

CITY OF SACRAMENTO

Permit No: 0115255

1231 I Street, Sacramento, CA 95814

Insp Area: 1

Thos Bros: 298 A7

Site Address: 6101 S ST SAC

Sub-Type: COM

Parcel No: 011-0090-010

Housing (Y/N): N

CONTRACTOR

GRINNELL FIRE
5704 DRYCREEK RD.
SAC CA 95673

OWNER

SACRAMENTO MUNICIPAL UTILITY DISTRICT
6201 S ST
SACRAMENTO CA 95852-1830

ARCHITECT

Nature of Work: NEW SIDEWALL SPRINKLERS IN EXISTING CANOPY

CONSTRUCTION LENDING AGENCY: I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name _____ Lender's Address _____

LICENSED CONTRACTORS DECLARATION: I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

X License Class C110 License Number 280525 X Date 11-30-01 X Contractor Signature Marcus Clive

OWNER-BUILDER DECLARATION: I hereby affirm under penalty of perjury that I am exempt from the contractors License Law for the following reason (Sec. 7031.5, Business and Professions Code; any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 8 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars (\$500.00);

I, as a owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professional Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his/her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he/she did not build or improve for the purpose of sale.)

I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law).

I am exempt under Sec. _____ B & PC for this reason: _____

Date _____ Owner Signature _____

IN ISSUING THIS BUILDING PERMIT, the applicant represents, and the city relies on the representation of the applicant, that the applicant verified all measurements and locations shown on the application or accompanying drawings and that the improvement to be constructed does not violate any law or private agreement relating to permissible or prohibited locations for such improvements. This building permit does not authorize any illegal location of any improvement or the violation of any private agreement relating to location of improvements.

I certify that I have read this application and state that all information is correct. I agree to comply with all city and county ordinances and state laws relating to building construction and hereby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

X Date 11-30-01 X Applicant/Agent Signature Marcus Clive

WORKER'S COMPENSATION DECLARATION: I hereby affirm under penalty of perjury one of the following declarations:

I have and will maintain a certificate of consent to self-insure for workers' compensation as provided for by Section 3700 of the Labor Code, for the performance of work for which the permit is issued.

MAC I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier AMERICAN HOME ASSURANCE Policy Number RMWC 5277471 Exp Date 10/01/2002

(This section need not be completed if the permit is for \$100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

X Date 11-30-01 X Applicant Signature Marcus Clive

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S FEE.

THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK IS NOT COMMENCED WITHIN 180 DAYS.

APPLICATION FOR COMMERCIAL BUILDING PERMIT

CITY OF SACRAMENTO
DEVELOPMENT SERVICES DIVISION
PERMIT SERVICES SECTION

1231 I Street, Rm. 200
Sacramento, CA 95814 (916) 264-7619 FAX 264-7046

ACTIVITY # **0115255** Insp. Area **C**

Applicant **MUST** complete **ALL Unshaded areas**

ADDRESS 6101 S Street ; Verify Suite _____
PARCEL # 011-0090-010

CONTACT Name <u>Simplex Carinell (Vincent)</u> Street Address <u>5704 Dry Creek Rd.</u> City/State/Zip <u>Rio Linda, CA</u> Phone <u>(916) 991-5977</u> FAX <u>(916) 991-9388</u> E-mail: _____		LICENSED CONTRACTOR Lic No. # <u>280525</u> Name <u>Simplex Carinell</u> Address <u>5704 Dry Creek Rd.</u> City/State/Zip <u>Rio Linda, CA</u> Phone <u>(916) 991-5977</u> FAX <u>(916) 991-9388</u> E-mail: _____	
ARCHITECT/ENGINEER Name _____ Address _____ City/State/Zip _____ Phone _____ FAX _____ E-mail: _____		OWNER Name <u>SMUD</u> Address <u>6301 S ST.</u> City/State/Zip <u>SAC CA</u> Phone _____ FAX _____ E-mail: _____	

Will permittee have any employees on the jobsite? No Yes → INSURANCE CO: American Home Assurance
 WORKER'S COMPENSATION POLICY # RMWC 5277471 EXPIRATION DATE: 10-1-02

NATURE OF WORK IN DETAIL: NEW SIDEWALL SPRINKLERS IN EXISTING
Canopy
NEED PERMIT FOR MODULAR - None on record.

OCCUPANT/TENANT: SMUD VALUATION: \$ 1500⁰⁰

FLOOD STATUS:				S.C.A.T.						
JOB DESCRIPTION		BLDG	SHELL	APT	TI()	REM()	SW	FIRE	ADD	OTH
INSPECTION DISCIPLINES			BLDG	MECH	PLUMB	ELEC		SITE	FIRE	
# Stories	1st flr Area	Total Area	Use Zone	Occp Group	Const type	Fire Req: Y / N		Fed Code	Vio. File	
						SPR	ALARM		[H]	[Quad]
B	L	P	M	E	F	S		D	PW	UTIL

COMMENTS: Site Map

REGIONAL SANITATION FEES? Yes No HEALTH DEPARTMENT? Yes No
 WATER FLOW TEST FOR NEW BUILDINGS OR ADDITIONS? Provided Faxed

GRINNELL FIRE PROTECTION
5704 DRY CREEK ROAD
RIO LINDA, CA 95673

CITY OF SACRAMENTO
PERMIT ASSISTANCE

NOV 19 2001

RECEIVED

HYDRAULIC CALCULATIONS

FOR

S.M.U.D. - CANOPY
6101 "S" STREET, SAC, CA

FILE NUMBER:
DATE: Nov 19, 2001

ISSUED

NOV 30 2001

Sacramento Building Division

SHOULD BE KEPT IN THE OFFICE OF THE PERMITTING OFFICER
violation of any City Ordinance.

-DESIGN DATA-

OCCUPANCY CLASSIFICATION:	LIGHT
DENSITY:	.10 gpm/sq. ft.
AREA OF APPLICATION:	5 A.S. DESIGN
COVERAGE PER SPRINKLER:	256 sq. ft.
NUMBER OF SPRINKLERS CALCULATED:	5 sprinklers
TOTAL SPRINKLER WATER FLOW REQUIRED:	134.5 gpm
TOTAL WATER REQUIRED (including hose):	234.6 gpm
FLOW AND PRESSURE (@ BOR):	134.5 gpm @ 40.0 psi
SPRINKLER ORIFICE SIZE:	1/2 inch
NAME OF CONTRACTOR:	SIMPLEXGRINNELL
DESIGN/LAYOUT BY:	V. MARQUEZ
AUTHORITY HAVING JURISDICTION:	CITY OF SACRAMENTO
CONTRACTOR CERTIFICATION NUMBER:	C-16 - 280525

CALCULATIONS BY HASS COMPUTER PROGRAM (LICENSE # 5003013222)
HRS SYSTEMS, INC.
ATLANTA, GA

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

Date: 11/19/2001
JOB TITLE: S.M.U.D.- CANOPY
WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. @ (PSI)	TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
1	46.0	42.0	1859.0	45.9	234.6	42.4

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	234.6 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	100.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	134.6 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
1	-3.0	SOURCE	42.4	134.6
2	0.5	- - - -	40.0	- - -
3	11.5	- - - -	33.8	- - -
4	11.5	- - - -	27.6	- - -
21	11.5	- - - -	25.8	- - -
22	11.5	- - - -	24.5	- - -
23	11.5	- - - -	24.1	- - -
24	11.5	- - - -	25.5	- - -
25	11.5	- - - -	25.1	- - -
101	9.2	K= 5.60	23.8	27.3
102	9.2	K= 5.60	22.6	26.6
103	9.2	K= 5.60	22.3	26.4
104	9.2	K= 5.60	23.5	27.2
105	9.2	K= 5.60	23.2	26.9

