ends and are used to connect one external device to another in series.

2.4.1 Detection Cables, Lead (P/N 24409-XX); Extension (P/N 24410-XX) [ITEM 5 / 6]

Detection Lead Cables are used to connect a detection device (LHD or SHD) to the STRIKE™ Control Unit in the detection circuits only. Detection Extension Cables are used as an extension between individual detection devices connected in series. Color coding (green) can be found on each cable end. Various lengths of each cable are available and shown in the Parts List (See Section 2.12).

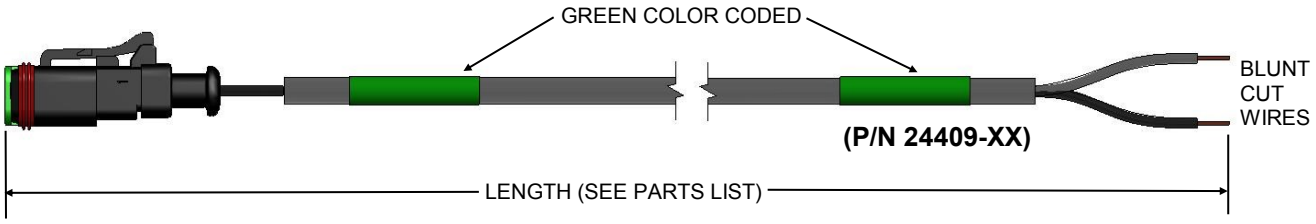


Figure 2.4.1a

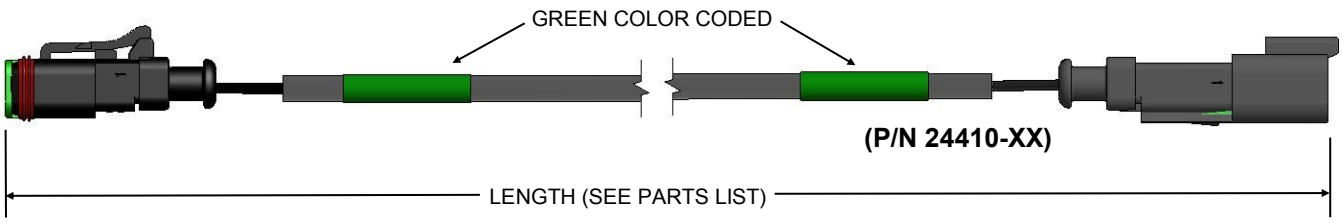


Figure 2.4.1b

2.4.2 Actuation Cable, Lead (P/N 24411-XX) [ITEM 7]

Actuation Lead Cables are used to connect a Linear Actuator to the STRIKE™ Control Unit in an actuation circuit only. Only one Linear Actuator may be connected to each actuation circuit, therefore no extension cables are available. Color coding (yellow) can be found on each cable end. Various lengths of this cable are available and shown in the Parts List (See Section 2.12).

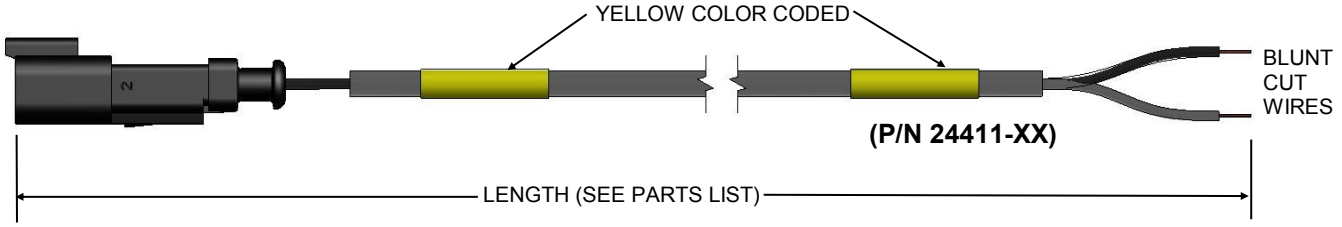


Figure 2.4.2

2.4.3 Manual Pull Station Cables, Lead (P/N 24412-XX); Extension (P/N 24413-XX) [ITEM 8 / 9]

Manual Pull Station Lead Cables are used to connect a Manual Pull Station to the STRIKE™ Control Unit in the manual pull circuit only. Manual Pull Station Extension Cables are used as an extension between multiple stations connected in series. Color coding (green) can be found on each cable end. Various lengths of each cable are available and shown in the Parts List (See Section 2.12).

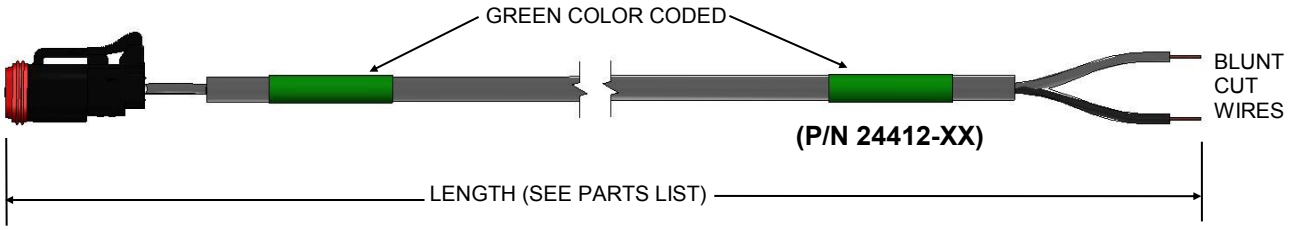


Figure 2.4.3a

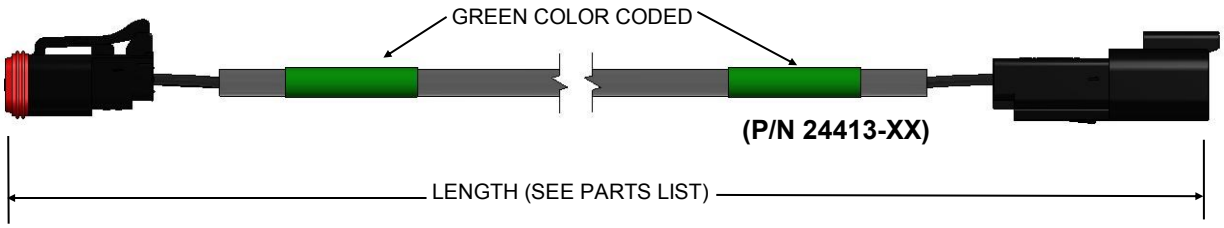


Figure 2.4.3b

2.4.4 Pressure Switch Cables, Lead (P/N 24414-XX); Extension (P/N 24703-XX) [ITEM 10 / 11]

The Pressure Switch Circuit is not currently available for use with KP™. This section is reserved.

2.4.5 Communication Cable (P/N 25264-XX) [ITEM 12]

The Communication Circuit is not currently available for use with KP™. This section is reserved.

2.4.6 PC Interface Cable (P/N 16609) [ITEM 13]

The PC Interface Cable is used with the STRIKE™ PC software to program a system configuration, view Monitor Mode, or download the Event Log on the STRIKE™ ECS. The cable connects the PC Interface Port on the STRIKE™ Control Unit to the USB port of a laptop computer or PC. The latest version of STRIKE™ PC software is available on and can be downloaded from the www.amerex-fire.biz website.

Figure 2.4.5

2.5 KP™ Cylinder Pressure Switch [ITEM 14, Reference Only]

The Pressure Switch Circuit is not currently available for use with KP™. This section is reserved.

2.6 Linear Actuator (P/N 24448) [ITEM 15]

The Linear Actuator is a device that, when electrically activated, extends a metal shaft to mechanically open agent cylinder (with an electric actuation option) in the AMEREX® KP™ Fire Suppression System. The Linear Actuator connects to the end of an actuation circuit and is color coded yellow. Once activated, a Linear Actuator cannot be reused and must be replaced. Service life of the Linear Actuator is 6 years after which it must be replaced. Total life of the Linear Actuator is 10 years after which it must be replaced whether it has been placed in service or not. Each Linear Actuator is supplied with a Mylar style label for identifying date of manufacture. Reference the latest AMEREX® KP™ Fire Suppression Installation, Operation and Maintenance Manual (P/N 20150) for selection of a suppression system with electric actuation capability.

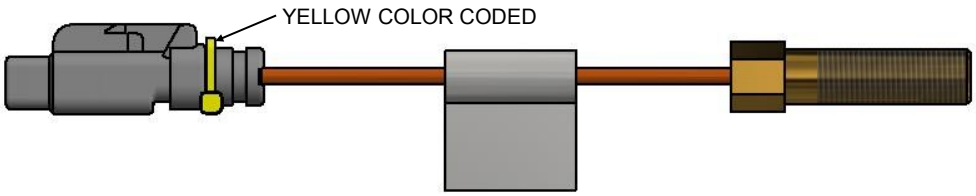


Figure 2.6

2.7 End Of Line Module (P/N 23474) [ITEM 16]

The End Of Line Module (EOL) is utilized to supervise circuitry and installed on the end of the Class B detection circuits and manual pull circuit. The device provides a continuous electrical circuit allowing for supervision of the normally open detection network. Three EOL modules are supplied with each STRIKE™ Control Unit: two for detection circuits and one for the manual pull circuit. The EOL is color coded green.

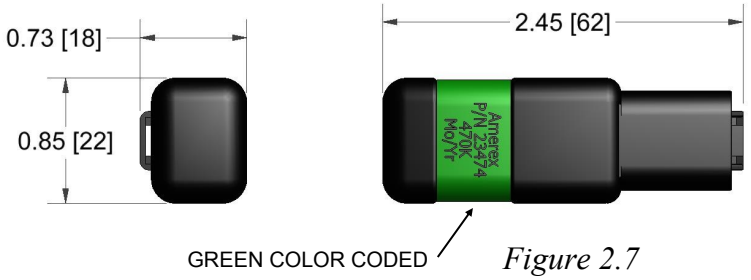


Figure 2.7

2.8 Battery, Service & Replacement (P/N 24903) [ITEM 17]

The STRIKE™ Control Unit requires two batteries (2 x P/N 24903), a primary and secondary, which are capable of sustaining normal operating condition of the electronics for up to 6 months, after which a Replacement Battery is required. These additional Replacement Batteries are supplied with a battery identification label located on each (See Figure 2.8a) which displays the AMEREX® part number, serial number, and battery description. An additional battery replacement label is also supplied with each battery and must be populated and applied during installation of a Battery (See Figure 2.8b). Specific battery replacement instructions and directions for installing this label are described in Section 5.5. The Replacement Batteries are UN/DOT compliant for shipping purposes and must be stored in a clean, cool (86ºF/30ºC max), and dry environment. Replacement battery shelf life is 10 years.

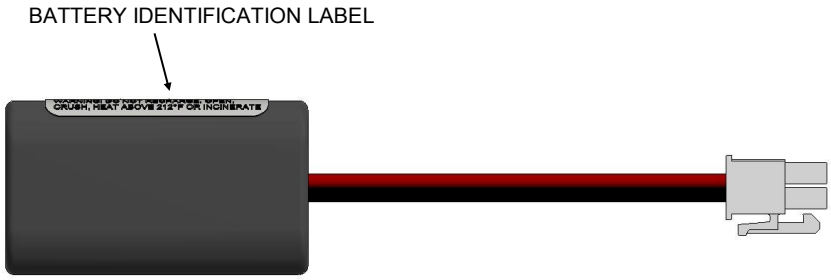


Figure 2.8a

Figure 2.8b

2.9 Auxiliary Devices

The following auxiliary devices are available for use with the AMEREX® STRIKE™ ECS. Relay Modules can be connected to the auxiliary outputs terminal (TB2) on the STRIKE™ Control Unit and used to control other auxiliary devices such as AMEREX® supplied Electric Gas Valves and Horn and Strobe Assemblies, as well as other AC powered external signaling devices, fan motors, pumps, appliances, etc.

2.9.1 Relay Modules, Gas Valve Only (P/N 24694); Control (P/N 24695) [ITEM 18]

Relay Modules are used to control external 110-220 VAC devices in the event of an alarm condition or loss of power. These modules are controlled by and connected to the auxiliary outputs (TB2) of the STRIKE™ Control Unit and contain electrical terminals for AC power and external devices. These modules are surface mounted to a wall and consist of a stainless steel housing with a hinged cover for internal access and (4) 3/4" electrical knockouts for all associated wiring.

Relay Modules feature an AC power indicator LED and an internal relay (Relay #1) with manual reset button for connection to an Electric Gas Valve. In the event of a STRIKE™ Control Unit alarm condition or AC power failure, this relay will electrically close the associated gas valve, preventing gas flow to a connected appliance. The gas valve may then only be opened by manually resetting the Relay Module by pressing the reset button located on the module face. Two versions of Relay Modules are available. The Gas Valve Relay Module (P/N 24694) contains the single gas valve relay and manual reset only (See Figure/Table 2.9.1a). The Control Relay Module (P/N 24695) contains two addition relays (Relay #2 & #3) for control of external AC powered devices, in addition to the gas valve relay and manual reset (See Figure/Table 2.9.1b). All dimensions are in inches [mm].

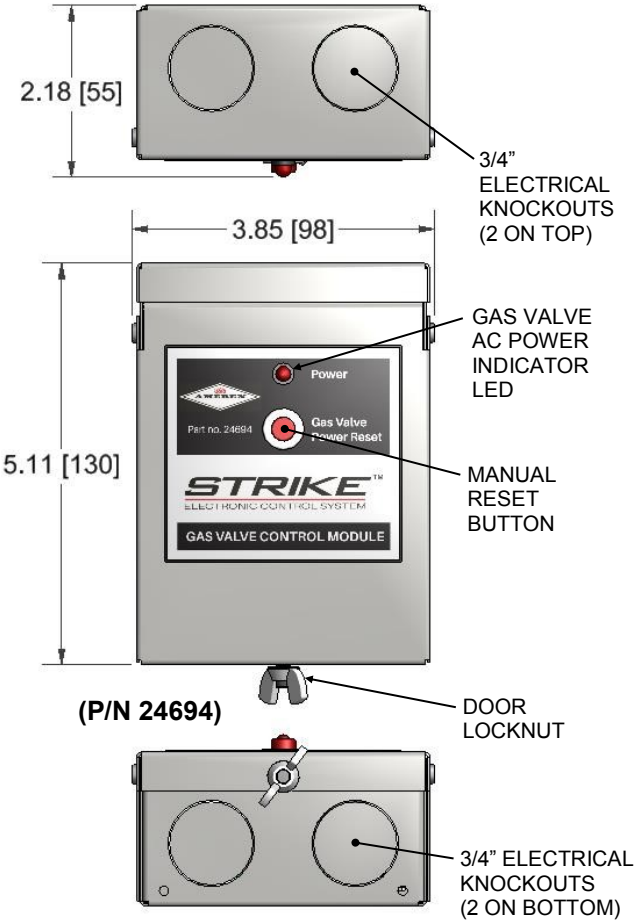


Figure 2.9.1a

Gas Valve Relay Module (P/N 24694)	
Features/Specs	**Notes**
Single AC Gas Valve Relay	Provides normal gas valve operation and fail safe shutdown (latching) in the event of an alarm condition (from STRIKE™ Control Unit) or AC power failure; Rated for 10 Amps @ 110-220 VAC; UL Listed Electronics (UL 508)
Manually Resettable	Manual Reset Button located on module face resets single relay and restores power to gas valve
Gas Valve AC Power Indicator LED	LED located on module face indicates a System Normal condition with AC power delivered to gas valve
Momentary Power Failure Operation	Provides normal operation for up to 2 seconds during momentary power glitch or failure
Stainless Steel Enclosure with Hinged Door	Type I UL Listed Enclosure (UL 50E)
Power Consumption	Normal Operation: 35 mA (4 watts) @ 120 VAC
Temperature Rating	-40ºF to 104ºF (-40ºC to +40ºC)
Weight	1.0 lb (0.45 kg)

Table 2.9.1a

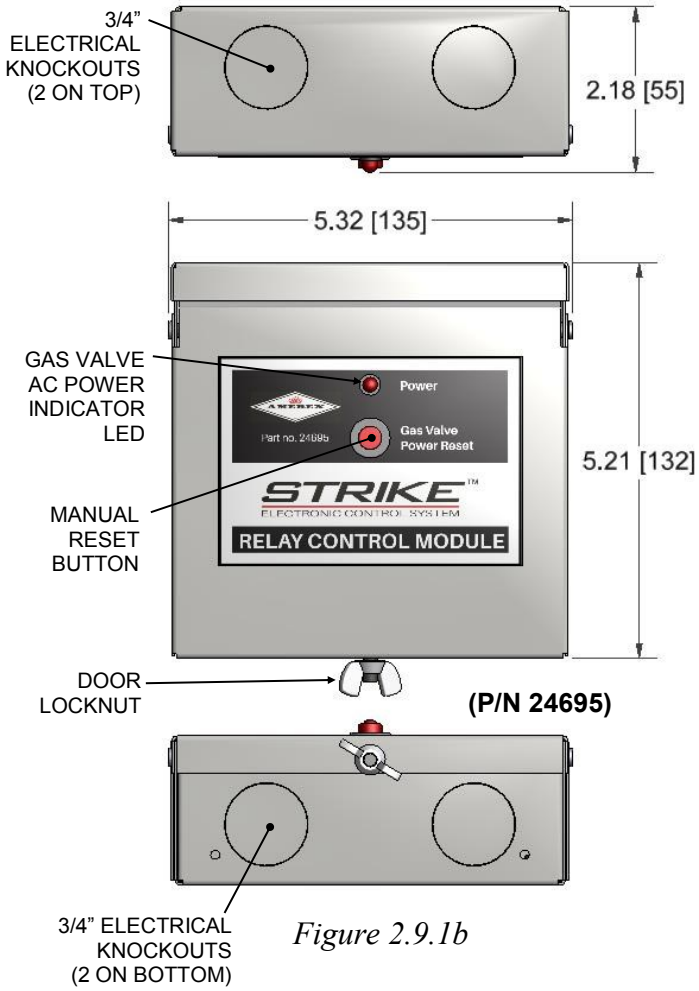


Figure 2.9.1b

Relay Control Module (P/N 24695)	
Features/Specs	**Notes**
Single AC Gas Valve Relay	Provides normal gas valve operation and fail safe shutdown (latching) in the event of an alarm condition (from STRIKE™ Control Unit) or AC power failure; Rated for 10 Amps @ 110-220 VAC; UL Listed Electronics (UL 508)
Two Additional AC Relays (#2 & #3)	Switching capability for additional AC powered devices; Rated for 10 Amps @ 110-220 VAC
Manually Resettable (Gas Valve Relay only)	Manual Reset Button located on module face resets relay and restores power to gas valve
Gas Valve AC Power Indicator LED	LED located on module face indicates a System Normal condition with AC power delivered to gas valve
Momentary Power Failure Operation	Provides normal operation for up to 2 seconds during momentary power glitch or failure
Stainless Steel Enclosure with Hinged Door	Type I UL Listed Enclosure (UL 50E)
Power Consumption	Normal Operation: 35 mA (4 watts) @ 120 VAC
Temperature Rating	-40ºF to 104ºF (-40ºC to +40ºC)
Weight	1.3 lb (0.59 kg)

Table 2.9.1b

2.9.2 Electric Gas Valves (P/N *Varies*) [ITEM 19]

Gas Valves must be used on all gas-fired cooking appliances requiring AMEREX® KP™ Fire Suppression System protection. An electric option is available for use with the STRIKE™ ECS. These valves operate on standard 120 VAC and are installed in the gas supply line to the appliance. Electrical current holds an internal solenoid open, allowing the flow of gas to the appliance under normal operating conditions. In the event of an alarm condition on the STRIKE™ Control Unit or building power interruption, a Relay Module interrupts the electric current, closing the gas valve. **An AMEREX® supplied Relay Module (P/N 24694/24695) must be used in conjunction with any Electric Gas Valve.** Various UL Listed sizes of Electric Gas Valves are available (See Table 2.9.2).

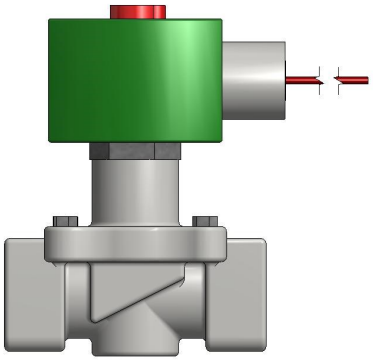


Figure 2.9.2

P/N	Size (NPT)	Manufacturer
12870	3/4 in	ASCO
12871	1 in	
12872	1 1/4 in	
12873	1 1/2 in	
12874	2 in	
12875	2 1/2 in	
12876	3 in	

Table 2.9.2

2.9.3 Horn & Strobe Assembly, 120 VAC (P/N 21396) [ITEM 20]

A Horn & Strobe Assembly is available for use when audio and visual indicators are required in the event of an alarm condition. This device operates on standard 120 VAC and is installed using an installer supplied standard 4" (10.16 cm) square by 2 1/8" (5.5 cm) deep back electrical box with conduit entrance. The device may be installed indoors or outdoors. When using this device in conjunction with the AMEREX® STRIKE™ ECS, a Relay Module is required to control AC power to the device. **An AMEREX® supplied Relay Control Module (P/N 24695) must be used in conjunction with any Horn & Strobe Assembly used to indicate a STRIKE™ Control Unit alarm condition.** Installation instructions are provided with each Horn & Strobe Assembly.

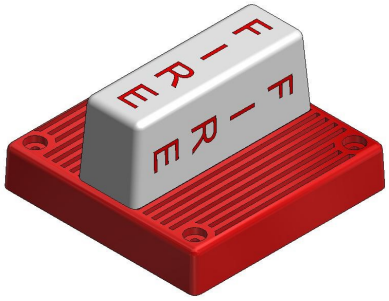


Figure 2.9.3

2.10 Detection (LHD) Installation Accessories

The following accessories are available for use with the AMEREX® STRIKE™ ECS when installing a Linear Heat Detector (LHD) as a detection device. When installing an LHD in a hood, plenum or duct it must be secured using LHD Support Clips and Tubing. These clips may be attached using installer supplied fasteners or AMEREX® supplied rivet style or Quik-Fasteners. When penetrating a hood, plenum or duct with an LHD, an LHD Bulkhead Penetration Seal must be used.

2.10.1 LHD Support Clips (P/N 16501/23524) & Support Tubing (P/N 24539) [ITEM 21 /22]

AMEREX® supplied LHD Support Clips and Support Tubing must be used for securing and supporting an LHD detection device throughout the hood, plenum or duct. These are available painted red (P/N 16501) or stainless steel (P/N 23524). These clips contain a 1/4" (6 mm) mounting hole used for attachment (See Figure 2.10.1b). In addition, the Support Tubing must be used to secure and cushion the LHD in the Support Clip. These part numbers are supplied in bags of quantity 25 each. All dimensions are in inches [mm].

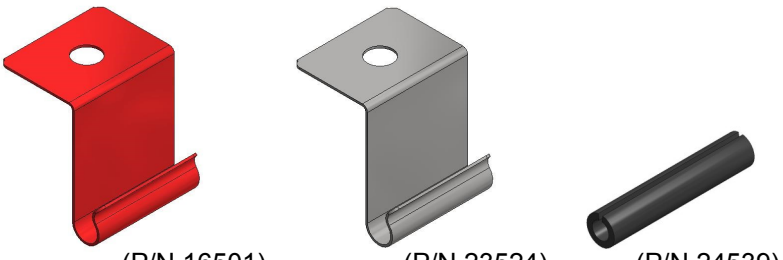


Figure 2.10.1a

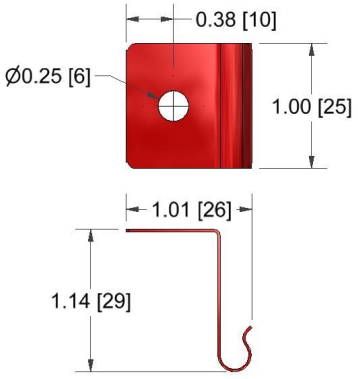


Figure 2.10.1b

2.10.2 Hood Fasteners, Quik-Fastener (P/N 24832) [ITEM 23]

Quik-Fasteners are available for securing LHD Support Clips to a sheet metal mounting surface. These fasteners are supplied 24 to a bag along with a pilot drill bit for easy installation using a hand drill (capable of 2000-3500 rpm) with a 10 mm hex driver. These fasteners are self sealing. Installation instructions are provided with each bag. All dimensions are in inches [mm].

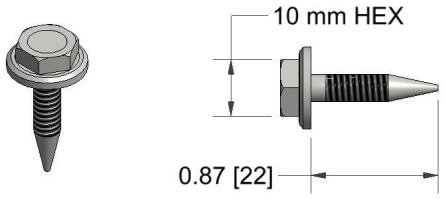


Figure 2.10.2

2.10.3 Hood Fasteners, Rivet Style: Rivet Stud (P/N 20535); Rivet Nut (P/N 20536); Rivet Installation Tool Set (P/N 20552) [ITEM 24 / 25 / 26]

Installer supplied standard 1/4" fasteners or Quik-Fasteners may be used for securing LHD Support Clips to a hood mounting surface. However, if no access is available to the opposite side of the support structure, blind rivet-style fasteners are available:

- Rivet Studs (P/N 20535, qty 10) contain a male 1/4-20UN-2A thread by approx. 3/4" length. Attach LHD Support Clips using a standard 1/4-20UN nut and lock washer.
- Rivet Nuts (P/N 20536, qty 10) contain a female 1/4-20UN-2B thread by approx. 3/4" depth. Attach LHD support clips using a standard 1/4-20UN bolt and lock washer.
- The Rivet Nut Installation Set (P/N 20552) contains a mandrel and nosepiece for installing either rivet studs or nuts.

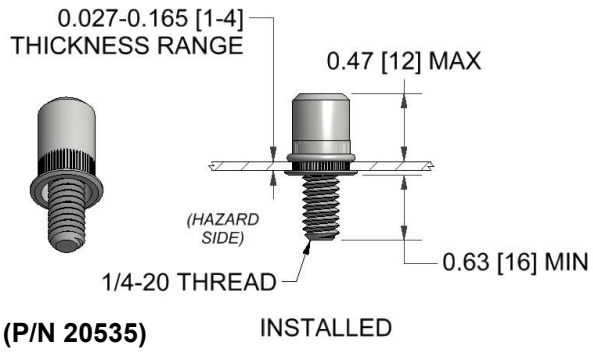


Figure 2.10.3a

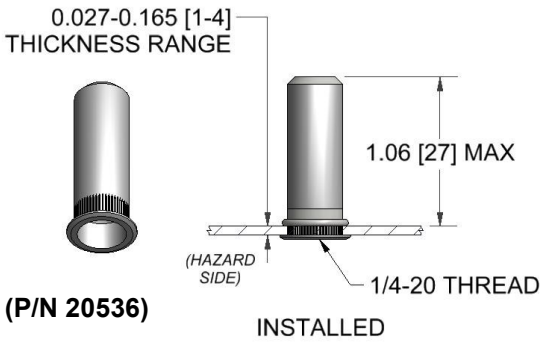


Figure 2.10.3b

2.10.4 LHD Bulkhead Quik-Seal (P/N 24737) [ITEM 27]

When using an LHD for detection, a grease tight seal must be used anywhere the LHD penetrates a bulkhead such as a hood, plenum or duct wall. An LHD Quik-Seal is provided to accomplish this and allows the uninstalled connector end of an LHD to be passed through the bulkhead from the outside in and then sealed afterward. Use of this seal requires a Ø3/4" hole to be drilled through the bulkhead. The assembly contains a seal, lock washer, and jam nut for installation into a bulkhead and also contains a compression nut that creates a grease tight seal around an LHD when tightened. All dimensions are in inches [mm].

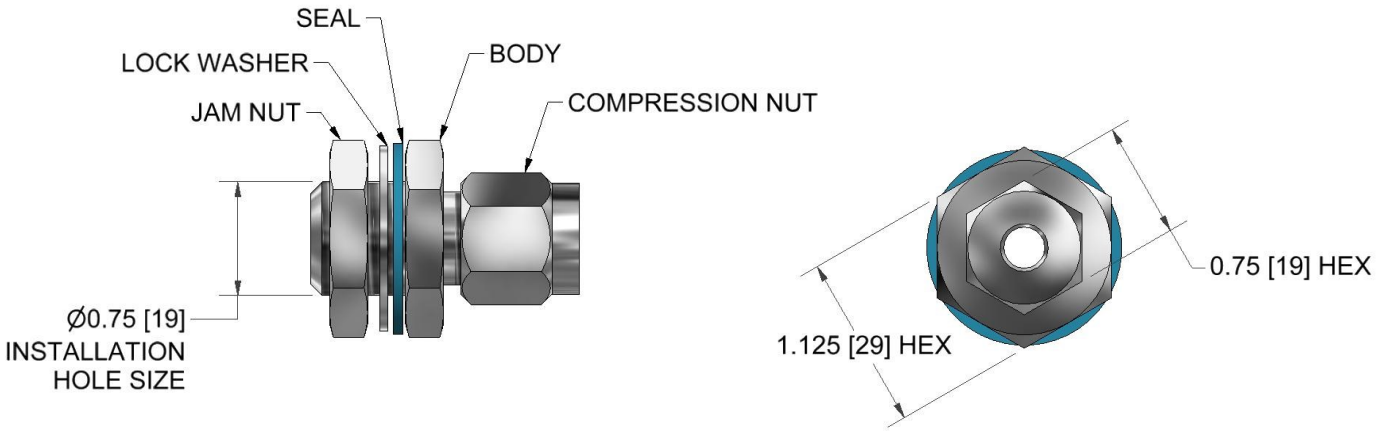


Figure 2.10.4

2.11 Function Testing Devices

Test devices for performing function testing during initial commissioning or during required maintenance are available. These devices include LHD Test Leads for testing an LHD detection circuit and Alarm Modules for testing actuation circuits. Reference the function testing section (See Section 4.12) and maintenance section (See Section 5.3) for instructions on how and when to use these devices.

2.11.1 LHD Test Leads (P/N 24527) [ITEM 28]

LHD Test Leads provide a means of functionally testing detection circuit(s) that use LHD detection devices. These sacrificial leads are inserted in the detection circuit in place of the actual LHD (already installed) and can be subjected to set point temperatures to verify that the STRIKE™ Control Unit responds properly. These one time use devices can then be removed from the circuit and properly disposed. LHD Test Leads are 12” long and supplied in bags of quantity 10 each. All dimensions are in inches [mm].

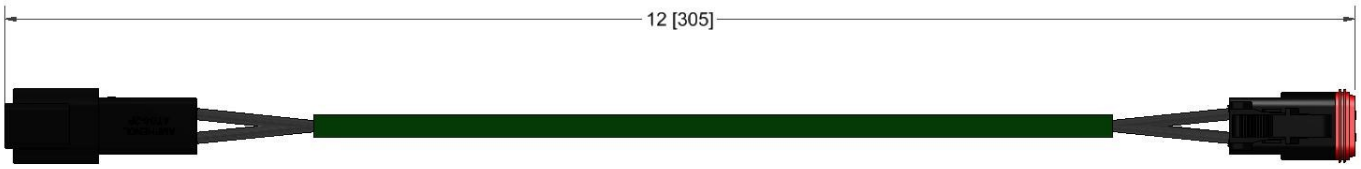


Figure 2.11.1

2.11.2 Alarm Modules (P/N 24787) [ITEM 29]

Alarm Modules provide a means of functionally testing actuation circuits. These devices are installed at the end of the actuation circuit, in place of a Linear Actuator, when performing function testing or required maintenance. These devices contain an LED indicator which illuminates when the actuation circuit is activated and can be manually reset afterwards by pressing the ‘Push to Reset’ button. Color coding (yellow) can be found on the cable end.

