CITY OF
PORTLAND, OREGON
BUREAU OF DEVELOPMENT SERVICES
1900 SW 4th Ave., Suite 5000
Portland, OR 97201

MULTNOMAH COUNTY

FACILITY PERMIT

13-191338-000-00-FA

Site Address: **1417 NW FLANDERS ST**

Issued: **8/15/13**

FX-FIXED SYSTEM:TI 3316597:George Dia:George Dia

PROJECT INFORMATION		Occ. Group	Const. Type
Fixed Extinguishing Systems	**Alteration**		

Project Description: FIXED SYSTEM - INSTALLATION OF (1) NEW ANSUL R-102 UL-300 FIRE SUPPRESSION SYSTEM INTO (1) CAPTIVE AIRE HOOD

APPLICANT	**METRO SAFETY AND FIRE INC**	Phone (503) 281-2999
PROPERTY OWNER	**ND FLANDERS LLC**	Phone (503) 227-6969
CONTRACTOR	**No Contractor**	Phone

Project Details	
Building/Mechanical Inspector	DISCIASJ
Electrical Inspector	RISERJ
Fire Marshal	GALVANJ
Plumbing Inspector	SISKJ
Return Plans/Permit to?	APPLICANT

Project Details	
Code Edition (Year)	2010 OSSC
Energy Code Edition	2010 Oregon Energ
Folder Name	FIXED SYSTEM
Project Reference Number	FLANDERS VANILL
Zoning - Property (1)	EXdCC

FOR INSPECTION CONTACT Galvan,Jeff at 503-823-4032

This permit expires if, at any time, 180 days pass without an approved inspection. If you are not able to obtain an inspection approval within 180 days, you may request a one-time only extension of 180 days by calling 503-823-5996.

BEFORE YOU DIG

ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center. (Note: the telephone number for the Oregon Utility Notification Center is 1-800-332-2344).

CITY CONTACT Phone:

E-Mail: Fax: (503) 823-7425

INSPECTION REQUEST PHONE NUMBERS

TDD: (503) 823-6868

IVR Inspection Request Number:

Contact your inspector directly for inspection requests.

JEFF GALVAN
Fire & Life Safety Plans Examiner
1900 SW 4th Ave
Portland, OR 97201
Ph: (503) 823-4032 Fax: (503) 823-7425
Jeff.Galvan@portlandoregon.gov

APPLICATION FOR PERMIT TO INSTALL FIXED SYSTEM

City of Portland Oregon
1300 SE Gideon, Portland,OR 97202-2419
(503) 823-3712

For PFB Use Only
Permit Number

TOTAL COST OF THIS PERMIT $ _____ DATE: 8/7/13

RECEIPT# _____ PERMIT APPLICATION # _____

BUILDINGS/FACILITIES PERMIT # BW 13-172423 FA

PFI # _____ BLDG KEY _____ CHECK # _____ CODE: _____

13-170338 PA 19/338 PA

PLANS MUST BE SUBMITTED TO THE FIRE PREVENTION DIVISION AND APPROVED BEFORE INSTALLATION. LISTED FIRE EXTINGUISHING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING AND MANUFACTURERS' INSTRUCTIONS.

Valuation: $ 850.00

Location

Building Name: BREW CYCLE Occupied as: BREW CYCLE

Address: 1425 NW FLANDERS ST. Portland, OR Zip 97209

Suite # A Levels (#) _____

Building/Facilities Permit No.: _____ Appeal No.: _____

Installation	Coverage	System Type	Shut Off	
☒ New	☒ Hood/vent	☒ Wet Chem	☒ Gas	☐ In Existing Building
☐ Addition	☐ Paint Booth	☐ Dry Chem	☐ Electrical	☒ New Construction
☐ Alteration	☐ Computer Room	☐ Water		
☐ Remove	☐ Other	☐ FM 200		
☐ Repair	_____	☐ Halon		
		☐ C02		
		☐ Inergen		

Total Work Area 24 sf Total No. of Heads 5 No. of Systems 1

Description of Work: INSTALLATION OF (1) ONE NEW ANSUL R-102 UL-300 FIRE SUPPRESSION SYSTEM INTO (1) ONE CAPTIVE AIRE HOOD

Installing Company Information

Applicant Name: FRANK LUDE
Company Name: METRO SAFETY AND FIRE
Address: 14324 SE STARK STREET
City, State, Zip: PORTLAND OR 97233
Phone/Fax: 503-231-7999

Owner Information

Name: BREW CYCLE
Phone/Fax: 971-221-3775

Mail permit to: METRO SAFETY AND FIRE
Address: 14324 SE STARK STREET
City, state, zip: PORTLAND, OR 97233

Name of Applicant: _____ 8/6/13
(SIGNATURE) (DATE)

BY: _____ INSPECTOR 8/15/13 DATE

PERMIT FEE DOUBLES IF WORK HAS STARTED WITHOUT BENEFIT OF PERMIT

BREW CYCLE

TOTAL SYSTEM

There are four types of R-102 Restaurant Fire Suppression Systems:

1. Single-tank System
2. Double-tank System
3. Three-tank System (1 Cartridge)
4. Multiple Tank System (Three Tanks or More – Multiple Cartridges)

The type of system required for the particular installation will be determined through the guidelines covered in "System Design." Additional equipment which may be required to complete the system design is explained in the "System Components" section. Additional devices covered are: remote manual pull stations, mechanical and electrical gas shut-off valves, electrical switches, and pressure switches.

Single-Tank System

The R-102 single-tank system is available with a stainless steel enclosure and consists of:

1. ANSUL AUTOMAN Regulated Release Assembly (Electrical or Mechanical)
2. Nitrogen Cartridge and/or Carbon Dioxide Cartridge
3. ANSULEX Low pH Liquid Fire Suppressant
4. Discharge Nozzles
5. Detection Components
6. Additional Devices (As Required)

The regulated release assembly contains the regulated release mechanism, agent tank, expellant gas hose for agent tank hookup, and enclosure knockouts to facilitate installing detection system and additional equipment. Refer to "System Components" section for individual component descriptions.

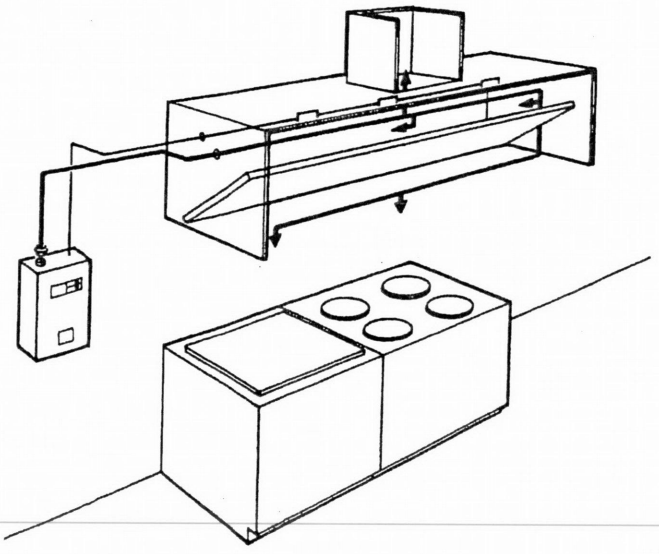


FIGURE 1
000133

Double-Tank System

The R-102 double-tank system is available with stainless steel enclosures and consists of:

1. ANSUL AUTOMAN Regulated Release Assembly (Electrical or Mechanical)
2. Nitrogen Cartridge and/or Carbon Dioxide Cartridge
3. ANSULEX Low pH Liquid Fire Suppressant
4. Enclosure or Bracket Assembly
5. Discharge Nozzles
6. Detection Components
7. Additional Devices (As Required)

The regulated release assembly contains the regulated release mechanism, agent tank, expellant gas hose for agent tank hookup, and enclosure knockouts to facilitate installing expellant piping, detection system, and additional equipment.

The enclosure or bracket assembly is mounted separately but within the guidelines of the regulated release assembly expellant gas piping requirements to ensure simultaneous actuation of the system. Refer to "System Components" section for individual component descriptions.

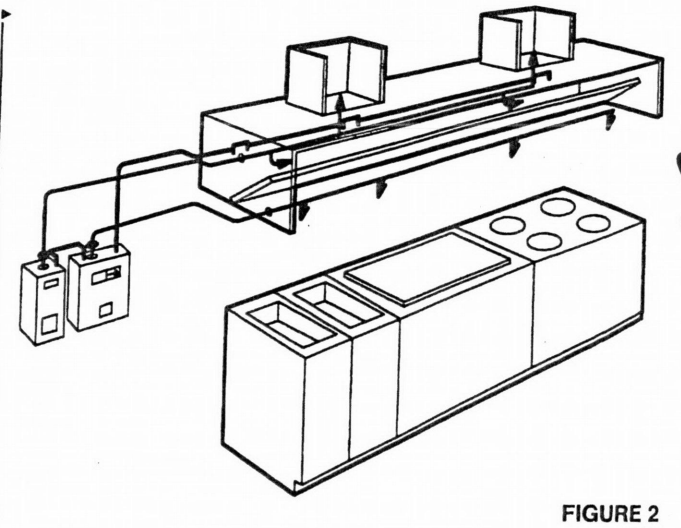


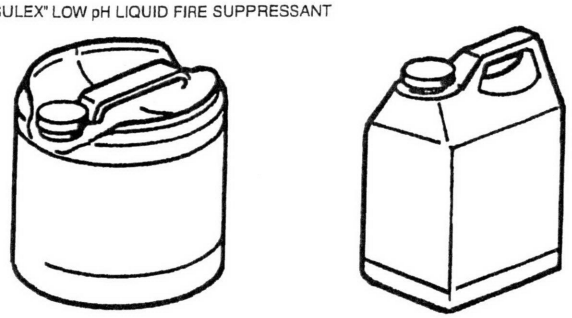
FIGURE 2
008321

13-191338 FM

EXTINGUISHING AGENT

ANSULEX Low pH Liquid Fire Suppressant (1.5 gallon – Part No. 79694 or 3.0 gallon – Part No. 79372) is a potassium-based solution designed for fast knock-down and suppression of grease-related fires. The agent is shipped in plastic containers which provide one complete tank charge. (Refer to Section V, Page 5-2.1, for maximum agent fill capacity.) Agent storage life expectancy is twelve years and can be stored at a temperature of –40 °F to 130 ► °F (–40 °C to 54 °C). **Note: When installing agent in R-102 sys- ► tem, temperature range is 32 °F (0 °C) to 130 °F (54 °C).** The distributor must record the batch numbers and date of shipment receipt to be filed with each installation record.