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

Date: 11/19/2001

JOB TITLE: S.M.U.D.- CANOPY

PIPE DATA

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.
NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	(FT)	SUM.	
						F.L./FT		(PSI)	
1	Pipe: 1	-3.0	SRCE	42.4	(N/A)	134.6	4.000	PL 126.00	PF 0.8
2		0.5	0.0	40.0	0.0	3.4	150 FTG 2ETLG	PE -1.5	
							0.004 TL 196.28	PV 0.1	
2	Pipe: 2	0.5	0.0	40.0	0.0	134.5	2.635	PL 11.00	PF 1.5
3		11.5	0.0	33.8	0.0	7.9	120 FTG C	PE -4.8	
							0.050 TL 30.00	PV 0.4	
3	Pipe: 3	11.5	0.0	33.8	0.0	134.5	2.635	PL 99.00	PF 6.2
4		11.5	0.0	27.6	0.0	7.9	120 FTG ET	PE 0.0	
							0.050 TL 124.00	PV 0.4	
4	Pipe: 4	11.5	0.0	27.6	0.0	80.4	1.610	PL 0.50	PF 1.8
21		11.5	0.0	25.8	0.0	12.7	120 FTG T	PE 0.0	
							0.212 TL 8.50	PV 1.1	
21	Pipe: 5	11.5	0.0	25.8	0.0	53.1	1.610	PL 13.00	PF 1.3
22		11.5	0.0	24.5	0.0	8.4	120 FTG ----	PE 0.0	
							0.098 TL 13.00	PV 0.5	
22	Pipe: 6	11.5	0.0	24.5	0.0	26.4	1.610	PL 14.00	PF 0.4
23		11.5	0.0	24.1	0.0	4.2	120 FTG ----	PE 0.0	
							0.027 TL 14.00	PV 0.1	
4	Pipe: 7	11.5	0.0	27.6	0.0	54.1	1.610	PL 12.50	PF 2.1
24		11.5	0.0	25.5	0.0	8.5	120 FTG T	PE 0.0	
							0.102 TL 20.50	PV 0.5	
24	Pipe: 8	11.5	0.0	25.5	0.0	26.9	1.610	PL 15.00	PF 0.4
25		11.5	0.0	25.1	0.0	4.2	120 FTG ----	PE 0.0	
							0.028 TL 15.00	PV 0.1	
21	Pipe: 10	11.5	0.0	25.8	0.0	27.3	1.049	PL 3.83	PF 3.0
101		9.2	5.6	23.8	27.3	10.1	120 FTG 2ET	PE 1.0	
							0.232 TL 12.83	PV 0.7	
22	Pipe: 11	11.5	0.0	24.5	0.0	26.6	1.049	PL 3.83	PF 2.8
102		9.2	5.6	22.6	26.6	9.9	120 FTG 2ET	PE 1.0	
							0.221 TL 12.83	PV 0.7	
23	Pipe: 12	11.5	0.0	24.1	0.0	26.4	1.049	PL 3.83	PF 2.8
103		9.2	5.6	22.3	26.4	9.8	120 FTG 2ET	PE 1.0	
							0.218 TL 12.83	PV 0.6	
24	Pipe: 13	11.5	0.0	25.5	0.0	27.2	1.049	PL 3.83	PF 2.9
104		9.2	5.6	23.5	27.2	10.1	120 FTG 2ET	PE 1.0	
							0.229 TL 12.83	PV 0.7	
25	Pipe: 14	11.5	0.0	25.1	0.0	26.9	1.049	PL 3.83	PF 2.9
105		9.2	5.6	23.2	26.9	10.0	120 FTG 2ET	PE 1.0	
							0.226 TL 12.83	PV 0.7	

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

Date: 11/19/2001
JOB TITLE: S.M.U.D.- CANOPY

NOTES:

- (1) Calculations were performed by the HASS 6.6.0 computer program under license no. 5003013222 granted by
HRS Systems, Inc.
4792 LaVista Road
Tucker, GA 30084
- (2) The system has been balanced to provide an average imbalance at each node of 0.015 gpm and a maximum imbalance at any node of 0.198 gpm.
- (3) Velocity pressures are printed for information only, and are not used in balancing the system. Maximum water velocity is 12.7 ft/sec at pipe 4.
- (4) PIPE FITTINGS TABLE

Pipe Table Name: CUSTOM.PIP

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv

	N NP Tee							
1.049	2.00	5.00	2.00	5.00	6.00	1.00	10.00	10.00
	5.00							
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00
	8.00							

PAGE: B MATERIAL: THNWL HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv

	N NP Tee							
2.635	8.00	17.00	6.00	19.00	10.00	1.00	14.00	14.00
	17.00							

PAGE: * MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv

	N NP Tee							

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

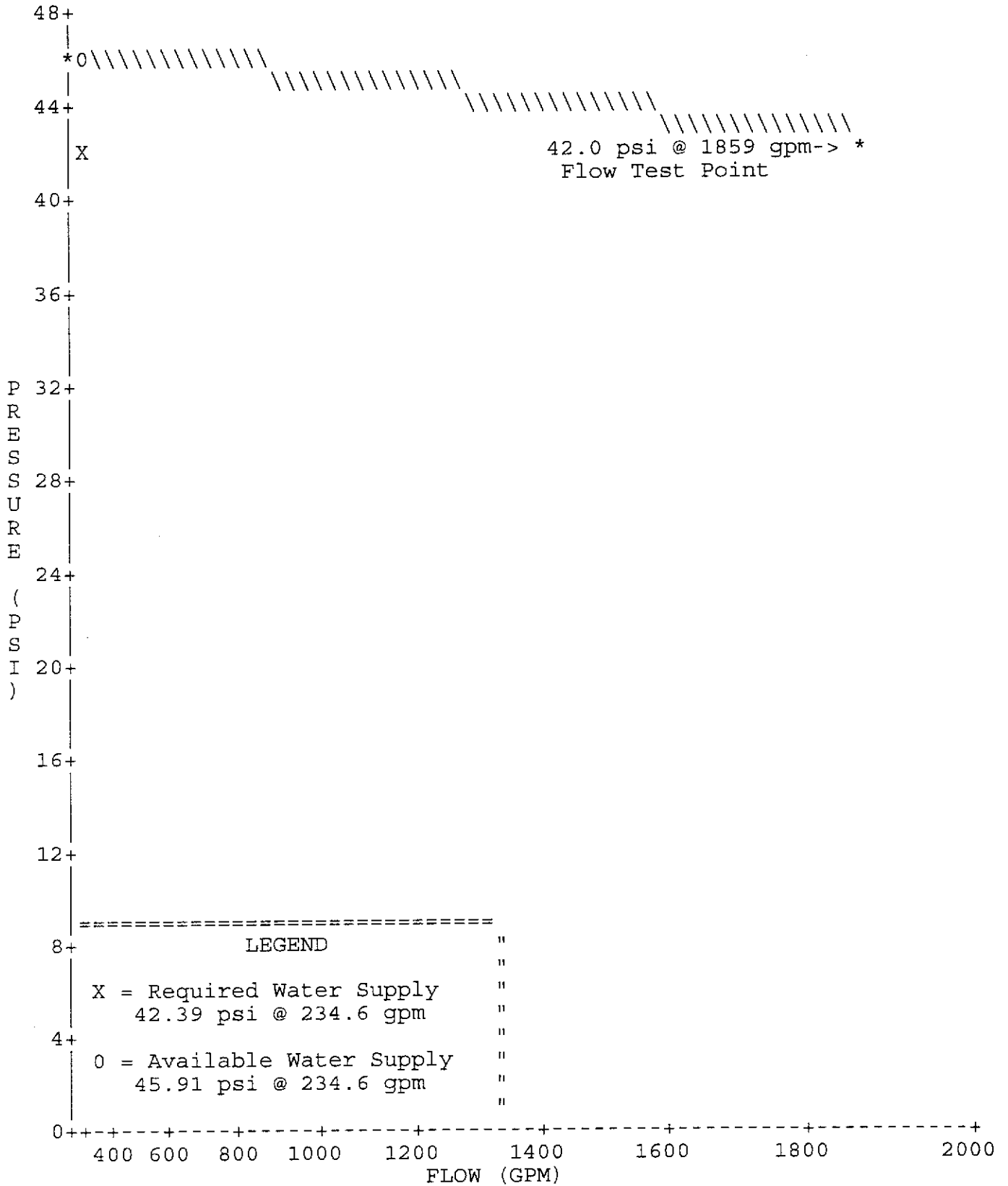
Date: 11/19/2001

JOB TITLE: S.M.U.D.- CANOPY

4.026	10.00	20.00	6.00	22.00	12.00	2.00	20.00	10.00
	20.00							

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

Date: 11/19/2001
JOB TITLE: S.M.U.D.- CANOPY
WATER SUPPLY CURVE



NOV 19 2001



DRY SPRINKLERS, STANDARD RESPONSE **RECEIVED**

HORIZONTAL SIDEWALL

MODEL F960/Q-46 DESIGNER, SR, 5 mm BULB TYPE, 1/2" (15 mm) ORIFICE

GENERAL DESCRIPTION

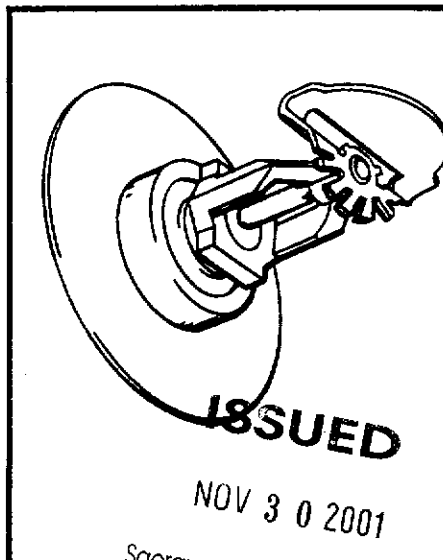
The 1/2 inch orifice Model F960/Q-46 Standard Response Designer Dry Horizontal Sidewall Sprinklers (Ref. Figure A) are automatic sprinklers of the frangible bulb type. They are "standard response - standard orifice sidewall sprinklers" intended to be used in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on NFPA 13 requirements).

They are designed for installation along a wall and just beneath a smooth ceiling. Installed with their centerline of waterway horizontal, these sprinklers produce a quarter-spherical water discharge pattern that is predominately directed downward and outward from the deflector; however, a portion of the spray is directed towards the backwall. Horizontal sidewall sprinklers are generally used in lieu of pendent sprinklers because of aesthetic, building

construction, or installation economy considerations.

