

PIRANHA Restaurant Fire Suppression Systems

Features

- UL and ULC Listed – Meets requirements of UL 300
- Overlapping appliance protection
- Four nozzle styles cover all hazards
- Dual agents
- Rapid flame knockdown
- Proprietary agent with increased performance
- Fifteen times faster than single wet agent systems in reducing the temperature of the grease below the reflash point
- Reliable cartridge operation
- Aesthetically appealing
- CE Marked

Application

The ANSUL® PIRANHA Restaurant Fire Suppression System is an automatic, pre-engineered, fixed, fire suppression system designed to protect cooking equipment and ventilation equipment including:

Ventilation Equipment

- Hoods
- Ducts
- Plenums
- Filters

Cooking Equipment

- Fryers
- Range Tops
- Griddles
- Broilers: Natural Charcoal Or Chain-Type
- Char-broilers: Electric, Lava Rock, Mesquite Or Gas-Radiant
- Upright
- Woks

The system is ideally suited for use in restaurants, hospitals, nursing homes, hotels, schools, airports, and other similar facilities.

Use of the PIRANHA Restaurant System is limited to interior applications only, or locations that provide weather proof protection to the PIRANHA equipment within tested temperature limitations. The regulated release and tank assemblies must be mounted in an area where the air temperature will not fall below 32 °F (0 °C) or exceed 130 °F (54 °C). The system must be designed and installed within the guidelines of the UL Listed Design, Installation, Recharge, and Maintenance Manual.

System Description

The PIRANHA Restaurant Wet Agent Fire Suppression System is a dual-agent, pre-engineered, fixed, automatic fire suppressing system developed specifically for improved fire protection of commercial restaurant cooking appliances, exhaust hoods and ducts.



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The PIRANHA system is available in three sizes:

- PIRANHA-7 (1.5 gal (5.7 L), 7 nozzle capacity)
- PIRANHA-10 (2.25 gal (8.5 L), 10 nozzle capacity)
- PIRANHA-13 (3.0 gal (11.4 L), 13 nozzle capacity)

When actuated, the system discharges a fixed amount of proprietary wet chemical agent followed by water through the same nozzles. Water is provided by a connection to the domestic or sprinkler water supply. Advantages of the dual system over single wet agent systems include: (1) more robust suppression of hostile fires in protected restaurant hazards; (2) greater hazard area protection with less wet agent; (3) faster flame knockdown and securement of hot fuels such as cooking shortening; (4) overlapping protection of cooking appliances from fixed nozzle spacings, allowing most appliances to be interchanged freely without changing nozzles; (5) more rapid cooling of hot fuels and appliances to prevent re-ignition; (6) simplicity of design and installation; (7) higher nozzle placement for aesthetics.

The addition of the water discharge significantly aids in increasing and prolonging the foam blanket generated by the wet chemical agent. The longer retention of the foam blanket helps the hot grease to cool below the auto-ignition temperature.

The system design for appliance protection under the hood allows the nozzles to be positioned uniformly from one end of the appliance line to the other. Most appliances under the hood can be protected in this overlapping manner; therefore, it is not necessary to protect each appliance individually. Appliances are free to be shifted around under the hood. The only exceptions to this overlapping type coverage are upright broilers, salamanders, and chain broilers. These types of appliances require dedicated nozzle protection.

The system is capable of automatic detection and actuation and/or remote manual actuation. Additional equipment is available for mechanical or electrical power shut-off applications.

The detection portion of the fire suppression system allows for automatic detection by means of specific alloy rated fusible link detectors or electric thermal detectors which, when the temperature exceeds the rating of the link, separate, allowing the regulated release to actuate.

System Description (Continued)

A system owner's guide is available containing basic information pertaining to system operation and maintenance. A detailed technical manual is also available including system description, design, installation, recharge, and maintenance procedures, plus additional equipment installation and resetting instructions.

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

The basic system consists of an AUTOMAN regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. The tank valve is designed to allow the wet chemical agent to discharge onto the hazard area first.

Immediately following the agent discharge, the valve will automatically allow the water to flow through the piping and out the system nozzles. Nozzle blow-off caps, detectors, cartridges, agent, fusible links, and pulley elbows are supplied in separate packages in the quantities needed for the fire suppression system arrangement.

Additional equipment includes remote manual pull station, mechanical and electrical gas valves, and electrical switches for automatic equipment and gas line shut-off. Accessories can be added such as warning lights, etc., to install where required.

The water supply piping includes a lockable valve (for domestic and sprinkler water supply only).

