

Ansul System

3 gallon tank 11 Flow Points

Exhaust 2N Nozzle 2 Flow Pt.

Plenum 1N Nozzle 1 Flow Pt

Stove 3-1F Nozzles 3 Flow Pts.

Griddle. 1-1N Nozzle 1 Flow Pt.

7 total

Flow Pts.

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.

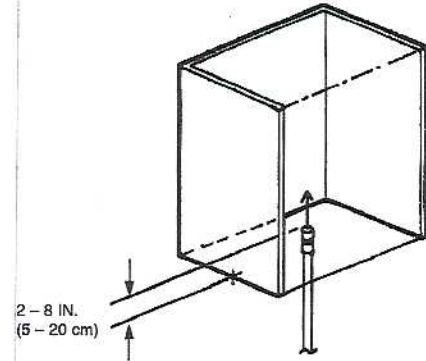


FIGURE 1
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2. In installations where a UL listed damper assembly is employed, the duct nozzle can be installed beyond the 8 in. (20 cm) maximum, to a point just beyond the damper assembly that will not interfere with the damper. Exceeding the maximum 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 be 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

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.

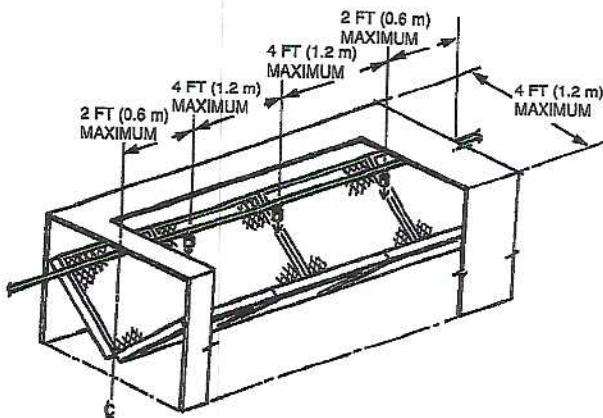


FIGURE 6
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When protecting plenums with the 1W nozzle, two options of coverage are available:

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.

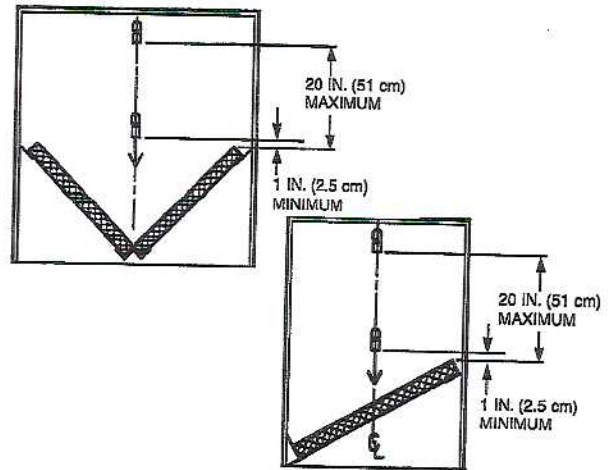


FIGURE 7
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Option 2: The 1W nozzle must be placed perpendicular, 8-12 in. (20-30 cm) from the face of the filter and angled to the center of the filter. The nozzle tip must be within 2 in. (5 cm) from the perpendicular center line of the filter. See Figure 8.

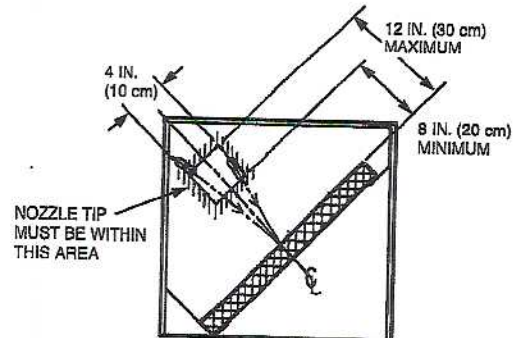


FIGURE 8
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HORIZONTAL PROTECTION - OPTION 1

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.