Available in a wide range of operating temperatures and in order lengths of 1/2 inch increments from 2-1/2 to 48 inches, the F960/Q-46 is intended for

use in applications where the sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures (e.g. horizontal piping extensions from a wet pipe system through a wall to protect a freezer or an unheated area of a building).



TEMPERATURE RATINGS AND BULB LIQUID COLOR CODE:

135°F / 57°C	Orange
155°F / 68°C	Red
175°F / 79°C	Yellow
200°F / 93°C	Green
286°F / 141°C	Blue
360°F / 182°C	Mauve

NOMINAL K-FACTOR:

5.5 (GPM / psi^{1/2})
79.2 (LPM / bar^{1/2})

"S" ORDER LENGTHS:

2-1/2 to 48 inches in 1/2 inch increments

FINISH COMBINATIONS:

Sprinkler	Escutcheon
Chrome Plated	Chrome Plated
Chrome Plated	White Painted
Natural Brass	White Painted

COMPONENTS:

- 1-Deflector
- 2-Frame
- 3-Guide Tube Sub-assembly
- 4-Water Tube
- 5-Spring
- 6-Compression Screw
- 7-Bulb
- 8-Bulb Seat
- 9-Casing
- 10-Yoke
- 11-Inlet
- 12-Plug
- 13-O-Ring Seal
- 14-Escutcheon, Inner Piece
- 15-Escutcheon, Outer Piece

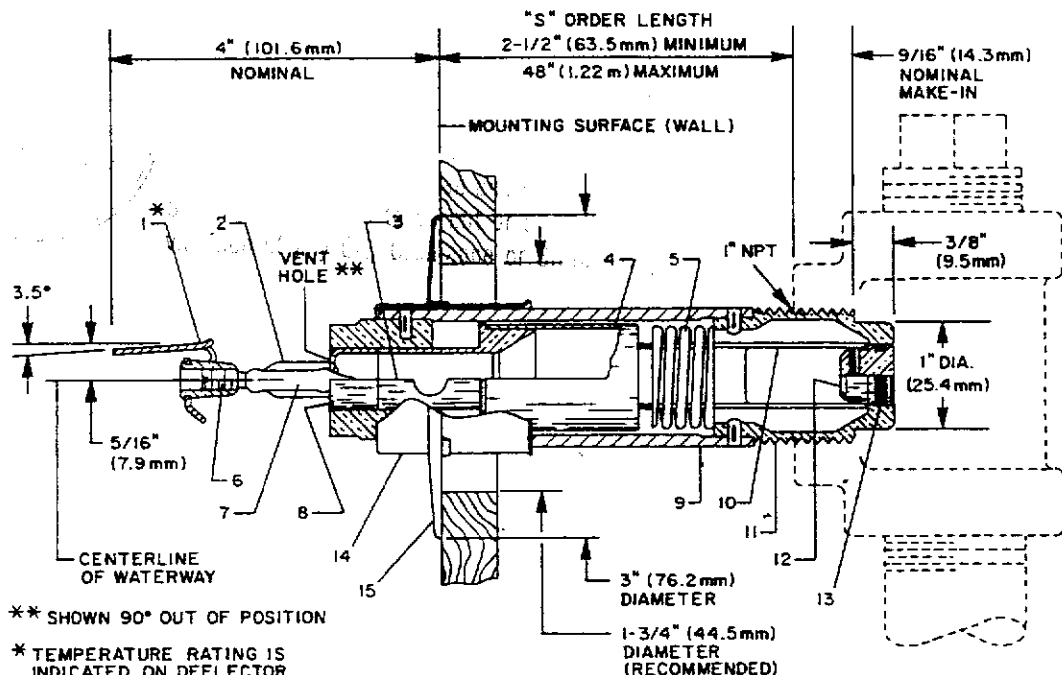
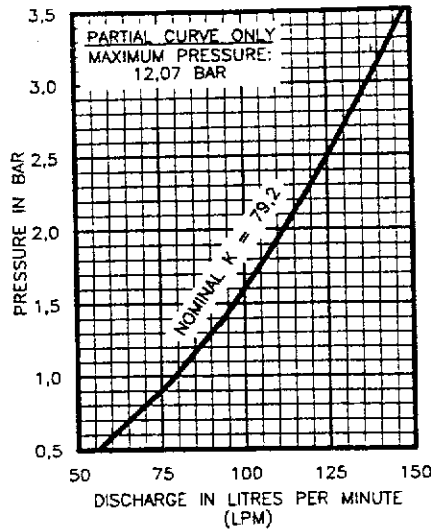
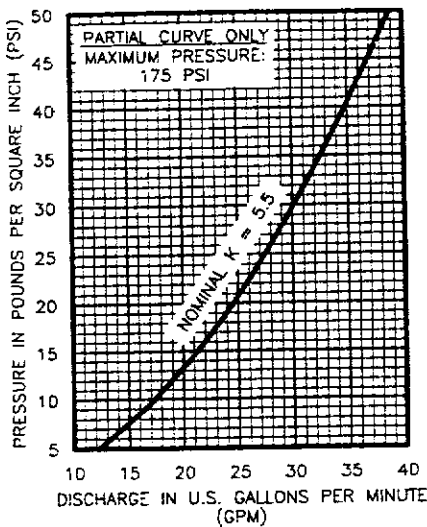


FIGURE A
MODEL F960/Q-46 DRY HORIZONTAL SIDEWALL SPRINKLER
WITH STANDARD ESCUTCHEON PLATE



**FIGURE B
NOMINAL DISCHARGE CURVES**

When the F960/Q-46 is in service, water is prevented from entering the assembly by the Plug and O-Ring Seal in the Inlet of the Sprinkler. Upon exposure to a temperature sufficient to operate the Bulb, the Bulb shatters and the Bulb Seat is released. The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls outward on the Yoke, withdrawing the Plug and O-Ring Seal from the Inlet and initiating water flow.

The Escutcheon Plate has been designed to provide 1 inch of total horizontal adjustment (plus or minus 1/2 inch), to assure proper field positioning and to reduce the accuracy to which the sprinkler fitting must be installed. The 3 inch outside diameter of the outer piece of the Escutcheon Plate combined with the 1-3/4 inch diameter clearance hole size also contributes to the ease of installation by covering offset clearance holes.

The Escutcheon Plate is a separable two-piece design which allows installation of the sprinklers and pressure testing of the fire protection system, prior to wall construction and/or application of a finish coat to the wall. It also permits refinishing of a wall surface without having to first shut down the fire protection system and remove the sprinklers.

APPROVALS AND STANDARDS

The 135°F/57°C through 360°F/182°C Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers are listed by Underwriters Laboratories Inc. and Underwriters' Laboratories of Canada for use in Ordinary Hazard Occupancies.

The 135°F/57°C through 286°F/141°C Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers are approved by Factory Mutual Research Corporation for use in Light Hazard Occupancies.

The laboratory listings and approval only apply to the order lengths, sprinkler finishes, and escutcheon plate finishes stated in Figure A.

The Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers are accepted by the City of New York under MEA 214-94-E.

WARNING

The Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers described herein must be installed and maintained in compliance with this document, as well as applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the integrity of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted relative to any questions.

The Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers must only be installed in fittings that meet the requirement of the System Design section.

TECHNICAL DATA

The 1/2 inch orifice Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers are rated for use at a maximum service pressure of 175 psi. The available temperature ratings, order lengths, sprinkler finishes, and escutcheon plate finishes are given in Figure A.

The F960/Q-46 must be installed with a deflector to ceiling distance of 4 to 12 inches. To meet this requirement, the centerline of the sprinkler waterway (Ref. Fig. A) must be between 4-5/16 and 12-5/16 inches below the ceiling.

The nominal discharge curves plotted in Figure B represents the flow "Q" in GPM (LPM) as determined by the formula:

$$Q = K\sqrt{p}$$

where the nominal sprinkler discharge coefficient "K" equals 5.5 (79.2); and "p" equals the residual pressure in psi (bar). Listing standards permit the actual value of "K" to vary from 5.3 to 5.8 (76.4 to 83.6); however, for hydraulic calculations a K-factor of 5.5 (79.2) is to be applied.

Figure A illustrates the F960/Q-46 assembly. The Plug and Inlet are brass per ASTM B16 (C36000), and the O-Ring Seal is silicone rubber. The Casing is galvanized carbon steel per ASTM A135 Grade A. The Frame is bronze per ASTM B62 (C83600), the Deflector is brass per ASTM B36 (C22000), the Compression Screw is bronze per ASTM B140 (C31400), and the two pieces of the Escutcheon Plate are 0.020 inch thick carbon steel per SAE 1008/1010. The Water Tube is brass per ASTM B135 (C33000). The Bulb Seat, Spring, and Yoke are all Type 302 stainless steel. The Guide Tube sub-assembly is constructed of Type 302 stainless steel and brass per ASTM B16 (C36000).

