SUBMITTAL DATA
PREPARED FOR:

CAROLINA DIESEL TRUCKS

62 PROGRESS DRIVE
FUQUAY VARINA, NC 27562

PREPARED BY:
J & D SPRINKLER CO, INC.
315 W. MAIN STREET
CLAYTON, NC 27520

PH: (919)-553-2356 FAX: (919)-359-0622

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SPRINKLER HEADS

VIKING®

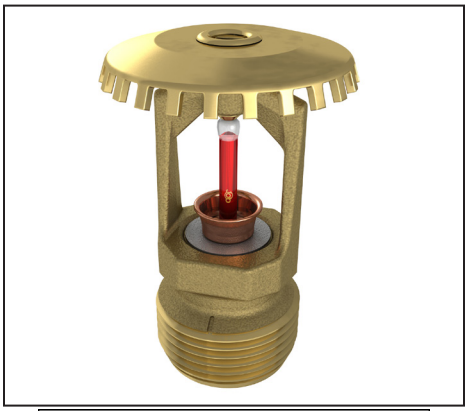
TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

The Viking Microfast® Quick Response Upright Sprinkler VK350 is a small, thermo-sensitive, glass-bulb spray sprinkler available in several different finishes, temperature ratings, and K-Factors to meet design requirements. The special Polyester, and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are listed/approved as as indicated in the Approval Charts.



WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414017, G414018, G4980020, and G4060054

LPCB Approved: Certificate 096e/03

CE Certified: Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021 and EC-certificate of conformity 0786-CPD-40278

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

MED Certified: Standard EN 12259-1, EC-certificate of conformity 0832-MED-1003

NOTE: Other International approval certificates are available upon request.

Refer to Approval Chart 1 and Design Criteria cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)*
Maximum Working Pressure: 175 psi (12 bar) wwp.
Factory tested hydrostatically to 500 psi (34.5 bar)
Testing: U.S.A. Patent No. 4,831,870
Thread size: 1/2” NPT, 15 mm BSP, 3/4” NPT, 20 mm BSP
Nominal K-Factor: 8.0 U.S. (115.2 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-5/16” (59 mm)

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400
Deflector: Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)

Order Viking Microfast® Quick Response Upright Sprinkler VK350 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix (°F/°C): 135°/57° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, and 286°/141° = G
For example, sprinkler VK350 with a 1/2” thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 18259AB

VIKING®	TECHNICAL DATA	MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

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Available Finishes And Temperature Ratings: Refer to Table 1.
Accessories: (Also refer to the Viking website.)
Sprinkler Wrench: Standard Wrench: Part No. 21475M/B (available since 2017)
Sprinkler Cabinets:
A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION
Refer to appropriate NFPA Installation Standards.

5. OPERATION
During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY
The Viking Microfast® Quick Response Upright Sprinkler VK350 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE
For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT
Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester and ENT. ENT in all temperature ratings except 135 °F (57 °C)

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.
[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
[3] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated on pages 51c-e. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester, ENT, and PTFE coatings. For ENT coated automatic sprinklers, the waterway is coated.

Figure 1: Sprinkler Wrench

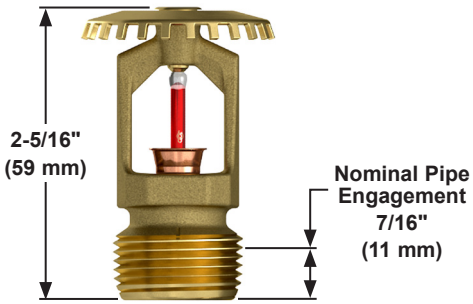

Figure 2: Sprinkler Dimensions

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

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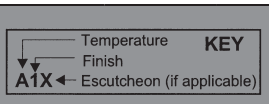
Approval Chart 1 (UL)

Microfast® Quick Response Upright Sprinkler VK350
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)					
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE	10	
18257	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	
18278	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	
18259[9]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	B1[8]	--	
20382	VK350	3/4”	--	8.0	115.2	2-5/16	59	--	--	--	--	--	C3
20237	VK350	--	20 mm	8.0	115.2	2-5/16	59	--	--	--	--	--	C3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)													
06665B	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	--
14817	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	--
06764B[9]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	A1[8]	--	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
C - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], and Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.
[7] CE Certified, Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021 and EC-certificate of conformity 0786-CPD-40278.
[9] The 1/2” NPT Large Orifice Sprinkler is listed and approved for retrofit only when installed in accordance with NFPA 13.
[10] MED Certified, Standard EN 12259-1, EC-certificate 0832-MED-1003.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1)

cULus Listing Requirements:

The Microfast® Quick Response Upright Sprinkler VK350 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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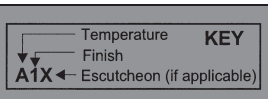
Approval Chart 2 (FM)

Microfast® Quick Response Upright Sprinkler VK350
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
18257	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2
18278	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2
18259[5]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
06665B	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2
14817	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2
06764B[5]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]
2 - ENT[6]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Check with the manufacturer for any additional approvals.

[4] Other colors are available on request with the same Approvals as the standard colors.

[5] The 1/2” NPT Large Orifice Sprinkler is listed and approved for retrofit only when installed in accordance with NFPA 13.

[6] FM approved as corrosion proofing for corrosive environments.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Microfast® Quick Response Upright Sprinkler VK350 is FM Approved as a quick response **Non-Storage** upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

TECHNICAL DATA

VK3001 QUICK RESPONSE UPRIGHT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

The Viking VK3001 Quick Response Upright Sprinkler is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are Listed and Approved as indicated in the Approval Chart.

2. LISTINGS AND APPROVALS

UL Listed: Category VNIV

FM Approved: Classes 2016, 2043
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 PSI (-207 mbar).

CE: Standard EN12259-1, DOP_XT1A_1-3-21

Refer to the Approval Chart and Design Criteria for requirements that must be followed.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

3. TECHNICAL DATA

Minimum Operating Pressure: 7 PSI (0.5 bar)
Rated to: UL - 250 PSI (24 bar) WWP
FM - 175 PSI (12 bar) WWP
Factory tested hydrostatically to 500 PSI (34.5 bar)
Thread size: 1/2" NPT (15 mm BSPT)
Nominal K-factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Metric K-factor measurement shown is in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Material Standards:
Sprinkler Body: Brass CW602N, UNS-C84400 or QM Brass
Deflector: Stainless Steel UNS S30400
Pip Cap Shell - Stainless Steel UNS-S44400
Pip Cap Disc - Stainless Steel UNS-S30100
Belleville Spring - Nickel Alloy
Pip Cap Seal - Polytetrafluoroethylene (PTFE)
Compression Screw: Brass CW612N, CW508L, UNS-C36000 or UNS-C26000
Shipping Cap: Polyethylene
Bulb: Glass, nominal 3 mm diameter

Ordering Information: (Refer to Table 1 and the current Viking List Price Book.)

4. INSTALLATION

Refer to appropriate NFPA, FM Global, and/or any other applicable installation standards. Refer to Figure 3

NOTICE **Risk of permanent damage.**

Over-tightening the sprinkler can cause permanent damage.
> Tighten the sprinkler to a MAXIMUM torque of 14 ft-lbs (19 N-m).

5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See the website for the closest distributor or contact Viking.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TECHNICAL DATA

VK3001 QUICK RESPONSE UPRIGHT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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TABLE 1: ORDERING INFORMATION

Instructions: Using the sprinkler base part number,
(1) add the suffix for the desired Finish
(2) add the suffix for the desired Temperature Rating.

Sprinkler Base Part Number	Size		1: Finishes		2: Temperature Ratings			
	NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature[2]	Suffix
23869	1/2	--	Brass	A	135 °F (57 °C)	Orange	100 °F (38 °C)	A
23881	--	15	Chrome	F	155 °F (68 °C)	Red	100 °F (38 °C)	B
			White Polyester [3,5]	M-/W	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
			Black Polyester [3,5]	M-/B	200 °F (93 °C)	Green	150 °F (65 °C)	E
			ENT [3,4,5]	JN	286 °F (141 °C)	Blue	225 °F (107 °C)	G
					OPEN	--	--	Z

Example: 23869MB/W = VK3001 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

Accessories

Sprinkler Wrenches (see Figure 1):
Standard (straight) Wrench: Part number 23559MB.
Sprinkler Cabinet:
A. Up to 6 sprinklers: Part number 01724A
B. 6-12 sprinklers: Part number 01725A

Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
3. UL Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. The corrosion resistant and corrosion proofing coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.
6. UL Listed for 250 PSI (17.2 bar) WWP.

Figure 1: Sprinkler Wrench

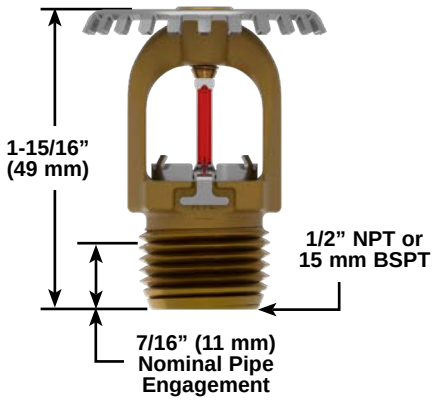

Figure 2: Sprinkler Dimensions

TECHNICAL DATA

VK3001 QUICK RESPONSE UPRIGHT SPRINKLER (K5.6)

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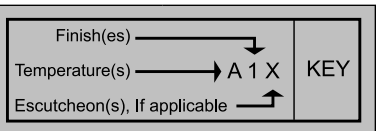
APPROVAL CHART

Viking Quick Response Upright Sprinkler
VK3001 K5.6 (80.6 metric)



Sprinkler Base Part Number[1]	Thread Size		Listings and Approvals[2,6]				
	NPT	BSPT	cULus		FM		CE[6]
	Inch	mm	Approval Listing	Maximum WWP	Approval Listing	Maximum WWP	Approval Listing
23869	1/2	--	A1	250 PSI (17.2 bar)	A1	175 PSI (12 bar)	B1
23881	--	15	A1	250 PSI (17.2 bar)	A1	175 PSI (12 bar)	B1

Approved Temperature Ratings:

A = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
B = 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)

Approved Finishes:

1 = Brass, Chrome, White Polyester [3,4], Black Polyester [3,4], and ENT [4,5]

Footnotes

1. Base Part number is shown. For complete part number, refer to Viking's current price schedule.
2. This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
3. Other colors are available upon request with the same Listings and Approvals as the standard colors.
4. cULus Listed as corrosion resistant.
5. FM Approved as corrosion resistant.
6. CE: Standard EN12259-1, Declaration of Performance DOP_XT1A_1-3-21.

DESIGN CRITERIA - UL

cULus Listing Requirements:

The Viking VK3001 Quick Response Upright Sprinkler is cULus Listed as indicated in Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers shall be followed.

DESIGN CRITERIA - FM

FM Approval Requirements:

The Viking VK3001 Quick Response Upright Sprinkler is FM Approved as quick response Non-Storage upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM Installation guidelines may differ from UL and/or NFPA criteria.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®	TECHNICAL DATA	VK3001 QUICK RESPONSE UPRIGHT SPRINKLER (K5.6)

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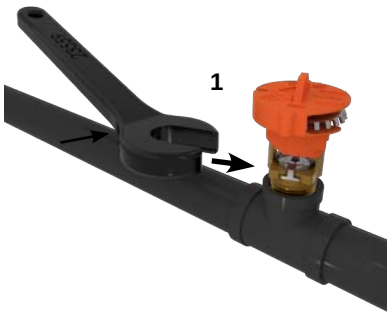
1. Carefully slide the wrench onto the wrench flats.



2. Install the sprinkler into the pipe fitting.
NOTE: The sprinkler frame arms shall be parallel to the pipe.

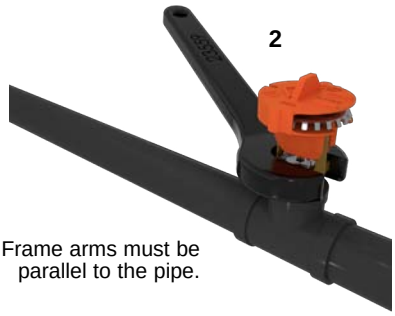


Figure 3: Installation

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

The Viking VK3021 Quick Response Pendent Sprinkler is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are Listed and Approved as indicated in the Approval Chart.

2. LISTINGS AND APPROVALS

UL Listed: Category VNIV

FM Approved: Classes 2017, 2015, 2043
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 PSI (-207 mbar)

CE: Standard EN12259-1, DOP_XT1A_1-3-21

Refer to the Approval Chart and Design Criteria for requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 PSI (0.5 bar)
Rated to: UL - 250 PSI (24 bar) WWP
FM - 175 PSI (12 bar) WWP
Factory tested hydrostatically to 500 PSI (34.5 bar)
Thread size: 1/2" NPT (15 mm BSPT)
Nominal K-factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

* Metric K-factor measurement shown is in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Material Standards:
Sprinkler Body: Brass CW602N, UNS-C84400 or QM Brass
Deflector: Stainless Steel UNS S30400
Pip Cap Shell - Stainless Steel UNS-S44400
Pip Cap Disc - Stainless Steel UNS-S30100
Belleville Spring - Nickel Alloy
Pip Cap Seal - Polytetrafluoroethylene (PTFE)
Compression Screw: Brass CW612N, CW508L, UNS-C36000 or UNS-C26000
Shipping Cap: Polyethylene
Bulb: Glass, nominal 3 mm diameter

Ordering Information: (Refer to Table 1 and the current Viking List Price Book.)

4. INSTALLATION

Refer to appropriate NFPA, FM Global, and/or any other applicable installation standards.

NOTICE **Risk of permanent damage.**

Over-tightening the sprinkler can cause permanent damage.
> Tighten the sprinkler to a MAXIMUM torque of 14 ft-lbs (19 N-m).

5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See the website for the closest distributor or contact Viking.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

TABLE 1: ORDERING INFORMATION

Instructions: Using the sprinkler base part number,
(1) add the suffix for the desired Finish
(2) add the suffix for the desired Temperature Rating.

Sprinkler Base Part Number	Size		1: Finishes		2: Temperature Ratings			
	NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature[3]	Suffix
23870[7]	1/2		Brass	A	135 °F (57 °C)	Orange	100 °F (38 °C)	A
23882[7]		15	Chrome	F	155 °F (68 °C)	Red	100 °F (38 °C)	B
			White Polyester [4,6]	M-/W	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
			Black Polyester [4,6]	M-/B	200 °F (93 °C)	Green	150 °F (65 °C)	E
			ENT [4,5,6]	JN	286 °F (141 °C)	Blue	225 °F (107 °C)	G
					OPEN	--	--	Z

Example: 23870MB/W = VK3021 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

Accessories

Sprinkler Wrenches (see Figure 1):

A. Standard Wrench: Part number 23559MB
B. Recessed Socket Wrench: Part number 23560MB[2]

Sprinkler Cabinet:

A. Up to 6 sprinklers: Part number 01724A
B. 6-12 sprinklers: Part number 01725A

Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Requires a 1/2" ratchet which is not available from Viking.
3. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
4. UL Listed as corrosion resistant.
5. FM Approved as corrosion resistant.
6. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.
7. UL Listed for 250 PSI (17 bar) WWP.

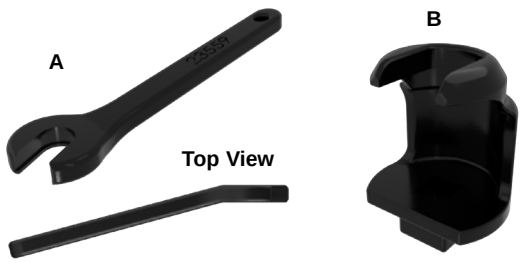


Figure 1: Sprinkler Wrenches

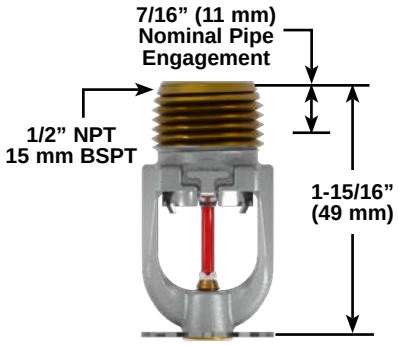


Figure 2: Sprinkler Dimensions

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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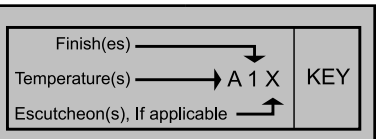
APPROVAL CHART

Viking Quick Response Pendent Sprinkler
VK3021 K5.6 (80.6 metric)



Sprinkler Base Part Number[1]	Thread Size		Listings and Approvals[2,6]				
	NPT	BSPT	cULus		FM		CE[6]
	Inch	mm	Approval Listings	Maximum WWP	Approval Listings	Maximum WWP	Approval Listings
23870	1/2	--	A1, B2X, B3Y	250 PSI (17 bar)	A1, B2X, B3Y	175 PSI (12 bar)	C1, D2X, D3Y
23882	--	15	A1, B2X, B3Y	250 PSI (17 bar)	A1, B2X, B3Y	175 PSI (12 bar)	C1, D2X, D3Y

Approved Temperature Ratings:

A = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
B = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C= 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
D= 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes:

1 = Brass, Chrome, White Polyester [3,4], Black Polyester [3,4], and ENT [4,5]
2 = Brass, Chrome, White Polyester [3,4], and Black Polyester [3,4]
3 = ENT [4,5]

Approved Escutcheon Code:

X = Installed with Viking Recessed Escutcheons Models NP-1, NP-2, and NP-3, or Viking Standard Surface Mounted Escutcheons
Y = Installed with Viking Model NP-1 Recessed Escutcheon OR Standard Surface Mounted Escutcheons

Footnotes

1 Base Part number is shown. For complete part number, refer to Viking's current price schedule.
2 This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
3 Other colors are available upon request with the same Listings and Approvals as the standard colors.
4 cULus Listed as corrosion resistant.
5 FM Approved as corrosion resistant.
6 CE: Standard EN12259-1, Declaration of Performance DOP_XT1A_1-3-21.

DESIGN CRITERIA - UL

cULus Listing Requirements:

The Viking VK3021 Quick Response Pendent Sprinkler is cULus Listed as indicated in Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray pendent sprinklers shall be followed.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®	TECHNICAL DATA	VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

DESIGN CRITERIA - FM

FM Approval Requirements:
The Viking VK3021 Quick Response Pendent Sprinkler is FM Approved as quick response Non-Storage Pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.
NOTE: The FM Installation guidelines may differ from UL and/or NFPA criteria.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

1. Install the escutcheon inner ring onto the sprinkler threads.
2. Carefully slide the wrench** sideways around the protective cap then push upwards to engage with the sprinkler wrench flats.
3. Install the sprinkler and escutcheon assembly into the pipe fitting. Be sure the escutcheon outer ring contacts the surface of the finished ceiling.

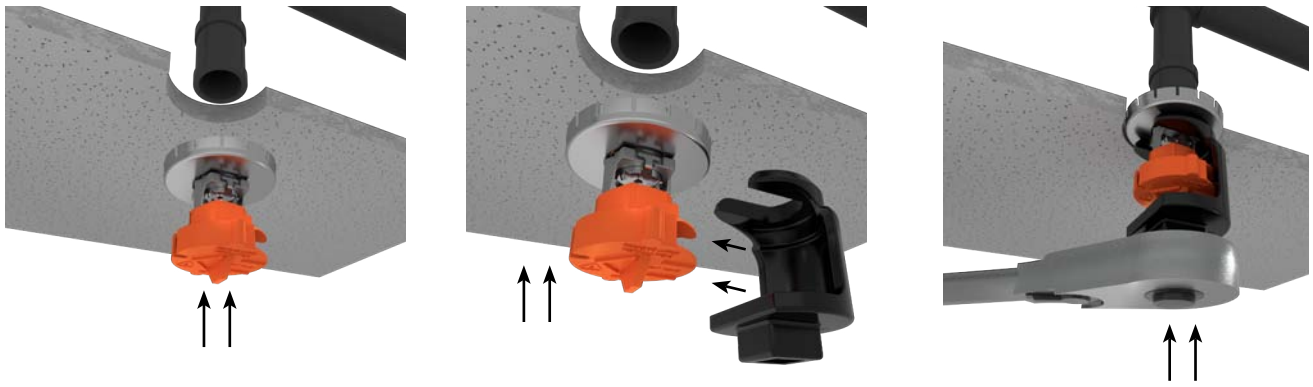


Figure 3: Recessed Installation (with Recessed Socket Wrench)
****A 1/2" ratchet is required (not available from Viking).**

1. Install the escutcheon onto the sprinkler threads.
2. Carefully slide the wrench onto the sprinkler wrench flats.
3. Install the sprinkler and escutcheon assembly into the pipe fitting. Be sure the escutcheon contacts the surface of the finished ceiling.

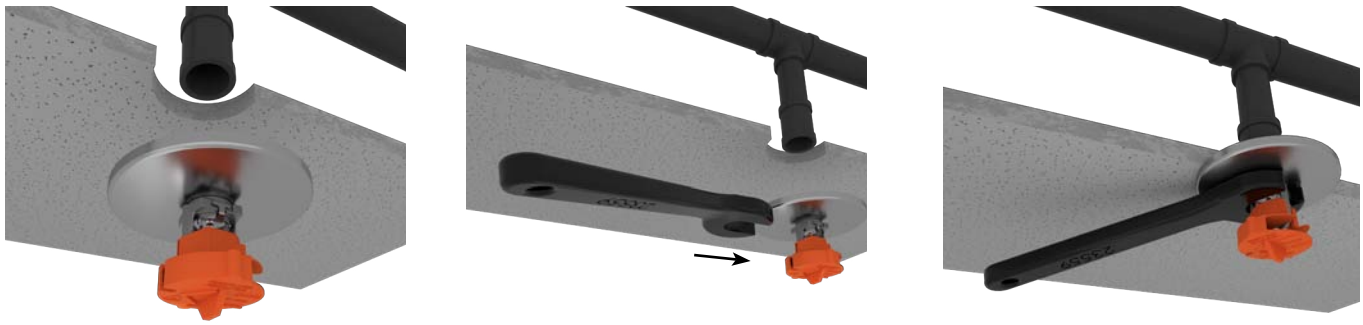


Figure 4: Installation (with Standard Wrench)

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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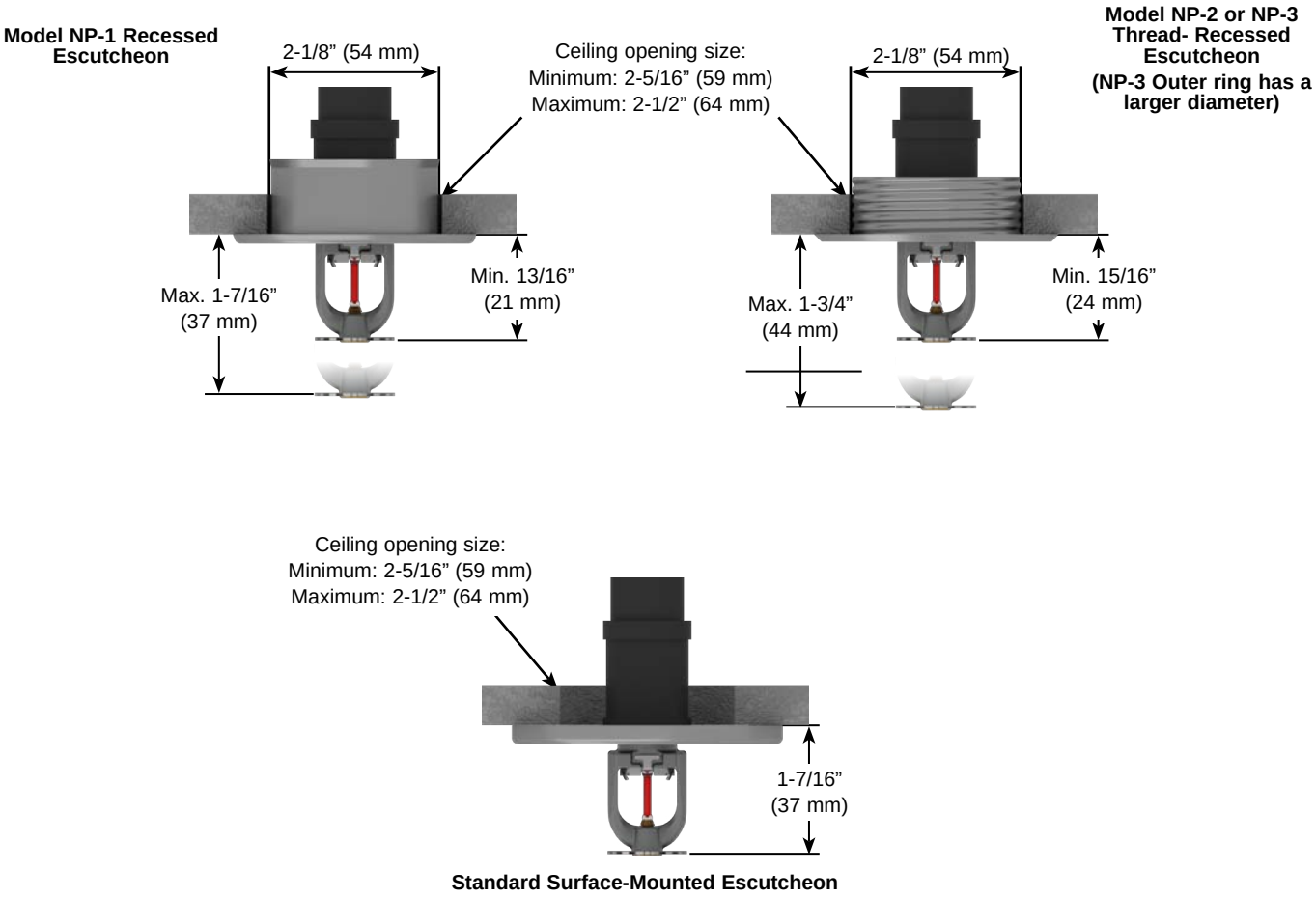
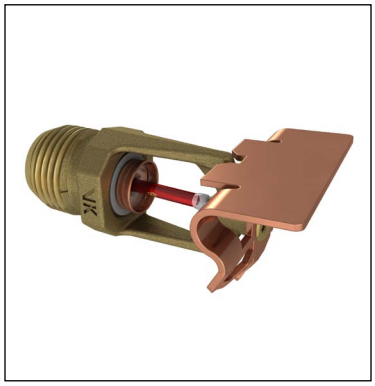


Figure 5: Installation Dimensions with Viking Escutcheons

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION



The Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in Approval Charts.