"ANSULEX" LOW pH LIQUID FIRE SUPPRESSANT



3.0 GALLON
SHIPPING WT. 35 LB (16 kg)
000136

1.5 GALLON
SHIPPING WT. 19 LB (9 kg)
000137

FIGURE 1

REGULATED RELASE ASSEMBLY (MECHANICAL)

The ANSUL AUTOMAN Regulated Mechanical Release Assembly (Part No. 429853) contains the regulated release mechanism, expellant gas hose for agent tank hookup, and enclosure knockouts to facilitate installing actuation piping; expellant piping; detection system; and additional equipment. This regulated release assembly is used in single, double, and multiple-tank systems and must be mounted to a rigid surface. The release mechanism can be used to interconnect both the actuation and expellant gas lines as required per system design. The regulator is designed to allow ► a constant flow of gas into the tank at 110 psi (7.6 bar) when the system is actuated. The agent tank must be ordered separately.

In single, double, and multiple-tank systems, the provided expellant gas hose connects the agent tank to the bottom outlet of the regulator. In double and multiple-tank system configurations, the back outlet of the regulator is used as an expellant gas feed for one additional tank-enclosure or tank-bracket hookup. The enclosure contains the required knockouts to facilitate this connection. If a pressure switch is to be attached to the regulator, additional fittings are required.

The tank is mounted within the enclosure. The tank contains an adaptor/tube assembly with a burst disc union. The burst disc helps prevent siphoning of the agent up the pipe due to significant temperature fluctuations in the area where the tank is located. The ► tank is stainless steel and, under normal conditions, requires hydrostatic testing every twelve years.

The detection and additional equipment required per system design are connected to the release mechanism. The enclosure contains knockouts to facilitate detection and additional hookups.

The system can be actuated automatically or manually. Automatic actuation occurs when a fusible link within the detection system separates in a fire condition. Manual actuation of the system occurs when personnel pull on the remote manual pull station pull ring.

"ANSUL AUTOMAN" REGULATED RELEASE ASSEMBLY (MECHANICAL)

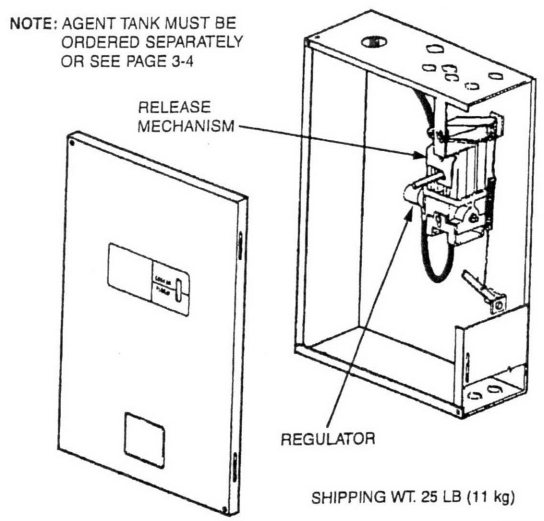


FIGURE 2
000138

REGULATED RELEASE ASSEMBLY (ELECTRICAL)

The ANSUL AUTOMAN Regulated Electrical Release Assembly (Part No. 429856) is identical to the mechanical version except it also contains a factory installed 120 VAC solenoid and electrical switch.

The solenoid is used to provide electrical actuation of the release mechanism. The electric switch is used to protect the solenoid by opening the circuit to the solenoid once the system is fired. Additional electrical switches can be added as required for automatic equipment and gas shut-off accessories, as well as initiating audible and visual alarms.

"ANSUL AUTOMAN" REGULATED RELEASE ASSEMBLY (ELECTRICAL)*

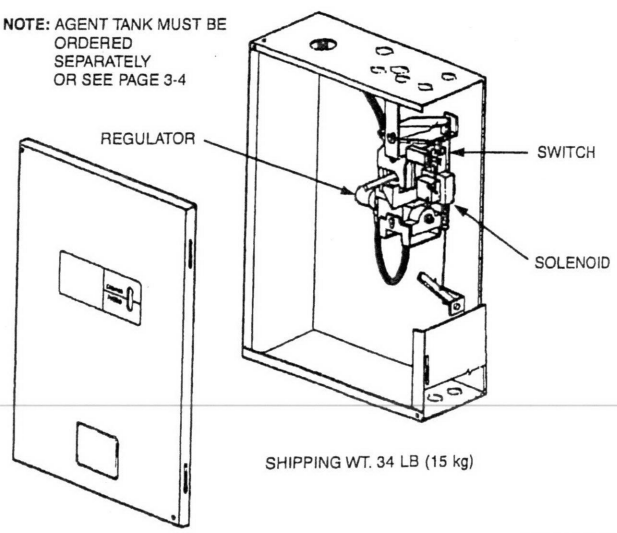


FIGURE 3
000139

* **NOTE:** ANSUL AUTOMAN Regulated Electrical Release, Part No. 429856, is not intended to be used with electric detection.

REMOTE MECHANICAL RELEASE

The Remote Mechanical Release, Part No. 433485, is used to actuate up to five (5) R-102 regulated actuators. The remote mechanical release utilizes a 101-10 carbon dioxide cartridge as the actuation pressure to operate the regulated actuators. The release is housed in a stainless steel enclosure.

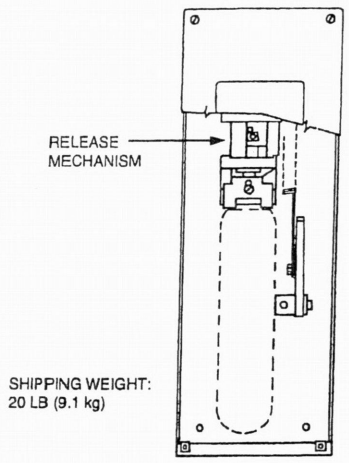


FIGURE 4
007498

SINGLE TANK ENCLOSURE ASSEMBLY

The Single Tank Enclosure Assembly (Part No. 429870) is used in double and multiple-tank systems and must be mounted to a rigid surface near the regulated release or regulated actuator assembly its expellent gas line will be connected to.

The enclosure is designed for mounting either a 1.5 gallon (Part No. 429864) or a 3.0 gallon tank (Part No. 429862) in a minimum amount of space.

ENCLOSURE ASSEMBLY

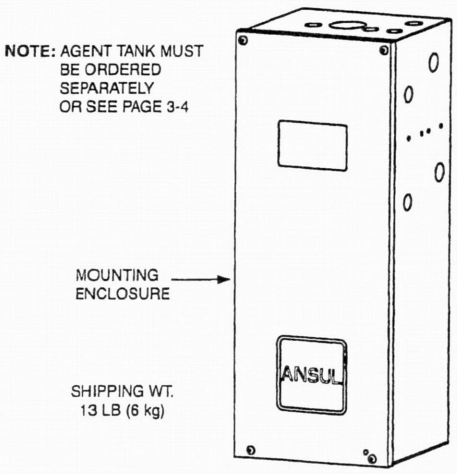


FIGURE 5
000142

RED PAINTED BRACKET ASSEMBLY

The Bracket Assembly (Part No. 429878) is used in double and multiple-tank systems and must be mounted to a rigid surface near the regulated release assembly or regulated actuator assembly that its expellant gas line will be connected to.

The tank bracket is constructed of mild steel and painted red. It is designed for mounting the tank in a minimum amount of space. The Bracket Assembly can only be utilized with 3.0 gallon tanks (Part No. 429862).

BRACKET ASSEMBLY

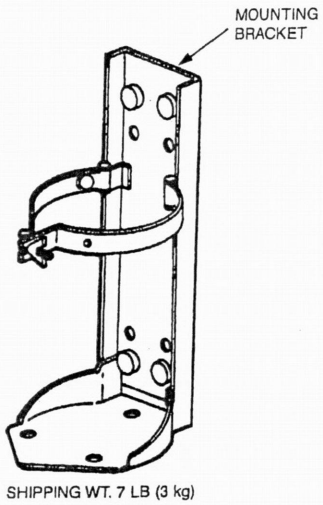


FIGURE 6
000141

REGULATED ACTUATOR ASSEMBLY

The Regulated Actuator Assembly (Part No. 429850) contains the regulator, pneumatic actuator, expellant gas hose for agent tank hookup, and enclosure knockouts to facilitate installing expellant piping. This assembly is used in multiple-tank systems and must be mounted to a rigid surface.

The regulator contains two outlets 135° apart. One outlet is used to interconnect the expellant gas hose to the enclosed agent tank. The other outlet connects an expellant gas line to an additional enclosure or bracket assembly. The regulator is designed to allow a constant flow of nitrogen into each agent tank connected (two ▸ tanks maximum) at 110 psi (7.6 bar).

The pneumatic actuator is designed to puncture the expellant gas cartridge seal upon receiving pressure from the regulated release assembly actuation piping. The enclosure contains a knockout to facilitate distribution piping hookup.