SYSTEM DESIGN

The F960/Q-46 Dry Horizontal Sidewall Sprinklers are to be installed in the 1 inch NPT outlet of a malleable iron threaded tee fitting per ANSI B16.3 or cast iron threaded tee fitting per ANSI B16.4 with the end sprinkler fitting on a branch line to be plugged as shown in Figure A; or, installed in the side outlet of a Gruviok® Figure 7105 Socket™ x 1 inch NPT side outlet fitting manufactured by Grinnell Corporation.

NOTES

Do not install the F960 into any other type fitting without first consulting

the Technical Data Department. Failure to use the appropriate fitting may result in binding of the inlet Plug or insufficient engagement of the inlet pipe threads with consequent leakage.

Branch, cross, and feedmain piping that is connected to dry horizontal sidewall sprinklers and subject to freezing temperatures must be pitched for drainage in accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems.

The outer piece of the Escutcheon Plate cannot be used to hold the F960/Q-46 Sprinkler in position. Pipe support must be provided in accordance with the minimum requirements of the National Fire Protection Association with respect to armovers and wall mounted sidewall sprinklers.

When dry horizontal sidewall sprinklers are to be used in wet pipe sprinkler systems protecting areas subject to freezing temperatures (e.g., coolers or freezers), consideration must be given to the appropriate length of the sprinkler that will prevent freezing of the water in the connecting pipes, due to conduction. When the temperature surrounding the wet pipe sprinkler system is maintained at a minimum temperature of 40°F/4°C, the following are the minimum recommended lengths between the face of the F960/Q-46 sprinkler fitting and the outside surface of the protected area (i.e., length exposed to minimum ambient of 40°F/4°C):

- 6 inches when the temperature within the protected area is 0°F;
- 12 inches when the temperature within the protected area is -20°F;
- 18 inches when the temperature within the protected area is -40°F; and,
- 24 inches when the temperature within the protected area is -60°F.

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

NOTE

When the F960/Q-46 Sprinklers penetrate a wall into an area subject to freezing, the clearance space around the Sprinkler Casing must be completely sealed, in order to prevent the leakage of moist air into the freezing area which might result in the formation of condensate around the Frame, Deflector, Bulb Seat, or Bulb.

Failure to prevent the formation of condensate could result in the build-up of ice around the releasing components and, consequently, either an inadvertent operation of the sprinkler or, impaired operation due to reduced thermal sensitivity.

INSTALLATION

NOTES

The Model F960/Q-46 Dry Horizontal Sidewall Sprinkler must only be installed in fittings that meet the requirements of the System Design sections.

Refer to the System Design section for other important requirements regarding piping design.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontal, a small air bubble should be present. The diameter of the air bubble varies from approximately 1/16 inch for the 135°F/57°C rating to 1/8 inch for the 360°F/182°C rating.

The sprinkler fitting should be located so that the face-of-fitting to mounting surface distance is within plus or minus 1/4 inch (6,4 mm) of the sprinkler order length. The remaining escutcheon plate adjustment can then be used to compensate for the possible manufacturing variations in the take-out of the fittings, as well as in the make-in of the sprinklers (as permitted by ANSI B1.20.1).

The F960/Q-46 must be installed with a deflector to ceiling distance of 4 to 12 inches. To meet this requirement, the centerline of the sprinkler waterway (Ref. Fig. A) must be between 4-5/16 and 12-5/16 inches below the ceiling.

The Model F960/Q-46 must be installed with the centerline of the waterway horizontal and perpendicular to the back wall surface. The word "TOP" on the deflector must face upwards toward the ceiling.

It is recommended that a lightweight spirit level (less than 1 pound), be used to level the sprinkler fitting and the sprinkler Deflector, as shown in Figure C.

NOTE

The Deflector is angled forward-downward at a nominal angle of 3.5°; consequently, the spirit level must be carefully positioned left-to-right, when using it to level the deflector.

Proceed with the installation as follows:

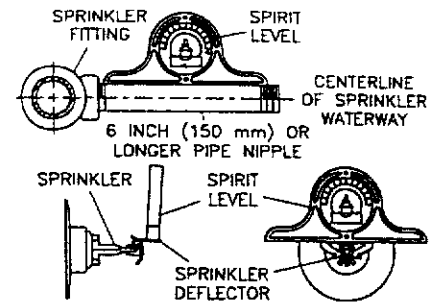


FIGURE C
LEVELING OF
SPRINKLER FITTING
AND DEFLECTOR

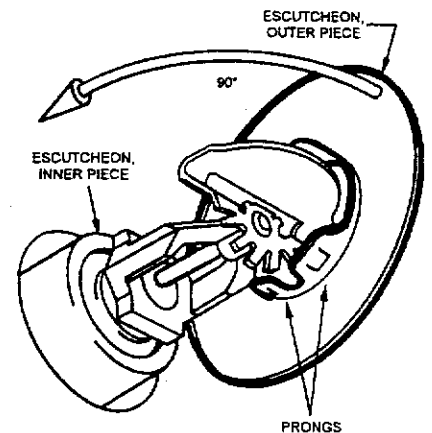


FIGURE D
ESCUTCHEON OUTER PIECE
INSTALLATION

1. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.
2. Wrench tighten the F960/Q-46 by wrenching on the Casing with a pipe wrench, whenever the Casing is readily accessible. Otherwise, use a 10 inch adjustable wrench applied to the wrench flats of the Frame.

NOTES

A leak tight 1 inch NPT sprinkler joint should be obtained with a torque of 20 to 30 ft.lbs. Higher levels of torque may distort the Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in an escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

3. After the wall has been installed or the finish coat has been applied, install the outer piece of the Escutcheon as follows:
 - a. Refer to Figure D and place the outer piece of the Escutcheon

TEMPERATURE RATING		SPRINKLER FINISH		ESCUTCHEON PLATE FINISH		"S" ORDER LENGTH INCHES DECIMAL (FOR EXAMPLE)	
940	135°F / 57°C	0	CHROME PLATED	0	WHITE PAINTED	025	2.5"
941	155°F / 68°C	1	NATURAL BRASS	1	WHITE PAINTED	080	8.0"
942	175°F / 79°C	9	CHROME PLATED	9	CHROME PLATED	180	18.0"
943	200°F / 93°C					185	18.5"
944	286°F / 141°C					475	47.5"
945	360°F / 182°C					480	48.0"

TABLE A
PRODUCT SYMBOL NUMBER SELECTION

FOR MODEL F960/Q-46 SR DRY HORIZONTAL SIDEWALL SPRINKLERS WITH STANDARD ESCUTCHEON PLATES

over one side of the Deflector with one pair of the Prongs at the bottom as shown in Figure D, and with the other pair of Prongs directly above the Deflector.

- b. Pass the outer piece of the Escutcheon over the Deflector by horizontally swinging the outer piece 90° towards the wall.
- c. Slide the outer piece of the Escutcheon over the inner piece until the outer piece contacts the wall.

CARE AND MAINTENANCE

Automatic sprinklers must never be shipped or stored where their temperatures will exceed 100°F/38°C and they must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers — both before and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (ref. Installation Section Note.)

NOTES

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Before closing a fire protection system control valve for maintenance work on the fire protection system which it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

It is recommended that automatic sprinkler systems be inspected quarterly by a qualified Inspection Service.

NOTES

It is recommended that the piping connected to dry horizontal sidewall sprinklers be periodically checked to assure that proper pitch and drainage is in accordance with the minimum requirements of the National Fire Protection Association, if the piping is subject to freezing temperatures.

A Vent Hole is provided in the Bulb Seat (Ref. Figure A) to indicate that the Dry Horizontal Sidewall Sprinkler is remaining dry. Evidence of leakage from this Vent Hole is an indication that there may be weepage past the O-Ring Seal and, therefore, it is an indication that the sprinkler must be removed for determining the cause of leakage (e.g. an improper installation or an ice plug). The fire protection system control valve must be closed and the system drained before removing the sprinkler.

WARRANTY

Seller warrants for a period of one year from the date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship.

For further details on Warranty, see Price List.

ORDERING PROCEDURE

Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers are furnished based upon "Ordered Lengths" as measured from the face of the wall to the face of the fitting in which the individual sprinkler is to be installed (refer to Figure A). After the measured length is taken, round the measurement up or down to the nearest 1/2 inch increment of 2-1/2 to 48 inches. Orders must include the description and Product Symbol Numbers.

Sprinklers:

Specify: (temperature rating) Model F960/Q-46 SR Dry Horizontal Sidewall Sprinkler with (specify type) finish Sprinkler and (specify type) finish Standard Escutcheon Plate and "S" Order Length of (specify) inches, PSN (specify from Table A).

Contact your local distributor for availability.

Replacement Parts:

Specify: F960/Q-46 Standard Outer Escutcheon with (specify finish), PSN (specify).

- Painted White PSN 56-960-0-007
- Chrome Plated PSN 56-960-9-007

PATENTS

U.S.A. Patent No. 5,188,185 applies to the Model F960/Q-46 Standard Response Dry Horizontal Sidewall Sprinklers.



