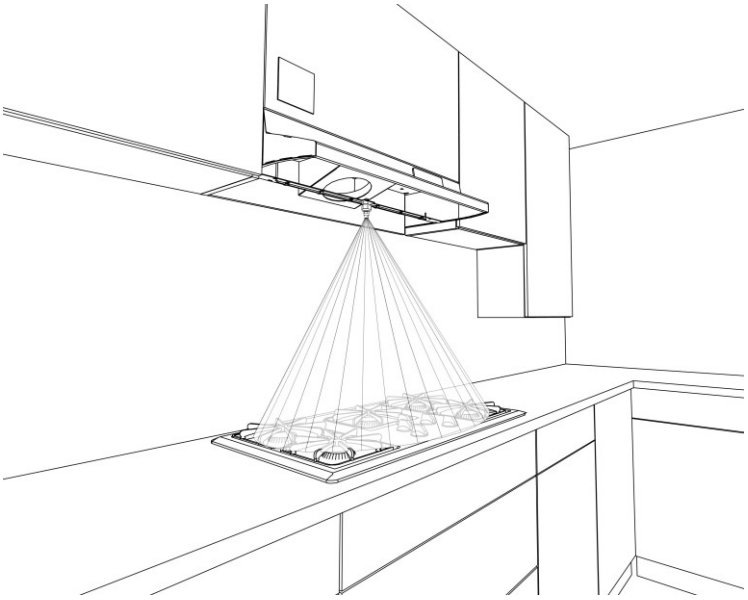
Kitchen Fire Stop Installation and Maintenance Manual

March 2020



Tested and listed by:

More Fire Protection Ltd.
#127 7198 Vantage Way
Delta, BC, V4G 1K7,
CANADA

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Warranty Certificate

1. A product purchased under this Warranty Certificate will benefit from a warranty period of 12 months from the date of purchase (hereinafter - “Warranty Period”), on the terms set forth in this Warranty Certificate.
2. Upon receipt of the product and/or service, the customer confirms, by acceptance of the product/service, that they have been supplied to him by More Fire Protection Ltd. or a licensed distributer, that they comply fully and precisely with what the customer ordered from More Fire Protection, and that he has no complaints and/or demands vis-à-vis More Fire Protection in connection with such product/service.
3. More Fire Protection liability is limited to replacing defective parts in the product, at the exclusive discretion of More Fire Protection, in the course of the Warranty Period only, and subject to the contents of Clauses 4-6 below. This liability is individual to the customer whose particulars are stated at the top of this Warranty Certificate, it is valid solely for him and it may not be transferred to any third party whatsoever.
4. The liability contemplated is the sole, exclusive and full liability of More Fire Protection with respect to the product and/or service, and makes no representations in addition to and/or other than those stipulated in this Warranty Certificate and all attachments thereto in connection with the product and/or service, and it gives no warranty in addition to and/or other than as stipulated expressly in this Warranty Certificate. Without derogating from the generality of the aforesaid, it is hereby clarified that the warranty contemplated by this certificate shall not apply to any loss, damage and/or consequence, whether direct or indirect, that may be caused to the customer or any third party in connection with the product/service/equipment beyond the warranty specified in Clause 3 above.
5. The liability for the product shall not apply to the following events and cases:

    5.1 The product was used in other than ordinary conditions or not in accordance with More Fire Protection technical specifications and instructions for use attached to this Warranty Certificate as the Kitchen Fire Stop Installation and Maintenance Manual.

    5.2 The damage to the product was caused due the use of unreasonable force, malice or exposure of the product to corrosive conditions.

    5.3 The installation and annual maintenance of the product were not performed as detailed in this manual and not reported to kitchenfirestop.com.

    5.4 Repairs and/or changes and/or adaptations were performed in the product (or in any part or component thereof) and/or in its accompanying equipment, including transfer from place to place of a system fixed onto a wall without prior approval by More Fire Protection’s representative.

    5.5 The damage to the product was caused as a result of force majeure such as fire, flood, accident, etc.

    5.6 The product was damaged as a result of the customer’s negligence and neglect.

5.7 Replacements and/or adjustments were installed and/or made and/or executed in the product or any part thereof, using products and replacement parts not originally supplied by More Fire Protection.

6. For the removal of doubt it is hereby emphasized that More Fire Protection's liability for the product is conditional upon the cumulative fulfillment of all of the following conditions:

   6.1 The product has been handled, stored, installed, maintained and used reasonably and correctly in accordance with the information delivered to the customer in connection with the product attached to this Warranty Certificate as the **Kitchen Fire Stop Installation and Maintenance Manual**.
   6.2 The customer will notify More Fire Protection through kitchenfirestop.com, in the course of the Warranty Period and immediately after the event occurred, that a defect or any incapacity has developed in the product, with a precise description of the defects and the scope thereof, attaching this Warranty Certificate, with full particulars and the purchase invoice details thereto.
   6.3 The customer has transferred to More Fire Protection or its distributer a full payment for the product and/or the service, before delivery of the product and/or provision of the service to the customer.

7. All supply, installation, maintenance services for More Fire Protection products shall be performed precisely according to this manual.
8. No later than 14 business days after the date of the customer's notification through kitchenfirestop.com concerning the discovery of the defect in the product, More Fire Protection shall send a qualified representative on its behalf to the customer's premises. The representative shall perform the service operation on the product, to the extent it can actually be performed on the customer's premises. In the event that the More Fire Protection representative decides in his exclusive discretion, that it is not possible to repair the product on the customer's premises, the product and/or the related equipment shall be taken by the More Fire Protection representative to the More Fire Protection factory or maintenance facility for further handling.
9. In the event that, in the exclusive discretion of More Fire Protection or anyone on its behalf, it is determined that it is necessary to replace the product or parts and equipment related thereto, More Fire Protection shall repair the product or shall replace what has to be repaired with a new or substitute product/equipment, provided that the substitute product complies with parameters materially similar to those of the product and/or equipment it replaces. It is clarified that the decision concerning replacement of a product/equipment and/or installation of a new product/equipment is subject solely to the absolute and exclusive discretion of More Fire Protection and its qualified representatives.
10. This Warranty Certificate shall be in effect only when it is attached to a tax invoice describing the type of product/system/equipment/service, the date of purchase / provision of service, stamp and signature, and only after the customer has filled in all details, and after the customer registered the product installed at

kitchenfirestop.com no later than 14 days after the date of purchase. A pre-condition for complying with the Warranty Certificate herein is the customer's full, absolute and timely compliance with his undertaking to pay for the aforesaid product/equipment/service.

11. The exclusive jurisdiction in connection with and deriving from this Warranty Certificate is vested solely in the competent courts in British Columbia, Canada.

About this manual

This installation and maintenance manual contain essential information on installing and maintaining the Kitchen Fire Stop Residential Kitchen Fire Suppression System safely and effectively. Before use, thoroughly review this manual and use the system as instructed.

Keep this manual in a safe, accessible location.

The words WARNING, CAUTION, and Note carry special information that the user should be carefully review.

	**WARNING**	Provides information to the user regarding conditions that could be hazardous.
	**CAUTION**	Provides information regarding possible operation that could result in personal injury or damage to the equipment.
Note	**Note**	Provides special information to clarify instructions or present additional information.

1 General Information

The Kitchen Fire Stop automatic wet chemical suppression system is designed and tested to provide fire protection for residential cooking. This protection system covers the appliance. This system is manufactured by More Fire Protection Ltd.

The Kitchen Fire Stop systems are a pre designed and limited to manufacturer-covered specifications.

It is essentially important that all processes for installation of the Kitchen Fire Stop be performed as defined in this manual. All specifications and functions, including pipe limitations, nozzle coverage, detector placements, and so forth, have been stringently tested and conformed with the UL 300A standard. Use of components not included in this manual, or any installation beyond the limitations defined in the instruction manual, or changing range-hoods or appliances after system installation by any cause, or maintenance, not according to the requirements of this manual shall void all Kitchen Fire Stop system listings and More Fire Protection warranty.

1.1 Listing

The Kitchen Fire Stop is listed by Intertek Testing Services NA as a wet chemical fire extinguishing system unit. The system is evaluated according to Subject UL300A.

Tests required for listing involved live fire tests under special conditions, as required by UL300A for fire suppression for residential cooktops. Test fires were allowed to reach high level of intensity before the agent was discharged. Representative tests were repeated using both maximum and minimum distance between hood and cooktop, as well as variations in the cylinder agent storage pressure, in order to simulate maximum and minimum temperature levels with hoods fans operating and turned off. Splash test was conducted to assure that the discharge of the agent would not cause burning oil to splash, and thereby preserve maximum user safety during cooking operations.

1.2 Design

The Kitchen Fire Stop is based on mechanical and electrical components to be installed by any skilled person. The system consists of a cylinder charged with a liquid agent, and a discharge valve including an electrical release valve.

The system operates automatically via a linear detector, or manually with a manual pull station. Either way the system will immediately shut down energy or fuel sources to the cooking appliance. The electric disconnecting box and natural gas disconnecting box with a suitable gas valve are referred to in this manual. Other features such as audible/visual alarm and trouble indicator are part of the ME300 control unit.

The Kitchen Fire Stop fire suppression system in residential cooking equipment uses a spray liquid extinguishing agent "K -TYPE" engineered to extinguish cooktop fires.

The Kitchen Fire Stop system should only be installed in a one-to-one setup (one Kitchen Fire Stop to one cooking appliance).

The primary objective for fire suppression is the saponification of grease laden surfaces, along with the cooling of hot oil and metal surfaces thereby reducing temperature levels below the self-ignition point of cooking oil.

When the system triggers operations, the exhaust fans could be left on and the appliance supply will be cut off.

The extinguishing agent cylinder shall not be installed or stored in an environment below 0° or over 49°C.

1.3 Terms and Definitions

1.3.1 Adjustable Joint

A device holding the nozzle allowing adjustment of discharge spray to be directed to the center of the cooktop.

1.3.2 Agent cylinder assembly

Pressurized 5 Lb. cylinder (2.3 liter) with a dispersion valve and containing a wet chemical kitchen fire extinguishing agent marked "K-TYPE".

1.3.3 Authority having jurisdiction (AHJ)

The organization, office or individual responsible for approving the equipment, that installation was done correctly and procedures followed.

The phrase "Authority Having Jurisdiction" is used in the NFPA documents in a broad manner, since different agencies are responsible for approvals, where public safety is in order.

1.3.4 Cooking appliance

Includes, but not limited to ranges, griddles, char broilers and cooktops.

1.3.5 Detector/Nozzle bracket

A bracket that holds the linear detector and the nozzle.

1.3.6 Disconnecting box

Equipment used in conjunction with the Kitchen Fire Stop system to shut down power to the range/stove/cooktop in a metal box.

1.3.7 End of line resistor

Connected at the end of the linear detector and manual pull station to enable supervision of the device.

1.3.8 Gas valve

An electrical valve that shuts down the flow of natural gas to a cooking appliance at the instant the fire suppression system goes off. This device is required to stop heating the cooking vessels. It is normally closed. It will need continuous 110v supply to allow gas delivery.

