

ALT STAND ALONE FIRE SPRINKLER PERMIT

City of Newberg

PERMIT NUMBER
NCMB24-0030

PERMIT TYPE: ALT STAND ALONE FIRE SPRIN	SUBDIVISION/COMM SITE:	TAX MAP NO: R3208 02900
PERMIT SUB TYPE : RESIDENTIAL ALTERATIO		BLDG USE GROUP:
JOB ADDRESS: 996 E RORK CT		
DESCRIPTION: Fire Sprinkler System 13D Stand Alone		
ZONED AS:	TOTAL SQFT: 0	SPRINKLERS:
TOTAL WORK VALUE: \$3,122.00	TYPE OF CONSTRUCTION:	BUILDING USE:

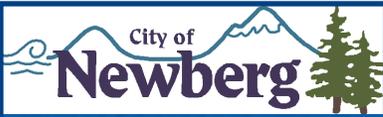
APPLICANT: Wyatt Fire Protection Inc	PHONE: (503)684-2928
MAILING ADDRESS: 9095 SW Burnham Street Tigard, OR 97223-6104	FAX: (503)684-9657
ARCHITECT DESIGNER ENGINEER OR WHO DREW THE PLANS: Wyatt Fire Protection Inc	PHONE: (503)684-2928
MAILING ADDRESS: 9095 SW Burnham Street Tigard, OR 97223-6104	FAX: (503)684-9657
CONTRACTOR: Wyatt Fire Protection Inc	PHONE: (503)684-2928
MAILING ADDRESS: 9095 SW Burnham Street Tigard, OR 97223-6104	FAX: (503)684-9657
OWNER: Canopy Building Group, LLC	PHONE: (503)956-9307
MAILING ADDRESS: 15962 Boones Ferry Rd - Suite 202 Lake Oswego, OR 97035	FAX:

COMMENTS

FEES			
DESCRIPTION	ACCOUNT	QUANTITY	PAID AMOUNT
COMMUNITY DEVELOPMENT FEE .75 PERCENT	01-0000-322009	0	\$23.42
FIRE AND LIFE SAFETY PLAN REVIEW FEE 60 PERCENT	08-0000-322001	0	\$85.96
STATE SURCHARGE FEE 12 PERCENT - STRUCTURAL	08-0000-202011	0	\$17.19
STRUCTURAL PERMIT FEE	08-0000-322001	0	\$143.27
STRUCTURAL PLAN REVIEW FEE 85 PERCENT	08-0000-322001	0	\$121.78
TECHNOLOGY FEE 5 PERCENT - STRUCTURAL	08-0000-341006	0	\$7.16
			TOTAL: \$398.78

**ALL WORK TO CONFORM TO THE CURRENT EDITION OF THE ORSC AND OSCC.
INSPECTIONS REQUESTED PRIOR TO 7AM ILL BE COMPLETED THE SAME BUSINESS DAY.
INSPECTION RECIEVED AFTER 7AM WILL BE SCHEDULE FOR THE NEXT BUSINESS DAY.**





ALT STAND ALONE FIRE SPRINKLER PERMIT

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PERMIT NUMBER
NCMB24-0030

8.15.150 UNNECESSARY NOISE – PERMITTED EXCEPTIONS.

A. UNREASONABLE NOISE AND EXCEPTIONS.

3. The following acts are declared to be per se violations of this section. This enumeration does not constitute an exclusive list:

j. Construction or Repair of Buildings, or Excavation of Streets and Highways. The construction, demolition, alteration or repair of any building or the excavation of streets and highways other than between the hours of 7:00 a.m. and 7:00 p.m. on weekdays. In cases of emergency, construction or repair noises are exempt from this provision. In nonemergency situations, the city may issue a permit, upon application, if the city determines that the public health and safety, as affected by loud and raucous noise caused by construction or repair of buildings or excavation of streets and highways between the hours of 7:00 p.m. and 7:00 a.m. will not be impaired, and if the city further determines that loss or inconvenience would otherwise result. The permit shall grant permission in nonemergency cases for a period of not more than three days. The permit may be renewed once for a period of three days or less.

Building Official: Brooks Bateman

Issued By: Michele Faber

Date: 2/3/2025



WYATT

FIRE PROTECTION, INC.

9095 S.W. Burnham

Tigard, OR 97223

RORK CT

996 E RORK CT

NEWBERG, OR

**FIRE PROTECTION
HYDRAULIC CALCULATIONS**



Hydraulic Overview

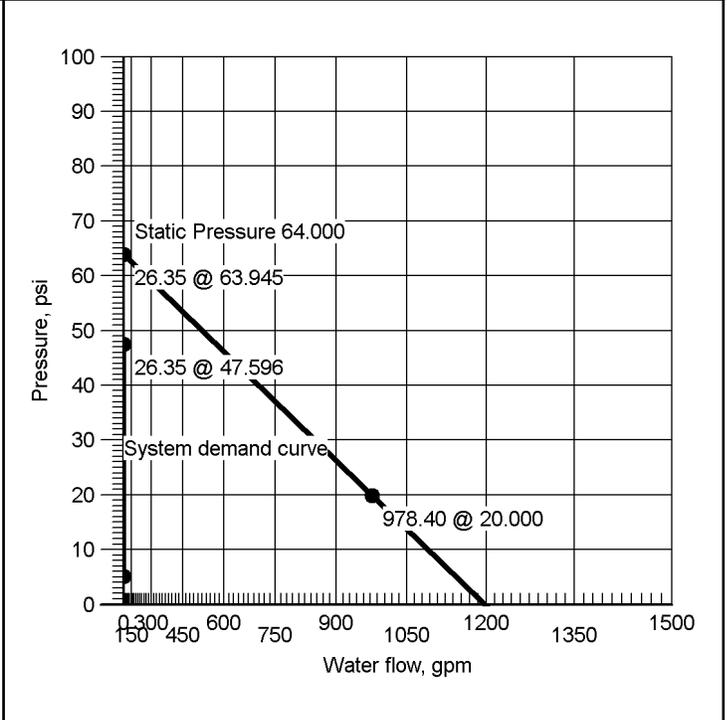
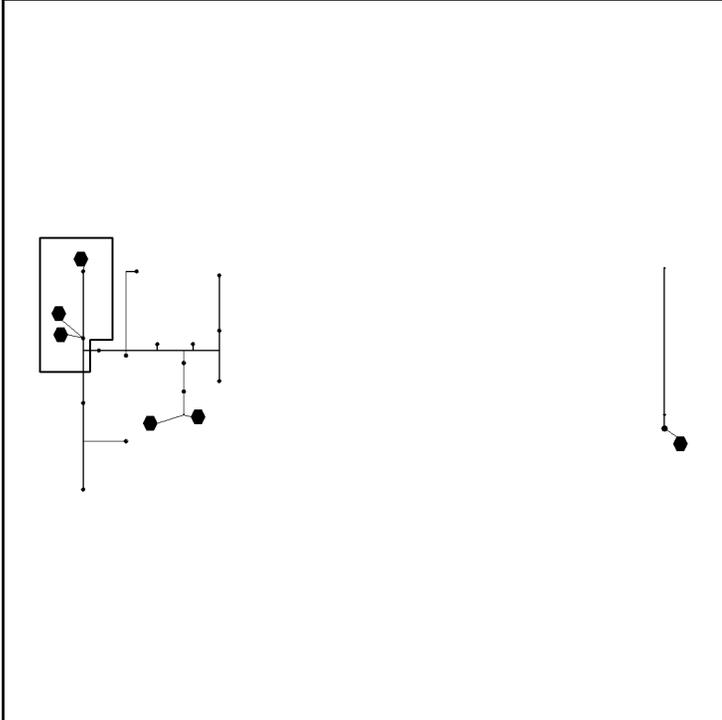
Job Number: 1
Report Description: Residential

Job	
Job Number 1	Designer
Job Name: Drawing2	Phone FAX
Address 1	State Certification/License Number
Address 2	AHJ
Address 3	Job Site/Building

System		
Density 0.05gpm/ft ²	Area of Application 900ft ² (Actual 313ft ²)	
Most Demanding Sprinkler Data 4.9 K-Factor 12.96 at 7.000	Hose Streams 0.00	
Coverage Per Sprinkler 256ft ²	Number Of Sprinklers Calculated 2	Number Of Nozzles Calculated 0
System Pressure Demand 47.596	System Flow Demand 26.35	
Total Demand 26.35 @ 47.596	Pressure Result +16.349 (25.6%)	

Supplies						Check Point Gauges			
Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)	Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
1	Water Supply	978.40		64.000	20.000				

Rork Ct 5.cad Water Supply at Node 1 (978.40, 0.00, 64.000, 20.000)





Summary Of Outflowing Devices

Job Number: 1

Report Description: Residential

Device	Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
⇒ Sprinkler 101	12.96	12.80	4.9	7.000			
Sprinkler 105	13.39	12.80	4.9	7.463			

⇒ Most Demanding Sprinkler Data



Hydraulic Analysis

Job Number: 1
Report Description: Residential

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	
Route 1							
DR	1.1010	12.96	4.37	150	0.030510	13'-0"	Pf 0.641
101	9'-0"	12.96	4.9	7.000	Sprinkler,	8'-0"	Pe -0.217
9	9'-6"			7.424	E(7'-0"), Tr(1'-0)	21'-0"	Pv
BL	1.1010	26.35	8.88	150	0.113320	33'-0½"	Pf 6.239
9	9'-6"	13.39		7.424	Flow (q) from Route 2	22'-0"	Pe
26	9'-6"			13.663	2T(5'-0"), 5Tr(1'-0), E(7'-0)	55'-0½"	Pv
BL	1.0490	26.35	9.78	120	0.216730	9'-6"	Pf 8.559
26	9'-6"			13.663			Pe 4.119
24	0'-0"			26.341	BFP(-6.500)	9'-6"	Pv
BL	0.8740	26.35	14.09	150	0.348860	33'-0"	Pf 19.954
24	0'-0"			26.341		7'-0"	Pe 1.301
1	-3'-0"			47.596	E(7'-0"), WMV(-6.000), S	40'-0"	Pv
		0.00			Hose Allowance At Source		
1		26.35					
Route 2							
DR	1.1010	13.39	4.51	150	0.032371	0'-6"	Pf 0.178
105	9'-0"	13.39	4.9	7.463	Sprinkler,	5'-0"	Pe -0.217
9	9'-6"			7.424	T(5'-0)	5'-6"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1

Report Description: Residential

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend	
AO	Arm-Over
BL	Branch Line
CM	Cross Main
DN	Drain
DR	Drop
DY	Dynamic
FM	Feed Main
FR	Feed Riser
MS	Miscellaneous
OR	Outrigger
RN	Riser Nipple
SN	Swing Nipple
SP	Sprig
ST	Stand Pipe
UG	Underground

Units Legend	
Diameter	Inch
Elevation	Foot
Flow	gpm
Discharge	gpm
Velocity	fps
Pressure	psi
Length	Foot
Friction Loss	psi/Foot
HWC	Hazen-Williams Constant
Pt	Total pressure at a point in a pipe
Pn	Normal pressure at a point in a pipe
Pf	Pressure loss due to friction between points
Pe	Pressure due to elevation difference between indicated points
Pv	Velocity pressure at a point in a pipe

Fittings Legend	
ALV	Alarm Valve
AngV	Angle Valve
b	Bushing
BalV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DeV	Deluge Valve
DPV	Dry Pipe Valve
E	90° Elbow
EE	45° Elbow
Ee1	11¼° Elbow
Ee2	22½° Elbow
f	Flow Device
fd	Flex Drop
FDC	Fire Department Connection
fE	90° FireLock(TM) Elbow
fEE	45° FireLock(TM) Elbow
flg	Flange
FN	Floating Node
fT	FireLock(TM) Tee
g	Gauge
GloV	Globe Valve
GV	Gate Valve
Ho	Hose
Hose	Hose
HV	Hose Valve
Hyd	Hydrant
LtE	Long Turn Elbow
mecT	Mechanical Tee
Noz	Nozzle
P1	Pump In
P2	Pump Out
PIV	Post Indicating Valve
PO	Pipe Outlet
PRV	Pressure Reducing Valve
PrV	Pressure Relief Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap



WYATT

FIRE PROTECTION, INC.

9095 S.W. Burnham
Tigard, OR 97223

Fire Hydrant Fire Flow

PROJECT	RORK CT LOT 5	
ADDRESS	1012 E RORK CT NEWBERG OR	
CROSS STREET	219 & College	
FLOW		
HYDRANT LOCATION	1019 E Rork Ct	
STATIC	64	
PITOT RESIDUAL	34	
GPM	978.40	
GPM AT 20 PSI	1749.41	<i>calculated per NFPA 291</i>
DATED	06-06-2024	
MONITOR		
HYDRANT LOCATION	219 & College	
STATIC	64	
RESIDUAL	49	
DATED	06-06-2024	
WITNESS		
WITNESSED BY	Joey & Brandon	
TITLE		
ORGANIZATION	City of Newberg	
SIGNATURE	Joey & Brandon	
PERFORMED BY	MIKE SAYTI	

City of Newberg, OR

Inspection Report

Inspection: Building Final Inspection

Inspector: BLD- Brooks Bateman

Inspection Date: Oct 16, 2025

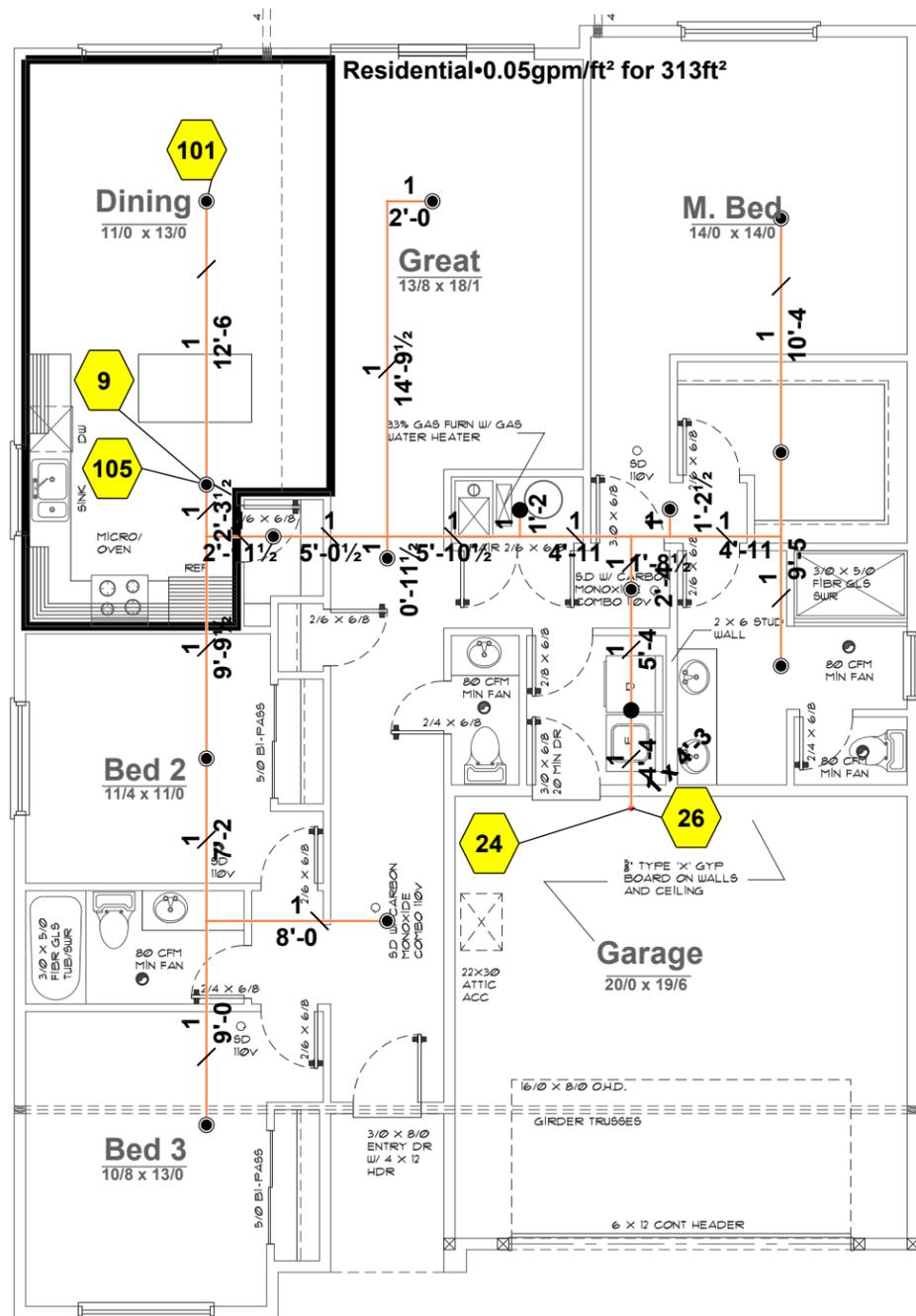
Record: *Fire Sprinkler/Suppression/Alarm Installation Permit
#FIRE-25-21

