

JUN 31 1998



CONSTRUCTION PERMIT APPLICATION

"NAIL IN"

DIV. OF INSPECTION

DIV. OF INSPECTION **Section I** **Completions:** Sections I, II, III (optional), IV, VI, and VII

1. Proposed Work Site at: 1722 RT 88

2. Name of Owner in Fee: Costco Wholesale Tel. ()

Address 999 Lake Dr. Bristow WA

street municipality zip code

3. Ownership in Fee: Public Private ☒

4. Principal Contractor: EneMaster Tel. (732) 938-3473

Address 133 Yellowbrook Rd. Framingdale NY 07722

License No. OR, if new home, Builder Reg. No. Exp. Date

Federal Employee No. 94-307792B FAX: (732) 919-0503

5. Architect or Engineer Tel. ()

Address

6. Responsible Person in Charge of Work Peter J. Bervae

Tel. (732) 938-3473 FAX (732) 919-0503

1.	Building	\$		
2.	Electrical			
3.	Plumbing			
4.	Fire Protection		184.	
5.	Elevator Devices			
6.	Subtotal	\$		
7.	Less 20% for State Plan Review			
8.	Subtotal	\$		
9.	DCA Training Fee		2	
10.	Subtotal			
11.	Cert. of Occupancy			
12.	Other			
13.	TOTAL	\$	186.	

1. Number of Stories _____
2. Height of Structure _____ ft.
3. Area — Largest Floor _____ sq. ft.
4. New Building Area _____ sq. ft.
5. Volume of New Structure _____ cu. ft.
6. Construction Classification _____
7. Total Land Area Disturbed _____ sq. ft.
8. Flood Hazard Zone _____
9. Base Flood Elevation _____ ft.
10. Wetlands yes _____
 no _____
11. Max. Live Load _____
12. Max. Occupancy Load _____

(office use only)

1. ☐ Minor Work
2. ☐ New Building
3. ☐ Addition
4. ☐ Alteration
5. ☐ Fire Protection
6. ☐ Plumbing
7. ☐ Electrical
8. ☐ Elevator Devices
9. ☐ Asbestos Abat. Subch. 8
10. ☐ Lead Hazard Abatement
11. ☐ Demolition

2500	
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[illegible]

2500

- ☐ Partial Releases
- ☐ Prototype Processing

1. ☐ Elevators/Escalators/Lifts/
Dumbwaiters/Moving Walks

2. ☐ High Pressure Boilers

3. ☐ Pressure Vessels

4. ☐ Refrigeration Systems

5. ☐ Cross-Connections/Backflow Preventers

6. ☐ Hazardous Uses/Places of Assembly

7. ☐ Sprinklers

8. ☐ Smoke Control Systems in Open Wells

9. ☐ Underground Storage Tanks

A. RESIDENTIAL

1. ☐ Hotels (R-1)
2. ☐ Multi-Family (R-2)
3. ☐ Two-Family (R-3) BOCA
4. ☐ Two-Family (R-4) CABO
5. ☐ One-Family (R-3) BOCA
6. ☐ One-Family (R-4) CABO

No. of dwelling units:

Before Construction

After Construction

Net Gain or Loss

B. NON-RESIDENTIAL

- 1. State Specific Use:**

2. Use Group: RETAIL/CONSUMER

n

3. Change in Use Group, Indicate Former:

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)1.vii:
- ☐ I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:32-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☐ Check if contractor.

Agent Name _____

Address _____

Telephone (_____) _____

Signature _____

III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer									
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)

Name of Code & Edition	Name of Code & Edition	Other
Building _____	Energy _____	
Electrical _____	Barrier Free _____	
Plumbing _____	Flood Hazard _____	
Fire Protection _____	As Built Elevation Cert. _____	
Mechanical _____	Other _____	

X. CERTIFICATES ISSUED (office use only)

	DATE ISSUED	DATE EXPIRED	DATE REISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____	_____	_____	_____
☐ Temporary Certificate of Compliance	No. _____	_____	_____	_____
☐ Continued Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Compliance	No. _____	_____	_____	_____
☐ Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Approval	No. _____	_____	_____	_____

1 and Abatement Placement Certificate

TOWNSHIP OF BRICK
401 CHAMBERS BRIDGE RD
DIVISION OF INSPECTIONS

UCC NEW JERSEY
CONSTRUCTION
PERMIT

0002
982837*H

BLOCK	1170 #	0.00
LOT	5 #	0.00
FIRE		184.00
D.C.A.		2.00
TOTAL		186.00
CHECK		186.00
CHANGE		0.00

IDENTIFICATION Block 1170 Lot 5 Qual

08/18/98 NO. 5 0015A005 10:25

Date Issued 08/18/98
Control #
Permit # 98-2837

Work Site Location 1722 RT 88 COSTCO WHOLESALE
SUPPRESSION SYSTEM
Owner in Fee COSTCO WHOLESALE
Address 999 LAKE DR
BOOTSQUAH, WA 980 -
Telephone (425)313-6287

Contractor FIREMASTER
Address 133 YELLOWBROOK RD.
FARMINGDALE, NJ 07727-
Telephone (908)938-3473
Lic. No. or Bldrs. Reg. No.
Federal Emp. No. 94-3077928

Is hereby granted permission to perform the following work:

☐ BUILDING ☐ PLUMBING ☐ LEAD HAZARD ABATEMENT
☐ ELECTRICAL ☒ FIRE PROTECTION ☐ DEMOLITION
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT ☐ OTHER
(Subchapter 8 only)

DESCRIPTION OF WORK:
INSTALL PREPARED ANSUL R102 SUPPRESSION SYSTEM IN HOODS. PRE-ENGINEERED
SYSTEM. NEW HOODS TO BE INSTALLED PER CONTRACTOR.

NOTE: If construction does not commence within one (1) year of date of issuance,
or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$ 2,500

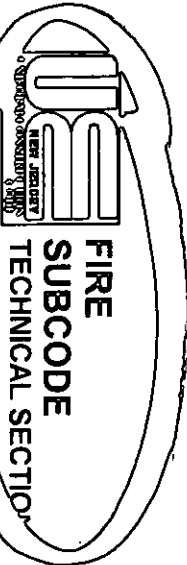
Construction Official

08/18/98
Date

U.C.C. P170 (Rev. 3/96)

PAYMENTS (Office Use Only)

Building	0
Electrical	0
Plumbing	0
Fire Protection	184
Elevator Devices	0
Other	
DCA Training Fee	2
Cert. of Occupancy	0
Total	186
Check No.	4607
Cash	
Collected By	VP



A. IDENTIFICATION—APPLICANT: COMPLETE ALL INFORMATION FOR CONTRACTORS. NOTIFY THIS OFFICE. CALL UTILITY DIG NO. 1-800-850-8500 FOR INFORMATION.

Block 1170 Lot 5
Work Site Location 1722 Rt 88 Costco Warehouse

Owner in Fee Costco Wholesale
Address 999 Lake Dr.
130073500044H WA

Tele. (425) 313 0287
Contractor Firemaster

Address 133 Yellowback Rd.
Freemontdale NS 07727
Tele. (732) 938 3473 Fax (732) 919 0503

Lic. No. 94-3077928
Federal Emp. No. 94-3077928

B. FIRE PROTECTION CHARACTERISTICS

Use Group Present Proposed
Constr. Class Present Proposed
Heating Systems Present Proposed Existing HVAC
Type: Gas Oil Electric Solar
Other
Location: New Existing
Fire Alarm System New Existing
Location of Panel: Fire Suppression/Standpipe System
New Existing
Location of Main Control Valve: New Existing

C. JOB SUMMARY (Office Use Only)

PLAN REVIEW	INSPECTIONS	Dates (Month/Day)	Initial
☐ No Plans Required	Type: <u>Alarm System</u>	<u>Failure</u>	<u>Failure</u>
Joint Plan Review Required:	<u>Suppression Sys.</u>	<u>Failure</u>	<u>Failure</u>
☐ Building ☐ Plumbing	<u>Standpipe</u>	<u>Failure</u>	<u>Failure</u>
☐ Electric ☐ Elevator	<u>Fire Pump</u>	<u>Failure</u>	<u>Failure</u>
Date: <u>8-12-98</u>	<u>Pre-Eng. System</u>	<u>Failure</u>	<u>Failure</u>
Approved by: <u>EC</u>	<u>Mechanical</u>	<u>Failure</u>	<u>Failure</u>
SUBCODE APPROVAL	<u>Smoke Control</u>	<u>Failure</u>	<u>Failure</u>
☐ CO ☐ CCO <u>LCA</u>	<u>TCO</u>	<u>Failure</u>	<u>Failure</u>
Date: <u>8-28-98</u>	<u>Final</u>	<u>Failure</u>	<u>Failure</u>
Approved by: <u>EC</u>	<u>Other</u>	<u>Failure</u>	<u>Failure</u>

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.



D. TECHNICAL SITE DATA

Date Received 8-18-98
Date Issued 8-18-98
Control # 98-2837
Permit # 98-2837

DESCRIPTION OF WORK: Install fire alarm (2)
Asul R102 suppression system in
heads. Are engineered system.
Water Supply Source _____
Method of Alarm/Suppression System Supervision _____

Storage Tanks

Type: ☐ Flammable Liquid ☐ Combustible Liquid
☐ LPG ☐ LNG Capacity _____ Fuel _____
Alarm Systems ☐ 110V Interconnected NUMBER
☐ System

Alarm Devices (i.e., smoke, heat, pulls, water/flow) _____

Supervisory Devices (i.e., tamper, low/high air) _____
Signaling Devices (i.e., horn/strobes, bells) _____
Other Devices _____

Other

Fire Pump _____
Dry Pipe/Alarm Valves _____
Pre-action Valves _____
Sprinkler Heads (Dry and Wet) _____

Standpipes _____

Pre-engineered Systems

Wet Chemical 2
Dry Chemical _____
CO₂ Suppression _____
Foam Suppression _____
Halon Suppression _____
Other _____

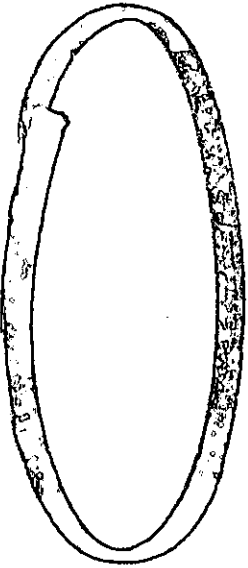
Kitchen Hood Exhaust System _____
Smoke Control System _____
Gas ☐ or Oil ☐ Fired Appliances _____
Other _____

FEE (Office Use Only)

Administrative Surcharge	\$ <u>184</u>
Minimum Fee	\$ <u>2</u>
DCA Training Fee	\$ <u>2</u>
TOTAL FEE	\$ <u>186</u>

Signature _____

- Automatic 8-28-57 LMS @ 1000
- Gas shut off valve over top of units (cooling area roof)
 - Test rather ok



COMMERCIAL

TOWNSHIP OF
BRICK NJ

08/18/98 NO. 5

0002

982837**

BLOCK 0.00

1170 #

LOT 0.00

5 #

FIRE 184.00

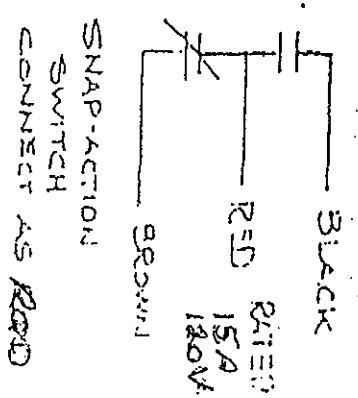
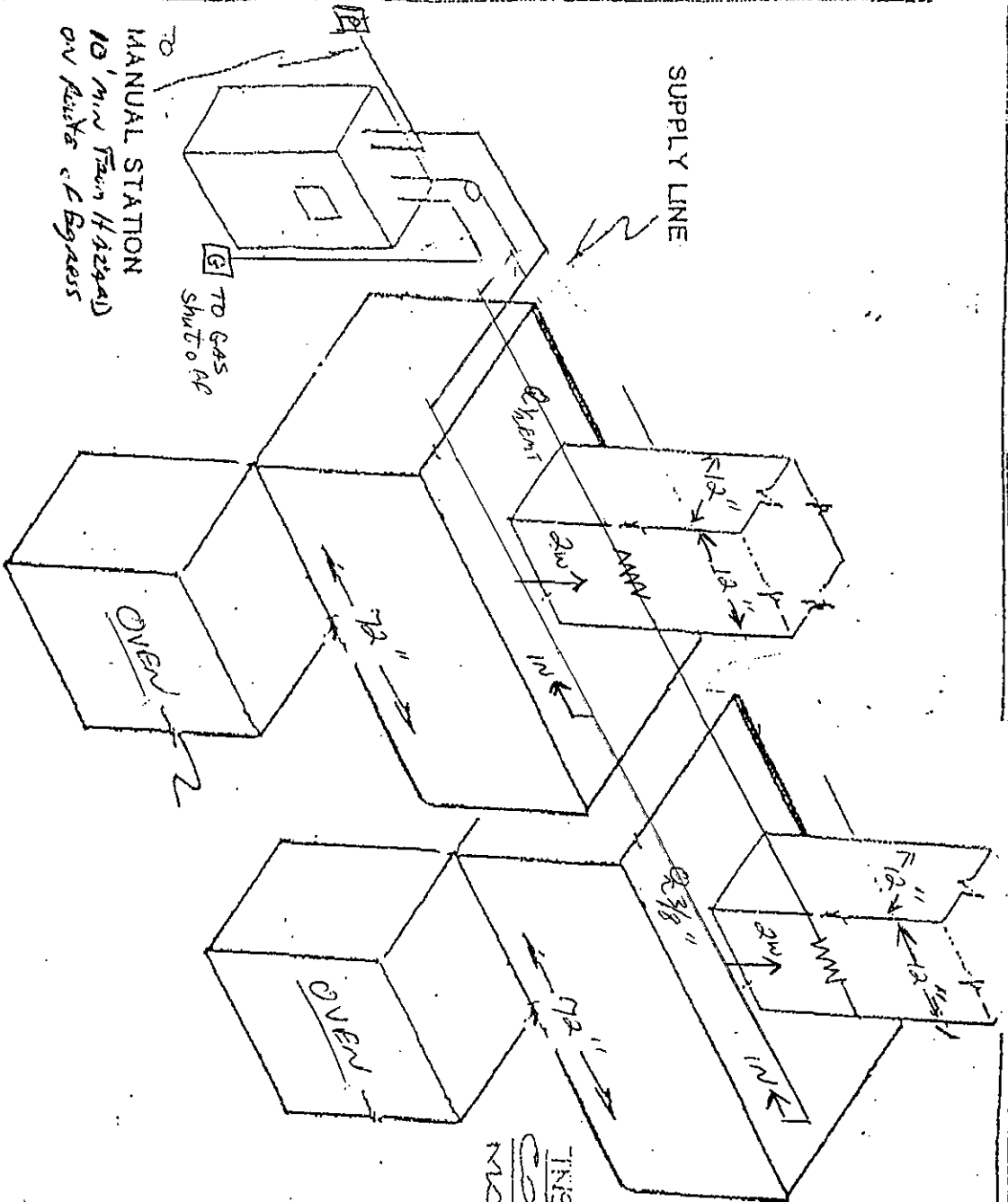
D.C.A. 2.00

TOTAL 186.00

CHECK 186.00

CHANGE 0.00

0015A005 10:25



INSTALLATION SHALL
COMPLY WITH UL LISTED
MANUAL U.L. NO. 3470
& ULC BOCA codes.

Costco Wholesale
1722 Rt. 88
Baird NJ 08724

MATERIAL LIST

NO	QTY	DESCRIPTION	PART NO
1	1	Alarm R-102	R-102
2	2	DUCT NOZZLE	2W
3	2	ARMOR NOZZLE	1W
4		ARMOR NOZZLE	Ø
5	2	FUSIBLE LINK 360°	360°
8	1	PULL BOX	MPS



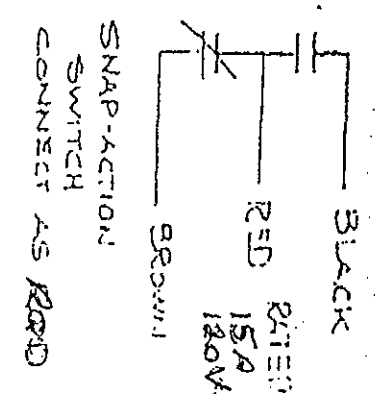
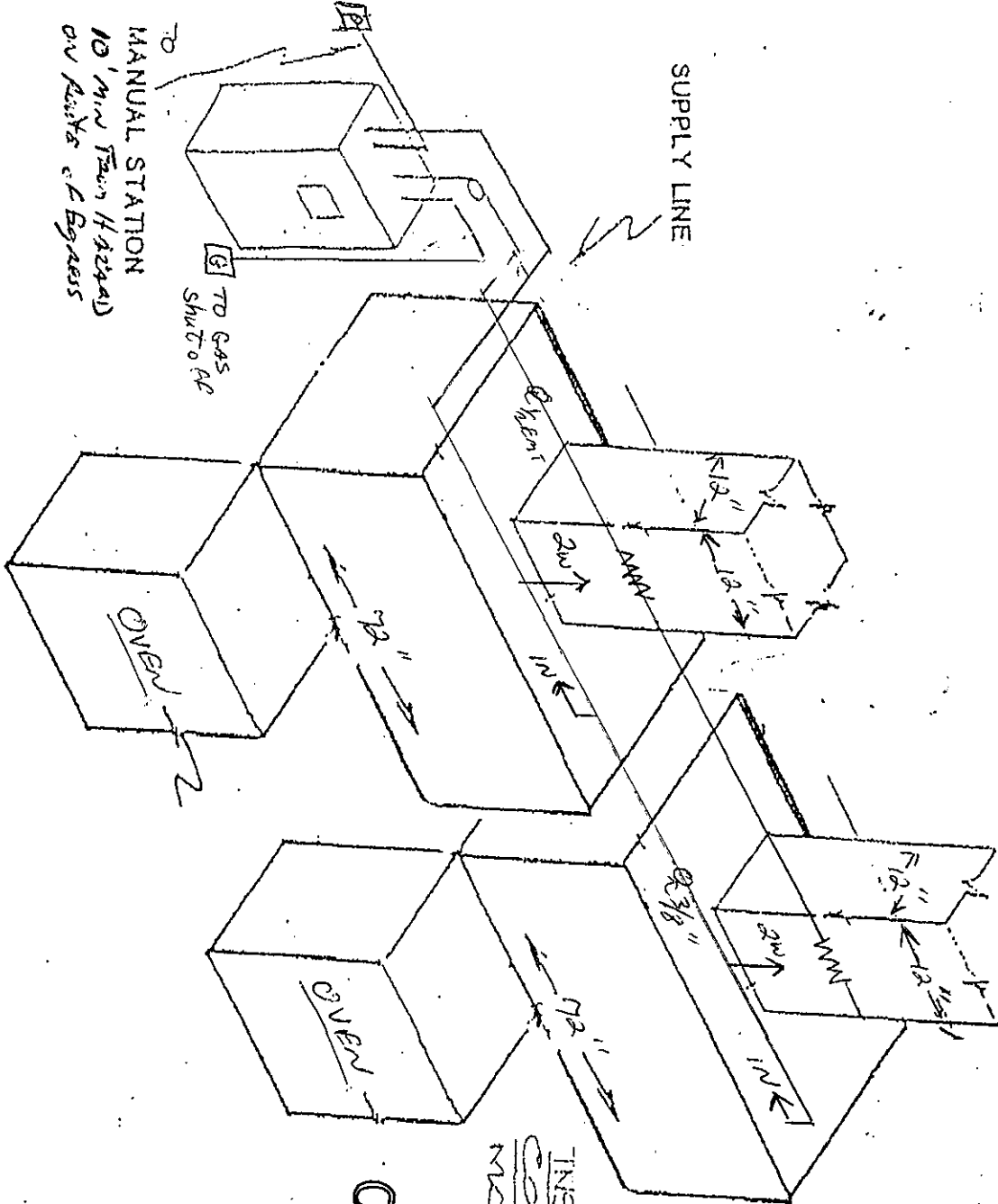
FireMaster

760 FAIRFIELD AVENUE.
KENILWORTH, NJ 07033 • (201) 241-2950

OWN
CHK'D
DATE
DWG NO

7-23-98
1722-98

98-2837



INSTALLATION SHALL
COMPLY WITH UL LISTED
MANUAL U.L. NO. 3470
& U.L.C. BOCA codes.

COMMERCIAL

Costco Wholesale
1722 Rt. 88
Beck NJ 08224

MATERIAL LIST			
NO	QTY	DESCRIPTION	PART NO
1	1	Manual R-102	R-102
2	2	DUCT NOZZLE	2W
3	2	ARMOR NOZZLE	1W
4		ARMOR NOZZLE	Ø
5	2	FUSIBLE LINK 30°	360°
6	1	PULL BOX	MPS

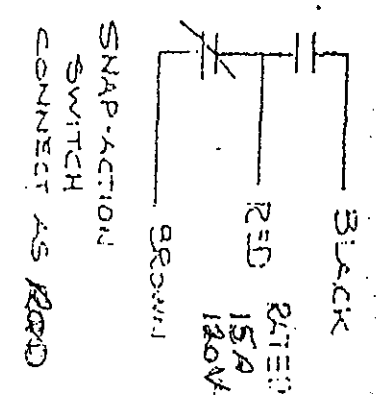
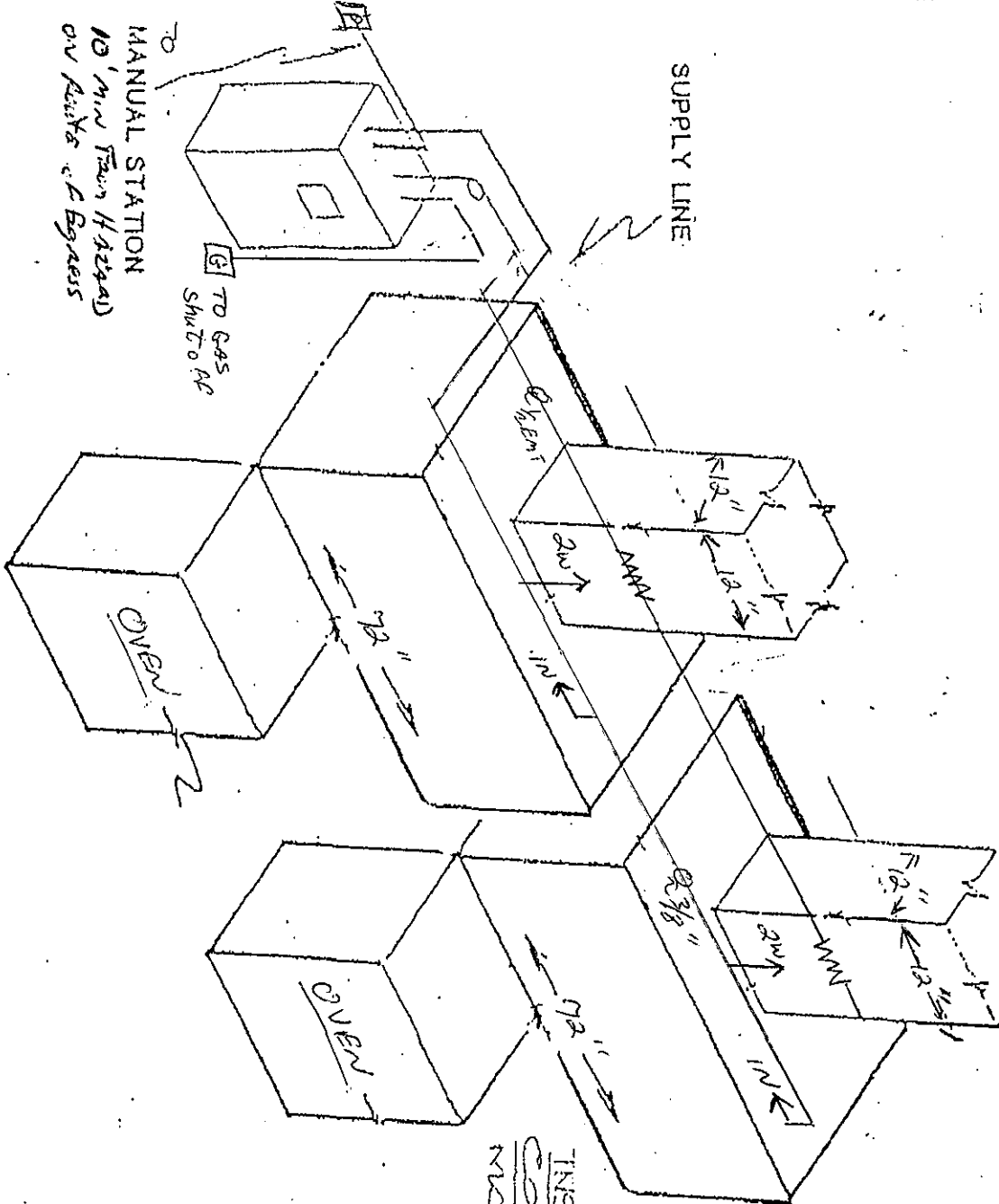
DWN
CHK'D
DATE
DWG NO

658
7-23-98
1722-98

FireMaster

760 FAIRFIELD AVENUE.
KENILWORTH, NJ 07033 • (201) 241-2950

98-283
COMMERCIAL



INSTALLATION SHALL
COMPLY WITH UL LISTED
MANUAL U.L. NO. 3470
& U.L.C. BOCA codes.

COMMERCIAL

Costco Wholesale
1722 Rt. 88
Berk NJ 08724

MATERIAL LIST			
NO	QTY	DESCRIPTION	PART NO
1	1	Manual R-102	R-102
2	2	DUCT NOZZLE	2W
3	2	RENUH NOZZLE	1W
4		APPLANCE NOZZLE	Ø
5	2	FUSIBLE LINK 30°	360°
6	1	PULL BOX	MPS

DWN
CHK'D
DATE
DWG NO

1722
7-23-98
1722-98

FireMaster

760 FAIRFIELD AVENUE.
KENILWORTH, NJ 07033 • (201) 241-2950

98-2837

COMMERCIAL

BLOCK

1170

N.J.A.C. (Uniform Code) 5:23-2.5, Paragraph 5. The approved set of plans must be on the job site at all times. If the plans are not on the site no inspections will be made.

LOT

5

APPROVED

This Permit Must Be Displayed Immediately At Start of Construction

APPROVAL OF THESE PLANS BY THE BUILDING INSPECTOR DOES NOT IN ANY WAY ALLOW THE ENCROACHMENT OF ANY BUILDING OR PART THEREOF IN CONNECTION THEREWITH BEYOND THE PROPERTY LINE, NOR IN ANY WAY PERMIT ANY VIOLATION OF THE BUILDING CODE WHETHER SHOWN ON PLANS OR NOT.

Before starting to build read the Building Code.

Owner

PERMIT NO.

Contractor

DATE APPROVED

8-18-98

CONSTRUCTION OFFICIAL

BRICK TOWNSHIP

FEE PAID

186.-

THIS PERMIT EXPIRES ONE YEAR FROM ABOVE APPROVED DATE,

OR IF WORK IS SUSPENDED OR ABANDONED FOR A PERIOD OF SIX MONTHS.

INSPECTIONS

1. FOOTING

2. FOUNDATION

3. SHEATHING

4. FRAMING

5. INSULATION

6. SHEET ROCK

7. PLUMBING

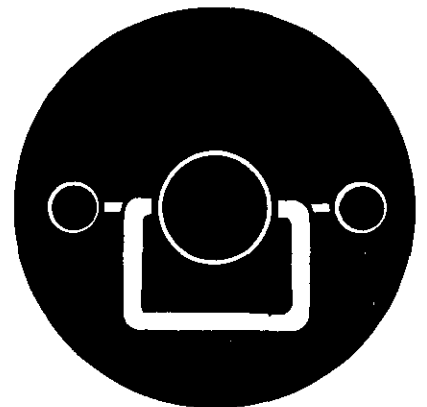
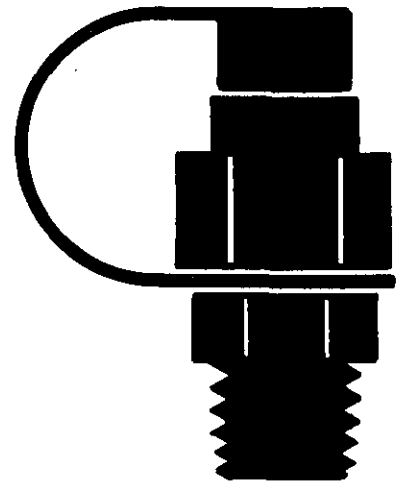
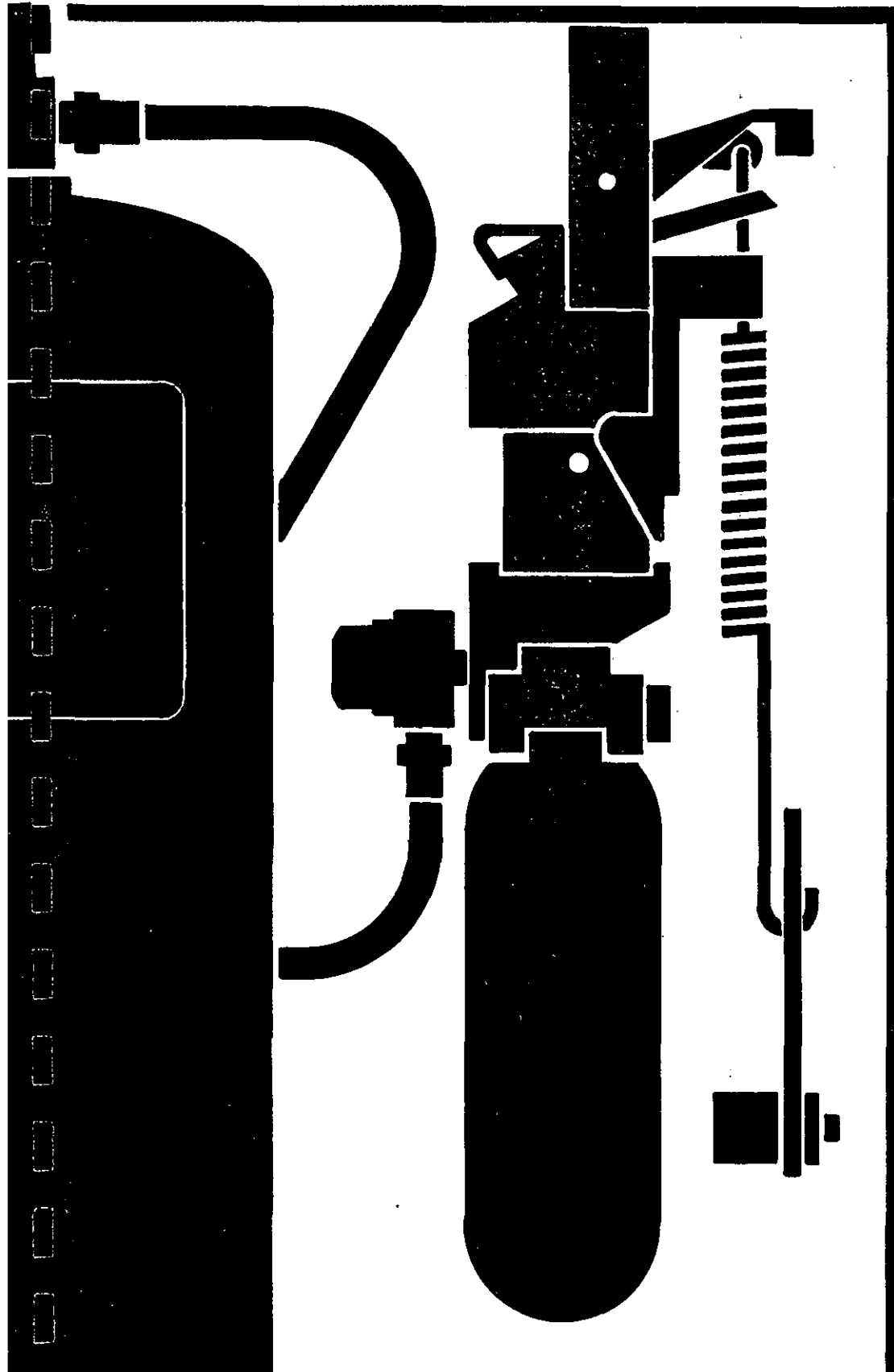
8. FIRE INSPECTION

9. FINAL

ANSUL®

**DESIGN
INSTALLATION
RECHARGE AND
MAINTENANCE
MANUAL**

**R-102 RESTAURANT
FIRE SUPPRESSION
SYSTEM
(Standard UL 300 Listed)**



This manual is intended for use with Ansul R-102 Restaurant Fire Suppression Systems.

Those who install, operate, recharge, or maintain these fire suppression systems should read this entire manual. Specific sections will be of particular interest depending upon one's responsibilities.

Fire suppression systems are mechanical devices. They need periodic care. Maintenance is a vital step in the performance of your fire suppression system. As such it must be performed in accordance with NFPA 96 (Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment) and NFPA 17A (Standard on Wet Chemical Extinguishing Systems) by an authorized Ansul distributor. To provide maximum assurance that the fire suppression system will operate effectively and safely, maintenance must be conducted at six-month intervals, or earlier if the situation dictates. Twelve-year maintenance must include agent tank hydrostatic testing.

ANSUL, ANSUL AUTOMAN and ANSULEX are registered trademarks.

DATE	PAGE	REV. NO.	DATE	PAGE	REV. NO.
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3-15-95	4-37	1	3-29-96	8-4	2
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6-1-95	4-32	1	7-1-96	4-16 - 4-17	3
6-1-95	4-33 - 4-34	2	7-1-96	4-17.1	1
6-1-95	4-34.1	1	7-1-96	4-18	2
6-1-95	5-2.1	1	7-1-96	4-19	1
6-1-95	7-2	2	7-1-96	4-20	2
6-1-95	8-6	2	7-1-96	4-21 - 4-22	1
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3-29-96	4-34	3	7-1-96	4-25	4

► Indicates revised information.

NOTE: All pages are dated 11-1-94 except those noted with later revisions as listed above.

UL EX 3470 7-1-96

UL EX 3470

7-1-96

► Indicates revised information.

NOTE: All pages are dated 11-1-94 except those noted with later revisions as listed above.

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TANK-ENCLOSURE ASSEMBLY	3-2
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ANSULEX LOW pH LIQUID FIRE SUPPRESSANT EXTINGUISHING AGENT DATA SHEET	F-9140
MECHANICAL SEALING ADAPTORS DATA SHEET	F-86173-1
R-102 OWNER'S GUIDE	Part No. 418127-01
R-102 REGULATOR TEST AND REPLACEMENT INSTRUCTIONS	F-87125
R-101/R-102 INSTALLATION DESIGN SHEET	Part No. 24790
DISTRIBUTOR CERTIFICATION	Part No. 24789-03

DESIGN AND APPLICATION

The Ansul R-102 Restaurant Fire Suppression System is designed to provide fire protection for restaurant cooking appliances, hoods, and ducts. It is a pre-engineered group of mechanical and electrical components for installation by an authorized Ansul distributor. The basic system consists of an ANSUL AUTOMAN regulated release assembly which includes a regulated release mechanism and a liquid agent storage tank housed within a single enclosure. Nozzles, detectors, cartridges, liquid agent, fusible links, pulley tees, and pulley elbows are supplied in separate packages in the quantities needed for each fire suppression system arrangement.

The system provides automatic actuation; or it can be actuated manually through a remote manual pull station. The gas or electrical supply to all protected appliances will be immediately shut off upon actuation of the system, using appropriate gas shut-off or electrical shut-down devices.

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

The R-102 system suppresses fire by spraying the plenum area, the filters, cooking surfaces, and the exhaust duct system with a predetermined flow rate of ANSULEX Low pH Liquid Fire Suppressant. When the liquid agent is discharged onto a cooking appliance fire, it cools the grease surface, and reacts with the hot grease (saponification) forming a layer of soap-like foam on the surface of the fat. This layer acts as insulation between the hot grease and the atmosphere, thus helping to prevent the escape of combustible vapors.

Exhaust fans in the ventilating system should be left on. The forced draft of these fans assists the movement of the liquid agent through the ventilating system, thus aiding in the fire suppression process. These fans also provide a cooling effect in the plenum and duct after the fire suppression system has been discharged. The system is UL listed with or without fan operation.

It is also recommended that make up or supply air fans be shut down upon system actuation. Shutdown of fuel and power to all appliances located under protected ventilating equipment is required upon system actuation.

UL LISTING

The R-102 Restaurant Fire Suppression System has been tested and is listed by Underwriters Laboratories, Inc. as a pre-engineered system. These tests require extinguishment of fires which are initiated in deep fat fryers, griddles, char-broilers, upright broilers, chain-broilers, filters, plenum chambers, hoods, and ducts after pre-loading each appliance with a prescribed amount of cooking grease. Each fire is allowed to progress to maximum intensity before the fire suppression system is actuated.

DEFINITION OF TERMS

Actuation Gas Line: Piping from the ANSUL AUTOMAN Regulated Release Assembly which supplies nitrogen or carbon dioxide to the Regulated Actuator Assembly for multiple-tank system actuation.

Agent Tank: A pressure vessel containing the liquid agent.

ANSUL AUTOMAN Regulated Release Assembly (Electrical): An assembly which contains the regulated release mechanism, agent tank, expellant gas hose, solenoid, and electric switch within a metal enclosure. The enclosure contains knockouts to facilitate component hookups.

ANSUL AUTOMAN Regulated Release Assembly (Mechanical): An assembly which contains the regulated release mechanism, agent tank, and expellant gas hose within a metal enclosure. The enclosure contains knockouts to facilitate component hookups.

Authority Having Jurisdiction: The "authority having jurisdiction" is the organization, office, or individual responsible for "approving" equipment, an installation, or a procedure. The phrase "Authority Having Jurisdiction" is used in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local, or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction;" at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Blow-Off Cap: A cap which covers the end of the nozzle tip and prevents grease from plugging the nozzle orifice.

Branch Line: The agent distribution piping which extends from the supply line to the nozzle(s).

Bursting Disc: A disc installed in the tank adaptor which eliminates the siphoning of the agent up the pipe during extreme temperature variations.

Cartridge: A sealed, steel pressure vessel containing nitrogen or carbon dioxide gas used to pressurize the agent tank.

Cooking Appliance: Includes fryers, griddles, ranges, upright broilers, chain broilers, natural charcoal broilers, or char-broilers (electric, lava rock, gas-radiant, or mesquite).

Conduit Offset Assembly: A pre-formed piece of conduit which can be installed between the Ansul regulated release and the conduit to allow the wire rope for the detection, gas valve and remote manual pull station to be installed in a more convenient manner.

DEFINITION OF TERMS (Continued)

Detector: A device which includes the detector bracket, detector linkage, and fusible link used for automatic operation of the fire suppression system.

Detector Linkage: A device used to support the fusible link.

Distribution Piping: Piping which delivers the extinguishing agent from the tank to each discharge nozzle. See also Supply or Branch lines.

Ducts (or Duct System): A continuous passageway for the transmission of air and vapors which, in addition to the containment components themselves, may include duct fittings, plenums, and/or other items or air handling equipment.

Electrostatic Precipitator: A device used to aid in the cleaning of the exhaust air. This device is normally installed at or near the base of the ventilation duct.

Expellant Gas Line: Piping and/or hose which supplies the nitrogen or carbon dioxide gas from the regulated release assembly/regulated actuator assembly to each agent tank.

Flow Number: Term used in system design to describe the flow capacity of each nozzle used to determine the quantity of tanks needed to cover a certain group of hazards.

Fusible Links: A form of fixed temperature heat detecting device employed to restrain the operation of a mechanical control until its designed temperature is reached.

Gas Valve: A device used to shut off the gas supply to the cooking equipment when the system is actuated.

Gas Valve Air Cylinder: An air cylinder, located in the release mechanism, which operates pneumatically to mechanically unlatch a mechanical gas valve actuator, causing the gas valve to close upon system actuation.

High Proximity: Indicates a distance (vertically) between the nozzle tip and the surface of the appliance being protected.

Hood: A device provided for cooking appliances to direct and capture grease-laden vapors and exhaust gases. It shall be constructed in a manner which meets the requirements of NFPA 96.

Liquid Agent: A potassium-based solution used for the knock-down and suppression of fire.

Low Proximity: Indicates a distance (vertically) between the nozzle tip and the surface of the appliance being protected.

Maximum Length of Cooking Appliance: The maximum dimension, on any side, which may be protected by one nozzle.

Maximum Piping: Specified length of piping and number of fittings which must not be exceeded for each system.

Medium Proximity: Indicates a distance (vertically) between the nozzle tip and the surface of the appliance being protected.

Minimum Piping: Minimum length of distribution piping required between the agent tank outlet and any nozzle protecting a griddle, range, or fryer.

Nozzle: A device designed to deliver the liquid agent with a specific flow rate and stream pattern.

Overlapping Protection: When two types of appliances, side by side, are protected as a common hazard. This protection requires the maximum hazard size to be limited to the listed size of the worst hazard.

Plenum: The space enclosed by the filters and the portion of the hood above the filters.

Pulley Elbow: A device used to change the direction of the wire rope which runs between: the regulated release mechanism and the detectors, the regulated release mechanism and the mechanical gas valve, and/or the regulated release mechanism and the remote manual pull station.

Pulley Tee: A device used to change the direction of two wire ropes which run from the regulated release mechanism to two remote manual pull stations, or from two regulated release assemblies to a single mechanical gas valve.

Regulated Actuator Assembly: An assembly which contains the regulator, pneumatic actuator, agent tank, and expellant gas hose within a metal enclosure. This assembly is used to pressurize additional agent tanks in a multiple tank system.

Regulated Release Mechanism: An enclosed device within the ANSUL AUTOMAN regulated release assembly which releases the expellant gas, activates alarms, and/or shuts off other devices when signaled automatically by a detector or manually with a remote pull station.

Regulator: A device used to regulate the pressure from the nitrogen cartridge into the agent tank(s) when the system is actuated.

Remote Manual Pull Station: A device which provides manual actuation of the system from a remote location.

Salamander Broiler: A broiler very similar in design to the upright broiler. A salamander broiler is used for general broiling of meats and fish, toasting, and holding/warming foods. Most contain a removable grease drip tray.

Supply Line: The agent distribution piping which extends from the agent tank outlet and serves as a manifold for the branch lines.

Series Detector: Any detector located in-line between the regulated release assembly and the terminal detector.

Terminal Detector: The last in a series of detectors, or the only detector used in a single-detector system. This detector is thus named because it is at the point at which the wire rope ends, or "terminates." There is only one terminal detector per detection system.

Transition: An extension of the hood or canopy which allows for the smooth transmission of gases, air, and vapors between the hood opening and the base of the ventilation duct.

Vent Plug: A device used to prevent pressure build-up within the agent tank or agent distribution lines due to temperature fluctuations.

TOTAL SYSTEM

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

1. Single-tank System
2. Double-tank System
3. Multiple-tank System

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.

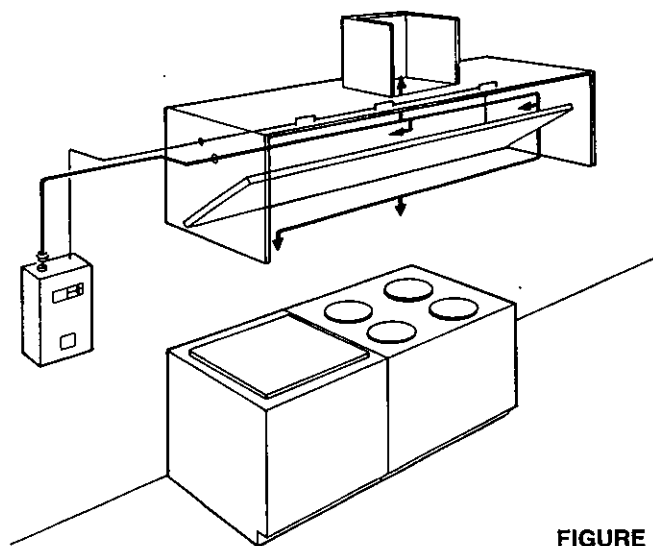


FIGURE 1

Double-Tank System

The R-102 double-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. Tank-Enclosure or Tank-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 tank-enclosure or tank-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.

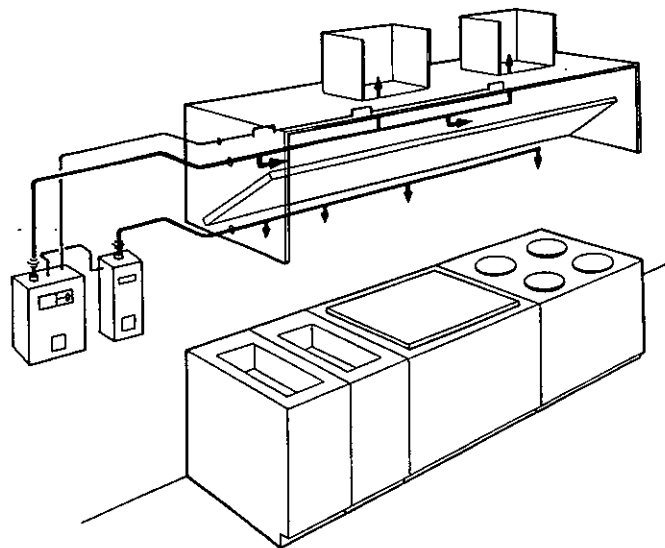


FIGURE 2

TOTAL SYSTEM (Continued)

Multiple-Tank System

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

1. ANSUL AUTOMAN Regulated Release Assembly (Electrical or Mechanical)
2. Nitrogen Cartridge(s) and/or Carbon Dioxide Cartridge(s)
3. Regulated Actuator Assembly(ies)
4. ANSULEX Low pH Liquid Fire Suppressant
5. Tank-Enclosure or Tank-Bracket Assembly(ies)
6. Discharge Nozzles
7. Detection Components
8. 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 actuation piping, expellant piping, detection system, and additional equipment.

Each regulated actuator assembly is mounted separately but within the guidelines of the regulated release assembly actuation/expellant gas piping requirements to ensure simultaneous actuation of the system. The assembly contains the pneumatic actuator, regulator, agent tank, expellant gas hose for agent tank hookup, and enclosure plugs to facilitate installing expellant piping.

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

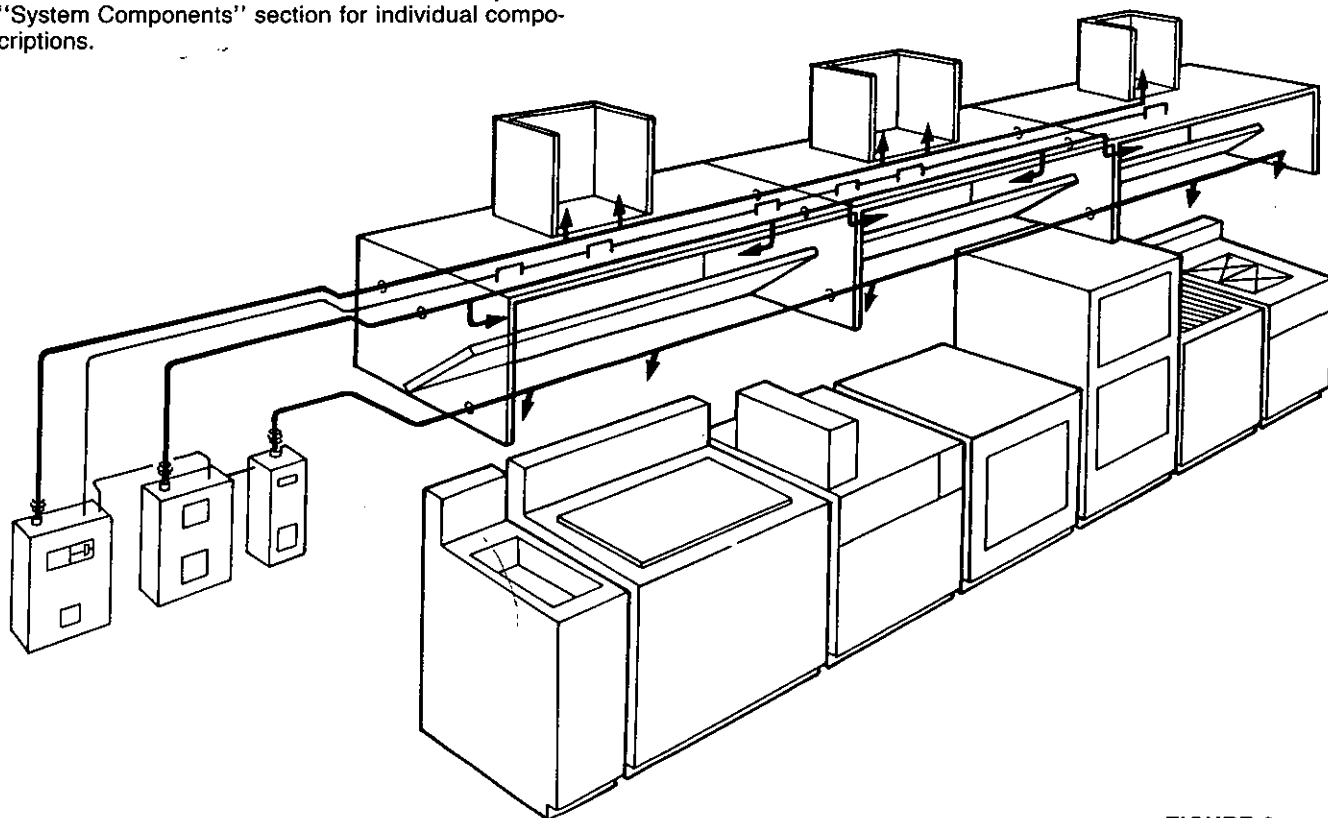


FIGURE 3

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. Agent storage life expectancy is twelve years. 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

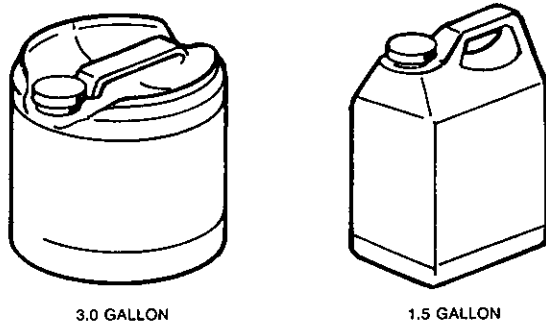


FIGURE 1

REGULATED RELEASE ASSEMBLY (MECHANICAL)

The ANSUL AUTOMAN Regulated Mechanical Release Assembly (3.0 gallon – Part No. 79290 or 1.5 gallon – Part No. 79291) contains the regulated release mechanism, agent tank, 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 100 psi (690 kPa) when the system is actuated.

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 mild steel and, under normal conditions, requires hydrostatic testing every twelve years.

The agent tank is shipped uncharged and must be filled with 1.53 gallons (5.8 L) or 3.06 gallons (11.6 L) of only ANSULEX Low pH Liquid Fire Suppressant during installation.

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)

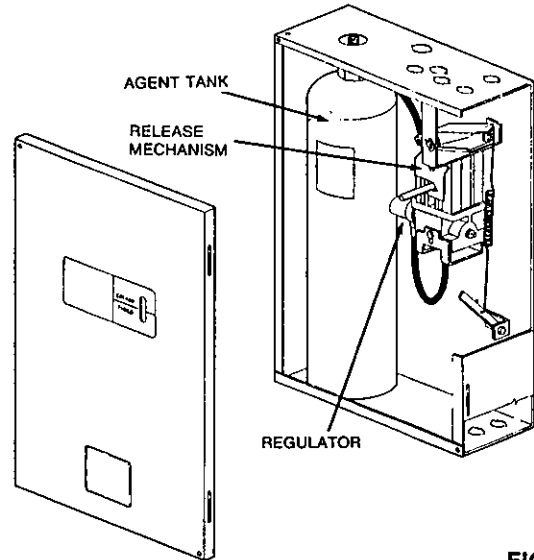


FIGURE 2

REGULATED RELEASE ASSEMBLY (ELECTRICAL)

The ANSUL AUTOMAN Regulated Electrical Release Assembly (3.0 gallon Part No. 79292) is identical to the mechanical version except it 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)

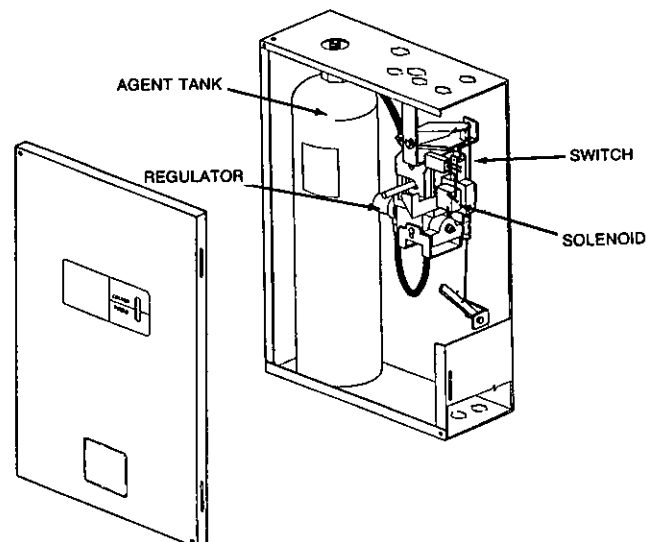


FIGURE 3

TANK-BRACKET ASSEMBLY

The Tank-Bracket Assembly (1.5 gallon – Part No. 78232 or 3.0 gallon – Part No. 78937) consists of an agent storage tank and mounting bracket. This assembly 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 contains an adaptor/tube assembly with a bursting disc. The bursting disc helps prevent agent leakage due to significant temperature fluctuations in the area where the tank is located. The tank is mild steel and, under normal conditions, requires hydrostatic testing every twelve years. The date of manufacture is stamped on the bottom of the tank.

The tank is shipped uncharged and must be filled with 1.53 gallons (5.8 L) or 3.06 gallons (11.6 L) of only ANSULEX Low pH Liquid Fire Suppressant during installation. The tank bracket is designed for mounting the tank in a minimum amount of space.

TANK-BRACKET ASSEMBLY

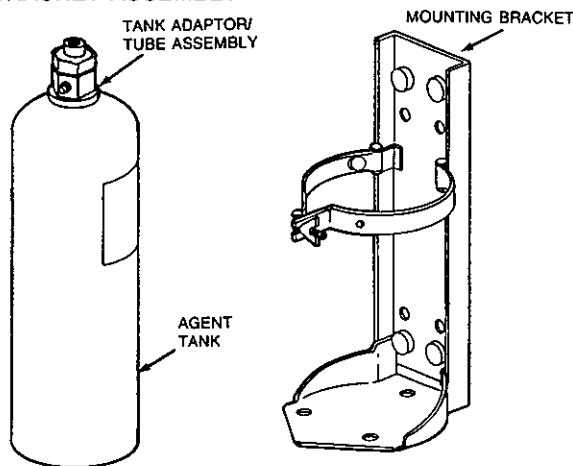


FIGURE 4

TANK-ENCLOSURE ASSEMBLY

The Tank-Enclosure Assembly (1.5 gallon – Part No. 78921 or 3.0 gallon – Part No. 78929) consists of an agent storage tank and mounting enclosure. This assembly 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 expellant gas line will be connected to.

The tank contains an adaptor/tube assembly with a bursting disc. The bursting disc helps prevent agent leakage due to significant temperature fluctuations in the area where the tank is located. The date of manufacture is stamped on the bottom of the tank.

The tank is shipped uncharged and must be filled with 1.53 gallons (5.8 L) or 3.06 gallons (11.6 L) of only ANSULEX Low pH Liquid Fire Suppressant during installation.

The tank-enclosure is designed for mounting the tank in a minimum amount of space.

TANK ENCLOSURE ASSEMBLY

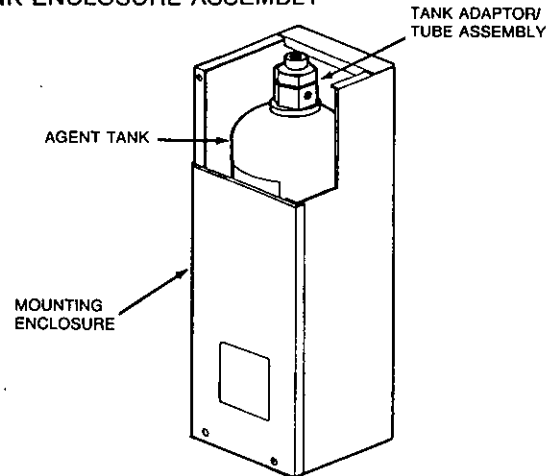


FIGURE 5

REGULATED ACTUATOR ASSEMBLY

The Regulated Actuator Assembly (1.5 gallon – Part No. 79137 or 3.0 gallon – Part No. 79327) contains the regulator, pneumatic actuator, agent tank, 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 tank-enclosure or tank-bracket assembly. The regulator is designed to allow a constant flow of nitrogen into each agent tank connected (two tanks maximum) at 100 psi (690 kPa).

The pneumatic actuator is designed to puncture the expellant gas cartridge seal upon receiving pressure from the regulated release assembly actuation piping. The agent tank is shipped uncharged and must be filled with 1.53 gallons (5.8 L) or 3.06 gallons (11.6 L) of only ANSULEX Low pH Liquid Fire Suppressant during installation. The tank is mounted and secured within the enclosure. The enclosure contains a knockout to facilitate distribution piping hookup.

REGULATED ACTUATOR ASSEMBLY

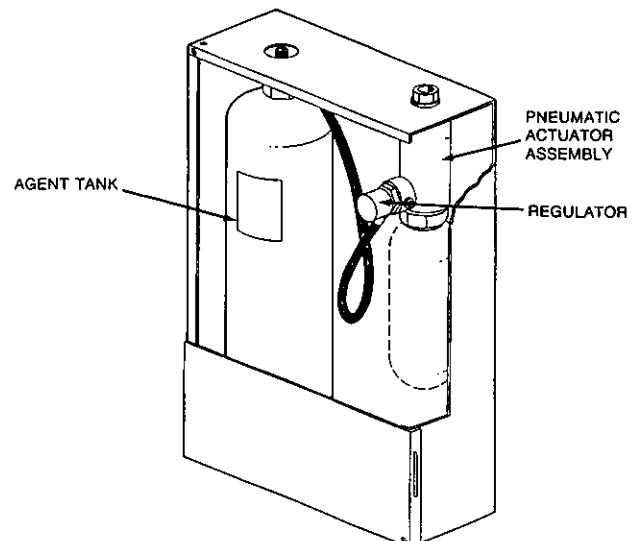


FIGURE 6

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

The OEM Release/Bracket Assembly, Part No. 79493, contains the same regulated release mechanism as the standard ANSUL AUTOMAN Regulated Release Assembly. This release/bracket assembly must be installed in a fire cabinet either horizontally or vertically. It contains 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.