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class 2020

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

Refer to Approval Charts and Design Criteria for listing and approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Nominal K-Factor: 5.6 U.S. (80.6 metric*)

* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Overall Length: 2-3/4" (68 mm)

Material Standards:
Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring - Exposed, Screw and Pip cap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)
Order Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F / 57 °C = A, 155 °F / 68 °C = B, 175 °F / 79 °C = D, 200 °F / 93 °C = E, and 286 °F / 141 °C = G
For example, sprinkler 12997 with a Brass finish and a 155 °F / 68 °C temperature rating = Part No. 12997AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrenches:
A. Standard Wrench: Part No. 21475M/B (available since 2017).
B. Wrench for recessed and/or wax coated sprinklers: Part No. 13655W/B** (available since 2006)
**A ½" ratchet is required (not available from Viking).

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive fusible link disengages, the pip cap and spring are released, and the waterway is opened. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

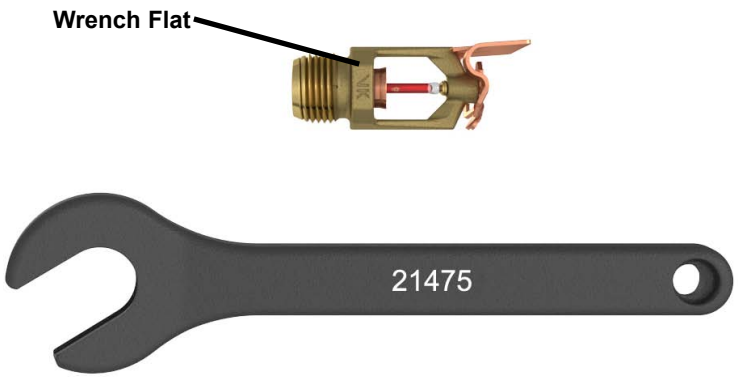


Figure 1:
Standard Sprinkler Wrench 21475M/B

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester, and ENT

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. For ENT coated sprinklers, the waterway is coated. Note that the spring is exposed on sprinklers with Polyester, and ENT coatings.

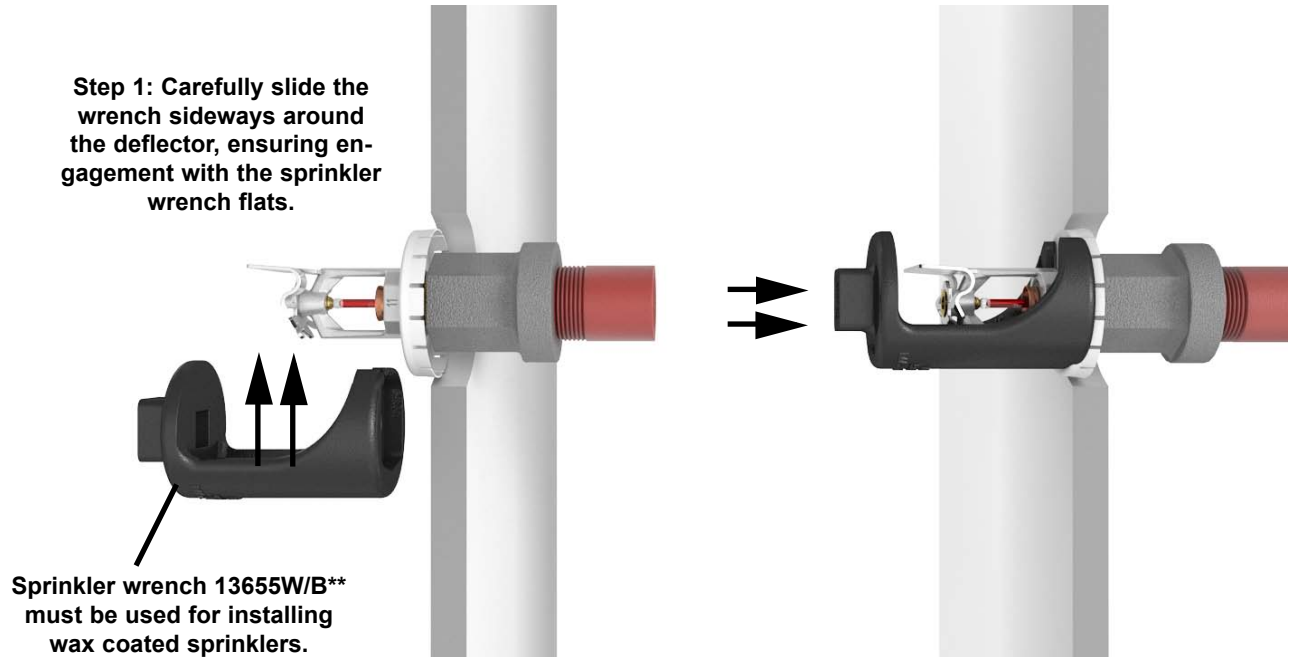


Figure 2: Wrench 13655W/B for Recessed Sprinklers

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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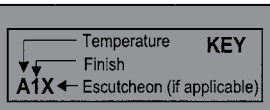
Approval Chart 1 (UL)

Microfast® Quick Response Horizontal Sidewall Sprinkler VK305
For Light or Ordinary Hazard Occupancies
Maximum 175 PSI (12 Bar) WWP
Deflector must be located 4" to 12" (102 mm to 305 mm) below the ceiling.



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria on page 43x.)			
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	LPCB	CE	RCM
12997	VK305	HSW	1/2"	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X, C2W, D2Z	--	--	--
19782	VK305	HSW	1/2"	--	5.6	80.6	2-11/16	68	--	--	--	E3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)												
12121	VK305	HSW	1/2"	15 mm	5.6	80.6	1-11/16	68	A1Y, B1X, C2W, D2Z	--	--	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
D - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
E - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Poly-ester[5,6], and Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Approved Escutcheons

W - Installed with standard surface-mounted escutcheons
X - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, or G-1 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon
Z - Installed with standard surface-mounted escutcheons or recessed with the Viking Micromatic Model E-1

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion-resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

cULus Listing Requirements:

Quick Response Horizontal Sprinkler VK305 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for sidewall standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- Locate with the deflector 4" to 12" (102 mm to 305 mm) below the ceiling.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
- Minimum spacing allowed is 6 ft. (1.8 m).
- Align the top of the deflector parallel with the ceiling.
- Locate no less than 4" (102 mm) from end walls.
- Maximum distance from end walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.

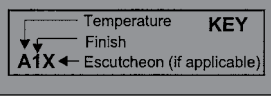
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Approval Chart 2 (FM)

Quick Response Sidewall Sprinklers
Maximum 175 PSI WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3,4] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
12997	VK305	1/2”	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
12121	VK305	1/2”	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 - Brass

Approved Escutcheons

X - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, E-3, or G-1 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.
[4] Viking vertical sidewall sprinklers may be installed pendent or upright.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

Horizontal Sidewall Sprinkler VK305 is FM Approved as a quick response **Non-Storage** sidewall sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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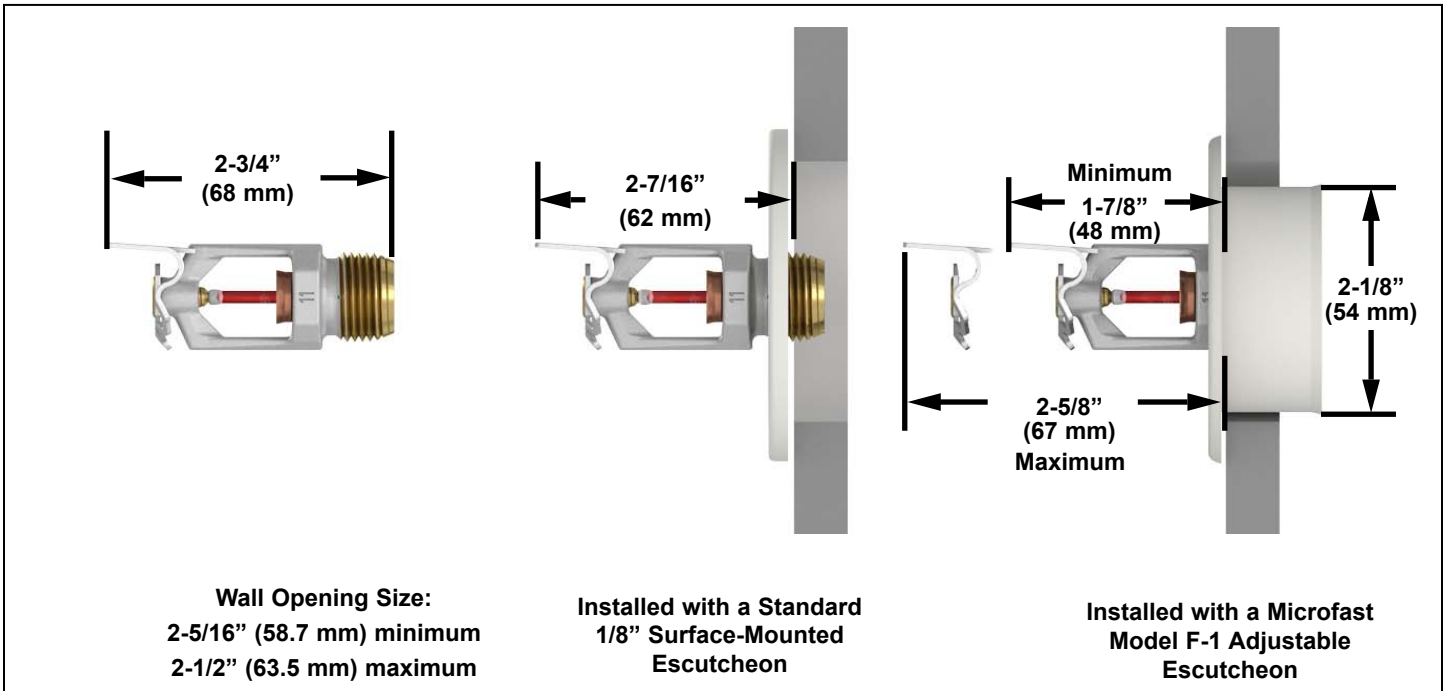


Figure 3: Sidewall Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

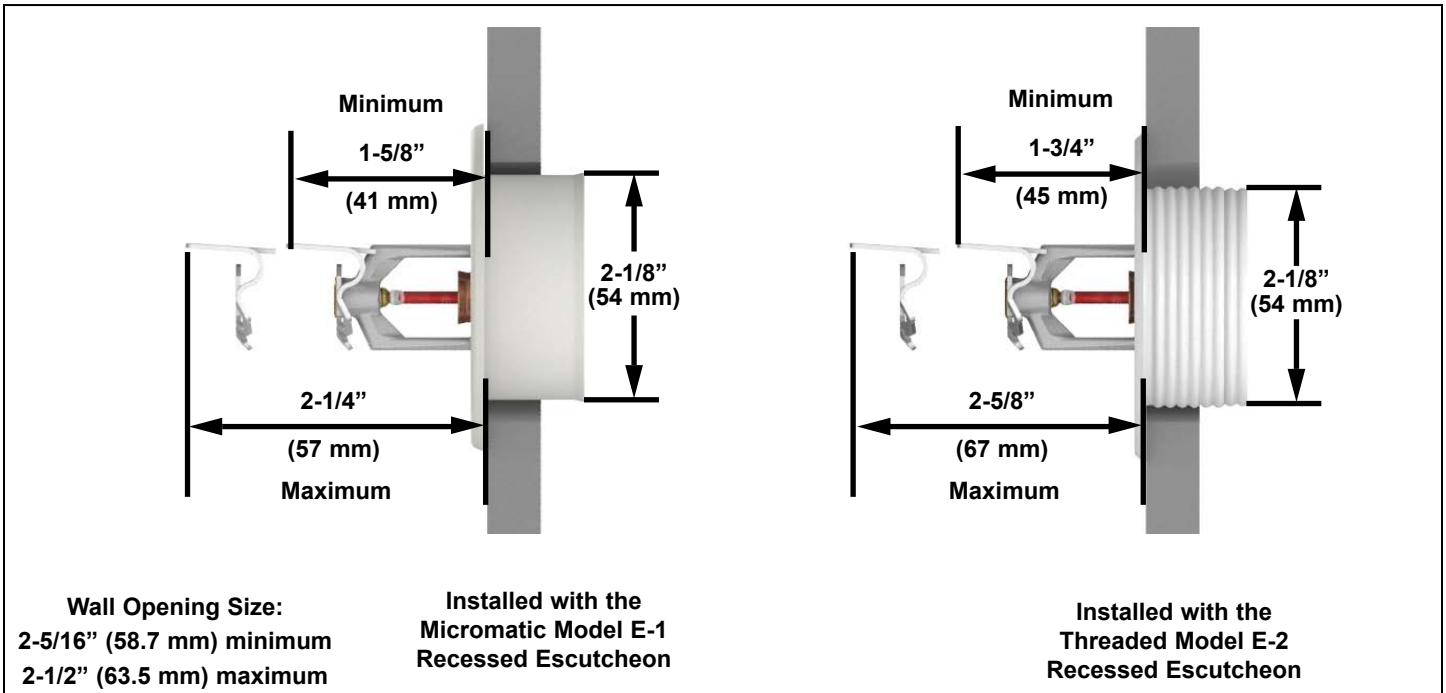


Figure 4: Sidewall Sprinkler VK305 Dimensions with the Model E-1 and E-2 Recessed Escutcheons

VIKING®	TECHNICAL DATA	STANDARD/QUICK RESPONSE EXTENDED COVERAGE PENDENT SPRINKLER VK534 (K11.2)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

Viking EC/QREC Pendent Sprinkler VK534 is a thermosensitive spray sprinkler available in several different finishes and temperature ratings to meet varying design requirements. The extra-large orifice produces the flows required to meet Light and Ordinary Hazard density requirements at lower pressures than standard orifice or large orifice sprinklers. The glass bulb operating element and special deflector characteristics meet the challenges of quick response extended coverage standards. Pendent Sprinkler VK534 is cULus Listed as standard and quick response. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, ENT coating has been investigated for installation in corrosive atmospheres. See Approval Charts.

2. LISTINGS AND APPROVALS

c(UL)us **cULus Listed:** Category VNIV
Refer to Approval Chart 1 and Design Criteria cULus Listing requirements.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: Refer to the Approval Charts.
Maximum Working Pressure: 175 psi (12 Bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 3/4" (20 mm) NPT
Nominal K-Factor: 11.2 U.S. (161.3 metric†)
† Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-3/8" (61 mm)

Material Standards:
Sprinkler Frame: Brass UNS-C84400
Deflector: Brass UNS-C26000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinkler: Belleville Spring-Exposed, Screw and Pipcap-ENT plated.

Viking Technical Data may be found on The Viking Corporation's Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

Ordering Information: (Also refer to the current Viking price list.)
Order Viking EC/QREC Pendent Sprinkler VK534 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F (57 °C) = A, 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, and 286 °F (141 °C) = G
For example, sprinkler VK534 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 08340AB

Available Finishes And Temperature Ratings:
Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

Sprinkler Wrenches:
A. Standard Wrench: Part No. 05118CW/B (available since 1981)
B. Wrench for recessed pendent sprinkler: Part No. 11663W/B** (available since 2001)
**A ½" ratchet is required (not available from Viking).

Sprinkler Cabinets:
A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking EC/QREC Pendent Sprinkler VK534 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

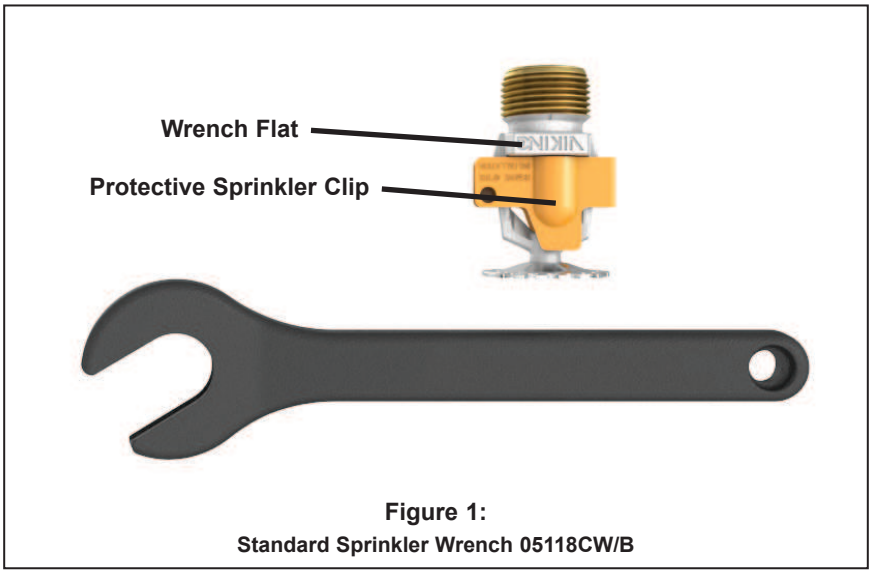


Figure 1:
Standard Sprinkler Wrench 05118CW/B

VIKING®	TECHNICAL DATA	STANDARD/QUICK RESPONSE EXTENDED COVERAGE PENDENT SPRINKLER VK534 (K11.2)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester[3], Black Polyester[3], and ENT

Corrosion-Resistant Coatings[4]: ENT

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester coatings.

[4] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For ENT sprinklers, all exposed surfaces and the waterway are coated, but note that the spring is exposed.

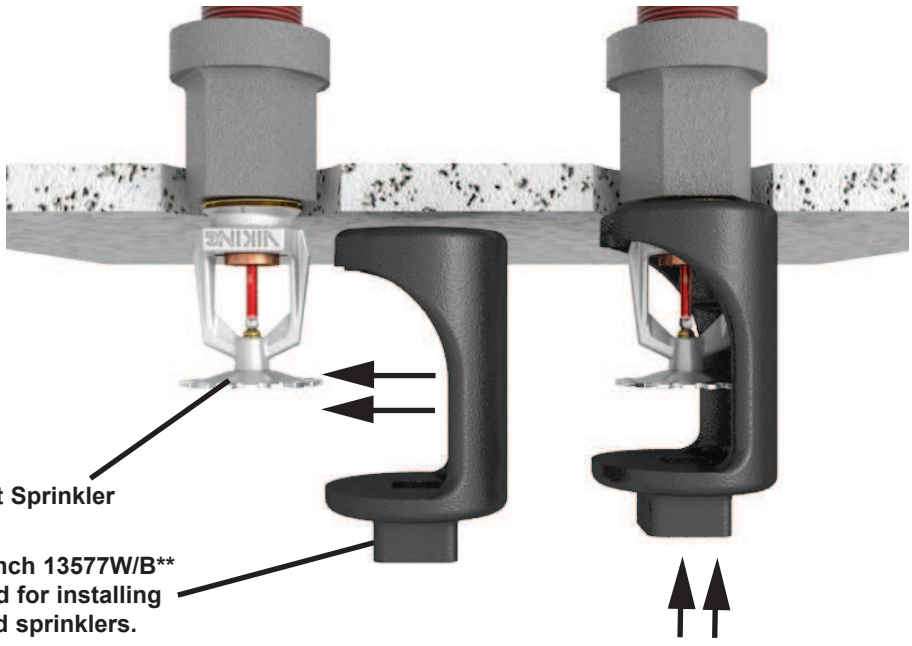


Figure 2: Wrench 11663W/B for Recessed Pendent Sprinkler VK534

VIKING®

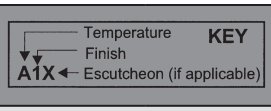
TECHNICAL DATA

STANDARD/QUICK RESPONSE EXTENDED COVERAGE PENDENT SPRINKLER VK534 (K11.2)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Approval Chart 1 (UL)

SR/QR EC Pendent Sprinkler VK534



Sprinkler Base Part Number[1]	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric[2]		Inches	mm
08340 Pendent	VK534	3/4	20	11.2	161.3	175 psi (12 Bar)	2-5/16	59

Max. Sprinkler Spacing (L x W[7])	Maximum Area per Sprinkler	Minimum Water Supply Requirements[5]			Listings and Approvals[3] (Refer also to UL Design Criteria)
		Light Hazard	Ordinary Hazard Group I	Ordinary Hazard Group II	
		Flow / Pressure	Flow / Pressure	Flow / Pressure	cULus[4]
Standard Response					
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft² (23.8 m²)	--	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)	51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)	C1X, D1Y, D2Z, C2W
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft² (30.1 m²)	--	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)	65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)	C1X, D1Y, D2Z, C2W
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft² (37.2 m²)	--	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	C1X, D1Y, D2Z, C2W
Quick Response					
12 ft. x 12 ft. (3.7 m x 3.7 m)	144 ft² (13.4 m²)	--	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	E1Y, E2Z
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft² (18.2 m²)	--	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	E1Y, E2Z
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft² (23.8 m²)	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	--	--	B1Y, F2Z
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft² (30.1 m²)	33 gpm @ 8.7 psi (124.9 L/min @ .60 Bar)	--	--	B1Y, F2Z
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft² (37.2 m²)	40 gpm @ 12.8 psi (151.4 L/min @ .88 Bar)	--	--	A1Y, G2Z

Approved Temperature Ratings

A - 135 °F (57 °C) and 175 °F (79 °C)
B - 135 °F (57 °C), 155 °F (68 °C), and 175 °F (79 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
D - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
E - 155 °F (68 °C)
F - 155 °F (68 °C), and 175 °F (79 °C)
G - 175 °F (79 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester, and Black Polyester
2 - ENT[6]

Approved Escutcheons

W - Standard surface-mounted escutcheons only
X - Standard surface-mounted escutcheons or the Micro-fast® Model F-1 Adjustable Escutcheon
Y - Standard surface-mounted escutcheons or the Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Z - Standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.

[4] cULus Listed for use in the U.S. and Canada.

[5] To determine "Minimum Water Supply Requirement" for areas of coverage where length and width of actual sprinkler spacing are not equal, select the "Maximum Sprinkler Spacing" from the chart that is equal to or greater than the larger of the actual spacing (length or width) dimensions used. Example: When using 10'-6" x 13'-0" sprinkler spacing, provide the "Minimum Water Supply Requirement" listed in the chart for 14'-0" x 14'-0" spacing. For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" in the appropriate hazard group for the next larger area listed. The distance from sprinklers to walls shall not exceed one-half the "Maximum Sprinkler Spacing" listed for the "Minimum Water Supply Requirement" used.

[6] cULus Listed as corrosion-resistant.

VIKING®	TECHNICAL DATA	STANDARD/QUICK RESPONSE EXTENDED COVERAGE PENDENT SPRINKLER VK534 (K11.2)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

cULus Listing Requirements:

EC-ELO Pendent Sprinkler VK534 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for extended coverage pendent spray sprinklers as indicated below:

- The minimum water supplies and maximum areas of coverage shown in Approval Chart 1 are designed to provide the following design densities: 0.10 gpm/ft^2 (4.1 mm/min) for Light Hazard densities; 0.15 gpm/ft^2 (6.1 mm/min) for Ordinary-Hazard Group I densities; 0.2 gpm/ft.^{2} (8.1 mm/min) for Ordinary-Hazard Group II densities.
- The sprinkler installation rules contained in NFPA 13 for extended coverage pendent spray sprinklers must be followed.
- Viking EC-ELO Pendent Sprinklers are cULus Listed for use in unobstructed construction, and noncombustible obstructed construction consisting of solid steel and/or concrete beams as defined in the latest edition of NFPA 13.
- Ceiling slope not to exceed 2/12 (9.5°).