REGULATED ACTUATOR ASSEMBLY

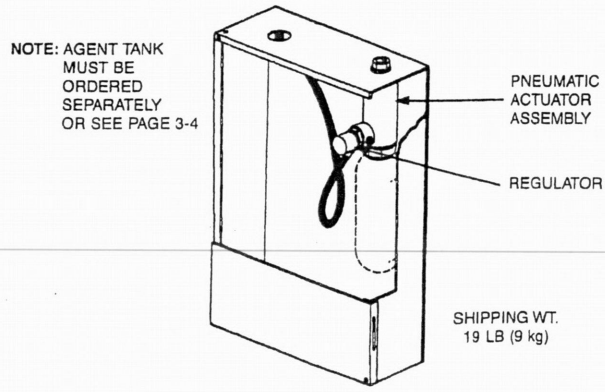


FIGURE 7
000143

AGENT TANK ASSEMBLY

The agent tank shipping assembly (3-Gallon, Part No. 429862, and 1.5 Gallon, Part No. 429864) consists of a stainless steel tank and an adaptor/tube assembly. The adaptor/tube assembly contains a burst disc. The burst disc prevents agent leakage due to significant temperature fluctuations in the area where the tank is located. Under normal conditions, the tank requires hydrostatic testing every twelve years. The date of manufacture is stamped on the tank nameplate.

The tank is shipped uncharged and must be filled with only ANSULEX Low pH Liquid Fire Suppressant during installation.

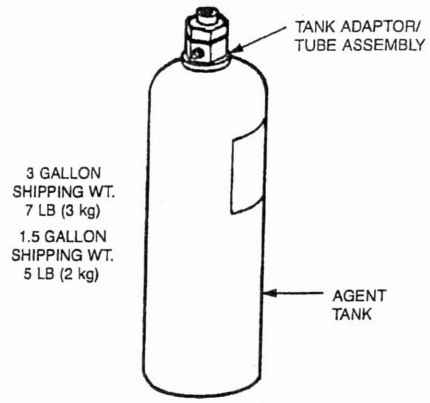


FIGURE 8
000140

OEM RELEASE/BRACKET ASSEMBLY (FOR OEM IN-CABINET USE ONLY)

The OEM Regulated Mechanical Release/Bracket Assembly, Part No. 79493, contains the same regulated release mechanism as the standard ANSUL AUTOMAN Regulated Release Assembly. The OEM Regulated Electrical Release/Bracket Assembly, Part No. 418054*, is identical to the mechanical version except it contains a factory installed 120 VAC solenoid and electrical switch. These release/bracket assemblies must be installed in a suitable equipment enclosure either horizontally or vertically. They contain all the necessary mounting and conduit holes needed to fully install the assembly. The agent tank is installed separately and need not be bracketed once it is piped and filled. **Note:** OEM Release/Bracket Assembly must be installed high enough in cabinet so that there is sufficient room to install and remove cartridge.

***Note:** OEM Regulated Electrical Release/Bracket Assembly, Part No. 418054, is not intended to be used with electric detection.

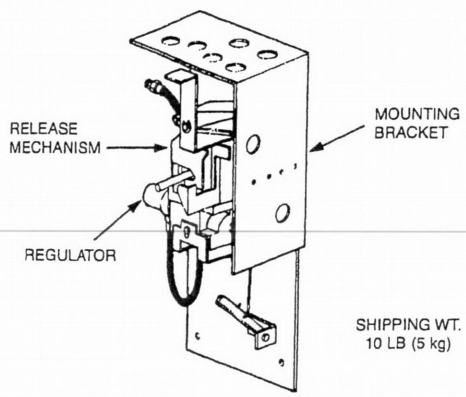


FIGURE 9
000144

OEM REGULATED ACTUATOR ASSEMBLY

The OEM Regulated Actuator Assembly, Part No. 418691, includes the regulator, pneumatic actuator, expellant gas hose and OEM bracket. Also available is an OEM Regulated Actuator Assembly with all the above mentioned components except for the bracket. This assembly is Part No. 418522.

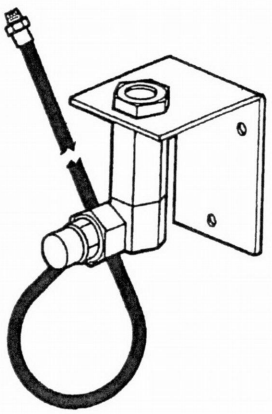


FIGURE 10
002225

TWO TANK ENCLOSURE ASSEMBLY

The Two Tank Enclosure Assembly, Part No. 429872, consists of two expellant gas hoses, two grommets, and the mounting enclosure. The assembly is used in 9 gallon systems. It can be coupled with a 3-gallon regulated release assembly or a 3-gallon regulated actuator assembly to give a total of 9 gallons of agent. Agent tanks must be ordered separately.

The tank enclosure is designed to mount in a minimum amount of space.

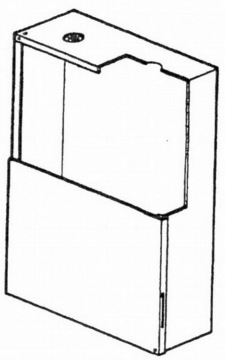


FIGURE 11
002277

GAS CARTRIDGES

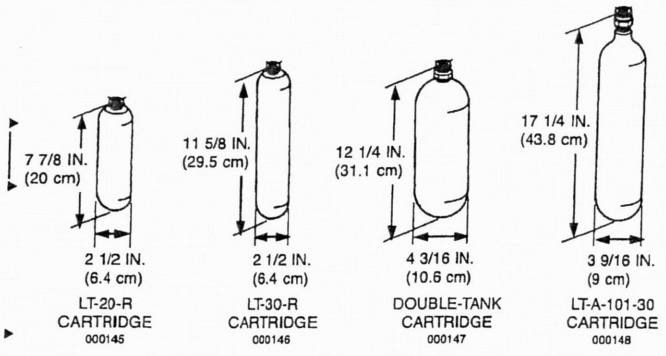
The R-102 system uses gas cartridges to store nitrogen or carbon dioxide expellant gases under pressure until the system is actuated, at which time the cartridge seal is punctured and the released gas expels liquid agent from one or more tanks through the discharge piping and out the discharge nozzles.

Four nitrogen gas cartridges and three carbon dioxide gas cartridges are available as shown in Figure 13.

Cartridges noted as TC/DOT are both Transport Canada (TC) and Department of Transportation (DOT) approved. Cartridges noted as DOT are Department of Transportation approved only.

Cartridge selection options are provided in Section IV under Tank and Cartridge Requirements.

NITROGEN GAS CARTRIDGES



CARBON DIOXIDE CARTRIDGES

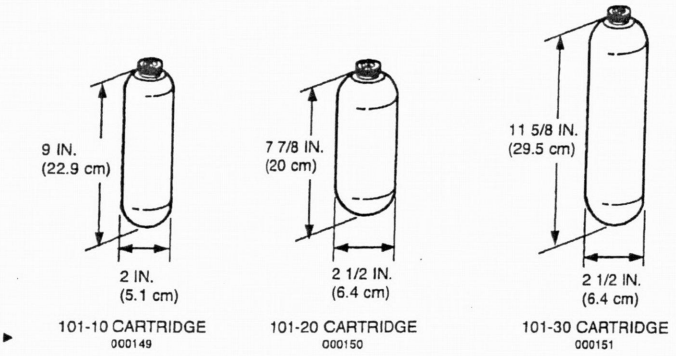


FIGURE 13

Additional cartridge shipping assemblies are available for European and Australian requirements.

Cartridge Description	European Part No.	Australian Part No.	TC/DOT Part No.
LT-20-R	428440	428948	423429
LT-30-R	428441	426553	423435
Double Tank	428446	426563	423493
LT-A-101-30	428442	426555	423491
101-10 – CO2	428443	N/A	423439
101-20 – CO2	428445	N/A	423441
101-30 – CO2	428444	N/A	423443

Note: For 101-10 cartridge, Part No. 15850 is DOT only.

NOZZLES

There are 11 types of discharge nozzles each designed to distribute the liquid agent in a uniform pattern throughout the hazard area:

1. 1W Nozzle
2. 1N Nozzle
3. 1/2N Nozzle
4. 3N Nozzle
5. 2W Nozzle
6. 230 Nozzle
7. 245 Nozzle
8. 260 Nozzle
9. 290 Nozzle
10. 2120 Nozzle
11. 1F Nozzle

Although these nozzles are similar in appearance and have certain common parts, the tip of each nozzle is designed for a specific application and must only be used in those areas. See Nozzle Application Chart in Section IV – System Design, for individual nozzle usage.

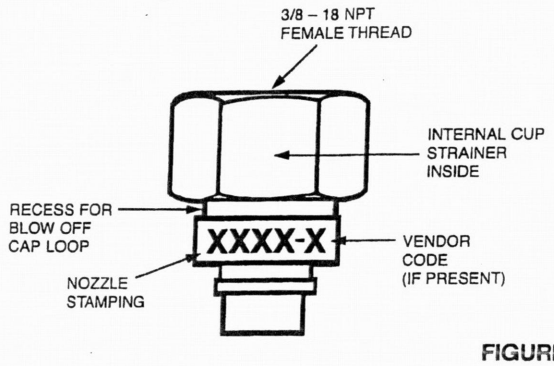


FIGURE 14
000002

Nozzle Identification Chart

Note: See Component Index for nozzle package shipping assembly part numbers.

Nozzle Type	Nozzle Part No.	Nozzle* Stamping	Nozzle Flow No.	Nozzle Material
1W Nozzle	419336	1W**	1	Chrome-Plated Body
1N Nozzle	419335	1N**	1	Chrome-Plated Body
1/2N Nozzle	419334	1/2N	1/2	Chrome-Plated Body
3N Nozzle	419338	3N	3	Chrome-Plated Body
2W Nozzle	419337	2W	2	Chrome-Plated Body
230 Nozzle	419339	230	2	Chrome-Plated Body
245 Nozzle	419340	245	2	Chrome-Plated Body
260 Nozzle	419341	260	2	Chrome-Plated Body
290 Nozzle	419342	290	2	Chrome-Plated Body
2120 Nozzle	419343	2120	2	Chrome-Plated Body
1F Nozzle	419333	1F	1	Chrome-Plated Body

*Nozzle stamping may contain an additional letter indicating a vendor's code.

