TRANSMITTAL LETTER FROM:

Sunland Fire Protection, Inc.

www.sunlandfire.com
P.O. Box 277, Jamestown, NC 27282
1218 Elon Place, High Point, NC 27263
(336) 886-7027 -- Fax (336) 886-7024
transmittal@sunlandfire.com

PROJECT: **CCG H-2 Room Sprinkler Upfit**

Location: Lillington, NC

Contract#: Project #S1103993

Date: 9/18/2019

To: **Harnett County Central Permitting**
C/O: Plan Reviewer
P.O. Box 65
Lillington, NC 27546

☒For Approval ☐For Your Use
☐As Requested ☐For Review and Comment
☐Approved As Noted ☐Approved As Submitted
☐For Bids Due

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COPIES	DESCRIPTION
2	FIRE SPRINKLER DRAWING FP-01
2	SUBMITTAL DATA
1	TRANSMITTAL LETTER

Please return 1 copy/copies of each indicating your approval and/or comments.

REMARKS:
Should you have any questions regarding this submittal please contact me at 336-862-1219 or by e-mail at dylan.garner@sunlandfire.us

All the best,

cc: File
Copies of the indicated items have also been transmitted to the following parties:

SIGNED: Dylan Garner

SUNLAND
FIRE PROTECTION, INC.

SUBMITTAL DATA BOOKLET

FOR

CCG H-2 ROOM

LILLINGTON, NC

(CONTRACT #S1103993)

Home Office: P.O. Box 277, Jamestown, NC 27282 Physical Address: 1218 Elon Place, High Point, NC 27263
336-886-7027 FAX 336-886-7024
Branch Office: P.O. Box 12833, Wilmington, NC 28405 Physical Address: 6420-B Windmill Way, Wilmington, NC 28405
910-794-9101 FAX 910-794-9103
www.sunlandfire.com

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SPRINKLERS

Bulletin 129 May 2019

Reliable®

Model GXLO
Standard Spray
Standard Response
Storage and Non-storage Sprinkler

K11.2 (160 metric)
(SIN R2921) Upright
(SIN R2916) Pendent

Model GXLO Upright

Model GXLO Pendent

Features

1. Upright cULus Listed as a Control Mode Density Area (CMDA) sprinkler for storage & non-storage protection.
2. Upright and Pendent FM Approved as Standard-response, storage and non-storage sprinklers.
3. Standard ¾-inch NPT or ISO 7-R¾ threads; optional ½-inch NPT or ISO 7-R½ threads for upright retrofit applications only.

Listings & Approvals:

The following organizations provide Listings or Approvals for Model GXLO sprinklers. See the Technical Data table for listing and approvals applicable to each sprinkler.

1. Underwriters Laboratories, Inc. and Underwriters Laboratories of Canada (cULus) - Upright only.
2. Approved by Factory Mutual (FM) as a storage and non-storage sprinkler - Upright and Pendent.

UL Guide Number

VNIV

UL Listing Category

Sprinklers, Automatic and Open; Sprinklers for Storage Protection (Control Mode Density Area)

Technical Data

Sprinkler Type	Nominal K Factor		Sprinkler Height	Approvals	Sprinkler Identification Number (SIN)
	US	Metric			
Upright 0.64 Orifice with ¾" NPT (R¾)	11.2	160	2.71" (68.8mm)	cULus, FM	R2921
Upright Retrofit 0.64 Orifice with ½" NPT (R½)	11.2	160	2.82" (71.6mm)	cULus, FM	R2921
Pendent 0.64 Orifice with ¾" NPT (R¾)	11.2	160	2.71" (68.8mm)	FM	R2916

Note: This product has been tested and listed for storage applications to qualify its use in lieu of 5.6K or 8.0K Factor sprinklers for the protection of high-piled storage.

Product Description

The Reliable Model GXLO sprinkler is a center strut, solder in compression, extra large orifice sprinkler that has been designed for storage and non-storage applications. The Model GXLO sprinkler is available in either an upright or pendent configuration. The Model GXLO sprinkler is available with either 3/4-inch NPT or ISO 7-R3/4 threads. The Model GXLO Upright is optionally available with either 1/2-inch NPT or ISO 7-R1/2 threads for retrofit applications only.

Design Criteria

The Model GXLO sprinkler is intended for use as a standard response standard spray sprinkler in hydraulically designed sprinkler systems with a minimum pressure of 7 psi (0.5 bar) in accordance with the area/density curves of NFPA 13 or in accordance with FM Property Loss Prevention Data Sheets.

The Model GXLO sprinkler is not a "Large Drop" or "ESFR" sprinkler.

Temperature Ratings

Classification	Sprinkler Rating		Maximum Ambient Temperature		Frame Color
	°F	°C	°F	°C	
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

Optional Guards and Water Shields

Sprinkler	Guard or Water Shield	Listings & Approvals
GXLO Upright	D-6 Guard & Water Shield	cULus
	D-7 Guard & Water Shield	FM
	Water Shield (factory installed)	
GXLO Pendent	D-8 Guard	FM
	D-9 Guard & Water Shield	

Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523

Installation

Reliable's Model GXLO sprinkler must be installed according to NFPA Standards or the appropriate Factory Mutual Loss Prevention Data Sheets for all area/density methods of design as well as requirements of the Authority Having Jurisdiction.

Model GXLO sprinklers must be installed with the Reliable Model H sprinkler wrench. Any other type of wrench may damage the sprinkler.

A leak tight joint should be obtained with a torque of 14 to 20 lb-ft (19 to 27 N-m) for ¾-inch NPT and ISO 7-R¾ thread sprinklers. For ½-inch NPT and ISO 7-R½ thread sprinklers the recommended installation torque is 8 to 18 lb-ft (11 to 24 N-m). Do not tighten sprinklers over the maximum recommended installation torque, because it may cause leakage or impairment of the sprinklers.

Model H Wrench

Use only the Model H sprinkler wrench for sprinkler removal and installation. Any other type of wrench may damage the sprinkler.

Maintenance

Model GXLO Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Ordering Information

Specify:

1. Sprinkler: Model GXLO
2. Orientation: [Upright] [Pendent]
3. Temperature Rating: [Ordinary, 165°F] [Intermediate, 212°F] [High 286°F]
4. Finish: (See Finishes Chart)
5. Threads: [¾-inch NPT] [ISO 7-R¾] [½-inch NPT (Upright only)] [ISO 7-R½ Upright only]
6. Optional Guard or Water Shield

Finishes

Standard Finishes	
Bronze	
Chrome [1]	
Special Application Finishes	
Lead Plated [1]	- 165°F (74°C), 212°F (100°C) and 286°F (141°C) Temp. Ratings
Wax [1] [2]	- 165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax
Wax/Lead [1] [2]	- 165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax

[1] cULus, upright (without shield) only.

[2] 212°F (100°C) Brown wax may be used on 286°F (141°C) Sprinklers when maximum ambient temperatures do not exceed 150°F (66°C).

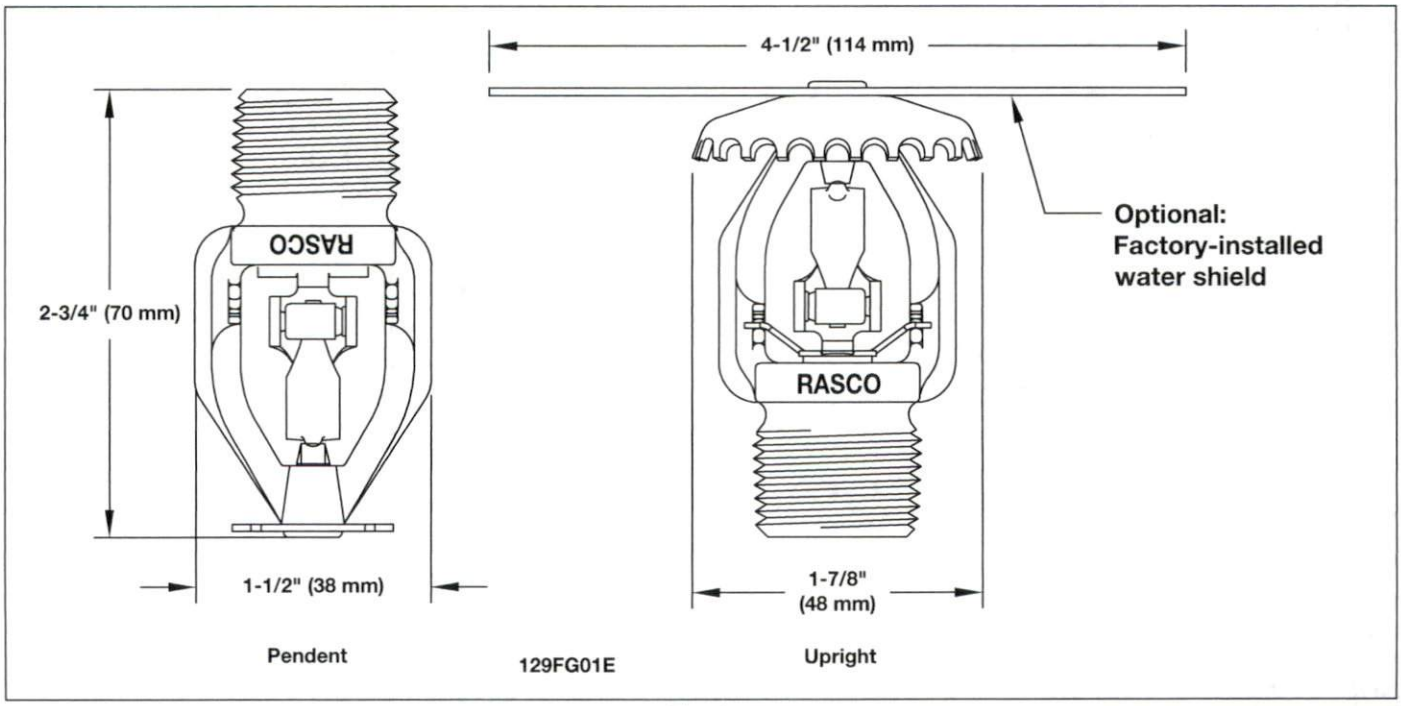

Fig. 1

Model GXLO Technical Data

Table A

ITEM	DESCRIPTION
Sprinkler Identification Number (SIN)	R2921 (Upright), R2916 (Pendent)
K-factor US (Metric)	11.2 (160)
Thread Size	3/4" (ISO 7-R3/4), 1/2" (ISO 7-R1/2) Retrofit Upright
Sprinkler Orientation	Upright; Pendent
Maximum Working Pressure, PSI (bar)	175 PSI (12 bar)

Model GXLO Commodity Selection and Design Criteria Overview

Table B

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	CMDA	Storage
Response Type	SR	SR
System Type	Pendent-Wet Upright- Wet,Dry, Preaction	Pendent- Wet Upright- Wet,Dry,Preaction
Temperature Rating F (C)	165,212,286 (74,100,141)	165,212,286 (74, 100,141)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I - IV and Group A or B Plastics	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I - IV and Group A or B Plastics	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0,8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 8-3
Rolled Paper Storage	See NFPA 13	N/A Pendent See FM 8-21 for Upright
Flammable Liquid Storage	See NFPA 30	See FM 7-29 and 8-9
Aerosol Storage	See NFPA 13	See FM 7-31
Auto Components in Portable Racks	N/A	N/A

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.
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(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

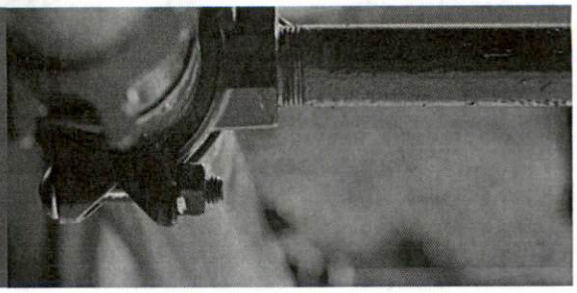
EG. Printed in U.S.A. 05/19 P/N 9999970022

PIPE

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe
Wheatland Tube's Schedule 10 and Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Approvals and Specifications
Schedule 10 and Schedule 40 meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1–8 NPS)
- ASTM A795, Type E, Grade A (Schedule 40, 1–2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2–8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1–4 NPS)
- NFPA® 13 and NFPA 14

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 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 hot-dip galvanized, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53.

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

SUBMITTAL INFORMATION

PROJECT: _____ CONTRACTOR: _____ DATE: _____

ENGINEER: _____ SPECIFICATION REFERENCE: _____ SYSTEM TYPE: _____

LOCATIONS: _____ COMMENTS: _____

☐ BLACK ☐ HOT-DIP GALVANIZED

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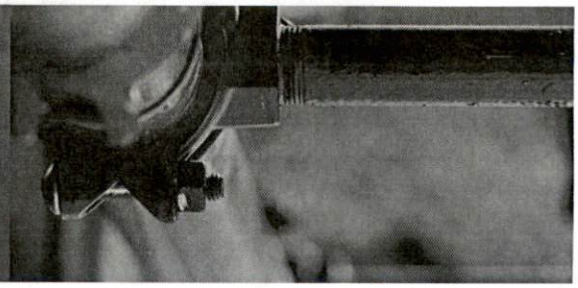
Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet



SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

** 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).*

*** 8 NPS Schedule 40 is FM Approved but not UL Listed.*

WFS-081619

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A DIVISION OF ZEKELMAN INDUSTRIES

FITTINGS

Victaulic® FireLock™ Fittings

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ¼ – 8"/DN32 – DN200

Maximum Working Pressure

- Pressure ratings for Victaulic FireLock™ Fittings conform to the ratings of Victaulic FireLock EZ™ Style 009N couplings (refer to publication 10.64 for more information).