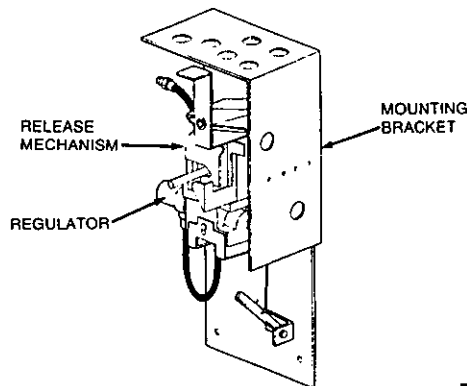


FIGURE 7

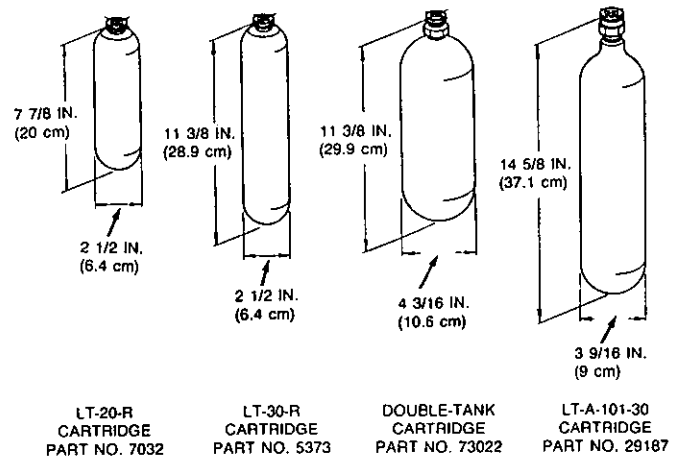
GAS CARTRIDGES

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 8.

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

NITROGEN GAS CARTRIDGES



CARBON DIOXIDE CARTRIDGES

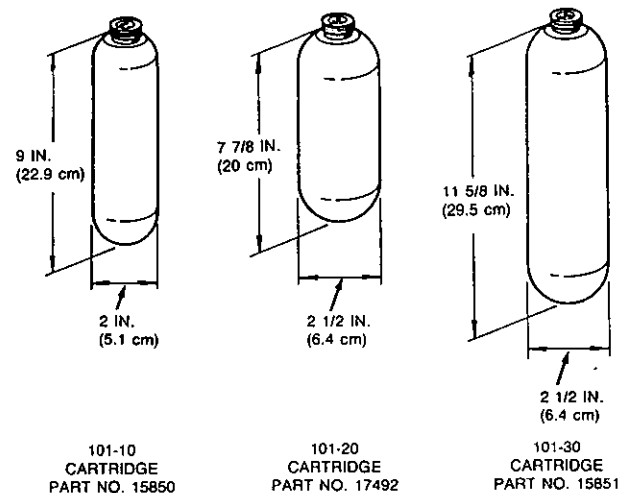


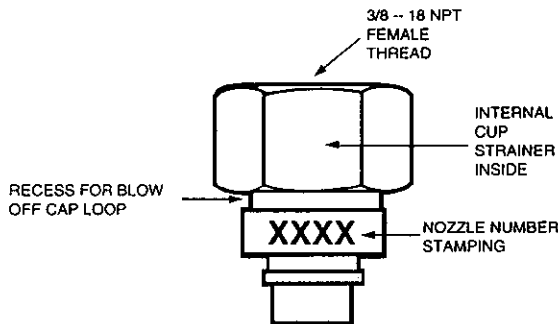
FIGURE 8

▶ NOZZLES

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

- | | |
|----------------|-----------------------------|
| 1. 1W Nozzle | 8. 245 Nozzle |
| 2. 1N Nozzle | 9. 260 Nozzle |
| 3. 1/2N Nozzle | 10. 290 Nozzle |
| 4. 3N Nozzle | 11. 2120 Nozzle |
| 5. 2WH Nozzle | 12. 1NSS Nozzle (Stainless) |
| 6. 2W Nozzle | 13. 1WSS Nozzle (Stainless) |
| 7. 230 Nozzle | 14. 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.



EXCEPTION: 1WSS, 1NSS, AND 2WH NOZZLES ARE TWO-PIECE

FIGURE 9

▶ Swivel Adaptor

The Swivel Adaptor Assembly, Part No. 418569, 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.

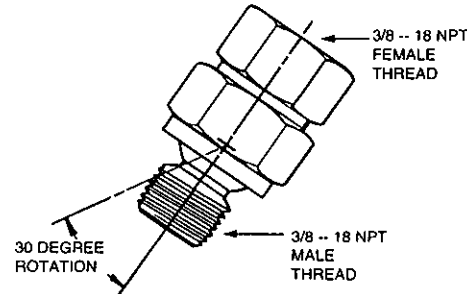


FIGURE 10

Rubber Blow-Off Caps

The Rubber Blow-Off Cap, Part No. 77676, help 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.

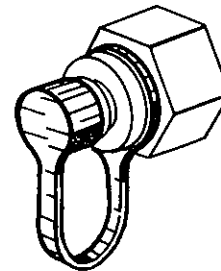


FIGURE 11

Nozzle Identification Chart

Nozzle Type	Nozzle Part No.	Nozzle Stamping	Nozzle Flow No.	Nozzle Identification	Comments
1W Nozzle	419336	1W	1	Chrome-Plated Body	–
1WSS Nozzle	417333	1W	1	Stainless Steel Body	Two-piece construction with male 3/8 NPT threads.
1N Nozzle	419335	1N	1	Chrome-Plated Body	–
1NSS Nozzle	417332	1N	1	Stainless Steel Body	Two-piece construction with male 3/8 NPT threads.
1/2N Nozzle	419334	1/2N	1/2	Chrome-Plated Body	Metal blow-off caps are not allowed with the 1/2N nozzle.
3N Nozzle	419338	3N	3	Chrome-Plated Body	–
2W Nozzle	419337	2W	2	Chrome-Plated Body	–
2WH Nozzle	78078	2WH	2	Chrome-Plated Body	Use 2WH nozzles on 1.5 gallon, 6 flow duct and plenum protection only, Option 2. Two-piece construction with male 3/8 NPT threads.
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	–

METAL BLOW-OFF CAP

Two types of metal blow-off caps are available as options to the standard rubber caps. The metal cap can be used in unusually high heat conditions, generally over 400 °F (204 °C). The metal blow-off cap is attached to the nozzle by means of a stainless steel wire which prevents it from falling into the appliance during discharge. Shipping Assembly Part No. 79745 contains 10 metal blow-off caps for use on standard, non-swivel nozzles and Shipping Assembly Part No. 415568 contains 10 metal blow-off caps for use on swivel nozzles.

NOTICE

If metal blow-off caps are required for upright broiler protection, use (2) two 1N nozzles (Part No. 56930) instead of 1/2N nozzles.

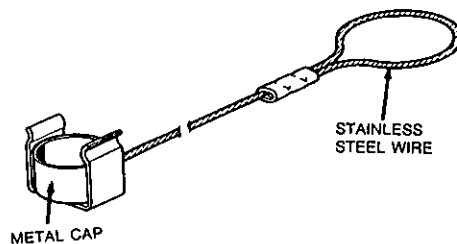


FIGURE 12

CONDUIT OFFSET ASSEMBLY

The conduit offset assembly, Part No. 79825, 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.

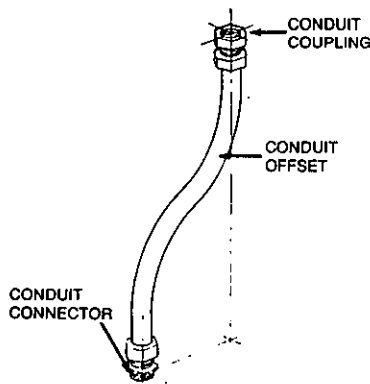


FIGURE 13

"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. 78195), 3/8 in. (Part No. 77284), 1/2 in. (Part No. 77286), or 3/4 in. (Part No. 77288) pipe or conduit sizes. When using with EMT conduit, a conduit connector must be installed in each end of the adaptor.

Size	Hole Size Required
1/4 in.	3/4 in.
3/8 in.	1 1/8 in.
1/2 in.	1 1/8 in.
3/4 in.	1 3/8 in.

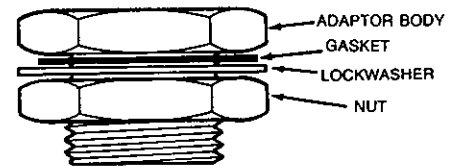


FIGURE 14

"COMPRESSION-SEAL" ADAPTOR

This adaptor is a mechanical bulkhead fitting that produces a liquid-tight seal around pipe and conduit when installing distribution piping and detection conduit through restaurant hoods and ducts. The "Compression-Seal" adaptor is a straight-through design requiring no cutting or threading of conduit or pipe. The adaptor is available for pipe sizes of 1/4 in. (Part No. 79148), 3/8 in. (Part No. 79150), 1/2 in. (Part No. 79146), and EMT conduit size of 1/2 in. (Part No. 79152).

Size	Hole Size Required
1/4 in.	3/4 in.
3/8 in.	1 1/8 in.
1/2 in.	1 1/8 in.

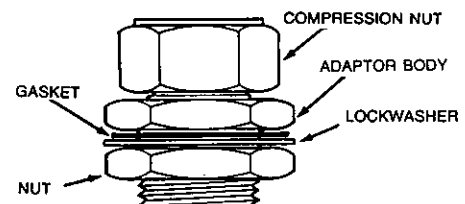


FIGURE 15

"HOOD SEAL" ADAPTOR ASSEMBLY

This adaptor, shipping assembly Part No. 79768, is a mechanical bulkhead fitting that produces a liquid-tight seal around 1/2 in. EMT conduit when installing the detection line through restaurant hoods and duct. The adaptor accepts a high temperature pulley elbow and, when used, correctly positions the elbow or conduit in line with the conduit adaptor hole in the detector bracket. The "Hood Seal" eliminates the need for multiple elbows when penetrating the top of a hood when installing the detection line.

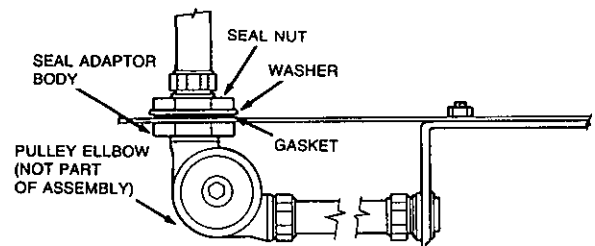


FIGURE 16

SECTION III – SYSTEM COMPONENTS

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REV. 1

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.

There are three styles of detectors available: the clip-on style, the hinged style, and the scissor style.

The clip-on style 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 hinged style detector requires the wire rope to be strung to the detector bracket, and then "threaded" through the linkage assembly before continuing to the next detector bracket.

The scissor style 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.

Each style of detector consists of two types of assemblies:

The Terminal Detector (Part No. 56838, 15375, or 417368) 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.

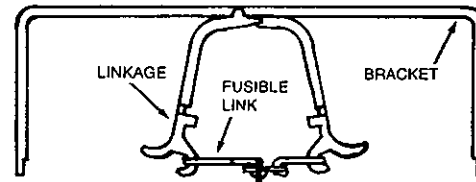
The Series Detector (Part No. 56837, 15373, or 417369) is any detector located in-line between the regulated release assembly and the terminal detector.

When using Part No. 56837 and 56838 style detectors, a total of 12 detectors can be in one detection system: 11 series detectors, Part No. 56837 and 1 terminal detector, Part No. 56838.

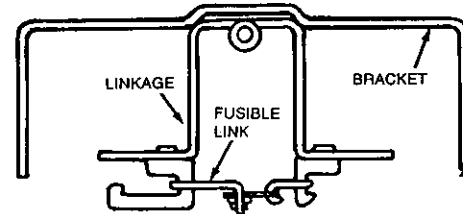
When using Part No. 15373 and 15375 style detectors, a total of 5 detectors can be in one detection system: 4 series detectors, Part No. 15373 and 1 terminal detector, Part No. 15375.

When using Part No. 417368 and 417369 style detectors, a total of 15 detectors can be in one detection system: 14 series detectors, Part No. 417369 and 1 terminal detector, Part No. 417368.

CLIP-ON STYLE – PART NO. 56837 AND 56838



HINGED STYLE – PART NO. 15373 AND 15375



SCISSOR STYLE – PART NO. 417368 AND 417369

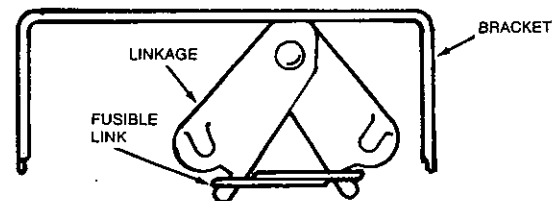


FIGURE 17

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. 45771 has compression ring ends also for 1/2 in. conduit.

PART NO. 415670

PART NO. 45771

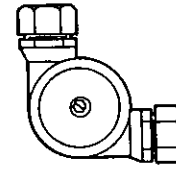
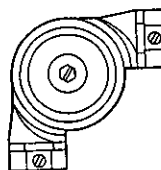


FIGURE 18

PULLEY TEE

The Pulley Tee (Part No. 15342) 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. Pulley tees can only be used to operate one gas valve from two ANSUL AUTOMAN Releases.

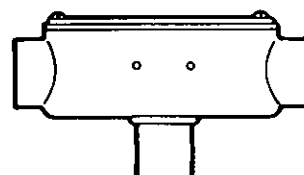


FIGURE 19

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. 4835, Part No. 54011, or Part No. 415255) is required for manual actuation of the regulated release assembly. The remote manual pull station should be mounted at a point of egress and positioned at a height determined by the authority having jurisdiction.

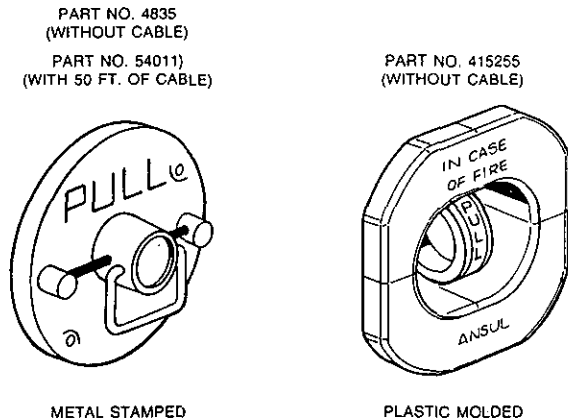


FIGURE 20

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.

Part No.	Description	Maximum Operating Pressure
55598	3/4 in. Gas Valve (ANSUL)	10 psi (69 kPa)
55601	1 in. Gas Valve (ANSUL)	10 psi (69 kPa)
55604	1 1/4 in. Gas Valve (ANSUL)	10 psi (69 kPa)
55607	1 1/2 in. Gas Valve (ANSUL)	10 psi (69 kPa)
55610	2 in. Gas Valve (ANSUL)	10 psi (69 kPa)
25937	2 1/2 in. Gas Valve (ASCO)	5 psi (34.5 kPa)
25938	3 in. Gas Valve (ASCO)	5 psi (34.5 kPa)

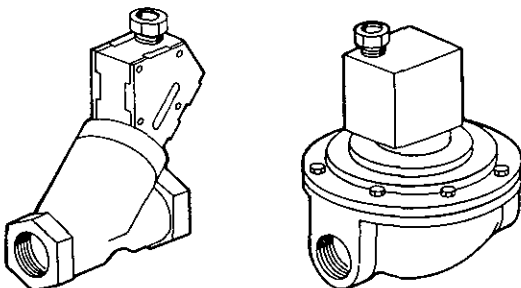


FIGURE 21

ELECTRICAL GAS VALVES

The electrical gas valves are designed to shut off the flow of either natural or LP gas to the appliances upon actuation of the regulated release assembly. The valves are available in sizes of 3/4 in., 1 in., 1 1/2 in., 2 in., and 3 in.. The valve is held open by an energized solenoid and upon system actuation, the switch contacts in the regulated release assembly open, thus de-energizing the circuit to the gas valve solenoid, causing the valve to close. Valves are available in 120 VAC and are UL Listed.

Part No.	Description	Maximum Operating Pressure
13707	3/4 in. Solenoid Gas Valve (ASCO)	2 psi (13.8 kPa)
13708	1 in. Solenoid Gas Valve (ASCO)	1 psi (6.9 kPa)
13709	1 1/2 in. Solenoid Gas Valve (ASCO)	25 psi (172 kPa)
13710	2 in. Solenoid Gas Valve (ASCO)	25 psi (172 kPa)
17643	3 in. Solenoid Gas Valve (ASCO)	5 psi (34.5 kPa)

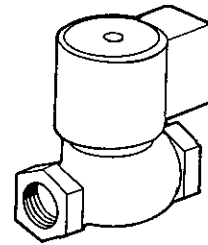


FIGURE 22

MANUAL RESET RELAY

The manual reset relay, Part No. 14702, is required when using an electrical gas valve shut-off system. After the electric gas valve has closed, either due to system actuation or power failure, the valve can not be re-opened, allowing gas to flow, until the reset relay button is manually pressed, re-energizing the circuit. The reset relay is available 120 VAC. The manual reset relay is also recommended for electrical shut down.

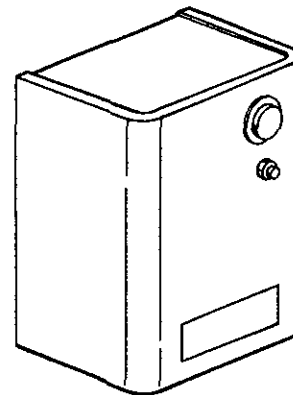


FIGURE 23

ELECTRICAL SWITCHES

The electrical switches are intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices and other electrical devices that are designed to shut off or turn on when the system is actuated. The switches are rated for 15 amp 1/3 hp, 125 or 250 VAC, with 1/2 amp at 125 VDC and 1/4 amp at 250 VDC. The switches are available in SPDT (Part No. 15549), DPDT (Part No. 32222), 3PDT (Part No. 415868) and 4PDT (Part No. 32220) models.

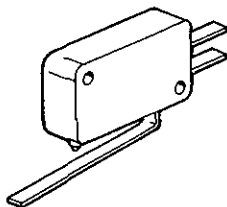


FIGURE 24

PRESSURE SWITCHES

The pressure switch, Part No. 53133 (SPDT) and Part No. 24377 (DPDT), is a pneumatically operated electrical switch intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices, and other electrical devices that are designed to shut off or turn on when the fire suppression system is actuated. The switches are rated at 20 amp, 125, 250, or 480 VAC - with 10 amp at 125 VAC "L" 1 hp-115 VAC, 2 hp-230 VAC, 1/2 amp at 125 VDC, 1/4 amp at 250 VDC, and are available in SPDT or DPDT models. The switch enclosure contains an external reset button for convenient resetting.

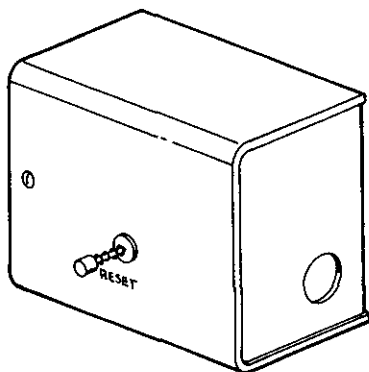


FIGURE 25

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.

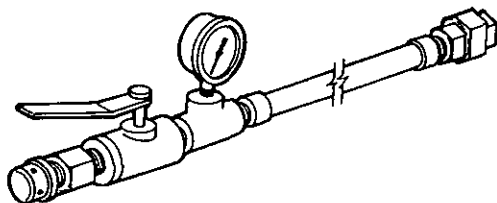
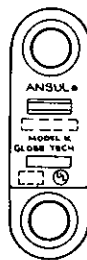


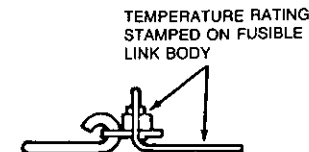
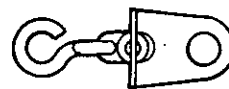
FIGURE 26

FUSIBLE LINK

In order to determine the normal operating temperature at the fusible link location, utilize a maximum registering thermometer (Part No. 15240), temperature tape or other accurate thermometer.



K STYLE



ML STYLE
500 °F (260 °C) ONLY

FIGURE 27

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

Fusible Link Part No.	Temperature Rating	To Be Used Where Temperature Does Not Exceed
415739	165 °F (74 °C)	100 °F (38 °C)
415740	212 °F (100 °C)	150 °F (66 °C)
415741	280 °F (138 °C)	225 °F (107 °C)
415742	360 °F (182 °C)	290 °F (143 °C)
415743	450 °F (232 °C)	360 °F (182 °C)
56816	500 °F (260 °C)	400 °F (204 °C)

BURSTING DISC

The R-102 Bursting Disc is installed in the tank adaptor assembly. The bursting disc eliminates the siphoning of the agent up the pipe during extreme temperature variations. The bursting discs are available in packs of 10, Part No. 417911.



FIGURE 28

SYSTEM DESIGN

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 plenum, duct, and individual appliance protection. This section must be completed before determining tank quantity and piping requirements.

Duct Protection

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

- ▶ 1. 1W Nozzle (Part No. 419336) – 1.5 Gallon and 3.0 Gallon Systems:

The R-102 systems, both 1.5 gallon and 3.0 gallon, use the 1W nozzle (Part No. 419336) for duct protection of 27 in. (68.6 cm) perimeter or less or 8.5 in. (21.6 cm) diameter or less. The nozzle tip is stamped with 1W, indicating that this is a one-flow nozzle and is to be counted as one flow number.

- Single Nozzle (One Flow Number) Duct Protection:

One 1W nozzle (Part No. 419336) will protect ducts with a maximum perimeter of 27 in. (68.6 cm) or a maximum diameter of 8.5 in. (21.6 cm). The nozzle must be installed 2-8 in. (5-20 cm) into the center of the duct opening and positioned as shown in Figure 1.

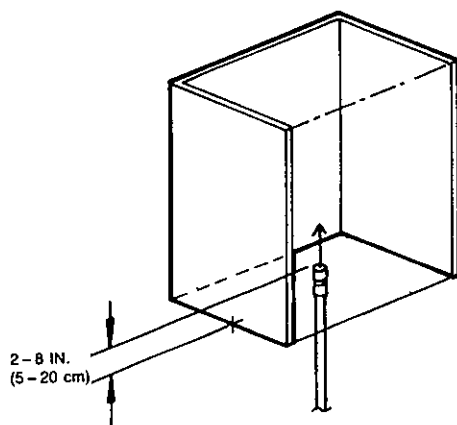


FIGURE 1

- Single Nozzle (One Flow Number) Transition Protection:

One 1W nozzle (Part No. 419336) will protect transitions where the perimeter of 27 in. (68.6 cm) or the diameter of 8.5 in. (21.6 cm) or less begins within that transition. The nozzle must be placed in the center of the transition opening where the maximum perimeter or diameter begins as shown in Figures 2 and 3.

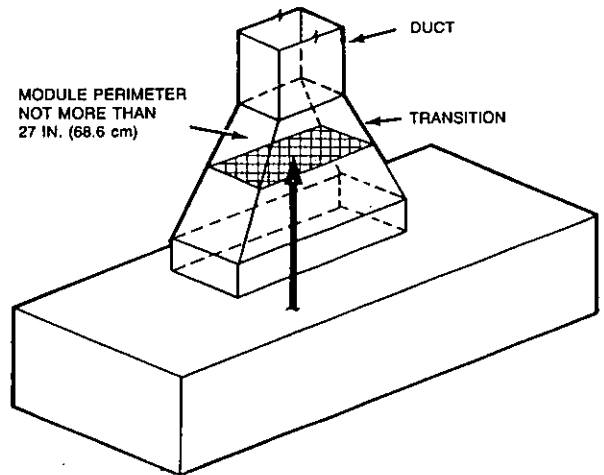


FIGURE 2

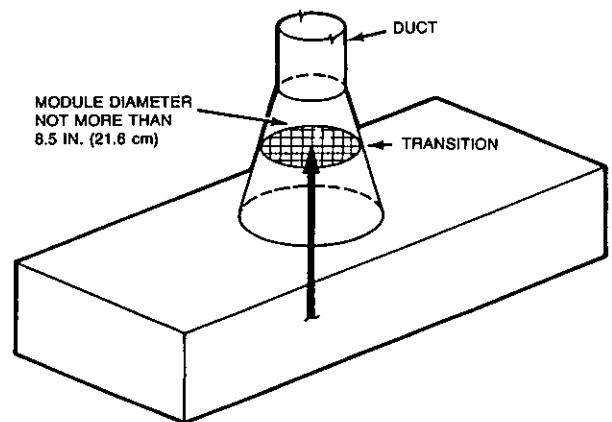


FIGURE 3

NOTICE

A 2WH nozzle must be substituted for a 2W nozzle for any installation using Option 2 of the 1.5 gallon system coverage (6 flow duct and plenum protection only).

- ▶ 2. 2W Nozzle (Part No. 419337):
- ▶ The R-102 System, uses the 2W nozzle (Part No. 419337) for duct protection of 75 in. (190.5 cm) perimeter or less, or 24 in. (61 cm) diameter or less. The nozzle tip is stamped with 2W, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Duct Protection (Continued)

The 1W and 2W nozzles will protect the following:

3. Single Nozzle (2W) Duct Protection:

One 2W nozzle will protect ducts with a maximum perimeter of 75 in. (190.5 cm) or a maximum diameter of 24 in. (61 cm). The nozzle must be installed 2-8 in. (5-20 cm) into the center of the duct opening and positioned as shown in Figure 4.

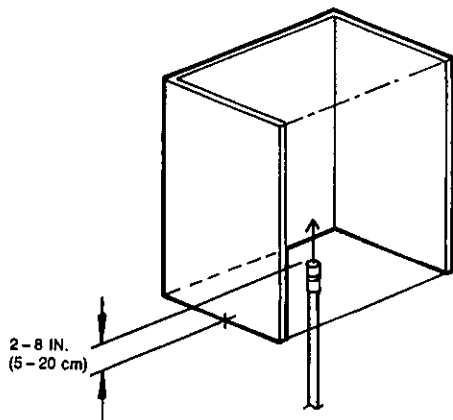


FIGURE 4

4. Single Nozzle (2W) Transition Protection:

One 2W nozzle will protect transitions at the point where the perimeter of 75 in. (190.5 cm) or the diameter of 24 in. (61 cm) or less begins within that transition. The nozzle must be placed in the center of the transition opening where the maximum perimeter or diameter begins as shown in Figures 5 and 6.

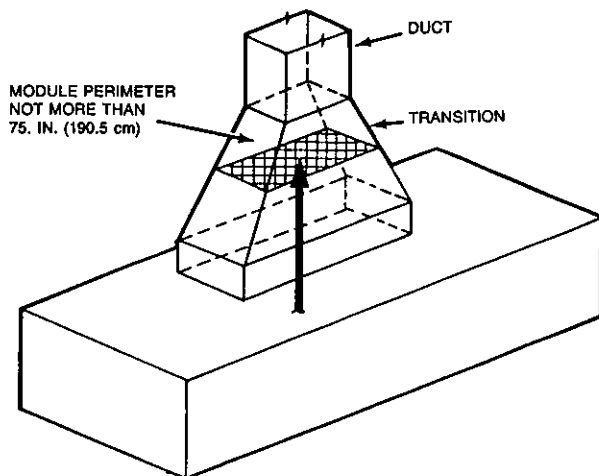


FIGURE 5

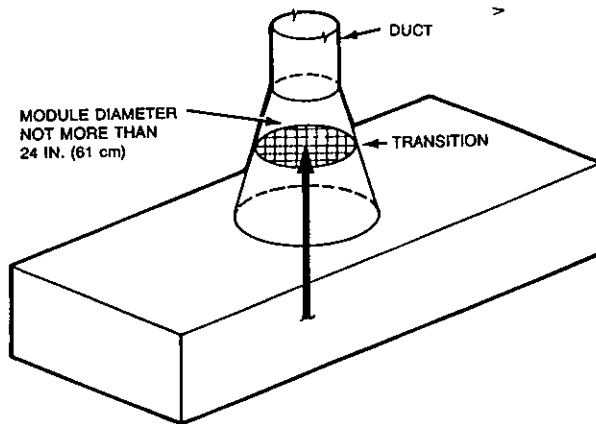


FIGURE 6

5. Dual-Nozzle Duct Protection:

Two 2W nozzles will protect ducts with a maximum perimeter of 150 in. (381 cm) or a maximum diameter of 48 in. (122 cm). The nozzles must be installed 2-8 in. (5-20 cm) into the duct opening and positioned as in Figure 7.

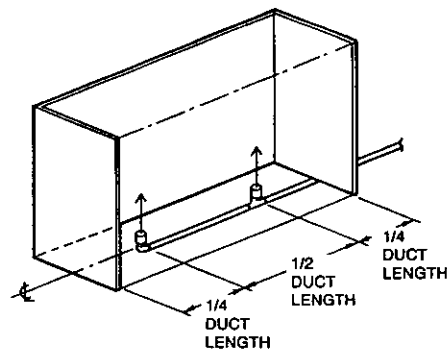


FIGURE 7

NOTICE

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.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Duct Protection (Continued)

6. Dual-Nozzle Transition Protection:

Two 2W nozzles will protect transitions with a maximum perimeter of 150 in. (381 cm). The transition area must be divided where two equally sized modules begin within that transition. The nozzle must be placed in the center of the transition opening where the maximum module perimeter begins as shown in Figure 8.

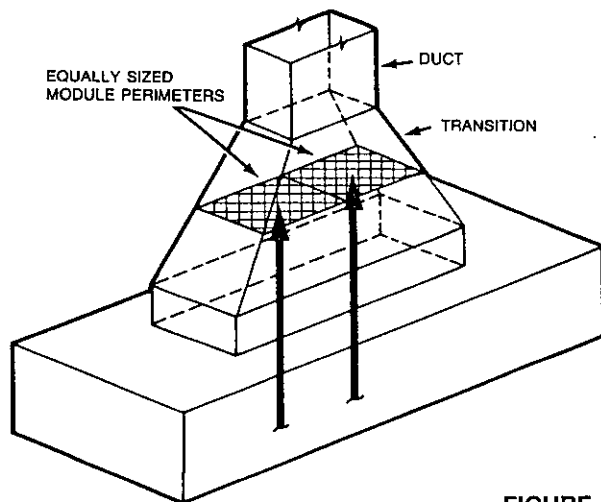


FIGURE 8

7. Dual-Nozzle Duct Protection (3 Flow Numbers):

Rectangular ducts larger than 75 in. (191 cm) perimeter, up to a maximum of 102 in. (260 cm) perimeter, (diameters larger than 24 in. (61 cm), up to 32 in. (81 cm) diameter) can be protected with a combination of one 1W nozzle (Part No. 419336) and one 2W nozzle (Part No. 419337). Each nozzle must be installed on its own duct branch line and positioned 2-8 in. (5-20 cm) into the center of the duct. See Figure 9.

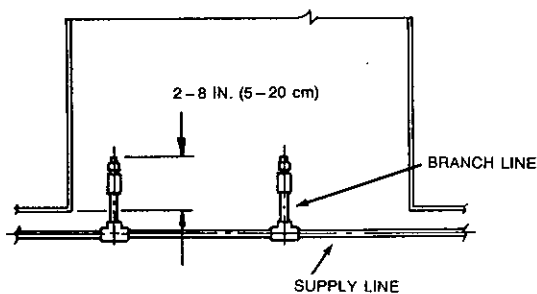


FIGURE 9

To correctly locate the nozzles in the duct, the longest side of the duct must be divided into four equal modules. See Figure 10.

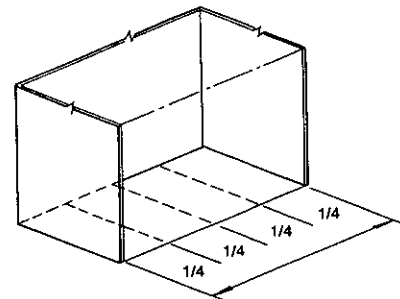
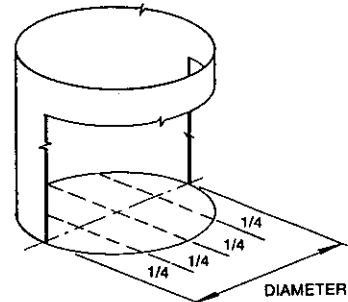


FIGURE 10

The 1W nozzle (Part No. 419336) is then centered in one of the outside modules. See Figure 11.

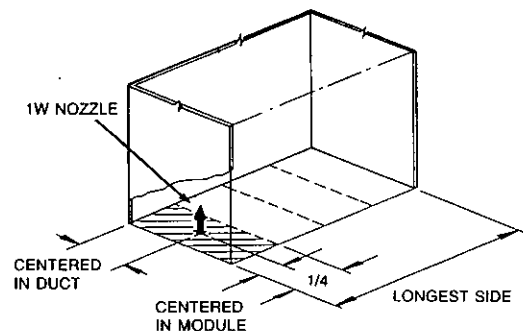
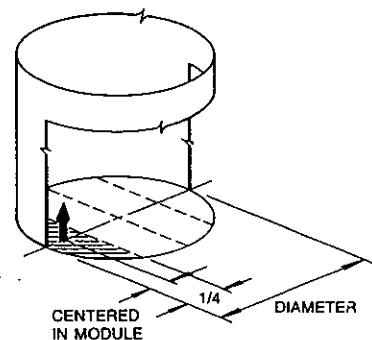


FIGURE 11

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Duct Protection (Continued)

7. (Continued)

- The 2W nozzle (Part No. 419337) is then centered in the remaining three modules. See Figure 12.

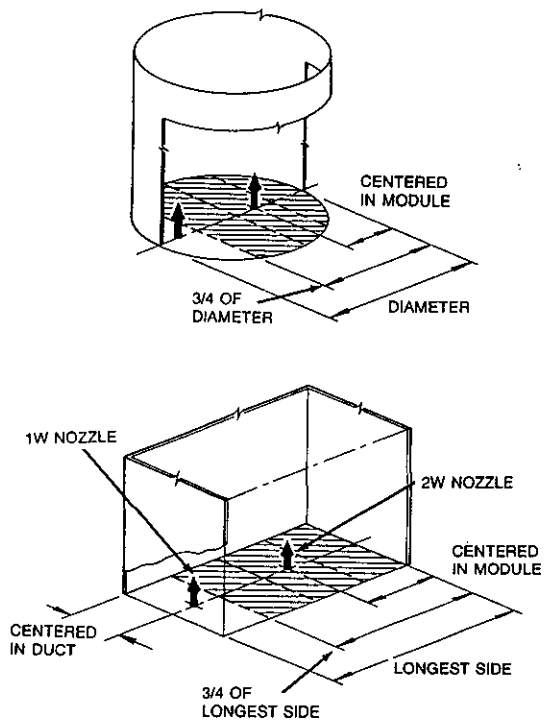


FIGURE 12

The nozzles must be positioned on the same centerline, parallel to the longest side. See Figure 13.

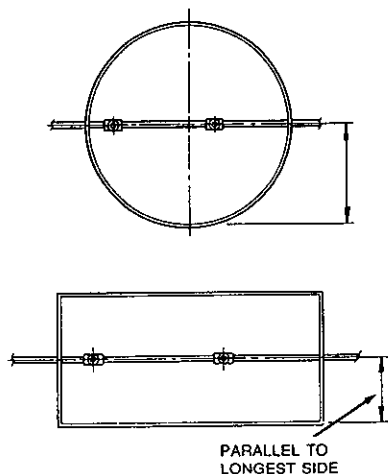


FIGURE 13

8. Triple-Nozzle Duct Protection (5 Flow Numbers):

NOTICE

When protecting the duct with a 1.5 gallon system using this type of protection, no appliance branch lines are allowed on the 1.5 gallon system.

Rectangular/square ducts larger than 150 in. (381 cm) perimeter, up to a maximum of 177 in. (450 cm) perimeter, may be protected with a combination of one 1W nozzle (Part No. 419336) and two 2W nozzles (Part No. 419337). Each nozzle must be installed on its own duct branch line and positioned 2-8 in. (5-20 cm) into the center of the duct. See Figure 14.

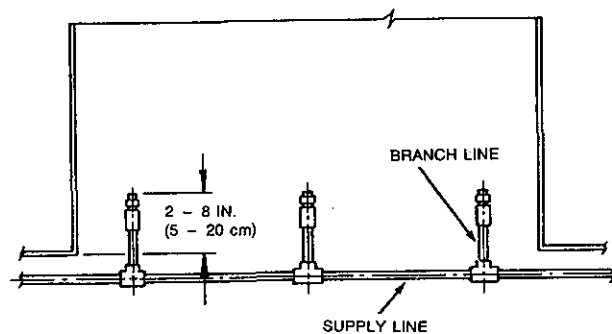


FIGURE 14

To determine if this type of protection can be used, first divide the longest side of the duct in half. See Figure 15.

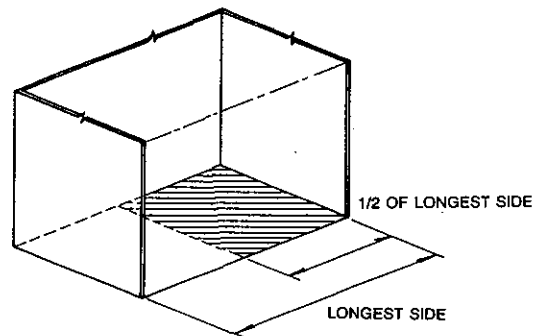


FIGURE 15

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Duct Protection (Continued)

8. (Continued)

At the halfway point, center a module 13.5 in. (34 cm) wide. See Figure 16.

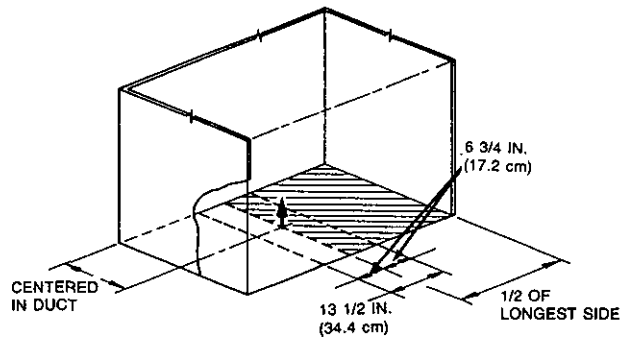


FIGURE 16

Next, check the diagonal dimension of the two remaining modules to make certain that the maximum diagonal dimension of 35.5 in. (85 cm) is not exceeded. Both diagonal dimensions should be the same. Make this check by measuring from one corner of the module to the opposite corner. See Figure 17.

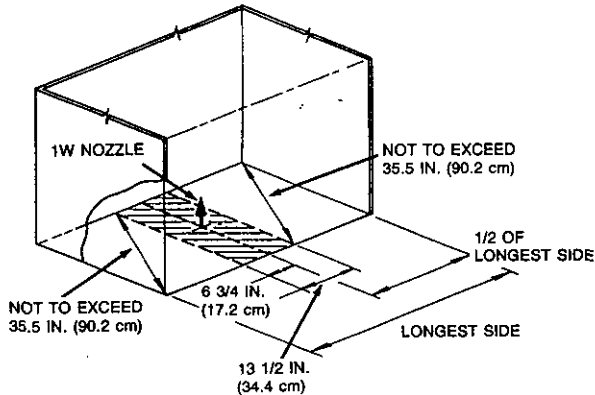


FIGURE 17

If this measurement exceeds 35.5 in. (85 cm), triple nozzle coverage cannot be used. The requirements for "Multiple-Nozzle Duct Protection" (using all 2 flow nozzles) must then be followed.

If the diagonal dimension of 35.5 in. (85 cm) has not been exceeded on either of the two outside modules, then a 1W nozzle (Part No. 419336) can be located in the center of the 13.5 in. (34 cm) wide center module and a 2W nozzle (Part No. 419337) can be centered in each of the two outside modules. See Figure 18.

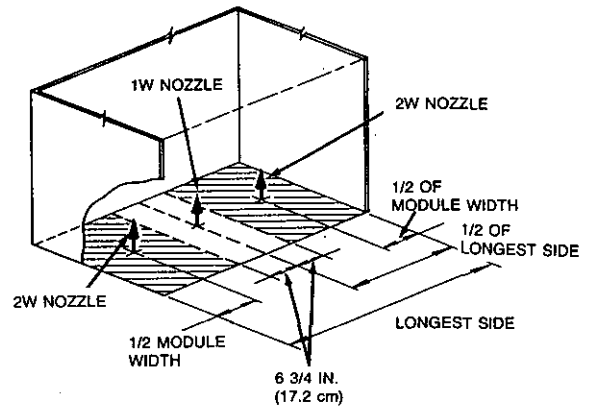


FIGURE 18

The nozzles must be positioned on the same centerline, parallel to the longest side. See Figure 19.

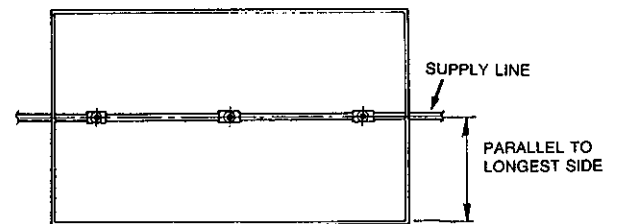


FIGURE 19

Triple-nozzle duct protection (5 flow numbers) is limited to rectangular or square ducts only. This application cannot be used with round ducts.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Duct Protection (Continued)

9. Multiple-Nozzle Duct Protection:

For ducts larger than 150 in. (254 cm) perimeter, the total perimeter of the duct must be divided by 75. If the answer contains a decimal (or fraction), it must be rounded-up to the nearest whole number. This answer signifies the number of equally-sized modules in which the duct must be divided. The diagonal dimension of each module must not exceed 35.5 in. (90.2 cm). If diagonal dimension is exceeded, additional module divisions must be added until the diagonal dimension is not exceeded. A nozzle must then be centered in each module.

Example: Figure 20 shows a duct opening of 270 in. (686 cm) perimeter. By dividing 270 in. (686 cm) by 75, it is determined that the duct must be divided into 4 equally-sized modules. Because the diagonal dimension of each module is 33.54 in. (85.2 cm), it is within the maximum limit of 35.5 in. (90.2 cm) and therefore acceptable as shown in Figure 21. One nozzle is then centered in each module as shown in Figure 22.

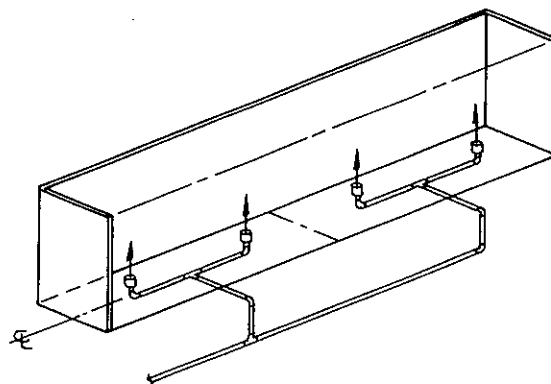


FIGURE 22

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

Description	Part No.	3.0 Gallon System	1.5 Gallon System
▶ 1W Nozzle	419336	Maximum 27 in. (69 cm) Perimeter	Maximum 27 in. (69 cm) Perimeter
▶ 2W Nozzle	419337	Maximum 75 in. (191 cm) Perimeter	Maximum 75 in. (191 cm) Perimeter
2WH Nozzle	78078		Maximum 75 in. (191 cm) Perimeter

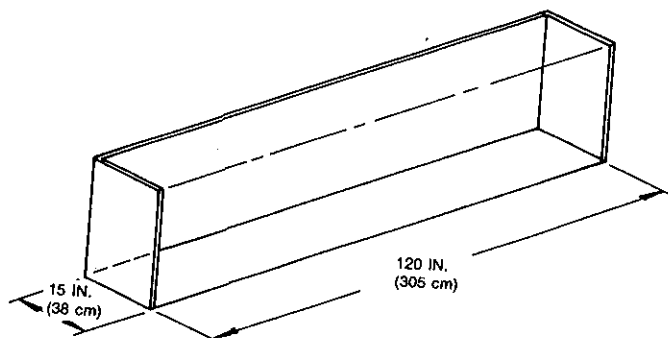


FIGURE 20

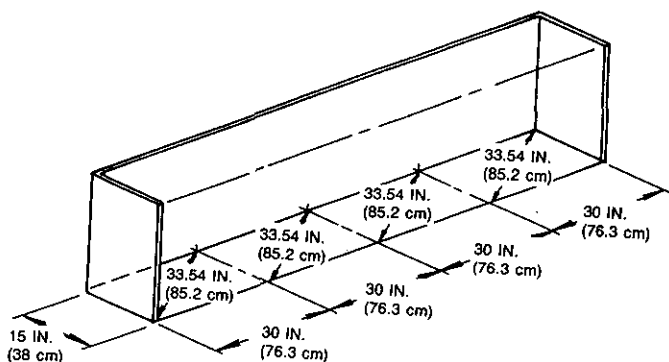


FIGURE 21

Electrostatic Precipitator Protection

Some restaurant ventilating ducts have an electrostatic precipitator installed at or near the base. These precipitators are used to aid in the cleaning of exhaust air.

Normally electrostatic precipitators do not require protection but should the "authority having jurisdiction" require protection, use the following guidelines.

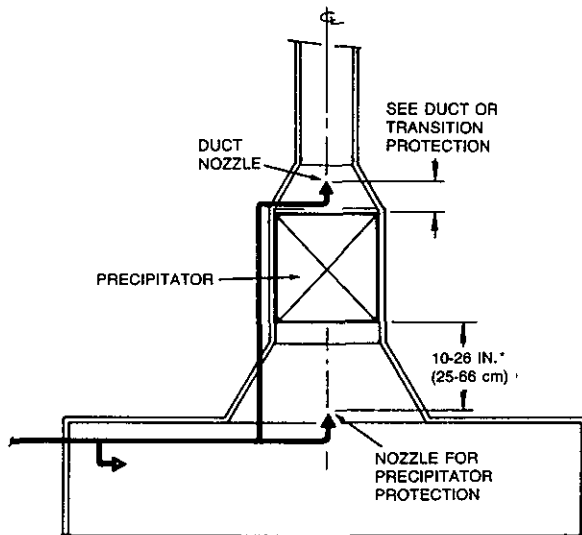
Ducts with precipitators located at or near the base can be protected using duct nozzle(s) above the precipitator and 1/2N nozzle(s) (Part No. 419334) for the precipitator. One 1/2N nozzle must be used for each cell being protected. This nozzle tip is stamped with 1/2N, indicating that it is a 1/2-flow nozzle and must be counted as 1/2 flow number.

When protecting ducts equipped with precipitators, the duct nozzle(s) must be installed above the precipitator and aimed to discharge downstream. If the area above the precipitator is a duct, the nozzle(s) must be positioned according to duct protection guidelines. If the area above the precipitator is a transition, the transition guidelines must be followed. See Figure 20.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Electrostatic Precipitator Protection (Continued)

- ▶ The 1/2N nozzle (Part No. 419334) must be centered 10 to 26 in. (25 to 66 cm) below the precipitator and aimed to discharge at the center of each precipitator cell. However, if it is physically impossible to mount the nozzle at 10 to 26 in. (25 to 66 cm) due to precipitator placement, the nozzle may be mounted closer than 10 in. (25 cm). See Figure 23.



*IF PHYSICALLY IMPOSSIBLE AT 10 TO 26 IN. (25 TO 66 cm), NOZZLE MAY BE MOUNTED CLOSER THAN 10 IN. (25 cm).

FIGURE 23

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 both one-flow nozzles and must be counted as one flow number each.

▶ 1W NOZZLE – PART NO. 419336

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. (.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 24.

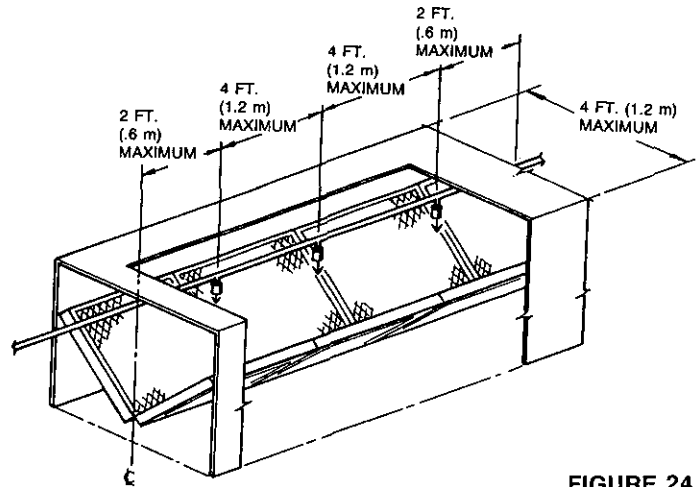


FIGURE 24

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 25.

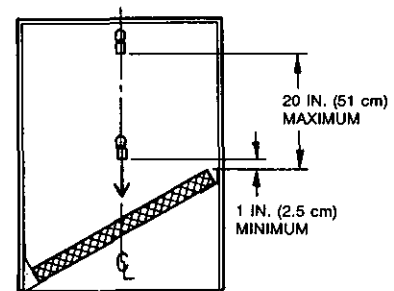
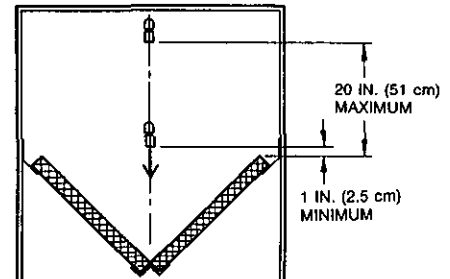


FIGURE 25

- 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 26.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Plenum Protection (Continued)

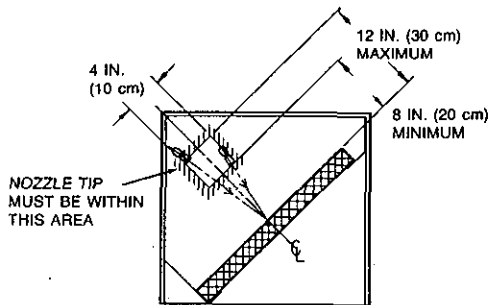


FIGURE 26

► 1N NOZZLE – PART NO. 419335

One 1N nozzle will protect 8 linear feet (2.4 m) of single filter bank plenum or two 1N nozzles will protect 8 linear feet (2.4 m) of "V" bank plenum. In either application, 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 filter height **must not** exceed 20 in. (51 cm). See Figure 27.

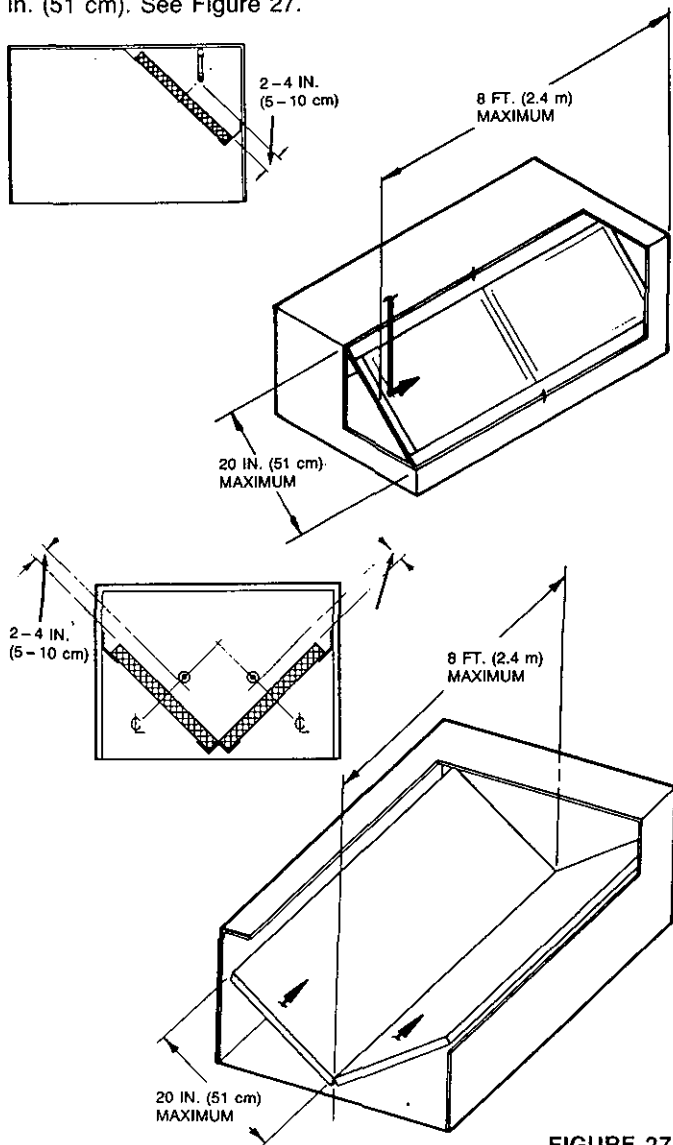


FIGURE 27

Exception: When the plenum chamber contains filters that do not exceed 10 in. (25.4 cm) in height and the 1N nozzle can be installed at the intersecting center lines of both filter banks and not exceed the 2-4 in. (5 to 10 cm) distance from either filters, a single 1N nozzle can be used. See Figure 27a.

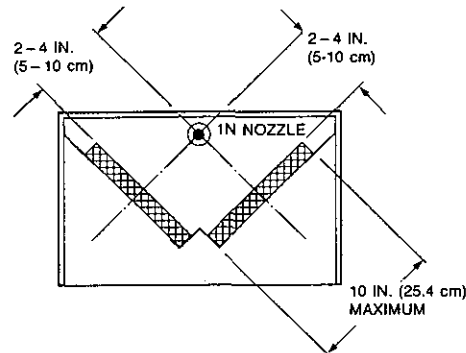


FIGURE 27a

NOTICE

If 1N nozzle coverage does not exceed 7 linear ft. (2.1 m), the nozzle can be mounted 2 to 6 in. (5-15 cm) from the face of the filter.

For a plenum, either single or "V" bank, with a linear extension longer than 8 feet (2.4 m), each bank may be protected using one 1N nozzle every 8 ft. (2.4 m) or less depending on the overall length of the plenum. See Figure 28. The nozzles may point in the opposite directions as long as the entire plenum area is protected, and the 8 ft. (2.4 m) limitation is not exceeded. See Figure 29. The nozzle positioning shown in Figure 30 is not an acceptable method of protection because the plenum area directly under the tee is not within the discharge pattern of either nozzle.

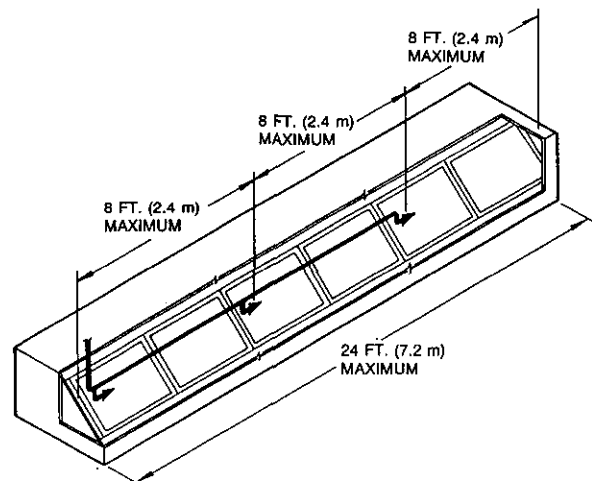


FIGURE 28

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Plenum Protection (Continued)

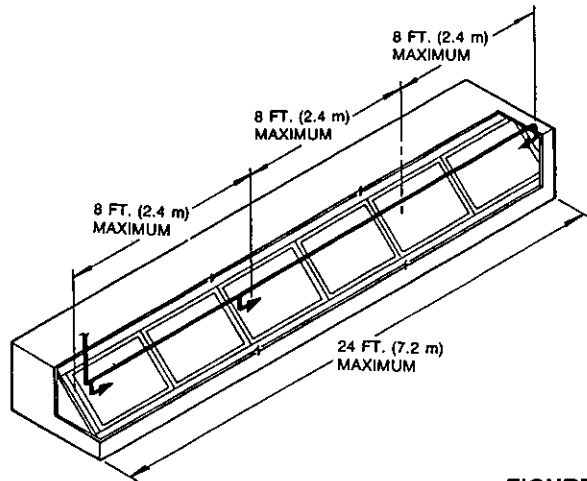


FIGURE 29

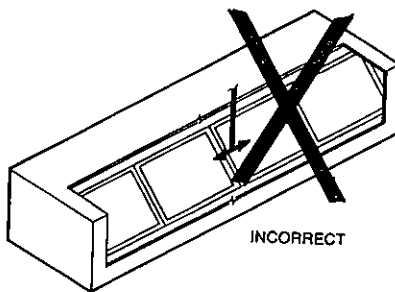


FIGURE 30

The following pages detail types of appliance protection. Each design requires several factors: correct nozzle choice, correct nozzle height above hazard, correct nozzle location and correct aiming point.

When protecting appliances which are larger than single nozzle coverage, multiple nozzles can be used.

Larger appliances can be divided into several modules, each equal to or smaller than single nozzle coverage. Exception: Fryers must not exceed a maximum of 864 sq. in. (5574 sq. cm).

Single Nozzle Fryer Protection – 2-Flow High Proximity/ 2-Flow Medium Proximity

If the fryer **does not** have a drip board, the maximum hazard (fry pot) size is 15 in. (38 cm) x 14 in. (36 cm) (maximum area of 210 sq. in. (1355 sq. cm)). If the fryer **has** a drip board, the maximum hazard (cooking surface) size is 21 in. (53 cm) x 14 in. (36 cm) (maximum area of 294 sq. in. (1897 sq. cm)). The maximum fryer pot size must still not exceed 15 in. (38 cm) x 14 in. (36 cm) (210 sq. in. (1355 sq. cm) of maximum area.) The nozzle must be aimed at the center of the hazard area.

The R-102 system uses two different style nozzles for the protection of fryers.

1. **High Proximity Applications:** 27 to 47 in. (68 to 119 cm) above the top surface of fryer. See Figure 31a and Figure 31b.