1.3.9 Grease

Animal fat, vegetal oils or any combination thereof used for cooking. Grease can be vaporized into exhaust air as grease laden vapors and can be in liquid or solid states.

1.3.10 Grease filter

This component traps oil from vapors. Exhaust vapors are funneled through the filter reducing the amount of combustible vapors into the environment.

1.3.11 Input

An incoming event monitored by the ME300 control unit. Examples of an input include a detector sensing fire or the manual pull station being activated.

1.3.12 Inspection

A "quick check" done to assure that the system has not been tampered with and is in good operating condition.

1.3.13 Interconnection cable

A 4 wire 22-gauge cable used to connect the disconnecting box control together with 12 VDC Power Supply to the ME300 control unit. This cable should be protected against heat/fire.

1.3.14 Linear Heat Detector

A heat detector (wire), installed under and adjacent to the hood, on a bracket, that will trigger in 68°, 105° or 138° degrees Celsius (155°, 220° or 280° Fahrenheit).

1.3.15 Listed

Approved equipment, materials, components and parts published by an organization acceptable to the AHJ (Authority Having Jurisdiction). Listed products meet certain quality standards suitable for a specific use and maintain approved status following periodic inspections by the listing organization. Listed products are valid only if they show the approving label.

1.3.16 Maintenance

A thorough inspection to assure the system will operate as intended. Design parameters should be closely examined for hazardous changes since the last inspection. Parts and components should be closely examined tested or replaced if necessary.

1.3.17 Manual pull station

A triggering device close to or remotely located from a fire that allows the system to be discharged manually.

1.3.18 ME300 Control Unit

A unit which performs detection and control actions to be enclosed in a two-gang box.

1.3.19 Nozzle

The suppression agent discharge unit. The nozzle is to be installed pointing at the center of the cooktop via an adjustable joint.

1.3.20 Output

A system's response when an input command is received at the ME300. For example: agent release (output), power shut-off (output), remote signal (output), gas valve closure (output), buzzer sounder goes off.

1.3.21 Pre-designed system

A system having pre-determined flow rate, cylinder pressure and quantity of agent. A pre-designed system has specific flexible hose size and length, a specific nozzle a specific detector etc. The hazards protected by a pre-designed system are specifically limited 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.

1.3.22 Saponification

Soap like foam produced when fats and/or oils react with alkaline materials. Fire extinguishing agents made with sodium bicarbonate, potassium bicarbonate, potassium acetate and potassium carbonate cause Saponification when they come in contact with hot grease. Rendered animal fat and oils containing high percentages of saturated fat saponify better than cooking oils containing low percentages of saturated fat.

1.3.23 Under Cabinet Range Hood

A common residential unit with a fan or fans that can accommodate up to 680 CFM and up to 36” width.

1.3.24 Over the Range Microwave Oven

OTR **Microwave**, combines a **microwave oven** with a **range** hood. This 2-in-1 unit is designed to be installed **over** a **range** or cooktop and includes all required mounting hardware. 30” wide.

2 System Description

This section details the specifications for a pre-designed system with wet chemical for extinguishing fires in residential kitchens.

2.1 Kitchen Fire Stop

The Kitchen Fire Stop for residential kitchens is a pre-designed system. It contains a liquid agent stored under pressure that when activated is transmitted through flexible hose and discharged through a nozzle.

Under no circumstances shall the customer recharge the system.

If a recharge is required, contact More Fire Protection.

The system has been designed, assembled and maintained according to the instructions in the **Kitchen Fire Stop Residential Kitchen Fire Suppression System Installation and Maintenance Manual**.

This system shall be installed according to local regulations. A skilled person can install, operate, and maintain the system.

2.2 Suppression Agent

The "K-TYPE" liquid agent is based on a metal salt compound that extinguishes cooking oil fires by means of cooling and saponification. The PH of the extinguisher agent is 9-11. The cylinder steel surface and discharge unit are protected.

2.3 Cylinder Assembly / Discharge Valve

The cylinder is steel manufactured DOT 4B or 4BW, tested per UL 299. The discharge valve and the extinguishing agent are charged at a nominal pressure of 100 PSI.

2.4 Detection

The detection network uses a linear detector XCR 280F/220F/155F: continuous cable that triggers at 280° F (138° C)/ 220° F (105° C)/ 155° F (68° C). The different temperature rating is due to the distance between the hood and the cooktop and the type of cooktop: electrical or gas.

2.5 Suppression Agent Cylinder Bracket

The cylinder mounting bracket is made of steel and supplied by More Fire Protection.

2.6 Detector/Nozzle Bracket

This bracket is made of stainless steel and runs under the bottom surface of the hood.

2.7 Discharge Nozzle

Discharge nozzle is made of brass (stainless steel available); 3/8” inlet and providing in average 0.7 gallon per minute onto the cooktop surface for 45 seconds.

2.8 Manual Pull Station

The manual pull station will trigger the system in the same manner the linear detector will. A hex key (enclosed) is required to reset the station.

2.9 Gas Valve

If the range is a natural gas or propane type, then an electrical gas valve is specified. More Fire Protection supplies a UL listed valve for use in low pressure applications (up to 2 PSI).

The valve is normally closed. It will close without power.

2.10 Disconnecting Box

All systems, electric or gas, will be equipped with a disconnecting box for the purpose of shutting off the power when the system is activated.

The electric disconnecting box includes a UL-listed power relay which will supply current to the range, stove or cooktop.

The gas disconnecting box will drive the UL-listed natural gas valve.

Both boxes will host the 12VDC 2 AMP UL-listed power supply (enclosed).

3 System Components

System components include the following:

- Fire extinguishing agent (2 Liters)
- Suppression agent cylinder (KFS 5 Lb. / 2.3 liter)
- Mounting bracket (for 5 Lb. /2 liter cylinder)
- Discharge nozzle
- Adjustable joint
- Detector/nozzle bracket
- Linear detector
- Manual pull station
- Electrical shut off gas valve
- Disconnecting box
- Control plug (3 wires)
- ME300 Control Unit
- Flexible braided hose
- Nozzle and Adjustable Joint

3.1 Fire Extinguishing Agent (5 Gallons)

3.1.1 Product number: KFS7670005

The liquid extinguishing agent "K-TYPE" is a special formulated SALT compound for use in fats and cooking oil fires. More Fire Protection ships the filler in plastic containers, with date and batch details marked on each one. This item ships to distributors only.

The "K-TYPE" wet chemical is a strong basic mixture. Personnel who will handle them must wear safety glasses and gloves and avoid the chemical from contacting the skin.

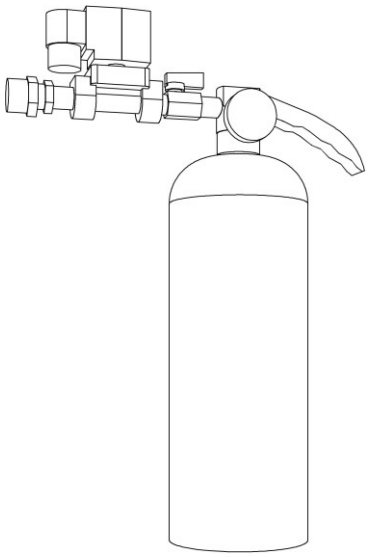
In case of contact, wash the solution off hoods and cooktops to avoid damage to appliances. Discard any food that has come in contact with the agent.

Agent must be replaced every five years to keep its suppression qualities. See Chapter 7: System Maintenance.

3.2 Suppression Agent Cylinder and Discharge Head (5 Lb. / 2.3 liter)

3.2.1 Product number: KFS1310005

Cylinders with capacities of 5 pounds (2.3 liters) charged with 2 liters of "K-TYPE" liquid agent, are shipped filled from the factory. The agent is pressurized with air pressure of 100 PSI at 70°F (21°C). The air charge is used as the expellant gas which discharges the "K-TYPE" agent into the discharge network.



Cylinders for the system are produced with: DOT 4B, tested to UL 299 requirements.

All components and cylinders are designed to work at temperatures from 0°C to 49°C.

The discharge ball valve is manufactured of brass and mechanically activated. It is shipped in “close” position and should only be turned “on” after installation once the system is fully tested.

The UL listed solenoid valve attached to the ball valve is controlled by the ME300 control unit and will open once the system goes off.

The discharge ball valve and the solenoid valve have a male/female joint of 3/8" NPT.

This product ships filled and pressurized.

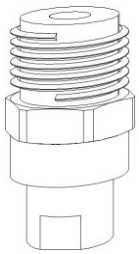
3.3 Mounting Bracket (for 5 Lb. /2 liter cylinder)

3.3.1 Product number: KFS1310010

This mounting bracket is used to secure the 5 Lb. (2.3 liter) cylinder assembly to the mounting surface. The bracket is made of steel with horizontal and vertical supports welded on it. It employs a latching mechanism to lock the cylinder in place. The bracket will be installed only in vertical position where the discharge valves facing up.

3.4 Discharge Nozzle

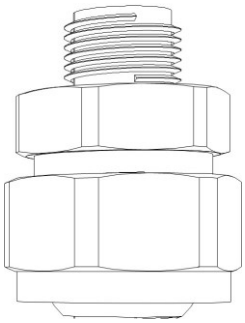
3.4.1 Product number: KFS2050005



There is only one type of nozzle listed for use with the Kitchen Fire Stop system. The nozzle has a specific flow rate and a specific discharge pattern. Installation and coverage of the nozzle is described in the **System Installation** section of this manual.

3.4.2 Adjustable Joint

Product number: KFS2050010



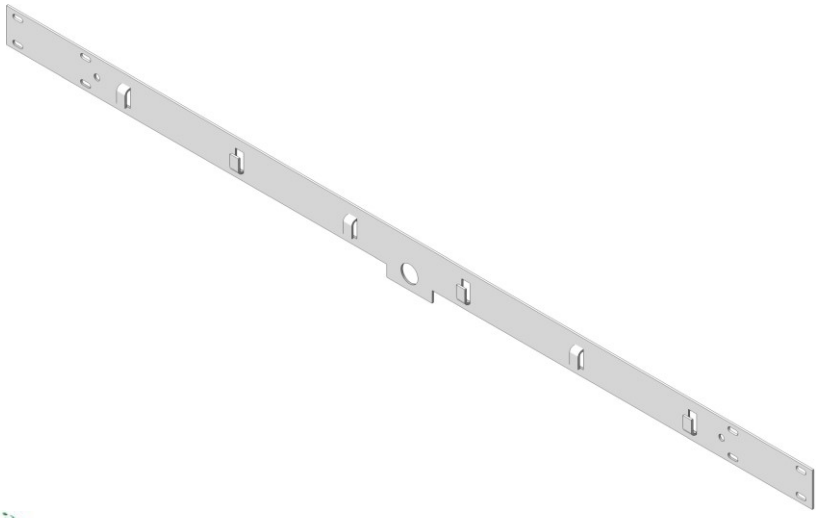
This is a 3/8” in 3/8” out swivel joint used to direct the nozzle to the center of the burners or cooktop up to 45 degrees.

3.5 Detector/Nozzle Bracket

3.5.1 Product number: KFS2050015

The mounting bracket serves as a support for the detector wire and the adjustable joint and is attached to a stable and rigid surface (at the bottom corners of the range hood or the OTR microwave. The bracket will fit 30” or 36” wide hoods (parts extending the hood ends must be cut off) and 30” OTR microwave.