Application

- FireLock™ fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.
- Connects pipe, provides change in direction and adapts sizes or components

Pipe Materials

- Carbon steel

2.0 CERTIFICATION/LISTINGS

EN 10311
Regulation (EU)
No. 305/2011

3.0 SPECIFICATIONS – MATERIAL

Fitting: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Fitting Coating:

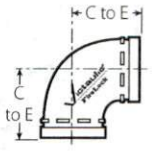
- ☐ Orange enamel.
- ☐ Red enamel in Europe, Middle East, Africa, and India.
- ☐ Optional: Hot dipped galvanized.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

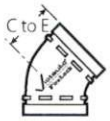
System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

4.0 DIMENSIONS



No. 001



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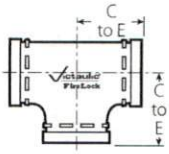


No. 002

No. 006

Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow C to E inches mm	No. 001 90° Elbow Approximate Weight Each lb kg	No. 003 45° Elbow C to E inches mm	No. 003 45° Elbow Approximate Weight Each lb kg	No. 002 Straight Tee C to E inches mm	No. 002 Straight Tee Approximate Weight Each lb kg	No. 006 Cap T inches mm	No. 006 Cap Approximate Weight Each lb kg
1¼	1.660	—	—	—	—	—	—	0.82	0.3
DN32	42.4	—	—	—	—	—	—	21	0.1
1½	1.900	—	—	—	—	—	—	0.82	0.4
DN40	48.3	—	—	—	—	—	—	21	0.2
2	2.375	2.75	1.7	2.00	1.8	2.75	2.4	0.88	0.6
DN50	60.3	70	0.8	51	0.8	70	1.1	22	0.3
2½	2.875	3.00	3.1	2.25	2.2	3.00	3.6	0.88	1.0
	73.0	76	1.4	57	1.0	76	1.6	22	0.5
	3.000	3.00	3.30	2.25	2.4	3.00	3.8	—	—
DN65	76.1	76	1.5	57	1.1	76	1.7		
3	3.500	3.38	4.0	2.50	3.1	3.38	5.3	0.88	1.2
DN80	88.9	86	1.8	64	1.4	86	2.4	22	0.5
	4.250	4.00	5.7	3.00	5.1	4.00	7.5	—	—
	108.0	102	2.6	76	2.3	102	3.4		
4	4.500	4.00	6.7	3.00	5.6	4.00	8.7	1.00	2.4
DN100	114.3	102	3.0	76	2.5	102	3.9	25	1.1
5	5.563	4.88	12.6	3.25	8.3	4.88	15.7	1.00	4.1
	141.3	124	5.7	83	3.8	124	7.1	25	1.9
	5.500	4.88	12.4	3.25	8.2	4.88	15.4	—	—
DN125	139.7	124	5.6	82.6	3.7	124	6.9		
	6.250	5.50	12.6	3.50	9.2	5.50	17.9	—	—
	158.8	140	5.7	89	4.2	140	8.0		
6	6.625	5.50	18.3	3.50	11.7	5.50	22.7	1.00	5.9
DN150	168.3	140	8.3	89	5.3	140	10.3	25	2.7
	6.500	5.43	17.6	3.50	11.4	5.50	22.0	—	—
	165.1	140	7.9	89	5.2	140	9.9		
8	8.625	6.81	25.5	4.25	20.4	6.94	38.7	1.13	12.7
DN200	219.1	173	11.6	108	9.3	176	17.6	29	5.8
	8.515	6.81	23.1	—	—	6.94	33.6	—	—
	216.3	173	10.5	—	—	176	15.2	—	—

5.0 PERFORMANCE

Flow Data

Size		Frictional Resistance Equivalent of Straight Pipe[1]			
		Elbows		No. 002 Straight Tee	
Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow feet meters	No. 003 45° Elbow feet meters	Branch feet meters	Run feet meters
1¼	1.660	—	—	—	—
DN32	42.4	—	—	—	—
1½	1.900	—	—	—	—
DN40	48.3	—	—	—	—
2	2.375	3.5	1.8	8.5	3.5
DN50	60.3	1.1	0.5	2.6	1.1
2½	2.875	4.3	2.2	10.8	4.3
	73.0	1.3	0.7	3.3	1.3
	3.000	4.5	2.3	11.0	4.5
DN65	76.1	1.4	0.7	3.4	1.4
3	3.500	5.0	2.6	13.0	5.0
DN80	88.9	1.5	0.8	4.0	1.5
	4.250	6.4	3.2	15.3	6.4
	108.0	2.0	0.9	4.7	2.0
4	4.500	6.8	3.4	16.0	6.8
DN100	114.3	2.1	1.0	4.9	2.1
5	5.563	8.5	4.2	21.0	8.5
	141.3	2.6	1.3	6.4	2.6
	5.500	8.3	4.1	20.6	8.3
DN125	139.7	2.5	1.3	6.3	2.5
	6.250	9.4	4.9	25.0	9.6
	158.8	2.9	1.5	7.6	2.9
6	6.625	10.0	5.0	25.0	10.0
DN150	168.3	3.0	1.5	7.6	3.0
	6.500	9.8	4.9	24.5	9.8
	165.1	3.0	1.5	7.5	3.0
8	8.625	13.0	5.0	33.0	13.0
DN200	219.1	4.0	1.5	10.1	4.0
	8.515	13.0	—	33.0	13.0
	216.3	4.0	—	10.1	4.0

[1] The flow data listed is based upon the pressure drop of Schedule 40 pipe.

6.0 NOTIFICATIONS

General Notes

NOTE: When assembling FireLock EZ™ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ™ Style 009N/009H couplings, use FireLock™ No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H/009N couplings.

7.0 REFERENCE MATERIALS

10.64: Victaulic® FireLock™ Rigid Coupling Style 009N

10.02: Victaulic® FireLock™ Rigid Coupling Style 005H with Vic-Plus™ Gasket System

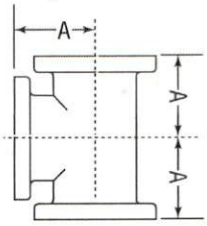
29.01: Victaulic® Terms and Conditions of Sale

10.03 1539 Rev N Updated 09/2017

CAST IRON FLANGED FITTINGS

Class 125 (Standard)

FIGURE 811
Flanged Tee



Size		A		AA		Flange Diameter		Thickness				Unit Weight			
								Flange		Wall		Black		Galv.	
NPS	*DN*	in	*mm*	in	*mm*	in	*mm*	in	*mm*	in	*mm*	lbs	*kg*	lbs	*kg*
1 1/2	*40*	4	*102*	8	*203*	5	*127*	9/16	*14*	5/16	*8*	15.00	*6.80*	–	–
2	*50*	4 1/2	*114*	9	*229*	6	*152*	5/8	*16*	5/16	*8*	21.00	*9.52*	–	–
2 1/2	*65*	5	*127*	10	*254*	7	*178*	11/16	*17*	5/16	*8*	30.00	*13.61*	–	–
3	*80*	5 1/2	*140*	11	*279*	7 1/2	*191*	3/4	*19*	3/8	*10*	37.00	*16.78*	37.00	*16.78*
4	*100*	6 1/2	*165*	13	*330*	9	*229*	15/16	*24*	1/2	*13*	64.00	*29.02*	64.00	*29.02*
5	*125*	7 1/2	*191*	15	*381*	10	*254*	15/16	*24*	1/2	*13*	81.00	*36.73*	–	–
6	*150*	8	*203*	16	*406*	11	*279*	1	*25*	9/16	*14*	105.00	*47.62*	105.00	*47.62*
8	*200*	9	*229*	18	*457*	13 1/2	*343*	1 1/8	*29*	5/8	*16*	165.00	*74.83*	165.00	*74.83*
10	*250*	11	*279*	22	*559*	16	*406*	1 3/16	*30*	3/4	*19*	270.00	*122.45*	–	–
12	*300*	12	*305*	24	*610*	19	*483*	1 1/4	*32*	13/16	*22*	380.00	*172.34*	–	–

Note: See following page for pressure-temperature ratings.

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

CAST IRON FLANGED FITTINGS AND FLANGES

Class 125 (Standard) and Class 250 (Extra Heavy)

c UL us FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil Sales Representative.

Specifications

All Cast Iron Flanged Fittings and Flanges in sizes listed are made to ASME and are marked 125 or 250 for pipe sizes 12 NPS *(300 DN)* and smaller. Unless otherwise specified, cast iron flanges and fittings are drilled and faced in accordance with ASME B 16.1.

Coatings

Flanged fittings and flanges are available in both black painted and galvanized. Consult an Anvil Representative for available sizes.

Sizes

Size of all flanged fittings and flanges scheduled indicates nominal pipe diameter of ports. Standard reducing elbows carry the same dimensions center-to-face as regular elbows of largest straight size.

Ordering

To order reducing companion flanges, specify threaded or reduced size first, then the outside diameter of flange wanted. For instance, if a reducing flange is required to connect a 5-inch pipe to an 8-inch flanged valve or fitting having a 13 1/2 inch O.D. flange, order: 5 x 13 1/2 inch standard reducing flange.

Dimensions

Bolt holes for bolts smaller than 1 3/4 inches *(44mm)* in diameter are drilled 1/8 inch larger than the bolt diameter; 1 3/4 inch *(44mm)* and larger bolts have holes drilled 1/4 inch *(6mm)* larger than bolt diameter. Bolt holes straddle the center line. Bolt holes are spot faced on order only.

Tolerances

An inspection limit of plus or minus 1/32 inch *(1mm)* shall be allowed on all center to contact surface dimensions for sizes up to and including 10 NPS *(250 DN)*; plus or minus 1/16 inch *(1.5mm)* on sizes larger than 10 NPS *(250 DN)*. Inspection limit of plus or minus 1/16 inch *(1.5mm)* shall be allowed on all contact surface to contact surface dimensions for sizes up to and including 10 NPS *(250 DN)*; plus or minus 1/8 inch *(3mm)* on sizes larger than 10 NPS *(250 DN)*. The largest opening in the fitting governs the tolerance to be applied to all openings.

Cast Iron Flanged Fittings and Cast Iron Flanges					
Temperature		Pressure*			
		Class 125		Class 250	
		1"–12"		1"–12"	
(°F)	*(°C)*	psi	*bar*	psi	*bar*
-20° to 150°	*-28.9° to 65.6°*	200	*13.8*	500	*34.5*
200°	*93.3°*	190	*13.1*	460	*31.7*
225°	*107.2°*	180	*12.4*	440	*30.3*
250°	*121.1°*	175	*12.1*	415	*28.6*
275°	*135.0°*	170	*11.7*	395	*27.2*
300°	*148.9°*	165	*11.4*	375	*25.9*
325°	*162.8°*	155	*10.7*	355	*24.5*
350°	*178.3°*	150	*10.3*	335	*23.1*
375°	*190.6°*	145	*10.0*	315	*21.7*
400°	*207.8°*	140	*9.7*	290	*20.0*
425°	*218.3°*	130	*9.0*	270	*18.6*
450°	*232.2°*	125	*8.6*	250	*17.2*

* Applies to fittings and flanges manufactured with ASTM A-126 Class B material only.

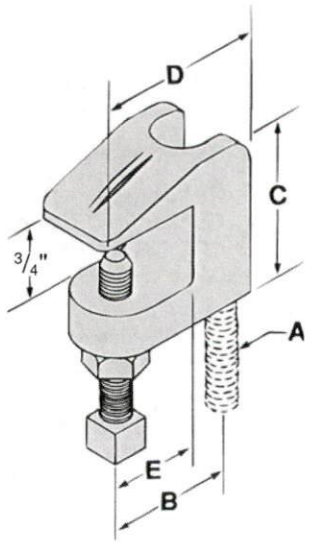
Standards and Specifications					
	Dimensions	Material	Galvanizing**	Thread	Pressure Rating
CAST IRON FLANGES AND FLANGED FITTINGS					
Class 125 (1"-12")	ASME B16.1	ASTM A- 126 (A) or (B)	ASTM A-153	ASME B1.20.1	ASME B16.1
Class 250 (1"-12")	ASME B16.1	ASTM A- 126 (A) or (B)	ASTM A-153	ASME B1.20.1	ASME B16.1

** ASTM B 633. Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.

HANGERS

Malleable Iron Beam Clamps

Fig. 350
BEAM CLAMP



FUNCTION: Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed 3/4 inch. The open U design permits rod adjustment. The universal design of the 3/8 Fig. 350 allows it to be used in an inverted position on the bottom flange of a beam as well.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for all sizes. Factory Mutual Approved for rod sizes 3/8" and 1/2" only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 19). Fig. 350 sized for 3/8 rod can be used in an inverted position (bottom of beam) and follows the same U.S. (UL), Canada (CUL), and Factory Mutual Approvals. Used in this manner the 3/8" Fig. 350 also complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 23) (Approvals are only for Fig. 350 with locknut).

MATERIAL: Malleable iron with hardened steel cup point set screw

FINISH: Plain or electro-galvanized

ORDERING: Specify rod size, finish and figure number.

Rod Size A	B	C	D	E	Max. Pipe Size	Max. Rec. Load/lbs.	Wt. Each (in lbs.)
Δ3/8	1	1 1/2	1 5/8	1/2	4	400	.33
1/2	1	1 1/2	1 11/16	1/2	8	500	.34
5/8	1 1/16	1 1/2	1 7/8	5/8	8	600	.39
3/4	1 5/16	1 3/4	2 3/8	5/8	8	800	.63
7/8	1 5/16	1 3/4	2 3/8	5/8	8	1200	.60

Note: See MSS ANSI/SP-69 and SP-58 specifications for proper set screw torque values.