**Stainless steel versions are available in the 1W nozzle (Part No. 432527) and the 1N nozzle (Part No. 435672).

SILICONE LUBRICANT

Dow Corning Compound 111, Part No. 78112, is available in a 5.3-ounce tube. Compound has excellent qualities for sealing and lubricating system components.

SWIVEL ADAPTOR

The Swivel Adaptor Assembly consists of a swivel nut, swivel body and swivel ball. All are chrome-plated. The swivel adaptor allows any nozzle to be rotated approximately 30° in all directions. Swivel Adaptors must be ordered as a Swivel Adaptor Shipping Assembly, Part No. 423572, which contains 25 Swivel Adaptors or Part No. 419385, which contains 9 Swivel Adaptors.

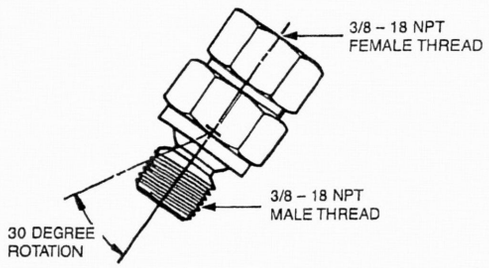


FIGURE 15
000003

RUBBER BLOW-OFF CAPS

The Rubber Blow-Off Cap helps keep the orifice of the nozzle free of grease or other substances that could interfere with agent distribution. A retaining strap attaches the blow-off cap to the nozzle. Rubber Blow-Off Caps must be ordered as a Shipping Assembly, Part No. 77695, which contains 50 blow-off caps, or Part No. 77411, which contains 12 blow-off caps.

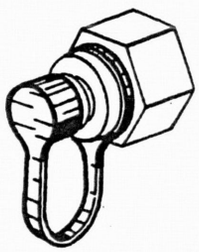


FIGURE 16
000009

CB METAL BLOW-OFF CAP

The CB Metal Blow-off Cap Package, Part No. 433208, is used for all high temperature environments. The metal blow-off cap contains a special O-ring placed inside the cap which integrates with the nozzle to create a seal and to help hold the blow-off cap in position.

The CB Metal Blow-Off Cap Package, Part No. 433208, contains 10 blow-off caps.

Also available is a 10 pack of CB Stainless Steel Blow-Off Caps, Part No. 434707.

A 10 pack of Metal Blow-Off Cap O-rings, Part No. 551530, is also available.

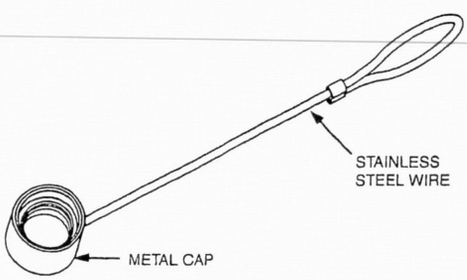


FIGURE 17
007633

CONDUIT OFFSET ASSEMBLY

The conduit offset assembly, Part No. 435961, is used to change direction of the wire rope on detection, mechanical gas valve, and remote pull station lines. The conduit offset assembly can only be used in the area where the conduit attaches to the regulated release assembly. When using the conduit offset assembly, the maximum number of pulley elbows is still allowed. The Conduit Offset Shipping Assembly, Part No. 436063, consists of 6 conduit offsets.

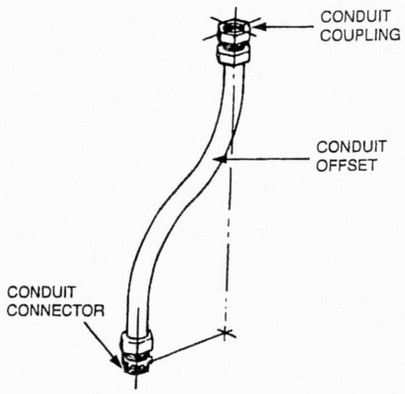


FIGURE 18
000153

"QUIK-SEAL" ADAPTOR

The "Quik-Seal" adaptor is a listed mechanical bulkhead fitting that produces a liquid-tight seal around both distribution piping and detection conduit which runs through restaurant hoods and ducts. The "Quik-Seal" adaptor accepts threaded pipe or conduit. The adaptor is available for 1/4 in. (Part No. 78196), 3/8 in. (Part No. 77285), 1/2 in. (Part No. 77287), or 3/4 in. (Part No. 77289) pipe or conduit sizes. When using with EMT conduit, a conduit connector must be installed in each end of the adaptor. The "Quik-Seal" Adaptor Shipping Assembly must be ordered as stated below:

Size	Shipping Assembly Part No.	Qty.	Hole Size Required
1/4 in.	78196	24	3/4 in.
3/8 in.	77285	24	1 1/8 in.
1/2 in.	77287	24	1 1/8 in.
3/4 in.	77289	24	1 3/8 in.

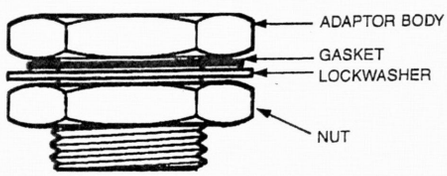


FIGURE 19
000154

DETECTORS

The detector consists of three basic components: the bracket, linkage, and fusible link. (Fusible links are not included and must be ordered separately.) The bracket holds the entire assembly to the mounting surface. The linkage is used to support the fusible link. The fusible link is designed to separate at a specific temperature and release the wire rope, thereby actuating the regulated release mechanism.

The scissor style detector allows the wire rope to be strung completely through the detection system conduit and brackets first and the detector linkage assemblies are then clipped on later.

The detector consists of two types of assemblies:

The Terminal Detector (Part No. 435546) includes a test link and is placed last in a series of detectors. This detector is sometimes referred to as the end-of-line detector and is thus named because it is at the point at which the wire rope "terminates," or is anchored at the detector bracket. Only one terminal detector is required per detection system.

The Series Detector (Part No. 435547) is any detector located in-line between the regulated release assembly and the terminal detector.

When using Part No. 435546 and 435547 detectors, a total of 15 detectors can be in one detection system: 14 series detectors, Part No. 435547 and 1 terminal detector, Part No. 435546.

Note: Series Detector, Part No. 435547, is also available as Part No. 435548, 25/Pkg.

SCISSOR STYLE – PART NO. 435546 AND 435547

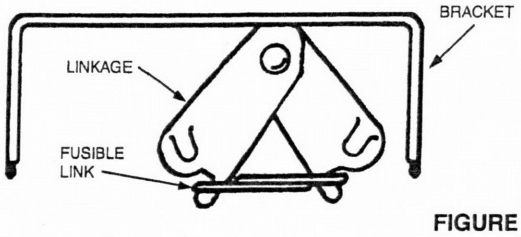
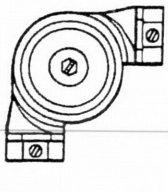


FIGURE 24
000159

PULLEY ELBOWS

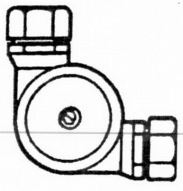
There are two types of pulley elbows used to change the direction of the wire rope by 90°. ANSUL recommends for temperatures not in excess of 700 °F (371 °C). Part No. 415670 has socket ends with set screws for 1/2 in. conduit, and Part No. 423250 has compression ring ends also for 1/2 in. conduit. Pulley elbows must be ordered in quantities of 50 as Shipping Assembly Part No. 415671 (socket end type) and Part No. 423251 (compression end type).

PART NO. 415670



000160

PART NO. 423250



000161

FIGURE 25

PULLEY TEE

The Pulley Tee (Part No. 427929) is used to change the direction of two wire ropes by 90°. It must be used in areas where the temperatures are within the range of 32 °F to 130 °F (0 °C to 54 °C). Pulley tees can be used in mechanical gas valve actuation lines and remote manual pull station lines. Pulley tees cannot be used within a detection line.

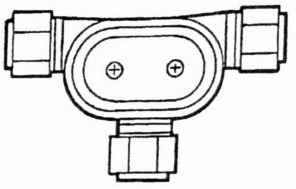


FIGURE 26
000447

STAINLESS STEEL CABLE

The 1/16 in. stainless steel cable is run from the terminal detector, through conduit, all series detectors and pulley elbows, and into the regulated release mechanism trip lever. When any fusible link separates, the tension on the cable is relaxed, and the trip lever actuates the regulated release mechanism. The cable can also be used for mechanical gas valves and remote manual pull stations. The cable is available in 50 ft (15 m) (Part No. 15821) and 500 ft (152.4 m) (Part No. 79653) lengths.

REMOTE MANUAL PULL STATION

The remote manual pull station (Part No. 434618 or 435960) is made out 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 compatible with the ANSUL Flexible Conduit. The molded manual pull station should be mounted at a point of egress and positioned at a height determined by the authority having jurisdiction. Trim Rings, Part No. 427074 (pack of 10), are available.

Part No. 434618 (Without Wire Rope)
Part No. 435960 (With 50 ft (15.2 m) of Wire Rope)

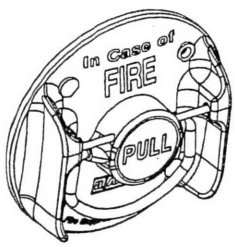


FIGURE 27
008326

FLEXIBLE CONDUIT

Flexible conduit allows for quicker 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 Manual Pull Station, Part No. 434618, and mechanical gas valve installations. The Flexible Conduit comes in a 500 ft (152.4 m) length, Part No. 434525, or together with 500 ft (152.4 m) of wire rope, Part No. 435959.

Also available is a Flexible Conduit Strain Relief (50-pack), Part No. 435979.

