



**DESIGN, INSTALLATION,
MAINTENANCE & RECHARGE
MANUAL**

NO. 12385 REV. A

**AMEREX KP
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 KP Restaurant Fire Suppression System in strict accordance with this manual.

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GENERAL INFORMATION

The Amerex KP Series Automatic Wet Chemical Extinguishing System is designed and has been tested to provide fire protection for commercial cooking operations covering the hood, ducts, plenum and appliances. Amerex KP 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 Series Systems be performed in compliance with this manual. **Those individuals responsible for the design, installation, operation and maintenance of the Amerex KP 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 Series System listings.

LISTINGS:

The Amerex KP Series is a listed pre-engineered fire extinguishing system. The KP system is 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. 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 System consists of mechanical and electrical components to be installed by an Authorized Factory Trained and Certified Amerex KP Systems distributor. The system is composed of an agent cylinder/discharge valve charged with Amerex KP Liquid Agent and a Mechanical Release Module (MRM). 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 KP System suppresses fire in commercial cooking equipment by spraying KP liquid agent in a predetermined 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 October require exhaust fans to be shut down by the fire suppression system. Check local fire codes and requirements in the specific area that the system is being installed.

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

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 to the Agent Cylinder/Discharge Valve(s).

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

AUTHORITY HAVING JURISDICTION (AHJ): The organization, office or individual responsible for "approving" equipment, an installation or a procedure. The phrase "Authority Having Jurisdiction" is used in NFPA documents in a broad manner since jurisdiction and approval agencies vary as to their responsibilities. Where public safety is primary, the "Authority Having Jurisdiction" October 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 October be the "Authority Having Jurisdiction"; at government installations, the Commanding Officer or departmental official October the "Authority Having Jurisdiction".

AUXILIARY EQUIPMENT: Listed equipment used in conjunction with the Amerex KP restaurant fire system to shut down: power, fuel and make-up air. Auxiliary equipment October also operate 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.

BRANCH LINE: The portion of the piping in the distribution network that runs from the supply line to the nozzle(s).

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 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.

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.

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: 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: 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.

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, October include duct fittings, plenums and/or other items or air handling equipment.

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 in the cable, causing the system to discharge.

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 October be liberated and entrained in exhaust air or October 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, 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 and is in a charged, operable condition.

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 October 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): An assembly that connects and controls the actuation cartridge, the detectors, the manual pull station(s), the gas valve, the microswitch(es) and the agent cylinder/discharge valve(s). It receives inputs and activates appropriate outputs – including agent release, auxiliary signals and power or gas shut-off.

MICROSWITCHES: 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 or elbow 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 $[18 + 18 + 9 + 9 = 54]$)

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

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

PNEUMATIC RELEASE MODULE (PRM): This single hazard control panel 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 panel 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 a 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 and the terminal detector.

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

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 October be used specifically for holding or warming foods.

VENT CHECK: A device installed in the actuation network that is used to safely relieve pressure.

October 2003

LIMITED WARRANTY

Amerex warrants its KP 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. 12385 Rev. A. 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.

SECTION 1

GENERAL INFORMATION

MANUAL P/N 12385 REV. A

AMEREX KP 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

October 2003

GENERAL INFORMATION

The Amerex KP Series Restaurant 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 KP 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 Series Systems be performed in compliance with this manual. **Those individuals responsible for the design, installation, operation and maintenance of the Amerex KP Restaurant Fire Suppression System must be trained by Amerex and hold a current Amerex KP 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 Series System listings.

LISTINGS:

The Amerex KP Series is a listed pre-engineered restaurant fire suppression system. The KP system is 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. 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 System consists of mechanical and electrical components to be installed by an Authorized Factory Trained and Certified Amerex KP Systems distributor. The system is composed of an agent cylinder/discharge valve charged with Amerex KP Liquid Agent and a Mechanical Release Module (MRM) or Pneumatic Release Module (PRM). 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 KP System suppresses fire in commercial cooking equipment by spraying KP liquid agent in a predetermined 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 must be automatically shut off along with all cooking appliances. Some local Authorities Having Jurisdiction may require exhaust fans to be shut down by the fire suppression system. Check local fire codes and requirements in the specific area that the system is being installed.

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

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 ASSEMBLY: Pressurized vessel with valve assembly containing Amerex KP 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 KP restaurant fire suppression system to shut down: power, fuel and make-up air. Auxiliary equipment may also operate 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, containers are placed over each nozzle and the system is fully discharged. These containers 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 prevent 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 assembly.

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 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.

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: 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: 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 assembly valves to 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.

FLOW POINT: The term used to describe the flow capacity of each nozzle. This information is used to determine the number of agent cylinder assemblies 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 in the cable, causing the system to discharge.

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 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 and is in a charged, operable condition.

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): An assembly that connects and controls the actuation cartridge, the detectors, the manual pull station(s), the gas valve(s), the microswitch(es) and the agent cylinder assembly(s). It receives inputs and activates appropriate outputs – including agent release, auxiliary signals and power or gas shut-off.

MICROSWITCHES: 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 [$18 + 18 + 9 + 9 = 54$])

GAS TRIP ASSEMBLY: A pneumatic device mounted in the MRM 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.

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 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. 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 of 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 or compressed air 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 Zone Defense Manual for definitions.

SAPONIFICATION: The reaction of fats and/or oils to alkaline materials, producing a 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 and the terminal detector.

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 cable 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 food 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 PLUG: 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.

SECTION 2

SYSTEM COMPONENTS

MANUAL P/N 12385 Rev. A

AMEREX
KP
RESTAURANT
FIRE SUPPRESSION SYSTEM

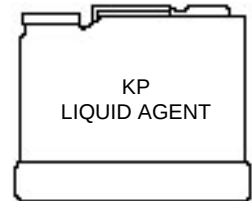
Tested and Listed by
Underwriters Laboratories, Inc.
to UL Standard 300
Effective November 21, 1994
EX 4658

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

OCTOBER 2003

SYSTEM COMPONENTS

AMEREX KP LIQUID AGENT is a specially formulated potassium acetate based solution specifically designed for use on grease and cooking oil fires. Amerex KP Wet Chemical Recharge is shipped in plastic pails with each pail marked with date and batch code. Shipping weight: P/N 12866 3.75 Gal. Pail – 42½ lbs. (19.277 kg)
P/N 15416 6.14 Gal. Pail – 67 lbs. (29.71 kg)



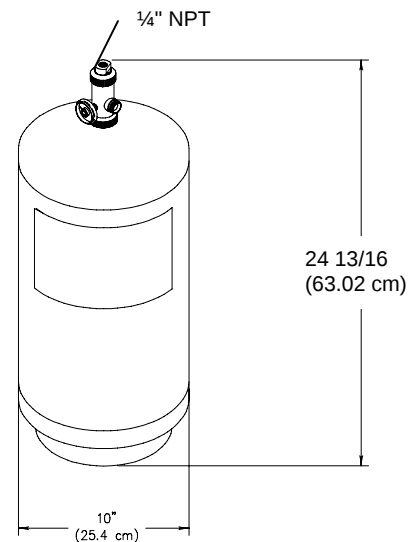
WARNING: AMEREX KP WET CHEMICAL IS A STRONG ALKALINE MIXTURE, SAFETY GLASSES AND GLOVES SHOULD BE WORN WHENEVER HANDLING THE AGENT. CONTACT WITH SKIN SHOULD BE AVOIDED. IN CASE OF DISCHARGE, THE SOLUTION SHOULD BE CLEANED UP PROMPTLY TO AVOID DAMAGE TO APPLIANCES, HOOD AND DUCT, ALL FOOD IN CONTACT WITH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

P/N 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

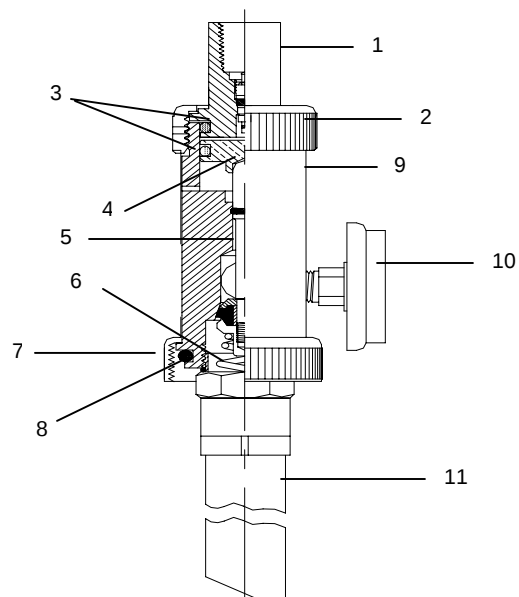
AGENT CYLINDER/ASSEMBLY – KP375 (P/N 13334)

Amerex KP systems **3.75 gallon capacity agent cylinder assembly** is shipped factory filled with Amerex “KP” liquid agent. It is pressurized with dry nitrogen to a pressure of 240 psi (1655 kPa) at 70 °F. The nitrogen charge is the expellant gas which discharges the KP agent through the distributor network.

The machined brass **discharge valve** is actuated pneumatically from the Mechanical Release Module. The valve assembly has a ¼ in. NPT (female) actuation port and a discharge adapter with threads to accept a flexible discharge hose.

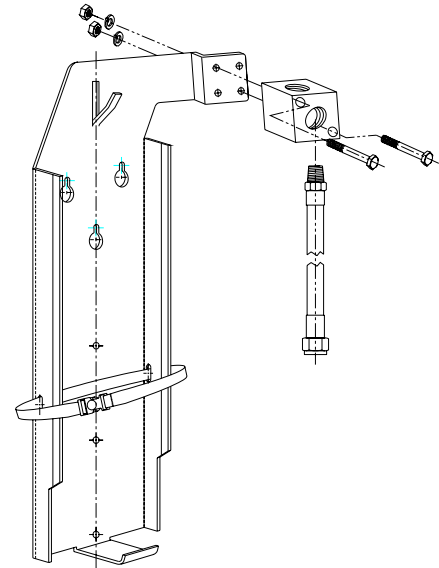


ITEM	DESCRIPTION
1	CAP W/CHECK VALVE
2	CAP NUT
3	O-RINGS (2)
4	PISTON
5	VALVE STEM ASSY
6	SPRING (STAINLESS STEEL)
7	RETAINER NUT
8	COLLAR O-RING
9	VALVE BODY
10	240 PSI GAUGE
11	DOWNTUBE



CYLINDER MOUNTING BRACKET (P/N 16085)

The mounting bracket is used to secure the 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.

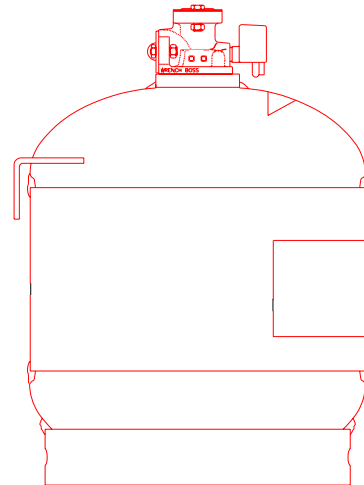
**DISTRIBUTION HOSE (P/N 13069)**

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).

AGENT CYLINDER/ASSEMBLY-KP600 (P/N 15196)

Amerex KP600 – 6.14 Gallon Capacity – Agent Cylinder Assembly is shipped factory filled with Amerex KP Liquid Agent. It is pressurized with dry Nitrogen 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.**

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 cylinder is fitted with an attachment bracket welded to the cylinder for ease of installation. 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.

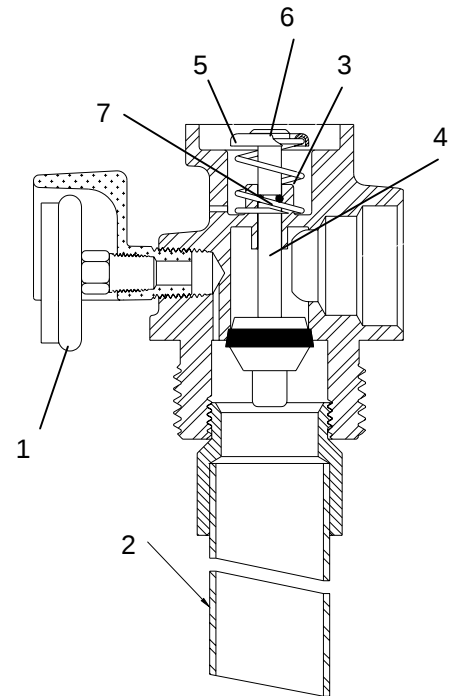


P/N 15196	U.S.	METRIC
Height	27.59 in	70.08 cm
Diameter	12 in	30.5 cm
Weight full	114 lb	51.70 kg
Capacity	6.14 gal	23.2 liter

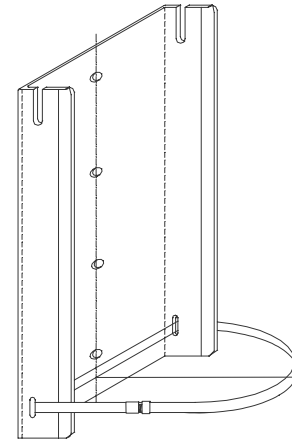
KP600 CYLINDER VALVE ASSEMBLY (P/N 15060)

The cylinder valve assembly is made with a forged brass body which has been electrolisis 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.

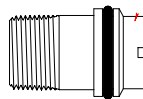
ITEM	DESCRIPTION	PART NO.
1	Gauge – 240 PSI	12402
2	Downtube Assembly	15195
3	Spring	10097
4	Valve Stem Assembly	15063
5	Washer – Stainless Steel	10102
6	Screw	10732
7	O-ring	10733

**KP600 CYLINDER MOUNTING BRACKET (P/N 15166)**

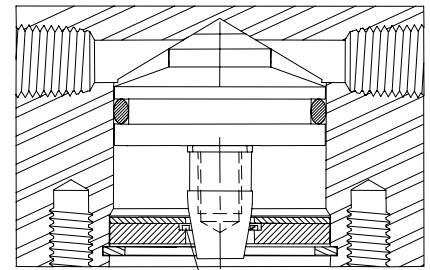
The mounting bracket is used to secure the agent cylinder assembly to the mounting surface. The bracket consists of a steel mounting base and stainless steel strap. The base is attached to the wall by appropriate means via three of the four holes. A stainless steel worm gear strap is provided to hold the cylinder against the base.

**KP600 DISCHARGE FITTING KIT (P/N 10199)**

The discharge fitting kit consists of a brass fitting with an o-ring on one end, 3/4 NPT male pipe threads on the other and a stainless steel flange for locking the fitting into place. One discharge fitting kit is required for each KP600 Agent Cylinder Assembly.

**KP 600 PNEUMATIC ACTUATOR (P/N 15157)**

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 1/4" 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 spiral retainer ring that locks the piston in its extended position.



MECHANICAL RELEASE MODULE (MRM) (P/N 11977)

The mechanical release module is used to actuate the agent cylinder/discharge valve either automatically or manually by puncturing a nitrogen cylinder. The pressure from the cylinder pneumatically opens the discharge valve(s).

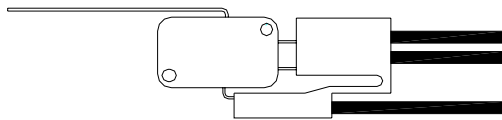
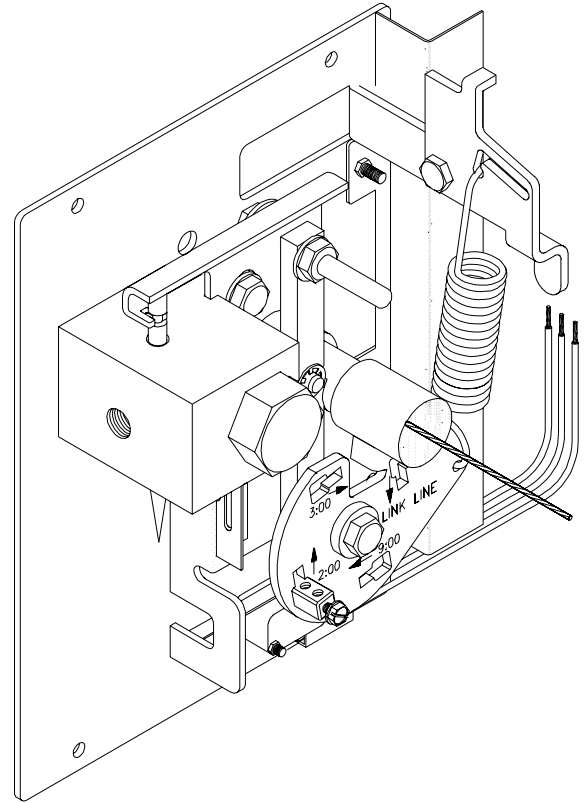
Automatic release of agent is accomplished when a fusible link detector separates under a fire condition and releases tension on the cable. This causes a spring-loaded plunger to perforate the cylinder seal and releases nitrogen through the actuation hose/piping network to the discharge valve(s).

Manual release of agent is accomplished by pulling on a manual pull station which is connected to the mechanical release module by a cable.

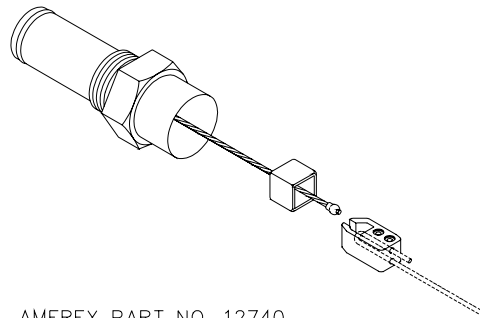
The mechanical release module is equipped with one microswitch (P/N 12524) for electrical signaling, power shutdown and other auxiliary functions. An additional three microswitches may be added.

Operation of one or two mechanical gas valves may be accomplished by adding a piston plug/gas trip assembly (P/N 12740).

The cable for the gas valves, manual pull stations and detection network may be attached to the MRM from any of three sides (top, bottom and right).



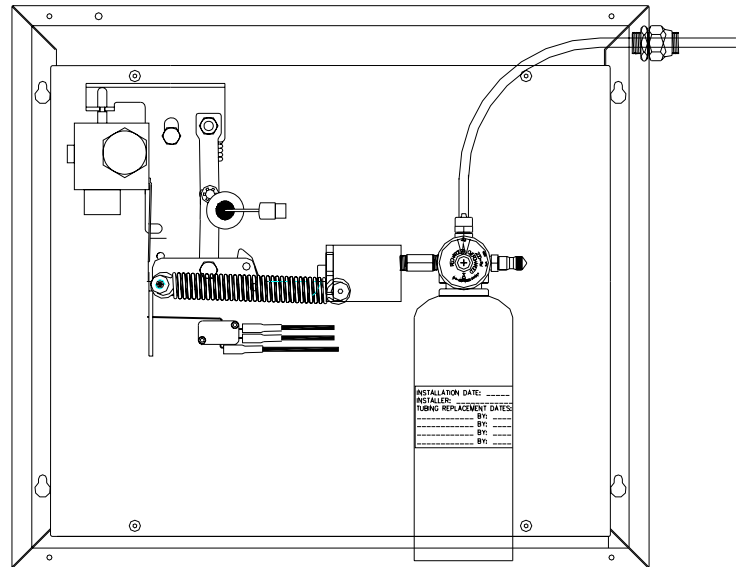
AMEREX PART NO. 12524



AMEREX PART NO. 12740

**PNEUMATIC RELEASING MODULE
– PRM (P/N 16547)**

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. Refer to the Design and Installation Manual, P/N 16546 for further details.

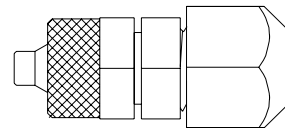
**DETECTION TUBING – ¼" DIAMETER**

P/N 16551 - 50'
P/N 16552 - 150'
P/N 16554 - 300'

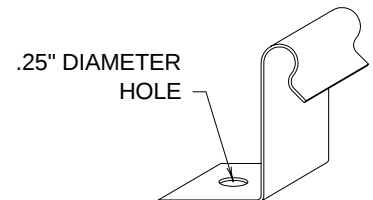
Pressurized thermal responsive tubing that provides a mechanical movement via loss of pressurization, anywhere along its entire length, that results in system actuation.

END OF LINE FITTING (P/N 16506)

The "End of Line Fitting" is installed at the end of the pneumatic detection network to allow for a means of relieving pressure in the detection tubing without damaging the tubing and thereby testing the functionality of the PRM.

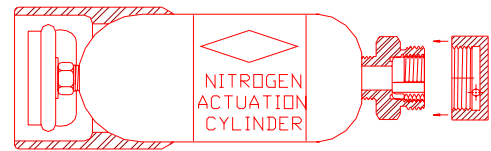
**TUBING SUPPORT CLIP (P/N 16501)**

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.



NITROGEN ACTUATION CYLINDER (P/N 12856)

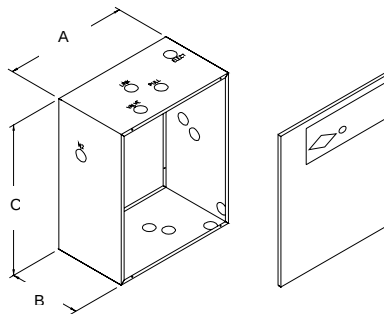
The 10 in³ N₂ cylinder, P/N 12856, supplies nitrogen gas pressure to the cylinder through the actuation network for the purpose of opening the agent cylinder valve. This cylinder is charged to 1800 psig (12410 KPa) at 70°F (21°C) and contains enough nitrogen to actuate up to **ten KP 375** or **six KP 600** agent cylinder assemblies at a maximum distance of 100 feet (21.3 meters) to the last control head. Pressure is retained in the N₂ cylinder by a gold plated rupture disc. Replacement rupture discs are available as P/N 09958. Only genuine Amerex rupture discs may be used when recharging nitrogen cylinders. Proper charge pressure is indicated by a pressure gauge located on the cylinder bottom and protected by an impact resistant plastic gauge guard. The N₂ 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 cylinders.) Construction of the N₂ cylinder is per DOT 3E. The cylinder is rechargeable by certified Amerex installers and does not require periodic hydrotesting. The 10 in³ nitrogen cylinder may be used in the MRM or PRM.



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

ENCLOSURES - MRM**(Painted – P/N 12853)****(Stainless Steel – P/N 13393)**

Either painted (red) or stainless steel are available for secure mounting of the MRM. Knockouts are provided for installation of all external devices. Viewports for system status indicator and external inspection of nitrogen actuation cylinder are provided. The enclosure cover cannot be attached if the MRM tension bar is in the "OFF" or "DOWN" position.

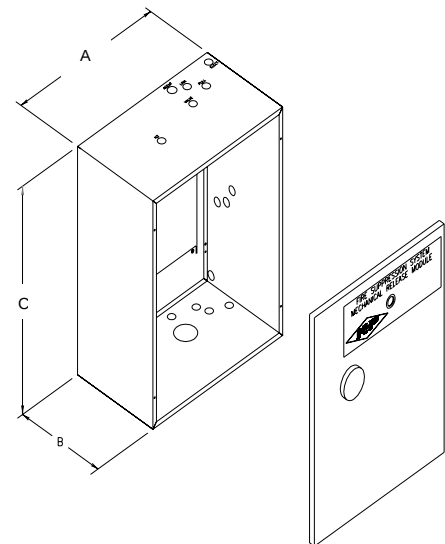


P/N 12853 P/N 13393	U.S.	Metric
(A) Width	10 in	25.4 cm
(B) Depth	5 in.	12.7 cm
(C) Height	11 3/4 in	51.5 cm

CABINET (P/N 11978)

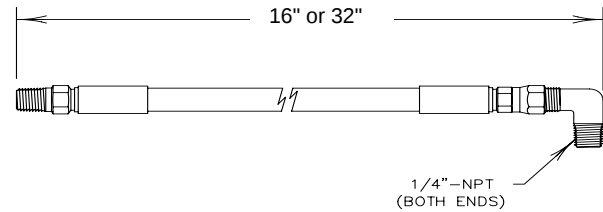
Stainless steel cabinets are available for single cylinder systems. The cabinet will house the agent cylinder assembly, the agent cylinder mounting bracket and the mechanical release module.