Location: 996 E RORK CT, Newberg, OR 97132

Applicant: Wyatt Fire Protection Inc

FIRE SPRINKLER FINAL

Overall Result: Pass

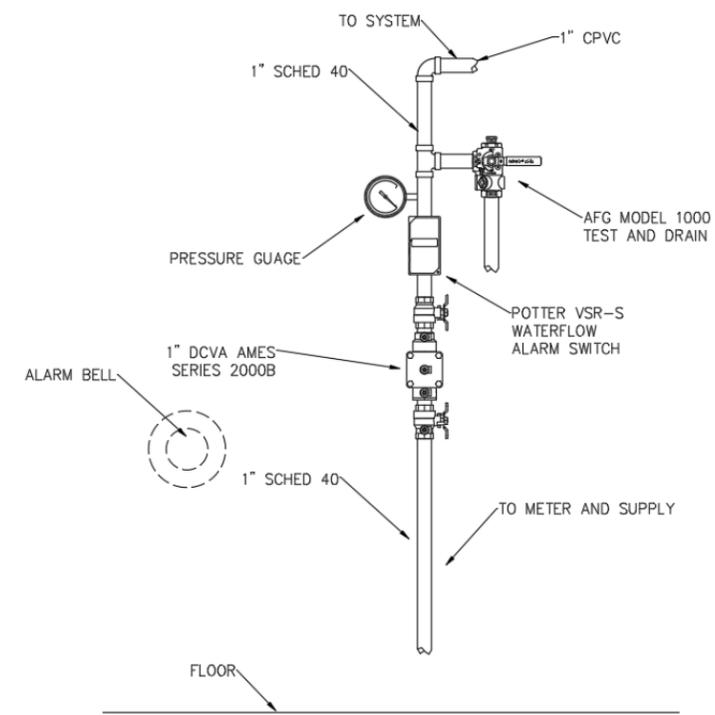


PIPING PLAN

1/8"=1'-0"
0' 2' 4' 8'

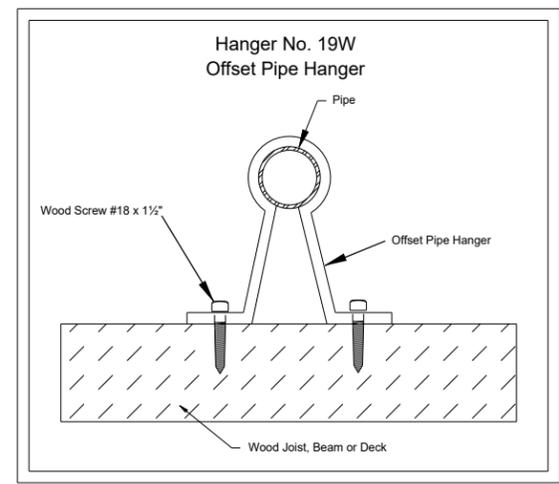
Sprinkler Legend							
Symbol	SIN	Model	Quantity	K-Factor	Type	Size	Temperature
●	TY2534	LFII	13	4.9	Concealed Pendent	1/2	155°F
●	TY3531	Royal Flush II	2	5.6	Concealed Pendent	1/2	200°F
			Total = 15				

Hydraulic Information		Supply Flow Test Data	
OCCUPANCY CLASSIFICATION	Residential	Static Pressure	64.000
DENSITY (gpm/ft²)	0.05 for 900ft² (Actual 313ft²)	Residual Pressure:	20.000
TOTAL HEADS FLOWING	2	Flow	978.40
K-FACTOR	4.9		
TOTAL WATER REQUIRED	26.35		
TOTAL PRESSURE REQUIRED	47.596		
SAFETY MARGIN (psi)	+16.349 (25.6%)		



RISER DETAIL

NOT TO SCALE



GENERAL NOTES:

1. Fire sprinkler system design is per NFPA 13D, 2019 edition.
2. Contract to begin after backflow device.
3. Freeze protection to be provided and installed by others.
4. Areas containing wet-pipe sprinkler equip. to be maintained at 40 deg. F min. (by owner).
5. All pipe supports and bracing connections to be FM approved/UL listed and per NFPA 13D.
6. Concealed piping to be CPVC with CPVC fittings and pipe strap hangers.
7. All pipe dimensions listed to be cut dimensions.
8. Any and all painting of sprinkler pipe is to be by others.
9. All sprinklers to be installed per NFPA 13D and per local AHJ.
10. If field conditions result in a change to the shop drawing installation in any way, contact the project engineer to verify proposed changes are compliant with NFPA 13 requirements and per hydraulic design.
11. This print or drawing shall be used only with reference to contracts of proposals of Wyatt Fire Protection, Inc. This print or drawing shall not be copied for, reproduced for nor exhibited to outside parties. This print or drawing and any and all copies therefore shall be returned to Wyatt Fire Protection, Inc. upon request. Nothing disclosed herein not publicly available shall be used without written permission from Wyatt Fire Protection, Inc.
12. Sprinkler system supplied by city water service located about 30' of 1" PEX piping away.

NCMB24-0030 996 Rork Ct. - Approved
Reviewed & Approved for Code Compliance
NEITHER THE APPROVAL OF PLANS AND SPECIFICATIONS OR THE ISSUANCE OF A BUILDING PERMIT SHALL BE CONSTRUED AS PERMISSION OF ENDORSEMENT TO VIOLATE THE CITIES ADOPTED BUILDING CODE OR ANY OTHER MUNICIPAL ORDINANCE PERMIT ISSUED IN ACCORD WITH THE BUILDING CODE SHALL BE VALID ONLY TO THE EXTENT THAT THE WORK OR USE WHICH IS AUTHORIZED IS LAWFUL.
DATE: 1/15/2025 PLANS EXAMINER: LemenMa

JOB NAME: **RORK CT LOT 1
996 E RORK CT
NEWBERG OR**

SHEET NAME: **FIRE SPRINKLER PLAN**

WYATT
FIRE PROTECTION, INC.
9095 S.W. Burnham
Tigard, OR 97223
(503) 684-2928

REVISIONS:	xx/xx/xx XXXXXXXXXXXXXXXX	DRAWN BY:	RC
1		DATE:	6/28/2024
2		JOB #:	C24-421
3		SHEET NO:	FP1



WYATT

FIRE PROTECTION, INC.

9095 S.W. Burnham

Tigard, OR 97223

RORK CT

1012&1016 E RORK CT

NEWBERG, OR

**FIRE PROTECTION
EQUIPMENT SUBMITTAL**

RAPID RESPONSE Series LFII Residential 4.9 K-factor Concealed Pendent Sprinkler Flat Plate, Wet Pipe System

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Scan the QR code or enter the URL in a web browser to access the most up-to-date electronic version of this document. Data rates may apply.



[docs.jci.com/tycofire/
rapid-response-4_9k](https://docs.jci.com/tycofire/rapid-response-4_9k)

General Description

The TYCO RAPID RESPONSE Series LFII Residential 4.9K Concealed Pendent Sprinklers (TY2534) are decorative, glass bulb sprinklers, available in both ordinary 155°F (68°C) and intermediate 200°F (93°C) temperature rated configurations. They are designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

The cover plate assembly conceals the sprinkler operating components above the ceiling. The flat profile of the cover plate provides the optimum aesthetically appealing sprinkler design. In addition, the concealed design of the Series LFII Residential Concealed Pendent Sprinklers provides 3/4" (19,1 mm) vertical adjustment. This adjustment provides a measure of flexibility when cutting fixed sprinkler drops.

The Series LFII Residential Concealed Pendent Sprinklers are intended for use in the following scenarios:

- Wet pipe residential sprinkler systems for one and two family dwellings and mobile homes per NFPA 13D
- Wet pipe residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R
- Wet pipe sprinkler systems for the residential portions of any occupancy per NFPA 13

The Series LFII Residential Concealed Pendent Sprinklers have been designed with heat sensitivity and water distribution characteristics proven to help in the control of residential fires and to improve the chance for occupants to escape or be evacuated.

The Series LFII Residential Concealed Pendent Sprinklers (TY2534) are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed for installation, and then it can be replaced to help protect the sprinkler while the ceiling is being installed or finished. The tip of the Protective Cap can also be used to mark the center of the ceiling hole into the plaster board, ceiling tiles, and so on, by gently pushing the ceiling product against the Protective Cap. When the ceiling installation is complete the Protective Cap is removed and the Cover Plate Assembly is installed.



NOTICE

The Series LFII Residential Concealed Pendent Sprinklers (TY2534) described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY2534

Technical Data

Approvals

UL and C-UL Listed

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers are Listed only when installed with LFII Concealed Cover Plates having factory-applied finishes.

Sprinklers and Cover Plates are separately ordered. See the Ordering Procedure section for more information.

Maximum Working Pressure

175 psi (12,1 bar)

Discharge Coefficient

$K=4.9 \text{ GPM/psi}^{1/2}$ (70,6 LPM/bar^{1/2})

Temperature Rating

Ordinary

155°F (68°C) Sprinkler
 139°F (59°C) Cover Plate

Note: Maximum Ambient Ceiling Temperature for the ordinary temperature configuration is 100°F (38°C).

Intermediate

200°F (93°C) Sprinkler
 165°F (74°C) Cover Plate

Note: Maximum Ambient Ceiling Temperature for the intermediate temperature configuration is 150°F (65°C).

Vertical Adjustment

3/4 in. (19,1 mm)

Finishes

See the Ordering Procedure section

Physical Characteristics

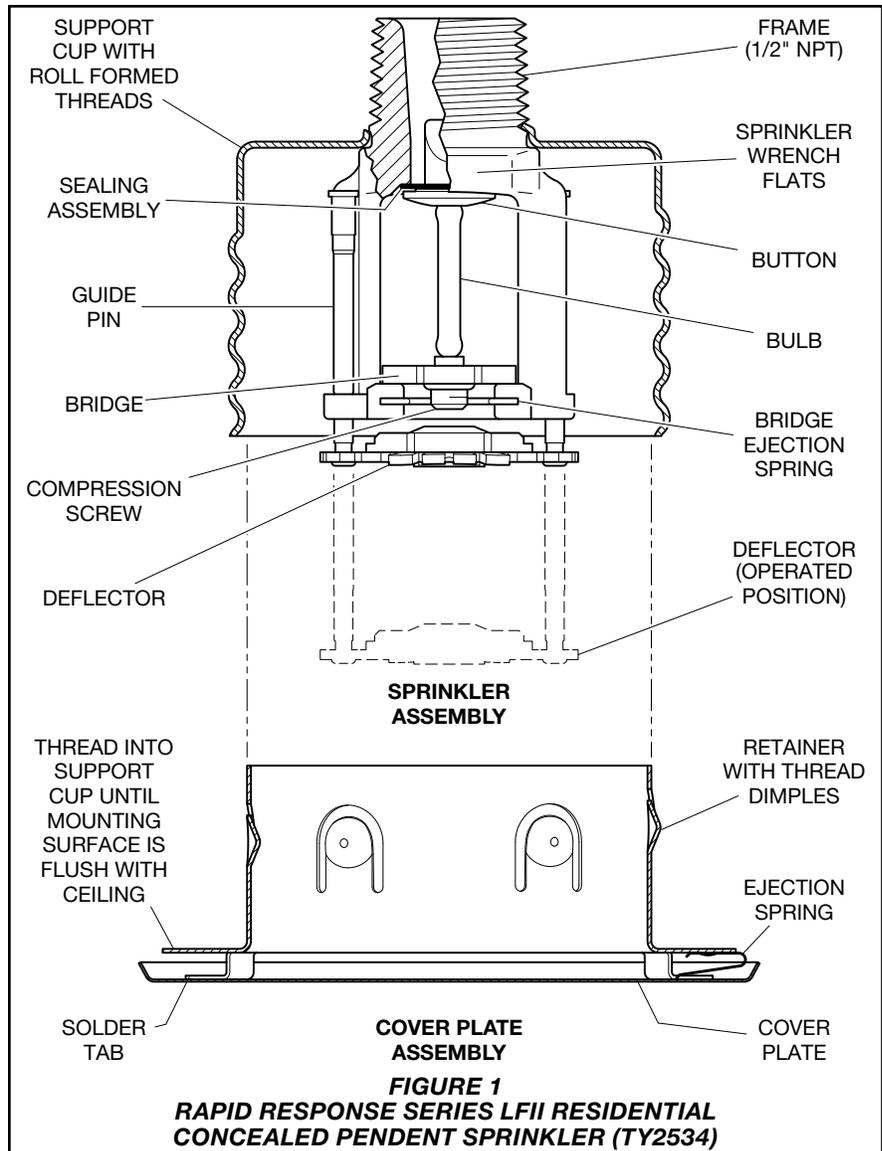
Frame	Brass
Support Cup	Plated Steel
Guide Pins	Stainless Steel
Deflector	Bronze
Compression Screw	Brass
Bulb	Glass
Button	Phosphor Bronze
Sealing Assembly ..	Beryllium Nickel w/TEFLON
Cover Plate	Brass
Retainer	Plated Steel
Cover Plate Ejection Spring	Stainless Steel
Bridge	Bronze
Bridge Ejection Spring	INCONEL

Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector, supported by the Guide Pins, then drops down to its operated position.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, activating the sprinkler and allowing water to flow.