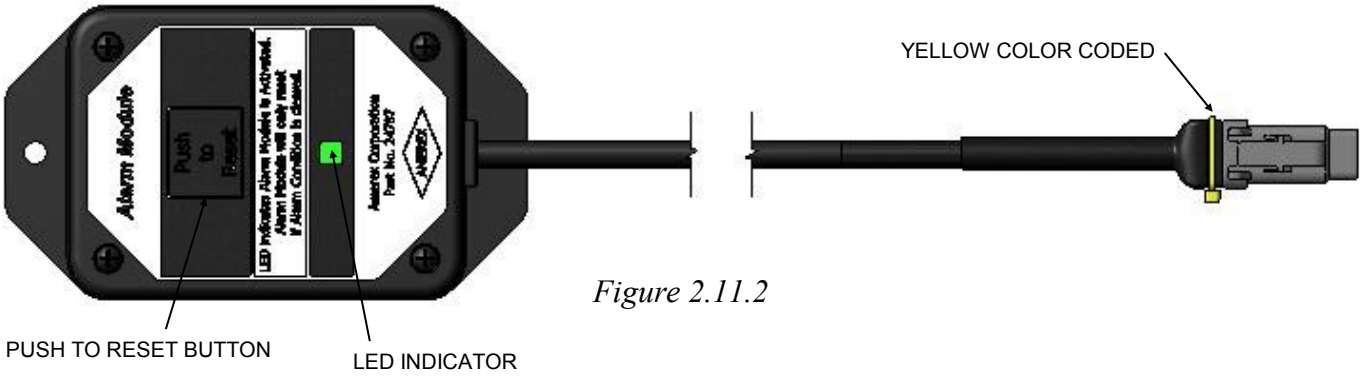


Figure 2.11.2

2.12 Parts List

Parts List			
Item Number	**Part Number**	**Description**	**Qty. per System**
1	23826	STRIKE™ Control Unit & Enclosure	1
2	24944	Spot Heat Detector 350°F (Bulkhead Mount)	Optional
	24514	Spot Heat Detector 485°F (Bulkhead Mount)	
3	24744-03	Linear Heat Detector, 3 Foot Length	Optional, Max 100 feet total per detection circuit
	24744-06*	Linear Heat Detector, 6 Foot Length	
	24744-08*	Linear Heat Detector, 8 Foot Length	
	24744-10*	Linear Heat Detector, 10 Foot Length	
	24744-12*	Linear Heat Detector, 12 Foot Length	
	24744-15	Linear Heat Detector, 15 Foot Length	
	24744-20	Linear Heat Detector, 20 Foot Length	
	24744-25	Linear Heat Detector, 25 Foot Length	
	24744-30	Linear Heat Detector, 30 Foot Length	
	24744-40	Linear Heat Detector, 40 Foot Length	
	24744-50	Linear Heat Detector, 50 Foot Length	
4	24168	Manual Pull Station, Flush Mount	1 (Minimum)
	24290	Manual Pull Station, Surface Mount	
5	24409-03	Detection Lead Cable, 3 Foot Length	1 for each detection circuit used
	24409-05	Detection Lead Cable, 5 Foot Length	
	24409-10*	Detection Lead Cable, 10 Foot Length	
	24409-15	Detection Lead Cable, 15 Foot Length	
	24409-20	Detection Lead Cable, 20 Foot Length	
	24409-25*	Detection Lead Cable, 25 Foot Length	
	24409-30	Detection Lead Cable, 30 Foot Length	
	24409-40	Detection Lead Cable, 40 Foot Length	
	24409-50*	Detection Lead Cable, 50 Foot Length	
6	24410-03	Detection Extension Cable, 3 Foot Length	Optional
	24410-05*	Detection Extension Cable, 5 Foot Length	
	24410-10*	Detection Extension Cable, 10 Foot Length	
	24410-15	Detection Extension Cable, 15 Foot Length	
	24410-20	Detection Extension Cable, 20 Foot Length	
	24410-25	Detection Extension Cable, 25 Foot Length	
	24410-30	Detection Extension Cable, 30 Foot Length	
	24410-40	Detection Extension Cable, 40 Foot Length	
	24410-50	Detection Extension Cable, 50 Foot Length	

* Commonly stocked lengths

Parts List (continued)			
Item Number	**Part Number**	**Description**	**Qty. per System**
7	24411-03	Actuation Lead Cable, 3 Foot Length	1 for each actuation circuit used
	24411-05	Actuation Lead Cable, 5 Foot Length	
	24411-10*	Actuation Lead Cable, 10 Foot Length	
	24411-15	Actuation Lead Cable, 15 Foot Length	
	24411-20	Actuation Lead Cable, 20 Foot Length	
	24411-25*	Actuation Lead Cable, 25 Foot Length	
	24411-30	Actuation Lead Cable, 30 Foot Length	
	24411-40	Actuation Lead Cable, 40 Foot Length	
	24411-50	Actuation Lead Cable, 50 Foot Length	
8	24412-03	Manual Pull Lead Cable, 3 Foot Length	1
	24412-05*	Manual Pull Lead Cable, 5 Foot Length	
	24412-10	Manual Pull Lead Cable, 10 Foot Length	
	24412-15	Manual Pull Lead Cable, 15 Foot Length	
	24412-20	Manual Pull Lead Cable, 20 Foot Length	
	24412-25*	Manual Pull Lead Cable, 25 Foot Length	
	24412-30	Manual Pull Lead Cable, 30 Foot Length	
	24412-40	Manual Pull Lead Cable, 40 Foot Length	
	24412-50	Manual Pull Lead Cable, 50 Foot Length	
9	24413-03	Manual Pull Extension Cable, 3 Foot Length	Optional
	24413-05	Manual Pull Extension Cable, 5 Foot Length	
	24413-10	Manual Pull Extension Cable, 10 Foot Length	
	24413-15	Manual Pull Extension Cable, 15 Foot Length	
	24413-20	Manual Pull Extension Cable, 20 Foot Length	
	24413-25	Manual Pull Extension Cable, 25 Foot Length	
	24413-30	Manual Pull Extension Cable, 30 Foot Length	
	24413-40	Manual Pull Extension Cable, 40 Foot Length	
	24413-50*	Manual Pull Extension Cable, 50 Foot Length	
10	Currently not available	Pressure Switch Lead Cable, 3 Foot Length	-
		Pressure Switch Lead Cable, 5 Foot Length	
		Pressure Switch Lead Cable, 10 Foot Length	
		Pressure Switch Lead Cable, 15 Foot Length	
		Pressure Switch Lead Cable, 20 Foot Length	
		Pressure Switch Lead Cable, 25 Foot Length	
		Pressure Switch Lead Cable, 30 Foot Length	
		Pressure Switch Lead Cable, 40 Foot Length	
		Pressure Switch Lead Cable, 50 Foot Length	

* Commonly stocked lengths

Parts List (continued)

Item Number	Part Number	Description	Qty. per System
11	Currently not available	Pressure Switch Extension Cable, 3 Foot Length	-
		Pressure Switch Extension Cable, 5 Foot Length	
		Pressure Switch Extension Cable, 10 Foot Length	
		Pressure Switch Extension Cable, 15 Foot Length	
		Pressure Switch Extension Cable, 20 Foot Length	
		Pressure Switch Extension Cable, 25 Foot Length	
		Pressure Switch Extension Cable, 30 Foot Length	
		Pressure Switch Extension Cable, 40 Foot Length	
		Pressure Switch Extension Cable, 50 Foot Length	
12	Currently not available	Communication Cable FACP STRIKE, 25 Foot Length	-
		Communication Cable FACP STRIKE, 50 Foot Length	
		Communication Cable FACP STRIKE, 100 Foot Length	
		Communication Cable FACP STRIKE, 200 Foot Length	
13	16609	PC Interface Cable	Optional
14	-	Pressure Switch (Not currently used with KP™)	-
15	24448	Linear Actuator	1 for each actuation circuit used
16	23474	End of Line Module (EOL)	3[+]
17	24903	Battery, Service & Replacement	2
18	24694	Relay Module, Gas Only	Optional
	24695	Relay Module, Control	
19	12870	Electric Gas Valve, 3/4 in	Optional
	12871	Electric Gas Valve, 1 in	
	12872	Electric Gas Valve, 1 1/4 in	
	12873	Electric Gas Valve, 1 1/2 in	
	12874	Electric Gas Valve, 2 in	
	12875	Electric Gas Valve, 2 1/2 in	
	12876	Electric Gas Valve, 3 in	
20	21396	Horn & Strobe Assembly	Optional
21	16501	LHD Support Clips, Red (Bag of 25)	1 for LHD
	23524	LHD Support Clips, SS (Bag of 25)	
22	24539	LHD Support Tubing (Bag of 25)	1 for LHD
23	24832	Quik-Fasteners (Bag of 24)	Optional
24	20535	Rivet Stud Hood Fastener (Bag of 10)	Optional
25	20536	Rivet Nut Hood Fastener (Bag of 10)	Optional
26	20552	Rivet Installation Tool Set	Optional
27	24737	LHD Bulkhead Penetration Seal	Optional
28	24527	LHD Test Leads (Bag of 10)	Service Tool
29	24787	Alarm Module	Service Tool

* Commonly stocked lengths
[+] Included with STRIKE™ Control Unit, P/N 23826 (ITEM 1)

Chapter 3: System Design

Prior to installation of any components of the AMEREX® STRIKE™ Electronic Control System (ECS), a complete system design must be established. This design must comply with all requirements and limitations associated with the STRIKE™ ECS, as well as the AMEREX® KP™ Fire Suppression System, all applicable NFPA standards including National Electric Code, and all other standards or laws deemed applicable to an installation by local authorities having jurisdiction (AHJ). Also, a hazard analysis must be performed where potential hazards requiring protection must be identified. The hazard analysis will determine locations and types of detection required, along with the quantity of fire suppression agent necessary for protection. When creating a system design and performing a hazard analysis, some helpful tools that can be useful are:

- Cameras and note pads – Installers must document and retain all system designs and create a Bill of Materials.
- Temperature measuring devices – Thermocouples work well in helping to identify ambient operating temperatures.
- Access to all AMEREX® Installation, Operation, & Maintenance Manuals – Updated Manuals and Technical Bulletins are available online at www.amerex-fire.com.

The following sections describe design requirements and limitations for a system and its circuits.

3.1 Introduction

The STRIKE™ ECS Control Unit is supplied with a pre-programmed default configuration with only certain circuits enabled, requiring that only those circuits be used in a system and connected to the STRIKE™ Control Unit (See Table 3.1). An example of a simple system schematic is shown below, which demonstrates a basic system design using the pre-programmed default setup with an LHD detection device for single hood protection (See Figure 3.1a). A Relay Module is also included for electric gas valve and external device control.

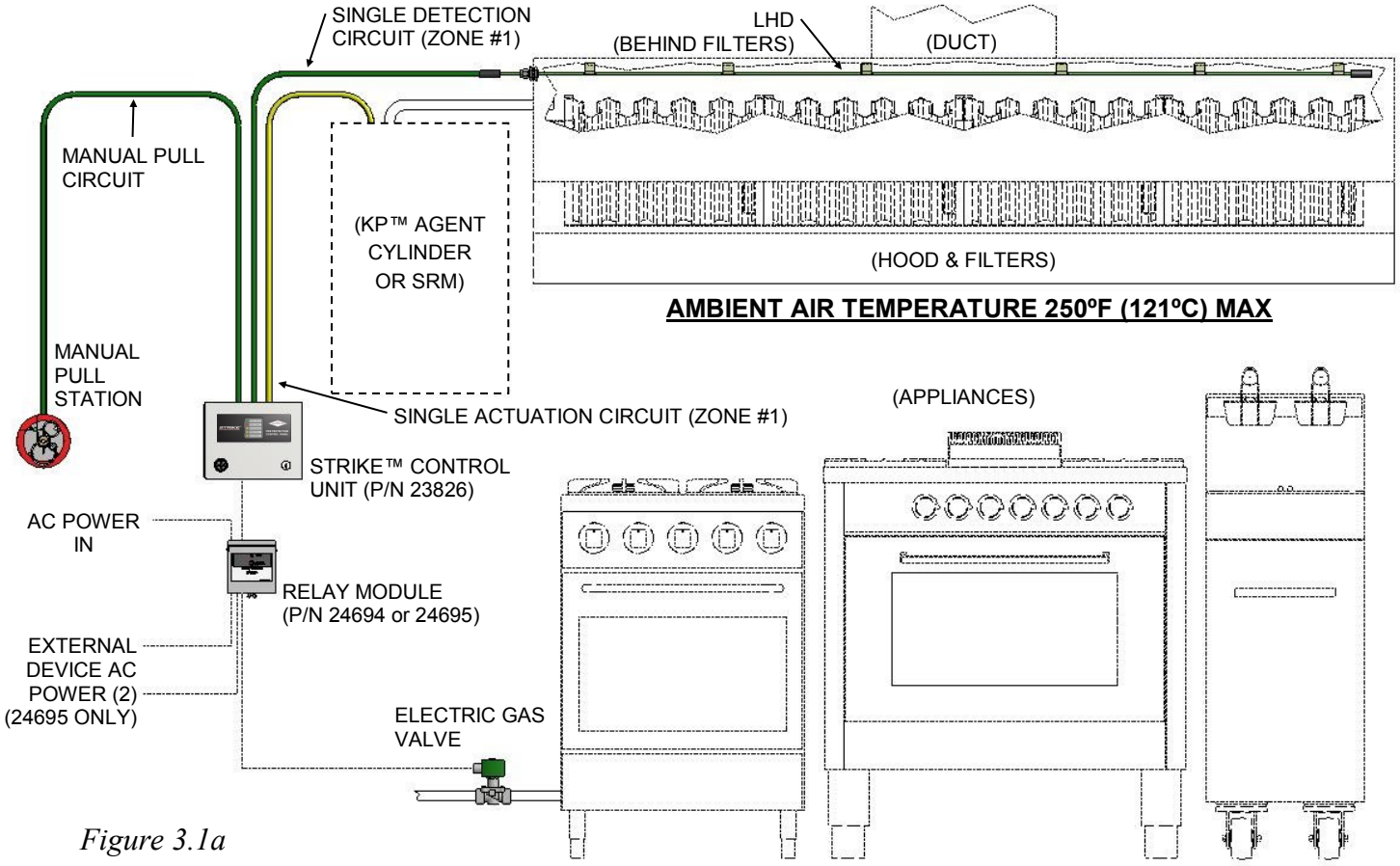


Figure 3.1a

Table 3.1

Pre-programmed Default STRIKE™ Control Unit Configuration	
Circuit	**Default Setting**
Detection Zone #1	**ENABLED**
Detection Zone #2	Disabled
Manual Pull	**ENABLED**
Actuation Zone #1	**ENABLED**
Actuation Zone #2	Disabled
Pressure Switch (Currently not available)	**ENABLED**
Auxiliary Outputs (Relay 1, 2 & 3; FACP)	**ENABLED**

When additional circuits are needed, in addition to the default configuration as shown in Table 3.1, STRIKE™ Control Unit programming is required to enable those additional circuits (See Section 4.11). A more complex system design may require the use of those available circuits for additional protection or system requirements. In the figure below, dual detection and release circuits are utilized to facilitate dual AMEREX® KP™ Fire Suppression System installations (Zone #1 & Zone #2) on two separate hoods. In this case, the STRIKE™ Control Unit could be programmed with Detection Zone #1 mapped to release Actuation Zone #1 and Detection Zone #2 mapped to release Actuation Zone #2. However, if the two hoods in the example below shared a common exhaust duct, each detection circuit could be programmed to simultaneously release both actuation zones as required. Also shown in the example below are multiple Manual Pull Stations and Pressure Switches, series connected in their dedicated circuits (See Figure 3.1b).

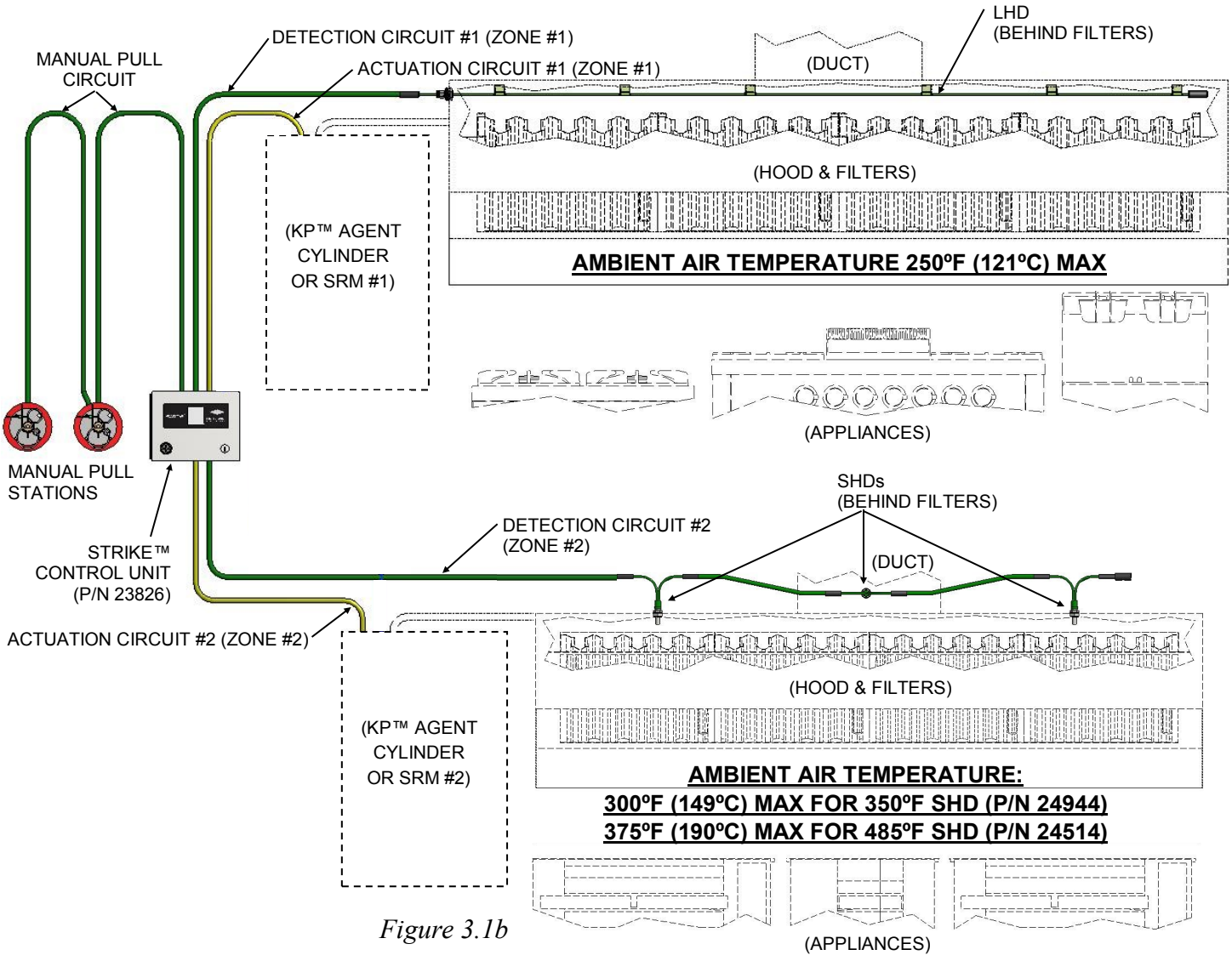


Figure 3.1b

3.2 Detection Circuit Design

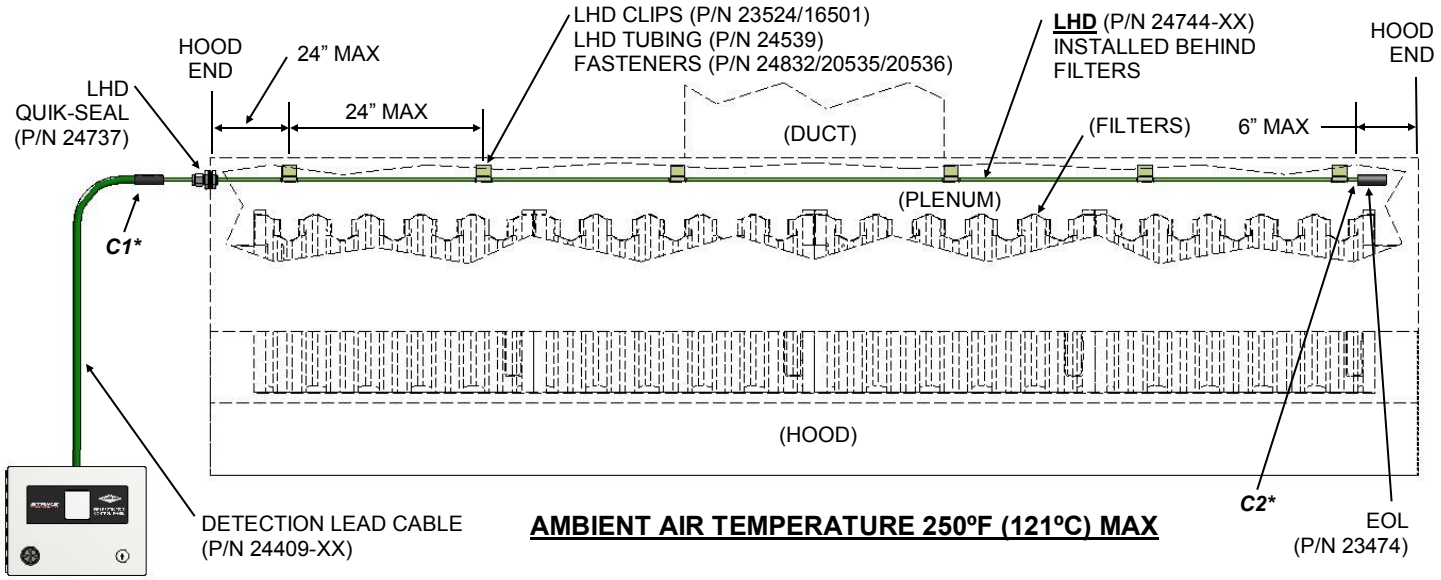
The amount of detection and locations required in a system will depend on the number of ducts and appliances and the location of appliances under a hood. For duct detection, a detector is required to be placed within the duct opening or up to 12 inches into the duct. Every appliance under a hood protected by a fire suppression system must have a detector placed over it and positioned within the path of exhaust vapors. **WARNING: Do not locate detectors directly in the path of gas appliance exhaust flue gases. Doing so could result in unnecessary alarm conditions and unwanted discharge of the suppression system.**

The AMEREX® STRIKE™ ECS supports up to two detection circuits. Each detection circuit may utilize Linear Heat Detectors (LHD), Spot Heat Detectors (SHD), or a combination of both depending on system design requirements. Multiple detection devices may be used in a single circuit and can be connected in series. When choosing which detection device is more suitable for a particular installation, use the hazard analysis to identify limiting factors such as ambient operating temperature and installation and maintenance requirements, along with the amount of detection required. Each detection circuit is limited to 100 feet (30.5 m), including installed detection devices. An EOL (P/N 23474) is always required at the end of each circuit. Manual Pull Stations may also be used in a detection circuit (See Figure 3.2d).

Linear Heat Detectors (LHD) are preset (356ºF/180ºC) heat sensing devices capable of sensing an overheat condition at any point along its routed path. Features and limitations for LHDs are:

- Preset device with 356ºF (180ºC) set point
- Maximum ambient operating temperature: 250ºF (121ºC)
- One time use device and must be replaced after sensing an overheat condition
- Flexible (2.5”/64 mm min. bend radius) for continuous routing along a desired path
- Suitable for detection over large areas or over multiple appliances using single LHD
- Available in various lengths
- Installed using Quik-Seal (P/N 24737) for bulkhead penetration and LHD Support Clips (P/N 23524/16501) and Split Tubing (P/N 24539) for support at a min. of every 24” (0.61 m)

A typical LHD installation and circuit is shown below (See Figure 3.2a):



*C#** = *CONNECTION LOCATION (FOR PRE-TERMINATED CONNECTORS IN SEQUENTIAL ORDER)*

Figure 3.2a

Spot Heat Detectors (SHD) are preset heat sensing devices capable of localized overheat detection. For detection over large areas, multiple SHDs must be used and may be series connected. SHDs may be placed over individual appliances or placed at intervals of 24" (0.61 m) maximum for complete hood detection. Features and limitations for SHDs are:

- Preset device with set point of 350ºF(177ºC) for P/N 24944 / 485ºF(252ºC) for P/N 24514
- Maximum ambient operating temperature of 300ºF (149ºC) for P/N 24944 / 375ºF(190ºC) for P/N 24514
- Reusable and self resetting device
- Suitable for detection over individual appliances or localized areas and suitable for detection over large areas by placing SHDs at 24" (0.61 m) maximum intervals
- Bulkhead style mounting configuration with included seal and jam nut

An example of a single SHD installation and circuit is shown below (See Figure 3.2b). An example of a multiple SHD installation over multiple appliances is also shown below (See Figure 3.2c):

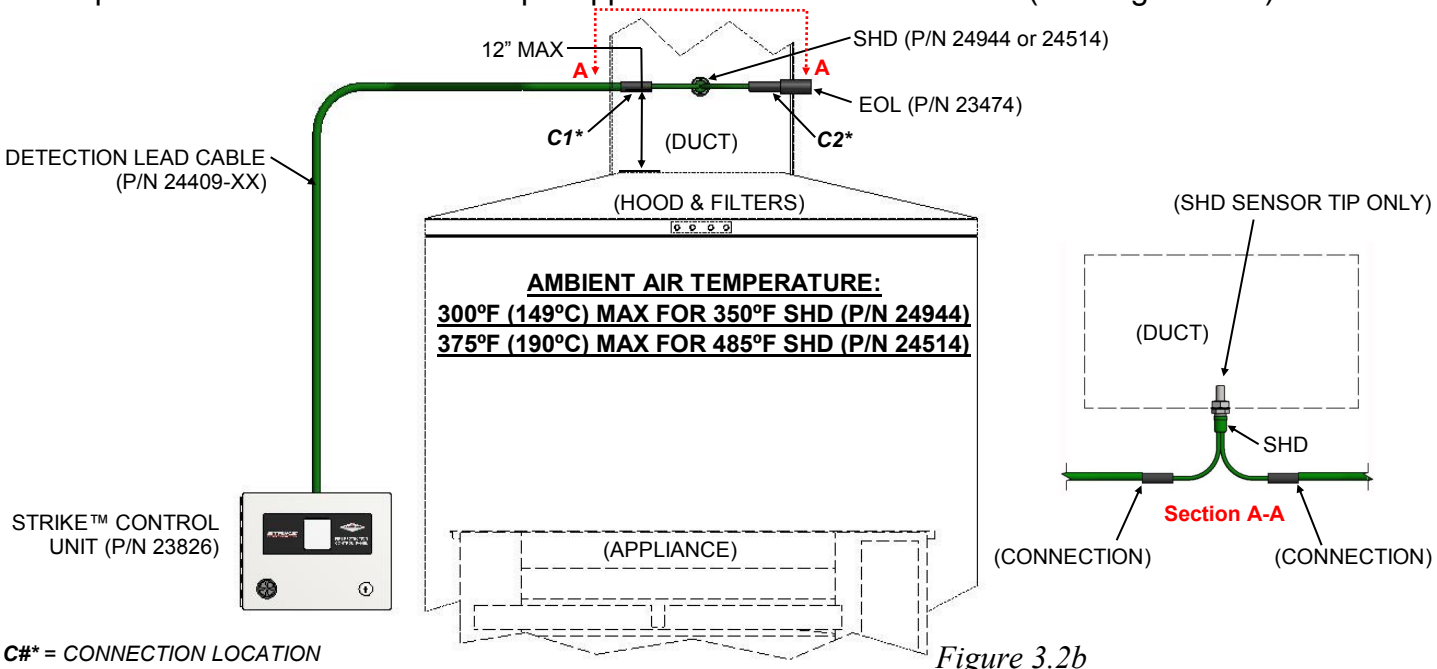


Figure 3.2b

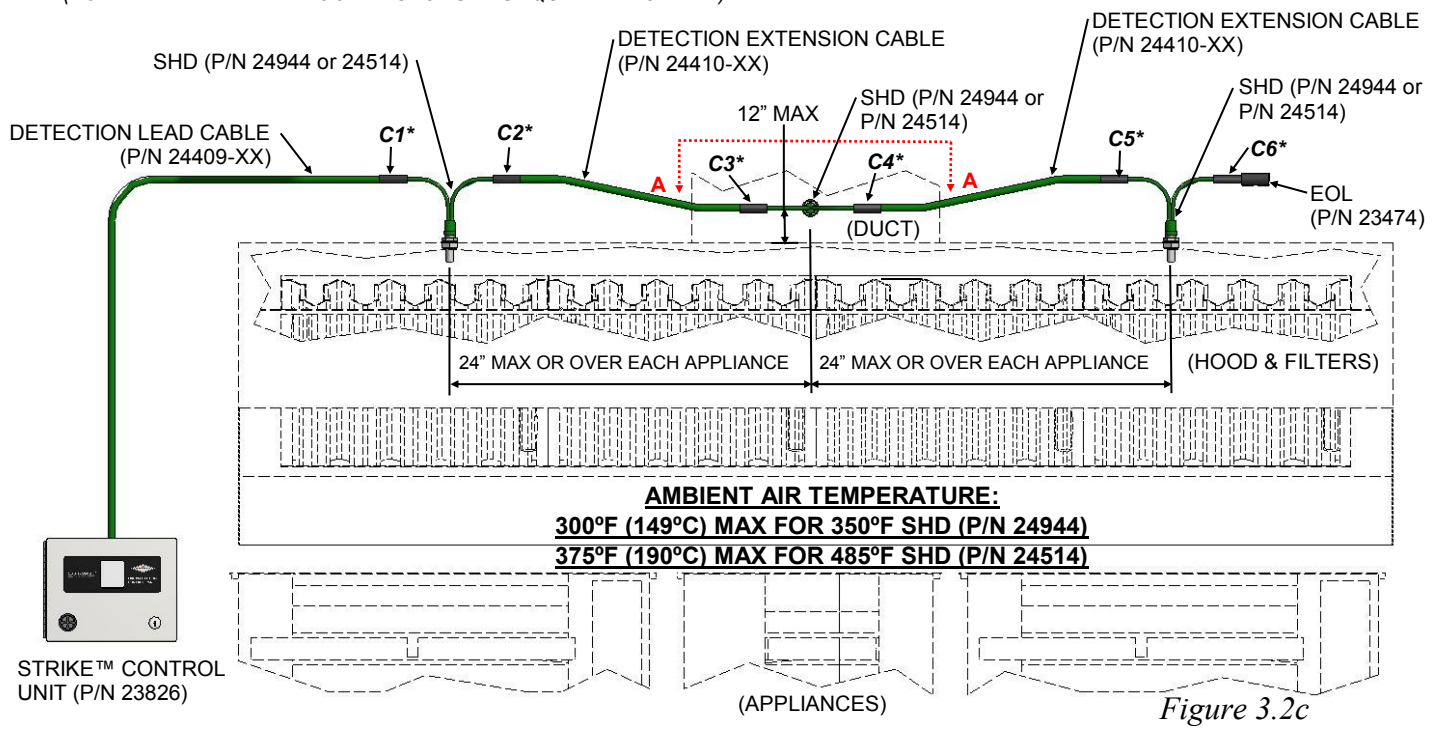


Figure 3.2c

Manual Pull Stations are remotely located devices used to manually activate the STRIKE™ ECS in the event that a fire condition is witnessed. The AMEREX® STRIKE™ ECS requires at least one Manual Pull Station (P/N 24168 or P/N 24290) be installed. Manual Pull Stations may be installed in the dedicated manual pull circuit for complete system actuation as described in Section 3.4. Otherwise, Manual Pull Stations may be installed in a detection circuit for zone specific actuation. For dedicated Manual Pull Stations installed in a detection circuit, the Manual Pull Station must be the first device in series, installed between the Control Unit and the first detection device. Also, Manual Pull Lead Cables (P/N 24412-XX) and Extension Cables (P/N 24413-XX) must be used in lieu of Detection Lead and Extension Cables for all connections to a Manual Pull Station.

WARNING: Manual Pull Stations installed in a detection circuit are intended for zone specific actuation only, and only the programmed actuation zones for that detection circuit will be activated when pulled.

Manual Pull Stations must be installed no higher than 48 inches (1.21 m) from the floor and must be located along a path of egress. Consult the local AHJ for final approval for quantity, locations, mounting heights, and all other considerations prior to installing all Manual Pull Stations. An example of a Manual Pull Station installed in a detection circuit is shown below (See Figure 3.2d).

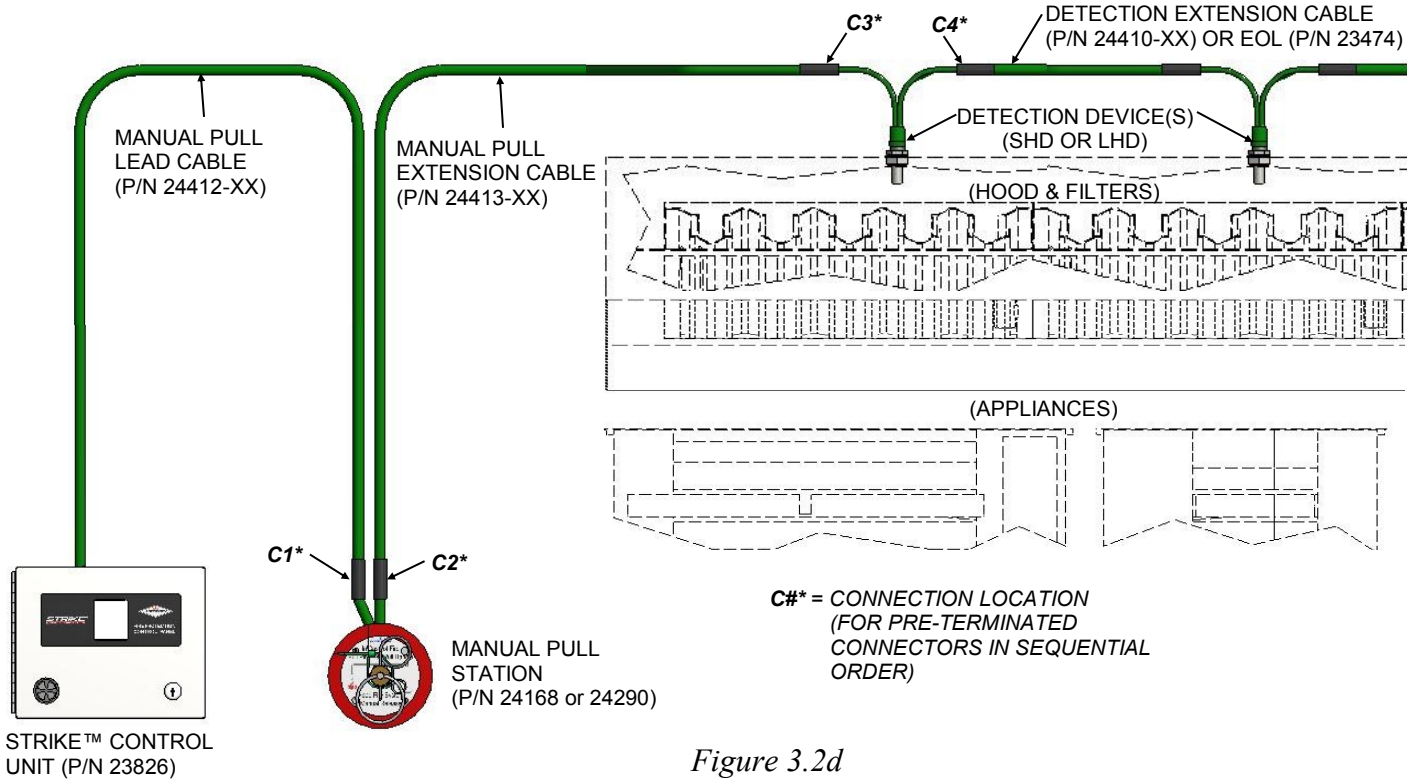


Figure 3.2d

3.3 Actuation Circuit Design

The number of actuation devices or circuits required in a system will depend on the amount of fire suppression required. The AMEREX® STRIKE™ ECS supports up to two actuation circuits. Each actuation circuit may utilize only one Linear Actuator (P/N 24448) for actuation of a KP™ Fire Suppression System equipped with an electric actuator option. Reference the latest AMEREX® KP™ Fire Suppression Installation, Operation and Maintenance Manual (P/N 20150) for systems and components compatible with Linear Actuators.

The entire actuation circuit must be routed through an electrical conduit for mechanical protection, from the STRIKE™ Control Unit to the KP™ Fire Suppression System enclosure. 3/4" electrical knockouts are provided on each. All installations must follow NFPA 70 (National Electric Code) and all state and local codes. Each actuation circuit is limited to 100 feet (30.5 m). A Linear Actuator (P/N 24448) is always installed at the end of each circuit. An example of an actuation circuit is shown below (See Figure 3.3) using either a STRIKE™ Releasing Module (P/N 26607 / 26577), Actuator Asy KP600 (P/N 26797), or Electric Control Head (P/N 26127) per actuation circuit. If the second actuation circuit (Zone #2) is used, it must be routed separately to the second KP™ Fire Suppression System.