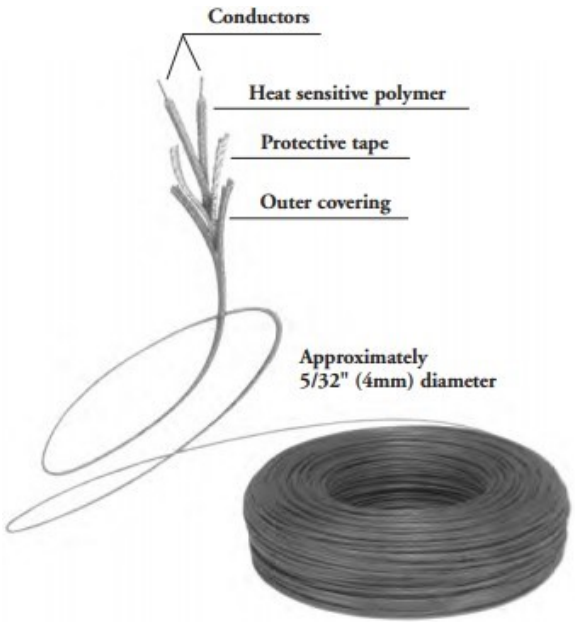
Installation of the bracket is described in the System Installation section of this manual.



3.6 Linear Detector

3.6.1 Product number: KFS3050015-280/220/155

This special wire cable extends from the ME300 control unit connection box, through the hood and down to the holding bracket. The cable will trigger at 280/220/155°F (138/105/68°C) and becomes **permanently** shorted.



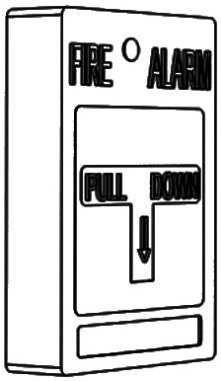
3.7 Manual Pull Station

3.7.1 Product number: KFS4050015

Each Kitchen Fire Stop system shall have one manual pull station. This device provides a means of activating the system manually.

Manual pull station should be located away from the cooktop and mounted at a height easy to reach for the tenants. As tenants maybe little kids or people with disabilities, it is necessary to consult the site manager/owner for the proper location and height of the pull station.

The manual pull station may be recessed into a wall, or surface mounted (one-gang box).



3.8 Electrical Shut Off Gas Valve

	The electrical gas valve used in the Kitchen Fire Stop is UL Listed for the intended end use.

3.8.1 Product number: KFS5050015

The valve consists of a 120 VAC 60 Hz solenoid which keeps the valve open against a spring. Upon activation of the system, current to the solenoid is interrupted by the disconnecting box controlled by ME300 control unit, causing the valve to close. A loss of electrical power will also cause an electrical gas valve to close. Connection sizes are ½".

	Gas valve must be installed by a licensed gas fitter.

3.9 Disconnecting Box

	The disconnecting box shall be installed for each range or cooktop.

3.9.1 120V Natural Gas Box (for Natural Gas applications)

Product number: KFS6050015

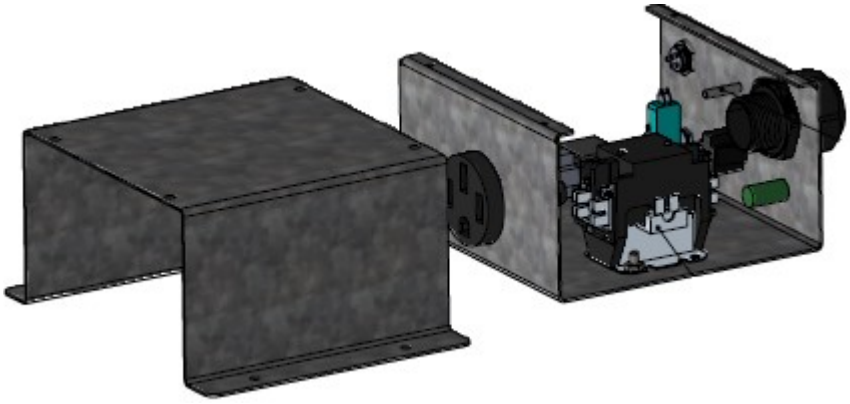
The natural gas box (Box G) is connected to the 120VAC gas valve and controlled by the ME300 control unit. It includes 120V socket to host the 12VDC power supply. The box comes with 120VAC cord and plug.

3.9.2 240V Electrical Disconnecting Box (for electrical applications)

Product number: KFS6050020

The electrical disconnecting box is connected to the 240VAC existing wall range socket with a cord. It contains 50 AMPS power relay which supplies continuous power to the range/cooktop. Upon activation, the box will stop supplying power to the range. Resuming supply only after system reset.

It includes 120V socket to host the 12VDC power supply.



Note: Both the natural gas box and electrical disconnecting box contain a quick test button.

3.10 Control Plug

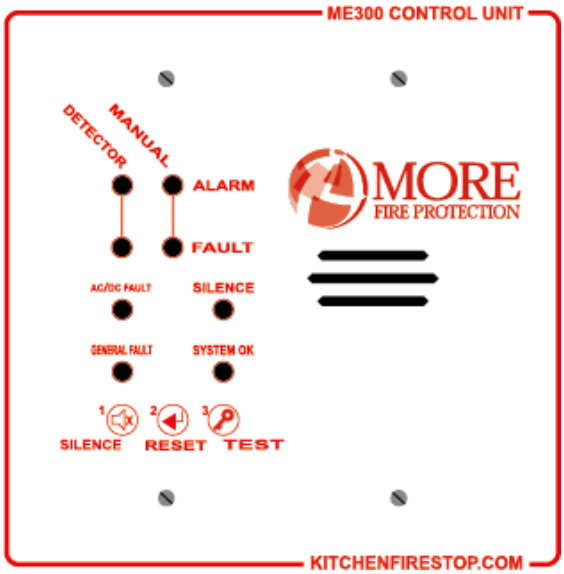
3.10.1 Product number KFS5050025

A dedicated plug which comes with three wires to connect a disconnecting box to the slicing connector in a terminal box (box not supplied).

3.11 ME300 Control Unit

3.11.1 Product number: KFS6060020

The ME300 control unit is the heart of Kitchen Fire Stop suppression system tested to comply with UL 521. The unit will be installed inside a two-gang box (not supplied) either surface mount or wall mount, rather visible to the house tenants.



This unit is powered by the 12V 2AMPS power supply (Product number KFS6050040). It contains rechargeable battery set (Product number KFS6050030)

Upon system activation (automatic or manual) the unit will perform the following:

- Activate suppression for 45 seconds
- Allow buzzer to go off until silence button is pressed
- Allow disconnecting box to stop supply of gas/power to the range/cooktop until reset
- Close alarm output to allow for reporting back to a remote panel such as a home alarm or central fire alarm

RESET operation is available only after system components and agent have been restored.

TROUBLE status is visible with the unit FAULT LEDs and an output reporting to a remote panel.

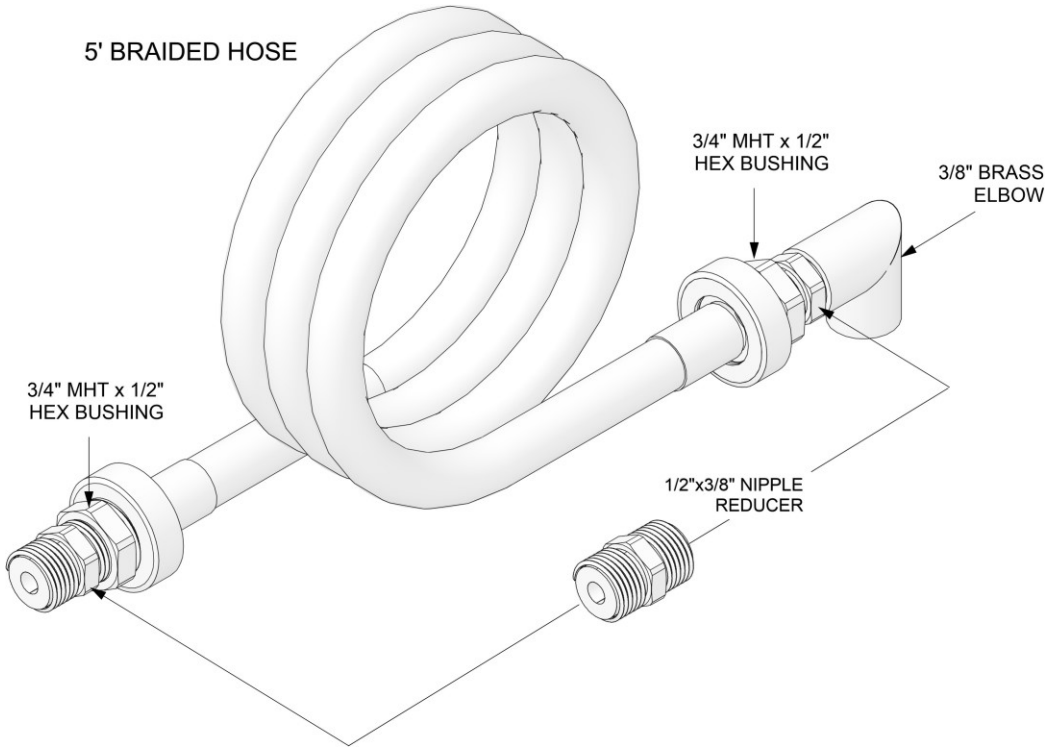
TROUBLE lookup state is enabled with a special code. LEDs analyzed.

This unit continuously supervises the input and output lines, as well as power (AC and DC supply).

Note: Installation of the ME300 control unit is detailed in Chapter 6: ME300 Control Unit Installation and Operation section of this manual.

3.12 Flexible Braided Hose and Fittings

3.12.1 Product number: KFS1300220



The flexible braided hose is made of PVC core and Grade 304 stainless steel braiding.

It’s 5-foot-long and comes with a ¾ brass nut on each end. It may be rounded to minimum of 4” radius (8” diameter). The brass fittings supplied with the hose are shown in the illustration.

3.13 Backup Batteries

3.13.1 Product number: KFS6050025

A pack of four 18650 rechargeable batteries come with a connector compatible with ME300.