Maximum Coverage Area ¹ ft x ft (m x m)	Maximum Spacing ft (m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure ^{2,3}				
		Temp. Rating 155°F (68°C), 200°F (93°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft (m)
		Flow GPM (LPM)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	7.0 (0,48)	Smooth Ceilings 3/8 to 1 1/8 in. Beamed Ceilings per NFPA 13D or 13R, or 13. Installed in beam 3/8 to 1 1/8 in. below bottom of beam	Concealed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49,2)	7.0 (0,48)			
16 x 16 (4,9 x 4,9)	16 (4,9)	13 (49,2)	7.0 (0,48)			
18 x 18 (5,5 x 5,5)	18 (5,5)	17 (64,3)	12.0 (0,83)			
20 x 20 (6,1 x 6,1)	20 (6,1)	20 (75,7)	16.7 (1,15)			

Notes:

- For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
- Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
- For NFPA 13 residential applications, the greater of 0.1 GPM/ft² over the design area or the flow in accordance with the criteria in this table must be used.

**TABLE A
WET PIPE SYSTEM
SERIES LFII RESIDENTIAL 4.9 K-FACTOR FLAT PLATE CONCEALED PENDENT SPRINKLER (TY2534)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA**

Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY2534) are UL and C-UL Listed for installation in accordance with this section.

Note: When conditions exist that are outside the scope of the provided criteria, refer to the Residential Sprinkler Design Guide TFP490 for the manufacturer's recommendations that may be acceptable to the authority having jurisdiction.

Ceiling Types

Smooth flat horizontal, beamed, or sloped in accordance with NFPA 13D, 13R, or 13 as applicable.

Hydraulic Design (NFPA 13D and 13R)

For systems designed to NFPA 13D or NFPA 13R, the minimum required sprinkler flow rates are given in Table A as a function of temperature rating and the maximum allowable coverage areas.

The sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as

specified in NFPA 13D or NFPA 13R.

Hydraulic Design (NFPA 13)

For systems designed to NFPA 13, the number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in Table A as a function of temperature rating and the maximum allowable coverage area
- A minimum discharge of 0.1 GPM/ft² over the design area comprised of the four most hydraulically demanding sprinklers for actual coverage areas protected by the four sprinklers

Obstruction to Water Distribution

Sprinklers are to be located in accordance with the obstruction rules of NFPA 13D, 13R, and 13 as applicable for residential sprinklers as well as with the obstruction criteria described within the Technical Data Sheet TFP490.

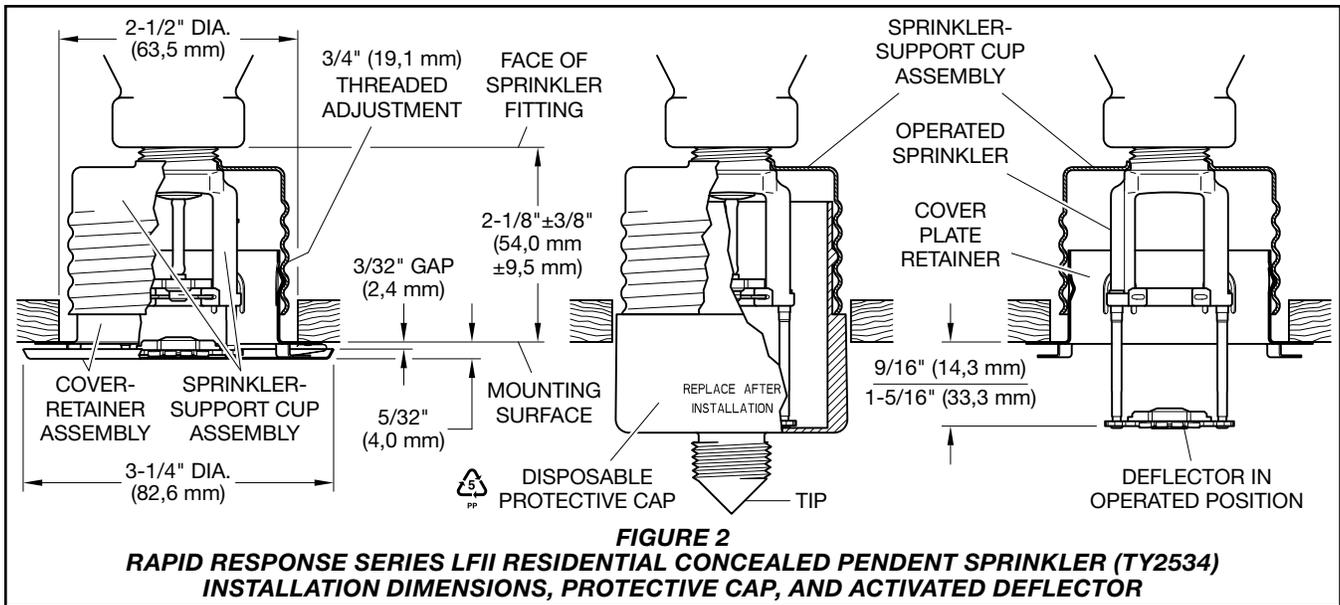
Operational Sensitivity

The sprinklers are to be installed relative to the ceiling mounting surface as shown in Figure 2.

Sprinkler Spacing

The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (see Table A) being hydraulically calculated, for example, maximum 12 ft for a 12 ft x 12 ft coverage area, or 20 ft for a 20 ft x 20 ft coverage area.

The Series LFII must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Support Cup could delay sprinkler operation in a fire situation.



Installation

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY2534) must be installed in accordance with this section.

General Instructions

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 horizontally, a small air bubble should be present.

A 1/2 in. NPT sprinkler joint should be obtained with a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Cover Plate Assembly by under- or over-tightening the Sprinkler. Readjust the position of the sprinkler fitting to suit.

Step 1. The sprinkler must only be installed in the pendent position and with the centerline of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

Step 3. With pipe thread sealant applied to the pipe threads and using the W-Type 42 Wrench shown in Figure 3, position the wrench recess to first straddle the deflector guide pins from the side and then push the wrench into the support cup to engage the sprinkler wrench flats. Rotate clockwise to tighten the Sprinkler/Support Cup Assembly into the fitting. The W-Type 42 Wrench will accept a 1/2 in. ratchet drive.

Note: Do not engage the sprinkler frame arms by the wrench, engage only the sprinkler wrench flats.

Step 4. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. The Protective Cap helps prevent damage to the Deflector and Guide Pins during ceiling installation and/or during application of the finish coating of the ceiling. It may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the Cap.

Note: As long as the protective Cap remains in place, the system is considered to be "Out Of Service."

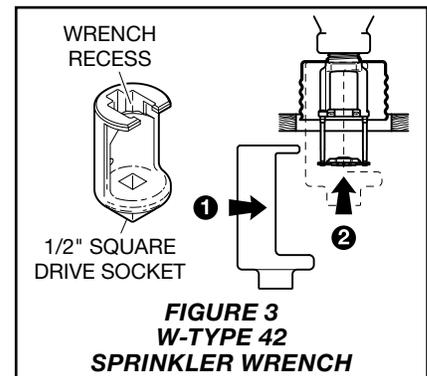
Step 5. After the ceiling has been completed with the 2 1/2 in. (63 mm) diameter clearance hole and in preparation for installing the Cover Plate Assembly, remove and discard the Protective Cap, and verify that the Deflector moves up and down freely.

If the sprinkler has been damaged and the Deflector does not move up and down freely, replace the entire sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.

Step 6. Push on the Cover Plate Assembly until its flange comes in contact with the ceiling.

Do not continue to push on the Cover Plate Assembly such that it lifts a ceiling panel out of its normal position.

If the Cover Plate Assembly cannot be engaged with the Mounting Cup or the Cover Plate Assembly cannot be engaged sufficiently to contact the ceiling, the Sprinkler Fitting must be repositioned.



Care and Maintenance

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY2534) must be maintained and serviced in accordance with this section.

Before closing a fire protection system main 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.

Absence of a Cover Plate may delay the sprinkler operation in a fire situation.

When properly installed, there is an air gap between the lip of the Cover Plate and the ceiling. The Cover Plate assembly has a nominal 3/32 (2,4 mm) air gap, as shown in Figure 2. This air gap is necessary for proper operation of the sprinkler by allowing heat flow from a fire to pass below and above the Cover Plate to help assure appropriate release of the Cover Plate in a fire situation. If the ceiling is to be repainted after the installation of the Sprinkler, care must be exercised to ensure that the new paint does not seal off any of the air gap.

Factory painted Cover Plates must not be repainted. They should be replaced, if necessary, by factory painted units. Non-factory applied paint may adversely delay or prevent sprinkler operation in the event of a fire.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified or over heated sprinklers must be replaced.

Care must be exercised to avoid damage before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and part number (P/N).

Sprinkler Assemblies

Specify: Series LFII (TY2534) 4.9K Residential Concealed Pendent Sprinkler, P/N (specify):

155°F (68°C)	51-549-1-155
200°F (93°C)	51-549-1-200

Note: Sprinkler and Cover Plates are separately sold. See below for Cover Plate ordering information.

Cover Plate Assemblies

Specify: LFII Concealed Sprinkler Cover Plate Assembly, temperature rating (specify), (specify) finish, P/N (specify):

139°F (59°C)	
Ivory (RAL1015)	56-891-0-135
Bright Chrome	56-891-9-135B
Beige (RAL1001)	56-891-2-135
Pure White (RAL9010)*	56-891-3-135
Signal White (RAL9003)**	56-891-4-135
Grey White (RAL9002)	56-891-5-135
Brown (RAL8028)	56-891-6-135
Black (RAL9005)	56-891-7-135
Brushed Brass	56-891-8-135
Brushed Chrome	56-891-9-135
Custom Paint	56-891-X-135

165°F (74°C)	
Ivory (RAL1015)	56-891-0-165
Bright Chrome	56-891-9-165B
Beige (RAL1001)	56-891-2-165
Pure White (RAL9010)*	56-891-3-165
Signal White (RAL9003)**	56-891-4-165
Grey White (RAL9002)	56-891-5-165
Brown (RAL8028)	56-891-6-165
Black (RAL9005)	56-891-7-165
Brushed Brass	56-891-8-165
Brushed Chrome	56-891-9-165
Custom Paint	56-891-X-165

* Eastern Hemisphere sales only
** Previously known as Bright White

Note: All Custom Cover Plates are painted using SHERWIN-WILLIAMS Interior Latex Paint. Contact Johnson Controls Customer Service with any questions related to custom orders.

Sprinkler Wrench

Specify: W-Type 42 Sprinkler Wrench, P/N 56-000-1-079

Series RFII — 5.6 K-factor “Royal Flush II” Concealed Pendent Sprinklers Quick & Standard Response, Standard Coverage

General Description

The TYCO Series RFII 5.6 K-factor, “Royal Flush II” Concealed Pendent Sprinklers Quick Response (3-mm bulb) and Standard Response (5-mm bulb), are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. These sprinklers are optimal for architecturally sensitive areas such as hotel lobbies, office buildings, churches, and restaurants.

Each sprinkler includes a Cover Plate/Retainer Assembly and a Sprinkler/Support Cup Assembly. The separable, two-piece assembly design provides the following benefits:

- Allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling.
- Permits the removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers.
- Provides for 1/2 in. (12,7 mm) of vertical adjustment to allow a measure of flexibility in determining the length of fixed piping to cut for the sprinkler drops.

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the “INSTALLER WARNING” that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

The Series RFII Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed during installation and replaced to help protect the sprinkler during ceiling installation or finish. The tip of the Protective Cap can be used to mark the center of the ceiling hole into plaster board or ceiling tiles by gently pushing the ceiling product against the Protective Cap. When ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed.

As an option, the Series RFII Standard Response (5-mm bulb) “Royal Flush II” Concealed Pendent Sprinklers can be fitted with a silicone Air and Dust Seal. (Refer to Figure 5.) The Air and Dust Seal is intended for sensitive areas where it is desirable to prevent air and dust from the area above the ceiling to pass through the cover plate.

NOTICE

The Series RFII Concealed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

Sprinkler Identification Number (SIN)

TY3531 — 3 mm bulb
TY3551 — 5 mm bulb



Technical Data

Sprinkler Approvals

Approvals apply only to the service conditions indicated in the Design Criteria section.

- TY3531 (3 mm Bulb) is UL Listed, C-UL Listed and NYC Approved (MEA 353-01-E) as Quick Response.
 - TY3531 (3 mm Bulb) is VdS Approved (Certificate No. G4090007).
 - TY3531 (3 mm Bulb) is FM and LPCB Approved (Ref. No. 094a/10) as Standard Response.
- Note:** FM and LPCB do not approve concealed sprinklers for quick response.
- TY3551 (5 mm Bulb) is UL Listed, C-UL Listed, FM Approved, LPCB Approved (Ref. No. 094a/9), and NYC Approved (MEA 353-01-E) as Standard Response.

Approvals for Air and Dust Seal

UL and C-UL Listed for use with the RFII Standard Response Concealed Sprinkler (TY3551)

Maximum Working Pressure

Maximum 250 psi (17,3 bar) by UL, C-UL, and NYC

Maximum 175 psi (12,1 bar) by FM, VdS, and LPCB

Temperature Rating

155°F (68°C) Sprinkler with
139°F (59°C) Cover Plate

200°F (93°C) Sprinkler with
165°F (74°C) Cover Plate

Discharge Coefficient

K= 5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Adjustment

1/2 inch (12,7 mm)

Finishes

See the Ordering Procedure section.

Physical Characteristics

Frame	Bronze
Support Cup	Plated Steel
Guide Pins	Stainless Steel
Deflector	Bronze
Compression Screw	Brass
Bulb	Glass
Cap	Bronze or Copper
Sealing Assembly	Beryllium Nickel w/TEFLON
Cover Plate	Brass
Retainer	Brass
Ejection Spring	Stainless Steel

Design Criteria

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 and VdS Approval is based on the CEA 4001.

For more information on LPCB and VdS Approvals, contact Johnson Controls at the following office:

Enschede, Netherlands
 Telephone: 31-53-428-4444
 Fax: 31-53-428-3377

The Series RFI Concealed Pendent Sprinklers are only listed and approved with the Series RFI Concealed Cover Plates having a factory applied finish.

NOTICE

Do not use the Series RFI in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Sprinkler/Support Cup Assembly can delay sprinkler operation in a fire situation.

Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector — supported by the Guide Pins — then drops down to its operational position.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, activating the sprinkler and allowing water to flow.

