APPLIANCE PROTECTION (Continued)

Fryer – Single Nozzle Protection (Continued)

TABLE 4-2: MAXIMUM AREA DIMENSIONS – SINGLE NOZZLE FRYER PROTECTION (Continued)

Max. Size Frypot Only	Max. Size Overall With Dripboard	Type of Nozzle	Nozzle Height Above Top of Fryer	Nozzle Location
Full Vat 14 1/2 in. x 16 1/2 in. (368 mm x 419 mm)	Full Vat 14 1/2 in. x 26 1/2 in. (368 mm x 673 mm)	290	16 in. to 21 in. (406 mm to 533 mm)	See Figure 4-17
Full Vat 19 1/2 in. x 19 in. (495 mm x 482 mm)	Full Vat 19 1/2 in. x 25 3/8 in. (495 mm x 644 mm)	290	13 in. to 16 in. (330 mm to 406 mm)	See Figure 4-17
Full Vat 19 1/2 in. x 19 in. (495 mm x 482 mm)	Full Vat 19 1/2 in. x 25 3/8 in. (495 mm x 644 mm)	3N	See Figure 4-18	See Figure 4-18
Full Vat 18 in. x 18 in. (457 mm x 457 mm)	Full Vat 18 in. x 27 3/4 in. (457 mm x 704 mm)	3N	25 in. to 35 in. (635 mm to 889 mm)	See Figure 4-19

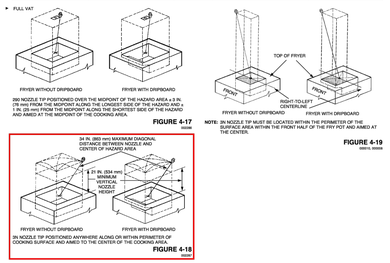


FIGURE 4-17 (000004)

FIGURE 4-18 (000005)

FIGURE 4-19 (000014, 000006)

APPLIANCE PROTECTION (Continued)

Range Protection (With or Without Back Shelf/ Obstruction)

When this type of hazard is equipped with a back shelf or other similarly sized obstruction located above the range top, two protection options are available: One requires a 1F nozzle and the other option requires a 260 nozzle.

RANGE PROTECTION 1F (1-FLOW) NOZZLE (WITH OR WITHOUT BACK SHELF/OBSTRUCTION)

Single and multiple burner ranges can be protected using a 1F nozzle. The nozzle is stamped with 1F indicating that it is a one-flow nozzle and must be counted as one flow number.

- The 1F nozzle range protection allows the shelf to be installed at a minimum height of 18 in. (457 mm) above the hazard area.

When using the 1F nozzle for range protection with or without back shelf, the maximum length of the hazard area being protected must not exceed 28 in. (711 mm) and the maximum area of the hazard area must not exceed 336 in.^{2} (0.216 m^2). See Figure 4-39 for nozzle location details.

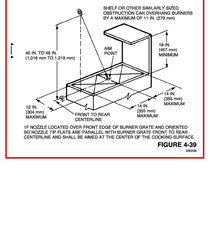


FIGURE 4-39 (000008)

APPLIANCE PROTECTION (Continued)

RANGE PROTECTION 260 (2-FLOW) NOZZLE (WITH OR WITHOUT BACK SHELF/OBSTRUCTION)

Single and multiple burner ranges can be protected using a 260 nozzle. The nozzle is stamped with 260 indicating that it is a two-flow nozzle and must be counted as two flow numbers.

When using the 260 nozzle for range protection with or without back shelf or other similarly sized obstruction, the maximum length of burner grates being protected must not exceed 32 in. (812 mm) and the maximum area of the burner grates must not exceed 384 in.^{2} (0.247 m^2). Nozzle must be located on the front edge of the burner grates and aimed at a point 10 in. (254 mm) from the back edge of the burner grates. Nozzle must be mounted 30 in. to 40 in. (762 mm to 1,016 mm) above the hazard surface. See Figure 4-40.