Δ Reversible design approved for bottom beam use.

PHD Manufacturing, Inc. • 44018 Columbiana-Waterford Road • Columbiana, OH 44408
Toll Free (800) 321-2736 • Phone: (330) 482-9256 • Fax: (330) 482-2763 • www.phd-mfg.com

Adjustable Swivel Ring Hangers

Fig. 141 & 141F NFPA SWIVEL RING HANGER

FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved for sizes ¾" to 8". Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

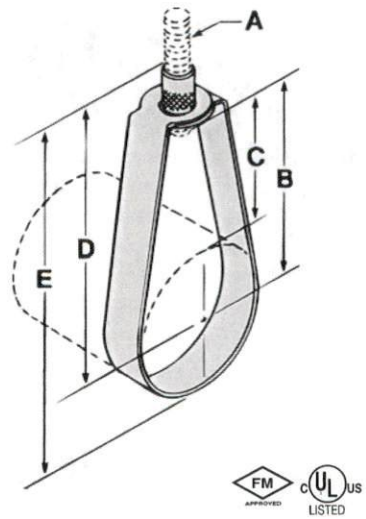
ORDERING: Specify pipe size and figure number.

Fig. 141 PRE-GALVANIZED

Fig. 141F PRE-GALVANIZED WITH FELT LINING

Pipe Size	Rod Size A	B	Adj. C	D	E	Max. Rec. Load/lbs.	Wt. Each (in lbs.)
1/2	3/8	1 7/8	1 7/16	2 3/4	3 1/16	300	.10
3/4	3/8	1 11/16	1 1/8	2 1/2	3 1/16	300	.10
1	3/8	1 5/8	1	2 1/2	3 3/16	300	.10
1 1/4	3/8	1 15/16	1 1/16	2 13/16	3 9/16	300	.11
1 1/2	3/8	2 1/8	1 1/16	3 1/8	3 7/8	300	.11
2	3/8	2 7/16	1 1/8	3 5/16	4 3/8	300	.14
2 1/2	3/8	3 1/16	1 5/8	3 15/16	5 3/8	525	.19
3	3/8	3 11/16	1 7/8	4 9/16	6 5/16	525	.23
3 1/2	3/8	3 3/4	1 7/8	4 5/8	6 5/8	525	.25
4	3/8	4 3/16	1 7/8	5 1/16	7 5/16	650	.30
5	1/2	4 5/8	1 5/8	5 5/8	8 3/8	1000	.50
6	1/2	5 5/8	2 1/4	6 1/2	9 13/16	1000	.58
8	1/2	6 13/16	2 7/16	7 15/16	12 1/4	1000	.90

Note: If ordering Fig. 141F felt lined hangers for pipe sizes of 3 1/2" or under, order the next largest size to allow for the thickness of the felt lining.



MATERIAL: Low carbon steel

Fig. 151 & 151F SWIVEL RING HANGER

FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut, allows for vertical adjustment after installation. Fig. 151F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for all sizes. Complies with Federal Specification A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

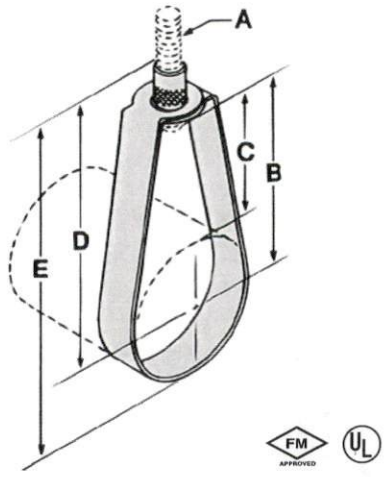
ORDERING: Specify pipe size and figure number.

Fig. 151 PRE-GALVANIZED

Fig. 151F PRE-GALVANIZED WITH FELT LINING

Pipe Size	Rod Size A	B	Adj. C	D	E	Max. Rec. Load/lbs.	Wt. Each (in lbs.)
2 1/2	1/2	2 3/4	1 1/4	3 11/16	5 1/8	600	.33
3	1/2	3 1/8	1 1/8	4	5 7/8	600	.35
3 1/2	1/2	3 5/8	1 1/2	4 5/16	6 5/8	600	.37
4	5/8	3 7/8	1 1/4	4 15/16	7 1/8	1000	.48
5	5/8	4 3/8	1 3/8	5 5/8	8 1/2	1000	.57
6	3/4	5 5/16	2	6 11/16	10 1/8	1250	1.06
8	3/4	6 15/16	2 5/8	8 5/16	12 7/8	1250	1.32

Note: If ordering Fig. 151F felt lined hangers for pipe sizes of 3 1/2" or under, order the next largest size to allow for the thickness of the felt lining.

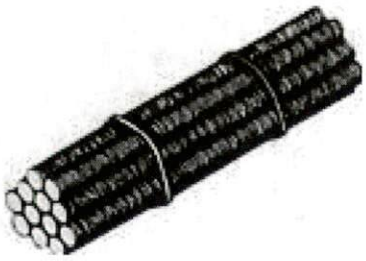


MATERIAL: Low carbon steel

PHD Manufacturing, Inc. • 44018 Columbiana-Waterford Road • Columbiana, OH 44408
Toll Free (800) 321-2736 • Phone: (330) 482-9256 • Fax: (330) 482-2763 • www.phd-mfg.com

Fig. 20 & 21 CONTINUOUS THREADED ROD

Fig. 20* PLAIN
Fig. 21 ELECTRO-GALVANIZED



FUNCTION: Useful in applications where stud lengths cannot be predetermined.

MATERIAL: Low carbon steel

ORDERING: Specify rod size, length and figure number.

Rod Size	Packaging Feet Per Bundle			Max. Rec. Load/lbs.		Wt. Per Foot/lbs.
	6 ft.	10 ft.	12 ft.	650°F	750°F	
1/4-20	300	500	600	240	210	.12
3/8-16	150	250	240	610	540	.29
1/2-13	72	120	144	1130	1010	.54
5/8-11	48	80	96	1810	1610	.83
3/4-10	30	50	60	2710	2420	1.25
7/8-9	24	40	48	3770	3360	1.65
1-8	12	20	24	4960	4420	2.25

*Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number.

Price on request.

VALVES

GLOBE FIRE SPRINKLER CORPORATION

4077 Airpark Dr. Standish, MI 48658 • 989-846-4583 • www.globesprinkler.com
Technical Support • 989-414-2600 • techservice@globesprinkler.com

DUCTILE IRON BUTTERFLY VALVES 2½", 3", 4", 6", 8"
MODEL GLR300G GROOVED END
MODEL GLR300W WAFER STYLE

GENERAL DESCRIPTION

The Globe Models GLR300G and GLR300W Ductile Iron Butterfly Valves are indicating type valves designed and listed for use in fire protection systems. These valves are rated for a maximum working pressure of 300 psi (20 bar) and provide a visual indication as to whether the valve is open or closed. They are provided with 2 sets of factory installed Form-C internal supervisory switches monitoring the valves in the normally open position. These supervisory switches transfer their electrical contacts within the first two revolutions of the handwheel towards the closed position. The valves are available with grooved end connections (GLR300G) or as a wafer style (GLR300W). The GLR300G and GLR300W are typically used as system indicating control/shutoff valves.

GLR300G

TECHNICAL DATA

Approvals

- UL
- ULC
- FM

Factory installed UL Listed and FM Approved Double Tamper Switch for indoor and outdoor use.

Maximum Working Pressure

- 300 psi (20 bar)

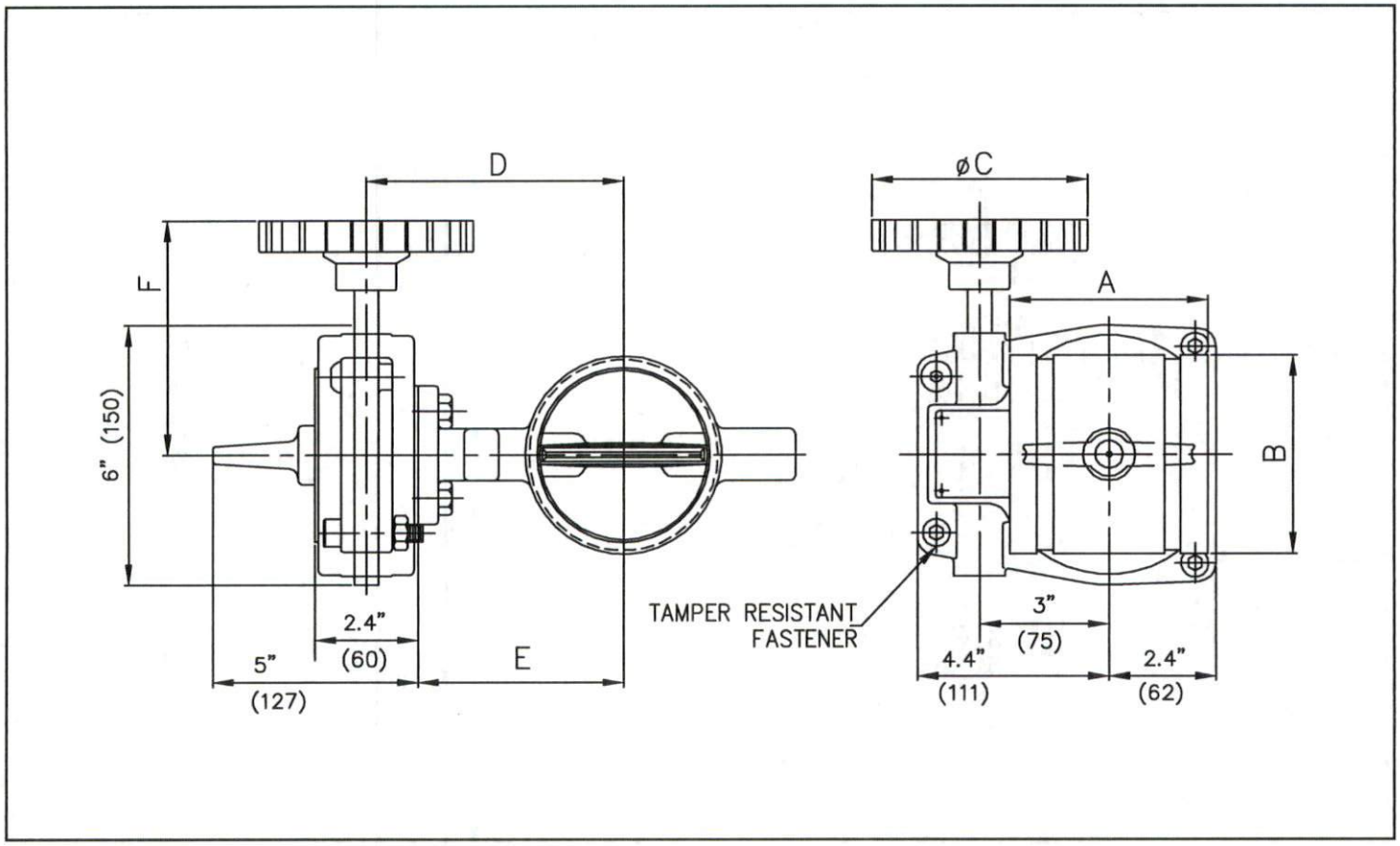
Materials of Construction

- **Body**: Ductile Iron
- **Disc**: Ductile Iron
- **Stem**: Stainless Steel
- **Housing**: Ductile Iron
- **Handwheel**: Ductile Iron
- **Indicator**: Ductile Iron

GLR300W

NOTE:
Users should refer to Globe's web site (www.globesprinkler.com) to assure that the most recent technical literature is being utilized.