A 50-pack of Flexible Conduit Inserts, Part No. 434347, is also available.

Note: Flexible conduit cannot be used in detection systems.

MECHANICAL GAS VALVES

The mechanical gas valves are designed to shut off the flow of gas to the appliances upon actuation of the regulated release assembly. The valves are available in sizes of 3/4 in., 1 in., 1 1/4 in., 1 1/2 in., and 2 in. ANSUL style; and 2 1/2 in. and 3 in. ASCO style. The valves are rated for natural and LP gas. Both styles are UL Listed and includes the air cylinder, tubing, and fittings, Part No. 15733, for connection to the release mechanism.

Part No.	Description	Maximum Operating Pressure
55598	3/4 in. Gas Valve (ANSUL)	10 psi (0.69 bar)
55601	1 in. Gas Valve (ANSUL)	10 psi (0.69 bar)
55604	1 1/4 in. Gas Valve (ANSUL)	10 psi (0.69 bar)
55607	1 1/2 in. Gas Valve (ANSUL)	10 psi (0.69 bar)
55610	2 in. Gas Valve (ANSUL)	10 psi (0.69 bar)
25937	2 1/2 in. Gas Valve (ASCO)	5 psi (0.35 bar)
25938	3 in. Gas Valve (ASCO)	5 psi (0.35 bar)

Pipe Size (inches)	Flow Capacity (CFH) P.D. 1 in. WC 0.64 SP GR	BTU/HR, at 1 in. P.D. 0.64 SP GR 1000 BTU/ft³ Natural Gas
3/4	751	751,000
1	1288	1,288,000
1 1/4	1718	1,718,000
1 1/2	2630	2,630,000
2	4616	4,616,000
2 1/2	5700	5,800,000
3	7100	7,300,000

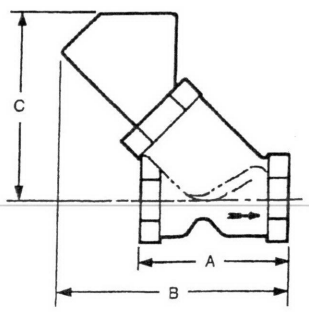
To calculate gas flow for other than 1 inch p.d.:

New cfh = (cfh at 1 inch) x $\sqrt{\text{new p.d.}}$

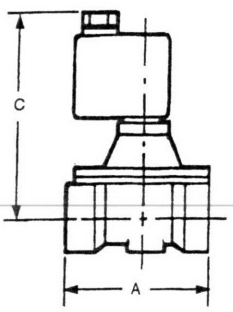
To calculate gas flow for other than 0.64 SP GR:

New cfh = (cfh at 0.64) x $\sqrt{\frac{0.64}{\text{New SP GR}}}$

Valve Size	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
3/4 in.	3 3/4	(95.3)	6 3/8	(161.9)	5 1/2	(139.7)
1 in.	3 3/4	(95.3)	6 3/8	(161.9)	5 1/2	(139.7)
1 1/4 in.	4 7/8	(123.8)	7 3/8	(187.3)	6 3/8	(161.9)
1 1/2 in.	4 7/8	(123.8)	7 3/8	(187.3)	6 3/8	(161.9)
2 in.	5 7/8	(149.2)	7 7/8	(200.0)	6 11/16	(169.9)
2 1/2 in.	7 13/16	(198.4)	-----		9 1/16	(230.2)
3 in.	7 25/32	(197.6)	-----		9 1/16	(230.2)



3/4 IN. THRU 2 IN.
004208



2 1/2 IN. THRU 3 IN.
004209

FIGURE 28

ALARM INITIATING SWITCH

The Alarm Initiating Switch Kit, Part No. 428311, can be field mounted within the ANSUL AUTOMAN release. This switch must be used to close a supervised alarm circuit to the building main fire alarm panel when the ANSUL AUTOMAN release actuates. This action will signal the fire alarm panel that there was a system actuation in the kitchen area. The switch kit contains all necessary mounting components along with a mounting instruction sheet. The switch is rated 50 mA, 28 VDC.

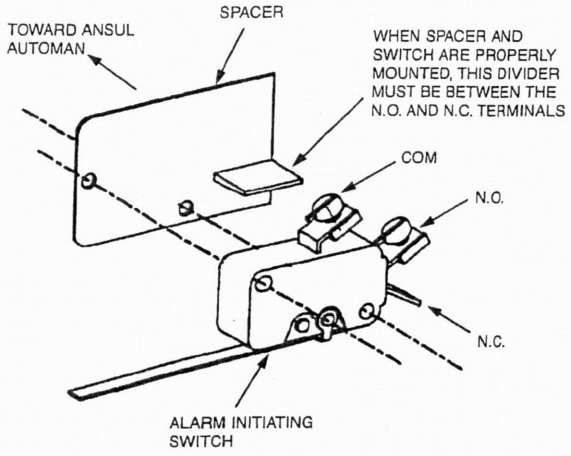


FIGURE 32
004890

REGULATOR TEST KIT

The Test Kit Assembly (Shipping Part No. 56972) is required to test the regulator setting and nitrogen flow during 12-year maintenance examinations. This will ensure that the regulator is functioning properly.

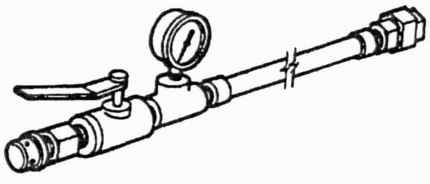


FIGURE 33
000169

FUSIBLE LINK

Select correct UL Listed fusible link(s) for installation in detector(s) according to the temperature condition chart below:

K STYLE

Fusible Link Part No.	Fusible Link Shipping Assembly Part No.	Temperature Rating	To Be Used Where Temperature Does Not Exceed
415739 (1)	415739 (1)	165 °F (74 °C)	100 °F (38 °C)
415740 (1)	415740 (1)	212 °F (100 °C)	150 °F (66 °C)
415741 (1)	415744 (25)	280 °F (138 °C)	225 °F (107 °C)
415742 (1)	415745 (25)	360 °F (182 °C)	290 °F (143 °C)
415743 (1)	415746 (25)	450 °F (232 °C)	360 °F (182 °C)

ML STYLE

Fusible Link Part No.	Fusible Link Shipping Assembly Part No.	Temperature Rating	To Be Used Where Temperature Does Not Exceed
550368 (1)	551522 (10)	165 °F (74 °C)	100 °F (38 °C)
550365 (1)	551523 (10)	212 °F (100 °C)	150 °F (66 °C)
550366 (1)	551524 (10)	280 °F (138 °C)	225 °F (107 °C)
550009 (1)	551525 (10)	360 °F (182 °C)	290 °F (143 °C)
550367 (1)	551526 (10)	450 °F (232 °C)	360 °F (182 °C)
56816 (1)	551527 (10)	500 °F (260 °C)	400 °F (204 °C)
56816 (1)	73867 (25)	500 °F (260 °C)	400 °F (204 °C)

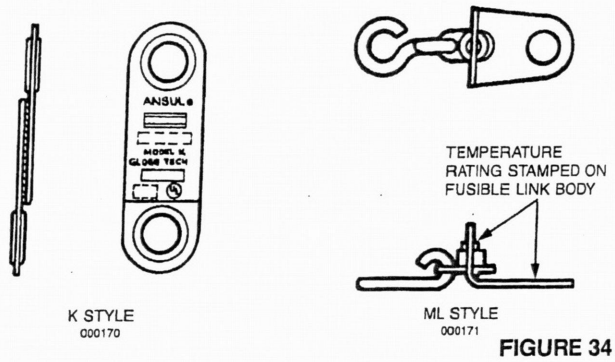


FIGURE 34

MAXIMUM REGISTERING THERMOMETER

The Maximum Registering Thermometer, Part No. 15240, may be used to indicate the highest normal temperature for the protected area. Once this is established, the correct rated fusible link can be chosen. Other methods for determining maximum temperatures may be used.

HOSE/GROMMET PACKAGE

The Hose/Grommet Package, Part No. 418511, consists of a 24 in. rubber hose and 2 (two) grommets. This package is required when expellant gas hose is routed outside the ANSUL AUTOMAN Regulated Release, Regulated Actuator, and/or tank enclosure assemblies.

SYSTEM DESIGN

The ANSUL R-102 Restaurant Fire Suppression System may be used on a number of different types of restaurant cooking appliances and hood and duct configurations. The design information listed in this section deals with the limitations and parameters of this pre-engineered system. Those individuals responsible for the design of the R-102 system must be trained and hold a current ANSUL certificate in an R-102 training program.

The R-102 and the PIRANHA systems use compatible agents and components, therefore, they may be used together for cooking appliance, hood, and duct protection. The primary ANSUL AUTOMAN Release can be either an R-102 or a PIRANHA ANSUL AUTOMAN Release and can actuate up to two additional R-102 or PIRANHA Regulated Actuators. In systems utilizing a 101 remote release, any combination of the maximum number of regulated actuators can be used.

- Both systems must actuate simultaneously.
- Each system must be designed and installed per its appropriate manual.
- Adjacent appliances requiring protection must be protected with the same type of system, either R-102 or PIRANHA, unless the center-to-center spacing between the adjacent R-102 and PIRANHA nozzles is no less than 36 in. (91.4 cm).
- When appliances are protected with R-102 nozzles, the hood and connecting duct above those appliances cannot be protected with PIRANHA nozzles.
- Mixing systems in a common plenum is not allowed.

One of the key elements for restaurant fire protection is a correct system design. This section is divided into ten sub-sections: Nozzle Placement Requirements, Tank Quantity Requirements, Actuation and Expellant Gas Line Requirements, Distribution Piping Requirements, Detection System Requirements, Manual Pull Station Requirements, Mechanical Gas Valve Requirements, Electrical Gas Valve Requirements, Electrical Switch Requirements, and Pressure Switch Requirements. Each of these sections must be completed before attempting any installation. System design sketches should be made of all aspects of design for reference during installation.