► The 230 Nozzle (Part No. 419339) is used for high proximity applications. The nozzle tip is stamped with 230, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

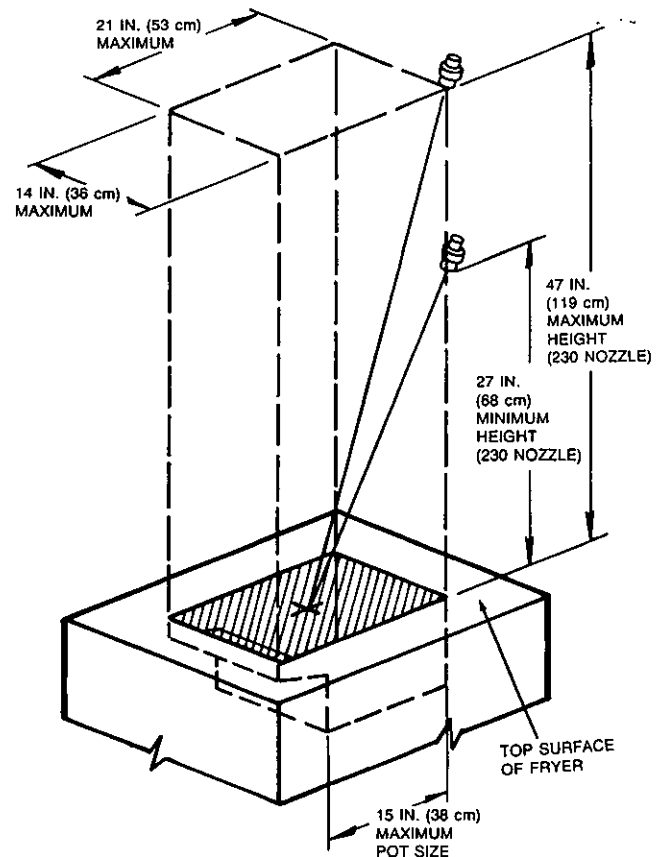
When using this nozzle for fryer protection, the nozzle tip must be positioned anywhere along or within the perimeter of the maximum hazard area and angled to the center.

FRYER WITH DRIP BOARD:

MAXIMUM DIMENSIONS 21 IN. (53 cm) x 14 IN. (36 cm)
MAXIMUM AREA 294 SQ. IN. (1897 sq. cm)

FRY POT:

MAXIMUM DIMENSIONS 15 IN. (38 cm) x 14 IN. (36 cm)
MAXIMUM AREA IS 210 SQ. IN. (1354 sq. cm)



230 NOZZLE TIP POSITIONED ANYWHERE ALONG OR WITHIN PERIMETER OF COOKING SURFACE AND AIMED TO THE CENTER OF THE COOKING SURFACE.

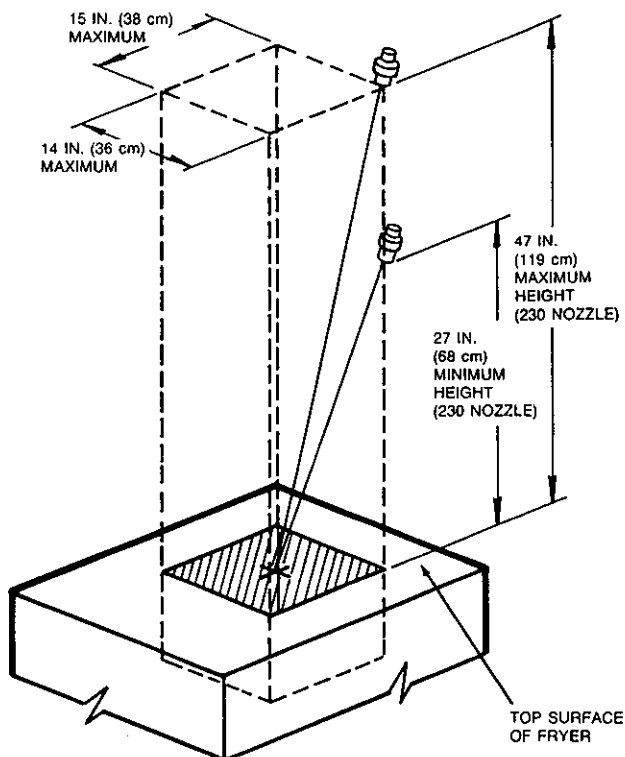
FIGURE 31a

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Single Nozzle Fryer Protection – 2-Flow High Proximity/2-Flow Medium Proximity (Continued)

1. (Continued)

FRYER WITHOUT DRIP BOARD:
 MAXIMUM DIMENSIONS 15 IN. (38 cm) x 14 IN. (36 cm)
 MAXIMUM AREA 210 SQ. IN. (1355 sq. cm)



230 NOZZLE TIP POSITIONED ANYWHERE ALONG OR WITHIN PERIMETER OF COOKING SURFACE AND AIMED TO THE CENTER OF THE COOKING SURFACE.

FIGURE 31b

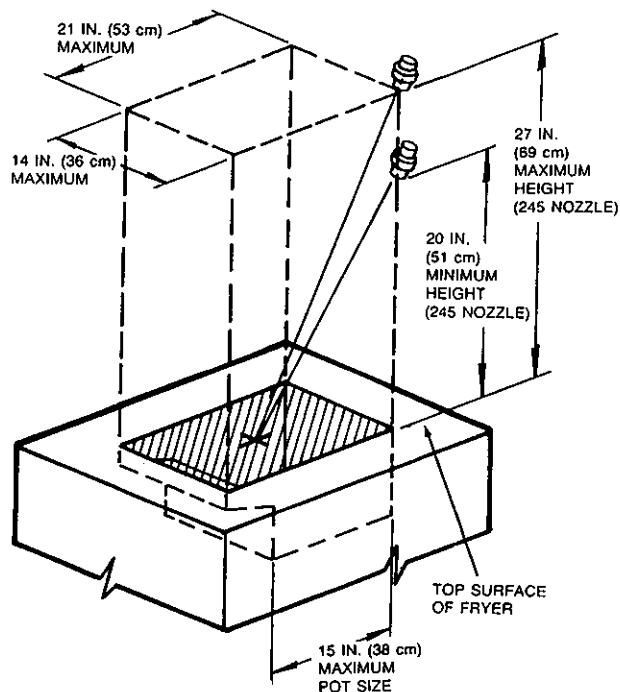
2. Medium Proximity Applications: 20 to 27 in. (51 to 69 cm) above top surface of fryer. See Figure 32a and Figure 32b.

The 245 Nozzle (Part No. 419340) is used for medium proximity applications. The nozzle tip is stamped with 245, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

When using this nozzle for fryer protection, the nozzle tip must be positioned anywhere along or within the perimeter of the maximum hazard area and angled to the center.

FRYER WITH DRIP BOARD:
 MAXIMUM DIMENSIONS 21 IN. (53 cm) x 14 IN. (36 cm)
 MAXIMUM AREA 294 SQ. IN. (1897 sq. cm)

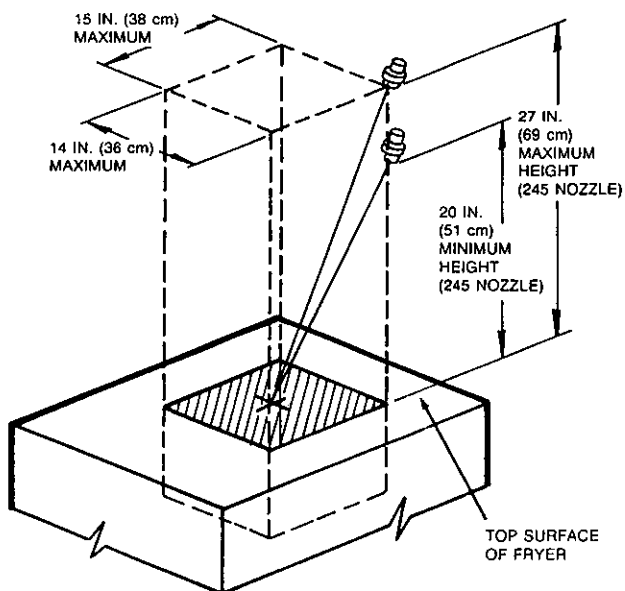
FRY POT:
 MAXIMUM DIMENSIONS 15 IN. (38 cm) x 14 IN. (36 cm)
 MAXIMUM AREA 210 SQ. IN. (1355 sq. cm)



245 NOZZLE TIP POSITIONED ANYWHERE ALONG OR WITHIN PERIMETER OF COOKING SURFACE AND AIMED TO THE CENTER OF THE COOKING SURFACE.

FIGURE 32a

FRYER WITHOUT DRIP BOARD:
 MAXIMUM DIMENSIONS 15 IN. (38 cm) x 14 IN. (36 cm)
 MAXIMUM AREA 210 SQ. IN. (1355 sq. cm)



245 NOZZLE TIP POSITIONED ANYWHERE ALONG OR WITHIN PERIMETER OF COOKING SURFACE AND AIMED TO THE CENTER OF THE COOKING SURFACE.

FIGURE 32b

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Split Vat Fryer

The protection for split vat fryers is the same as the standard fryer coverage as stated on Pages 4-9 through 4-10. Once again, if a fryer does not have a drip board, the maximum hazard size is 15 in. (38 cm) x 14 in. (36 cm) (maximum area of 210 sq. in. (1355 sq. cm)). If the fryer has a drip board, the maximum hazard size is 21 in. (53 cm) x 14 in. (36 cm) (maximum area of 294 sq. in. (1897 sq. cm)). (The maximum fry pot size must still not exceed 15 in. (38 cm) x 14 in. (36 cm) (maximum area 210 sq. in. (1355 sq. cm)). The nozzle must be aimed at the center of the hazard area. See Figure 33.

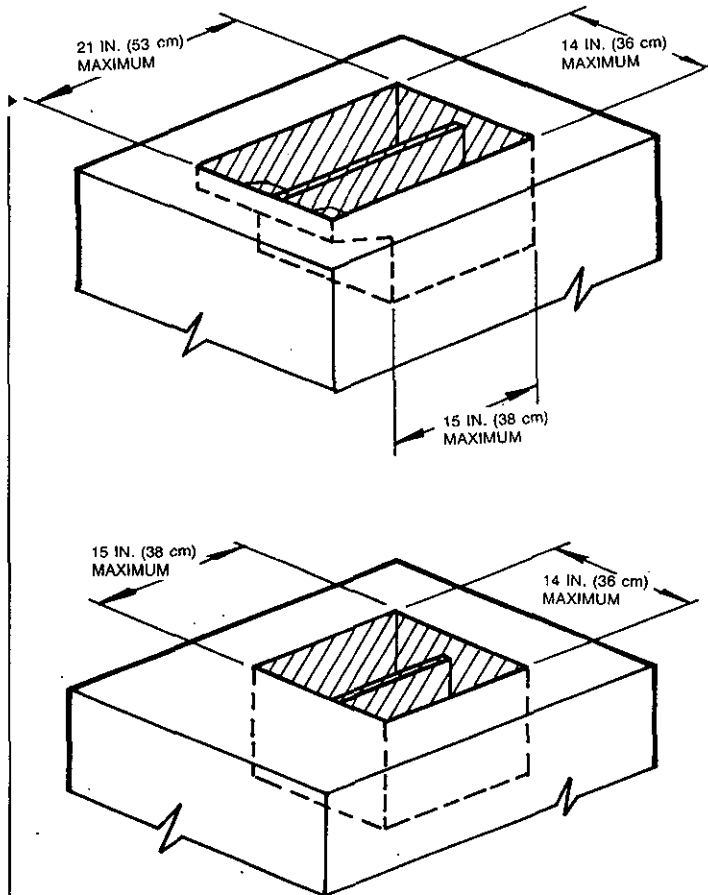


FIGURE 33

Multiple Nozzle Fryer Protection – 2-Flow High Proximity/ 2-Flow Medium Proximity

Fryers exceeding the coverage of a single, 2-flow nozzle can be protected with multiple nozzles up to a maximum of 864 sq. in. (.6 sq. m). See Figure 33a.

864 SQ. IN. (5574 sq. cm) MAXIMUM TOTAL AREA THAT CAN BE PROTECTED BY MULTIPLE NOZZLES

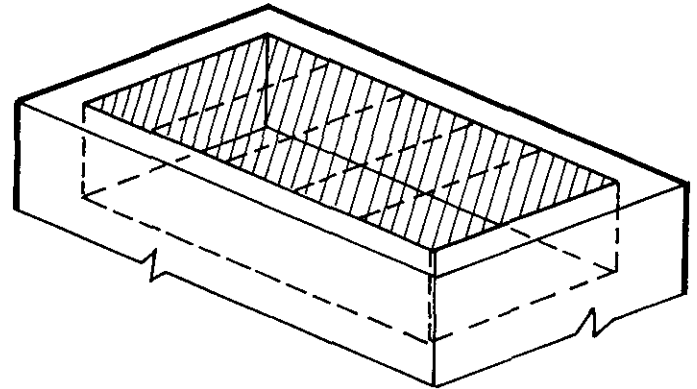


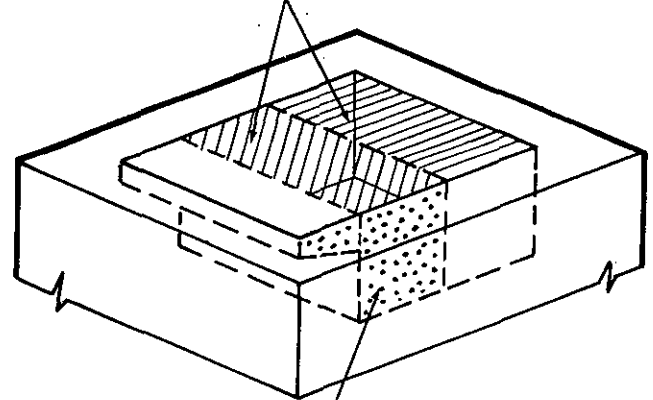
FIGURE 33a

FRYERS WITH DRIP BOARDS

A single R-102 nozzle can protect a maximum surface area of 294 sq. in. (1897 sq. cm) (fry pot area plus drip board area), or a maximum of 210 sq. in. (1355 sq. cm) of cooking area of fry pot only. The longest side of the total hazard must not exceed 21 in. (53 cm). See Figure 33b.

To properly protect this hazard with multiple nozzles, divide the surface area into modules not exceeding 294 sq. in. (1897 sq. cm) (cooking area plus drip board area) and 210 sq. in. (1355 sq. cm) of fry pot only. When dividing into modules, the longest side of each module must not exceed 21 in. (53 cm). See Figure 33b.

THIS IS TOTAL MODULE AREA WITHOUT
 DRIP BOARD
 21 IN. (53 cm) MAXIMUM DIMENSION
 (COOKING AREA NOT TO EXCEED 210 SQ.
 IN. (1355 sq. cm) MAXIMUM)



THIS IS TOTAL MODULE AREA WITH DRIP BOARD
 21 IN. (53 cm) MAXIMUM DIMENSION INCLUDING DRIP BOARD
 (AREA INCLUDING DRIP BOARD NOT TO EXCEED
 294 SQ. IN. (1897 sq. cm) MAXIMUM)

FIGURE 33b

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Multiple Nozzle Fryer Protection – 2-Flow High Proximity/ 2-Flow Medium Proximity (Continued)

The R-102 system uses two different style nozzles for this protection.

1. **High Proximity Applications:** 27 to 47 in. (69 to 120 cm) above the top surface of fryer. See Figure 33c.

- ▶ The 230 Nozzle (Part No. 419339) is used for high proximity applications. The nozzle tip is stamped with 230, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

When using this nozzle for fryer protection, the nozzle tip must be positioned anywhere along or within the perimeter of the area it is protecting and aimed at the mid point of the respective modular area.

2. **Medium Proximity Applications:** 20 to 27 in. (51 to 69 cm) above top surface of fryer. See Figure 33c.

- ▶ The 245 Nozzle (Part No. 419340) is used for medium proximity applications. The nozzle tip is stamped with 245, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

To protect each area, the nozzle tip must be located within the perimeter of the area it is protecting and aimed at the mid point of the respective modular area. See Figure 33c.

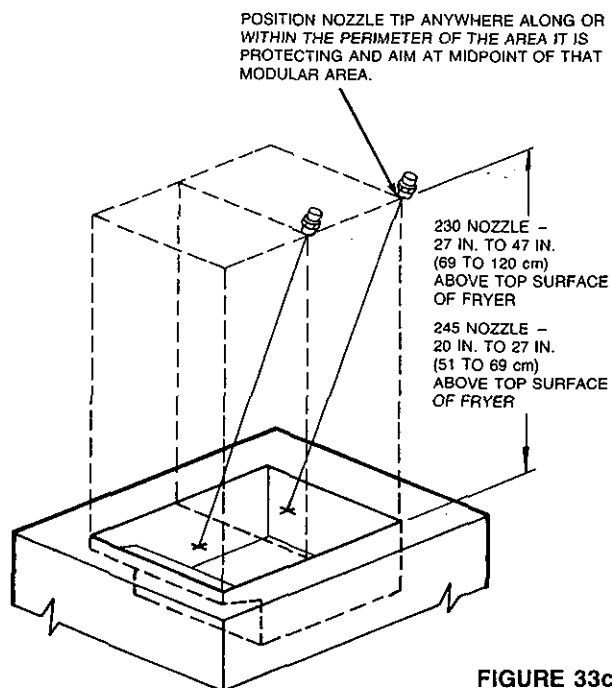


FIGURE 33c

See Figure 33d for two examples of modularizing larger drip board fryers.

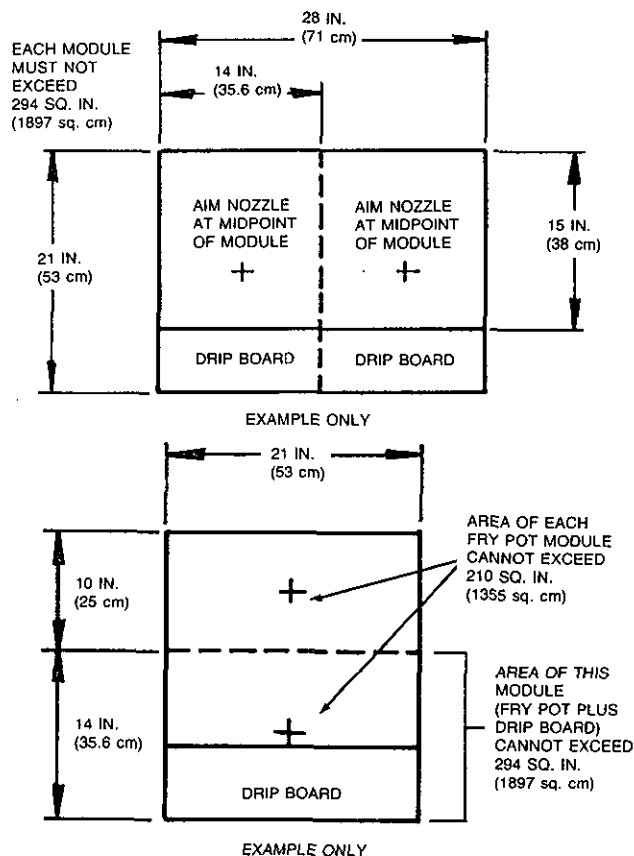


FIGURE 33d

FRYERS WITHOUT DRIP BOARDS

When protecting a fryer without a drip board using multiple nozzles, the hazard surface area must not exceed 210 sq. in. (1355 sq. cm) per nozzle and the longest side of each module must not exceed 21 in. (53 cm). See Figure 33e.

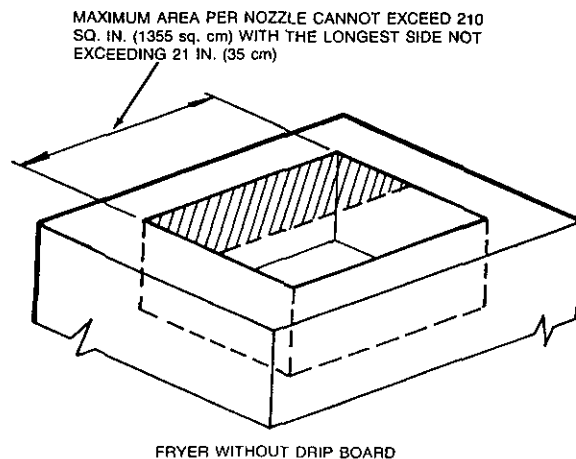
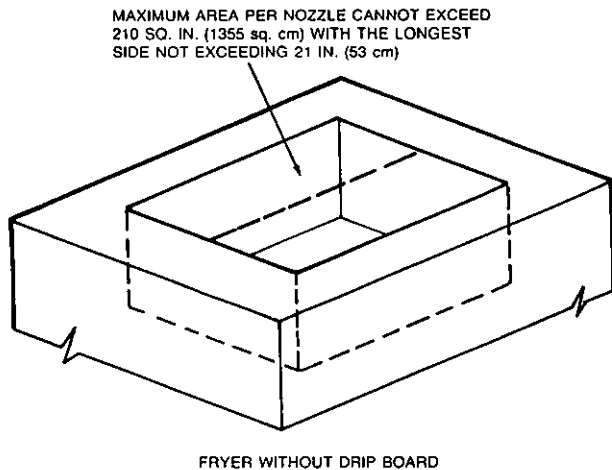


FIGURE 33e

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Multiple Nozzle Fryer Protection – 2-Flow High Proximity/ 2-Flow Medium Proximity (Continued)

To properly protect this hazard, divide the surface area into modules not exceeding 210 sq. in. (1355 sq. cm). When dividing into modules, the longest side of each module must not exceed 21 in. (53 cm). See Figure 33f.



FRYER WITHOUT DRIP BOARD

FIGURE 33f

The R-102 system uses two different style nozzles for this protection.

1. **High Proximity Applications:** 27 to 47 in. (69 to 130 cm) above the top surface of fryer. See Figure 33g

- The 230 Nozzle (Part No. 419339) is used for high proximity applications. The nozzle tip is stamped with 230, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

When using this nozzle for fryer protection, the nozzle tip must be positioned anywhere along or within the perimeter of the modular area it is protecting and aimed at the mid point of the respective modular area.

2. **Medium Proximity Applications:** 20 to 27 in. (51 to 69 cm) above top surface of fryer. See Figure 33g.

- The 245 Nozzle (Part No. 419340) is used for medium proximity applications. The nozzle tip is stamped with 245, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

To protect each area, the nozzle tip must be located within the perimeter of the area it is protecting and aimed at the mid point of the respective modular area. See Figure 33g.

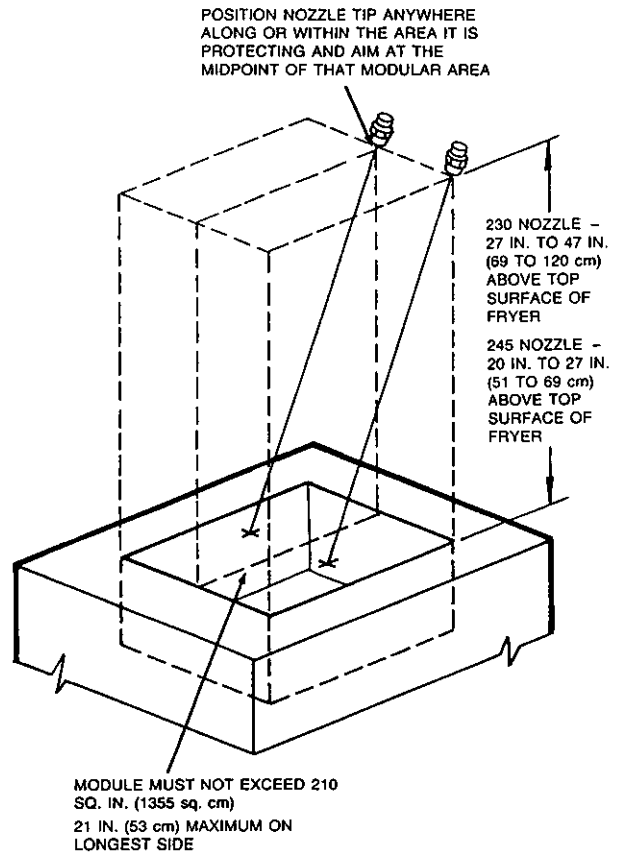


FIGURE 33g

SECTION IV – SYSTEM DESIGN

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REV. 3

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Range Protection

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

NOTICE

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

1. Range Protection (1-Flow Nozzle)

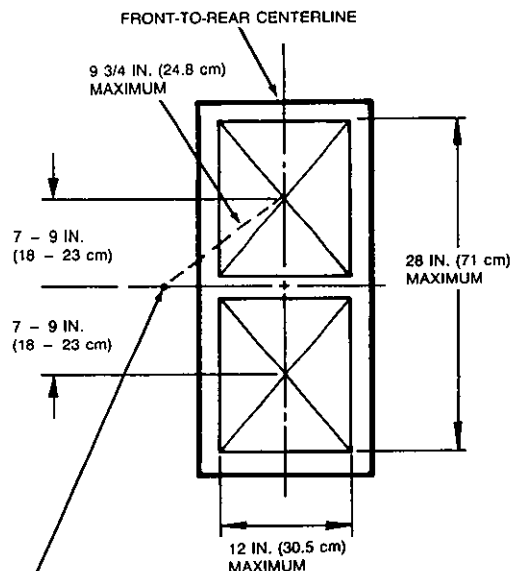
Single and multiple burner ranges can be protected using a 1F nozzle, Part No. 419333. The nozzle tip is stamped with 1F, indicating that this is a one-flow nozzle and must be counted as one flow number.

When using this nozzle for range protection, the maximum length of the burners being protected with a single nozzle must not exceed 28 in. (71 cm) and the maximum area of the burners must not exceed 336 sq. in. (2168 sq. cm).

When protecting a two burner area, the 1F nozzle tip must be located anywhere on the burner centerline of the burners up to a maximum of 9 3/4 in. (24.8 cm) of horizontal distance from the nozzle tip to the center of either burner and shall be aimed at the center of the cooking surface.

The nozzle tip must be positioned so that the burner centerline and the tip flats are parallel. See Figure 34.

When protected a single burner, the nozzle must be located over either of the shortest edges.



1F NOZZLE TIP LOCATED ANYWHERE ON THE LONGITUDINAL CENTERLINE AND NOT MORE THAN 9 3/4 IN. (24.8 cm) HORIZONTAL DISTANCE FROM NOZZLE TIP TO CENTER OF BURNER.

THE NOZZLE MUST BE LOCATED ALONG THE BURNER CENTERLINE. THE BURNER CENTERLINE MUST BE BETWEEN 7 - 9 IN. (18 - 23 cm) FROM THE CENTER OF THE BURNERS BEING PROTECTED AND SHALL BE AIMED AT THE CENTER OF THE COOKING SURFACE.

NOZZLE TIP MUST BE POSITIONED SO THAT THE NOZZLE IS AIMED AT THE FRONT-TO-REAR CENTERLINE AND THE NOZZLE TIP FLATS ARE PARALLEL WITH THE FRONT-TO-REAR CENTERLINE.

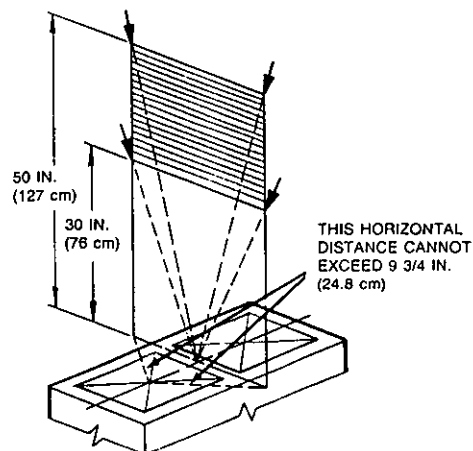
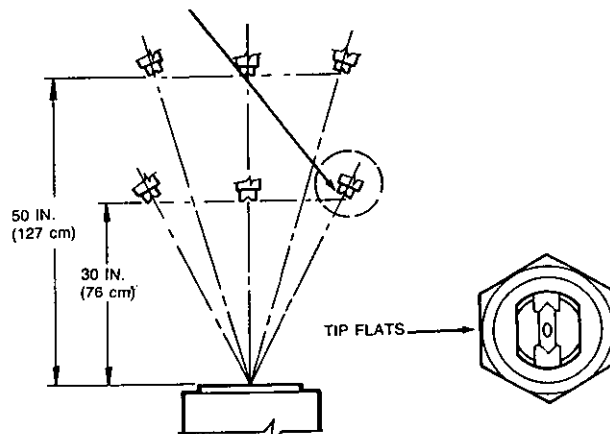
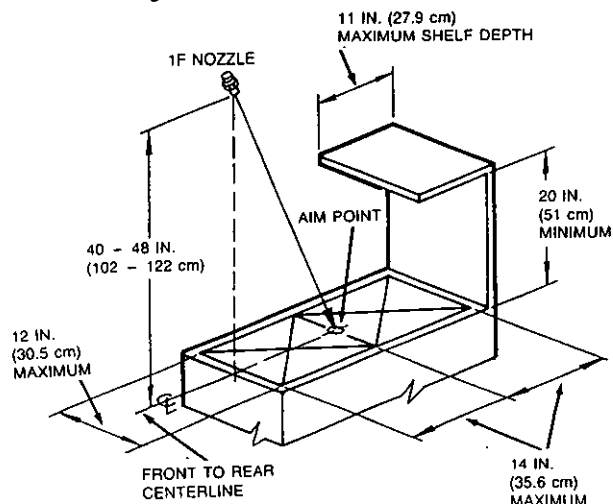


FIGURE 34

When this type of hazard is equipped with a back shelf located above the range top, the 1F nozzle can also be utilized. See Figure 34a for nozzle location details.



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

FIGURE 34a

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Range Protection (Continued)

2. **High Proximity Application (Two-Flow Nozzle):** 40 in. to 50 in. (102 cm to 127 cm) above the cooking surface.

The high proximity application uses the 245 nozzle, Part No. 419340.

The nozzle tip is stamped with 245 indicating this is a two-flow nozzle and must be counted as two flow numbers.

One 245 nozzle will protect a cooking area of 672 sq. in. (4335 sq. cm) with maximum dimensions of 28 in. x 24 in. (71 cm x 61 cm).

When using this nozzle for range protection, the nozzle must be pointed vertically down and positioned as shown in Figures 35 and 36.

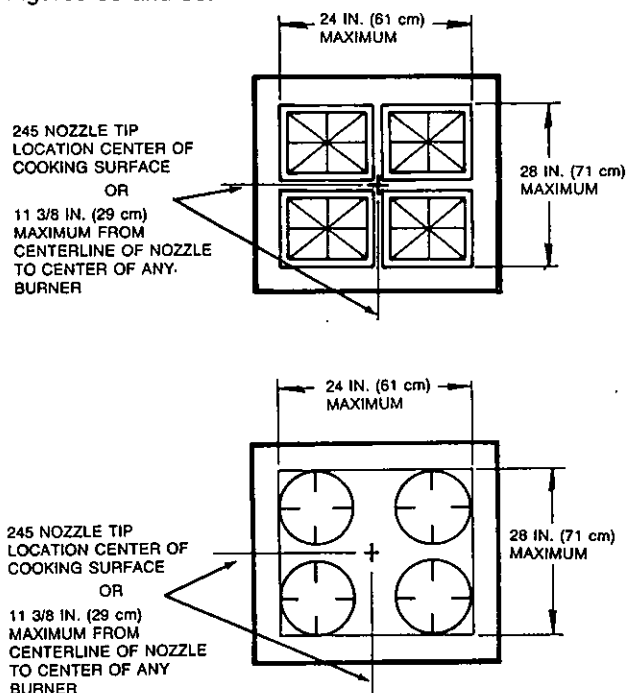


FIGURE 35

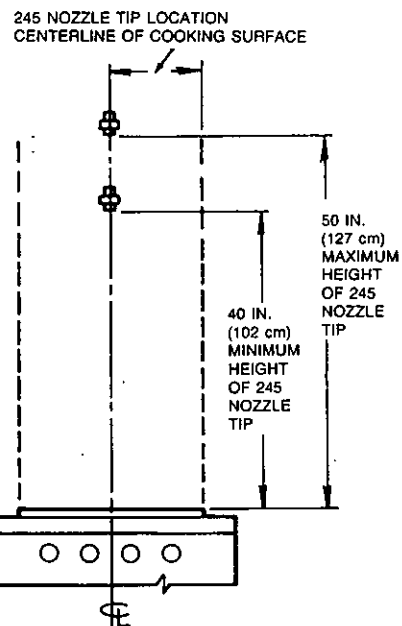
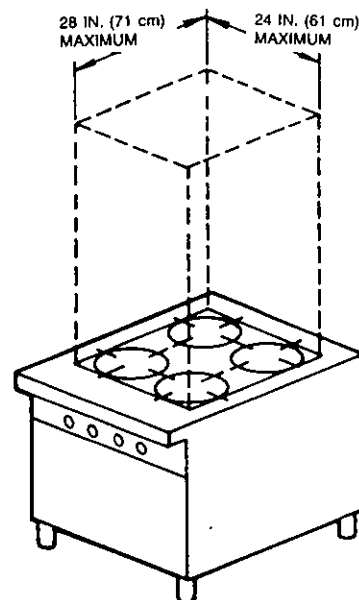


FIGURE 36

NOTICE

Four burners shown in Figure 35. For single or double burners, locate nozzle at center of cooking surface or 11 3/8 in. (29 cm) maximum from nozzle centerline to center of any burner.

SECTION IV – SYSTEM DESIGN

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REV. 3

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Range Protection (Continued)

3. **Medium Proximity Application (Two-Flow Nozzle):** 30 in. to 40 in. (76 cm to 102 cm) above the cooking surface.

The medium proximity application uses the 260 nozzle, Part No. 419341.

The nozzle tip is stamped with 260 indicating this is a two-flow nozzle and must be counted as two flow numbers.

One 260 nozzle will protect a cooking area of 672 sq. in. (4335 sq. cm) with maximum dimensions of 28 in. x 24 in. (71 cm x 61 cm).

When using this nozzle for range protection, the nozzle must be pointed vertically down and positioned as shown in Figures 37 and 38.

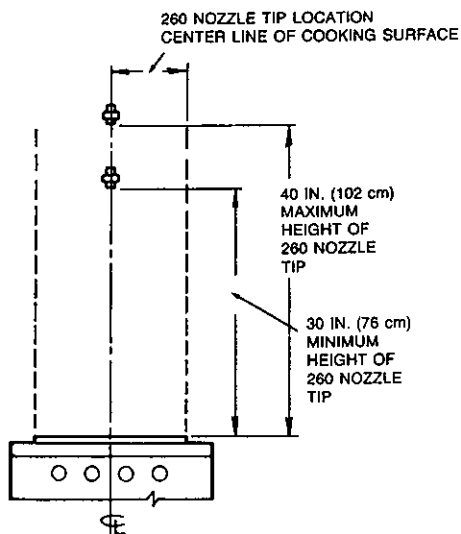
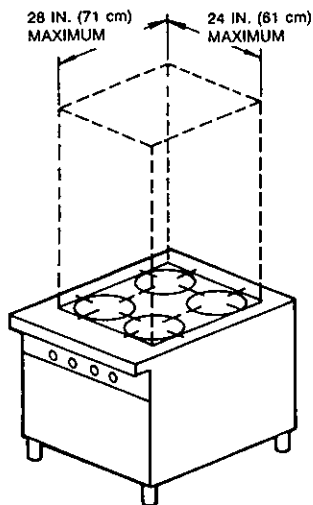


FIGURE 37

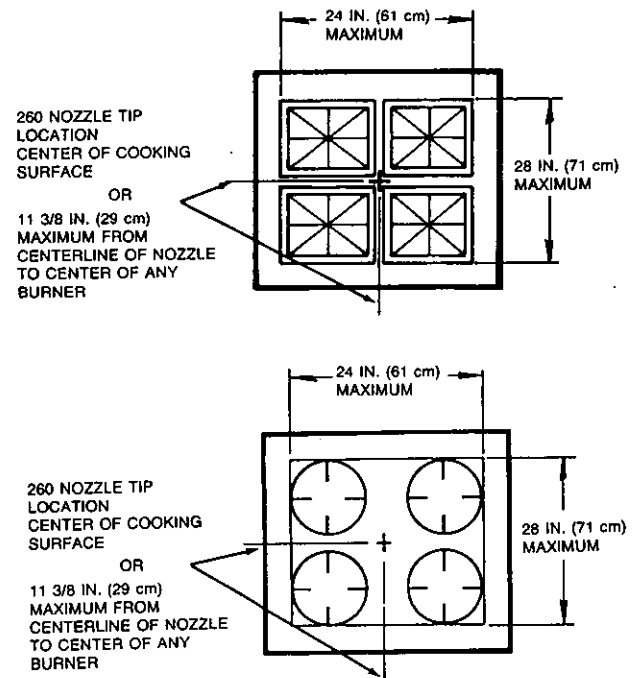


FIGURE 38

NOTICE

Four burners shown in Figure 38. For single or double burners, locate nozzle at center of cooking surface or 11 3/8 in. (29 cm) maximum from nozzle centerline to center of any burner.

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Range Protection (Continued)

4. **Low Proximity Application (Two-Flow Nozzle):** 15 in. to 20 in. (38 cm to 51 cm) above the cooking surface.

The low proximity application requires two (2) 290 nozzles, Part No. 419342.

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

Two (2) 290 nozzles will protect a cooking area of 1008 sq. in. (6503 sq. cm) with maximum dimensions of 28 in. x 36 in. (71 cm x 92 cm).

When using two of these nozzles for low proximity range protection, the nozzles must be positioned along the cooking surface perimeter to 1.5 in. (3.8 cm) inside the perimeter, and aimed at a 45° angle along the longitudinal centerline of the range. See Figures 39 and 39a.

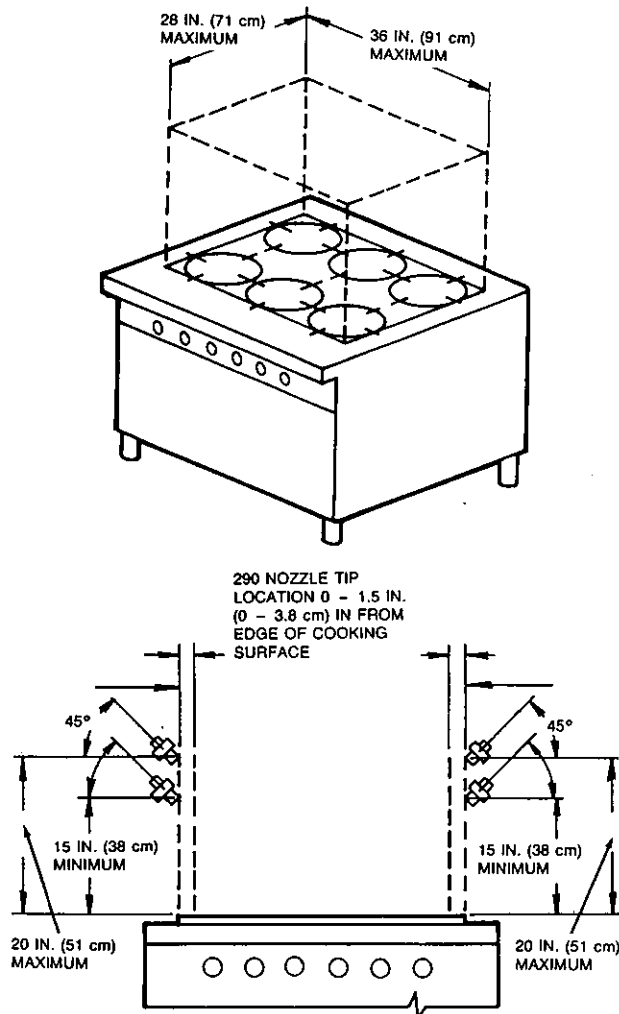


FIGURE 39

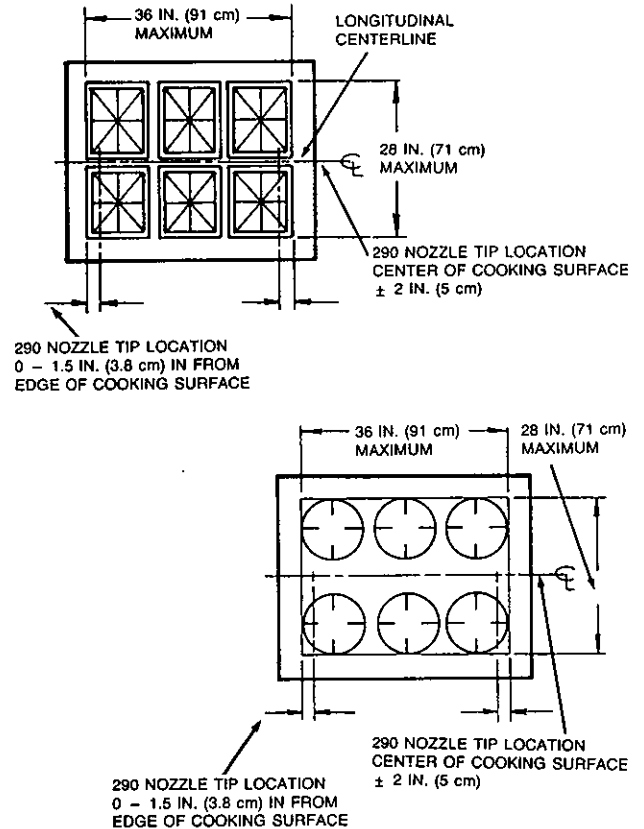


FIGURE 39a

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Griddle Protection

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

One-Flow Griddle Protection

1. **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 cooking area of 1080 sq. in. (6968 sq. cm) 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 40a and 40b.

NOTICE

When using this type of griddle protection, only 5 flow numbers are allowed on a 1.5 gallon system and only 11 flow numbers are allowed on a 3 gallon system.

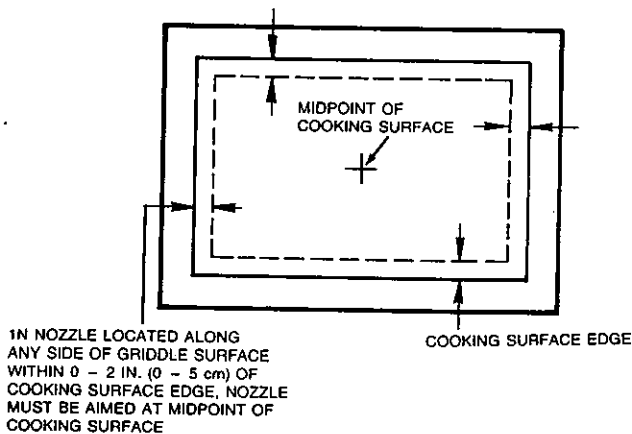


FIGURE 40a

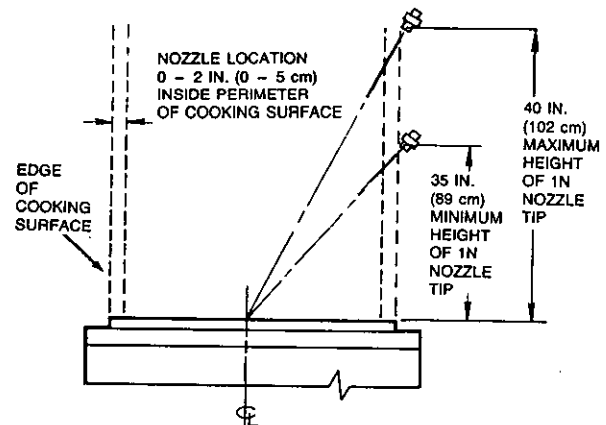
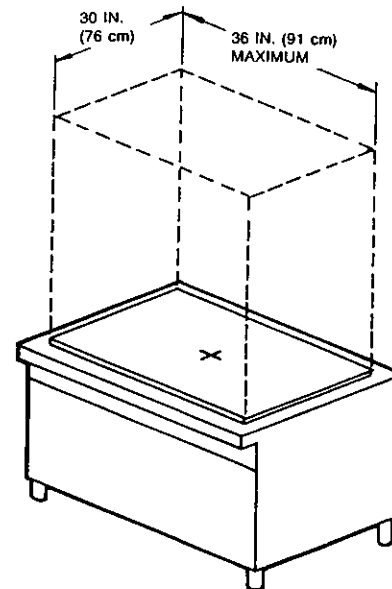


FIGURE 40b

Two-Flow Griddle Protection

1. **High Proximity Application:** (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 two-flow nozzle and must be counted as two flow numbers.

One 290 nozzle will protect a cooking area of 720 sq. in. (9290 sq. cm) with maximum dimensions of 24 in. x 30 in. (61 cm x 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 40c and 40d.

► NOZZLE PLACEMENT REQUIREMENTS (Continued)
 Two-Flow Griddle Protection. (Continued)

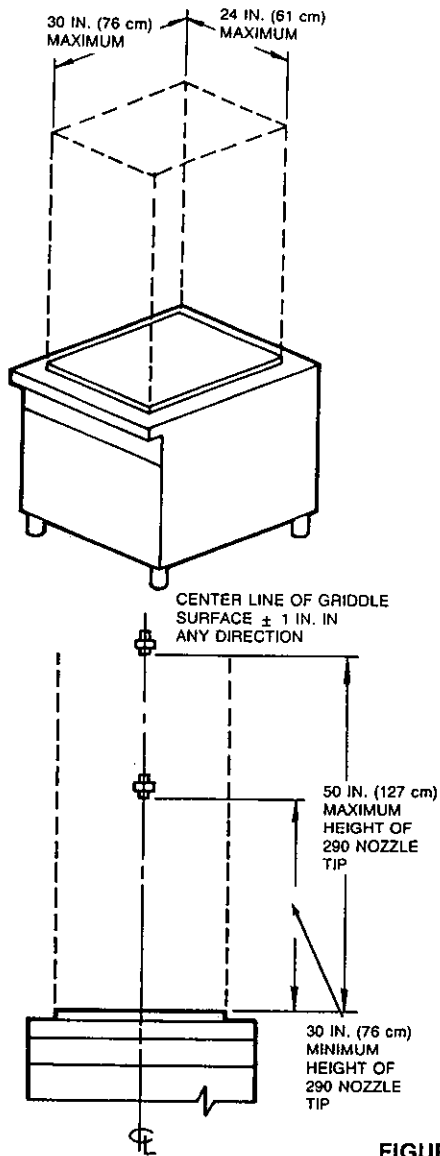


FIGURE 40c

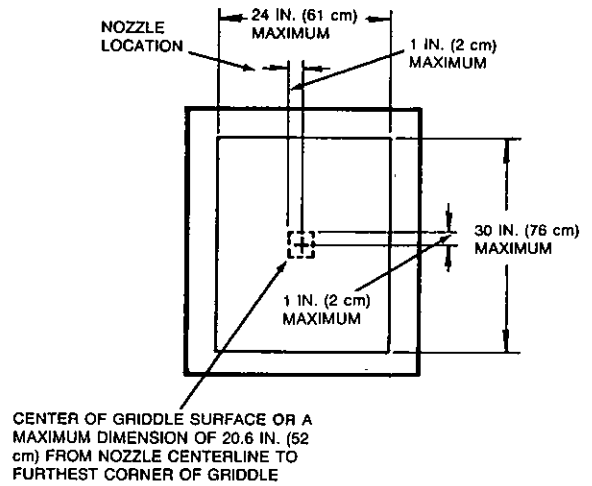


FIGURE 40d

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Two-Flow Griddle Protection (Continued)

2. High Proximity Application: (Nozzle Perimeter Located) 30 in. to 50 in. (76 cm to 127 cm) above the cooking surface.

This high proximity application uses the 260 nozzle, Part No. 419341.

The nozzle tip is stamped with 260 indicating this is a two-flow nozzle and must be counted as two flow numbers.

One 260 nozzle will protect a cooking area of 1440 sq. in. (9290 sq. cm) with maximum dimensions of 30 in. x 48 in. (76 cm x 122 cm).

When using this nozzle for griddle protection, the nozzle must be positioned along the cooking surface perimeter to 2 in. (5.1 cm) inside perimeter, and aimed at the center of the cooking surface. See Figure 41a and 41b.

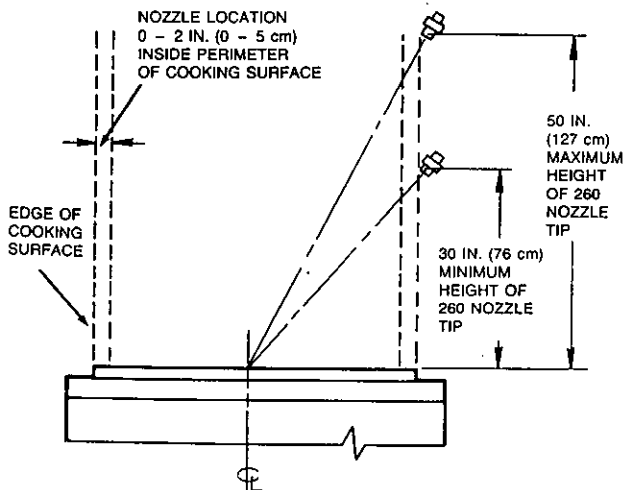
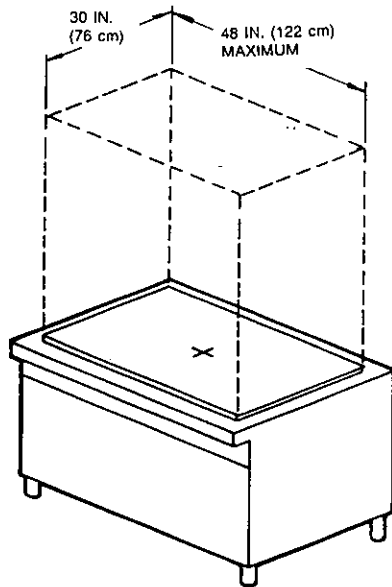
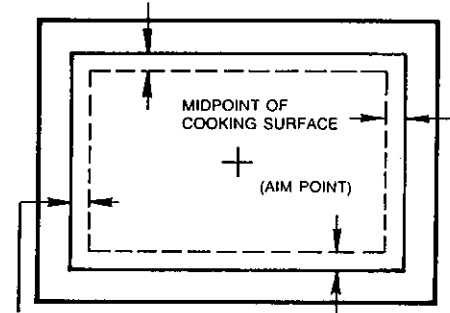


FIGURE 41a



260 NOZZLE LOCATED ALONG ANY SIDE OF GRIDDLE SURFACE WITHIN 0 – 2 IN. (0 – 5 cm) OF COOKING SURFACE EDGE. NOZZLE MUST BE AIMED AT MIDPOINT OF COOKING SURFACE.

FIGURE 41b

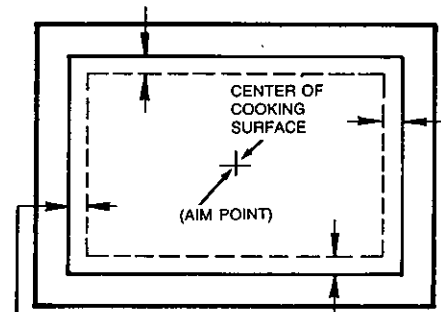
3. Medium Proximity Application: (Nozzle Perimeter Located) 20 in. to 30 in. (51 cm to 76 cm) above the cooking surface.

The medium proximity application uses the 290 nozzle, Part No. 419342.

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

One 290 nozzle will protect a cooking area of 1440 sq. in. (9290 sq. cm) with maximum dimensions of 30 in. x 48 in. (76 cm x 122 cm).

When using this nozzle for griddle protection, the nozzle must be positioned along the perimeter to 2 in. (5.1 cm) inside perimeter, and aimed at the center of the cooking surface. See Figure 42 and 43.



290 NOZZLE LOCATED ALONG ANY SIDE OF GRIDDLE SURFACE WITHIN 0 – 2 IN. (0 – 5 cm) OF COOKING SURFACE EDGE. NOZZLE MUST BE AIMED AT CENTER OF COOKING SURFACE.

FIGURE 42

NOZZLE PLACEMENT REQUIREMENTS (Continued)
Two-Flow Griddle Protection (Continued)

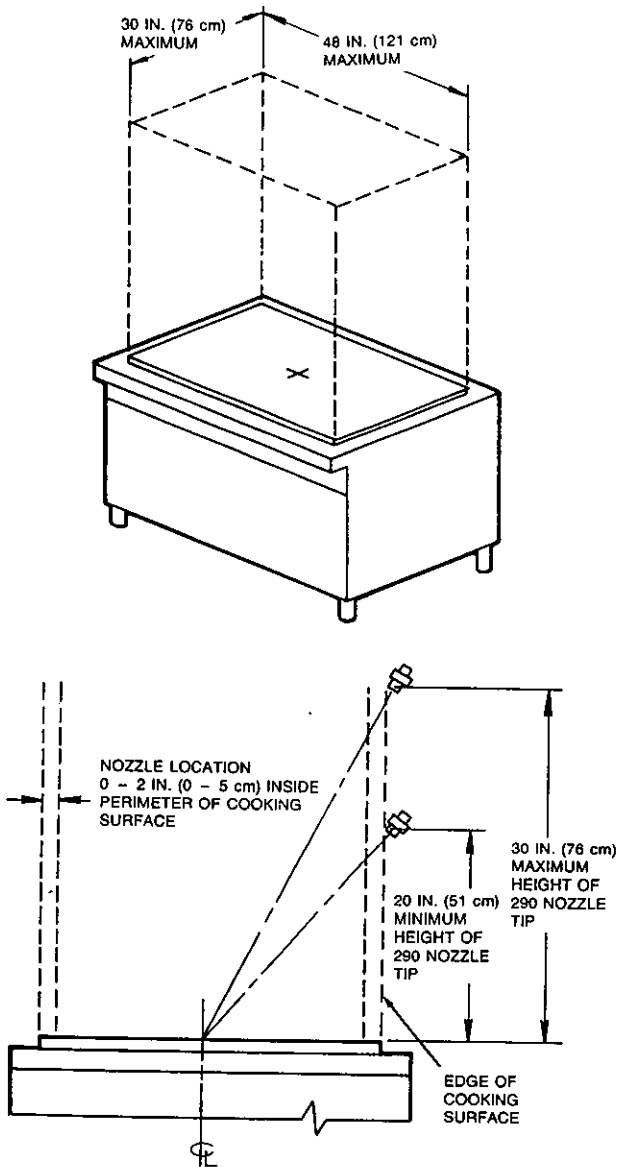


FIGURE 43

4. Low Proximity Application: (Nozzle Perimeter Located)
10 in. to 20 in. (25 cm to 51 cm) above the cooking surface.

The low proximity application uses the 2120 nozzle, Part No. 419343.

The nozzle tip is stamped with 2120 indicating this is a two-flow nozzle and must be counted as two flow numbers.

One 2120 nozzle will protect a cooking area of 1440 sq. in. (9290 sq. cm) with maximum dimensions of 30 in. x 48 in. (76 cm x 122 cm).

When using this nozzle for griddle protection, the nozzle must be positioned along the perimeter to 2 in. (5.1 cm) inside perimeter, and aimed at the center of the cooking surface. See Figure 44 and 45.

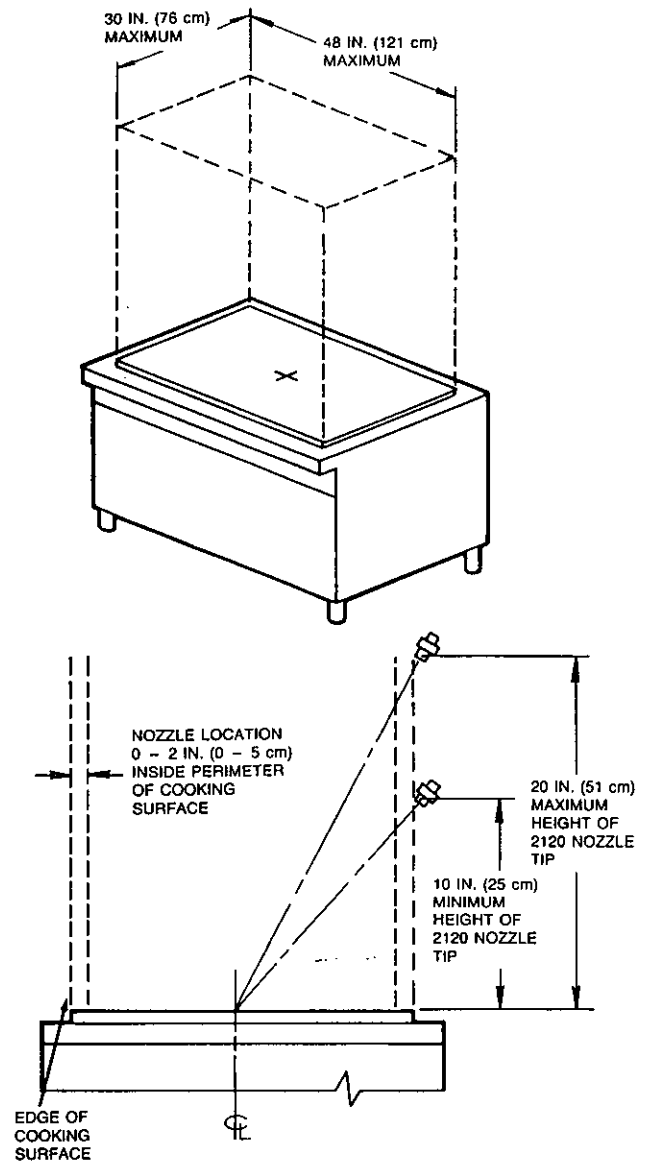


FIGURE 44

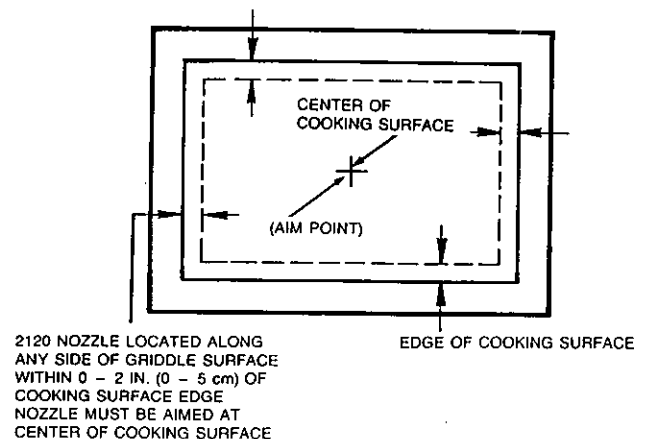


FIGURE 45

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Chain Broiler Protection

- The R-102 system uses two 1N Nozzles (Part No. 419335) for chain broiler protection. The nozzle tip is stamped 1N, indicating that this is a one-flow nozzle and must be counted as one flow number (total of two flow numbers for each chain broiler being protected).