Also, Viking ECOH-ELO Pendent Sprinkler VK534 is specifically cULus Listed for Ordinary Hazard Occupancies:

- For non-combustible obstructed construction within trusses or bar joists having non-combustible web members greater than 1" (25.4 mm) when applying the 4 times obstruction criteria rule as defined in NFPA 13 under "Obstructions to Sprinkler Discharge Pattern Development".
- For installation under concrete tees when installed as follows:
  1. The stems of the concrete tee construction must be spaced between 3 ft (0.9 m) and 7 ft-6 in (2.3 m) on center. The depth of the concrete tees must not exceed 30 in (762 mm). The maximum permitted concrete tee length is 32 ft (9.8 m). However, where the concrete tee length exceeds 32 ft (9.8 m), non-combustible baffles, equal in height to the depth of the tees, can be installed so that the space between the tees does not exceed 32 ft (9.8 m).
  2. The sprinkler deflector is to be located in a horizontal plane at or above 1" (25.4 mm) below the bottom of the concrete tee stems.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to pages EC1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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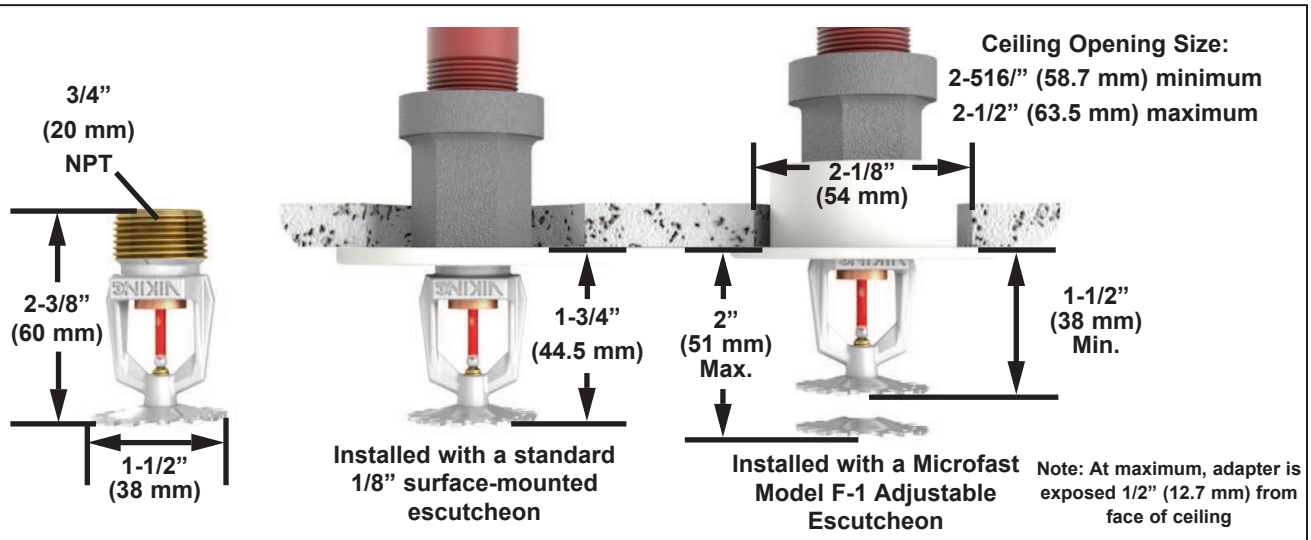

Figure 3: Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

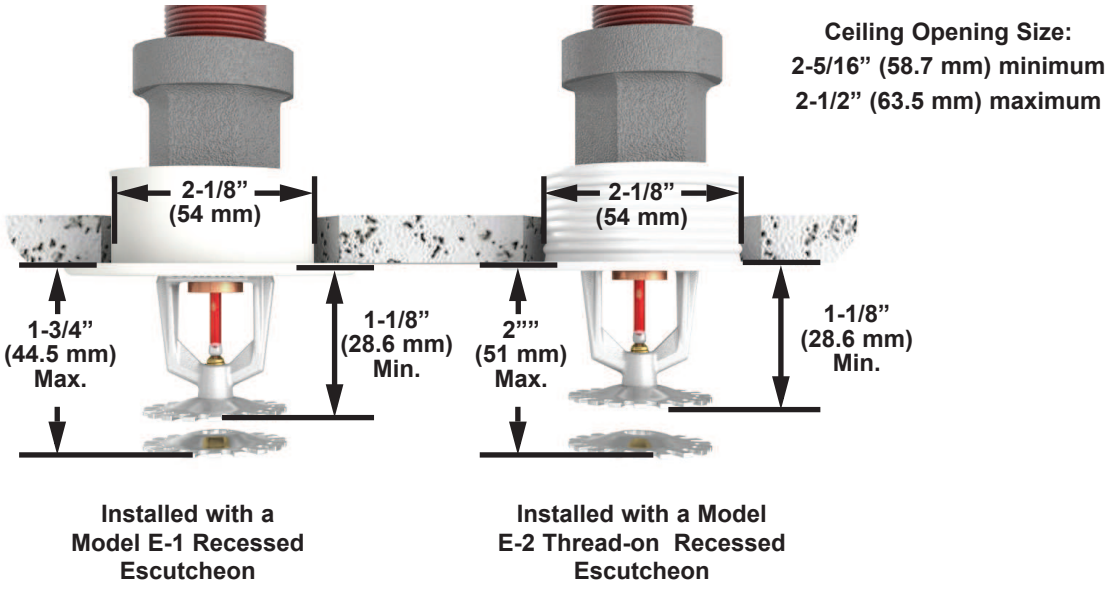

Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

PIPE

SCHEDULE 10 & 40

Always ready to protect your most valuable assets.

As the leading supplier of steel sprinkler pipe, we understand that there are no second chances in fire suppression. You need products of enduring quality and exceptional strength–plus reliable service. You need Bull Moose.

Bull Moose Fire Sprinkler Pipe Product Information

	Nominal Pipe Size (Inches)	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
SCHEDULE 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.820	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086
	C.R.R.	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805
	Pieces per Lift	91	61	61	37	30	19	19	10	7
	Lift Weight (lbs) 21' lengths	2,695	2,319	2,677	2,051	2,224	1,732	2,242	1,951	2,490
	Lift Weight (lbs) 24' lengths	3,079	2,650	3,060	2,344	2,542	1,979	2,563	2,230	2,848
	Lift Weight (lbs) 25' lengths	3,208	2,760	3,187	2,442	2,648	2,062	2,670		

	NPS (In.)	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
SCHEDULE 40		1.315	1.660	1.900	2.375	2.875	3.500	4.500
		1.049	1.380	1.610	2.067	2.469	3.068	4.026
		1.680	2.270	2.720	3.660	5.800	7.580	10.800
		2.055	2.918	3.602	5.114	7.875	10.783	16.316
		1.00	1.00	1.00	1.00	1.00	1.00	1.00
		70	51	44	30	30	19	19
		2,470	2,431	2,513	2,306	3,654	3,024	4,309
		2,822	2,778	2,872	2,635	4,176	3,456	4,925
		2,940	2,894	2,992	2,745	4,350	3,601	5,130

SCHEDULE 10 & 40 ADVANTAGES:

- UL listed (US & Canada) and FM approved
- ASTM A135 and A795 Type E, Grade A Certified
- Complies with NFPA-13, 13R and 14
- Industry-leading hydraulic characteristics
- CRR of 1.0 and greater
- All pipe NDT weld tested

OTHER BENEFITS/SERVICES:

- We have the most stocking locations in the industry, for best delivery and availability
- Plain end or roll groove
- Eddy Guard II™ bacterial-resistant internal coating
- Custom length options
- Hot dipped galvanization
- Reddi-Pipe® red or black pipe eliminates field painting
- Compatible for use in wet, dry, preaction and deluge sprinkler systems
- The only maker with EPDs (to help earn LEED points).

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FM APPROVED

NFPA

AFSA American Fire Sprinkler Association

NFSA The Voice of the Fire Sprinkler Industry

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sales@BullMooseIndustries.com
BullMooseTube.com

HANGER MATERIAL

Threaded Rods

Low Carbon Steel Threaded Rod

The most economical and most common form of Threaded Rod. Typically used by the plumbing and contracting trades. Used in maintenance departments in various applications including hanging, mounting, bracing, supporting, and fastening applications.

- Low carbon steel according to ASTM A307, Grade A requirements
- Conforms to ASME B18.31.3
- Class 1A rolled threads
- Zinc Plated according to Fe/Zn 3AT Per ASTM F1941
- Hot Dip Galvanized according to ASTM A153 or F2329
- 60,000 psi Min. Tensile Strength

Thread - Coarse																	
		1 ft		2 ft		3 ft			6 ft			10 ft			12 ft		
		Plain	Zinc	Plain	Zinc	Plain	Zinc	Hot Dip Galvanized	Plain	Zinc	Hot Dip Galvanized	Plain	Zinc	Hot Dip Galvanized	Plain	Zinc	Hot Dip Galvanized
Diameter	Thread Size	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
#6	32	-	-	-	-	47002	47052	-	47102	47152	-	-	-	-	-	-	-
#8	32	-	-	-	-	47003	47053	-	47103	47153	-	47136	47186	-	-	-	-
#10	24	-	-	-	-	47004	47054	-	47104	47154	-	47137	47187	-	-	-	-
#12	24	-	-	-	-	47006	47056	-	-	47156	-	-	-	-	-	-	-
1/4"	20	0156376	0156317	0156377	0156318	47007	47057	-	47107	47157	-	47140	47190	-	47207	47257	-
5/16"	18	0156378	0156319	0156379	0156320	47009	47059	-	47109	47159	-	47141	47191	-	47209	47259	-
3/8"	16	0156380	0156321	0156381	0156322	47011	47061	47602	47111	47161	47618	47142	47192	47634	47211	47261	47650
7/16"	14	0156382	0156323	0156383	0156324	47013	47063	0156404	47113	47163	-	47143	47193	-	47213	47263	-
1/2"	13	0156384	0156325	0156385	0156326	47015	47065	47604	47115	47165	47620	47144	47194	47636	47215	47265	47652
9/16"	12	0156386	0156327	0156387	0156328	47017	47067	-	47117	47167	-	47145	47195	-	47217	47267	-
5/8"	11	0156388	0156329	0156389	0156330	47019	47069	47606	47119	47169	47622	47146	47196	47638	47219	47269	47654
3/4"	10	0156390	0156331	0156391	0156332	47021	47071	47607	47121	47171	47623	47147	47197	47639	47221	47271	47655
7/8"	9	0156392	0156333	0156393	0156334	47023	47073	0156408	47123	47173	47624	47148	47198	47640	47223	47273	47656
1"	8	0156394	0156335	0156395	0156336	47025	47075	47609	47125	47175	47625	47149	47199	47641	47225	47275	47657
1-1/8"	7	-	-	-	-	47027	47077	-	47127	47177	47626	47150	47200	47642	47227	47277	47658
1-1/4"	7	-	-	-	-	47028	47078	47611	47128	47178	47627	47151	47201	47643	47228	47278	47659
1-3/8"	6	-	-	-	-	47029	47079	-	47129	47179	-	47233	47237	47644	47229	47279	47660
1-1/2"	6	-	-	-	-	47030	47080	-	47130	47180	47629	47234	47238	47645	47230	47280	47661
1-3/4"	5	-	-	-	-	47031	47081	-	47131	47181	47630	47235	47239	47646	47231	47281	47662
2"	4.5	-	-	-	-	47032	47082	-	47132	47182	-	47236	47240	47647	47232	47282	47663

Thread - Fine							
		3 ft		6 ft		12 ft	
		Plain	Zinc	Plain	Zinc	Plain	Zinc
Diameter	Thread Size	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
#10	32	47005	47055	47105	47155	-	-
1/4"	28	47008	47058	47108	47158	47208	47258
5/16"	24	47010	47060	47110	47160	47210	47260
3/8"	24	47012	47062	47112	47162	47212	47262
7/16"	20	47014	47064	47114	47164	47214	47264
1/2"	20	47016	47066	47116	47166	47216	47266
9/16"	18	47018	47068	47118	47168	-	47268
5/8"	18	47020	47070	47120	47170	47220	47270
3/4"	16	47022	47072	47122	47172	47222	47272
7/8"	14	47024	47074	47124	47174	47224	47274
1"	14	47026	47076	47126	47176	47226	47276
1-1/8"	12	47033	47085	47133	47183	47094	-
1-1/4"	12	47034	47086	47134	47184	47095	47098
1-1/2"	12	47035	47087	47135	47185	47096	-

Left Hand Low Carbon Steel Threaded Rod

The most economical and most common form of Threaded Rod. Typically used by the plumbing and contracting trades. Used in maintenance departments in various applications; left hand threading. Plain Finish, or bare metal finish which may contain a light coating of oil.

- 6 foot lengths

Thread - Left Hand - Coarse		
		Plain
Diameter	Thread Size	Part No.
1/4"	20	47302
5/16"	18	47303
3/8"	16	47304
1/2"	13	47306
5/8"	11	47308
3/4"	10	47309
7/8"	9	47310
1"	8	47311
1-1/8"	7	47312
1-1/4"	7	47313
1-1/2"	6	47315
2"	4.5	47318

Metric Threaded Rod

- Made from heat treated Class 8.8 steel.

Thread - Coarse				
		Class 4.6		Class 8.8
		Plain	Zinc	Plain
Diameter	Thread Size	Part No.	Part No.	Part No.
M2	0.4	-	0162065	-
M3	0.5	-	0162068	-
M4	0.7	47556	0162070	-
M5	0.8	47570	0162071	-
M6	1.0	47571	0162072	47870
M8	1.25	47572	0162073	47872
M10	1.5	47573	0162075	47873
M12	1.75	47574	0162078	47874
M14	2.0	47575	0162081	47875
M16	2.0	47576	0162083	47876
M18	2.5	47577	0162085	47877
M20	2.5	47578	0162086	47878
M22	2.5	47579	-	47879
M24	3.0	47580	0162088	47880

Thread - Coarse				
		Class 4.6		Class 8.8
		Plain	Zinc	Plain
Diameter	Thread Size	Part No.	Part No.	Part No.
M27	3.0	47581	0162089	47881
M30	3.5	47582	0162090	47882
M33	3.5	47733	-	47883
M36	4.0	47583	-	47884
M39	4.0	47734	-	47885
M42	4.5	47735	-	47886
M48	5.0	47737	-	-

Thread - Fine		
		Class 4.6
		Zinc
Diameter	Thread Size	Part No.
M8	1.0	0162074
M10	1.0	0162077
M10	1.25	0162076
M12	1.25	0162080
M12	1.5	0162079
M14	1.5	0162082
M16	1.5	0162084

Fig. 69 (Formerly Afcon Fig. 300) Adjustable Swivel Ring, Tapped Per NFPA Standards

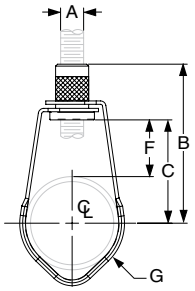
Size Range: 1/2" through 8"
Material: Carbon steel
Finish: Strap is Pre-Galvanized Zinc Material. Nut is Zinc Plated.
Service: Recommended for suspension of non-insulated **stationary** pipe line.
Maximum Temperature: 450° F
Approvals: Complies with Federal Specification A-A-1192A (Type 10), *WW-H-171-E (Type 10)*, and ANSI/MSS SP-58 (Type 10). UL Listed and FM Approved (Sizes 3/4" - 8").
Features:

- 1/2" - 2" sizes designed for use with steel and CPVC piping and manufactured with FBC System Compatible oil.
- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the 1/2" through 6" sizes. The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but not allowing the nut to fall completely out.

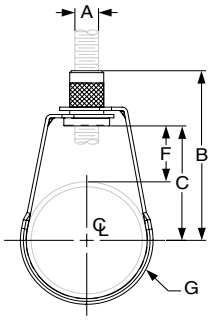
Ordering: Specify size, figure number and name.
Non-captured nut also available upon request.

1/2" through 2" Size
Rounded Edge Design

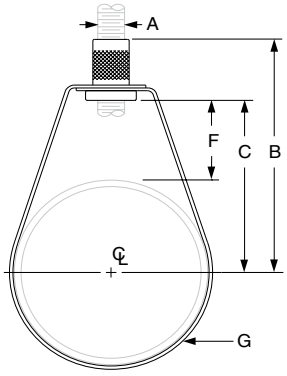
c UL us LISTED FM APPROVED



1/2" through 1" pipe



1 1/4" through 2" pipe



2 1/2" through 8" pipe

2 1/2" through 8" Size

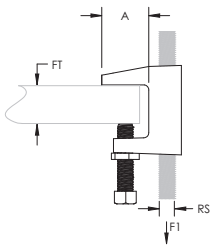
FIG. 69: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

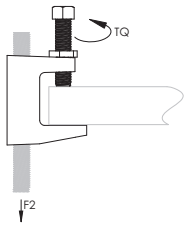
Pipe Size	Max Load	Weight	Rod Size A	B	C	F	G Width
1/2	300	0.10	3/8	2 7/8	2	1 9/16	5/8
3/4		0.10		2 3/4	1 7/8	1 5/16	
1		0.10		2 9/16	1 11/16	1	
1 1/4		0.10		2 5/8	1 3/4	7/8	
1 1/2		0.10		2 3/4	1 7/8		
2		0.11		3 1/4	2 3/8	1 1/8	
2 1/2	525	0.20		4	2 3/4	1 5/16	3/4
3		0.20		3 13/16	2 15/16	1 3/16	
4	650	0.30		4 11/16	3 13/16	1 9/16	
5	1,000	0.54	1/2	5 5/16	4 3/8		
6		0.65		6 11/16	5 9/16	2 1/4	
8		1.00		8 9/16	7 9/16	3 1/4	

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

300 Universal Beam Clamp

- Conforms with Federal Specification WW-H-171 (Type 23), Manufacturers Standardization Society ANSI®/MSS-SP-58 (Type 19 and 23)





Material: Steel

Part Number	Rod Size RS	Flange Thickness FT	A	Torque TQ	Static Load 1 F1	Static Load 2 F2	Certifications	Standard Packaging Quantity
Finish: Plain								
3000037PL	3/8"	13/16" Max	1 1/8"	5 ft lb	500 lb	250 lb	cULus, FM	100 pc
3000050PL	1/2"	13/16" Max	1 1/8"	8 ft lb	950 lb	760 lb	cULus, FM	50 pc
3000062PL	5/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000075PL	3/4"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000087PL	7/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
Finish: Electrogalvanized								
3000037EG	3/8"	13/16" Max	1 1/8"	5 ft lb	500 lb	250 lb	cULus, FM	100 pc
3000050EG	1/2"	13/16" Max	1 1/8"	8 ft lb	950 lb	760 lb	cULus, FM	50 pc
3000062EG	5/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000075EG	3/4"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc
3000087EG	7/8"	13/16" Max	1 1/8"	5 ft lb	950 lb	760 lb	cULus	50 pc

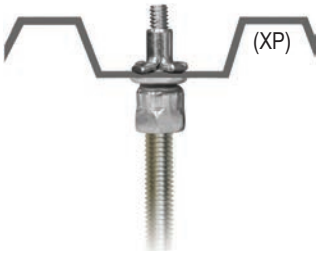
Setscrew must be tightened and torqued onto the sloped side of the I-beam.

Recognizing that torque wrenches are generally not used or available on many job sites, the setscrew should be tightened so it contacts the I-beam and then an additional 1/4 to 1/2 turn added.

SAMMY X-PRESS® *Installs into Metal Deck, Purlin, or Tubular Steel*

SAMMY X-PRESS® - Vertical Application

Application

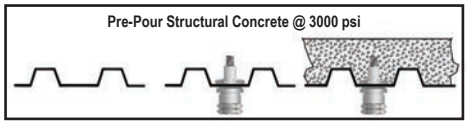


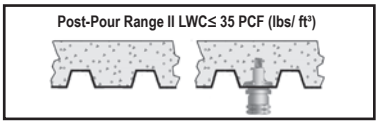
Product Features

- The ***Sammy X-Press*** expands to provide direct vertical attachment in:
  - light gauge steel deck or purlin (22 ga. - 1/8").
- Installs in seconds with Sammy X-Press It® Tool, saving time & installation costs.
- Use in applications where access to the back of the installed fastener is prohibited. ie. metal roof deck, tubular steel, or vapor barrier fabric.
- Less jobsite material needed.
- No retaining nut required.
- Provides design flexibility.
- Manufactured in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

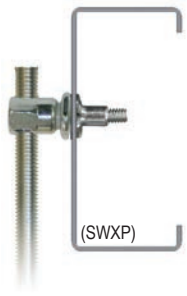
Approvals	Rod Size	Part Number	Model	Description	Ultimate Pullout (lbs)	UL Test Load (lbs)	UL Min Thick	FM Test Load (lbs)	FM Min Thick	Max Thick	Box Qty	Case Qty	Application
VERTICAL MOUNT													
UL	1/4"	8181922	XP 200	Sammy X-Press 200	1146 (22 ga)	185 (Luminaire) 250 (Luminaire)	.027" .056"			.125"	25	125	Metal Deck
UL FM	3/8"	8150922	XP 20	Sammy X-Press 20	1146 (22 ga)	850 (2½" Pipe) 185 (Luminaire) 250 (Luminaire) 283 (Conduit & Cable)	.027" .027" .056" .029"	940 (2" Pipe) 1475 (4" Pipe)	.029" .104"	.125"	25	125	Metal Deck
UL FM	3/8"	8153922	XP 35	Sammy X-Press 35	1783 (16 ga)	1500 (4" Pipe) 185 (Luminaire) 250 (Luminaire) 416 (Conduit & Cable)	.060" .029" .056" .059"	940 (2" Pipe) 1475 (4" Pipe)	.029" .104"	.125"	25	125	Purlin
UL	3/8"	8150922	XP 20	Sammy X-Press 20	1146 (22 ga)	850 (2½ Pipe)		Pre-Pour Structural Concrete@ 3000 psi Post-Pour Range II LWC≤ 35 PCF (lbs/ft³)			25	125	Metal Deck (Pre-Pour) Metal Deck (Post-Pour)





SAMMY X-PRESS SIDEWINDER™ - Horizontal Application

Application



Product Features

- The ***Sammy X-Press Sidewinder*** expands to provide horizontal attachment in:
  - 16 ga - 3/16" steel - purlin, tubular steel.
- Installs in seconds with Sammy X-Press It® Tool, saving time & installation costs.
- Use in applications where access to the back of the installed fastener is prohibited; ie. metal roof deck, tubular steel, or vapor barrier fabric.
- Less jobsite material needed.
- No retaining nut required.
- Provides design flexibility.
- Manufactured in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Description	Ultimate Pullout (lbs)	UL Test Load (lbs)	UL Min Thick	FM Test Load (lbs)	Max Thick	Box Qty	Case Qty	Application
HORIZONTAL MOUNT												
UL	3/8"	8293957	SWXP 35	Sidewinder X-Press 35	1798 (16 ga)	1250 (3½" Pipe) 80 (Luminaire) 416 (Conduit & Cable)	.059"		.125"	25	125	Purlin

MANUFACTURED U.S.A.

RoHS Compliant

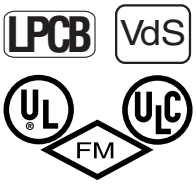
FITTINGS

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500
www.tyco-fire.com

Grinnell Grooved Fire Protection Products
Grooved Fittings

General Description



See Fire Protection Submittal Sheet for Pressure Rating and Listing/Approval Information

The grooved fittings provide an economical and efficient method of changing direction, adding an outlet, reducing, or capping grooved piping systems. Grooved fittings are available in durable ductile iron or fabricated steel as indicated.

Note: Figure 510S and 519S fittings are special short radius fittings with smaller center to end dimensions than standard grooved fittings. Depending on the size and coupling used, there may be interferences at the bolt pads that require repositioning of the coupling orientation. The use of flange adapters is not recommended with Figures 510S and 519S fittings. Contact Tyco Fire Products for details.

WARNING

The 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 this device.***

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

Approvals:

UL, FM, ULC, VdS, and LPCB;

Note: See Fire Protection Submittal Sheet for exact Listing / Approval information.

Material:

Cast: Figures: 201, 210, 219, 250, 260, 501, 510, 519, 510DE, 501S, 510S and 519S - Ductile iron conforming to ASTM A-536, Grade 65-45-12

Fabricated Steel: Figures 391, 392, 393, 312, 313, 321, 327, 341 and 350 - Carbon Steel, (Sizes 1¼" - 6" are Schedule 40); (Sizes 8" - 12" are Schedule 30), conforming to ASTM A-53 Grade B

Protective Coatings:

- Non-lead orange paint
- Fire brigade red (optional) non-lead paint
- Hot dipped galvanized conforming to ASTM A-153

Ordering Procedure

When placing an order, indicate the full product name. Please specify the quantity, figure number, wall thickness, and size.

Grinnell Grooved Piping Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, through a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance 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. Any impairment must be immediately corrected. It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

Limited Warranty

Products manufactured by Tyco Fire Products 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 Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 (NFPA), and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products 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 TYCO FIRE PRODUCTS 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 TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.

Figures 201, 210, 219, and 260

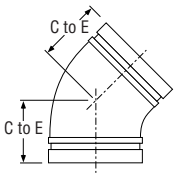


Figure 201

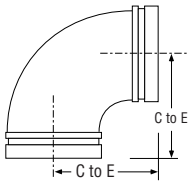


Figure 210

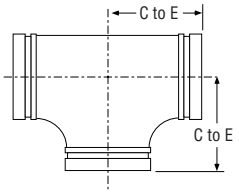


Figure 219

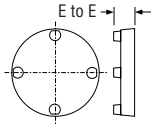


Figure 260

Friction Resistance* (Expressed as Equivalent Straight Pipe)				
Size Inches *mm*	Elbow 90° Feet *Meters*	Elbow 45° Feet *Meters*	Tee Branch Feet *Meters*	Tee Run Feet *Meters*
1¼ *42.4*	1.9 *0.6*	1.0 *0.3*	4.8 *1.5*	1.9 *0.6*
1½ *48.3*	2.3 *0.7*	1.2 *0.4*	5.8 *1.8*	2.3 *0.7*
2 *60.3*	3.2 *1.0*	1.6 *0.5*	8.0 *2.5*	3.2 *1.0*
2½ *73.0*	3.9 *1.2*	2.0 *0.6*	9.8 *3.0*	3.9 *1.2*
76.1mm	4.1 *1.2*	2.1 *0.6*	10.3 *3.1*	4.1 *1.2*
3 *88.9*	4.9 *1.5*	2.4 *0.7*	12.2 *3.7*	4.9 *1.5*
108.0mm	6.5 *2.0*	3.3 *1.0*	16.3 *5.0*	6.5 *2.0*
4 *114.3*	6.5 *2.0*	3.3 *1.0*	16.3 *5.0*	6.5 *2.0*
133.0mm	8.0 *2.4*	4.0 *1.2*	20.0 *6.1*	8.0 *2.4*
139.7mm	8.0 *2.4*	4.1 *1.3*	20.0 *6.1*	8.0 *2.4*
5 *141.3*	8.2 *2.5*	4.1 *1.3*	20.5 *6.3*	8.2 *2.5*
159.0mm	9.5 *2.9*	4.8 *1.4*	23.8 *7.2*	9.5 *2.9*
165.1mm	9.5 *2.9*	4.8 *1.4*	23.8 *7.2*	9.5 *2.9*
6 *168.3*	9.9 *3.0*	5.0 *1.5*	24.8 *7.6*	9.9 *3.0*
216.3mm	13.1 *4.0*	6.6 *2.0*	32.8 *10.0*	13.1 *4.0*
8 *219.1*	13.1 *4.0*	6.6 *2.0*	32.8 *10.0*	13.1 *4.0*
10 *273.0*	16.5 *5.0*	8.3 *2.5*	41.3 *12.6*	16.5 *5.0*
12 *323.4*	19.9 *6.1*	9.9 *3.0*	49.7 *15.1*	19.9 *6.1*

For reducing tees and branches, use the value that is corresponding to the branch size. Example: for 8" x 8" x 2" tee, the branch value 2" is 8.0 feet.