P/N 11978	U.S.	Metric
(A) Width	20 1/2"	52.07 cm
(B) Depth	10 3/4"	27.3 cm
(C) Height	26 1/4"	66.68 cm



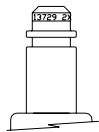
ACTUATION HOSE (P/N 12854) – 16"
ACTUATION HOSE (P/N 16448) – 32"

To aid in the installation of systems, an **OPTIONAL** actuation hose is available. This 16" or 32" hose connects the MRM (mechanical release module) or PRM (mechanical release module) actuation port to the top of the cylinder discharge valve(s).

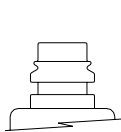
**DISCHARGE NOZZLES**

There are six (6) types of nozzles listed for use with the Amerex KP System. Each has a specific amount of flow and a specific discharge pattern. Correct installation, coverages and limitations of each nozzle are listed on the "Nozzle Application Chart" in Section 3 DESIGN of this manual.

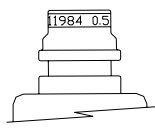
APPLIANCE TYPE	PART NO.	FLOW POINTS	MARKINGS
Fryer & Griddle	13729	2	13729 2 x FG
Appliance & Plenum	11982	1	11982 1 x 38
Solid fuel Charbroiler	11983	1.5	11983 1 x 55
Upright Broiler (salamander)	11984	½ ea.	11984 .05 x 71
Range (4 Burner)	14178	2	14178 2 x R
Duct	16416	1	16416 1 x D



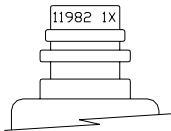
Fryer/Griddle
P/N 13729



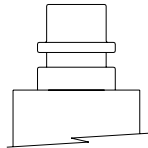
Solid Fuel
Charbroiler
P/N 11983



Upright Broiler
P/N 11984



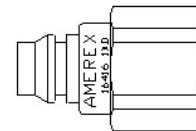
Appliance & Plenum
P/N 11982



Range (4 Burner)
P/N 14178



Duct Nozzle
P/N 16416



One Piece
Body & Tip



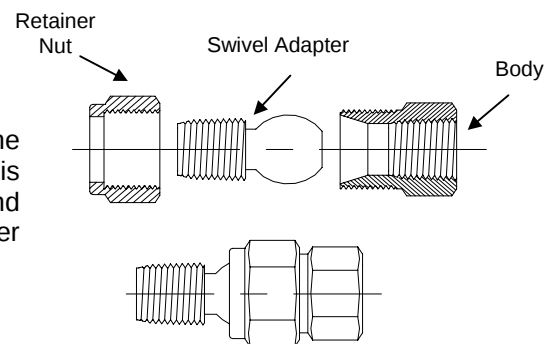
Internal
Filter



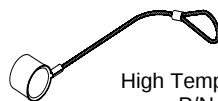
Snap
Ring

**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 system. 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).



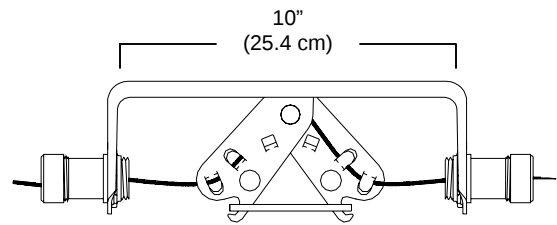
High Temperature Cap
P/N 12504



Standard Cap
P/N 12334

DETECTOR (P/N 12508)

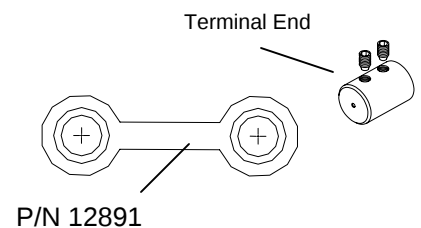
Each detector in the Amerex KP Restaurant System is comprised of three parts. The detector bracket, detector linkage and the fusible link (ordered separately). The bracket serves as support for the linkage and is attached to a rigid surface. The linkage supports the fusible link and a continuous cable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

**Fusible link not included with detector**

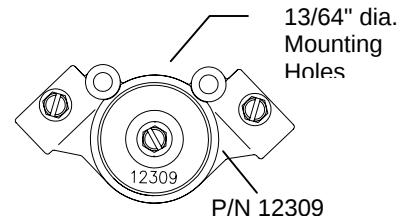
This manual will refer to series and terminal detectors. There is no difference in part numbers or dimensions between series and terminal detectors. A terminal detector is the last or only detector in the network and the cable must be "terminated" there. A series detector is any detector located between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

TEST LINKS (P/N 12891)

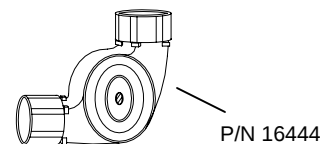
Test links are available for conducting functional tests of the detection system. This device fits the detector in the same manner as the fusible link, is normally placed on the terminal detector and can be cut, simulating a fusible link separating under fire conditions.

**P/N 12891****CORNER PULLEY (P/N 12309)**

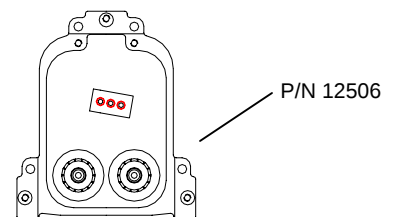
The Amerex KP Restaurant System uses a "high temperature" corner pulley to change direction of the cable by 90°. This corner pulley may be used in environments with temperatures up to 700°F (371°C). Mounting holes are provided for anchoring the corner pulley **where allowed by local codes**.

**P/N 12309****CORNER PULLEY (P/N 16444)**

The Amerex KP Restaurant System also uses 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).

**P/N 16444****PULLEY TEE (P/N 12506)**

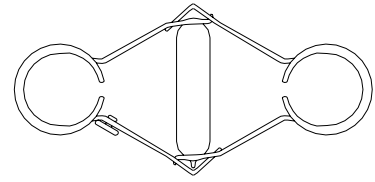
A pulley tee is used to change the direction of two cables by 90°. This device can be used with mechanical gas valves and manual pull stations but **not fusible link detectors**. It cannot be used where temperatures exceed the range of 32° - 120°F (0° - 49°C).

**P/N 12506****CABLE (P/N 12553)**

Cable is used to run from the MRM 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).

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.

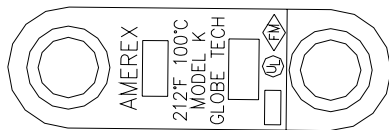


Job Quick Response Link
Load Limit: 1 to 55 lb.

Part No.	Response Type	Link Rating		Max. Ambient Temperature	
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.



Globe Type "K"

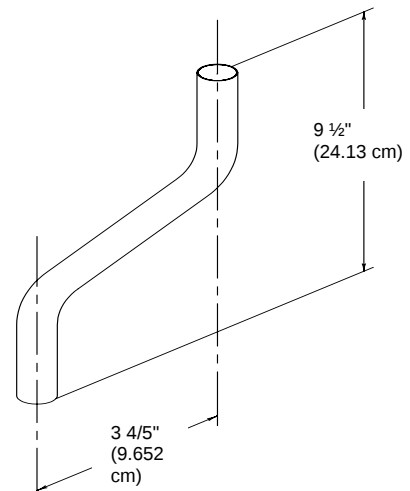
Load Limit: Maximum Load – 50 lbs. (22.68 Kg)
Minimum Load - 3 lbs. (1.37 Kg)

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.

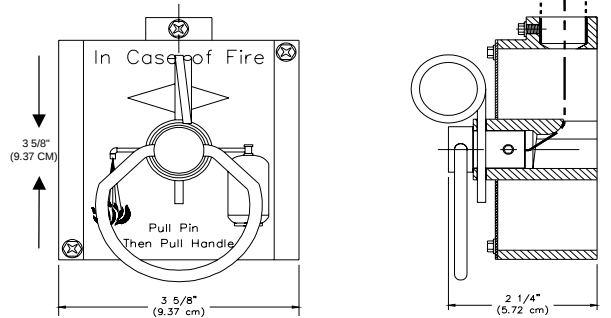
CONDUIT OFFSET (P/N 12507)

The conduit offset is used to allow a smooth transition for cable runs into or out of the mechanical release module 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 OR THE PRM.**



MANUAL PULL STATION (P/N 11993)

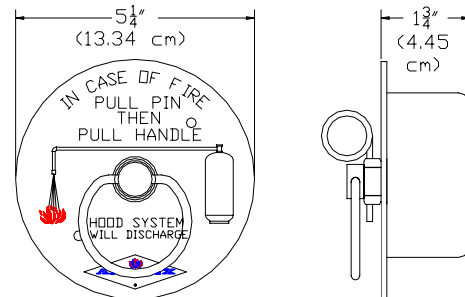
Every Amerex KP Restaurant System must use at least one manual pull station. This device provides a means of discharging the system manually. Manual pull stations should be located in a **PATH OF EGRESS** and mounted at a height conforming with the local Authority Having Jurisdiction. The manual pull station may be recessed or surface mounted, see Installation Section 4, Page 16 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.

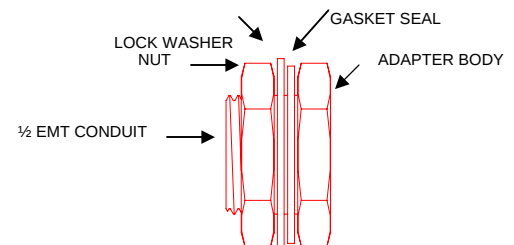
MANUAL PULL STATIONS (OVERSIZED) (P/N 14320)

This manual pull station may be either surface or recess mounted. The oversized cover is large enough to cover the standard 4" octagonal sheetrock access hole and remain attractive and functional. Manual pull stations should be located in the **path of egress** and mounted at a height conforming with the local Authority Having Jurisdiction.

**“QUICK-SEAL” ADAPTER**

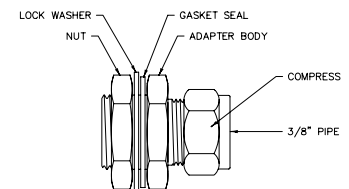
(3/8" pipe – P/N 12276) (1/2" pipe – P/N 14204)

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**

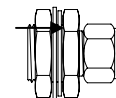
(3/8" pipe – P/N 12510) (1/2" pipe – P/N 12512)

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)

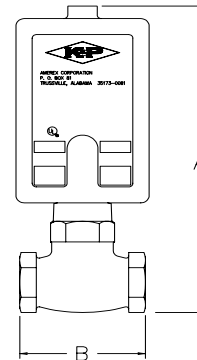
This listed mechanical bulkhead fitting produces a liquid tight seal around the detection tubing where the tubing penetrates the hoods.



MECHANICAL GAS VALVE

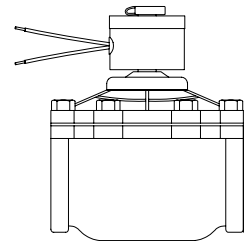
All Amerex KP Restaurant Systems protecting gas-fired cooking appliances must use a gas shut-off valve listed for use with the system. Amerex mechanical gas valves are held open with a latching device. Upon system discharge a piston in the MRM or PRM will pull on a cable connected to the latch in the gas valve, releasing the latch and allowing the 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.

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)	

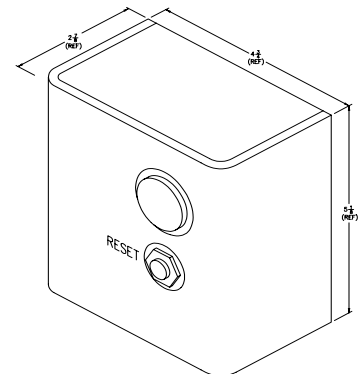
**ELECTRIC GAS VALVES**

Electric gas 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 microswitch in the MRM 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 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)**

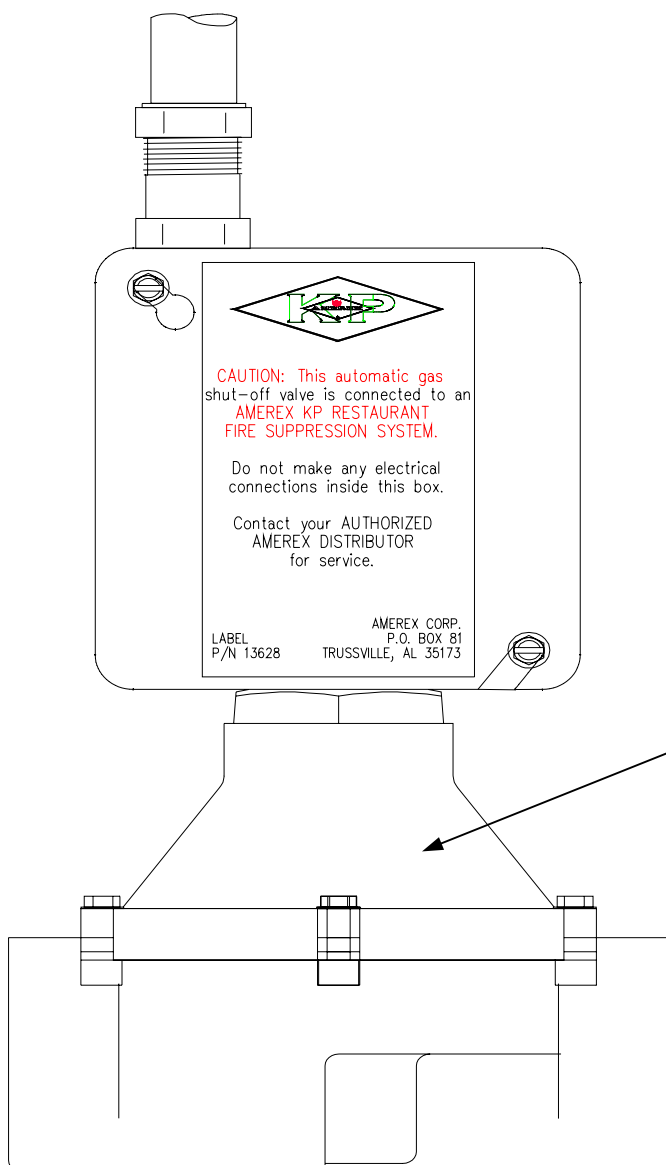
Anytime an electrical gas valve is connected to an Amerex KP Restaurant System, a manual reset relay must be used. After an electrical gas valve has closed (either because of system discharge or because of power failure), the valve cannot be opened without manually pressing the reset button on the manual 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 KP Restaurant Fire Suppression system, ASCO valves are purchased separately. See Section 4, Page 14 for installation instructions.

**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"

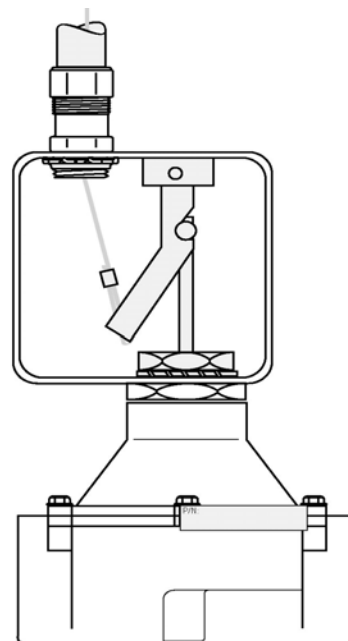
Note: P/N 13622 ASCO Mechanical Gas Valve Kit is sold separately from the Gas Valve. A gas trip assembly, P/N 12740, is also required when using any of these valves.

ASCO Gas Shut-Off Valves must be purchased separately

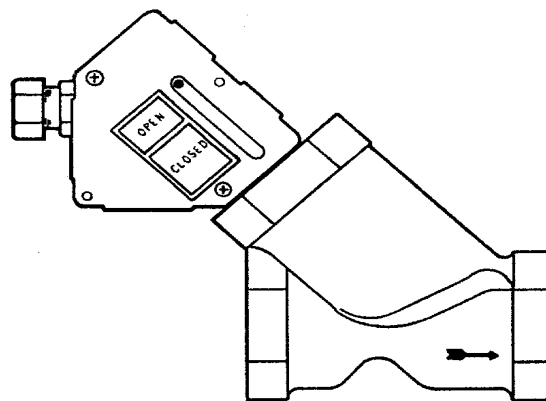
ASCO MECHANICAL GAS VALVES

All Amerex KP Restaurant 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 KP Restaurant Fire Suppression systems are listed below with appropriate part numbers. See “Installing a Mechanical Gas Valve” in the Installation section for instruction on installation.

APPLICATIONS		
Amerex Part No.	ASCOPart 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"
Note: P/N 12740 Gas Trip Assembly must be purchased separately.		

**ANSUL MECHANICAL GAS VALVES**

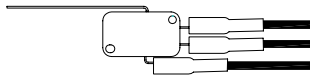
All Amerex KP Restaurant systems that protect any gas fired cooking appliance must use a “pull to close” type gas shut-off valve. The valve is held open with a latching device. Upon system discharge a piston in the gas trip assembly will pull on a cable connected to the latch on the gas valve, release 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's KP Restaurant 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.



APPLICATIONS		
Ansul Part No.	Size	Max. Operating Pressure
55598	¾"	10 PSI (69 kPa)
55601	1"	
55604	1¼"	
55607	1½"	
55610	2"	
Note: P/N 12740 gas trip assembly must be purchased separately.		

MICROSWITCHES (P/N 12524)

Microswitches, designed to be mounted in the MRM, as well as the 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 a building fire alarm system, shut off supply air fans and energize a relay to shut off electrical appliances. One SPDT switch is pre-installed in the MRM and PRM. Up to 3 additional SPDT switches may be added for a total of our configurations – SPDT, DPDT, 3PDT and 4PDT.

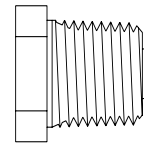


MICROSWITCH
SINGLE POLE
DOUBLE THROW
P/N 12524

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

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.



SECTION 3

DESIGN

MANUAL P/N 12385 Rev. A

AMEREX KP 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

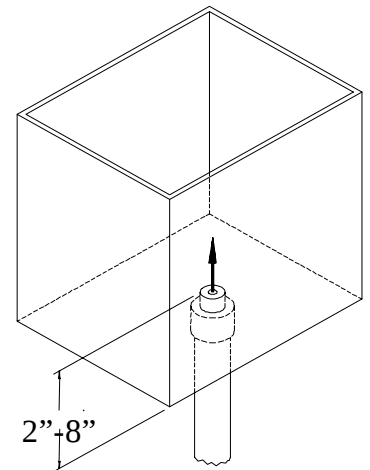
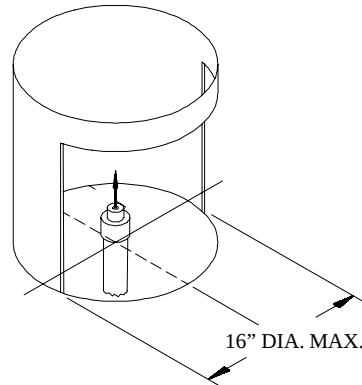
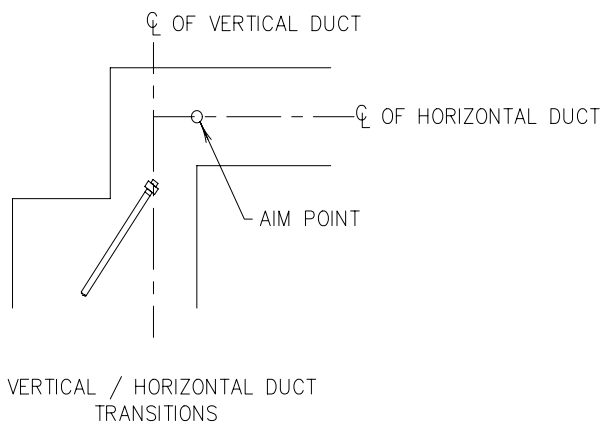
October 2003

DUCT PROTECTION

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.

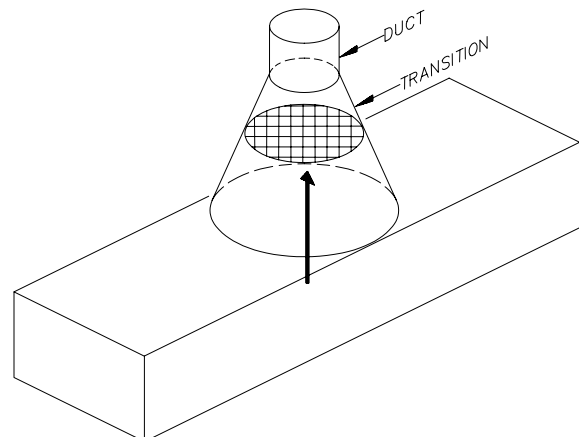
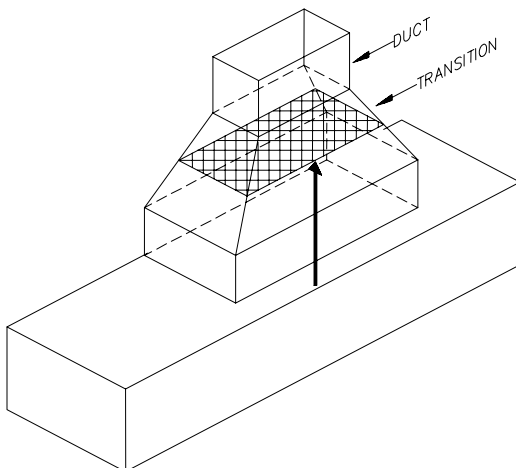
NOTE: In no case shall the diagonal dimension of the duct exceed 18.8 inches without additional duct nozzles.



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

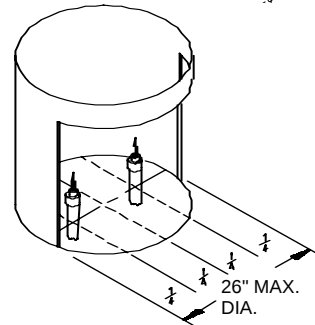
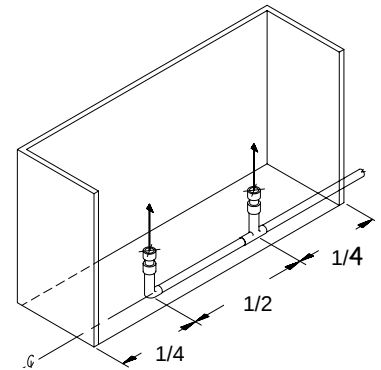
TRANSITION LIMITATIONS – SINGLE NOZZLE (P/N 16416)

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)**

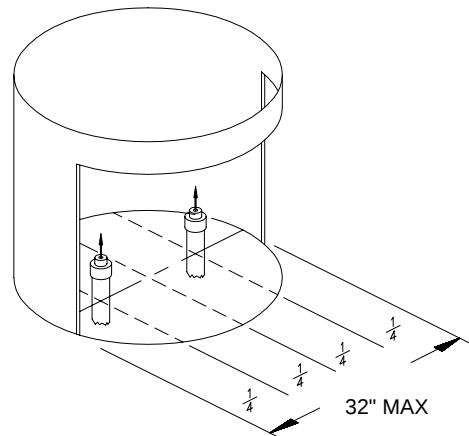
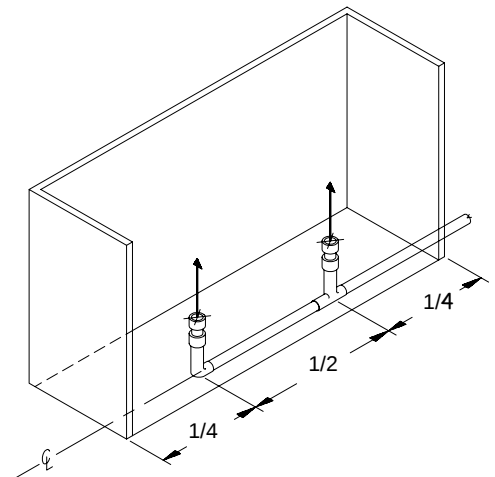
Two Amerex duct nozzles (P/N 16416) will protect ducts with a perimeter of 51 inches to 82 inches (129.5 – 208.3 cm) or a maximum diameter of 26 inches (66 cm). To correctly position the nozzles a rectangular duct should be divided along its longest side into four equal distances. A circular duct should 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 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 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 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.