Two 1N nozzles are always needed for chain broiler protection when the hazard area to be protected does not meet the "Overhead Broiler Protection" requirements. The maximum internal size of the broiler is 43 x 31 in. (109 cm x 79 cm). The nozzles must be positioned at each end of the enclosed cooking chamber 1 to 3 in. (2.5 to 7.5 cm) above the surface of the chain and a maximum distance of 4 in. (10 cm) away from the broiler opening. The nozzles may be mounted at either corner as long as they are at opposite ends of the chain broiler and positioned to discharge diagonally across the top of the chain. See Figures 46 and 47.

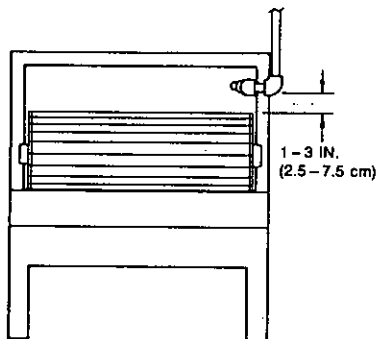
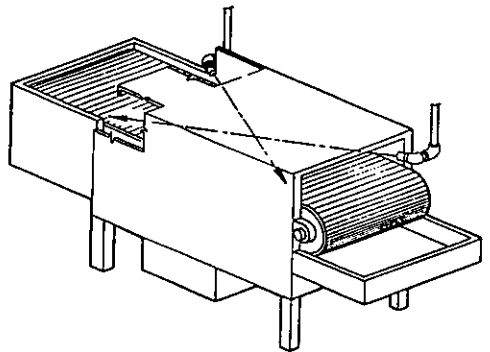


FIGURE 46

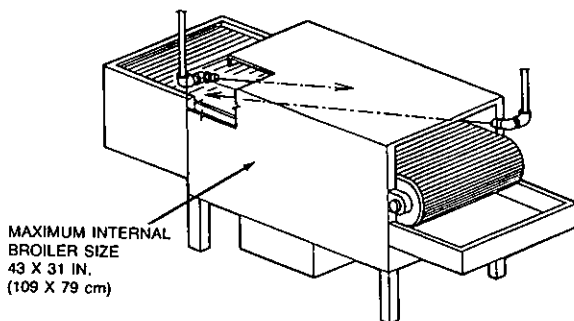


FIGURE 47

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Overhead Chain Broiler Protection

- The R-102 system uses two 1W Nozzles (Part No. 419336) for overhead chain broiler protection. The nozzle tip is stamped with 1W, indicating that this is a one-flow nozzle and must be counted as one flow number.

Overhead protection is **only** available for chain broilers with exhaust opening dimensions that are not less than 60% of the internal broiler length and not less than 60% of the internal broiler width, to a minimum size of 12 in. x 12 in. (30.5 x 30.5 cm). Internal broiler size can not be larger than 32 in. x 34 in. (81 x 86 cm).

Example No. 1 – Internal broiler size is 24 in. long x 20 in. wide (61 x 51 cm), with an opening of 16 in. x 16 in. (40.6 x 40.6 cm).

To determine minimum opening size, multiply the internal length and the internal width by 0.6:

Length of opening – 24 in. x 0.6 = 14.4 in. (61 cm x 0.6 = 36.6 cm)

Width of opening – 20 in. x 0.6 = 12.0 in. (51 cm x 0.6 = 30.5 cm)

The minimum allowable opening for overhead protection would be 14.4 in. x 12.0 in. (36.6 x 30.5 cm).

This example would be acceptable for overhead protection.

Example No. 2 – Internal broiler size is 30 in. long x 24 in. wide (76 x 61 cm) with an opening of 22 in. x 12 in. (56 x 30 cm).

To determine minimum opening size, multiply internal length and internal width by 0.6:

Length of opening – 30 in. x 0.6 = 18.0 in. (76 cm x 0.6 = 45.7 cm)

Width of opening – 24 in. x 0.6 = 14.4 in. (61 cm x 0.6 = 36.6 cm)

Minimum allowable opening for overhead protection would be 18 in. x 14.4 in. (45.7 x 36.6 cm).

Because this broiler has an opening of 22 in. x 12 in., the 12 in. width is below the minimum allowable calculated dimension of 14.4 in. (36.6 cm) and therefore would not be acceptable for overhead protection.

When overhead protection is used, the nozzles must be centered above the exhaust opening within 4 to 8 in. (10 to 20 cm) of each other and they must be located 10 to 26 in. (25 to 66 cm) above the top of the broiler surface. See Figure 48.

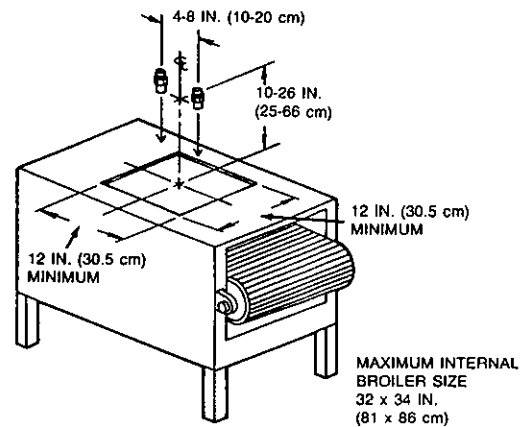


FIGURE 48

The nozzles may vary in position as long as they are evenly spaced from the exhaust center and are always 180° opposite of each other. If the opening is not square, the nozzles must be positioned along the centerline, parallel to the longest side of the opening. See Figure 49.

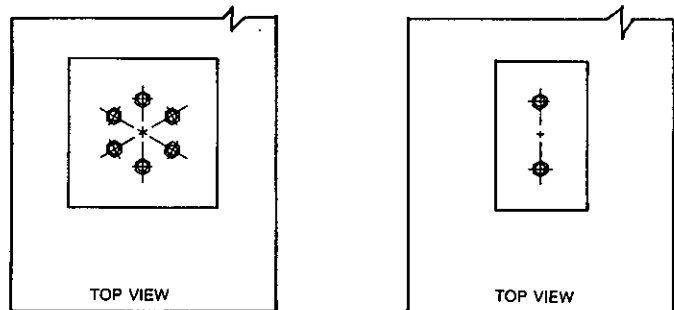


FIGURE 49

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Nieco Broiler With Catalytic Converter Protection

Certain models of the Nieco broiler (Models 940, 962, and 960) are equipped with a catalytic converter to comply with new clean air laws. Because of the converter, it is necessary to protect these broilers in a special way. The guidelines for protecting these broilers are as follows:

- The maximum internal broiling area is 29 in. x 23.5 in. (74 cm x 60 cm).
- An R-102 3-gallon system with a maximum of 6 flow numbers, must be used for protection of each broiler, including plenum and duct.
- Each individual broiler must be protected with a minimum of (2) two, 1N nozzles, Part No. 419335. The nozzles must be located as shown in Figure 50.
- The broiler must be fitted with two 1 in. (2.5 cm) high agent barriers on the angled surface of the broiler. See Figure 50. If these have not been completed by the equipment supplier, they must be added in the field.

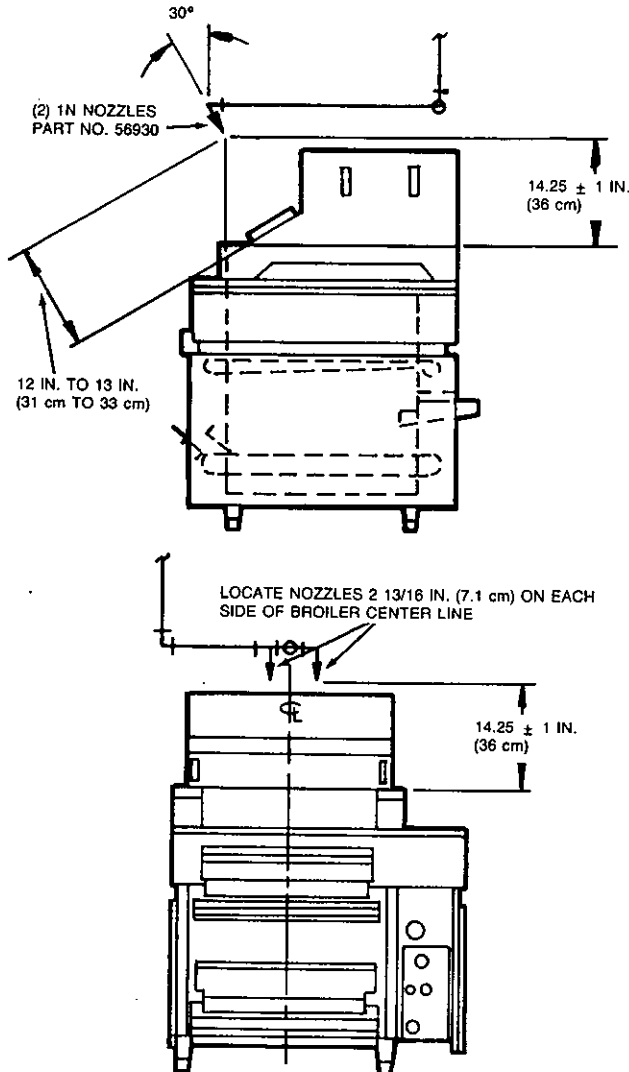


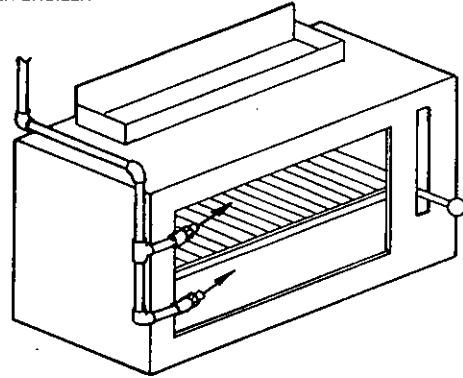
FIGURE 50

Upright/Salamander Broiler Protection

- The R-102 system uses two 1/2N Nozzles (Part No. 419334) for all upright/salamander 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 broiler nozzles will protect a hazard area (internal broiler chamber) of 30 in. x 32.5 in. (76 cm x 82.5 cm). These nozzles must always be used in pairs on an upright/salamander 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 51.

SALAMANDER BROILER



UPRIGHT BROILER

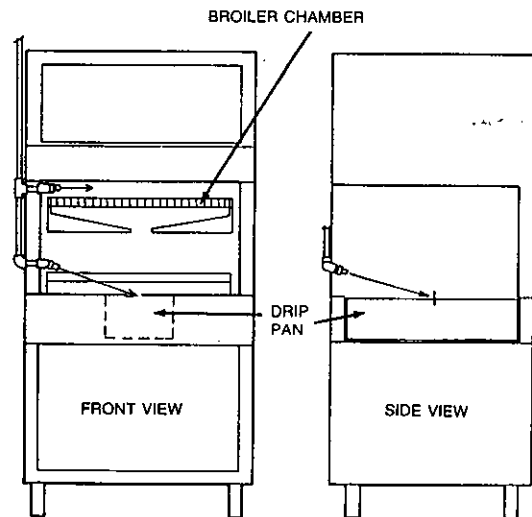


FIGURE 51

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Electric Char-Broiler Protection

The R-102 system uses the 1N nozzle for the protection of electric char-broilers. The maximum length of the hazard can be no longer than 34 in. (86 cm) and the total hazard area must not exceed 680 sq. in. (4388 sq. cm).

1. **Nozzle Location:** 20 to 50 in. (51 to 127 cm) above the grate surface.

The 1N Nozzle (Part No. 419335) is used for electric char-broiler applications. 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 electric char-broiler protection, the nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and shall be aimed at the center of the cooking surface. See Figure 52.

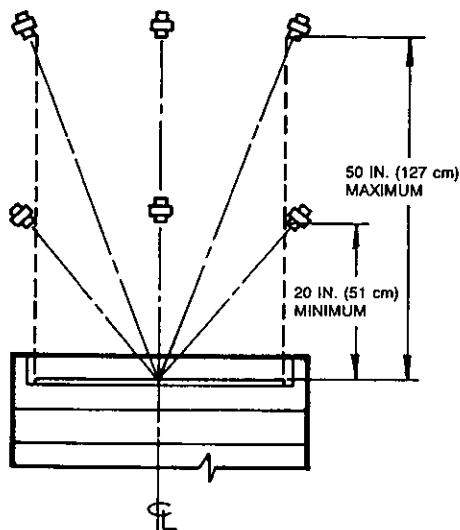
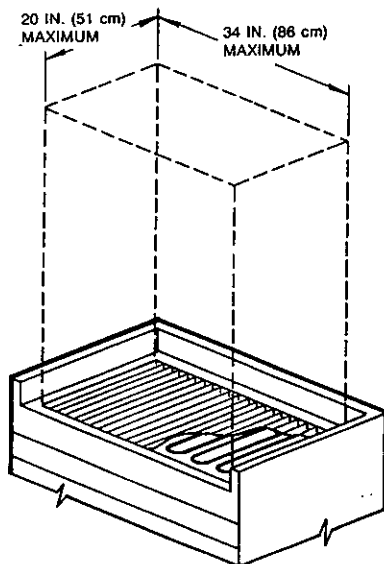


FIGURE 52

Gas-Radiant Char-Broiler Protection

- The R-102 system uses either the 1N nozzle, (Part No. 419335) or the 245 nozzle (Part No. 419340) for gas-radiant 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.

The nozzle tip on the 245 nozzle is stamped with 245, indicating that this is a two-flow nozzle and must be counted as two flow numbers.

One 1N nozzle will protect a hazard with a maximum length of 24 in. (61 cm) and a total area which does not exceed 528 sq. in. (3406 sq. cm). The nozzle tip must be located 26 to 40 in. (66 to 102 cm) above the hazard surface. When using this nozzle for gas-radiant char-broiler protection, the nozzle must be located within a 1 in. (2.5 cm) radius of the center of the grate area and shall be aimed at the center of the area. See Figure 53.

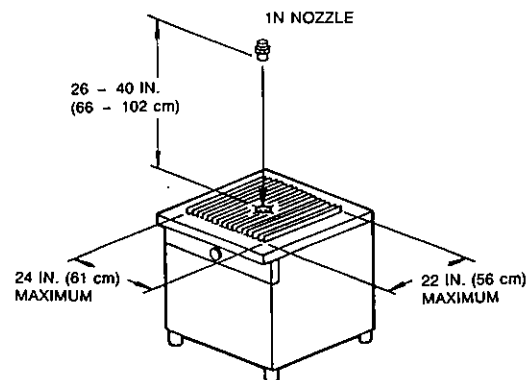


FIGURE 53

One 245 nozzle will protect a hazard with a maximum length of 24 in. (61 cm) and a total hazard area which does not exceed 528 sq. in. (3406 sq. cm). The nozzle tip must be located 18 to 40 in. (46 to 102 cm) above the hazard surface. When using this nozzle for gas-radiant char-broiler protection, the nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and shall be aimed at the center of the cooking surface. See Figure 53a.

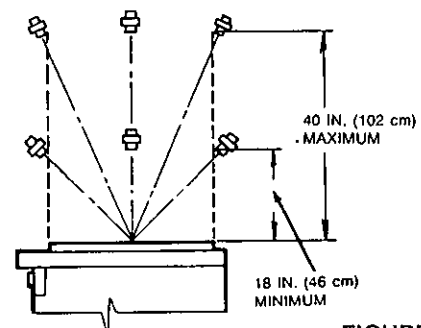
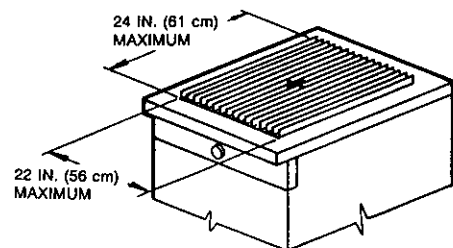


FIGURE 53a

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Lava Rock (Ceramic) Char-Broiler Protection

- The R-102 system uses the 1N Nozzle (Part No. 419335) for all lava rock char-broiler protection. The nozzle tip is stamped with 1N, indicating that this is a one-flow nozzle and must be counted as one flow number.

One 1N nozzle will protect a hazard which has a maximum length of 24 in. (61 cm) and a total hazard area which does not exceed 312 sq. in. (2013 sq. cm). The nozzle tip must be located 18 to 35 in. (46 to 89 cm) above the hazard surface. When using this nozzle for lava rock (ceramic) char-broiler protection, the nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and angled to the center. See Figure 54.

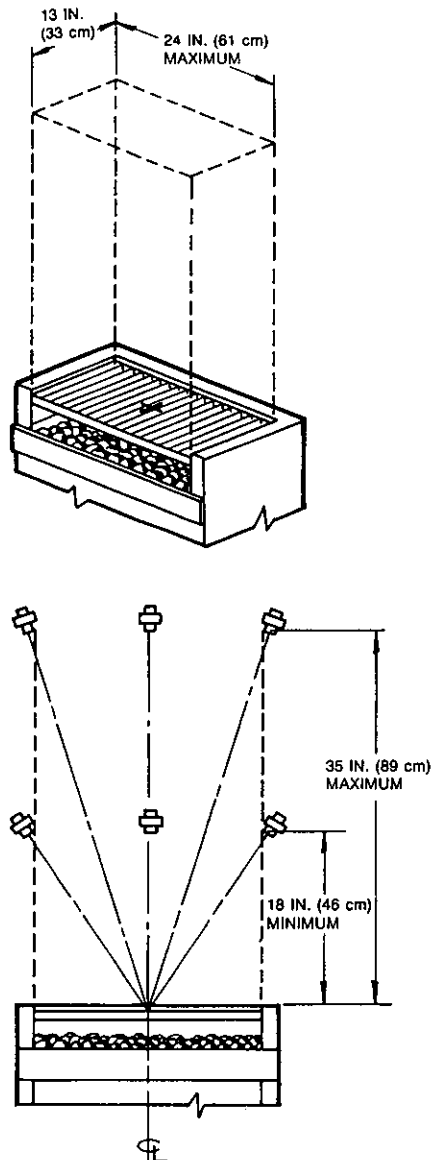


FIGURE 54

Natural Charcoal Broiler Protection

- The R-102 system uses the 1N Nozzle (Part No. 419335) for all natural charcoal broiler protection. The nozzle tip is stamped with 1N indicating that this is a one-flow nozzle and must be counted as one flow number.

One 1N nozzle will protect a hazard area which has a maximum length of 24 in. (61 cm) and a total hazard area which does not exceed 288 sq. in. (1858 sq. cm). The nozzle tip must be located 18 to 40 in. (46 to 102 cm) above the hazard surface. When using this nozzle for natural charcoal broiler protection, the nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and aimed at the center of the cooking surface. See Figure 55.

The coverage of such appliances only applies when the depth of the charcoal does not exceed 4 in. (10 cm).

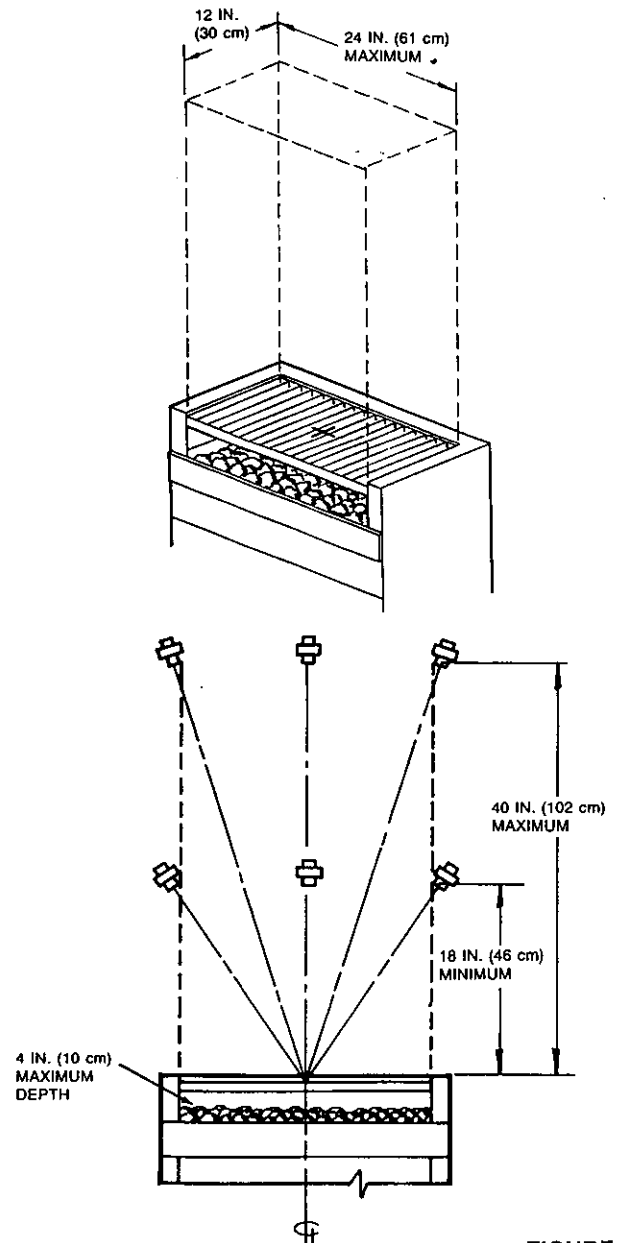


FIGURE 55

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Alternate Ceramic/Natural Charcoal Char-broiler Protection

- The R-102 system may also use the 3N nozzle (Part No. 419338) for all ceramic (lava rock) and natural charcoal char-broiler protection. The nozzle tip is stamped with 3N, indicating that this is a three-flow nozzle and must be counted as three flow numbers.

One 3N nozzle will protect a hazard which has a maximum length of 30 in. (76 cm) and a total hazard area which does not exceed 720 sq. in. (4645 sq. cm). The nozzle tip must be located 14 to 40 in. (36 to 102 cm) above the hazard surface. The nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and angled to the center. See Figure 56.

For natural charcoal char-broiler protection, this coverage only applies when the depth of the charcoal does not exceed 4 in. (10 cm).

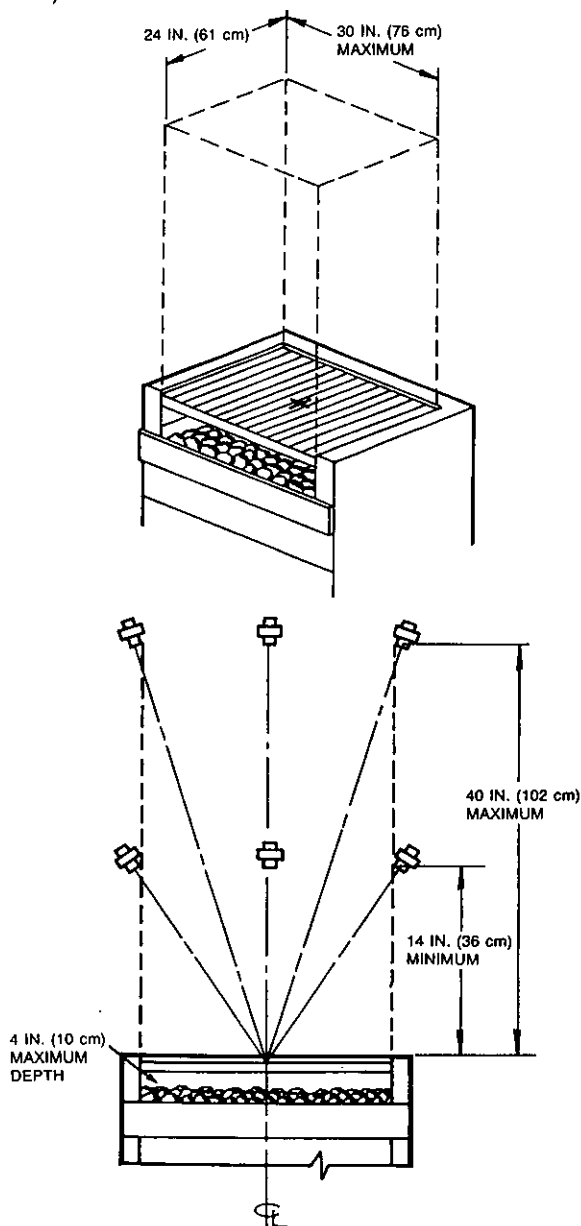


FIGURE 56

Mesquite Char-Broiler Protection

- The R-102 system uses the 3N Nozzle (Part No. 419338) for mesquite char-broiler protection. The nozzle tip is stamped with 3N indicating that this is a three-flow nozzle and must be counted as three flow numbers.

One 3N nozzle will protect a hazard which has a maximum length of 30 in. (76 cm) and a total hazard area which does not exceed 720 sq. in. (4645 sq. cm). The nozzle tip must be located 14 to 40 in. (36 to 102 cm) above the hazard surface. The nozzle must be positioned anywhere along or within the perimeter of the maximum hazard area and aimed at the center of the cooking surface. See Figure 57.

Mesquite logs and pieces, no smaller than 4 in. (10 cm) in length, may be protected with a maximum allowable wood depth of 6 in. (15 cm).

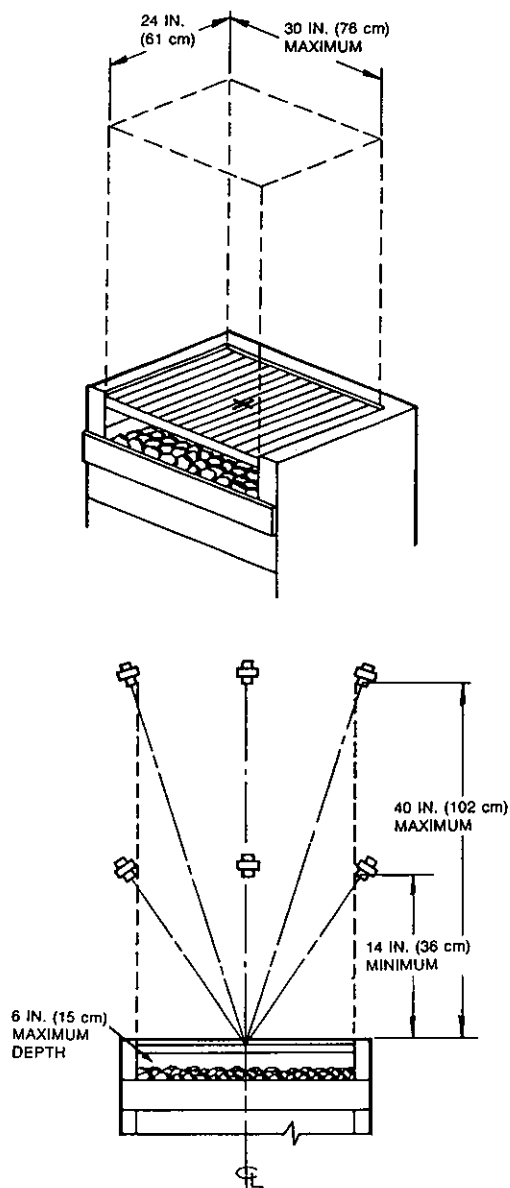


FIGURE 57

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Wok Protection

The R-102 system uses two different nozzles for the protection of woks.

- ▶ 1. A 260 nozzle, Part No. 419341, will protect a wok 14 in. (36 cm) minimum diameter up to 30 in. (76 cm) maximum diameter. The wok depth must be no less than 3.75 in. (9.5 cm) and no greater than 8 in. (20 cm).

The nozzle tip is stamped with 260 indicating that this is a two-flow nozzle and must be counted as two flow numbers.

When using this nozzle, the nozzle must be positioned as shown in Figure 58a.

NOZZLE MUST BE POSITIONED WITHIN 1 IN. (2 cm) RADIUS OF THE CENTER OF THE WOK, POINTED VERTICALLY DOWN

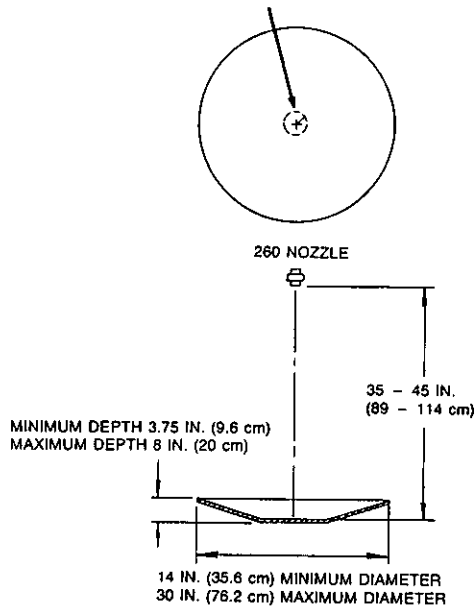


FIGURE 58a

- ▶ 2. A 1N nozzle, Part No. 419335, will protect a wok 11 in. (28 cm) minimum diameter up to 18 in. (46 cm) maximum diameter. The wok depth must be no less than 3 in. (7.6 cm) and no greater than 5 in. (13 cm).

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, the nozzle must be positioned as shown in Figure 58b.

NOZZLE MUST BE POSITIONED WITHIN 1 IN. (2 cm) RADIUS OF CENTER OF THE WOK, POINTED VERTICALLY DOWN.

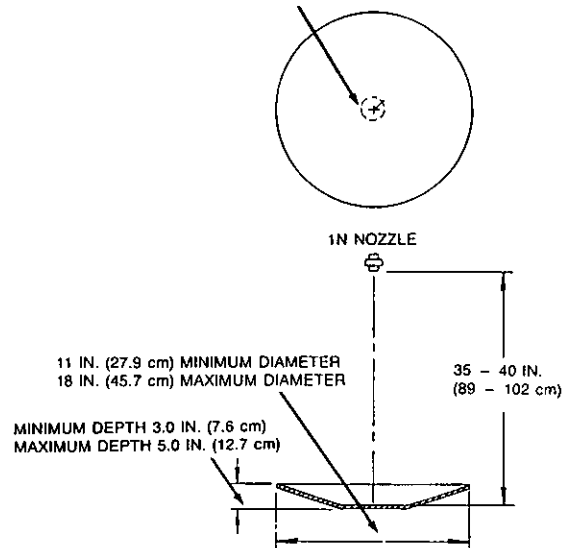


FIGURE 58b

- ▶ 3. A 1N Nozzle, Part No. 419335, will also protect a wok 11 in. (28 cm) minimum diameter up to 24 in. (61 cm) maximum diameter. The wok depth must be no less than 3 in. (8 cm) and no greater than 6 in. (15 cm). 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, the nozzle must be positioned as shown in Figure 58c.

NOTICE

When using this type of wok protection, only 5 flow numbers are allowed on a 1 1/2 gallon system, and only 11 flow numbers are allowed on a 3 gallon system.

NOZZLE MUST BE POSITIONED WITHIN 1 IN. (2 cm) RADIUS OF CENTER OF THE WOK, POINTED VERTICALLY DOWN.

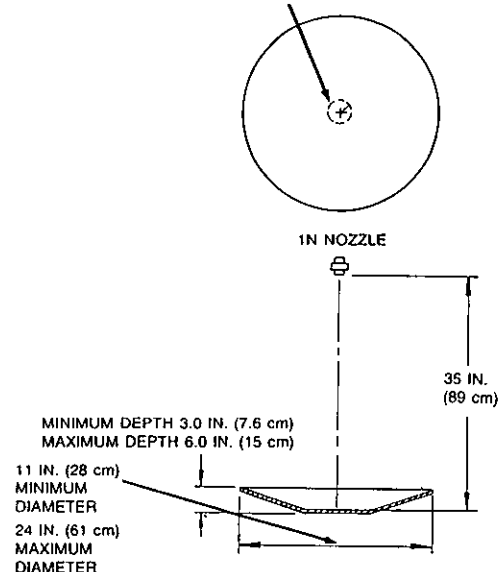


FIGURE 58c

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REV. 3

NOZZLE PLACEMENT REQUIREMENTS (Continued)**Nozzle Application Chart**

The following chart has been developed to assist in calculating the quantity and type of nozzle required to protect each duct, plenum, or appliance.

NOTICE

This chart is for general reference only. See complete details for each type of hazard.

<u>Hazard</u>	<u>Maximum Hazard Dimensions</u>	<u>Nozzle Quantity</u>	<u>Nozzle Heights</u>	<u>Nozzle Part No.</u>	<u>Nozzle Tip Stamping – Flow No.</u>
▶ Duct or Transition (Single Nozzle)	Length – Unlimited Perimeter – 27 in. (67 cm) Diameter – 8.5 in. (22 cm)	1	–	419336	1W
▶ Duct or Transition (Single Nozzle)	Length – Unlimited Perimeter – 75 in. (190.5 cm) Diameter – 24 in. (61 cm)	1	–	419337/78078*	2W/2WH*
▶ Duct or Transition (Dual Nozzle)	Length – Unlimited Perimeter – 150 in. (381 cm) Diameter – 48 in. (122 cm)	2	–	419337/78078*	2W/2WH*
▶ Electrostatic Precipitator (At Base of Duct)	Individual Cell	1	–	419334	1/2N
▶ Plenum (Horizontal Protection)	Length – 8 ft. (2.4 m) Filter Height – 20 in. (51 cm)	1	–	419335/417332	1N/1NSS
▶ Plenum (Vertical Protection)	Length – 4 ft. (1.2 m) Width – 4 ft. (1.2 m)	1	–	419336/417333	1W/1WSS
Fryer/Split Vat Fryer**	Maximum Size (without drip board) 15 in. (38 cm) x 14 in. (36 cm) Area – 210 sq. in. (1355 sq. cm) Maximum				
▶	High Proximity	1	27 – 47 in.	419339	230
▶	Medium Proximity	1	20 – 27 in.	419340	245
	Maximum Size (with drip board) 21 in. (53 cm) x 14 in. (36 cm) Area – 294 sq. in. (1897 sq. cm) Maximum (Fry Pot must not exceed 15 in. x 14 in. (38 cm x 36 cm))				
▶	High Proximity	1	27 – 47 in.	419339	230
▶	Medium Proximity	1	20 – 27 in.	419340	245

*Use 2WH nozzle on 1.5 gallon, 6 flow, duct and plenum protection only.

**For multiple nozzle protection of single fryers, see detailed information on Pages 4-10.1 through 4-10.8

NOZZLE PLACEMENT REQUIREMENTS (Continued)

Nozzle Application Chart (Continued)

Hazard	Maximum Hazard Dimensions	Nozzle Quantity	Nozzle Heights	Nozzle Part No.	Nozzle Tip Stamping – Flow No.
Fryer**	Maximum Size (without drip board) 19 1/2 in. (49.5 cm) x 19 in. (48.2 cm) Area – 370 1/2 sq. in. (2390 sq. cm) Maximum				
▶	High Proximity	1	21 – 34 in.	419338	3N
▶	Low Proximity	1	13 – 16 in.	419342	290
	Maximum Size (with drip board) 25 3/8 in. (64.4 cm) Area – 495 sq. in. (3194 sq. cm) Maximum (Fry pot side must not exceed 19 1/2 in. (49.5 cm) x 19 in. (48.2 cm)				
▶	High Proximity	1	21 – 34 in.	419338	3N
▶	Low Proximity	1	13 – 16 in.	419342	290
▶ Range	Longest Side 28 in. (71 cm) Area – 336 sq. in. (2168 sq. cm)	1	30 – 50 in. (76 – 127 cm) 40 – 48 in. (102 – 122 cm) (With Backshelf)	419333	1F
▶	Longest Side (High Proximity) 28 in. (71 cm) Area – 672 sq. in. (4335 sq. cm)	1	40 – 50 in. (102 – 127 cm)	419340	245
▶	Longest Side (Medium Proximity) 28 in. (71 cm) Area – 672 sq. in. (4335 sq. cm)	1	30 – 40 in. (76 – 102 cm)	419341	260
▶	Longest Side (Low Proximity) 36 in. (91 cm) Area – 1008 sq. in. (6503 sq. cm)	2	15 – 20 in. (38 – 51 cm)	419342	290
▶ Griddle	Longest Side (High Proximity) 48 in. (122 cm) Area – 1440 sq. in. (9290 sq. cm)	1	30 – 50 in. (76 – 127 cm) (perimeter located)	419341	260
▶	Longest Side (High Proximity) 30 in. (76 cm) Area – 720 sq. in. (1829 sq. cm)	1	30 – 50 in. (76 – 127 cm) (center located)	419342	290
▶	Longest Side (High Proximity) 36 in. (91 cm) Area – 1080 sq. in. (2743 sq. cm)	1	35 – 40 in. (89 – 102 cm) (perimeter located)	419335/417332	1N/1NSS
▶	Longest Side (Medium Proximity) 48 in. (122 cm) Area – 1440 sq. in. (9190 sq. cm)	1	20 – 30 in. (51 – 76 cm) (perimeter located)	419342	290

**For multiple nozzle protection of single fryers, see detailed information on Pages 4-10.1 through 4-10.8

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NOZZLE PLACEMENT REQUIREMENTS (Continued)

Nozzle Application Chart (Continued)

Hazard	Maximum Hazard Dimensions	Nozzle Quantity	Nozzle Heights	Nozzle Part No.	Nozzle Tip Stamping – Flow No.
► Griddle (Continued)	Longest Side (Low Proximity) 48 in. (122 cm) Area – 1440 sq. in. (9290 sq. cm)	1	10 – 20 in. (25 – 51 cm) (perimeter located)	419343	2120
► Chain Broiler* (Overhead Protection)	Longest Side – 34 in. (86 cm) Area – 1088 sq. in. (7019 sq. cm)	2	10 – 26 in. (25 – 66 cm)	419336/417333	1W/1WSS
► Chain Broiler (Horizontal Protection)	Length – 43 in. (109 cm) Width – 31 in. (79 cm)	2	1 – 3 in. (3 – 8 cm)	419335/417332	1N/1NSS
► Gas-Radiant Char-Broiler	Longest Side – 24 in. (61 cm) Area – 528 sq. in. (3406 sq. cm)	1	18 – 40 in. (46 – 102 cm)	419340	245
	Longest Side – 24 in. (61 cm) Area – 528 sq. in. (3406 sq. m)	1	26 – 40 in. (66 – 102 cm)	419335/417332	1N/1NSS
► Electric Char-Broiler	Longest Side – 34 in. (86 cm) Area – 680 sq. in. (4388 sq. cm)	1	20 – 50 in. (51 – 127 cm)	419335/417332	1N/1NSS
► Lava-Rock Broiler	Longest Side – 24 in. (61 cm) Area – 312 sq. in. (2013 sq. cm)	1	18 – 35 in. (46 – 89 cm)	419335/417332	1N/1NSS
► Natural Charcoal Broiler	Longest Side – 24 in. (61 cm) Area – 288 sq. in. (1858 sq. cm)	1	18 – 40 in. (46 – 102 cm)	419335/417332	1N/1NSS
► Lava-Rock or Natural Charcoal Char-Broiler	Longest Side – 30 in. (76 cm) Area – 720 sq. in. (4645 sq. cm)	1	14 – 40 in. (36 – 102 cm)	419338	3N
► Mesquite Char-Broiler	Longest Side – 30 in. (76 cm) Area – 720 sq. in. (4645 sq. cm)	1	14 – 40 in. (36 – 102 cm)	419338	3N
► Upright Broiler	Length – 32.5 in. (82.5 cm) Width – 30 in. (76 cm)	2	–	419334	1/2N
► Salamander Broiler	Length – 32.5 in. (82.5 cm) Width – 30 in. (76 cm)	2	–	419334	1/2N
► Wok	14 in. – 30 in. (36 – 76 cm) Diameter 3.75 – 8.0 in. (9.5 – 20 cm) Deep	1	35 – 45 in. (89 – 114 cm)	419341	260
►	11 in. – 18 in. (28 – 46 cm) Diameter 3.0 – 5.0 in. (7.6 – 13 cm) Deep	1	35 – 40 in. (89 – 102 cm)	419335/417332	1N/1NSS
►	11 in. – 24 in. (28 – 61 cm) Diameter 3.0 – 6.0 in. (8 – 15.2 cm) Deep		35 in. (89 cm)	419335/417332	1N/1NSS

*Minimum chain broiler exhaust opening – 12 in. x 12 in. (31 cm x 31 cm), and not less than 60% of internal broiler size.

► TANK AND CARTRIDGE REQUIREMENTS

Once the hazard analysis is completed and the total nozzle flow numbers are established, the quantity and size of agent tanks and cartridges needed to supply the nozzles with the proper volumes of agent at the proper flow rates can be determined. For cartridges used in the regulated release mechanism, flow capacities, tank quantities and sizes, and regulated release cartridge options are given in the table below.

Total Flow Numbers*	Quantity and Size of Tank(s)	Regulated Release Cartridge Options	
		Nitrogen	Carbon Dioxide
1 – 5	(1) 1.5 Gallon	LT-20-R (7032)	101-10 (15850)
6 – 11	(1) 3.0 Gallon	LT-30-R (5373)	101-20 (17492)
11 – 16	(1) 1.5 Gallon	Double (73022)	101-30 (15851)
	(1) 3.0 Gallon		
16 – 22	(2) 3.0 Gallon	Double (73022)	101-30 (15851)**

*For exceptions to maximum flow numbers, see Distribution Piping Requirements for 1.5 gallon and 3.0 gallon systems in this Section

**The 101-30 cartridge Part No. 15851, can not be used when (2) two 3.0 gallon tanks are manifolded together.)

For higher total flow numbers (23 to 110), multiple cartridges and regulated actuators are required as shown in the System Selection Guide in Section IX – Appendix.

ACTUATION AND EXPELLANT GAS LINE REQUIREMENTS

This section contains the guidelines for installing the actuation and expellant gas lines between the regulated release mechanism regulator, each regulated actuator regulator, and each agent tank. These limitations should be considered when selecting the component mounting locations.

Actuation Gas Line – 6 Tanks Maximum

1. Use only 1/4 in. Schedule 40 black iron, hot-dipped galvanized, chrome-plated, or stainless steel pipe and fittings.
2. The actuation gas line piping is installed from the regulated release mechanism to each regulated actuator connected within the system. The total length of the actuation gas line from the regulated release assembly to the regulated actuator assembly(ies) **must not exceed 20 ft. (6 m)** when using an LT-20-R (Part No. 7032), an LT-30-R nitrogen cartridge (Part No. 5373), or a 101-10 (Part No. 15850) or a 101-20 (Part No. 17492) carbon dioxide cartridge. See Figure 59.

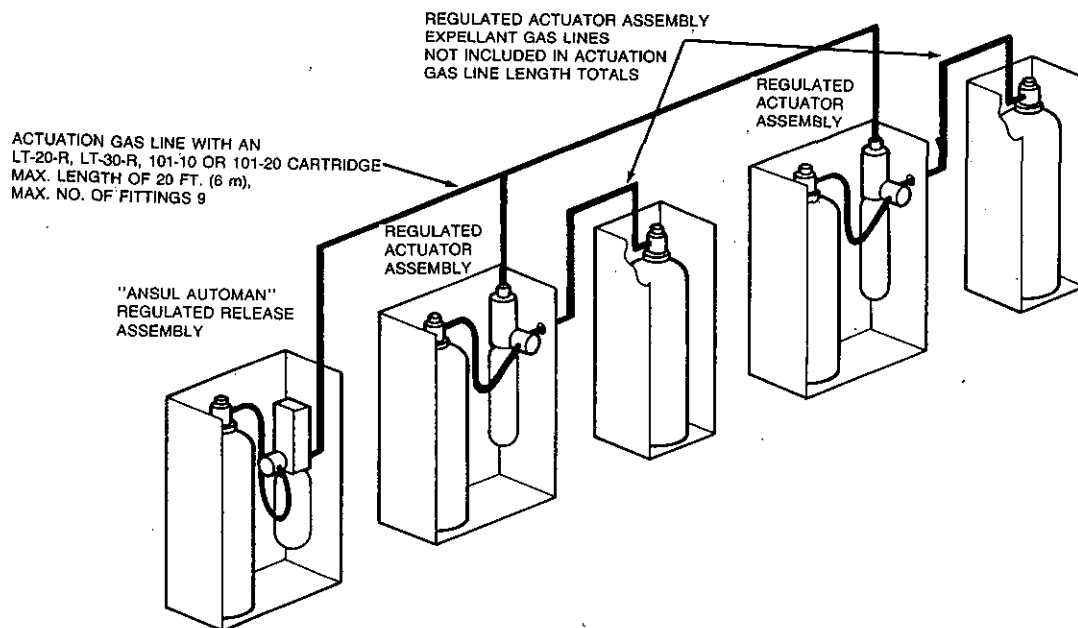


FIGURE 59

ACTUATION AND EXPELLANT GAS LINE REQUIREMENTS (Continued)

Actuation Gas Line – 6 Tanks Maximum (Continued)

3. If an expellant gas line is connected to the regulated release assembly along with an actuation gas line, the total combined length of the actuation and expellant gas line **must not exceed 30 ft. (9 m)** when using a "double-tank" nitrogen cartridge (Part No. 73022) or a 101-30 carbon dioxide cartridge (Part No. 15851). See Figure 60.
4. A combined total of nine fittings may be used in these lines, eight 90° elbows and one tee. Two 45° elbows equal one 90° elbow.

Actuation Gas Line – 10 Tanks Maximum

1. Use only 1/4 in. Schedule 40 black iron, hot-dipped galvanized, chrome-plated, or stainless steel pipe and fittings.
2. The actuation gas line piping is installed from the 101 remote mechanical release to each R-102 regulated actuator assembly. The total length of the actuation gas line from the remote mechanical release to the regulated actuator assemblies must not exceed 100 ft. (30.5 m).
3. A combined total of 20 elbows and 9 tees may be used in these lines. Two 45° elbows equal one 90° elbow. See Figure 61.
4. Use only a 101-10 carbon dioxide cartridge (Part No. 15850) in the 101 remote mechanical release.
5. A safety vent relief valve (Part No. 15677) is required in the actuation gas line to relieve residual pressure after actuation.

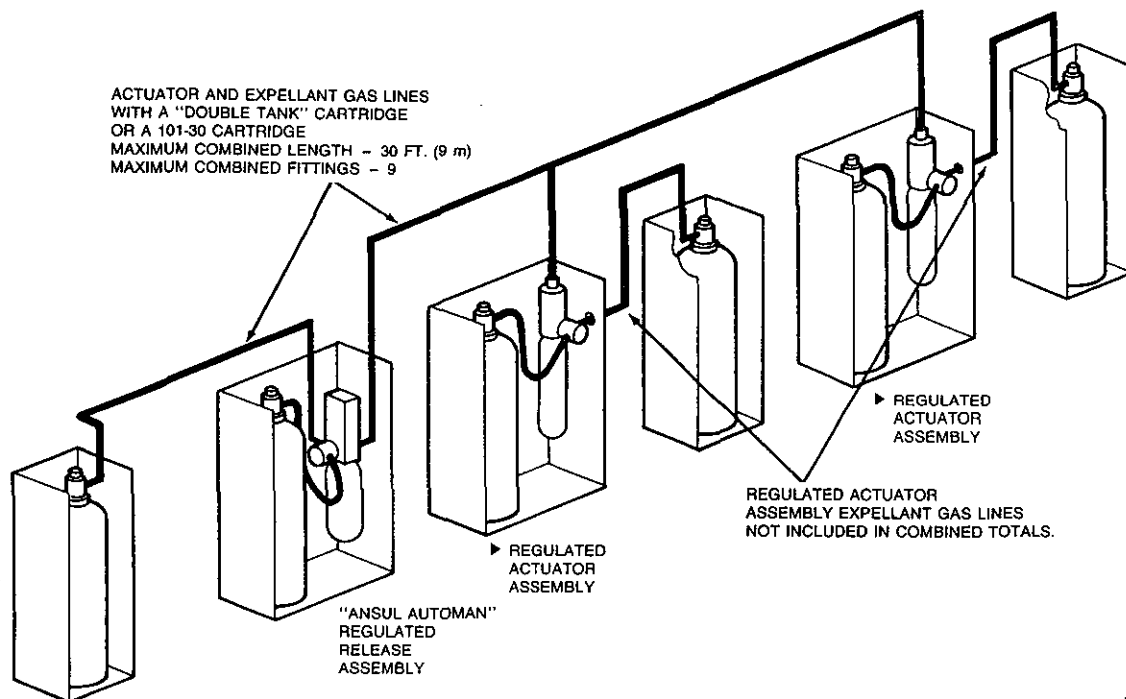


FIGURE 60

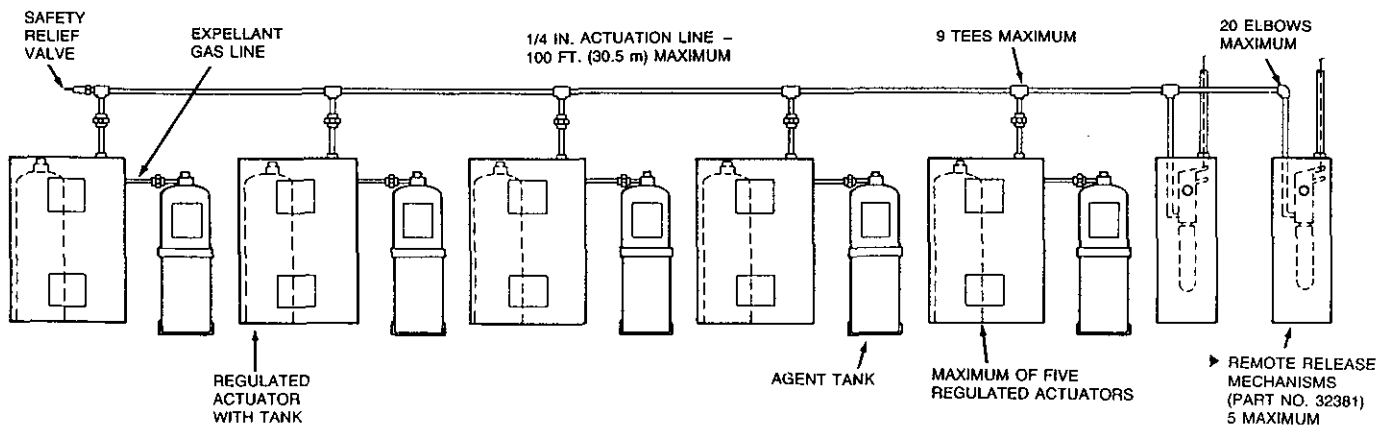


FIGURE 61

ACTUATION AND EXPELLANT GAS LINE REQUIREMENTS (Continued)

Expellant Gas Line

1. The expellant gas line piping is installed from the regulated release mechanism in double and multiple-tank systems, and from the regulated actuator assembly in multiple-tank systems. The expellant gas line is the piping between the regulator and the tank-enclosure/tank-bracket assembly. The total length of the expellant gas line from the regulated release mechanism or each regulated actuator assembly **must not exceed 30 ft. (9 m)** when using a "double-tank" cartridge (Part No. 73022), an LT-A-101-30 Cartridge (Part No. 29187), or a 101-30 Cartridge (Part No. 15851). See Figures 62 and 63.

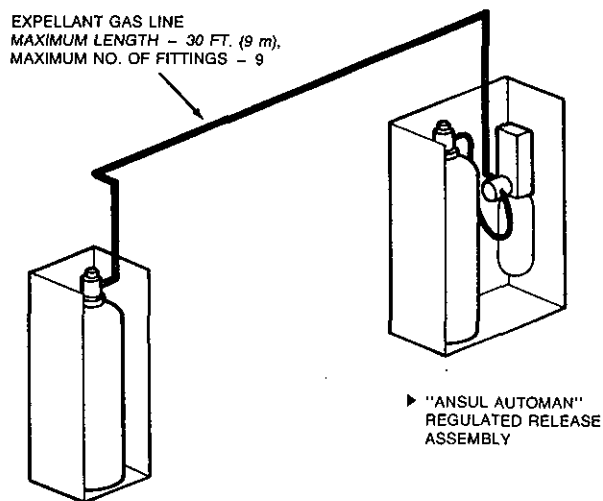


FIGURE 62

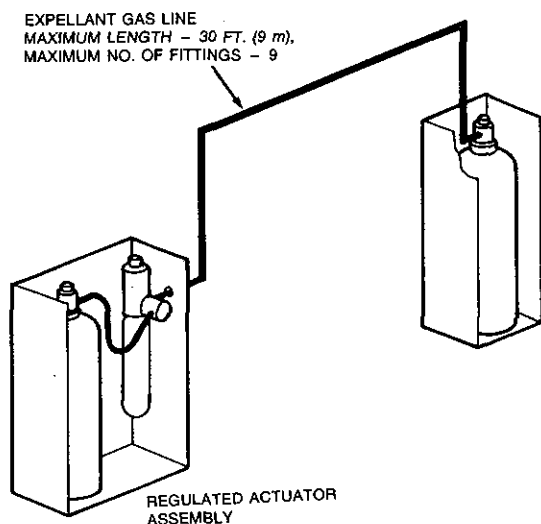


FIGURE 63

2. A combined total of nine fittings may be used in these lines, eight 90° elbows and one tee. Two 45° elbows equal one 90° elbow.
3. If two tanks are connected to the regulated release assembly in a multiple-tank system arrangement, the total combined length of the actuation and expellant gas lines **must not exceed 30 ft. (9 m)** when using a "double-tank" nitrogen cartridge (Part No. 73022), an LT-A-101-30 nitrogen cartridge (Part No. 29187) or a 101-30 carbon dioxide cartridge (Part No. 15851). See Figure 60.

DISTRIBUTION PIPING REQUIREMENTS

Once the nozzle placement and quantity of tanks has been determined, it is then necessary to determine the piping configurations between the tank adaptor and each discharge nozzle. This section contains the guidelines and limitations for designing the distribution piping so that the liquid agent will discharge from the nozzles at a proper flow rate. These limitations should also be referred to when selecting the mounting location for the regulated release mechanism and agent tank.

General Piping Requirements

1. All R-102 system piping is straight line. Therefore, the need for critical lengths and balancing is minimized.
2. Two 45° elbows count as one 90° elbow.
3. Each branch line includes the tee or elbow leading to it, and all fittings within the branch line itself.
4. The minimum piping length of Schedule 40, 3/8 in. pipe from the tank outlet to any nozzle protecting a range, fryer, or wok must be 6 ft. (1.8 m).
5. Pipe lengths are measured from center of fitting to center of fitting. See Figure 64.

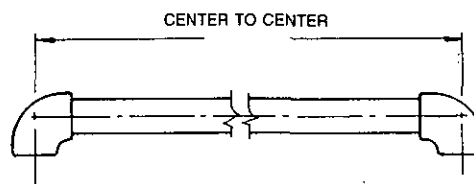


FIGURE 64

6. All distribution piping must be Schedule 40 black iron, chrome-plated, or stainless steel. **Do not use hot dipped galvanized pipe on the distribution piping.**

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Supply and Branch Line Identification

The R-102 distribution piping network is broken down into four specific pipe runs: the Supply Line, the Duct Branch Line, the Plenum Branch Line, and the Appliance Branch Line. See Figure 65.

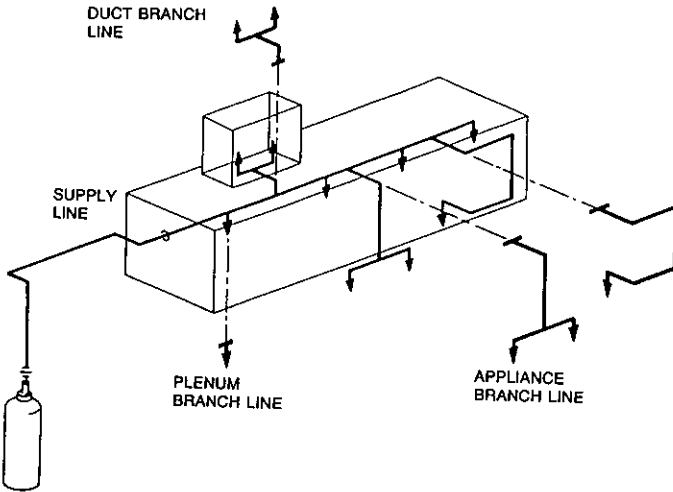


FIGURE 65

NOTE: THESE ARE EXAMPLES ONLY. OTHER CONFIGURATIONS CAN BE DESIGNED.

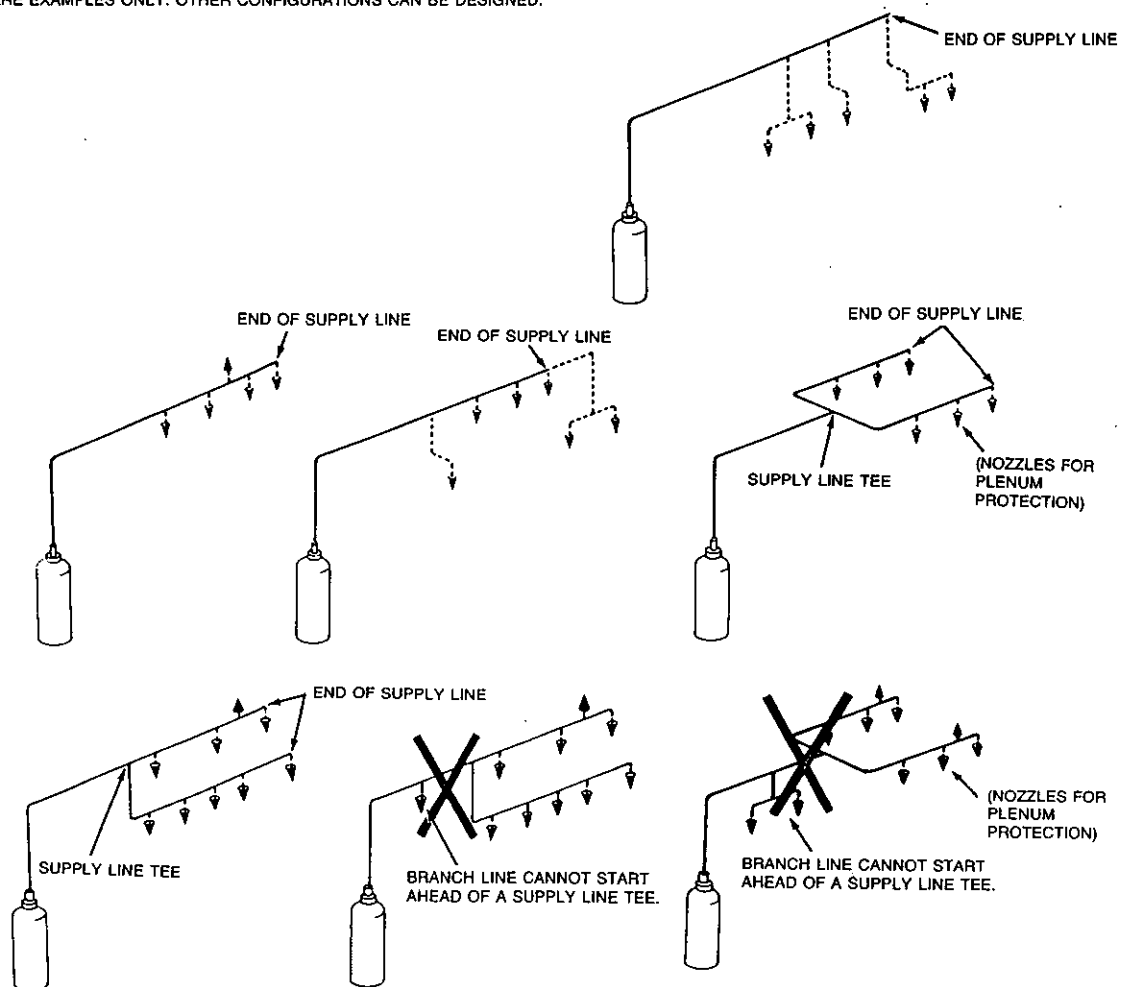


FIGURE 66

DISTRIBUTION PIPING REQUIREMENTS (Continued)**Supply and Branch Line Identification (Continued)****SUPPLY LINE**

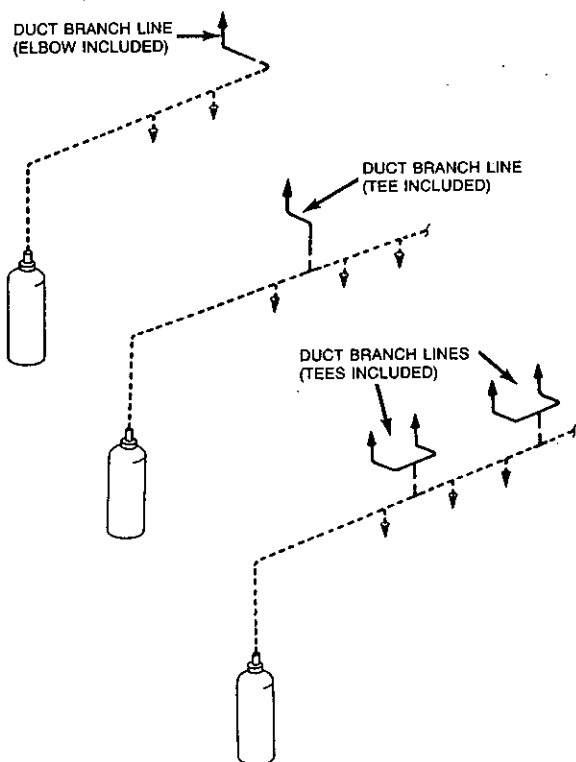
The Supply Line is defined as the length of pipe which runs from the agent tank outlet to the last branch line (whether a duct, appliance, or plenum branch line). This includes all supply line fittings except for the tees or elbows leading to the branch lines. See Figures 65 and 66.