* Friction resistance for all elbows and tees except Figures 510S and 519S.

Nominal Size	Figure 201 45° Elbow C to E Inches *mm*	Figure 201 45° Elbow Appx. Wt. Lbs. *Kg.*	Figure 210 90° Elbow C to E Inches *mm*	Figure 210 90° Elbow Appx. Wt. Lbs. *Kg.*	Figure 219 Tee C to E Inches *mm*	Figure 219 Tee Appx. Wt. Lbs. *Kg.*	Figure 260‡ End Cap E to E Inches *mm*	Figure 260‡ End Cap Appx. Wt. Lbs. *Kg.*
1¼"	1.75 *44.5*	0.9 *0.4*	2.75 *69.9*	1.0 *0.5*	2.75 *69.9*	1.4 *0.6*	0.88 *22.4*	0.4 *0.2*
1½"	1.75 *44.5*	1.1 *0.5*	2.75 *69.9*	1.2 *0.5*	2.75 *69.9*	1.8 *0.8*	0.88 *22.4*	0.6 *0.3*
2"	2.00 *50.8*	1.8 *0.8*	3.25 *82.6*	2.0 *0.9*	3.25 *82.6*	2.7 *1.2*	0.88 *22.4*	0.9 *0.4*
2½"	2.25 *57.2*	2.2 *1.0*	3.75 *95.3*	3.0 *1.4*	3.75 *95.3*	5.8 *2.6*	0.88 *22.4*	0.9 *0.4*
76.1mm	2.25 *57.2*	2.2 *1.0*	3.75 *95.3*	3.0 *1.4*	3.75 *95.3*	5.8 *2.6*	0.94 *23.9*	1.1 *0.5*
3"	2.50 *63.5*	3.5 *1.6*	4.25 *108.0*	4.5 *2.0*	4.25 *108.0*	7.0 *3.2*	0.88 *22.4*	1.1 *0.5*
108.0mm	2.88 *73.0*	5.5 *2.5*	4.75 *120.7*	8.5 *3.9*	4.75 *120.7*	11.5 *5.2*	-	-
4"	3.00 *76.2*	5.2 *2.4*	5.00 *127.0*	8.5 *3.9*	5.00 *127.0*	11.8 *5.4*	1.00 *25.4*	2.6 *1.2*
133.0mm	3.25 *82.6*	7.7 *3.5*	5.25 *133.4*	11.3 *5.1*	5.25 *133.4*	10.6 *4.8*	-	-
139.7mm	3.25 *82.6*	7.7 *3.5*	5.50 *139.7*	11.3 *5.1*	5.50 *139.7*	15.3 *6.9*	0.92 *23.4*	4.7 *2.1*
5"	3.25 *82.6*	8.5 *3.9*	5.50 *139.7*	13.5 *6.1*	5.50 *139.7*	17.0 *7.7*	1.00 *25.4*	5.0 *2.3*
159.0mm	3.50 *88.9*	12.0 *5.4*	6.00 *152.4*	14.6 *6.6*	6.00 *152.4*	13.9 *6.3*	-	-
165.1mm	3.50 *88.9*	12.0 *5.4*	6.50 *165.1*	18.5 *8.4*	6.50 *165.1*	26.0 *11.8*	1.00 *25.4*	7.5 *3.4*
6"	3.50 *88.9*	12.0 *5.4*	6.50 *165.1*	18.5 *8.4*	6.50 *165.1*	26.0 *11.8*	1.00 *25.4*	7.5 *3.4*
216.3mm	4.25 *108.0*	23.0 *10.4*	7.75 *196.9*	36.5 *16.6*	7.75 *196.9*	45.0 *20.4*	-	-
8"	4.25 *108.0*	23.0 *10.4*	7.75 *196.9*	36.5 *16.6*	7.75 *196.9*	45.0 *20.4*	1.19 *30.2*	12.8 *5.8*
10"	4.75 *120.7*	31.0 *14.1*	9.00 *228.6*	60.0 *27.2*	9.00 *228.6*	72.1 *32.7*	1.25 *31.8*	20.0 *9.1*
12"	5.25 *133.4*	40.0 *18.1*	10.00 *254.0*	67.0 *30.4*	10.00 *254.0*	92.5 *42.0*	1.25 *31.8*	36.0 *16.3*

‡ - Available with tapped plugs, contact Tyco Fire & Building Products.

Figures 501, 510, 519 and 510DE

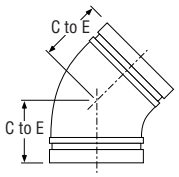


Figure 501

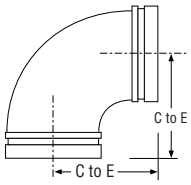


Figure 510

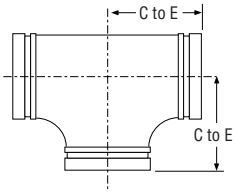


Figure 519

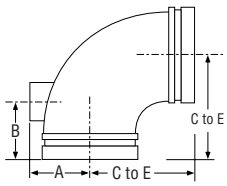


Figure 510DE

Nominal Size	Figure 501 45° Elbow C to E Inches *mm*	Figure 501 45° Elbow Appx. Wt. Lbs. *Kg.*	Figure 510 90° Elbow C to E Inches *mm*	Figure 510 90° Elbow Appx. Wt. Lbs. *Kg.*	Figure 519 Tee C to E Inches *mm*	Figure 519 Tee Appx. Wt. Lbs. *Kg.*	Figure 510DE 90° Drain Elbow C to E Inches *mm*	Figure 510DE 90° Drain Elbow A Inches *mm*	Figure 510DE 90° Drain Elbow B Inches *mm*	Figure 510DE 90° Drain Elbow Appx. Wt. Lbs. *Kg.*
1¼"	1.75 *44.5*	0.9 *0.4*	2.75 *69.9*	1.0 *0.5*	2.75 *69.9*	1.4 *0.6*	-	-	-	-
1½"	1.75 *44.5*	1.1 *0.5*	2.75 *69.9*	1.2 *0.5*	2.75 *69.9*	1.8 *0.8*	-	-	-	-
2"	2.00 *50.8*	1.8 *0.8*	3.25 *82.6*	2.0 *0.9*	3.25 *82.6*	2.7 *1.2*	-	-	-	-
2½"	2.25 *57.2*	2.2 *1.0*	3.75 *95.3*	3.0 *1.4*	3.75 *95.3*	5.8 *2.6*	3.75 *95.3*	2.00 *50.8*	2.75 *69.9*	2.7 *1.2*
3"	2.50 *63.5*	3.5 *1.6*	4.25 *108.0*	4.5 *2.0*	4.25 *108.0*	7.0 *3.2*	4.25 *108.0*	2.34 *59.4*	2.75 *69.9*	3.7 *1.7*
4"	3.00 *76.2*	5.2 *2.4*	5.00 *127.0*	8.5 *3.9*	5.00 *127.0*	11.8 *5.4*	5.00 *127.0*	2.85 *72.4*	2.75 *69.9*	7.0 *3.2*
5"	3.25 *82.6*	8.5 *3.9*	5.50 *139.7*	13.5 *6.1*	5.50 *139.7*	17.0 *7.7*	5.50 *139.7*	3.38 *85.9*	2.75 *69.9*	13.0 *5.9*
6"	3.50 *88.9*	12.0 *5.4*	6.50 *165.1*	18.5 *8.4*	6.50 *165.1*	26.0 *11.8*	6.50 *165.1*	3.92 *99.6*	2.75 *69.9*	13.4 *6.1*
8"	4.25 *108.0*	23.0 *10.4*	7.75 *196.9*	36.5 *16.6*	7.75 *196.9*	45.0 *20.4*	7.75 *196.9*	4.95 *125.7*	2.75 *69.9*	26.3 *11.9*

Figures 501S, 510S and 519S

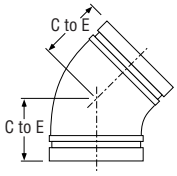


Figure 501S

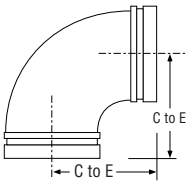


Figure 510S*

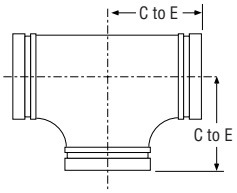


Figure 519S*

Friction Resistance 501S, 510S & 519S (Expressed as Equivalent Straight Pipe)				
Size Inches *mm*	Elbow 90° Feet *Meters*	Elbow 45° Feet *Meters*	Tee Branch Feet *Meters*	Tee Run Feet *Meters*
2 *60.3*	3.2 *1.0*	1.6 *0.5*	8.0 *2.5*	3.2 *1.0*
2½ *73.0*	3.9 *1.2*	2.0 *0.6*	9.8 *3.0*	3.9 *1.2*
76.1mm	4.1 *1.2*	2.1 *0.6*	10.3 *3.1*	4.1 *1.2*
3 *88.9*	4.9 *1.5*	2.4 *0.7*	12.2 *3.7*	4.9 *1.5*
4 *114.3*	6.5 *2.0*	3.3 *1.0*	16.3 *5.0*	6.5 *2.0*
139.7mm	8.0 *2.4*	4.1 *1.3*	20.0 *6.1*	8.0 *2.4*
5 *141.3*	8.2 *2.5*	4.1 *1.3*	20.5 *6.3*	8.2 *2.5*
165.1mm	9.5 *2.9*	4.8 *1.4*	23.8 *7.2*	9.5 *2.9*
6 *168.3*	9.9 *3.0*	5.0 *1.5*	24.8 *7.6*	9.9 *3.0*
8 *219.1*	13.1 *4.0*	6.6 *2.0*	32.8 *10.0*	13.1 *4.0*

Nominal Size	Figure 501S 45° Elbow C to E Inches *mm*	Figure 501S 45° Elbow Appx Wt. Lbs. *Kg.*	Figure 510S 90° Elbow C to E Inches *mm*	Figure 510S 90° Elbow Appx. Wt. Lbs. *Kg.*	Figure 519S Tee C to E Inches *mm*	Figure 519S Tee Appx. Wt. Lbs. *Kg.*
2"	2.00 *50.8*	1.8 *0.8*	2.75 *69.9*	1.5 *0.7*	2.75 *69.9*	2.1 *1.0*
2½"	2.25 *57.2*	2.2 *1.0*	3.00 *76.2*	2.2 *1.0*	3.00 *76.2*	3.0 *1.4*
76.1mm	2.25 *57.2*	2.2 *1.0*	3.00 *76.2*	2.3 *1.0*	3.00 *76.2*	3.1 *1.4*
3"	2.50 *63.5*	3.5 *1.6*	3.38 *85.9*	3.0 *1.3*	3.38 *85.9*	4.1 *1.9*
4"	3.00 *76.2*	5.2 *2.4*	4.00 *101.6*	5.6 *2.6*	4.00 *101.6*	7.7 *3.5*
139.7mm	3.25 *82.6*	7.7 *3.5*	4.88 *124.0*	8.6 *3.9*	4.88 *124.0*	12.0 *5.4*
5"	3.25 *82.6*	8.5 *3.9*	4.88 *124.0*	8.8 *3.9*	4.88 *124.0*	12.0 *5.4*
165.1mm	3.50 *88.9*	12.0 *5.4*	5.50 *139.7*	11.00 *5.0*	5.50 *139.7*	15.0 *6.8*
6"	3.50 *88.9*	12.0 *5.4*	5.50 *139.7*	11.2 *5.1*	5.50 *139.7*	15.2 *6.9*
8"	4.25 *108.0*	23.0 *10.4*	6.88 *174.8*	23.4 *10.6*	6.88 *174.8*	31.2 *14.2*

***Note: Figure 510S and 519S fittings are special short radius fittings with smaller center to end dimensions than standard grooved fittings. Depending on the size and coupling used, there may be interferences at the bolt pads which requires repositioning of the coupling orientation. The use of flange adapters is not recommended with Figures 510S and 519S fittings. Contact Tyco Fire Products for details.**

Figures 250 and 350

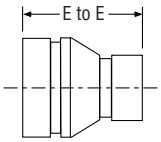


Figure 250
Cast

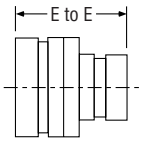


Figure 350
Fabricated
Sizes 3" to 6"

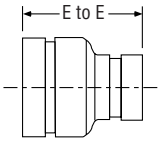


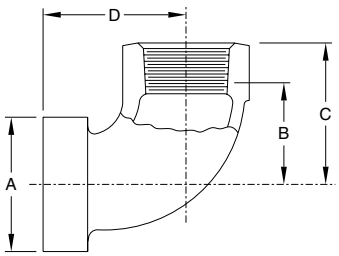
Figure 350
Fabricated
Sizes 8" to 12"

Figures 250 and 350 Concentric Reducer - Groove x Groove								
Nominal Size *Inches*	E to E Inches *mm*	Appx. Wt. Lbs. *Kg.*	Nominal Size *Inches*	E to E Inches *mm*	Appx. Wt. Lbs. *Kg.*	Nominal Size *Inches*	E to E Inches *mm*	Appx. Wt. Lbs. *Kg.*
*2 x 1¼	2.50 *63.5*	1.0 *0.5*	*139.7mm x 3	3.50 *88.9*	4.2 *1.9*	*6 x 5	4.00 *101.6*	5.8 *2.6*
*2 x 1½	2.50 *63.5*	1.3 *0.6*	*139.7mm x 4	3.50 *88.9*	4.4 *2.0*	8 x 2	5.00 *127.0*	12.2 *5.5*
*2½ x 2	2.50 *63.5*	1.2 *0.5*	5 x 1½	3.50 *88.9*	4.6 *2.1*	8 x 2½	5.00 *127.0*	12.1 *5.5*
*76.1mm x 1½	2.50 *63.5*	1.5 *0.7*	5 x 2	3.50 *88.9*	4.6 *2.1*	8 x 3	5.00 *127.0*	12.0 *5.5*
*76.1mm x 2	2.50 *63.5*	1.6 *0.8*	5 x 2½	3.50 *88.9*	4.5 *2.0*	8 x 4	5.00 *127.0*	11.9 *5.4*
3 x 1¼	2.50 *63.5*	1.3 *0.6*	5 x 3	3.50 *88.9*	4.4 *2.0*	8 x 5	5.00 *127.0*	11.3 *5.1*
3 x 1½	2.50 *63.5*	1.3 *0.6*	*5 x 4	3.50 *88.9*	4.5 *2.0*	8 x 6	5.00 *127.0*	10.8 *4.9*
*3 x 2	2.50 *63.5*	1.3 *0.6*	*165.1mm x 3	4.00 *101.6*	5.5 *2.5*	10 x 4	6.00 *152.4*	21.9 *10.0*
*3 x 2½	3.00 *76.2*	1.5 *0.7*	*165.1mm x 4	4.00 *101.6*	6.0 *2.7*	10 x 5	6.00 *152.4*	21.6 *9.8*
*3 x 76.1mm	3.00 *76.2*	2.0 *0.9*	*165.1mm x 139.7mm	4.00 *101.6*	5.6 *2.5*	10 x 6	6.00 *152.4*	21.1 *9.6*
4 x 1¼	3.00 *76.2*	2.2 *1.0*	*6 x 2	4.00 *101.6*	6.0 *2.7*	10 x 8	6.00 *152.4*	19.5 *8.9*
4 x 1½	3.00 *76.2*	2.3 *1.0*	6 x 2½	4.00 *101.6*	6.0 *2.7*	12 x 4	7.00 *177.8*	28.0 *12.7*
*4 x 2	3.00 *76.2*	2.3 *1.0*	*6 x 76.1mm	4.00 *101.6*	6.0 *2.7*	12 x 6	7.00 *177.8*	30.0 *13.6*
*4 x 2½	3.00 *76.2*	2.3 *1.0*	6 x 3	4.00 *101.6*	6.0 *2.7*	12 x 8	7.00 *177.8*	28.0 *12.7*
*4 x 76.1mm	3.00 *76.2*	3.2 *1.5*	*6 x 4	4.00 *101.6*	5.9 *2.7*	12 x 10	7.00 *177.8*	33.0 *15.0*
4 x 3	3.00 *76.2*	2.6 *1.2*	*6 x 139.7mm	4.00 *101.6*	6.3 *2.9*			

Note: Sizes marked with an asterisk (*) are only available in Figure 250 Cast.
Sizes without an asterisk are only available in Figure 350 Fabricated.

ADA CAP®

Patented



Pipe		Nominal Dimensions				Net Wt. Lbs. *Kg.*
		O.D.	Takeout	Center to End		
Size Inches	Outlet NPT* Inches	A Inches *mm*	B Inches *mm*	C Inches *mm*	D Inches *mm*	
1½	½	1.900 *48.3*	1.25 *31.8*	1.75 *44.5*	1.89 *48.0*	0.77 *0.3*
	¾		1.25 *31.8*	1.75 *44.5*	1.89 *48.0*	0.77 *0.3*
	1		1.37 *34.8*	2.00 *50.8*	2.02 *51.3*	0.88 *0.4*
2	½	2.375 *60.3*	1.25 *31.8*	1.75 *44.5*	1.89 *48.0*	0.92 *0.4*
	¾		1.25 *31.8*	1.75 *44.5*	1.89 *48.0*	0.92 *0.4*
	1		1.37 *34.8*	2.00 *50.8*	2.02 *51.3*	1.06 *0.5*
2½	½	2.875 *73.0*	1.47 *37.3*	1.97 *50.0*	1.89 *48.0*	1.28 *0.6*
	¾		1.47 *37.3*	1.97 *50.0*	1.89 *48.0*	1.28 *0.6*
	1		1.37 *34.8*	2.00 *50.8*	2.02 *51.3*	1.50 *0.7*

* ISO-7 threaded outlets are available upon request.

Figures 391, 392, 393, 312 and 313

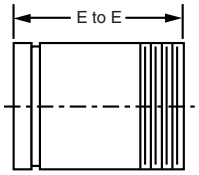


Figure 391

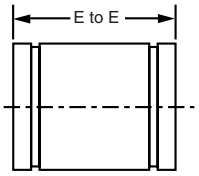


Figure 392

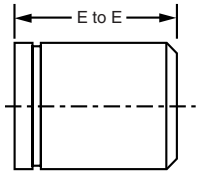


Figure 393

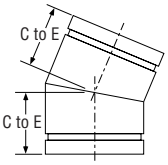


Figure 312

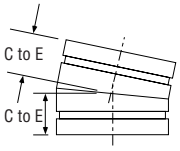


Figure 313

Nominal Size	Figures 391, 392 and 393 Adapter Nipples E to E Inches *mm*	Appx. Wt. Lbs. *Kg.*	Figure 312 22½° Elbow C to E Inches *mm*	Appx. Wt. Lbs. *Kg.*	Figure 313 11¼° Elbow C to E Inches *mm*	Appx. Wt. Lbs. *Kg.*
1¼"	4.00 *101.6*	0.8 *0.4*	1.75 *44.5*	0.4 *0.2*	1.38 *35.1*	0.4 *0.2*
1½"	4.00 *101.6*	0.9 *0.4*	1.75 *44.5*	0.5 *0.2*	1.38 *35.1*	0.5 *0.2*
2"	4.00 *101.6*	1.2 *0.5*	1.88 *47.8*	0.6 *0.3*	1.38 *35.1*	0.6 *0.3*
2½"	4.00 *101.6*	1.9 *0.9*	2.00 *50.8*	0.7 *0.3*	1.50 *38.1*	1.1 *0.5*
3"	4.00 *101.6*	2.5 *1.1*	2.25 *57.2*	1.4 *0.6*	1.50 *38.1*	1.2 *0.5*
4"	6.00 *152.4*	5.5 *2.5*	2.63 *66.8*	2.4 *1.1*	1.75 *44.5*	2.2 *1.0*
5"	6.00 *152.4*	7.4 *3.4*	2.88 *73.2*	4.1 *1.9*	2.00 *50.8*	3.3 *1.5*
6"	6.00 *152.4*	9.5 *4.3*	3.13 *79.5*	5.6 *2.5*	2.00 *50.8*	4.6 *2.1*
8"	6.00 *152.4*	14.2 *6.4*	3.88 *98.6*	11.1 *5.0*	2.00 *50.8*	8.7 *3.9*
10"	8.00 *203.2*	27.0 *12.2*	4.38 *11.3*	14.0 *6.4*	2.13 *54.1*	9.1 *4.1*
12"	8.00 *203.2*	33.0 *15.0*	4.88 *124.0*	22.0 *10.0*	2.25 *57.2*	16.7 *7.6*

Figures 327 and 341

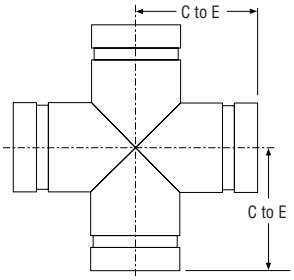


Figure 327

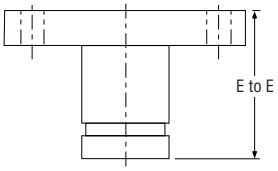


Figure 341

Nominal Size	Figure 327 Cross C to E nches *mm*	Appx. Wt. Lbs. *kg.*	Figure 341 150 lbs. Flange Adapter E to E Inches *mm*	Appx. Wt. Lbs. *kg.*
1¼"	2.75 *69.6*	2.0 *0.9*	4.00 *101.6*	2.8 *1.3*
1½"	2.75 *69.9*	2.2 *2.0*	4.00 *101.6*	3.2 *1.5*
2"	3.25 *82.6*	2.7 *1.2*	4.0 *101.6*	5.2 *2.4*
2½"	3.75 *95.3*	5.0 *2.3*	4.00 *101.6*	8.0 *3.6*
3"	4.25 *108.0*	7.1 *3.2*	4.00 *101.6*	10.2 *4.6*
4"	5.00 *127.0*	11.9 *5.4*	6.00 *152.4*	17.2 *7.8*
5"	5.50 *139.7*	17.1 *7.8*	6.00 *152.4*	21.4 *9.7*
6"	6.50 *165.1*	27.5 *12.5*	6.00 *152.4*	26.0 *11.8*
8"	7.75 *196.9*	47.0 *21.3*	6.00 *152.4*	38.4 *17.4*
10"	9.00 *228.6*	68.0 *30.8*	8.00 *203.2*	65.0 *29.5*
12"	10.00 *254.0*	107.0 *48.5*	8.00 *203.2*	91.0 *41.3*

Figure 321

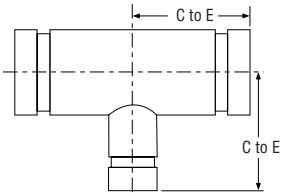


Figure 321

Figure 321 Reducing Tee					
Nominal Size Inches	C to E Inches *mm*	Appx. Wt. Lbs. *Kg.*	Nominal Size Inches	C to E Inches *mm*	Appx. Wt. Lbs. *Kg.*
1½ x 1½ x 1¼	3.25 *82.6*	2.0 *0.9*	6 x 6 x 4	6.50 *165.1*	26.6 *12.1*
2 x 2 x 1½	3.25 *82.6*	2.7 *1.2*	6 x 6 x 5	6.50 *165.1*	27.0 *12.2*
2½ x 2½ x 1¼	3.75 *95.3*	4.2 *1.9*	8 x 8 x 2	7.75 *196.9*	36.2 *16.4*
2½ x 2½ x 1½	3.75 *95.3*	4.2 *1.9*	8 x 8 x 3	7.75 *196.9*	36.5 *16.6*
2½ x 2½ x 2	3.75 *95.3*	4.3 *2.0*	8 x 8 x 4	7.75 *196.9*	36.6 *16.6*
3 x 3 x 1½	4.25 *108.0*	5.3 *2.4*	8 x 8 x 5	7.75 *196.9*	36.8 *16.7*
3 x 3 x 2	4.25 *108.0*	5.5 *2.5*	8 x 8 x 6	7.75 *196.9*	37.0 *16.8*
3 x 3 x 2½	4.25 *108.0*	5.8 *2.6*	10 x 10 x 2	9.00 *228.6*	57.1 *25.9*
4 x 4 x 1¼	5.00 *127.0*	9.8 *4.4*	10 x 10 x 3	9.00 *228.6*	57.4 *26.0*
4 x 4 x 1½	5.00 *127.0*	9.9 *4.5*	10 x 10 x 4	9.00 *228.6*	57.6 *26.1*
4 x 4 x 2	5.00 *127.0*	10.1 *4.6*	10 x 10 x 5	9.00 *228.6*	57.8 *26.2*
4 x 4 x 2½	5.00 *127.0*	10.3 *4.7*	10 x 10 x 6	9.00 *228.6*	58.0 *26.3*
4 x 4 x 3	5.00 *127.0*	10.5 *4.8*	10 x 10 x 8	9.00 *228.6*	58.4 *26.5*
5 x 5 x 2	5.50 *139.7*	14.5 *6.6*	12 x 12 x 3	10.00 *254.0*	80.2 *36.4*
5 x 5 x 2½	5.50 *139.7*	14.8 *6.7*	12 x 12 x 4	10.00 *254.0*	80.5 *36.5*
5 x 5 x 3	5.50 *139.7*	15.2 *6.9*	12 x 12 x 5	10.00 *254.0*	80.7 *36.6*
5 x 5 x 4	5.50 *139.7*	15.8 *7.2*	12 x 12 x 6	10.00 *254.0*	80.9 *36.7*
6 x 6 x 2	6.50 *165.1*	26.5 *11.9*	12 x 12 x 8	10.00 *254.0*	91.4 *41.5*
6 x 6 x 2½	6.50 *165.1*	26.5 *12.0*	12 x 12 x 10	10.00 *254.0*	91.8 *41.6*
6 x 6 x 3	6.50 *165.1*	26.5 *12.0*			

General Notes: It is the Designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Always read and understand the installation instructions (IH-1000). Never remove any piping component or correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

ISO 9001 Certified Company

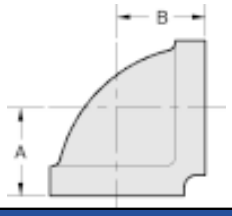
C.I. THREADED FITTINGS

S.P FITTINGS
A Division of Star Pipe Products

LISTED LISTED APPROVED

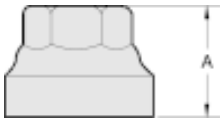
For fire protection services request submittal GRS 1.3

CAST IRON THREADED FITTINGS ARE UL, ULC LISTED AND FACTORY MUTUAL APPROVED FOR 300 PSI SERVICE. GRAY IRON PER ASTM A126 CLASS B. DIMENSIONS CONFORM TO ANSI B16.4 CLASS 125 EXCEPT PLUGS CONFORM TO ASME B16.14. THREADS ARE NPT PER ANSI/ASME B1.20.1.