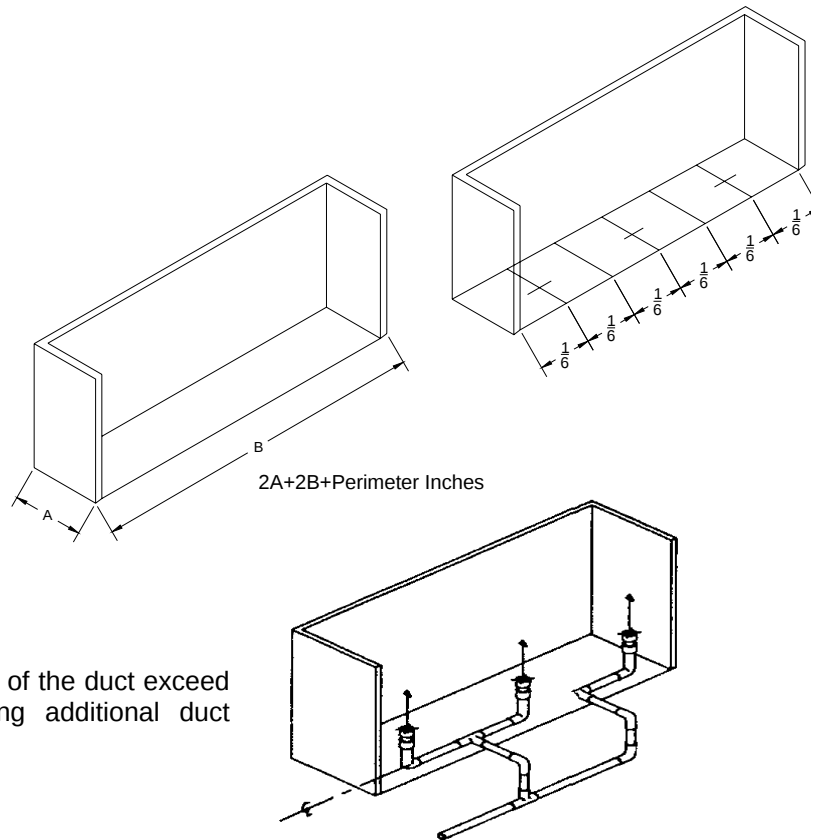


NOTE: In no case can the diagonal dimension of the duct exceed 37.2 inches (94.4 cm) without adding additional duct nozzles.

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 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 NOZZLE (P/N 11983)

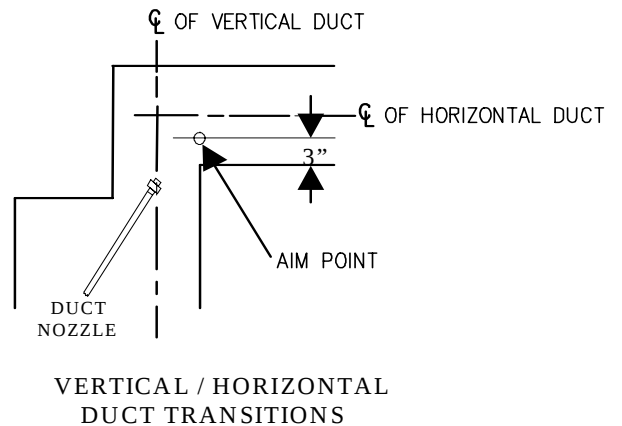
A transition is a section of some exhaust systems between the hood and the duct. Two Amerex solid fuel appliance/duct nozzles (P/N 11983) will protect a transition at the point where the transition is 100 perimeter inches (254 cm) or less or a diameter of 32 inches (94.4 cm) or less. The nozzles total 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 3-2 FOR PICTORIAL REPRESENTATION)

NOZZLE LOCATION AND AIMING FOR HORIZONTALLY RUN DUCTS PROTECTED BY DUCT NOZZLE 11983

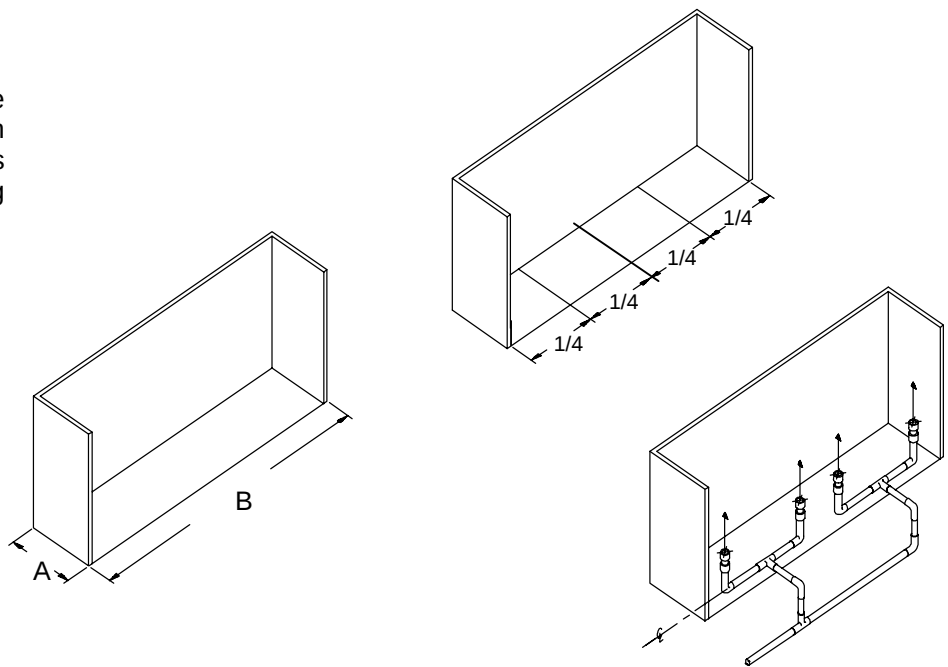
The nozzles are to be located on the centerline of the vertically run duct, 2-8 inches (5.08-20.3cm) into the duct. The aiming point is to be a point 3 (7.6cm) inches above the base of the horizontally run duct and in the same vertical plane of the nozzle. See illustration.



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

Protecting ducts larger than 100 perimeter inches (254 cm) utilizing the single flow point nozzle (P/N 16416) the perimeter is divided by 50 (126.9 cm). The resulting number must be rounded up to the next whole number. This equals the minimum number of duct nozzles that must be used. The cross sectional area of the duct is then divided into the same number of equally sized modules. The duct nozzle is then located in the center of each module.

Note: In no case can the diagonal dimension of each module exceed 18.8 inches (46 cm) without adding additional duct nozzles.



$$2A + 2B = \text{PERIMETER}$$

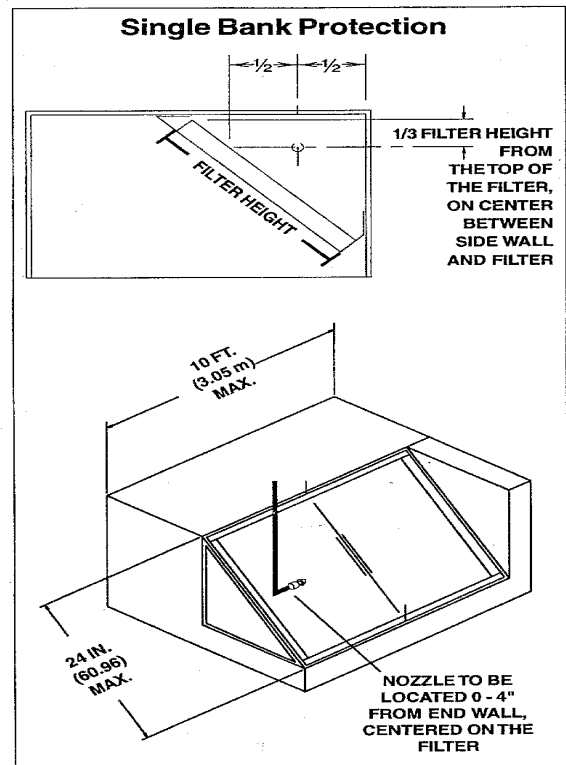
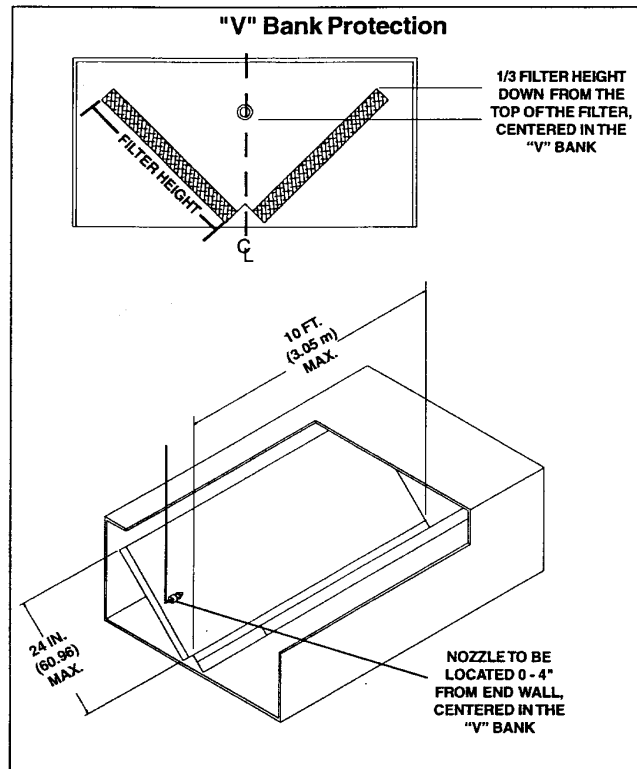
OR

$$(A + B) 2 = \text{PERIMETER}$$

PLENUM PROTECTION

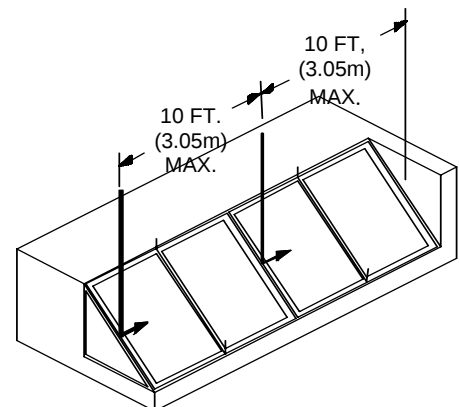
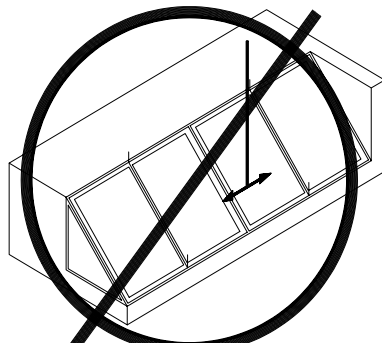
PLENUM PROTECTION LIMITATIONS – SINGLE FLOW POINT NOZZLE (P/N 11982)

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 wall, aimed horizontally and positioned down 1/3 the filter height from the top of the filter.



PLENUM PROTECTION – MULTIPLE NOZZLES

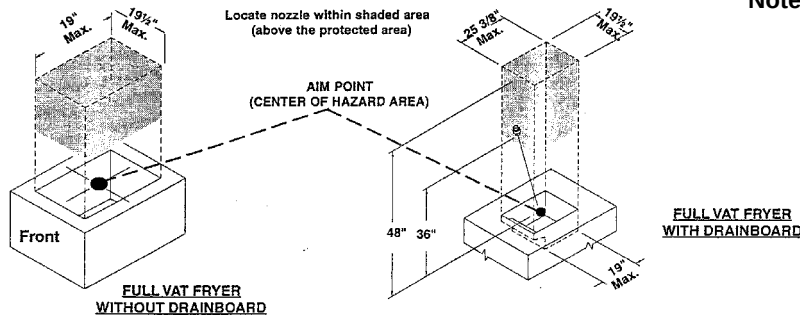
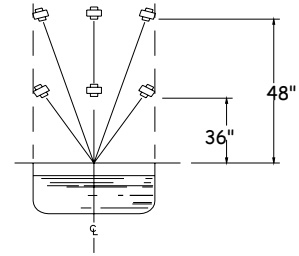
Plenums exceeding 10 feet (3.048 m) in length may be protected by using multiple plenum nozzles. Each nozzle must be protecting an area of no more than 10 feet in length. Nozzles may be positioned facing each other or facing the same direction as long as the entire plenum area is being covered. Nozzles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



**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 ft² (2350 cm²). If the fryer does contain a drainboard the maximum fryer dimensions for single nozzle coverage are 25-3/8" x 19½" (65 x 48 cm) and the maximum protected area is 3.44 ft² (3195 cm²). However, the maximum hazard area must not exceed 19" x 19½" (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.

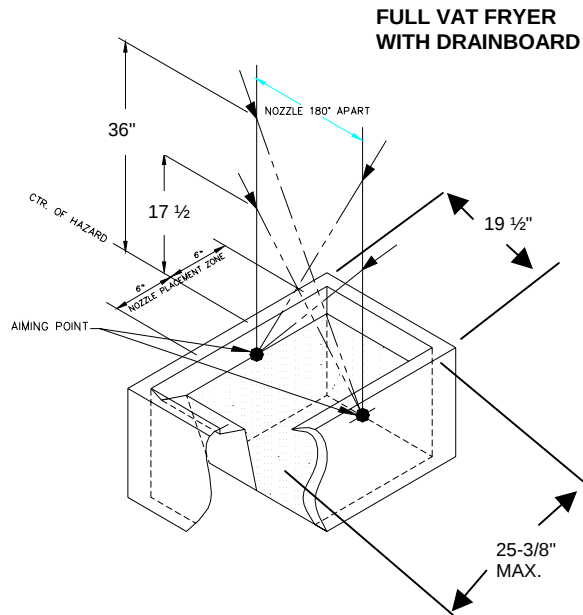


Note: Maximum & minimum heights must be measured vertically from the tip of nozzle to the top of the appliance.

**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)

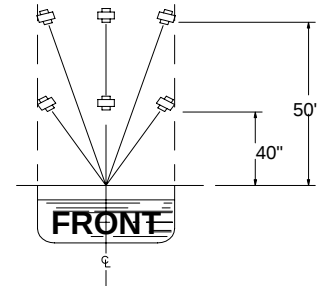
A pair of Amerex single flow point nozzles (P/N 11982) will protect a full vat fryer. The nozzles must be used in pairs located on the perimeter of the appliance, ½" back from the inside edge of the appliance and within a zone extending 6" in both directions of the center of the hazard. The nozzles are 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 ft² (2530 cm²). If the fryer does contain a drainboard, the maximum fryer dimensions are 25 3/8" x 19½" (65 x 50 cm) and the maximum protected area is 3.44 ft² (3195 cm²). However, the maximum hazard area must not exceed 19½" x 19" (50 x 48 cm). The nozzle's height must be within 17½" to 36" (45 - 92 cm) above the appliance surface.



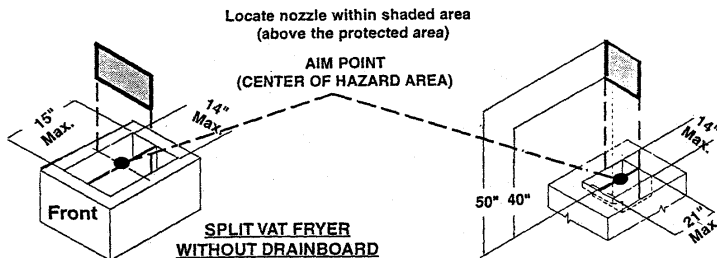
FRYER PROTECTION (SPLIT VAT)**TWO FLOW POINT NOZZLE (P/N 13729)**

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 cm²). 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 cm²). 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

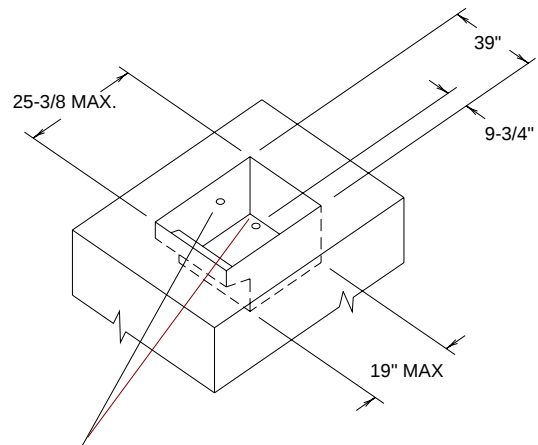


NOTE: Maximum and minimum heights must be measured vertically from the tip of nozzle to the top of the appliance.

SPLIT VAT FRYER
WITH DRAINBOARD

FRYERS EXCEEDING SINGLE NOZZLE PROTECTION:

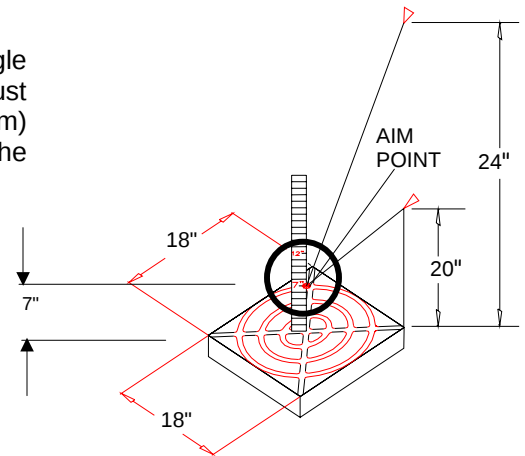
Multiple Amerex fryer nozzles (P/N 13729) may be used to protect single vat fryers with maximum protected areas exceeding single vat coverages up to a maximum protected area of 6 ft.². The fryer must be divided into modules for single nozzle coverages and the nozzle located and aimed for each module as indicated for single nozzle coverages. For modules that do not include drainboards, the maximum module dimensions for single nozzle coverage is 19 1/2" x 19" (50 x 48 cm) and the maximum protected area is 2.53 ft² (2350 cm²). If the module does contain a drainboard, the maximum module dimensions for single nozzle coverage is 25 3/8" x 19 1/2" (65 x 50 cm) and a maximum protected area is 3.44 ft² (3195 cm²). However, the maximum frying area of a module must not exceed 19 1/2" x 19" (50 x 48 cm).



AIM POINTS

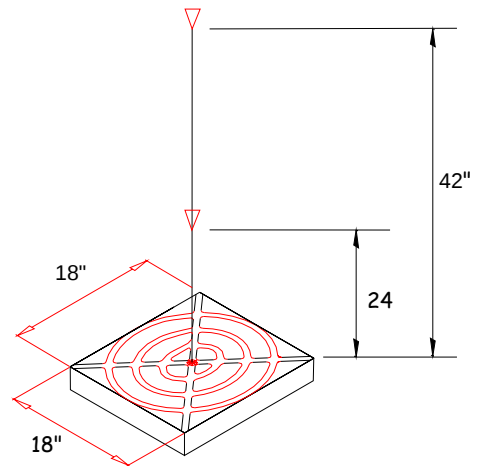
SINGLE BURNER RANGE PROTECTION ONE – ½ FLOW POINT NOZZLE (P/N 11984)

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)

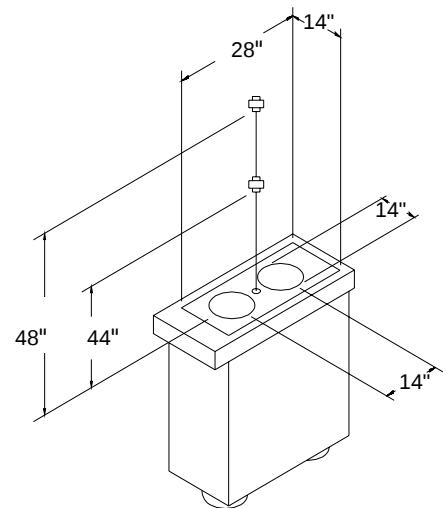
The Amerex half (½) flow point nozzle (P/N 11984) will protect a single burner with a surface area of 18" x 18" (46 x 46 cm). The nozzles must be located directly above the center of the burner and 24 to 42" (61 - 107 cm) above the burners surface. The nozzle is aimed at the center of the burner.



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.

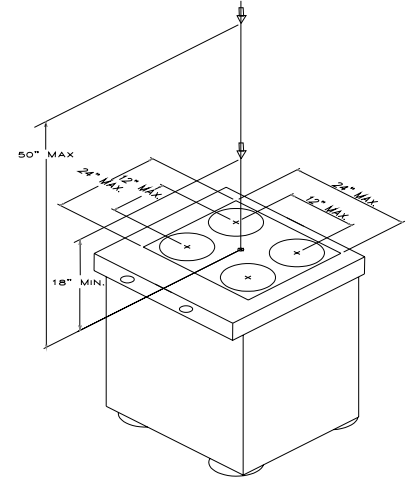
NOTE: Maximum and minimum heights must be measured from the tip of nozzle to the surface of the appliance.



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.

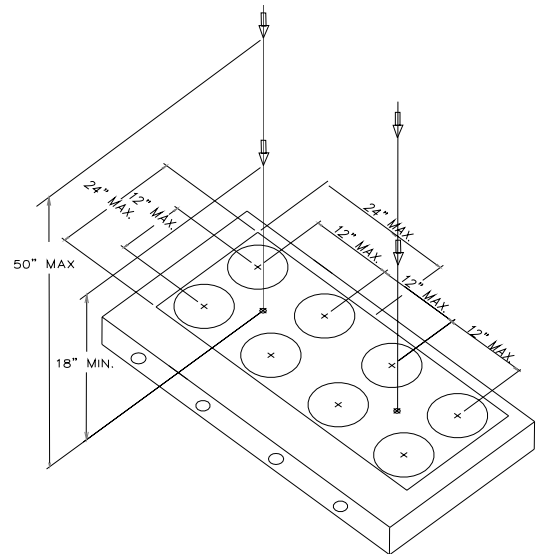
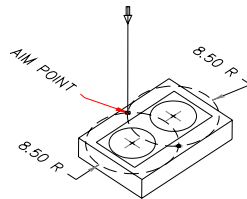
NOTE: Maximum and minimum heights must be measured from the tip of nozzle to the surface of the appliance.



RANGE PROTECTION-MULTIPLE NOZZLES (P/N 14178)

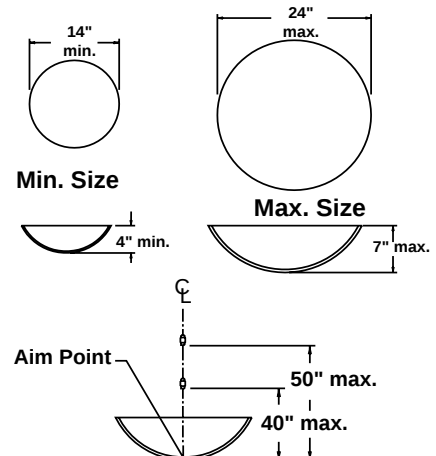
For ranges that have a surface area exceeding the capabilities of a single nozzle, multiple nozzles must be used provided that the surface area of the range is divided into equally sized modules. Each module must be equal to or less than 24" x 24" (61 x 61 cm).

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)

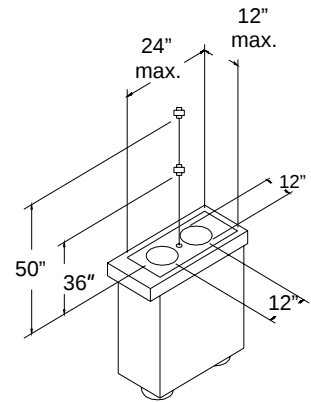
The Amerex appliance plenum nozzle (P/N 11982) has one flow point and will protect a wok with dimensions between a minimum diameter of 14" (36 cm) and a maximum diameter of 24" (61 cm) inclusive. The wok must have a height dimension between a minimum of 4" (10 cm) and a maximum of 7" (18 cm) inclusive. 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.



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.