NOTICE

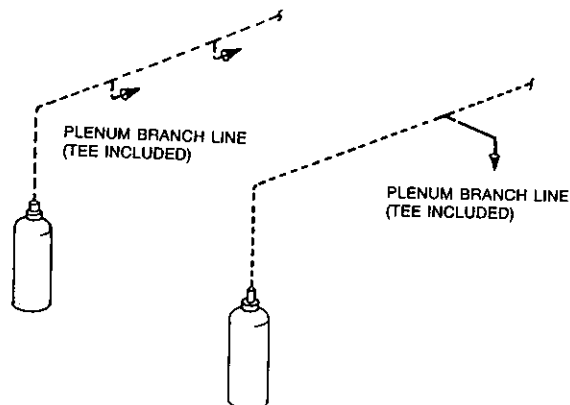
Branch lines cannot start ahead of a supply line tee.

DUCT BRANCH LINE

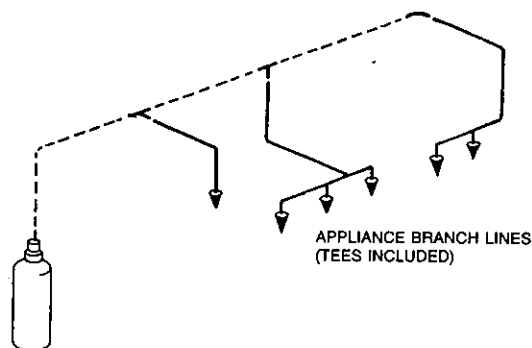
The Duct Branch Line is defined as the length of pipe which runs from the supply line to the duct nozzle(s). This includes all branch line fittings as well as the tee or elbow used to start the branch line. See Figures 65 and 67.

**FIGURE 67****PLENUM BRANCH LINE**

The Plenum Branch Line is defined as the length of pipe which runs from the supply line to the plenum nozzle(s). This includes all branch line fittings as well as the tee or elbow used to start the branch line. See Figures 65 and 68.

**FIGURE 68****APPLIANCE BRANCH LINE**

The Appliance Branch Line is defined as the length of pipe which runs from the supply line to the appliance nozzle(s). This includes all branch line fittings as well as the tee or elbow used to start the branch line. See Figures 65 and 69.

**FIGURE 69**

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 1.5 Gallon System

OPTION 1 – DUCT, PLENUM, AND APPLIANCE PROTECTION

- Any combination of duct, plenum and/or appliance protection may be used with this option.
- Only one duct branch line, with one nozzle, either a 1W or a 2W, may be used with this option.
- All distribution piping, supply and branch, must be 3/8 in. Schedule 40 black iron, chrome-plated, or stainless steel.
- Each 1.5 gallon tank allows a maximum of five flow numbers.*
- The pipe length between the start of the first branch line and the start of the last branch line must not exceed 8 ft. (2.4 m). When the supply line is split, the **combined length** of both legs of the supply line (start of first branch line to start of last branch line) must not exceed 8 ft. (2.4 m). See Figure 70.
- The combined length of all branch lines must not exceed 22 ft. (6.7 m). See Figure 71.
- The requirements of the following table must not be exceeded:

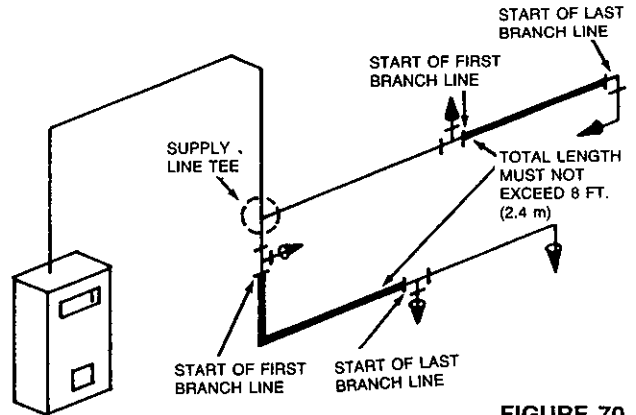
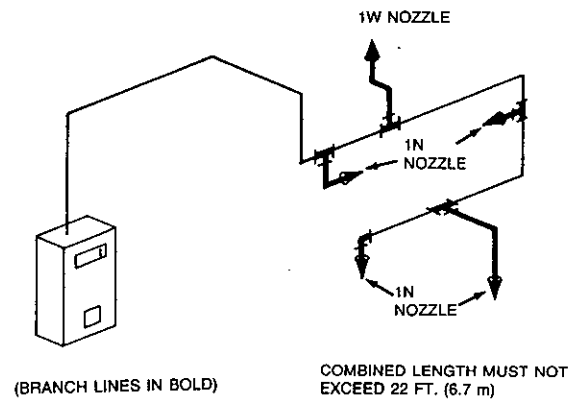


FIGURE 70



(BRANCH LINES IN BOLD)

COMBINED LENGTH MUST NOT EXCEED 22 FT. (6.7 m)

FIGURE 71

Requirements	Supply	Duct Branch Line	Plenum Branch Line	Appliance Branch Line
Pipe Size	3/8 in.	3/8 in.	3/8 in.	3/8 in.
Maximum Length	40 ft. (12.2 m)	6 ft. (1.8 m)	4 ft. (1.2 m)	10 ft. (3 m)
Maximum Rise	6 ft. (1.8 m)	4 ft. (1.2 m)	2 ft. (.6 m)	2 ft. (.6 m)
Maximum 90° Elbow	9	4	4	6
Maximum Tees	1	1	2	3
Maximum Flow Numbers	5*	2	2	3

*Exceptions: 6 flow numbers are allowed when:

- Duct branch line is the last branch line on the piping network and no 1N nozzles are used to protect woks or griddles, or,
- Only six (6) 1N nozzles** are installed and none are used to protect woks or griddles, or
- Only two (2) 3N nozzles, Part No. 76782, are used

**Only five (5) flow numbers are allowed if a 1N nozzle is used for wok or griddle protection.

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 1.5 Gallon System (Continued)

OPTION 2 – DUCT AND PLENUM PROTECTION ONLY

1. Up to three nozzles, either 1W or 2WH, may be used with this option for duct protection, however, only two duct nozzles may be used on a single branch line.
2. 1W and 2WH nozzles cannot be mixed on the same duct branch line.
3. Whenever two duct nozzles are used on the same branch line, the flow must enter the bull and exit the ends of the last tee in the branch line to assure balanced flow to each duct nozzle.
4. **Appliance branch lines are not allowed with this option.**
5. All distribution piping must be **only 1/4 in.** Schedule 40 black iron, chrome-plated, or stainless steel. Use a 3/8 in. nipple and a 3/8 in. x 1/4 in. reducing fitting for tank adaptor connection to distribution piping. See Figure 72.
6. The pipe length between the start of the first branch line and the start of the last branch line must not exceed 8 ft. (2.4 m). See Figure 73. When the supply line is split, the **combined length** of both legs of the supply line (start of first branch line to start of last branch line) must not exceed 8 ft. (2.4 m). See Figure 70.
7. The combined length of all branch lines must not exceed 16 ft. (4.9 m). See Figure 73.

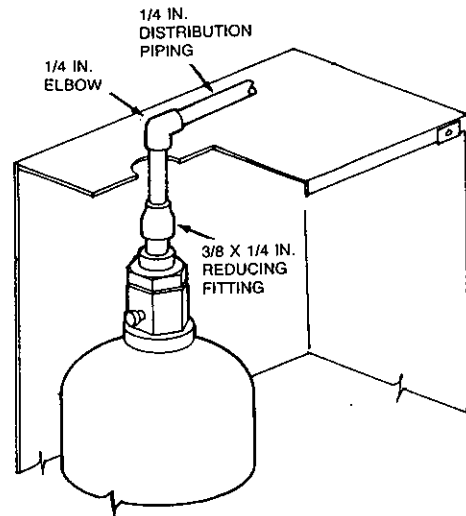
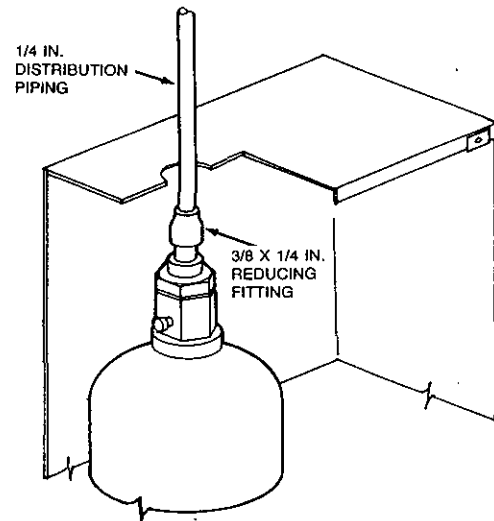


FIGURE 72

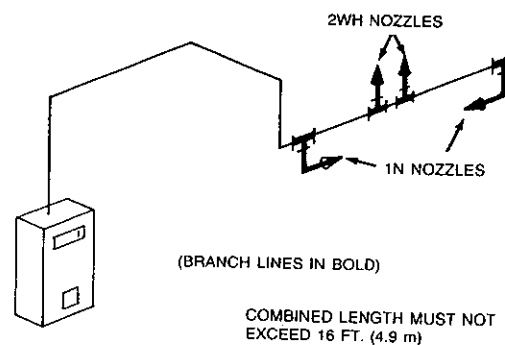
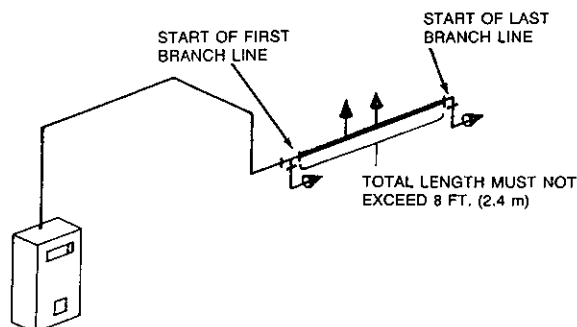


FIGURE 73

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 1.5 Gallon System (Continued)

8. Each 1.5 gallon tank allows a maximum of six flow numbers.
9. The requirements of the following table must not be exceeded:

<u>Requirements</u>	<u>Supply</u>	<u>Duct Branch Line</u>	<u>Plenum Branch Line</u>	<u>Appliance Branch Line</u>
Pipe Size	1/4 in.	1/4 in.	1/4 in.	- -
Maximum Length	40 ft. (12.2 m)	6 ft. (1.8 m)	6 ft. (1.8 m)	Not Allowed
▶ Maximum Rise	6 ft. (1.8 m)	4 ft. (1.2 m)	2 ft. (.6 m)	Not Allowed
▶ Maximum 90° Elbows	9	4	3	Not Allowed
▶ Maximum Tees	1	2	2	Not Allowed
Maximum Flow Numbers	6	4*	2	Not Allowed

*NOTE: A maximum of two nozzles are allowed per duct branch line.

SECTION IV – SYSTEM DESIGN

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REV. 3

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 3.0 Gallon System

1. The maximum length between the start of the first branch line and the start of the last branch line must not exceed 24 ft. (7.3 m). When the supply line is split, the **combined total** of both legs of the supply line (from the start of the first branch line to the start of the last branch line) must not exceed 24 ft. (7.3 m). See Figure 74.
2. The total length of all branch lines must not exceed 36 ft. (10.9 m). See Figure 74.
3. Use a 3/8 in. union to connect the tank adaptor to the 3/8 in. supply line.
4. A maximum of two nozzles are allowed per duct branch line.
5. The requirements of the following table must not be exceeded:

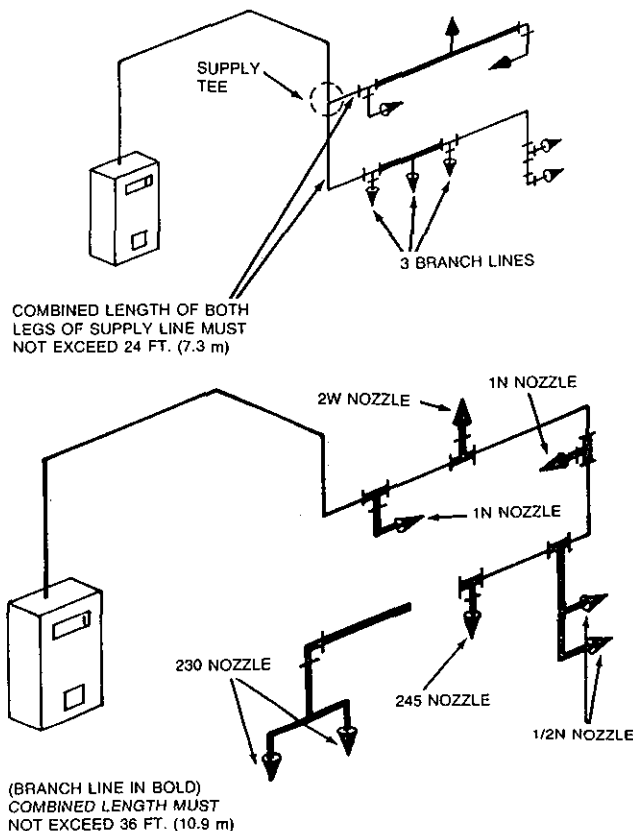


FIGURE 74

Requirements	Supply Line	Duct Branch Line	Plenum Branch Line	Appliance Branch Line
Pipe Size	3/8 in.	3/8 in.	3/8 in.	3/8 in.
Maximum Length	40 ft. (12.2 m)	8 ft. (2.4 m)	4 ft. (1.2 m)	12 ft. (3.7 m)
Maximum Rise	6 ft. (1.8 m)	4 ft. (1.2 m)	2 ft. (.6 m)	2 ft. (.6 m)
Maximum 90° Elbows	9	4	4	6
Maximum Tees	1	2	2	4
Maximum Flow Numbers	11*	4	2	4

*Exceptions: 1. 11.5 flow numbers are allowed when using a combination of one (1) 2W duct nozzle, one (1) 1/2N electrostatic precipitator nozzle, one (1) 1N plenum nozzle, and four (4) two-flow appliance nozzles.

2. 12 flow numbers are allowed:

- a. In any one tank **not** containing two-flow appliance nozzles**, or
- b. In any one tank using **only** two-flow appliance nozzles.
- c. In any one tank using only 3-flow appliance nozzles.

d. When (4) four Dean Industries GTI Gas Fryers are protected at low proximity as shown in Figure 33V on Page 4-11, the discharge piping must be as shown in Figure 83 on Page 4-42.

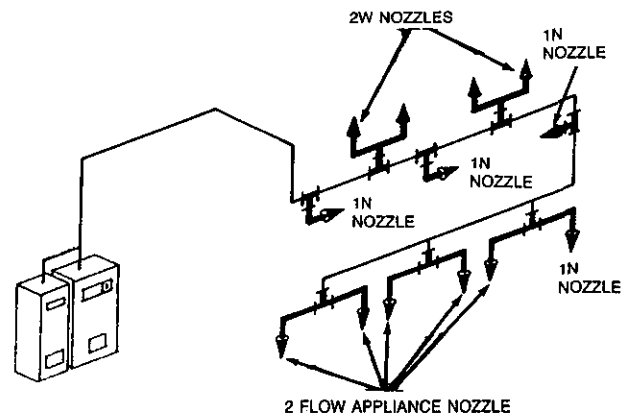
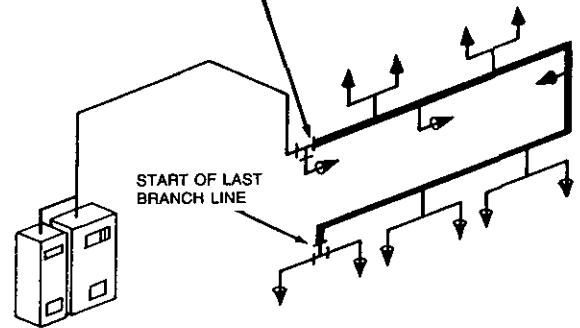
**Only eleven (11) flow numbers are allowed if a 1N nozzle is used for wok or griddle protection, or a 1F nozzle is used for range protection.

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 6.0 Gallon Manifolded System

1. All piping must be 3/8 in. Schedule 40.
2. See Figure 74b for tank connections.
3. The length of supply line piping between the start of the first branch line and the start of the last branch line must not exceed 24 ft. (7.3 m). See Figure 74a. When the supply line is split, the **combined total** of both legs of the supply line (from the start of the first branch line to the start of the last branch line) must not exceed 24 ft. (7.3 m).
4. The combined length of all branch lines must not exceed 36 ft. (10.9 m). See Figure 74a.
5. A maximum of 22 flow numbers are allowed.
6. The requirements of the following table must not be exceeded.

LENGTH OF PIPING MUST NOT EXCEED 24 FT. (7.3 m) FROM START OF FIRST BRANCH LINE TO START OF LAST BRANCH LINE.



(BRANCH LINES IN BOLD)
 COMBINED LENGTH MUST NOT EXCEED 36 FT. (10.9 m)

FIGURE 74a

Requirements	Supply Line	Duct Branch Line	Plenum Branch Line	Appliance Branch Line
Pipe Size	3/8 in.	3/8 in.	3/8 in.	3/8 in.
Maximum Length	32 ft. (9.7 m)	8 ft. (2.4 m)	4 ft. (1.2 m)	12 ft. (3.7 m)
Maximum Rise	6 ft. (1.8 m)	4 ft. (1.2 m)	2 ft. (.6 m)	2 ft. (.6 m)
Maximum 90° Elbows	8	4	4	6
Maximum Tees	2	2	2	4
Maximum Flow Numbers	22	4	2	4

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 6.0 Gallon Manifolded System (Continued)

This configuration consists of two 3 gallon tanks. Both tanks are connected to a common manifold tee and are pressurized from a single double tank (Part No. 73022) nitrogen cartridge in the regulated release assembly. See Figure 74b.

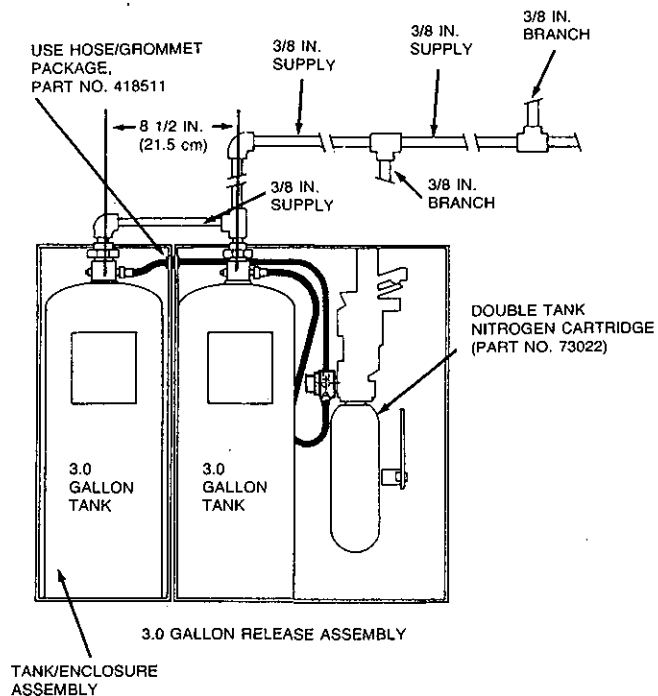


FIGURE 74b

Independent pipe runs can also be used with the regulated release assembly and the tank/enclosure assembly. See Figure 74c.

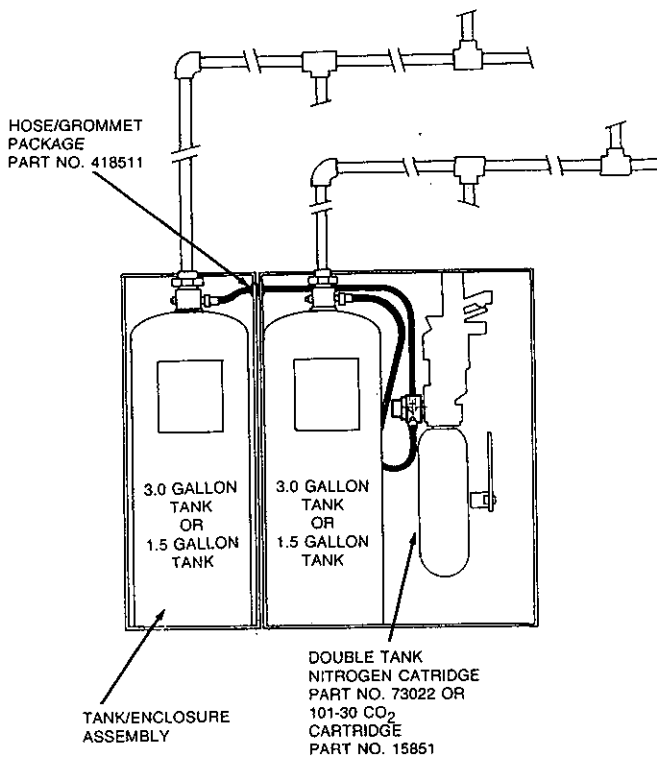


FIGURE 74c

DISTRIBUTION PIPING REQUIREMENTS (Continued)

Distribution Piping Requirements – 9.0 Gallon System

This configuration consists of three 3-gallon tanks, all pressurized from a single double-tank nitrogen cartridge (Part No. 73022) with expellant gas hoses connected as shown in Figure 74d. Tanks No. 1 and No. 2 must be connected directly to the regulator with separate expellant gas hoses and Tank No. 3 must be connected to Tank No. 2 with a third expellant gas hose as shown in Figure 74d. Each tank must be connected to an independent distribution piping network as shown in Figure 74d. Distribution piping requirements for each network must be as follows:

1. The maximum length between the start of the first branch line and the start of the last branch line must not exceed 24 ft. (7.3 m). When the supply line is split, the **combined total** of both legs of the supply line (from the start of the first branch line to the start of the last branch line) must not exceed 24 ft. (7.3 m). See Figure 74.
2. The total length of all branch lines must not exceed 36 ft. (10.9 m). See Figure 74.
3. Use a 3/8 in. union to connect the tank adaptor to the 3/8 in. supply line.
4. A maximum of two nozzles are allowed per duct branch line.
5. The requirements of the following table must not be exceeded:

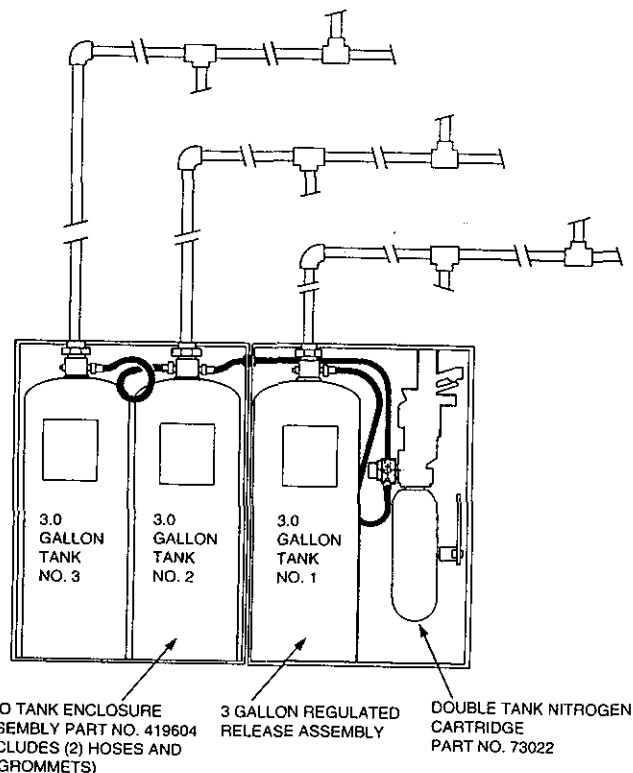


FIGURE 74d

Requirements	Supply Line	Duct Branch Line	Plenum Branch Line	Appliance Branch Line
Pipe Size	3/8 in.	3/8 in.	3/8 in.	3/8 in.
Maximum Length	40 ft. (12.2 m)	8 ft. (2.4 m)	4 ft. (1.2 m)	12 ft. (3.7 m)
Maximum Rise	6 ft. (1.8 m)	4 ft. (1.2 m)	2 ft. (.6 m)	2 ft. (.6 m)
Maximum 90° Elbows	9	4	4	6
Maximum Tees	1	2	2	4
Maximum Flow Numbers	11*	4	2	4

*Exceptions: 1. 11.5 flow numbers are allowed when using a combination of one (1) 2W duct nozzle, one (1) 1/2N electrostatic precipitator nozzle, one (1) 1N plenum nozzle, and four (4) two-flow appliance nozzles.

2. 12 flow numbers are allowed:

- a. In any one tank not containing two-flow appliance nozzles**, or
- b. In any one tank using only two-flow appliance nozzles.
- c. In any one tank using only 3-flow appliance nozzles.

d. When (4) four Dean Industries GT1 Gas Fryers are protected at low proximity as shown in Figure 83 on Page 4-42, the discharge piping must be as shown in Figure 84 on Page 4-42.

**Only eleven (11) flow numbers are allowed if a 1N nozzle is used for wok or griddle protection, or a 1F nozzle is used for range protection.

DETECTOR SYSTEM REQUIREMENTS (Continued)

Detector Replacement Requirements (Continued)

COOKING APPLIANCES

If the cooking appliance is located under an exhaust duct where a detector has been mounted, it is normally not necessary to utilize another detector for that cooking appliance, provided the detector is not more than 12 in. (30 cm) into the duct. See Figure 77.

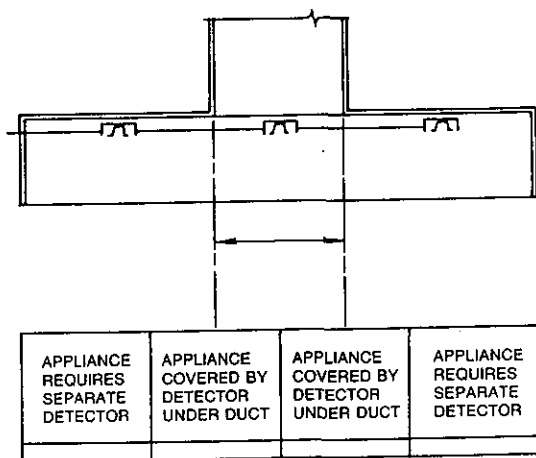


FIGURE 77

Detectors used for cooking appliances must be located above the surface and within the perimeter of the cooking appliance. They must be positioned toward the exhaust duct side of the appliance and high enough to prevent accidental actuation of the system. The cooking appliance detectors must be located in the air stream of the cooking fumes for quick fire detection. It is normally necessary to use one detector per area of single nozzle coverage, even though more than one appliance may be covered with a single nozzle.

Detection Line Requirements

CONDUIT

Rigid conduit, 1/2 inch Schedule 40 galvanized pipe, or 1/2 inch EMT thin-wall conduit may be used. Standard steel conduit fittings (compression type are recommended) must be employed to properly install the detection system. All conduit or pipe must be firmly supported. When using pipe, make certain that all ends are carefully reamed, deburred and blown clear of chips and scale before assembly.

NOTICE

The conduit offset can be used at the top or bottom of the regulated release to change direction of the conduit. The conduit offset cannot be used with pulley tees. All other changes in direction must be made by using Ansul approved pulley elbows, Part No. 45771 or 415670. See Figure 78.

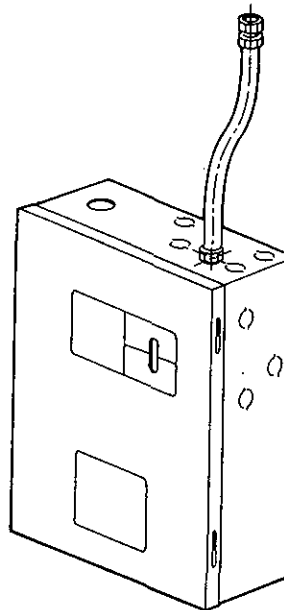


FIGURE 78

Fusible Link Selection

When possible, temperature readings should be taken at each detector location to determine correct fusible link temperature rating. Temperature can be recorded using either a maximum registering thermometer, Part No. 15240, temperature tape or any other accurate thermometer.

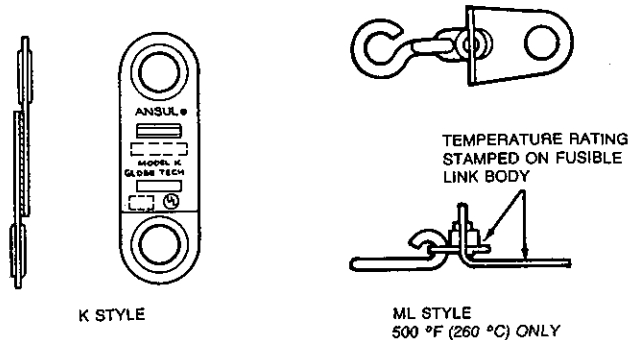


FIGURE 79

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

Fusible Link Part No.	Temperature Rating (See Figure 79)	To Be Used Where Temperature Does Not Exceed
415739	165 °F (74 °C)	100 °F (38 °C)
415740	212 °F (100 °C)	150 °F (66 °C)
415741	280 °F (138 °C)	225 °F (107 °C)
415742	360 °F (182 °C)	290 °F (143 °C)
415743	450 °F (232 °C)	360 °F (182 °C)
56816	500 °F (260 °C)	400 °F (204 °C)

MANUAL PULL STATION REQUIREMENTS

A remote manual pull station allows the R-102 system to be manually operated at some point distant from the regulated release assembly. The pull station should be installed at a maximum height of 60 in. (152 cm) and located in the path of exit. The pull station is the only source of manual actuation of the regulated release assembly.

Two styles of remote pull stations are available: metal stamped and plastic molded.

▶ The total length of the cable used for each manual pull station within a system must not exceed 150 ft. (46 m).

The maximum number of pulley elbows that may be used per system is 20.

One pulley tee, Part No. 15342, is allowed per system.

Exception: When using a pulley tee, Part No. 15342, in the pull station line, the maximum length of wire rope to each pull station must not exceed 125 ft. (38 m) and the maximum number of elbows must not exceed 18.

Metal Stamped Style – Part No. 4835 or 54011

Parts that may be used for installation of a metal stamped remote manual pull station are:

Description	Part No.
Remote Manual Pull Station Assembly*	54011
Remote Manual Pull Station Assembly	4835
Pulley Elbow	45771
Pulley Elbow	415670
Pulley Tee**	15342

*Assembly includes parts listed below:

1/16" Stainless Steel Cable 50 ft. (15 m)	15821
Oval Press-To-Crimp Sleeves	4596
Glass Break Rod (1)	4834

**Designed for 32 °F to 130 °F (0 °C to 54 °C) temperature areas. Utilized when two remote manual pull stations are being connected to one regulated release assembly.

Plastic Molded Style – Part No. 415255

Parts that may be used for installation of a plastic molded remote manual pull station are:

Description	Part No.
Remote Manual Pull Station Assembly	415255
Trim Ring Shipping Assembly (25)	415256
Replacement Seal Shipping Assembly (25)	415317
1/16" Stainless Steel Cable 500 ft. (152 cm)	79653
Oval Press-To-Crimp Sleeves	4596
Pulley Elbow	45771
Pulley Tee	15342

MECHANICAL GAS VALVE REQUIREMENTS

An Ansul or Ansul approved mechanical gas shut-off valve system can be attached to the R-102 system. The system works both mechanically and pneumatically by use of an air cylinder located inside the regulated release assembly. Upon actuation of the fire suppression system, a pneumatically-operated air cylinder assembly will mechanically close the gas shut-off valve.

The total length of the cable for the mechanical gas valve must not exceed 150 ft. (46 m). The maximum number of pulley elbows that may be used is 20.

▶ One pulley tee (Part No. 15342) is allowed per system.

▶ **Exception:** When using a pulley tee, Part No. 15342, the maximum length of wire rope to each gas valve must not exceed 125 ft. (38 m) and the maximum number of elbows must not exceed 18.

Parts that may be used for installation of a Mechanical Gas Shut-off Valve are:

Description	Part No.
Gas Valve/Actuator 3/4 in. Assembly (Ansul)*	55598
Gas Valve/Actuator 1 in. Assembly (Ansul)*	55601
Gas Valve/Actuator 1 1/4 in. Assembly (Ansul)*	55604
Gas Valve/Actuator 1 1/2 in. Assembly (Ansul)*	55607
Gas Valve/Actuator 2 in. Assembly (Ansul)*	55610
Gas Valve/Actuator 2 1/2 in. Assembly (ASCO)*	25937
Gas Valve/Actuator 3 in. Assembly (ASCO)*	25938
Pulley Elbow**	45771
Pulley Elbow**	415670
▶ Pulley Tee***	15342
1/16" Stainless Steel Cable	15821 or
50 ft. (15 m) or 500 ft. (152 m) roll	79653
Oval Press-To-Crimp Sleeve	4596
Stop Sleeve (2)	26317

*Assemblies include parts listed below:

**Approved for 700 °F (371 °C) temperature areas.

▶ ***Used with two (2) ANSUL AUTOMAN releases to operate one (1) mechanical gas valve.

Air Cylinder Assembly	15733
Air Cylinder	15521
Tubing Assembly	15529
Copper Tubing, 1/8 in.	15525
Male Elbow	15523
Male Connector	15522
Machine Screw (2)	15421
Hex Nut (2)	15527
Lockwasher (2)	4141
Visual Inspection Seal (2)	197

All valves above are UL listed and approved. They may be mounted in any position. Pipe threads are type NPT. Ambient operating temperature range of all valves is 32 °F to 120 °F (0 °C to 49 °C). The valves are not weatherproof and must be located indoors in areas approved by the "authority having jurisdiction."

ELECTRICAL GAS VALVE REQUIREMENTS

A UL Listed electrically-operated gas shut-off valve can be attached to the R-102 system to provide an electrical means of shutting off the gas line at a predetermined point. If an electric gas shut-off valve is used in the system it must be attached with both an electric (snap-action) switch and a manual reset relay. For more information on the types of electric (snap-action) switches, refer to the Electrical Switch, Field Installation section on Page 5-24. The manual reset relay is reviewed in this section.

All electrical connections should be performed by a **QUALIFIED ELECTRICIAN** and in accordance with authority having jurisdiction.

The following is a brief explanation of how the R-102 system operates with an Electric Gas Shut-off Valve attached:

With the regulated release cocked in the ready condition, the normally closed contacts in the snap-action switch allow current to flow to the manual reset relay. With the relay coil energized, normally open contacts in the reset relay close, allowing the solenoid in the gas valve to be energized.

ELECTRICAL GAS VALVE REQUIREMENTS (Continued)

Once the R-102 system is activated, the normally closed contacts in the snap-action switch will open, de-energizing the reset relay. This will, in turn, open the contacts in the relay which will cause the gas valve to become de-energized and close.

The system must be re-armed and the "push to reset" button on the reset relay must be operated to reopen the gas valve.

It is important to note that a power failure or an electrical power interruption will cause the gas valve to close even though the system was not fired.

In either case, whether in a fired condition or when a power failure has occurred, the manual reset relay and electric gas shut-off valve must be reset to resume a normal operating condition. **For resetting, refer to the "Recharge and Resetting Procedures" section in this manual.**

Approvals

Ansul gas valves listed in this section are UL listed and approved for 110 VAC. If more information is required, refer to the Gas and Oil Equipment List of Underwriters Laboratories, Inc. under "Electrically Operated Valves Guide No. 440 A5" or consult Ansul Incorporated, Marinette, Wisconsin 54143-2542.

If other gas valves are used, they shall be "UL listed electrically-operated safety valves for natural or LP gas as required, of appropriate pressure and temperature rating, 110 VAC/60 Hz." The information on temperature and type of gas that the valves are suitable for may be found in the Gas and Oil Equipment List of Underwriters Laboratories, Inc. under "Electrically Operated Valves Guide No. 440 A5."

The electrically operated gas valve must be of the type that needs to be energized to remain open.

Parts that may be used for installation of a 110 VAC Gas Shut-off Valve are:

Description	Part No.
Electric Solenoid Valve, 3/4 in. NPT*	13707
Electric Solenoid Valve, 1 in. NPT*	13708
Electric Solenoid Valve, 1 1/2 in. NPT*	13709
Electric Solenoid Valve, 2 in. NPT*	13710
Electric Solenoid Valve, 3 in. NPT*	17643
Manual Reset Relay (110 VAC)	14702

*Valves are normally closed when de-energized.

PRESSURE SWITCH REQUIREMENTS

The pressure switches for the R-102 system are specially designed. The switches are intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices, and other electrical devices that are designed to shut off or turn on when the fire suppression system is actuated.

Pressure Switches that may be used on system are:

Description	Part No.
Single-Pole, Double-Throw*	53133
Double-Pole, Double-Throw*	24377

*Rated for 20 amps, 125, 250 or 480 VAC with 10 amp 125 VAC "L" 1 hp-115 VAC, 2 hp-230 VAC, 1/2 amp 125 VDC, 1/4 amp 250 VDC. A relay must be supplied by others if equipment load exceeds the rated capacity of the switch.

ELECTRICAL SWITCH REQUIREMENTS

The electric (snap-action) switches for the R-102 system are specially designed to fit the regulated release assembly. The switches are intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices, and other electrical devices that are designed to shut off or turn on when the fire suppression system is actuated. (See Figures 80 through 82 for reference.)

Contractors shall supply "UL listed, enclosed industrial control equipment or magnetic switch having a rating matching that of the cooking appliance, coil 110 VAC/60 Hz or 24 VAC/60 Hz."

All electrical connections should be performed by a **QUALIFIED ELECTRICIAN** and in accordance with authority having jurisdiction.

Electric (Snap-Action) Switches that may be used are:

Description	Part No.
Single-Pole, Double-Throw Assembly*	15549
Assembly Includes:	
Snap-Action Switch	17781
Wire Assembly Connector	17765
Self-Tapping Screws (2)	15609
Lock Nut	21918
Screw	415870
Double-Pole, Double-Throw Assembly*	32222
Assembly Includes:	
Snap-Action Switch (2)	17781
Wire Assembly Connector (2)	17765
Self-Tapping Screws (2)	32085
Trip Lever Pin	415844
Lock Nut	21918
Three-Pole, Double-Throw Assembly*	415868
Assembly Includes:	
Snap-Action Switch (3)	17781
Wire Assembly Connector (3)	17765
Machine Screw w/Hex Nut (2)	32221
Trip Lever Pin	415844
Lock Nut	21918
Four-Pole, Double-Throw Assembly*	32220
Assembly Includes:	
Snap-Action Switch (4)	17781
Wire Assembly Connector (3)	17765
Machine Screw w/Hex Nut (2)	32221
Trip Lever Pin	415844
Lock Nut	21918

*Rated for 15 amps, 1/3 hp, 125 or 250 VAC, with 1/2 amp 125 VDC and 1/4 amp 250 VDC. A relay must be supplied by others, if equipment load exceeds the rated capacity of the switch.

Electrical wiring and equipment shall be installed in accordance with NFPA 70 (National Electrical Code) or the requirements of the authority having jurisdiction.

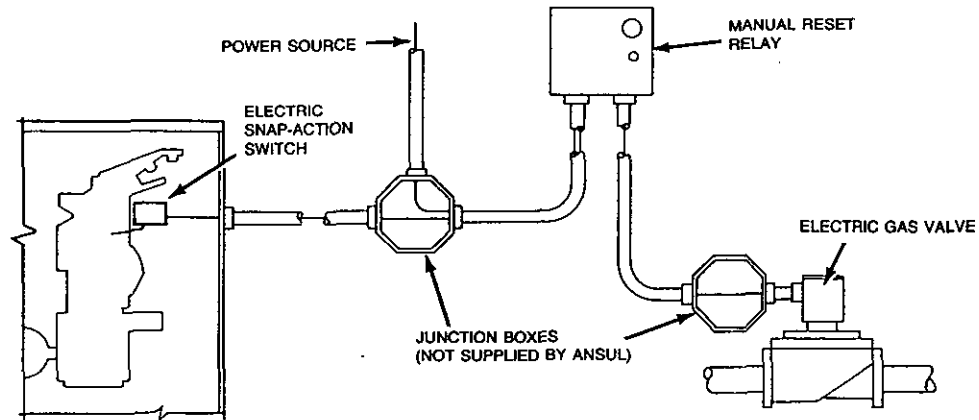
If a fire alarm system is provided, the fire extinguishing system shall be connected to the alarm system in accordance with the requirements of the appropriate Signalling Standard (NFPA 71, 72A, 72B, 72C or 72D) so that the actuation of the extinguishing system will sound the fire alarm as well as provide the extinguishing function of the system.

If supervision of the electrical detection, electrical actuation or electrical power supply circuit is provided, it shall give prompt audible or visual indication of trouble and shall be distinctive from alarms or indicators indicating operation or hazardous conditions as specified in NFPA 17A.

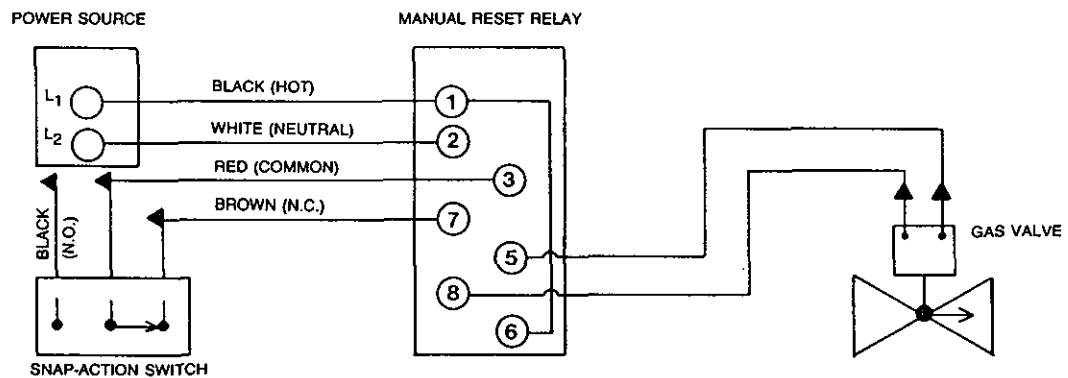
ELECTRICAL SWITCH REQUIREMENTS (Continued)

Electric (110 VAC/60 Hz) Gas Shut-off Valve

INSTALLATION OVERVIEW

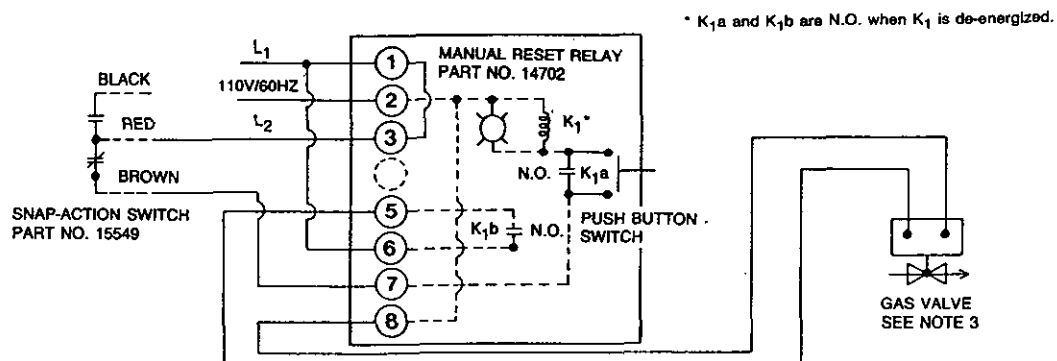


BASIC WIRING DIAGRAM



NOTE: DO NOT USE BLACK WIRE ON SNAP-ACTION SWITCH IN NORMAL INSTALLATION.
BLACK WIRE TO BE USED ONLY FOR EXTRANEIOUS ALARM, LIGHT CIRCUITS, ETC.

WIRING SCHEMATIC



NOTE:

1. _____ DENOTES FIELD INSTALLATION.
2. - - - - - DENOTES FACTORY INSTALLATION.
3. GAS VALVES: "UL LISTED ELECTRICALLY-OPERATED SAFETY VALVE FOR NATURAL, OR LP GAS AS NEEDED OF APPROPRIATE PRESSURE AND TEMPERATURE RATING, 110V/60 HZ" OR ANSUL GAS VALVES, PART NUMBERS 13707, 13708, 13709, 13710, AND 17643.

FIGURE 80

INSTALLING THE ACTUATION AND EXPELLANT GAS LINE (Continued)

Actuation Gas Line From 101 Remote Release(s) to Regulated Actuators

Install actuation gas piping from the remote release(s) to the regulated actuators by completing the following:

1. Pipe the 1/4 in. actuation gas line from the 1/4 in. outlet in the remote release receiver, through the knockout provided in the top of the release enclosure, to each regulated actuator assembly.

The maximum length of the actuation gas line from the remote release to all regulated actuators **must not** exceed 100 ft. (30.5). See Figure 12.

2. A maximum of nine tees and twenty elbows are allowed in the actuation piping. Two 45° elbows equal one 90° elbow. See Figure 12.
3. A safety relief valve (Part No. 15677) must be installed in the actuation piping. See Figure 12.

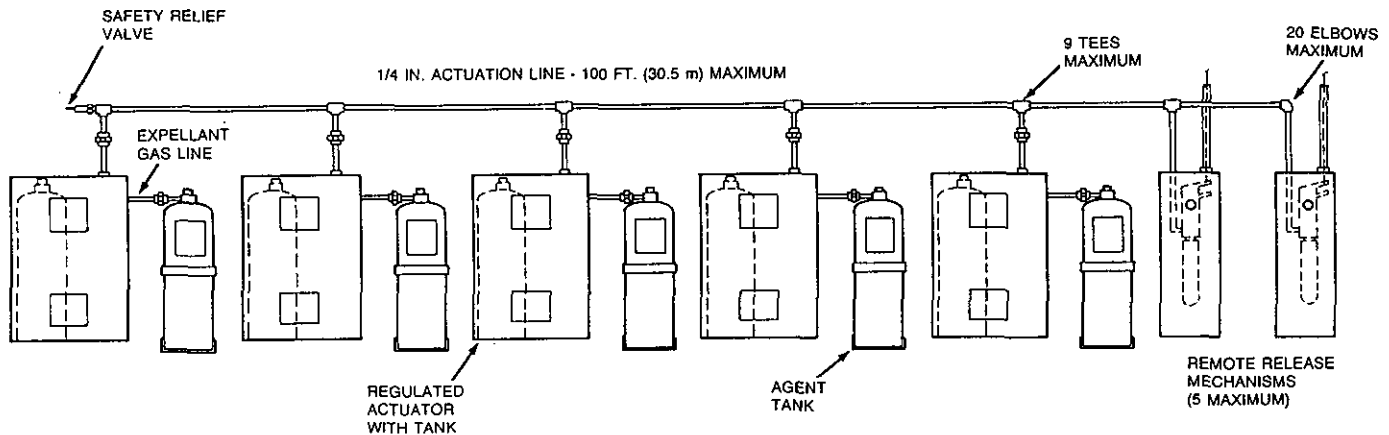


FIGURE 12

INSTALLING THE DISTRIBUTION PIPING

Before the following procedures can be completed, the piping design must already be determined; and the actuation and expellant gas lines from the regulated release, each regulated actuator, and each tank-enclosure or tank-bracket assembly should already be installed.

These installation instructions are identical for single, double, and multiple-tank systems except for the quantity of tanks and hazard areas to be covered.

General Piping Requirements

1. Use Schedule 40 black iron, chrome-plated, or stainless steel pipe and fittings.

NOTICE

Do not use hot-dipped galvanized iron pipe or fittings in the agent distribution piping.

2. Before assembling the pipe and fittings, make certain all ends are carefully reamed and blown clear of chips and scale. Inside of pipe and fittings must be free of oil and dirt.
3. The distribution piping and fitting connections, located in the protected area, must be sealed with pipe tape. When applying pipe tape, start at the second male thread and wrap the tape (two turns maximum) clockwise around the threads, away from the pipe opening.

NOTICE

Do not allow tape to overlap the pipe opening as the pipe and nozzles could become plugged.

Thread sealant or compound must not be used as it could plug the nozzles.

4. Distribution piping may be run independently or two agent tanks may be manifolded together and run to the predetermined hazard area. Only agent tanks expelled from the same cartridge may be manifolded.

NOTICE

Closely follow the piping requirements for each size system, as detailed in the "System Design" section, when installing distribution piping.

Piping Installation

1. Starting at the tank, pipe directly from the union located on the tank adaptor. A reducing fitting may be necessary to conform to the distribution piping.

2. Based on the piping sketch developed in the "System Design" section of this manual, install the supply line and position the tees at points where branch lines must be installed. See Figure 13.

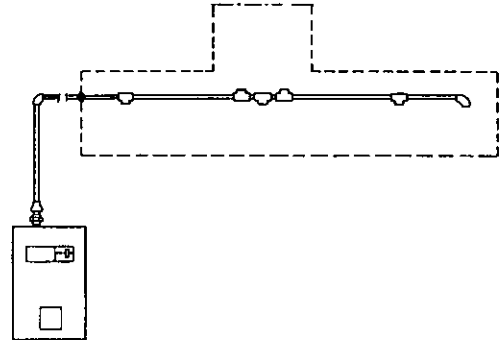


FIGURE 13

3. Run all branch lines to the hazard area and connect each nozzle. (Make certain all fittings are tight and all piping is securely bracketed.) The 1WS and 1NS nozzles can be aimed by slipping a 3/8 in. Schedule 40 pipe over the tip, moving the tip to the correct aiming point, and then wrench tightening the retaining ring.
4. All threaded connections located in the protected area, must be sealed with pipe tape. Tape should be applied to male threads only. Make certain tape does not extend over the end of the thread, as this could cause possible blockage of the agent distribution.
5. Before installing blow-off caps on nozzles, apply a small amount of Dow Corning No. 111 silicone grease across the opening in the nozzle tip and also a small amount coating the exterior of the blow-off cap. This will help keep cooking grease from building up on the cap.

NOTICE

When using a metal blow-off cap, make certain the spring clip rotates freely on the metal cap.

6. Make certain a blow-off cap is in place over each nozzle tip. These blow-off caps are designed to keep grease from building-up on the nozzle orifice and inhibiting the agent flow. See Figure 14.

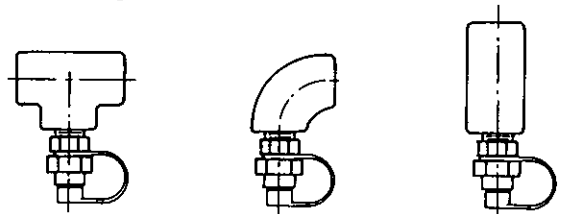


FIGURE 14

INSTALLING THE DETECTION SYSTEM

Before the following procedures can be completed, the detection design must already be completed. These installation instructions are identical for single, double, and multiple-tank systems except for the number of hazard areas to be covered.

NOTICE

Inform customer that fusible links should not be exposed to ammonia-based chemical cleaners or steam.

1. Based on the requirements listed in the "System Design" section, mount the detectors in their predetermined locations.
2. Run 1/2 in. conduit from the regulated release mechanism trip hammer assembly knockout hole to locations selected for mounting the detectors.

When changing the direction of conduit, use only Ansul pulley elbows, except, at the top of the regulated release, it is acceptable to use the "Conduit Offset Assembly" (Part No. 79825).

Ansul offers three styles of detector bracket assemblies. Part No. 56837 and 56838 are the "clip-on" style series and terminal detector assemblies. These detector assemblies use a "clip-on" style linkage assembly and **do not require** the wire rope to be threaded through the linkage assembly while it is being fed through the detection system.

Part No. 15373 and 15375 are the "hinged" style series and terminal detector assemblies. These detector assemblies use a detector linkage assembly which **requires** the wire rope to be threaded through each linkage assembly while the rope is being fed through the detection system.

Part No. 417368 and 417369 are the "scissor" style series and terminal detector assemblies. These detector assemblies use a detector linkage assembly which does not require the wire rope to be threaded through the linkage assembly while it is being fed through the detection system.

2. For a terminal detector located in a duct or header opening, secure both sides of the detector bracket with conduit, as shown in Figure 16.

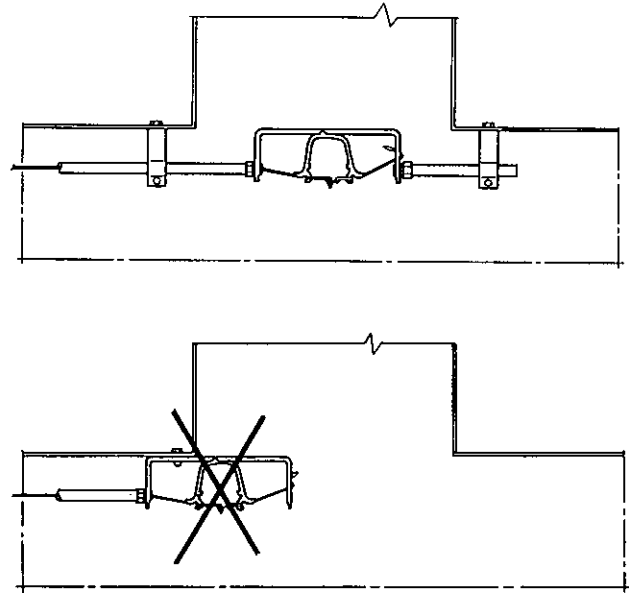


FIGURE 16

3. Starting at the regulated release assembly, feed the wire rope through the hole in the regulated release mechanism locking clamp, allowing the excess wire rope to hang down. (Do not tighten set screws in locking clamp at this time.) See Figure 17.

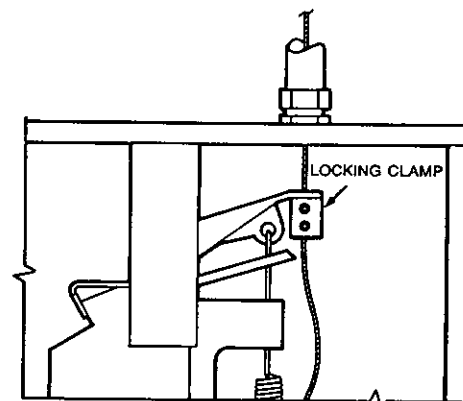


FIGURE 17

Installing "Clip-On" Style Linkage

1. Secure the conduit to the detector bracket using the two 1/2 in. steel compression fittings on the series detector bracket or the single 1/2 in. steel compression fitting on the terminal detector bracket. See Figure 15.

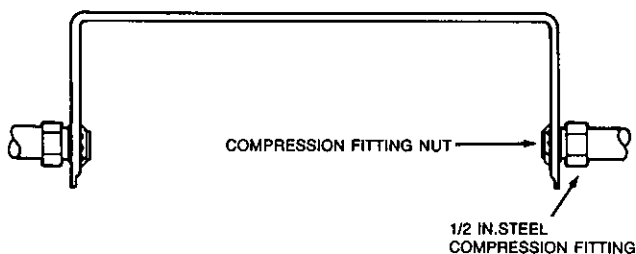


FIGURE 15

NOTICE

Do not use zinc die cast compression connectors on the detection conduit lines as these will not withstand the normally high temperatures experienced in the plenum area.

INSTALLING THE DETECTION SYSTEM (Continued)

Installing "Clip-On" Style Linkage (Continued)

4. From the regulated release assembly, run the stainless steel wire rope through the conduit, pulley elbows and detector brackets to the terminal detector.

NOTICE

If wire rope requires splicing, make certain splice is at least 12 in. (30.5 cm) away from any pulley elbow or conduit adaptor to avoid interference.

5. Feed the wire rope through the terminal detector bracket as shown in Figure 18 or as shown in Figure 19 if the terminal detector is mounted within a duct or header opening, and install the stop sleeve approximately 2 to 3 in. (5 to 8 cm) from the end of the wire rope. See Figure 20. Use the National Telephone Supply Company Nicopress Sleeve Tool (Stock No. 51-C-887) or equal to properly crimp the stop sleeve.