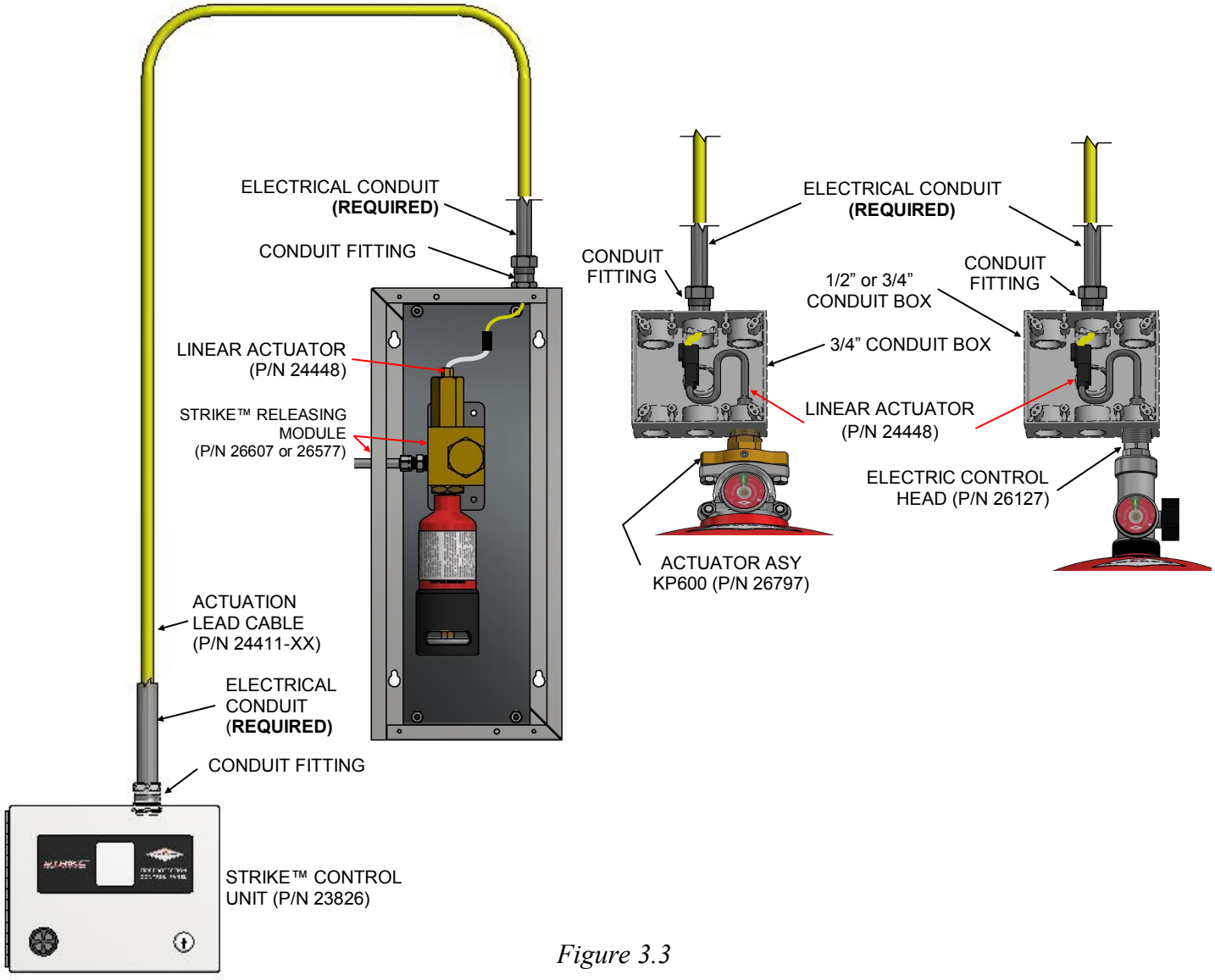


Figure 3.3

3.4 Manual Pull Circuit Design

Manual Pull Stations are remotely located devices used to manually activate the STRIKE™ ECS in the event that a fire condition is witnessed. The AMEREX® STRIKE™ ECS requires at least one Manual Pull Station (P/N 24168 or P/N 24290) be installed. Manual Pull Stations may be installed in the dedicated manual pull circuit for complete system actuation. Multiple Manual Pull Stations may be used and can be connected in series. The dedicated manual pull circuit is limited to 100 feet (30.5 m). An EOL (P/N 23474) is always required at the end of the circuit. **Detection devices may NOT be used in the dedicated manual pull circuit.**

Manual Pull Stations must be installed no higher than 48 inches (1.21 m) from the floor and must be located along a path of egress. Consult the local AHJ for final approval for quantity, locations, mounting heights, and all other considerations prior to installing all Manual Pull Stations. An example of a single Manual Pull Station installed in the dedicated manual pull circuit is shown below (See Figure 3.4a). An example of the same circuit with multiple Manual Pull Stations connected in series is also shown (See Figure 3.4b).

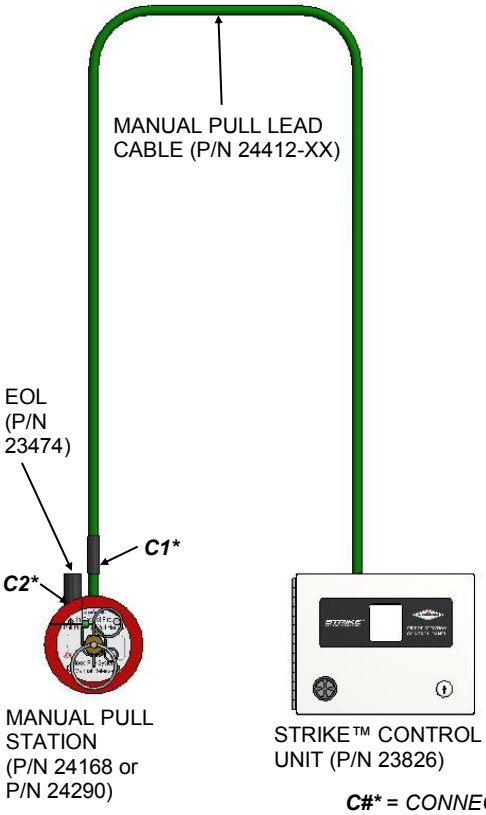


Figure 3.4a

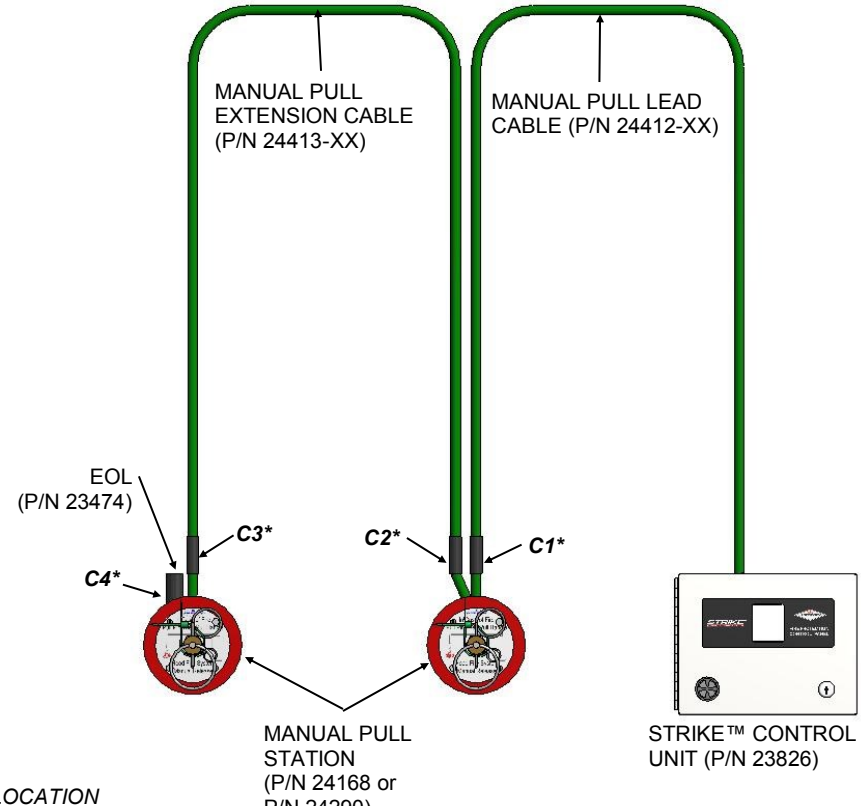


Figure 3.4b

C#* = *CONNECTION LOCATION (FOR PRE-TERMINATED CONNECTORS IN SEQUENTIAL ORDER)*

3.5 Pressure Switch Circuit Design

The Pressure Switch Circuit is not currently available for use with KP™. This section is reserved.

3.6 Relay Module & Auxiliary Circuit Design

The AMEREX® STRIKE™ ECS supports the use of an optional Relay Module to control AC power to external devices such as gas valves or other devices and to enable communication with an optional auxiliary Fire Alarm Control Panel (FACP). These circuits utilize installer supplied wiring and connect to a terminal board (TB2) located on the STRIKE™ Control Unit.

If an AMEREX® supplied Electric Gas Valve (P/N Varies) or any other UL approved electric gas valve is used to control natural gas or propane to a gas fired appliance, a Relay Module (P/N 24694 or P/N 24695) must be used to control power to the valve. These Electric Gas Valves are held open, providing gas to the appliance, when energized. In the event of an alarm condition, the STRIKE™ Control Unit will signal the Relay Module to interrupt power to the Electric Gas Valve. The same occurs in the event of a building power outage. Before power can be restored to the Electric Gas Valve, these Relay Modules must be manually reset by pressing a reset button on the module face. The Gas Valve Relay Module (P/N 24694) features only the manually resettable relay (Relay #1) to control power to the Electric Gas Valve. The Relay Control Module (P/N 24695) features the same manually resettable gas valve relay with two additional relays (Relay #2 & #3) for controlling power to other optional devices, such as alarms, fans, appliances, motors, pumps, etc. **A qualified electrician must perform any field wiring and connections involving the shut-down of electric cooking equipment or Electric Gas Valves.**

If an auxiliary FACP is used, it can be connected to and receive a supervised signal from the STRIKE™ Control Unit in the event of a fault or alarm condition. The STRIKE™ Control Unit also provides terminal connections for an EOL resistor as required in the FACP circuit. An example of a circuit design utilizing a Relay Module and auxiliary FACP is shown (See Figure 3.6):

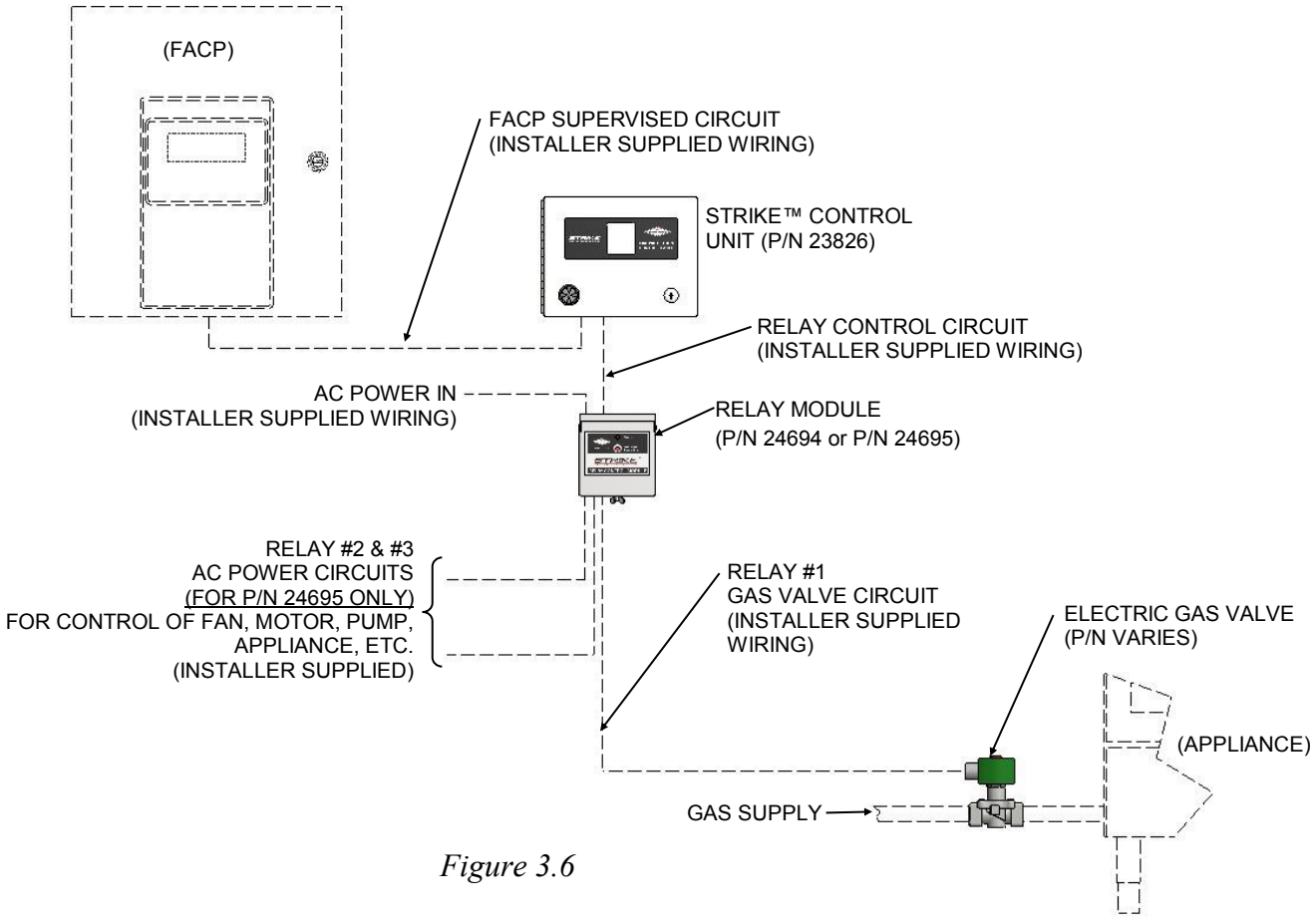


Figure 3.6

3.7 Communication Circuit Design

The Communication Circuit is not currently available for use with KP™. This section is reserved.

Chapter 4: System Installation

This Chapter describes installation of the STRIKE™ Electronic Control System (ECS). Prior to system installation, a complete hazard analysis must be performed and a proposed system layout or schematic, including a bill of materials, shall be created per Chapter 3. Always contact the local AHJ for fire codes and health inspectors for special requirements for a proposed installation. All installations are to be in accordance with NFPA 72 (National Fire Alarm Code) and NFPA 70 (National Electric Code) and all other state and local codes. For the addition of mechanical components as part of the wet chemical fire suppression system, reference the latest AMEREX® KP™ Fire Suppression Installation, Operation and Maintenance Manual (P/N 20150).

4.1 Steps to System Installation

- The appropriate quantity and selection of heat detection devices, actuators, manual pull, pressure switches, relay modules, and any other devices must be made after a hazard analysis has been completed. Appropriate lengths and selection of AMEREX® supplied wiring cables must be made to accommodate the particular devices installed and their locations. Materials such as EMT conduit and fittings, fasteners, clamps, and mounting hardware are not provided by AMEREX® and shall be installer supplied. Any field wiring for relay modules or auxiliary FACPs shall also be installer supplied.
- The STRIKE™ Control Unit must be properly located and installed (See Section 4.2).
- The appropriate detection devices must be located and installed (See Section 4.3 & 4.4).
- Any Linear Actuators for suppression system actuation must be installed (See Section 4.5).
- Any Manual Pull Stations must be located and installed (See Section 4.6).
- Any optional devices, including Relay Modules and the supported devices such as external alarms, Electric Gas Valves, etc., must be located and installed (See Section 4.8).
- Appropriate wiring paths must be established and wiring installed including any required protective conduit from each device to the STRIKE™ Control Unit (See Section 4.9).
- Once all needed cables and wiring are installed and securely routed back to and into the STRIKE™ Control Unit enclosure, each must be terminated to the provided terminal boards (See Section 4.10).
- Once all wiring connections are made, STRIKE™ Control Unit programming may be performed as required (See Section 4.11).
- Component testing and initial commissioning must be performed prior to placing the system into service (See Section 4.12).

4.2 STRIKE™ Control Unit Installation

The STRIKE™ Control Unit (P/N 23826) must be surface mounted in a convenient location permitting inspection and periodic maintenance along with minimal wiring and cable lengths. Proper routing of all wiring and cables to each system component is required and should be considered when choosing an appropriate location. Any obstacles, moving parts, hazard areas, or bulkheads that may inhibit complete connection of all system components or cause damage to components must be avoided.

The STRIKE™ Control Unit must be mounted in a location where the audio and visual indicators on the face of the unit may be seen and heard easily. The STRIKE™ Control Unit must be mounted in a dry location safe from any potential moisture or damage and must be mounted to a surface capable of supporting the weight of the unit and any additional mounting or wiring components.

Consider the most convenient wire routing path of all external devices when determining the best mounting location for the STRIKE™ Control Unit and enclosure. Electrical knockouts (3/4") are provided on the top, bottom, right side and back of the enclosure which are used for all field wiring entering the enclosure. Install the STRIKE™ Control Unit per the following instructions:

1. The STRIKE™ Control Unit enclosure contains (4) mounting holes as detailed in Figure 4.2a.
2. Use the dimensions shown in Figure 2.1.b or use the enclosure as a template to mark then drill the top two holes in the selected mounting surface.
3. Loosely assemble the enclosure to the mounting surface using appropriate hardware (#10 fasteners are recommended). Level the enclosure and match drill the remaining two lower holes.
4. Finish the installation by securely attaching the enclosure using appropriate hardware (See Figure 4.2b). **Do NOT connect any batteries or field wiring to the STRIKE™ Control Unit until directed to do so in Section 4.11 and 4.12.**

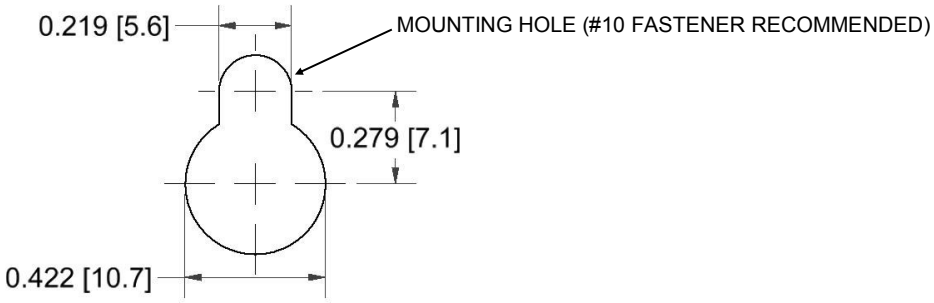


Figure 4.2a

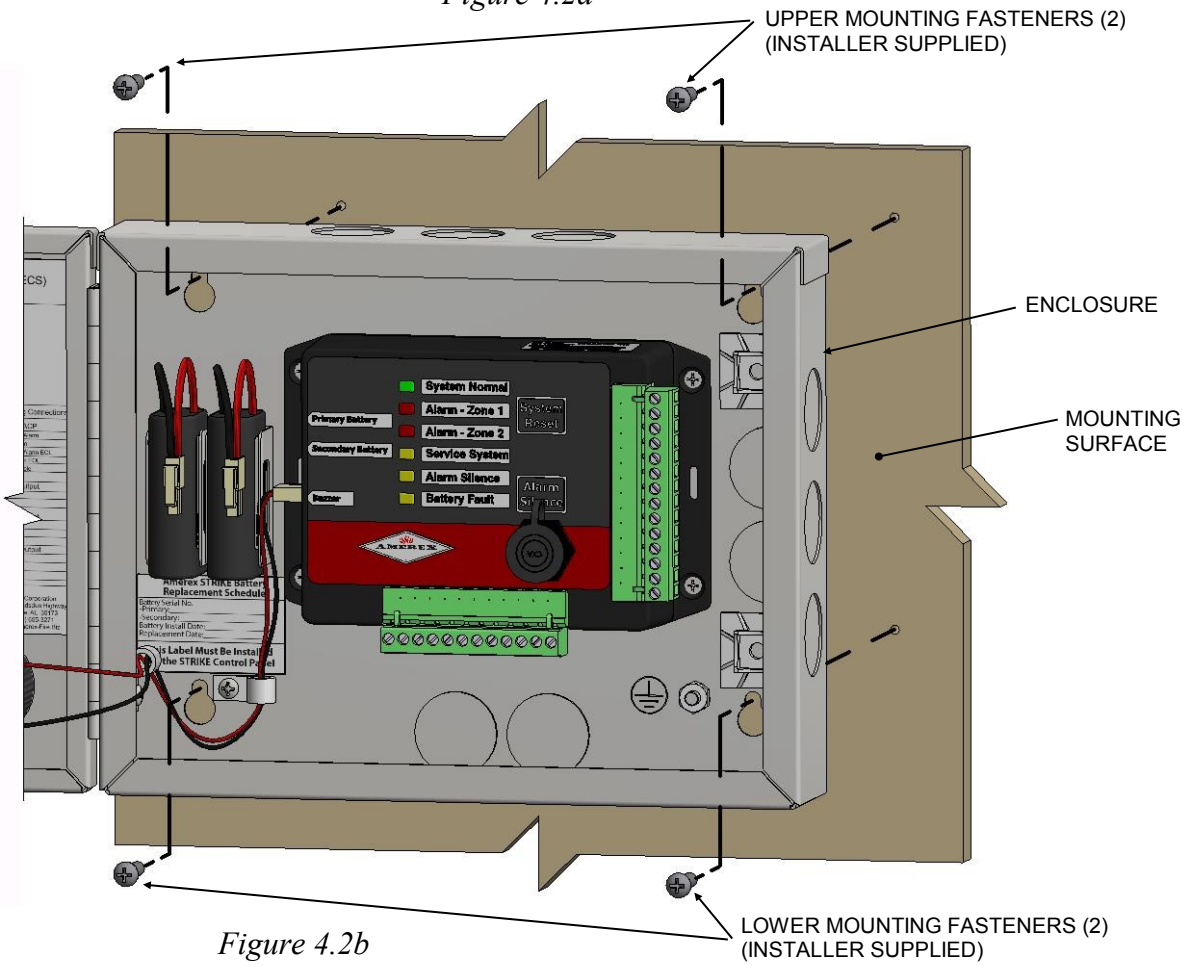


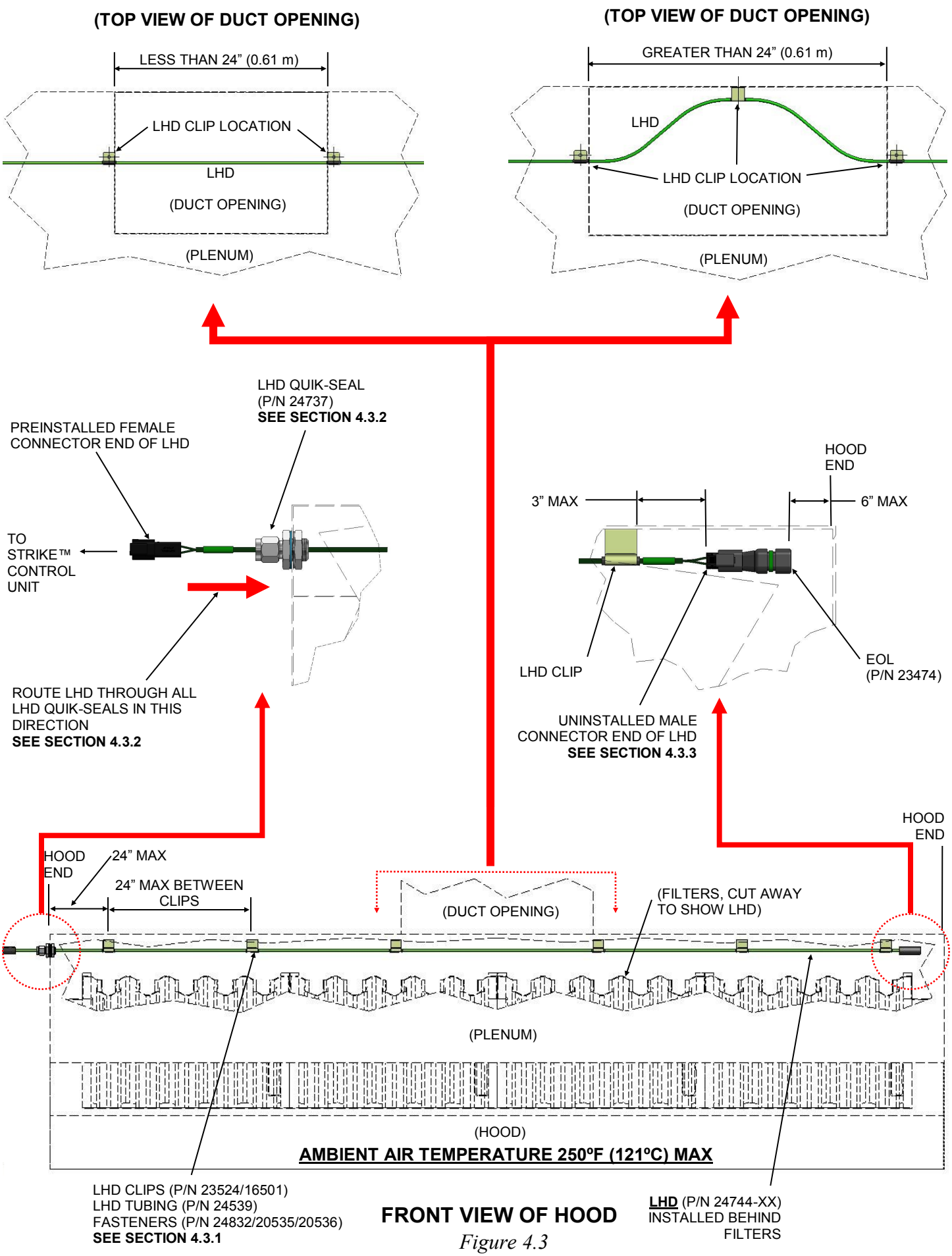
Figure 4.2b

4.3 Linear Heat Detector (LHD) Installation (P/N 24744-XX)

The Linear Heat Detector (LHD) is a preset (356ºF/180ºC) heat sensing device capable of sensing an overheat condition at any point along its routed path. All LHDs must be installed in accordance with the following instructions:

- Each LHD must be supported using AMEREX® supplied LHD Support Clips and Support Tubing (P/N 16501 or P/N23524 Clips; P/N 24539 Tubing). The LHD must be supported a minimum of every 24" (0.61 m). A support is also required within 3" (0.07 m) of an EOL Module connected to the end of an LHD (See Section 4.3.1).
- Any LHD penetration through a hood, plenum or duct requires the use of an LHD Quik-Seal (P/N 24737) (See Section 4.3.2).
- LHDs are supplied with an uninstalled connector on a single end to facilitate installation through any LHD Penetration Seals. After this end of the LHD is installed through all LHD Penetration Seals or if no Seals are required, the included connector and connector lock must be installed on the end of the LHD (See Section 4.3.3). Only then can an EOL or additional detection devices be installed.
- The LHD must be installed high in a hazard area where higher temperatures are prevalent in overheat or fire conditions. For hood installations, the LHD must be routed throughout the top of the plenum, behind the filters from one end of the plenum to the opposite end to ensure total detection coverage. Additionally, the LHD must cross over the hood/duct opening in accordance with NFPA 17A. If this opening exceeds the 24" (0.61 m) maximum mounting clip spacing, the LHD must be installed on three of the four sides of the hood/duct opening (See Figure 4.3).
- The LHD wire must NOT be installed within any hazard area that exceeds 250°F (121ºC) during normal operating conditions. Physical contact with any high heat surfaces exceeding 250°F (121ºC) is not permitted. The LHD must NOT be routed in the path of hot flue gasses from a gas fired appliance which may result in unwanted system actuation.
- The LHD must NOT be obscured by structural or support structures and should be fully exposed to any rising hot gases from cooking media to ensure rapid detection.
- The LHD must be installed in areas where potential damage resulting from normal appliance operation, moving parts or access openings will not occur. The LHD must not interfere with routine appliance maintenance.
- The LHD cannot be chafed, cut, bent or crushed.
- Selection of the LHD length should be such that it adequately covers the hazard area but is not excessively long, reducing the potential of damage.
- The LHD must be installed in the detection circuits only. Multiple LHDs or SHDs can be connected in series or used in the same circuit, but combined length of all devices used in a single circuit must not exceed 100 feet (30.5 m).
- The LHD must NOT be installed taught without strain relief. The LHD must NOT be crimped, pinched or bent beyond its minimum bend radius of 2 1/2" (0.06 m).

A typical LHD installation is shown on the following page. If no other detection devices are to be installed downstream of the LHD, an EOL Module must be installed on the end of the LHD (after the LHD connector is installed per Section 4.3.3). This EOL may be located inside the plenum, but must be within 6" (0.15 m) of the end of the plenum (See Figure 4.3). If additional detection devices are to be installed in series, downstream of the LHD, a second LHD Penetration Seal must be installed on that side of the plenum, with any additional connections to the LHD located on the outside of the plenum.



FRONT VIEW OF HOOD

Figure 4.3

4.3.1 LHD Support Clip (P/N 16501 or P/N 23524) & Support Tubing (P/N 24539) Installation

An LHD must be supported at a minimum of every 24" (0.61 m) using LHD Support Clips with LHD Support Tubing. A support is also required within 3" (0.07 m) of an EOL Module connected to the end of an LHD. It is recommended that the LHD Support Clips be installed first with the LHD temporarily placed in a series of clips before installing the LHD Support Tubing. Install these items per the following instructions:

1. Mount the LHD Support Clips to a suitable mounting surface using the 1/4" mounting hole. Installer supplied 1/4" fasteners may be used or AMEREX® supplied Quik-Fasteners (P/N 24832) or mounting rivets (P/N 20535 or P/N 20536) may be used (See Figure 4.3.1a). Installation instructions are provided with Quik-Fasteners and the Rivet Installation Tool (P/N 20552).
2. Once all LHD Support Clips are fully installed, temporarily route the LHD by placing it in in each clip location (See Figure 4.3.1b). Never pull an LHD through a series of Support Clips which may result in damage or chafing to the LHD.
3. Moving from one support location to the next, carefully lift out the LHD, wrap a section of LHD Support Tubing around the LHD and press both back into the LHD Support Clip (See Figure 4.3.1b).

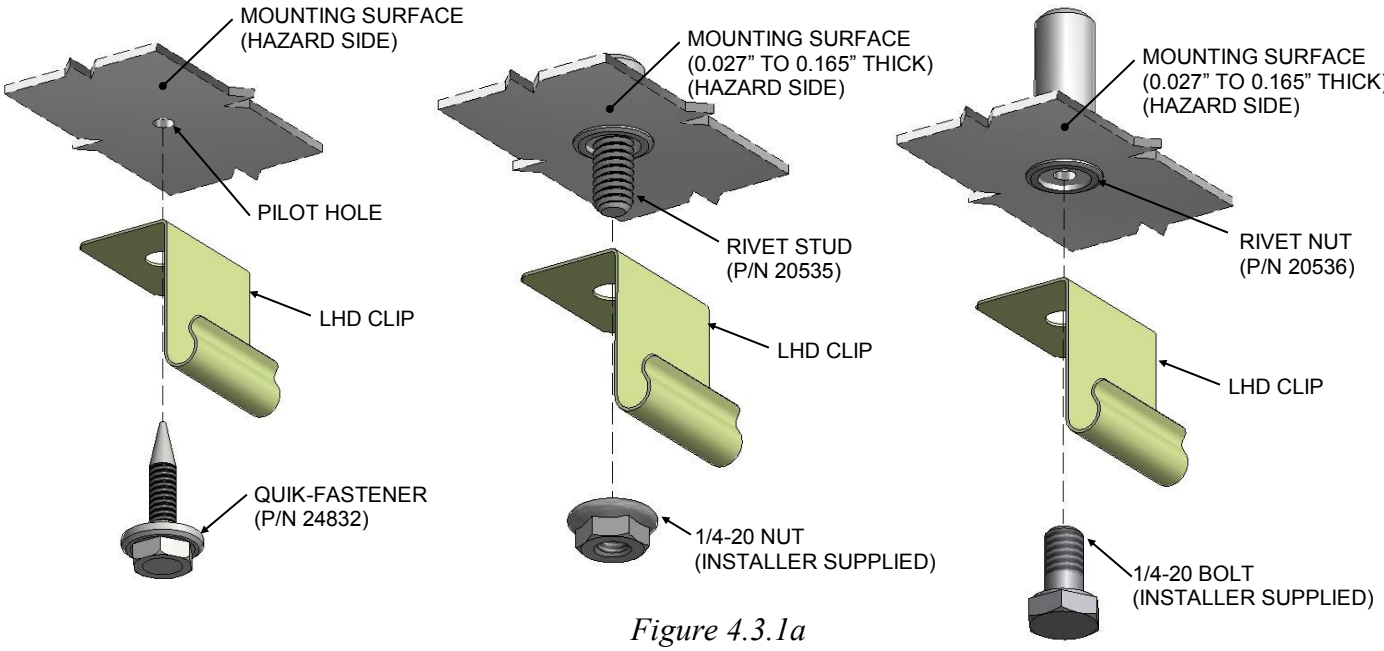


Figure 4.3.1a

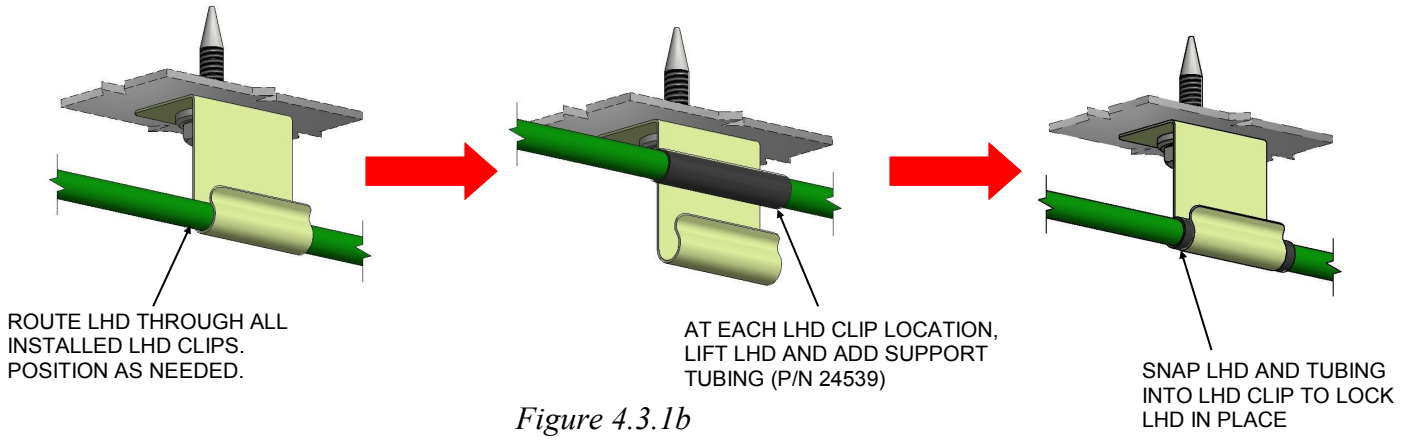


Figure 4.3.1b

4.3.2 LHD Quik-Seal (P/N 24737) Installation

Any LHD penetration through the bulkhead or wall of a hood, plenum or duct requires the use of an LHD Quik-Seal. LHDs are supplied with an uninstalled male connector on the downstream side (opposite end from STRIKE™ Control Unit) to facilitate installation through any LHD Quik-Seals. **All LHD Quik-Seals must be installed with LHD routed through each prior to installing the male connector on the LHD per Section 4.3.3.** Install an LHD Quik-Seal per the following instructions:

1. Drill a 3/4" (19 mm) hole through a bulkhead or wall at the selected mounting location.
2. Install the LHD Quik-Seal into the hole. Ensure the sealing washer and lock washer are installed where shown (See Figure 4.3.2a). Torque the jam nut to 25-30 ft-lb. Note: The LHD Quik-Seal may be oriented in either direction with the body located on either side of the bulkhead.
3. Ensure the compression nut is loose with internal fiber seal installed. Insert the LHD end (with no connector) through the LHD Quik-Seal (See Figure 4.3.2b).
4. Position the LHD as needed and pull all required slack through the LHD Quik-Seal. **Fully install the LHD as described in the previous section prior to proceeding to Step 5**.
5. Tighten the compression nut to seal and lock the LHD in place. Tighten using a wrench until fully bottomed (See Figure 4.3.2c). Do not over-tighten. Ensure the LHD is locked in place.