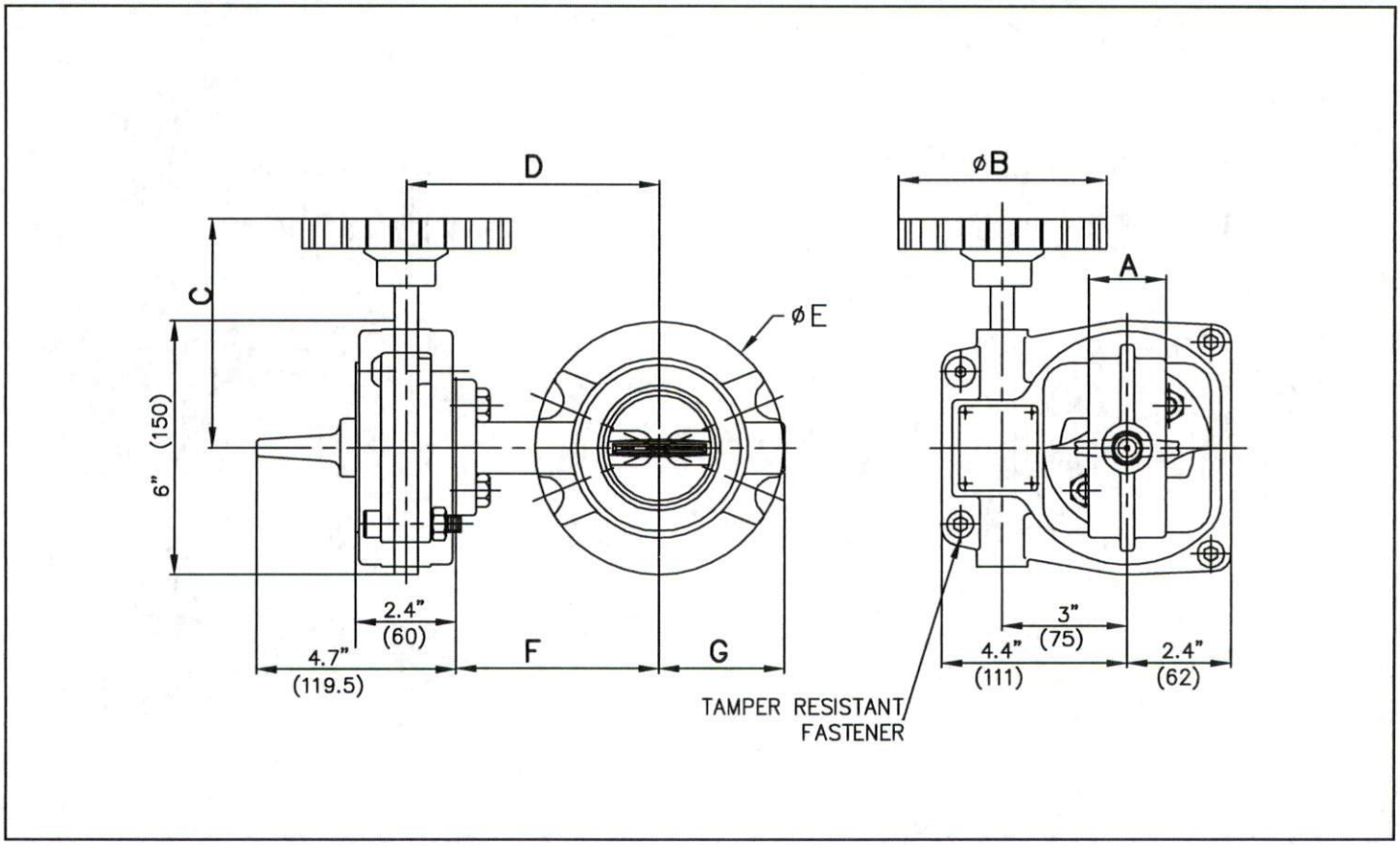
MODEL GLR300G GROOVED END 2½" – 8"



SIZE in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	WEIGHT lb. (kg)	EQ. FTG. LENGTH ft. (mm)
2½" (65)	3.8 (96.4)	2.87 (73.0)	5.04 (128)	5.31 (135)	4.13 (105)	5.31 (135)	19.84 (9.0)	8 (2438)
76.1 mm	(96.4)	(73.0)	(128)	(135)	(105)	(135)	(9.0)	(2438)
3" (76)	3.8 (96.4)	3.5 (88.9)	5.04 (128)	5.60 (142)	4.41 (112)	5.31 (135)	20.94 (9.5)	6 (1828)
4" (100)	4.5 (115.4)	4.5 (114.3)	5.04 (128)	6.89 (175)	5.71 (145)	5.31 (135)	25.35 (11.5)	5 (1524)
6" (150)	5.2 (132.4)	6.63 (168.3)	8.66 (220)	8.23 (209)	7.05 (179)	7.60 (193)	38.58 (17.5)	7 (2134)
165.1 mm	(132.4)	(168.3)	(220	(209)	(179)	(193)	(17.5)	(2134)
8" (200)	5.8 (147.4)	8.63 (219.1)	8.66 (220)	9.21 (234)	8.03 (204)	7.60 (193)	50.71 (23.0)	4 (1220)

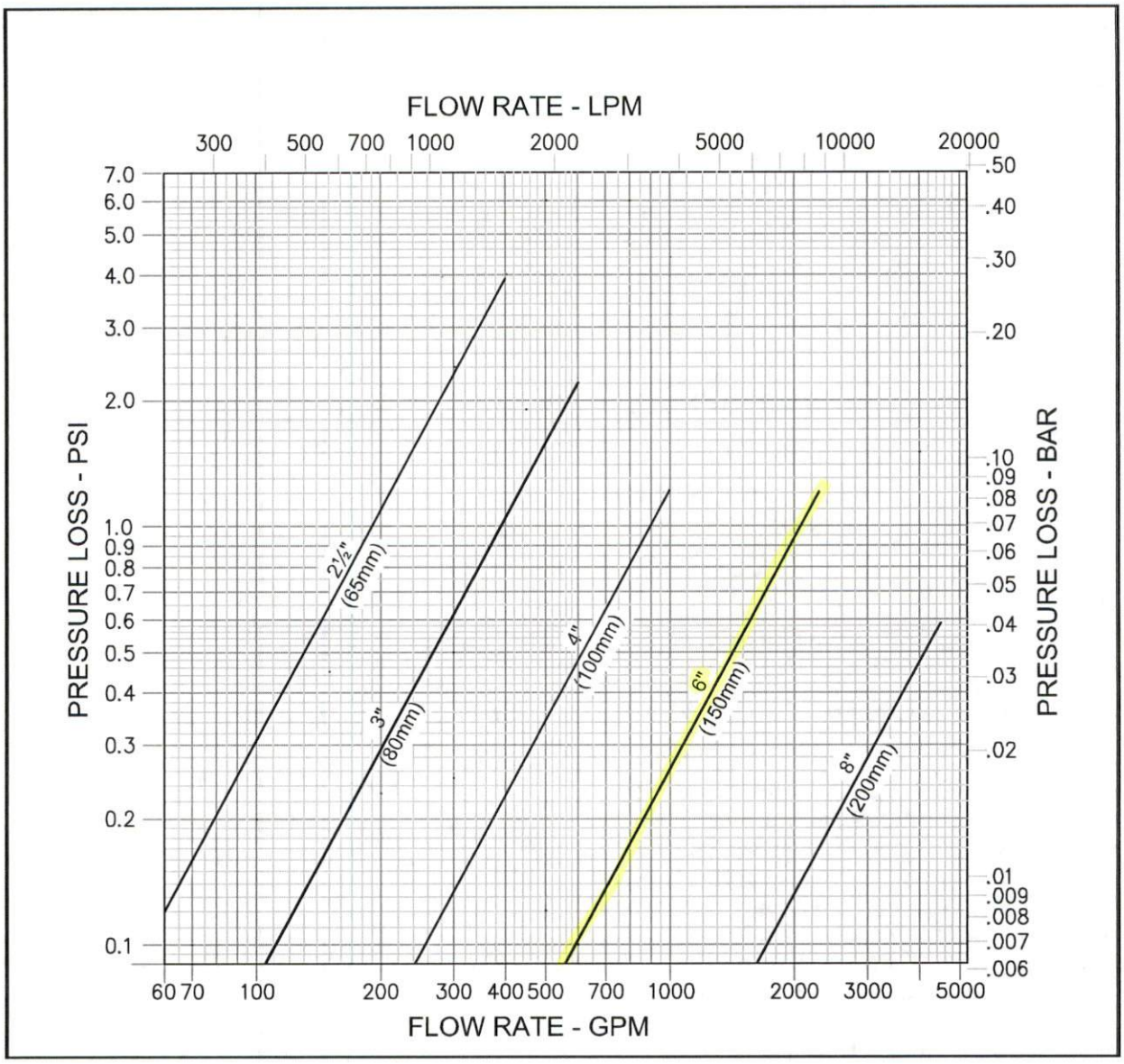
FIGURE 1

MODEL GLR300W WAFER END 2½" – 8"



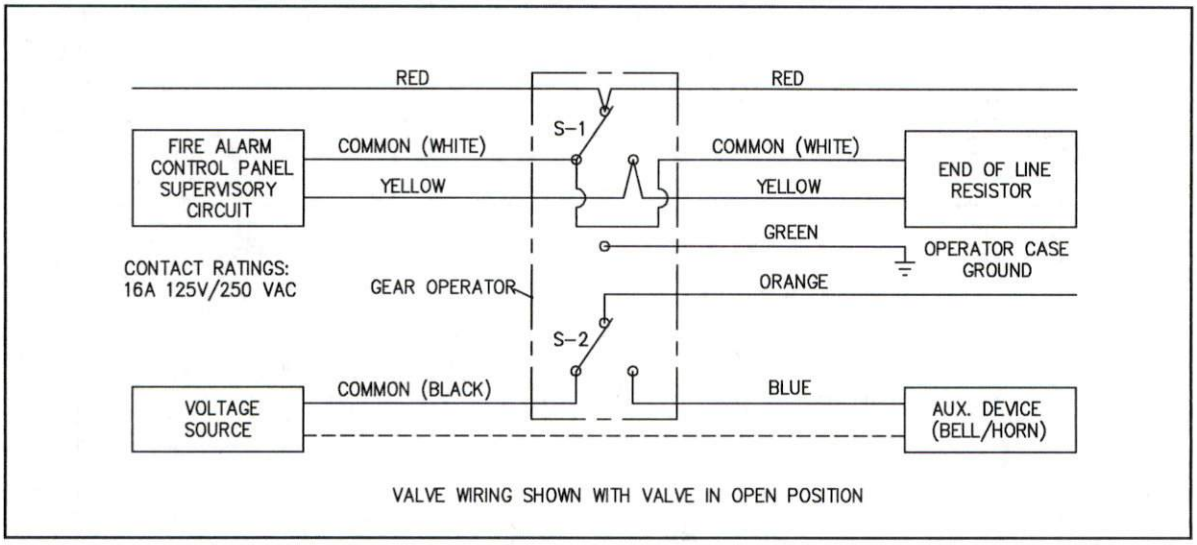
SIZE in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	WEIGHT lb. (kg)	EQ. FTG. LENGTH ft. (mm)
2½" (65)	1.81 (46)	5.04 (128)	5.31 (135)	6.53 (166)	5.88 (149.4)	5.35 (136)	19.84 (9)	8 (2438)
3" (76)	1.81 (46)	5.04 (128)	5.31 (135)	6.81 (173)	6.62 (168.2)	5.63 (143)	20.50 (9.3)	6 (1828)
4" (100)	2.05 (52)	5.04 (128)	5.31 (135)	7.32 (186)	7.88 (200.2)	6.14 (156)	22.05 (10)	5 (1524)
6" (150)	2.20 (56)	8.66 (220)	7.60 (193)	8.58 (218)	10.62 (269.8)	7.40 (188)	31.97 (14.5)	7 (2134)
8" (200)	2.28 (58)	8.66 (220)	7.60 (193)	10.0 (252)	13.0 (330.2)	8.74 (222)	41.89 (19)	4 (1220)

FIGURE 2



MODEL GLR300G and GLR300W

FIGURE 3



SUPERVISORY SWITCH DIAGRAM

FIGURE 4

CARE & MAINTENANCE

When closing the Butterfly Control Valve for maintenance or inspection work, always first obtain permission from the proper authorities and notify all personnel who may be affected. All Inspections, Testing, and Maintenance, and their frequency, is the responsibility of the Owner and should be performed in accordance with the applicable standards of the National Fire Protection Association (i.e. NFPA 25), in addition to any local jurisdiction requirements which may be in place. It is recommended that a qualified contractor/inspection service be contacted to perform required maintenance on the fire protection system. Any impairment of the Butterfly Valve must be immediately corrected.

ORDERING INFORMATION

SPECIFY:

• MODEL • SIZE • PN

MODEL GLR300G

2½"	311785-G	***-D for 65mm***
3"	311790-G	
4"	311795-G	
6"	311805-G	***-D for 150mm***
8"	311815-G	

MODEL GLR300W

2½"	311836-G
3"	311839-G
4"	311846-G
6"	311861-G
8"	311871-G

GLOBE® PRODUCT WARRANTY

Globe agrees to repair or replace any of its own manufactured products found to be defective in material or workmanship for a period of one year from date of shipment. For specific details of our warranty please refer to Price List Terms and Conditions of Sale (Our Price List).

Reliable®

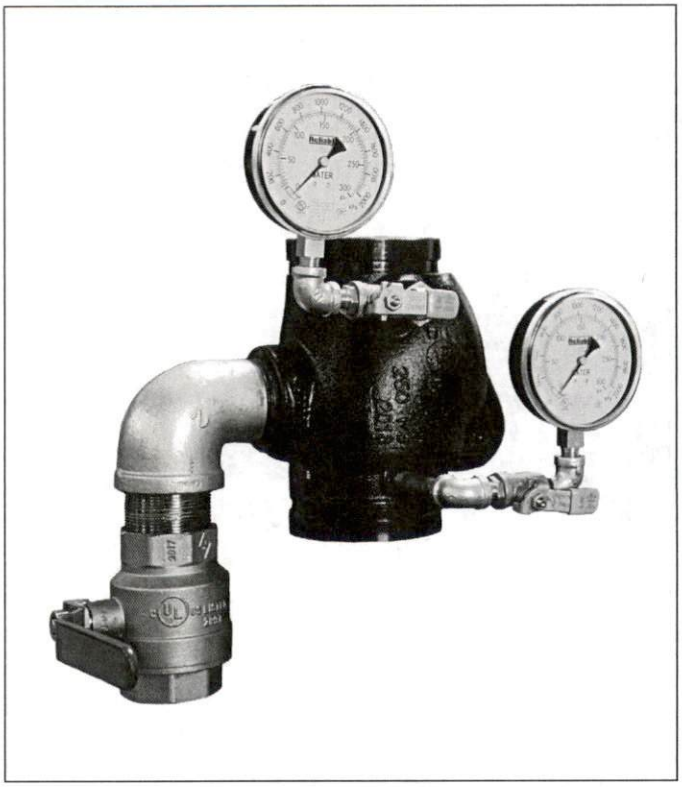
Model G Riser Check Valve

1-1/2", 2", 2-1/2", 3", 4", 6", 8", & 10" Sizes

cULus Listed, FM Approved

Features

- Grooved end connections.
- Compact, lightweight design.
- Non-slamming, spring loaded clapper to minimize water hammer.
- Approved for horizontal and vertical installation.
- Stream-lined body design provides very low friction loss.
- Gage ports provided both sides for universal application.