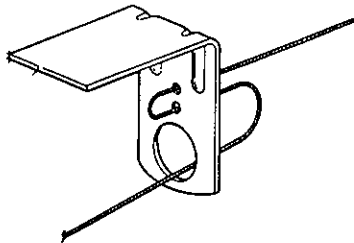


FIGURE 18

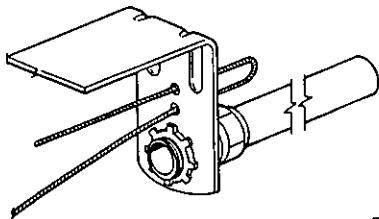


FIGURE 19

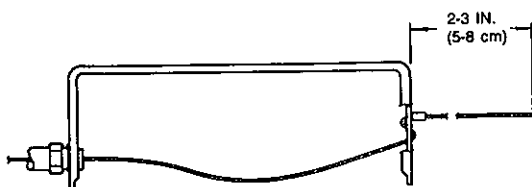


FIGURE 20

6. To give a constant tension on the wire rope during installation of the detector linkage, hang a vice grip or other weighted device on the excess stainless steel wire rope, leaving an adequate length of spare wire rope between the locking clamp and the weighted device.

NOTICE

When attaching the weighted device to the excess wire rope, allow approximately 3 in. (8 cm) of wire rope for each detector linkage for proper installation.

Example: If the system has six detectors, there should be approximately 18 in. (46 cm) of excess wire rope between the locking clamp and the weighted device, which will be utilized when the linkage is put in place.

7. Starting at the terminal detector, place the small tab of the detector linkage onto the wire rope. See Figure 21.

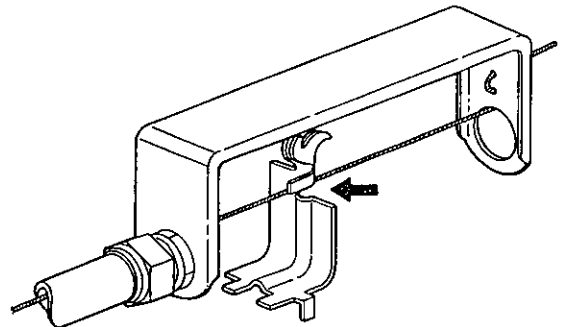


FIGURE 21

8. With the tab positioned on the wire rope, press and snap the detector linkage onto the wire rope. See Figure 22.

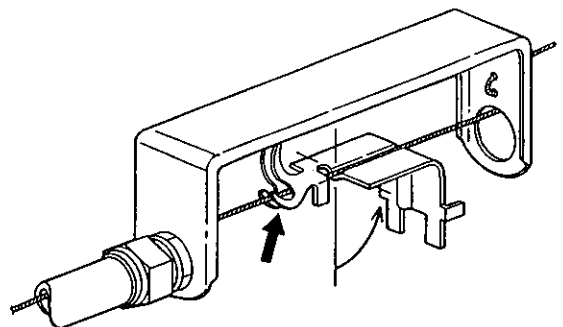


FIGURE 22

INSTALLING THE DETECTION SYSTEM (Continued)

Installing "Clip-On" Style Linkage (Continued)

9. Place the tab of the other half of the detector linkage on the opposite side of the wire rope and press the linkage until it snaps onto the rope. See Figure 23.

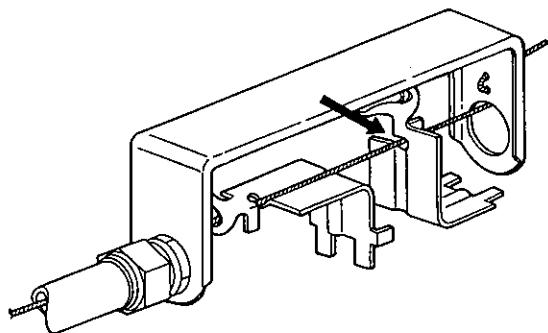


FIGURE 23

NOTICE

The hook portions of the detector linkage should now face away from each other.

10. Next, rotate both halves of the detector linkage upside down, with the detector linkage groove over the wire rope. See Figure 24.

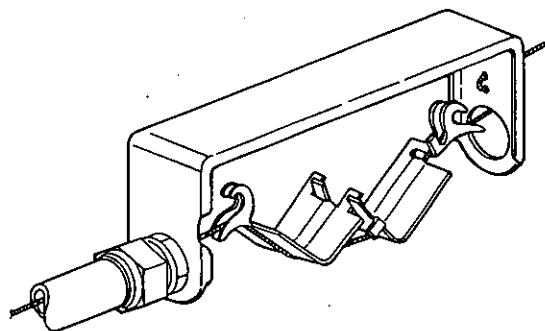


FIGURE 24

11. After fitting the pivot point of the two detector linkage halves together, squeeze the two halves and place the correctly rated Ansul approved fusible link over both detector hooks. See Figure 25.

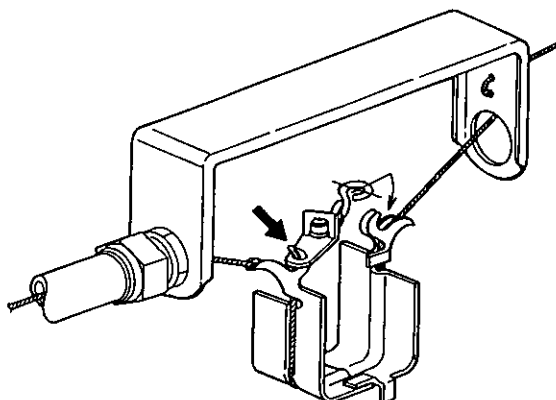


FIGURE 25

12. Position the assembled linkage onto the detector bracket. See Figure 26. (For optimum detection, make certain the solder joint is in the down position.)

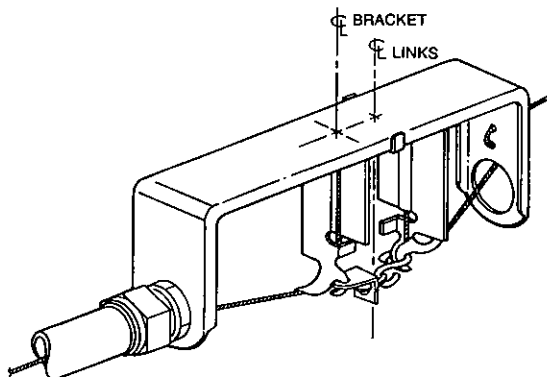


FIGURE 26

NOTICE

When positioning the linkage in the bracket, it is recommended to locate the linkage slightly off center, toward the terminal detector side.

13. Install the linkage and the correct Ansul approved fusible link in the remainder of the detector brackets.
14. Insert cocking lever (Part No. 14995) on left side of the regulated release mechanism, with the movable flange resting securely against the corner of the cartridge receiver and spring housing, and with the notched lever portion engaging the cocking pin on both sides of the regulated release mechanism. See Figure 27.

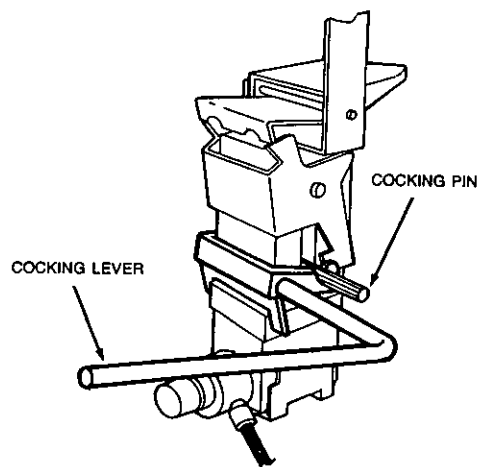
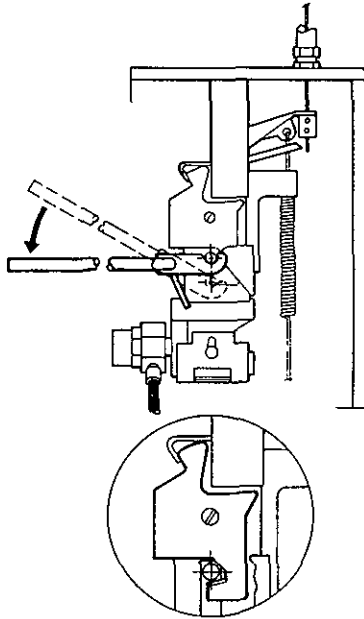


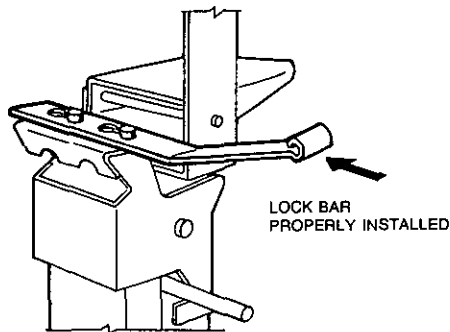
FIGURE 27

INSTALLING THE DETECTION SYSTEM (Continued)**Installing "Clip-On" Style Linkage (Continued)**

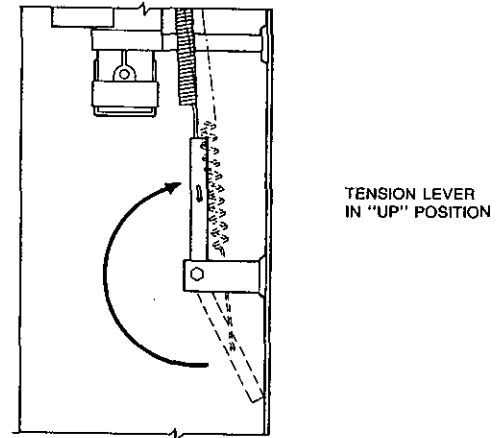
15. With a downward motion of the cocking lever, raise cocking pin until the trip lever indented surface moves underneath the pin and locks the pin in the up position. See Figure 28.

**FIGURE 28**

16. Remove cocking lever and insert lock bar (Part No. 14985) on left side of the cable lever, over the two shouldered projecting stud extensions, and slide bar forward into locking position. (The regulated release mechanism cannot be actuated, nor can enclosure cover be replaced until the lock bar is removed.) See Figure 29.

**FIGURE 29**

17. Make certain tension lever is in the "UP" position. See Figure 30.

**FIGURE 30**

18. Verify each detector linkage assembly, with correct fusible link, is in the detector bracket, located slightly toward the terminal detector side.

NOTICE

Due to the close adjustment between the trip hammer and cable lever assemblies, use only the particular fusible link(s) selected for installation in each detector, including terminal detector, to ensure correct adjustment when performing Steps 19 and 20.

19. Raise trip hammer 3/8 in. to 1/2 in. (9.5 to 12.7 mm), pull all slack out of wire rope, and tighten set screws on locking clamp.

INSTALLING THE DETECTION SYSTEM (Continued)

Installing "Clip-On" Style Linkage (Continued)

20. Lower tension lever to "DOWN" position and inspect the base of the wire rope clamping device to make certain that there is a minimum of 1/4 in. (6.4 mm) clearance between the base of the trip-hammer assembly and the cable lever assembly. See Figure 31. (If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever, loosen set screws on locking clamp and repeat Steps 19 and 20.)

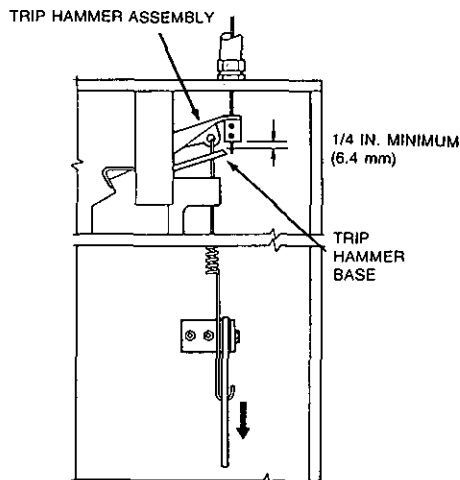


FIGURE 31

CAUTION

Do not install cartridge at this time as an accidental actuation could cause system discharge.

21. Test detection system in accordance with the "Testing and Placing in Service," Testing Detection System section of this manual.
22. When testing has been completed, cut off excess wire rope in the regulated release assembly, leaving approximately 2 in. (5.1 cm) of wire rope below the clamping device.

"Scissor" Style Linkage Installation

1. Secure the conduit to the detector bracket using the two 1/2 in. steel compression fittings on the series detector bracket or the single 1/2 in. steel compression fitting on the terminal detector bracket. See Figure 32.

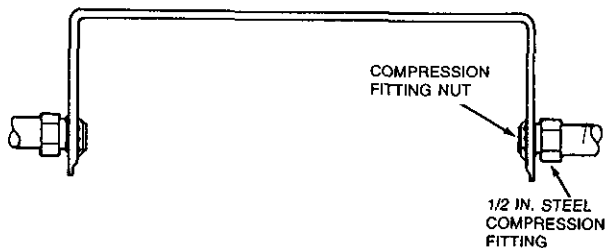


FIGURE 32

NOTICE

Do not use zinc die cast compression connectors on the detection conduit lines as these will not withstand the normally high temperatures experienced in the plenum area.

2. For a terminal detector located in a duct or header opening, secure both sides of the detector bracket with conduit, as shown in Figure 33.

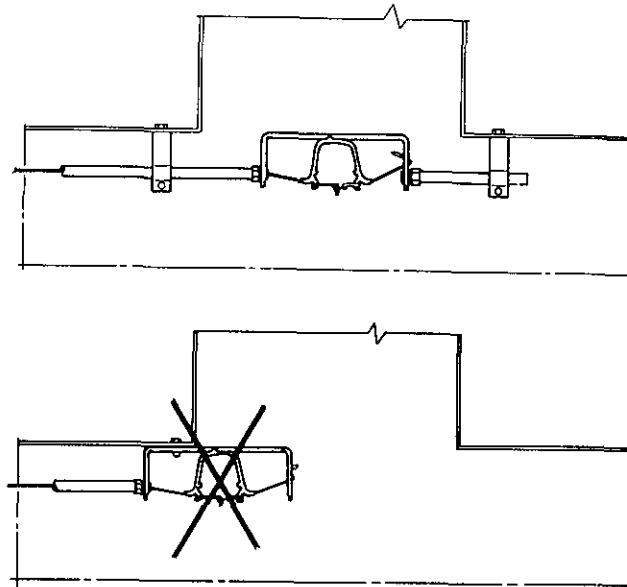


FIGURE 33

3. Starting at the release assembly, feed the wire rope through the hole in the release mechanism locking clamp, allowing the excess wire rope to hang down. (Do not tighten set screws in locking clamp at this time.) See Figure 34.

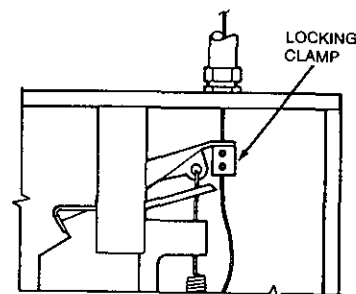


FIGURE 34

INSTALLING THE DETECTION SYSTEM (Continued)

"Scissor" Style Linkage Installation (Continued)

4. From the release assembly, run the stainless steel wire rope through the conduit, pulley elbows and detector brackets to the terminal detector.

NOTICE

If wire rope requires splicing, make certain splice is at least 12 in. (30.5 cm) away from any pulley elbow or conduit adaptor to avoid interference.

5. Feed the wire rope through the terminal detector bracket as shown in Figure 35 or as shown in Figure 36 if the terminal detector is mounted within a duct or header opening, and install the stop sleeve approximately 2 to 3 in. (5 to 8 cm) from the end of the wire rope. See Figure 37. Use the National Telephone Supply Company Nicopress Sleeve Tool (Stock No. 51-C-887) or equal to properly crimp the stop sleeve.

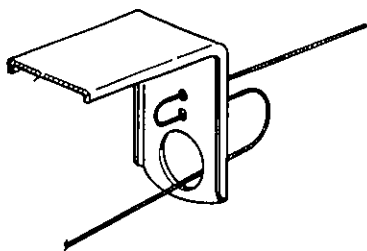


FIGURE 35

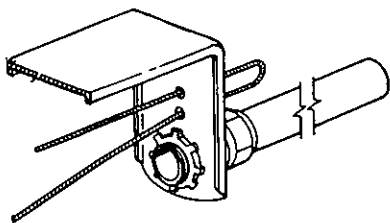


FIGURE 36

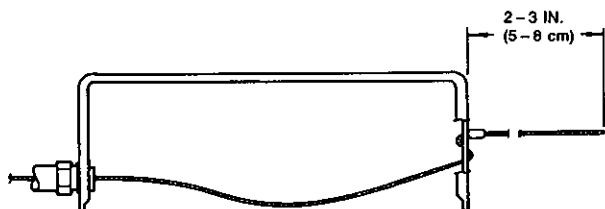


FIGURE 37

6. To give a constant tension on the wire rope during installation of the detector linkage, hang a vice grip or other weighted device on the excess stainless steel wire rope, leaving an adequate length of spare wire rope between the locking clamp and the weighted device.

NOTICE

When attaching the weighted device to the excess wire rope, allow approximately 3 in. (8 cm) of wire rope for each detector linkage for proper installation.

Example: If the system has six detectors, there should be approximately 18 in. (46 cm) of excess wire rope between the locking clamp and the weighted device, which will be utilized when the linkage is put in place.

7. Install detector scissor assembly as shown in Figure 38. Note that the ANSUL AUTOMAN release is located on the left side of the detector bracket. Slightly crimp the two assembly "boot-hooks" over the cable with pliers so the cable is captured under each hook but the whole assembly can move from side to side. Center the assembly in the detector bracket.

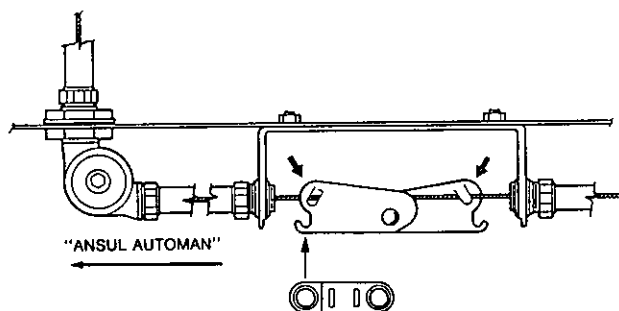


FIGURE 38

8. Hook the fusible link on the ANSUL AUTOMAN release side of the hook assembly, then pull the fusible link to the opposite side and complete the hookup as shown in Figure 39 and 40. The top of the hook assembly must be inside the bracket stiffeners. The hook assembly with the fusible link in place must be located toward the terminal detector side of the bracket.

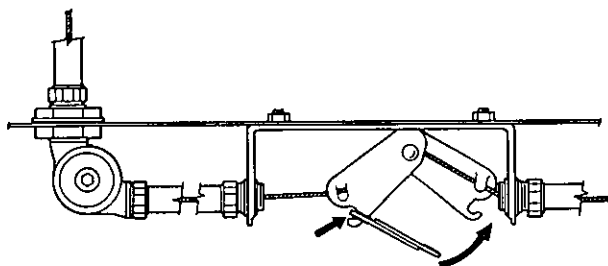


FIGURE 39

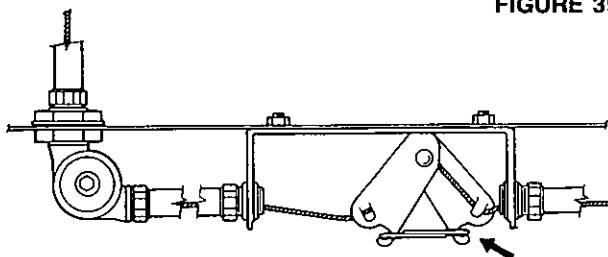


FIGURE 40

INSTALLING THE DETECTION SYSTEM (Continued)

"Scissor" Style Linkage Installation (Continued)

9. Install the linkage and the correct Ansul approved fusible link in the remainder of the detector brackets.
10. Insert cocking lever (Part No. 14995) on left side of the release mechanism, with the movable flange resting securely against the corner of the cartridge receiver and spring housing, and with the notched lever portion engaging the cocking pin on both sides of the release mechanism. See Figure 41.

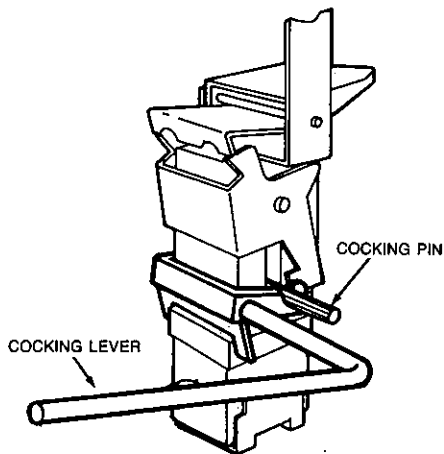


FIGURE 41

11. With a downward motion of the cocking lever, raise cocking pin until the trip lever indented surface moves underneath the pin and locks the pin in the up position. See Figure 42.

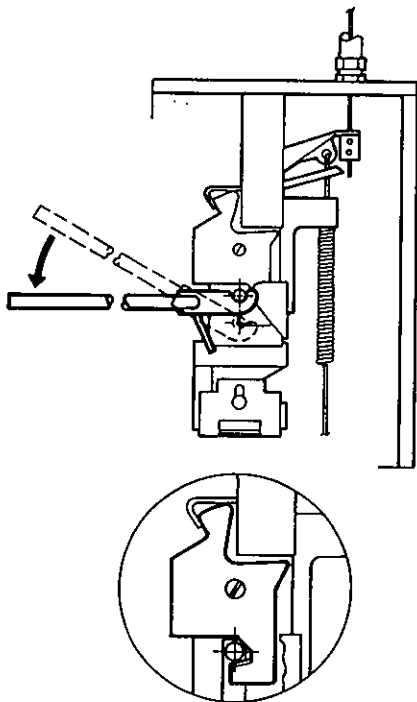


FIGURE 42

12. Remove cocking lever and insert lock bar (Part No. 14985) on left side of the cable lever, over the two shouldered projecting stud extensions, and slide bar forward into locking position. (The release mechanism cannot be actuated, nor can enclosure cover be replaced until the lock bar is removed.) See Figure 43.

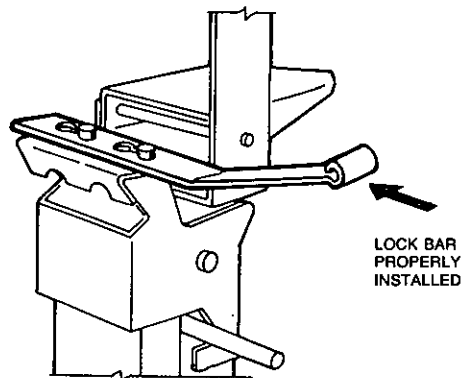


FIGURE 43

13. Make certain tension lever is in the "UP" position. See Figure 44.

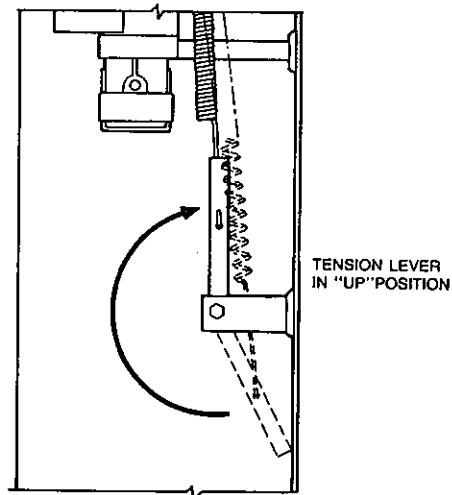


FIGURE 44

14. Verify each detector linkage assembly, with correct fusible link, is in the detector bracket, located fully toward the terminal detector side.

NOTICE

Due to the close adjustment between the trip hammer and cable lever assemblies, use only the particular fusible link(s) selected for installation in each detector, including terminal detector, to ensure correct adjustment when performing Steps 15 and 16.

INSTALLING THE DETECTION SYSTEM (Continued)

"Scissor" Style Linkage Installation (Continued)

15. Raise trip hammer 3/8 in. to 1/2 in. (9.5 to 12.7 mm), pull all slack out of wire rope, and tighten set screws on locking clamp.
16. Lower tension lever to "DOWN" position and inspect the base of the wire rope clamping device to make certain that there is a minimum of 1/4 in. (6.4 mm) clearance between the base of the trip hammer assembly and the cable lever assembly. See Figure 45. (If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever, loosen set screws on locking clamp and repeat Steps 15 and 16.)

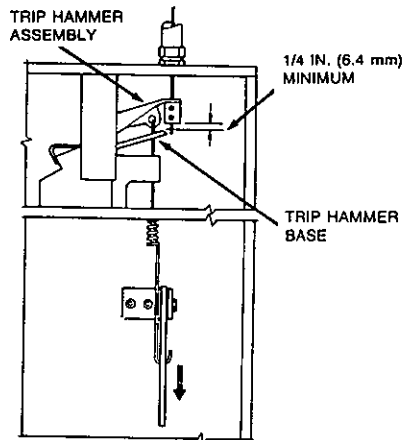


FIGURE 45

CAUTION

Do not install cartridge at this time as an accidental actuation could cause system discharge.

17. Test detection system in accordance with the Testing and Placing in Service Section, Page 7-1 – 7-3, of this manual.
18. When testing has been completed, cut off excess wire rope in the regulated release assembly, leaving approximately 2 in. (5.1 cm) of wire rope below the clamping device.

Installing "Hinged" Style Linkage

1. Secure the conduit to the detector bracket using 1/2 in. steel compression fittings. Thread the compression fitting into the detector bracket and then secure by using the lock nut supplied with the fitting. See Figure 46.

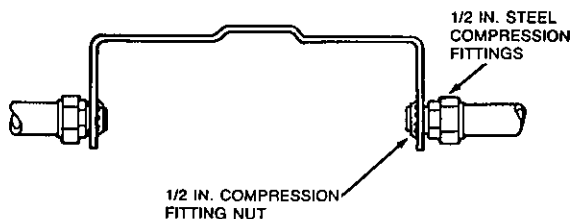


FIGURE 46

NOTICE

Do not use zinc die cast compression connectors on the detection conduit lines as zinc will not withstand the normally high temperatures experienced in the plenum area.

2. Starting at the regulated release assembly, feed wire rope up through hole in regulated release mechanism locking clamp, allowing excess wire rope to hang down. (Do not tighten set screws in locking clamp at this time.) See Figure 47.

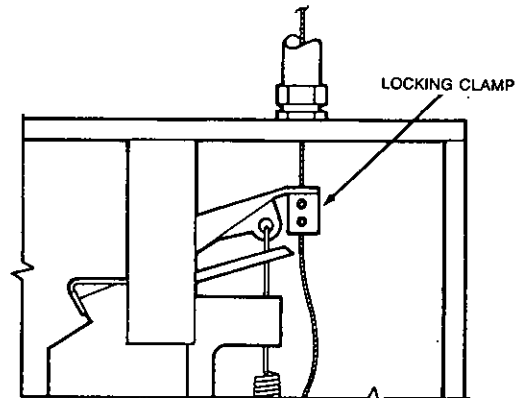


FIGURE 47

3. From the regulated release assembly, run the stainless steel wire rope through the conduit, pulley elbows and to the first detector.
4. Before continuing on past the detector bracket, feed the wire rope through the detector linkage assembly. See Figure 48.
5. Continue running the wire rope through the conduit and pulley elbows and feed it through each detector linkage assembly at each additional bracket.
6. At the terminal detector, feed wire rope through the terminal detector clamping device. Allow 2-3 in. (5-8 cm) of wire rope to extend beyond the clamping device and wrench tighten the set screws. See Figure 48.

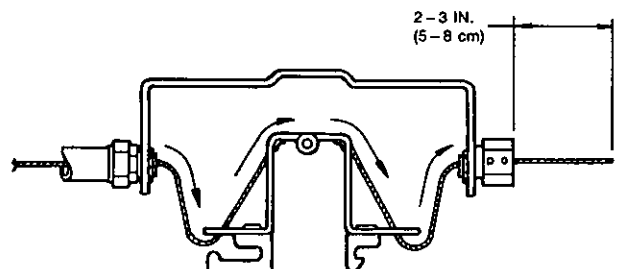


FIGURE 48

7. To give a constant tension on the wire rope during positioning of the detector linkage(s), hang a vise grip or other weighted device on the excess stainless steel wire rope, leaving an adequate length of spare wire rope between the locking clamp and the weighted device.

INSTALLING THE DETECTION SYSTEM (Continued)

Installing "Hinged" Style Linkage (Continued)

NOTICE

When attaching the weighted device to the excess wire rope, allow approximately 3 in. (8 cm) of wire rope for each detector linkage for proper installation.

Example: If the system has six detectors, there should be approximately 18 in. (46 cm) of excess wire rope between the locking clamp and the weighted device, which will be utilized when the linkage is put in place.

8. Starting at the terminal detector, squeeze the linkage together and place the correctly rated Ansul approved fusible link over both detector hooks. For optimum detection, make certain the solder joint is in the down position. Locate the linkage in the center of the detector bracket. See Figure 49.

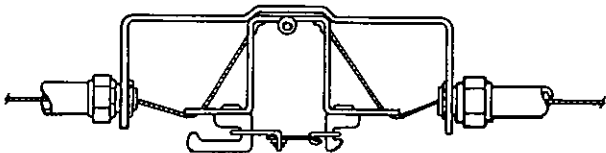


FIGURE 49

9. Proceed to install the remainder of the Ansul approved fusible links on the detector hooks and position the linkage in the center of each bracket.
10. Insert cocking lever (Part No. 14995) on left side of regulated release mechanism with the movable flange resting securely against the corner of cartridge receiver and spring housing, with the notched lever portion engaging the cocking pin on both sides of the regulated release. See Figure 50.

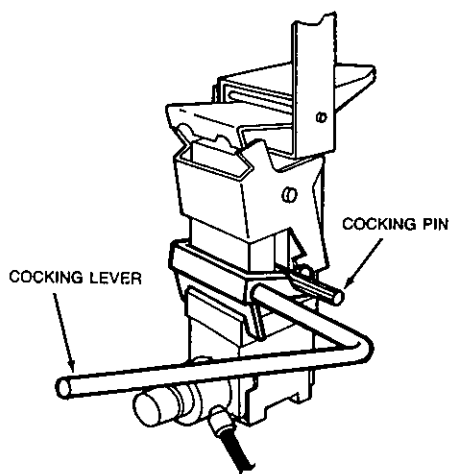


FIGURE 50

11. With a downward motion of the cocking lever, raise the cocking pin until trip hammer indented surface moves underneath the pin. See Figure 51.

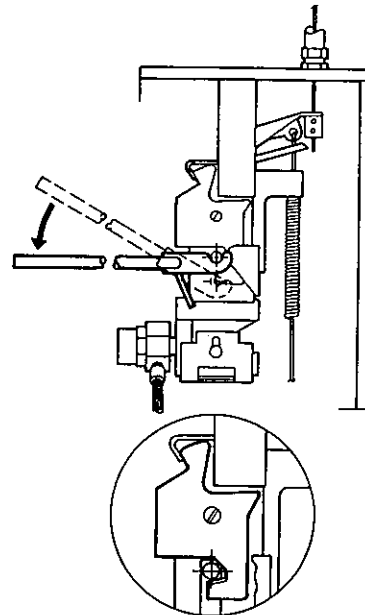


FIGURE 51

12. Remove the cocking lever and insert lock bar (Part No. 14985) on left side of cable lever, over the two shouldered projecting stud extensions, and slide the bar forward into the locking position. (The regulated release mechanism cannot be actuated, nor can enclosure cover be replaced until the lock bar is removed.) See Figure 52.

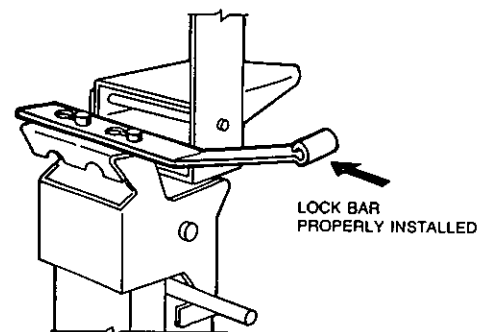


FIGURE 52

INSTALLING THE DETECTION SYSTEM (Continued)

Installing "Hinged" Style Linkage (Continued)

13. Make certain tension lever is in the "UP" position. See Figure 53.

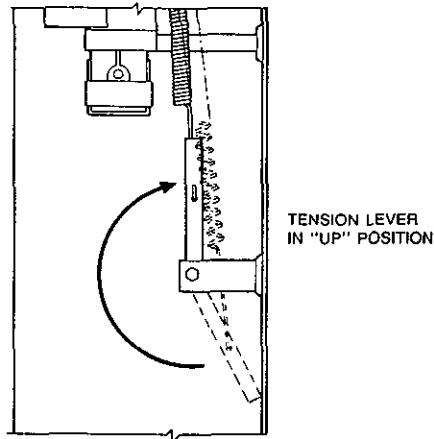


FIGURE 53

14. Verify each detector linkage assembly, with correct fusible link, is approximately centered in the detector bracket.

NOTICE

Due to the close adjustment between the trip hammer and cable lever assemblies, use only the particular fusible link(s) selected for the installation in each detector, including the terminal detector, to ensure correct adjustment when performing Steps 15 and 16.

15. Raise trip hammer 3/8 in. to 1/2 in. (9.5 to 12.7 mm), pull all slack out of wire rope, and tighten set screw on locking clamp.
16. Lower tension lever to "DOWN" position and inspect the base of wire rope clamping device to make certain that there is a minimum of 1/4 in. (6.4 mm) clearance between the base of trip hammer assembly and cable lever assembly. See Figure 54. (If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever, loosen set screws on locking clamp and repeat Steps 15 and 16.)

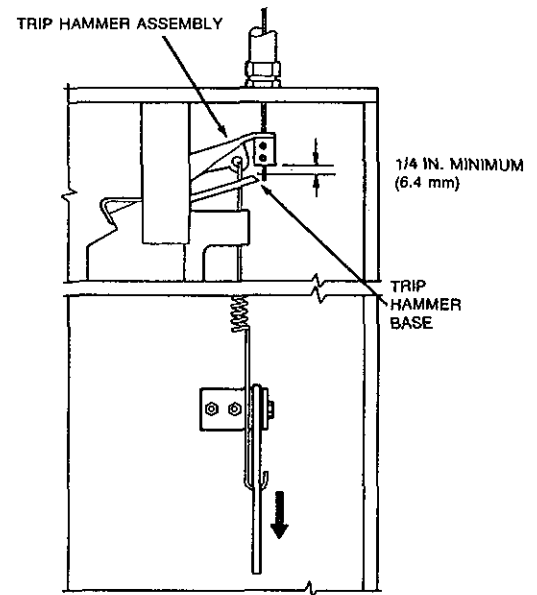


FIGURE 54

CAUTION

Do not install cartridge or do not remove lock bar at this time as an accidental actuation could cause system discharge.

17. Test detection system in accordance with the "Testing and Placing in Service," Testing Detection System section of this manual.
18. When all testing has been completed in the "Testing and Placing in Service" section, cut off excess wire rope in the regulated release assembly, leaving approximately 2 in. (5.1 cm) of wire rope below the clamping device.

INSTALLING REMOTE MANUAL PULL STATION

To install a remote manual pull station complete the following steps:

1. Make certain that regulated release assembly enclosure cover is detached and lock bar is properly inserted within the regulated release mechanism.

NOTICE

Failure to follow these instructions may lead to system actuation.

2. Verify that cartridge has been removed from regulated release assembly and that the regulated release assembly is in the cocked position.

If regulated release assembly does not have lock bar inserted or cartridge removed, refer to the "Semi-Annual Maintenance," Page 8 – 1, in "Maintenance Examination" section, and complete Steps 2 and 3 before completing the following installation steps.

3. Select a convenient location in the path of exit for mounting the pull station(s) to the wall. Height and location of pull station should be determined in accordance with authority having jurisdiction.

The total length of the wire rope used for each manual pull station within a system must not exceed 150 ft. (46 m).

The maximum number of pulley elbows that may be used per system is 20 of Part No. 45771 or 415670.

Exception: When using a pulley tee, Part No. 15342, in the pull station line, the maximum length of wire rope to each pull station must not exceed 125 ft. (38 m) and the maximum number of elbows must not exceed 18.

4. If junction box(es) is used, fasten a 4 in. (10 cm) junction box to wall or in wall where pull station is to be mounted, with mounting screws positioned so that when pull station cover is positioned in place, the printing will appear right side up and readable.

ALTERNATE METHOD OF CONNECTION:

- a. Thread 3/4 x 1/2 in. reducing coupling to bushing on back of each cover assembly.
 - b. Mount pull station cover(s) directly to wall at selected location so that printing is right side up and readable.
5. Install and secure 1/2 in. conduit, pulley tee (if required), and pulley elbows from each pull station to regulated release assembly as necessary. See Figure 55 or 56.

If a pulley tee is used, it must be installed between the regulated release assembly and first pulley elbow. The ambient temperature range of the pulley tee is between 32 °F to 130 °F (0 °C to 54 °C).

REMOTE MANUAL PULL STATION SINGLE APPLICATION

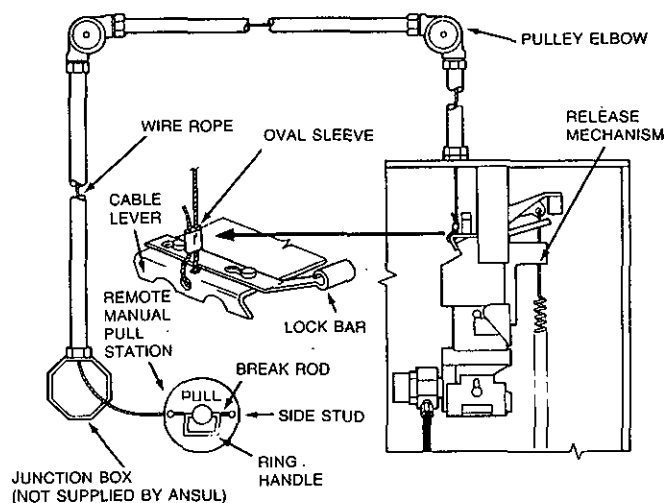


FIGURE 55

REMOTE MANUAL PULL STATION DUAL APPLICATION

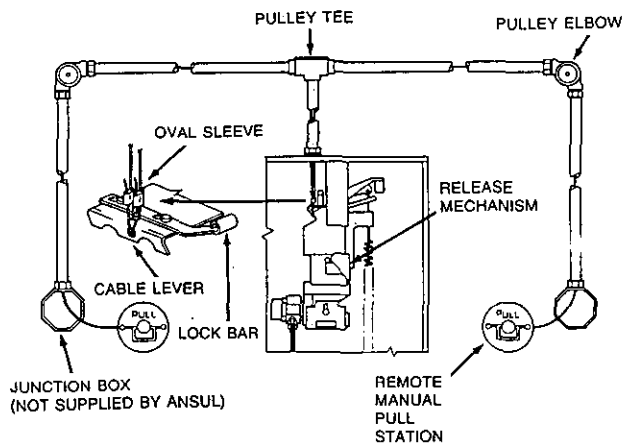


FIGURE 56

6. Feed wire rope from each pull station through conduit and each pulley elbow to cable lever located at regulated release assembly.

NOTICE

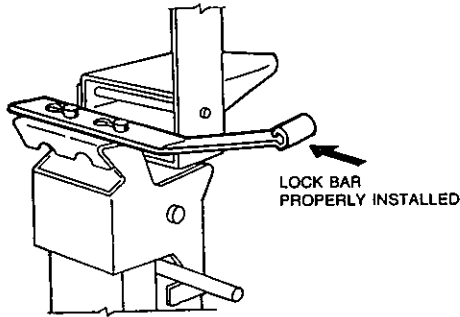
Make certain that wire rope rides on top and in center of pulley sheave. If the 50 ft. (15 m) wire rope has been spliced to accommodate a longer run, do not allow the spliced ends to be within 12 in. (30 cm) of any pulley elbow or conduit adaptor.

7. Fasten pull station assembly to each junction box (if junction box is used).
8. Slide oval crimp sleeve onto wire rope. Loop wire rope through cable lever guide holes and back through the oval crimp sleeve. See Figure 55.
9. Pull slack out of each wire rope and crimp sleeve. (Use the National Telephone Supply Company Nicopress Sleeve Tool Stock No. 51-C-887 or equal to properly crimp stop sleeve.) See Figure 55.

INSTALLING REMOTE MANUAL PULL STATION (Continued)**Molded Plastic Style**

To install a remote manual pull station complete the following steps:

1. Make certain the regulated release assembly enclosure cover is detached and lock bar is properly inserted within the regulated release mechanism. See Figure 57.

**FIGURE 57****NOTICE**

Failure to follow these instructions may lead to system actuation.

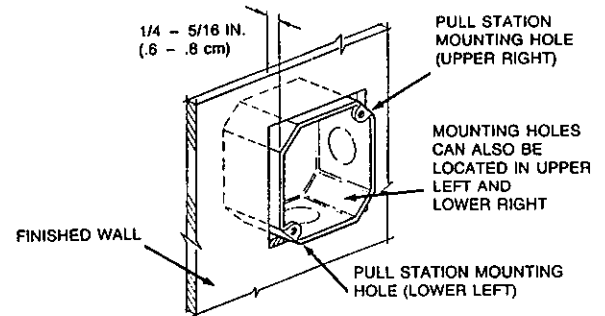
2. Verify cartridge has been removed from regulated release assembly and regulated release assembly is in the cocked position.
3. Select a convenient location in the path of exit for mounting the pull station(s) to the wall. Height and location of pull station should be determined in accordance with authority having jurisdiction.

The total length of the wire rope used for each manual pull station within a system must not exceed 150 ft. (45.7 m).

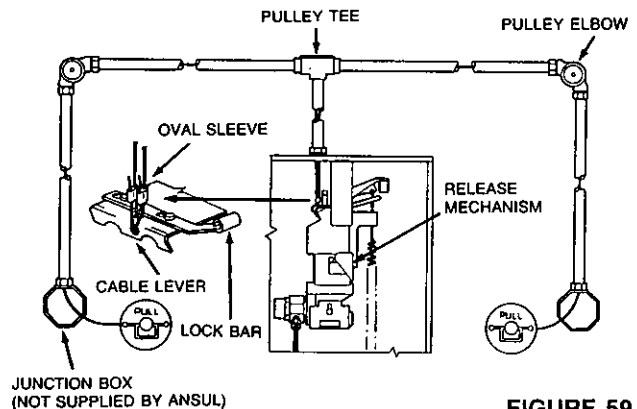
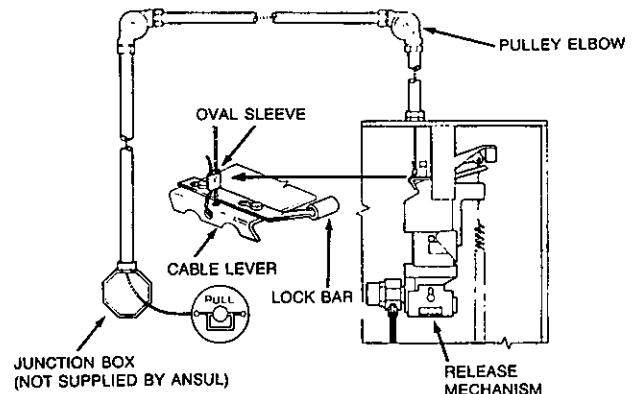
The maximum number of pulley elbows that may be used per system is 20 of the high temperature pulley elbows, Part No. 45771. This is the only style elbow approved for use with this pull station.

Exception: When using a pulley tee, Part No. 15342, in the pull station line, the maximum length of wire rope to each pull station must not exceed 125 ft. (38 m) and the maximum number of elbows must not exceed 18.

4. Pull station can be surface mounted or flush mounted. In either case, a 4 in., octagonal, Raco No. 165 or equal junction box must be used. This style junction box is 2 1/8 in. (5.4 cm) deep, which is required for proper installation of this type pull station. If flush mounted, the junction box must stick out 1/4 to 5/16 in. (.6 to .8 cm) from the finished wall surface to accommodate the trim ring and cover. See Figure 58. The trim ring is used only when the pull station is flush mounted to cover up the hole cut in the wall.

**FIGURE 58**

5. Mount the junction box. Location of mounting holes for pull station cover can be either in the upper right and lower left or upper left and lower right. See Figure 58.
6. Install and secure 1/2 in. conduit, pulley tee (if required), and pulley elbow(s) from each pull station to the regulated release assembly as necessary. See Figure 59. Do not exceed maximum length of wire rope or maximum number of elbows.

**FIGURE 59**

If a pulley tee is used, it must be installed between the regulated release assembly and the first pulley elbow.

7. Select the two mounting bosses on the back of the cover which match up with the mounting holes on the junction box and drill out the blind hole, using a 3/16 diameter drill bit. Attach pull station cover and trim ring (if necessary) to junction box using two, 8-32 x 3/8 in. (.9 cm) long screws (supplied with junction box). Make certain wording on cover is oriented in the correct position. See Figure 60.

INSTALLING REMOTE MANUAL PULL STATION (Continued)
Molded Plastic Style (Continued)

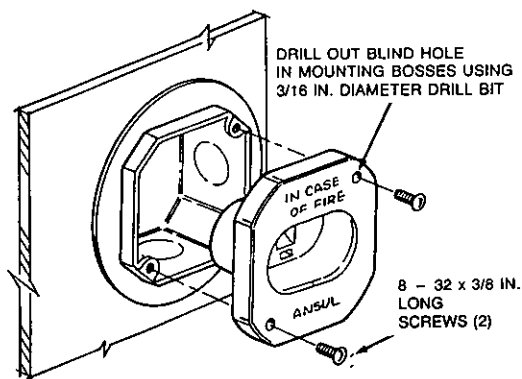


FIGURE 60

8. Feed wire rope from pull station location through conduit and each pulley elbow to the cable lever located in the regulated release assembly.

NOTICE

Make certain the wire rope rides on top and in the center of each pulley sheave. If the wire rope has been spliced, do not allow the spliced ends to be within 12 in. (30 cm) of any pulley elbow or conduit adaptor.

9. Slide oval crimp sleeve, Part No. 4596, over end of wire rope and then loop end of wire rope in groove around pull ring. Insert end of rope through sleeve, snug tightly around pull ring and crimp sleeve. See Figure 61. (Use the National Telephone Supply Company Nicopress Sleeve Tool Stock No. 51-C-887 or equal to properly crimp stop sleeve.)

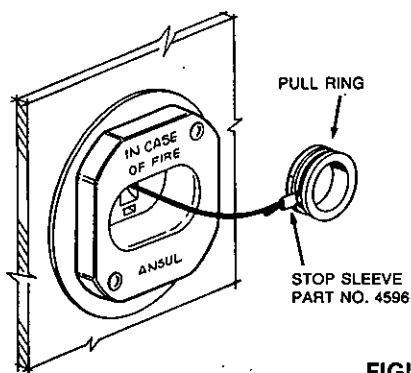


FIGURE 61

10. At the release mechanism, slide oval crimp sleeve onto wire rope. Loop wire rope through cable lever guide holes and back through the oval sleeve. Pull all but 1 to 2 in. (2.5 to 5.1 cm) of slack out of wire rope and crimp sleeve. See Figure 59. (Use the National Telephone Supply Company Nicopress Sleeve Tool Stock No. 51-C-887 or equal to properly crimp stop sleeve.) Cut off excess wire rope.

11. At the pull station, position pull ring vertically in pull station cover, insert break-away seal, Part No. 79029, through holes in cover and snap in place. See Figure 62.

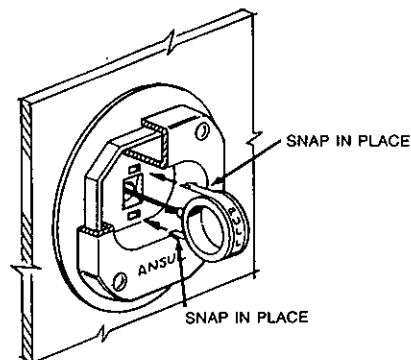


FIGURE 62

INSTALLING MECHANICAL GAS VALVE

To install each Mechanical Gas Shut-off Valve complete the following steps. (All gas valve installation and testing shall be made in accordance with the authority having jurisdiction.)

1. Make certain that regulated release assembly enclosure cover is detached and lock bar is properly inserted in the regulated release mechanism.

NOTICE

Failure to follow these instructions may lead to system actuation.

2. Verify that cartridge has been removed from regulated release assembly and that the regulated release mechanism is in the cocked position.

If regulated release mechanism does not have lock bar inserted or cartridge removed, refer to the "Semi-Annual Maintenance," Page 8-1, in "Maintenance Examination" section, and complete Steps 2 and 3 before completing the following installation steps.

3. Remove plug from cartridge receiver. See Figure 63.

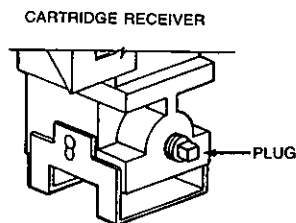


FIGURE 63

INSTALLING MECHANICAL GAS VALVE (Continued)

4. Locate air cylinder and bracket assembly over the two 7/32 in. (.6 cm) holes on right side of the enclosure. Assemble with screws, lockwashers, and nuts. Wrench tighten. See Figure 64. Air cylinder(s) can also be mounted in the inverted position, allowing for direct exit out the knockout(s) in the bottom of the enclosure. See Figure 65.

FOR MOUNTING ONE MECHANICAL GAS VALVE

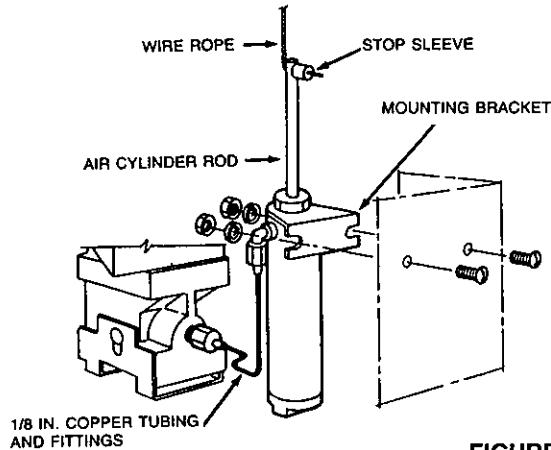


FIGURE 64

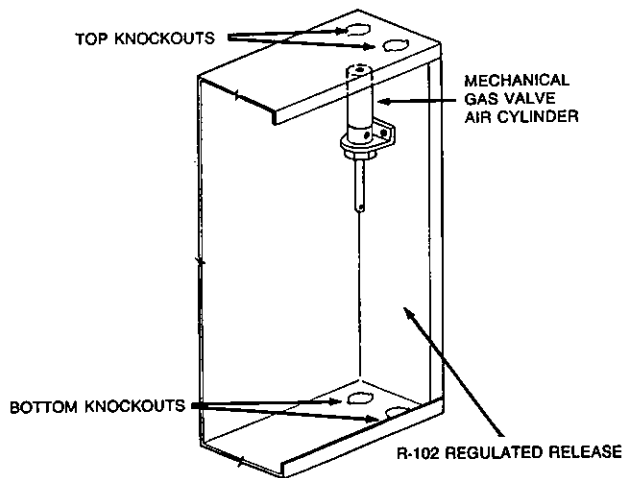


FIGURE 65

If two mechanical gas valves are being attached, complete Step 5. If not, go to Step 6.

5. To install second mechanical gas valve shut-off system, locate second air cylinder and bracket assembly adjacent to first assembly and over the two remaining 7/32 in. (.6 cm) holes provided on right side of the enclosure. Assemble second cylinder with screws, lockwashers, and nuts as required. Wrench tighten. See Figure 66.

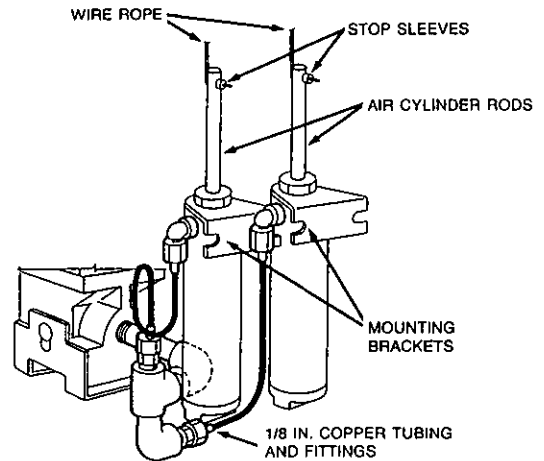


FIGURE 66

6. Install the necessary 1/8 in. copper tubing and fittings for each air cylinder to the accessories piping arrangement on the regulated release mechanism. See Figures 64 and 66.

NOTICE

Do not kink 1/8 in. copper tubing or form a bend too close to a fitting. Secure each fitting without over tightening. Over tightening could result in pressure leakage or line separation at actuation.

7.

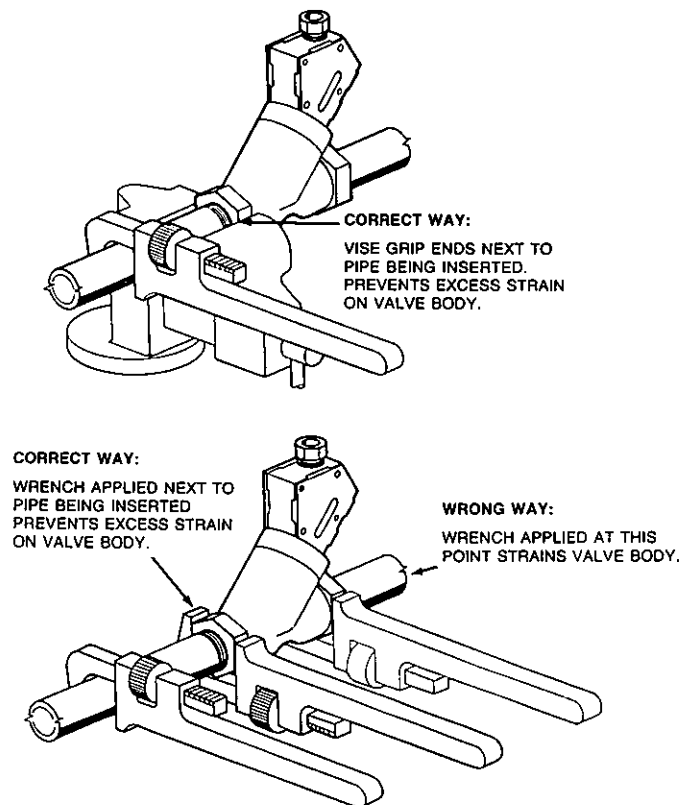
CAUTION

To reduce the risk of explosion due to leaking gas, make certain that the gas line is turned off before connecting the gas valve.

Install mechanical gas valve to its selected location in gas line so that it ensures safe shut-off to all predetermined appliances being protected upon actuation of the system. Mechanical gas valves may be mounted in any convenient horizontal or vertical position. See Figure 67.

- a. Use new pipe, properly reamed and cleaned of metal chips.
- b. Make certain gas flow is in the same direction as arrow shown on gas valve. To avoid cracking the gas valve casting, do not overtighten pipe connections. If pipe tape, paste, spray, or similar lubricant is used, extra care should be taken to avoid overtightening. Apply lubricant to male threads only.
- c. Wrench tighten pipe to gas valve. **DO NOT USE GAS VALVE AS A LEVER WHEN INSTALLING OR VALVE DAMAGE MAY OCCUR.** See Figure 67.
- d. If strainer is utilized, attach strainer ahead of gas valve.
- e. If necessary, install drip leg in gas line in accordance with the authority having jurisdiction.
- f. The total length of wire rope allowed for each valve must not exceed 150 ft. (46 m).
- g. The maximum number of pulley elbows allowed for each gas valve is 20.

INSTALLING MECHANICAL GAS VALVE (Continued) ANSUL MECHANICAL GAS VALVES



ASCO MECHANICAL GAS VALVES

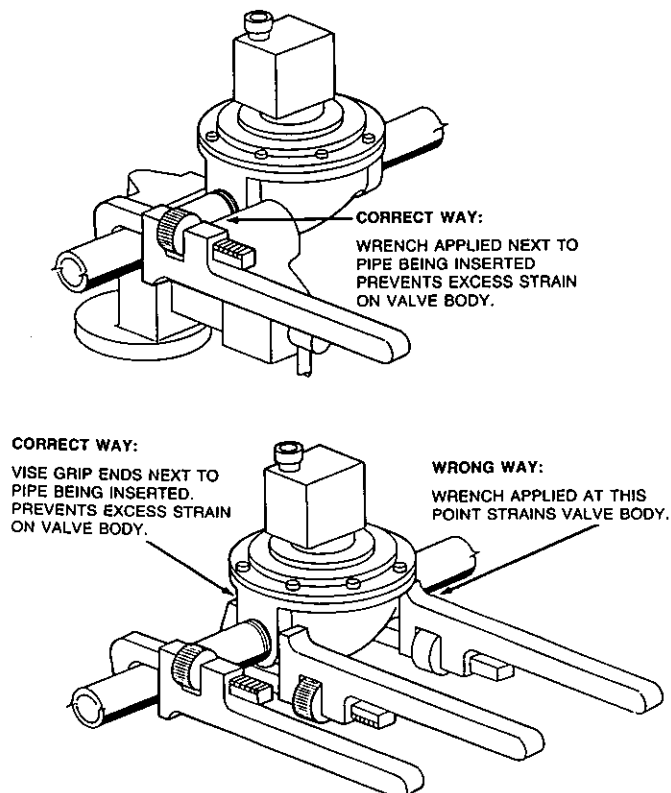


FIGURE 67

8. Install 1/2 in. conduit, and pulley elbow(s) from the mechanical gas valve to regulated release assembly enclosure as necessary.
9. Beginning at the regulated release assembly, thread the end of the wire rope through hole provided in air cylinder rod. See Figure 64.
10. Feed end of wire rope through conduit and each pulley elbow.

Make certain that wire rope rides on top and in center of pulley sheave. If the 50 ft. (15 m) wire rope has been spliced to accommodate a longer run, do not allow the spliced ends to be within 12 in. (30 cm) of any pulley elbow or conduit adaptor.

11. Remove side cover on gas valve and thread end of wire rope through hole in cocking lever. Slide stop sleeve (Part No. 26317) on to wire rope and crimp. (Use the National Telephone Supply Company Nicopress Sleeve Tool Stock No. 51-C-887 or equal to properly crimp stop sleeve.) Make certain crimp is on top of cocking lever, with wire rope curled under lever. See Figure 68.