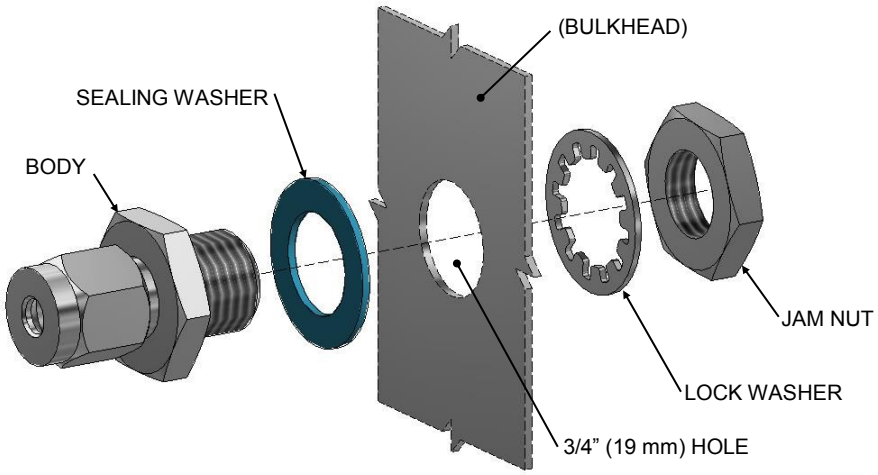


Figure 4.3.2a

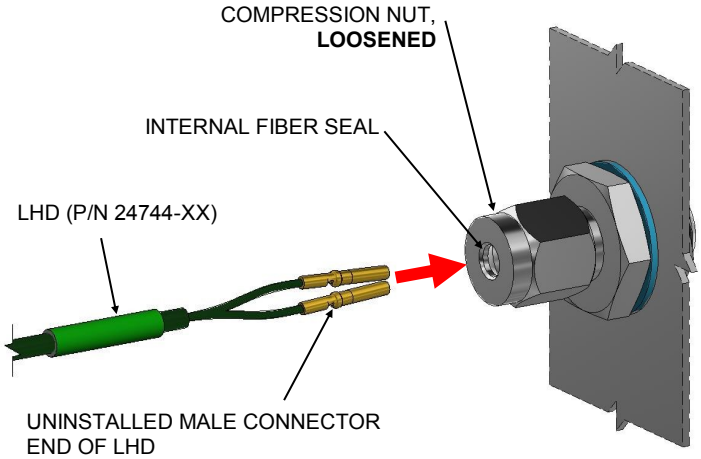


Figure 4.3.2b

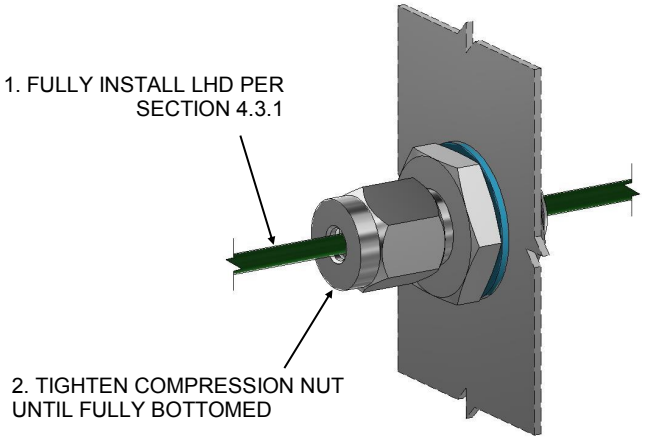


Figure 4.3.2c

4.3.3 LHD Connector Installation

LHDs are supplied with an uninstalled male connector on the downstream side (opposite end from STRIKE™ Control Unit) to facilitate installation through any LHD Quik-Seals. **Only after the LHD is installed through any LHD Quik-Seals can the included male connector be installed on the LHD.** Install the male connector per the following instructions:

1. Each LHD is supplied with an uninstalled, bagged male connector and connector lock (See Figure 4.3.3a). Locate these items.
2. Insert both LHD sockets into the seals on the back of the male connector. **Both sockets must be inserted at the same time** (See Figure 4.3.3b). Insert fully until a "click" is heard for each and the sockets are flush with the front of the connector face (See Figure 4.3.3c).
3. Insert the included connector lock into the slot on the front of the connector. The lock will snap into place and is fully installed when in contact with the connector face (See Figure 4.3.3d).
4. The connector is fully installed. EOL Modules or additional detection devices or extension cables may now be connected to this connector.

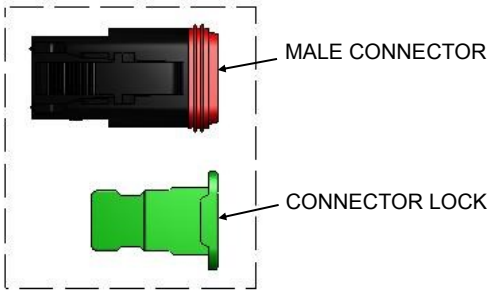


Figure 4.3.3a

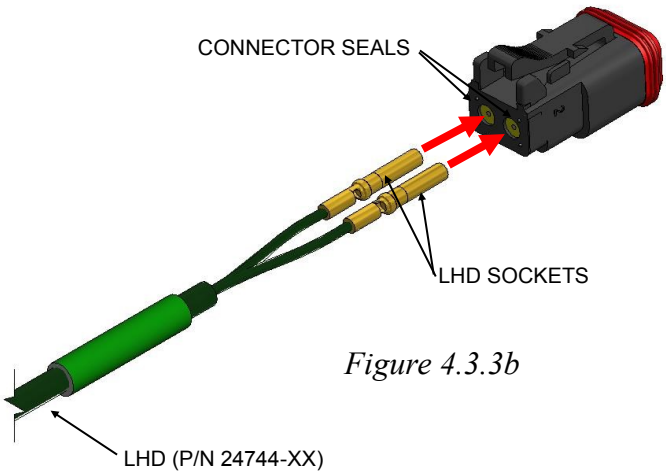


Figure 4.3.3b

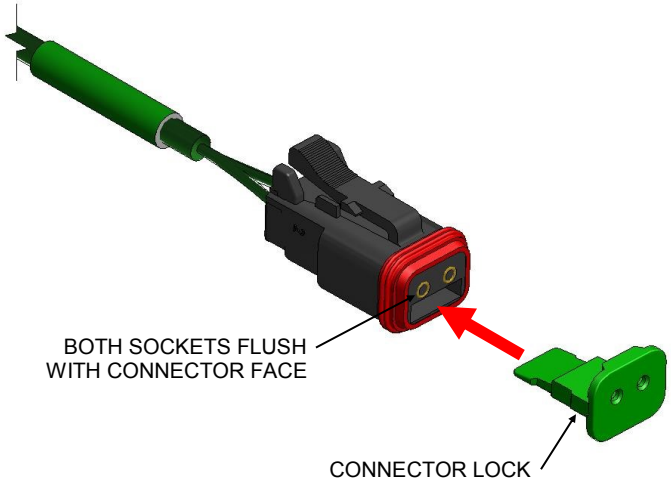


Figure 4.3.3c

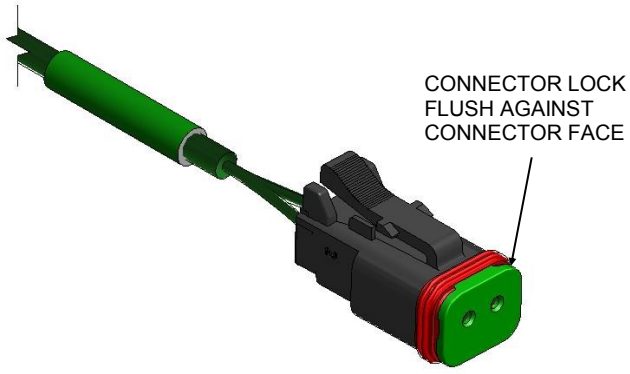


Figure 4.3.3d

4.4 Spot Heat Detector (SHD) Installation (P/N 24944 or P/N 24514)

The Spot Heat Detector (SHD) is a preset heat sensing device designed to detect heat in localized areas of the hazard area. All SHDs must be installed in accordance with the following instructions:

- The SHD must be mounted in a bulkhead configuration. Only the metallic sensor tip of each SHD is to be subjected to the hazard area requiring protected. Wiring and connections are located on the opposite side of the bulkhead.
- The SHD must be installed in a hazard area where the potential for fire or overheat conditions exist. Ambient operating temperature range for the sensor tip side of the SHD is 300ºF (149ºC) for P/N 24944 or 375ºF (190ºC) for P/N 24514; however, the maximum temperature for the wiring portion of the SHD must not exceed 230ºF (110ºC) for extended periods of time.
- If an SHD is used to protect a single appliance, it must be centered over the appliance.
- If multiple SHDs are used to protect multiple appliances along the length of a hood, each appliance under the hood that is being protected by a suppression system may have a detector placed over it and positioned within the path of exhaust vapors; or, SHDs may be placed at intervals of 24” (0.61 m) maximum for complete hood detection.
- Each SHD must NOT be routed in the path of hot flue gasses from a gas fired appliance which may result in unwanted actuation.
- Each SHD must NOT be obscured by structural or support structures and should be fully exposed to any rising hot gasses from cooking media to ensure rapid detection.
- If an SHD is used to protect a duct, the SHD must be placed within the duct opening or up to 12 inches (0.3 m) into the duct.
- Locate the SHD where the potential for buildup of grease or any foreign debris will not interfere with the sensor tip.
- Each SHD and its wiring must be installed in a location allowing access for testing and maintenance.
- Each SHD must be installed in areas where potential damage resulting from normal appliance operation, moving parts or access openings will not occur. The SHD must not interfere with routine appliance maintenance.
- Each SHD must be installed in the detection circuits only. Multiple SHDs or LHDs can be connected in series or used in the same circuit, but combined length of all devices used in a single circuit must not exceed 100 feet (30.5 m).

A typical SHD installation is shown on the following page. If no other detection devices are to be installed downstream of a single SHD, and EOL Module must be installed on the SHD (See Figure 4.4a). If additional SHDs or detection devices are to be installed in series, downstream of the first SHD, the EOL must be located on the last device. A Detection Extension Cable (P/N 24410-XX) may be required between each SHD or detection device (See Figure 4.4b). All device connections must be located outside of the hazard area.

Each SHD is supplied with a seal washer and jam nut. Install each SHD per the following instructions (See Figure 4.4c):

1. Drill a single Ø25/32” to Ø7/8” (20 to 22 mm) hole through the hood or bulkhead (0.036” MIN to 0.188” MAX thickness).
2. Insert the SHD with seal washer. Secure by threading the jam nut to the threaded portion of the SHD using a medium grade thread locking compound. Tighten to 10 –15 ft-lbs.

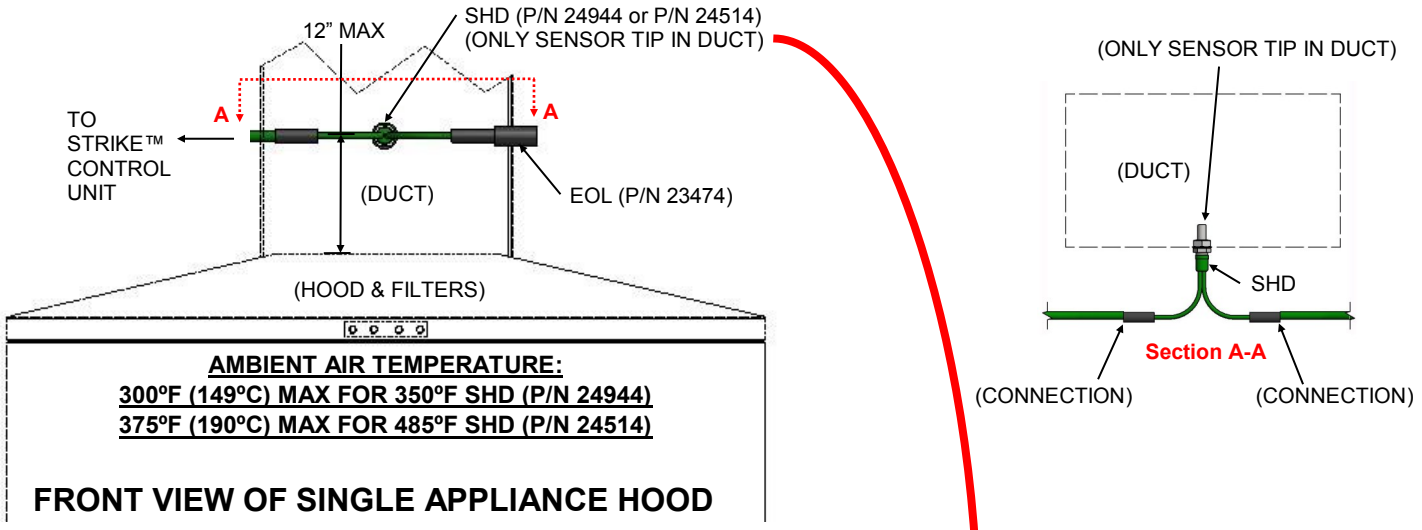


Figure 4.4a

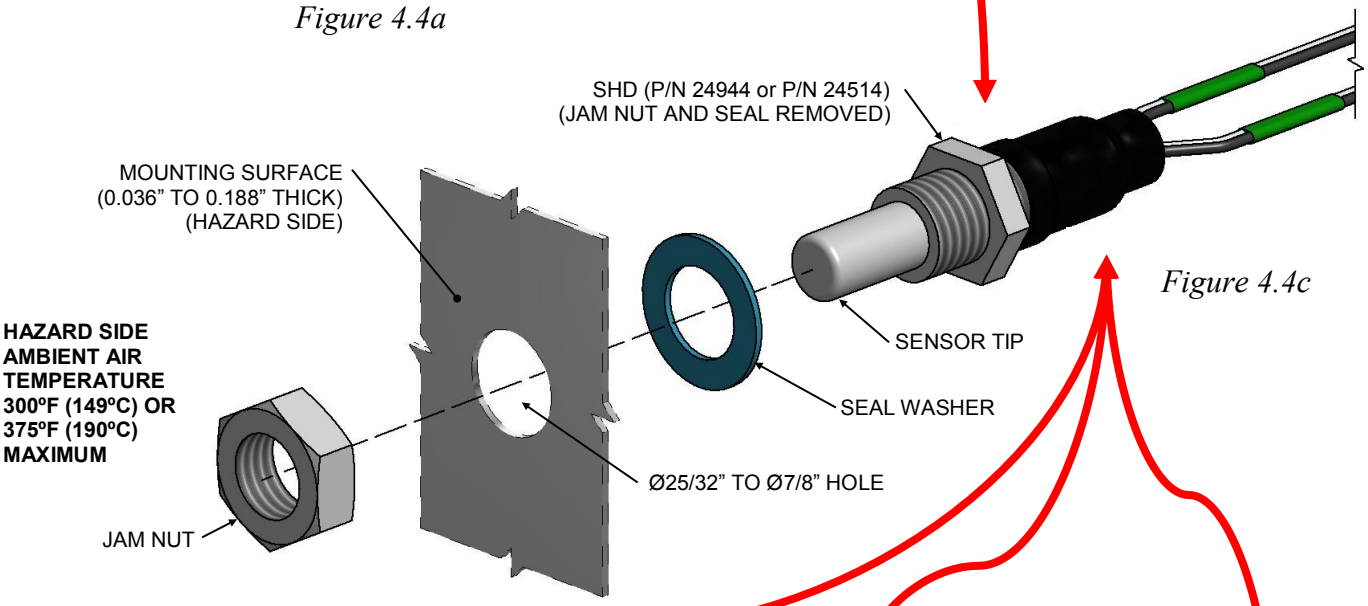


Figure 4.4c

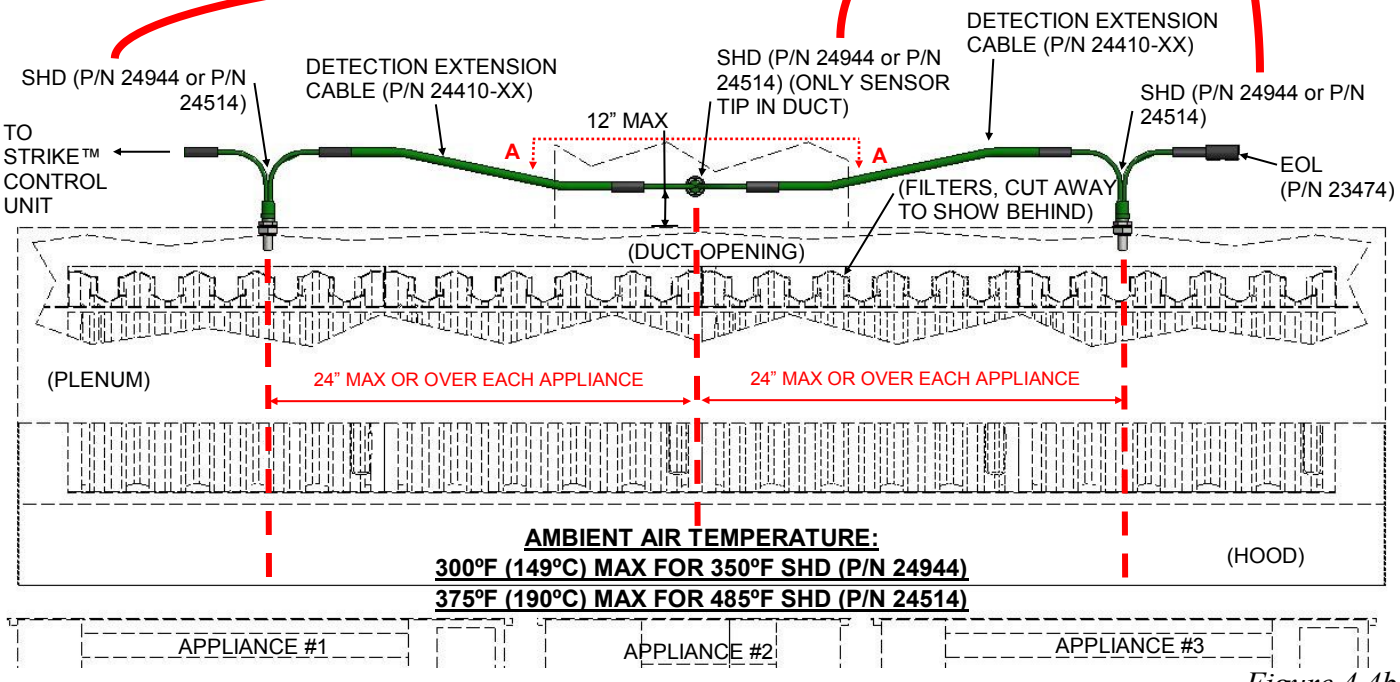


Figure 4.4b

4.5 Linear Actuator Installation

Linear Actuators (P/N 24448) are used for actuation of an AMEREX® KP™ Fire Suppression System equipped with an electric actuator option. Reference the latest AMEREX® KP™ Fire Suppression Installation, Operation and Maintenance Manual (P/N 20150) for selection of systems and components requiring Linear Actuators.

The STRIKE™ ECS supports up to two actuation circuits and therefore up to two Linear Actuators. All Linear Actuators must be installed in accordance with the following instructions. **Do NOT connect any field wiring to installed Linear Actuators until directed to do so in Section 4.9.**

1. Thread the Linear Actuator into the top of the SRM (See Figure 4.5a), Actuator Asy KP600 (See Figure 4.5b) or Electric Control Head (See Figure 4.5c) . **Hand tighten only and ensure that the brass hex portion of the Linear Actuator is fully bottomed against the electric actuator assembly. Do not over tighten. Do not use PTFE thread tape**.

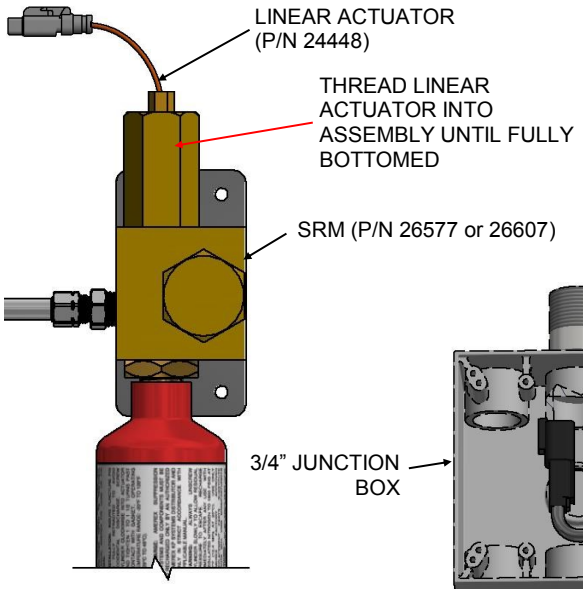


Figure 4.5a

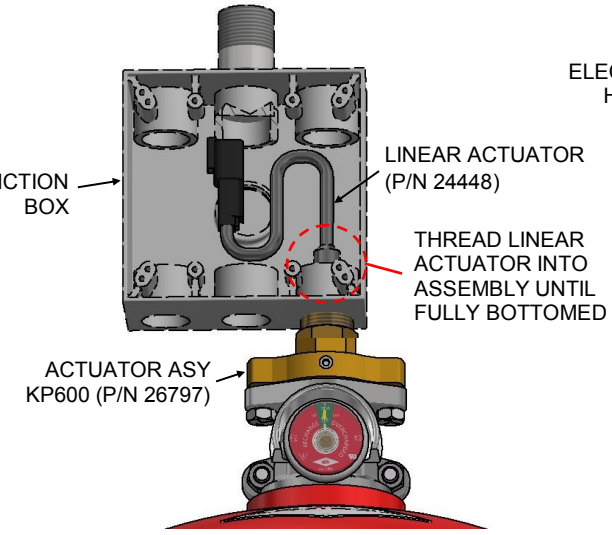


Figure 4.5b

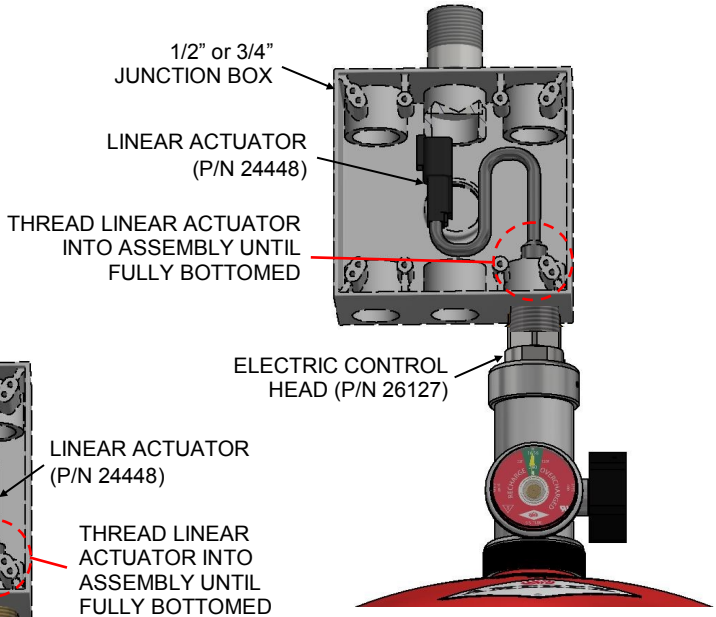


Figure 4.5c

4.6 Manual Pull Station Installation

The AMEREX® STRIKE™ ECS requires at least one Manual Pull Station (P/N 24168 or P/N 24290) be installed. Manual Pull Stations must be installed no higher than 48 inches (1.21 m) from the floor and must be located along a path of egress. Consult the local AHJ for final approval for quantity, locations, mounting heights and all other considerations prior to installation.

Mounting locations shall permit easy access to a Manual Pull Station in the event that it must be used. The assembly must be mounted to a solid structure capable of supporting the weight of the assembly and additional wiring components as well as capable of handling the potential force applied to the station when pulled manually. Proper cable routing should be considered when choosing an appropriate location. Any obstacles, moving parts, hazard areas, or walls that may inhibit access or cause damage to the Manual Pull Station must be avoided.

The Manual Pull Station is available in two mounting configurations: surface mounted (P/N 24290) or flush mounted (P/N 24168). An electrical outlet/conduit box is provided with each unit to house the electrical wiring, connectors and EOL. This electrical box contains knockouts which are used for all field wiring to and from each Manual Pull Station.

4.6.1 Surface Mounting (P/N 24290)

For surface mount applications, the Manual Pull Station contains a red cover cup which conceals the included electrical outlet/conduit box and all wiring. The electrical outlet/conduit box contains 1/2" and 3/4" knockouts for wiring and EMT conduit. If multiple Manual Pull Stations are used and connected in series, the box must be oriented so that a 3/4" knockout is located on top. If only one Manual Pull Station is used, the box may be oriented so that either a 1/2" or 3/4" knockout is located on top, depending on wiring/conduit preference. Install per the following instructions (See Figure 4.6.1):

1. Use the box as a template to match drill two holes in the selected mounting surface with a stud or solid structure.
2. Assemble the electrical box to the mounting surface and stud using appropriate hardware.
3. The Manual Pull Station is attached to the electrical box using the (2) provided #8 screws. Install the provided plastic plugs (2) in the remaining two holes on the cover. **Do NOT connect any cables or field wiring until directed to do so in Section 4.9.**

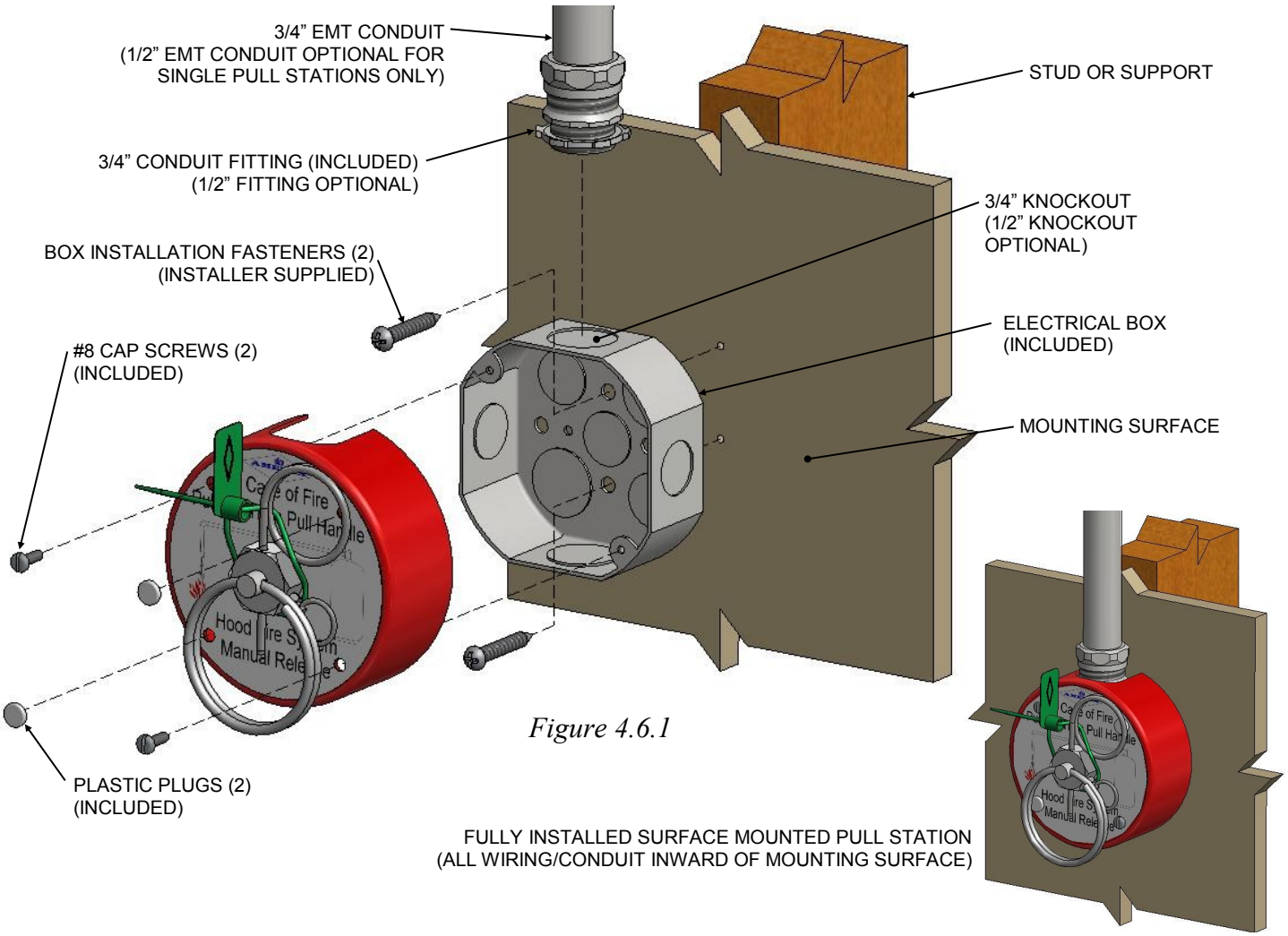


Figure 4.6.1

4.6.2 Flush Mounting (P/N 24168)

For flush mount applications, the Manual Pull Station contains an oversize red cover plate which conceals a cutout in the mounting surface used to recess the included electrical outlet/conduit box and all wiring. Flush mounting requires the electrical box to be attached to a stud or solid structure. The electrical box contains 1/2" and 3/4" knockouts on the sides and back, either of which can be used for wiring or EMT conduit if desired. If multiple Manual Pull Stations are used, they are to be connected in series, and a 3/4" knockout must be used. If only one Manual Pull Station is used, either a 1/2" or 3/4" knockout will suffice. Install per the following instructions (See Figure 4.6.2):

1. If walls are installed, use the box as a template to cut out a hole in the mounting surface or wall, directly adjacent to a stud.
2. Drill two mounting holes (approx. Ø 5/32") in the side of the box that will attach to the stud.
3. Using appropriate hardware, mount the box to the stud so that the front edge of the box is flush with the mounting surface.
4. The Manual Pull Station is attached to the electrical box using the (2) provided #8 screws. Install the provided plastic plugs (2) in the remaining two holes on the cover. **Do NOT connect any cables or field wiring until directed to do so in Section 4.9.**

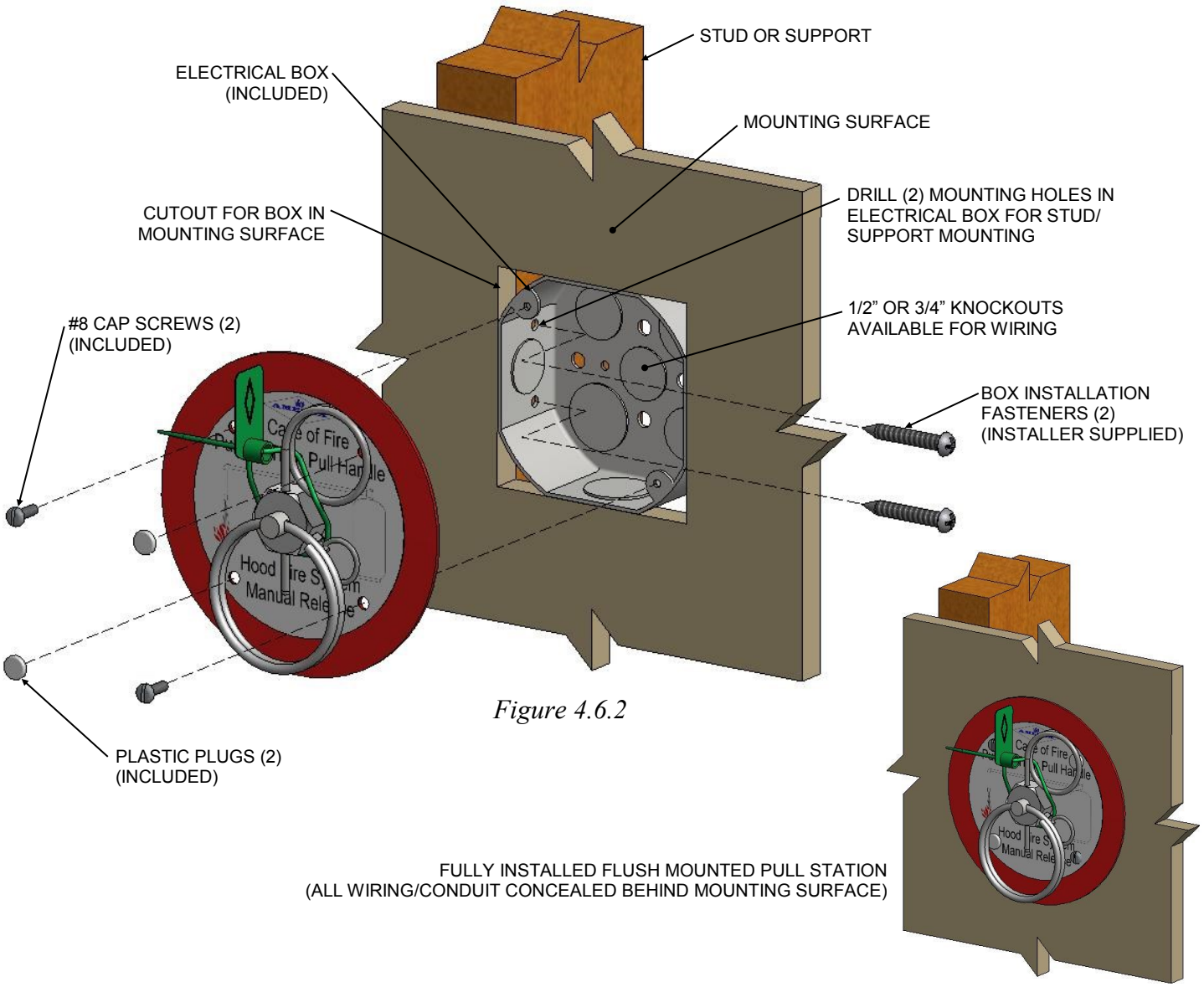


Figure 4.6.2

4.7 Pressure Switch Installation

The Pressure Switch Circuit is not currently available for use with KP™. This section is reserved.

4.8 Relay Module & Optional Device Installation

The STRIKE™ ECS supports several optional devices if desired or required by the local AHJ. Such devices may include Relay Modules that can be used to control additional devices such as Electric Gas Valves, external alarms or signaling devices, fans, appliances, motors, pumps, etc. The STRIKE™ ECS may also be connected to an external Fire Alarm Control Panel (FACP) to indicate a fault or alarm condition to the FACP. Such devices are connected to the STRIKE™ ECS using the provided FACP and relay output terminal board on the STRIKE™ Control Unit (TB2).

Installation instructions for AMEREX® supplied optional devices are shown in the following sections. **Do NOT connect any field wiring to installed optional devices until directed to do so in Section 4.9.**

4.8.1 Relay Module Installation

AMEREX® offers two Relay Modules: The Gas Valve Relay Module (P/N 24694) or the Relay Control Module (P/N 24695). Either must be mounted in a convenient location permitting access for inspection or for manual resetting of the gas valve relay. Proper routing of all installer supplied field wiring to a Relay Module, including communication with the STRIKE™ Control Unit, building AC power input, and controlled AC power out to any optional device, is required and should be considered when choosing an appropriate location. Any obstacles, moving parts, hazard areas, or bulkheads that may inhibit complete connection of all system components or cause damage to components must be avoided.