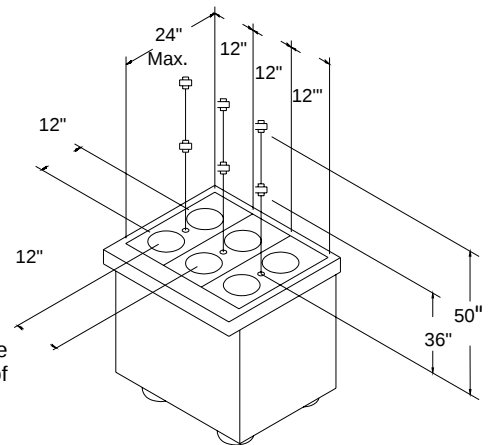


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

RANGE PROTECTION

MULTIPLE NOZZLES (P/N 11982)

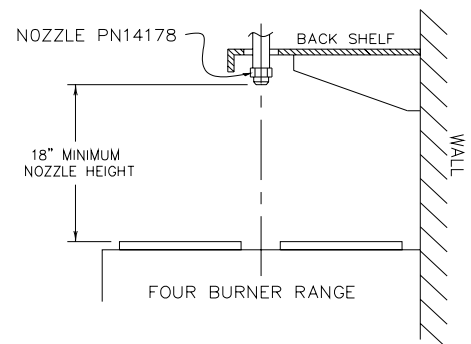
For ranges that have a surface area exceeding the capabilities of a single appliance nozzle, multiple nozzles must be used provided that the surface area of the range is divided into equally sized modules. Each module must be equal to or less than 12" x 24" (31 x 61 cm).



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

PROTECTION OF BACK SHELVES

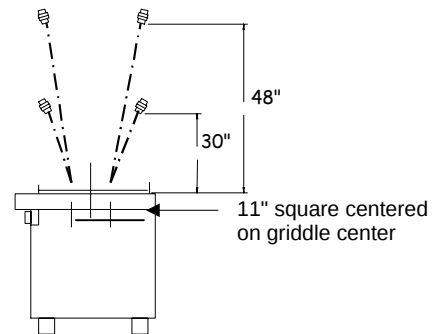
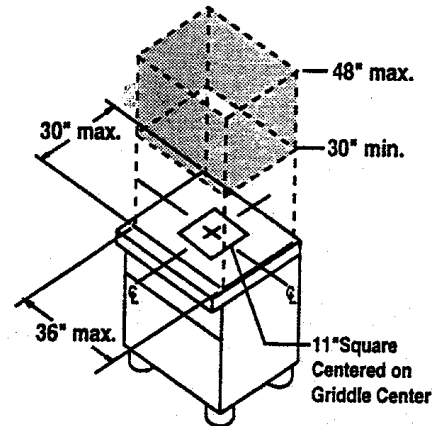
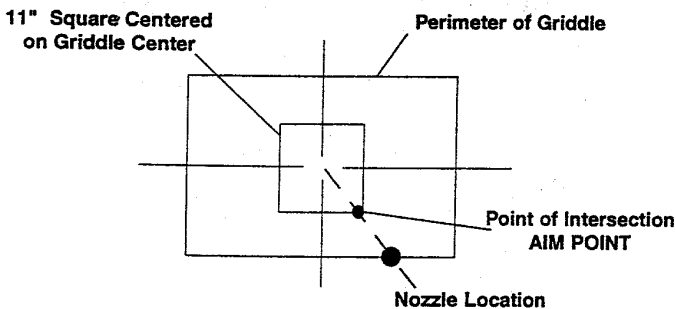
Confronted with a back shelf that obstructs the spray pattern of the protecting nozzle? Locate the nozzle so that it is below the shelf and still within its listed minimum. When the shelf interferes with the proper nozzle orientation it may be necessary to route the pipe under the shelf or provide a hole in the shelf for the nozzle. Always receive agreement on shelf alterations before performing the work.



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

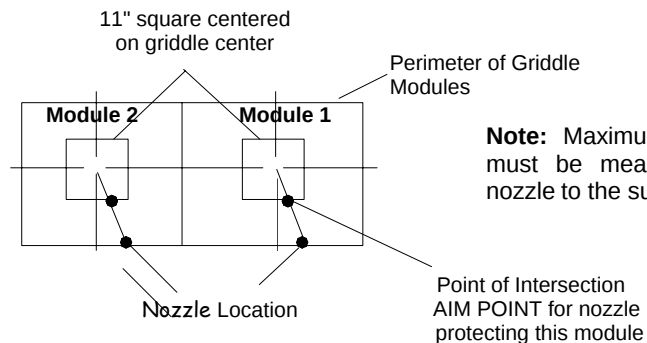
The Amerex griddle nozzle (P/N 11982) has one flow point and will protect a griddle surface of 36 inches wide (91 cm) x 30 inches deep (76 cm). The nozzle must be located along the perimeter of the appliance and within a vertical height range from 30" to 48" (76 – 122. cm) above the surface of the appliance. 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.

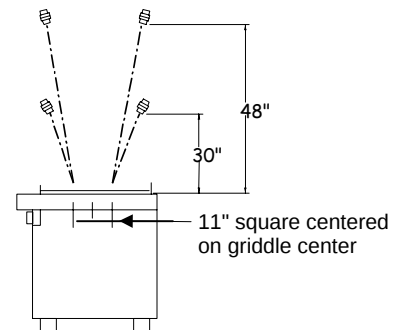
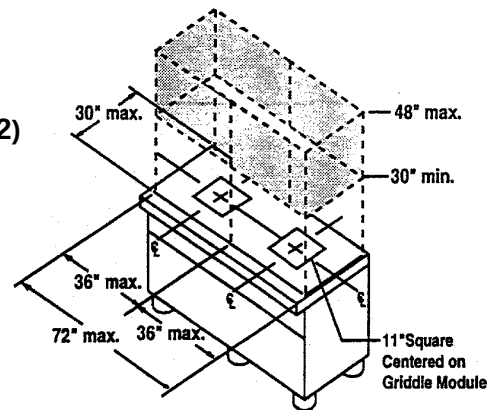


GRIDDLE PROTECTION – MULTIPLE SINGLE FLOW POINT NOZZLES (P/N 11982)

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.

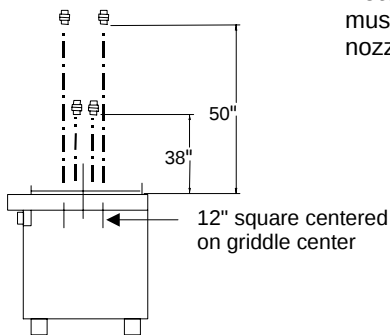


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

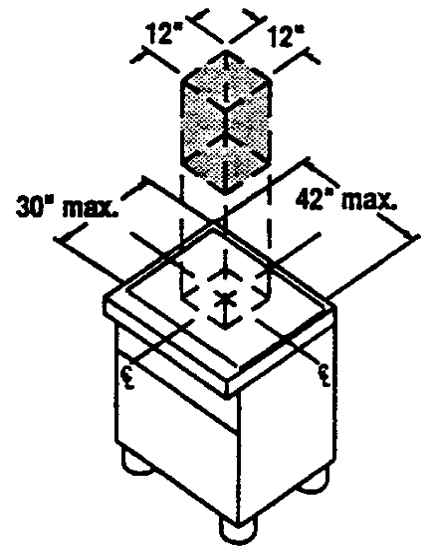


GRIDDLE PROTECTION – OVERHEAD TWO FLOW POINT NOZZLE (P/N 13729)

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.

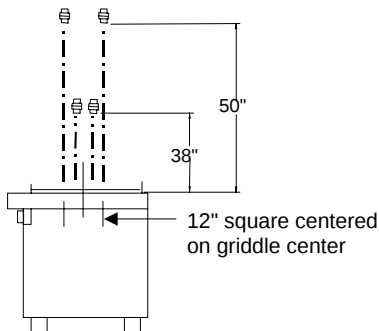


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

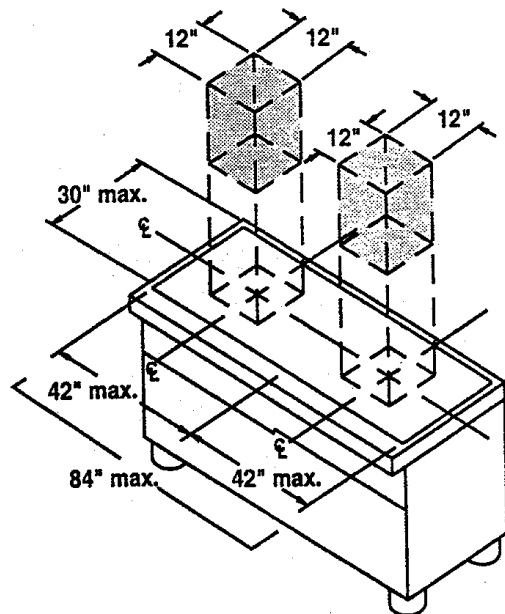


GRIDDLE PROTECTION – OVERHEAD MULTIPLE TWO FLOW POINT NOZZLES (P/N 13729)

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).

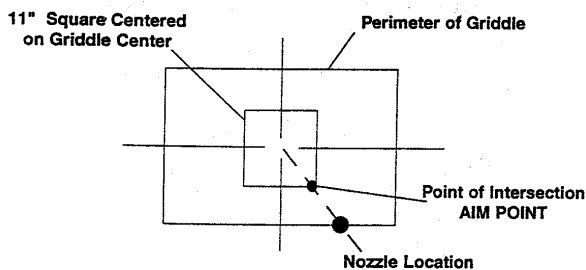


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

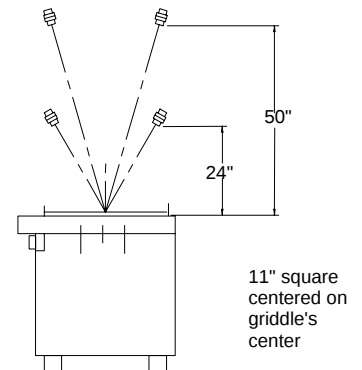
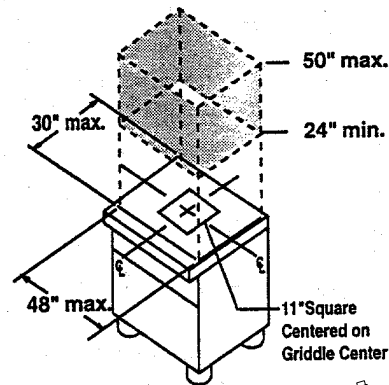


GRIDDLE PROTECTION - LARGE TWO (2) FLOW POINT NOZZLE (P/N 14178)

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.

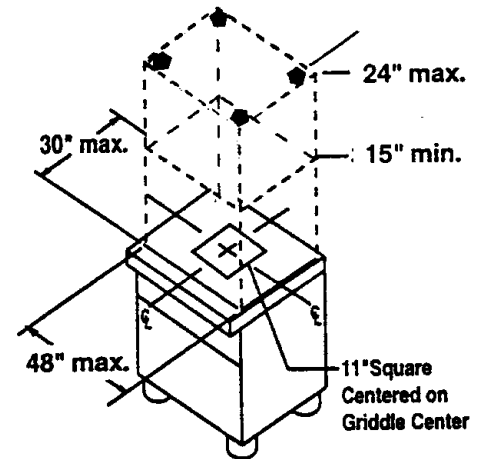


Note Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.

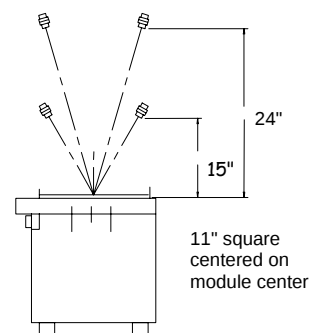


GRIDDLE PROTECTION - LOW PROXIMITY TWO (2) FLOW POINT NOZZLE (P/N 14178)

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.

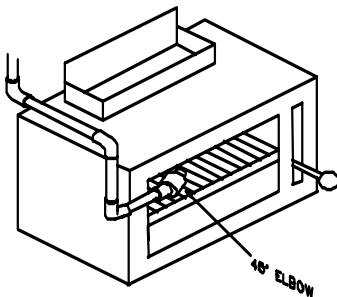
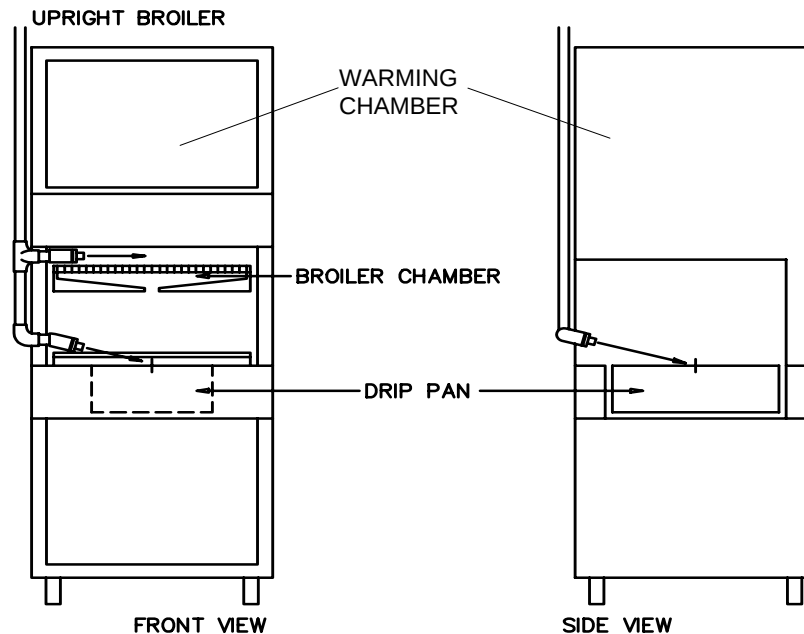


Note: Maximum & minimum heights must be measured from the tip of nozzle to the surface of the appliance.



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

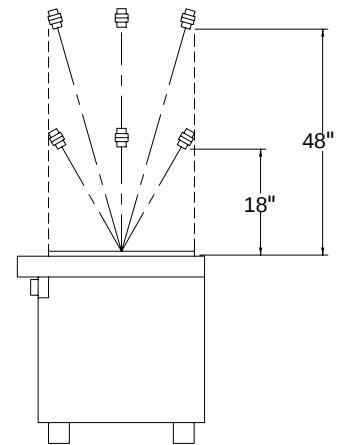
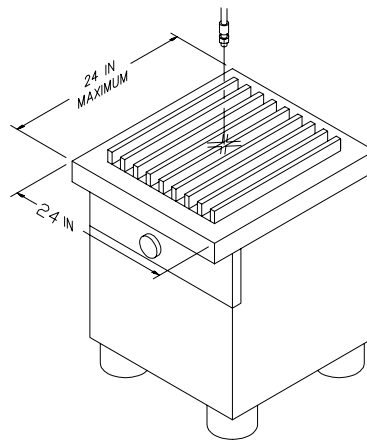
Two Amerex upright broiler nozzles are required for this application. Each upright broiler nozzle (P/N 11984) equals a ½ flow point. **These nozzles must always be used in pairs equaling one flow point** and will protect an internal broiler chamber measuring 30 ½" X 28 ½" (77 x 72 cm). The nozzles must 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.

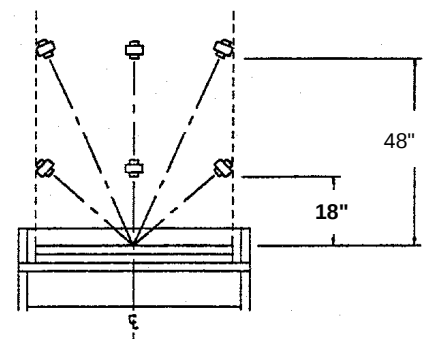
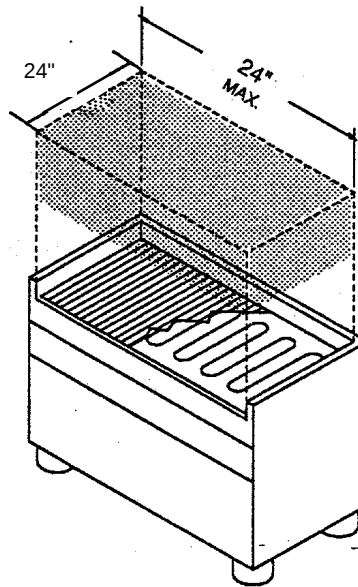
**GAS RADIANT CHARBROILER PROTECTION
SINGLE FLOW POINT NOZZLE (P/N 11982)**

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.

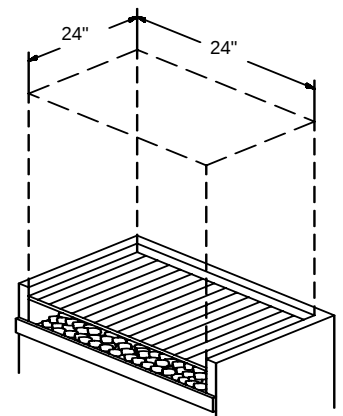
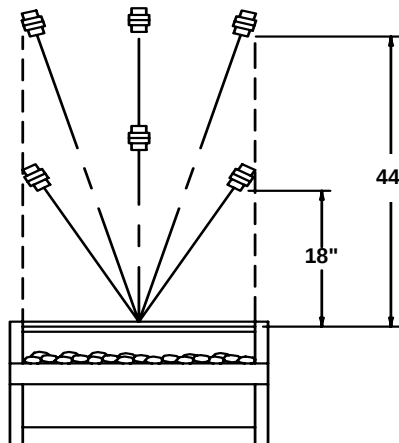
Electric charbroilers with an open grate may be protected with one Amerex appliance, plenum nozzle (P/N 11982) provided that the area is no larger than 24 inches X 24 inches (61 x 61 cm). The nozzle uses one flow point and must be located within 18 – 48 inches (46 – 122 cm) above the grate surface, anywhere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



Note: Max. & Min. heights must be measured from the tip of nozzle to the top of the cooking surface

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

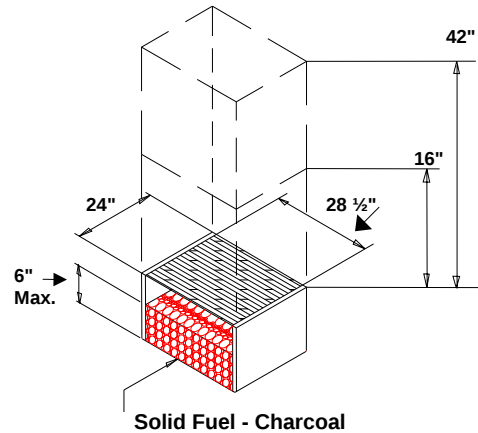
A single Amerex solid fuel appliance plenum nozzle (P/N 11983) will protect a lava rock charbroiler with a maximum cooking surface of 24 inches wide (61 cm) by 24 inches deep (61 cm). The appliance nozzle uses 1 ½ flow point and for this application must be located between 18 to 44 inches (46 to 122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



SOLID FUEL APPLIANCES

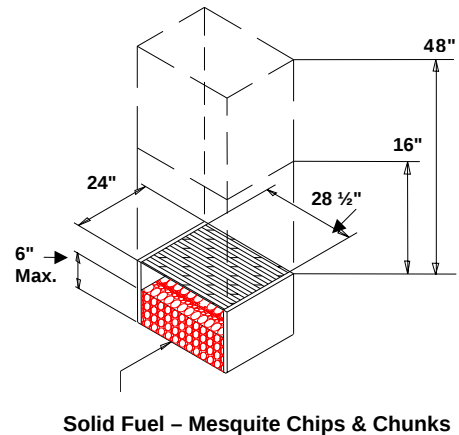
NATURAL AND MESQUITE CHARCOAL CHARBROILER PROTECTION ONE AND ONE HALF (1½) FLOW POINT NOZZLE (P/N 11983)

One Amerex solid fuel appliance nozzle (P/N 11983) will protect a charcoal charbroiler 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.



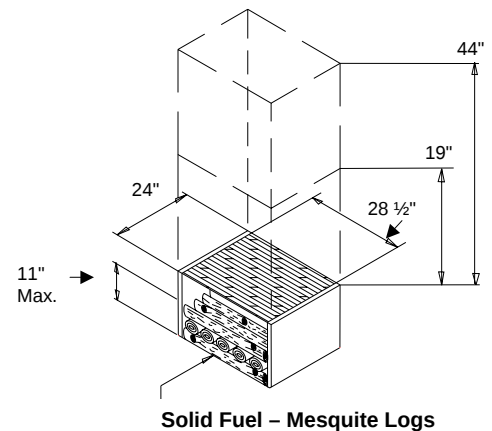
MESQUITE CHIPS & CHUNKS CHARBROILER ONE AND ONE HALF (1½) FLOW POINT NOZZLE (P/N 11983)

A single Amerex solid fuel appliance nozzle (P/N 11983) will protect a mesquite charbroiler 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.



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 charbroiler 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.



AMEREX KP RESTAURANT SYSTEM NOZZLE APPLICATION CHART

Appliance	Nozzle P/N	Flow Points	Width	Length	Min. Height	Max. Height
Deep Fat Fryer – without Drip Pan	13729	2	19 ½ in.	19 in.	36 in.	48 in.
Deep Fat Fryer – with Drip Pan	13729	2	19 ½ in.	25 3/8 in.	36 in.	48 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	11982	1	14 in.	28 in.	44 in.	48 in.
Range – Two Burner	11982	1	12 in.	24 in.	36 in.	50 in.
Range – Four 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	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.
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	2-11983	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	-
<i>Protection is not limited to the items listed on this chart. Modulizing larger appliances is an acceptable practice. See your Amerex KP Manual for additional information.</i>						

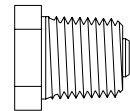
AGENT QUANTITY AND CYLINDER SELECTION:

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. **ONE 3.75 GALLON CYLINDER (P/N 13334) WILL SUPPLY SUFFICIENT AGENT FOR UP TO AND INCLUDING 11 FLOW POINTS.** Cylinders may be used together for multiple cylinder systems with one MRM or PRM. A MAXIMUM OF 10 KP 375 AGENT CYLINDERS MAY BE USED PER MECHANICAL RELEASE MECHANISM OR PNEUMATIC RELEASE MODULE. 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 or PRM

ACTUATION NETWORK LIMITATIONS – MRM OR PRM

The actuation network for the Amerex KP Restaurant Fire Suppression System consists of factory supplied hose, installer supplied copper tubing or pipe that connects the MRM or PRM to each cylinder discharge valve. A single MRM or PRM is capable of actuating up to ten (10) 3.75 gallon agent cylinder discharge valves or six (6) 6.14 gallon agent cylinder discharge valves by discharging a single 10 in³ nitrogen cylinder (P/N 12856) through the actuation network. If the network is a combination of 3.75 & 6.14 gallon cylinders, 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.



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.

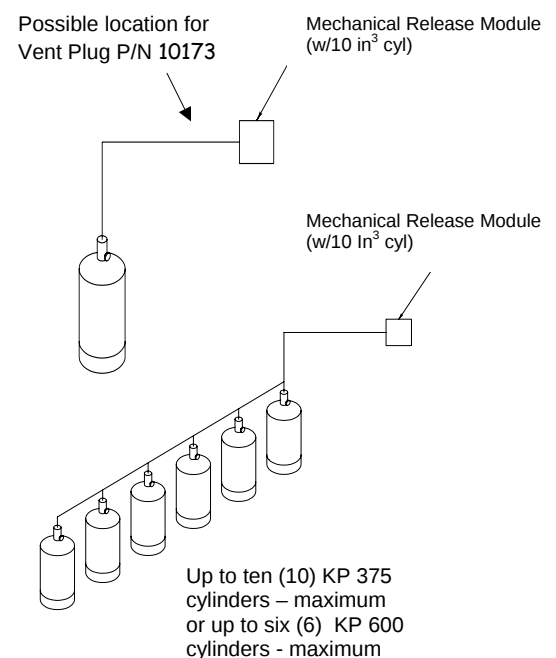
Maximum length – 22.2 feet (6.77m)

Maximum tees – 9

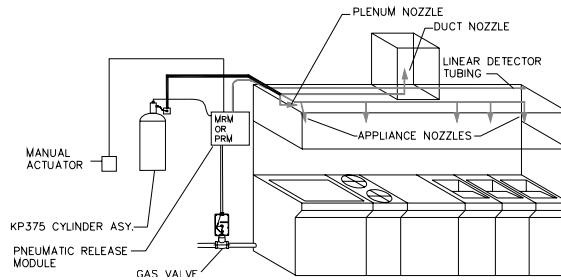
Maximum elbows – 9 (note: 2 – 45° elbows = 90°)

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.