Product Description

Reliable Model G Riser Check Valves are intended for installation as wet pipe fire protection system risers. When used with a water flow detector to provide an electric alarm, the Model G Riser Check Valve is a cost effective alternative in installations not requiring a mechanical alarm.

Grooved end connections provide fast and easy installation using listed or approved mechanical grooved couplings. Rigid style grooved couplings can be used for positive clamping to resist flexural and torsional loads where required.

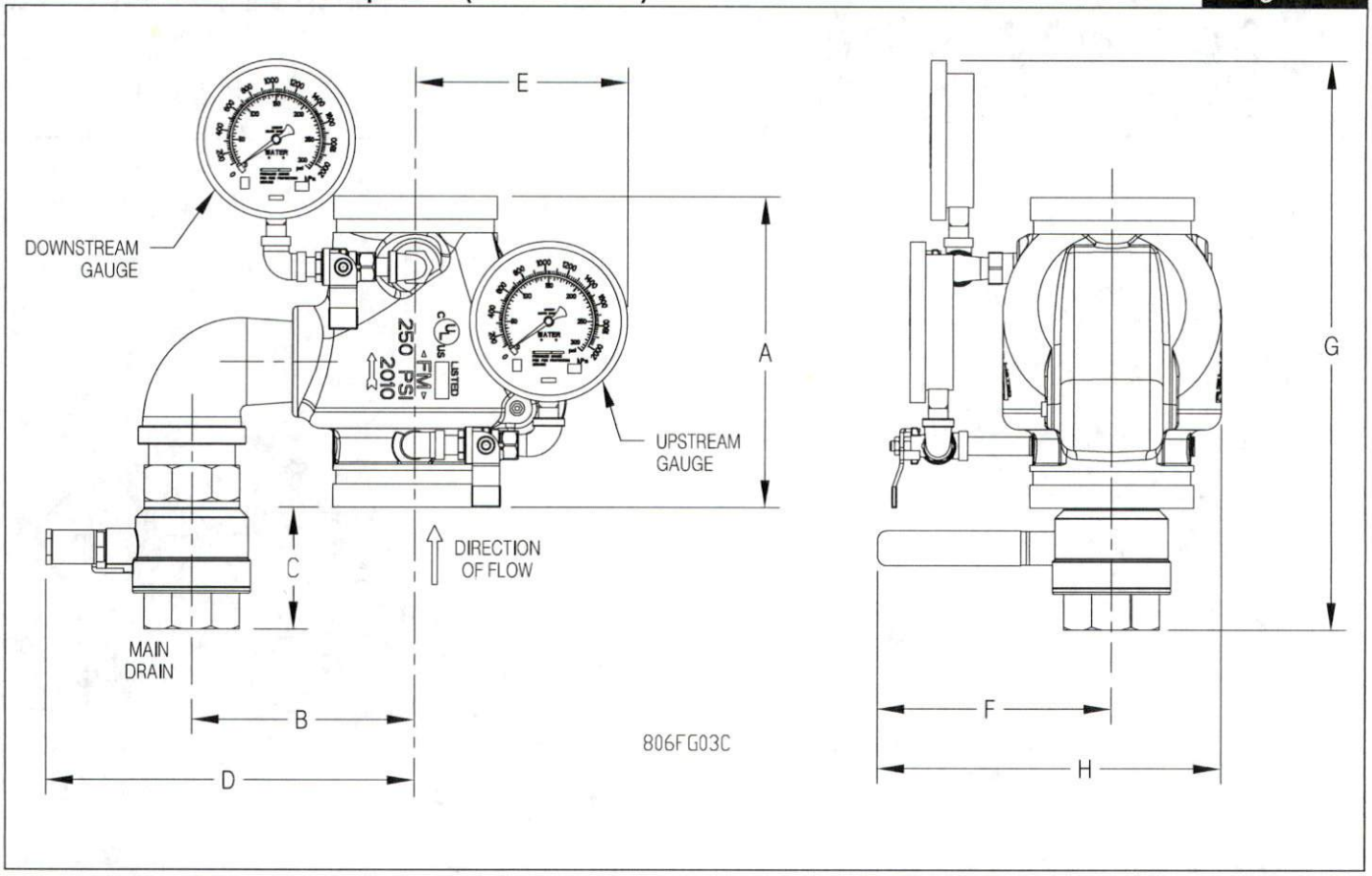
Model G Riser Check Valves are factory tapped for 3/4", 1-1/4", or 2" NPT drain depending on size. Factory tapped outlets (1/4" NPT upstream and 1/2" NPT) downstream are provided on each side of the valve to facilitate universal positioning (refer to Figure 2).

Technical Data — **Table A**

Valve Size	Pressure Rating	Face-to-Face Dimension	Eq. Length C = 120	Eq. Length C = 100	Cv Factor	Valve Shipping Weight	Trim Shipping Weight
1-1/2" (40 mm)	300 psi (20.7 bar)	6-1/4 " (160 mm)	6.7' (2.0 m)	4.8' (1.5 m)	36	5 lbs (2.3 kg)	4 lbs. (1.8 kg)
2" (50 mm)		6-1/2" (165 mm)	9.6' (2.9 m)	6.8' (2.1 m)	67	6 lbs (2.7 kg)	
2-1/2" (65 mm)		7-1/8" (180 mm)	6.0' (1.8m)	4.3' (1.3m)	212	9 lbs (4.1 kg)	6 lbs. (2.7 kg)
76 mm		7-1/8" (180 mm)	6.0' (1.8m)	4.3' (1.3m)	212	9 lbs. (4.1 kg)	
3" (80 mm)		7-5/8" (195 mm)	5.3' (1.6m)	3.8' (1.2m)	376	11 lbs. (5.0 kg)	
4" (100 mm)	250 psi (17.3 bar)	8-7/16" (215 mm)	7.1' (2.2m)	5.0' (1.5m)	656	17 lbs. (7.7 kg)	9.25 lbs. (4.2 kg)
6" (150 mm)		10-1/4" (260 mm)	13.7' (4.2m)	9.8' (3.0m)	1395	38 lbs. (17.2 kg)	
165 mm		10-1/4" (260 mm)	13.7' (4.2m)	9.8' (3.0m)	1395	38 lbs. (17.2 kg)	
8" (200 mm)		12-1/2" (320 mm)	15.9' (4.8m)	11.3' (3.4m)	2818	63 lbs. (28.6 kg)	
10" (250 mm)	300 psi (20.7 bar)	14-1/2" (370 mm)	28.8' (8.8m)	20.6' (6.3m)	3928	102 lbs. (46.3 kg)	

Model G Riser Check Valve Components (refer to Table B)

Figure 1



Model G Riser Check Valve Dimensions (refer to Fig. 1)

Table B

Valve Size	Dimensions							
	A	B	C	D	E	F	G	H
1-1/2" (40 mm)	6-1/4" (160mm)	3-1/2" (90mm)	3/8" (9.5mm)	4-15/16" (125mm)	5-3/4" (146mm)	3-5/16" (84mm)	10-5/8" (270mm)	4-7/8" (124mm)
2" (50 mm)	6-1/2" (165mm)	3-3/4" (95mm)	3/8" (9.5mm)	5-3/16" (132mm)	5-3/4" (146mm)	3-5/16" (85mm)	10-7/8" (276mm)	5-3/16" (132mm)
2-1/2" (65 mm)	7-1/8" (180mm)	4-11/16" (120mm)	1-15/16" (49.2mm)	5-3/16" (132mm)	5-3/4" (146mm)	5-1/2" (140mm)	13-1/8" (333mm)	7-3/4" (197mm)
76 mm	7-1/8" (180mm)	4-11/16" (120mm)	1-15/16" (49.2mm)	5-3/16" (132mm)	5-3/4" (146mm)	5-1/2" (140mm)	13-1/8" (333mm)	7-3/4" (197mm)
3" (80 mm)	7-5/8" (195mm)	4-15/16" (125mm)	1-15/16" (49.2mm)	7-11/16" (195mm)	5-3/4" (146mm)	5-1/2" (140mm)	13-1/8" (333mm)	8-1/8" (265mm)
4" (100 mm)	8-7/16" (215 mm)	6-1/8" (156mm)	3-5/16" (84.1mm)	10-1/8" (257mm)	5-3/4" (145mm)	6-7/16" (165mm)	15-1/2" (395mm)	9-7/16" (240mm)
6" (150 mm)	10-1/4" (260 mm)	7" (178mm)	3-5/16" (84.1mm)	11" (280mm)	5-3/4" (146mm)	6-7/16" (165mm)	15-1/2" (395mm)	10-7/16" (265mm)
165 mm	10-1/4" (260 mm)	7" (178mm)	3-5/16" (84.1mm)	11" (280mm)	5-3/4" (146mm)	6-7/16" (165mm)	15-1/2" (395mm)	10-7/16" (265mm)
8" (200 mm)	12-1/2" (320 mm)	8-1/8" (205mm)	3-5/16" (84.1mm)	12-1/8" (308mm)	5-3/4" (145mm)	6-7/16" (165mm)	17-3/4" (450mm)	11-7/16" (290mm)
10" (250mm)	14-1/2" (368mm)	9-1/8" (232mm)	3-5/16" (84.1mm)	13-1/8" (333mm)	5-3/4" (145mm)	6-7/16" (165mm)	19-3/4" (502mm)	12-7/16" (316mm)

Figure Components (refer to Table C) **Figure 2**

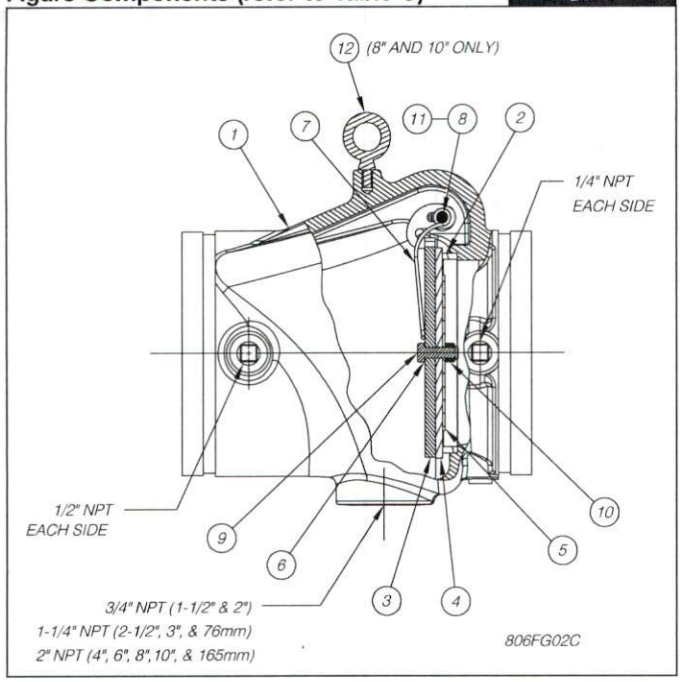


Figure Components (refer to Figure 2) **Table C**

Item No.	Part Name	Material
1	Valve Body	Gray Iron, ASTM–A48 Class 30A
2	Seat	Bronze C83600 or C93200, ASTM–B505
3	Clapper	Stainless Steel 304, ASTM–A240
4	Facing Seal *	EPDM Rubber
5	Clamping Ring	Stainless Steel 304, ASTM–A240
6	Gasket *	EPDM Rubber
7	Spring	Stainless Steel 302, ASTM–A313
8	Hinge Pin	Stainless Steel 303, ASTM–A582
9	Bolt	Stainless Steel 304, ASTM–F593
10	Locknut *	Stainless Steel 303, ASTM–F594
11	Plug, 1/8"NPT	Steel
12	Shoulder Eye	Steel

* Part of Replacement Seal Kit

Replacement Seal Kits **Table D**

	Part Number									
	1-½" (40mm)	2" (50mm)	2-½" (65mm)	76mm	3" (80mm)	4" (100mm)	6" (150mm)	165mm	8" (200mm)	10" (250mm)
Replacement Seal Kit	6888040015	6888040020	6888040025	6888040025	6888040030	6888040040	6888040060	6888040060	6888040080	6888040090
Body Seat Sub Assembly	9100520A	9100520B	91005202	91005201	91005203	91005204	91005206	91005205	91005218	91005210

Installation

The Model G Riser Check Valve shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. When installed vertically, the direction of flow shall be up through the assembly. For horizontal installations, the hinge pin must be located to the top. Failure to follow installation instructions may void the warranty and/or listing of the valve. Verify compatibility of the Model G Riser Check Valve materials with the water supply and the environment where the valve will be installed prior to installation.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system out of service may eliminate the fire protection that is provided by the fire protection system. Notify any required authorities having jurisdiction and implement appropriate precautions prior to proceeding.

The Reliable Model G Riser Check Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Replace any components found to be corroded, damaged, worn or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials and/or operation of the assembly.

Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

1. Reliable Model G Riser Check Valve
2. Size

Model 1011T
TESTANDRAIN®

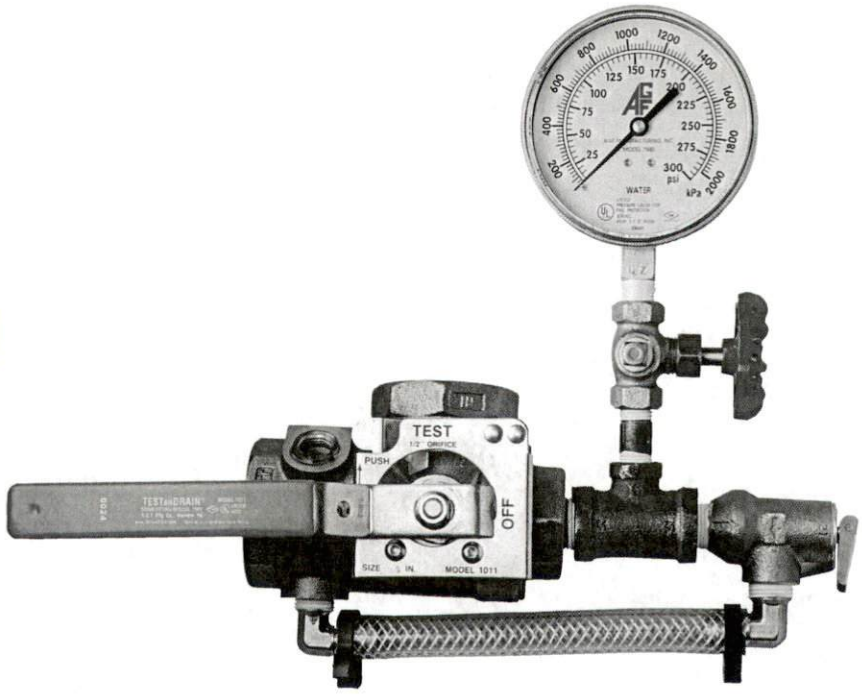
Sectional Floor Control Test and Drain Valve with Pressure Gauge for Systems Requiring Pressure Relief Valve

Sizes:

¾"	1"	1¼"	1½"	2"

The AGF **Model 1011T TESTANDRAIN®** provides the test and express drain functions for wet fire sprinkler systems on multi-story installations requiring pressure relief (NFPA 13 and NFPA 13R). The **Model 1011A** features a **Model 7000 Pressure Relief Valve** with drain pipe, 3½" **Model 7500 Pressure Gauge** and 3-Way Globe Valve.

The **Model 1011T** is available in a full range of sizes (¾" to 2") with NPT connections (BSPT available). The **Model 7000 Pressure Relief Valve** (UL/FM) features a flushing handle and a 175 PSI factory rating (other pressure ratings available).



- Complies with NFPA 13 Requirements
- Compact, Single-Handle Ball Valve
- Tamper-Resistant Test Orifice and Sight Glasses
- 300 PSI rated.
- Specifiable orifice sizes: ⅜" (2.8K), 7/16" (4.2K), ½" (5.6K), 17/32" (8.0K), ⅝" (11.2K, ELO), ¾" (14.0K, ESFR), and K25
- Relieves Excess System Pressure caused by Surges or Temperature Changes
- Includes **Model 7500 Pressure Gauge** and UL/FM **Model 7600 Globe Valve**
- Shipped with Relief Valve and Bypass Drain Ports Plugged to Expedite Pressure Testing
- Locking Kit Available

Repair kits are available for all **TESTANDRAIN®** valves. Kit includes: Adapter Gasket (1), Ball (1), Valve Seats (2), Stem Packing (1), and Stem Washer (1). ***Valve and orifice size must be specified when ordering.***

NOTE: It is important to note that the pressure rating of the relief valve indicates an operating range of pressure for both opening and closing of the valve. Standard relief valves are required to OPEN in a range of pressure between 90% and 105% of their rating. The valves are required to CLOSE at a pressure above 80% of that rating. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

Reliability, Versatility, Code Compatibility

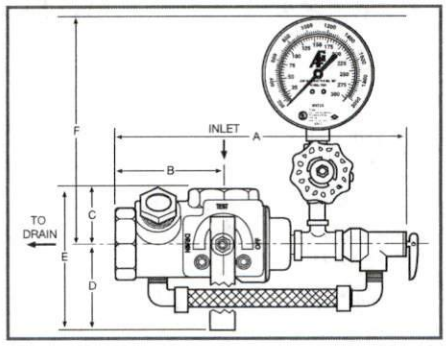
Model 1011T
TEST AN DRAIN®

Model 1011T 300 PSI Bronze Ball Valve, Model 7000 Pressure Relief Valve, Model 7500 Pressure Gauge, and Model 7600 ¼" 3-Way Globe Valve

Dimensions

SIZE	A	B	C	D	E	F
¾"	10¼" (256 mm)	3⅜" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6⅜" (162.5 mm)	8¾" (119 mm)
1"	10¼" (256 mm)	3⅜" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6⅜" (162.5 mm)	8¾" (119 mm)
1¼"	10½" (263 mm)	3⅝" (91 mm)	1 15/16" (51 mm)	5 9/16" (141 mm)	7½" (192 mm)	9" (225 mm)
1½"	11½" (288 mm)	3⅞" (99 mm)	2⅝" (67 mm)	8¼" (207 mm)	10⅞" (274 mm)	9 11/16" (242 mm)
2"	11½" (288 mm)	3⅞" (99 mm)	2⅝" (67 mm)	8¼" (207 mm)	10⅞" (274 mm)	9 11/16" (242 mm)

Model 1011T - Front View



The Model 1011T provides the following...

From the 2013 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 & 8.16.2.4.3	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.
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 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.
Chapter 7.1.2	- a wet pipe system shall be provided with a listed relief valve set to operate at 175 PSI or 10 PSI in excess of the maximum system pressure, whichever is greater.
Chapter 8.16.1.2.3*	A listed relief valve of not less than ½" in size shall be provided on the discharge side of the pressure-reducing valve set to operate at a pressure not exceeding rated pressure of the system.
Chapter A.8.16.1.2.3	- consideration should be given to piping the discharge from the (pressure relief) valve
Chapter 8.16.1.2.2	Pressure gauges shall be installed on the inlet and outlet sides of each pressure reducing valve.

Orifice Sizes

⅜", 7/16", ½", 17/32", ⅝" ELO*, ¾" ESFR*, and K25**

Materials

Handle	Steel
Stem	Rod Brass
Ball	C.P. Brass
Body	Bronze
Valve Seat	Impregnated Teflon®
Indicator Plate	Steel
Relief Valve	Bronze
Bypass Fittings	Brass
Bypass Tubing	Nylobraid

Approvals

UL and ULC Listed:
(EX4019 & EX4533)
FM Approved
NYC-BSA No. 720-87-SM

MADE IN U.S.A.

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:_____

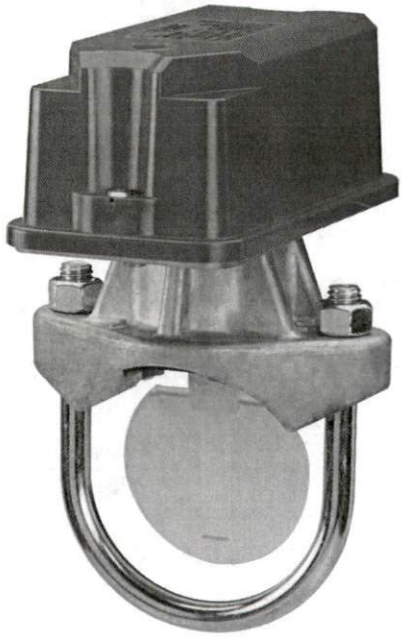
Contractor:_____

*Available on 1¼" to 2" size units only • **Available on 1½" and 2" size units only

ALARMS

SYSTEM SENSOR®

WFDN Series Waterflow Detector



The System Sensor WFDN series is compatible with schedule 7 through 40 steel pipe, for sizes 2 in. through 4 in. and compatible with schedule 10 through 40 steel pipe, sizes 5 in. through 8 in., and can be mounted in a vertical or horizontal position.

Features

- New directional cover allows installers and inspectors to easily see the direction of flow
- UL-listed models are NEMA 4 rated
- New cover provides a better seal, is lighter weight, not painted and corrosion resistant
- Sealed retard mechanism immune to dust and other contaminants
- Less exposed metal reduces shock hazard, plastic cover acts as insulator and is resistant to arcing
- Visual switch activation
- Audible switch activation (73 dBA)
- Field-replaceable timer/switch assembly
- Accommodates up to 12 AWG wire
- Switch Synchronization activates both alarm panel and local bell or horn strobe
- Tamper-resistant cover screws
- Improved water sealing
- Reduced product weight
- Wire-ready terminals
- Improved wiring with new terminal block layout
- Snap-in optional cover tamper switch
- Improved timer repeatability and accuracy

Agency Listings

c UL us LISTED S739

7770-1653:0231

FM APPROVED 3051266

The new **WFDN Series** waterflow detectors from **System Sensor** consists of a rugged, NEMA 4-rated enclosure that is more damage resistant than previous metal designs. The waterflow detector is designed for both indoor and outdoor use, with the widest available temperature range, from 32°F to 150°F. They are also approved for installation on the widest range of pipe schedules, sizes 2 in. through 4 in. are approved for installation on pipe schedules 7 through 40.

UL-listed models are equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block with new layout designed to make wiring easy with wire ready terminals, COM terminals are on a different elevation, large barrier between switches and easy to read raised textured lettering all make wiring easy. An optional cover tamper switch is available, securely snaps into place, no tools required.

The WFDN series incorporates a mechanical time delay feature, which minimizes the risk of false alarm due to pressure surges or air trapped in the fire sprinkler system. The larger and easy to turn timer dial makes setting the waterflow detector easy with high contrast pad printed markings. The dial offers three tabs to help with turning, with one larger tab located on the dial position for approximately 60 seconds, a notch is also indicated on the dial to locate approximately 30 seconds making setting the detector in dimmly lit locations easy.

The WFDN series is designed for accuracy and repeatability. The detector also offers improved performance during vibration in riser applications where detectors are exposed to a large in rush of water.

Waterflow Detector Specifications

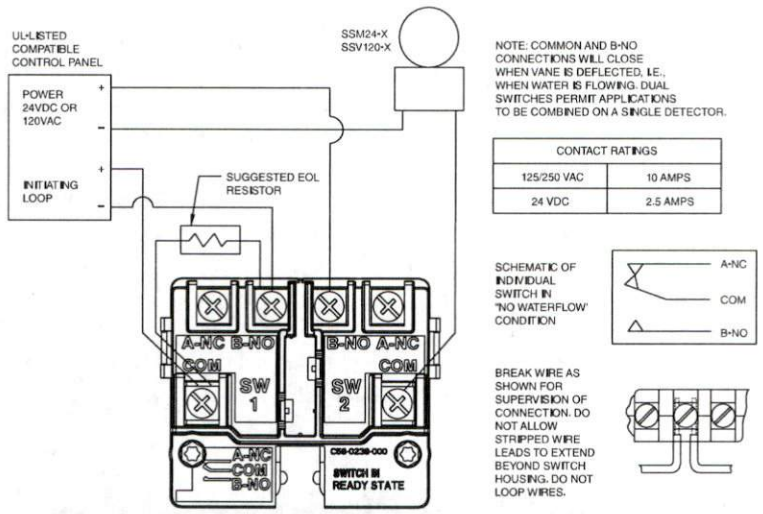
Engineering Specifications

Vane-type waterflow detectors shall be installed on system piping as designated on the drawing and/or as specified herein. Detectors shall mount on any clear pipe span of the appropriate nominal size, either a vertical upflow or horizontal run, at least 6 in. from any fittings that may change water direction, flow rate, or pipe diameter or no closer than 24 in. from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 450 psi for 2 in. – 8 in. pipes. The detector shall respond to waterflow in the specified direction after a preset time delay that is field adjustable. The delay mechanism shall be a sealed mechanical pneumatic unit with visual and audible indication of actuation. The actuation mechanism shall include a ethylene vinyl acetate vane inserted through a hole in the pipe and connected by a mechanical linkage to the delay mechanism. Outputs shall consist of dual SPDT switches (Form C contacts). Two conduit entrances for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. Unless noted, enclosures shall be NEMA 4 listed by Underwriters Laboratories Inc. All detectors shall be listed by Underwriters Laboratories Inc. for indoor or outdoor use.

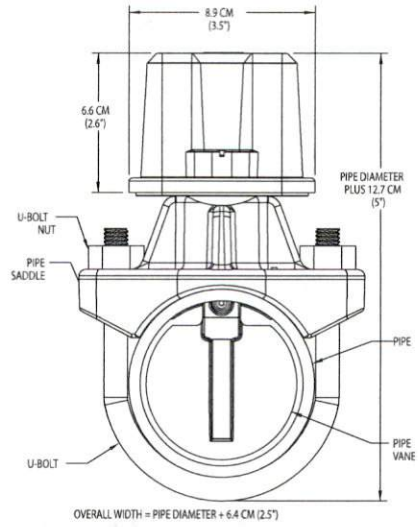
Standard Specifications

Static Pressure Rating	450 PSI	**Operating Temperature Range**	32°F to 150°F (0°C to 66°C)
Maximum Surge	18 Feet Per Second (FPS)	**Enclosure Rating***	NEMA 4 – suitable for indoor/outdoor use
Triggering Threshold Bandwidth (Flow Rate)	4–10 GPM	**Cover Tamper Switch**	Standard with ULC models, optional for UL models, part no. CTS
Conduit Entrances	Two openings for ½ in. conduit. NEMA 4 rated plugs	**Service Use**	Automatic Sprinkler: NFPA-13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA-72
Contact Ratings	Two sets of SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	**Warranty**	3 Years
Compatible Pipe	Steel water pipe, schedule 7 through 40*		

WFDN Field Wiring Diagram



Overall Dimensions, Installed



Ordering Information

UL Model	ULC Model	Pipe Size	Hole Size	Shipping Weights
WFD20N	WFD20NA	2 in.	1¼ in.	2.6 lbs.
WFD25N	WFD25NA	2½ in.	1¼ in.	2.6 lbs.
WFD30N	WFD30NA	3 in.	2 in.	3.1 lbs.
WFD40N	WFD40NA	4 in.	2 in.	4.0 lbs.
WFD50N	WFD50NA	5 in.	2 in.	4.9 lbs.
WFD60N	WFD60NA	6 in.	2 in.	5.6 lbs.
WFD80N	WFD80NA	8 in.	2 in.	7.3 lbs.
Accessories				
FS-RT	Delay mechanism and switch assembly			
CTS	Tamper-proof switch kit			
WFDW	Tamper-proof wrench for cover			

* 2 in. - 4 in. rated for use with Schedule 7 through 40 pipe, 6 in. - 8 in. rated for use with Schedule 10 through 40 pipe.