DRY HORIZONTAL SIDEWALL SPRINKLERS, EC

MODEL F960/Q-48 DESIGNER, 1/2" ORIFICE

GENERAL DESCRIPTION

The 1/2 inch orifice Model F960/Q-48 Designer EC Dry Horizontal Sidewall Sprinklers (Ref. Figure A) are automatic sprinklers of the frangible bulb type. They are intended for use in light hazard, extended coverage (EC) automatic sprinkler system applications per NFPA 13.

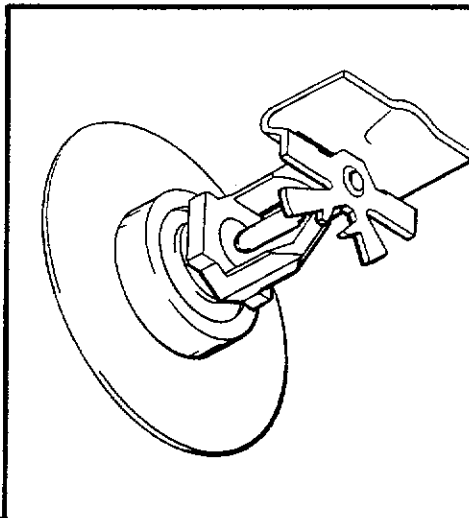
They are designed for installation along a wall and just beneath a smooth and level ceiling. Horizontal sidewall sprinklers are generally used in lieu of pendent sprinklers because of aesthetic, building construction, or installation economy considerations.

Available in 135°F and 155°F temperature ratings, as well as in order lengths of 1/2 inch increments from 2-1/2 to 48 inches, the F960/Q-48 is intended for use in applications where the sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures (e.g. horizontal piping extensions from a wet pipe system through a wall to protect a freezer or an unheated area of a building).

When the F960/Q-48 is in service, water is prevented from entering the assembly by the Plug and O-Ring Seal in the Inlet of the Sprinkler. Upon exposure to a temperature sufficient to operate the Bulb, the Bulb shatters and the Bulb Seat is released. The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls outward on

the Yoke, withdrawing the Plug and O-Ring Seal from the Inlet and initiating water flow.

The Escutcheon Plate has been designed to provide 1 inch of total horizontal adjustment (plus or minus 1/2 inch), to assure proper field positioning and to reduce the accuracy to which the sprinkler fitting must be installed. The 3 inch outside diameter of the



TEMPERATURE RATINGS AND BULB LIQUID COLOR CODE:

135°F / 57°C Orange
155°F / 68°C Red

NOMINAL K-FACTOR:

5.5 (GPM ÷ √psi)
79.2 (LPM ÷ √bar)

"S" ORDER LENGTHS:

2-1/2 to 48 inches in 1/2 inch increments

FINISH COMBINATIONS:

Sprinkler	Escutcheon
Chrome Plated	Chrome Plated
Chrome Plated	White Painted
Natural Brass	White Painted

COMPONENTS:

- 1-Deflector
- 2-Frame
- 3-Guide Tube Sub-assembly
- 4-Water Tube
- 5-Spring
- 6-Compression Screw
- 7-Bulb
- 8-Bulb Seat
- 9-Casing
- 10-Yoke
- 11-Inlet
- 12-Plug
- 13-O-Ring Seal
- 14-Escutcheon, Inner Piece
- 15-Escutcheon, Outer Piece

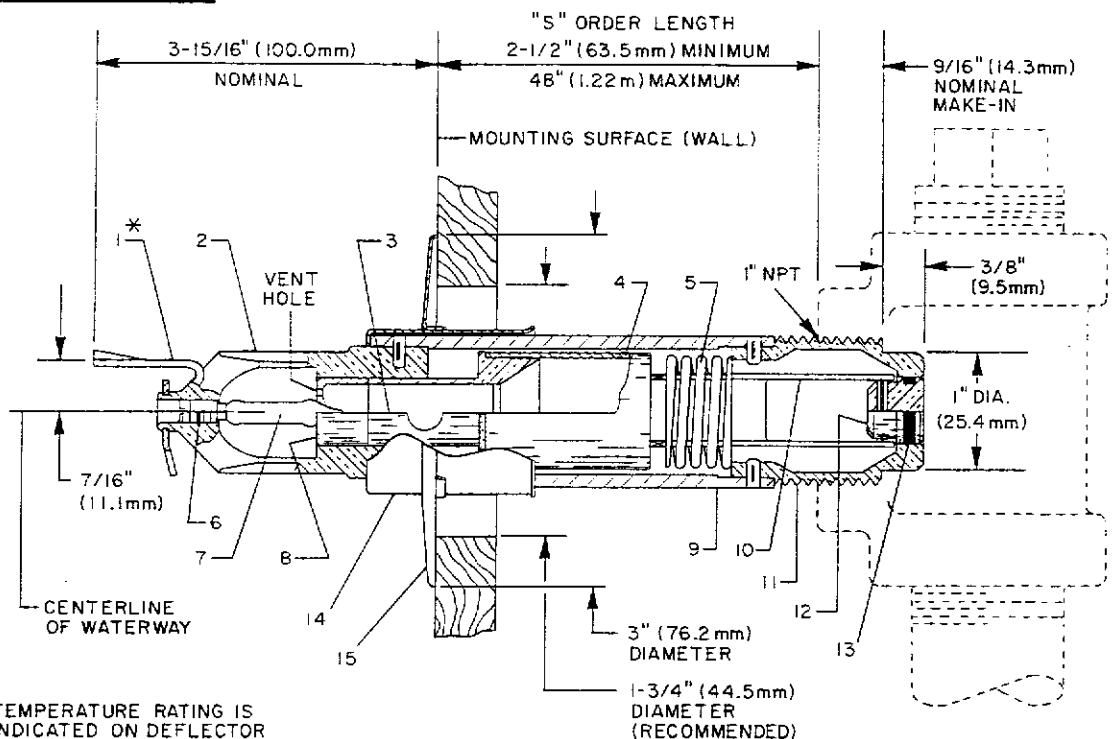
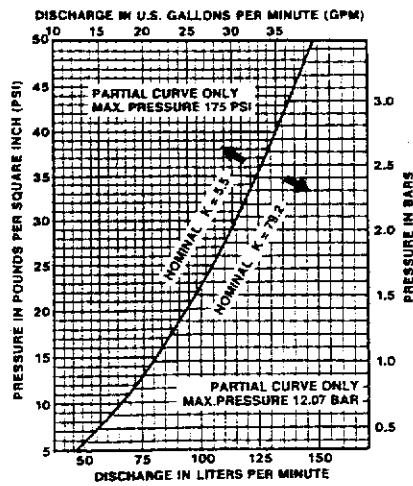


FIGURE A
MODEL F960/Q-48 EC DRY HORIZONTAL SIDEWALL SPRINKLER
WITH STANDARD ESCUTCHEON PLATE



**FIGURE B
NOMINAL DISCHARGE CURVE**

outer piece of the Escutcheon Plate combined with the 1-3/4 inch diameter clearance hole size also contributes to the ease of installation by covering off-set clearance holes.

The Escutcheon Plate is a separable two-piece design which allows installation of the sprinklers and pressure testing of the fire protection system, prior to wall construction and/or application of a finish coat to the wall. It also permits refinishing of a wall surface without having to first shut down the fire protection system and remove the sprinklers.

APPROVALS AND STANDARDS

The 1/2 inch orifice Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers are listed by Underwriters Laboratories Inc. and Underwriters' Laboratories of Canada.

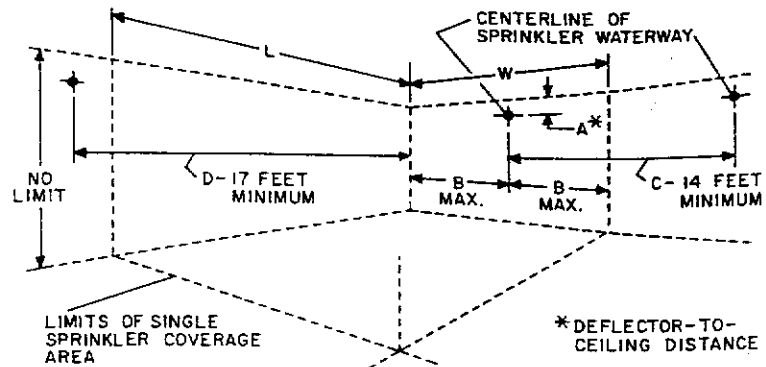
The laboratory listings only apply to the temperature ratings, order lengths, sprinkler finishes, and escutcheon plate finishes stated in Figure A, and only apply to the service conditions indicated in the Technical Data and EC Design Criteria sections.

WARNING

The Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers described herein must be installed and maintained in compliance with this document, as well as applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the integrity of these devices.