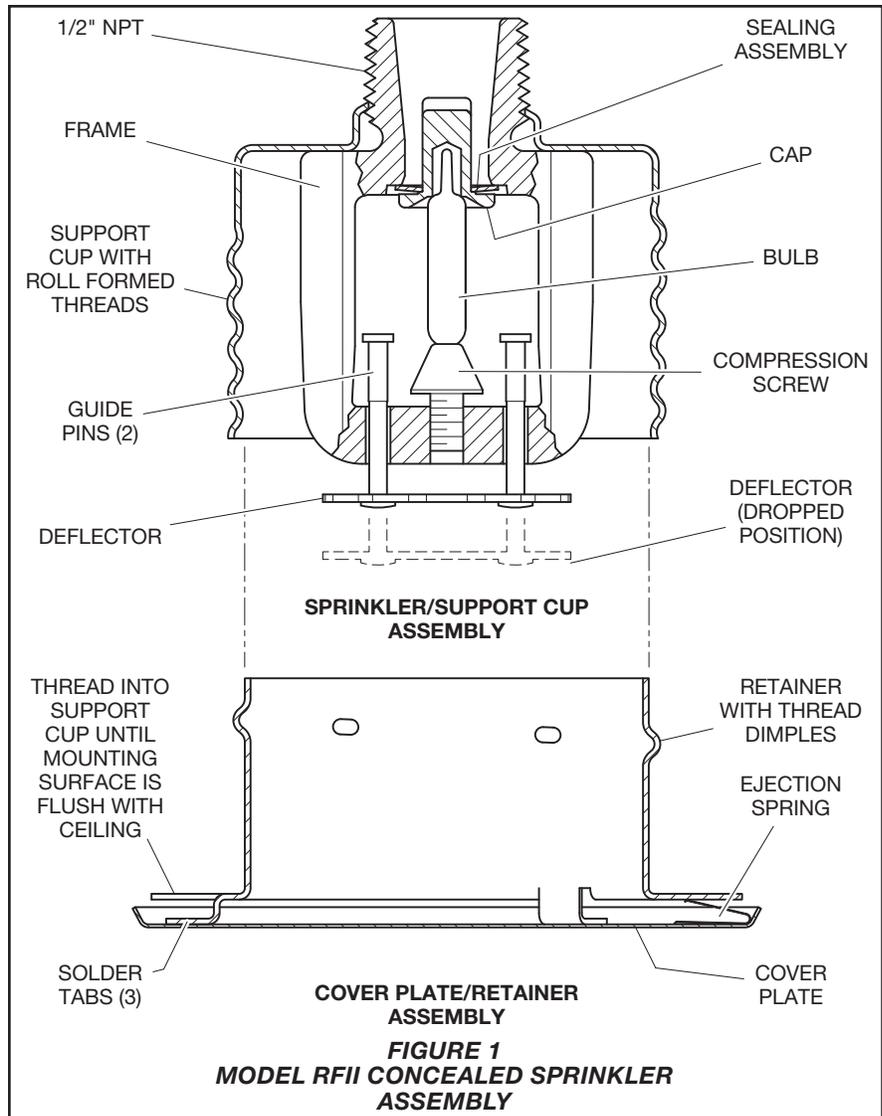


FIGURE 1
MODEL RFI CONCEALED SPRINKLER ASSEMBLY

Installation

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers must be installed in accordance with this section.

General Instructions

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 horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 155°F (68°C) and 3/32 inch (2,4 mm) for the 200°F (93°C) temperature ratings.

A leak-tight 1/2 inch NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

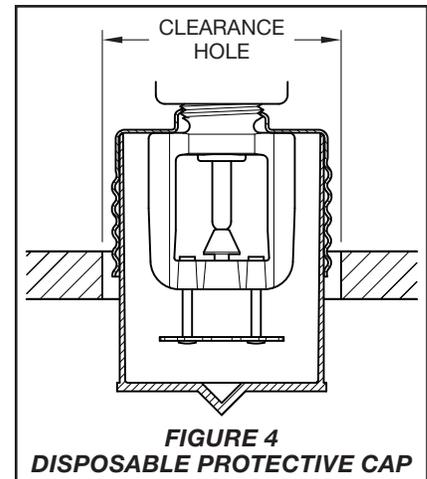
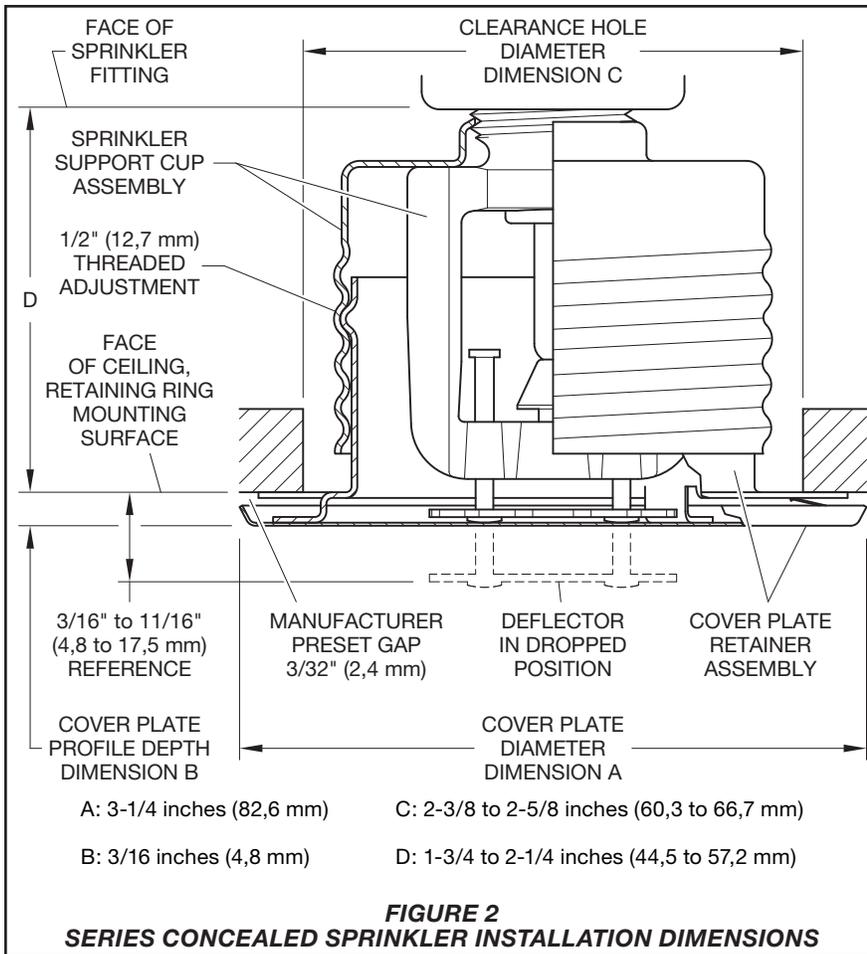
Do not attempt to compensate for insufficient adjustment in the Sprinkler by under- or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

Step 1. Install the sprinkler only in the pendent position with the center-line of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

Step 3. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 4. Wrench-tighten the sprinkler using only the RFI Sprinkler Wrench. (Refer to Figure 3.) Apply the RFI Sprinkler Wrench to the Sprinkler as shown in Figure 3.



Step 5. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. (Refer to Figure 4.) The Protective Cap helps prevent damage to the Deflector and Arms during ceiling installation and/or finish. You can also use the Protective Cap to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

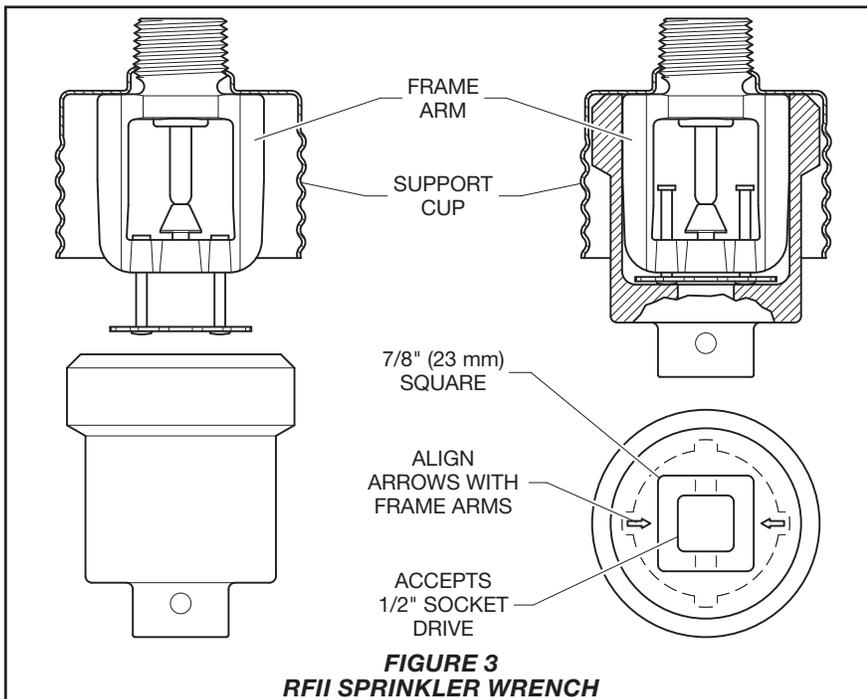
NOTICE

As long as the Protective Cap remains in place, the system is considered "Out of Service".

Step 6. After the ceiling has been completed with the 2-1/2 in. (63,5 mm) diameter clearance hole and in preparation for installing the Cover Plate/Retainer Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely.

If the Sprinkler is damaged and the Deflector does not move up and down freely, replace the entire Sprinkler. Do not attempt to modify or repair a damaged sprinkler.

Step 7. When installing an Air and Dust Seal, refer to Figure 5; otherwise, proceed to Step 8. To attach the Air and Dust Seal, verify the angle of the outside edge of the seal is oriented according to Figure 5. Start the edge of the Retainer in the grooved slot of the Air and Dust Seal and continue around the retainer until the entire Air and Dust Seal is engaged.



Step 8. Screw on the Cover Plate/Retainer Assembly until the Retainer (shown in Figure 2) or the Air and Dust Seal (shown in Figure 5) contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If you cannot engage the Cover Plate/Retainer Assembly with the Support Cup or you cannot engage the Cover Plate/Retainer Assembly sufficiently to contact the ceiling, you must reposition the Sprinkler Fitting.

Care and Maintenance

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers must be maintained and serviced in accordance with this section.

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

Absence of the Cover Plate/Retainer Assembly can delay sprinkler operation in a fire situation.

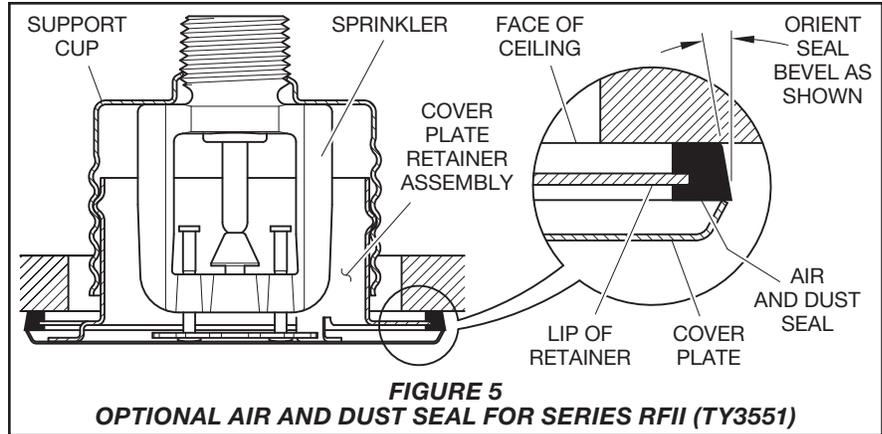
When properly installed, there is a nominal 3/32 in. (2,4 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 2.

This air gap is necessary for proper operation of the sprinkler. If the ceiling requires repainting after sprinkler installation, ensure that the new paint does not seal off any of the air gap.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers 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 - before, during, 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.)

Exercise care to avoid damage to sprinklers before, during, and after installation. Replace sprinklers damaged by dropping, striking, wrench twisting, wrench slipping, or the like. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Refer to the Installation section.)

If you must remove a sprinkler, do not reinstall it or a replacement without reinstalling the Cover Plate/Retainer Assembly. If a Cover Plate/Retainer Assembly becomes dislodged during service, replace it immediately.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national code.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name.

Sprinkler/Support Cup Assembly
 Specify: Series RFI (specify SIN), K=5.6, "Royal Flush II" Pendent Sprinklers (specify) temperature rating, P/N* (specify):

	155°F (68°C)	200°F (93°C)
TY3531	51-792-1-155	51-792-1-200
TY3551	51-790-1-155	51-790-1-200

* Use Suffix "I" for ISO 7-1 connection; for example, 51-792-1-155-I

Separately Ordered Cover Plate/Retainer Assembly:

Specify: (temperature rating from below) Series RFI Concealed Cover Plate with (finish), P/N (specify).

	139°F (59°C)(a)	165°F (74°C)(b)
Grey White (RAL9002)	56-792-0-135	56-792-0-165
Brass	56-792-1-135	56-792-1-165
Pure White (c) (RAL9010)	56-792-3-135	56-792-3-165
Signal White (RAL9003)	56-792-4-135	56-792-4-165
Jet Black (RAL9005)	56-792-6-135	59-792-6-165
Brushed		
Chrome	56-792-8-135	56-792-8-165
Chrome	56-792-9-135	56-792-9-165
Custom	56-792-X-135	56-792-X-165

- (a) For use with 155°F (68°C) sprinklers.
- (b) For use with 200°F (93°C) sprinklers.
- (c) Eastern Hemisphere sales only.

Sprinkler Wrench
 Specify: RFI Sprinkler Wrench, P/N 56-000-1-075

Air and Dust Seal
 Specify: Air and Dust Seal, P/N 56-908-1-001

BlazeMaster[®] CPVC Fire Sprinkler Pipe & Fittings Submittal Sheet

General Description

Tyco Fire & Building Products (TFBP) BlazeMaster CPVC Pipe and Fittings are designed exclusively for use in wet pipe automatic fire sprinkler systems. They are made from a specially developed thermoplastic compound composed of post chlorinated polyvinyl chloride (CPVC) resin and state of the art additives. TFBP BlazeMaster CPVC products are easier to install than traditional steel pipe systems, and at the same time, provide superior heat resistance and strength as compared to traditional CPVC and PVC piping materials used in the plumbing trade. Various adapters are available to connect CPVC pipe to metallic piping. All female pipe thread adapters have brass inserts for durability. Grooved adapters connect directly to grooved end valves and metallic pipe, with flexible grooved end couplings.

WARNING

*Tyco Fire & Building Products (TFBP) BlazeMaster CPVC Pipe and Fittings described herein must be installed and maintained in compliance with this document, as well as with the 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 performance of these devices.***

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

Technical Data

Sizes

3/4" to 3"

Maximum Working Pressure

175 psi

Approvals

UL, FM, CUL, NSF, Dade County, LPCB, MEA, and the City of Los Angeles. (Refer to IH-1900, Rev. 0, January 2005 "Installation Instruction & Technical Handbook" for exact listing/approval information.)

Manufacture Source

U.S.A.

Material

- Pipe: ASTM F442, SDR 13.5
- Fittings: ASTM F438 (Sch. 40) and ASTM F439 (Sch. 80), ASTM F1970

Color

Orange



NOMINAL SIZE	AVERAGE O.D.	AVERAGE I.D.	WEIGHT lbs./ft.	WATER FILLED WEIGHT lbs./ft.	FT. OF PIPE PER LIFT	WEIGHT PER LIFT lbs.
3/4"	1.050"	0.874"	0.18	0.44	7875	1339
1"	1.315"	1.101"	0.26	0.67	5040	1320
1-1/4"	1.660"	1.394"	0.42	1.08	2835	1191
1-1/2"	1.900"	1.598"	0.54	1.41	2205	1213
2"	2.375"	2.003"	0.84	2.20	1260	1084
2-1/2"	2.875"	2.423"	1.26	3.26	1215	1531
3"	3.500"	2.952"	1.87	4.83	720	1344

FIGURE 1 — PIPE DIMENSIONS

Installation

Tyco Fire and Building Products (TFBP) BlazeMaster CPVC Pipe and Fittings are to be installed in accordance with IH-1900, Rev. 0, January 2005 "Installation Instruction & Technical Handbook".