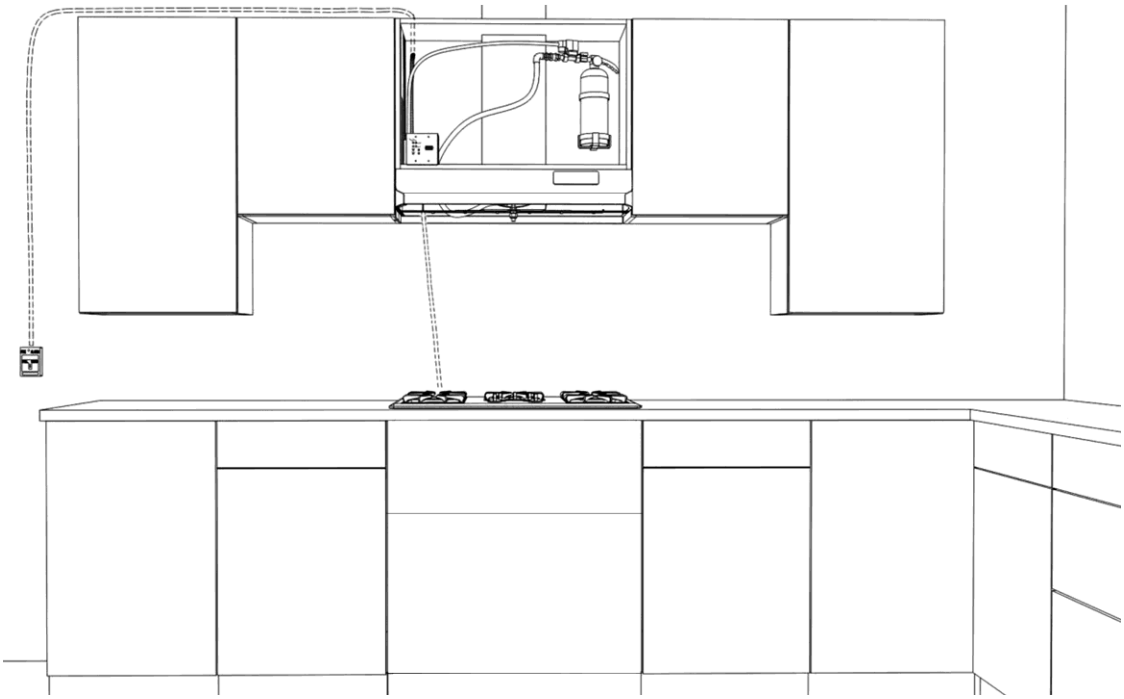
4 System Installation

For the Kitchen Fire Stop system to operate with safe and precise accuracy, it is absolutely essential that it is installed according to the instructions provided here.

This section covers installation of the following:

- Suppression agent cylinder
- Nozzle or detector bracket
- Nozzle and adjustable ball
- Flexible hose
- Linear detector
- Manual pull station
- Electric and Natural Gas disconnecting boxes

The Kitchen Fire Stop has been designed to meet Subject UL300A through fire tests. The system has been proven successful when installed according to the limitations described in this manual. Pictures of the installed system and a checklist shall be provided by the person who installed the system into kitchenfirestop.com and also kept with installers records.



A Kitchen Fire Stop system installed showing a gas stove application

4.1 Limitations of System Coverage

The Kitchen Fire Stop is designed to protect kitchen cooking appliances in a perimeter up to 36” wide.

4.1.1 Distance between cooktop surface and bottom of range hood- 30” or 36” wide cooktops

The distance between the cooktop surface (bottom of cooking vessels and bottom of range hood) can vary between 24” to 36”.

4.1.2 Distance between cooktop surface and 30” over-the-range microwave ovens

The distance between the cooktop surface (bottom of cooking vessels) and bottom of over the range microwave can vary between 16” to 30”.

4.2 Nozzle Location

Nozzle must be connected to the adjustable joint. The pair needs to be installed underneath the hood bottom surface to allow setting the nozzle directed to a middle point of the cooking area.

The adjustable joint must be secured to the bracket and to the surface of the range hood (if it is a closed bottom hood). A 0.75” diameter hole must be drilled in the hood bottom further to determining the location of the bracket.

Note: Installation of the nozzle and detector bracket is detailed in the Install Nozzle and Detector Bracket section.

The adjustable joint can be tilted up to 45 degrees to allow positioning the bracket, ball and nozzle at the closest to center of the cooktop available location under the hood surface.

After installation and setting the direction of the nozzle, lock the joint tight so no one can tilt it without proper tooling.

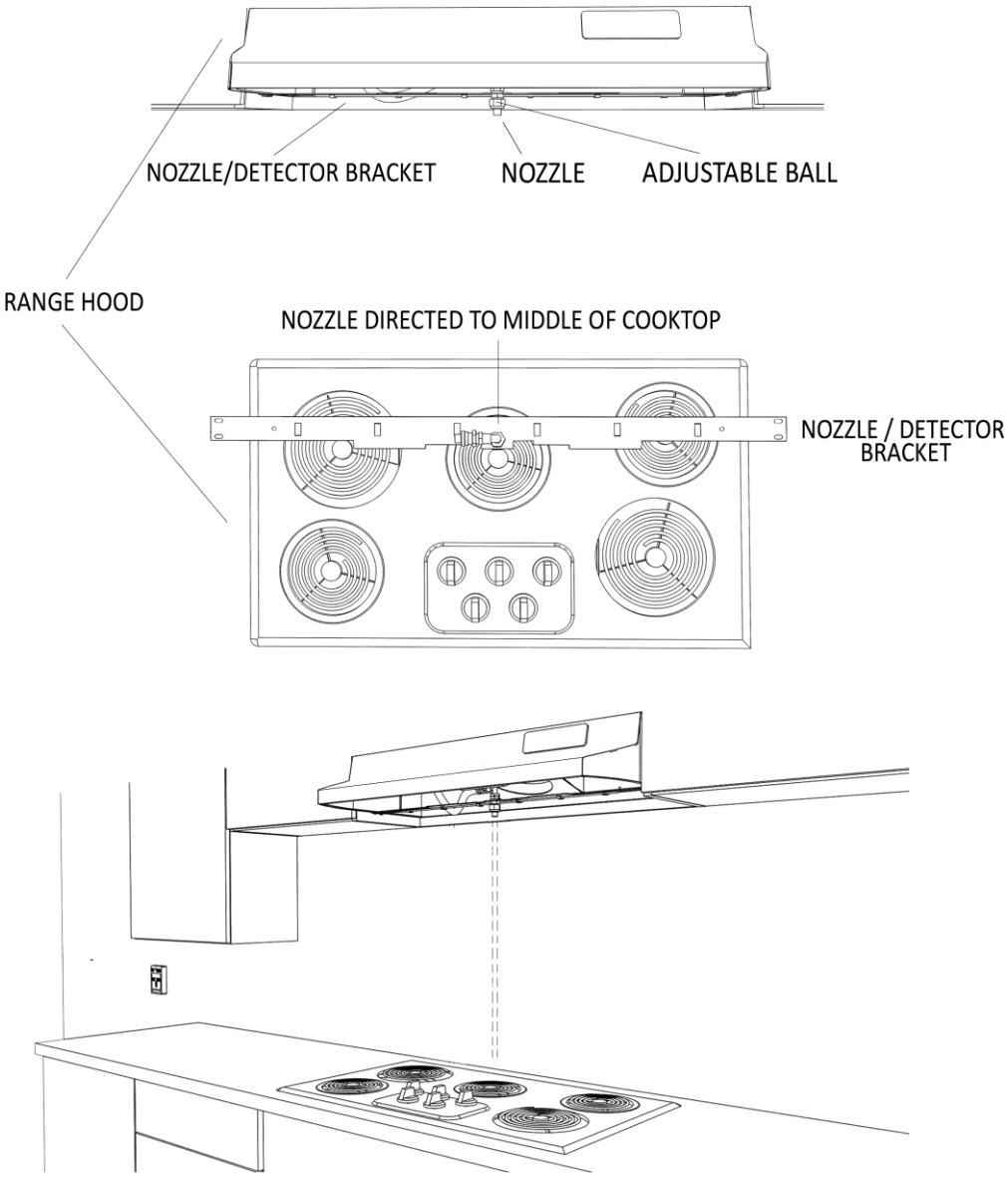


Illustration showing nozzle location

4.3 Install Suppression Agent Cylinder

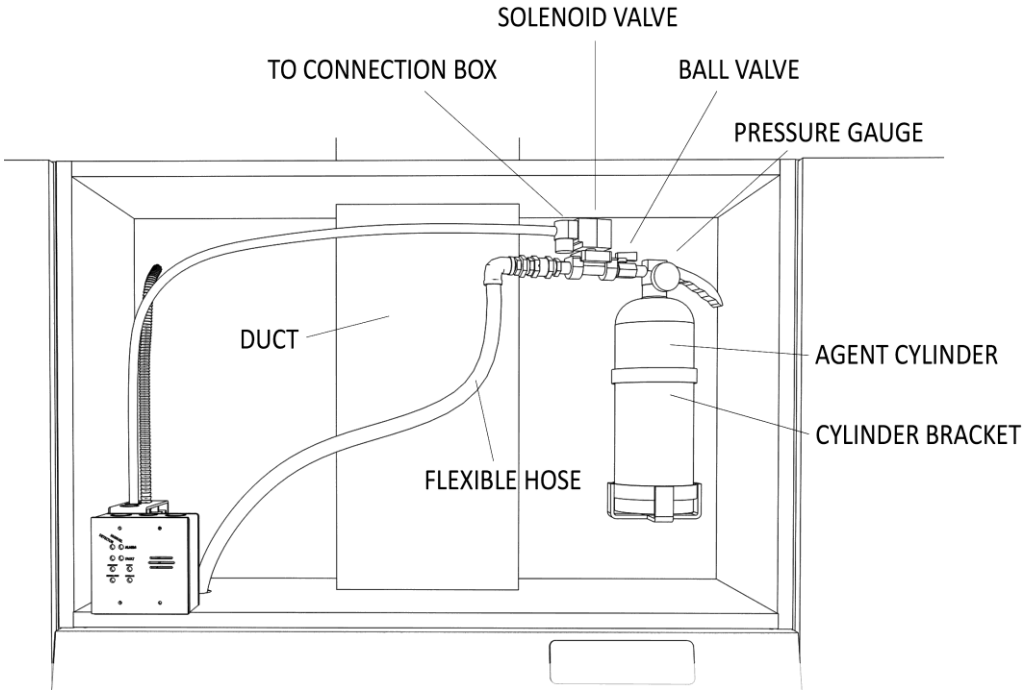


Illustration showing position of components

The suppression agent cylinder is supplied filled and pressurized to 100 psi. The cylinder must be installed in an environment that does not exceed the system's temperature range of 32°F - 120°F (0°C - 49°C).

The ball valve is secured in the **Closed** position to prevent accidental operation **before** system is completely installed and inspected.

The suppression agent cylinder is supplied with the following components:

- Ball valve
- Solenoid valve
- Fittings

They are all connected together to enable the flexible hose to be connected once the suppression agent cylinder is installed.

To install the suppression agent cylinder, complete the following steps:

1 Select the best location to install the suppression agent cylinder:
   - The location must allow for the suppression agent cylinder to be installed vertically.
   - The suppression agent cylinder may be located inside the hood duct cabinet, other cabinet or on the wall.
   - Consider the height and width of the suppression agent cylinder and discharge unit.

- The flexible hose must be connected in a way that it can penetrate the hood without interfering with hood fan operation.
- It must allow for the 5 feet hose and to have maximum bending radius of 4”.
- The discharge unit needs to be facing left and the pressure gauge could be inspected.

2 Mark and install the cylinder bracket into the cabinet back plate or wall using three wood screws.
- If the cylinder is not supported from down below by a cabinet member, find a stud, and hook to it.