NOZZLE PLACEMENT REQUIREMENTS

This section gives guidelines for nozzle type, positioning, and quantity for duct, plenum, and individual appliance protection. This section must be completed before determining tank quantity and piping requirements.

Duct Protection – Single Nozzle

All duct protection is UL listed without limitation of maximum duct length (unlimited length). This includes all varieties of ductworks both horizontal and vertical including ducts that run at angles to the horizontal and ducts with directional bends.

The R-102 system uses different duct nozzles depending on the size of duct being protected.

GENERAL INFORMATION

1. Nozzles must be located 2-8 in. (5-20 cm) into the center of the duct opening, discharging up. See Figure 1.

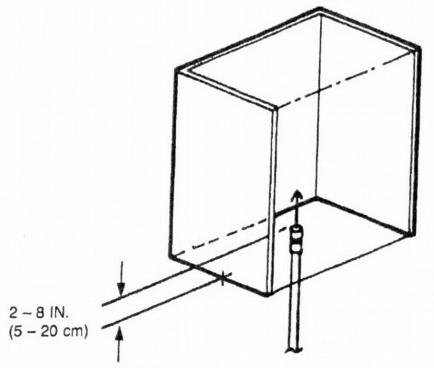


FIGURE 1
000173

2. In installations where a UL listed damper assembly is employed, the duct nozzle can be installed beyond the 8 in. (20 cm) maximum, to a point just beyond the damper assembly that will not interfere with the damper. Exceeding the maximum of 8 in. (20 cm) in this way will not void the UL listing of the system.
3. Previously listed 3 flow number and 5 flow number duct protection detailed in earlier published manual, Part No. 418087-06, can also still by utilized.

DUCT SIZES UP TO 50 IN. (127 cm)
PERIMETER/ 16 IN. (41 cm) DIAMETER

- One 1W nozzle (Part No. 419336) = one flow number
- 50 in. (127 cm) perimeter maximum
- 16 in. (41 cm) diameter maximum

DUCT SIZES UP TO 100 IN. (254 cm)
PERIMETER/ 32 IN. (81.3 cm) DIAMETER

- One 2W Nozzle (Part No. 419337) = two flow numbers
- 100 in. (254 cm) perimeter maximum
- 32 in. (81.3 cm) diameter maximum

The chart below shows the maximum protection available from each duct nozzle.

Description	Part No.	3.0 Gallon System	1.5 Gallon System
2W Nozzle	419337	Maximum 100 in. (254 cm) Perimeter	Maximum 100 in. (254 cm) Perimeter
1W Nozzle	419336	Maximum 50 in. (127 cm) Perimeter	Maximum 50 in. (127 cm) Perimeter

Duct Protection – Multiple Nozzle

DUCT SIZES UP TO 135 IN. (343 cm) PERIMETER – 3 FLOW OPTION

- One 1W Nozzle (Part No. 419336) and one 2W Nozzle (Part No. 419337) = three flow numbers
- 135 in. (343 cm) perimeter maximum
- No round duct option available
- Follow design table in Figure 2 to determine maximum module size for each nozzle

Side A Maximum		Side B Maximum		1W Module Side B Maximum		2W Module Side B Maximum	
in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)
4	(10)	60.0	(152)	23.0	(58)	37.0	(94)
5	(13)	60.0	(152)	23.0	(58)	37.0	(94)
6	(15)	59.5	(151)	22.5	(57)	37.0	(94)
7	(18)	59.0	(150)	22.0	(56)	37.0	(94)
8	(20)	58.5	(149)	22.0	(56)	36.5	(93)
9	(23)	58.0	(147)	21.5	(55)	36.5	(93)
10	(25)	57.0	(145)	21.0	(53)	36.0	(91)
11	(28)	56.0	(142)	20.5	(52)	35.5	(90)
12	(31)	55.5	(141)	20.0	(51)	35.5	(90)
13	(33)	54.5	(138)	19.5	(50)	35.0	(89)
14	(36)	53.5	(136)	18.5	(47)	35.0	(89)
15	(38)	52.0	(132)	18.0	(46)	34.0	(86)
16	(41)	51.0	(130)	17.0	(43)	34.0	(86)
17	(43)	49.5	(126)	16.0	(41)	33.5	(85)
18	(46)	47.5	(121)	14.5	(37)	33.0	(84)
19	(48)	46.0	(117)	13.5	(34)	32.5	(83)
20	(51)	43.5	(111)	12.0	(31)	31.7	(81)
21	(53)	41.0	(104)	10.0	(25)	31.0	(79)
22	(56)	38.0	(97)	7.5	(19)	30.5	(78)
23	(58)	33.5	(85)	4.0	(10)	29.5	(75)

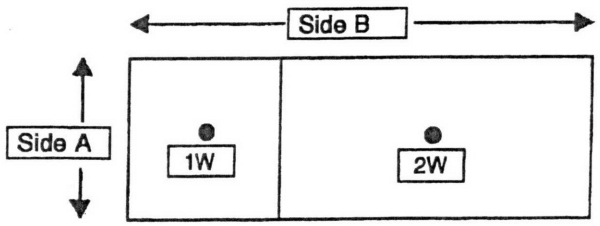


FIGURE 2
006521

Example: Protection is required for a duct that has an "A" dimension of 8.0 in. (20 cm) wide and a "B" dimension of 55 in. (140 cm) long.

Referring to the table in Figure 2, if the "A" dimension is 8.0 in. (20 cm), the "B" dimension must not exceed 58.5 in. (149 cm). In this example, the "B" dimension is 55 in. (140 cm), therefore, this duct can be protected with a three flow application.

Read over from the 8.0 in. (20 cm) line on the table to the 1W Module column. At that point, the chart shows that the "B" module length for the 1W nozzle can be 22.0 in. (56 cm). Center the 1W nozzle in that module. The 2W module can now be centered within the remaining module.

Plenum Protection

The R-102 system uses the 1W Nozzle (Part No. 419336) or the 1N Nozzle (Part No. 419335) for plenum protection. The 1W nozzle tip is stamped with 1W and the 1N nozzle tip is stamped with 1N, indicating they are one-flow nozzles and must be counted as one flow number each. When protecting a plenum chamber, the entire chamber must be protected regardless of filter length.

VERTICAL PROTECTION – GENERAL

▸ 1W NOZZLE – PART NO. 419336 – SINGLE AND "V" BANK
▸ PROTECTION

One 1W nozzle will protect 4 linear feet (1.2 m) of plenum. The maximum distance from the end of the hood to the first and last nozzle must be no more than 2 ft (0.6 m). After the first nozzle, any additional nozzles must be positioned at a maximum of 4 ft (1.2 m) apart down the entire length of the plenum. The plenum width must not exceed 4 ft (1.2 m). (The 1W nozzle can be used on single or V-bank filter arrangements.) See Figure 6.

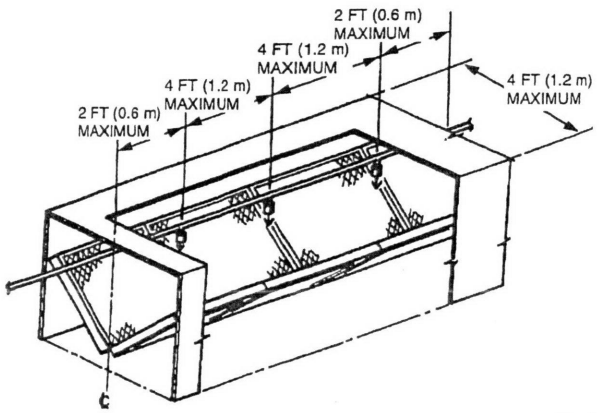


FIGURE 6
000197

When protecting plenums with the 1W nozzle, two options of coverage are available:

Option 1: The 1W nozzle must be on the center line of the single or "V" bank filter and positioned within 1-20 in. (2.5-51 cm) above the top edge of the filter. See Figure 7.

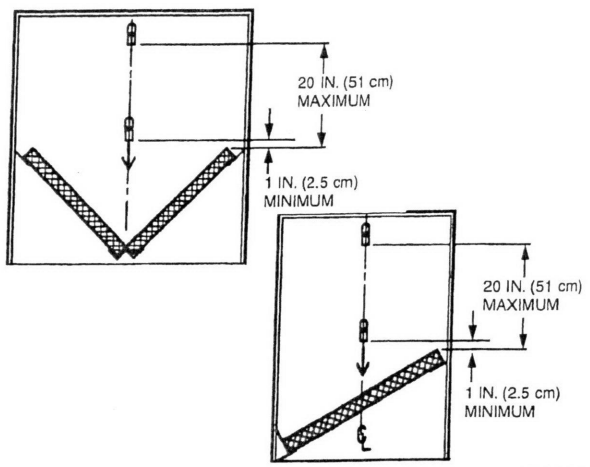


FIGURE 7
000199

Option 2: The 1W nozzle must be placed perpendicular, 8-12 in. (20-30 cm) from the face of the filter and angled to the center of the filter. The nozzle tip must be within 2 in. (5 cm) from the perpendicular center line of the filter. See Figure 8.

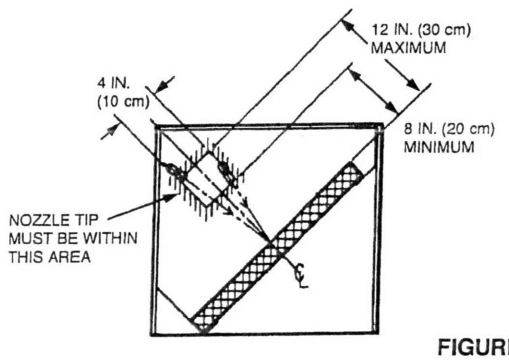


FIGURE 8
000200

HORIZONTAL PROTECTION – OPTION 1

1N NOZZLE – PART NO. 419335 – SINGLE BANK PROTECTION

One 1N nozzle will protect 10 linear feet (3.1 m) of single filter bank plenum. The nozzle(s) must be mounted in the plenum, 2 to 4 in. (5 to 10 cm) from the face of the filter, centered between the filter height dimension, and aimed down the length. The nozzle must be positioned 0-6 in. (0-15 cm) from the end of the hood to the tip of the nozzle. See Figure 9.