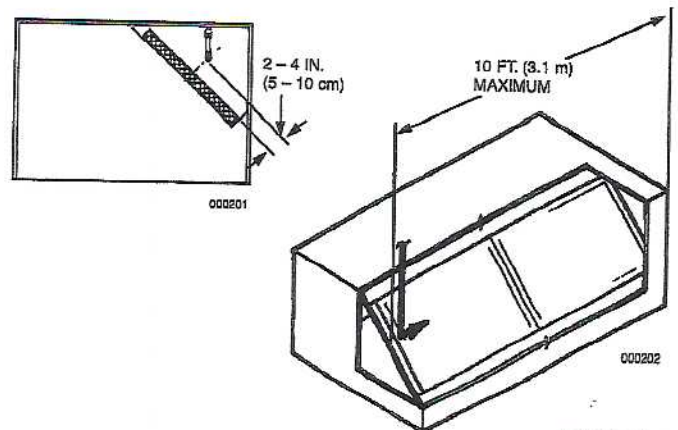


FIGURE 9

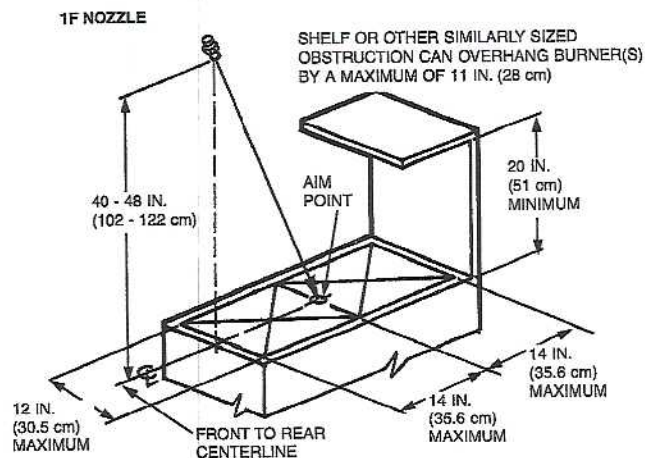
► **Range Protection (With or Without Back Shelf/Obstruction)**

► 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, Part No. 419333, and the other option requires a 260 nozzle, Part No. 419341.

► **Range Protection 1F (1-Flow) Nozzle (With or Without Back Shelf/Obstruction)**

Single and multiple burner ranges can be protected using a 1F nozzle, Part No. 419333. The nozzle tip is stamped with 1F indicating that it is a one-flow nozzle and must be counted as one flow number.

When using the 1F nozzle for range protection with or without back shelf or other similarly sized obstruction, the maximum length of the burner grates being protected must not exceed 28 in. (71 cm) and the maximum area of the burner grates must not exceed 336 in.² (2168 cm²). See Figure 37 for nozzle location details.



1F NOZZLE LOCATED OVER FRONT EDGE OF BURNER GRATE AND ORIENTED SO NOZZLE TIP FLATS ARE PARALLEL WITH BURNER GRATE FRONT TO REAR CENTERLINE AND SHALL BE AIMED AT THE CENTER OF THE COOKING SURFACE.

FIGURE 37
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► **Range Protection 260 (2-Flow) Nozzle (With or Without Back Shelf/Obstruction)**

Single and multiple burner ranges can be protected using a 260 nozzle, Part No. 419341. The nozzle tip 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. (81 cm) and the maximum area of the burner grates must not exceed 384 in.² (2477 cm²). Nozzle must be located on the front edge of the burner grates and aimed at a point 10 in. (25 cm) from the back edge of the burner grates. Nozzle must be mounted 30 to 40 in. (76 to 102 cm) above the hazard surface. See Figure 38.