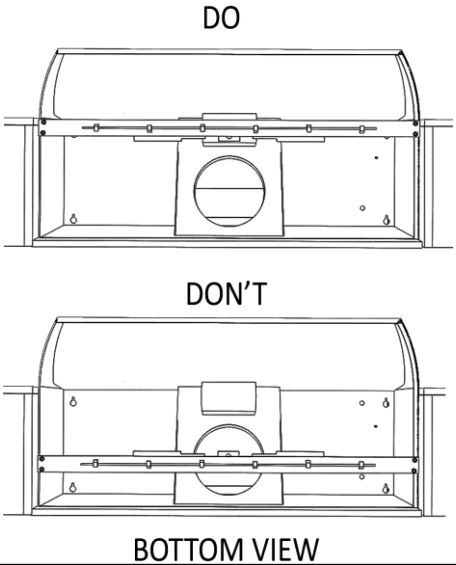
3 Insert the suppression agent cylinder into the bracket and secure the bracket closure.

4.4 Install Nozzle and Detector Bracket

The Kitchen Fire Stop nozzle and detector bracket must be located on the bottom side of the range hood and hooked to the bottom margins of the hood unit.

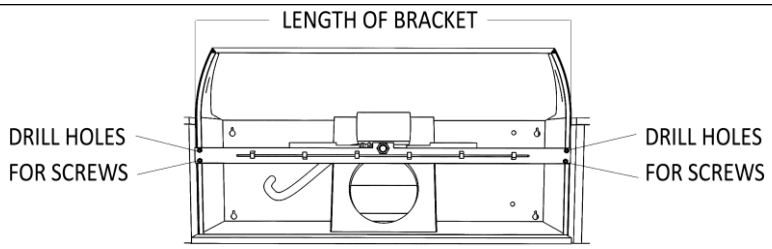
To install the nozzle or detector bracket, complete the following steps:

1 Find a location for the bracket where it can go right to left, as close as possible to the center of the burners on the cooktop.



2 Measure the exact length to fit the hood margins and mark it on the bracket.

Note: 36” or 30” range hoods will fit the bracket. Excess parts will need to be shortened.



3 Determine the exact location of the four screws (two each side) to fit the hood margins and mark them on the margins.
- If needed, you may have to cut the bracket to the length marked.

4 Drill four holes as marked, 0.2” diameter into the margins.

5 Using the bracket, mark the center of nozzle hole on the hood bottom surface.

Note: The nozzle hole must be as close to the center of the burners as possible.

6 Using the bracket, mark the two heat detector holes on the bottom cover of the hood.
- Drill two 0.25” holes as marked.

Note: An open hood needs no holes for nozzle and detector at the bottom.

7 Install bracket.

For bottom covered hoods:
- Drill four 5/64 holes as marked.
- Use 8X1/2 metal screws.

For open bottom hoods:
- Drill four 9/34 holes.
- Use 6-32X3/4 machine screws and nuts.

8 Tighten screws to lock bracket in place.
- Bracket will fit 36” hood with pre-drilled holes to connect it to hood margins.
- Bracket will fit 30” hood with pre-drilled holes to connect to hood margins. Excess parts may need to be cut out.

4.5 Install Nozzle and Adjustable Joint

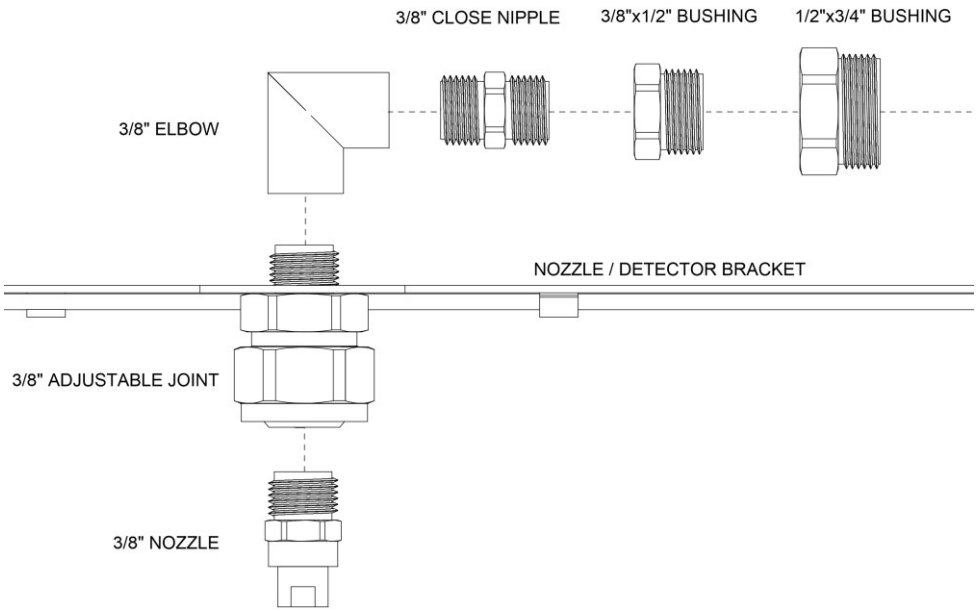
To install the nozzle and adjustable joint, complete the following steps:

1 Insert adjustable joint 3/8” threaded inlet into the nozzle/detector bracket ¾” hole.

2 Connect the 3/8” elbow to the 3/8” joint inlet and tighten strongly.
- Make the elbow facing the side you intend to bring the braided hose from.

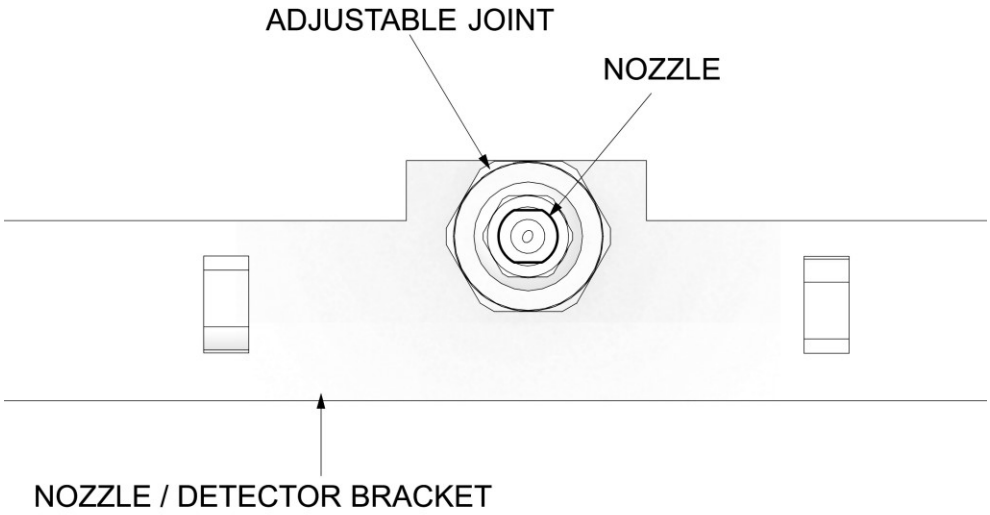
3 Connect the 1/2X3/8 bushing to the elbow with a close 3/8 nipple and tighten strongly.

4 Connect the ½X3/8 bushing to the ¾X1/2 bushing.
- See illustration.



5 Install the nozzle to the adjustable joint.
- Make sure the nozzle’s straight edges are parallel to the back wall to ensure that the oval spray pattern will be directed properly.

6 Tighten the adjustable joint.
- Ensure nozzle is facing to a center point between the burners.



BOTTOM VIEW

7 Next, go to Section 4.6: Flexible Install Braided Hose procedure.

4.6 Install Flexible Braided Hose

The flexible braided hose transfers the liquid agent from cylinder discharge unit to the nozzle.

To install the flexible hose, complete the following steps:

1	Determine the penetrating point into the top surface of the hood and mark it. • Make sure it doesn't interfere with the hood fan operation.
2	Using a Step drill bit with up to 1 3/8" hall diameter, drill a hole for the hose ¾" female connector to pass.
3	Pass the hose into the hood and connect it to the (3/4" male) hose fitting and tighten manually. • If this is a closed hood, reinstall the bottom cover and secure the bracket.
4	Roll the excess portion of the hose with a minimum diameter of 4" and secure the roll with a cable tie.
5	Connect the hose female connector (female, ¾") to the discharge unit fitting (male, ¾"") and tighten by hand.

4.7 Install Linear Heat Detector

The linear heat detector is the wire used to detect a fire in a flame situation.

There are three different detector ratings that can be installed:

30" to 36" wide ELECTRIC cooktops

- Distance cooktop to hood bottom 24" to 30" – use 220 F
- Distance cooktop to hood bottom 31" to 36" – use 155 F

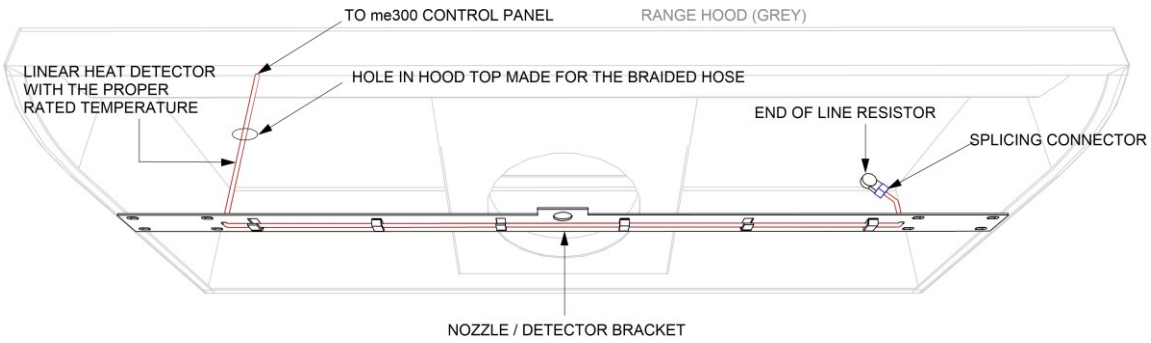
30" to 36" wide NATURAL GAS cooktops

- Distance cooktop to hood bottom 24" to 30" – use 280 F
- Distance cooktop to hood bottom 31" to 36" – use 220 F

30" ELECTRIC cooktop with over-the-range microwave

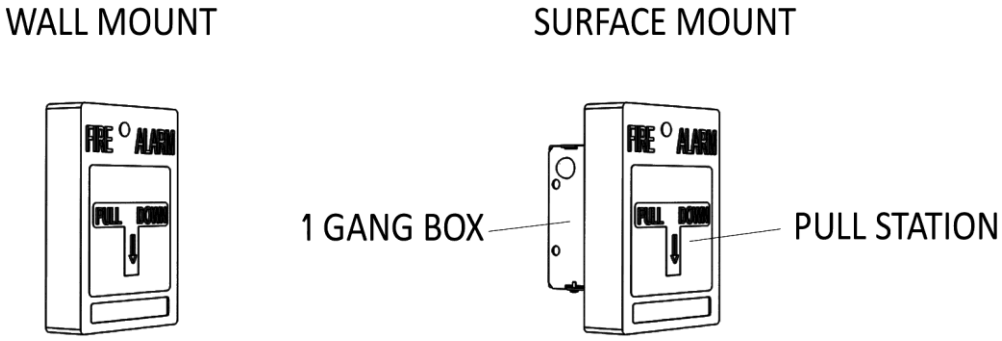
- Distance cooktop to microwave bottom 16" to 19" – use 280 F
- Distance cooktop to microwave bottom 20" to 30" – use 220 F
- Distance cooktop to microwave bottom 31" to 36" – use 155 F

To install the liner heat detector, complete the following steps:



1	Strip 1” off from both edges of the wire and expose 0.5” of the metal conductors.
2	Insert the wire through the same hall used to install the flexible hose into the hood plenum.
3	Insert the wire into one of the bracket detector halls and draw 30” of wire.
4	Run the wire along the bracket teeth and insert it back into the hood plenum through the opposite detector hall.
5	Use a splice connector and connect the bared wires to the end of line resistor (supplied).
6	Finish the splice seal by wrapping Scotch/3M Super 33+ or No. 35 electrical tape.
7	Connect the other end to the ME300 control unit as described in the Section 6.2: Install the ME300 Control Unit procedure.