The owner is responsible for main-

APPLICATION	W x L FT x FT	TEMP °F	MIN. FLOW ^(b) GPM	MIN. PRESSURE ^(b) PSI	A INCHES	B FEET
EC ^(a)	16 x 16	135 & 155	26	22.3	4 to 12 ^(c)	8
EC ^(a)	16 x 18	135 & 155	29	27.8	4 to 12 ^(c)	8
EC ^(a)	16 x 20	135 & 155	32	33.9	4 to 12 ^(c)	8
EC ^(a)	18 x 16	135 & 155	29	27.8	4 to 12 ^(c)	9



NOTES:

- Light Hazard Occupancy automatic sprinkler system applications per NFPA 13.
- Requirement is based on minimum flow in GPM from each sprinkler. The indicated residual pressures are based on the nominal K-factor.
- To meet this requirement, the centerline of the waterway (Ref. Fig. A) must be installed between 4-7/16 and 12-7/16 inches below the ceiling.

**TABLE A
INSTALLATION CRITERIA FOR 1/2 INCH ORIFICE
MODEL F960/Q-48 EC DRY HORIZONTAL SIDEWALL SPRINKLERS**

taining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted relative to any questions.

The Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers cannot be installed in threaded elbow fittings or plain end pipe fittings without first having the fitting manufacturer verify that there will be clearance between the F960/Q-48 Inlet and the inside of the pipe fitting. Failure to use a pipe fitting with clearance for the F960/Q-48 Inlet may result in a binding of the Plug and a failure of the sprinkler to operate or, insufficient engagement of the 1 inch NPT pipe threads with consequent leakage.

TECHNICAL DATA

The 1/2 inch orifice Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers are rated for use at a maximum service pressure of 175 psi. The available temperature ratings, order lengths, sprinkler finishes, and escutcheon plate finishes are given in Figure A.

The F960/Q-48 must be installed with a deflector to ceiling distance of 4 to 12

inches. To meet this requirement, the centerline of the sprinkler waterway (Ref. Fig. A) must be between 4-7/16 and 12-7/16 inches below the ceiling.

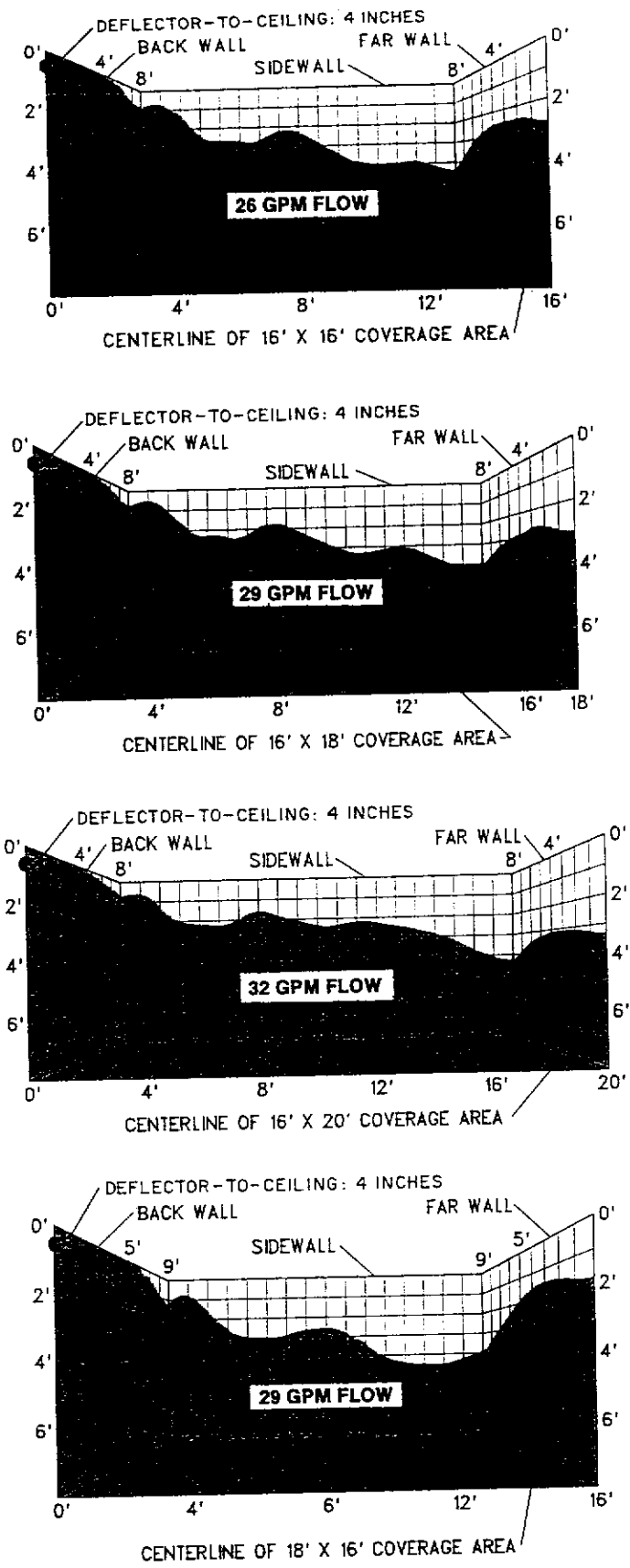
The nominal discharge curve for the F960/Q-48 is plotted in Figure B and it represents the flow "Q" in U.S. gallons per minute (gpm) as determined by the formula:

$$Q = K\sqrt{p}$$

where the nominal sprinkler discharge coefficient "K" = 5.5 and "p" = pressure in pounds per square inch (psi). Listing standards permit the actual value of "K" to vary from 5.3 to 5.8.

The F960/Q-48 EC Dry Horizontal Sidewall Sprinklers are to be installed in fittings that provide clearance between the F960/Q-48 Inlet and the inside of the fitting. The F960/Q-48 Sprinklers may be installed in 1 inch NPT outlet connections of malleable iron threaded tee fittings per ANSI B16.3 or cast iron threaded tee fittings per ANSI B16.4. For threaded tee fittings, the end sprinkler fitting on a branch line is to be a plugged tee fitting (Ref. Figure A).

Gruvlok® Sock-It™ x 1 inch NPT side outlet fittings manufactured by Grinnell



- NOTES:
 1. Patterns shown with no ceiling mounted obstructions.
 2. See Warranty Section.

FIGURE C
NOMINAL WETTING PATTERNS AT MINIMUM REQUIRED FLOWS
FOR EC APPLICATIONS

Corporation also provide adequate clearance between the F960/Q-48 inlet and the inside of the fitting.

The Plug and Inlet are brass per ASTM B16 (C36000), and the O-Ring Seal is silicone rubber. The Casing is galvanized carbon steel per ASTM A135 Grade A. The Frame is bronze per ASTM B62 (C83600), the Deflector is brass per ASTM B36 (C22000), the Compression Screw is bronze per ASTM B140 (C31400), and the two pieces of the Escutcheon Plate are 0.020 inch thick carbon steel per SAE 1008/1010. The Water Tube is brass per ASTM B135 (C33000). The Bulb Seat, Spring, and Yoke are all Type 302 stainless steel. The Guide Tube sub-assembly is constructed of Type 302 stainless steel and brass per ASTM B16 (C36000).

EC DESIGN CRITERIA

The 1/2 inch orifice Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers must only be installed and utilized in Light Hazard Occupancies, under smooth and level ceilings, and in accordance with the criteria given in Table A. The nominal wetting patterns are illustrated in Figure C for the minimum flows required for each coverage area.

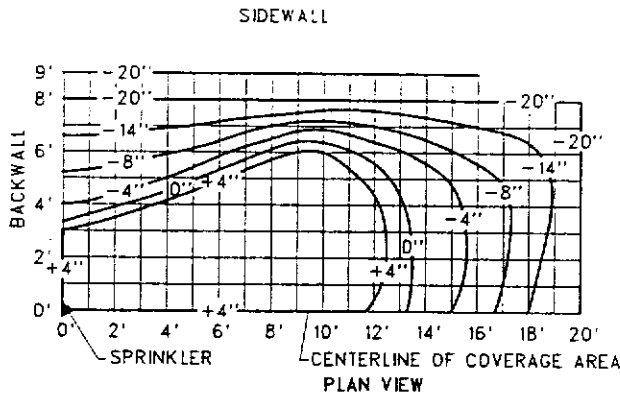
NOTE
 For coverage area dimensions less than or between those indicated in Table A, it is necessary to use the minimum required flow for the next highest width (W) and length (L) for which installation criteria are stated.

Ceiling mounted obstructions such as heating or air conditioning diffusers, overhangs, and light fixtures must be located above an elevation, as shown in Figure D, where they will not interfere with the proper distribution of water by the sprinkler.

NOTE
 The F960/Q-48 Sprinklers must NOT be used with beams, joists, or ducts located within the sprinkler coverage area. They may be located along the boundaries separating adjacent sprinkler coverage areas.

SYSTEM DESIGN

Branch, cross, and feedmain piping that is connected to dry horizontal sidewall sprinklers and subject to freezing temperatures must be pitched for drainage in accordance with the



NOTES:

1. For a given position within the coverage area, ceiling mounted obstructions must not hang below the elevation dimension given in the graph.
2. Elevation dimensions are with respect to the top of the Deflector Hat (ref. Fig.A), where positive (+) dimensions are above the Deflector Hat and negative (-) dimensions are below. (Reference: The Deflector Hat is 7/16" above the centerline of the sprinkler waterway.)