Relay Modules must be mounted in a dry location safe from any potential moisture or damage and must me mounted to a surface capable of supporting the weight of the module and any additional wiring components. Consider the most convenient wire routing path of all connected devices when determining the most suitable mounting location. Electrical knockouts (3/4") are provided on the top and bottom the enclosure which are used for all field wiring entering the module enclosure. Install the Relay Modules per the following instructions (See Figure 4.8.1):

1. The Relay Module enclosure contains (3) 1/4" (6 mm) mounting holes. Use the enclosure as a template to mark then drill the holes in the selected mounting surface.
2. Loosely assemble the enclosure to the mounting surface using appropriate hardware (#10 or 1/4" fasteners are recommended).
3. Finish the installation by securely attaching the enclosure. **Do NOT connect any field wiring to the Relay Module until directed to do so in Section 4.9.**

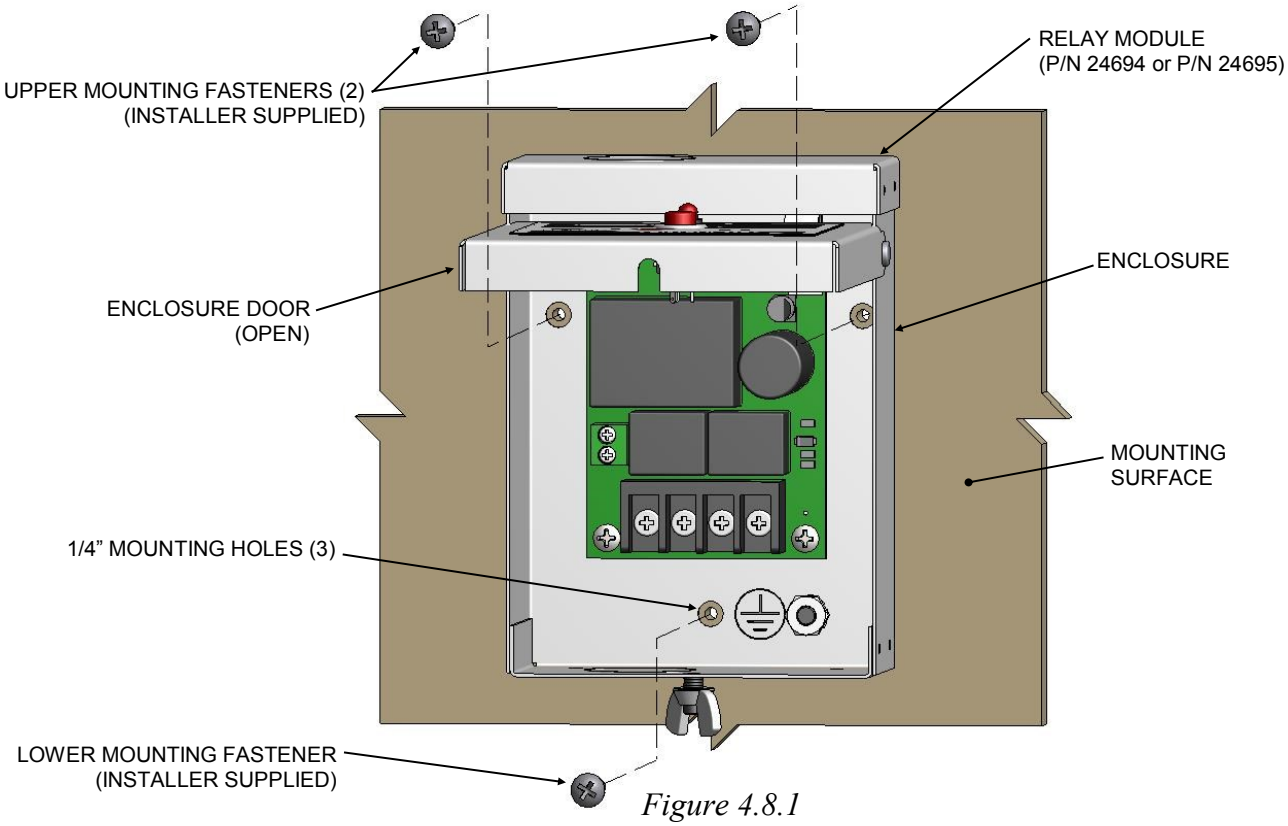


Figure 4.8.1

4.8.2 Optional Device Installation

Installation instructions for the following AMEREX® supplied devices are supplied with each device. Reference the included instructions for installation procedures:

- Electric Gas Valves (P/N 12870 thru P/N 12876)
- Horn/Strobe (P/N 21396)

For other optional devices including FACPs not provided by AMEREX®, reference the manufacturers installation instructions. **Do NOT connect any field wiring to any installed optional devices until directed to do so in Section 4.9.**

4.9 Field Wiring

Field wiring for the STRIKE™ ECS may be performed following the installation of the STRIKE™ Control Unit enclosure along with all other detection, manual release, actuation, and optional devices. **AMEREX® supplied wiring cables must be used for connection of each detection, manual pull, and actuation circuit back to the STRIKE™ Control Unit enclosure.** Optional devices, such as Relay Modules, FACPs, gas valves, and external alarms/signaling devices require installer supplied wiring. Always contact the local AHJ for a proposed wiring installation. All installations must follow NFPA 70 (National Electric Code) and all state and local codes. Traditional wiring support methods or EMT conduit may be used as required.

The following subsections describe the available cables and wiring methods for routing each circuit from each device to and into the STRIKE™ Control Unit enclosure. **AMEREX® recommends routing individual cables by starting at each device and routing the blunt cut end (no connector) of each "Lead" cable back into the STRIKE™ Control Unit enclosure.** The STRIKE™ Control Unit enclosure contains 13 electrical knockouts (3/4") available for use for all field wiring entering the enclosure (See Figure 2.1a/2.1b). Typical installations utilize many cables that require the use of several of these knockouts. Traditional cable clamps, connectors, or conduit may be used as required for cable entry into the enclosure. Always contact the local AHJ for a proposed wiring installation. **Termination of each circuit to the STRIKE™ Control Unit is described later in Section 4.10.**

4.9.1 Detection Circuits

The STRIKE™ ECS has two dedicated Class B detection circuits which support SHD or LHD detection devices or zone specific Manual Pull Station devices. Each detection circuit may utilize a single device or multiple devices connected in series. The Detection Lead Cable (P/N 24409-XX) is used to connect a single detection device, or to connect the first device in a series, back to the STRIKE™ Control Unit enclosure. The Detection Extension Cable (P/N 24410-XX) is used between detection devices connected in series on the same circuit. **An End of Line Module or EOL (P/N 23474) is ALWAYS required at the end of each detection circuit.** All detection cables and components are color coded green for reference.

WARNING: Manual Pull Stations installed in a detection circuit are intended for zone specific actuation only, and only the programmed actuation zones for that detection circuit will be activated when pulled. Also, Manual Pull Lead Cables (P/N 24412-XX) and Extension Cables (P/N 24413-XX) must be used in lieu of Detection Lead and Extension Cables for all connections to a Manual Pull Station. Reference Figure 4.9.1c for specific instructions for cable connection at the Manual Pull Station.

For single detection device (LHD or SHD) circuit installations (See Figure 4.9.1a):

1. Route the blunt cut end of the Detection Lead Cable (P/N 24409-XX) from the installed device back into the STRIKE™ Control Unit enclosure through the selected knockout. Any excess length in the cable should be pulled into the STRIKE™ Control Unit enclosure and may be trimmed later. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
2. Connect the female device connector (F) to the lead cable connector (M).
3. Ensure an EOL Module (P/N 23474) is installed on the male device connector (M) at the end of the circuit.

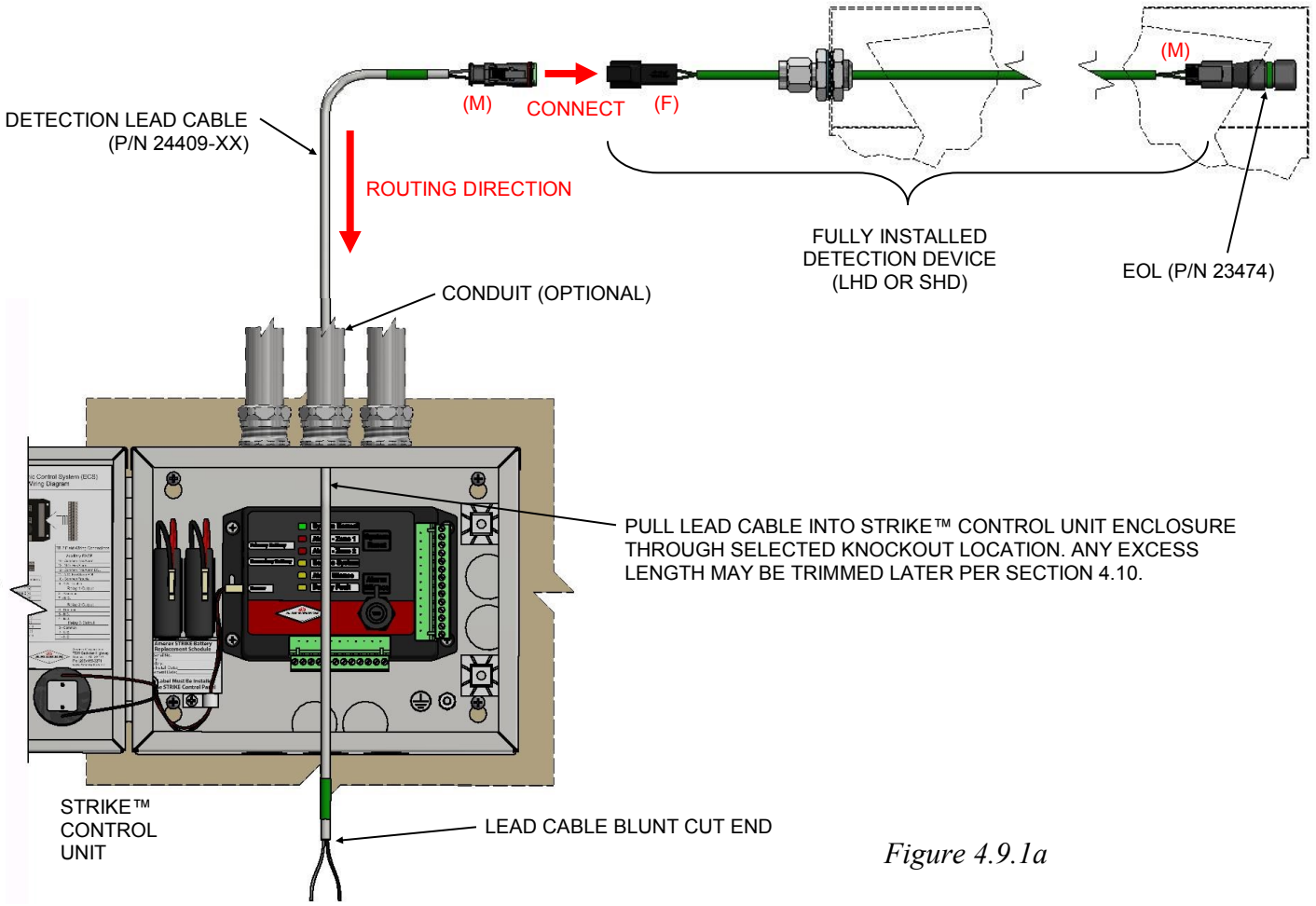


Figure 4.9.1a

4. Termination of the Detection Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **Ensure the device and associated cable are fully installed and connected before proceeding to prevent any fault or alarm conditions or accidental discharges!**

For multiple detection device (LHD or SHD) (See Figure 4.9.1b):

1. Begin at the last installed device located farthest from the STRIKE™ Control Unit, and route the female connector end (F) of the Detection Extension Cable (P/N 24410-XX) from that device to the next device location, leaving the male extension cable connector end (M) at the starting location. Any excess length in the extension cable must be stored away from the devices. If conduit is used, it must be 3/4" conduit. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
2. Connect the female device connector (F) to the male extension cable connector (M).
3. Install an EOL Module (P/N 23474) on the male device connector.
4. If more than two devices are used, repeat previous steps 1-2 for the next device in series. Connect the male device connector (M) to the female connector (F) of the previous extension cable. Once the first device is reached (closest to the STRIKE™ Control Unit), proceed to the next step.
5. At the first device location, route the blunt cut end of the Detection Lead Cable (P/N 24409-XX) from the installed device back into the STRIKE™ Control Unit enclosure through the selected knockout. Any excess length in the cable should be pulled into the STRIKE™ Control Unit enclosure and can be trimmed later. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
6. Connect the female device connector (F) to the lead cable connector (M).
7. Termination of the Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **Ensure all detection devices and all associated cables are fully installed and connected before proceeding to prevent any fault or alarm conditions or accidental discharges!**

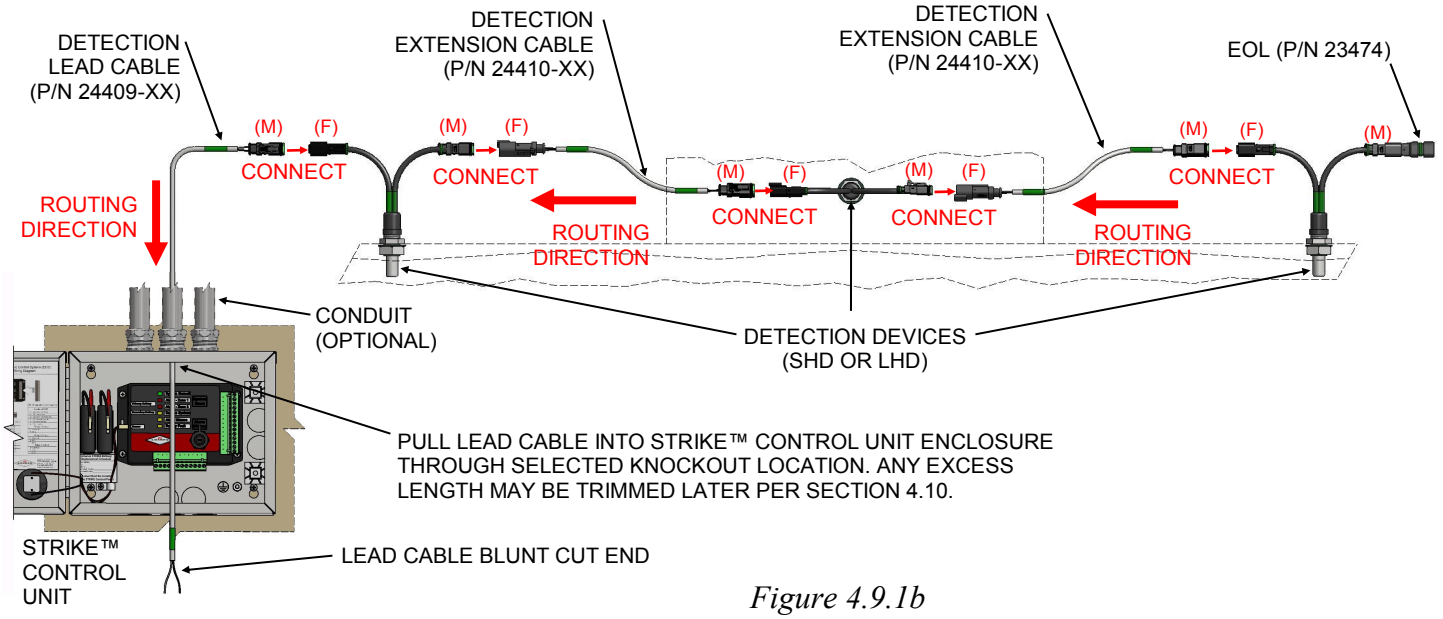


Figure 4.9.1b

For dedicated manual pull stations installed in a detection circuit, the Manual Pull Station must be the first device in series, installed between the Control Unit and the first detection device. Also, for all connections to a Manual Pull Station, Manual Pull Lead Cables (P/N 24412-XX) and Extension Cables (P/N 24413-XX) must be used in lieu of Detection Lead and Extension Cables. (See Figure 4.9.1c):

1. If multiple detection devices (LHD or SHD) are installed downstream of the Manual Pull Station, route Detection Extension Cables (P/N 24410-XX) between each detection device as shown on the previous page (See Figure 4.9.1b).
2. At a single detection device, or at the first detection device located closest to the Control Unit/Manual Pull Station, route the female connector end (F) of a Manual Pull Extension Cable (P/N 24413-XX) from that detection device to and into the Manual Pull Station electrical box, leaving the male extension cable connector end (M) at the starting location. Only about 5" of the electrical connector shall be pulled into the electrical box as shown. Any excess length in the extension cable must be stored away from the devices. If conduit is used, it must be 3/4" conduit. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
3. Connect the male extension cable connector (M) to the female detection device connector (F).
4. Connect the male pull station connector (M) to the female ext. cable connector (F).
5. Route the blunt cut end of the Manual Pull Lead Cable (P/N 24412-XX) from the installed electrical box back to the STRIKE™ Control Unit enclosure until only about 5" of the electrical connector remains in the electrical box as shown. Any excess length in the cable should be pulled to the Control Unit enclosure.
6. Connect the female Pull Station connector (F) to the male lead cable connector (M).
7. Tuck the electrical connections into the electrical box as shown and reinstall the Manual Pull Station using the (2) provided #8 cap screws. **Do not pinch any electrical wiring or connectors during installation.**
8. Termination of the Manual Pull Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **Ensure all Manual Pull Stations are fully installed AND all Pull Pins are properly installed before proceeding to prevent any fault or alarm conditions or accidental discharges!**

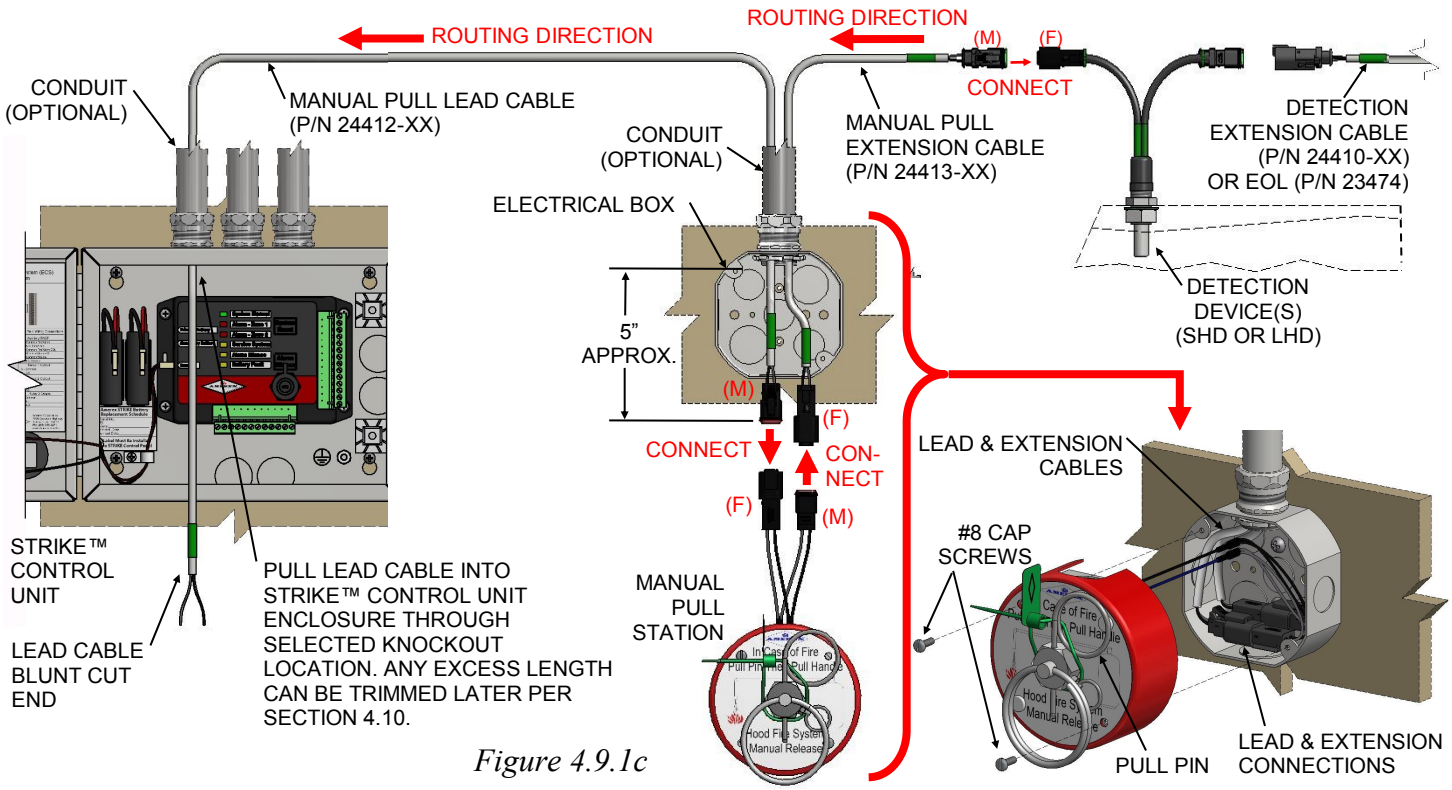


Figure 4.9.1c

4.9.2 Actuation Circuits

The STRIKE™ ECS has two dedicated actuation circuits which support the Linear Actuators used to actuate the AMEREX® KP™ Fire Suppression System. Each actuation circuit must support only one Linear Actuator. The Actuation Lead Cable (P/N 24411-XX) is used to connect the Linear Actuator to the STRIKE™ Control Unit. All actuation cables and components are color coded yellow for reference. Each of the two actuation circuits may be programmed later or mapped to be used with individual detection circuits as desired (See Section 4.11). **Do NOT connect any actuation field wiring to the STRIKE™ Control Unit until directed to do so in Section 4.10.**

The entire actuation circuit must be routed from the STRIKE™ Control Unit enclosure to the KP™ Fire Suppression System enclosure within electrical conduit for mechanical protection. 3/4" electrical knockouts are provided on each. Each actuation circuit is limited to 100 feet (30.5 m). A Linear Actuator (P/N 24448) is always installed at the end of each circuit.

For actuation circuit installations (See Figure 4.9.2),

1. Beginning at the installed Linear Actuator within the SRM enclosure (Figure 4.9.2a), route the blunt cut end of the Actuation Lead Cable (P/N 24411-XX) out of the SRM enclosure at the provided knockout location ("ELEC") to and into the STRIKE™ Control Unit enclosure through the selected knockout. The entire route must be within electrical conduit for mechanical protection. Any excess length in the cable should be pulled into the STRIKE™ Control Unit enclosure and can be trimmed later. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
2. For Electric Control Head applications (Figure 4.9.2b), begin at the installed Linear Actuator on top of the Electric Control Head, route the blunt cut end of the Actuation Lead Cable (P/N 24411-XX) from the junction box (if required) to and into the STRIKE Control Unit enclosure through the selected knockout.
3. Connect the Linear Actuator connector (M) to the lead cable connector (F).
4. Termination of the Actuation Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **To prevent any fault conditions**, **ensure the Linear Actuator & associated cable are fully installed & connected before proceeding.**

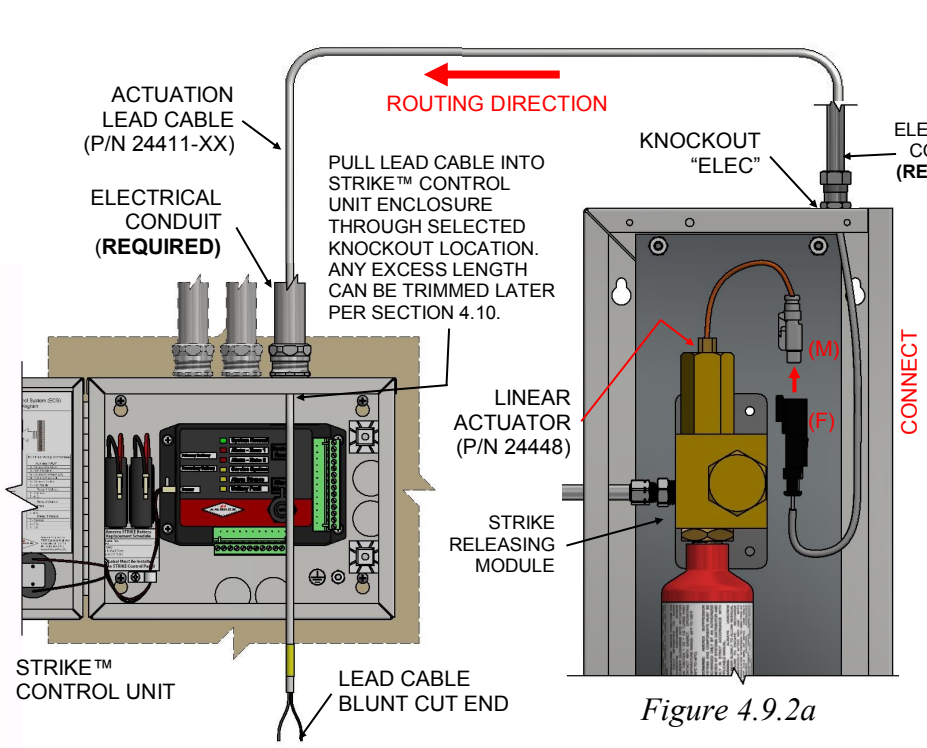


Figure 4.9.2a

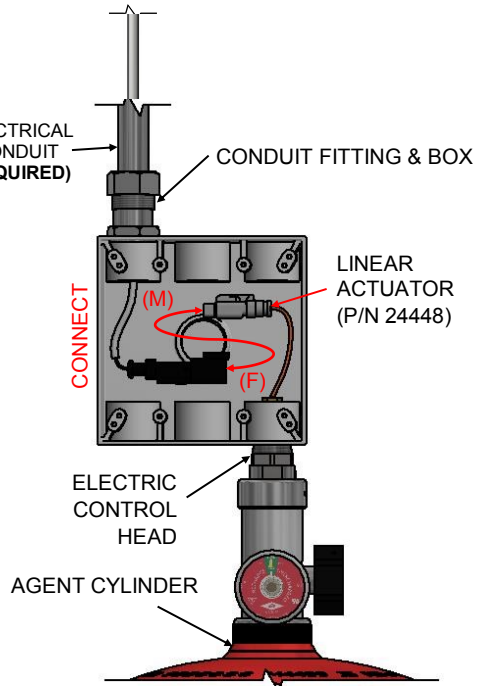


Figure 4.9.2b

4.9.3 Manual Pull Circuit

The STRIKE™ ECS has a single dedicated Class B manual pull circuit which supports any Manual Pull Stations desired for complete system actuation. The manual pull circuit may utilize a single Manual Pull Station or multiple Manual Pull Stations connected in series. The Manual Pull Station Lead Cable (P/N 24412-XX) is used to connect a single device, or to connect the first device in series, back to the STRIKE™ Control Unit enclosure. The Manual Pull Station Extension Cable (P/N 24413-XX) is used between devices connected in series on the same circuit. **An End of Line Module or EOL (P/N 23474) is ALWAYS required at the end of the manual pull circuit.** Manual Pull Station cables & components are color coded green for reference.

For single Manual Pull Station installations (See Figure 4.9.3a):

1. Route the blunt cut end of the Manual Pull Lead Cable (P/N 24412-XX) from the installed electrical box back to the STRIKE™ Control Unit enclosure until only about 5" of the electrical connector remains in the electrical box as shown. Any excess length in the cable should be pulled into the Control Unit enclosure. **Do not cut, pinch, crush, or chafe any electrical wiring or connectors during installation.**
2. Connect the female Pull Station connector (F) to the lead cable connector (M).
3. Install an EOL Module (P/N 23474) on the male Manual Pull Station connector (M).
4. Tuck the electrical connections into the electrical box as shown and reinstall the Manual Pull Station using the (2) provided #8 cap screws. **Do not pinch any electrical wiring or connectors during installation.**
5. Termination of the Manual Pull Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **Before proceeding, ensure the Manual Pull Station is fully installed AND the Pull Pin is properly installed to prevent any fault or alarm conditions or accidental discharges!**

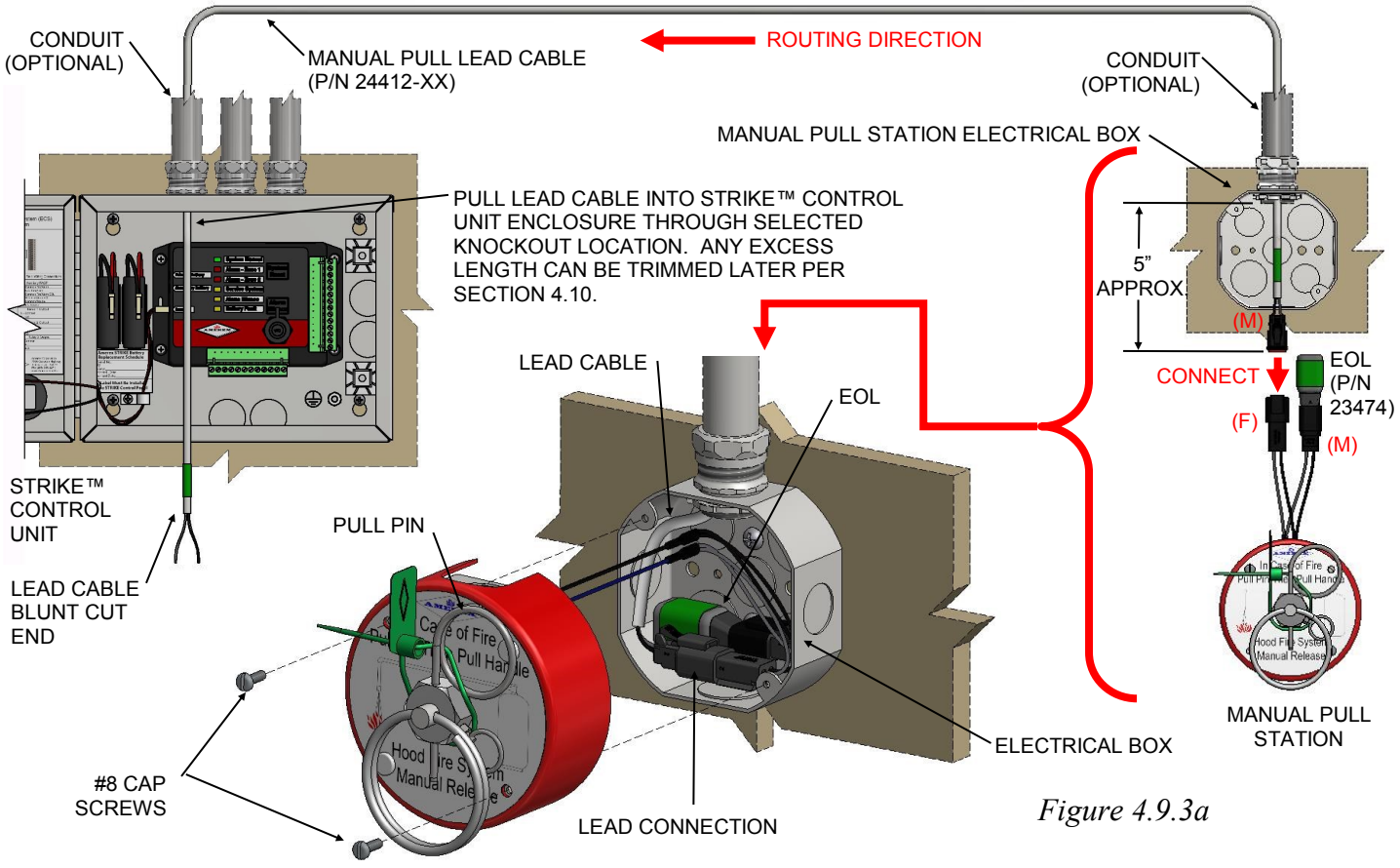


Figure 4.9.3a

For multiple Manual Pull Station installations (See Figure 4.9.3b):

1. Begin at the last Manual Pull Station, located farthest from the STRIKE™ Control Unit, and route the female connector end (F) of the Manual Pull Extension Cable (P/N 24413-XX) from the installed electrical box to and into the next Manual Pull Station electrical box location. Only about 5" of the electrical connectors shall remain in each electrical box as shown. Any excess length in the extension cable must be stored outside of these electrical boxes. Any conduit must be 3/4" conduit.
2. Connect the female pull station connector (F) to the male ext. cable connector (M).
3. Install an EOL Module (P/N 23474) on the male Manual Pull Station connector (M).
4. Tuck the electrical connections into the electrical box as shown and reinstall the Manual Pull Station using the (2) provided #8 cap screws (See Figure 4.9.3a). **Do not pinch any electrical wiring or connectors during installation**.
5. If more than two Manual Pull Stations are used, repeat the previous steps (1, 2 & 4) for the next in series, then connect the male pull station connector (M) to the previous ext. cable connector (F). Otherwise, proceed to step 6.
6. At the first Manual Pull Station location, closest to the STRIKE™ Control Unit, route the blunt cut end of the Manual Pull Lead Cable (P/N 24412-XX) from the installed electrical box back to the STRIKE™ Control Unit enclosure until only about 5" of the electrical connector remains in the electrical box as shown. Any excess length in the cable should be pulled to the Control Unit enclosure (See Figure 4.9.3a).
7. Connect the male Pull Station connector (M) to female ext. cable connector (F).
8. Connect the female Pull Station connector (F) to male lead cable connector (M).
9. Tuck the electrical connections into the electrical box as shown and reinstall the Manual Pull Station using the (2) provided #8 cap screws. **Do not pinch any electrical wiring or connectors during installation.**
10. Termination of the Manual Pull Lead Cable to the STRIKE™ Control Unit is performed in Section 4.10. **Ensure all Manual Pull Stations are fully installed AND all Pull Pins are properly installed before proceeding to prevent any fault or alarm conditions or accidental discharges!**

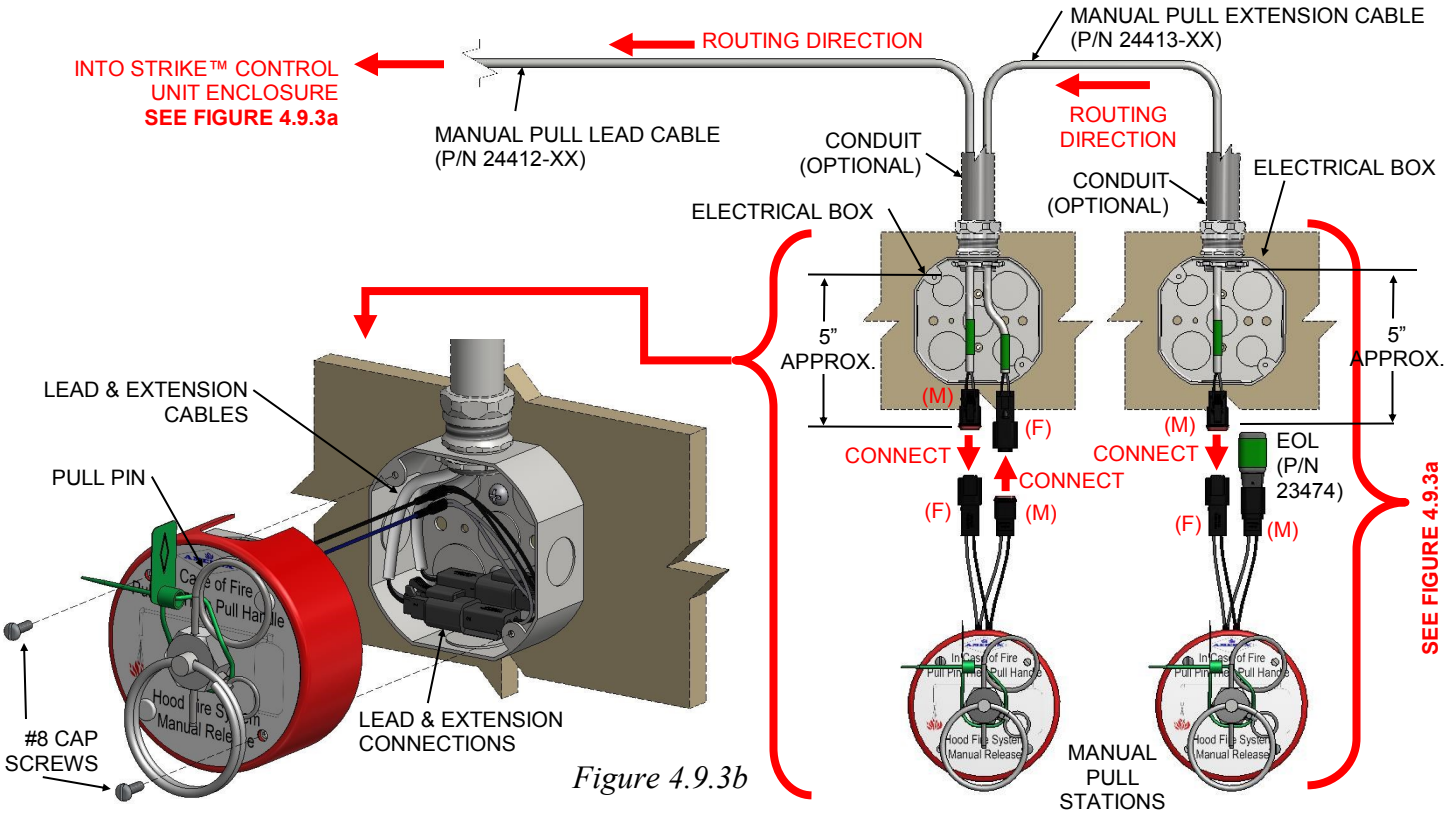


Figure 4.9.3b

4.9.4 Pressure Switch Circuit

The Pressure Switch Circuit is not currently available for use with KP™. This section is reserved.