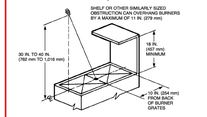


FIGURE 4-40 (000009)

APPLIANCE PROTECTION (Continued)

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

35 in. to 40 in. (889 mm to 1,016 mm) above the cooking surface.

This high proximity application uses the 1N nozzle.

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

One 1N nozzle protects a maximum cooking area of 1,080 in.^{2} (0.696 m^2) with the maximum longest side of 36 in. (914 mm).

When using this nozzle for griddle protection, the nozzle must be positioned along the cooking surface perimeter to a maximum of 2 in. (51 mm) inside the perimeter, and aimed to the midpoint of the cooking surface. See Figure 4-41 and Figure 4-42.

NOTICE

When using this type of griddle protection, only five 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.

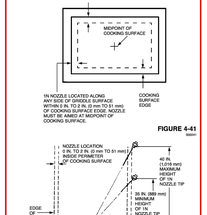


FIGURE 4-41 (000011)

FIGURE 4-42 (000012)

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

30 in. to 50 in. (762 mm to 1,270 mm) above the cooking surface.

This high proximity application uses the 290 nozzle.

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

One 290 nozzle protects a maximum cooking area of 720 in.^{2} (0.464 m^2) with a maximum dimension of 30 in. (762 mm).

When using this nozzle for high proximity applications, the nozzle must be positioned within 1 in. (25 mm) of the center of the cooking surface and pointed vertically down. See Figure 4-43 and Figure 4-44.

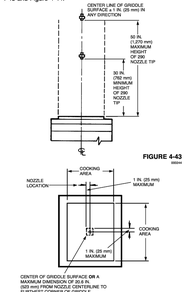


FIGURE 4-43 (000013)

FIGURE 4-44 (000170)

APPLIANCE PROTECTION (Continued)

Salamander Broiler Protection

The R-102 system uses three different nozzle locations for salamander broiler protection. All of the design options require a one-flow nozzle.

Salamander Broiler Protection – 1N (1-Flow) Nozzle Overhead

A salamander broiler with a maximum hazard area (internal broiler chamber) of 16 in. (406 mm) deep x 29 in. (736 mm) wide can be protected using a 1N nozzle. The nozzle is stamped with 1N, indicating that this is a one-flow nozzle.

The single 1N nozzle must be located directly in line with either vertical edge of the broiler opening, 6 in. to 12 in. (152 mm to 304 mm) in front of the broiler, and 0 in. to 12 in. (0 mm to 304 mm) above the top of the broiler. The nozzle must be aimed at the center of the broiler opening. See Figure 4-59.

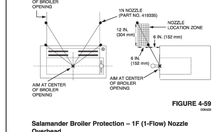


FIGURE 4-59 (000018)

Salamander Broiler Protection – 1F (1-Flow) Nozzle Overhead

A salamander broiler with a maximum hazard area (internal broiler chamber) of 15 1/2 in. (393 mm) deep x 31 in. (787 mm) wide can be protected using a 1F nozzle. The nozzle is stamped with 1F, indicating that this is a one-flow nozzle.

The single 1F nozzle must be located directly in line with the center of the broiler opening, 8 in. to 12 in. (203 mm to 304 mm) in front of the broiler and 12 in. to 18 in. (304 mm to 457 mm) above the top of the broiler. The nozzle must be aimed at the center of the top broiler opening when the grate is located in the middle position. The nozzle must be oriented so the nozzle tip flats are parallel with the grate left to right centerline. See Figure 4-60.

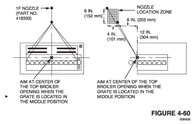


FIGURE 4-60 (000019)

Salamander Broiler Protection – 1N (1-Flow) Nozzle Local

Note: The use of the Agent Distribution Hose should be considered when protecting a salamander broilerrange combination appliance that employs casters.

A salamander broiler with a maximum hazard area (internal broiler chamber) of 15 in. (381 mm) deep x 31 in. (787 mm) wide can be protected using a 1N nozzle. The nozzle is stamped with 1N, indicating that this is a one-flow nozzle.

The single 1N nozzle must be affixed to the side of the cooking chamber, above the grate on either vertical edge of the broiler opening. The nozzle must be aimed at the center of the grates. See Figure 4-61.