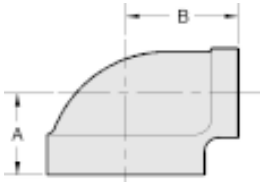
CAST IRON 90 DEGREE ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	CB90033	300	1.50	1.50	0.95
1 1/4	CB90044	300	1.75	1.75	1.34
1 1/2	CB90055	300	1.94	1.94	1.80
2	CB90066	300	2.25	2.25	2.90
2 1/2	CB90077	300	2.70	2.70	4.75



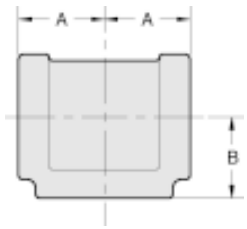
CAST IRON RED. COUPLING

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSION A	WEIGHT EACH PIECE
1X1/2	CRC031	300	1.70	0.62
1X3/4	CRC032	300	1.70	0.80



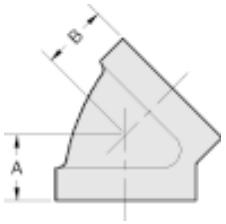
CAST IRON RED. 90 DEG. ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1X1/2	CB90031	300	1.26	1.36	0.64
1X3/4	CB90032	300	1.37	1.45	0.87
1 1/4X1/2	CB90041	300	1.34	1.53	0.96
1 1/4X3/4	CB90042	300	1.45	1.62	1.13
1 1/4X1	CB90043	300	1.58	1.67	1.16
1 1/2x1 1/2	CB90051	300	1.41	1.66	1.17
1 1/2x3/4	CB90052	300	1.52	1.75	1.28
1 1/2X1	CB90053	300	1.65	1.80	1.51
1 1/2X1 1/4	CB90054	300	1.82	1.88	1.62
2X1/2	CB90061	300	1.49	1.88	2.00
2X3/4	CB90062	300	1.60	1.97	2.05
2X1	CB90063	300	1.73	2.02	2.10
2X1 1/4	CB90064	300	1.90	2.10	2.30
2X1 1/2	CB90065	300	2.02	2.16	2.60



CAST IRON STRAIGHT TEE

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	CT333	300	1.50	1.50	1.21
1 1/4	CT444	300	1.75	1.75	1.87
1 1/2	CT555	300	1.94	1.94	2.51
2	CT666	300	2.25	2.25	3.96
2 1/2	CT777	300	2.70	2.70	6.45



CAST IRON 45 DEGREE ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	CB45033	300	1.12	1.12	0.84
1 1/4	CB45044	300	1.29	1.29	1.40
1 1/2	CB45055	300	1.43	1.43	1.80
2	CB45066	300	1.68	1.68	2.79

CAST IRON PLUGS

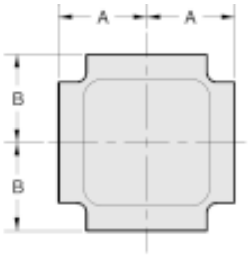
NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSION A	WEIGHT EACH PIECE
1/2	CPL001	300	0.94	0.10
3/4	CPL002	300	1.07	0.17
1	CPL003	300	1.25	0.28
1 1/4	CPL004	300	1.36	0.44
1 1/2	CPL005	300	1.45	0.62
2	CPL006	300	1.56	0.91

C.I. THREADED FITTINGS

S.P FITTINGS
A Division of Star Pipe Products

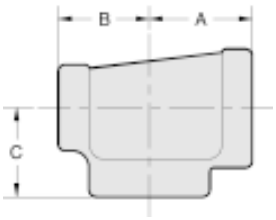
LISTED LISTED APPROVED

For fire protection services request submittal GRS 1.3



CAST IRON CROSS

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS		WEIGHT EACH PIECE
			A	B	
1	CX033	300	1.50	1.50	1.54
1 1/4	CX044	300	1.75	1.75	2.40
1 1/2	CX055	300	1.94	1.94	3.10
2	CX066	300	2.25	2.25	4.00
1 1/4X1	CX043	300	1.58	1.67	2.05
1 1/2X1	CX053	300	1.65	1.80	2.40
2X1	CX063	300	1.73	2.02	2.75



CAST IRON REDUCING TEE

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS			WEIGHT EACH PIECE
			A	B	C	
1X1X1/2	CT331	300	1.26	1.26	1.36	0.95
1X1X3/4	CT332	300	1.37	1.37	1.45	1.10
1X1/2X1	CT313	300	1.50	1.36	1.50	1.08
1X3/4X1	CT323	300	1.50	1.45	1.50	1.18
1X1X1 1/4	CT334	300	1.67	1.67	1.58	1.52
1X1X1 1/2	CT335	300	1.80	1.80	1.65	1.73
1 1/4X1X1/2	CT431	300	1.34	1.26	1.53	1.17
1 1/4X1X3/4	CT432	300	1.45	1.37	1.62	1.38
1 1/4X1X1	CT433	300	1.58	1.50	1.57	1.47
1 1/4X1X1 1/4	CT434	300	1.75	1.67	1.75	1.80
1 1/4X1X1 1/2	CT435	300	1.88	1.80	1.82	2.05
1 1/4X1 1/4X1/2	CT441	300	1.34	1.34	1.53	1.37
1 1/4X1 1/4X3/4	CT442	300	1.45	1.45	1.62	1.54
1 1/4X1 1/4X1	CT443	300	1.58	1.58	1.67	1.65
1 1/4X1 1/4X1 1/2	CT445	300	1.88	1.88	1.82	2.21
1 1/4X1 1/4X2	CT446	300	2.10	2.10	1.90	2.55
1 1/2X1X1/2	CT531	300	1.41	1.34	1.66	1.41
1 1/2X1X3/4	CT532	300	1.52	1.37	1.75	1.65
1 1/2X1X1	CT533	300	1.65	1.50	1.80	1.65
1 1/2X1X1 1/4	CT534	300	1.82	1.67	1.88	2.00
1 1/2X1X1 1/2	CT535	300	1.94	1.80	1.94	2.30
1 1/2X1 1/4X1/2	CT541	300	1.41	1.34	1.66	1.58
1 1/2X1 1/4X3/4	CT542	300	1.52	1.45	1.75	1.72
1 1/2X1 1/4X1	CT543	300	1.65	1.58	1.80	1.85
1 1/2x1 1/4x1 1/4	CT544	300	1.82	1.75	1.88	2.22
1 1/2x1 1/4x1 1/2	CT545	300	1.94	1.88	1.94	2.45
1 1/2X1 1/4X2	CT546	300	2.16	2.10	2.02	2.80
1 1/2X1 1/2X1/2	CT551	300	1.41	1.41	1.66	1.76
1 1/2X1 1/2X3/4	CT552	300	1.52	1.52	1.75	1.87
1 1/2X1 1/2X1	CT553	300	1.65	1.65	1.80	1.94
1 1/2X1 1/2X1 1/4	CT554	300	1.82	1.82	1.88	2.29
1 1/2X1 1/2X2	CT556	300	2.16	2.16	2.02	3.28
2X1X2	CT636	300	2.25	2.02	2.25	3.40
2X1 1/4X2	CT646	300	2.25	2.10	2.25	2.80
2X1 1/2X1/2	CT651	300	1.49	1.41	1.88	2.09
2X1 1/2X3/4	CT652	300	1.60	1.52	1.97	2.40
2X1 1/2X1	CT653	300	1.73	1.65	2.02	2.54
2X1 1/2X1 1/4	CT654	300	1.90	1.82	2.10	2.85
2X1 1/2X1 1/2	CT655	300	1.49	1.41	1.88	2.24
2X1 1/2X2	CT656	300	2.25	2.16	2.25	3.75
2X2X1/2	CT661	300	1.49	1.49	1.88	2.60
2X2X3/4	CT662	300	1.60	1.60	1.97	2.71
2X2X1	CT663	300	1.73	1.73	2.02	2.97
2X2X1 1/4	CT664	300	1.90	1.90	2.10	3.32
2X2X1 1/2	CT665	300	2.02	2.02	2.16	3.72
2x2x2 1/2	CT667	300	2.60	2.60	2.39	5.10

VALVES

Model 375ASTDA

Reduced Pressure Detector Assembly

Application

Designed for installation on water lines in fire protection systems to protect against both backsiphonage and back-pressure of contaminated water into the potable water supply. The Model 375ASTDA shall provide protection where a potential health hazard exists. Incorporates metered by-pass to detect leaks and unauthorized water use.

Standards Compliance (Horizontal)

- ASSE® Listed 1047
- AWWA Compliant C550
- UL® Classified
- C-UL® Classified
- FM® Approved
- CSA® Certified B64.4
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California
- Meets the requirements of NSF/ANSI 61*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

By-Pass Backflow Assembly 3/4" Model 975XLD

Materials

Main valve body	304L Stainless steel
Access covers	304L Stainless steel
Internals Stainless steel	300 Series
	NORYL™
Fasteners & Springs	Stainless steel, 300 Series
Elastomers	EPDM (FDA approved)
	Buna Nitrile (FDA approved)
Polymers	NORYL™
Sensing line	Stainless steel, braided hose

Features

Sizes: 2 1/2", 3", 4", 6", 8", 10"	
Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel pipe)	AWWA C606
(Flanged)	ANSI B16.1 Class 125

Dimensions & Weights (do not include pkg.)

MODEL 375ASTDA SIZE		WEIGHT							
		WITH OS&Y GATES (GXF)		WITH OS&Y GATES(GXG)		WITH BUTTERFLY VALVES (GXG)		WITH BUTTERFLY VALVES (GXF)	
in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	137	62	127	58	104	47	114	52
3	80	155	71	143	65	109	50	122	56
4	100	229	104	209	95	112	51	134	61
6	150	364	166	334	152	176	80	206	94
8	200	681	309	627	284	364	165	387	176
10	250	900	408	842	382	536	243	594	269

(SHOWN WITH OPTIONAL GROOVED END BUTTERFLY VALVES)

LEAD FREE

NSF/ANSI 61

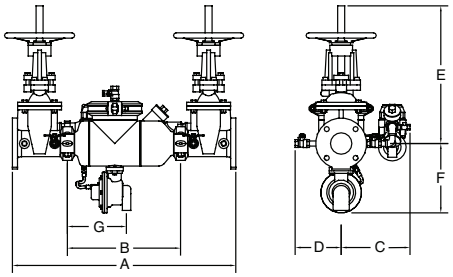
Options (Suffixes can be combined)

- ☐ - with flanged end OS & Y gate valves (standard)
- ☐ LM - less water meter
- ☐ - with remote reading meter
- ☐ - with gpm meter (standard)
- ☐ CFM - with cu ft/min meter
- ☐ G - with grooved end OS&Y gate valves
- ☐ FG - with flanged inlet gate connection and grooved outlet gate connection
- ☐ MS - with Integral Relief Valve Monitor Switch
- ☐ PI - with Post Indicator Gate Valves
- ☐ BG - with grooved end butterfly valves with integral supervisory switch
- ☐ BF - with flanged end butterfly valves with integral supervisory switch
- ☐ –509 - with AWWA C509 gate valves
- ☐ RV - with by-pass on right hand side

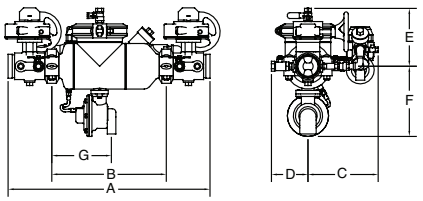
Accessories

- ☐ Air gap (Model AG)
- ☐ Repair kit (rubber only)
- ☐ Thermal expansion tank (Model XT)
- ☐ OS & Y Gate valve tamper switch (OSY-40)
- ☐ QT-SET Quick Test Fitting Set

MODEL 375ASTDA with standard OS&Y



MODEL 375ASTDA with BG option



Relief Valve discharge port:
2 1/2"- 6" - 2.75 sq. in.
8"-10" - 3.69 sq. in.

MODEL 375ASTDA SIZE		DIMENSION (approximate)																			
		A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E WITH BUTTERFLY VALVES		F		G	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2 1/2	65	31 7/8	810	28 3/4	730	n/a	n/a	12	305	7 1/4	184	17 3/4	451	15 3/8	391	8 1/4	210	9 3/4	248	8 5/8	219
3	80	32 7/8	835	29 3/8	746	n/a	n/a	12	305	7 1/4	184	20 1/4	514	17	432	8 1/4	210	9 3/4	248	8 5/8	219
4	100	34 7/8	886	30 1/4	768	n/a	n/a	12	305	8	203	22 1/2	572	18 1/4	464	9	229	9 3/4	248	8 5/8	219
6	150	43 1/2	1105	36 1/2	927	n/a	n/a	10 1/2	267	10	254	30 1/2	775	24 1/4	616	10 1/4	260	10 3/4	273	11 1/4	286
8	200	52 3/4	1340	45 3/4	1162	n/a	n/a	15 1/8	384	11	279	37	940	28 1/2	724	18 1/2	470	15 5/8	397	13 1/4	337
10	250	55 3/4	1416	49 3/4	1264	n/a	n/a	15 1/8	384	12	305	45 5/8	1159	34 3/4	883	18 1/2	470	15 5/8	397	13 1/4	337

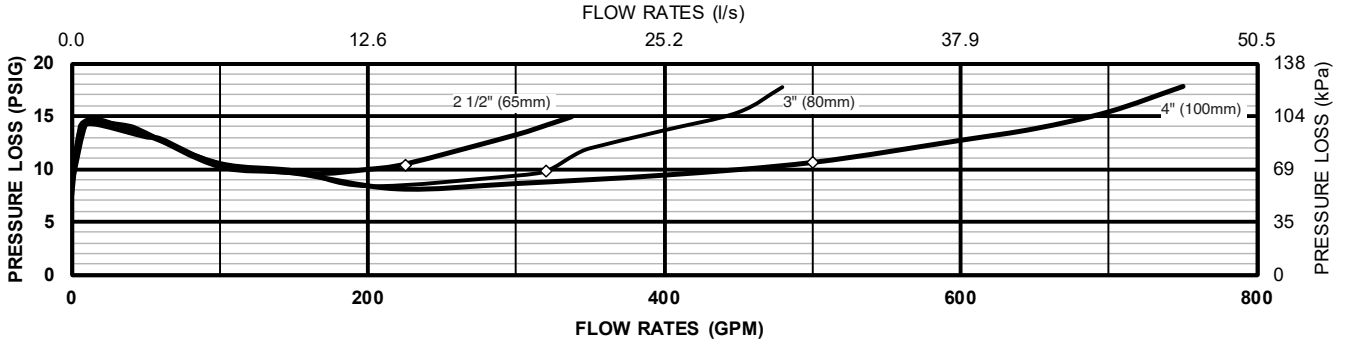
Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9876, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W6, 877-892-5216
www.zurn.com

Rev. P
Date: 4/20
Document No. BF-375ASTDA
Product No. Model 375ASTDA

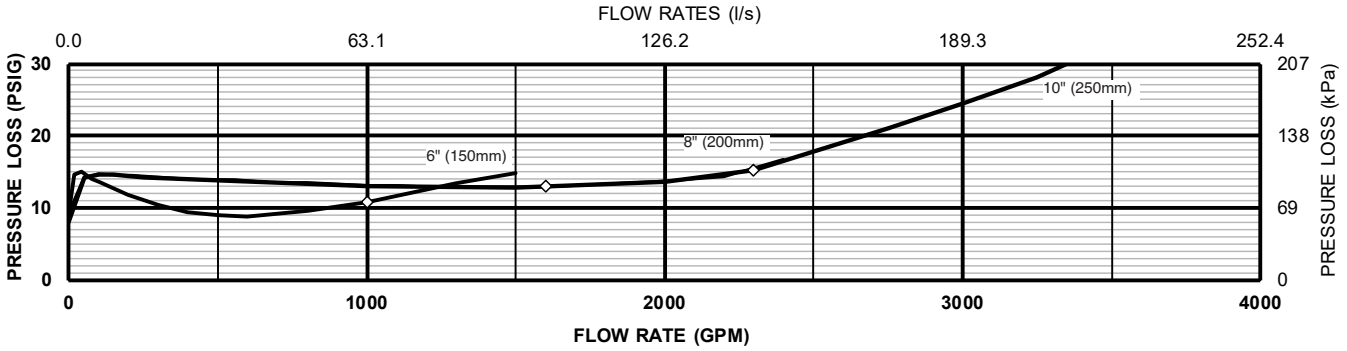
Flow Characteristics

◇Rated Flow (established by approval agencies)

MODEL 375ASTDA 2 1/2", 3" & 4" (STANDARD & METRIC)



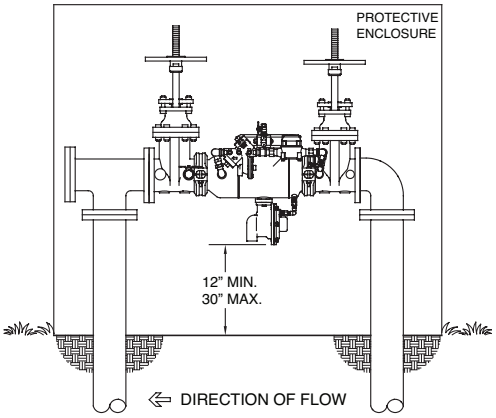
MODEL 375ASTDA 6", 8" & 10" (STANDARD AND METRIC)



Typical Installation

Local codes shall govern installation requirements. To be installed in accordance with the manufacturer's instructions and the latest edition of the Uniform Plumbing Code. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288



ZURN WILKINS MODEL 375ASTDA
OUTDOOR HORIZONTAL INSTALLATION

Specifications

The Reduced Pressure Detector Backflow Prevention Assembly shall be certified to NSF/ANSI 61, ASSE® Listed 1047, and supplied with full port OS & Y gate valves. The main body and access cover shall be 304L Stainless Steel, the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks and the relief valve shall be accessible for maintenance without removing the device from the line. The Reduced Pressure Detector Backflow Prevention Assembly shall be a ZURN WILKINS Model 375ASTDA.

Zurn Industries, LLC | Wilkins
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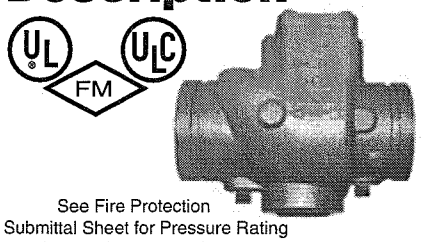
tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500
www.tyco-fire.com

Tyco Fire Products Model CV-1F Check Valve

General Description



See Fire Protection Submittal Sheet for Pressure Rating and Listing/Approval Information

The Model CV-1F Fire Protection Check Valve is furnished with grooved ends and can be installed using grooved couplings. The Model CV-1F can be installed with ANSI class 150 Flanges utilizing Grinnell Figure 71 flange adapters and also ANSI class 300 Flange Adapters. All Model CV-1F Check Valves have been designed with a removable cover for ease of field maintenance. Valves installed horizontally or inclined (flow up or down) are to be positioned with the cap facing up. Valves installed vertically may be positioned with flow up or down.
A Maintenance Check Valve Kit is available to allow the maintenance procedure of backflushing through the fire department connection without removing the Model CV-1F Check Valve from the pipe line.
The Model CV-1F Check Valves are a redesignation for the Central Figure 590F and Grinnell Figure 590F.

WARNING

The Model CV-1F Check Valve 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 this device.***
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

Model: CV-1F
Sizes: 2", 2½", 76.1mm, 3", 4", 139.7mm, 5", 165.1mm, 6", 8", 10" and 12"
Max. Working Pressure: 300 psi (2068 kPa)
Factory Hydro Test: 100% at 600 psi (4137 kPa)
- Seat and shell complies with test requirements of MSS SP-71, UL, FM and ULC

Approvals: UL, FM and ULC;
See Fire Protection Submittal Sheet for exact Listing / Approval information.
Body and Cap: Ductile iron conforming to ASTM A-536, Grade 65-45-12
Clapper: Stainless Steel (2" - 8") or Ductile Iron (10" and 12")
Seal: Grade "E" EPDM
Protective Coatings: Valve assembly
- Non-lead paint

Ordering Procedure

When placing an order, indicate the full product name. Please specify the quantity, valve model number, size, type of seal, Grade "E" EPDM, and part number from the following list.

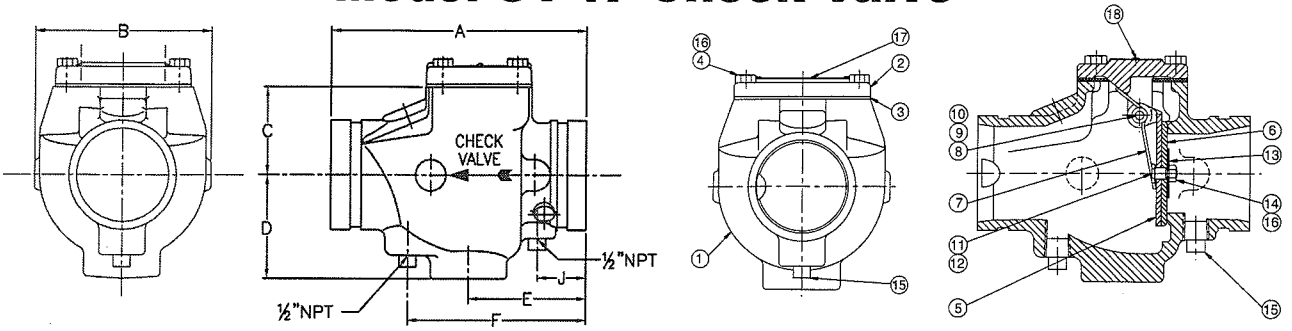
Valve Size	Valve Part Number
2"	59-590-0-020
2½"	59-590-0-025
76.1mm	59-590-0-076
3"	59-590-0-030
4"	59-590-0-040
139.7mm	59-590-0-139
5"	59-590-0-050
165.1mm	59-590-0-165
6"	59-590-0-060
8"	59-590-0-080
10"	59-590-0-100
12"	59-590-0-120

Tyco Fire Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, through a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

Limited Warranty

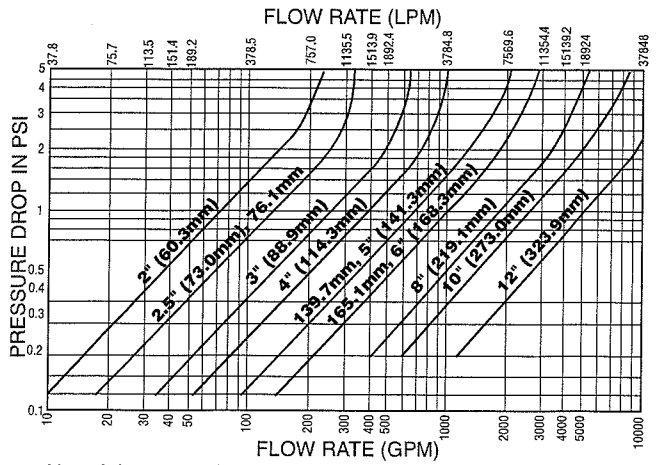
Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 (NFPA), and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products 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 TYCO FIRE PRODUCTS 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 TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.