Each tank is limited to a listed maximum number of nozzles.

Component Description

Wet Chemical Agent

The PRX agent is a specially-formulated, aqueous solution of inorganic salts designed for rapid flame knockdown and foam securement of grease-related fires. It is available in 5.0 gal (18.9 L) plastic containers with instructions for wet chemical handling and usage.

Agent Tank

The agent tank is constructed of stainless steel and is installed in a stainless steel enclosure.

Tanks are available in three sizes:

PIRANHA-7:	1.5 gal (5.7 L) capacity
PIRANHA-10:	2.25 gal (8.5 L) capacity
PIRANHA-13:	3.0 gal (11.4 L) capacity

Each tank has a working pressure of 150 psi (10.3 bar), a test pressure of 450 psi (31.0 bar), and a minimum burst pressure of 900 psi (62.1 bar).

The tank includes an adaptor/tube assembly. The adaptor is chrome-plated steel with 1/4 in. NPT female low pressure gas inlet port and a 3/8 in. NPT female agent outlet port. The adaptor also contains a bursting disc seal which prevents the siphoning of agent up the pipe during extreme temperature variations.

Connected to the adaptor/tube assembly is the water flow valve. This valve is designed to allow the wet chemical agent to flow first, and then the valve will automatically switch internally to allow the water to start flowing, thus increasing the foam blanket and providing additional cooling.

AUTOMAN Regulated Release Mechanism

The regulated release mechanism is a spring-loaded, mechanical/pneumatic type capable of providing the expellant gas supply to the agent tank. It contains a factory installed regulator deadset at 150 psi (10.3 bar) with an internal relief of approximately 190 psi (13.1 bar). It has automatic actuation capabilities

by a fusible link detection system and remote manual actuation by a mechanical pull station.

The regulated release mechanism contains a release assembly, regulator, and expellant gas hose in a stainless steel enclosure with cover. The enclosure contains knock-outs for 1/2 in. conduit. The cover contains an opening for a visual status indicator. The regulated release assembly also contains an anti-siphon vacuum breaker which is designed to prevent back-siphonage of possible contaminated water into a potable water supply.

The regulated release mechanism is compatible with mechanical gas shut-off devices or, when equipped with a field or factory installed switch, compatible with electric gas valve appliance shut-off devices.

Regulated Actuator Assembly

When more than one tank(s) is required for the application, a regulated actuator(s) is available to provide expellant gas for the additional tank(s). It contains a regulator dead set at 150 psi (10.3 bar) with an external relief of approximately 180 psi (12.4 bar). It has automatic actuation capabilities using pressure from the regulated release mechanism cartridge.

The regulated actuator assembly contains an actuator, regulator, expellant gas hose, and agent tank housed in a stainless steel enclosure with cover. The enclosure contains knockouts to permit installation of the expellant gas line.

Discharge Nozzles

Four types of discharge nozzles are tested with the PIRANHA system for all applications. The P34 and P41 nozzle types are used for overlapping, high proximity appliance protection. The AP type is used for medium proximity appliance and plenum protection, and the DL type is used for all duct protection and low proximity appliance protection. Each nozzle has a metal blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.

Water Shutdown Device

The water shutdown device is an optional component which can be field installed in the AUTOMAN release. With the device installed, the water flow to the discharge nozzles will automatically shut down approximately 10 minutes after system actuation.

Agent Distribution Hose

Kitchen appliances manufactured with or resting on casters (wheels/rollers) may include an agent distribution hose as a component of the suppression system. This allows the appliance to be moved for cleaning purposes without disconnecting the appliance fire suppression protection. The hose assembly includes a restraining cable kit to limit the appliance movement within the range (length) of the flexible hose.

Flexible Conduit

Flexible conduit allows for quicker pull station and/or mechanical gas valve installations and the convenience of being able to route the cable over, under, and around obstacles. Flexible conduit can be used as a substitute for standard EMT conduit or can be used with EMT conduit.

Flexible conduit can be used only with the Molded Remote Manual Pull Station.

Pull Station Assembly

The remote manual pull station is made of a molded red composite material. The red color makes the pull station more readily identifiable as the manual means for fire suppression system operation. The pull station is designed with a pull handle to allow for three-finger operation, and includes a built-in guard to protect the pull handle.

The pull station is compatible with the ANSUL Flexible Conduit and 1/2 in. EMT conduit.