4.8 Install Manual Pull Station

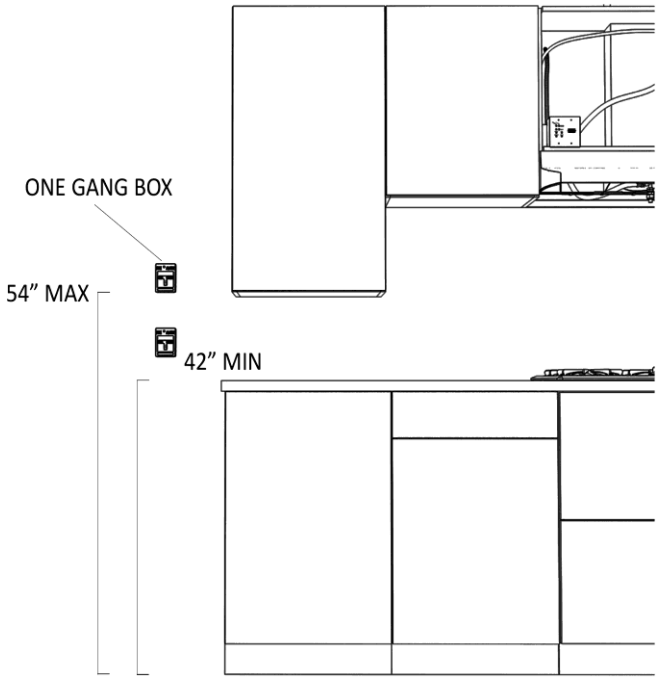


The manual pull station is the part of the Kitchen Fire Stop system that enables manual operation.

To install the manual pull station, complete the following steps:

1 Determine the location for the manual pull station:

- It should be located in a spot not too close to the range or cooktop, or no less than 4 feet away.
- It should be accessible for the user, a child, or a person on a wheelchair.
- The bottom of station must be between 42” and 54” from the floor.
- It must not be obstructed by appliances such as a microwave oven or toaster.



2 Select the location for the gang box.

- The gang box could either be surface or a wall mount.

3	Run two 22 gauge conductor wires from the gang box to ME300 control unit.
4	Connect the two wires to the pull station terminal and end of line resistor on the same contact points.
5	Test the ME300 control unit end. • Using a digital multi-tester, check the pull station connection on the ME300 side. • Verify that the ME300 control unit detects a short when handle is pulled down.
6	Slightly turn the knob using the supplied hex key, and push back the handle to its place.

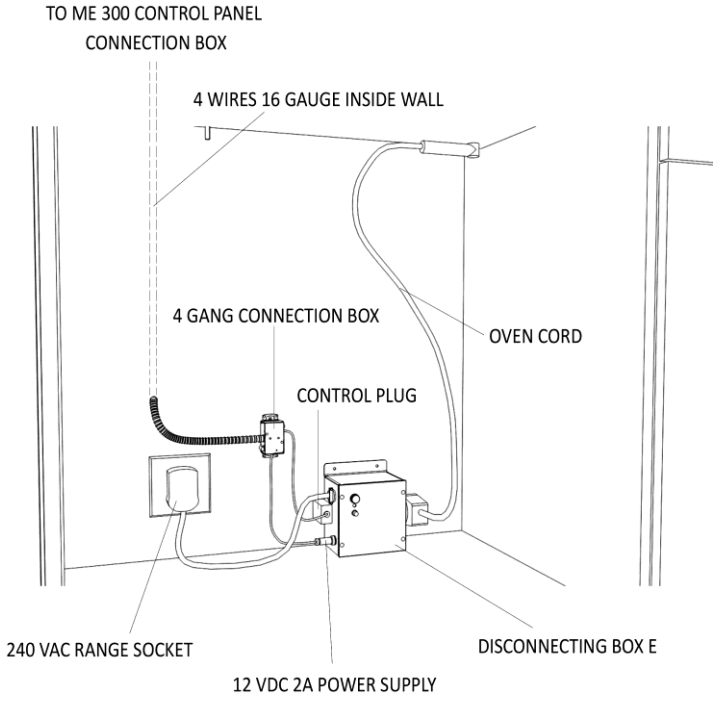
4.9 Install for Electric Cooktop Application

A Kitchen Fire Stop for electric oven and cooktop will employ the following:

- 230VAC 50 AMPS disconnecting box for the oven or cooktop
- 12VDC 2 AMPS for the ME300 control unit
- Control Plug

To install a Kitchen Fire Stop for electric cooktop application, complete the following steps:

1	Locate the disconnecting box on the wall behind the oven.



2	Run five 22 gauge wire cables through one-gang box to ME300 control unit.

3	Connect the 12VDC power supply wires to two of the five wires using a 2 out of 5 terminal slicing connectors. • Use a multi-tester to verify polarity. It is common for the red wire to be positive and the black to be negative.
4	Connect the disconnecting **control plug** three wires through the remaining three terminals of the slicing connector to the other three wires of the five-wire cable. • It is common for blue and brown to have no polarity. • the yellow-green is GROUND
5	Plug in the 12VDC power supply into the 115VAC socket on the box.
6	Insert the oven's 230VAC plug to the box socket.
7	Insert the disconnecting box's 230VAC plug to the wall socket. • A green light should lit up to indicate the range or cooktop is getting power.
8	Turn on the oven and feel for heat.
9	Press the test button on the disconnecting box to confirm that the power to the oven is off.
10	After completing the test, unplug the 12VDC power supply and the 240VAC wall plug. • Keep them unplugged until the system installation is complete.

4.10 Install for Natural Gas Oven Application

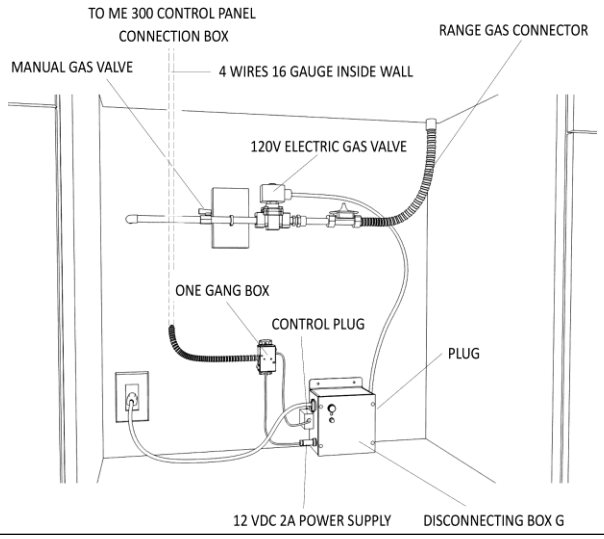
A certified gasfitter is required to install the gas valve and hose to the system for a natural gas application.

A Kitchen Fire Stop for a natural gas oven and cooktop will employ the following:

- 115 VAC 60 Hz gas valve
- 12VDC 2 AMPS for the ME300 control unit
- Disconnecting box

To install a Kitchen Fire Stop for a natural gas oven or cooktop application, complete the following steps:

1	Locate the disconnecting box on the wall behind the oven.



2	Run five 22 gauge wire cables through one-gang box to ME300 control unit.
3	Connect the 12VDC power supply wires to two of the four wires using a 2 out of 5 terminal slicing connectors. • Use a multi-tester to verify polarity. It is common for the red wire to be positive and the black to be negative.
4	Connect the disconnecting control plug three wires through the remaining three terminals of the slicing connector to the other three wires of the five-wire cable. • It is common for blue and brown to have no polarity. • the yellow-green wire is GROUND.
5	Plug in the 12VDC into the 115VAC socket on the box.
6	Install the gas valve on the ½" natural gas supply line. • Complete it with the original gas hose connecting the oven back to the gas supply (now controlled by the gas valve). • Plug the gas valve's 115VAC plug (male, supplied) to the box socket (female).
7	Insert the disconnecting box's 115VAC plug to the wall socket. • A green light should light up to indicate the range or cooktop is starting to receive gas.
8	Turn on the oven and watch the burner flame.
9	Press the test button on the disconnecting box to confirm that gas flow is interrupted.

10	After completing the test, unplug the 12VDC power supply and the 115VAC wall plug. • Keep them unplugged until the system installation is complete.

5 Installation and System Readiness Checklist

Before finishing the ME300 control unit installation, we need to verify that the system is ready for operation.

Note: Installation of the ME300 control unit is detailed in the ME300 Control Unit Installation and Operation section.

Below is a checklist for up to this point in the Kitchen Fire Stop installation.

- Agent cylinder is secured and ball valve is in the closed position.
- Hose is connected to nozzle and cylinder properly.
- Nozzle is directed at the middle of the cooking surface and has been tightened.
- Linear heat detector sits well under its bracket and penetrates hood plenum on both ends.
- End of line resistor is connected and wrapped inside hood plenum.
- Bracket is secured to hood margins.
- Manual pull station is accessible and wired with end of line resistor.
- Disconnecting box green light is not lit up. This means the oven or cooktop is not powered. 12VDC power supply is unplugged temporarily.

6 ME300 Control Unit Installation and Operation

More Fire Protection's ME300 control unit is a stand-alone two channel extinguishing panel. The ME300 control unit receives a linear heat detector (cable) designed to short at a fixed temperature (155, 220 or 280°F). This smart control unit reports back to any management device. Activation of the **EXTING mode** releases the extinguisher media for grease fire suppression.

The ME300 control unit offers an additional input for manual activation using the manual pull station.

Alarms, faults, and good working status are indicated by the panel LED bulbs. The ME300 control unit is powered by a 12VDC power source and a rechargeable battery backup that could last up to 72 hours.

The ME300 control unit is intended to perform fire detection and automatic extinguishing as required according to UL Subject 300A.

Installing the unit near the protected area is a must with good visual contact to the unit.

Install all system components as described in System Components section before installing ME300 control unit.