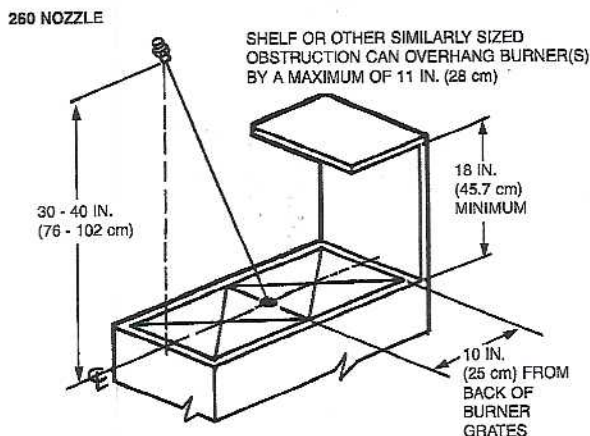


FIGURE 38
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SECTION IV – SYSTEM DESIGN

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 cm²) 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.

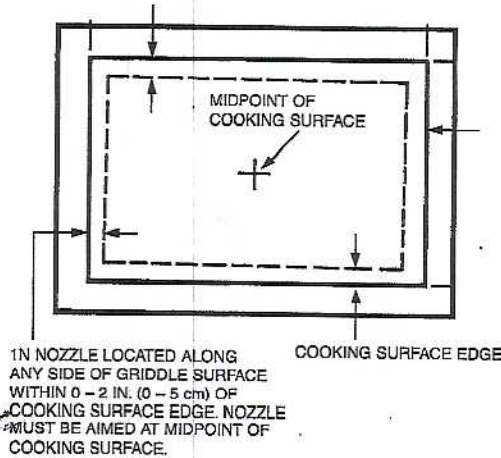


FIGURE 39
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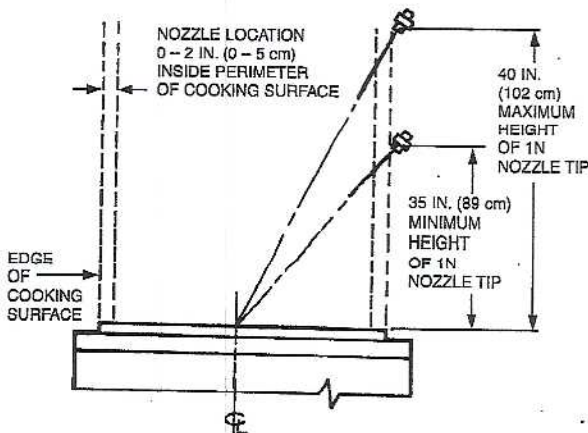


FIGURE 40
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Griddle Protection 290 (2-Flow) Nozzle – High Proximity Application

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 cm²) 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 cooking surface and pointed vertically down. See Figure 41 and 42.

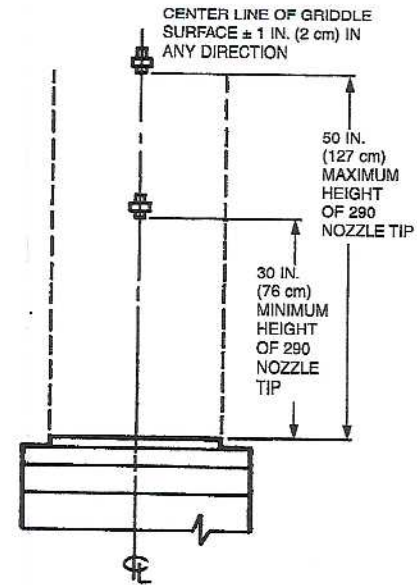


FIGURE 41
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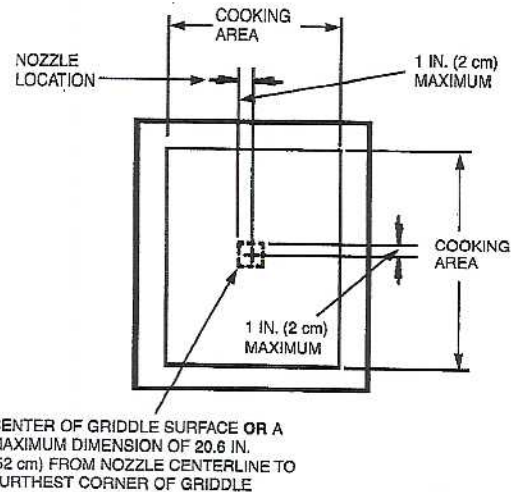


FIGURE 42
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