SYSTEM SENSOR®
3825 Ohio Avenue • St. Charles, IL 60174
Phone: 800-SENSOR2 • Fax: 630-377-6495
www.systemsensor.com

WFDS87903 • 11/16

SSM/SSV Specifications

Architectural/Engineering Specifications

Model shall be a SSM or SSV Series alarm bell. Bells shall have underdome strikers and operating mechanisms. Gongs on said bells shall be no smaller than nominal 6″/8″/10″ (specify size) with an operating voltage of 24VDC or 120VAC (specify by part number). Bells shall be suitable for surface or semi-flush mounting. Outdoor surface mounted installations shall be weatherproof (using optional WBB weatherproof electrical box). Otherwise bells shall mount to a standard 4″ square electrical box having a maximum projection of 2½″. Bells shall be located as shown on the drawings or as determined by the Authority Having Jurisdiction. Bells shall be listed for indoor/outdoor use by Underwriters Laboratories and the California State Fire Marshal, and approved by Factory Mutual and MEA.

Physical/Operating Specifications

Operating Temperature Range	–31°F to 140°F
Operating Voltage	SSM series: 24 VDC SSV series: 120 VAC
Termination	Provided with 2 sets of leads for in/out wiring
Service Use	Fire Alarm, General Signaling, Burglar Alarm
Warranty	3 years

Electrical Specifications

Model	Gong Diameter (inches)	Nominal Voltage	Operating Voltage Limit	Maximum Current	Sound Output (dBA)
SSM24-6	6	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	82
SSM24-8	8	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	80
SSM24-10	10	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	81
SSV120-6	6	Regulated 120VAC	96 to 132VAC	53mA	85
SSV120-8	8	Regulated 120VAC	96 to 132VAC	53mA	82
SSV120-10	10	Regulated 120VAC	96 to 132VAC	53mA	82

* Sound output measured at Underwriter Laboratories, as specified in UL464

Ordering Information

UL/FM Model No.	ULC/Canadian Model No.	Description
SSM24-6	SSM24-6A	Bell, 6″, 24VDC, Polarized, 82dBA
SSM24-8	SSM24-8A	Bell, 8″, 24VDC, Polarized, 80dBA
SSM24-10	SSM24-10A	Bell, 10″, 24VDC, Polarized, 81dBA
SSV120-6	SSV120-6A	Bell, 6″, 120VAC, 85dBA
SSV120-8	SSV120-8A	Bell, 8″, 120VAC, 82dBA
SSV120-10	SSV120-10A	Bell, 10″, 120VAC, 82dBA
WBB		Weatherproof back box for SSM and SSV series, when installed outdoors

SYSTEM SENSOR®

3825 Ohio Avenue • St. Charles, IL 60174
Phone: 800-SENSOR2 • Fax: 630-377-6495
www.systemsensor.com

WFDS74501 • 3/12

SSM/SSV Series Alarm Bells

System Sensor's SSM and SSV series alarm bells are low current, high decibel notification appliances for use in fire and burglary systems or other signaling applications.

Features

- Approved for indoor and outdoor use
- Low current draw
- High dB output
- Available in six-inch, eight-inch, and ten-inch sizes
- AC and DC models
- DC models polarized for use with supervision circuitry
- Mount directly to standard four-inch square electrical box indoors
- SSM and SSV series come pre-wired

Reliable Performance. The SSM and SSV series provide loud resonant tones. The SSM series operates on 24VDC and are motor driven, while the SSV series operates on 120VAC utilizing a vibrating mechanism.

Simplified Installation. For indoor use, the SSM and SSV series mount to a standard four-inch square electrical box. For outdoor applications, weatherproof back box, model number WBB, is used.

The SSM and SSV series come pre-wired, to reduce installation time. The SSM series incorporates a polarized electrical design for use with supervision circuitry.

Agency Listings

UL LISTED S4011

ULC CS549

FM APPROVED 3005255

7135-1653:0125

HYDRAULIC CALCS

Hydraulic Calculations

for

Project Name: CCG LILLINGTON H-2 ROOM
Location: , 807 EDWARDS BROTHERS DRIVE, LILLINGTON, NC 27546
Drawing Name: S1103993 CCG Lillington H-2 Room
Calculation Date: 9/13/2019

Design

Remote Area Number:
Remote Area Location: H2 OPEN AREA
Occupancy Classification: Extra Hazard Group II

Pressure: 0.40gpm/ft²
Area of Application: 2500.00ft² (Actual 2545.62ft²)
Coverage per Sprinkler: 100.00ft²
Type of sprinklers calculated: Upright
No. of sprinklers calculated: 28
No. of nozzles calculated: 0
In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 500.0 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 1567.2 @ 36.7 (Safety Margin = 5.7 psi)
Type of System:
Volume of Dry or PreAction System: N/A

for Node: 1 Date:
Location:
Source: Town of Lillington

Name of Contractor:
Address: ,
Phone Number:
Name of designer: DYLAN GARNER
Authority Having Jurisdiction: TOWN OF LILLINGTON

Notes:

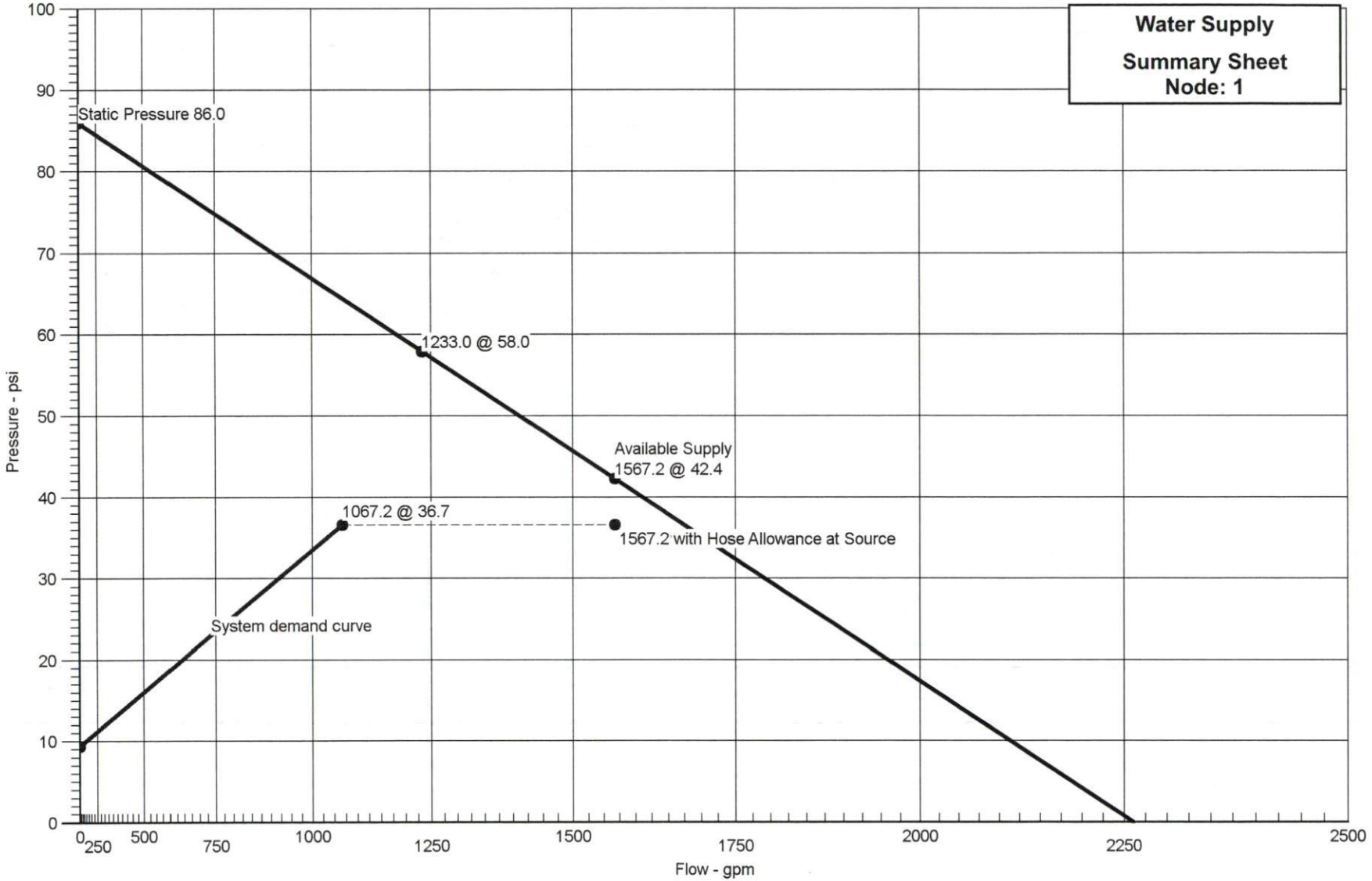
Automatic peaking results Left: 41.3 Right: N/A

Hydraulic Graph

Job Name: CCG LILLINGTON H-2 ROOM
Remote Area Number:

$N^{1.85}$

Date: 9/13/2019



Summary Of Outflowing Devices

Job Number: S1103993
Report Description: Extra Hazard Group II

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
⇨ **Sprinkler**	**101**	**36.8**	**36.8**	**11.2**	**10.8**		
Sprinkler	102	36.9	36.8	11.2	10.9		
Sprinkler	103	37.5	36.8	11.2	11.2		
Sprinkler	104	38.7	36.8	11.2	12.0		
Sprinkler	105	36.8	36.8	11.2	10.8		
Sprinkler	106	37.1	36.8	11.2	10.9		
Sprinkler	107	36.8	36.8	11.2	10.8		
Sprinkler	108	37.0	36.8	11.2	10.9		
Sprinkler	109	37.5	36.8	11.2	11.2		
Sprinkler	110	38.8	36.8	11.2	12.0		
Sprinkler	111	36.8	36.8	11.2	10.8		
Sprinkler	112	37.1	36.8	11.2	11.0		
Sprinkler	113	36.9	36.8	11.2	10.9		
Sprinkler	114	37.0	36.8	11.2	10.9		
Sprinkler	115	37.6	36.8	11.2	11.3		
Sprinkler	116	38.8	36.8	11.2	12.0		
Sprinkler	117	36.9	36.8	11.2	10.9		
Sprinkler	118	37.2	36.8	11.2	11.0		
Sprinkler	119	37.1	36.8	11.2	11.0		
Sprinkler	120	37.2	36.8	11.2	11.0		
Sprinkler	121	37.7	36.8	11.2	11.4		
Sprinkler	122	39.0	36.8	11.2	12.1		
Sprinkler	123	37.1	36.8	11.2	11.0		
Sprinkler	124	37.3	36.8	11.2	11.1		
Sprinkler	125	42.3	36.8	11.2	14.3		
Sprinkler	126	42.3	36.8	11.2	14.3		
Sprinkler	127	42.4	36.8	11.2	14.3		
Sprinkler	128	42.5	36.8	11.2	14.4		

⇨ Most Demanding Sprinkler Data

Supply Analysis

Node	Name	Static (psi)	Residual (psi) @ Flow (gpm)		Available (psi) @ Total Demand (gpm)		Required Pressure (psi)
1	Water Supply	86.0	58.0	1233.0	42.4	1567.2	36.7

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1017	15-11½		13.8		
1018	17-9		14.5		
1019	17-9		14.6		
1020	17-9		14.7		
1021	15-11½		14.0		
1022	15-11½		14.0		
1023	15-11½		14.1		
1	-4-0	Supply	36.7	1067.2	
101	17-9	Sprinkler	10.8	36.8	
102	17-9	Sprinkler	10.9	36.9	
103	17-9	Sprinkler	11.2	37.5	
104	17-9	Sprinkler	12.0	38.7	
105	17-9	Sprinkler	10.8	36.8	
106	17-9	Sprinkler	10.9	37.1	
107	17-9	Sprinkler	10.8	36.8	
108	17-9	Sprinkler	10.9	37.0	
109	17-9	Sprinkler	11.2	37.5	
110	17-9	Sprinkler	12.0	38.8	
111	17-9	Sprinkler	10.8	36.8	