6.1 Specifications

Dimensions (W / H / D)	85 / 125 / 55 mm
Weight	390 gr.
Operating temperature range	-40°C – +80°C (-40F – 176°F)
Relative humidity range	10% – 93% non-condensing
Operating voltage	5 V up to 7 V
Input voltage	12 V DC
Output pulse energy	1 Joule

6.1.1 Backup supplied by pack of four 18650 rechargeable batteries

Battery operating time	5 to 6 years, depending on battery and environmental conditions

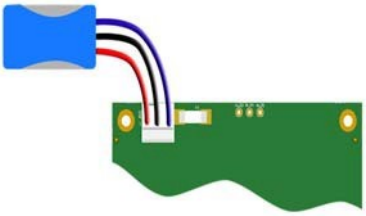
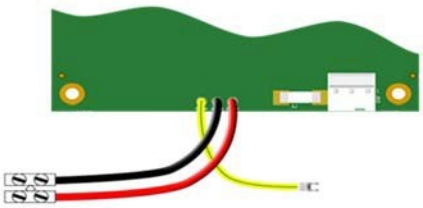
6.1.2 Average current consumption

Standby	500 µA
Alarm	150 mA
Activation temperature	Depending on the linear heat cable
Remote activation resistance to trigger alarm	0 to 900 Ohm
Remote activation (automatic and manual) end of line resistor	5.1 K Ohm

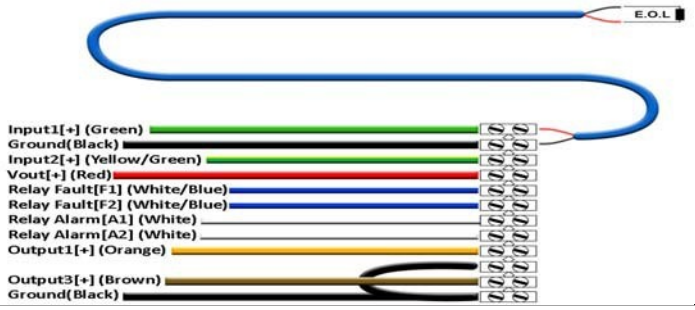
6.2 Install the ME300 Control Unit

Disconnect all power sources before installing the ME300 control unit.

To install ME300 control unit, complete the following steps:

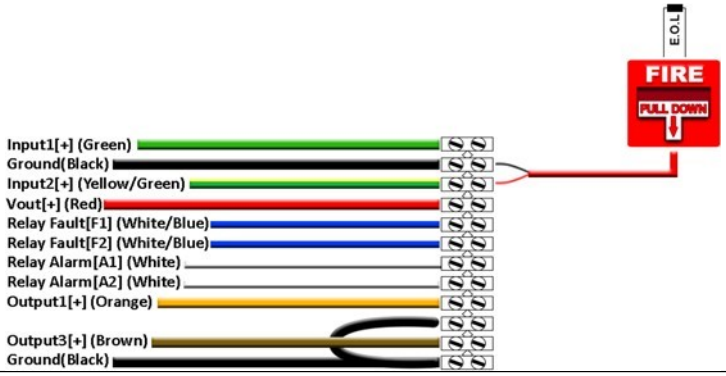
1	Plug in the wire extender and insert the wire pack to the connection box, next to the ME300 control unit's final location.
2	Connect all coming wires to a 16 gauge splicer connector with 12 terminals (included and connected to the ME300)
3	Plug the rechargeable batteries to the battery connector. 
4	Plug the 12vDC adaptor to the V marked on the printed circuit board (PCB). 
5	Secure the ME300 control unit to the two-gang box with 4 6/32 wafer screws.
6	Connect the linear heat detector cable to the terminal marked **INPUT 1** (green and black cables).

Note: The linear heat detector comes in a 6 feet length. Use 16 gauge two-wire extensions if required with no polarity.



7 Connect the end of line resistor to the furthest end of the detector wires.

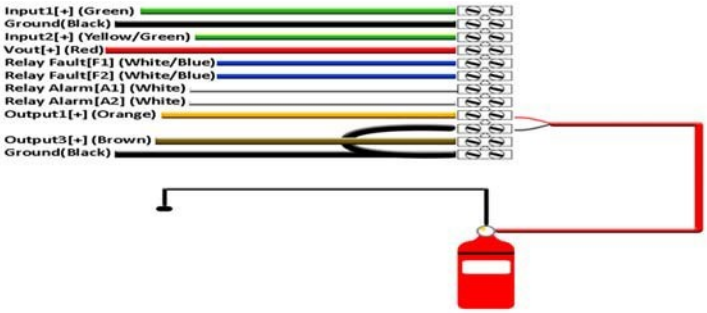
8 Connect the manual pull station to the terminal marked **INPUT 2** (yellow/green and black cables).



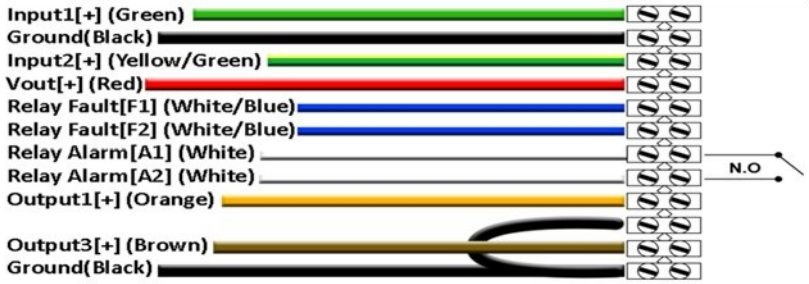
9 Connect the end of line resistor to the manual pull station terminals.

10 Connect the extinguisher discharged solenoid valve to the terminal marked **OUTPUT 1** (orange and black cables).

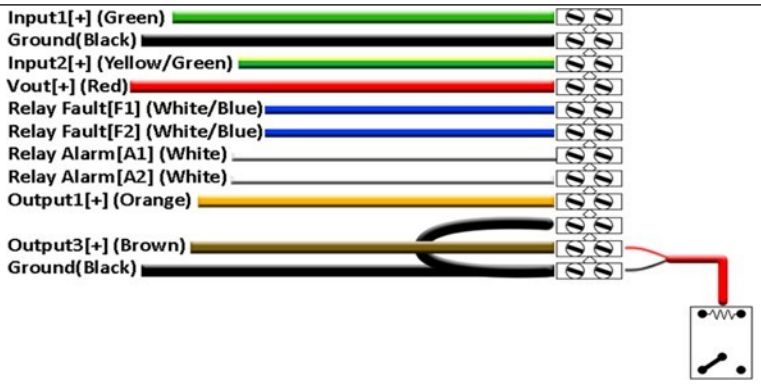
Note: No polarity. Connect the solenoid valve GROUND wire to the connection box GND terminal.



11 Connect alarm relay output to a remote alarm system if required.



12 Connect the disconnecting box control to the terminal marked **OUTPUT 3**.



13 Connect the control plug GROUND wire to the GND terminal of the connection box

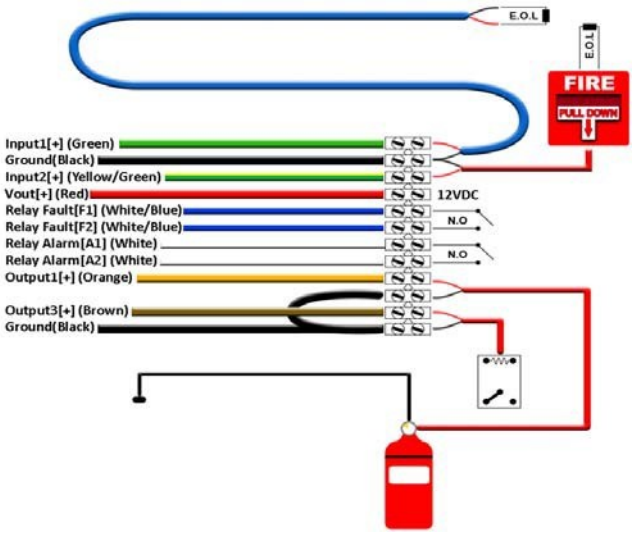
14 Power up the disconnecting box:

- Plug the 115VAC disconnecting box to the wall receptacle and plug the 12VDC power supply (plugged into to the disconnecting box 115VAC socket).

15 Verify proper operation of the ME300 control unit:

- Check if the green LED flickers every 5 seconds. This indicates normal status.
- Take a photo of the discharge head and gauge and the ME300 control unit panel

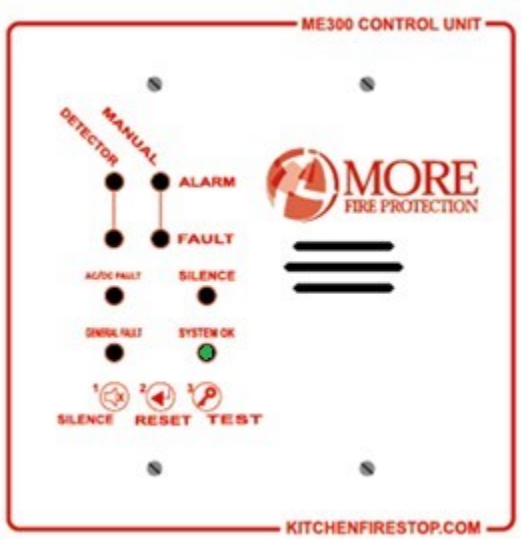
Note: The following illustration shows all the accessories connected to the ME300 control unit.



16	Verify that the only blinking light is SYSTEM OKAY, then turn on and secure the **discharge manual ball valve**. • System is ready for operation.
17	Keep record of Installation Check List and photos.

6.3 Mode of Operation

The ME300 control unit has LEDs to indicate operation status.



System OK

- Indicates normal status
- The LED flickers every 5 seconds to indicate a normal status

Manual or Detector

- Indicates an alarm
- Buzzer will go off and the specific red LED (detector or manual) will light up to indicate activation. A signal to the remote alarm panel will be sent
- This LED is off during normal operation
- Alarm signal is latched until a reset is completed

Fault

- Indicates a specific system faults such as detector fault, manual fault, AC/DC fault, and general fault
- When a fault is detected, the buzzer will beep every 5 seconds
- Pressing the SILENCE button in the ME300 control unit turns off the buzzer

The ME300 control unit can also detect the following fault situation:

- Power fault
- Line fault/ground fault
- External device disconnected

6.3.4 Test

- Pressing the TEST key while the ME300 is in normal mode initiates the test
- All LEDs will blink for 5 seconds and the buzzer will beep twice

Silence

- Press silence key to turn buzzer off
- Silence LED will lit up and stay off until system has been reset or fault has been resolved

6.3.6 Critical System Fault

- All LEDs blink to indicate the system is not functioning

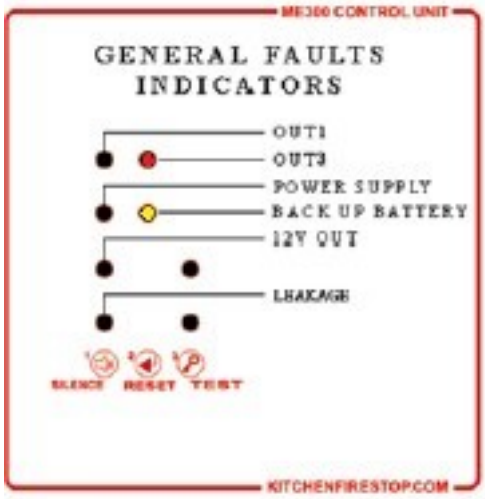
Note: Upon activation, ME300 will keep Discharge Solenoid Valve on for 45 seconds.