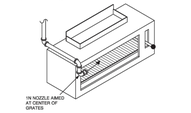


FIGURE 4-61 (000020)

Upright Broiler/Salamander Protection

The R-102 system uses two 1/2N Nozzles for all upright broiler protection. The nozzle is stamped 1/2N, indicating that this is a half-flow nozzle. A pair of these nozzles equals one flow number.

Two 1/2N nozzles protects a maximum hazard area (internal broiler chamber) of 30 in. x 32 1/2 in. (761 mm x 825 mm). These nozzles 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 4-62 and Figure 4-63.

APPLIANCE PROTECTION (Continued)

Upright Broiler/Salamander Protection (Continued)

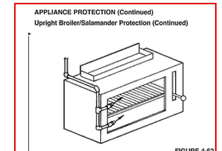


FIGURE 4-62 (000021)

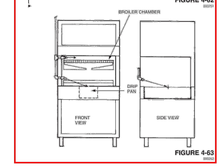


FIGURE 4-63 (000022)

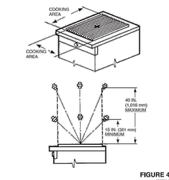


FIGURE 4-64 (000023, 000027)

Electric Char-Broiler Protection (Optional)

The R-102 system uses the 1N nozzle for electric char-broiler protection.

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

One 1N nozzle protects a hazard with a maximum length of 34 in. (863 mm) and a total cooking area which does not exceed 680 in.^{2} (0.438 m^2). The nozzle tip must be located 20 in. to 50 in. (508 mm to 1,270 mm) above the hazard surface. When using this nozzle for 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 4-65.

Gas-Radiant/Electric Char-Broiler Protection

The R-102 system uses the 1N nozzle for gas-radiant/electric char-broiler protection.

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

One 1N nozzle protects a hazard with a maximum length of 36 in. (914 mm) and a total cooking area which does not exceed 864 in.^{2} (0.557 m^2). The nozzle tip must be located 15 in. to 40 in. (381 mm to 1,016 mm) 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 4-64.

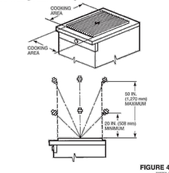


FIGURE 4-65 (000024, 000027)

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 held 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 AUTOMAN Release can be either an R-102 or a PIRANHA AUTOMAN Release and can actuate up to two additional R-102 or PIRANHA Regulated Actuators. 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. (914 mm).
- 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 sub-sections:

- Nozzle Placement Requirements
- Tank and Cartridge 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
- Alarm Initiating Switch Requirements
- Electrical 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.

Note: Ducts from multiple hoods connected to a common ductwork must be protected in compliance with NFPA 17A and all local codes.

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

GENERAL INFORMATION

1. Nozzles must be located 2 in. to 8 in. (51 mm to 203 mm) into the center of the duct opening, discharging into the opening. See Figure 4-1.

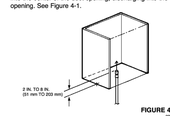


FIGURE 4-1 (000073)

2. In installations where a UL Listed damper assembly is employed, install the duct nozzle beyond the 8 in. (203 mm) maximum, to a point just beyond the damper assembly that does not interfere with the damper. Exceeding the maximum of 8 in. (203 mm) in this way does not void the UL Listing of the system.
3. Previously listed three flow number and five flow number duct protection detailed in earlier published manual (Part No. 418087-06) can also still be utilized.

DUCT SIZES UP TO 50 IN. (1,270 mm) PERIMETER
16 IN. (406 mm) DIAMETER

- One 1W nozzle = one flow number
- 50 in. (1,270 mm) perimeter maximum
- 16 in. (406 mm) diameter maximum

DUCT SIZES UP TO 100 IN. (2,540 mm) PERIMETER
32 IN. (812 mm) DIAMETER

- One 2W nozzle = two flow numbers
- 100 in. (2,540 mm) perimeter maximum
- 32 in. (812 mm) diameter maximum

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Plenum Protection (Continued)

HORIZONTAL PROTECTION – OPTION 1

1N Nozzle Single Bank Protection

One 1N nozzle protects 10 linear feet (3.0 m) by 4 ft (1.2 m) wide of single filter bank plenum. Mount the nozzles in the plenum,

- 2 in. to 4 in. (51 mm to 102 mm) from the face of the filter, centered between the filter height dimension, and aimed down the length. The nozzle must be positioned 0 in. to 6 in. (0 mm to 152 mm) from the end of the plenum to the tip of the nozzle. See Figure 4-9.