Model CV-1F Check Valve



Nominal Dimensions									Approx.
Size	A	B	C	D	E	F	J	Cover	Weight
Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Bolt Torq.	lbs.
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*Lb.-ft./Nm*	*Kg.*
2"	6.75	4.38	2.55	2.57	3.25	4.75	1.62	15	9.0
60.3	*171.5*	*111.3*	*64.8*	*65.3*	*82.3*	*120.7*	*41.5*	*21*	*4.5*
2½"	8.00	5.80	3.41	3.40	3.88	6.00	1.70	39	10.0
73.0	*203.2*	*147.3*	*86.6*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*4.5*
76.1mm	8.00	5.80	3.41	3.40	3.88	6.00	1.70	39	10.00
	203.2	*147.3*	*86.6*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*4.5*
3"	8.37	5.76	3.60	3.40	3.88	6.00	1.70	39	11.0
88.9	*212.6*	*1.46.3*	*91.4*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*5.0*
4"	9.63	6.74	4.61	3.63	4.56	7.13	1.84	39	25.0
114.3	*244.6*	*171.2*	*117.1*	*92.2*	*115.1*	*181.1*	*46.7*	*54*	*11.3*
139.7mm	10.50	7.50	5.29	4.20	4.90	7.60	1.90	39	29.0
	266.7	*190.5*	*134.4*	*106.7*	*124.5*	*193.0*	*48.3*	*54*	*13.2*
5"	10.50	7.50	5.29	4.20	4.90	7.60	1.90	39	29.0
141.3	*266.7*	*190.5*	*134.4*	*106.7*	*124.5*	*193.0*	*48.3*	*54*	*13.2*
165.1mm	11.50	80.5	5.75	4.50	5.00	7.60	1.48	60	47.0
	292.1	*204.5*	*146.1*	*114.3*	*127.0*	*193.0*	*37.6*	*82*	*21.3*
6"	11.50	8.05	5.75	4.50	5.00	7.60	1.48	60	47.0
168.3	*292.1*	*204.5*	*146.1*	*114.3*	*127.0*	*193.0*	*37.6*	*82*	*21.3*
8"	14.00	10.25	7.75	5.62	5.45	8.40	2.20	120	66.0
219.1	*355.6*	*260.4*	*196.9*	*142.7*	*138.4*	*213.4*	*58.9*	*164*	*29.9*
10"	18.00	13.00	10.21	6.38	7.50	10.50	3.00	120	109.7
273.0	*457.2*	*330.2*	*259.3*	*162.1*	*190.5*	*266.7*	*76.2*	*164*	*49.4*
12"	21.0	14.28	11.31	7.26	7.62	10.62	2.75	120	151.0
323.9	*533.4*	*362.7*	*287.2*	*184.4*	*193.5*	*269.7*	*69.9*	*164*	*68.0*

Detail	Part	Material	Qty.
1	Body	Ductile Iron	1
2	Cap	Ductile Iron	1
3	Gasket	Synthetic Fiber	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper	Stainless Steel or Ductile Iron	1
6	Seal Facing	EPDM Grade "E"	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
10	Washer	Teflon	2
11	Retention Bolt	Stainless Steel	1
12	Seal Ring	Neoprene	1
13	Retaining Disc	Stainless Steel	1
14	Locknut	Stainless Steel	1
15	Plug-½"-14 NPT	Cast Iron	2
16	Adhesive	Thread Sealer	AR
17	Nameplate	Aluminum	1
18	Rivet	Steel	2



Note: It is good piping practice to apply a safety factor of 15% to 20% to the values in the above table for design purposes.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance 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. Any impairment must be immediately corrected. It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

General Notes: It is the Designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Always read and understand the installation instructions (IH-1000). Never remove any piping component or correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

ISO 9001 Certified Company

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500
www:tyco-fire.com

Tyco Fire Products Model BFV-1 Butterfly Valve

General Description

See Fire Protection Submittal Sheet for Pressure Rating and Listing/Approval Information

The Model BFV-1 Butterfly Valve is specifically designed to provide for efficient control of fire protection water supplies. The Model BFV-1 is designed to meet the increasing pressure requirements of the Fire Protection Industry with a maximum operating pressure of 300 psi. Flow may be from either direction, and the valves may be positioned in any orientation. The valve is furnished with grooved ends for use with grooved couplings and can be easily adapted to flanged components utilizing Grinnell Figure 71 Class 150 flange adapters. The body and disc construction provides for increased strength and durability. The Model BFV-1 Butterfly Valve is provided with 2 sets of SPDT Supervisory Switches for use in outdoor and indoor applications. A high strength stainless steel upper stem is provided for dependability. The surfaces at the upper stem and lower trunnion areas incorporate a reduced dynamic torque and anti-compression set design to ensure low operating torque and increased seal longevity.

This unique Tyco design feature prevents elastomeric failure of the disc encapsulation that is commonly experienced with other manufacturers. This is accomplished by providing uniform compression throughout the opening and closing operation of the disc.

The Model BFV-1 Butterfly Valves are a redesignation for the Central Figure 570, Central Figure 580 and Grinnell Figure 580.

WARNING

The Model BFV-1 Butterfly Valve 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 integrity of this device.

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

Technical Data

Model: BFV-1
Sizes: 2-1/2", 3", 4", 5", 6", 8" & 10"
Maximum Working Pressure: 300 psi (2068 kPa)
Factory Hydro Test: 100% at 600 psi (4137 kPa) in accordance with test requirements of MSS SP-67, UL, FM and ULC
Approvals: UL, FM and ULC for both indoor and outdoor use. Note: 8" - 10" are FM approved only. See Fire Protection Submittal Sheet for exact Listing / Approval information.
Materials of Construction:
Body: Ductile iron conforming to ASTM A-536, Grade 65-45-12
Body Coating: Epoxy
Disc: Ductile iron conforming to ASTM A-536, Grade 65-45-12
Disc Seal: Grade EPDM "E"encapsulated rubber conforming to ASTM D-2000
Upper Stem: Type 440 Stainless Steel (2-1/2"-8") Type 17-4 Stainless Steel (10")
Lower Plug and Stem: Type 17-4 Stainless Steel
Operator: Gear operator with iron housing coated with Epoxy
Bracket: Steel - Black Zinc Plated

Ordering Information

When placing an order, indicate the full product name. Please specify the quantity, valve model number, size, type of seal; EPDM "E", and part number from the following list.

Valve Size	Valve Part Number
2-1/2"	59-300-F-025
3"	59-300-F-030
4"	59-300-F-040
5"	59-300-F-050
6"	59-300-F-060
8"	59-300-F-080
10"	59-300-F-100

Tyco Fire Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, through a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance 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. Any impairment must be immediately corrected.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

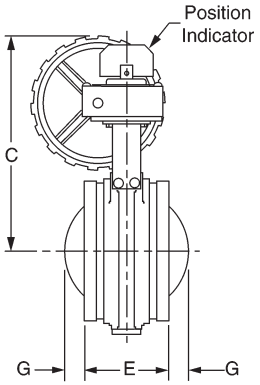
Limited Warranty

Products manufactured by Tyco Fire Products 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 Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

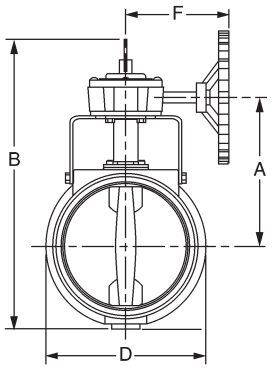
IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.

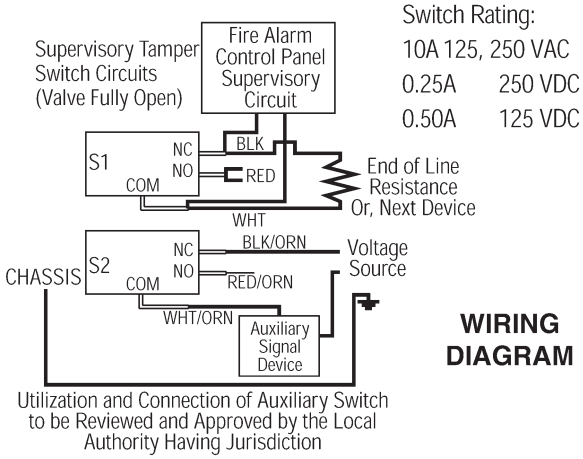
Model BFV-1 Butterfly Valve



Side view with valve open



Front view with valve open



WIRING DIAGRAM

Utilization and Connection of Auxiliary Switch to be Reviewed and Approved by the Local Authority Having Jurisdiction

Nominal Dimensions								Approx. Weight
Size Inches *mm*	A Inches *mm*	B Inches *mm*	C Inches *mm*	D Inches *mm*	E Inches *mm*	F Inches *mm*	G Inches *mm*	lbs. *Kg.*
2½" *73.0*	5.08 *129.0*	10.41 *264.4*	6.97 *177.0*	2.88 *73.0*	3.81 *96.8*	5.72 *145.3*	N/A*	12.0 *5.4*
3" *88.9*	5.41 *137.4*	11.38 *289.1*	7.29 *185.2*	3.50 *88.9*	3.81 *96.8*	5.72 *145.3*	N/A*	14.0 *6.4*
4" *114.3*	6.37 *161.8*	12.70 *322.6*	8.25 *209.6*	4.75 *120.7*	4.56 *115.8*	5.72 *145.3*	N/A*	22.0 *10.0*
5" *141.3*	7.33 *186.2*	14.56 *369.8*	10.41 *264.4*	6.25 *158.8*	5.81 *147.6*	6.18 *157.0*	N/A*	31.0 *14.1*
6" *168.3*	7.62 *193.5*	15.23 *386.8*	10.70 *271.8*	6.75 *171.5*	5.81 *147.6*	6.18 *157.0*	N/A*	36.0 *16.3*
8" *219.1*	9.24 *234.7*	17.50 *444.5*	13.37 *339.6*	10.00 *254.0*	5.25 *133.4*	6.43 *163.3*	1.22 *31.0*	52.0 *23.6*
10" *273.0*	11.81 *299.9*	21.78 *553.2*	16.93 *430.0*	12.00 *304.3*	6.25 *158.8*	7.96 *202.2*	1.75 *44.5*	75.0 *34.1*

* End of disc does not extend beyond valve body.

Friction Resistance	
Size	Equiv. Length in Feet
2 ½"	6'
3"	7'
4"	6'
5"	10'
6"	13'
8"	14'
10"	16'

Note: Friction Resistance is specified in equivalent length of Std. weight (C-120) steel pipe.

General Notes: It is the Designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Always read and understand the installation instructions (IH-1000). Never remove any piping component or correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

ISO 9001 Certified Company

VIKING®

TECHNICAL DATA

EASY RISER® SWING CHECK VALVE MODELS E-1 & F-1

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Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

The Viking Easy Riser® Swing Check Valve is a general purpose rubber-faced check valve approved for use in fire service systems. The valve is for use in wet system risers, preaction system risers and wherever a check valve with a drain connection and gauge connections can be utilized. When used with a flow switch on wet pipe systems not requiring a mechanical alarm, the Easy Riser® Swing Check Valve may replace an alarm check valve.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

1-A Features

1. Ductile iron body for less weight and extra strength.
2. Rated to 300 psi (20.7 bar) water working pressure.
3. Rubber-faced clapper hinged to access cover for quick removal and easy servicing. All moving parts can be serviced without removing the valve from the installed position.
4. With the cover/clapper assembly removed, clapper rubber replacement requires removal of only one screw.
5. Valve housing tapped for inlet and outlet pressure gauges, and system main drain.

1-B Accessories

300 PSI (20.7 bar) Trim Package including:

A. All necessary nipples and fittings
B. Main Drain Ball Valve
C. Necessary gauges

2. LISTINGS AND APPROVALS:.

cULus Listed: HMER
FM Approved: Single Check Valves
NYC Department of Buildings: MEA 89-92-E, Vol. XI
VNIIPO (250 psi (17.2 bar) MWP)
CE: Pressure Equipment Directive 97/23/EC (250 psi (17.2 bar) MWP)

3. TECHNICAL DATA

Specifications:

Standard Flanged Connections: ANSI B16.42 Class 150 (mates with ANSI Class 125 and Class 150 flanges).

Standard Grooved Connections: ANSI/AWWA C606

Drain outlet: 2-1/2” and 3” valves - one 1-1/4” (32 mm) NPT; 4”, 6” & 8” valves - 2” (50 mm) NPT

Gauge Outlets: two 1/4” (8 mm) NPT

Other Outlets: two 1/2” (15 mm) NPT

Systems with water working pressures above 175 psi (12 bar) may require extra-heavy pattern fittings. Viking Easy Riser® Swing Check Valve flanges are Ductile Iron ANSI B16.42, Class 150, with a maximum water working pressure of 300 psi (20.7 bar). ANSI B16.42, Class 150 flanges are NOT compatible with ANSI Class 250 or Class 300 flanges. To mate the Easy Riser® Swing Check Valve with ANSI Class 250 or Class 300 flanges, use the grooved-inlet/grooved-outlet style installed with listed grooved/flanged adapters of the appropriate pressure rating. For piping with grooved connections, the grooved-inlet and/or grooved-outlet style Easy Riser® Swing Check Valve may be installed with listed grooved couplings of the appropriate pressure rating.

Material Standards:

Refer to Figure 1.

Ordering Information:

See Table 1 for part numbers and shipping weights.

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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4. INSTALLATION

The Easy Riser® Swing Check Valve must be installed in an area not subject to freezing temperatures or physical damage. When corrosive atmospheres and/or contaminated water supplies are present, it is the owner's responsibility to verify compatibility with the Easy Riser® Swing Check Valve, trim, and associated equipment.

Prior to installing the valve, thoroughly flush the water supply piping to verify that no foreign matter is present.

The Easy Riser® Swing Check Valve may be installed in the vertical position with direction of flow up, or in the horizontal position with the access cover up.

1. Remove all plastic thread protectors from the openings of the Easy Riser® Swing Check Valve.
2. Apply a small amount of pipe-joint compound or tape to the external threads of all pipe connections required. Take care not to allow any compound, tape, or other foreign matter inside any of the nipples or openings of the valve or trim components.
3. Easy Riser® Swing Check Valve Trim Charts are provided with Trim Packages and on the Viking website.
4. Verify that all system components are rated for the water working pressure of the system.

Hydrostatic Test:

The Easy Riser® Swing Check Valve is manufactured and listed for use at a maximum water working pressure of 300 psi (20.7 bar). The valve is factory tested at 600 psi (41.4 bar). Easy Riser® Swing Check Valves may be hydrostatically tested at 350 psi (24.1 bar) and/or 50 psi (3.5 bar) above the normal water working pressure for limited periods of time (two hours) for the purpose of acceptance by the Authority Having Jurisdiction. If air testing is required, DO NOT exceed 40 psi (2.8 bar) air pressure.

5. OPERATION (Refer to Figure 1.)

Water flowing through the Viking Easy Riser® Swing Check Valve lifts the rubber-gasketed clapper (8 and 9) off the seat (12) and flows into the sprinkler piping. When flow through the valve stops, the clapper (8) closes quickly. The rubber gasket (9) forms a tight seal against the brass water seat (12), trapping pressurized water above the clapper and preventing reverse flow from the sprinkler piping.

6. INSPECTIONS, TESTS, AND MAINTENANCE

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

The Viking Easy Riser® Swing Check Valve and trim must be kept free of foreign matter, freezing conditions, corrosive atmospheres, contaminated water supplies, and any condition that could impair its operation or damage the device.

It is imperative that the system be inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, and corrosive atmospheres. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

⚠ WARNING

Any system maintenance that involves placing a control valve or detection system out of service may eliminate the fire protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

6-A. Five-Year Internal Inspection

Internal inspection of check valves is recommended every five years unless inspections and tests indicate more frequent inspections are required. (Refer to Figure 1.)

1. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the area affected that the system will be taken out of service. Consideration should be given to employment of a fire patrol in the affected areas.
2. Close the water supply main control valve, placing the system out of service.
3. Open the main drain. If necessary, open the system test valve to vent and completely drain the system.
4. Use the appropriate wrench to loosen and remove cover screws (14), and remove cover and clapper assembly (2-11).
5. Inspect water seat (12). Wipe away all contaminants, dirt, and mineral deposits. DO NOT use solvents or abrasives.
6. Inspect cover and clapper assembly (2-11) and cover gasket (13). Test the hinged clapper (8) for freedom of movement. Renew or replace damaged or worn parts as required.

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⚠ CAUTION

NEVER apply any lubricant to seats, gaskets, or any internal operating parts of the valve. Petroleum-based grease or oil will damage rubber components and may prevent proper operation.

7. When internal inspection of the Easy Riser® Swing Check Valve is complete, perform step 5 of paragraph 6-B. MAINTENANCE to re-install cover and clapper assembly (2-11).

6-B. Maintenance (Refer to Figure 1.)

1. Perform steps 1 through 5 of paragraph 6-A, FIVE-YEAR INTERNAL INSPECTION.
2. To replace clapper assembly (3, 6-11):
   a. Remove the cover screws (14) from the cover (2) using a Socket Wrench with a 9/16" socket.
   b. Remove the cover and clapper assembly (2-11) from the valve.
   c. Remove the cover gasket (13) by sliding it over the clapper assembly.
   d. Remove the existing clapper assembly (3, 6-11) from the cover assembly (2):
      i. Remove one of the retaining rings (5) from the clapper hinge pin (4) using a flat head screwdriver.
      ii. Remove the clapper hinge pin (4) from the cover and clapper assembly. This will allow the clapper assembly (3, 6-11) to be removed from the cover assembly (2).
   e. Install the new clapper assembly (3, 6-11) onto the cover assembly (2):
      i. Make sure the clapper rubber (9) is facing opposite the direction of the flow arrow on the inside of the cover (2).
      ii. Line up the holes of the cover assembly (2) and the clapper assembly (3, 6-11) and insert the hinge pin (4).
      iii. Install the retaining ring (5) onto the hinge pin (4).
      iv. Install the cover gasket (13) onto the new cover and clapper assembly (2-11) by sliding the cover gasket (13) over the clapper assembly (3, 6-11) and lining up the holes with the cover (2).
      v. To install the new cover and clapper assembly (2-11) into the valve, slide the clapper assembly into the valve with the clapper rubber (9) lined up with the water seat (12). Ensure the rubber retainer (10) fits inside the seat of the valve (pull back slightly and there should be some resistance).
      vi. Line up the holes of the cover (2) and cover gasket (13) with the valve body (1) and replace the cover screws (14) using a Socket Wrench with a 9/16" socket.
3. To replace the clapper rubber (9):
   i. Remove the cover screws (14) from the cover (2) using a Socket Wrench with a 9/16" socket.
   ii. Remove the cover and clapper assembly (2-11) from the valve.
   iii. Remove the cover gasket (13) by sliding it over the clapper assembly (3, 6-11).
   iv. Use a 7/32" Allen wrench to hold the button head socket screw (11) in place and remove the jam nut (6) from the clapper rubber (9) using a Socket Wrench with a 9/16" socket.
   v. Remove the button head socket screw (11) and sealing washer (7) from the clapper assembly (3, 6-11).
   vi. Remove the clapper rubber retainer (10) from the clapper (8) to free the clapper rubber (9).
   vii. To install the new clapper rubber (9), position the clapper rubber (9) on the clapper assembly so the grooved edge is facing down. This will allow the clapper rubber retainer (10) to fit up into the grooved edge of the clapper rubber (9).
   viii. Install the button head socket screw (11) and sealing washer assembly (7) and the jam nut (6) using a 7/32" Allen wrench and a Socket Wrench with a 9/16" socket.
   ix. Install the cover gasket (13) onto the cover (2) by sliding it over the clapper assembly (3, 6-11).
   x. Re-install the cover and clapper assembly (2-11) back into the valve, with the clapper rubber (9) lined up with the water seat (12). Ensure the clapper rubber retainer (10) fits inside the seat of the valve (pull back slightly and there should be some resistance).
   xi. Line up the holes of the cover (2) and cover gasket (13) with the valve body (1) and replace the cover screws (14) using a Socket Wrench with a 9/16" socket.
4. To replace the cover gasket (13):
   i. Remove the cover screws (14) from the cover (2) using a Socket Wrench with a 9/16" socket.
   ii. Remove the cover and clapper assembly (2-11) from the valve.
   iii. Remove the cover gasket (13) by sliding it over the clapper assembly (3, 6-11).
   iv. Install the new cover gasket (13) by sliding it over the clapper assembly (3, 6-11), onto the cover (2).
5. Reinstall the cover and clapper assembly (2-11) into the valve:
   i. Line up the clapper rubber (9) with the water seat (12). Ensure the clapper rubber retainer (10) fits inside the seat of the valve (pull back slightly and there should be some resistance).
   ii. Line up the holes of the cover (2) and cover gasket (13) with the valve body (1) and replace the cover screws (14) using a Socket Wrench with a 9/16" socket.

VIKING®

TECHNICAL DATA

EASY RISER® SWING CHECK VALVE MODELS E-1 & F-1

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Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

7. AVAILABILITY

The Viking Easy Riser® Swing Check Valve is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

Table 1 - Valve Part Numbers and Specifications

Description	Nominal Size	Part Number	Friction Loss*	Shipping Weight
Flange/Flange				
Flange Drilling	**Model F-1**			
ANSI	3"	08505	10 ft. (3.1m)	35 lbs. (16 kg)
ANSI	4"	08508	13 ft. (4.0 m)	44 lbs. (20 kg)
ANSI	6"	08511	20 ft. (6.0 m)	75 lbs. (34 kg)
ANSI/Japan	DN100	09039	13 ft. (4.0 m)	44 lbs. (20 kg)
ANSI/Japan	DN150	09385	20 ft. (6.0 m)	75 lbs. (34 kg)
ANSI/Japan	DN200	14023	23 ft. (7.0 m)	119 lbs. (54 kg)
PN10/16	DN80	08796	10 ft. (3.1m)	35 lbs. (16 kg)
PN10/16	DN100	08797	13 ft. (4.0 m)	44 lbs. (20 kg)
PN10/16	DN150	08835	20 ft. (6.0 m)	75 lbs. (34 kg)
PN10	DN200	08836	23 ft. (7.0 m)	119 lbs. (54 kg)
PN16	DN200	12355	23 ft. (7.0 m)	119 lbs. (54 kg)
Flange/Groove				
Flange Drilling / Pipe O.D.	**Model F-1**			
ANSI / 89mm	3"	08506	10 ft. (3.1m)	27 lbs. (12 kg)
ANSI / 114mm	4"	08509	13 ft. (4.0 m)	37 lbs. (17 kg)
ANSI / 168mm	6"	08512	20 ft. (6.0 m)	64 lbs. (29 kg)
ANSI / 219mm	8"	08515	23 ft. (7.0 m)	119 lbs. (54 kg)
PN10/16 / 89mm	DN80	12648	10 ft. (3.1m)	27 lbs. (12 kg)
PN10/16 / 114mm	DN100	12649	13 ft. (4.0 m)	37 lbs. (17 kg)
PN10/16 / 165mm	DN150	12652	20 ft. (6.0 m)	64 lbs. (29 kg)
PN10/16 / 168mm	DN150	08512	20 ft. (6.0 m)	64 lbs. (29 kg)
PN10 / 219mm	DN200	12651	23 ft. (7.0 m)	119 lbs. (54 kg)
PN16 / 219mm	DN200	12650	23 ft. (7.0 m)	119 lbs. (54 kg)
Groove/Groove				
Pipe O.D.	**Model E-1**			
73mm	2½" / DN65	07929	6 ft. (1.8m)	16 lbs. (7 kg)
76 mm	2½" / DN65	13516	6 ft. (1.8m)	16 lbs. (7 kg)
	Model F-1			
89mm	3" / DN80	08507	10 ft. (3.1m)	20 lbs. (9 kg)
114mm	4" / DN100	08510	13 ft. (4.0 m)	27 lbs. (12 kg)
165mm	DN150	12356	20 ft. (6.0 m)	51 lbs. (23 kg)
168mm	6" / DN150	08513	20 ft. (6.0 m)	51 lbs. (23 kg)
219mm	8" / DN200	08516	23 ft. (7.0 m)	106 lbs. (48 kg)

*Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams formula: C = 120.

Table 2 - Torque Values for Easy Riser Swing Check Valve Cover Screws

Valve Size	Screw Size	Torque Value
2-1/2" (DN65)	3/8"-16 H.H.C.	19 ft-lb (2.63 kg-m)
3" (DN80)	3/8"-16 H.H.C.	19 ft-lb (2.63 kg-m)
4" (DN100)	3/8"-16 H.H.C.	19 ft-lb (2.63 kg-m)
6" (DN150)	½"-13 H.H.C.	45 ft-lb (6.23 kg-m)
8" (DN200)	5/8"-11 H.H.C.	93 ft-lb (12.9 kg-m)

Table 3 - Trim Package Part Numbers

Valve Size	Part Number
Wet System Trim Packages	
2-1/2", 3" (DN65), (DN80)	07236
4", 6", 8", (DN100), (DN150), (DN200)	07237
Preaction System Trim Packages	
2-1/2", 3" (DN65)	13776
4", 6", 8", (DN80), (DN100), (DN150), (DN200)	13777

TECHNICAL DATA

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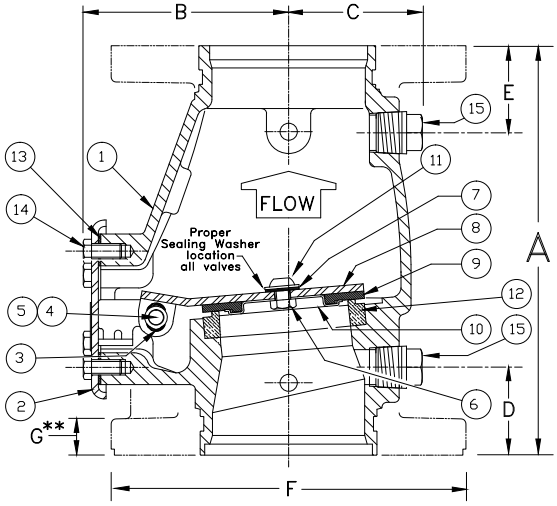

SIZE	A	B	C	D	E	F	G**
2-1/2" (65mm)	9" (228,6)	4-1/2" (114,3)	2-5/8" (66,7)	2" (50,8)	2" (50,8)	Flg-Flg Not Available	
3" (80mm)	10-1/8" (257)	4-13/16" (122,2)	2-11/16" (68,3)	2-9/32" (58.1)	2-9/32" (58.1)	7-7/8" (200)	25/32" (20)
4" (100mm)	10-5/8" (269,9)	5-3/16" (131,8)	3-1/8" (79.4)	2-1/4" (57.2)	2-1/4" (57,2)	9" (228,6)	15/16" (23,81)
6" (150mm)	13-3/8" (340)	6-13/16" (173,3)	4-1/16" (103.2)	2-1/4" (57,2)	2-1/4" (57,2)	11" (279,4)	1" (25,4)
8" (200mm)	17" (431,8)	8-13/16" (223,4)	5" (127)	2-1/2" (63,4)	2-7/8" (73,0)	13-1/2" (342,9)	1-1/8" (28,58)

Dimensions shown in parentheses are millimeter.

* For availability of Flg X Flg, Flg X Grv, or Grv X Grv options refer to Table 1.

** 4", 6", and 8" valves are manufactured with sculptured flanges. Dimension indicates thickness of flange at bolt holes.