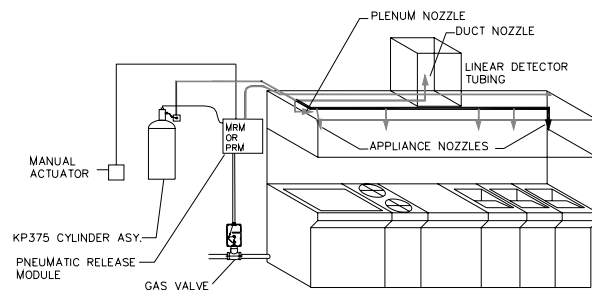
Nitrogen Cylinder	10 cu. in.	
Maximum Total Length for:	Feet	Meters
½" Copper tubing	100	30.48
¼" ID Hose	54	16.46
¼" Schedule 40 Pipe	22.2	6.77



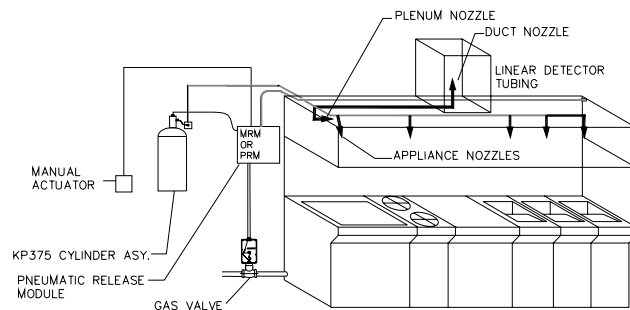
A **Supply Line** is the distribution piping that runs from the distributor outlet or discharge fitting to the first splitting tee.



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.



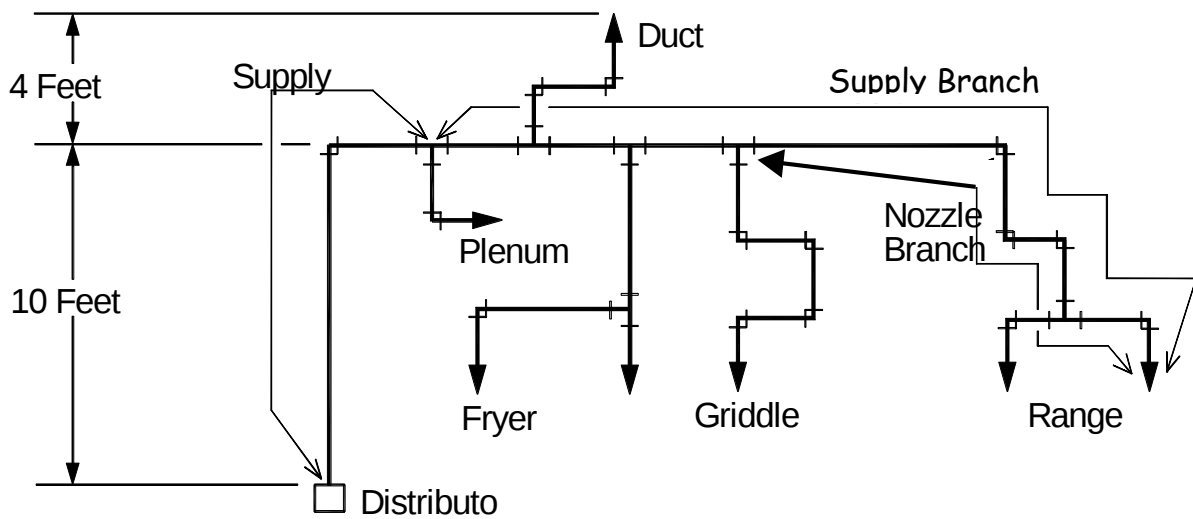
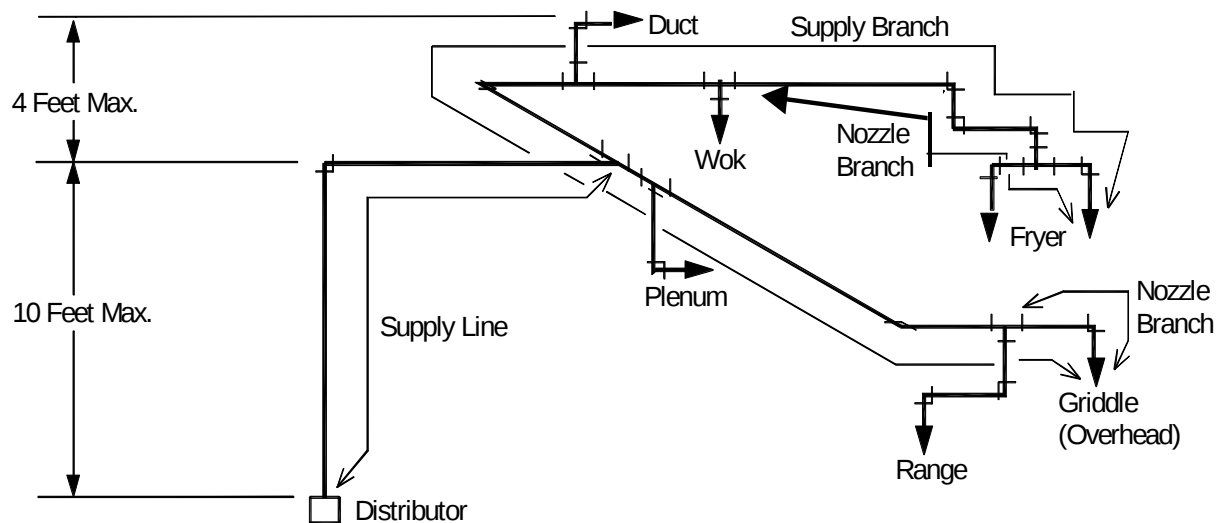
GENERAL PIPING REQUIREMENTS:

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.

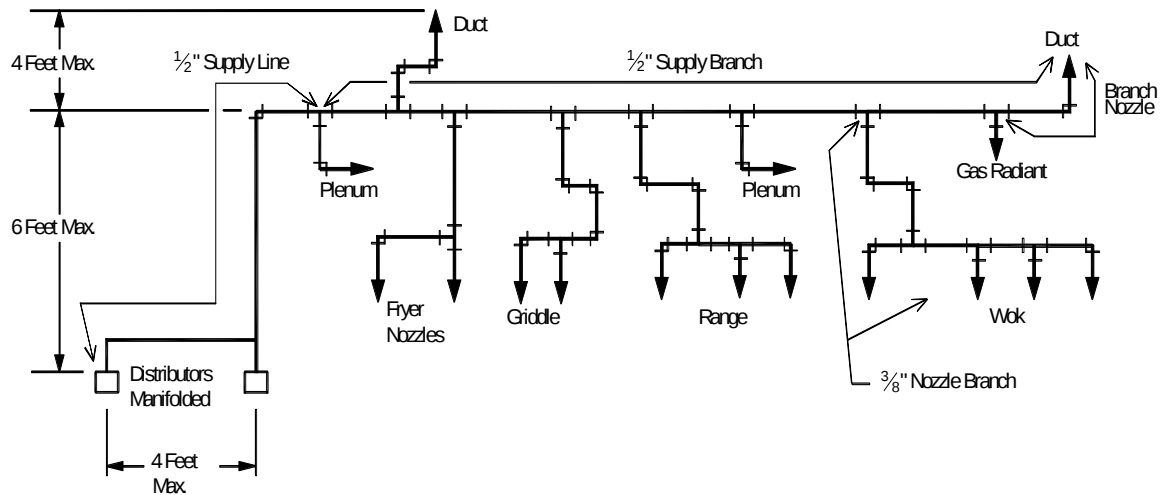
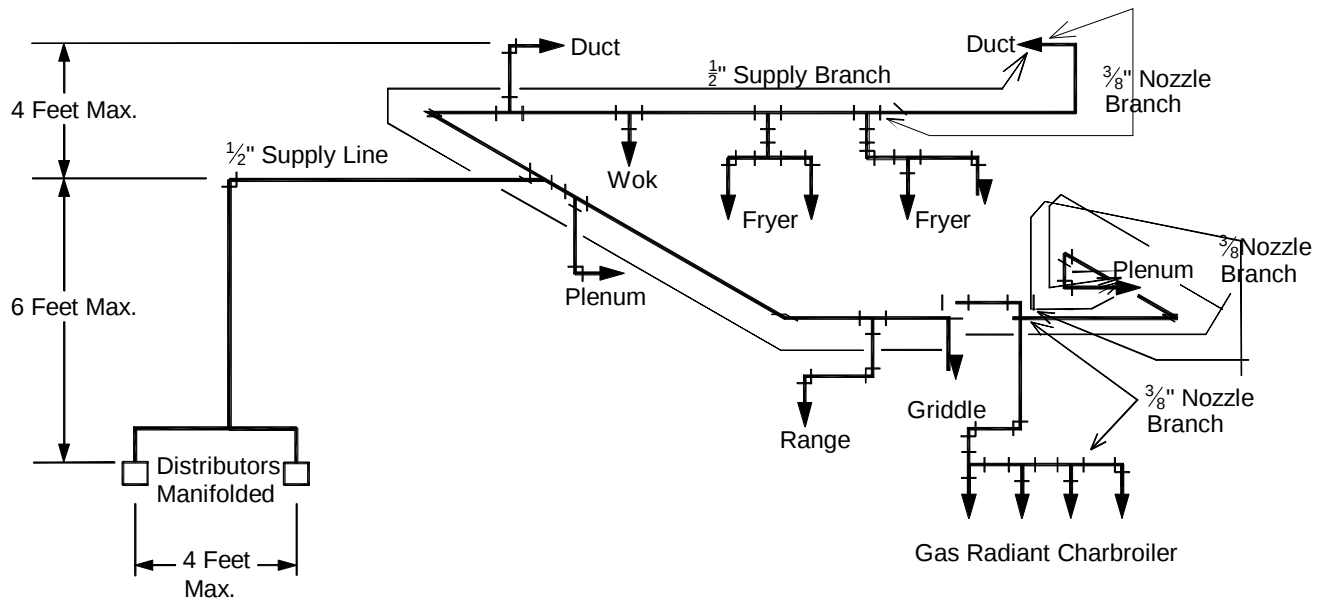
WARNING: GALVANIZED PIPE IS NOT ALLOWED

3. Maximum flow point per cylinder:
 - KP 375 = 11 flow points
 - KP 600 = 18 flow points
 - Twin KP 375 = 22 flow points

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

TYPICAL DISTRIBUTION NETWORK FOR SINGLE 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 (KP 375) CYLINDER SYSTEM**STRAIGHT PIPING SYSTEM****SPLIT PIPING SYSTEM**

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

KP DISTRIBUTION PIPING 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:

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
11	3/8 OR 1/2	25	1	5	1
18	1/2	25	1	5	2
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
11	3/8 OR 1/2	27	30	10	8	2
18	AS NOTED	35' OF 3/8" OR 1/2"	50' 3/8" PIPE ONLY	14	8	2
22	1/2	40	45	18	8	0

NOTE: In a single 3.75 Gallon Straight Pipe System, 5' of pipe may be transferred from the supply line to the supply branch line.

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
11	3/8 OR 1/2	32	8	12	11
18	3/8	32	11	18	15
22	3/8	32	18	18	20
MAX. PER NOZZLE BRANCH		7	3	6	4

GENERAL SYSTEM LIMITATIONS:

1. No 1/2" pipe nozzle branches shorter than 12" long.
2. Nozzle types may not be mixed on any nozzle branch line and a maximum of 4 flow points.
3. The discharge fitting, distributor and distribution hose are not to be included in any calculations.
4. No mixing of pipe sizes is allowed within pipe categories. Example: if one nozzle branch is to be 1/2" pipe then all must be 1/2" pipe. 1/2" pipe for nozzle branch lines is allowed only in an 11 flow point system.
5. Duct nozzle has a maximum vertical rise above the supply branch line of 4'0".

DETECTION NETWORK LIMITATIONS: MRM

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

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

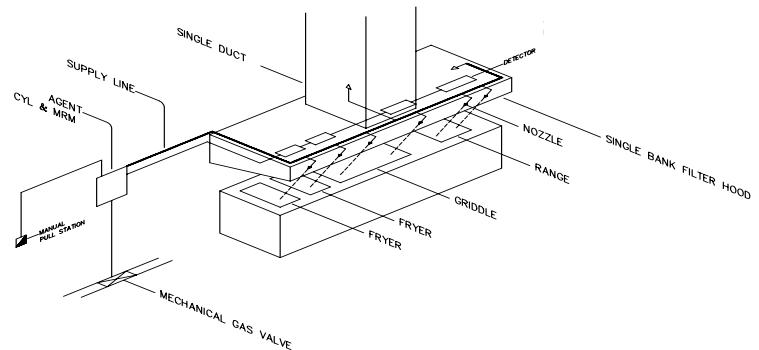
The quantity of detectors to be used in a system will depend on the number of ducts, number of appliances and the location of the appliances under the hood.

DETERMINING DETECTOR LOCATION AND NUMBER OF DETECTORS

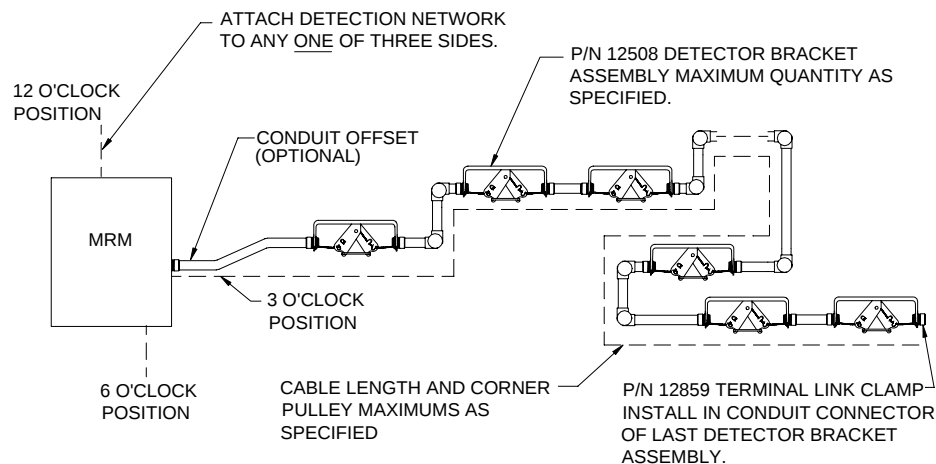
In order to detect a fire in the duct, a detector is required to be placed in the center of the duct, either at the duct opening or up to 12 inches into the duct. If it is mounted into the duct, the bracket cannot shield the fusible link from the hot vapors moving through the duct.

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 24 corner pulleys. (either style)
- Maximum of 20 detectors (any combination of temperature settings).
- Maximum of 120 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).



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 Links

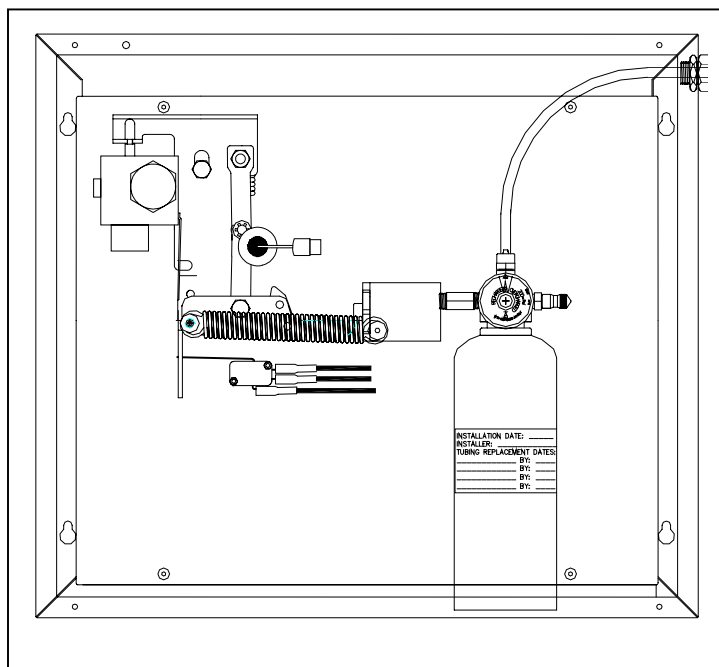
Temperature Measured	Link Rated Temp.	Part No.
70° to 150°F (21° to 65°C)	212°F (100°C)	12326
151° to 225°F (66° to 107°C)	280°F (138°C)	12327
226° to 300°F (21° to 65°C)	360°F (182°C)	12328
301° to 375°F (21° to 65°C)	450°F (232°C)	12329
376° (192°C) & above	Consult factory	Consult factory

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 or "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 expected ambient temperature does not exceed 375°F.



MANUAL PULL STATION NETWORK LIMITATIONS

Every Amerex KP 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

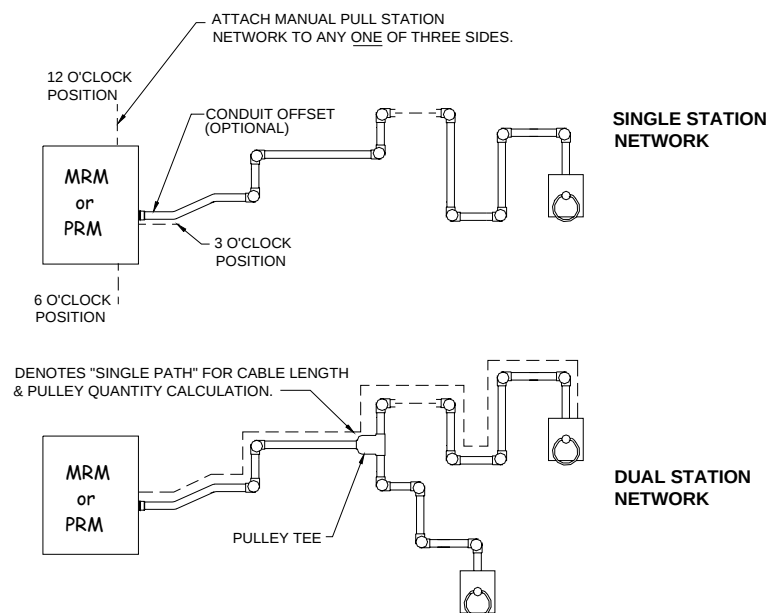
Maximum of 20 corner pulleys per manual pull station

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.



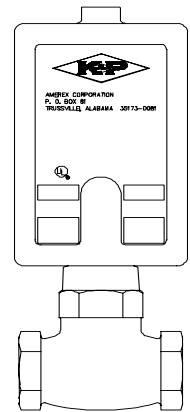
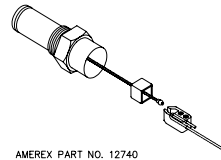
NOTE: The manual pull station(s) are the only MANUAL means of activating the Amerex KP Restaurant Fire Suppression System.

MECHANICAL GAS VALVE APPLICATIONS

The PRM or MRM 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 valve body to provide the closing force. Connection of the cable from the valve to the PRM or MRM 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.



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 void 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.

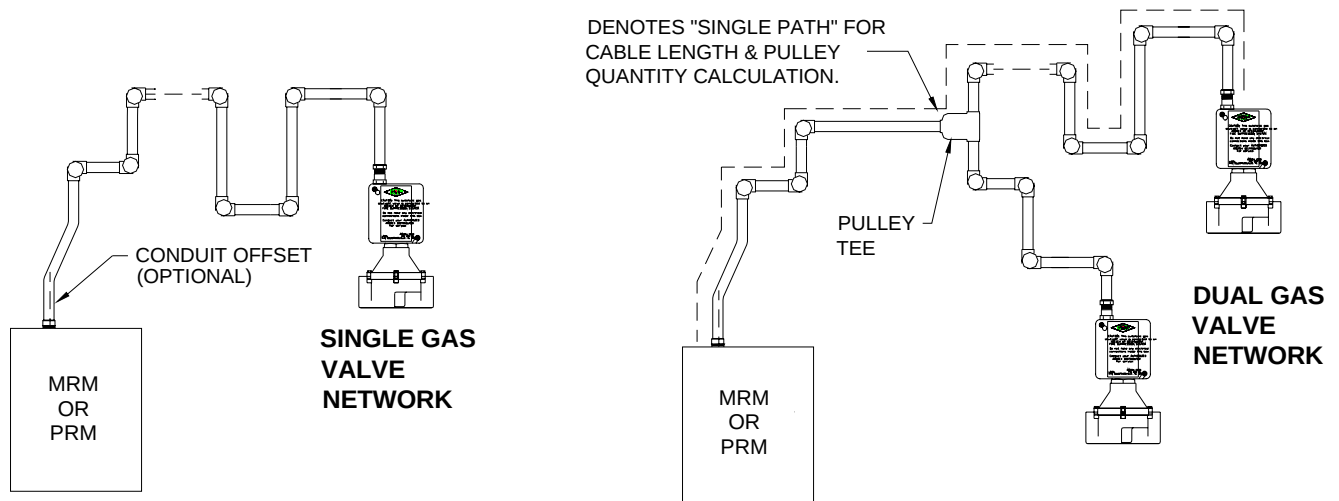
GENERAL LIMITATIONS OF MECHANICAL VALVE NETWORK

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

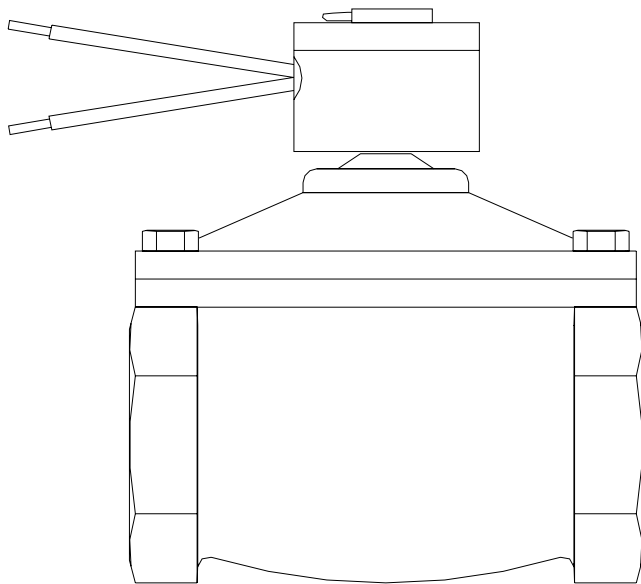
Maximum of 1 pulley tee per network (counts as one corner pulley for each mechanical gas valve)

Maximum of 1 conduit offset per network (must be located at pneumatic release module and before tee pulley when chose)



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 KP 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 microswitch 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.