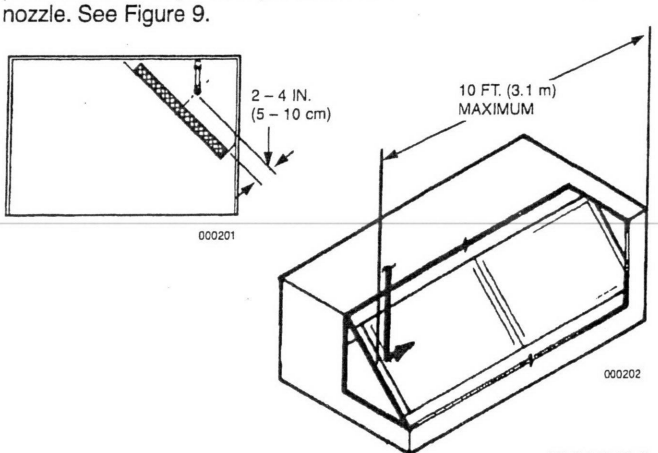


FIGURE 9

Range Protection

The R-102 system uses five different nozzles for the protection of ranges. Two of the design options require a one-flow nozzle and three of the design options require two-flow nozzles.

NOTICE

A 13 in. (33 cm) diameter wok pan is the largest wok size that can be protected on ranges.

When protecting hot top ranges, the entire cooking surface must be protected.

Range Protection 1N (1-Flow) Nozzle – High Proximity Application

No Obstructions

Single and multiple burner ranges can be protected using a 1N nozzle, Part No. 419335. The nozzle tip is stamped with 1N, indicating that this is a one-flow nozzle and must be counted as one flow number.

When using this nozzle for range protection, the maximum length of the burner grates being protected with a single nozzle must not exceed 32 in. (81 cm) and the maximum area of the burner grates must not exceed 384 in.^{2} (2477 cm^2) per nozzle.

When protecting a range, the 1N nozzle must be located a maximum of 10 in. (25.4 cm) from each burner grate centerline and must be aimed at the center of the cooking surface. See Figures 27 and 28.

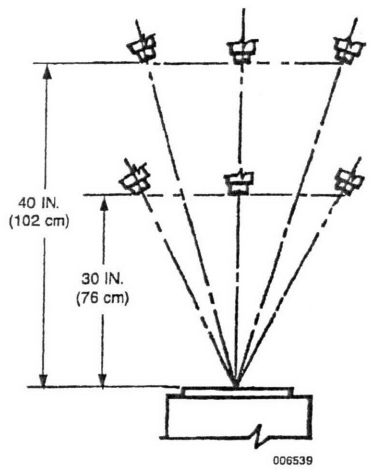


FIGURE 27

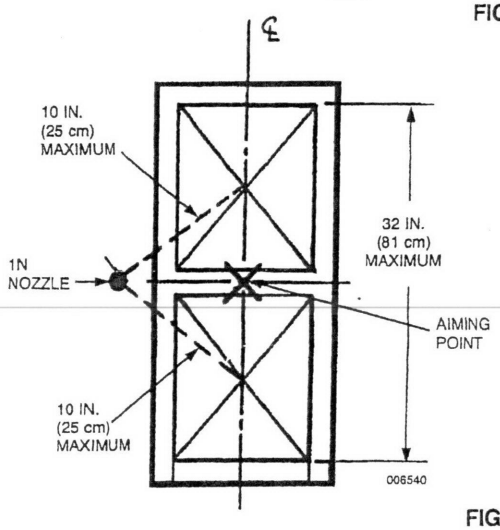


FIGURE 28

▸ Griddle Protection 1N (1-Flow) Nozzle – High Proximity Application

The R-102 system uses four different nozzles for the protection of griddles. One of the applications requires a 1-flow nozzle and three of the applications require a 2-flow nozzle.

High Proximity Application: 35 in. to 40 in. (89 to 102 cm) above the cooking surface.

This high proximity application uses the 1N nozzle, Part No. 419335.

The nozzle tip is stamped with 1N indicating this is a one-flow nozzle and must be counted as one flow number.

One 1N nozzle will protect a maximum cooking area of 1080 in.^{2} (6968 cm^2) with the maximum longest side of 36 in. (91 cm).

When using this nozzle for griddle protection, the nozzle must be positioned along the cooking surface perimeter to a maximum of 2 in. (5 cm) inside the perimeter, and aimed to the midpoint of the cooking surface. See Figure 39 and 40.

NOTICE

When using this type of griddle protection, only 5 flow numbers are allowed on a 1.5 gal (5.7 L) system and only 11 flow numbers are allowed on a 3 gal (11.4 L) system.

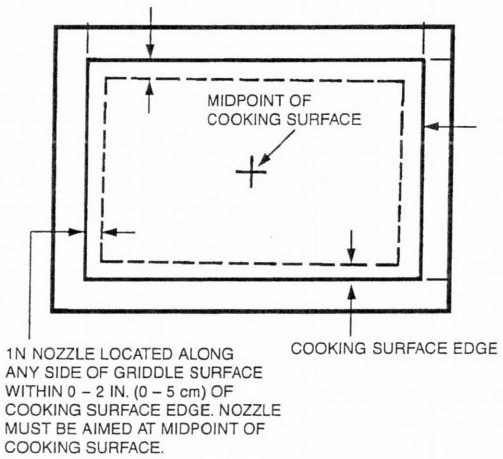


FIGURE 39
000241

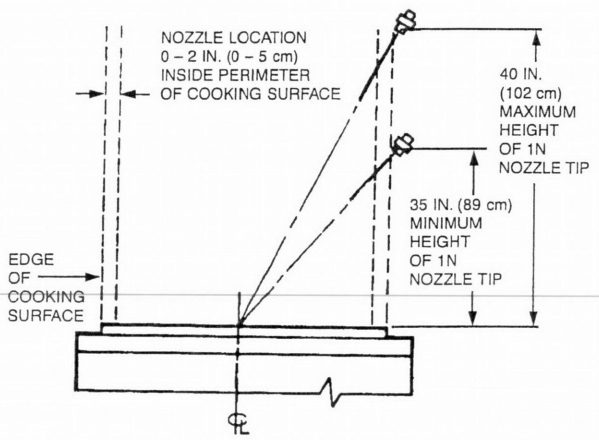


FIGURE 40
000243

▸ Griddle Protection 290 (2-Flow) Nozzle – High Proximity ▸ Application

Option 1 – Nozzle Center Located

▸ 30 in. to 50 in. (76 cm to 127 cm) above the cooking surface.

This high proximity application uses the 290 nozzle, Part No. 419342.

The nozzle tip is stamped with 290 indicating this is a 2-flow nozzle and must be counted as two flow numbers.

▸ One 290 nozzle will protect a maximum cooking area of 720 in.^{2} ▸ (4645 cm^2) with a maximum dimension of 30 in. (76 cm).

When using this nozzle for high proximity applications, the nozzle must be positioned within 1 in. (2.5 cm) of the center of the cook- ▸ ing surface and pointed vertically down. See Figure 41 and 42.

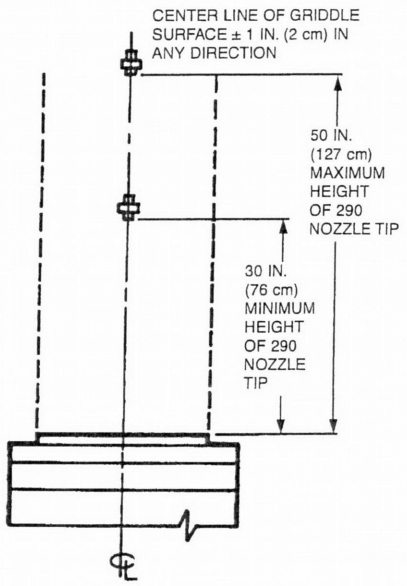


FIGURE 41
000244

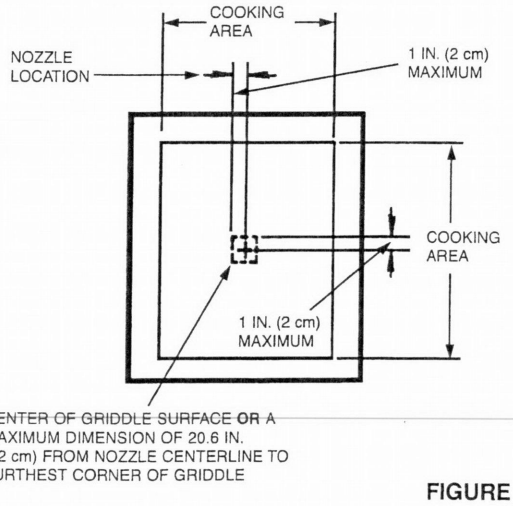


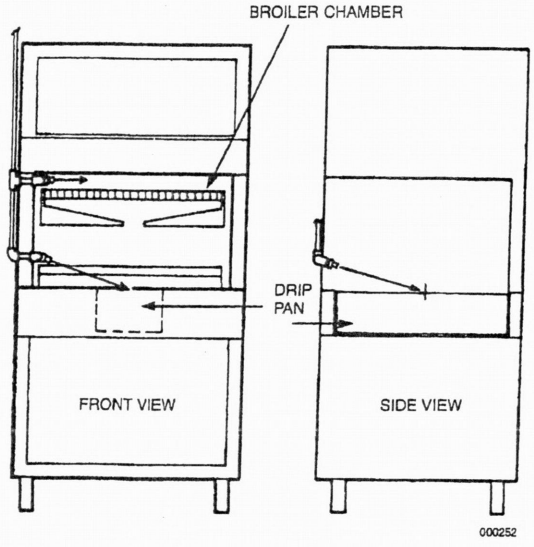
FIGURE 42
000773

▸ Upright Broiler Protection

The R-102 system uses two 1/2N Nozzles (Part No. 419334) for all ▸ upright broiler protection. The nozzle tip is stamped 1/2N, indicating that this is a half-flow nozzle. A pair of these nozzles will equal one flow number.