4.9.5 Relay Module & Optional Device Circuits

The STRIKE™ ECS Control Unit has three available relay output circuit terminals for use with a Relay Module to control optional external AC devices such as Electric Gas Valves, auxiliary alarms, horns, fans, motors, pumps, appliances, etc. The STRIKE™ Control Unit also features additional alarm and fault outputs for connection to an auxiliary Fire Alarm Control Panel (FACP). All wiring, cables, and/or components used in these circuits are installer supplied.

If a Gas Valve Relay Module (P/N 24694) is installed, it may be used for control of an Electric Gas Valve only. Two terminal boards are provided within the Relay Module for installer supplied wiring. The green terminal board is used for the D/C control circuit (+12 VDC) to the STRIKE™ Control Unit, and the lower black terminal board is for all AC wiring. 3/4" electrical knockouts (4) are provided on the Relay Module enclosure and must be used for all field wiring. EMT Conduit and a type 2 (or better) conduit hub must be used to maintain the UL Listing on the Relay Module. Use junction boxes as required for external wiring connections.

For Gas Valve Relay Module (P/N 24694) circuit installations (See Figure 4.9.5a):

1. Verify the voltage and rating of the installed Electric Gas Valve is rated for 120/240 VAC and less than 10 amps.
2. Route and connect the Line and Neutral gas valve leads to position 3 and 4 of the black terminal strip using 12-22 AWG wiring. Torque terminal screws to 7 in-lbs.
3. Route and connect AC power to position 1 and 2 of the lower black terminal strip using 12-22 AWG wiring. Connect ground wiring to the provided lug.
4. Connect and route wiring (12 VDC) from the green terminal strip (positions 1 & 2) to and into the STRIKE™ Control Unit enclosure using 14-26 AWG wiring. Torque terminal screws to 4 in-lbs. Termination of wiring to the STRIKE™ Control Unit is in Section 4.10.

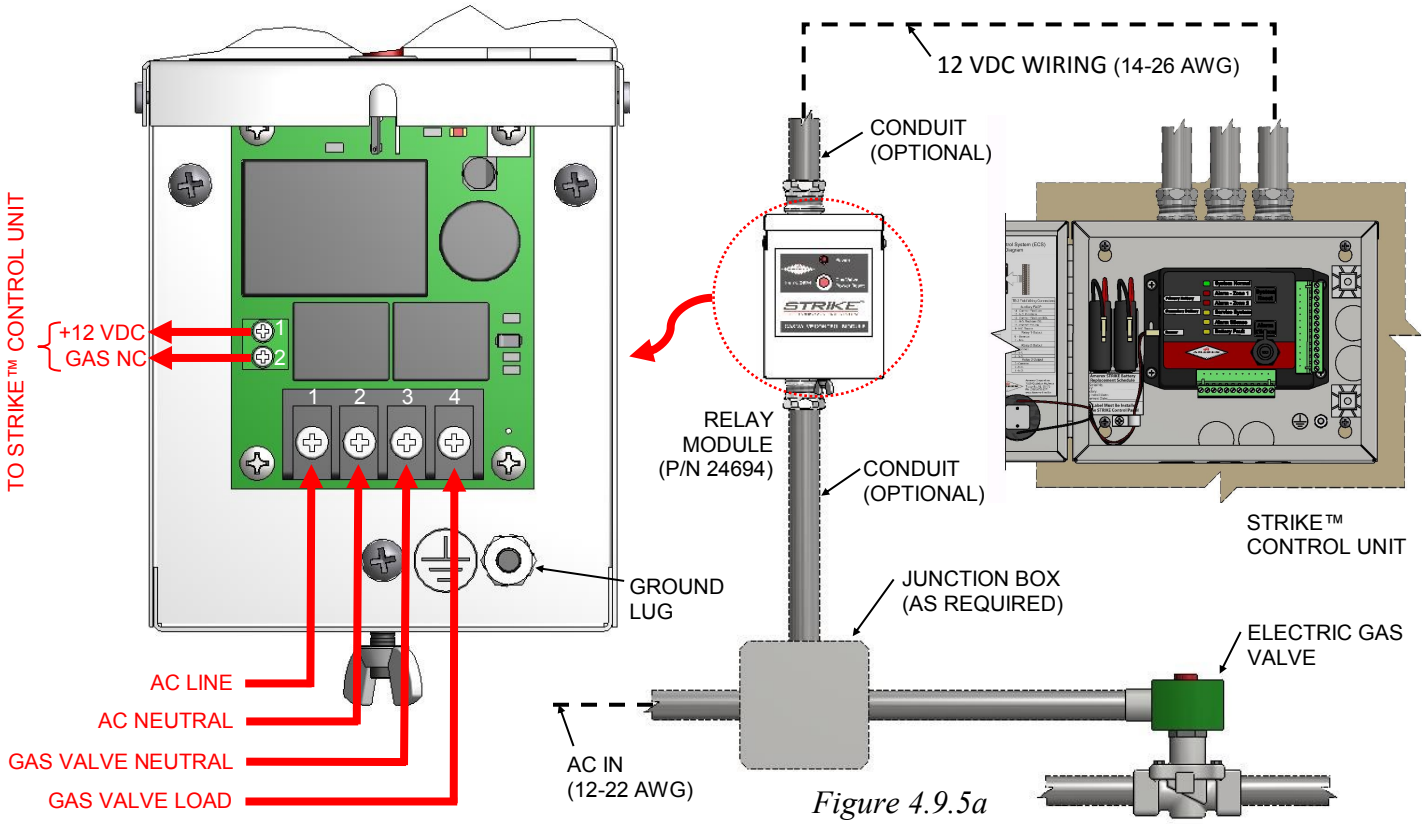


Figure 4.9.5a

If a Relay Control Module (P/N 24695) is installed, it may be used for control of an Electric Gas Valve (Relay #1) and up to two additional AC devices (Relay #2 & #3). Three terminal boards are provided within the Relay Module for installer supplied wiring. The green terminal board (4 position) is used for the DC control circuits (12 VDC) to the STRIKE™ Control Unit, the lower black terminal board (4 position) is for AC input and gas valve wiring (Relay #1), and the black terminal board on the right (6 position) is used for Relay # 2 & #3 wiring to optional devices. 3/4" electrical knockouts (4) are provided on the Relay Module enclosure and must be used for all field wiring. EMT Conduit and a type 2 (or better) conduit hub must be used to maintain the UL Listing on the Relay Module. Use junction boxes as required for external wiring connections.

For Relay Control Module (P/N 24695) circuit installations (See Figure 4.9.5b):

Electric Gas Valve Wiring (Relay #1):

1. Verify the voltage and rating of the installed Electric Gas Valve is rated for 120/240 VAC and less than 10 amps.
2. Route and connect the Line and Neutral gas valve leads to position 3 and 4 of the lower black terminal strip using 12-22 AWG wiring. Torque terminal screws to 7 in-lbs. Connect ground wiring to the provided lug.
3. Route and connect AC power to position 1 and 2 of the lower black terminal strip using 12-22 AWG wiring. Connect ground wiring to the provided lug.
4. Connect and route wiring (12 VDC) from the green terminal strip (positions 1 & 2) to and into the STRIKE™ Control Unit enclosure using 14-26 AWG wiring. Torque terminal screws to 4 in-lbs. Termination of wiring to the STRIKE™ Control Unit is shown in Section 4.10.

Additional AC Device Wiring (Relay #2 & #3):

Relay #2 & #3 are isolated SPDT/Form C contacts and operate independently. The relay #2 coil is controlled by position 3 of the green terminal strip and Relay #3 coil is controlled by position 4 of the green terminal strip.

5. Verify the voltage and rating of any additional AC devices do not exceed 28 VDC/277 VAC and 10 amps.
6. Connect and route control wiring (12 VDC) from the green terminal strip (positions 3 & 4) to and into the STRIKE™ Control Unit enclosure using 14-26 AWG wiring. Torque terminal screws to 4 in-lbs. Termination of wiring to the STRIKE™ Control Unit is shown in Section 4.10.
7. Connect and route wiring for Relay #2 or Relay #3 from the 6 position black terminal board to any additional AC devices using 12-22 AWG wiring. NC (Normally Closed), C (Common), and NO (Normally Open) terminals are available for each relay. Torque terminal screws to 7 in/lbs.

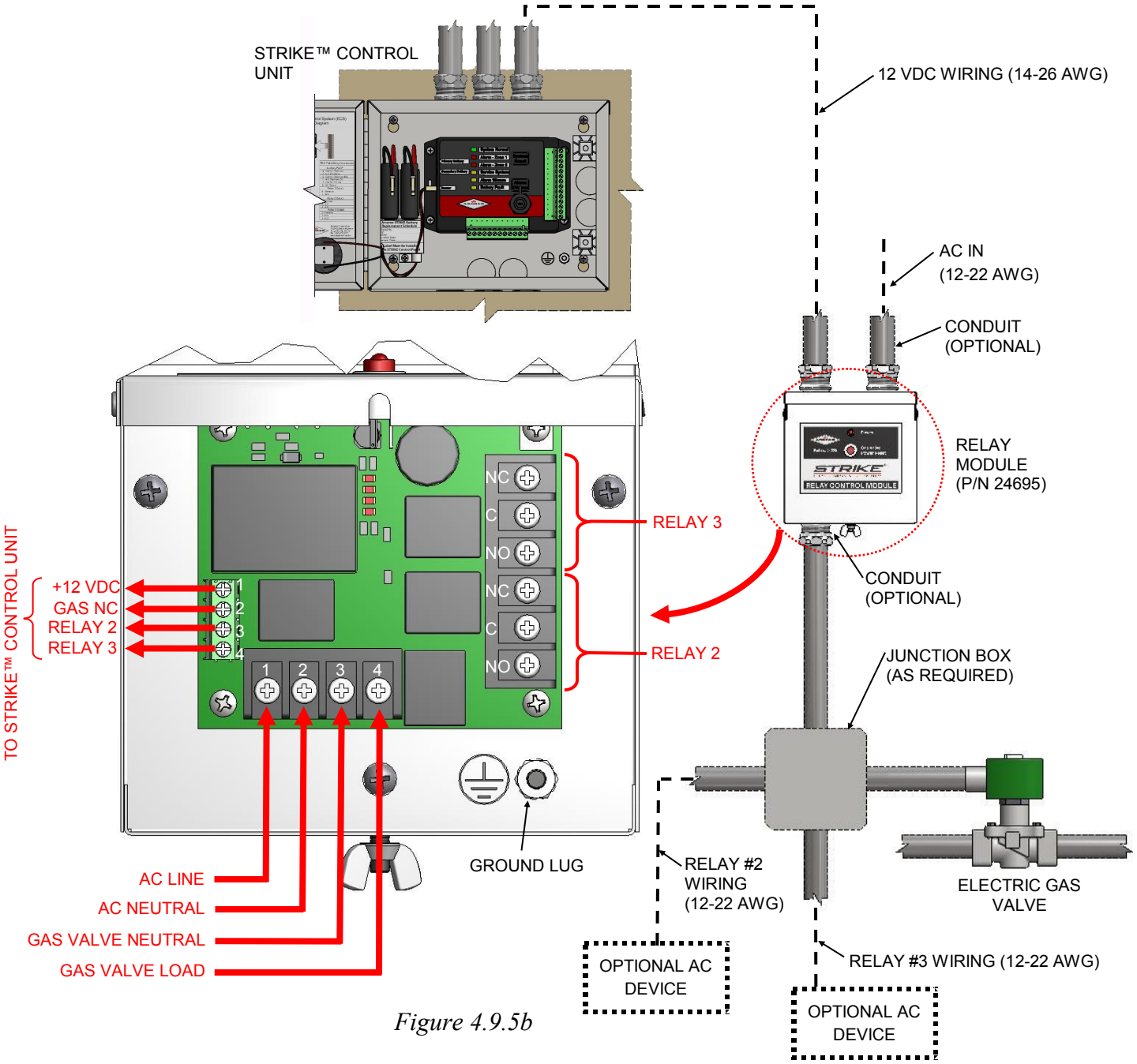


Figure 4.9.5b

If an Auxiliary FACP is used, the STRIKE™ Control Unit features additional alarm and fault outputs for connection to an auxiliary Fire Alarm Control Panel (FACP). An EOL may also be installed on the STRIKE™ Control Unit. Connect and route wiring from the FACP to and into the STRIKE™ Control Unit enclosure using 16-24 AWG wiring (See Figure 4.9.5c). Termination of wiring to the STRIKE™ Control Unit is shown in Section 4.10.

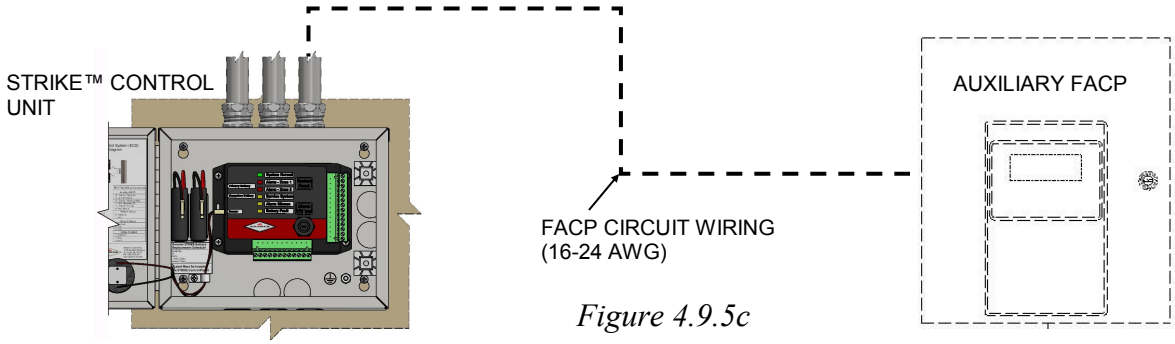


Figure 4.9.5c

4.10 STRIKE™ Control Unit Wiring & Termination

Following the installation of all field wiring to and into the STRIKE™ Control Unit enclosure, each individual circuit must be terminated to the provided terminal strips on the STRIKE™ Control Unit. An example of a terminated STRIKE™ Control Unit is shown below (See Figure 4.10a). **Do NOT connect any batteries to the STRIKE™ Control Unit until directed to do so in Section 4.11.1.**

The STRIKE™ Control Unit contains two terminal boards. The first terminal board (TB1), located on the bottom of the STRIKE™ Control Unit, contains screw terminals for all AMEREX® supplied "Lead" cables including detection (#1 & #2), actuation (#1 & #2) and manual pull. All AMEREX® supplied "Lead" cables have a blunt cut end with no connector for termination on the STRIKE™ Control Unit. Two cable tie mounts are provided within the enclosure for cable/wire routing around the STRIKE™ Control Unit. Any excess length or slack in each AMEREX® cable may be trimmed as required for termination. **Ensure that the entire length of each cable is fully installed and properly secured prior to trimming.** Since trimming will remove the installed color coded P/N label on the cable end, each cable is supplied with an extra color coded label, which can be installed on the trimmed cable end for circuit color code and part number reference. Terminate all installed cables where shown in Figure/Table 4.10b. A "Field Wiring Diagram" label is also located on the STRIKE™ Control Unit enclosure door. **Screw terminals for any unused cables or circuits may remain empty.**

The second terminal board (TB2), located on the right side of the STRIKE™ Control Unit, contains screw terminals for all installer supplied wiring including Relay Module and FACP circuits. Terminate these circuits where needed according to Table 4.10c. An example of a fully terminated wiring arrangement is shown in Figure 4.10c. A "Field Wiring Diagram" label is also located on the STRIKE™ Control Unit enclosure door. **Screw terminals for any unused circuits may remain empty.**

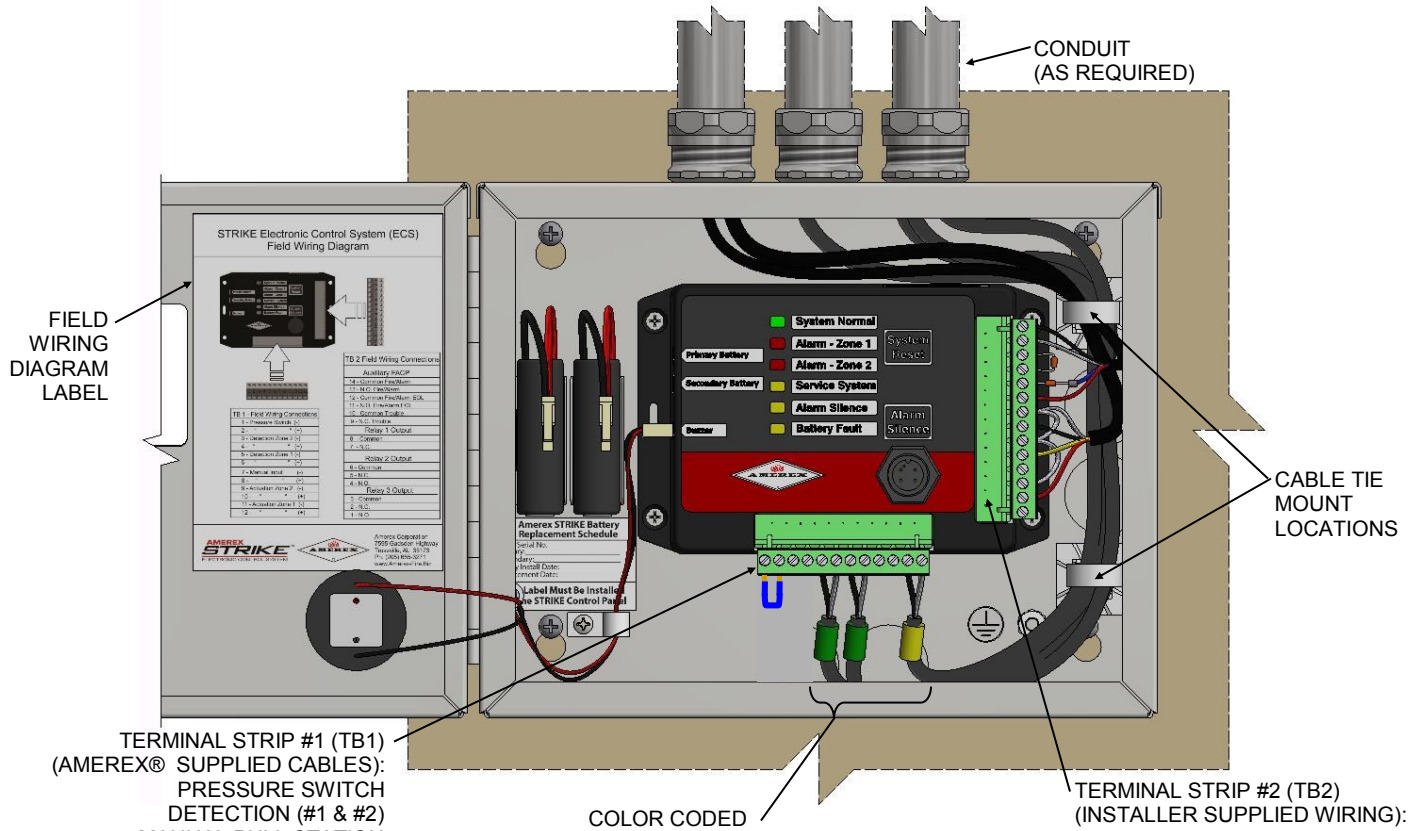


Figure 4.10a

TERMINAL BOARD #1 (TB1) CABLE CONNECTIONS			
SCREW TERMINAL #	**AMEREX® SUPPLIED CABLE (Only Actuation Cables are polarity sensitive)**		**COLOR CODE**
1*	(-)	JUMPER WIRE*	
2*	(+)		
3	(-)	DETECTION LEAD #2 (24409-XX)	
4	(+)		
5	(-)	DETECTION LEAD #1 (24409-XX)	
6	(+)		
7	(-)	MANUAL PULL LEAD (24412-XX)	
8	(+)		
9	**(-) BLACK**	ACTUATION LEAD #2 (24411-XX)	
10	**(+) WHITE**		
11	**(-) BLACK**	ACTUATION LEAD #1 (24411-XX)	
12	**(+) WHITE**		

*The Pressure Switch terminals are supplied with a jumper wire installed. **DO NOT REMOVE.**

Table 4.10b

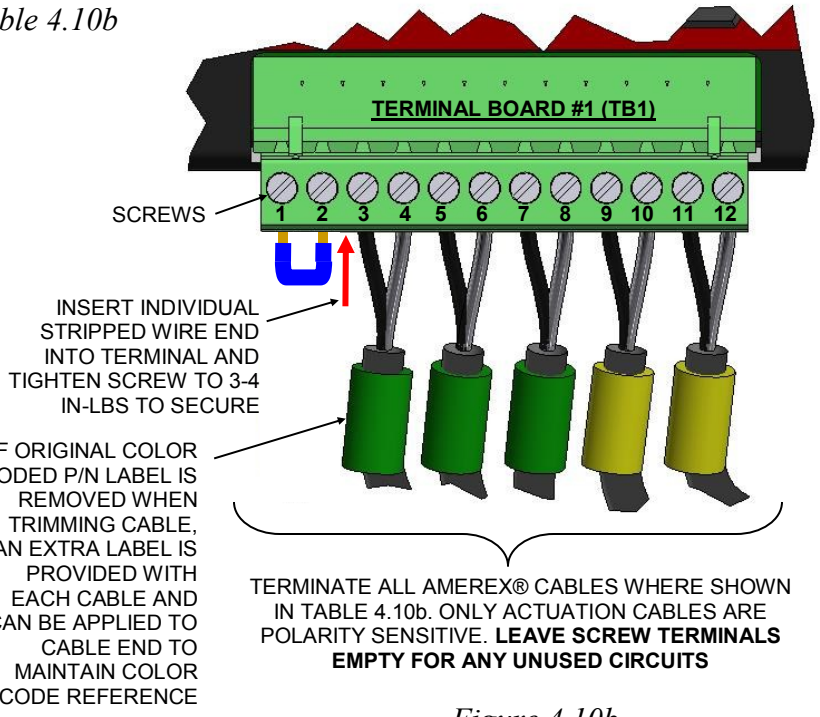


Figure 4.10b

TERMINAL BOARD #2 (TB2) CABLE CONNECTIONS			
SCREW TERMINAL #	**INSTALLER SUPPLIED WIRING CONNECTIONS**		
14	COM FIRE ALARM	AUXILIARY FACP	16 - 24 AWG WIRE
13	N/O FIRE ALARM		
12	COM FIRE ALARM EOL RESISTOR		
11			
10	COM TROUBLE WITH EOL RESISTOR IN SERIES		
9	N/C TROUBLE		
8	COM	RELAY #1 (GAS VALVE)	14 - 26 AWG WIRE
7	N/C		
6	COM	RELAY #2	
5	N/C		
4	N/O		
3	COM	RELAY #3	
2	N/C		
1	N/O		

Table 4.10c

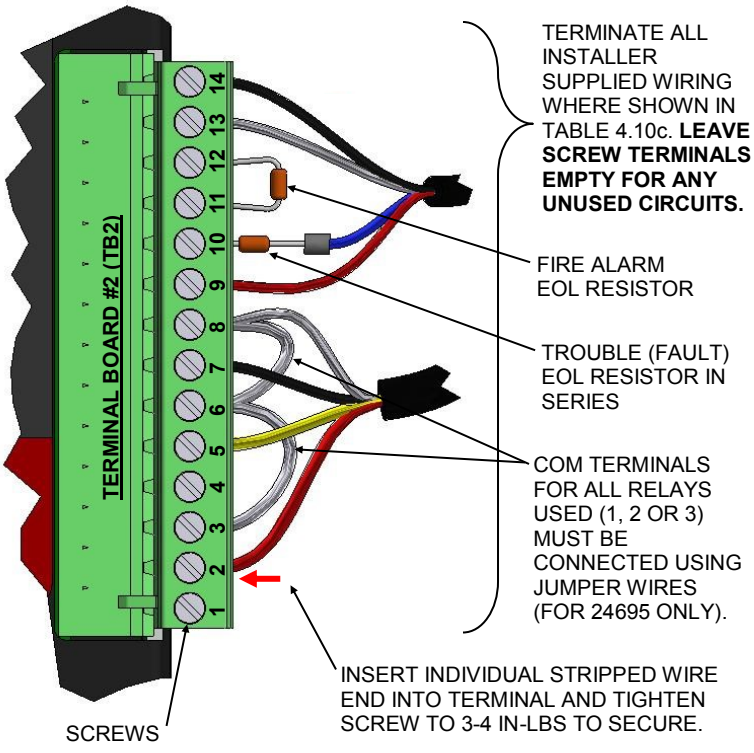


Figure 4.10c

4.11 STRIKE™ Control Unit Programming

Following the complete installation of all components and termination of all field wiring, the AMEREX® STRIKE™ ECS may be programmed to match or customized as desired. **Do NOT connect any batteries to the STRIKE™ Control Unit until directed to do so in Section 4.12.5.** The STRIKE™ Control Unit is pre-programmed with the following circuits enabled, requiring that these circuits be used and connected to the STRIKE™ Control Unit:

- Single Detection Zone (Zone #1)
- Single Actuation Zone (Zone #1)
- Manual Pull Circuit
- Pressure Switch Circuit (Jumper wire installed on STRIKE™ Control Unit, TB1. **DO NOT REMOVE.**

If additional circuits are needed and connected, programming is required. The default settings and all available programming options are shown in Table 4.11.3. A trained technician may program a system for any desired configuration as detailed in the following sections.

The STRIKE™ Control Unit requires (2) Batteries (2 x P/N 24903). However, because programming functions consume power, an additional third spare Replacement Battery (P/N 24903) is needed to provide temporary power to accomplish all programming functions so that power is not drained from the (2) service batteries. This temporary battery must also be used during function testing and initial commissioning (See Section 4.12). Also, programming functions require use of the PC Interface Cable (P/N 16609) and a laptop or tablet with the latest AMEREX® STRIKE™ PC software installed. The latest version of PC software is available on and can be downloaded from the www.amerex-fire.biz website.

4.11.1 Temporary Power Supply Connection

The spare Replacement Battery (P/N 24903) connects directly to the STRIKE™ Control Unit at the 'Primary' battery input connection. The intended secondary battery is also needed in order to avoid a resulting 'Battery Fault' condition on the STRIKE™ Control Unit. Connect these batteries in the following order (See Figure 4.11.1):

1. First, insert the spare Replacement Battery (P/N 24903) connector into the STRIKE™ Control Unit at the 'Primary' location.
2. Next, connect the intended Secondary battery at the 'Secondary' location. The STRIKE™ Control Unit will then power up, illuminate, and indicate system status.

The green 'System Normal' LED will indicate fully connected batteries.

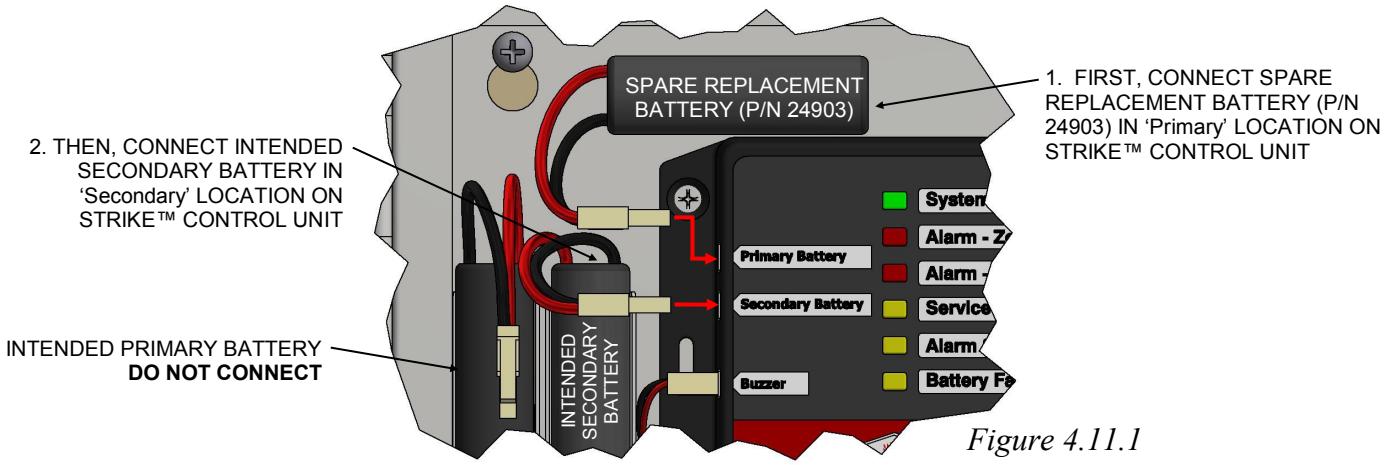


Figure 4.11.1

4.11.2 PC Software Installation & Interface Connection

The AMEREX® STRIKE™ PC software may be installed on any PC operating with Windows 10 or earlier version. The latest version of AMEREX® STRIKE™ PC software can be downloaded from the www.amerex-fire.biz website. Once downloaded, the executable file and drivers are installed in the Users 'Programs' or 'Program Files' folder in a sub-folder named 'Amerex'. The software also creates a folder in the users 'Documents' folder named 'My Amerex Files'. In the 'My Amerex Files' folder, a 'STRIKE ECS Unit' folder is created with subfolders including 'Config', 'EventLog', and 'Update'. After installation is complete, an 'Amerex STRIKE ECS Utility' executable icon is placed on the user's Desktop.

Next, connect the PC interface Cable (P/N 16609) from the PC Interface connector on the STRIKE™ Control Unit face to a USB slot on the PC (See Figure 4.11.2). Double clicking on the AMEREX® STRIKE™ ECS Utility icon opens the STRIKE™ ECS Unit Utility window, which uses the common Microsoft Windows menu structure.

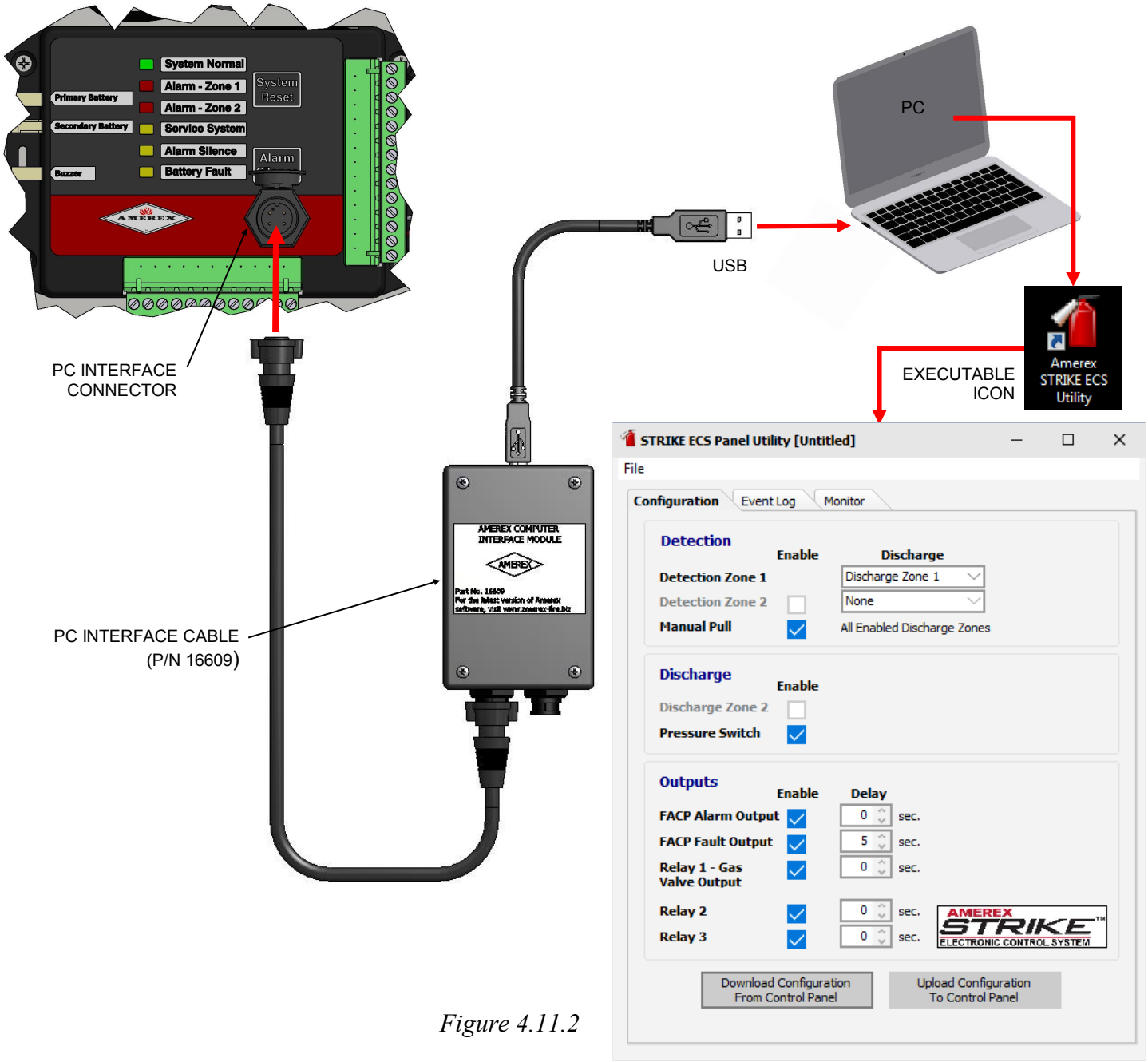


Figure 4.11.2

4.11.3 Programming a System Configuration

The STRIKE™ ECS may be programmed to match the desired configuration. To make changes to the pre-programmed configuration, the STRIKE™ Control Unit must be in programming mode. Also, the temporary spare replacement battery and PC Interface Cable must be connected, and the latest version of STRIKE™ PC Software must be installed.