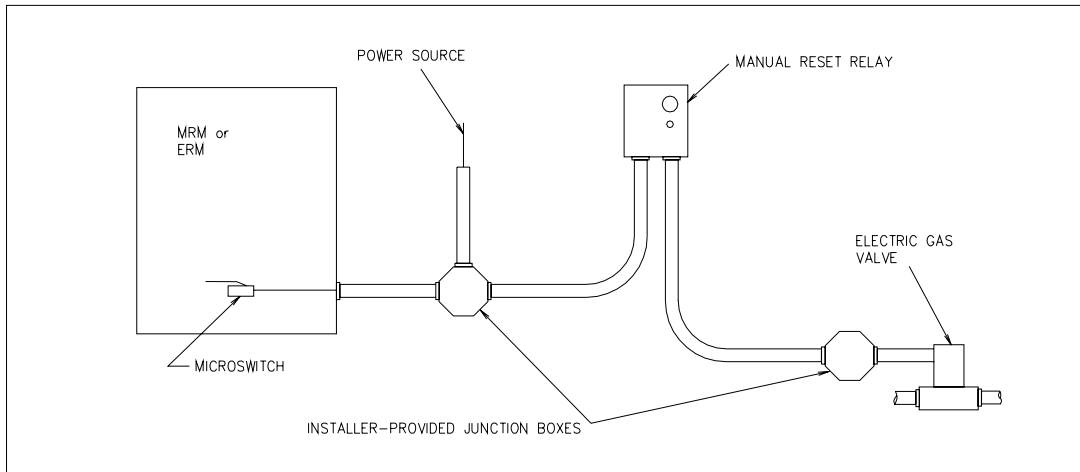
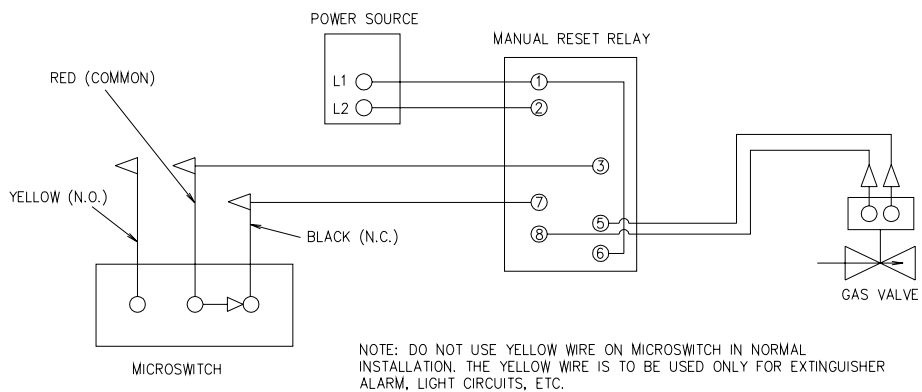
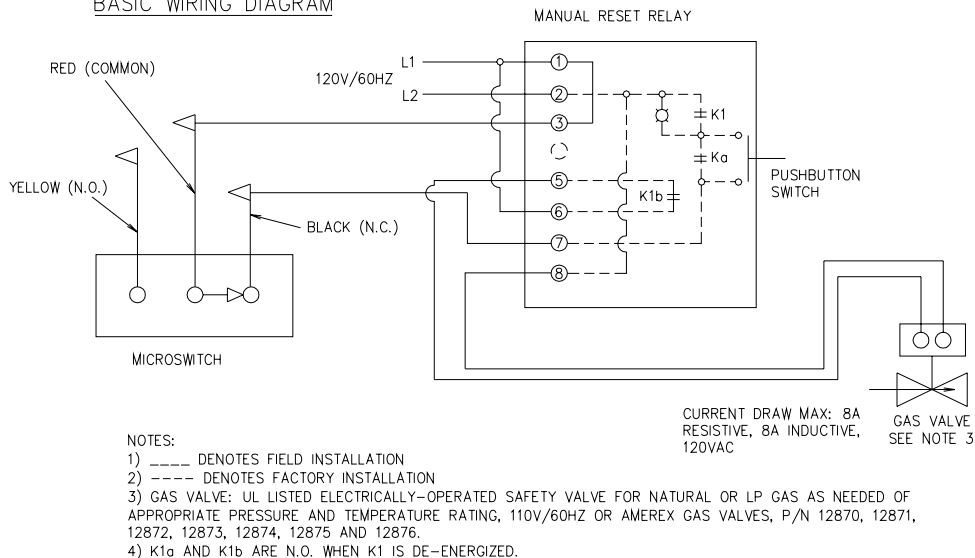
P/N	Size	Manufacturer
12870	¾"	Asco
12871	1"	
12872	1¼"	
12873	1½"	
12874	2"	
12875	2 ½"	
12876	3"	

ELECTRIC GAS VALVE OPERATION

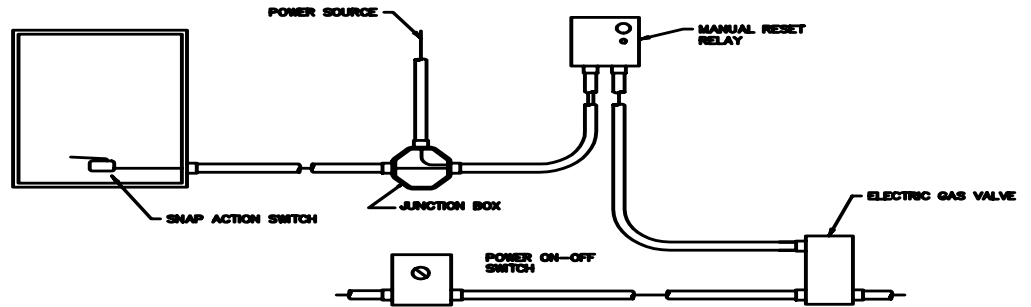
Power to the electric gas valve is run through the normally closed contact on a microswitch located in the pneumatic release module (PRM) or mechanical release module (MRM) to the manual reset relay and from the manual reset relay to the electric gas valve. In a normal (non fire) condition, current is 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 microswitch 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 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 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.

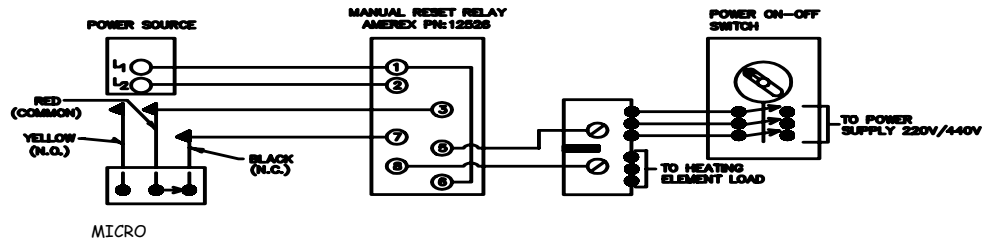
NOTE: SEE WIRING SCHEMATICS NEXT TWO PAGES

BASIC WIRING DIAGRAMBASIC WIRING DIAGRAM

INSTALLATION OVERVIEW

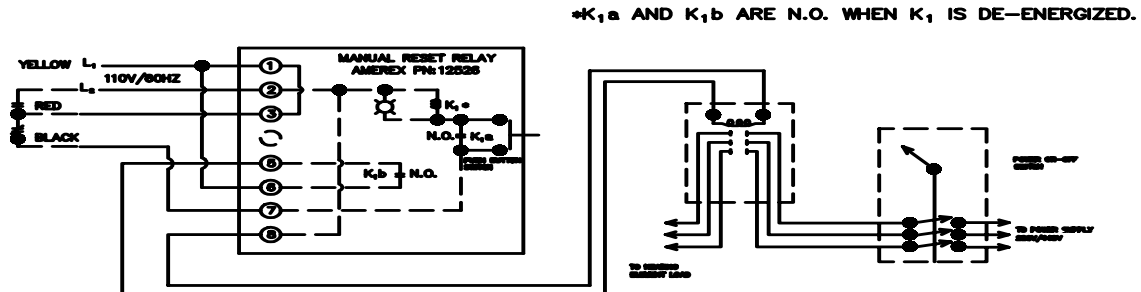


BASIC WIRING DIAGRAM



NOTE: DO NOT USE BLACK WIRE ON MICRO SWITCH IN NORMAL INSTALLATION. BLACK WIRE TO BE USED ONLY FOR EXTRANEIOUS ALARM, LIGHT CIRCUITS, ETC.

WIRING SCHEMATIC



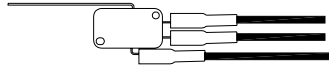
NOTE:

1. ———— DENOTES FIELD INSTALLATION.
2. - - - - - DENOTES FACTORY INSTALLATION.
3. GAS VALVE: "UL LISTED ELECTRICALLY-OPERATED SAFETY VALVE FOR NATURAL OR LP GAS AS NEEDED OF APPROPRIATE PRESSURE AND TEMPERATURE RATING, 110V/60HZ" OR AMEREX GAS VALVES, PART NUMBERS 12870, 12871, 12872, 12873, 12874, 12875 AND 12876.

MICROSWITCH APPLICATIONS

The P/N 12524 Microswitch is installed in the mechanical release module. Up to three additional switches may be added.

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.	

Microswitches may be used to perform a variety of output functions such as surrounding an auxiliary audible or visual alarm signaling device, sending a signal to a 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 MICROSWITCH, 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 OR PRM ENCLOSURE. ROUTE THE LEADS FROM THE MICROSWITCH THROUGH THE APPROPRIATE KNOCK-OUT TO AN ATTACHED, LISTED ELECTRICAL JUNCTION BOX (DISTRIBUTOR SUPPLIED).

SECTION 4

SYSTEM INSTALLATION

MANUAL P/N 12385

AMEREX
KP
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

October 2003

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.

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)

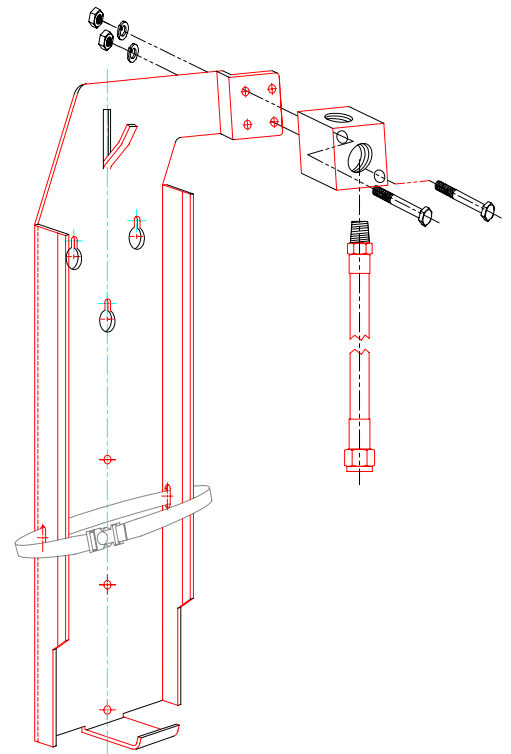
All system components – release module, cylinder assembly, mounting brackets, detectors, fusible links, pneumatic detection tubing, agent, nozzles, manual pull stations, gas shut off devices, corner pulleys, pulley tee, nitrogen cylinders, etc. – must be UL listed for use with the Amerex KP Restaurant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

INSTALLING THE KP375 AND AGENT CYLINDER BRACKET (P/N 16085)

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.

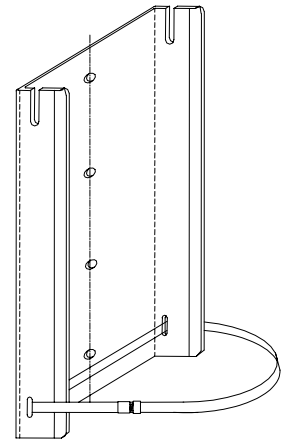
INSTALLING THE KP375 AGENT CYLINDER ASSEMBLY (P/N 13334)

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 hose to valve outlet.



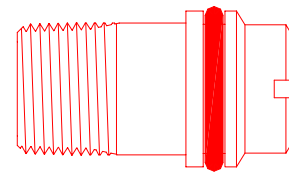
INSTALLING THE KP600 AGENT CYLINDER BRACKET (P/N 15166)

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 top and bottom 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 supplied with a stainless steel strap to hold the cylinder against the bracket. **A minimum of three holes, including the top hole, should be used to mount the bracket in any situation.**



INSTALLING THE KP600 DISCHARGE FITTING KIT (P/N 10199)

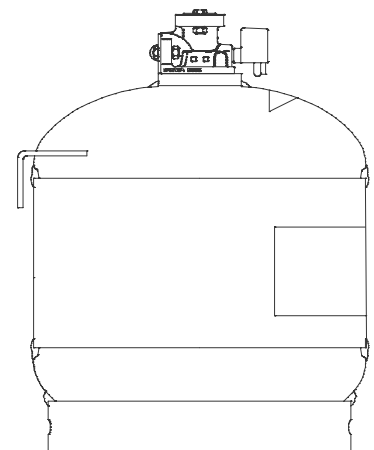
The discharge fitting kit consists of a brass fitting with an o-ring on one end and $\frac{3}{4}$ NPT male threads on the other, and a stainless steel flange for locking the fitting in place. The discharge fitting should be inserted into the outlet of the agent cylinder outlet **carefully**, to insure 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 KP600 AGENT CYLINDER (P/N 15196)

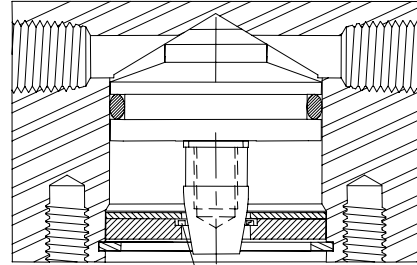
The KP600 agent cylinder assembly is fitted with an attachment bracket that is a component welded to the cylinder assembly. The attachment bracket is used to attach the cylinder assembly to the cylinder mounting bracket. The cylinder attachment bracket fits easily into the upper slotted portion of the 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 KP600 PNEUMATIC ACTUATOR
(P/N 15157)**

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 spiral retainer ring that locks the piston in its extended position.

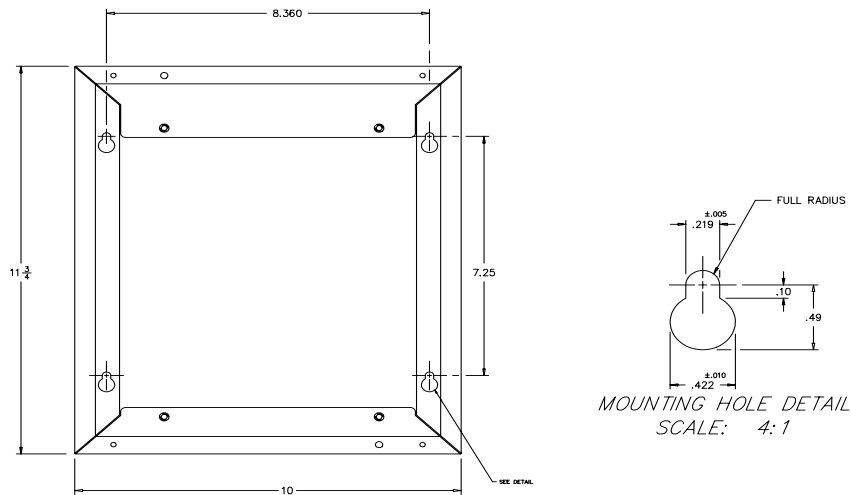


NOTE: WHEN INSTALLING ONLY ONE CYLINDER, THE ACTUATION LINE WOULD COME IN ON ONE SIDE OF THE ACTUATOR AND THE OTHER SIDE WOULD BE PLUGGED USING A ¼" NPT BRASS PIPE PLUG. IF YOU ARE INSTALLING MORE THAN ONE CYLINDER THE SECOND PORT IS USED TO TRANSFER PRESSURE TO THE NEXT CYLINDER AND SO ON, UNTIL YOU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

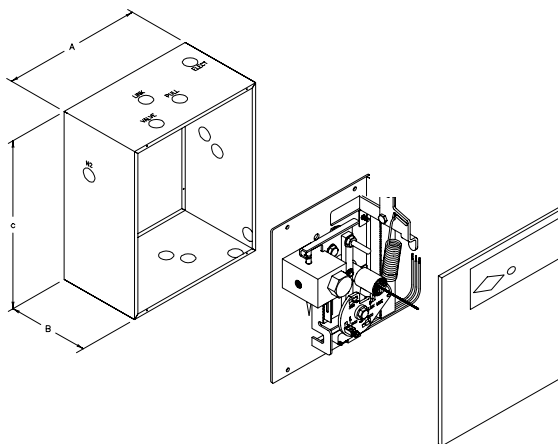
INSTALLING THE MECHANICAL RELEASE MODULE (MRM):

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

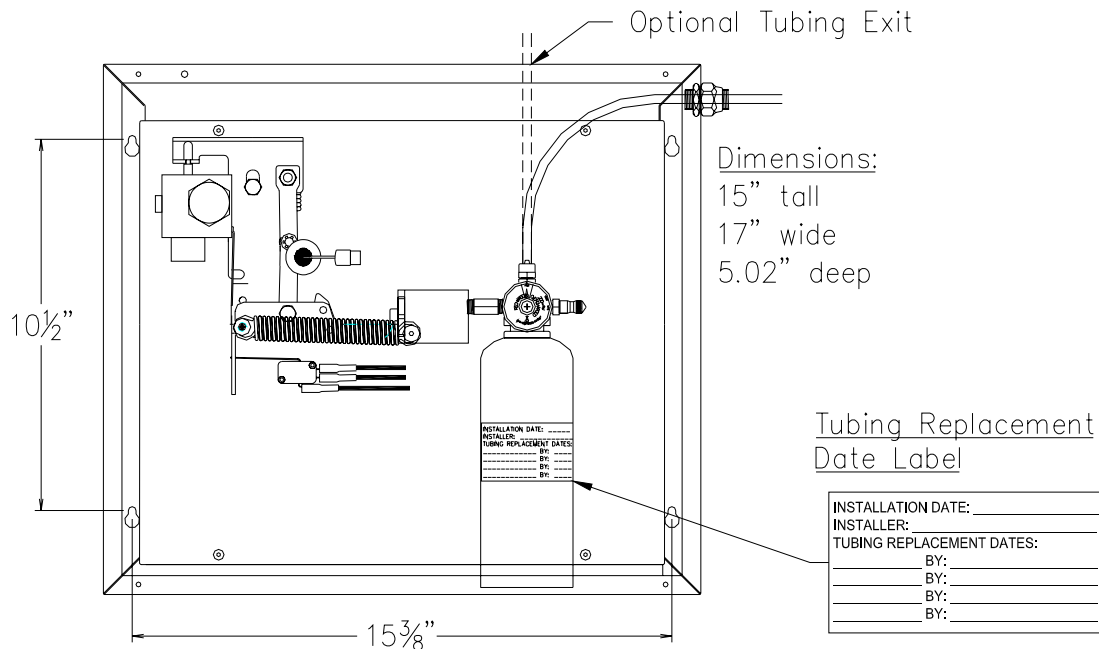
Special Note:

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 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 Microswitches 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.

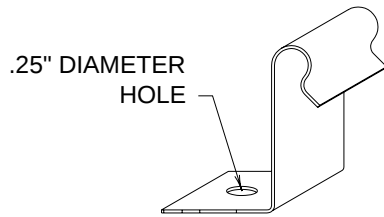
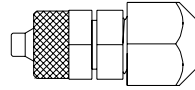
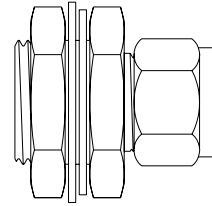
INSTALLATION OF DETECTION NETWORK - PRM

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). Install in areas where the maximum expected ambient temperature does not exceed 375 degrees Fahrenheit.

The Amerex part numbers for tubing lengths are:

P/N	Length
16551	50'
16552	150'
16554	300'

Tubing may be cut down to the required length, 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 (p/n 16501) is required at least every 18" (45.7cm) of tubing. A Tubing Clip is also required within one inch of the End of Line Fitting. The tubing can exit the panel either through the 5/8" hole at the upper right hand corner of the enclosure (where 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.

P/N 16501 TUBE CLIPP/N 16506 END OF LINE FITTINGP/N 16502 QUICKSEAL FITTING 1/4"

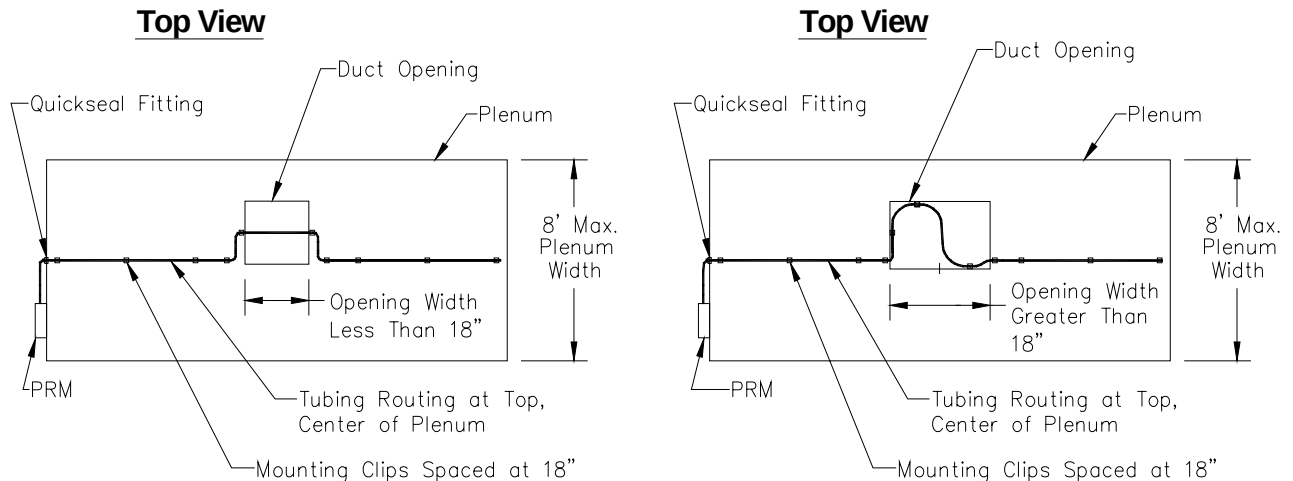
The p/n 16502 Quickseal Compression Fitting is required for kitchen hood and other penetrations requiring a UL-listed sealing device.

Warning: When tightening the nut on the p/n 16502 Compression Fitting, use a **MAXIMUM** of $\frac{1}{2}$ turn past hand tight. Wrenching the nut past $\frac{1}{2}$ 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, centered, from one end to the opposite end to ensure total detection coverage. Terminate the tubing within 6" (15.2cm) of the end of the plenum.

Additionally, the detection tubing is to cross over the hood / duct opening at its center. 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:



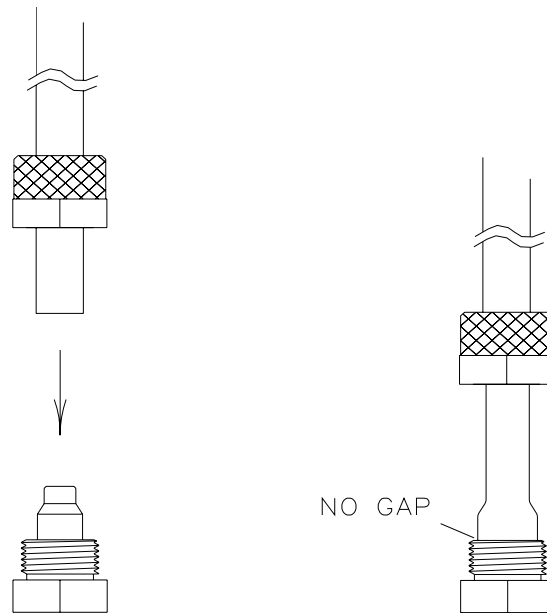
SECURING THE TUBING - PRM

The tubing must be secured at least every 18" with p/n 16501 Tubing Clip. 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. Avoid taking up slack by pulling the tubing through a series of clips, which 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.

NOTE: FOR ADDITIONAL DETAILED INFORMATION ON THE PRM SEE MANUAL16546

INSTALLING THE ACTUATION NETWORK

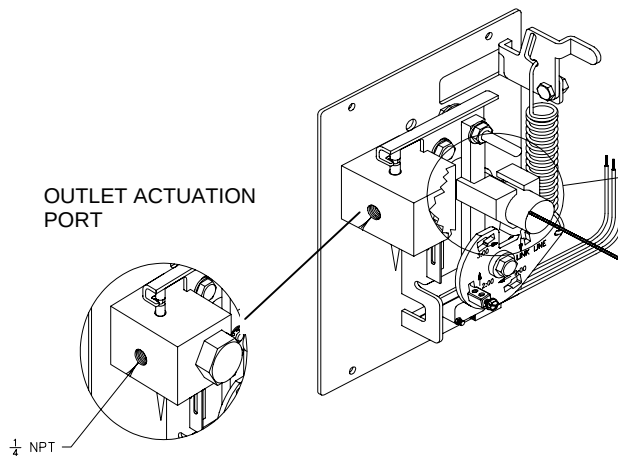
Refer to the Design section for limitations of the Actuation Network. Piping for the actuation network can be ¼" black, chrome plated, galvanized schedule 40 pipe, copper tubing or hose. The network originates at the pipe outlet of the MRM or PRM and continues to the top of each cylinder and valve assembly. The protective plug on each cylinder valve and the MRM 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 second thread from the pipe opening, wrap the tape clockwise around the threads 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 overtighten the pipe or pipe fittings into the pipe threads on the MRM. Overtightening can cause the MRM to malfunction.