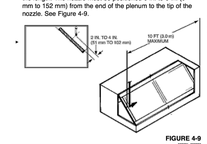


FIGURE 4-9 (000031, 000032)

HORIZONTAL PROTECTION – OPTION 2

1W Nozzle – "V" Bank Protection

One 1W nozzle protects 6 linear feet (1.8 m) of "V" bank plenum. Mount the nozzle horizontally, positioned at 1/3 the filter height down from the top of the filter. Nozzles can be located at 6 ft (1.8 m) spacings on longer plenums. Position the nozzle 0 in. to 6 in. (0 mm to 152 mm) from the end of the hood to the tip of the nozzle. See Figure 4-10.

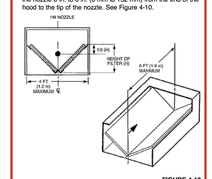


FIGURE 4-10 (000033, 000034)

Two 1N Nozzles – "V" Bank Protection

Two 1N nozzles protect 10 linear feet (3.0 m) by 4 ft (1.2 m) wide of "V" bank plenum. Mount the nozzles in the plenum,

- 2 in. to 4 in. (51 mm to 102 mm) from the face of the filter, centered between the filter height dimension, and aimed down
- the length. Position the nozzle 0 in. to 6 in. (0 mm to 152 mm) from the end of the plenum to the tip of the nozzle. See Figure 4-11.

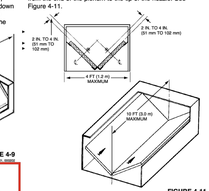


FIGURE 4-11 (000035, 000036)

For a plenum, either single or "V" bank, with a linear extension longer than 10 ft (3.0 m), each bank may be protected using one 1N nozzle every 10 ft (3.0 m) or less depending on the overall length of the plenum. See Figure 4-12. The nozzles may point in the opposite directions as long as the entire plenum area is protected, and the 10 ft (3.0 m) limitation is not exceeded. See Figure 4-13. The nozzle positioning shown in Figure 4-14 is not an acceptable method of protection because the plenum area directly under the tee is not within the discharge pattern of either nozzle.