**FIGURE D
ALLOWABLE ELEVATION FOR CEILING MOUNTED OBSTRUCTIONS
SUCH AS HEATING OR AIR CONDITIONING DIFFUSERS, OVERHANGS,
AND LIGHT FIXTURES**

minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems.

The outer piece of the Escutcheon Plate cannot be used to hold the F960/Q-48 Sprinkler in position. Pipe support must be provided in accordance with the minimum requirements of the National Fire Protection Association with respect to armovers and wall mounted sidewall sprinklers.

When dry horizontal sidewall sprinklers are to be used on wet pipe sprinkler systems protecting areas subject to freezing temperatures (e.g., coolers or freezers), consideration must be given to the appropriate length of the sprinkler that will prevent freezing of the water in the connecting pipes, due to conduction. The following are the minimum recommended lengths between the face of the F960/Q-48 sprinkler fitting and the outside surface of the protected area, when the temperature surrounding the wet pipe sprinkler system is maintained at a minimum temperature of 40°F:

- 6 inches when the temperature within the protected area is 0°F;
- 12 inches when the temperature within the protected area is -20°F;
- 18 inches when the temperature within the protected area is -40°F; and,
- 24 inches when the temperature within the protected area is -60°F.

For protected area temperatures be-

tween those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the individual values.

INSTALLATION

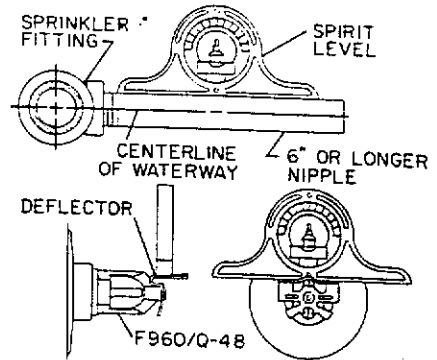
NOTES

The Model F960/Q-48 EC Dry Horizontal Sidewall Sprinkler must only be installed in fittings that meet the requirements of the Warning and Technical Data sections.

Refer to the System Design section for other important requirements regarding piping design.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontal, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch for the 135 F/57 C and 155 F/68 C temperature ratings.

The sprinkler fitting should be located so that the face-of-fitting to mounting surface distance is within plus or minus 1/4 inch of the sprinkler order length. The remaining escutcheon plate adjustment can then be used to compensate for the possible manufacturing variations in the take-out of the fittings, as well as in the make-in of the



**FIGURE E
LEVELING OF
SPRINKLER FITTING
AND DEFLECTOR**

sprinklers (as permitted by ANSI B1.20.1).

The F960/Q-48 must be installed with a deflector to ceiling distance of 4 to 12 inches. To meet this requirement, the centerline of the sprinkler waterway (Ref. Fig. A) must be between 4-7/16 and 12-7/16 inches below the ceiling.

The Model F960/Q-48 must be installed with the centerline of the waterway horizontal and perpendicular to the back wall surface. The word "TOP" on the deflector must face upwards toward the ceiling.

It is recommended that a lightweight spirit level (less than 1 pound), be used to level the sprinkler fitting and the sprinkler Deflector, as shown in Figure E.

NOTE

The Deflector has a raised portion at the front; consequently, the spirit level must be positioned on the rear flat portion of the Deflector.

Proceed with the installation as follows:

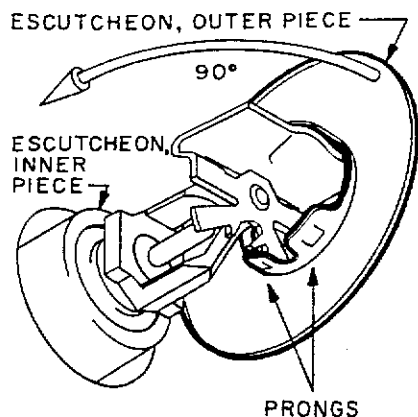
1. Apply pipe thread sealant sparingly to the 1 inch NPT sprinkler threads only. Use of a Teflon[†] based pipe joint sealant is recommended.
2. Install the F960/Q-48 by wrenching on the Casing with a pipe wrench, whenever the Casing is readily accessible. Otherwise, use a 10 inch adjustable wrench applied to the wrench flats of the Frame.

NOTES

A leak tight 1 inch NPT sprinkler joint should be obtained with a torque of 20 to 30 ft.lbs. Higher levels of torque may distort the Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to make-up for in-

[†] DuPont Registered Trademark



**FIGURE F
ESCUTCHEON OUTER PIECE
INSTALLATION PROCEDURE**

sufficient adjustment in an escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

3. After the wall has been installed or the finish coat has been applied, install the outer piece of the Escutcheon as follows:
 - a. Refer to Figure F and place the outer piece of the Escutcheon over one side of the Deflector with one pair of the Prongs at the bottom as shown in Figure F, and with the other pair of Prongs directly above the Deflector.
 - b. Pass the outer piece of the Escutcheon over the Deflector by horizontally swinging the outer piece 90° towards the wall.
 - c. Slide the outer piece of the Escutcheon over the inner piece until the outer piece comes in contact with the wall.

CARE AND MAINTENANCE

Automatic sprinklers must never be shipped or stored where their temperatures will exceed 100°F/38°C and they must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers — both before and after installation. Sprinklers dam-

aged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (ref. Installation Section.)

If a sprinkler must be removed for some reason, do not reinstall it or a replacement without reinstalling the outer piece of the Escutcheon Plate. If the outer piece of an escutcheon plate becomes dislodged during service, replace it immediately.

NOTES

Absence of the outer piece of an escutcheon plate may delay the time to sprinkler operation in a fire situation.

Before closing a fire protection system control valve for maintenance work on the fire protection system which it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

It is recommended that automatic sprinkler systems be inspected quarterly by a qualified Inspection Service.

NOTES

It is recommended that the piping connected to dry horizontal sidewall sprinklers be periodically checked to assure that proper pitch and drainage is in accordance with the minimum requirements of the National Fire Protection Association, if the piping is subject to freezing temperatures.

A Vent Hole is provided in the Bulb Seat (Ref. Figure A) to indicate that the Dry Horizontal Sidewall Sprinkler is remaining dry. Evidence of leakage from this Vent Hole is an indication that there may be weepage past the O-Ring Seal and, therefore, it is an indication that the sprinkler must be removed for determining the cause of leakage (e.g. an improper installation or an ice plug). The fire protection system control valve must be closed and the system drained before removing the sprinkler.

WARRANTY

Seller warrants for a period of one year from the date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship.

For further details on Warranty, see Price List.

PSN 60 — XXX — X — XXX

TEMPERATURE RATING		SPRINKLER FINISH		ESCUTCHEON PLATE FINISH		"S" ORDER LENGTH INCHES DECIMAL (FOR EXAMPLE)	
950	135°F / 57°C	0	CHROME PLATED		WHITE PAINTED	025	2.5"
951	155°F / 68°C	1	NATURAL BRASS		WHITE PAINTED	080	8.0"
		9	CHROME PLATED		CHROME PLATED	180	18.0"
						185	18.5"
						475	47.5"
						480	48.0"

TABLE B
PRODUCT SYMBOL NUMBER SELECTION
FOR MODEL F960/Q-48 EC DRY HORIZONTAL SIDEWALL SPRINKLERS WITH STANDARD ESCUTCHEON PLATES

ORDERING PROCEDURE

Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers are furnished based upon "Ordered Lengths" as measured from the face of the wall to the face of the fitting in which the individual sprinkler is to be installed (refer to Figure A). After the measured length is taken, round the measurement up or down to the nearest 1/2 inch increment from 2-1/2 to 48 inches. Orders must include the description and Product Symbol Numbers.

Sprinklers:
 Specify: (temperature rating) Model F960/Q-48 EC Dry Horizontal Sidewall Sprinkler with (specify type) finish Sprinkler and (specify type) finish Standard Escutcheon Plate and "S" Order Length of (specify) inches, PSN (specify from Table B).

Contact your local distributor for availability.

Replacement Parts:

To order a replacement for the outer piece of the Escutcheon Plate, specify description and for use with Model F960/Q-48 EC Dry Horizontal Sidewall Sprinkler, and Product Symbol Number (PSN). A replacement inner piece for the Escutcheon Plate is not available.

- Chrome Plated
 - Outer Piece for F960/Q-48 Standard Escutcheon Plate PSN 56-960-9-007
- Painted White
 - Outer Piece for F960/Q-48 Standard Escutcheon Plate PSN 56-960-0-007

PATENTS

There is a patent pending concerning certain features of the Model F960/Q-48 EC Dry Horizontal Sidewall Sprinklers.

CONVERSION FACTORS

Parenthetical metric conversion factors cited herein are approximate.

- 1 inch = 25.400 mm
- 1 ft.lb. = 1.356 Nm

FIG. 58 THREADED SIDE BEAM BRACKET

Size Range – 3/8 inch rod, pipe sizes 1/2 thru 4 inch.

Material – Carbon Steel

Function – Practical and economical bracket used to support piping from wood, concrete or steel beams.