Figure 1 - Replacement Parts

ITEM NO.	PART NUMBER E-1 2-1/2" (DN65)	F-1 3" (DN80)	F-1 4" (DN100)	F-1 6" (DN150)	F-1 8" (DN200)	DESCRIPTION	MATERIAL	NO. REQ'D 2-1/2"	3"	4"	6"	8"
1	--	--	--	--	--	Body	Ductile Iron, ASTM A536 (65-45-12)	1	1	1	1	1
2	--	--	--	--	--	Cover Assembly	E-Coated HSLA Steel, A715 and Stainless Steel, UNS-S30400	1	1	1	1	1
3	07576	07576	07576	07576	None	Bushing	Lubricomp 189 Ryton	2	2	2	2	0
4	05355A	05355A	04900A	04991A	05334A	Clapper Hinge Pin	Stainless Steel, UNS-S30400	1	1	1	1	1
5	05445A	05445A	05445A	05445A	05369A	Hinge Pin Retaining Ring	Stainless Steel, UNS-S15700	2	2	2	2	2
6	01755A					Clapper Hex Jam Nut #10-24 UNC	Stainless Steel, UNS-S30400	1	0	0	0	0
		08159	08159			Clapper Hex Jam Nut 3/8"-24 UNF	Stainless Steel, UNS-S30400	0	1	1	0	0
				08144	08144	Clapper Hex Jam Nut ½"-20 UNF	Stainless Steel, UNS-S30400	0	0	0	1	1
7	--	08158	08158	08143	08143	Sealing Washer	EPDM and Stainless Steel	1	1	1	1	1
8	*	*	*	*	*	Clapper	PTFE Coated HR Steel UNS-G10180	1	1	1	1	1
9	*	*	*	*	*	Clapper Rubber	EPDM, ASTM D2000	1	1	1	1	1
10	*	*	*	*	*	Clapper Rubber Retainer	Stainless Steel, UNS-S30400	1	1	1	1	1
11	06595A					H.H.C. Screw, #10-24 UNC x 1/2" (12.7 mm) lg.	Stainless Steel, UNS-S30400	1	0	0	0	0
		10194	10194			Screw, Button Head, Socket, 3/8" - 24 UNF x 1/2 (12.7 mm) lg.	Stainless Steel, UNS-S30400	0	1	1	0	0
				10308		Screw, Button Head, Socket, 1/2" - 20 UNF x 3/4 (19.1 mm) lg.	Stainless Steel, UNS-S30400	0	0	0	1	0
					10686	Screw, Button Head, Socket, 1/2" - 20 UNF x 7/8 (22.2 mm) lg.	Stainless Steel, UNS-S30400	0	0	0	0	1
12	--	--	--	--	--	Seat	Brass, UNS-C84400	1	1	1	1	1
13	05354B	05354B	04649B	04992B	05339C	Cover Gasket	EPDM, ASTM D2000	1	1	1	1	1
14	01517A	01517A	01517A			Screw, Hex Head Cap, 3/8" - 16 UNC x 3/4 (19.1 mm) lg.	Steel, Zinc Plated	4	4	6	0	0
				04993A		Screw, Hex Head Cap, 1/2" - 13 x 7/8 (22.2 mm) lg.	Steel, Zinc Plated	0	0	0	6	0
					01922A	Screw, Hex Head Cap, 5/8" - 11 UNC x 1-1/4" (31.8 mm) lg.	Steel, Zinc Plated	0	0	0	0	6
15	--	--	--	--	--	1/2" (15 mm) NPT Pipe Plug	Steel	2	2	2	2	2

-- Indicates replacement part is not available

* Indicates replacement part only available in a Sub-Assembly listed below.

Sub-Assemblies

3, 6-11	05499B	08518	08519	08520	08521	Clapper Assembly	
6, 7, 9-11,13	06343A	08522	08523	08524	08525	Replacement Rubber Kit	

TECHNICAL DATA

EASY RISER® SWING CHECK VALVE MODELS E-1 & F-1

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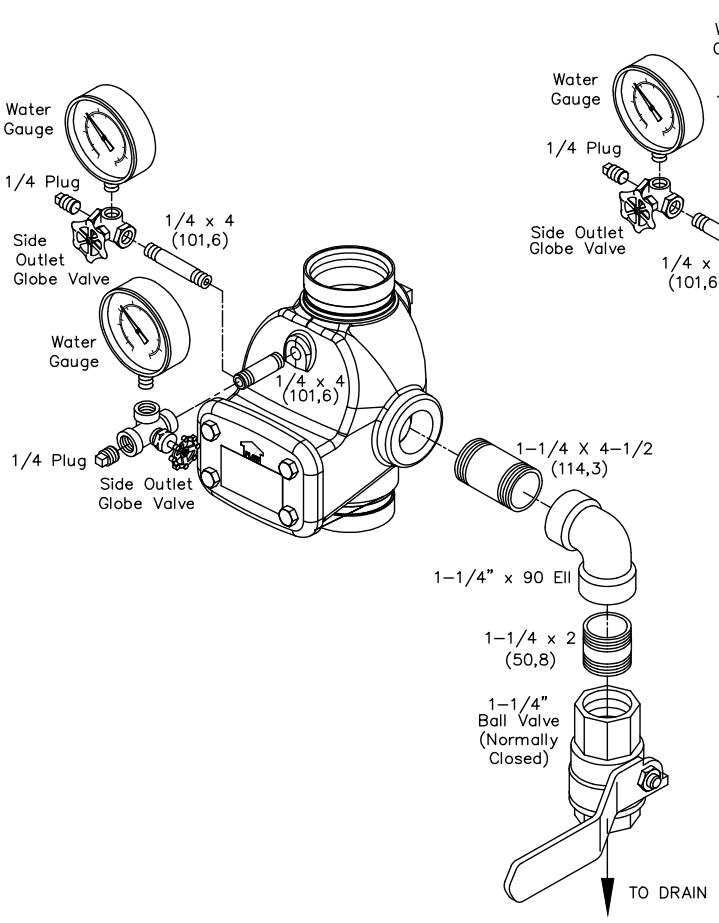
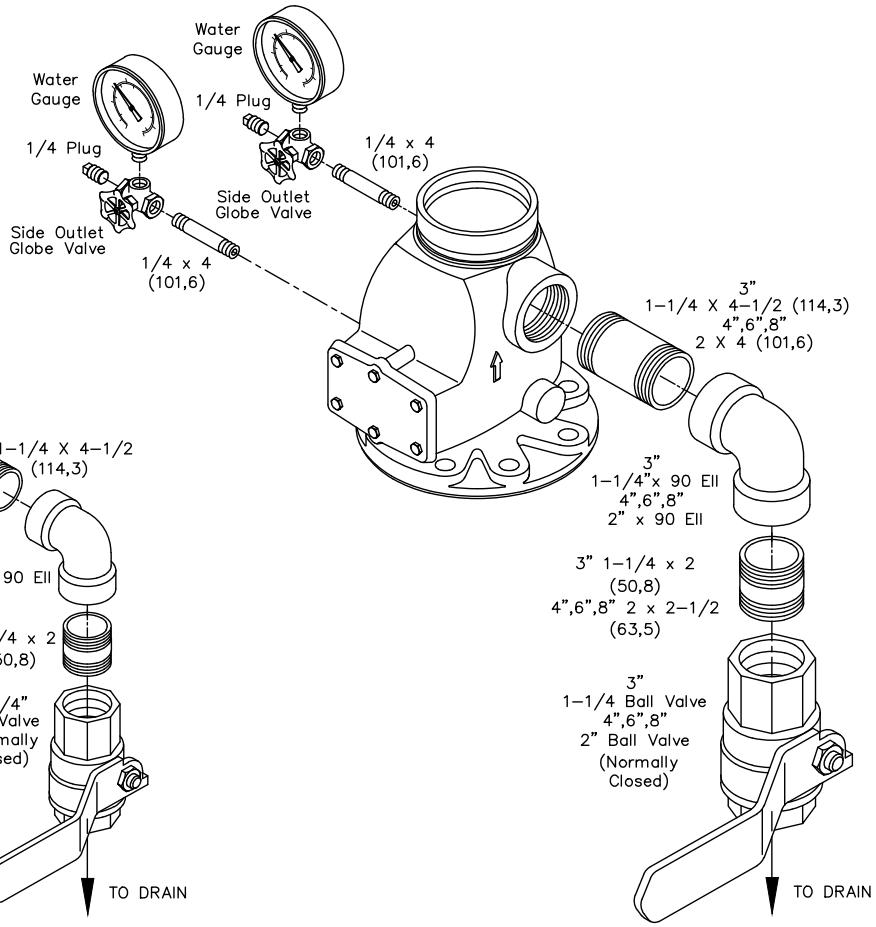


2-1/2" Model E-1
Easy Riser Check Valve
Trim Chart



3", 4", 6" and 8" Model F-1
Easy Riser Check Valve
Trim Chart

Figure 2

Note 1: 300 psi (20.7 bar) water pressure gauges are provided with trim. 600 psi (41.4 bar) water pressure gauges are available. Order separately when needed*. Refer to Viking's current price schedule.

* NFPA 13 requires gauges to have a minimum limit not less than twice the normal water working pressure at the point where the gauges are installed. When normal water working pressure exceeds 150 psi (10.3 bar), order 600 psi (41.4 bar) water pressure gauges separately.

Note 2: System Drain Ball Valve is UL Listed and FM Approved for 300 psi (20.7 bar) water working pressure.

TECHNICAL DATA

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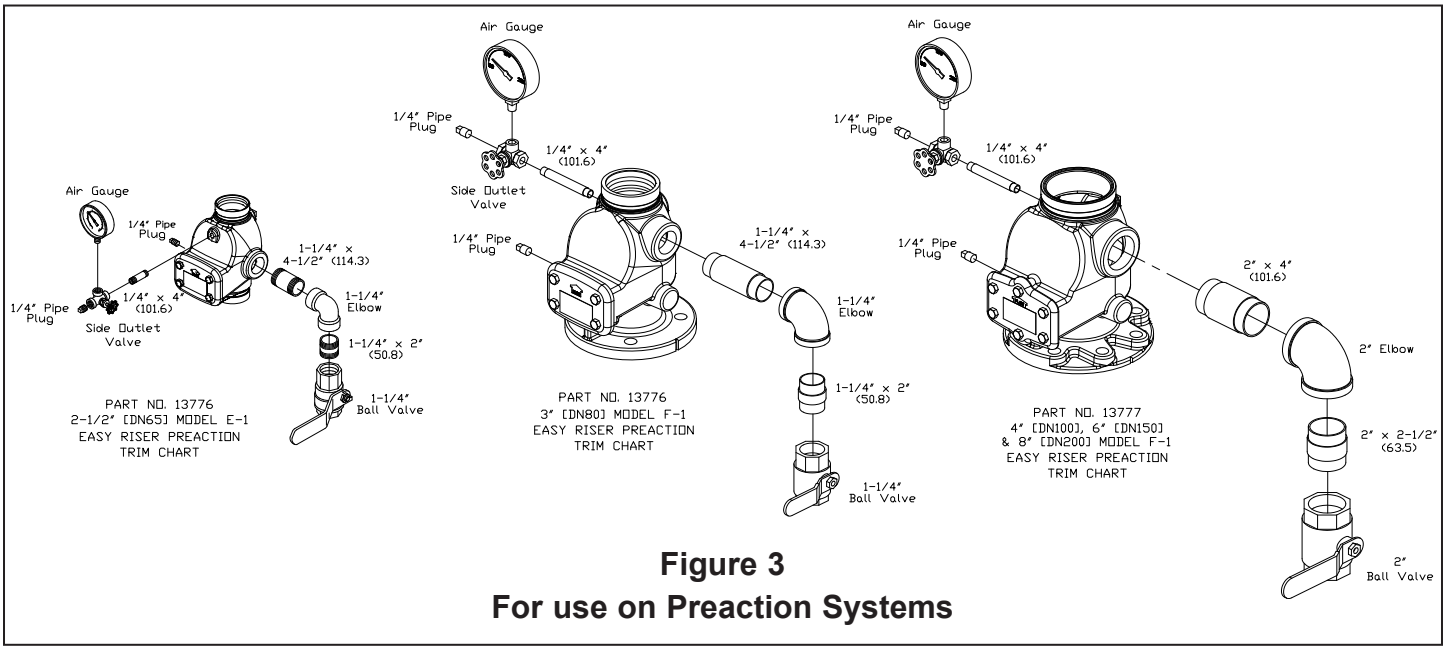
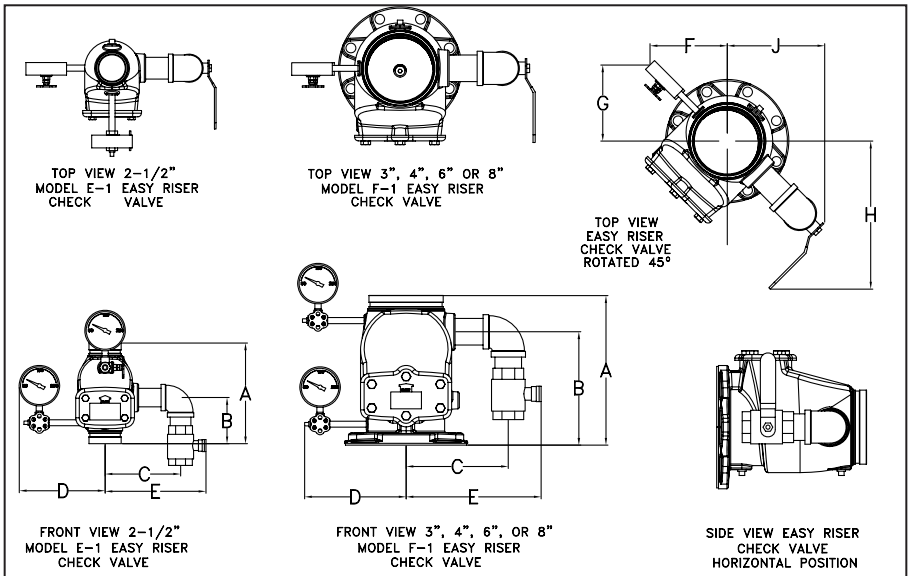


Figure 3
For use on Preaction Systems



SIZE	A	B	C	D	E	F	G	H	J
2-1/2" (65mm)	9" (228,6)	4-1/8" (105)	6-3/4" (171)	7-5/8" (194)	9" (229)	5-1/2" (139)	5-3/8" (137)	10-7/16" (265)	6-5/8" (169)
3" (80mm)	10-1/8" (257)	7-1/4" (184)	6-3/4" (171)	7-7/8" (200)	8-7/8" (226)	5-15/16" (150)	5-7/8" (149)	9-7/8" (251)	6-7/16" (163)
4" (100mm)	10-5/8" (270)	7-3/8" (187)	8-3/8" (213)	8-7/16" (214)	11-5/16" (287)	6-3/16"" (157)	6-1/8" (155)	12-11/16" (322)	8-1/16" (205)
6" (150mm)	13-3/8" (340)	10-1/8" (257)	9-1/8" (232)	9-1/2" (241)	12-1/16" (306)	6-7/8" (175)	6-13/16" (173)	13-3/16" (336)	8-5/8" (219)
8" (200mm)	17" (432)	13-1/8" (333)	9-15/16" (253)	10-3/4" (273)	13-1/16" (332)	7-5/8" (193)	7-1/2" (191)	13-15/16" (354)	9-5/16" (237)

Figure 4

Dimensions in parentheses are millimeter.
Dimensions are approximate.

UNITED BRASS WORKS, INC

714 S. Main St.. Randleman, N.C. 27317

Phone: 800/334-3

035 Fax: 800/498-4696

Model 125SUL Globe Valve
Soft Disc

UL Listed for Fire Sprinkler Service at 250 WOG

200 WOG @ 180 ° Max

100% Pressure Tested

Threaded Ends

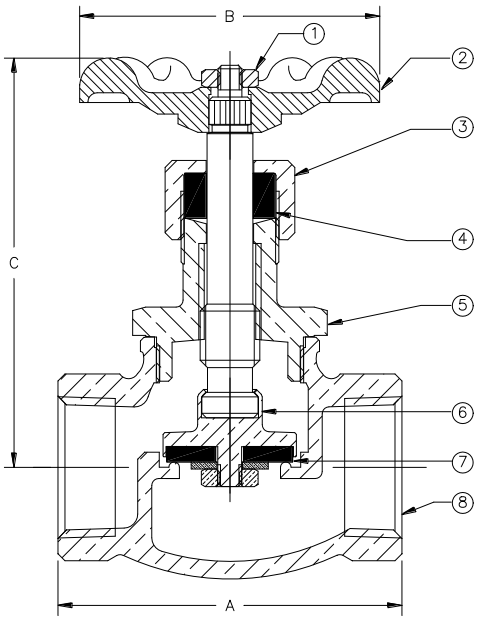
Rising Stem • Integral Seat

Swivel Disc Holder

Contains Lead. Not Intended for Use in Potable Water Systems

MATERIAL LIST

NO.	DESCRIPTION	MATERIAL
1	Hex Nut	Steel
2	Hand Wheel	Zinc
3	Packing Nut	Brass
4	Packing	Graphite Non-Asb.
5	Bonnet (¼" – 1") Bonnet (1¼" – 2")	Brass Bronze
6	Stem & Disc Holder	Brass
7	Disc	Buna N
8	Body	Bronze



Size	½"	¾"	1"	1 ¼"	1 ½"	2"
A	2.22	2.47	2.97	3.56	4.06	4.69
B	2.03	2.38	2.75	3.00	3.72	3.72
C (closed)	3.38	3.50	4.25	4.75	5.50	5.50
Ship Wt. (lbs.)	0.69	0.94	1.76	2.50	3.26	5.32
Qty. Unit Pack	12	6	6	4	2	2
Qty. Per Case	72	60	36	24	12	12

HYDRAULIC CALCULATIONS

Hydraulic Overview

Job Number: JM22197 - CDT
Report Description: Ordinary Group II (A)

Job

Job Number: JM22197	Design Engineer: BKB
Job Name: CAROLINA DIESEL TRUCKS	Phone: 919.243.2464 / FAX:
Address 1: 62 PROGRESS DRIVE	State Certification/License Number: 16269FS
Address 2: FUQUAY VARINA, NC 27526	AHJ: TOWN OF FUQUAY VARINA
Address 3:	Job Site/Building:

System

Density: 0.20gpm/ft²	Area of Application: 1500ft² (Actual 1566ft²)
Most Demanding Sprinkler Data: 8 K-Factor 26.00 at 10.562	Hose Streams: 250.00
Coverage Per Sprinkler: 130ft²	Number Of Sprinklers Calculated: 13 0
System Pressure Demand: 42.431	System Flow Demand: 350.07
Total Demand: 600.07 @ 42.431	Pressure Result: +13.552 (24.2%)

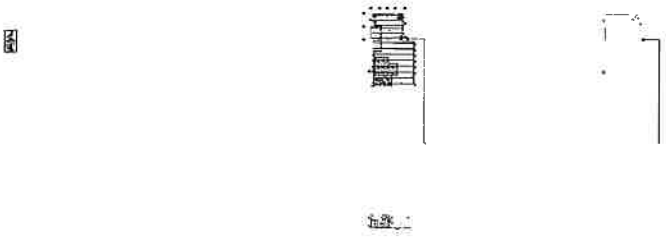
Supplies

Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)
1	Water Supply	1130.00	250.00	57.100	53.500

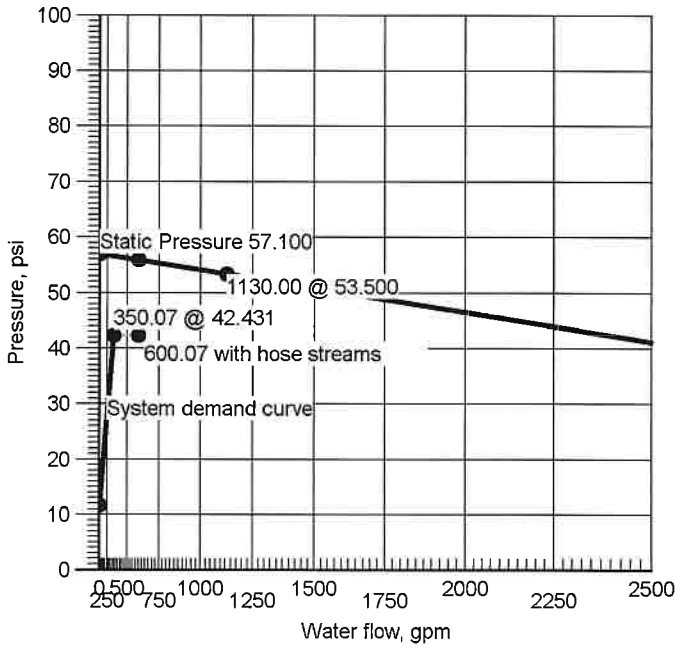
Check Point Gauges

Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
BOR	23.707	71.9	350.07

PIPING plan corrected



Water Supply at Node 1 (1130.00, 250.00, 57.100, 53.500)



Hydraulic Calculations

for

Project Name: CAROLINA DIESEL TRUCKS
Location: 62 PROGRESS DRIVE, FUQUAY VARINA, NC 27526,
Drawing Name: PIPING plan corrected

Calculation Date: 10/11/2022

Design

Remote Area Number:	A
Remote Area Location:	SEE PLAN
Occupancy Classification:	Ordinary Group II
Commodity Classification:	N/A
Density	0.20gpm/ft²
Area of Application:	1500ft² (Actual 1566ft²)
Coverage per Sprinkler:	130ft²
Type of sprinklers calculated:	Upright
No. of sprinklers calculated:	13
No. of nozzles calculated:	0

In-rack Demand:	N/A gpm	at Node:	N/A		
Hose Streams:	250.00	at Node:	1	Type:	Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 600.07 @ 42.431 (Safety Margin = 13.552)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherA N/A

Name of Contractor:
Address:
Phone Number:
Name of designer: BKB
Authority Having Jurisdiction:TOWN OF FUQUAY VARINA

Notes:

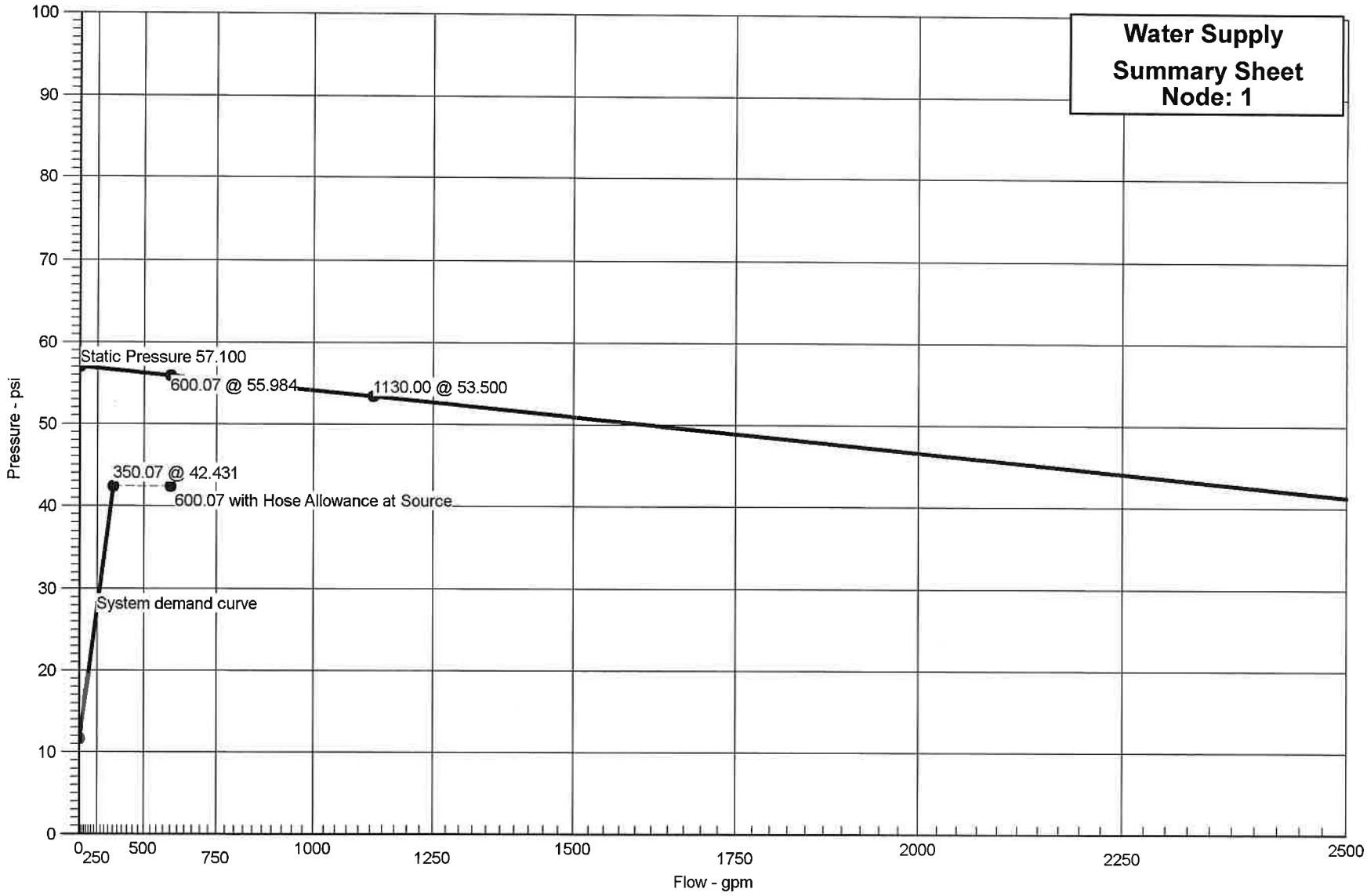
Automatic peaking results Left: 42.413 Right: 42.233

Hydraulic Graph

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: A

$N^{1.85}$

Date: 10/11/2022



Summary Of Outflowing Devices

Job Number: JM22197 - CDT
Report Description: Ordinary Group II (A)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	399	28.47	26.00	8	12.661		
Sprinkler	400	28.04	26.00	8	12.287		
Sprinkler	401	27.67	26.00	8	11.962		
Sprinkler	408	27.48	26.00	8	11.800		
Sprinkler	409	26.86	26.00	8	11.275		
Sprinkler	410	26.41	26.00	8	10.902		
Sprinkler	411	26.02	26.00	8	10.576		
Sprinkler	417	27.47	26.00	8	11.788		
Sprinkler	418	26.85	26.00	8	11.262		
Sprinkler	419	26.40	26.00	8	10.889		
⇨ **Sprinkler**	**420**	**26.00**	**26.00**	**8**	**10.562**		
Sprinkler	503	26.21	26.00	8	10.736		
Sprinkler	513	26.19	26.00	8	10.720		

⇨ 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	57.100	53.500	1130.00	55.984	600.07	42.431