In case system went off, secure the cylinder with the ball valve turned off, before changing with a replacement cylinder.

6.4 Determine the Fault Detected

To determine the fault detected, complete the following steps:

1	Press the following buttons in sequence: 1, 1, and 2.
2	Check the ME300 control unit to see which LED or LEDs is lit



for 5 seconds.

LED that lit up represent the faults; for this example: output 3 (the disconnecting box control) is cut off and the backup battery is faulty.

3	See Section 8.1: Reset the ME300 Control Unit After a Discharge.

7 System Maintenance

7.1 Maintenance Requirements

More Fire Protection requires the following to ensure proper operation of your Kitchen Fire Stop system:

- Replace the agent cylinder after 5 years
- Replace the battery pack after 5 years
- Replace the disconnecting box after 10 years
- If using the system for natural gas application, replace the gas shut off valve after 10 years

7.2 Conduct Bi-Monthly Inspection

The Kitchen Fire Stop must be properly maintained at regular intervals of two month to ensure its proper function.

To conduct a bi-monthly inspection on the Kitchen Fire Stop, complete the following steps:

1	Ensure that there is unobstructed access to the ME300 control unit's pane.
2	Ensure that there is unobstructed access to the manual pull station.
3	Ensure that linear heat detector has no damage or cuts and properly positioned on the bracket.
4	Verify that all labels and maintenance forms are present.
5	Visually inspect all nozzles for damage, obstruction, and direction.

6	Inspect for grease build up. • If detector and nozzle cannot be seen clearly, remove the grease and clean with soap and wet towel.
7	Check the pressure gauge: • If low (outside of the green zone), the cylinder requires charging by a More Fire Protection representative. Contact More Fire Protection or its representative. • If pressure gauge is damaged, immediate repairs are needed. Contact More Fire Protection/representative
8	Clean the following: • Range hood filters • Hood plenum • Detector and nozzle

7.3 Conduct Annual Inspection

To conduct an annual inspection on the Kitchen Fire Stop, complete the following steps:

1	Complete the steps in Section 7.2 Conduct Monthly Inspection procedure.
2	**Turn off the manual ball valve**.
3	Pull manual pull station handle down to trigger the alarm.
4	Check buzzer sounder level and press the Silence button.
5	Ensure that the solenoid discharge valve is on for 45 seconds.
6	Ensure that the power or gas supply is turned off by the disconnecting box.
7	Review the log/history at the remote panel (if connected).
8	After completing the inspection, reset the manual pull station: • Use a hex key to give the hex screw a half turn counter clockwise and pull back the unit handle.
9	Reset the system by pressing the following buttons in sequence: 1, 1, 3, and 2.
10	Check the for the following: • Red LED (alarm) is off. • Green LED (normal status) is on. • No fault LED is on.

11	**Turn on the manual ball valve**.
12	Keep record of the inspection form with comments.

7.4 Inspect the Cylinder

To inspect the suppression agent's cylinder, complete the following steps:

1	Ensure that the suppression agent's cylinder is in full view and totally accessible.
2	Inspect the cylinder for the following: • Expiration date on the tag or the cylinder base • Rust and peeling paint especially on the bottom of the cylinder and around the cylinder neck • Dents • Stripping on the inside threads of the cylinder neck
3	Inspect the pressure gauge for any damage or defects such as: • Broken glass • Warps • Missing needle *Note: Replace a defective or damaged pressure gauge with the proper gauge (part number KFS1310015) from More Fire Protection.*

8 System Reset and Recharge

After the system has discharged the suppression agent for any reason, notify the fire authorities and More Fire Protection with the reason for the discharge. Send a report and a request to recharge the suppression agent through kitchenfirestop.com.

Under no circumstances shall the customer recharge the system.

If a recharge is required, contact More Fire Protection.

8.1 Reset the ME300 Control Unit after a Discharge

After the system goes off and discharges all its content, it is important to reset it.

To reset the ME300 control unit, complete the following steps:

1	Remove current cylinder with its discharge head and replace it with a newly filled and pressurized cylinder with its own discharge head.
2	Clean the braided hose, nozzle and joint with water stream as described in Sectiom 8.3: Clean the Piping after a Discharge procedure. • You may reuse these items if they were not damaged by the fire.
3	Remove the linear heat detector and replace it with a new detector. • You may use the existing end of line resistor if it wasn't damaged by the fire.
4	Direct and tighten the adjustable joint.
5	Tighten the braided hose connectors by hand.
6	Connect the discharged head (solenoid) to the ME300 control unit and GROUND.
7	Ensure that the disconnecting box is properly connected to the power, stove, and the ME300 control unit plug.
8	Verify that no fault appears on the ME300 panel.
9	Verify the manual pull station is in its "normal" position.
10	Reset the system by pressing the following buttons in sequence: 1,1,3,2.

	• The alarm LED will turn off.
11	Verify that the only LED flickering is “system okay”.
12	Reset other applicable fire or alarm panels.
13	**Open the manual discharge valve fully**. • System is ready
14	Report reset and the system status to More Fire Protection.

8.2 Clean the Kitchen Fire Stop after a Discharge

Cleaning the Kitchen Fire Stop and the cooking area is required after the suppression agent has been discharged. The suppression agent used by the system creates a protective layer of foam on grease. Unless the system and the cooking area are heavily contaminated with grease, the extinguishing agent can easily be wiped off.

The extinguishing agent is not toxic. However, any exposed food must be discarded. Do not leave the extinguishing agent on kitchen surfaces for a long period. It is a chemical compound which may affect or stain the surface.

The liquid extinguishing agent can conduct electricity.

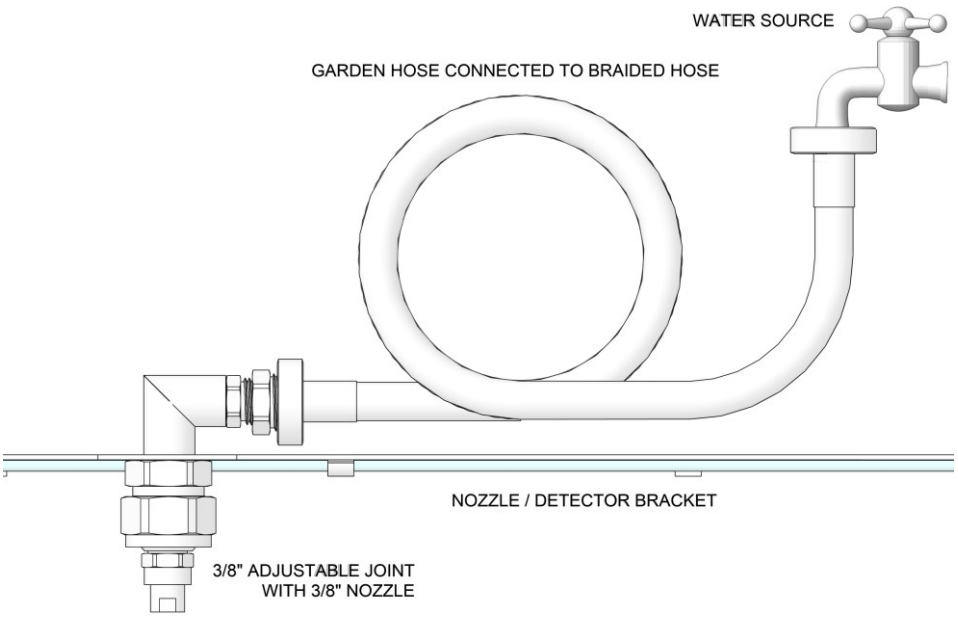
Make sure to disconnect all electric appliances before cleaning the system to prevent shock or electrocution.

Do not clean before the area is cooled down.

8.3 Clean the Piping after a Discharge

To clean the piping after a discharge, complete the following steps:

1	Ensure that all electrical appliances are disconnected from electricity.
2	Disconnect the braided hose from the discharge unit.
3	Connect a water hose to a water supply and to the system’s braided hose.



5	Flush the system's braided hose and nozzle with water for about one minute.
6	Turn off water and disconnect the hose from the water supply.
7	Connect to the main supply line an air compressor (not part of the system).
8	Force pressurized air through the pipe until there is no water coming out the nozzle.
9	Disconnect and replace nozzle.
10	Replace the linear heat detector with the same temperature rating detector.
11	Recharge the cylinder and reset the system.

9 Safety Information and Additional Precautions

The information provided in this section is correct to the best of our knowledge at the date of publication. The information detailed here is designed only as a guide for the safe handling, use, processing, storage, transportation, disposal and release of the cylinder and its content.

The information contained in this section is not to be considered as a warranty, safety and quality specification, or a substitute to a Material Safety Data Sheet (MSDS).

The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.

This fire suppression system was manufactured for specific use, and is designed to provide protection for during fires. Irresponsible use of the system may result in personal injury and damage property.

	The extinguishing agent's cylinder is pressurized for discharging the extinguishing agent to the source of fire. Beware of the following warnings: • The cylinder is pressurized. Do not damage or perforate the cylinder body • Keep the cylinder away from flames • Do not empty the agent towards other persons • Do not store the cylinder or agent in temperature exceeding 49°C • Keep away from children • Do not use a cylinder that is damaged or has rust • Avoid inhaling the agent, smoke or any toxic gas released during fire
	The extinguishing agent is non-toxic when used properly, but avoid contact with eyes, throat, and nose and any other areas as it may cause burning and irritation. Refer to the MSDS for the extinguishing agent at kitchenfirestop.com. In the event of a fire, evacuate the fire area immediately and ventilate before re-entry. Stay away from the fire zone after a system discharge.

Parts List

Part number	Description	Material	Units	Qty
KFS7670005	K-type wet chemical agent	Environmental friendly	US Gallons	5
KFS1310005	Filled and pressurized cylinder including discharge head and valves	Metal and brass	complete	1
KFS1310010	Mounting bracket	Metal	complete	1
KFS2050005	Discharge nozzle	Brass	complete	1
KFS2050005-SS	Discharge nozzle	Stainless steel	complete	1
KFS2050010	Adjustable joint	Brass	complete	1
KFS2050010-ss	Adjustable joint	Stainless steel	complete	1
KFS2050015	Nozzle & detector bracket	Stainless steel	complete	1
KFS3050015-280	Linear heat detector 280 F	Coated steel conductors	Foot	6
KFS3050015-220	Linear heat detector 220 F	Coated steel conductors	Foot	6
KFS3050015-155	Linear heat detector 155 F	Coated steel conductors	Foot	6
KFS4050015	Manual pull station	Plastic and aluminum	complete	1
KFS5050015	Shut off gas valve	Brass	complete	1
KFS1300220	Braided hose and fittings	PVC, SS and brass	Foot	5
KFS6050015	Natural gas disconnecting box	Metal	complete	1
KFS6050020	Electrical disconnecting box	Metal	complete	1
KFS5050025	Control plug with wires	Brass	complete	1
KFS6060020	ME300 control panel excluding rechargeable batteries		complete	1
KFS6060025	Pack of four batteries		complete	1