Codes and Standards

The PIRANHA hybrid wet agent system and its components meet the following codes, standards and recommended practices:

- UL/ULC Listed
- CE Marked
- LPCB
- ASSE
- IAPMO
- Meets requirements of NFPA 17A (Standard on Wet Chemical Extinguishing Systems)
- Meets requirements of NFPA 96 (Standard for Ventilation Control and Fire Protection of Commercial Cooking Equipment)

Ordering Information

Order all system components through your local authorized ANSUL Distributor.

Specifications

An ANSUL PIRANHA Fire Suppression System shall be furnished. The system shall be capable of protecting hazard areas associated with cooking equipment.

1.0 GENERAL

1.1 References

- 1.1.1 Underwriters Laboratories, Inc. (UL)
 - 1.1.1.1 UL Standard 300
- 1.1.2 Underwriters Laboratories of Canada (ULC)
- 1.1.3 National Fire Protection Association (NFPA)
 - 1.1.3.1 NFPA 96
 - 1.1.3.2 NFPA 17A
- 1.1.4 International Association of Plumbing and Mechanical Officials (IAPMO)
 - 1.1.4.1 PS 108-98

1.2 Submittals

- 1.2.1 Submit two sets of manufacturer's data sheets.
- 1.2.2 Submit two sets of piping design drawings

1.3 System Description

- 1.3.1 The system shall be an automatic fire suppression system using a dual agent concept; wet chemical agent and water for grease-related fires.
- 1.3.2 The system shall be approved for uniform, overlapping appliance protection.
- 1.3.3 The system shall be capable of suppressing fires in the following areas associated with cooking equipment: ventilating equipment including hoods, ducts, plenums, and filters; fryers, griddles and range tops; upright, natural charcoal, or chain-type broilers; electric, lava rock, mesquite or gas-radiant char-broilers; woks.
- 1.3.4 The system shall be the pre-engineered type having minimum and maximum guidelines established by the manufacturer and listed by Underwriters Laboratories, Inc. (UL) and Underwriters Laboratories of Canada (ULC).
- 1.3.5 The system shall be installed and serviced by personnel trained by the manufacturer.

1.4 Quality Control

- 1.4.1 Manufacturer: The Restaurant Fire Suppression System shall be manufactured by a company with over fifty years experience in the design and manufacture of pre-engineered fire suppression systems. The manufacturer shall be ISO 9001 registered.
- 1.4.2 Certificates: The wet agent shall be a specially formulated, aqueous solution of inorganic salts with a pH range between 9.5 – 10.5, designed for rapid flame knockdown and securement of grease-related fires, and specifically constituted to provide continuous evolution of foam when sprayed with water.

1.5 Warranty, Disclaimer, and Limitations

- 1.5.1 The pre-engineered restaurant fire suppression system components shall be warranted for five years from date of delivery against defects in workmanship and materials. Any purchased components, such as electric gas valves, reset relays, solenoids, pressure relief valves, regulators, electric switches, etc. shall be warranted for one year from date of purchase.

1.6 Delivery

- 1.6.1 Packaging: All system components shall be securely packaged to provide protection during shipment.

1.7 Environmental Conditions

- 1.7.1 The system shall be capable of operating in a temperature range of 32 °F to 130 °F (0 °C to 54 °C).

2.0 PRODUCT

2.1 Manufacturer

- 2.1.1 Johnson Controls, One Stanton Street, Marinette, Wisconsin 54143-2542, Telephone (715) 735-7411

2.2 Components

- 2.2.1 The basic system shall consist of a regulated release assembly which includes a regulated release mechanism, stainless steel enclosure, anti-siphon vacuum breaker (domestic and sprinkler water supply option only), and water flow valve (domestic and sprinkler water supply option only). The agent storage tank is purchased separately and shall be mounted within the enclosure.

Nozzles, blow-off caps, detectors, cartridges, agent, fusible links, and pulley elbows shall be supplied in separate packages in quantities needed for fire suppression system arrangements. Additional equipment shall include remote manual pull station, mechanical and electrical gas valves and electrical switches for automatic equipment and gas line shut-off.

- 2.2.2 Wet Chemical Agent: The fire suppressant shall be a specially formulated, aqueous solution of inorganic salts with a pH range between 9.5 – 10.5, designed for rapid flame knockdown and securement of grease-related fires.
- 2.2.3 Agent Tank: The agent tank shall be installed in a stainless steel enclosure. The tank shall be constructed of stainless steel. Tanks shall be available in three sizes; 1.5 gal (5.7 L), 2.25 gal (8.5 L), and 3.0 gal (11.4 L). The tanks shall have a working pressure of 150 psi (10.3 bar), a test pressure of 450 psi (31.0 bar), and a minimum burst pressure of 900 psi (62.1 bar). The tank shall include an adaptor/tube assembly containing a burst disc union.