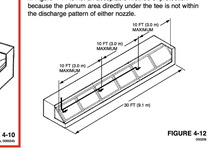
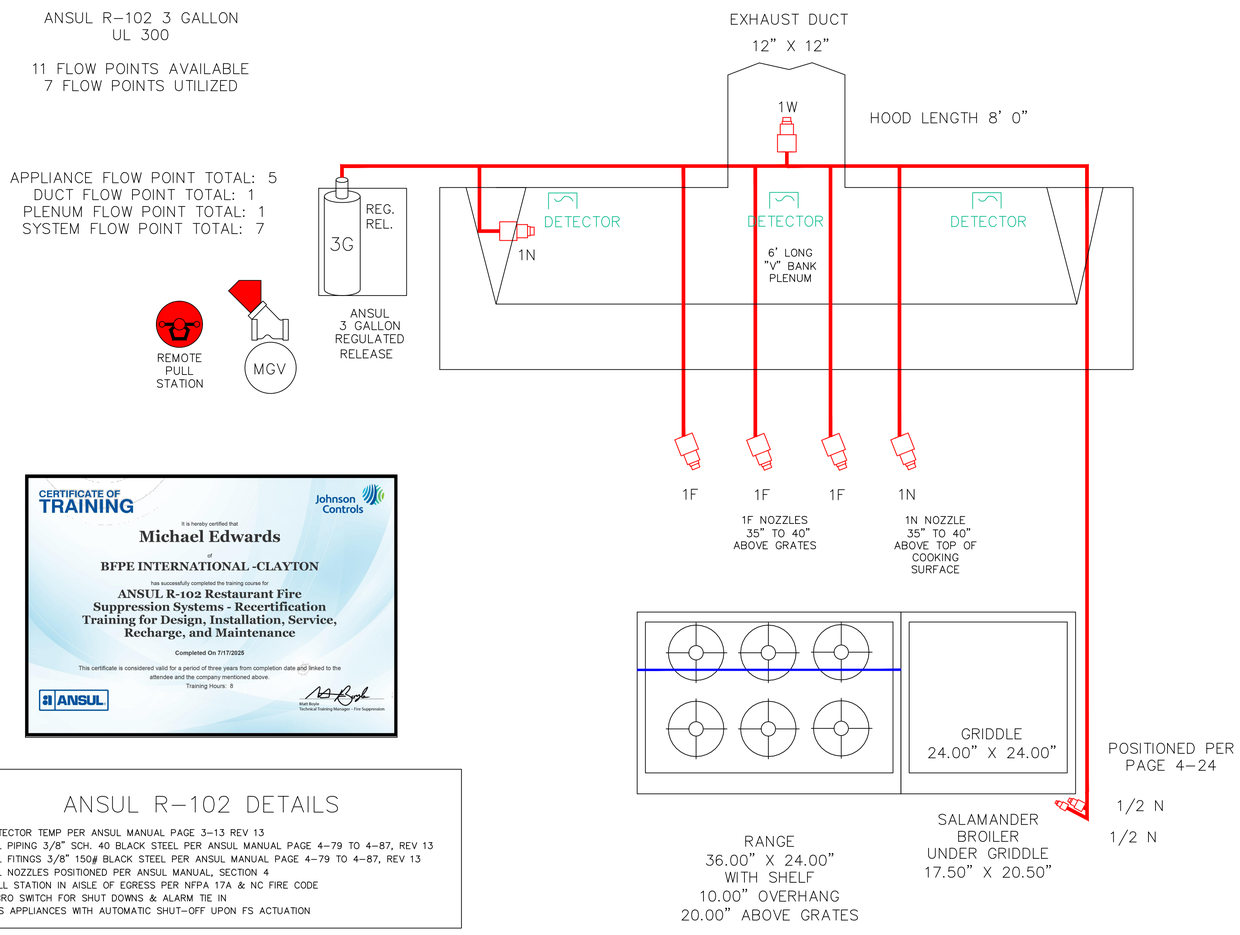


FIGURE 4-12 (000037)



ANSUL R–102 DETAILS

- DETECTOR TEMP PER ANSUL MANUAL PAGE 3–13 REV 13
- ALL PIPING 3/8" SCH. 40 BLACK STEEL PER ANSUL MANUAL PAGE 4–79 TO 4–87, REV 13
- ALL FITINGS 3/8" 150# BLACK STEEL PER ANSUL MANUAL PAGE 4–79 TO 4–87, REV 13
- ALL NOZZLES POSITIONED PER ANSUL MANUAL, SECTION 4
- PULL STATION IN AISLE OF EGRESS PER NFPA 17A & NC FIRE CODE
- MICRO SWITCH FOR SHUT DOWNS & ALARM TIE IN
- GAS APPLIANCES WITH AUTOMATIC SHUT–OFF UPON FS ACTUATION

MARK	REVISION	BY	DATE

REVISIONS

Seal

Pre–engineered Fire System Seal Not Required

SHOP DRAWINGS

BFPE INTERNATIONAL
FIRE, SAFETY & SECURITY
1125 SOUTH BRIGHT HORSE WAY
CLAYTON, NORTH CAROLINA 27520
(919) 550 – 2699

DRAWN BY: MWE

CHECKED BY:

SCALE: N.T.S

SHEET NO. 1 OF 1 SHEETS

DATE: JULY 22, 2025

PROJECT NO: N/A

Sheet Contents:

Ansul R–102 Fire System

Pinecrest Gardens Assisted Living
1984 Old US Hwy. 421
Lillington, NC 27546

DRAWING NO.:

FS100

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