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

NOTES

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

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

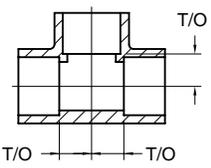
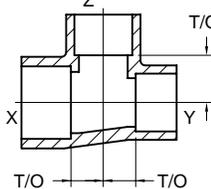
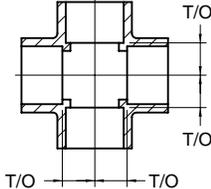
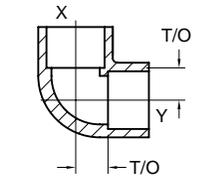
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)			SCHD.	WEIGHT (lb.)	
 <p>TEE</p>	80000	3/4"	5/8"			40	0.11	
	80001	1"	11/16"			40	0.19	
	80002	1-1/4"	7/8"			40	0.26	
	80003	1-1/2"	1-1/16"			80	0.51	
	80004	2"	1-3/8"			80	0.90	
	80005	2-1/2"	1-9/16"			80	1.59	
	80006	3"	1-13/16"			80	2.41	
 <p>REDUCING TEE</p>		X x Y x Z	X	Y	Z			
	80132	3/4" x 3/4" x 1"	3/4"	3/4"	5/8"	40	0.14	
	80133	1" x 3/4" x 3/4"	9/16"	9/16"	3/4"	40	0.14	
	80134	1" x 3/4" x 1"	3/4"	11/16"	3/4"	40	0.17	
	80260	1" x 1" x 3/4"	5/8"	5/8"	13/16"	40	0.16	
	80135	1-1/4" x 1" x 3/4"	5/8"	5/8"	15/16"	40	0.21	
	80136	1-1/4" x 1" x 1"	3/4"	3/4"	15/16"	40	0.22	
	80137	1-1/4" x 1" x 1-1/4"	15/16"	15/16"	7/8"	40	0.26	
	80261	1-1/4" x 1-1/4" x 3/4"	5/8"	5/8"	7/8"	40	0.23	
	80262	1-1/4" x 1-1/4" x 1"	3/4"	3/4"	7/8"	40	0.26	
	80138	1-1/4" x 1-1/4" x 1-1/2"	1"	1"	1"	80	0.43	
	80140	1-1/2" x 1-1/4" x 3/4"	9/16"	9/16"	1"	80	0.36	
	80141	1-1/2" x 1-1/4" x 1"	9/16"	9/16"	1-1/16"	80	0.38	
	80263	1-1/2" x 1-1/2" x 3/4"	9/16"	9/16"	1"	80	0.36	
	80264	1-1/2" x 1-1/2" x 1"	9/16"	9/16"	1-1/16"	80	0.38	
	80275	1-1/2" x 1-1/2" x 1-1/4"	7/8"	7/8"	1"	80	0.45	
	80265	2" x 2" x 3/4"	3/4"	3/4"	1-3/8"	80	0.61	
	80266	2" x 2" x 1"	7/8"	7/8"	1-3/8"	80	0.66	
	80274	2" x 2" x 1-1/4"	1-1/16"	1-1/16"	1-3/8"	80	0.74	
	80267	2" x 2" x 1-1/2"	1-1/8"	1-1/8"	1-3/8"	80	0.78	
	80271	2-1/2" x 2-1/2" x 1"	1-9/16"	1-9/16"	1-9/16"	80	1.43	
80272	2-1/2" x 2-1/2" x 1-1/4"	1-9/16"	1-9/16"	1-9/16"	80	1.46		
80273	2-1/2" x 2-1/2" x 1-1/2"	1-9/16"	1-9/16"	1-9/16"	80	1.48		
80276	2-1/2" x 2-1/2" x 2"	1-9/16"	1-9/16"	1-9/16"	80	1.50		
80270	3" x 3" x 1-1/2"	1-13/16"	1-13/16"	1-13/16"	80	2.28		
80268	3" x 3" x 2"	1-13/16"	1-13/16"	1-3/4"	80	2.25		
80269	3" x 3" x 2-1/2"	1-13/16"	1-13/16"	1-13/16"	80	2.44		
 <p>CROSS & REDUCING CROSS</p>	80009	3/4"	9/16"			40	0.13	
	80010	1"	11/16"			40	0.23	
	80011	1-1/4"	15/16"			40	0.34	
	80012	1-1/2"	1-1/16"			80	0.67	
	80013	2"	1-5/16"			80	1.00	
	80014	2-1/2"	1-9/16"			80	1.91	
	80008	3"	1-13/16"			80	2.89	
	80015	1" x 1" x 3/4" x 3/4"	7/8"			40	0.28	
	 <p>90° ELBOW & REDUCING ELBOW</p>	80025	3/4"	5/8"			40	0.09
		80026	1"	3/4"			40	0.14
80027		1-1/4"	7/8"			40	0.21	
80028		1-1/2"	1-1/16"			80	0.40	
80029		2"	1-5/16"			80	0.79	
80030		2-1/2"	1-9/16"			80	1.14	
80031		3"	1-13/16"			80	1.82	
80032		X x Y	X	Y				
		1" x 3/4"	11/16"	13/16"	40	0.16		

FIGURE 2 — FITTING DIMENSIONS (Part 1 of 4)

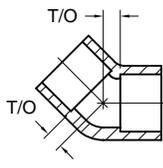
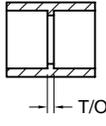
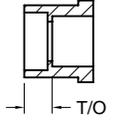
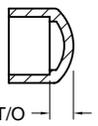
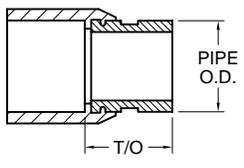
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)		SCHD.	WEIGHT (lb.)
			T/O	PIPE O.D.		
45° ELBOW 	80050	3/4"	3/8"		40	0.08
	80051	1"	3/8"		40	0.11
	80052	1-1/4"	3/4"		40	0.20
	80053	1-1/2"	1/2"		80	0.31
	80054	2"	3/4"		80	0.56
	80055	2-1/2"	13/16"		80	0.89
	80056	3"	1"		80	1.19
COUPLING & REDUCING COUPLING 	80075	3/4"	1/8"		40	0.07
	80076	1"	1/8"		40	0.11
	80077	1-1/4"	3/16"		40	0.12
	80078	1-1/2"	3/16"		80	0.25
	80079	2"	3/16"		80	0.38
	80080	2-1/2"	1/4"		80	0.67
	80081	3"	3/16"		80	0.91
	80220	1" x 3/4"	1/8"		40	0.08
REDUCER BUSHING 	80200	1" x 3/4"	7/16"		40	0.04
	80201	1-1/4" x 3/4"	1/2"		40	0.11
	80202	1-1/4" x 1"	5/16"		40	0.12
	80203	1-1/2" x 3/4"	5/8"		80	0.16
	80204	1-1/2" x 1"	1/2"		80	0.14
	80205	1-1/2" x 1-1/4"	3/8"		80	0.17
	80206	2" x 3/4"	13/16"		80	0.27
	80207	2" x 1"	11/16"		80	0.26
	80208	2" x 1-1/4"	9/16"		80	0.24
	80209	2" x 1-1/2"	7/16"		80	0.19
	80215	2-1/2" x 1"	15/16"		80	0.42
	80214	2-1/2" x 1-1/4"	13/16"		80	0.45
	80213	2-1/2" x 1-1/2"	11/16"		80	0.46
	80211	2-1/2" x 2"	5/8"		80	0.29
80210	3" x 2"	3/4"		80	0.72	
80212	3" x 2-1/2"	1/2"		80	0.47	
CAP 	80100	3/4"	5/16"		40	0.04
	80101	1"	3/8"		40	0.06
	80102	1-1/4"	7/16"		40	0.10
	80103	1-1/2"	11/16"		80	0.20
	80104	2"	5/8"		80	0.31
	80105	2-1/2"	7/8"		80	0.58
	80106	3"	1"		80	0.88
GROOVED COUPLING ADAPTER 	80160	1-1/4" x 1-1/4" Groove	2-5/16"	1-1/4" (1.660")	40	0.78
	80161	1-1/2" x 1-1/2" Groove	2-5/16"	1-1/2" (1.900")	80	0.95
	80162	2" x 2" Groove	2-5/16"	2" (2.375")	80	1.42
	80163	2-1/2" x 2-1/2" Groove	2-5/16"	2-1/2" (2.875")	80	2.28
	80164	3" x 3" Groove	2-1/4"	3" (3.500")	80	3.00
	80169	2-1/2" x 76,1 mm Groove	2-5/16"	76,1 mm (3.000")	80	2.28

FIGURE 2 — FITTING DIMENSIONS (Part 2 of 4)

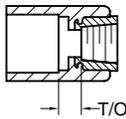
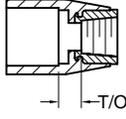
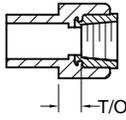
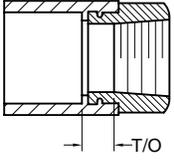
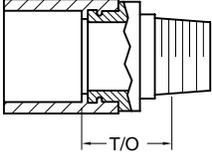
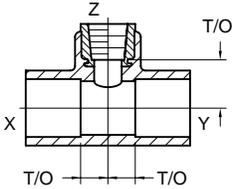
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)			SCHD.	WEIGHT (lb.)
			X	Y	Z		
SPRINKLER HEAD ADAPTER 	80175E	3/4" x 1/2" NPT	7/16"			80	0.20
	80176E	1" x 1/2" NPT	7/16"			80	0.22
	80175WL	3/4" x 1/2" NPT	7/16"			40	0.16
	80179	1" x 3/4" NPT	13/16"			40	0.43
SPRINKLER HEAD ADAPTER 	80175W	3/4" x 1/2" NPT	1/2"			40	0.19
	80176W	1" x 1/2" NPT	1/2"			40	0.18
SPRINKLER HEAD ADAPTER (SPIGOT) 	80177L	3/4" x 1/2" NPT	1/2"			40	0.16
	80178	1" x 1/2" NPT	9/16"			40	0.20
	80180	1" x 3/4" NPT	7/8"			40	0.40
FEMALE ADAPTER 	80142	3/4" x 3/4" NPT	13/16"			40	0.41
	80145	1" x 1" NPT	7/8"			40	0.63
	80146	1-1/4" x 1-1/4" NPT	1-1/8"			40	1.03
	80147	1-1/2" x 1-1/2" NPT	1-3/8"			80	1.42
	80148	2" x 2" NPT	1-11/16"			80	2.66
MALE ADAPTER 	80157	3/4" x 3/4" NPT	1-5/16"			40	0.33
	80158	1" x 1" NPT	1-3/8"			40	0.56
SPRINKLER HEAD ADAPTER TEE 		X x Y x Z	X	Y	Z		
	80250	3/4" x 3/4" x 1/2" NPT	9/16"	9/16"	1"	40	0.22
	80251	1" x 1" x 1/2" NPT	11/16"	11/16"	1-3/16"	40	0.29
	80249	1" x 1" x 1" NPT	15/16"	15/16"	1-9/16"	40	0.73
	80256	1-1/4" x 1" x 1/2" NPT	7/16"	9/16"	1-5/16"	40	0.30
	80252	1-1/4" x 1-1/4" x 1/2" NPT	7/16"	7/16"	1-5/16"	40	0.31
	80257	1-1/2" x 1-1/4" x 1/2" NPT	1/2"	11/16"	1-7/16"	80	0.43
	80254	1-1/2" x 1-1/2" x 1/2" NPT	1/2"	1/2"	1-7/16"	80	0.46
	80258	2" x 1-1/2" x 1/2" NPT	1/2"	5/8"	1-11/16"	80	0.56
	80253	2" x 2" x 1/2" NPT	1/2"	1/2"	1-11/16"	80	0.62

FIGURE 2 — FITTING DIMENSIONS (Part 3 of 4)

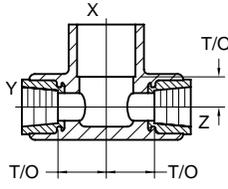
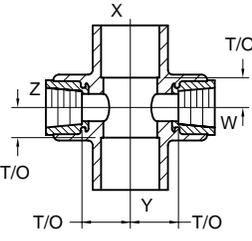
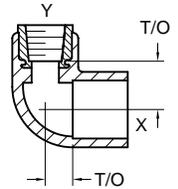
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)		SCHD.	WEIGHT (lb.)
			X	Y, Z		
BACK-TO-BACK TEE 	80459	X x Y x Z 1" x 1/2" NPT x 1/2" NPT	5/8"	1-5/16"	40	0.48
	80460	1" x 1/2" NPT x 1/2" NPT	5/8"	1-3/16"	40	0.46
BACK-TO-BACK CROSS 	80462	X x Y x Z x W 1" x 1" x 1/2" NPT x 1/2" NPT	5/8"	1-3/16"	40	0.46
	80463	1" x 1" x 1/2" NPT x 1/2" NPT	5/8"	1-5/16"	40	0.47
SPRINKLER HEAD ADAPTER 90° ELBOW 	80199	X x Y 3/4" x 1/2" NPT	9/16"	1"	40	0.20
	80198	1" x 1/2" NPT	3/4"	1-1/4"	40	0.26
	80196	1" x 3/4" NPT	1-1/16"	1-7/16"	40	0.26

FIGURE 2 — FITTING DIMENSIONS (Part 4 of 4)

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found

by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties

of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe

Wheatland's Schedule 10 and Schedule 40 steel fire sprinkler pipe is FM Approved and UL, C-UL and FM Listed.

Approvals and Specifications

Both products meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10)
- ASTM A795, Type E, Grade A (Schedule 40)
- NFPA 13

Manufacturing Protocols

Schedule 10 and Schedule 40 are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings

All Wheatland black steel fire sprinkler pipe up to 6" receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted, without special preparation. Schedule 10 and Schedule 40 can be ordered in black, or with hot-dip galvanizing, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53. All Wheatland galvanized material is also UL Listed.

Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Barcoding is acceptable as a supplementary identification method.

SCHEDULE 10 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL CRR*	PIECES Lift
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m		
1¼	1.660	42.2	1.442	36.6	.109	2.77	1.81	2.69	7.3	61
1½	1.900	48.3	1.682	42.7	.109	2.77	2.09	3.11	5.8	61
2	2.375	60.3	2.157	54.8	.109	2.77	2.64	3.93	4.7	37
2½	2.875	73.0	2.635	66.9	.120	3.05	3.53	5.26	3.5	30
3	3.500	88.9	3.260	82.8	.120	3.05	4.34	6.46	2.6	19
4	4.500	114.3	4.260	108.2	.120	3.05	5.62	8.37	1.6	19
5	5.563	141.3	5.295	134.5	.134	3.40	7.78	11.58	1.5	13
6	6.625	168.3	6.357	161.5	.134	3.40	9.30	13.85	1.0	10
8	8.625	219.1	8.249	209.5	.188	4.78	16.96	25.26	2.1	7

* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY.

* The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).

SCHEDULE 40 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL CRR*	PIECES Lift
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m		
1	1.315	33.4	1.049	26.6	.133	3.38	1.68	2.50	1.00	70
1¼	1.660	42.2	1.380	35.1	.140	3.56	2.27	3.39	1.00	51
1½	1.900	48.3	1.610	40.9	.145	3.68	2.72	4.05	1.00	44
2	2.375	60.3	2.067	52.5	.154	3.91	3.66	5.45	1.00	30

* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY.

* The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).