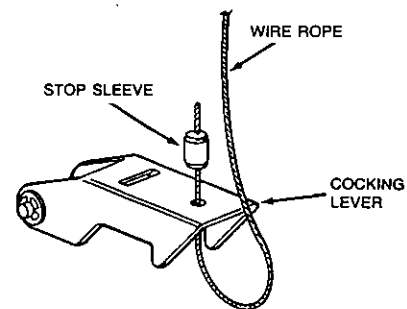
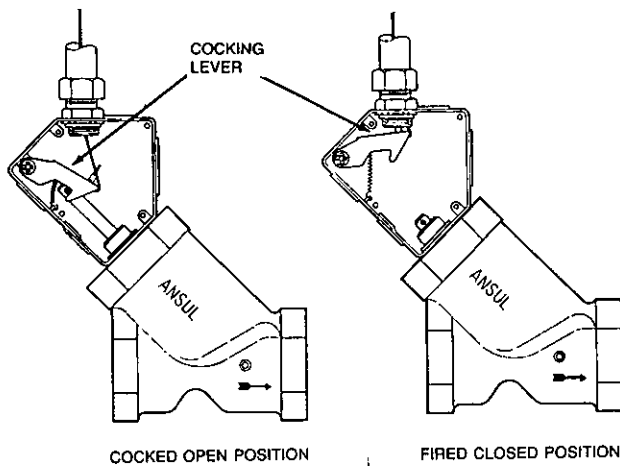
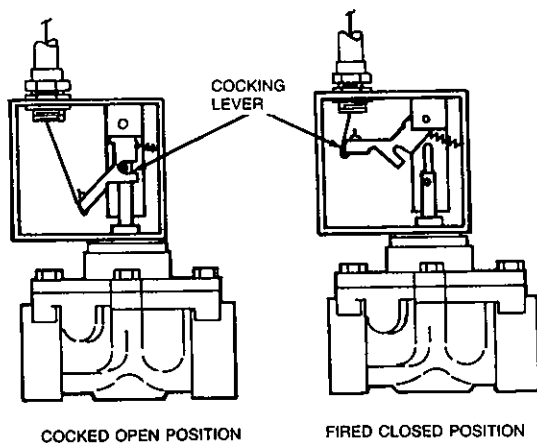


FIGURE 68

12. With the end of wire rope already threaded through hole in air cylinder rod, slide stop sleeve (Part No. 26317) onto wire rope and leave loose. Do not crimp stop sleeve at this time. See Figure 64.

INSTALLING MECHANICAL GAS VALVE (Continued)

13. Cock mechanical gas valve as shown in Figure 69.

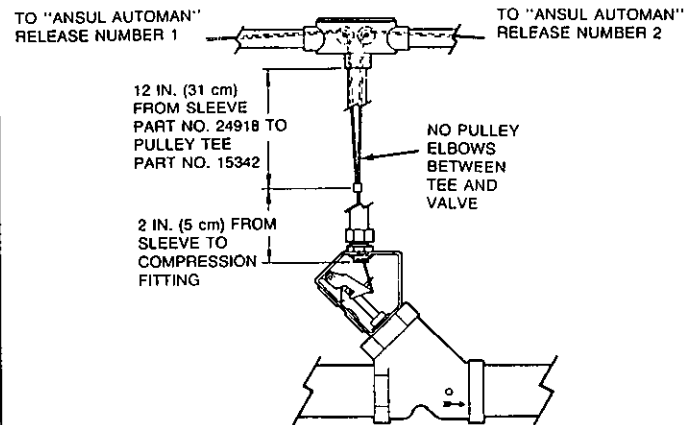
ANSUL MECHANICAL GAS VALVE**ASCO MECHANICAL GAS VALVE****FIGURE 69**

14. Raise air cylinder rod "UP" to its maximum extended position. See Figure 64.
15. Manually pull wire rope to remove excess slack.

NOTICE

DO NOT ACTUATE THE MECHANICAL GAS VALVE. Each Mechanical Gas Valve System must have gas valve cocked and air cylinder rod extended "UP" to its maximum extension before completing next step.

16. Slide stop sleeve against air cylinder rod, make certain all slack is removed from wire, and crimp stop sleeve. See Figure 64.
17. Cut off any excess wire rope approximately 3/4 in. (2 cm) from end of stop sleeve.
18. **NOTE:** If utilizing a pulley tee to operate a single mechanical gas valve from two (2) ANSUL AUTOMAN releases, see Figure 69a for installation instructions. Maximum length of wire rope to each ANSUL AUTOMAN release must not exceed 125 ft. (38 m) and maximum number of elbows must not exceed 18.

**FIGURE 69a****INSTALLING ELECTRICAL GAS VALVES**

The following instructions and schematics illustrate methods of procedures for installing 110 VAC Electric Gas Shut-off Valves.

1. Make certain that regulated release assembly enclosure cover is detached and lock bar is properly inserted within the regulated release mechanism.

NOTICE

Failure to follow these instructions may lead to system actuation.

2. Verify that cartridge has been removed from regulated release assembly and that the regulated release mechanism is in the cocked position.

If regulated release mechanism does not have lock bar inserted or cartridge removed, refer to the "Semi-Annual Maintenance," Page 8 – 1, in "Maintenance Examination" section, and complete Steps 2 and 3 before completing the following installation steps.

3.

CAUTION

To reduce the risk of explosion due to leaking gas, make certain that the gas line is turned off before connecting the gas valve.

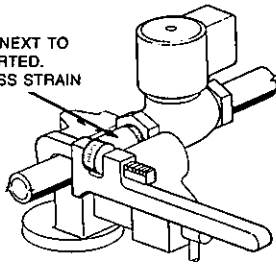
Install each electric gas valve to its selected location in gas line so that it ensures safe shut-off to all predetermined appliances being protected upon actuation of the system. Refer to manufacturer's instructions (if provided). See Figure 70.

- a. Use new pipe properly reamed and clean of metal chips.
- b. Install valve so that the actuator is above the horizontal pipe line with no more than a five degree (5°) lean either way.
- c. Make certain gas flow is in the same direction as arrow shown on gas valve.
- d. If strainer is utilized, attach strainer ahead of gas valve.
- e. If necessary, install drip leg in gas line in accordance with authority having jurisdiction.

INSTALLING ELECTRICAL GAS VALVES (Continued)

CORRECT WAY:

VICE GRIP ENDS NEXT TO
PIPE BEING INSERTED.
PREVENTS EXCESS STRAIN
ON VALVE BODY.



CORRECT WAY:

WRENCH APPLIED NEXT TO
PIPE BEING INSERTED
PREVENTS EXCESS STRAIN
ON VALVE BODY.

WRONG WAY:

WRENCH APPLIED AT THIS
POINT STRAINS VALVE BODY.

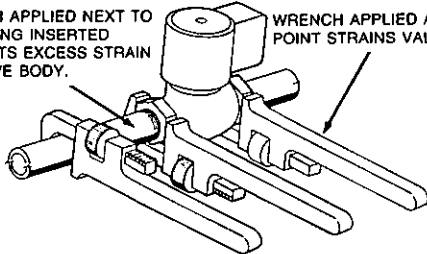


FIGURE 70

4. Install and secure 1/2 in. conduit from each electric gas valve to manual reset relay enclosure.
5. Tag and connect electrical wiring to each electric gas valve. Then, feed wire through conduit to manual reset relay. Tape or place a wire nut on any unused wire leads in accordance with authority having jurisdiction. Refer to Figures in "Design" section for typical wiring diagrams.

6.

CAUTION

Before working on any electrical wiring, make certain main power has been disconnected. Failure to disconnect main power could cause personal injury or death if contact is made with energized wires.

Connect electrical wiring to manual reset relay along with any contactor, or contractor supplied devices needed. Refer to manufacturer's instructions and proper figure listed for assistance.

7. Tape or place a wire nut on any unused wire leads in accordance with authority having jurisdiction.
8. Install and secure 1/2 in. conduit from the regulated release assembly enclosure to manual reset relay enclosure.
If snap-action switches have not been attached, go to "Electric Switch" section on Page 5 – 24 and install them at this time by completing Steps 3 through 8.
9. Tag and connect electrical wiring to each electric (snap-action) switch. Then, feed wire through conduit to manual reset relay.
10. Connect wiring from each electric (snap-action) switch to manual reset relay terminals. Refer to manufacturer's instructions (if provided) and proper figure for assistance.
11. Tape or place a wire nut on any unused wire leads in accordance with authority having jurisdiction.
12. Properly return electrical power to the system.

INSTALLING ELECTRICAL SWITCHES

The procedure for field installing an electric (snap-action) switch is as follows:

1. Make certain that regulated release assembly enclosure cover is detached with lock bar properly inserted within the regulated release mechanism.

NOTICE

Failure to follow these instructions may lead to system actuation.

2. Verify that cartridge has been removed from regulated release assembly and that the regulated release mechanism is in the cocked position. If regulated release mechanism does not have lock bar inserted or cartridge removed, refer to the "Semi-Annual Maintenance," Page 8 – 1, in "Maintenance Examination" section, and complete Steps 2 and 3 before completing the following installation steps.

If regulated release mechanism has a factory installed solenoid, it will also have a factory installed switch.

3. Press each 3-wire plug assembly into the 3-terminals located on the switch. Be sure that the plug is pressed tight against the switch. See Figure 71.

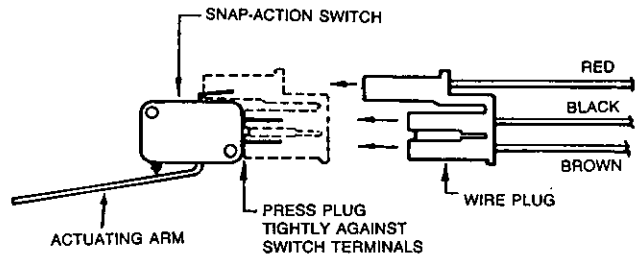


FIGURE 71

4. Insert fastening screws into switch. If switch (Part No. 32220, Four-Pole, Double-Throw or Part No. 415868, 3 pole, Double-Throw) is being used, skip Step 4 and proceed to Step 5. See Figure 72.

Switches, Part No. 15549 and 32222, are provided with two No.4-40 self-tapping screws.

Switch, Part No. 415868, is provided with two No. 4-40 x 1 1/2 in. long machine screws and two No. 4-40 Hex Nuts.

Switch, Part No. 32220, is provided with two No. 4-40 x 2 in. long machine screws and two No. 4-40 hex nuts.

5. To install the three-pole, double-throw switch, Part No. 415868, or the four-pole, double-throw switch, Part No. 32220, it will be necessary to enlarge the bracket mounting holes on the regulated release mechanism. The mounting holes are intended for self-tapping screws. Either drill the holes using No. 33 (1/8 in.) drill bit or tap out holes with a No. 4-40 tap. See Figure 72.

INSTALLING ELECTRICAL SWITCHES (Continued)

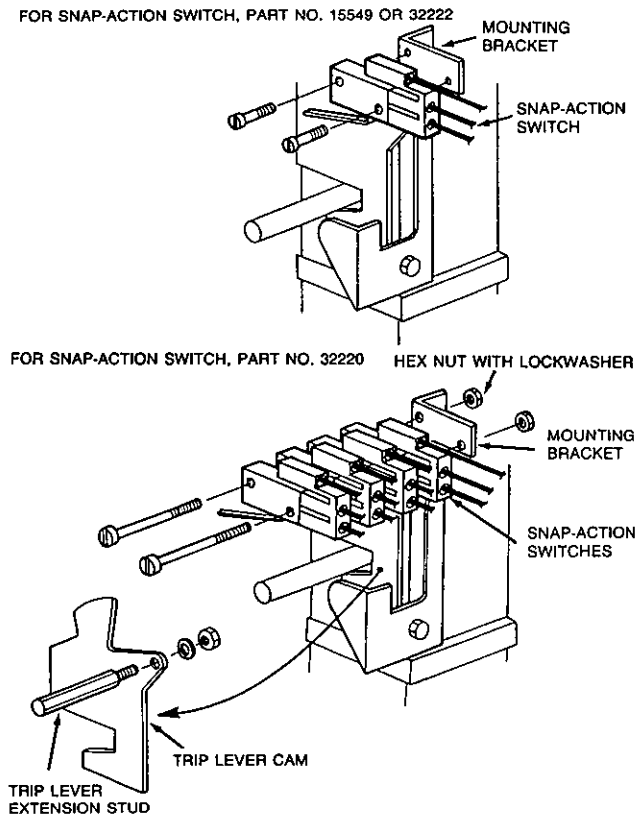


FIGURE 72

6. Install switch to the mounting bracket and tighten securely.
7. Raise switch actuating arm squarely over the cam surface of the trip lever. This will allow the trip lever, when actuated, to force the actuating arm "UP", thus reversing the normal condition of the switch. See Figure 73.

For switch, Part No. 15549, use screw, Part No. 415870, and nut, Part No. 21918, on trip lever.

For switch, Part No. 32222, 415868, and 32220, use the trip lever cam extension stud that is provided.

Before proceeding with Step 8, test electric (snap-action) switches:

- a. Remove lock bar. With the ANSUL AUTOMAN in the cocked or ready position, press the lever of each switch up. If the switch is working properly there should be an audible click.
- b. With the ANSUL AUTOMAN in the fired position, press the lever of each switch up, there should be no audible click.

- c. If an audible click is heard in the fired position several adjustments can be made. The trip lever extension pin can be rotated so the peak of one of the hex points is pointed up against the switch levers. Tighten it in that position. If this doesn't resolve the problem, loosen the screws holding the switches, apply a small counter-clockwise torque on the switches and retighten the screws. If necessary, a final adjustment can be made by removing the snap action switch and bending the lever slightly.
- d. After adjustments repeat steps a and b. Then, recock ANSUL AUTOMAN and install lock bar.

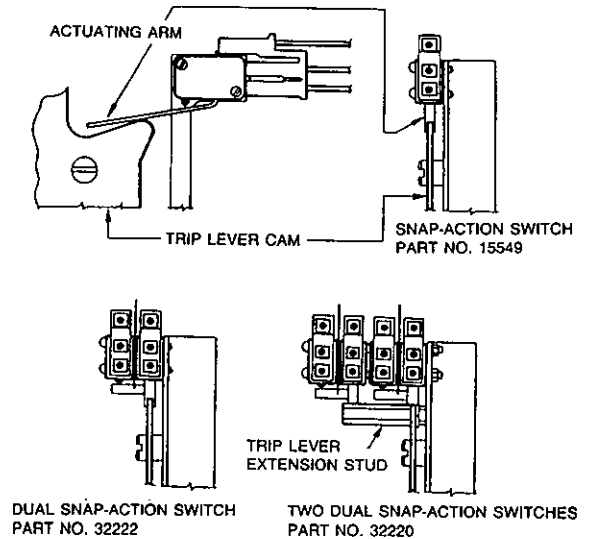


FIGURE 73

8. The switch may now be connected to compatible components that are predetermined to shut off or turn on. Refer to manufacturer's instructions (if provided) for proper wiring connections to compatible components.
9. Tape or place a wire nut on any unused wire leads in accordance with authority having jurisdiction.

NOTICE

Do not connect power source to any relay, contactor, or contractor supplied devices until all other electrical connections are made. Refer to proper section or manufacturer supplied instructions for recommended installation procedures for these devices.

10. Turn off power source and connect power line to any relay, contactor, or contractor supplied devices where used.

INSTALLING PRESSURE SWITCH

The procedure for field installing a pressure switch is as follows:

1. Make certain that regulated release assembly enclosure cover is detached with lock bar properly inserted within the release mechanism.

NOTICE

Failure to follow these instructions may lead to system actuation.

2. Verify that cartridge has been removed from regulated release assembly and that regulated release mechanism is in the cocked position.

If regulated release mechanism does not have lock bar inserted or cartridge removed, refer to the "Semi-Annual Maintenance," Page 8-1, in "Maintenance Examination" section, and complete Steps 2 and 3 before completing the following installation steps.

3. Assemble pressure switch through knockout holes provided on right side of regulated release assembly enclosure and secure with a 1/2 in. nut, which is provided. See Figure 53.

If two pressure switches are required, preassemble the switch enclosures using a 1/2 x 1 1/2 in. pipe nipple, 3/4 in. long spacer, and conduit nuts. The pipe nipple can be used as a wiring chaseway. See Figure 74.

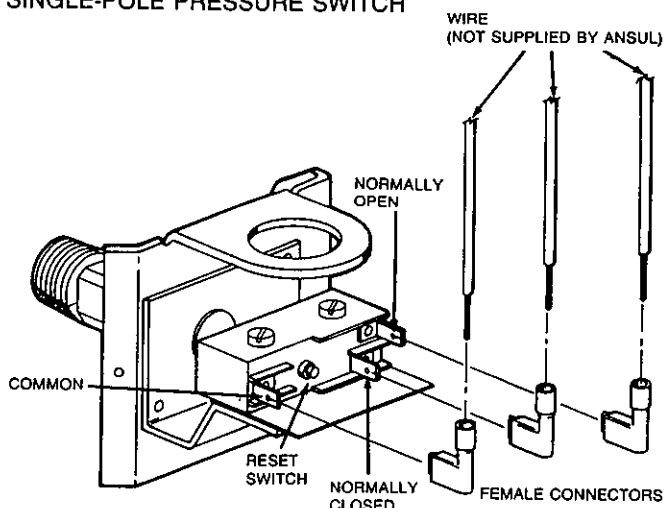
4. For single-tank systems, install a 1/8 in. reducing fitting in the top outlet of the regulator; double-tank systems require an additional 1/4 in. nipple (4 in. long) and a 1/4 in. tee for installation to the expellant gas piping. Attach remaining 1/8 in. fittings as required to facilitate piping requirements for each pressure switch that will be used. See Figure 74.

NOTICE

Do not kink 1/8 in. copper tubing or form a bend too close to a fitting. Secure each fitting without over tightening. Over tightening could result in pressure leakage or line separation at actuation.

5. Wire each pressure switch to other compatible components in accordance with manufacturer's instructions (if provided). A QUALIFIED ELECTRICIAN should connect all electrical components in accordance with authority having jurisdiction. See Figure 75.

SINGLE-POLE PRESSURE SWITCH



DOUBLE-POLE PRESSURE SWITCH

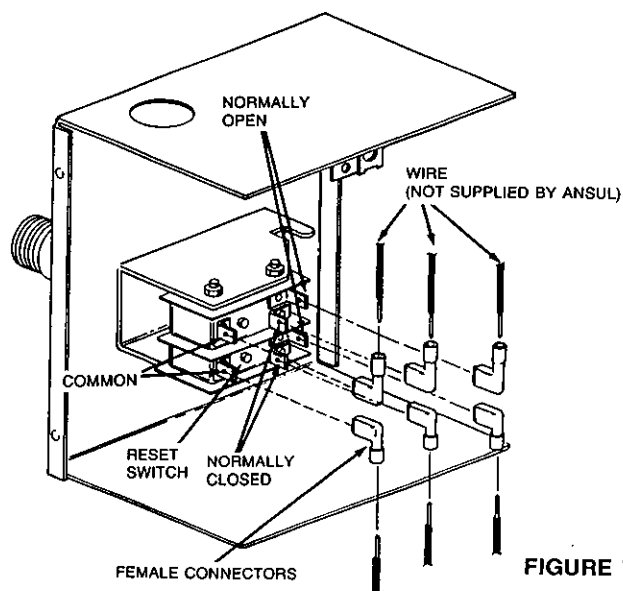
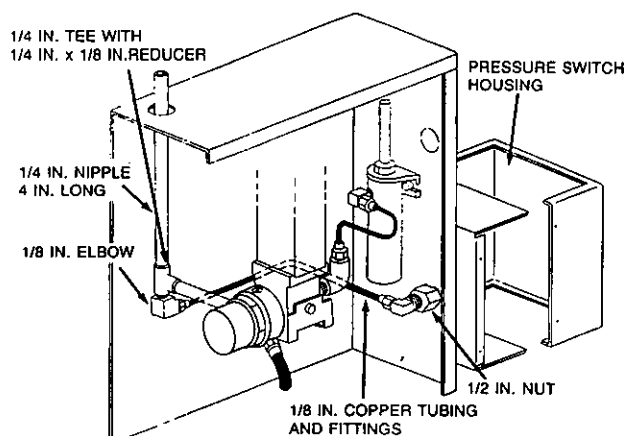


FIGURE 75

FOR MOUNTING ONE PRESSURE SWITCH



FOR MOUNTING TWO PRESSURE SWITCHES

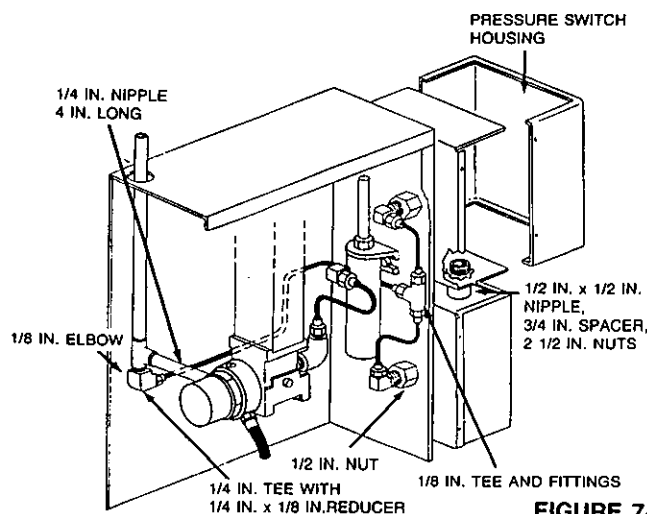


FIGURE 74

After the system has been completely installed, and **BEFORE INSTALLING THE CARTRIDGE**, the system must be tested at the regulated release assembly.

TESTING MANUAL PULL STATION

To test each remote manual pull station, complete the following steps:

1. With the expellant gas cartridge removed, remove lock bar from regulated release assembly cable lever.
2. On metal stamped pull station, remove glass break rod from pull station by removing set screw on side of stud and slide glass break rod out. On molded plastic pull station, seal will be broken during test and must be replaced.
3. Pull ring handle on pull station. If the regulated release assembly is tripped easily, the remote manual pull station is properly installed.
If the regulated release assembly does not trip, remove pulley tee (if provided) and each pulley elbow cover to make certain wire rope is resting on the pulley sheave. If this does not correct the problem, there is too much slack in the line and it must be retightened.
4. Cut off any excess wire rope 3/4 in. (2 cm) above oval sleeve.
5. Recock regulated release assembly using cocking lever (Part No. 14995) and reinstall lock bar (Part No. 14985)
6. On metal stamped pull station, slide glass break rod through stud and ring handle. Tighten set screw into stud. On molded plastic pull station, replace seal.

NOTICE

If no other devices are being attached, proceed to Page 6-4, Step No. 1, and test the detection system.

TESTING MECHANICAL GAS VALVES

To test each mechanical gas shut-off valve complete the following steps:

1.

⚠ WARNING

To reduce the risk of explosion due to leaking gas, before the gas line is turned on, make certain to extinguish any open flames and turn off all burners and any electrical or mechanical devices that are capable of igniting gas.

Turn gas line on.

2. Manually push each air cylinder rod to full "DOWN" position. The gas valve should close. If mechanical gas valve does not trip, remove each pulley elbow cover to make certain wire rope is resting on each pulley elbow sheave. If this does not correct the problem there may be too much slack in the line and it should be retightened.
3. Test for gas leaks by painting connections with a soap solution. Bubbles indicate a gas leak. Tighten connections where leaks appear and repeat test again to make certain no other gas leaks exist.
4. If no gas leak is found, pull air cylinder rod to full "UP" position.
5. Recock mechanical gas valve.

6. Check burners for gaseous odor. **IF GASEOUS ODOR EXISTS, MANUALLY PUSH THE AIR CYLINDER ROD TO THE FULL "DOWN" POSITION IMMEDIATELY.** This will cause the mechanical gas valve to shut the gas line off.

Open any doors and/or windows to clear the area of gaseous fumes, then correct the gas leak before proceeding any further.

7. If no gaseous odor exists, pilot light may be ignited at this time.
8. Reinstall side covers to gas valve housing. Make certain roll pin is positioned within both sides of the valve housing slot. Connect visual inspection seals (Part No. 197) on Ansul type valves. See Figure 1.

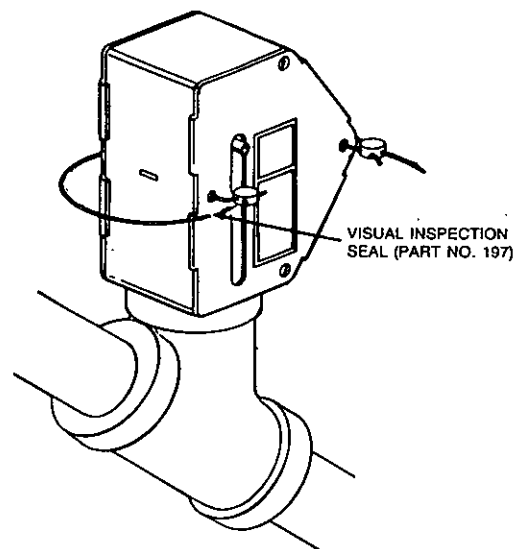


FIGURE 1

9. Make certain the regulated release mechanism is cocked with lock bar in place.

NOTICE

If no other devices are being attached, proceed to Page 6-4, Step No. 1, and test the detection system.

TESTING ELECTRICAL GAS VALVES

To test each Electric Gas Shut-off Valve complete the following steps:

1.

⚠ WARNING

To reduce the risk of explosion due to leaking gas, before the gas line is turned on, make certain to extinguish any open flames and turn off all burners and any electrical or mechanical devices that are capable of igniting gas.

Turn gas line on.

2. Make certain electric (snap-action) switch is properly wired.
3. Make certain all other devices connected to the manual reset relay are properly wired. Refer to typical wiring diagrams in Figures 80, 81, and 82 in "Design" section.
4. Test for gas leaks by painting connections with a soap solution. Bubbles indicate a gas leak. Tighten connections where leaks appear. Repeat test again to make certain no other gas leaks exist.
5. If no gas leaks are found, turn power source on and depress the reset button on the manual reset relay (RED LIGHT ON) to energize (OPEN) electric gas valve.
6. Remove lock bar from regulated release mechanism.

- ⚠ CAUTION**

Do not install cartridge at this time or system may be actuated.

7. Manually actuate the system by operating the remote pull station. (It may be necessary to remove the glass break rod prior to operating pull station.) Manual reset relay (RED LIGHT OUT) will de-energize (CLOSE) the electric gas valve, thus shutting off the gas line. If this does not happen, turn power source off. Then re-examine all wiring connections for proper hookup. Refer to Figures 80, 81, and 82 in "Design" section for typical wiring diagram.
8. If test is successful, recock regulated release mechanism using cocking lever (Part No. 14995) and reinstall lock bar (Part No. 14985). Depress reset button on manual reset relay (RED LIGHT ON).
9. Check burners for gaseous odor. **IF GASEOUS ODOR EXISTS, TURN OFF POWER SOURCE IMMEDIATELY.** This will cause the electric gas valve to shut the gas line off. Open any doors and/or windows to clear the area of gaseous fumes, then correct the gas leak before proceeding any further.
10. If no gaseous odor exists, pilot light may be ignited at this time.

NOTICE

If no other devices are being attached, proceed to Page 6-4, Step No. 1, and test the detection system.

TESTING ELECTRIC SWITCH

The procedure for testing a field installed Electric (Snap-Action) Switch is as follows:

NOTICE

If an electrical gas shut-off valve is attached to system, perform proper test procedure for the gas valve first, before completing the following steps.

1. Turn power source on and if installed, depress reset button on manual reset relay (RED LIGHT ON). All electrical devices should be operating at this time.
2. Remove lock bar.

- ⚠ CAUTION**

Do not install cartridge at this time or system may be actuated.

3. Manually actuate the system by operating the remote pull station. It may be necessary to remove the glass break rod prior to operating pull station. (If installed, the manual reset relay will de-energize the electric gas valve, thus shutting off the gas line.) All electrically-operated devices predetermined to shut off or turn on should do so. If this does not occur, turn power source off and make sure all wiring is properly connected and retest. Refer to Figures 84, 85, and 86 in "Design" section for typical wiring diagram.
4. If test is successful, recock regulated release mechanism using cocking lever (Part No. 14995) and reinstall lock bar (Part No. 14985). If a manual reset relay is installed, depress the reset button (RED LIGHT ON). It will also be necessary to re-light any pilot lights on the cooking appliances.

NOTICE

If no other devices are being attached, proceed to Page 6-4, Step No. 1, and test the detection system.

TESTING PRESSURE SWITCH

The procedures for testing a field installed pressure switch is as follows:

NOTICE

This test should only be performed by a **QUALIFIED ELECTRICIAN**.

If an electrical gas shut-off valve is attached to system, perform proper test procedure for the gas valve first, before completing the following steps.

1. Make certain power source is turned off.
2. Push each pressure switch reset button on front of switch housing assembly. An audible click may be heard at this time depending on which condition the switch is in. See Figure 2.

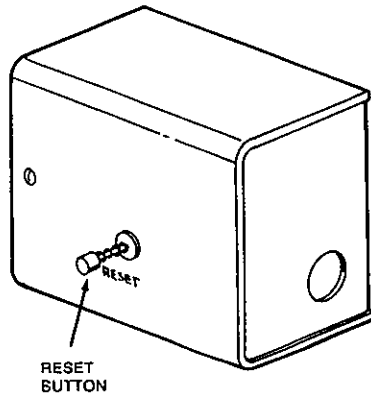


FIGURE 2

3. Detach each pressure switch cover from housing assembly.
4. By use of an ohmmeter, verify that contacts are in their normal (READY) condition. Contact conditions are marked on switch. See Figure 3.

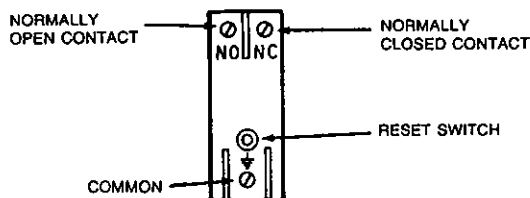


FIGURE 3

5. Manually lift up on each pressure plate or pressure nut. An audible click should be heard at this time. The sound verifies that the switch has transferred to an actuated condition. See Figure 4.

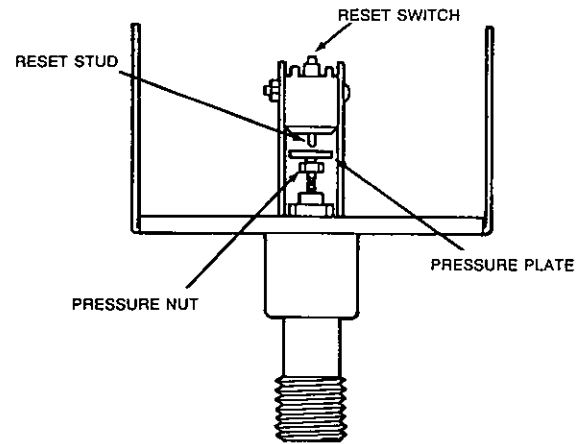


FIGURE 4

6. By use of an ohmmeter, verify that contacts are in their actuated condition. (Normally open is now closed and normally closed is now open.)
7. Reattach pressure switch cover to housing assembly.
8. Push each reset button to resume normal (READY) condition. An audible click should be heard at this time.
9. Turn power source on.
10. Make certain regulated release mechanism is cocked with lock bar in place.

NOTICE

If no other devices are being attached, proceed to Page 6-4, Step No. 1, and test the detection system.

TESTING DETECTION SYSTEM

1. Test detection system by completing the following steps:
 - a. Raise the regulated release mechanism tension lever to the "UP" position.
 - b. Remove the fusible link from the terminal detector and install a test link (Part No. 15751). See Figure 5.

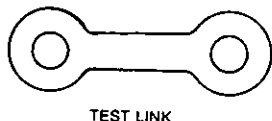


FIGURE 5

- c. Locate detector linkage and center in each bracket.
For "clip on" style linkage, locate linkage in bracket slightly toward termination end of detection run.
For "scissor" style linkage, locate linkage in bracket all the way toward termination end of detection run.
 - d. Lower regulated release mechanism tension lever to "DOWN" position and remove lock bar.
 - e. Using a wire cutter, cut the test link at the terminal detector to simulate automatic actuation.
 - f. If system actuates successfully, go to Step 4.
 2. If the regulated release mechanism does not actuate, check the following components and remedy any disorder as follows:
 - a. Check the detector linkage for correct positioning.
 - b. Check the wire rope for knotting or jamming.
 - c. Check pulley elbows to see that wire rope is free and centered in pulley sheaves. If any evidence of pulley elbow deformation is found, replace the pulley elbow.
 - d. Make certain that lock bar is removed.
 - e. Make certain that regulated release mechanism is cocked.
 - f. Make certain that tension lever is in "DOWN" position.
 3. Re-test the system by completing the following steps:
 - a. Make certain regulated release is cocked and lock bar is inserted.
 - b. Raise the regulated release mechanism tension lever to the "UP" position.
 - c. Install a new test link (Part No. 15751) on the terminal detector.
 - d. Lower the regulated release mechanism tension lever to the "DOWN" position.
 - e. Check for 1/4 in. (6.4 mm) minimum clearance between the trip hammer assembly and the cable lever assembly.
 - f. Remove the lock bar.
 - g. Using a wire cutter, cut the test link at the terminal detector to simulate automatic actuation.

4. Upon successful actuation of the system, complete the following steps:
 - a. Raise tension lever to "UP" position and install a properly-rated fusible link in the terminal detector.
 - b. Cock regulated release mechanism using cocking lever (Part No. 14995) and insert lock bar (Part No. 14985).
 - c. Lower tension lever to "DOWN" position.
 - d. Locate detector linkage and center in each bracket.
For "clip on" style linkage, locate linkage in bracket slightly toward termination end of detection run.
For "scissor" style linkage, locate linkage in bracket all the way toward termination end of detection run.
 - e. Make certain the 1/4 in. (6.4 mm) minimum clearance was maintained between the base of the trip hammer assembly and the cable lever assembly.

NOTICE

Reset any electrical equipment that may have been affected by the system actuation.

- f. Install appropriate cartridge into the regulated release mechanism receiver and each regulated actuator receiver. Hand tighten firmly.
 - g. Remove the lock bar.
 - h. Snap cover on regulated release assembly and each regulated actuator assembly, insert visual seal (Part No. 197) in each upper and lower cover hole and secure.
 - i. Record installation date on tag attached to unit and/or in a permanent file.

For continued fire protection, the R-102 restaurant fire suppression system must be recharged immediately after use. Recharge procedures for single, double, and multiple-tank systems are as follows.

RECHARGE

NOTICE

Determine the cause of system discharge and correct immediately before performing system recharge.

1. Remove the enclosure cover from the ANSUL AUTOMAN regulated release assembly and each regulated actuator assembly.
2. From tank in regulated release enclosure: Disconnect the expellant gas hose from each tank adaptor assembly.
From tank in mounting bracket or mounting enclosure: Disconnect expellant gas piping union at each tank adaptor inlet line(s).
3. Disconnect distribution piping union at each tank adaptor outlet line(s).
4. From tank in enclosure: Remove tank.
From tank in bracket assembly: Loosen wingnut, disengage bracket band, and remove each tank.
5. Remove each tank adaptor/tube assembly. Remove O-ring and inspect for damage. Clean and coat O-ring with a good grade of extreme temperature grease and reinstall into adaptor groove. See Figure 1.

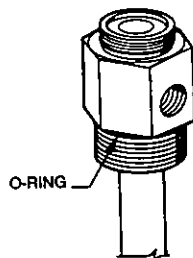


FIGURE 1

6.

CAUTION

Do not flush pipe with only water or other non-approved material, as this could cause internal corrosion, leading to possible improper discharge.

Piping system must be flushed to remove any wet chemical residue. To prepare the system for flushing:

- a. Pour the complete contents of one 4 oz. bottle of Ansul Flushing Concentrate (Part No. 79656) into an empty R-102 agent tank. One complete bottle is used for either size tank, the 1.5 gallon or the 3.0 gallon.
- b. Fill the tank approximately half full with warm, clean water. Agitate the tank for a few seconds and then add more warm water to bring the fill level to within approximately 1 in. (2.5 cm) from the bottom of the fill opening.

- c. Install adaptor/tube assembly and tighten.
 - d. At expellant gas line inlet to adaptor/tube assembly, install a 1/4 in. male quick connect adaptor.
 - e. Connect nitrogen cylinder outlet hose to the male quick connect adaptor using the female portion of the adaptor assembly.
7. To perform the flushing procedure, either secure heavy-duty plastic bags to each nozzle (See Figure 2) or remove each nozzle tip and strainer and attach plastic tubing. See Figure 3.
- If using plastic bags, secure bags and proceed to Step 9.
- If using plastic tubing, proceed to Step 8.

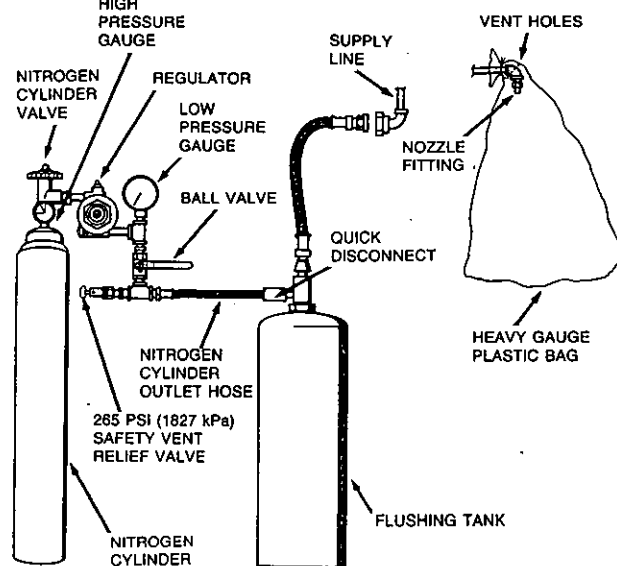


FIGURE 2

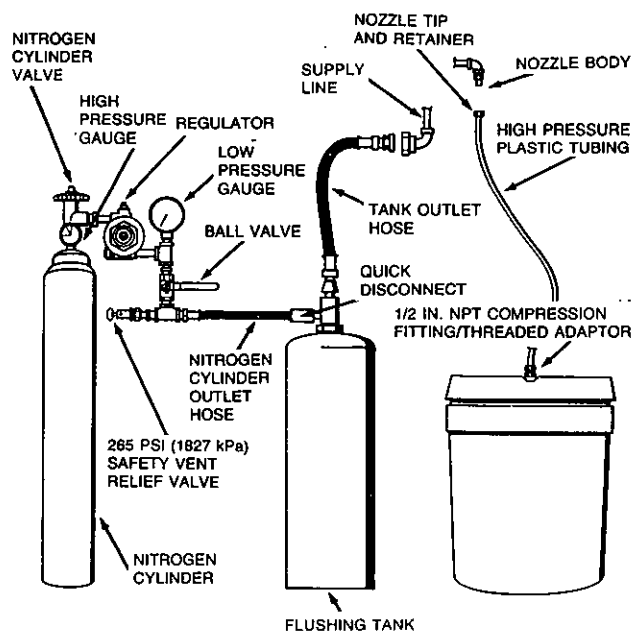


FIGURE 3

RECHARGE (Continued)

8. If using the plastic tubing option, utilize 1/2 in. (1.3 cm) O.D. plastic tubing with wall thickness not to exceed .062 in. (1.6 mm), and make certain it can withstand the pressures of at least 90 PSI (620.6 kPa) expelled during the flushing and blowdown procedures.

Also required is a container with some means of securing tubing to it such as a five-gallon plastic pail and cover that snaps onto the pail.

To prepare the plastic tubing:

- Cut as many tubing lengths as required, making them long enough to reach the container from each nozzle outlet.
- Using a 1N nozzle tip and retainer, (Part No. 56930), slide a length of 1/2 in. (1.3 cm) plastic tubing over the rib on the nozzle tip and secure with a 1/2 in. (1.3 cm) adjustable hose clamp. See Figure 4. This nozzle tip will be connected to the nozzle body left installed in the distribution piping.
- In the pail cover, drill the number of holes required, large enough to insert 1/2 in. NPT fittings, with one additional hole that can be used for venting.
- Secure 1/2 in. compression fitting/threaded adaptors to the pail cover, using 1/2 in. conduit nuts. See Figure 4.

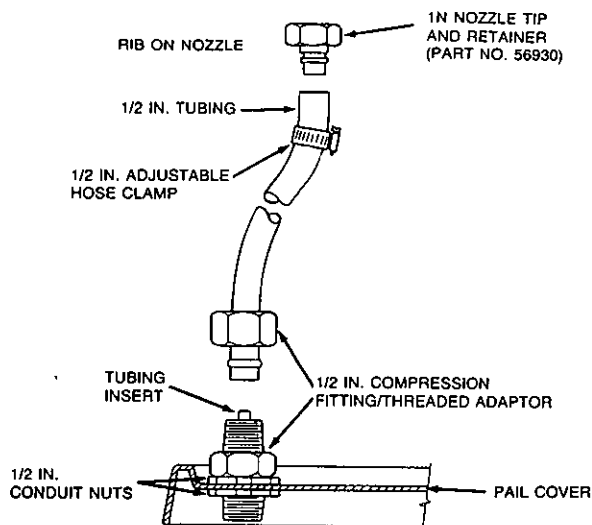


FIGURE 4

- Attach the tubing ends to the compression fittings. Tubing inserts will be required. See Figure 4.
- Install nozzle/tubing ends to nozzle bodies in discharge piping.
- Make certain each length of tubing is fastened to the pail cover with the cover snapped securely to the pail.

9. Complete the following steps in the flushing procedure:
- Connect discharge hose, from the flushing tank, to the distribution piping at the tank union.

b.

CAUTION

Before attempting any further procedures, the nitrogen cylinder assembly and flushing agent tank must be secured to an immovable object to prevent an accident due to hazardous cylinder and/or tank movement.

Secure both the nitrogen cylinder and discharge tank.

- Make certain that the nitrogen cylinder valve and the ball valve is **CLOSED**.
 - Verify that all hose and/or tubing is securely fastened.
 - With the regulator set at 100 PSI (690 kPa), open the nitrogen cylinder valve.
 - Open ball valve to pressurize and discharge the solution in the tank.
 - After all nozzles have stopped discharging liquid, allow nitrogen gas to flow for a minimum of 15 seconds, then close ball valve.
 - Close nitrogen cylinder valve.
 - Relieve pressure between ball valve and cylinder valve by opening ball valve.
 - After all pressure has been relieved from piping, disconnect all hoses and tubing/plastic bags.
 - Follow the same procedures for each additional tank piping to be flushed.
 - Wash out all system nozzle tips and strainers in warm soapy water, rinse and return all tips and strainers to their appropriate locations in the discharge piping.
 - Wash out nozzle tips used for blowdown and rinse out tubing and hose.
10. Fill each tank with 1.5 (5.8 L) or 3.0 gallons (11.6 L) of only ANSULEX Low pH Liquid Fire Suppressant.

CAUTION

Make certain tank is filled to 1 in. $\pm$ 1/8 in. (2.54 cm $\pm$.3 cm). During filling, the agent temperature should be 60 °F to 80 °F (16 °C to 27 °C). **DO NOT FILL WITH COLD AGENT. DO NOT OVERFILL.** Overfilling may result in agent entering gas hose and regulator potentially causing system malfunction.

- Replace bursting disc, Part No. 416974, in adaptor assembly. Make certain silver side of disc is away from tank.
- Replace adaptor/tube assembly and tighten into place. Return and secure each tank in regulated release assembly and mounting bracket/enclosure. Reconnect expellant gas and distribution piping as required.
- Raise tension lever to "UP" position.
- Cock regulated release mechanism using cocking lever (Part No. 14995) and install lock bar (Part No. 14985).

RECHARGE (Continued)

15. Remove empty cartridge from regulated release assembly and each regulated actuator assembly as required.

CAUTION

Do not install replacement cartridge at this time or system may be actuated.

16. Install properly-rated fusible links in all detectors except the terminal detector.

NOTICE

If actuation was caused by a fire situation, all fusible links must be replaced.

17. Install test link (Part No. 15751) in terminal detector.
18. Lower tension lever to "DOWN" position.
19. Remove the lock bar.
20. Using wire cutter, cut the test link at the terminal detector to simulate automatic actuation.

NOTICE

If regulated release mechanism does not actuate, refer to Steps 2 and 3 of the "Testing Detection System" portion of the "Testing and Placing In Service" section, Page 6-4, of this manual.

21. After successful actuation, raise the tension lever to "UP" position.
22. Install properly-rated, Ansul approved, fusible link in terminal detector.
23. Cock the regulated release mechanism and install lock bar (Part No. 14985).
24. Locate detector linkage and correctly position in each bracket.
25. Lower tension lever to "DOWN" position.
26. Inspect the base of the wire rope clamping device to make certain there is a minimum of 1/4 in. (6.4 mm) clearance between the base of the trip hammer assembly and the cable lever assembly.

NOTICE

If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever to "UP" position, raise trip hammer 3/8-1/2 in. (9.5-12.7 mm), tighten set screws, and repeat Steps 25 and 26.

27. Remove lock bar.
28. Manually test the regulated release mechanism by operating the remote manual pull station.
29. Recock the regulated release mechanism and insert the lock bar.
30. Reset all devices which were affected by the system actuation. Refer to "Resetting" section, Page 7-3 and 7-4.

RESETTING

Resetting Remote Manual Pull Station

Metal Stamped Style

Reset each remote manual pull station by completing the following steps:

1. If necessary, remove set screw that is retaining the break glass rod.
2. If necessary, carefully remove any remaining broken glass from station.
3. Press and position ring handle in proper location against cover and slide the replacement glass break rod (Part No. 4834) through stud and handle.
4. Tighten set screw into stud.
5. If no other resetting is required, refer to "Cartridge Replacement," Page 7-4, and complete steps 1 through 5.

Molded Plastic Style

1. Position pull ring in vertical groove of pull station cover.
2. Insert break-away seal, Part No. 79029, through holes in cover and snap in place.

Resetting Mechanical Gas Shut-Off Valve

Reset each mechanical gas shut-off valve by completing the following steps:

CAUTION

To reduce the risk of explosion due to leaking gas, before the gas line is turned on, make certain to extinguish any open flames and turn off all burners and any electrical or mechanical devices that are capable of igniting gas.

1. Remove side cover from gas valve housing.
2. Extend air cylinder rod to full "UP" position. Air cylinder is located inside the regulated release assembly enclosure.
3. Recock gas valve by pulling valve stem up so pin in stem engages in cocking lever.
4. Check burners for gaseous odor. **IF GASEOUS ODOR EXISTS, MANUALLY PUSH THE AIR CYLINDER ROD TO THE FULL "DOWN" POSITION IMMEDIATELY.** This will cause the mechanical gas valve to shut the gas line off. Open any doors and/or windows to clear the area of gaseous fumes, then correct the gas leak before proceeding any further.
5. If no gaseous odor exists, pilot light may be ignited at this time.
6. Reinstall side cover to gas valve housing. On Ansul type valve, make certain roll pin is positioned within both sides of the valve housing slot and secure visual inspection seal (Part No. 197).
7. If no other resetting is required, refer to "Cartridge Replacement," Page 7-4, and complete steps 1 through 5.

RESETTING (Continued)

Resetting Electrical Switch (Snap-Action)

Reset the electric (snap-action) switch by completing the following steps:

1. Make certain the power source is on.
2. Electric (snap-action) switch is reset automatically when the regulated release mechanism is recocked.
3. If no other resetting is required, refer to "Cartridge Replacement," Page 7-5, and complete steps 1 through 5.

Resetting Electrical Gas Shut-Off Valve

Reset each electric gas shut-off valve by completing the following steps:

⚠ CAUTION

To reduce the risk of explosion due to leaking gas, before the gas line is turned on, make certain to extinguish any open flames and turn off all burners and any electrical or mechanical devices that are capable of igniting gas.

1. Make certain the power source is on.
2. Depress reset button on manual reset relay (red light on). Gas valve will resume its normal operating (open) position.
3. Check burners for gaseous odor. **IF GASEOUS ODOR EXISTS, TURN OFF POWER SOURCE IMMEDIATELY.** This will cause the electric gas valve to shut the gas line off. Open any doors and/or windows to clear the area of gaseous fumes, then correct the gas leak before proceeding any further.
4. If no gaseous odor exists, pilot light may be ignited at this time.
5. If no other resetting is required, refer to "Cartridge Replacement," Page 7-5, and complete steps 1 through 5.

Resetting Pressure Switch

Reset the pressure switch by completing the following:

1. Depress the reset button(s) on the pressure switch cover. The pressure switch assembly(ies) is located on the right side of the regulated release enclosure. An audible click will be heard to verify the pressure switch has resumed its normal (non-actuated) condition.
2. If no other resetting is required, refer to "Cartridge Replacement," Page 7-5, and complete steps 1 through 5.

REPLACEMENT CARTRIDGE

To complete the recharge and resetting procedures:

1. Remove shipping cap and weigh replacement cartridge. Replace if weight is 1/2 ounce (14.2 g), or more, below weight stamped on cartridge.
2. Make certain regulated release mechanism is cocked and lock bar is installed. Then, install replacement cartridge into the regulated release assembly and each regulated actuator receiver and hand tighten.
3. Remove lock bar.
4. Snap cover on regulated release and each regulated actuator assembly, insert visual seal (Part No. 197) in upper and lower cover hole and secure.
5. Record recharge date on tag attached to unit and/or in a permanent file.

Maintenance is required semi-annually. At the 12 year interval, along with the normal maintenance exam, the tank(s) must be hydro-tested and the regulator(s) must be flow tested.

SEMI-ANNUAL MAINTENANCE EXAMINATION

Semi-annual maintenance procedures for single, double, and multiple-tank systems are as follows.

NOTICE

Under certain circumstances hood and duct cleaning operations may render the fire suppression system ineffective due to a coating of cleaning chemical left on the detection equipment or mishandling of the system by cleaning service personnel. Therefore, it is **strongly recommended that the R-102 system be completely inspected and serviced by an authorized Ansul distributor immediately following any such cleaning operations.**

1. Remove the enclosure cover from the ANSUL AUTOMAN regulated release assembly and each regulated actuator assembly.
2. Insert the lock bar (Part No. 14985) on the cocked regulated release mechanism. See Figure 1.

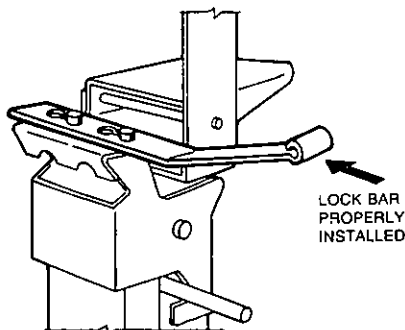


FIGURE 1

3. Remove cartridge from regulated release assembly and each regulated actuator assembly, install safety shipping cap, and set aside in a safe location.
4. Remove gasket from cartridge receiver in regulated release mechanism and each regulated actuator. Check gasket for elasticity or cuts and replace if necessary. Clean and coat gasket lightly with a good grade of extreme temperature grease. Reinstall gasket into cartridge receiver(s).
5. From tank in regulated release assembly: Disconnect the expellant gas hose from each tank adaptor assembly.
 From tank in bracket/enclosure assembly: Disconnect the expellant gas piping union at each tank adaptor inlet line.
6. Disconnect distribution piping union at each tank adaptor outlet line.

7. From tank in enclosure: Remove tank. Keep in upright position to avoid spilling the agent.

From tank in bracket assembly: Loosen wingnut, disengage bracket band, and remove each tank. Keep tank in upright position to avoid spilling the agent.

8. Remove tank adaptor/tube assembly from each tank. See Figure 2.

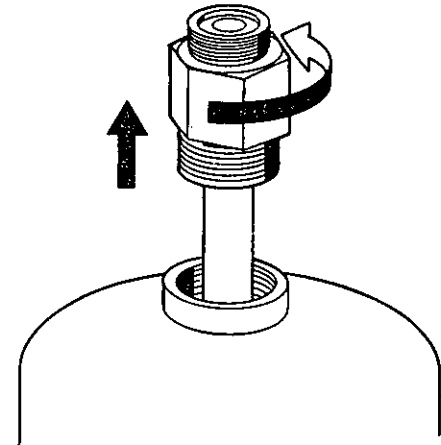


FIGURE 2

9. Make certain that each tank is filled to a level of 1 in. $\pm$ 1/8 (2.54 cm $\pm$.3) from the bottom of the fill opening. See Figure 3.

CAUTION

Make certain tank is filled to 1 in. $\pm$ 1/8 in. (2.54 cm $\pm$.3 cm). During filling, the agent temperature should be 60 °F to 80 °F (16 °C to 27 °C). **DO NOT FILL WITH COLD AGENT. DO NOT OVERFILL.** Overfilling may result in agent entering gas hose and regulator potentially causing system malfunction.

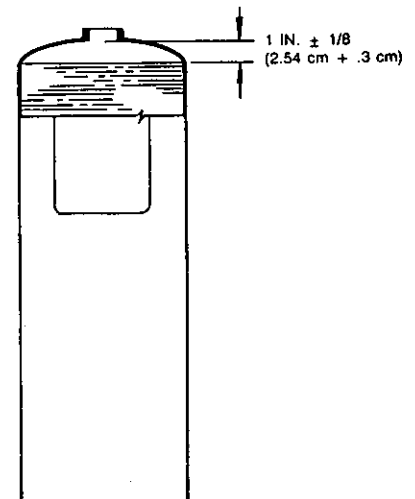


FIGURE 3

SEMI-ANNUAL MAINTENANCE EXAMINATION (Continued)

10. Examine threads on each tank adaptor and tank collar for nicks, burrs, or cross-threading. Clean and coat O-ring with a good grade of extreme temperature grease. Make certain bursting disc is in place and silver side is away from tank. Clean seating surface and return adaptor/tube assembly to each tank. Tighten securely. See Figure 4.

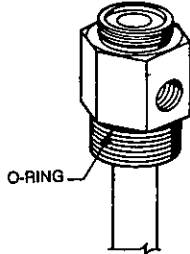


FIGURE 4

11. Place fully charged tanks in enclosures and/or brackets and secure.
12. Carefully assemble and wrench tighten all expellant gas and agent distribution piping.
13. Remove blow-off caps from nozzles. Inspect each blow-off cap and replace if deteriorated. On metal blow-off caps, make certain spring clip rotates freely on cap.

NOTICE

Rubber blow-off caps that have been installed in the system for one year or more must be replaced.

14. Check all nozzles to ensure that they are free of cooking grease build-up and have a covering of clean silicone grease on the orifice. Reinstall blow-off caps.
15. Remove the lock bar and manually test the regulated release assembly by operating the remote manual pull station. Check pull station cover for damage or wear. Replace cover if cable has worn a groove in the cover as deep as the diameter of the cable.
16. Cock the regulated release mechanism using cocking lever (Part No. 14995). See Figure 5.

Before proceeding with Step 18, test electric (snap-action) switches:

- a. With the ANSUL AUTOMAN in the cocked or ready position, press the lever of each switch up. If the switch is working properly, there should be an audible click.
- b. With the ANSUL AUTOMAN in the fired position, press the lever of each switch up, there should be no audible click.
- c. If an audible click is heard in the fired position several adjustments can be made. The trip lever extension pin can be rotated so the peak of one of the hex points is pointed up against the switch levers. Tighten it in that position. If this doesn't resolve the problem, loosen the screws holding the switches, apply a small counter-clockwise torque on the switches and retighten the screws. If necessary, a final adjustment can be made by removing the snap action switch and bending the lever slightly.

- d. After adjustments, repeat Steps a. and b. Then, recock ANSUL AUTOMAN and insert lock bar.

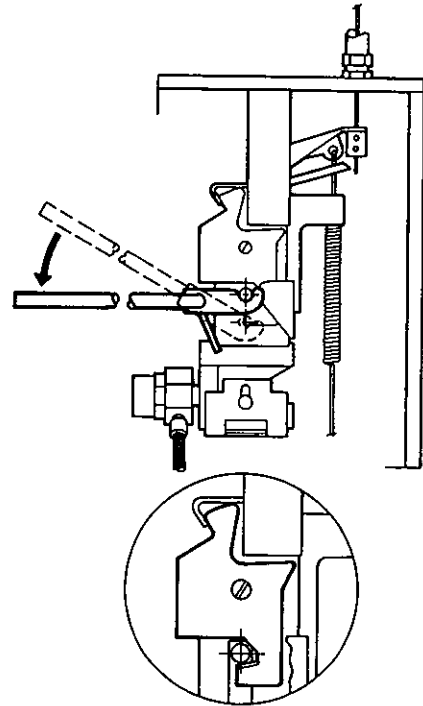


FIGURE 5

17. Raise tension lever to "UP" position. See Figure 6.

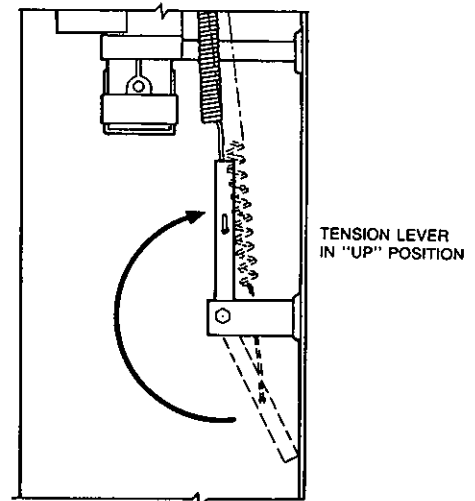


FIGURE 6

SEMI-ANNUAL MAINTENANCE EXAMINATION (Continued)

18. Install test link (Part No. 15751) in terminal detector.
19. Lower tension lever to "DOWN" position. See Figure 7.

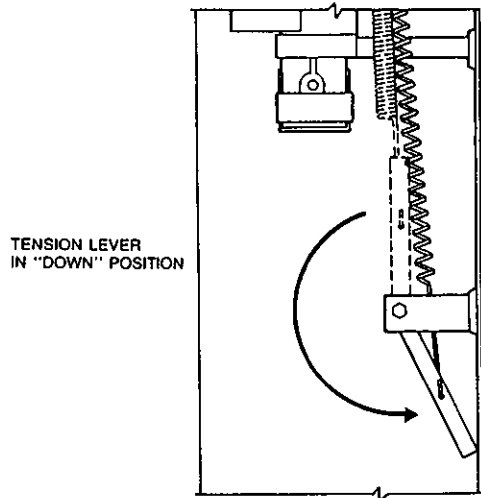


FIGURE 7

20. Using wire cutter, cut test link at terminal detector to simulate automatic actuation.

NOTICE

If regulated release mechanism does not actuate, refer to Steps 2 and 3 of "Testing Detection System" in "Testing and Placing in Service," Section 6, Page 6-3.