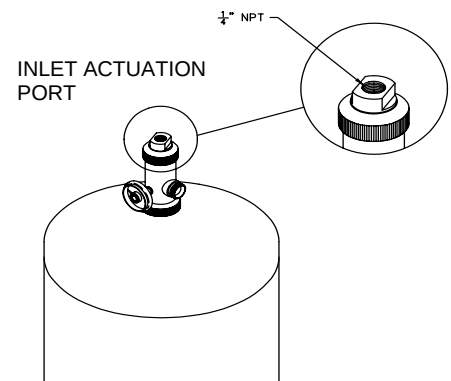
A single MRM or PRM will actuate a maximum of ten (10) KP375 agent cylinders or six (6) KP600 agent cylinders at the same time. Outlined below are the maximum amounts of pipe, hose or tubing allowed in the actuation network. When a network consists of more than one of the media listed, the total allowable 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

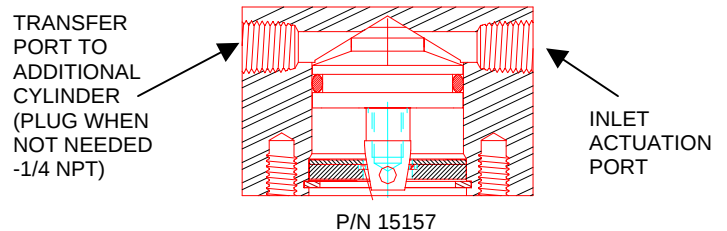
ACTUATION NETWORK OUTLET



ACTUATION INLET FOR KP375 AGENT CYLINDER



ACTUATION INLET FOR KP600 AGENT CYLINDER



Note: A vent plug (P/N 10173) must be used and placed in an accessible location anywhere at the end of 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.

LIMITATIONS (SINGLE OR MULTIPLE AGENT CYLINDER SYSTEMS)

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). 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 P/N 12854 hose assemblies if 40 or 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)

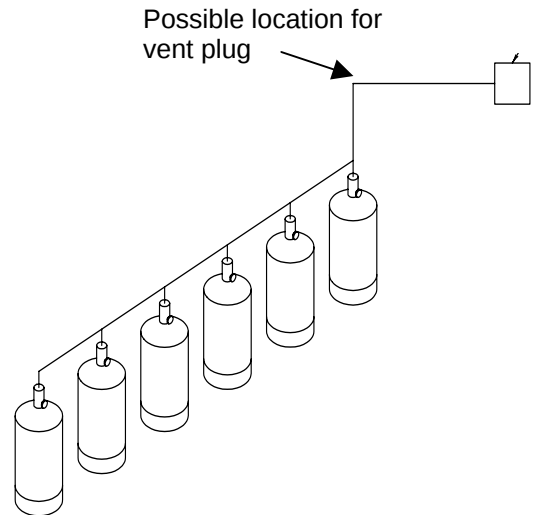
Maximum tees – 9

Maximum elbows – 9

(note: 2 – 45° elbows = 1 – 90° elbow)

Note: Different methods of construction the actuation network may be mixed, provided that the shortest limitations are followed.

Nitrogen Cylinder	10 cu. in.	
	Feet	Meters
Maximum Total Length for:		
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.

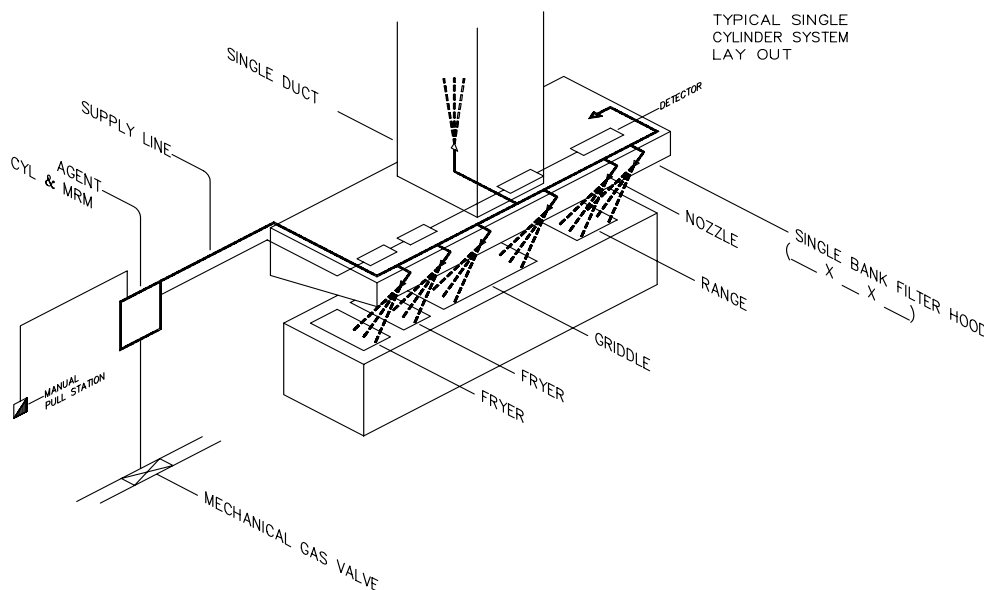
ALL PIPE MUST BE REAMED AND BLOWN CLEAR. DIRT AND/OR CUTTING OIL MUST BE REMOVED FROM THE INSIDE OF ALL PIPE AND FITTINGS BEFORE ASSEMBLY.

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 recommended)**. **UNLESS SPECIFICALLY REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION, THE USE OF TEFLON TAPE IS PROHIBITED. JOINT SEALANT OR PIPE COMPOUND MAY NOT BE USED UNDER ANY CIRCUMSTANCES.**

The Amerex KP 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.

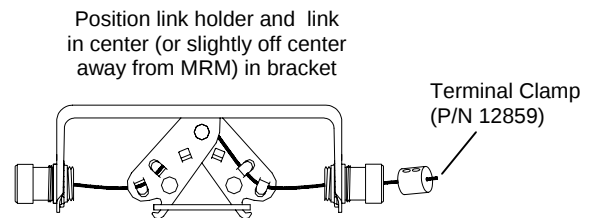
Swivel Adapter: Remove standard blow off cap – thread the loop of the high temp. cap onto the supply pipe before installing the nozzle body. Install o-ring on nozzle tip, place the cap on nozzle tip.

INSTALLING THE DETECTION NETWORK - MRM

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. A series detector is any detector located in between the MRM and the terminal detector in the network.

Starting at any of three sides (top, bottom or right) of the MRM at the corresponding knock-out, install ½" EMT conduit running from the MRM 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 duct or 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) 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.



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.

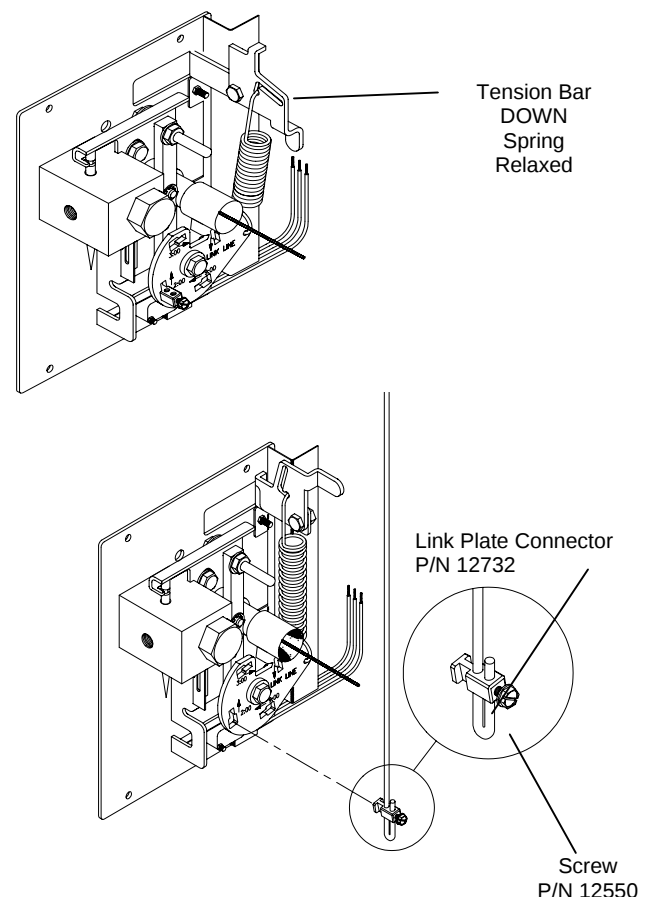
Each link and link holder, once assembled and placed on the cable, should be positioned in the bracket on center or slightly off center away from the MRM.

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).



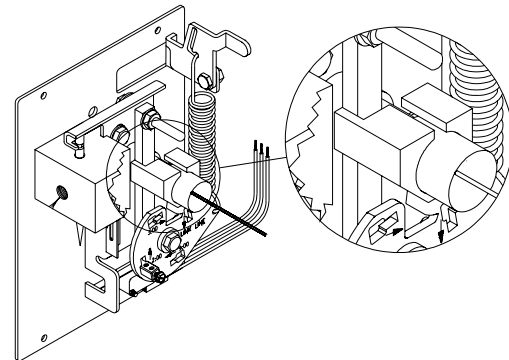
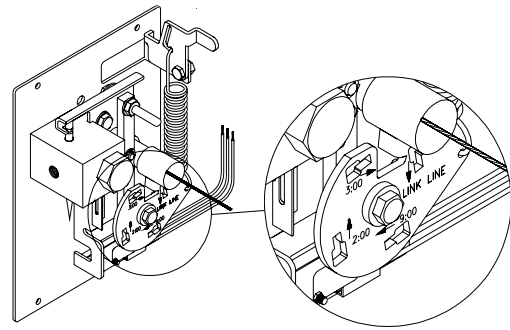
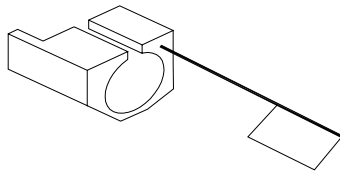
Insert the connector into the slot on the link plate that corresponds with the direction of pull on the cable.

The link plate is marked with clock positions (3:00, 6:00, and 12:00). **Note: early models also had a 9:00 position which CANNOT be used.**

Insert the connector at 12:00 if the cable enters the MRM at the TOP; 3:00 if it enters from the RIGHT and 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 link plate.



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.

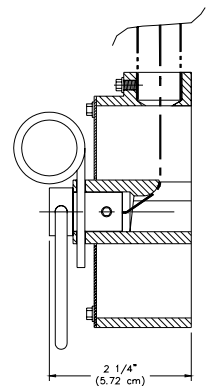
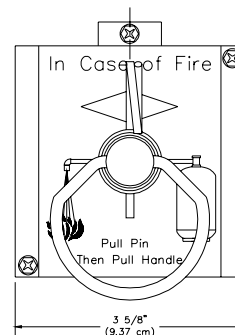
Remove the set-up tool and raise the tension bar to test cable run. Lower tension bar until system is ready to test. To test the detection network, refer to the testing and commissioning section.

INSTALLING THE MANUAL PULL STATION(S) – MRM 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.

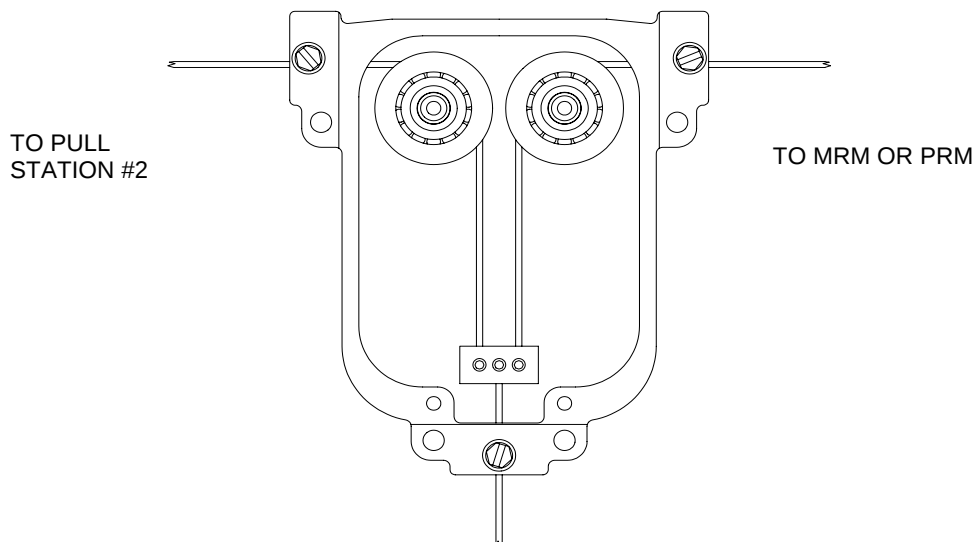
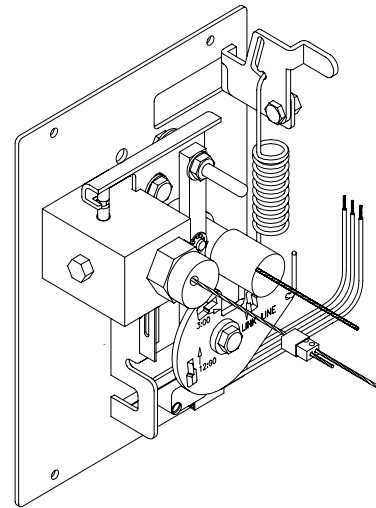
The MRM or PRM allows the cable for the manual pull station(s) to enter from any of the three sides (TOP, BOTTOM or RIGHT). Once a location for the pull station has been established, ½" EMT conduit is run from the module (using whichever exit side is most convenient) through corner pulleys to the pull 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 or PRM



(PLEASE TURN TO PAGE 4-16 FOR RECESSED INSTALLATION OF MANUAL REMOTE PULL STATION)

The cable attaches to the manual pull at the handle by using set screws. At the MRM 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 $\frac{3}{4}$ " 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 as possible.**

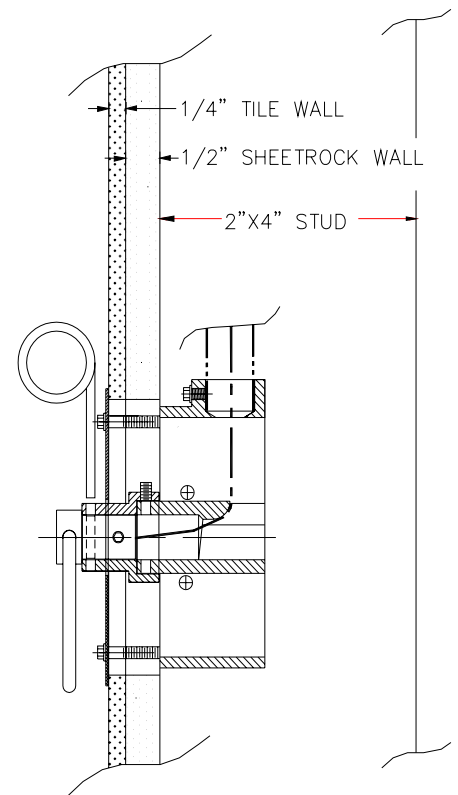
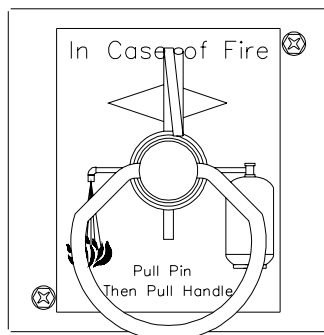


When installing the Manual Pull Station in a recess configuration, utilize the adapter kit (P/N 14193). The Manual Pull Station Adapter Kit includes an oversized cover plate to cover the hole cut in the sheetrock and/or tile wall. A pull handle extension collar to compensate for the thickness of the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

RECESSED INSTALLATION OF MANUAL REMOTE PULL STATION MRM OR PRM

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 1/2" conduit with the corner pulleys back to the MRM 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 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 or PRM as outlined in Section 4 Page 9.

INSTALLING A MECHANICAL GAS VALVE MRM OR PRM:

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

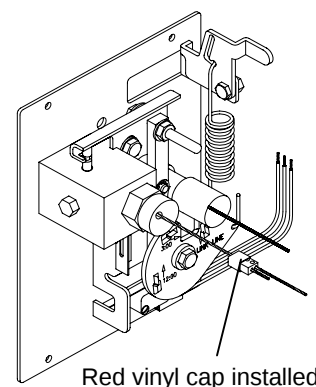
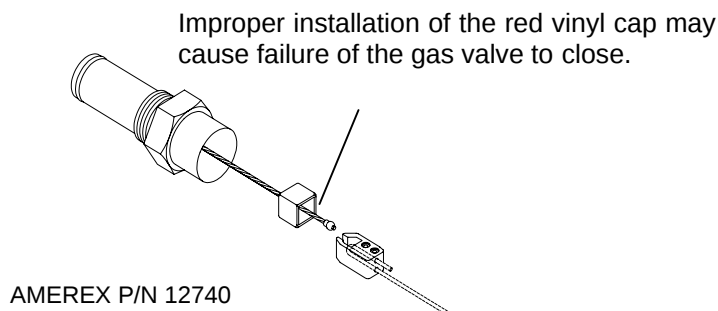
WARNING: CONFIRM THAT THE GAS IS SHUT OFF AT THE SOURCE OF SUPPLY BEFORE ATTEMPTING TO INSTALL THE MECHANICAL GAS VALVE. A QUALIFIED, LICENSED CONTRACTOR SHOULD PERFORM INSTALLATION OF THE GAS VALVE INTO THE GAS LINE.

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:

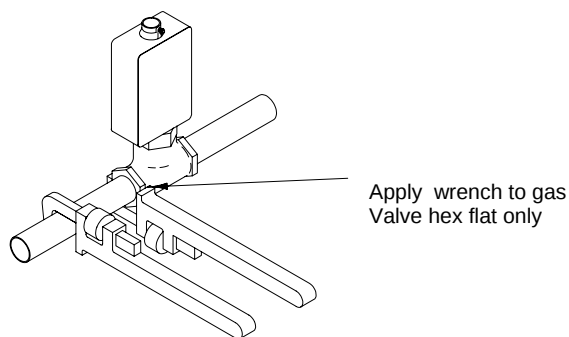
1. The MRM/PRM has the set-up/lock-out tool installed.
2. The tension bar is in the “down” (relaxed) position.
3. The nitrogen actuation cylinder has not been installed.

Remove the protective plug from the MRM 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



Gas Valve Trip Assembly installed

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.**

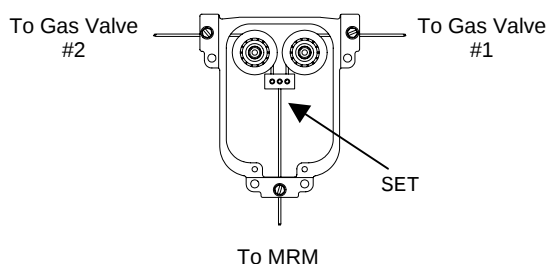


If pipe joint compound is used, it must be applied sparingly to the back male threads. Pipe joint compound entering the gas valve could cause the valve to fail.

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 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/PRM enclosure from three sides (top, bottom or right).

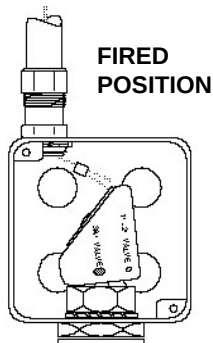


AT THE MECHANICAL GAS VALVE

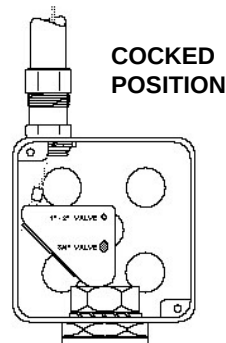
1. Connect the cable to the latching lever in the gas valve actuator housing by threading it around the pin in the latch (Amerex actuator) or through the hole in the latch (all others). Secure it with a loop and crimp.

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.



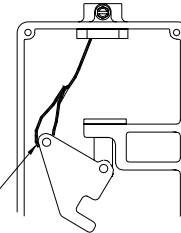
**FIRED
POSITION**



**COCKED
POSITION**

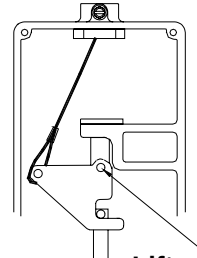
ASCO Gas Valve With Amerex Actuator Kit

FIRED POSITION



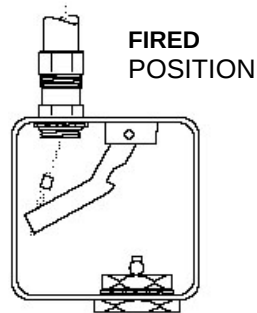
Thread cable
around pin, loop
and crimp.

COCKED POSITION

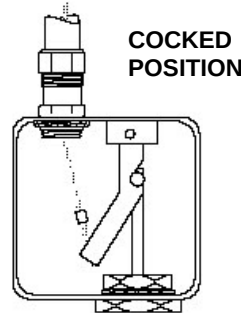


Lift stem,
engage
latch.

**AMEREX "Pull to
Release" Gas Valve**

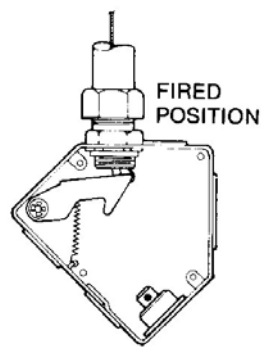


**FIRED
POSITION**

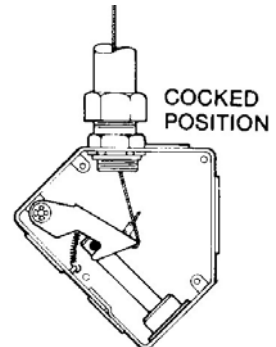


**COCKED
POSITION**

ASCO "Pull to Release" Gas Valve Actuator



**FIRED
POSITION**

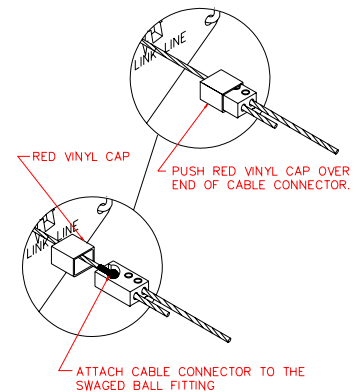


**COCKED
POSITION**

**ANSUL "Pull to release" Gas Valve
Actuator**

AT THE MRM/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 $\frac{1}{4}$ " 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/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/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 N₂ 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 overtighten pipe or pipe fittings into the MRM or PRM pipe threads. Overtightening 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.

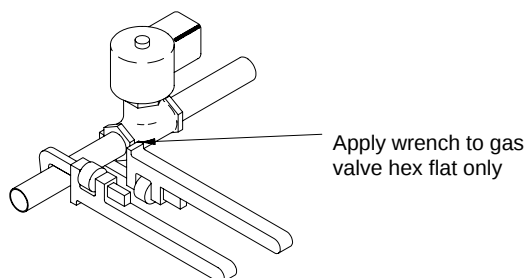
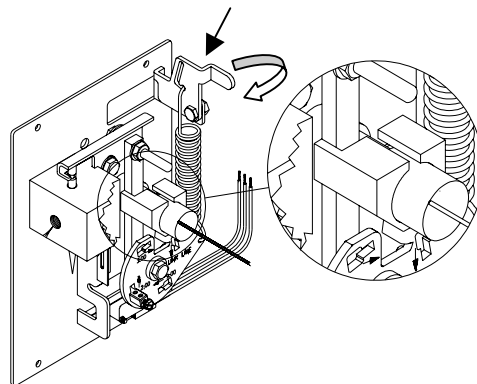
WARNING: THE MECHANICAL GAS VALVE AND ASSOCIATED COMPONENTS SHOULD BE TESTED AND EXERCISED EVERY TIME THAT SYSTEM MAINTENANCE IS PERFORMED. MAINTENANCE SHOULD BE PERFORMED AT INTERVALS NOT EXCEEDING SIX MONTHS. FAILURE TO TEST THE MECHANICAL GAS VALVE AND RELATED COMPONENTS COULD RESULT IN A TOTAL SYSTEM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

INSTALLING AN ELECTRICAL GAS VALVE MRM OR PRM

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 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 connecting the MRM/PRM to the electrical gas valve.

MOVE THE TENSION BAR TO THE "DOWN" (RELAXED) POSITION.



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.