SUBMITTAL INFORMATION

PROJECT:

CONTRACTOR:

DATE:

ENGINEER:

SPECIFICATION REFERENCE:

SYSTEM TYPE:

LOCATIONS:

COMMENTS:

BLACK

HOT-DIP GALVANIZED



Series 2000B

Double Check Valve Assemblies

Sizes: 1/2" – 2" (15 – 50mm)

Features

- Ease of maintenance with only one cover
- Top entry
- Replaceable seats and seat discs
- Modular construction
- Compact design
- 1/2" – 2" (15 – 50mm) Cast bronze body construction
- Top mounted ball valve test cocks
- Low pressure drop
- No special tools required
- 1/2" – 1" (15 – 25 mm) have tee handles



2" 2000B HC
(50mm)



3/4" 2000B
(20mm)

Available Models

Suffix:

B - Quarter turn ball valves

LBV - less ball valves

SH - stainless steel ball valve handles

HC - 2 1/2" inlet/outlet fire hydrant fitting (2" valve)

Pressure — Temperature

Temperature Range: 33°F – 140°F
(0.5°C – 60°C)

Maximum Working Pressure: 175psi
(12.1 bar)

Standards

AWWA Std. C510, IAPMO PS31

Series 2000B Double Check Valve Assemblies are designed to protect drinking water supplies for dangerous cross-connections in accordance with national plumbing codes and water authority requirements for non-health-hazard non-potable service applications such as irrigation, fire line, or industrial processing.

These valves meet the requirements of ASSE Std. 1015 and AWWA Std. C510 and are approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

Specifications

A Double Check Valve Assembly shall be installed at each noted location. The assembly shall consist of two positive seating check modules with captured springs and rubber seat discs. The check module seats and seat discs shall be replaceable. Service of all internal components shall be through a single access cover secured with stainless steel bolts. The assembly shall also include two resilient seated isolation valves and four top mounted, resilient seated test cocks. The assembly shall meet the requirements of ASSE Std. 1015 and AWWA Std. C510. Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. Assembly shall be an Ames Company Series 2000B.

Approvals



Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

LBV models not listed.

Horizontal and vertical "flow up" approval on all sizes.

WARNING

It is illegal to use this product in any plumbing system providing water for human consumption, such as drinking or dishwashing, in the United States. Before installing standard material product, consult your local water authority, building and plumbing codes.

Job Name _____ Contractor _____

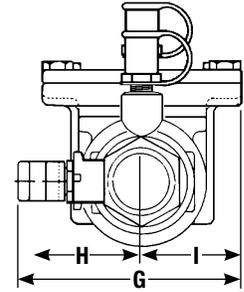
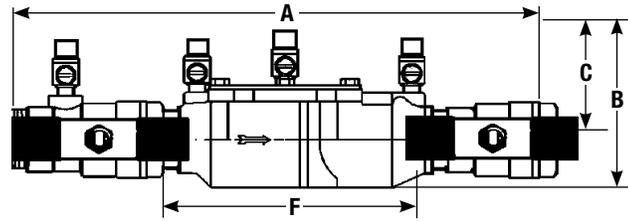
Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

Ames product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Ames Technical Service. Ames reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Ames products previously or subsequently sold.

Dimensions – Weights



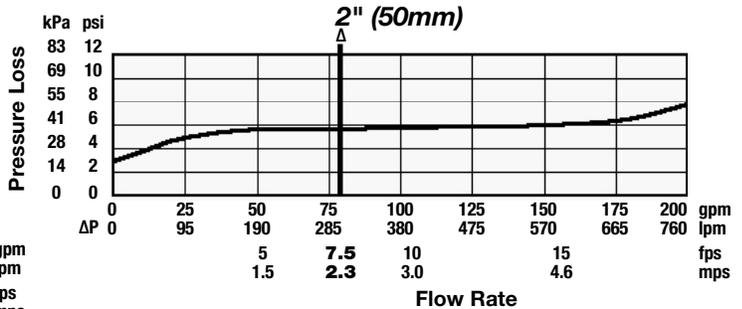
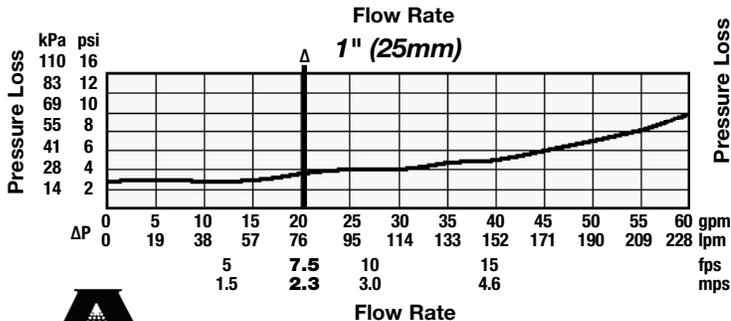
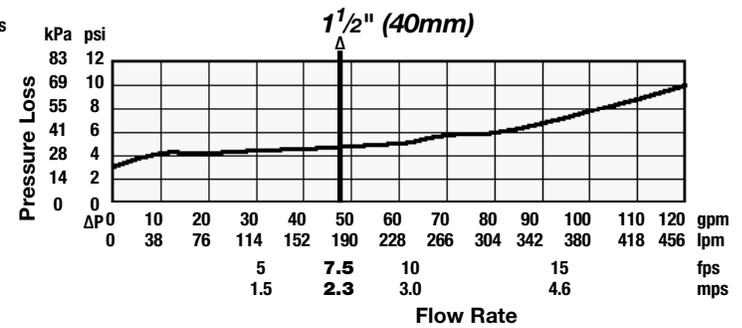
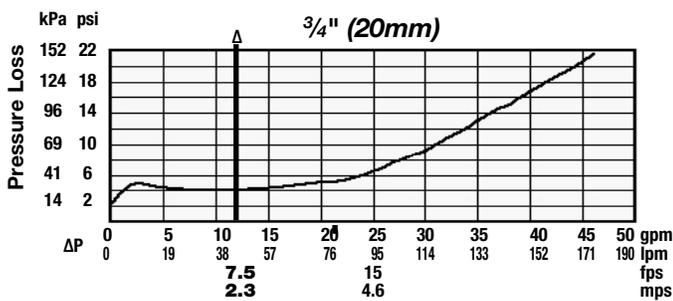
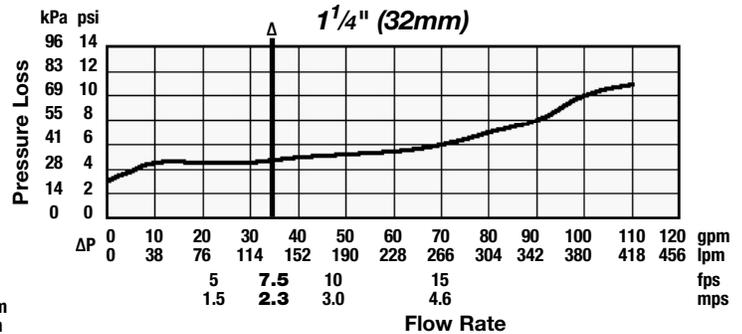
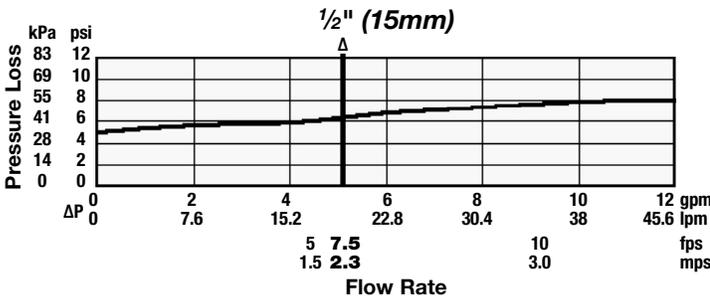
Suffix HC – Fire Hydrant Fittings dimension "A" = 23½" (594mm)

SIZE (DN)		DIMENSIONS										WEIGHT					
in.	mm	A		B		C		F		G		H		I		lbs.	kgs.
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		
½	15	10	254	4¾	117	2⅞	62	5	127	3⅝	85	2⅝	59	2⅞	52	4.5	2
¾	20	11⅞	282	4	102	3⅝	79	6⅞	157	3⅞	87	2⅞	54	1⅞	33	5	2.3
1	25	13¼	337	5⅞	130	4	102	7½	191	3⅞	85	11⅞	43	11⅞	43	12	5.4
1¼	32	16⅝	416	5	127	3⅞	84	9½	241	5	127	3	76	2	50	15	6.8
1½	40	16¾	425	4⅞	124	3½	89	9¾	248	5⅞	148	3⅞	79	2⅞	68	15.86	7.2
2	50	19½	495	6¼	159	4	102	13⅝	340	6⅞	156	3⅞	87	2⅞	68	25.75	11.7

Strainer sold separately

Capacities

As compiled from documented Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California lab tests. ΔTypical maximum system flow rate (7.5 feet/sec., 2.3 meters/sec.)



A Watts Water Technologies Company

USA: Backflow Tel: (978) 689-6066 • Fax: (978) 975-8350 • AmesFireWater.com
 USA: Control Valves Tel: (713) 943-0688 • Fax: (713) 944-9445 • AmesFireWater.com
 Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • AmesFireWater.ca
 Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • AmesFireWater.com



Stock No. 1144440

⚠ WARNING

Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.

Shock hazard. Disconnect power source before servicing. Serious injury or death could result.

Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

UL, ULC, CSFM Listed and NYMEA Accepted

Service Pressure: Up to 300 PSI (20,7 BAR)

Flow Sensitivity Range for Signal: 4-10 GPM (15-38 LPM) UL

Maximum Surge: 18 FPS (5,5 m/s)

Enclosure: Die-cast, red enamel finish
Cover held in place with tamper resistant screws

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250 VAC
2.0 Amps at 30 VDC Resistive
10mAmps min. at 24 VDC

Conduit Entrances: Two openings provided for 1/2" conduit.
Individual switch compartments suitable for dissimilar voltages.

Usage: Listed plastic, copper and schedule 40 iron pipe.
Fits pipe sizes - 1" (25mm), 1 1/4" (32mm), 1 1/2" (38mm) and 2" (50mm)
Note: 12 paddles are furnished with each unit, one for each pipe size of threaded and sweat TEE, one for 1" (25mm) CPVC, one for 1" (25mm) CPVC (Central), one for 1" threaded Nibco CPVC, and one for 1 1/2" (38mm) threaded (Japan).

Environmental Specifications:

- NEMA-4/IP54 Rated enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature range: 40° F to 120° F, (4,5° C to 49° C) UL

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Optional: Cover Tamper Switch Kit, Stock No. 0090148
(See Fig. 7 for terminations)

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

The Model VSR-S is a vane type waterflow switch for use on wet sprinkler systems that use 1" (25mm), 1 1/4" (32mm), 1 1/2" (38mm) or 2" (50mm) pipe size. The unit may also be used as a sectional waterflow detector on large systems.

The unit contains two single pole double throw snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 gallons per minute (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR-S switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

Installation

These devices may be mounted in horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6" (15cm) of a valve, drain or fitting which changes the direction of the waterflow. Select the proper paddle for the pipe size and type of TEE used see Fig. 1 for instructions on changing paddle. The unit has a 1" NPT bushing for threading into a non-corrosive TEE. See Fig. 2 for proper TEE size, type and installation. Use no more than three wraps of teflon tape.

Screw the device into the TEE fitting as shown in Fig. 2. Care must be taken to properly orient the device for the direction of waterflow.

The vane must not rub the inside of the TEE or bind in any way. The stem should move freely when operated by hand.

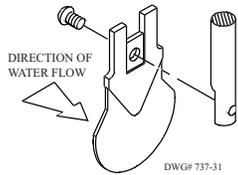
The device can also be used in copper or plastic pipe installations with the proper adapters so that the specified TEE fitting may be installed on the pipe run.

Note: Do not leave cover off for an extended period of time.

Fig. 1

Retard Adjustment

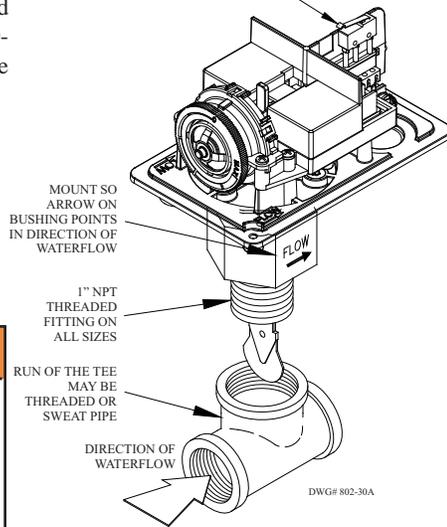
The time delay is factory set at 30 ± 10 seconds. The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms.



WARNING

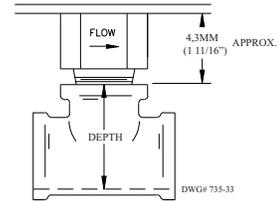
There are 12 paddles furnished with each unit. One for each size of threaded, sweat or plastic TEE as described in Fig. 2. These paddles have raised lettering that shows the pipe size and type of TEE that they are to be used with. The proper paddle must be used. The paddle must be properly attached (see drawing) and the screw that holds the paddle must be securely tightened.

DO NOT LEAVE COVER OFF FOR EXTENDED PERIOD OF TIME



Shown with optional Cover Tamper Switch Kit.

Fig. 2



Screw the device into the tee fitting as shown. Care must be taken to properly orient the device for the direction of waterflow. On sweat tees, no threaded bushings, inserts, or adapters are permitted, unless they comply with the dimensions listed in the chart below.

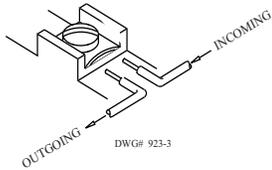
Important - The depth to the inside bottom of the tee should have the following dimensions:

Approximate Depth Requirement			
Tee Size	Threaded	Sweat	CPVC
1" x 1" x 1"	2 1/16"	1 3/4"	2 7/16"
1 1/4" x 1 1/4" x 1"	2 7/16"	2 7/16"	N/A
1 1/2" x 1 1/2" x 1"	2 11/16"	2 1/4"	N/A
2" x 2" x 1"	3 3/16"	2 3/4"	N/A

WARNING

Do not use more than three wraps of teflon tape.

Fig. 3 Switch Terminal Connections Clamping Plate Terminal

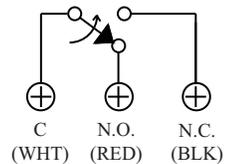


WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

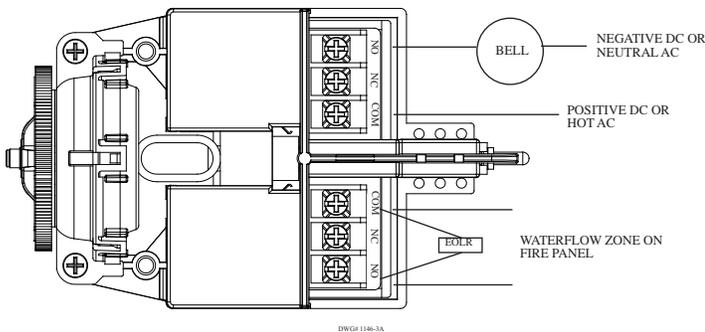
Fig. 7 Cover Tamper Switch Wiring

(Shown with cover in place)



DWG# 8810018-2

Fig. 4 Typical Electrical Connections



Notes:

1. The Model VSR-S has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other is used to operate a local audible or visual annunciator.
2. For supervised circuits see "Switch Terminal Connections" drawing and caution note (Fig. 3).