Enter Programming Mode - To enter programming mode, press and hold the 'System Reset' button and 'Alarm Silence' button simultaneously for approximately 5 seconds (See Figure 4.11.3a). Programming mode is indicated by two LED flashes and two audible alarm beeps, followed by no illuminated LEDs. The STRIKE™ Control Unit will automatically exit programming mode and return to normal condition after **3 minutes**, if no programming functions are performed, as indicated by a single LED flash and audible alarm beep. **The STRIKE™ Control Unit is disabled while in programming mode.**

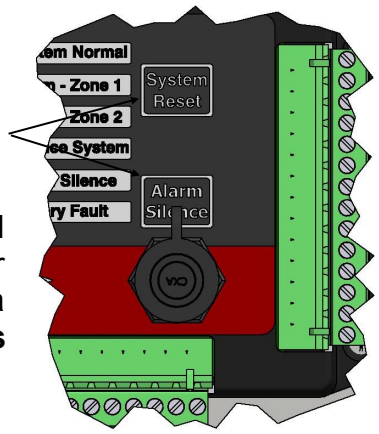


Figure 4.11.3a

Set System Time - Open the AMEREX® STRIKE™ ECS Unit Utility on the PC. To set the system (STRIKE™ Control Unit) internal clock by selecting the 'File' tab and 'Set Clock...'. Enter the password in the password prompt, after which a 'Clock' window will appear. Enter the desired date and time or check 'Use current date and time' (PC time) and click the 'Set System Time' box. Verify the system time is correct by clicking the 'Get System Time' box (See Figure 4.11.3b).

Downloading A System Configuration - Prior to making any changes to the system configuration, common practice is to download the configuration that currently exists on the STRIKE™ ECS. Ensure the PC Interface Cable is connected and the STRIKE™ Control Unit is in programming mode. The current configuration can be downloaded to the PC by clicking the 'Download Configuration...' button in the lower left corner of the STRIKE™ ECS Unit Utility window (See Figure 4.11.3b). A successful download is indicated by an Information window, after which the current configuration is displayed. The downloaded configuration can be saved on the PC for future use by selecting the 'File" tab and "Save As". The default folder in the user's 'Documents' folder is 'My Amerex Files\STRIKE ECS Unit\Config'.

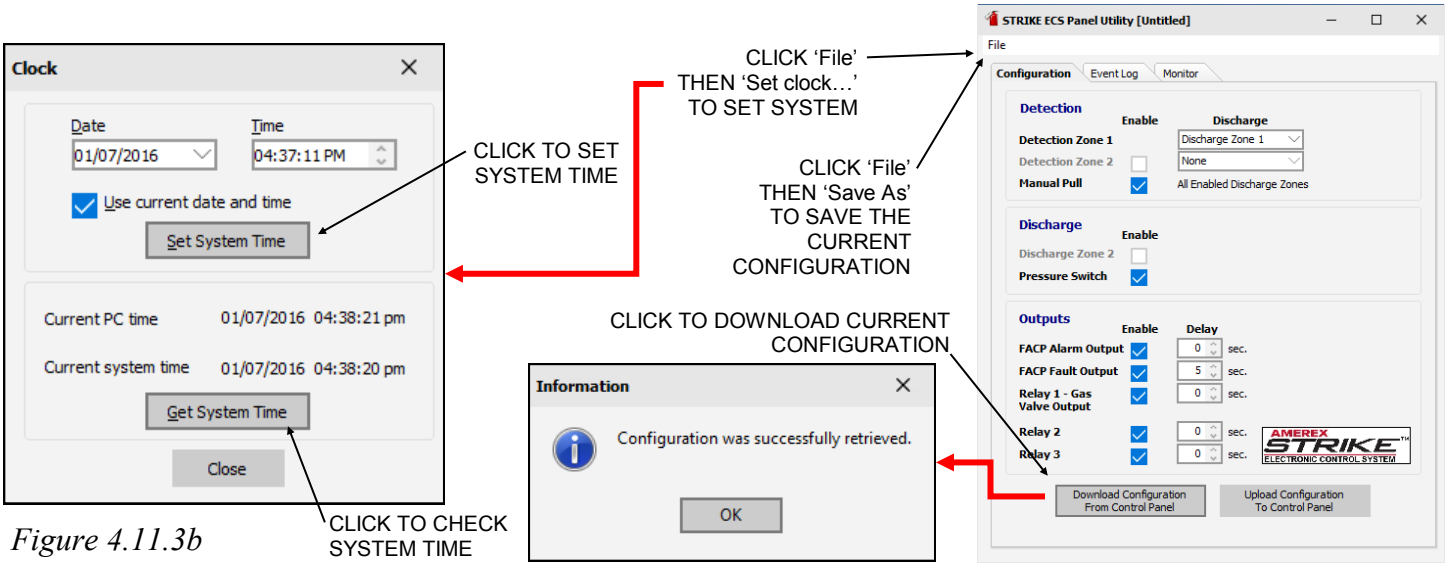


Figure 4.11.3b

Modifying a System Configuration - The trained technician is now able to adjust the various settings available with the AMEREX® STRIKE™ ECS. Two detection zones, two actuation zones and a manual pull circuit are all available and a variety of time delays and outputs may be programmed. A complete list of programming options, default settings, and acceptable settings per UL 864 are shown in Table 4.11.3.

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES			
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all, as indicated below:			
Program Feature or Option	**Permitted in UL 864? (Y/N)**	**Possible Settings**	**Settings permitted in UL 864**
Detection Zone 1 (Detection Circuit 1)	Y	Enabled Only	Enabled
		Discharge Zone Mapping: 1 or Both	Discharge Zone Mapping: 1 or Both
Detection Zone 2 (Detection Circuit 2)	Y	Enabled/Disabled (Default)	Enabled/Disabled (default)
		Discharge Zone Mapping: None, 1, 2 or Both	**Discharge Zone Mapping: 1, 2 or Both**
Manual Pull (Manual Pull Circuit)	Y	Enabled (Default)\Disabled	**Enabled, unless Pull Stations are installed in Detection Circuits for zone actuation**
		All Enabled Discharge Zones Only	All Enabled Discharge Zones Only
Discharge Zone 1 (Actuation Circuit 1)	Y	Enabled Only (Not Shown on Utility Window)	Enabled Only
Discharge Zone 2 (Actuation Circuit 2)	Y	Enabled/Disabled (Default)	Enabled/Disabled
Pressure Switch	Y	Enabled (Default)\Disabled	Enabled/Disabled
Alarm/Fault Outputs	Y	Each Enabled (Default)\Disabled	Each Enabled\Disabled
		Delays: 0-30 seconds (FACP Alarm); 5-30 seconds (FACP Fault); 0-30 seconds (Relay 1, 2 & 3)	**0 second delay Only (FACP Alarm)** **5 second delay Only (FACP Fault)** 0-30 seconds (Relay 1, 2, & 3)

Table 4.11.3

Enable/Disable Detection Zones - Detection Zone #1 is always enabled as a default setting. Detection Zone #2 may be enabled as required. In the STRIKE™ ECS Unit Utility window, next to Detection Zone #2, enable the zone by checking the 'Enable' box next to it. To disable Detection Zone #2, uncheck the 'Enable' box next to it (See Figure 4.11.3c).

Programming Detection Zones with Discharge Zones - The STRIKE™ ECS has two zones of detection with two discharge zones (actuation circuits). Each detection zone can be mapped to the desired discharge zone(s) as a means of actuating an AMEREX® KP™ Fire Suppression System zone. In the STRIKE™ ECS Unit Utility window, select the desired discharge zone(s) by choosing from the drop menu next to each enabled detection zone. Either Discharge Zone 1 or both zones may be selected for Detection Zone 1. A single discharge zone, both zones, or no zones may be selected for Detection Zone 2 when enabled (See Figure 4.11.3c). The 'Discharge Both Zones' option may be used in a situation where simultaneous actuation of both discharge zones is required. **WARNING: Selecting 'None' for the discharge zone for Detection Zone 2 (when enabled) is not permitted by NFPA or UL 864.**

Programming a Manual Pull Circuit - The dedicated manual pull circuit is enabled as a default setting since a manual means of system actuation is always required. The Manual Pull is always mapped to actuate all enabled Discharge Zones. However, in a situation where Manual Pull Stations are installed in the Detection Circuits for zone specific actuation, and this dedicated circuit is unused, it

may be disabled by unchecking the 'Enable' box next to it (See Figure 4.11.3c). **WARNING: Only when Manual Pull Stations are installed in detection circuits may this circuit be disabled; otherwise, disabling this circuit is not permitted by NFPA or UL 864.**

Pressure Switch Programming - The pressure switch circuit is enabled as a default setting. Since a pressure switch is not included as part of the AMEREX® KP™ Fire Suppression System, the circuit may be disabled or left enabled with the included jumper wire installed across terminals 1 and 2 of TB1.

Output Programming - The various available outputs may be used in conjunction with a Relay Module to alert or switch external devices on or off in the event of an overheat/fire or trouble condition. These outputs are all enabled as a default setting, but may be disabled if unused by unchecking the 'Enable' box next to each. Each output circuit may be programmed with an optional delay from 0-30 seconds for alarms or 5-30 seconds for faults (in 5 second increments) between alarm or fault detection and output switching (See Figure 4.11.3c). **WARNING: Any FACP delays other than the default settings are not permitted by NFPA or UL 864.**

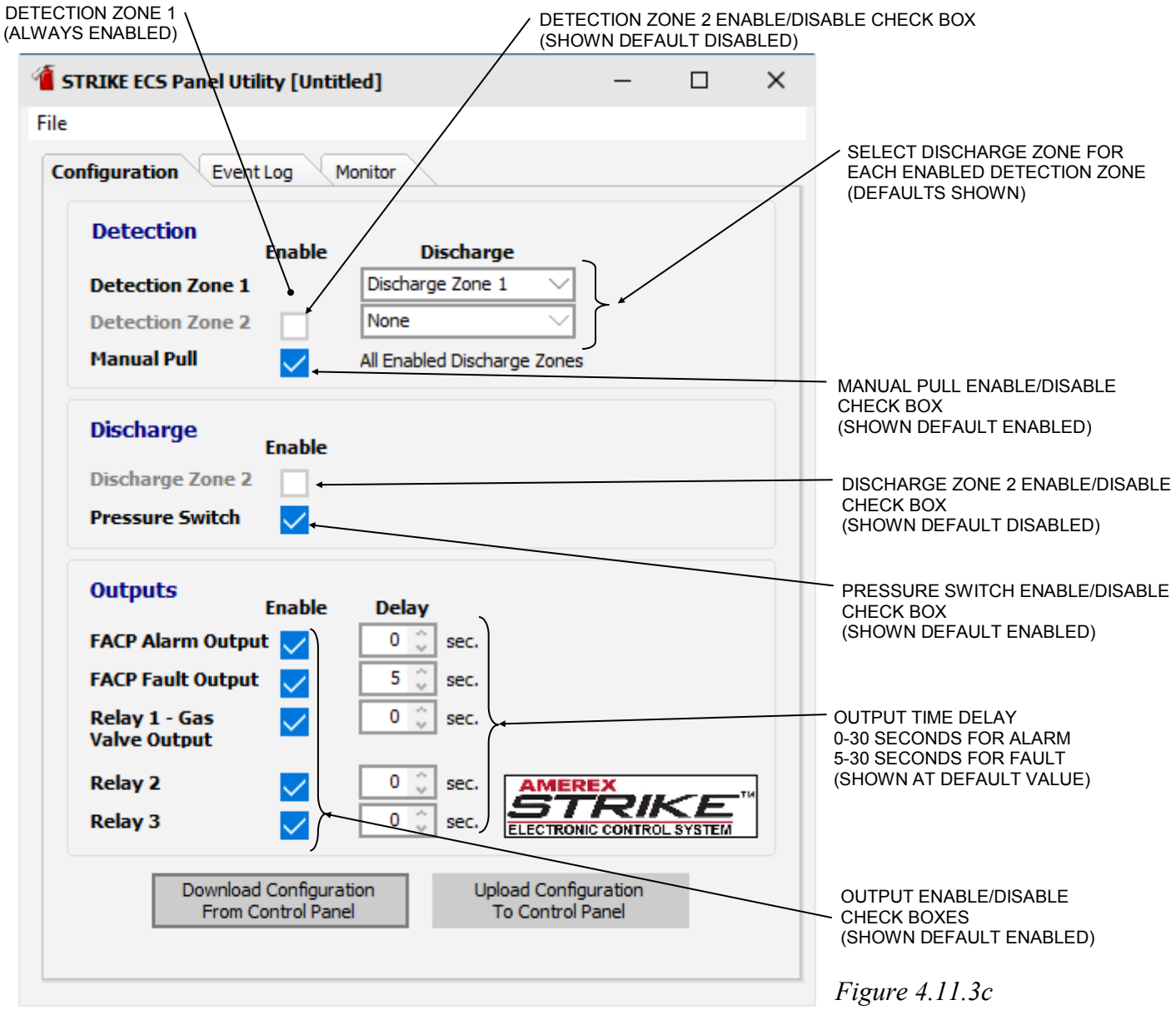


Figure 4.11.3c

Uploading a System Configuration - After all desired changes are made and the programmed configuration matches the system design, the configuration should be saved to the PC by clicking the 'File' tab and selecting 'Save' or 'Save As'. Ensure the PC Interface Cable is connected and the STRIKE™ Control Unit is in programming mode. Next, the configuration should be uploaded to the AMEREX® STRIKE™ ECS by clicking the 'Upload Configuration To Control Panel' button at the bottom right of the STRIKE™ ECS Unit Utility window. Enter the password in the password prompt, after which an 'Information' window should appear indicating that the upload was successful (See Figure 4.11.3d). **An error will be generated if the PC interface Cable is disconnected or the STRIKE™ Control Unit is not in programming mode. The STRIKE™ Control Unit will automatically exit programming mode and return to normal condition after 3 minutes if no programming functions are performed, as indicated by a single LED flash and audible alarm beep. Re-enter programming mode in the same manner as described earlier in this section.**

Once uploaded, the STRIKE™ ECS is now configured as shown in the STRIKE™ ECS Unit Utility window. The STRIKE™ Control Unit will exit programming mode (after 3 minutes). Once the STRIKE™ Control Unit exits programming mode, verify the green 'System Normal' LED is flashing once every 4 seconds. If not, verify the system is programmed to match the system design and all field wiring is connected. Otherwise, refer to the fault condition section (See Section 6.2). **Monitor Mode can be helpful in viewing system status for all circuits (See Section 4.11.4).** Once the system is functioning properly, disconnect the PC Interface Cable and reinstall the dust cap on the PC Interface connector on the STRIKE™ Control Unit.

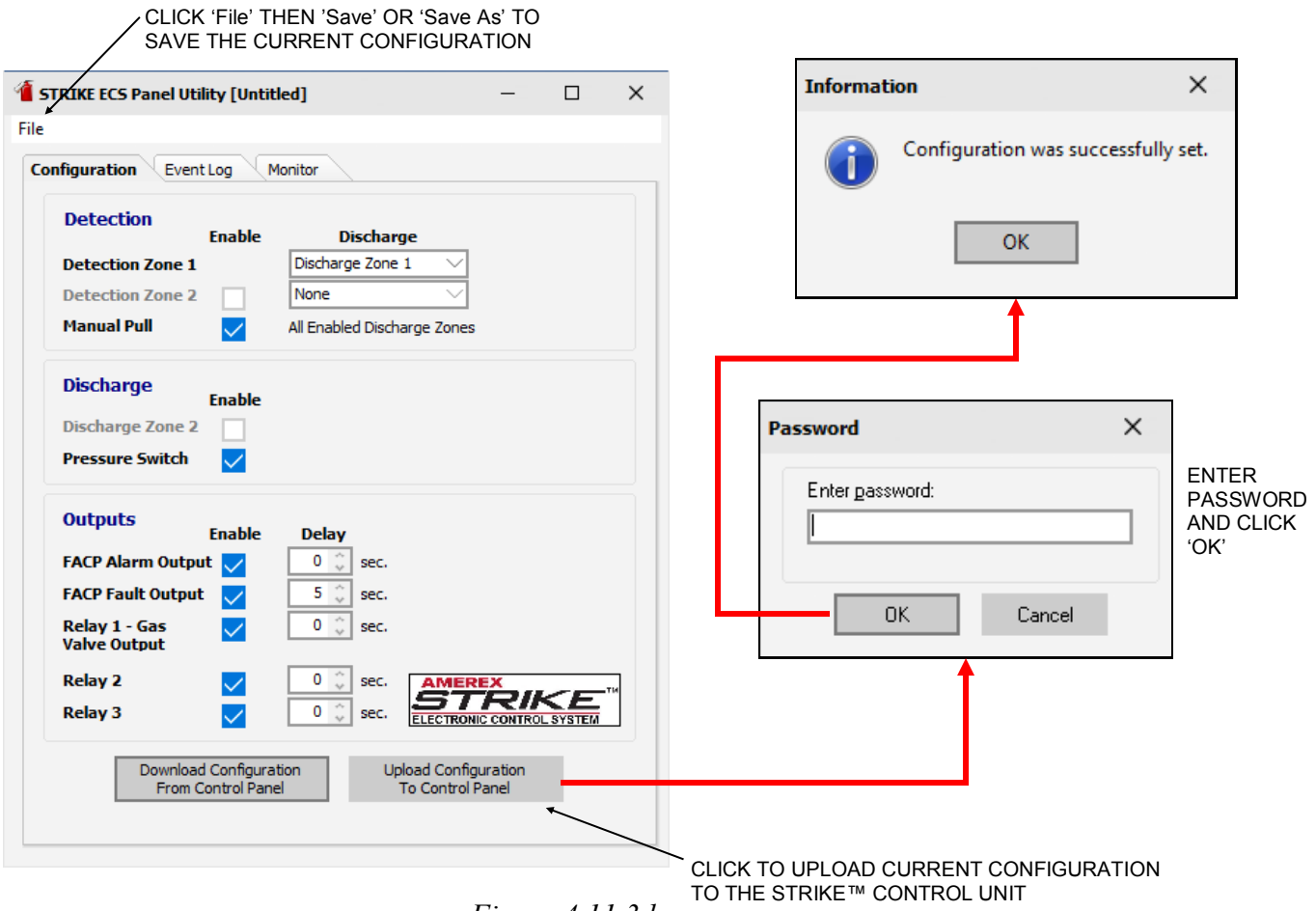


Figure 4.11.3d

4.11.4 Monitor Mode

When using the AMEREX® STRIKE™ PC software, a Monitor Mode tab is available on the STRIKE™ ECS Unit Utility window. Monitor Mode allows the user to view complete system status. This feature can be useful when programming a system configuration by indicating which circuits are enabled/disabled and if a fault or alarm condition currently exists. Also, primary battery and backup battery voltage and any ground faults are all displayed in Monitor Mode.

To access the Monitor Mode, the STRIKE™ ECS must be connected to a PC with the STRIKE™ ECS Unit Utility window open and running. The STRIKE™ Control Unit must be in programming mode. Click on the 'Monitor' tab (See Figure 4.11.4). Click the 'Get Status' button to display the current system status. The Monitor Mode window now displays the status of all available circuits as indicated by a colored circle next to each item. Displayed colors represent the following for detection and discharge zones:

Green: Working Enabled Circuit

Gray: Disabled Circuit

Yellow: Fault Condition Exists on Circuit

Red: Alarm Condition Exists on Circuit

Primary and secondary battery voltages are displayed including status. A disconnected buzzer or ground fault is also be displayed as a yellow circle if those conditions exist. Output transfers are indicated as yellow or red circles. **The 'Get Status' button must be pressed to update/refresh the Monitor Mode status window. Ensure the STRIKE™ Control Unit is in programming mode each time the button is pressed.**

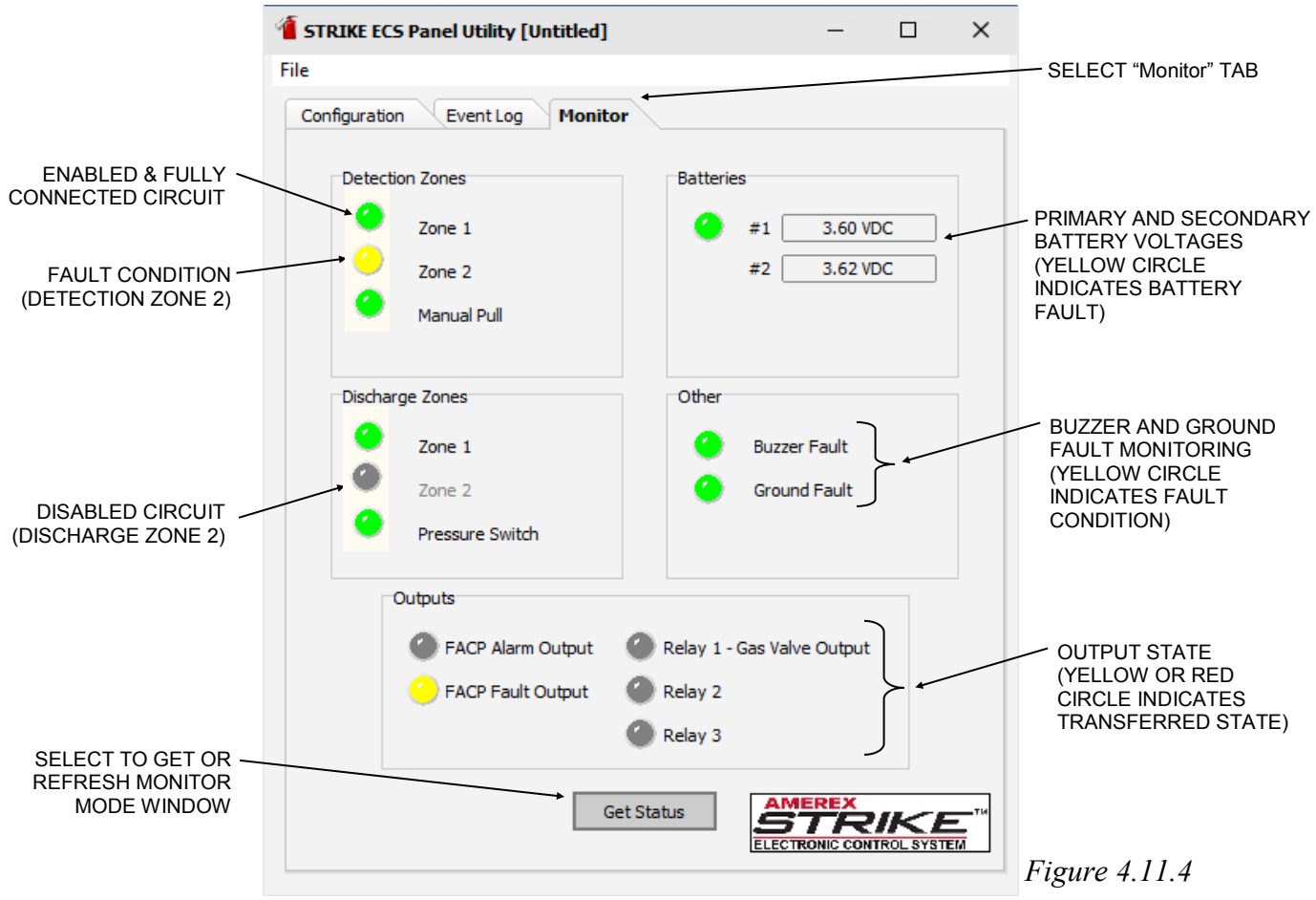


Figure 4.11.4

4.12 Function Testing & Initial Commissioning

After the desired configuration has been uploaded from a PC, the AMEREX® STRIKE™ ECS and components must be functionally tested as part of the initial commissioning, just prior to placing the system into service. These tests include STRIKE™ Control Unit display, manual pull, actuation circuits, detection sensor, and circuit fault testing as shown in the following steps. Any desired output circuits to Relay Modules and all associated wiring must be installed and connected to the STRIKE™ Control Unit. **Do NOT connect the batteries to the STRIKE™ Control Unit until directed to do so later in this section.** Because function testing consumes power, a temporary third Spare Replacement Battery (P/N 24903) is needed to accomplish all testing functions. If not already installed from programming per Section 4.11, install the temporary spare Replacement Battery as described in Section 4.11.1.

Function testing includes activating the actuation circuits, and therefore all Linear Actuators must be disconnected from each actuation circuit in order to prevent Linear Actuator consumption or an unwanted discharge of the AMEREX® KP™ Fire Suppression System. A Fire Alarm Module (P/N 24787) must be installed in place of each Linear Actuator on the actuation circuits. These resettable modules simulate an actual Linear Actuator and visually indicate a fully functioning actuation circuit during testing (See Figure 4.12). A fault condition will occur temporarily on the STRIKE™ Control Unit when disconnecting any Linear Actuators until Alarm Modules are connected in their place.

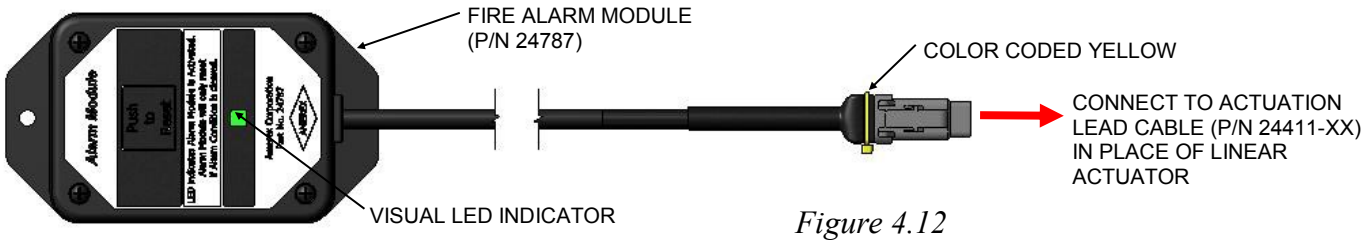


Figure 4.12

Only after connecting the spare Replacement Battery (P/N 24903) and Fire Alarm Modules (P/N 24787) in place of ALL Linear Actuators, perform the following steps to complete function testing of the AMEREX® STRIKE™ ECS.

4.12.1 STRIKE™ Control Unit Display Testing

STRIKE™ Control Unit LED and audible alarm testing is performed using the 'Push to Test' button (AMEREX® Logo) located on the face of the STRIKE™ Control Unit (See Figure 4.12.1). Press and hold the button for 3 seconds. All STRIKE™ Control Unit LEDs will illuminate and the audible alarm will beep once, indicating the STRIKE™ Control Unit is functioning properly.

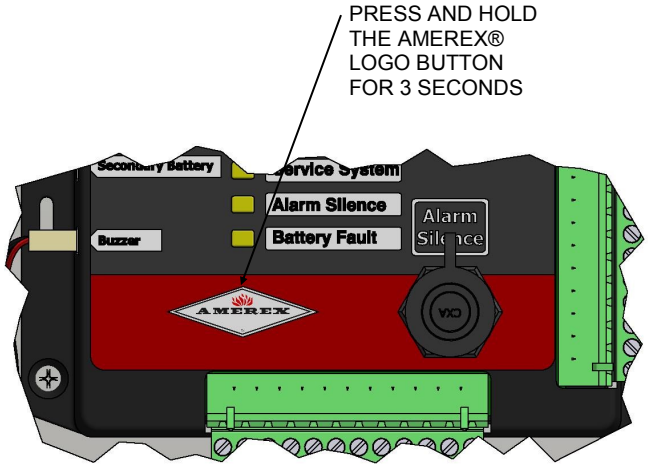


Figure 4.12.1

4.12.2 Detection Sensor Testing

Individual Spot Heat Detector (SHD) and Linear Heat Detector (LHD) sensors require testing upon initial commissioning of the AMEREX® STRIKE™ ECS. Each SHD sensor must be subjected to its set point temperature to ensure that a system alarm condition and actuation of the programmed discharge zone(s) will occur. LHD sensors CANNOT be subjected to their set point and must be tested in a different manner. **Verify the temporary spare Replacement Battery is installed AND all Linear Actuators have been replaced with Fire Alarm Modules before proceeding, as an AMEREX® KP™ Fire Suppression System discharge may occur.**

- Spot Heat Detectors: Installed SHD sensors must be subjected to their pre-programmed set point temperature. Use an electric heat gun to heat the sensor tip only to this set point. Set point temperatures are:
  - **Bulkhead Mount SHD (P/N 24944): 350ºF (177ºC) +/- 10ºF (+/- 5ºC)**
  - **Bulkhead Mount SHD (P/N 24514): 485ºF (252ºC) + 30ºF /- 0ºF (+16ºC / -0ºC)**

Do not overheat any SHD by more than 100ºF over the set point. Overheating the unit beyond these limitations may cause the unit's set point to change from factory settings. Once the set point is reached, immediately remove the heat gun and verify the following results have occurred on the STRIKE™ Control Unit and Alarm Modules and on any connected Relay Modules (See Table 4.12.2).

Indicator	**Result After SHD, LHD or Manual Pull Alarm Condition**
Green 'System Normal' LED	OFF
Red 'Alarm– Zone 1' or 'Alarm– Zone 2' LED	FLASHES every 3 seconds for actuated discharge zone(s)
Audible Alarm	Single beep every 3 seconds
Red LED on each Alarm Module (P/N 24787)	ON (for mapped discharge zones only) after programmed delay
Alarm Outputs (Relay 1, 2 & 3)	Transfers state (NC to open; NO to closed) after programmed delay
Auxiliary FACP Alarm Output	Transfers state (NO to closed) after programmed delay
Relay Module (P/N 24694 or P/N 24695)	**Result After Detection or Manual Pull Alarm Condition**
Relay #1 (Electric Gas Valve)	Transfers state (power removed from Electric Gas Valve to close)
Relay #2 & #3 (for P/N 24695 only)	Transfers state (NC to open; NO to closed)

Table 4.12.2

After verifying the SHD and associated actuation zone(s) are functioning properly, allow the SHD to cool below set point temperature. The SHD will automatically reset itself. Reset the STRIKE™ Control Unit per the following instructions:

1. The audible alarm can be silenced by pressing the 'Alarm Silence' button.
2. Press the "Push To Reset" button on each Alarm Module (P/N 24787).
3. Press and hold the "System Reset" button on the STRIKE™ Control Unit for approximately 10 seconds and verify the STRIKE™ Control Unit returns to normal condition with the green 'System Normal' LED flashing once every 4 seconds.

Repeat this test process for all SHDs used in the AMEREX® STRIKE™ ECS.

- Linear Heat Detectors: LHDs are one time use devices and therefore cannot be subjected to set point temperatures for testing purposes. However, LHD Tests Leads (P/N 24527) can be used to test each detection circuit. Install a single LHD Test Lead temporarily between the installed LHD and the End of Line Module (EOL) at the end of the circuit.

Once installed, use an electric heat gun or lighter to subject the middle of the LHD Test Lead only to its set point. Set point temperatures are:

- **LHD (P/N 24527): 356ºF (180ºC)**

Once the set point is reached, immediately remove the heat gun and verify the results shown have occurred on the STRIKE™ Control Unit and Alarm Modules and on any connected Relay Modules (See Table 4.12.2). Then, remove the used LHD Test Lead and reconnect the original circuit. To reset the STRIKE™ Control Unit, perform the same reset procedure shown previously for SHDs. Repeat this test process for all LHDs used in the AMEREX® STRIKE™ ECS.

4.12.3 Manual Pull Station Testing

All Manual Pull Stations require function testing upon initial commissioning of the AMEREX® STRIKE™ ECS. Each station must be manually pulled to ensure that a system alarm condition and actuation of the programmed discharge zone(s) will occur. **Verify the temporary spare Replacement Battery is installed AND all Linear Actuators have been replaced with Fire Alarm Modules before proceeding, as an AMEREX® KP™ Fire Suppression System discharge may occur.**

To activate a Manual Pull Station, lift and remove the pull pin from the assembly. Break the installed Tamper Seal if necessary (an extra Tamper Seal is included with each Manual Pull Station). Manually pull the large pull ring until it stops (See Figure 4.12.3a). The Manual Pull Station will lock in the pulled position. Verify the results shown have occurred on the STRIKE™ Control Unit and Alarm Modules and on any connected Relay Modules (See Table 4.12.2).

After verifying the Manual Pull Station and programmed actuation zone(s) are functioning properly, the Manual Pull Station may be reset by pulling and holding the small locking ring and pushing in the large pull ring (See Figure 4.12.3b). Reinstall the pull pin through the assembly. Install the included extra green Tamper Seal to secure the pull pin in place (See Figure 4.12.3c). To reset the STRIKE™ Control Unit, perform the same reset procedure shown previously for SHDs. Repeat this test process for all Manual Pull Stations used in the AMEREX® STRIKE™ ECS.

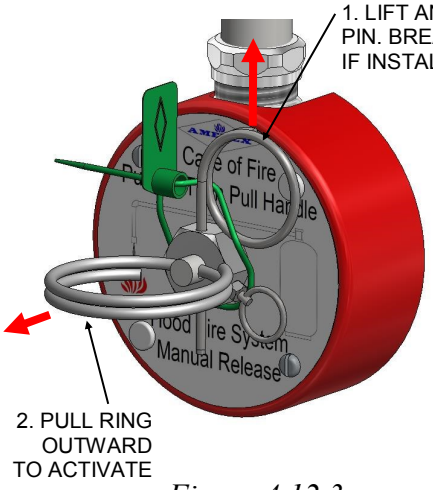


Figure 4.12.3a

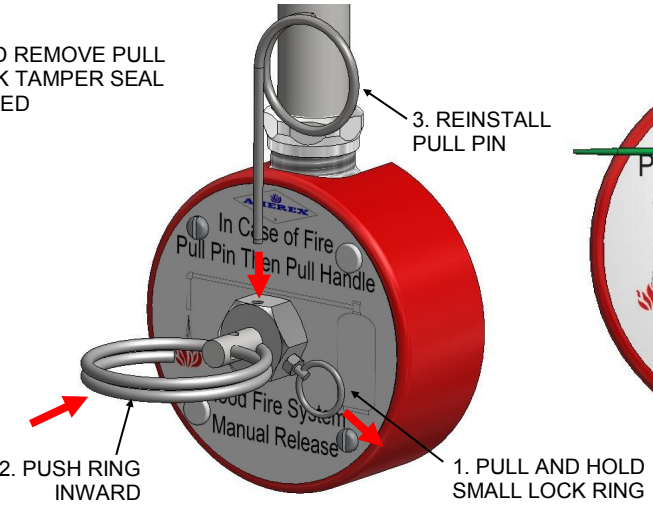


Figure 4.12.3b

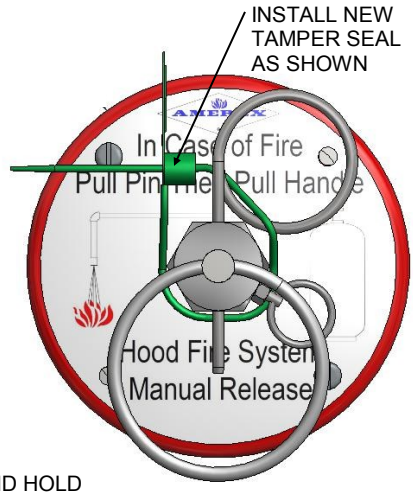


Figure 4.12.3c

4.12.4 Fault Testing

The AMEREX® STRIKE™ ECS continuously monitors all circuits and any devices and will display a fault condition on the STRIKE™ Control Unit if a problem is detected. A fault is indicated by the yellow 'Service System' LED. Additional fault conditions are shown in Section 6.2. Perform the following tests to check each circuit. **Verify the temporary spare Replacement Battery is installed before proceeding.**

- Pressure Switch Fault: since the pressure switch circuit is unused, no testing is required. If the circuit is enabled (default), verify that the jumper wire across terminals 1 and 2 of TB1 is present.