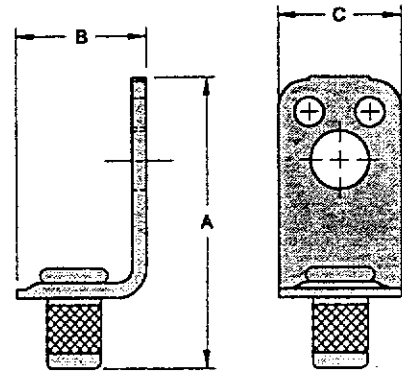
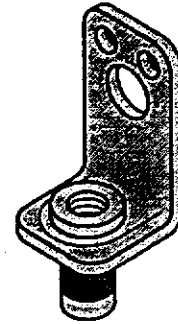
Features – Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept 3/8 and 1/2 inch fastener bolts. Per N.F.P.A. #13: 1/2 thru 2 inch pipe requires 3/8 inch fastener, 2-1/2 thru 4 inch pipe requires 1/2 inch fastener.*

Approvals – Underwriters' Laboratories Listed in the USA (UL), and Canada (cUL), and Factory Mutual Engineering Approved through 4 inch pipe.

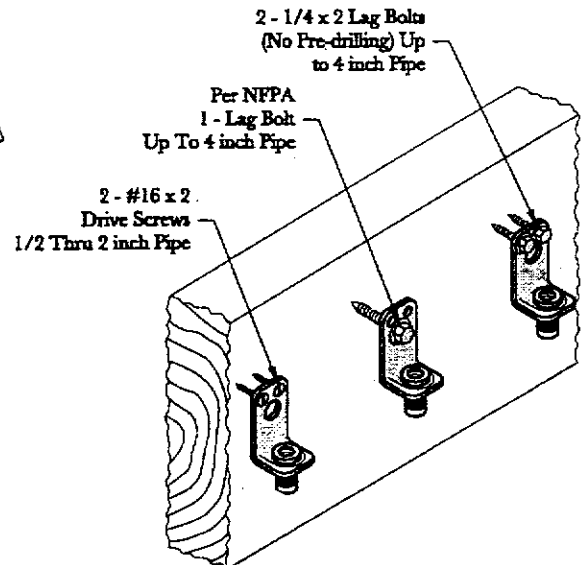
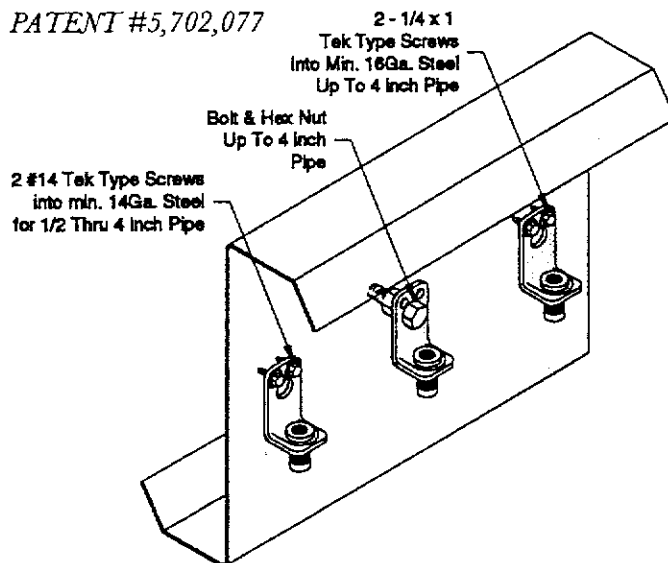
***Note**—Additionally U.L. has listed the Fig. 58 using (2) #16 x 2" drive screws in wood construction for 1/2 thru 2" pipe; (2) 1/4 " x 2" lag bolts with no pre-drilling 1/2 " thru 4" pipe. Also U.L. listed using (2) #14 Tek type screws in minimum 14ga. steel for 1/2 thru 4 inch pipe; (2) 1/4 " x 1" tek screws in minimum 16 ga. steel 1/2 " thru 4" pipe.

Finish – Plain and Electro-Galvanized

Order By – Figure number and finish.



U.S. PATENT #5,702,077



PIPE SIZE	ROD SIZE	A	B	C	MAX. REC. LOAD LBS.*	APPROX. WT./100
1/2 thru 4	3/8	2-3/4	1-1/2	1-1/8	300	14

*Safety Factor of 5



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FIG. 99
ALL THREAD ROD CUT TO LENGTH

Size Range - 3/8 thru 7/8 inch rod in 1 inch increments.

Material - Carbon Steel

Maximum Temperature - 750°F

Finish - Plain, Electro-Galvanized, and Stainless Steel.

Order By - Figure number, rod diameter, rod length, and finish.

ROD SIZE	MAX. REC. LOAD LBS. FOR SERVICE TEMPS.	
	650°F	750°F
3/8	610	540
1/2	1130	1010
5/8	1810	1610
3/4	2710	2420
7/8	3770	3360



FIG. 100
ALL THREAD ROD FULL LENGTHS

Size Range - 1/4 thru 1-1/2 inch rod in 10'-0" lengths.

Material - Carbon Steel

Maximum Temperature - 750°F

Finish - Plain, Electro-Galvanized, and Stainless Steel.

Order By - Figure number, rod diameter, and finish.

ROD SIZE	MAX. REC. LOAD LBS. FOR SERVICE TEMPS.		APPROX. WEIGHT PER 100 FT.
	650°F	750°F	
1/4	240	215	12
3/8	610	540	29
1/2	1130	1010	53
5/8	1810	1610	84
3/4	2710	2420	123
7/8	3770	3360	169
1	4960	4420	222
1-1/4	8000	7140	360
1-1/2	11630	10370	570



FIG. 200 ADJUSTABLE RING HANGER

Size Range - 1/2 thru 8 inch pipe.

Material - Carbon Steel, Mil. Galvanized to G-90 specifications.

Function - For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation. Spring tension on nut holds it securely in hanger before installation. Swivel nut is easily removed.

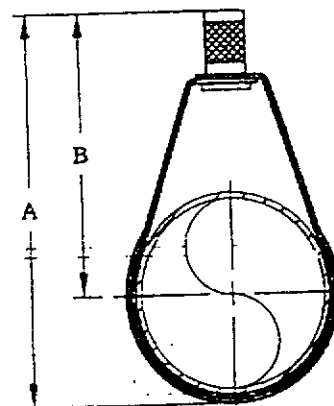
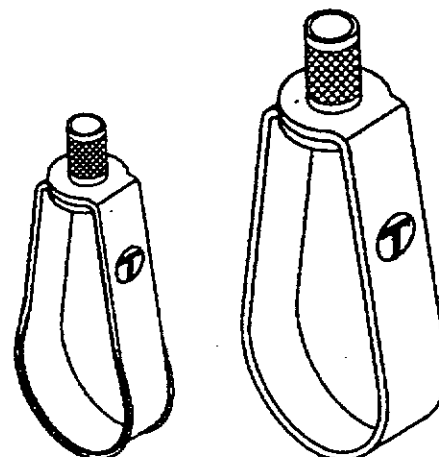
Features - Flared edges on sizes 1/2 thru 2 inch. Eases installation and protects CPVC pipe from any abrasion.

Approvals - Underwriters' Laboratories listed in the U.S. (UL) and Canada (cUL) for Steel and CPVC plastic pipe and Factory Mutual Engineering approved. Conforms to Federal Specifications WW-H-171E, Type 10, and Manufacturers Standardization Society SP-69, type 10.

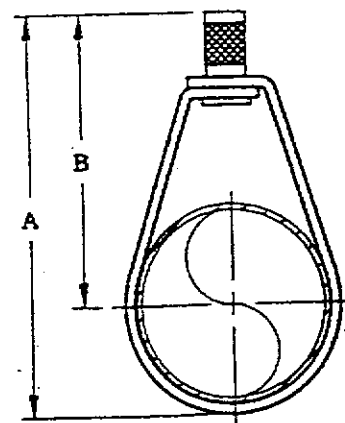
Maximum Temperature - 650°F.

Finish - Mil. Galvanized, HDG, and Stainless Steel.

Order By Figure number and pipe size.



1/2 - 2 inch pipe



2 1/2 - 8 inch pipe



PIPE SIZE	ROD SIZE	A	B	MAX. REC. LOAD LBS.	APPROX. WT./100
1/2	3/8	3-1/8	2-5/8	400	11
3/4	3/8	3-1/8	2-1/2	400	11
1	3/8	3-3/8	2-5/8	400	12
1-1/4	3/8	3-3/4	2-7/8	400	13
1-1/2	3/8	3-7/8	2-7/8	400	14
2	3/8	4-1/2	3	400	15
2-1/2	3/8	5-5/8	4-1/8	600	27
3	3/8	5-7/8	4	600	29
3-1/2	3/8	7-3/8	5-1/4	600	34
4	3/8	7-3/8	5	1000	35
5	1/2	9-1/8	6-1/4	1250	66
6	1/2	10-1/8	6-3/4	1250	73
8	1/2	13-1/8	8-3/4	1250	136