Specifications (Continued)

- 2.2.4 Tank Valve: The tank valve shall be designed to discharge dual agent onto the hazards being protected. The valve shall automatically shuttle to switch from wet chemical agent discharge to water discharge.
- 2.2.5 Regulated Release Mechanism: The regulated release mechanism shall be a spring-loaded, mechanical/pneumatic type capable of providing the expellant gas supply via a pressurized cartridge to a single agent tank. It shall contain a factory installed regulator deadset at 150 psi (10.3 bar) with an internal relief of approximately 190 psi (13.1 bar).
- It shall have automatic actuation by a fusible link or electric detection system and remote manual actuation by a mechanical pull station.
- The regulated release mechanism shall contain a release assembly, regulator, expellant gas hose, anti-siphon vacuum breaker, and agent storage tank housed in a stainless steel enclosure with cover. The enclosure shall contain knock-outs for 1/2 in. conduit. The cover shall contain an opening for a visual status indicator.
- It shall be compatible with mechanical gas shut-off devices or, when equipped with a field or factory-installed switch, compatible with electric gas line or appliance shut-off devices.
- 2.2.6 Discharge Nozzles: Four types of discharge nozzles shall be tested and listed with the system for all applications. Discharge Nozzles are available for low, medium, or high proximity applications. When using high proximity nozzles, nozzle drop piping can be kept to a minimum. In some applications, nozzles may be installed above the cooking appliance line directly in hood seals penetrating top of the hood. The P34 and P41 types shall be used for high proximity appliance protection, nozzle height ranges from 54 in. (1,371 mm) to 84 in. (2,133 mm). The AP type shall be used for medium proximity appliance and plenum protection, nozzle height ranges from 40 in. (1,016 mm) to 48 in. (1,219 mm), and the DL type shall be used for all duct and low proximity appliance protection, nozzle height ranges from 13 in. (330 mm) to 24 in. (610 mm). Each nozzle shall have a metal blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.
- 2.2.7 Distribution Piping: Distribution piping shall be Schedule 40 black iron, chrome-plated, or stainless steel pipe conforming to ASTM A120, A53, or A106.
- 2.2.8 Detectors: The detectors shall be the fusible link or electric thermal type designed to separate at a specific temperature.
- 2.2.9 Cartridges: The cartridge shall be a sealed steel pressure vessel containing nitrogen gas. The cartridge seal shall be designed to be punctured by the releasing device supplying the required pressure to expel the wet chemical agent from the storage tank.
- 2.2.10 Water supply piping: The water supply piping portion of the dual agent system shall contain a lockable ball valve. The lockable ball valve shall be installed in the water supply piping to allow authorized personnel to close the valve after a system actuation and stop the flow of water into the hazard area.
- 2.2.11 Water shutdown device: With the approval of the AHJ, a water shutdown device shall be installed. This device shall automatically shutdown the flow of water to the discharge nozzles approximately 10 minutes after system actuation.

- 2.2.12 Agent Distribution Hose: Kitchen appliances manufactured with or resting on casters (wheels/rollers) which have the fire suppression system hard piped, shall include a UL Listed agent distribution hose as a component of the suppression system. This option shall allow the appliance to be moved for cleaning purposes without disconnecting the appliance fire suppression protection. Hose assembly shall include a restraining cable kit to limit the appliance movement within the range (length) of the flexible hose.
- 2.2.13 Flexible Conduit: The manufacturer supplying the restaurant fire suppression system shall offer flexible conduit as an option to rigid EMT conduit for the installation of pull stations and/or mechanical gas valves. The flexible conduit shall be UL Listed and include all approved components for proper installation.
- 2.2.14 Pull Station Assembly: The fire suppression system shall include a remote pull station for manual system actuation. The pull station shall include a built-in guard to protect the pull handle. The pull station shall also be designed with a pull handle to allow for three finger operation and shall be red in color for quick visibility.



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Standard AUTOMAN Release

Size: 20 1/2 in. x 23 1/2 in. x 7 1/2 in.
(521 mm x 597 mm x 191 mm)

Weight: Approximately 70 lb (32 kg) including charged tank

3.0 IMPLEMENTATION

3.1 Installation

- 3.1.1 The fire suppression system shall be designed, installed, inspected, maintained, and recharged in accordance with the manufacturer's listed instruction manual.

3.2 Training

- 3.2.1 Employees shall be instructed in personal safety and the operation of the system by authorized ANSUL distributors who are trained by the manufacturer.

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

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