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
112	17-9	Sprinkler	11.0	37.1	
113	17-9	Sprinkler	10.9	36.9	
114	17-9	Sprinkler	10.9	37.0	
115	17-9	Sprinkler	11.3	37.6	
116	17-9	Sprinkler	12.0	38.8	
117	17-9	Sprinkler	10.9	36.9	
118	17-9	Sprinkler	11.0	37.2	
119	17-9	Sprinkler	11.0	37.1	
120	17-9	Sprinkler	11.0	37.2	
121	17-9	Sprinkler	11.4	37.7	
122	17-9	Sprinkler	12.1	39.0	
123	17-9	Sprinkler	11.0	37.1	
124	17-9	Sprinkler	11.1	37.3	
125	17-9	Sprinkler	14.3	42.3	
126	17-9	Sprinkler	14.3	42.3	
127	17-9	Sprinkler	14.3	42.4	
128	17-9	Sprinkler	14.4	42.5	
2	-4-0		35.2		
3	1-8		32.5		
4	1-8		31.3		
1000	17-9		14.5		
1001	15-10½		18.8		
1002	15-10½		18.8		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1003	15-10½		18.8		
1004	15-10½		18.9		
1005	15-10½		19.1		
1006	15-10½		19.3		
1007	15-10½		19.5		
1008	15-10½		19.8		
1013	15-11½		13.3		
1014	15-11½		13.4		
1015	15-11½		13.4		
1016	15-11½		13.6		

Pipe Information

Node 1 / Node 2	Elev 1 (Foot) / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) / Fitting (Foot) / Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes: Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
101	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	••••• Route 1 ••••• Sprinkler
102	17-9		30.7	2.1570		9-1	0.008583	0.1	
102	17-9	11.2	36.9	2	(See Notes)	9-1	120	10.9	Sprinkler
103	17-9		67.6	2.1570		9-1	0.037019	0.3	
103	17-9	11.2	37.5	2	(See Notes)	9-1	120	11.2	Sprinkler
104	17-9		105.1	2.1570		9-1	0.083733	0.8	
104	17-9	11.2	38.7	2	(See Notes)	4-10½	120	12.0	Sprinkler,
1000	17-9		143.9	2.1570		12-3½ 17-2	0.149629	2.6	PO(12-3½)
1000	17-9		42.3	2	(See Notes)	1-10½	120	14.5	Flow (q) from Route 9
1001	15-10½		186.2	2.1570		12-3½ 14-2	0.241108	0.8 3.4	PO(12-3½)
1001	15-10½			6		10-0½	120	18.8	
1002	15-10½		186.2	6.3570		10-0½	0.001248	0.0	
1002	15-10½		186.2	6		10-0½	120	18.8	Flow (q) from Route 3
1003	15-10½		372.4	6.3570		10-0½	0.004500	0.0	
1003	15-10½		186.3	6		10-0½	120	18.8	Flow (q) from Route 5
1004	15-10½		558.7	6.3570		10-0½	0.009529	0.1	
1004	15-10½		186.4	6		10-0½	120	18.9	Flow (q) from Route 7
1005	15-10½		745.1	6.3570		10-0½	0.016232	0.2	
1005	15-10½		77.9	6		10-0½	120	19.1	Flow (q) from Route 2
1006	15-10½		822.9	6.3570		10-0½	0.019509	0.2	
1006	15-10½		78.3	6		10-0½	120	19.3	Flow (q) from Route 13
1007	15-10½		901.2	6.3570		10-0½	0.023080	0.2	

Pipe Information

Node 1 / Node 2	Elev 1 (Foot) / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) Fitting (Foot) Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
1007	15-10½		79.5	6		10-0½	120	19.5	Flow (q) from Route 14
1008	15-10½		980.7	6.3570		10-0½	0.026989	0.3	
1008	15-10½		86.5	6	(See Notes)	103-10	120	19.8	Flow (q) from Route 15
4	1-8		1067.2	6.3570		54-11½ 158-9½	0.031557	6.2 5.3	3fE(12-7), f, sCV(17-2½), BV(-0.3)
4	1-8			6	(See Notes)	2-5	120	31.3	
3	1-8		1067.2	6.0650		30-0 32-5	0.039678	1.3	T(30-0)
3	1-8			8	(See Notes)	5-8	150	32.5	
2	-4-0		1067.2	7.9800		27-2 32-10	0.006901	2.5 0.2	E(27-2)
2	-4-0			8	(See Notes)	263-0	150	35.2	
1	-4-0		1067.2	8.3900		263-0	0.005407	1.4	Water Supply
			500.0					36.7	Hose Allowance At Source
1			1567.2						Total(Pt) Route 1
101	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	• • • • • **Route 2** • • • • • Sprinkler
105	17-9		6.1	2.1570		9-1	0.000434	0.0	
105	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	Sprinkler
106	17-9		42.9	2.1570		9-1	0.015967	0.1	
106	17-9	11.2	37.1	2	(See Notes)	7-7	120	10.9	Sprinkler,
1013	15-11½		80.0	2.1570		24-7½ 32-2½	0.050495	0.8 1.6	2PO(12-3½)
1013	15-11½			4		10-0½	120	13.3	
1014	15-11½		80.0	4.2600		10-0½	0.001836	0.0	
1014	15-11½		80.1	4		10-0½	120	13.4	Flow (q) from Route 4
1015	15-11½		160.1	4.2600		10-0½	0.006629	0.1	

Pipe Information

Node 1 / Node 2	Elev 1 / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) / Fitting (Foot) / Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes: Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
1015	15-11½		80.6	4		10-0½	120	13.4	Flow (q) from Route 6
1016	15-11½		240.6	4.2600		10-0½	0.014091	0.1	
1016	15-11½		81.5	4		10-0½	120	13.6	Flow (q) from Route 8
1017	15-11½		322.2	4.2600		10-0½	0.024177	0.2	
1017	15-11½			2	(See Notes)	59-8	120	13.8	PO(12-3½)
1005	15-10½		77.9	2.1570		49-2½ 108-10½	0.048062	0.0 5.2	3PO(12-3½)
								19.1	Total(Pt) Route 2
107	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	• • • • • **Route 3** • • • • • Sprinkler
108	17-9		30.6	2.1570		9-1	0.008552	0.1	
108	17-9	11.2	37.0	2	(See Notes)	9-1	120	10.9	Sprinkler
109	17-9		67.6	2.1570		9-1	0.036979	0.3	
109	17-9	11.2	37.5	2	(See Notes)	9-1	120	11.2	Sprinkler
110	17-9		105.1	2.1570		9-1	0.083705	0.8	
110	17-9	11.2	38.8	2	(See Notes)	4-10½ 12-3½	120	12.0	Sprinkler,
1018	17-9		143.9	2.1570		17-2	0.149629	2.6	PO(12-3½)
1018	17-9		42.3	2	(See Notes)	1-10½	120	14.5	Flow (q) from Route 10
1002	15-10½		186.2	2.1570		12-3½ 14-2	0.241150	0.8 3.4	PO(12-3½)
								18.8	Total(Pt) Route 3
107	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	• • • • • **Route 4** • • • • • Sprinkler
111	17-9		6.2	2.1570		9-1	0.000445	0.0	
111	17-9	11.2	36.8	2	(See Notes)	9-1	120	10.8	Sprinkler
112	17-9		43.0	2.1570		9-1	0.016040	0.1	

Pipe Information

Node 1 / Node 2	Elev 1 / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) / Fitting (Foot) / Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes: Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
112	17-9	11.2	37.1	2	(See Notes)	7-7	120	11.0	Sprinkler,
1014	15-11½		80.1	2.1570		24-7½	0.050644	0.8	2PO(12-3½)
						32-2½		1.6	
								13.4	Total(Pt) Route 4
113	17-9	11.2	36.9	2	(See Notes)	9-1	120	10.9	• • • • • Route 5 • • • • • Sprinkler
114	17-9		30.4	2.1570		9-1	0.008438	0.1	
114	17-9	11.2	37.0	2	(See Notes)	9-1	120	10.9	Sprinkler
115	17-9		67.4	2.1570		9-1	0.036834	0.3	
115	17-9	11.2	37.6	2	(See Notes)	9-1	120	11.3	Sprinkler
116	17-9		105.0	2.1570		9-1	0.083601	0.8	
116	17-9	11.2	38.8	2	(See Notes)	4-10½	120	12.0	Sprinkler,
1019	17-9		143.9	2.1570		12-3½	0.149628		PO(12-3½)
						17-2		2.6	
1019	17-9		42.4	2	(See Notes)	1-10½	120	14.6	Flow (q) from Route 11
1003	15-10½		186.3	2.1570		12-3½	0.241299	0.8	PO(12-3½)
						14-2		3.4	
								18.8	Total(Pt) Route 5
113	17-9	11.2	36.9	2	(See Notes)	9-1	120	10.9	• • • • • Route 6 • • • • • Sprinkler
117	17-9		6.5	2.1570		9-1	0.000485	0.0	
117	17-9	11.2	36.9	2	(See Notes)	9-1	120	10.9	Sprinkler
118	17-9		43.4	2.1570		9-1	0.016302	0.1	
118	17-9	11.2	37.2	2	(See Notes)	7-7	120	11.0	Sprinkler,
1015	15-11½		80.6	2.1570		24-7½	0.051186	0.8	2PO(12-3½)
						32-2½		1.6	
								13.4	Total(Pt) Route 6
119	17-9	11.2	37.1	2	(See Notes)	9-1	120	11.0	• • • • • Route 7 • • • • • Sprinkler
120	17-9		29.9	2.1570		9-1	0.008199	0.1	

Pipe Information

Node 1 / Node 2	Elev 1 (Foot) / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) / Fitting (Foot) / Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
120	17-9	11.2	37.2	2	(See Notes)	9-1	120	11.0	Sprinkler
121	17-9		67.1	2.1570		9-1	0.036526	0.3	
121	17-9	11.2	37.7	2	(See Notes)	9-1	120	11.4	Sprinkler
122	17-9		104.9	2.1570		9-1	0.083380	0.8	
122	17-9	11.2	39.0	2	(See Notes)	4-10½	120	12.1	Sprinkler,
1020	17-9		143.9	2.1570		12-3½ 17-2	0.149622	2.6	PO(12-3½)
1020	17-9		42.5	2	(See Notes)	1-10½	120	14.7	Flow (q) from Route 12
1004	15-10½		186.4	2.1570		12-3½ 14-2	0.241609	0.8 3.4	PO(12-3½)
								18.9	Total(Pt) Route 7
119	17-9	11.2	37.1	2	(See Notes)	9-1	120	11.0	• • • • • **Route 8** • • • • • Sprinkler
123	17-9		7.1	2.1570		9-1	0.000577	0.0	
123	17-9	11.2	37.1	2	(See Notes)	9-1	120	11.0	Sprinkler
124	17-9		44.2	2.1570		9-1	0.016864	0.2	
124	17-9	11.2	37.3	2	(See Notes)	7-7	120	11.1	Sprinkler,
1016	15-11½		81.5	2.1570		24-7½ 32-2½	0.052342	0.8 1.7	2PO(12-3½)
								13.6	Total(Pt) Route 8
125	17-9	11.2	42.3	2	(See Notes)	4-2½	120	14.3	• • • • • **Route 9** • • • • • Sprinkler,
1000	17-9		42.3	2.1570		12-3½ 16-6	0.015559	0.3	PO(12-3½)
								14.5	Total(Pt) Route 9
126	17-9	11.2	42.3	2	(See Notes)	4-2½	120	14.3	• • • • • **Route 10** • • • • • Sprinkler,
1018	17-9		42.3	2.1570		12-3½ 16-6	0.015571	0.3	PO(12-3½)
								14.5	Total(Pt) Route 10

Pipe Information

Node 1 / Node 2	Elev 1 (Foot) / Elev 2 (Foot)	K-Factor	Flow added this step (q) / Total Flow (Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) / Fitting (Foot) / Total (Foot)	C Factor / Pf Friction Loss Per Unit (psi)	Total(Pt) / Elev(Pe) / Friction(Pf)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
127	17-9	11.2	42.4	2	(See Notes)	4-2½	120	14.3	• • • • • **Route 11** • • • • •
						12-3½	0.015613		Sprinkler,
1019	17-9		42.4	2.1570		16-6		0.3	PO(12-3½)
								14.6	Total(Pt) Route 11
128	17-9	11.2	42.5	2	(See Notes)	4-2½	120	14.4	• • • • • **Route 12** • • • • •
						12-3½	0.015704		Sprinkler,
1020	17-9		42.5	2.1570		16-6		0.3	PO(12-3½)
								14.7	Total(Pt) Route 12
1021	15-11½		244.3	2	(See Notes)	59-8	120	14.0	• • • • • **Route 13** • • • • •
						49-2½	0.048524	0.0	PO(12-3½), Flow (q) from Route 16
1006	15-10½		78.3	2.1570		108-10½		5.3	3PO(12-3½)
								19.3	Total(Pt) Route 13
1021	15-11½		244.3	4		10-0½	120	14.0	• • • • • **Route 14** • • • • •
							0.007093		Flow (q) from Route 16
1022	15-11½		166.0	4.2600		10-0½		0.1	
1022	15-11½			2	(See Notes)	59-8	120	14.0	PO(12-3½)
						49-2½	0.049998	0.0	
1007	15-10½		79.5	2.1570		108-10½		5.4	3PO(12-3½)
								19.5	Total(Pt) Route 14
1022	15-11½		79.5	4	(See Notes)	10-0½	120	14.0	• • • • • **Route 15** • • • • •
						26-4	0.002123		Flow (q) from Route 14
1023	15-11½		86.5	4.2600		36-4½		0.1	PO(26-4)
1023	15-11½			2	(See Notes)	59-8	120	14.1	
						36-11	0.058375	0.0	
1008	15-10½		86.5	2.1570		96-7		5.6	3PO(12-3½)
								19.8	Total(Pt) Route 15
1017	15-11½		77.9	4		10-0½	120	13.8	• • • • • **Route 16** • • • • •
							0.014492		Flow (q) from Route 2
1021	15-11½		244.3	4.2600		10-0½		0.1	
								14.0	Total(Pt) Route 16

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

(Actual Inside Diameter / Schedule 40 Steel Pipe Inside Diameter) 4.87 = Factor

C Value Multiplier

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

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	DelV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				