Fig. 5

To remove knockouts:
Place screwdriver at edge of knockout, not in the center.

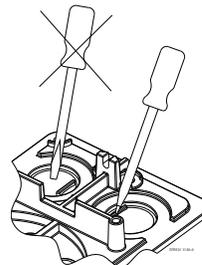
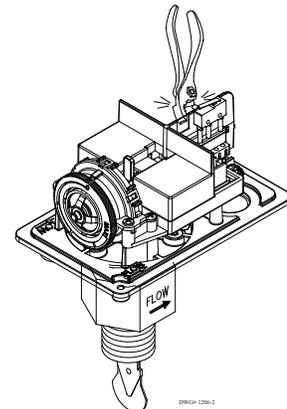


Fig. 6

Break out thin section of cover when wiring both switches from one conduit entrance.



Testing

The frequency of inspection and testing for the Model VSR-S and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently.)

An inspector's test valve (usually located at the end of the most remote branch line) should always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-S is not recommended or advisable.

A minimum flow of 10 gpm (38 Lpm) is required to activate this device.

NOTICE Please advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Maintenance

Inspect detectors monthly for leaks. If leaks are found, replace the detector. The VSR-S waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030. There is no maintenance required, only periodic testing and inspection.

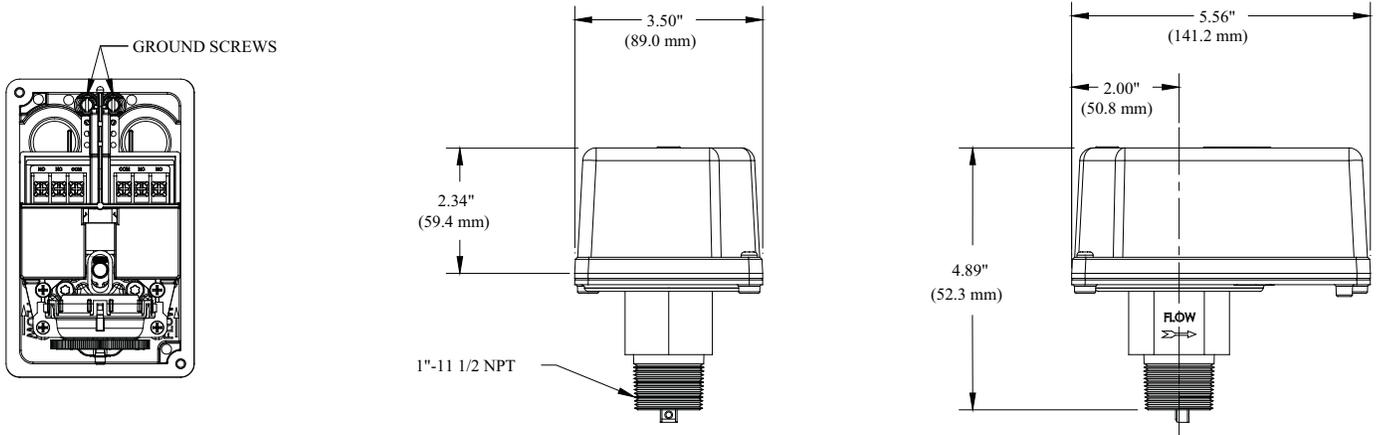
Removal

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Use a wrench on the flats of the bushing. Turn the switch counterclockwise to disengage the pipe threads.
- Gently lift with your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector.
- Lift detector clear of pipe.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Mounting Dimensions



DWG# 1206-5

Description

FPPI pressure gauges feature an impact and corrosion resistant case made from ABS (plastic). Features phosphor bronze bourdon tube movement with white enameled brass dial face with large numbers for easy reading. Dual scale to 300 PSI/2000Kpa. UL/ULc Listed (Sprinkler Gauge Model 111.10SP, UL Listed file EX5232) and FM Approved.



Applications

- Fire sprinkler systems
- Suitable for all media that will not obstruct the pressure system or attack copper alloy parts

Special Features

- UL-listed (UL-393), United States and Canada (Sprinkler Gauge Model 111.10SP, UL Listed file EX5232)
- Factory Mutual (FM) approved
- Reliable and economical

Standard Features

Design

EN 837-1 & ASME B40.100

Sizes

4" (100 mm)

Accuracy class

± 3 $\frac{2}{3}$ % of span
(ASME B40.100 Grade B)

Ranges

0/80 psi, retard to 250 psi (air)
0/300 psi (air, water, air/water)

Working Pressure

Steady: $\frac{3}{4}$ of full scale value
Fluctuating: $\frac{2}{3}$ of full scale value
Short time: full scale value

Operating Temperature

Ambient: -40°F to 140°F
(-40°C to 60°C)
Media: 140°F (+60°C) maximum

Temperature Error

Additional error when temperature changes from reference temperature of 68°F (20°C) +0.4% for every 18°F (10°C) rising or falling. Percentage of span.

Specifications

Bourdon Tube

Material: copper alloy C-type

Pressure Connection

Material: copper alloy
 $\frac{1}{4}$ " NPT lower mount (LM)

Movement

Copper alloy

Dial

White aluminum with stop pin; black and red lettering

Pointer

Black aluminum

Case

Black polycarbonate

Window

Snap-in clear polycarbonate



3198 LIONSHEAD AVE
CARLSBAD, CA 92010
TEL + 1 760 599-1168
+ 1 800 344-1822
FAX + 1 800 344-3775



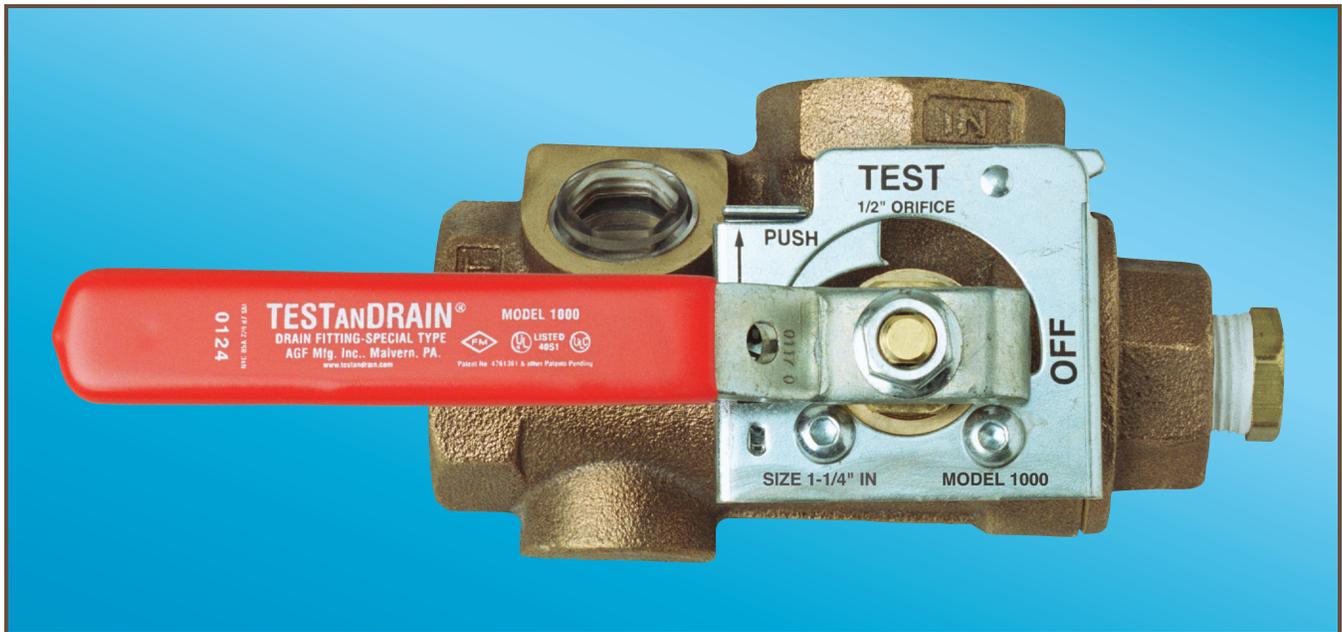
Model 1000

TEST AND DRAIN®

Sectional Floor Control Test and Drain Valve

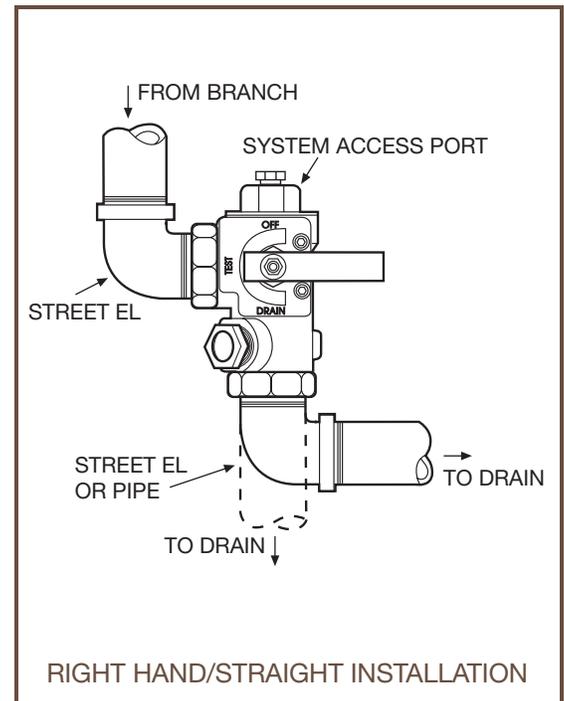


3/4" 1" 1 1/4" 1 1/2" 2"



- The AGF Manufacturing Inc. **Model 1000 TEST AND DRAIN®** provides both the test function and the express drain function for a wet fire sprinkler system.
- The **Model 1000** complies with the requirements of NFPA-13, NFPA-13R, and NFPA-13D.
- The **Model 1000 TEST AND DRAIN®** is a compact single handle ball valve which includes a tamper resistant test orifice and integral tamper resistant sight glasses, and is 300 PSI rated.
- Available in a full range of sizes from 3/4" to 2" NPT and BSPT, with all specifiable orifice sizes 3/8" (2.8K), 7/16" (4.2K), 1/2" (5.6K), 17/32" (8.0K), 5/8" (11.2K, ELO), 3/4" (14.0K, ESFR), and K25 as required by NFPA 13, 2007 Edition (see reverse).
- The orifice size is noted on the indicator plate and the valve features a tapped and plugged port for system access.
- A locking kit is available and can be ordered with the valve to provide vandal resistance or prevent unintentional alarm activation.
- Repair kits including (1) adapter gasket, (1) ball, (2) valve seats, (1) stem packing, and (1) stem washer are available for all **TEST AND DRAIN®** valves. Valve and orifice size must be specified when ordering.

MODEL 1000 - FRONT VIEW, VERTICAL INSTALLATION



Reliability, Versatility, Code Compatibility

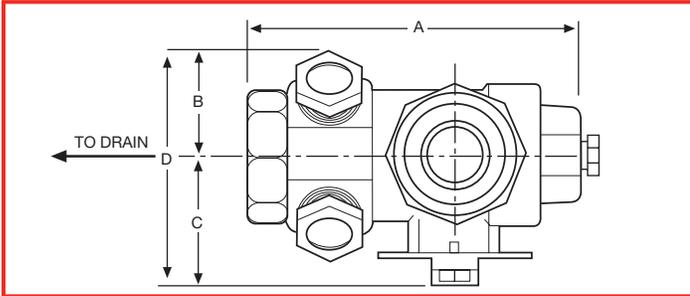


TEST AND DRAIN®

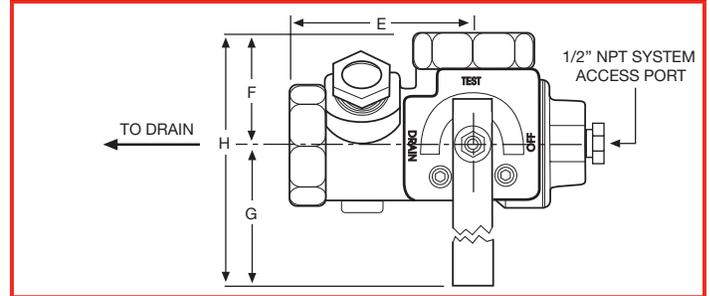
Model 1000

300 PSI Bronze Ball Valve

MODEL 1000 - PLAN VIEW



FRONT VIEW - HORIZONTAL INSTALL



DIMENSIONS

Orifice Size Available: 3/8", 7/16", 1/2", 17/32", ELO (5/8")*, ESFR (3/4")*, & K25**

SIZE	A	B	C	D	E	F	G	H
3/4"	5 1/16" (128 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1"	5 1/16" (128 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1 1/4"	5 7/16" (163 mm)	1 11/16" (43 mm)	2 9/16" (65 mm)	4 1/4" (108 mm)	3 5/16" (83 mm)	1 15/16" (51 mm)	5 9/16" (141 mm)	5 1/2" (192 mm)
1 1/2"	6 7/16" (163 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)
2"	6 7/16" (163 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)

* Available on 1 1/4" to 2" size units only

** Available on 1 1/2" and 2" size units only

THE MODEL 1000 PROVIDES ALL OF THE FOLLOWING...

From the 2007 Edition of NFPA 13

- Chapter 8.16.2.4.1* Provisions shall be made to properly drain all parts of the system.
- Chapter 8.16.2.4.2 Drain connections, interior sectional or floor control valve(s) – shall be provided with a drain connection having a minimum size as shown in Table 8.16.2.4.2.
- & 8.16.2.4.3
- Chapter 8.16.2.4.4 Drains shall discharge outside or to a drain capable of handling the flow of the drain.
- Chapter A.8.17.4.2 (Wet Pipe System) test connection is permitted to terminate into a drain capable of accepting full flow... using an approved sight test connection containing a smooth bore corrosion-resistant orifice giving a flow equivalent to one sprinkler...
- Chapter 8.17.4.2.2 The test connection valve shall be readily accessible.
- Chapter 8.17.4.2.4 shall be permitted to be installed in any location... downstream of the waterflow alarm.
- Chapter 8.17.4.3.1 (Dry Pipe System) a trip test connection not less than 1" in diameter, terminating in a smooth bore corrosion-resistant orifice, to provide a flow equivalent to one sprinkler...
- Chapter 8.17.4.3.2 The trip test connection... with a shutoff valve and plug not less than 1", at least one of which shall be brass.

MATERIALS

- Handle: Steel
- Stem: Rod Brass
- Ball: C.P. Brass
- Body: Bronze
- Valve Seat: Impregnated Teflon®
- Indicator Plate: Steel
- Handle Stop: Steel

APPROVALS

- UL and ULC Listed (EX4019)
- FM Approved
- NYC-BSA No. 720-87-SM



USA Patent # 4741361 and Other Patents Pending



AGF Manufacturing Inc.
 100 Quaker Lane, Malvern, PA 19355
 Phone: 610-240-4900
 Fax: 610-240-4906
 www.testandrain.com

Job Name: _____
 Architect: _____
 Engineer: _____
 Contractor: _____



TOLCO Fig. 29 series size range expansion

Double offset hanger and restrainer for CPVC plastic pipe & IPS steel pipe

The TOLCO™ Fig. 29 is designed as a hanger and restrainer for CPVC applications such as plastic fire sprinkler pipe. It provides a double offset from mounting surface to help eliminate abrasion, plus its unique design eliminates the need for wood block extension, allowing for retrofit attachment of hanger to the sprinkler pipe.