For installation of the microswitch see section labeled "Microswitch Installation". Unlike the mechanical gas valve, 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 OR PRM

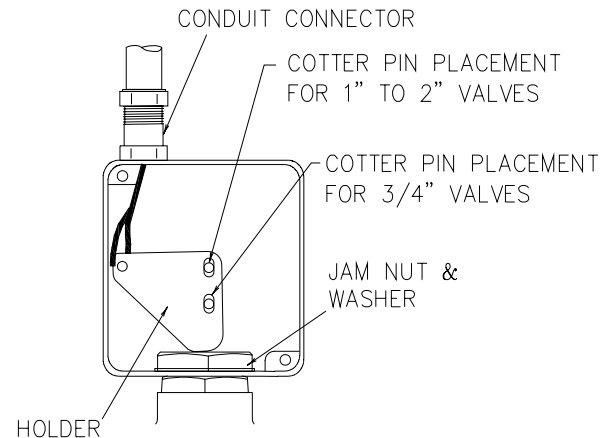
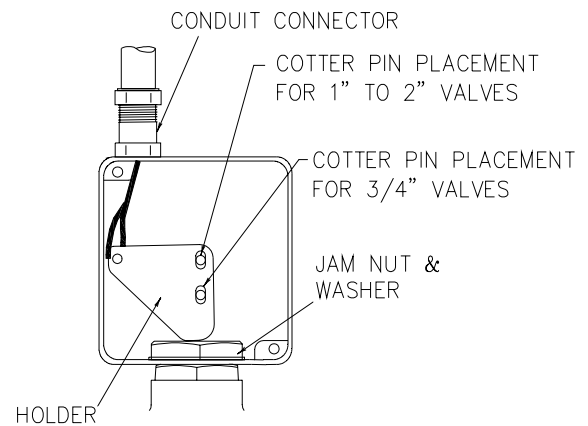
The gas shut off valve to be converted to a “pull to close” type should be located where it can be easily accessed for resetting, maintenance and service.

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/PRM has been locked out properly, refer to the Installation Section.

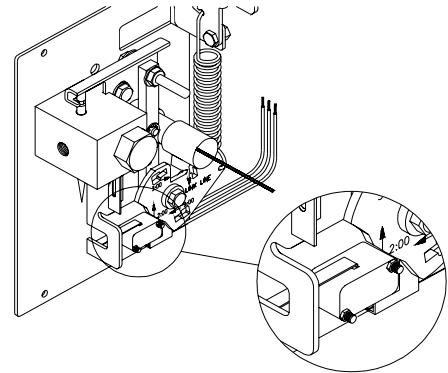
WARNING: VERIFY THAT THE MAIN GAS SUPPLY HAS BEEN SHUT OFF PRIOR TO INSTALLING THE GAS SHUT OFF VALVE. GAS VALVE INSTALLATION SHOULD BE PERFORMED BY A QUALIFIED, LICENSED CONTRACTOR.

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 and 2). 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), tee pulleys (P/N 12506 or 16444) 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.

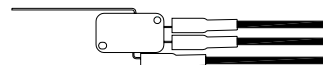
**FIGURE 1****FIGURE 2**

MICROSWITCH INSTALLATION MRM OR PRM

One SPDT switch is pre-installed in the MRM or PRM. Before beginning the installation of any additional microswitches, 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). If a DPDT switch is required, a second SPDT switch should be mounted or “stacked” onto the first switch. An additional three 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.



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

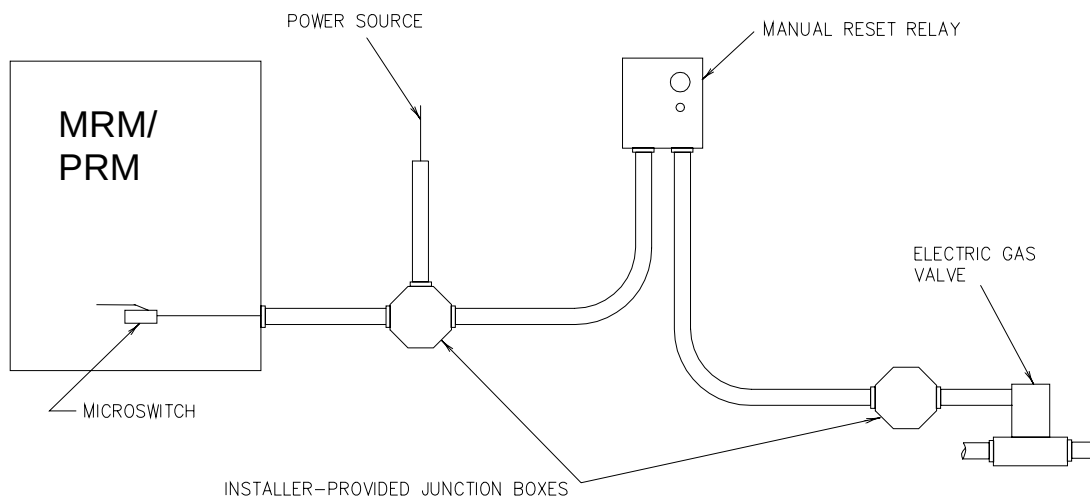


MICROSWITCH
P/N 12524

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

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

WARNING: POWER TO COOKING APPLIANCES SHOULD NEVER BE RUN THROUGH THE MICROSWITCH. 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.



SECTION 5

SYSTEM

TESTING & COMMISSIONING

MANUAL P/N 12385

AMEREX

KP

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

October 2003

TESTING & COMMISSIONING

Once the Amerex KP Restaurant Fire Suppression System has been completely installed, and **BEFORE INSERTING THE NITROGEN ACTUATION CYLINDER**, the system must be given a complete functional test to confirm proper operation.

TESTING THE DETECTION NETWORK - MRM

The **terminal detector** must have a test link (P/N 12891) installed in place of the fusible link. With the actuation cylinder removed from the MRM, 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 wire cutter or similar device. **The MRM must fire at this time.**

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

If the MRM did not fire, 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:

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 following re-pressurization.

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

If the PRM did not fire, 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 OR PRM

After the detection network has been tested and **before inserting the nitrogen actuation cylinder** the manual pull station must be tested. Remove the pull pin on the manual pull station, grab the handle and pull away from the mounting surface. **The MRM or PRM must fire at this time.**

If the MRM or PRM did fire, replace the pull pin, attach a tamper seal and follow the reset instructions.

If the MRM or PRM did not fire:

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

Once these items have been investigated and resolved, retest.

TESTING THE MECHANICAL GAS VALVE - MRM 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 must release at this time.**

If the gas valve does not release, follow the reset instructions and continue with the test.

If the gas valve does not release:

- check to see that it has been installed properly,
- that it is fitted tightly into the gas line,
- that the cable is not binding in the conduit or in a corner pulley(s),
- that it has been connected to the MRM 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 DISTRIBUTION PIPING NETWORK

The Amerex KP 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" are not considered necessary.

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 valve 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 or PRM

With the gas valve and the appliances working follow the procedure for testing the manual pull station. When the manual pull station is activated and the MRM/PRM fires, the microswitch(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 KP extinguishing 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.

SECTION 6

SYSTEM MAINTENANCE

MANUAL P/N 12385

AMEREX
KP
RESTAURANT
FIRE SUPPRESSION SYSTEM

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October 2003

MAINTENANCE

THE AMEREX KP 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 KP 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.

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 KP RESTAURANT SYSTEMS DISTRIBUTOR.

5. Amerex recommends that all fusible links be replaced every 6 months. **Under no circumstances shall fusible links be allowed to remain on line for more than ONE year.** 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.
6. 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.**
7. The agent cylinder assembly and nitrogen actuation cylinder must be checked for proper pressure (within the green pie **OPERABLE RANGE** on pressure gauges).
8. 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.

- 9 Replace nitrogen actuation cylinder, REMOVE SET UP/LOCK OUT TOOL, replace the MRM cover and install new tamper seals.
- 10 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.
- 11 Note date of service on Inspection/Maintenance tag and attach to system.

SECTION 7

SYSTEM RESET & RECHARGE

MANUAL P/N 12385

AMEREX
KP
RESTAURANT
FIRE SUPPRESSION SYSTEM

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

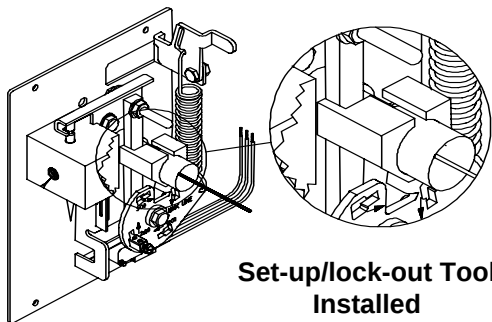
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to UL/ORD 1254.6-1995

October 2003

RESET AND RECHARGE**RESET PROCEDURES - MRM**

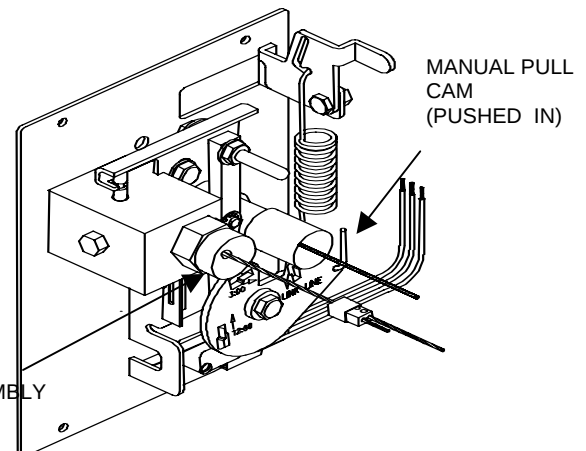
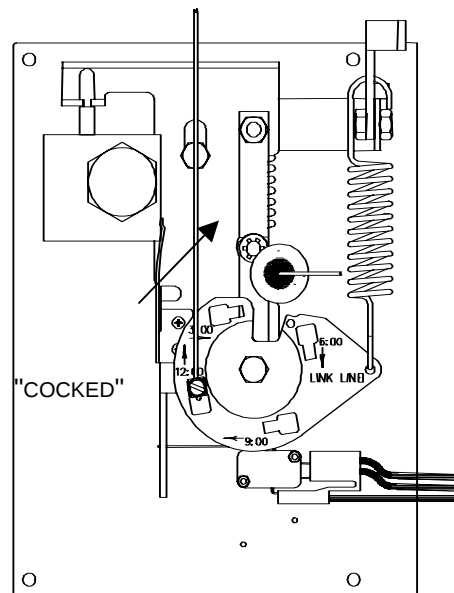
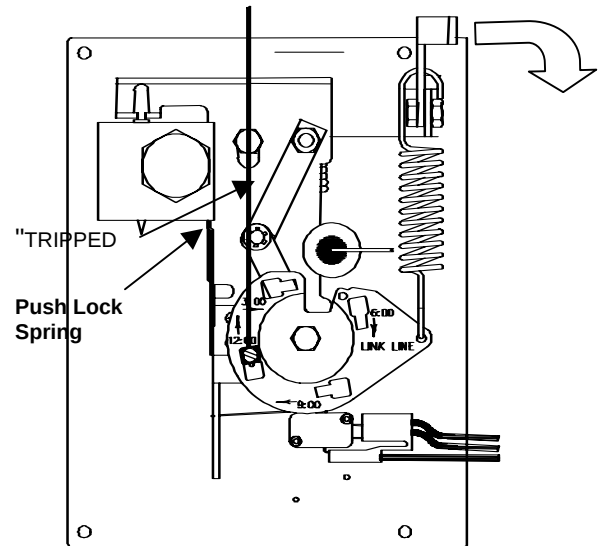
Each time the MRM is fired the following procedures must be performed to accomplish reset:

1. Remove cover of the MRM and move the tension bar to the "down" (relaxed) position.
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.



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.
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.

MOVE TENSION BAR DOWN



MECHANICAL GAS VALVES – DO ALL EXCEPT STEP 12
ELECTRICAL GAS VALVES – SKIP STEPS 9 THROUGH 11

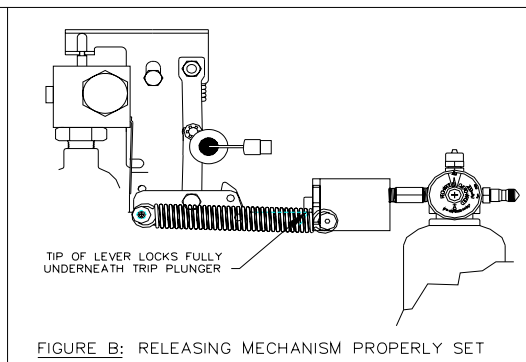
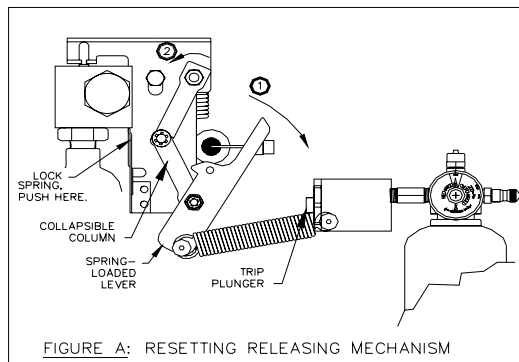
9. Confirm that the swaged ball fitting of the gas valve trip assembly is pulled all the way out and that the cable connected to the gas valve is properly attached using the cable connector and secured by the red vinyl cap. (Ref. 5-9)
10. To reset the mechanical gas valve, disconnect the cable for the 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 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 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 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 cover and install two new tamper seals on the cover.

**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 35 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 70 PSI at 70°F (483 kPa at 21°C). Leak 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).



RECHARGE PROCEDURES (KP 375 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.

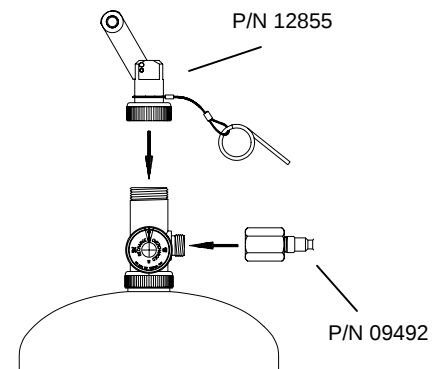
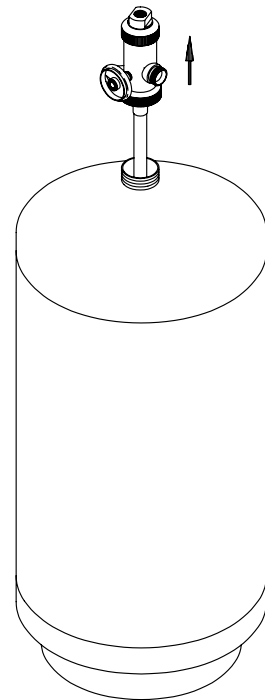
WARNING: ENSURE THAT ALL PRESSURE HAS BEEN RELIEVED FROM CYLINDER BEFORE PROCEEDING.

2. Slowly remove agent cylinder assembly from the mounting bracket.
3. 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.
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 KP Agent. Use Amerex P/N 12866 – 3.75 Gallon Recharge

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. Inspect valve and stem assembly for deterioration or wear. Replace if required. Install valve assembly and downtube into the cylinder.
7. Attach the recharge adapter (P/N 09492) to the valve discharge port.
8. Attach the "T" handle recharge adapter (P/N 12855) to the top of the discharge valve.



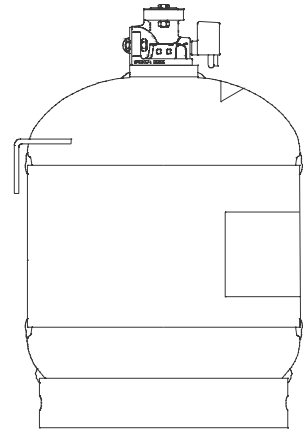
RECHARGE PROCEDURES (KP600 CYLINDER)**WARNING:**

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 KP 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) **KP375** – attach the actuation port connection
 b) **KP600** – install pneumatic actuator.
 Note: reset pneumatic actuator before installation.
 - 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

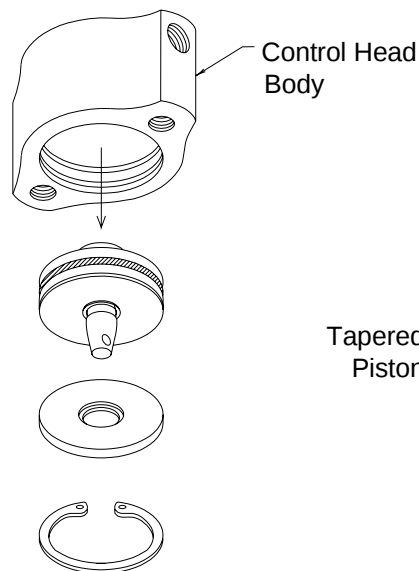


Figure 2

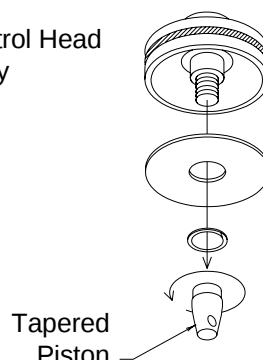
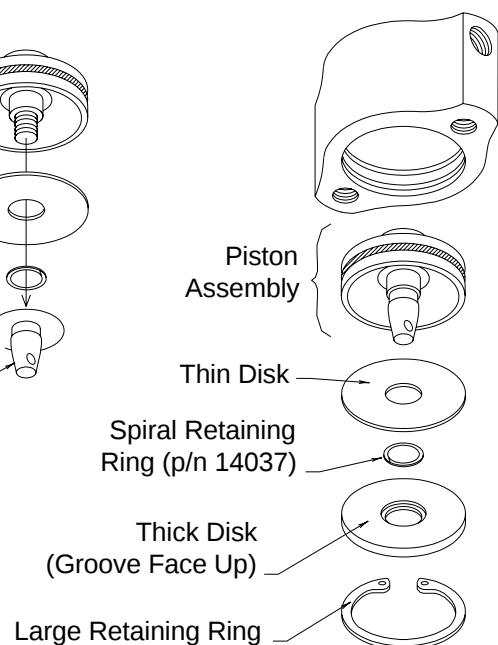


Figure 3



12. Check the valve outlet, top chamber and collar for leaks using a leak detection fluid (soapy water). Bubbles may take several minutes to appear. Blow dry and clean all surfaces and orifices following leak detection.
13. 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.**
14. Follow all reset procedures and conduct a full functional test of the system.
15. If the discharge was caused by a fire incident, replace **ALL** of the fusible links in the detection network.
16. 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.
17. 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.
18. Install a full charged nitrogen actuation cylinder. **See below.**
19. 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.

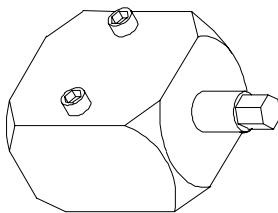
1. Remove nitrogen cylinder from MRM or PRM. Install shipping cap on N₂ cylinder.
CAUTION: UNSCREW THE NITROGEN CYLINDER SLOWLY TO ALLOW ANY RESIDUAL PRESSURE TO ESCAPE.
2. Clean the cylinder exterior to remove dirt, grease and foreign material. Check to make sure that the nameplate is in place and fully 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 N₂ 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 N₂ Cylinder Recharge Adapter.
 - b. Hold cylinder in place using a 1-1/8 inch wrench on the hex portion of the N₂ 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

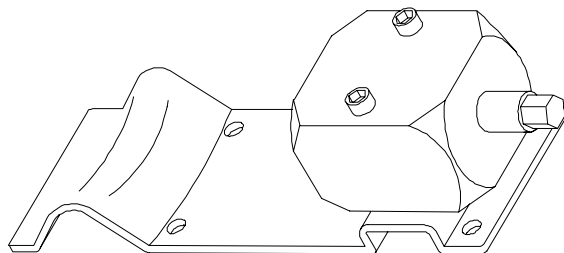
4. Inspect sealing seat on rupture disc fitting. Discard N₂ cylinder if the seat is damaged.
 5. Install new rupture disc assembly (replace only with Amerex P/N 09958 rupture disc assembly – use of substitute parts will void the manufacturer's warranty).
 - a. Wipe sealing seat on N₂ cylinder rupture 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 N₂ cylinder
 - a. Install cylinder in P/N 10270 N₂ 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 N₂ cylinder fitting.
 - d. Loosen the rupture disc 1/8 turn.
 - e. Connect a REGULATED nitrogen supply to the N₂ 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 N₂ 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 N₂ 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)

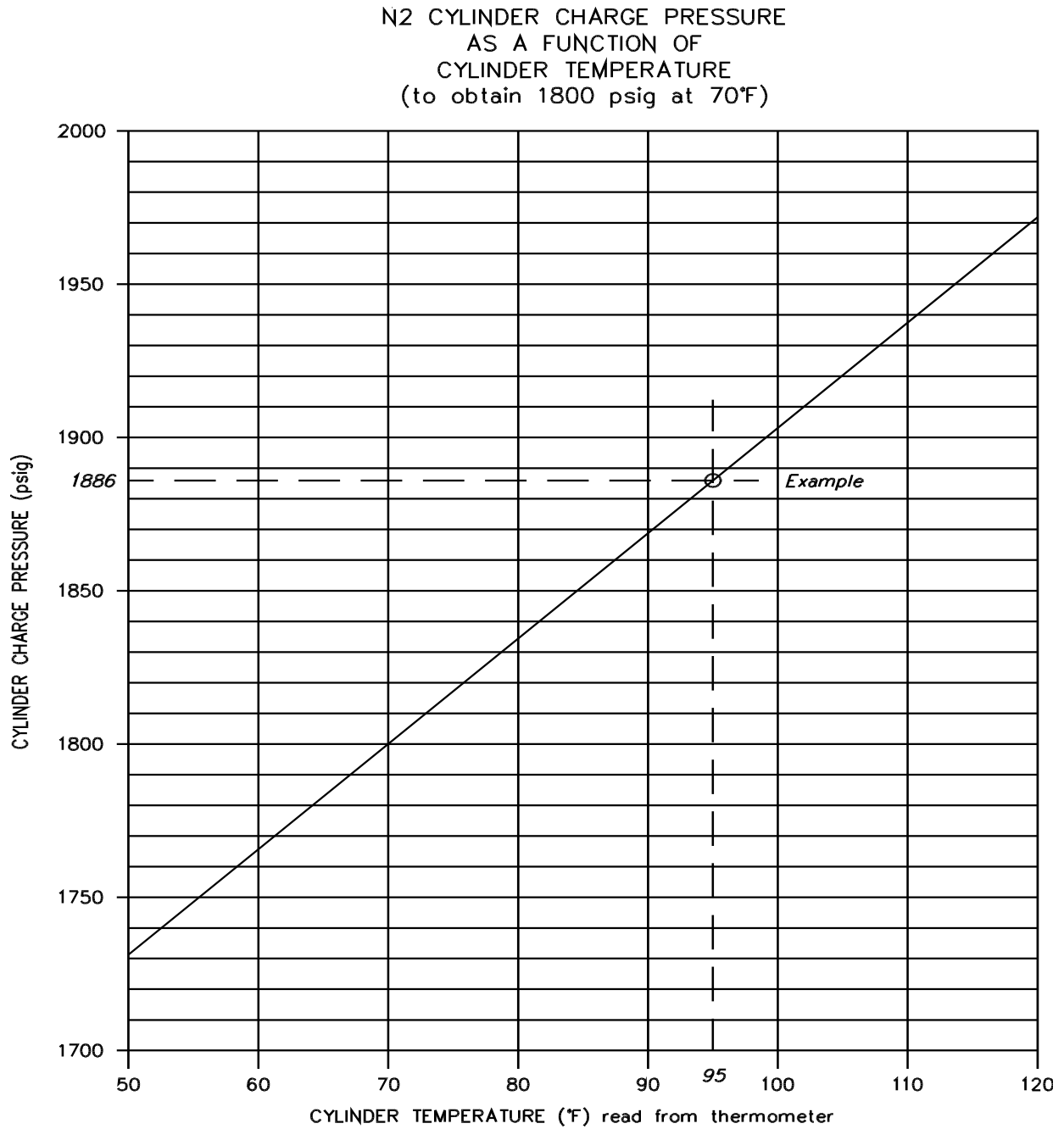


FIGURE 9.1