Two 1/2N nozzles will protect a maximum hazard area (internal broiler chamber) of 30 in. x 32.5 in. (76 cm x 82.5 cm). These noz- ▸ zles must always be used in pairs on an upright broiler. One nozzle must be positioned above the grate and pointed at the back opposite corner of the broiler chamber. The second nozzle must be pointed down into the center of the drip pan through the open ▸ slot. See Figure 58.

▸ UPRIGHT BROILER



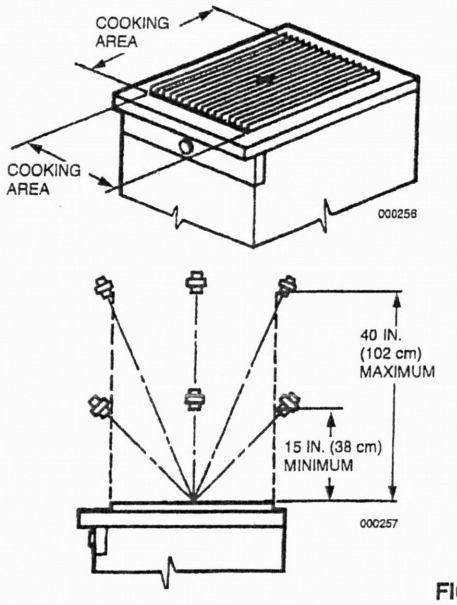
▸ **FIGURE 58**

Gas-Radiant/Electric Char-Broiler Protection

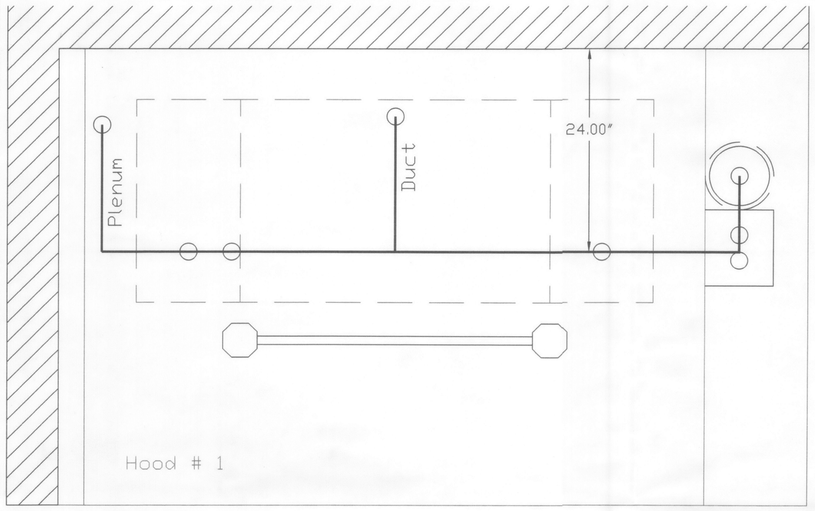
The R-102 system uses the 1N nozzle, (Part No. 419335) for gas-radiant/electric char-broiler protection.

The nozzle tip on the 1N nozzle is stamped with a 1N, indicating that this is a one-flow nozzle and must be counted as one flow number.

One IN nozzle will protect a hazard with a maximum length of 36 in. (91 cm) and a total cooking area which does not exceed ▸ 864 in.^{2} (5574 cm^2). The nozzle tip must be located 15 to 40 in. (38 to 102 cm) above the hazard surface. When using this nozzle for gas-radiant/electric char-broiler protection, the nozzle must be positioned anywhere along or within the perimeter of the maximum cooking area and shall be aimed at the center of the ▸ cooking surface. See Figure 59.



▸ **FIGURE 59**

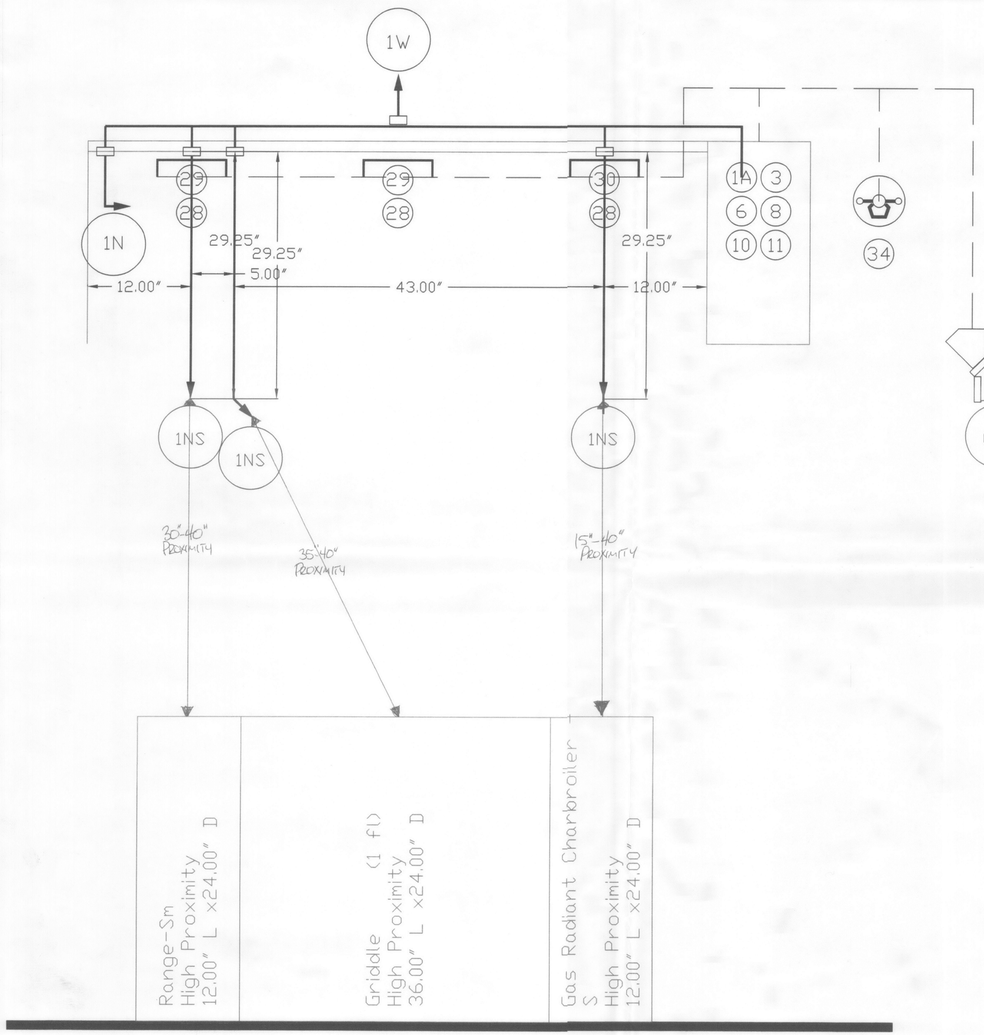


NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS

Job #: 1800904
Job Name: BREW CYCLE - PORTLAND
Drawn By:
System Size: ANSUL-1.5 Total FP required: 5
Hood # 1 6' 0.00" Long x 54" Wide x 24" High
Riser # 1 Size: 10" x 15"
Hood # 1 Metal Blow-Off Caps included.



LEGEND – FIRE CABINET ANSUL SYSTEM

1A	1.5 GALLON TANK
1B	3 GALLON TANK
2	OEM AUTOMAN RELEASE
3	OEM REGULATED RELEASE
4	OEM REGULATED ACTUATOR
5	ANSULEX LIQUID AGENT (3 GAL.)
6	ANSULEX LIQUID AGENT (1.5 GAL.)
7	CARTRIDGE (101-20)
8	CARTRIDGE (101-10)
9	CARTRIDGE (101-30)
9A	CARTRIDGE (LT-A-101-30)
9B	DOUBLE TANK CARTRIDGE
10	TEST LINK
11	DOUBLE MICROSWITCH
12	HOSE ASSEMBLY
1100	DUCT NOZZLE (430913)
2W	DUCT NOZZLE (419337)
1W	NOZZLE ASSEMBLY (419336)
1F	NOZZLE ASSEMBLY (419333)
1N	NOZZLE ASSEMBLY (419335)
1/2N	NOZZLE ASSEMBLY (419334)
3N	NOZZLE ASSEMBLY (419338)
245	NOZZLE ASSEMBLY (419340)
230	NOZZLE ASSEMBLY (419339)
2120	NOZZLE ASSEMBLY (419343)
290	NOZZLE ASSEMBLY (419342)
260	NOZZLE ASSEMBLY (419341)
28	DETECTOR BRACKET
29	LOW TEMP FUSIBLE LINK
30	HIGH TEMP FUSIBLE LINK
MGV	MECHANICAL GAS VALVE
EGV	ELECTRICAL GAS VALVE

APPROVED
For Conditions Shown and Subject to Final Inspection
FIRE MARSHAL
PORTLAND, OREGON
PERMIT#
BY: J.G DATE 8-15-13

13-191338 FA

Project Details
Brew Cycle
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Portland, Oregon 97209
Contact: Greg 503-804-6730

Installing Contractor
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CCB 63651
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503-231-2999
frank@metrosafetyandfire.com

METRO SAFETY & FIRE, INC.
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