And now, in addition to the existing ¾" and 1" sizes, the Fig. 29 includes a 1¼" solution to round out the Fig. 29 product size offering. The addition of the 1¼" size provides hanger and restrainer solutions for larger size CPVC pipe installations and projects leading to gained efficiency and cost savings.

Part No.	Pipe Size in. (mm)	Approx. Wt./100 lbs. (kg)
29-¾	¾" (20)	18 (8.1)
29-1	1" (25)	19 (8.6)
29-1¼	1¼" (32)	24 (10.8)

US Patent No. 9,726,304
Can. Pat. No. 2618941



Features and benefits

- UL Listed as a hanger and restraint to support fire sprinkler systems
- Offset edge helps eliminate abrasion
- Attaches easily to wood structure
- Thumb tab provides protection to restrain pipe in rough job site conditions, but is not required to be bent for listed installation
- Can be used as a single offset hanger by aligning "dimples" with top of mounting surface and utilizing two fasteners in two of the three holes provided
- Attaches easily to wood structure with two special #10 x 1" hex head self-threading screws furnished with product
- Ideal for mechanical, plumbing and fire sprinkler applications

Specifications

- Pipe size range: Available in ¾" (20mm), 1" (25mm), and 1¼" (32mm)
- Material finish: Pre-galvanized steel offers corrosion resistance

Approvals

- Approved by Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) as a hanger and restrainer to support thermoplastic fire sprinkler systems*
- Meets or exceeds requirements of NFPA 13, 13R and 13D.



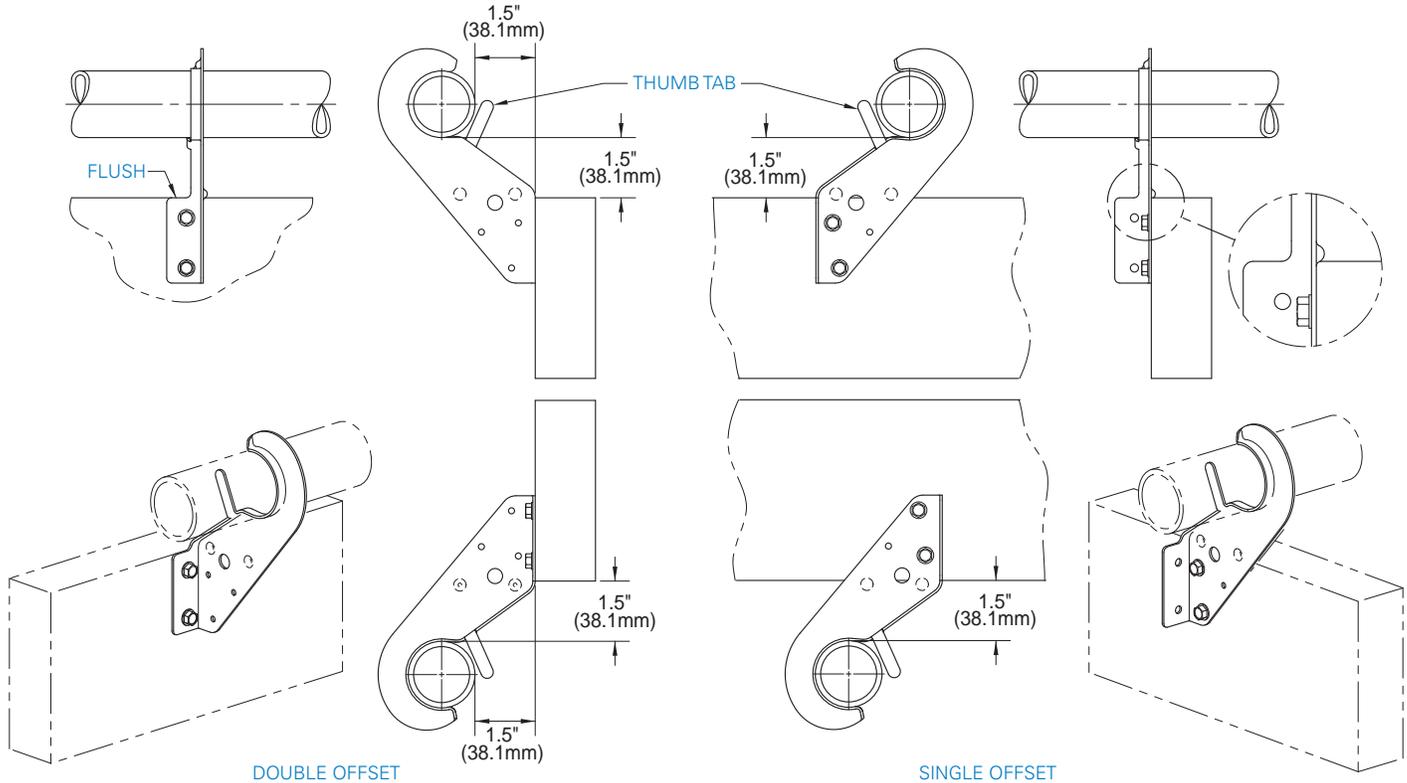
Powering Business Worldwide

*Not UL or cUL listed for use with metallic pipe.

TOLCO Fig. 29

Installation instructions

- Install using a rechargeable electric drill fitted with a $\frac{5}{16}$ " (8mm) socket attachment using the special hex head self-tapping screws provided.
- Install screws until they bottom out.
- Pipe can be "snapped" into the hanger before or after the installation of the screws to the mounting surface.
- "Thumb tab" may be bent up to provide additional protection for the pipe but is not required for performance of the hanger or restraint function.



**For more information,
visit Eaton.com/Fig-29.**

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United States
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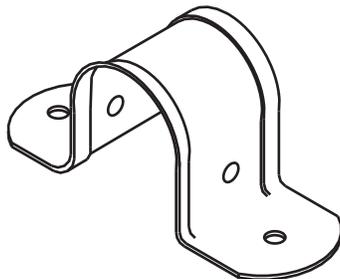




P.O. Box 3365 South El Monte, CA 91733 626.444.0541 Fax 626.444.3887 www.Afcon.org

510

**CPVC - COPPER - STEEL
HANGER**



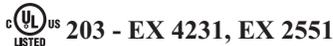
510 SIZE	Fastener Dim. Q - Q _c
3/4	2.125
1	2.312
1 1/4	3.170
1 1/2	3.400
2	4.010
2 1/2	4.320
3	5.320

SIZE - SYSTEM PIPE: 3/4" thru 3"

MATERIAL - Carbon Steel.

FINISH - Mil. Galvanized.

LISTING/APPROVAL -



FUNCTION - Support horizontal piping: CPVC, Copper or Steel.

Size 3/4" - 2" Prevents upward movement of pipe from pendent sprinkler discharge.

Stabilize vertical piping.

INSTALLATION - Per these instructions

including NFPA 13, 13R, 13D and CPVC manufacturers instructions.

Install on horizontal or vertical mounting surface.

FASTENERS - UL Listed per NFPA 13

in **WOOD**:

3/4" - 3" CPVC pipe - #905 screw - no pre-drill.

3/4" - 3" Steel and Copper pipe - #14 x 1 1/2" SMS or

1/4"x11/2" lag bolt - no pre-drill.

in **STEEL** - min. 18 GA.

3/4" - 3" CPVC, Copper and Steel pipe - 1/4" or #14 Tek Screw.

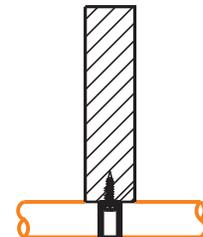
FEATURES

* Offset edge eliminates abrasion.

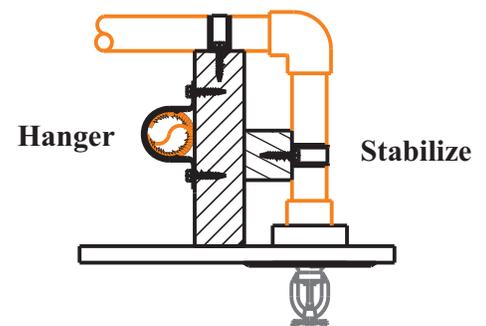
* Retainer dimples secure hanger to pipe during installation.

* Required AFCON #905 screw included - 5/16" hex head.

ORDERING - Part # and pipe size.



Restraint



**CAN ALSO BE USED TO REPLACE - #500 Pipe Strap
#520 Tin Strap**

Specific AFCON products are exclusively designed to be compatible ONLY with other AFCON products including parts and fasteners, resulting in a listed sway brace, restrainer or hanger assembly. Be advised the following warranty restriction will apply. **DISCLAIMER** - AFCON will NOT warrant against the failure of its products when used in combination with other products, parts or systems not manufactured or sold by AFCON. AFCON shall NOT be liable under any circumstances whatsoever for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, when non-AFCON products have been, or are used.



Fig. 188R (Formerly Afcon Fig. 514) Two Hole Standoff and Restrainer

Size Range: 3/4" through 2"

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service:

- Hanger and surge restraint for horizontal CPVC piping when installed on the top, bottom, and side of the supporting structure.
- Guide for vertical CPVC piping when installed on the side of the supporting structure.
- Horizontal and vertical seismic restraint per NFPA 13-2016 requirements.
- Listed with hardware provided on structural wood beams and composite wood beams (1" minimum). Listed with steel (18ga minimum) with two (2) #14x1" or 1/4"x1" hex washer head self-drilling TEK screws. For wood structures with less than 1" thickness, wood blocks may be placed on the backside of the wood structure. #10x1" fastener provided must be fully engaged in the wood block.
- May be installed with concrete, steel structural members, and other structural members with fasteners which comply with the requirements of NFPA 13.

Approvals: cULus Listed

Patents: No. 6,648,278

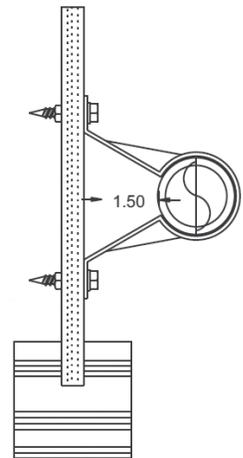
Installation:

- Snap hanger over pipe. If needed, squeeze strap back around pipe.
- CPVC pipe must be allowed to slide freely through the Fig. 188R.
- Secure hanger to mounting surface with screws provided or with listed fasteners.

Features:

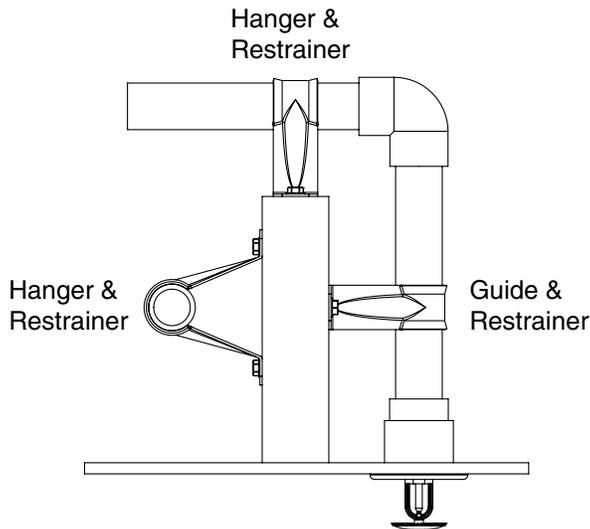
- Beveled edge design helps protect the CPVC pipe from any rough surface and eliminates pipe abrasion.
- Easily attaches to wood structure with #10 x 1" hex washer head self-threading screw supplied with product. No pre-drilling required.
- Bottom of pipe is offset 1 1/2" from the structure. Eliminates wooden spacer blocks.

Ordering: Specify CPVC pipe size, figure number and description.



Installation - Backing Nut
 Hanger = 1 - at top fastener
 Restraint = 2 - on each fastener

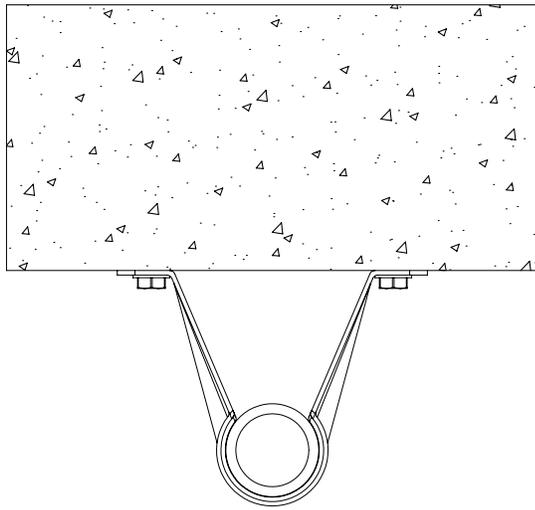
Per NFPA-13D and NFPA-13R



PROJECT INFORMATION		APPROVAL STAMP	
Project:		<input type="checkbox"/> Approved	
Address:		<input type="checkbox"/> Approved as noted	
Contractor:		<input type="checkbox"/> Not approved	
Engineer:		Remarks:	
Submittal Date:			
Notes 1:			
Notes 2:			

Fig. 188R (Formerly Afcon Fig. 514)

Two Hole Standoff and Restrainer (cont.)



Hanger and Restrainer

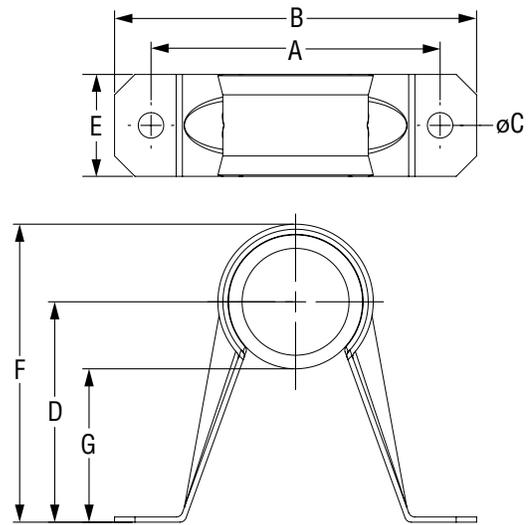


FIG. 188R: DIMENSIONS (IN) • WEIGHT (LBS)

CPVC Pipe Size	A	B	øC	D	E	F	G	Max. Hanger Spacing (FT.)	Approx. Weight/100 (lbs)
¾	2¾	3½	¼	2	1	2 ⁵ / ₈	1½	5½	11
1	2 ¹³ / ₁₆	3½	¼	2 ³ / ₁₆	1	2 ¹⁵ / ₁₆	1½	6	12
1¼	2 ¹³ / ₁₆	3½	¼	2 ⁵ / ₁₆	1	3¼	1½	6½	13
1½	3 ⁵ / ₈	4¼	¼	2 ⁷ / ₁₆	1	3½	1½	7	14
2	3 ¹¹ / ₁₆	4¾	¼	2 ¹¹ / ₁₆	1	4	1½	8	16