21. After successful actuation, raise the tension lever to "UP" position.
22. Clean and return properly-rated, Ansul approved, fusible link to terminal detector.

NOTICE

Fusible links installed in system for one year or more must be replaced. Ansul recommends replacement of links every six months.

23. Remove, clean, and return additional fusible links to series detector linkage(s). (Fusible links loaded with grease and other extraneous material can result in excessive delays in actuation.)
- ▶ 24. Inspect wire rope at all detector locations, pulley elbows, pulley tee and at ANSUL AUTOMAN release. If wire rope shows signs of wear or fraying, replace entire length.
- ▶ 25. Lower the tension lever to "DOWN" position.
- ▶ 26. Recock the regulated release mechanism and insert the lock bar.
- ▶ 27. Inspect the base of the wire rope clamping device to make certain that there is a minimum of 1/4 in. (6.4 mm) clearance between the base of the trip hammer assembly and the cable lever assembly. See Figure 8.

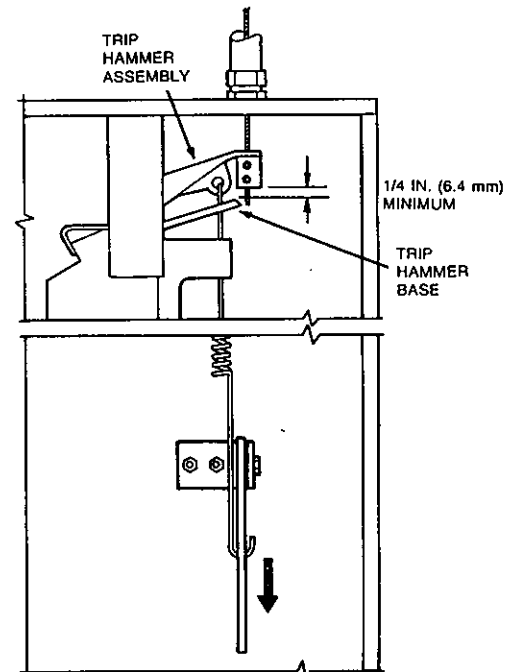


FIGURE 8

NOTICE

If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever to "UP" position, raise trip hammer 3/8-1/2 in. (9.5-12.7 mm), tighten set screws, and repeat Steps 24 and 26.

- ▶ 28. Locate detector linkage and properly position in each bracket.
 For "clip on" style linkage, locate linkage in bracket slightly toward termination end of detection run.
 For "scissor" style linkage, locate linkage in bracket all the way toward termination end of detection run.
- ▶ 29. Before reinstalling cartridge, reset all additional equipment by referring to appropriate section of "Recharge and Resetting Procedures," Section 7.
- ▶ 30. Remove shipping cap and weigh each cartridge. Replace if weight is 1/2 ounce (14.2 g), or more, below weight stamped on cartridge.
- ▶ 31. Make certain regulated release mechanism is cocked and lock bar is installed, then screw replacement cartridge into regulated release mechanism and each regulated actuator receiver(s) and hand tighten.
- ▶ 32. Remove lock bar.
- ▶ 33. Snap cover on regulated release and each regulated actuator, insert visual seal (Part No. 197) through holes in cover and box, and secure.
- ▶ 34. Record semi-annual maintenance date on tag attached to unit and/or in a permanent file.

12-YEAR MAINTENANCE EXAMINATION

Twelve-year maintenance procedures for single, double, and multiple-tank systems are as follows.

NOTICE

Under certain circumstances hood and duct cleaning operations may render your fire suppression system ineffective due to a coating of cleaning chemical left on the detection equipment or mishandling of the system by cleaning service personnel.

Therefore, it is strongly recommended that the R-102 system be completely inspected and serviced by an authorized Ansul distributor immediately following any such cleaning operations.

At twelve-year intervals, the liquid agent tank(s) must be hydrostatically tested and refilled with a fresh charge of ANSULEX Low pH Liquid Fire Suppressant. The date of manufacture is stamped on the bottom of the agent tank.

1. Remove the enclosure cover from the ANSUL AUTOMAN regulated release assembly and each regulated actuator assembly.
2. Insert the lock bar (Part No. 14985) on the cocked regulated release mechanism. See Figure 9.

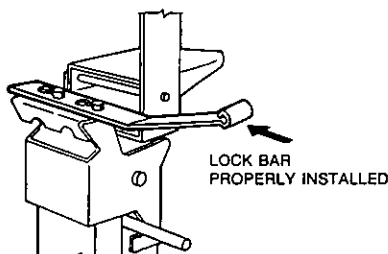


FIGURE 9

3. Remove cartridge from regulated release assembly and each regulated actuator assembly, install safety shipping cap, and set aside in a safe location.

CAUTION

Do not reinstall cartridge at this time or system may be actuated.

4. Remove gasket from cartridge receiver in regulated release mechanism and each regulated actuator. Check gasket for elasticity or cuts and replace if necessary. Clean and coat gasket lightly with a good grade of extreme temperature grease. Reinstall gasket into cartridge receiver(s).
5. From tank in enclosure: Disconnect the expellant gas hose from each tank adaptor assembly.
 From tank in bracket assembly: Disconnect expellant gas piping union at each tank adaptor inlet line.
6. Disconnect distribution piping union at each tank adaptor outlet line.

7. From tank in enclosure: Remove tank.

From tank in bracket assembly: Loosen wingnut, disengage bracket band, and remove each tank. Keep tank in upright position to avoid spilling the agent.

8. Loosen tank adaptor/tube assembly and remove.

9.

CAUTION

Safety glasses should be worn during transfer operations of ANSULEX Low pH Liquid Fire Suppressant. Avoid contact with skin or eyes. In case of contact, flush immediately with water for 15 minutes. If irritation persists, contact a physician. Do not take internally. If taken internally do not induce vomiting. Dilute with water or milk and contact a physician.

Pour the liquid agent from the tank into a clean, plastic container, and flush tank with clear water.

10. At this point, each liquid agent tank, including the 1/4 in. gas hose assembly, must be **HYDROSTATICALLY TESTED** to 330 psi (2275 kPa). Verify date stamped on cartridge. The cartridge must be hydrotested at intervals not greater than 12 years. If cartridge date indicates the need for hydrotesting, the cartridge must be bled down through normal ANSUL AUTOMAN release operation, returned to Ansul for credit, and replaced with a charged, replacement cartridge.

NOTICE

Cartridge bleed down can be used to verify pneumatic accessories operation.

11. The regulator must be flow tested at 12 year intervals. Check the date code stamped on the regulator body to determine if the regulator(s) requires the 12 year testing (see data code table). If regulator does not require testing, proceed to step 12. Flow test the regulator(s) per the following:

Date Code Table

Month – Code		Year – Code	
January	A	1986	R
February	B	1987	S
March	C	1988	T
April	D	1989	U
May	E	1990	V
June	F	1991	W
July	G	1992	Y
August	H	1993	Z
September	J	1994	A
October	K	1995	B
November	L	1996	C
December	M	1997	D
		1998	E
		1999	F
		2000	G

12-YEAR MAINTENANCE EXAMINATION (Continued)

11. (Continued)

a. Regulated Release Mechanism

For First Tank: Disconnect expellant gas hose from tank. Connect regulator test kit (Part No. 56972) to hose. See Figure 10.

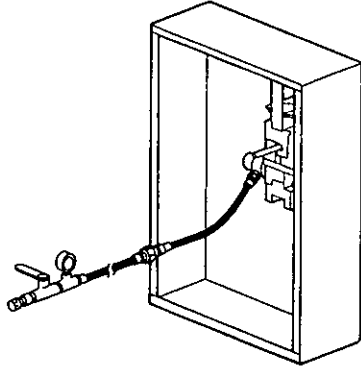


FIGURE 10

For Second Tank: Disconnect expellant gas piping at union. Remove union from expellant gas piping and install pipe cap to prevent cartridge pressure from escaping during test. See Figure 11.

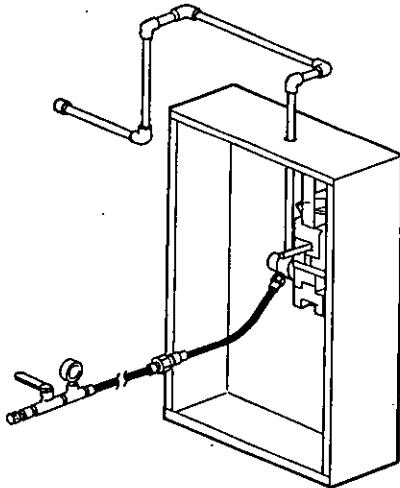


FIGURE 11

Pressure Switch: If pressure switch is provided, it should remain connected as part of system maintenance test.

NOTICE

For multiple-tank systems, one test kit (Part No. 56972) is required for each regulator in the system.

b. Regulated Actuator

For First Tank: Disconnect expellant gas hose from tank. Connect regulator test kit (Part No. 56972) to hose. See Figure 12.

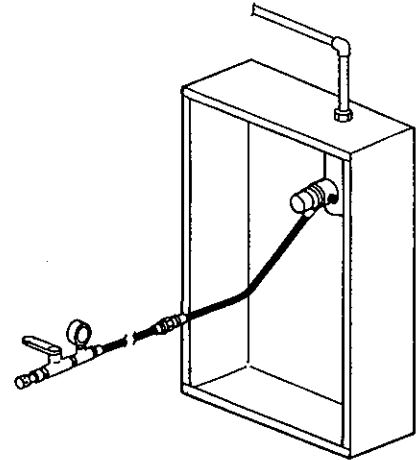


FIGURE 12

For Second Tank: Disconnect expellant gas piping at union. Remove union from expellant gas piping and install pipe cap to prevent cartridge pressure from escaping during test. See Figure 13.

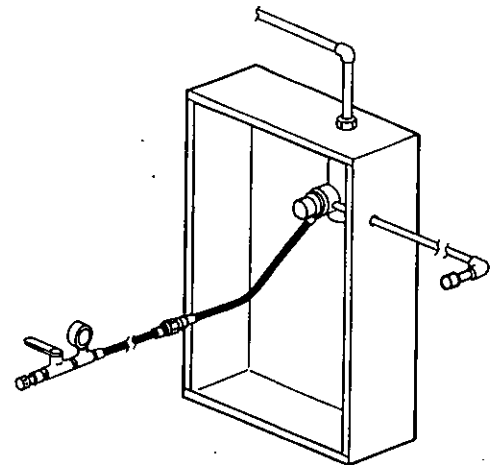


FIGURE 13

NOTICE

Make certain valve is closed on regulator test kit or pressure will escape before test can be performed.

- c. Install LT-30-R nitrogen cartridge(s) (Part No. 5373) into release mechanism and each regulated actuator provided with the system. (Cartridge should be conditioned to approximately 70 °F (21 °C) before test.)

12-YEAR MAINTENANCE EXAMINATION (Continued)

- d. Remove lock bar and operate remote manual pull station to actuate the regulated release and supply pressure to each test kit.
 - e. Flow test each regulator by completing the following steps:
 - Open test kit valve fully and check gauge while pressure is bleeding off. Gauge reading should stabilize between 95-125 psi (655-862 kPa) during the first 10 seconds of flow. Pressure will fall off as the cartridge is exhausted of nitrogen.
 - Allow cartridge pressure to completely bleed off.
 - If necessary, continue flow test at each additional regulated actuator. Test each regulated actuator by repeating step e.
 - f. Cock release mechanism using cocking lever (Part No. 14995) and insert lock bar (Part No. 14985).
 - g. Remove empty nitrogen cartridge(s) from release mechanism and each regulated actuator.
 - h. Remove test kit(s) from release mechanism and each regulated actuator.
 - i. If regulator test was not successful, replace regulator.
 - j. Reconnect all expellant gas lines.
 - k. Reset all additional equipment that was operated by release mechanism.
12. Examine threads on each adaptor and tank collar for nicks, burrs, or cross-threading. Clean and coat O-ring with a good grade of extreme temperature grease. Make certain bursting disc is in place and silver side is away from tank. See Figure 14.

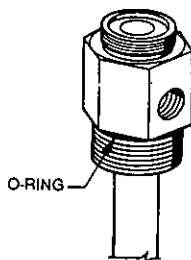


FIGURE 14

13. Refill each tank with 1.5 gallons (5.8 L) or 3.0 gallons (11.6 L) of new ANSULEX Low pH Liquid Fire Suppressant. When filled, level of liquid should be 1 in. $\pm$ 1/8 (2.54 cm $\pm$.3) from bottom of fill opening. See Figure 15.

CAUTION

Make certain tank is filled to 1 in. $\pm$ 1/8 in. (2.54 cm $\pm$.3 cm). During filling, the agent temperature should be 60 °F to 80 °F (16 °C to 27 °C). **DO NOT FILL WITH COLD AGENT. DO NOT OVERFILL.** Overfilling may result in agent entering gas hose and regulator potentially causing system malfunction.

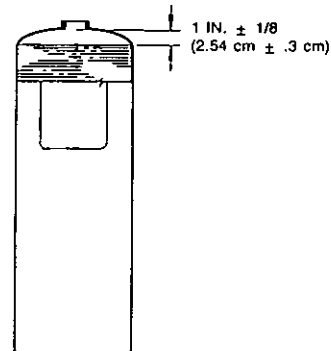


FIGURE 15

14. Clean seating surface and return each adaptor/tube assembly to tank. Firmly tighten.

NOTICE

Do not reinstall any tank at this time.

15. Remove blow-off caps from nozzles. Inspect each blow-off cap and replace if deteriorated. On metal blow-off caps, make certain spring clip rotates freely on cap.

NOTICE

Rubber blow-off caps that have been installed in the system for one year or more must be replaced.

16. Check all nozzles to ensure that they are free of cooking grease build-up and have a covering of clean silicone grease on the orifice. Reinstall blow-off caps.
17. Remove lock bar and manually test the regulated release assembly by operating the remote manual pull station.
18. Cock the regulated release mechanism using cocking lever (Part No. 14995). See Figure 16.

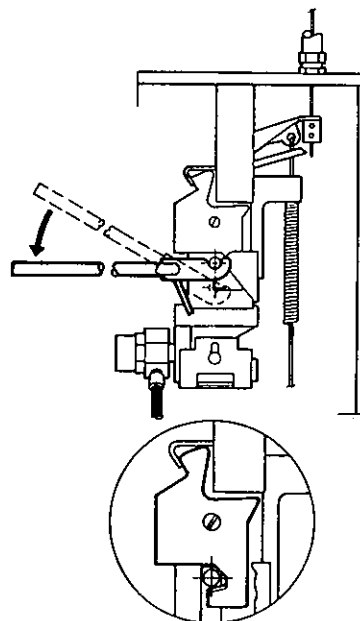


FIGURE 16

12-YEAR MAINTENANCE EXAMINATION (Continued)

19. Raise the tension lever to "UP" position. See Figure 17.

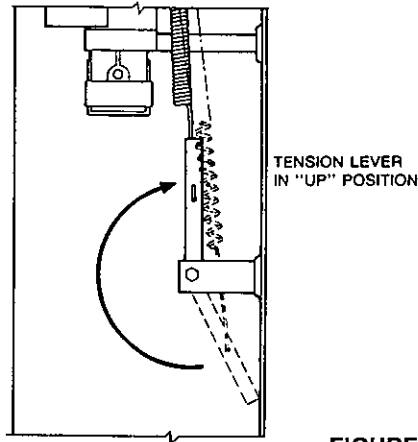


FIGURE 17

20. Install test link (Part No.15751) in terminal detector.
21. Lower tension lever to "DOWN" position. See Figure 18.

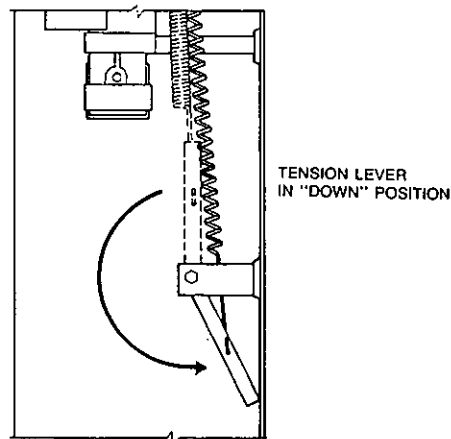


FIGURE 18

22. Using wire cutter, cut test link at terminal detector to simulate automatic actuation.

NOTICE

If regulated release mechanism does not actuate, refer to Steps 2 and 3 of "Testing Detection System" in "Testing and Placing in Service," Section 6.

23. After successful actuation, raise the tension lever to "UP" position.
24. Clean and return properly-rated, Ansul approved, fusible link to terminal detector.

NOTICE

Fusible links installed in system for one year or more must be replaced.

25. Remove, clean, and return additional fusible links to series detector linkage(s). (Fusible links loaded with grease and other extraneous material can result in excessive delays in actuation.)

26. Lower tension lever to "DOWN" position.
27. Recock the regulated release mechanism and insert lock bar.
28. Inspect the base of the wire rope clamping device to make certain that there is a minimum of 1/4 in. (6.4 mm) clearance between the base of the trip hammer assembly and the cable lever assembly. See Figure 19.

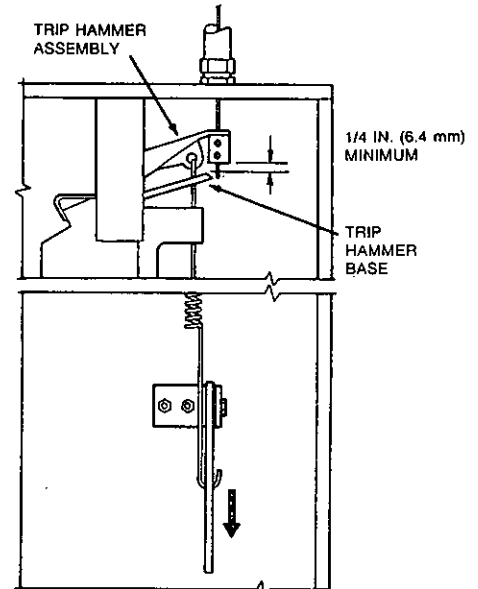


FIGURE 19

NOTICE

If clearance is not 1/4 in. (6.4 mm) minimum, raise tension lever to "UP" position, raise trip hammer 3/8-1/2 in. (9.5-12.7 mm), tighten set screws, and repeat Steps 26 and 28.

29. Locate detector linkage and properly position in each bracket.
30. Make certain additional devices have operated as intended.
31. Before reinstalling cartridge, reset all additional equipment by referring to appropriate section of "Recharge and Resetting Procedures," Section 7.
32. Place each fully charged tank in enclosure and/or bracket and secure.
33. Reconnect all distribution piping and expellant gas piping unions as required. Wrench tighten.
34. Check each gas cartridge by removing shipping cap and weighing cartridge. Replace if weight is 1/2 ounce (14.2 g), or more, below weight stamped on cartridge.
35. Make certain regulated release mechanism is cocked and lock bar is installed, then screw replacement cartridge into regulated release mechanism and each regulated actuator receiver(s) and hand tighten.
36. Remove lock bar.
37. Place regulated release assembly and each regulated actuator assembly enclosure cover in-place.
38. Insert visual seal (Part No. 197) in holes in cover and box and secure.
39. Record date of 12 year maintenance examination on tag attached to enclosure and/or in a permanent file.

SYSTEM SELECTION GUIDE (Continued)

Total Flow No.*	Tank Quantity	Type of System	Type of Hardware	Nitrogen Cartridge Required	Carbon Dioxide Cartridge Required
67-71	7	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			1.5 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
72-77	7	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
78-82	8	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			1.5 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
83-88	8	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			3.0 Gal. Reg. Actuator	LT-A-101-30 (28187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
89-93	9	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
94-99	9	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-30-R (5373)	101-20 (17492)

*Based on 5 flow numbers for a 1.5 gal. system and 11 flow numbers for a 3.0 gal. system. See pages 4-?? and 4-?? for exceptions.

**If tanks are manifolded, only a "double tank" nitrogen cartridge (Part No. 73022) can be used.

***If tanks are manifolded, only an LT-A-101-30 nitrogen cartridge (Part No. 29187) can be used.

SYSTEM SELECTION GUIDE (Continued)

<u>Total Flow No.*</u>	<u>Tank Quantity</u>	<u>Type of System</u>	<u>Type of Hardware</u>	<u>Nitrogen Cartridge Required</u>	<u>Carbon Dioxide Cartridge Required</u>
100-104	10	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			1.5 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank	LT-A-101-30 (29187)	101-30 (15851)***
105-110	10	Multiple	Remote Mechanical Release	101-10 (15850)	101-10 (15850)
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (29187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (28187)	101-30 (15851)***
			3.0 Gal. Additional Tank		
			3.0 Gal. Reg. Actuator	LT-A-101-30 (28187)	101-30 (15851)***
			3.0 Gal. Additional Tank	LT-A-101-30 (29187)	101-30 (15851)***

*Based on 5 flow numbers for a 1.5 gal. system and 11 flow numbers for a 3.0 gal. system. See pages 4-?? and 4-?? for exceptions.

**If tanks are manifolded, only a "double tank" nitrogen cartridge (Part No. 73022) can be used.

***If tanks are manifolded, only an LT-A-101-30 nitrogen cartridge (Part No. 29187) can be used.

SYSTEM COMPONENT INDEX

Part No.	Description	Part No.	Description
78937 (75920 ULC)	3.0 Gallon Red Painted Tank-Bracket Shipping Assembly Includes: Red Painted Tank Red Painted Bracket Adaptor/Tube Assembly	79694	1.5 Gallon (5.8 L) Container of ANSULEX Low pH Liquid Fire Suppressant
79290 (75931 ULC)	3.0 Gallon Mechanical ANSUL AUTOMAN Regulated Release Shipping Assembly Includes: Regulated Release Mechanism in Stainless Steel Mounting Enclosure Red Painted Tank Adaptor/Tube Assembly	79372 (76443 ULC)	3.0 Gallon (11.6 L) Container of ANSULEX Low pH Liquid Fire Suppressant
79292 (75926 ULC)	3.0 Gallon Electric ANSUL AUTOMAN Regulated Release Shipping Assembly Includes: Regulated Release Mechanism with Solenoid and Switch in Stainless Steel Mounting Enclosure Red Painted Tank Adaptor/Tube Assembly	7032	Cartridge Shipping Assembly (LT-20-R)
79327 (75922 ULC)	3.0 Gallon Regulated Actuator Shipping Assembly Includes: Actuator and Regulator in Stainless Steel Mounting Enclosure Red Painted Tank Adaptor/Tube Assembly	5373	Cartridge Shipping Assembly (LT-30-R)
78929 (418933 ULC)	3.0 Gallon Tank and Stainless Steel Mounting Box Shipping Assembly Includes: Red Painted Tank Stainless Steel Mounting Box Adaptor/Tube Assembly	73022	Cartridge Shipping Assembly (R-102 Double-Tank)
78232 (415017 ULC)	1.5 Gallon Tank-Bracket Shipping Assembly Includes: Red Painted Tank Red Painted Bracket Adaptor/Tube Assembly	29187	Cartridge Shipping Assembly (LT-A-101-30)
79291 (73601 ULC)	1.5 Gallon Mechanical ANSUL AUTOMAN Regulated Release Shipping Assembly Includes: Regulated Release Mechanism in Stainless Steel Mounting Enclosure Red Painted Tank Adaptor/Tube Assembly	15850	Cartridge Shipping Assembly (101-10)
79137 (73604 ULC)	1.5 Gallon Regulated Actuator Shipping Assembly Includes: Actuator and Regulator in Stainless Steel Mounting Enclosure Red Painted Tank Adaptor/Tube Assembly	17492	Cartridge Shipping Assembly (101-20)
78921 (418934 ULC)	1.5 Gallon Tank and Stainless Steel Mounting Box Shipping Assembly Includes: Red Painted Tank Stainless Steel Mounting Box Adaptor/Tube Assembly	15851	Cartridge Shipping Assembly (101-30)
56972	Regulator Test Kit Includes: Gauge, Hose and Valve Assembly	419347	Nozzle Shipping Assembly (1W) Includes: 25 1W Nozzles (Part No. 419336) 25 Blow-Off Caps
		419345	Nozzle Shipping Assembly (1/2N) Includes: 9 1/2N Nozzles (Part No. 419334) 9 Blow-Off Caps
		419346	Nozzle Shipping Assembly (1N) Includes: 25 1N Nozzles (Part No. 419335) 25 Blow-Off Caps
		419349	Nozzle Shipping Assembly (3N) Includes: 9 3N Nozzles (Part No. 419338) 9 Blow-Off Caps
		73830	Nozzle Shipping Assembly (2WH) Includes: 25 2WH Nozzles (Part No. 78078) 25 Blow-Off Caps
		419348	Nozzle Shipping Assembly (2W) Includes: 25 2W Nozzles (Part No. 419337) 25 Blow-Off Caps
		419350	Nozzle Shipping Assembly (230) Includes: 25 230 Nozzles (Part No. 419339) 25 Blow-Off Caps
		419351	Nozzle Shipping Assembly (245) Includes: 25 245 Nozzles (Part No. 419340) 25 Blow-Off Caps

SYSTEM COMPONENT INDEX (Continued)

Part No. Description

419352	Nozzle Shipping Assembly (260) Includes: 9 260 Nozzles (Part No. 419341) 9 Blow-Off Caps
418353	Nozzle Shipping Assembly (290) Includes: 9 290 Nozzles (Part No. 419342) 9 Blow-Off Caps
419354	Nozzle Shipping Assembly (2120) Includes: 9 2120 Nozzles (Part No. 419343) 9 Blow-Off Caps
419344	Nozzle Shipping Assembly (1F) Includes: 9 1F Nozzles (Part No. 419334) 9 Blow-Off Caps
419385	Swivel Adaptor Shipping Assembly Includes: 9 Swivel Adaptors (Part No. 418569)
77695	Blow-Off Cap Shipping Assembly (Spare) Includes: 50 Blow-Off Caps
79745	Metal Blow-Off Cap Shipping Assembly Includes: 10 Blow-Off Caps For Standard Non-Swivel Nozzles
415568	Metal Blow-Off Cap Shipping Assembly Includes: 10 Blow-Off Caps for Swivel Nozzles
56837	Series Detector Package ("Clip-On")
56838	Terminal Detector Package ("Clip-On") Includes: Test Link
15373	Series Detector Package ("Hinged")
15375	Terminal Detector Package ("Hinged") Includes: Test Link
417369	Series Detector Package ("Scissor")
417368	Terminal Detector Package ("Scissor") Includes: Test Link
415671	Pulley Elbows Shipping Assembly (Socket End) – to 700 °F (371 °C) Includes: 50 Elbows (Part No. 415670)
73868	Pulley Elbows Shipping Assembly (Compression End) – to 700 °F (371 °C) Includes: 50 Elbows (Part No. 45771)
15342	Pulley Tee
15821	Wire Rope (50 Feet (15 m))
79653	Wire Rope (500 Feet (152 m))
24919	Stop Sleeve Package Includes: 10 Stop Sleeves (Part No. 26317)
24918	Oval Sleeve Package Includes: 10 Oval Sleeves (Part No. 4596)

Part No. Description

78196	1/4 in. "Quik-Seal" Adaptor Package Includes: 24 "Quik-Seals" (Part No. 78195)
77285	3/8 in. "Quik-Seal" Adaptor Package Includes: 24 "Quik-Seals" (Part No. 77284)
77287	1/2 in. "Quik-Seal" Adaptor Package Includes: 24 "Quik-Seals" (Part No. 77286)
77289	3/4 in. "Quik-Seal" Adaptor Package Includes: 24 "Quik-Seals" (Part No. 77288)
79149	1/4 in. "Compression-Seal" Pipe Adaptor Package Includes: 24 "Compression-Seals" (Part No. 79148)
79151	3/8 in. "Compression-Seal" Pipe Adaptor Package Includes: 24 "Compression-Seals" (Part No. 79150)
79147	1/2 in. "Compression-Seal" Pipe Adaptor Package Includes: 24 "Compression-Seals" (Part No. 79146)
79153	1/2 in. "Compression-Seal" EMT Conduit Adaptor Package Includes: 24 "Compression-Seals" (Part No. 79152)
79768	Hood Seal Adaptor Shipping Assembly Includes: 6 Hood Seals
13707	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Solenoid Valve – 3/4 in.
13708	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Solenoid Valve – 1 in.
13709	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Solenoid Valve – 1 1/2 in.
13710	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Fluid Power Gas Valve – 2 in.
17643	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Fluid Power Gas Valve – 3 in.
14702	Gas Shut-off Equipment (Electrical 110 VAC, 60 Hz) Includes: Relay – Manual Reset

SYSTEM COMPONENT INDEX (Continued)

Part No. Description

15549	Electric Switch (Field Mounted) Single-Pole, Double Throw Includes: Electric Switch (SPDT)
32222	Electric Switch (Field Mounted) Double-Pole, Double Throw Includes: 2 Electric Switches (SPDT)
415868	Electric Switch (Field Mounted) Three-Pole, Double Throw Includes: 3 Electric Switches (SPDT)
32220	Electric Switch (Field Mounted) Four-Pole, Double Throw Includes: 4 Electric Switches (SPDT)
53133	Pressure Switch (SPDT)
24377	Pressure Switch (DPDT)
55598	Gas Shut-off Equipment Mechanical (Ansul) Includes: Mechanical Gas Valve – 3/4 in.
55601	Gas Shut-off Equipment Mechanical (Ansul) Includes: Mechanical Gas Valve – 1 in.
55604	Gas Shut-off Equipment Mechanical (Ansul) Includes: Mechanical Gas Valve – 1 1/4 in.
55607	Gas Shut-off Equipment Mechanical (Ansul) Includes: Mechanical Gas Valve – 1 1/2 in.
55610	Gas Shut-off Equipment Mechanical (Ansul) Includes: Mechanical Gas Valve – 2 in.
25937	Gas Shut-off Equipment Mechanical (ASCO) Includes: Mechanical Gas Valve – 2 1/2 in.
25938	Gas Shut-off Equipment Mechanical (ASCO) Includes: Mechanical Gas Valve – 3 in.
15733	Gas Shut-off Equipment Includes: Air Cylinder and Tube Assembly
4835	Remote Manual Pull Station – Metal Stamped Includes: Remote Manual Pull Station Assembly 50 Ft. (15 m) of Wire Rope
415255	Remote Pull Station – Plastic Molded
415256	Trim Ring (12) Includes: 25 Trim Rings, (Part No. 73859) (For Plastic Molded Pull Station)
415317	Break-away Seal Shipping Assembly Includes: 25 Break-away seals, Part No. 79029
24915	Break Rod Package Includes: 10 Glass Break Rods (Part No. 4834) (Replacement)

Part No. Description

7032	Recharge Equipment Includes: LT-20-R Cartridge
5373	Recharge Equipment Includes: LT-30-R Cartridge
73022	Recharge Equipment Includes: Double System Cartridge
29187	Recharge Equipment Includes: LT-A-101-30 Cartridge
15850	Recharge Equipment Includes: 101-10 Cartridge
17492	Recharge Equipment Includes: 101-20 Cartridge
15851	Recharge Equipment Includes: 101-30 Cartridge
79372	Recharge Equipment Includes: 3.0 Gallon (11.4 L) Container of ANSULEX Low pH Liquid Fire Suppressant
79674	Recharge Equipment Includes: 1.5 Gallon (5.7 L) Container of ANSULEX Low pH Liquid Fire Suppressant
417911	Recharge Equipment Includes: Package of 10 Tank Adaptor Bursting Discs
77695	Recharge Equipment Includes: 50 Blow-Off Caps
24916	Recharge Equipment Includes: 10 Test Links (Part No. 15751)
415739	Recharge Equipment Includes: Fusible Link 165 °F (74 °C)
415740	Recharge Equipment Includes: Fusible Link 212 °F (100 °C)
415744	Recharge Equipment Includes: 25 Fusible Links 280 °F (138 °C) (Part No. 415741)
415745	Recharge Equipment Includes: 25 Fusible Links 360 °F (182 °C) (Part No. 415742)
415746	Recharge Equipment Includes: 25 Fusible Links 450 °F (232 °C) (Part No. 415743)
73867	Recharge Equipment Includes: 25 Fusible Links 500 °F (260 °C) (Part No. 56816)

SYSTEM COMPONENT INDEX (Continued)

Part No. Description

- ▶ 79651 Recharge Equipment
Includes: Detector Bracket – “Clip-On”
- 53771 Recharge Equipment
Includes: Detector Linkage – “Clip-On”
- 79651 Recharge Equipment
Includes: Detector Bracket – “Scissor”
- 415817 Recharge Equipment
Includes: Detector Linkage – “Scissor”
- 15344 Recharge Equipment
Includes: Detector Bracket – “Hinged”
- 15343 Recharge Equipment
Includes: Detector Bracket Linkage –
“Hinged”
- 14985 Recharge Equipment
Includes: Lock Bar
- 14995 Recharge Equipment
Includes: Cocking Lever
- 15618 Recharge Equipment
Includes: Cocking Lever and Lock Bar
Assembly
- 15240 Recharge Equipment
Includes: 500 °F (260 °C) Exhaust Duct
Thermometer
- 197 Recharge Equipment
Includes: Lead and Wire Seal
- ▶ 418087 Recharge Equipment
Includes: Installation Manual

“ANSUL AUTOMAN” REGULATED RELEASE ASSEMBLY

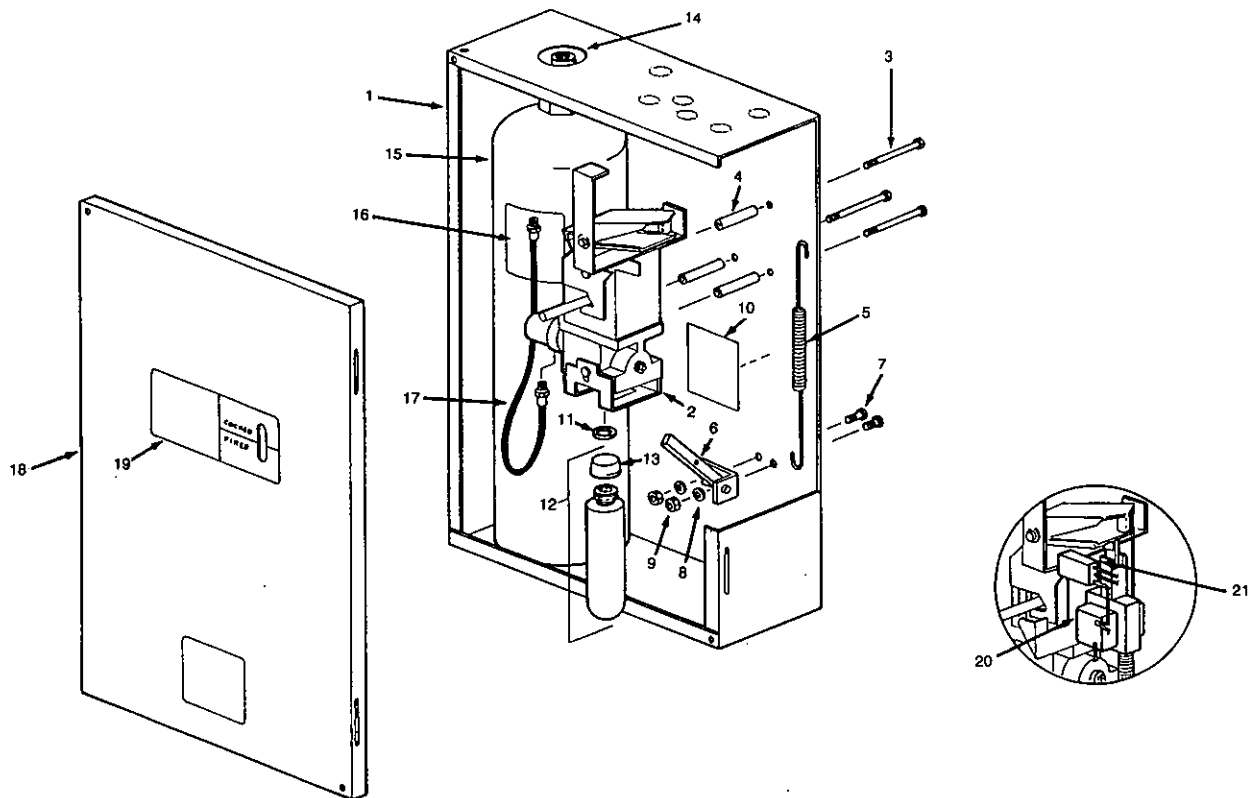


Figure No.	Description	1.5 Gallon Mechanical Part No.	3.0 Gallon Mechanical Part No.	3.0 Gallon Electrical Part No.
–	Regulated Release Shipping Assembly	79291	79290	79292
1	Mounting Box	79293	79293	79293
2	Basic Release w/Regulator	79140	79140	–
–	Basic Release w/Solenoid, Switch, and Regulator	–	–	79288
3	Self-Tapping Screw	71342	71342	71342
4	Spacer	76555	76555	76555
5	Tension Spring	79094	79094	79094
6	Lever and Bracket Assembly	79300	79300	79300
7	Machine Screw	14973	14973	14973
8	Lockwasher	7310	7310	7310
9	Hex Nut	14732	14732	14732
10	Caution Label	57652	57652	57652
11	Gasket	181	181	181
12	Expellant Gas Cartridge Assembly			
–	LT-20-R/101-10	7032/15850	–	–
–	LT-30-R/101-20	5373/17492	5373/17492	5373/17492
–	Double Tank/101-30	73022/15851	73022/15851	73022/15851
13	Safety Shipping Cap	77251	77251	77251
–	Tank Assembly	79098	79015	79015
14	Tank Adaptor Assembly	79101	79020	79020
–	Bursting Disc (Not Shown)	–	–	–
–	O-Ring (Not Shown)	56909	56909	56909
15	Shell	79100	79016	79016
16	Nameplate	73760	73761	73761
17	Hose Assembly	79007	79007	79007
18	Enclosure Cover	79325	79325	79325
19	Nameplate	79295	79296	79296
20	Solenoid Assembly	–	–	14988
21	Electric Snap-Action Switch	–	–	17781

TANK-BRACKET ASSEMBLY

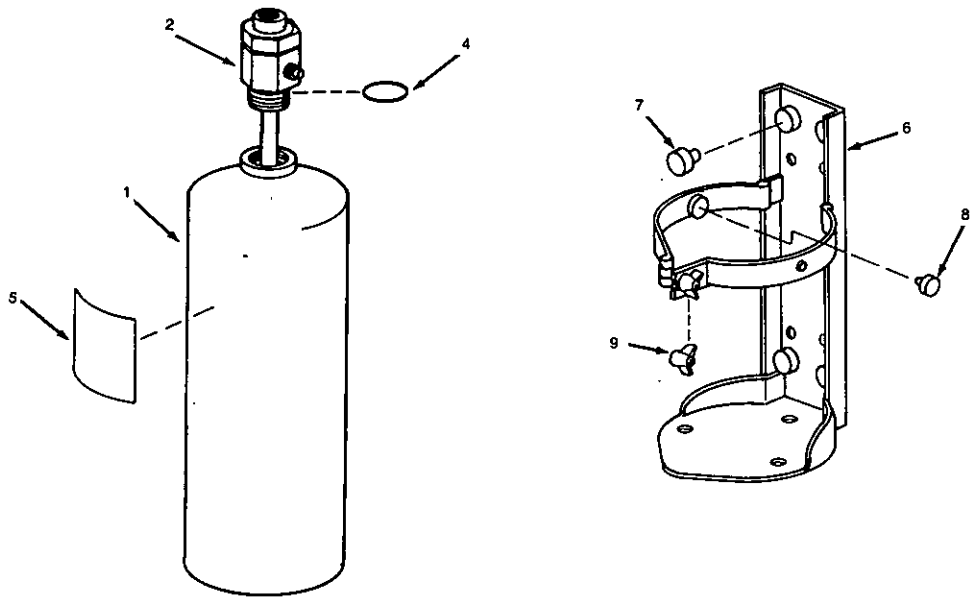


Figure No.	Description	1.5 Gallon Part No.	3.0 Gallon Part No.
–	Tank-Bracket Shipping Assembly	78232	78937
–	Tank Assembly	79098	79015
1	Shell	79100	79016
2	Tank Adaptor Assembly	79101	79020
3	Bursting Disc (Not Shown)	–	–
4	O-Ring	56909	56909
5	Nameplate	73760	73761
6	Bracket Assembly	31937	12063
7	Grommet	14089	14089
8	Grommet	8688	8688
9	Wing Nut	–	12065

► R-101/R-102 System Combination

A UL-300 R-102 Wet Chemical System may be used in combination with an existing R-101 Dry Chemical System. Since UL-300 revisions did not include changes to hood and duct protection, the existing R-101 Dry Chemical System protection can be retained in the hood and duct if acceptable to the authority having jurisdiction and a UL-300 listed R-102 Wet Chemical System can be added for appliance protection.

Those who install, recharge, inspect, or maintain Ansul R-101 and R-102 systems should understand the contents of the following manuals as well as the procedures outlined for combining the two systems.

Ansul R-101-10 Fire Suppression Systems Installation, Recharge, Inspection and Maintenance Manual (Part No. 15693-09, dated 9-15-75)

Ansul R-101-20 Fire Suppression Systems Installation, Recharge, Inspection and Maintenance Manual (Part No. 17548-06, dated 1-1-76)

Ansul R-101-30 Fire Suppression Systems Installation, Recharge, Inspection and Maintenance Manual (Part No. 25734-05, dated 4-15-76)

Ansul R-102 (UL-300) Fire Suppression Systems Installation, Recharge, Inspection and Maintenance Manual (Part No. 418087, current revision)

To update the appliance protection, the existing dry chemical system appliance protection must be removed and replaced with UL-300 listed R-102 wet chemical protection. All dry chemical piping connected to surface appliance nozzles must be removed. The remaining dry chemical piping for hood and duct protection must comply with piping design guidelines referenced in the appropriate R-101 manual. If the remaining dry chemical piping exceeds the piping guidelines, re-piping will be required.

In most cases, the R-101 ANSUL AUTOMAN, with the existing detection system and appliance shut-down, can be utilized. If necessary, the detection system must be upgraded, and, if in compliance with either the R-102 or the appropriate R-101 design manual, either ANSUL AUTOMAN release can be utilized.

The combination of R-101 and R-102 systems must use pneumatic actuation for simultaneous operation of both systems. The following three options are available for combining the systems using pneumatic actuation. Make certain the proper gas cartridge is used with each system as dictated in the applicable system manual.

1. The R-101-10 with 101-10 cartridge (Part No. 15850) or R-101-20 release mechanism with 101-20 cartridge (Part No. 17492) can be used to actuate a maximum of two additional pneumatic actuation devices. These devices may include a maximum of two pneumatically operated R-101 tanks or a maximum of two R-102 Regulated Actuator Assemblies (Part No. 79175 or 79327) or one of each. The actuation line must not exceed a maximum of 20 ft. of 1/8 in. Schedule 40 pipe with a maximum of 8-90° elbows and 1 tee. See Figure 1.

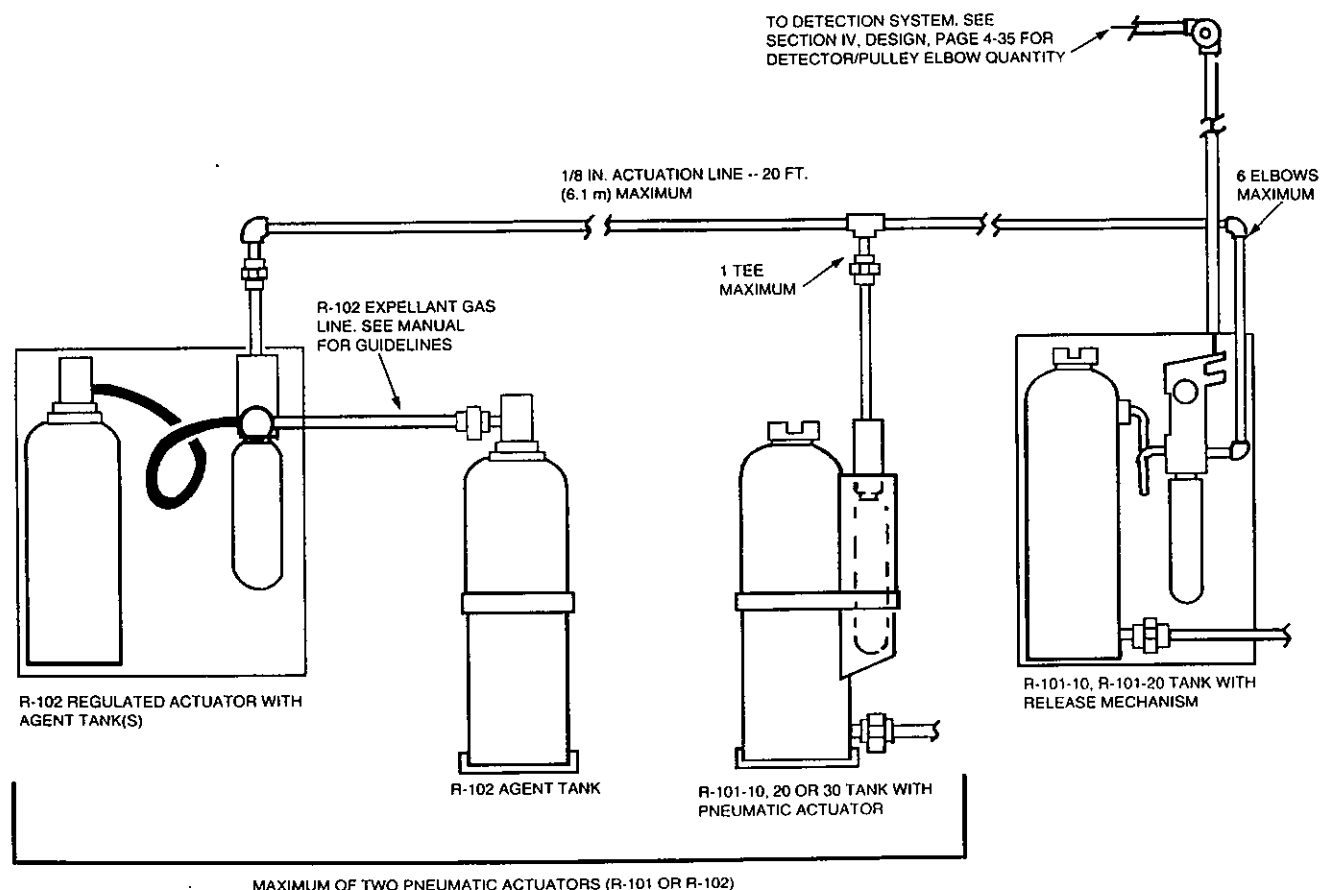
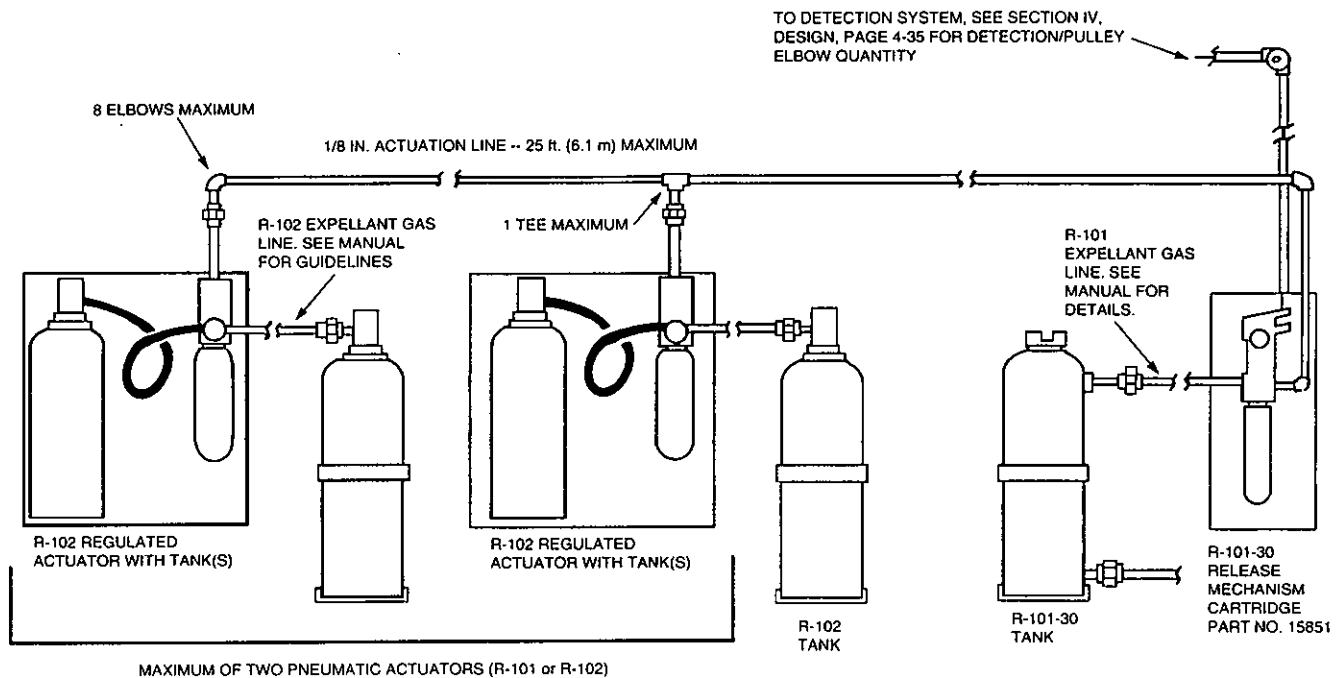


FIGURE 1

R-101/R-102 System Combination (Continued)

2. The R-101-30 release mechanism with 101-30 cartridge (Part No. 15851) can be used to actuate a maximum of two additional pneumatic actuation devices. These devices may include a maximum of two pneumatically operated R-101 anks or a maximum of two R-102 Regulated Actuator Assemblies (Part No. 79175 or 79327) or one of each. The actuation line must not exceed a maximum of 20 ft. of 1/8 inch Schedule 40 pipe with a maximum of 8-90° elbows and 1 tee. See Figure 2.

**FIGURE 2**

R-101/R-102 System Combination (Continued)

2. (Continued)

As an option, the pneumatically operated R-101 tanks and/or R-102 regulated actuators can be piped to the same side of the ANSUL AUTOMAN release mechanism as the standard R-101-30 tank. Utilizing this method, a maximum of 90 ft. of 1/4 in. Schedule 40 pipe may be used with a maximum of 13-90° elbows and 2 tees. See Figure 3.

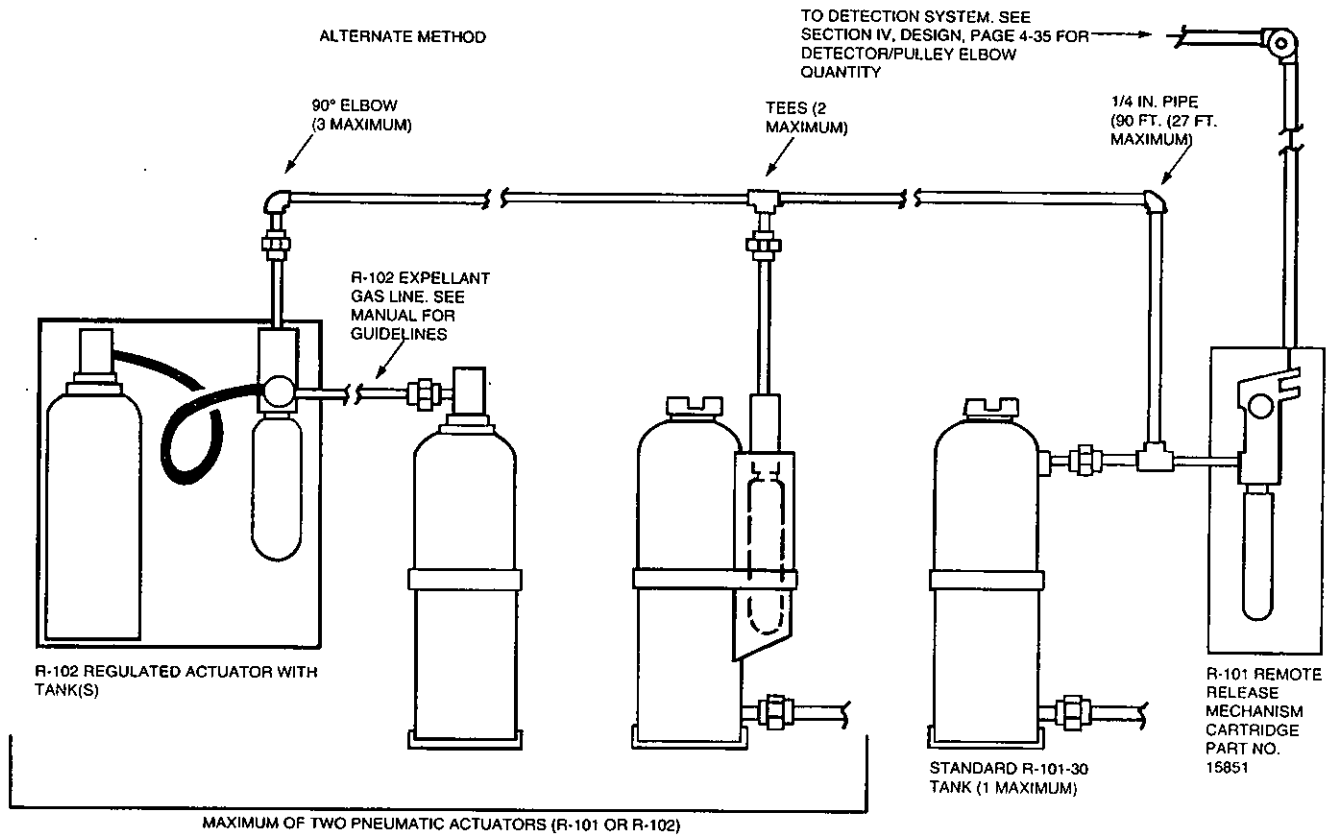
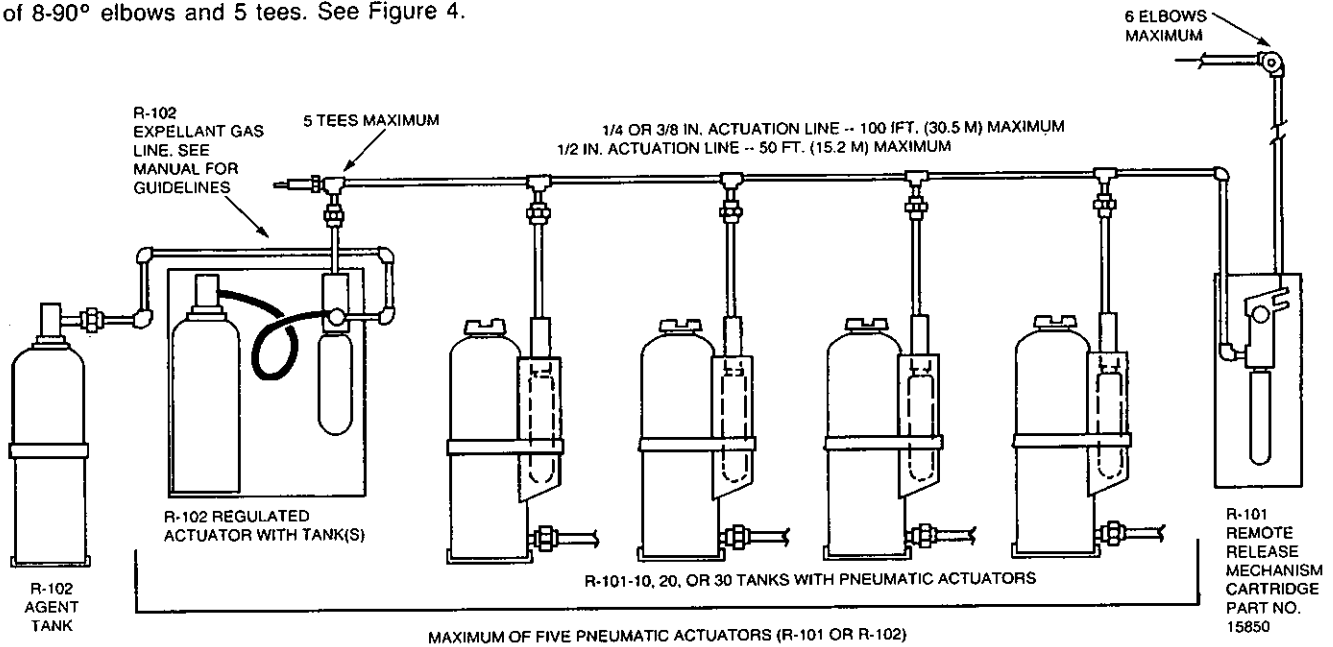


FIGURE 3

R-101/R-102 System Combination (Continued)

3. The R-101 remote release mechanism with 101-10 cartridge (Part No. 15850) can be used to actuate up to five pneumatic actuation devices. These devices may include a maximum of five pneumatically operated R-101 tanks or a maximum of five R-102 Regulated Actuator Assemblies (Part No. 79175 or 79327) or any combination of up to five devices. The actuation line must not exceed a maximum of 100 ft. of 1/4 in. or 3/8 in. Schedule 40 pipe or a maximum of 50 ft. of 1/2 in. Schedule 40 pipe, with a maximum of 8-90° elbows and 5 tees. See Figure 4.

**FIGURE 4**

WARRANTY AND LIMITS OF WARRANTY

A. Ansul Products

Except as indicated in B below, your R-102 System, supplied by Ansul Incorporated ("Ansul") is warranted to you as the original purchaser for five years from the date of delivery against defects in workmanship and material as purchaser's sole and exclusive remedy, Ansul will replace or repair any component part which, in its opinion, is defective and has not been tampered with or subjected to misuse, abuse or exposed to highly corrosive conditions.

B. Purchased Products

The following items, which are not manufactured but purchased by Ansul, are warranted against defects resulting from the manufacturer's fabrication, process or parts for one year from the date of purchase: fusible links, electric gas shut-off valves, manual reset relay, snap-action switch and solenoid, detectors, electric manual pull station, pressure relief valves, and regulators.

Evaluation of each reportedly defective relay, valve, etc. returned to Ansul will be made by the original manufacturer or an agent thereof and its judgment shall be final.

C. EXCEPT AS PROVIDED IN (A) AND (B), THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE MADE BY ANSUL CONCERNING THIS SYSTEM. ANSUL SHALL HAVE NO LIABILITY FOR ANY CONSEQUENTIAL, SPECIAL OR SIMILAR DAMAGES.

For repairs, parts and service of the Ansul System, contact your local Ansul representative, or Ansul Incorporated, Marinette, Wisconsin 54143-2542; 800-TO-ANSUL (800-862-6875).