- Detection Zone and Manual Pull Fault: Test the first detection circuit by disconnecting the End of Line Module (EOL) at the end of the circuit. Verify the following results have occurred on the STRIKE™ Control Unit (See Table 4.12.4a). Reconnect the EOL and verify the STRIKE™ Control Unit returns to normal condition with the green 'System Normal' LED flashing once every 4 seconds. Repeat this procedure for the second detection circuit (if enabled) and the manual pull circuit.

- Discharge Zone (Actuation) Fault: Test the first actuation circuit by disconnecting the Linear Actuator at the end of the circuit. Verify the following results have occurred on the STRIKE™ Control Unit (See Table 4.12.4a). Reconnect the Linear Actuator and verify the STRIKE™ Control Unit returns to normal condition with the green 'System Normal' LED flashing once every 4 seconds. Repeat this procedure for the second actuation circuit (if enabled).

Indicator	Result After Circuit Disconnect
Green 'System Normal' LED	OFF
Yellow 'Service System' LED	FLASHES every 4 seconds
Audible Alarm	Single beep every 4 seconds
Auxiliary FACP Fault Output	Transfers state (NC to open) after programmed delay

Table 4.12.4a

- Battery Fault: Test the battery fault by disconnecting the single 'Secondary' battery connector from the STRIKE™ Control Unit. Verify the following results have occurred on the STRIKE™ Control Unit (See Table 4.12.4b). Reconnect the battery and verify the STRIKE™ Control Unit returns to normal condition with the green 'System Normal' LED flashing once every 4 seconds.

Indicator	Result After Circuit Disconnect
Green 'System Normal' LED	OFF
Yellow 'Battery Fault' LED	FLASHES every 4 seconds (after approximately 30-60 seconds)
Audible Alarm	Single beep approximately every 10 minutes
Auxiliary FACP Fault Output	Transfers state (NC to open) after programmed delay

Table 4.12.4b

4.12.5 Placing the System into Service

Following the completion of all function testing and initial commissioning, the AMEREX® STRIKE™ ECS may be placed into service by performing the following steps:

1. Verify the STRIKE™ Control Unit is functioning properly and the green 'System Normal' LED is flashing once every 4 seconds.
2. Remove all Fire Alarm Modules (P/N 24787) used during function testing from the actuation circuits and reconnect all Linear Actuators (P/N 24448).
3. Disconnect the batteries used for programming (Section 4.11) and initial commissioning (Section 4.12) from the STRIKE™ Control Unit in the following order: **Disconnect the secondary battery first, then disconnect the temporary spare Replacement Battery from the 'Primary' location. The STRIKE™ Control Unit will turn off completely.**
4. Locate the two batteries, intended for use with the STRIKE™ Control Unit. Verify each is installed in the provided battery brackets in the STRIKE™ Control Unit enclosure. **First, connect the left battery to the 'Primary' battery connection port and then the right battery to the 'Secondary' battery connection port (See Figure 4.12.5).** Verify the STRIKE™ Control Unit returns to normal condition with green 'System Normal' LED is flashing once every 4 seconds.
5. Locate the included Battery Replacement Label. Populate the following information:
   - Primary battery serial number
   - Secondary battery serial number
   - Current date of commissioning (Installation date)
   - Battery replacement date (6 months from current date of commissioning).

The AMEREX® STRIKE™ Electronic Control System is now in service.

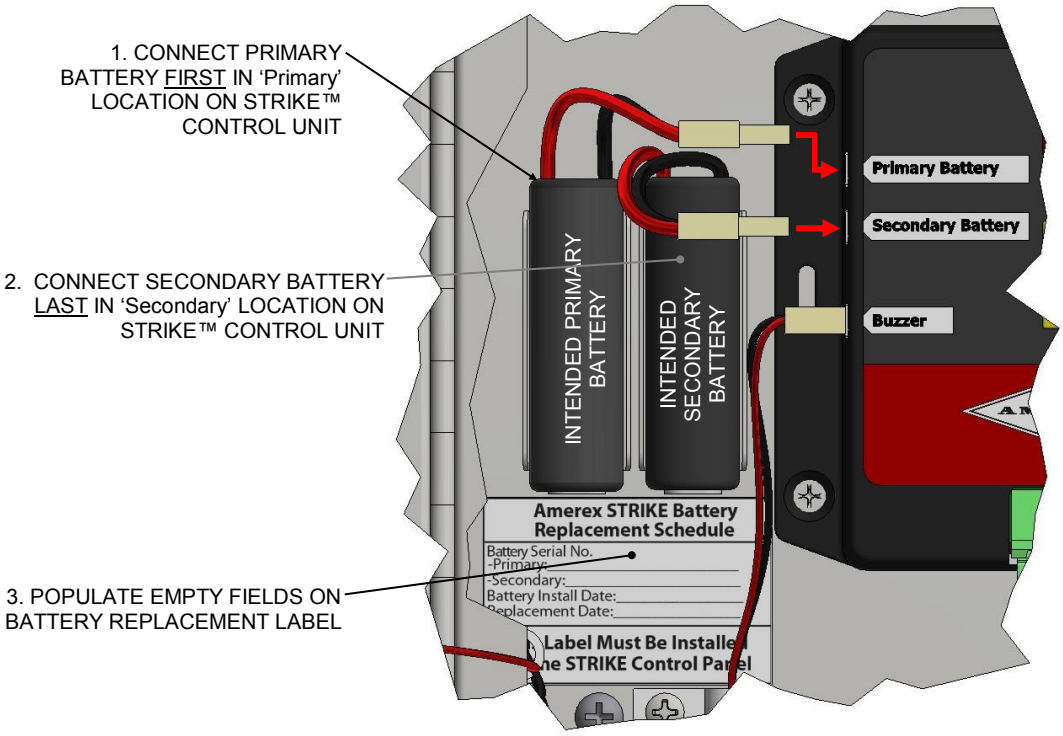


Figure 4.12.5

Chapter 5: Inspection & Maintenance

The AMEREX® STRIKE™ Electronic Control System (ECS) requires periodic care to provide maximum assurance that the system will operate effectively and safely. Inspection frequency should be based on the requirements of the local AHJ where the system will operate. Equipment operating continually and/or in harsh environments will require more frequent inspection and maintenance. The latest revisions of any AMEREX® Installation, Operation, and Maintenance Manuals referenced in this Chapter can be found at www.amerex-fire.com. All NFPA guidelines that are applicable to the system must be followed for service and maintenance. **The following inspection and maintenance requirements are additional AMEREX® required maintenance schedules and must be following to ensure reliable system performance.**

5.1 Daily Inspection: OPERATOR / OWNER

- Verify that the green 'System Normal' status LED on the STRIKE™ Control Unit is flashing once every 4 seconds and the STRIKE™ Control Unit enclosure is closed and locked.

5.2 Monthly Inspection: OPERATOR/ OWNER

- Verify that all components are present, in their original location and securely fastened.
- Verify that all Manual Pull Station devices are unobstructed by obstacles or clutter. Verify the green tamper seal is installed on each device.
- Verify that the maintenance tag or certificate is in place and up to date. Record the date of inspection and initials of inspector.
- Verify the physical condition of all components. Inspect for damage or conditions that may prevent operation. Perform a visual inspection of each detector, detection circuit, and actuation (discharge) circuit. During the visual inspection, verify no dents, dings, cracks, scorch marks from flames, or any other physical damage has occurred to any detector, component, or cable. Replace any suspect components. If a build-up of grease, dust, or any other foreign matter has accumulated on the detector or circuitry, clean with a vacuum or soft dry cloth.
- Verify the date of the battery replacement schedule on the Battery Replacement Label. If battery is scheduled to be replaced within a month, contact an AMEREX® Certified and Authorized Servicing Technician for scheduling a replacement.

If any service is required as a result of monthly inspections, it should be done only by an Authorized AMEREX® Service Representative.

5.3 Semi-Annual Maintenance: AUTHORIZED AMEREX® SERVICE REPRESENTATIVE

The AMEREX® STRIKE™ Electronic Control System must be serviced by an Authorized AMEREX® Service Representative that is trained and certified on the system and in accordance with NFPA and any federal, state, and/or local code requirements. Service and maintenance shall be done at intervals of six (6) months or more frequent if deemed necessary.

- Perform the monthly inspection procedure.
- Verify that hazards have not changed. Look for changes in appliance location or operation or cleaning procedures that may have increased the hazard. Compare with the original hazard analysis.
- Replace the batteries in accordance with the replacement procedure per Section 5.5. Also, perform a commission test of the system as described in Section 4.12. The batteries currently installed may be used for this commission testing, since the primary battery will be replaced. **Warning: Do NOT perform the commission tests on the system until all Linear Actuators (P/N 24448) are replaced with Fire Alarm Modules (P/N 24787). Otherwise, a system discharge may result!**

- Document all work completed during service for record retention. Disclose any anomalies, deficiencies to the property owner for corrective action requirements.

5.4 (6) Six-Year Maintenance: AUTHORIZED AMEREX® SERVICE REPRESENTATIVE

- Perform semi-annual inspection.
- Replace Linear Actuators if in service for 6 years.

5.5 Battery Replacement Procedure: AUTHORIZED AMEREX® SERVICE REPRESENTATIVE

The internal Lithium-Thionyl Chloride (LI-SOC12) batteries installed in the STRIKE™ Control Unit enclosure will require periodic replacement. Rather than replace both batteries at the same time, this replacement procedure involves removing the current 'Primary' battery and replacing it with the current 'Secondary' battery, and a new Replacement Battery (P/N 24903) is installed at the 'Secondary location. Before performing this replacement procedure or performing system maintenance, it is a safe practice to disconnect the discharge zones (actuation circuits). The battery replacement procedure shall also be performed following these events:

- Primary Battery is over 6 months old
- Battery Replacement Label is missing
- A trouble (fault) condition occurs
- An alarm condition event occurs
- Low battery indicator ('Battery Fault') on STRIKE™ Control Unit is illuminated.
- Label information is not legible

Battery Replacement Procedure:

1. Unplug the 'Secondary' battery from the STRIKE™ Control Unit (See Figure 5.5a).
2. Unplug and remove the 'Primary' Battery from the STRIKE™ Control Unit enclosure (See Figure 5.5a). Dispose of this battery properly.
3. Move the 'Secondary' battery to the 'Primary' bracket location on left (See Figure 5.5b).
4. Connect the previous secondary battery (left) to the 'Primary' battery connection port.
5. Install a new Replacement Battery (P/N 24903) in the 'Secondary' bracket location on right. Connect to the 'Secondary' battery connection port (See Figure 5.5c). Verify the STRIKE™ Control Unit powers up and resumes normal condition with green 'System Normal' LED is flashing once every 4 seconds.
6. Each new Replacement Battery is supplied with a new Battery Replacement Label. Populate the new label and place over the old label (See Figure 5.5c).

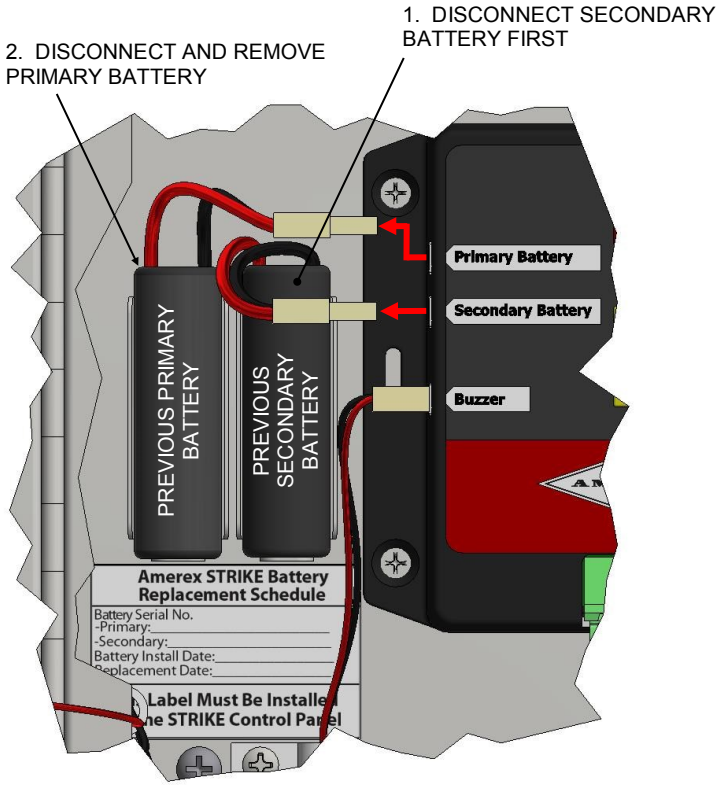


Figure 5.5a

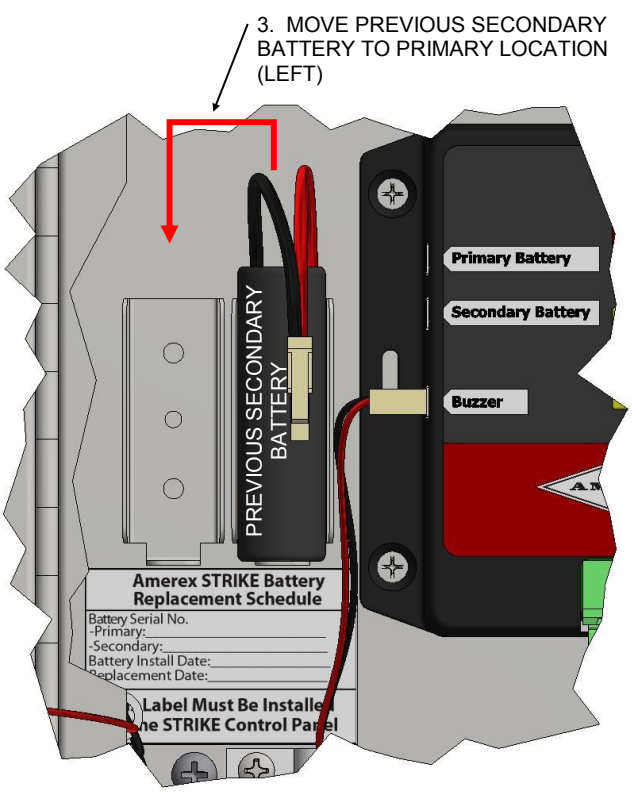


Figure 5.5b

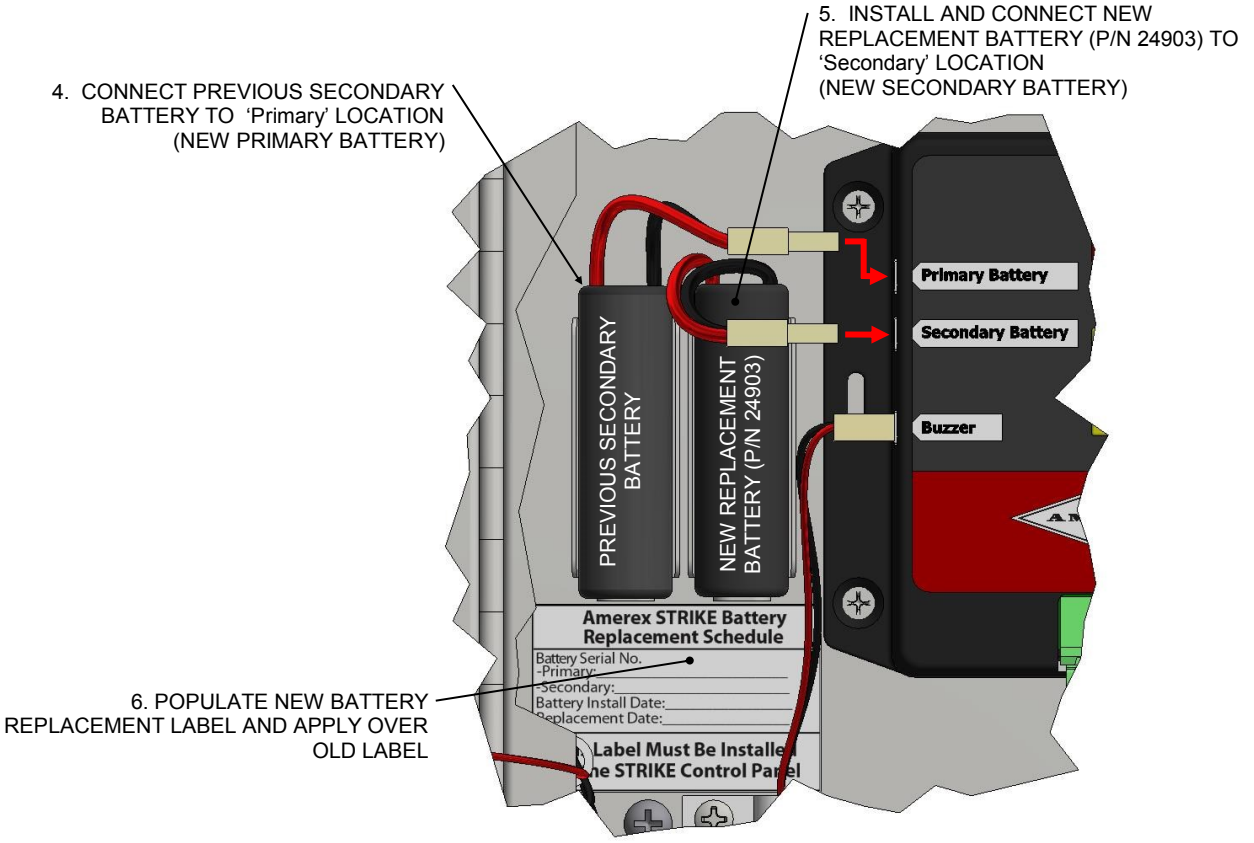


Figure 5.5c

Chapter 6: System Alarms & Troubleshooting

The AMEREX® STRIKE™ Electronic Control System (ECS), under normal working conditions, will display the green "System Normal" LED on the STRIKE™ Control Unit by flashing once approximately every 4 seconds. If the green "System Normal" LED is not flashing, an alarm or trouble condition exists with the system. **Any alarm or trouble condition shown on the STRIKE™ Control Unit mandates performing the Battery Replacement Procedure (See Section 5.5).**

6.1 System Alarm Condition

A system alarm condition is a latching alarm condition indicating an overheat/fire event. If the STRIKE™ Control Unit is experiencing a system alarm condition, the following indications will occur on the STRIKE™ Control Unit and any connected Relay Modules (See Table 6.1). If the alarm condition is caused by a detection or manual pull circuit, any programmed discharge zone(s) will be actuated and the associated Linear Actuator(s) fired, resulting in actuation of an AMEREX® KP™ Fire Suppression System.

Table 6.1

Indicator	**Result After Alarm Condition**
Green 'System Normal' LED	OFF
Red 'Alarm– Zone 1' or 'Alarm– Zone 2' LED	FLASHES every 3 seconds for actuated discharge zone(s)
Audible Alarm	Single beep every 3 seconds
Alarm Outputs (Relay 1, 2 & 3)	Transfers state (NC to open; NO to closed) after programmed delay
Auxiliary FACP Alarm Output	Transfers state (NO to closed) after programmed delay
Relay Module (P/N 24694 or P/N 24695)	**Result After Detection or Manual Pull Alarm Condition**
Relay #1 (Electric Gas Valve)	Transfers state (power removed from Electric Gas Valve to close)
Relay #2 & #3 (for P/N 24695 only)	Transfers state (NC to open; NO to closed)

The system will remain in alarm until the cause of the alarm has been identified and corrected and the system manually reset. The audible alarm can be silenced by pressing the 'Alarm Silence' button on the STRIKE™ Control Unit. **Inspection or use of the Monitor Mode (See Section 4.11.4) or Event Log (See Section 6.5) can be used to identify the cause of an alarm.** Any one time use or damaged components must be replaced. If an alarm condition actuated any discharge zones, replace fired Linear Actuators (P/N 24448).

Reset the STRIKE™ Control Unit by pressing and holding the "System Reset" button for approximately 10 seconds and verify the STRIKE™ Control Unit returns to normal condition with the green 'System Normal' LED flashing once every 4 seconds. An alarm condition most often results from the following:

Manual Pull Station activated - The technician must inspect all Manual Pull Stations for activation or see if the tamper seal is broken or missing.

Detection device initiated - If a detection device is initiated from an overheat/fire condition, the source of the alarm condition must be identified somewhere in the detection circuit(s), and the cause must be corrected by the AMEREX® servicing technician.

- SHD - Spot Heat Detectors are self-resetting devices. The technician must identify the overheat/ fire condition by evaluating the surrounding environment for indications such as smoke or fire damage in close proximity. SHDs are normally open devices when not exposed to set point parameters from overheat/fire conditions. If no smoke or fire damage exists, the SHD could potentially be damaged from some other means. Check for dents on the SHD housing.

- LHD - Linear Heat Detectors are one time use, normally open devices when not exposed to set point parameters from overheat/fire conditions. The LHD will have permanent damage such as melting, burns or cuts resulting from overheat/fire or damage from some other means. Locate any used or damaged LHDs and replace.

6.2 Service System (Fault) Condition

The AMEREX® STRIKE™ ECS is designed to supervise and monitor all detection, manual pull, actuation and circuits. If the system detects a problem, a trouble (fault) condition will result, indicated by the yellow 'Service System' LED and the following indications will be displayed on the STRIKE™ Control Unit (See Table 6.2).

Indicator	Result After Trouble (Fault) Condition
Green 'System Normal' LED	OFF
Yellow 'Service System' LED	FLASHES every 4 seconds
Audible Alarm	Single beep every 4 seconds
Auxiliary FACP Fault Output	Transfers state (NC to open) after programmed delay

Table 6.2

The STRIKE™ Control Unit will return to a 'System Normal' status automatically once the trouble condition is corrected. The audible alarm can be silenced by pressing the 'Alarm Silence' button on the STRIKE™ Control Unit. **Inspection or use of the Monitor Mode (See Section 4.11.4) or Event Log (See Section 6.5) can be used to identify the cause.** Trouble conditions most often result from the following:

Pressure Switch Circuit Trouble - The pressure switch circuit is a normally closed circuit. Since the pressure switch circuit is unused, if the circuit is enabled (default), the included jumper wire must be installed across terminals 1 and 2 of TB1, otherwise a fault will result. If the circuit is disabled, no wire is necessary.

Detection or Manual Pull Circuit Trouble - If any detection or manual pull cables or components are disconnected or damaged, a trouble condition will result. Inspect each circuit for disconnected connectors, broken or cut wiring, or damaged components. Also, the End Of Line Modules (EOL) (P/N 23474), located at the end of each circuit, can be used as tools for identifying damaged or faulty segments of the circuit. To do so, disconnect the EOL from the end of the circuit and reconnect it to the Class B Detection Lead Cable/Manual Pull Station Lead Cable connector (first connector) in that circuit. If the trouble condition no longer exists, the cause most likely lies downstream in that circuit. Repeat the process at each connection location of the circuit until the faulty cable or device is found.

Discharge (Actuation) Circuit Trouble - If any actuation circuit cables or components are disconnected or damaged, a trouble condition will result. Inspect each circuit for disconnected connectors, broken or cut wiring, or damaged components.

If an alarm condition has occurred resulting in the actuation of any programmed discharge zones, a trouble condition will occur until all fired Linear Actuators (P/N 24448) are replaced from those zones. Also, Fire Alarm Modules (P/N 24787) can be used as tools for identifying damaged or faulty Linear Actuators. To do so, disconnect the Linear Actuator from the end of the circuit and connect a Fire Alarm Module in its place. If the fault no longer exists, the cause most likely lies in the Linear Actuator.

Ground Fault Trouble - If a ground fault occurs on the detection or actuation circuits, a trouble condition will result. Inspect each circuit for potential ground fault sources such as chafed or pinched wiring or exposed wiring conductors. The Monitor Mode (See Section 4.11.4) feature will also display a ground fault condition.

6.3 Battery Fault Condition

A battery fault condition indicates low battery power in the STRIKE™ Control Unit by displaying the yellow 'Battery Fault' LED. The following indications are displayed on the STRIKE™ Control Unit (See Table 6.3). The Battery Replacement Procedure must be performed following a 'Battery Fault' condition (See Section 5.5).

Indicator	Result After Low Battery Power (Fault) Condition
Green 'System Normal' LED	OFF
Yellow 'Battery Fault' LED	FLASHES every 4 seconds (after approximately 30-60 seconds)
Audible Alarm	Single beep approximately every 10 minutes
Auxiliary FACP Fault Output	Transfers state (NC to open) after programmed delay

Table 6.3

6.4 Actions to Take if a Fire Condition is Witnessed

- Actuate the AMEREX® STRIKE™ Electronic Control System (ECS) by breaking the tamper seal and pulling a Manual Pull Station.
- Evacuate all people from the area to a safe location.
- Notify the local fire department.
- Stand by with portable fire extinguisher and watch for sources of re-ignition.

6.5 Event Log

The Event Log allows the user or servicing distributor to access a history of events that have occurred on AMEREX® STRIKE™ ECS. The Event Log can be used to identify intermittent issues that may not always be seen by the servicing technician. It may be used to determine the most recent maintenance performed on the system, or for system troubleshooting and analysis of past system history.

To access the Event Log, the STRIKE™ Control Unit must be in programming mode and be connected to a PC with the STRIKE™ ECS Unit Utility window open and running (See Section 4.11.2 & 4.11.3). Click the 'Event Log' tab (See Figure 6.5). Once the 'Event Log' tab is selected, the system allows the user to select the last 20 or all (up to 100) events by clicking the 'View Events' button on the bottom left. Each event is time and date stamped and provides a history of up to 100 events or actions performed on the system, including any alarm and trouble (fault) conditions and which circuit caused the condition. Once 100 events are recorded, the system overwrites the earliest event to maintain a total of 100 events. Alarm and fault system resets are displayed, as well as timestamps for new configuration uploads. These events are stored in "non-volatile" memory in the STRIKE™ Control Unit. **All timestamps correlate to system time as set by the installer (See Section 4.11.3).**

The Event Log may be saved on the PC by clicking the 'Save' button in the lower right of the window (See Figure 6.5). The default folder is 'My Amerex Files/STRIKE ECS Unit/EventLog'. The file format is *.csv, which can be opened and viewed using Microsoft Excel. It is recommended that the title of the saved file include the location identification number and date.

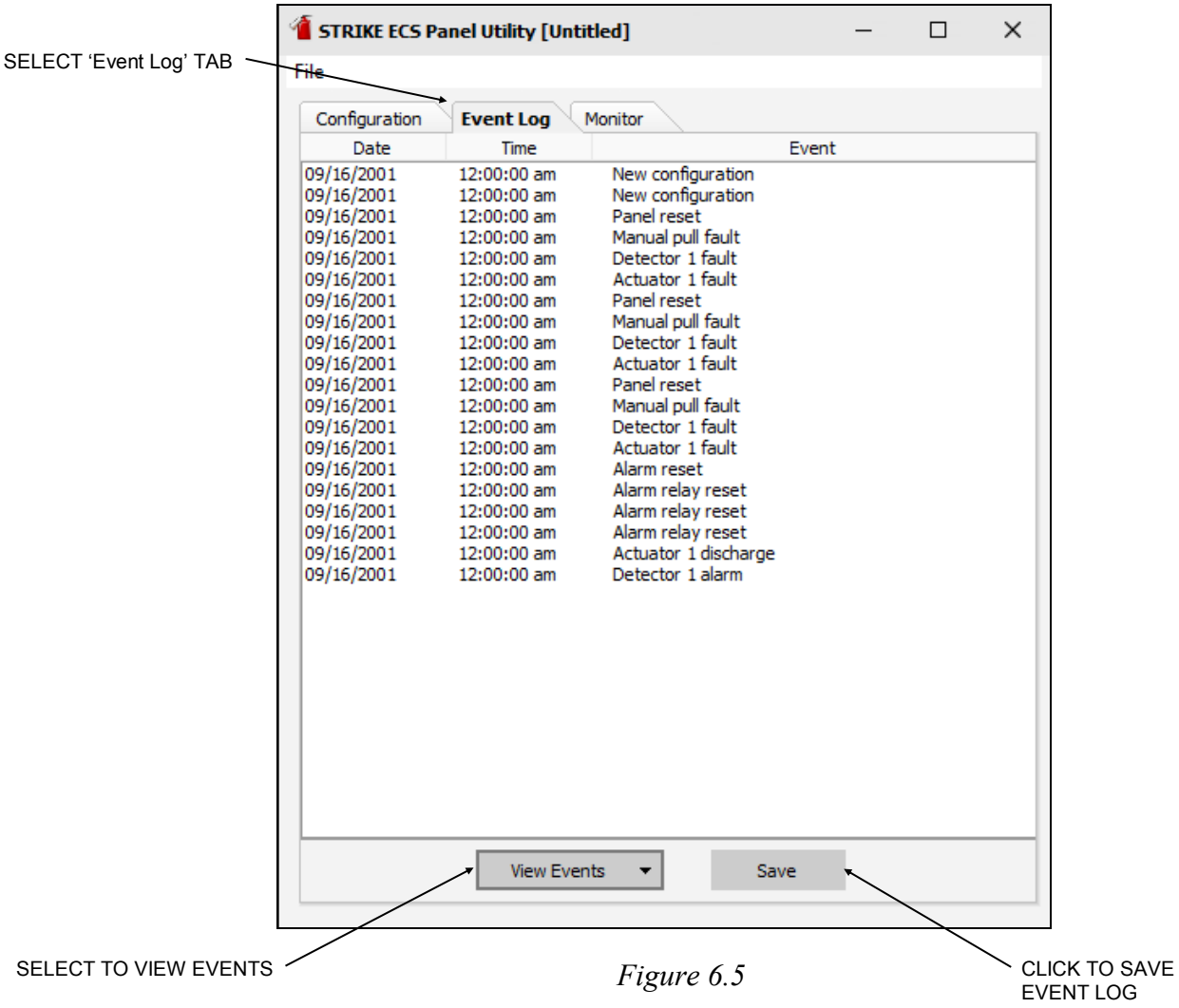


Figure 6.5

Chapter 7: Warranty

Warranty Statement:

Warranty and Limitation of Liabilities, Buyers Remedies, and Indemnification

AMEREX® Corporation (Seller) warrants that Fire Suppression System components (Goods) delivered are free from defects in material and workmanship under conditions of normal use for a period of three (3) years from the date of purchase. Non-standard products manufactured by Seller to customer specifications are warranted for a period of one (1) year. Contact AMEREX® Corporation for warranty statements for other AMEREX® Corporation products. Seller reserves the right to make any modifications required by production conditions to the information set forth in the Seller's catalogues and advertising literature. Seller shall not be liable or responsible, however, for (A) any defects attributed to normal wear and tear, erosion or corrosion or improper storage, use or maintenance, or (B) defects in any portion or part of the Goods manufactured by others. If (B) above is applicable, Seller will, as an accommodation to Buyer, assign to Buyer any warranties given to it by any such other manufacturers. Any claim by Buyer with reference to the Goods for any cause shall be deemed waived by Buyer unless submitted to Seller in writing within ten (10) days from the date Buyer discovered, or should have discovered, any claimed breach. Buyer shall give Seller an opportunity to investigate.

Provided that Seller is furnished prompt notice by Buyer of any defect and an opportunity to inspect the alleged defect as provided herein, Seller shall, at its option and in its sole discretion either: (i) repair the defective or non-conforming Goods, (ii) replace the nonconforming Goods, or part thereof, which are sent to Seller by Buyer within sixty days after receipt of the Goods at Buyer's plant or storage facilities, or (iii) if Seller is unable or chooses not to repair or replace, return the purchase price that has been paid and cancel any obligation to pay unpaid portions of the purchase price of nonconforming Goods. In no event shall any obligation to pay or refund exceed the purchase price actually paid. This warranty does not cover defects resulting from modification, alteration, misuse, exposure to corrosive conditions or improper installation or maintenance. Repair and/or replacement as provided above shall be at Seller's plant and shipped F.O.B. Plant unless otherwise agreed to by Seller. Transportation charges for the return of the Goods or part thereof to Seller shall be prepaid by Buyer, unless otherwise agreed to in writing by Seller. Seller shall, in no event, be responsible for any labor, removal or installation charges that may result from the above-described repair and/or replacement of any Goods. The foregoing warranty does not cover failure of any part or parts manufactured by others, the failure of any part or parts from external forces, including but not limited to earthquake, installation, vandalism, vehicular or other impact, application of excessive torque to the operating mechanism or frost heave. The exclusive remedy of Buyer and the sole liability of Seller, for any loss, damage, injury or expense of any kind arising from the manufacture, delivery, sale, installation, use or shipment of the Goods and whether based on contract, warranty, tort or any other basis of recovery whatsoever, shall be, at the election of Seller, the remedies described above.

The foregoing is intended as a complete allocation of the risks between the parties and Buyer understands that it will not be able to recover consequential damages even though it may suffer such damages in substantial amounts. Because this Agreement and the price paid reflect such allocation, this limitation will not have failed of its essential purpose even if it operates to bar recovery for such consequential damages.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED BY LAW. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY, SHALL SELLER BE LIABLE FOR ANY PUNITIVE, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFIT, LOSS OF USE OF THE GOODS OR OTHER PROPERTY EQUIPMENT, DAMAGE TO OTHER PROPERTY, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, DOWNTIME, OR THE CLAIMS OF BUYER'S CUSTOMERS FOR ANY OF THE AFORESAID DAMAGES. SELLER SHALL NOT BE LIABLE FOR AND BUYER AGREES TO DEFEND AND INDEMNIFY SELLER AGAINST ALL CLAIMS OR LOSSES (INCLUDING ATTORNEYS' FEES), INCLUDING PERSONAL INJURY, PROPERTY DAMAGE OR OTHER LIABILITY, RESULTING IN WHOLE OR IN PART FROM (1) THE NEGLIGENCE OF BUYER OR ITS CUSTOMERS; (2) BUYER'S OR ITS CUSTOMER'S MISUSE , DAMAGE, ALTERATION OR MODIFICATION OF SELLER'S GOODS; (3) BUYER'S OR ITS CUSTOMER'S USE OF THE GOODS IN ANY PRODUCT OR SYSTEM DESIGNED, MANUFACTURED OR SOLD BY BUYER OR ITS CUSTOMERS; OR (4) ANY BREACH OF THIS AGREEMENT; PROVIDED, HOWEVER, THAT BUYER SHALL HAVE NO OBLIGATION TO INDEMNIFY SELLER FOR CLAIMS OR LOSSES THAT ARISE SOLELY FROM THE NEGLIGENCE OR MISCONDUCT OF SELLER.

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