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1	-3'-0	Supply	42.431	350.07	
399	21'-7½	Sprinkler	12.661	28.47	
400	22'-4½	Sprinkler	12.287	28.04	
401	23'-1½	Sprinkler	11.962	27.67	
408	21'-7½	Sprinkler	11.800	27.48	
409	22'-4½	Sprinkler	11.275	26.86	
410	23'-1½	Sprinkler	10.902	26.41	
411	23'-11	Sprinkler	10.576	26.02	
417	21'-7½	Sprinkler	11.788	27.47	
418	22'-4½	Sprinkler	11.262	26.85	
419	23'-1½	Sprinkler	10.889	26.40	
420	23'-11	Sprinkler	10.562	26.00	
503	24'-0	Sprinkler	10.736	26.21	
513	24'-0	Sprinkler	10.720	26.19	
10	18'-6		16.130		
13	21'-1½		14.406		
15	18'-10		15.328		
29	18'-6		16.132		
32	18'-10		15.326		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
39	21'-1½		14.401		
41	18'-6		16.139		
44	18'-10		15.319		
57	18'-6		16.149		
61	18'-10		15.248		
69	18'-6		16.175		
73	18'-10		15.222		
84	18'-6		16.322		
89	18'-6		15.979		
93	18'-10		15.180		
104	3'-0	Gauge	23.707		
109	3'-0		38.783		
116	18'-10		15.119		
127	18'-6		15.339		
132	18'-10		15.040		
143	18'-6		15.221		
154	18'-6		15.116		
157	18'-10		14.675		
168	18'-6		15.018		
171	18'-10		14.578		
184	18'-10		14.526		
197	18'-10		14.516		
199	18'-6		14.952		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
214	18'-6		14.927		
217	18'-6		14.924		
220	18'-10		14.519		
248	18'-6		14.924		
251	18'-10		14.520		

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.
420	23'-11	8	26.00	2	(See Notes)	10'-5½	120	10.562	• • • • • Route 1 • • • • •
						12'-3½	0.008882	-0.044	Sprinkler,
513	24'-0		31.26	2.1570		22'-9½		0.202	2E(6'-2)
513	24'-0	8	26.19	2	(See Notes)	41'-10	120	10.720	Sprinkler,
						24'-7½	0.027386	2.387	
214	18'-6		57.45	2.1570		66'-5½		1.820	2PO(12'-3½)
214	18'-6		26.18	4		12'-6	120	14.927	Flow (q) from Route 14
							0.001994		
199	18'-6		83.63	4.2600		12'-6		0.025	
199	18'-6		57.62	4		12'-6	120	14.952	Flow (q) from Route 2
							0.005259		
168	18'-6		141.24	4.2600		12'-6		0.066	
168	18'-6		34.24	4		12'-6	120	15.018	Flow (q) from Route 7
							0.007857		
154	18'-6		175.48	4.2600		12'-6		0.098	
154	18'-6		13.74	4		11'-7	120	15.116	Flow (q) from Route 4
							0.009033		
143	18'-6		189.22	4.2600		11'-7		0.105	
143	18'-6		4.67	4		12'-5½	120	15.221	Flow (q) from Route 22
							0.009449		
127	18'-6		193.89	4.2600		12'-5½		0.118	
127	18'-6		6.91	4	(See Notes)	37'-2	120	15.339	Flow (q) from Route 23
						26'-4	0.010082		
89	18'-6		200.80	4.2600		63'-6		0.640	2E(13'-2)
89	18'-6		24.62	4	(See Notes)	1'-2	120	15.979	Flow (q) from Route 24
						26'-4	0.012487		
84	18'-6		225.41	4.2600		27'-6		0.343	T(26'-4)
84	18'-6		124.66	6	(See Notes)	24'-4	120	16.322	Flow (q) from Route 10
						140'-10	0.004013	6.722	
104	3'-0		350.07	6.3570		165'-2		0.663	5E(17'-7), CV(40'-3), BV(12'-7), BOR
104	3'-0			6	(See Notes)	1'-6	120	23.707	
						17'-7	0.004013	-0.000	
109	3'-0		350.07	6.3570		19'-1½		15.077	E(17'-7), BFP(-15.000)

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.
109	3'-0			6	(See Notes)	260'-9	140	38.783	
						66'-2½	0.003202	2.601	
1	-3'-0		350.07	6.2800		326'-11½		1.047	3E(22'-1), S
			250.00					42.431	Hose Allowance At Source
1			600.07						Total(Pt) Route 1
411	23'-11	8	26.02	2	(See Notes)	10'-5½	120	10.576	• • • • • **Route 2** • • • • •
						12'-3½	0.008958	-0.044	Sprinkler,
503	24'-0		31.40	2.1570		22'-9½		0.204	2E(6'-2)
503	24'-0	8	26.21	2	(See Notes)	41'-10	120	10.736	Sprinkler,
						24'-7½	0.027530	2.387	
199	18'-6		57.62	2.1570		66'-5½		1.830	2PO(12'-3½)
								14.952	Total(Pt) Route 2
419	23'-1½	8	26.40	2	(See Notes)	10'-0½	120	10.889	• • • • • **Route 3** • • • • •
							0.000328	-0.330	Sprinkler
420	23'-11		5.26	2.1570		10'-0½		0.003	
								10.562	Total(Pt) Route 3
419	23'-1½	8	26.40	2	(See Notes)	10'-0½	120	10.889	• • • • • **Route 4** • • • • •
							0.004308	0.330	Sprinkler
418	22'-4½		21.14	2.1570		10'-0½		0.043	
418	22'-4½	8	26.85	2	(See Notes)	10'-0½	120	11.262	Sprinkler
							0.019628	0.330	
417	21'-7½		47.99	2.1570		10'-0½		0.197	
417	21'-7½	8	27.47	2	(See Notes)	8'-10½	120	11.788	Sprinkler,
						24'-7½	0.045343	1.209	
197	18'-10		75.45	2.1570		33'-6		1.519	2PO(12'-3½)
197	18'-10			4		12'-6	120	14.516	
							0.000750		
184	18'-10		49.28	4.2600		12'-6		0.009	
184	18'-10		75.37	4		12'-6	120	14.526	Flow (q) from Route 6
							0.004173		
171	18'-10		124.65	4.2600		12'-6		0.052	

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: A

Date: 10/11/2022

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.
171	18'-10		49.94	4		12'-6	120	14.578	Flow (q) from Route 9
157	18'-10		174.59	4.2600		12'-6	0.007783	0.097	
157	18'-10			2	(See Notes)	91'-3½	120	14.675	PO(12'-3½)
154	18'-6		13.74	2.1570		61'-6½ / 152'-10	0.001942	0.145 / 0.297	3PO(12'-3½), 2E(6'-2)
								15.116	Total(Pt) Route 4
410	23'-1½	8	26.41	2	(See Notes)	10'-0½	120	10.902	• • • • • **Route 5** • • • • • Sprinkler
411	23'-11		5.39	2.1570		10'-0½	0.000343	-0.330 / 0.003	
								10.576	Total(Pt) Route 5
410	23'-1½	8	26.41	2	(See Notes)	10'-0½	120	10.902	• • • • • **Route 6** • • • • • Sprinkler
409	22'-4½		21.03	2.1570		10'-0½	0.004266	0.330 / 0.043	
409	22'-4½	8	26.86	2	(See Notes)	10'-0½	120	11.275	Sprinkler
408	21'-7½		47.89	2.1570		10'-0½	0.019555	0.330 / 0.196	
408	21'-7½	8	27.48	2	(See Notes)	8'-10½	120	11.800	Sprinkler,
184	18'-10		75.37	2.1570		24'-7½ / 33'-6	0.045252	1.209 / 1.516	2PO(12'-3½)
								14.526	Total(Pt) Route 6
401	23'-1½	8	6.57	2	(See Notes)	62'-4½	120	11.962	• • • • • **Route 7** • • • • •
168	18'-6		34.24	2.1570		36'-11 / 99'-3½	0.010509	2.013 / 1.043	Sprinkler,, Flow (q) from Route 8 2E(6'-2), 2PO(12'-3½)
								15.018	Total(Pt) Route 7
400	22'-4½	8	28.04	2	(See Notes)	10'-0½	120	12.287	• • • • • **Route 8** • • • • • Sprinkler
401	23'-1½		6.57	2.1570		10'-0½	0.000495	-0.330 / 0.005	
								11.962	Total(Pt) Route 8
400	22'-4½	8	28.04	2	(See Notes)	10'-0½	120	12.287	• • • • • **Route 9** • • • • • Sprinkler
399	21'-7½		21.48	2.1570		10'-0½	0.004435	0.330 / 0.044	

Pipe Information

Node 1 / Node 2	Elev 1 / Elev 2 (Foot)	K-Factor	Flow added this step / Total Flow (q / Q)	Nominal ID / Actual ID	Fittings & Devices / Equiv. Length (Foot)	Length (Foot) Fitting / Total	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
399	21'-7½	8	28.47	2	(See Notes)	8'-10½	120	12.661	Sprinkler,
						24'-7½	0.021133	1.209	
171	18'-10		49.94	2.1570		33'-6		0.708	2PO(12'-3½)
								14.578	Total(Pt) Route 9
29	18'-6		23.19 + 23.73	4		10'-0	120	16.132	• • • • • **Route 10** • • • • •
							0.000685		Flow (q) from Route 11 and 12
41	18'-6		46.92	4.2600		10'-0		0.007	
41	18'-6		23.50	4		7'-2	120	16.139	Flow (q) from Route 17
							0.001451		
57	18'-6		70.42	4.2600		7'-2		0.010	
57	18'-6		26.63	4		10'-0	120	16.149	Flow (q) from Route 20
							0.002626		
69	18'-6		97.05	4.2600		10'-0		0.026	
69	18'-6		27.61	4	(See Notes)	8'-10	120	16.175	Flow (q) from Route 18
						26'-4	0.004174		
84	18'-6		124.66	4.2600		35'-2		0.147	T(26'-4)
								16.322	Total(Pt) Route 10
39	21'-1½		23.19	2	(See Notes)	65'-0	120	14.401	• • • • • **Route 11** • • • • •
						49'-2½	0.005110	1.147	T(12'-3½), Flow (q) from Route 25
29	18'-6		23.19	2.1570		114'-3		0.584	2E(6'-2), 2PO(12'-3½)
								16.132	Total(Pt) Route 11
10	18'-6		23.73	4		10'-0	120	16.130	• • • • • **Route 12** • • • • •
							0.000194		Flow (q) from Route 13
29	18'-6		23.73	4.2600		10'-0		0.002	
								16.132	Total(Pt) Route 12
13	21'-1½		23.73	2	(See Notes)	64'-11½	120	14.406	• • • • • **Route 13** • • • • •
						43'-1	0.005337	1.147	T(12'-3½), Flow (q) from Route 16
10	18'-6		23.73	2.1570		108'-0½		0.577	3E(6'-2), PO(12'-3½)
								16.130	Total(Pt) Route 13
217	18'-6		13.07 + 13.11	4		12'-5½	120	14.924	• • • • • **Route 14** • • • • •
							0.000233		Flow (q) from Route 15 and 21
214	18'-6		26.18	4.2600		12'-5½		0.003	
								14.927	Total(Pt) Route 14

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.
197	18'-10		49.28	4		12'-5½	120	14.516	**• • • • • Route 15 • • • • •** Flow (q) from Route 4
220	18'-10		26.18	4.2600		12'-5½	0.000233	0.003	
220	18'-10			4		12'-0	120	14.519	
251	18'-10		13.07	4.2600		12'-0	0.000064	0.001	
251	18'-10			2	(See Notes)	91'-3	120	14.520	PO(12'-3½)
248	18'-6		13.07	2.1570		55'-4½ 146'-7½	0.001769	0.145 0.259	3E(6'-2), 2PO(12'-3½)
248	18'-6			4		12'-0	120	14.924	
217	18'-6		13.07	4.2600		12'-0	0.000064	0.001	
								14.924	Total(Pt) Route 15
44	18'-10		70.42	4		10'-0	120	15.319	**• • • • • Route 16 • • • • •** Flow (q) from Route 19
32	18'-10		46.92	4.2600		10'-0	0.000685	0.007	
32	18'-10			4		10'-0	120	15.326	
15	18'-10		23.73	4.2600		10'-0	0.000194	0.002	
15	18'-10			2	(See Notes)	2'-4	120	15.328	PO(10'-0)
13	21'-1½		23.73	2.0670		10'-0 12'-4	0.006568	-1.003 0.081	
								14.406	Total(Pt) Route 16
44	18'-10		70.42	2	(See Notes)	67'-4	120	15.319	**• • • • • Route 17 • • • • •**
41	18'-6		23.50	2.1570		61'-6½ 128'-10½	0.005238	0.145 0.675	PO(12'-3½), Flow (q) from Route 19 3PO(12'-3½), 2E(6'-2)
								16.139	Total(Pt) Route 17
73	18'-10		124.66	2	(See Notes)	53'-0½	120	15.222	**• • • • • Route 18 • • • • •**
69	18'-6		27.61	2.1570		61'-6½ 114'-7	0.007060	0.145 0.809	PO(12'-3½), Flow (q) from Route 27 3PO(12'-3½), 2E(6'-2)
								16.175	Total(Pt) Route 18

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.
73	18'-10		124.66	4		10'-0	120	15.222	• • • • • Route 19 • • • • • Flow (q) from Route 27
61	18'-10		97.05	4.2600		10'-0	0.002626	0.026	
61	18'-10			4	(See Notes)	22'-8	120	15.248	
44	18'-10		70.42	4.2600		26'-4 / 49'-0	0.001451	0.071	2E(13'-2)
								15.319	Total(Pt) Route 19
61	18'-10			2	(See Notes)	53'-0½	120	15.248	• • • • • Route 20 • • • • • PO(12'-3½)
57	18'-6		26.63	2.1570		61'-6½ / 114'-7	0.006602	0.145 / 0.757	3PO(12'-3½), 2E(6'-2)
								16.149	Total(Pt) Route 20
220	18'-10			2	(See Notes)	91'-3	120	14.519	• • • • • Route 21 • • • • • PO(12'-3½)
217	18'-6		13.11	2.1570		55'-4½ / 146'-7½	0.001779	0.145 / 0.261	3E(6'-2), 2PO(12'-3½)
								14.924	Total(Pt) Route 21
132	18'-10		160.85	2	(See Notes)	76'-9½	120	15.040	• • • • • Route 22 • • • • • PO(12'-3½), Flow (q) from Route 26
143	18'-6		4.67	2.1570		61'-6½ / 138'-4	0.000263	0.145 / 0.036	3PO(12'-3½), 2E(6'-2)
								15.221	Total(Pt) Route 22
132	18'-10		160.85	4		12'-5½	120	15.040	• • • • • Route 23 • • • • • Flow (q) from Route 26
116	18'-10		156.18	4.2600		12'-5½	0.006334	0.079	
116	18'-10			2	(See Notes)	76'-10	120	15.119	PO(12'-3½)
127	18'-6		6.91	2.1570		61'-6½ / 138'-4	0.000544	0.145 / 0.075	3PO(12'-3½), 2E(6'-2)
								15.339	Total(Pt) Route 23
93	18'-10		149.27	2	(See Notes)	53'-0½	120	15.180	• • • • • Route 24 • • • • • PO(12'-3½), Flow (q) from Route 28
89	18'-6		24.62	2.1570		61'-6½ / 114'-7	0.005710	0.145 / 0.654	3PO(12'-3½), 2E(6'-2)
								15.979	Total(Pt) Route 24
32	18'-10			2	(See Notes)	2'-4	120	15.326	• • • • • Route 25 • • • • • PO(10'-0)
39	21'-1½		23.19	2.0670		10'-0 / 12'-4	0.006289	-1.002 / 0.077	

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 / Total	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.
								14.401	Total(Pt) Route 25
157	18'-10		13.74	4	(See Notes)	28'-3	120	14.675	• • • • • **Route 26** • • • • •
						26'-4	0.006688		Flow (q) from Route 4
132	18'-10		160.85	4.2600		54'-7		0.365	2E(13'-2)
								15.040	Total(Pt) Route 26
93	18'-10		149.27	4		10'-0	120	15.180	• • • • • **Route 27** • • • • •
							0.004174		Flow (q) from Route 28
73	18'-10		124.66	4.2600		10'-0		0.042	
								15.222	Total(Pt) Route 27
116	18'-10		6.91	4		10'-6	120	15.119	• • • • • **Route 28** • • • • •
							0.005825		Flow (q) from Route 23
93	18'-10		149.27	4.2600		10'-6		0.061	
								15.180	Total(Pt) Route 28

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 Connectic	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				

Hydraulic Overview

Job Number: JM22197 - CDT
Report Description: Light Hazard (B)

Job

Job Number: JM22197	Design Engineer: BKB
Job Name: CAROLINA DIESEL TRUCKS	Phone: 919.243.2464 FAX:
Address 1: 62 PROGRESS DRIVE	State Certification/License Number: 16269FS
Address 2: FUQUAY VARINA, NC 27526	AHJ: TOWN OF FUQUAY VARINA
Address 3:	Job Site/Building:

System

Density: 0.10gpm/ft²	Area of Application: 1500ft² (Actual 167ft²)
Most Demanding Sprinkler Data: 11.2 K-Factor 40.07 at 12.800	Hose Streams: 100.00
Coverage Per Sprinkler: 400ft²	Number Of Sprinklers Calculated: 2 0
System Pressure Demand: 45.854	System Flow Demand: 83.41
Total Demand: 183.41 @ 45.854	Pressure Result: +11.122 (19.5%)

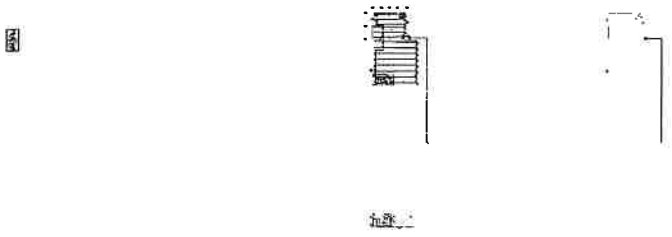
Supplies

Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)
1	Water Supply	1130.00	100.00	57.100	53.500

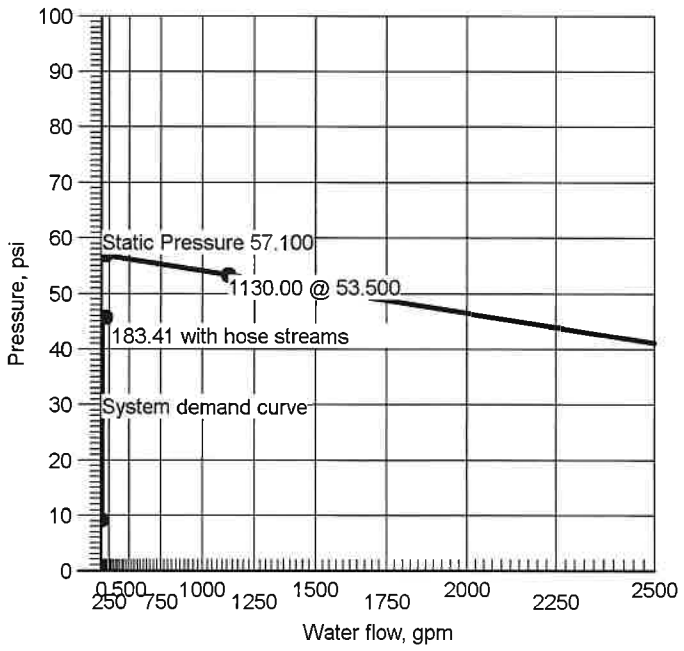
Check Point Gauges

Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
BOR	28.174	15.71	83.41

PIPING plan corrected



Water Supply at Node 1 (1130.00, 250.00, 57.100, 53.500)



Hydraulic Calculations

for

Project Name: CAROLINA DIESEL TRUCKS
Location: 62 PROGRESS DRIVE, FUQUAY VARINA, NC 27526,
Drawing Name: PIPING plan corrected

Calculation Date: 10/11/2022

Design

Remote Area Number:	B
Remote Area Location:	SEE PLAN
Occupancy Classification:	Light Hazard
Commodity Classification:	N/A
Density	0.10gpm/ft²
Area of Application:	1500ft² (Actual 167ft²)
Coverage per Sprinkler:	400ft²
Type of sprinklers calculated:	Pendent
No. of sprinklers calculated:	2
No. of nozzles calculated:	0

In-rack Demand:	N/A gpm	at Node:	N/A		
Hose Streams:	100.00	at Node:	1	Type:	Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 183.41 @ 45.854 (Safety Margin = 11.122)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherA N/A

Name of Contractor:
Address: ,
Phone Number:
Name of designer: BKB
Authority Having Jurisdiction:TOWN OF FUQUAY VARINA

Notes:

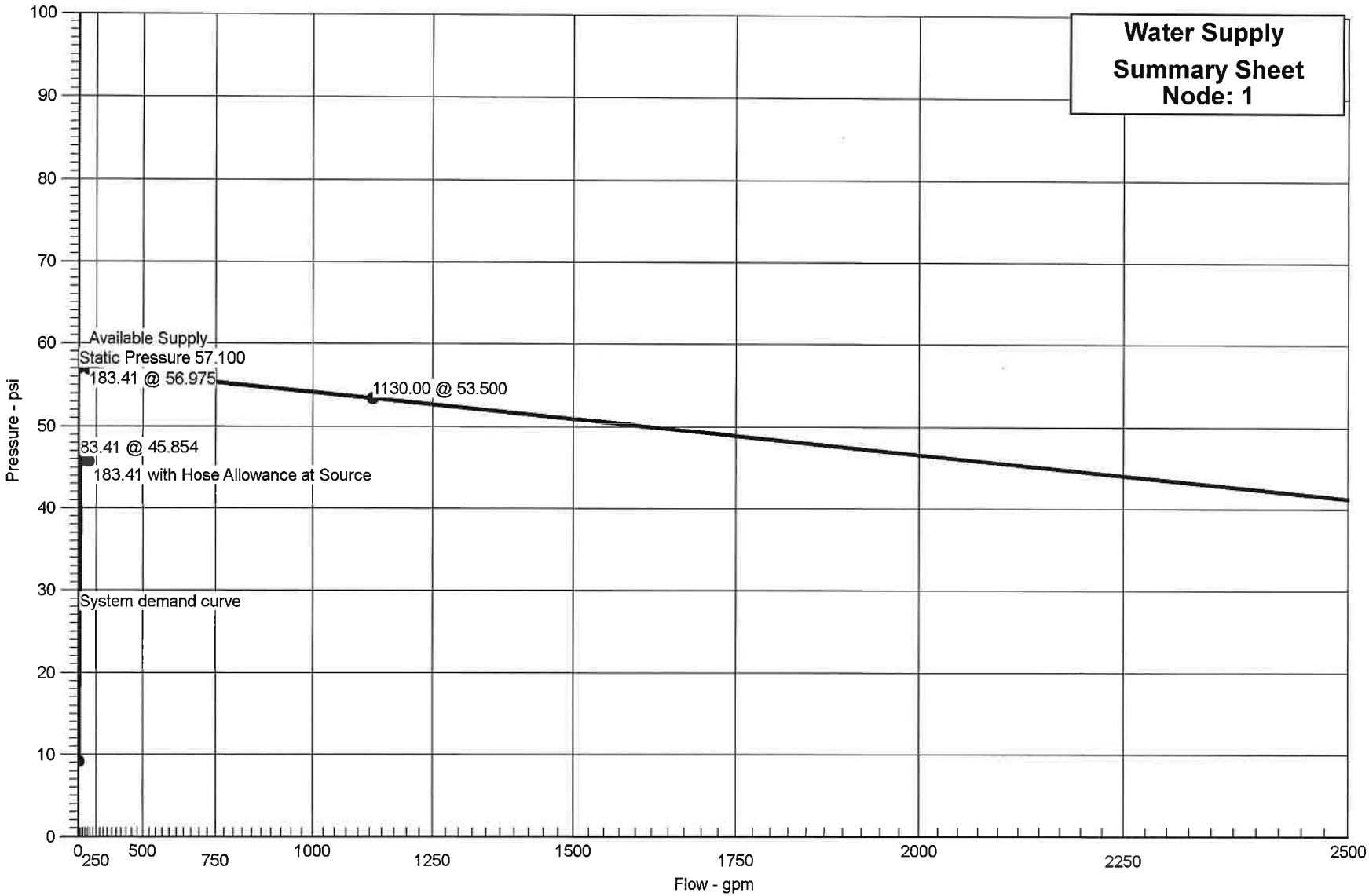
Automatic peaking results Left: N/A Right: N/A

Hydraulic Graph

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: B

$N^{1.85}$

Date: 10/11/2022



Summary Of Outflowing Devices

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	521	43.34	40.07	11.2	14.973		
⇨ **Sprinkler**	**522**	**40.07**	**40.07**	**11.2**	**12.800**		

⇨ 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	57.100	53.500	1130.00	56.975	183.41	45.854

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1	-3'-0	Supply	45.854	83.41	
521	18'-4	Sprinkler	14.973	43.34	
522	18'-4	Sprinkler	12.800	40.07	
10	18'-6		21.391		
13	21'-1½		20.201		
15	18'-10		21.197		
29	18'-6		21.391		
32	18'-10		21.197		
39	21'-1½		20.200		
41	18'-6		21.391		
44	18'-10		21.196		
57	18'-6		21.392		
61	18'-10		21.191		
69	18'-6		21.394		
73	18'-10		21.189		
84	18'-6		21.405		
89	18'-6		21.382		
93	18'-10		21.186		
104	3'-0	Gauge	28.174		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
109	3'-0		43.179		
116	18'-10		21.181		
127	18'-6		21.339		
132	18'-10		21.175		
143	18'-6		21.331		
154	18'-6		21.325		
157	18'-10		21.145		
168	18'-6		21.320		
171	18'-10		21.136		
184	18'-10		21.126		
197	18'-10		21.115		
199	18'-6		21.315		
214	18'-6		21.312		
217	18'-6		21.310		
220	18'-10		21.104		
248	18'-6		21.310		
251	18'-10		21.104		
255	18'-10		21.104		
270	22'-6½		19.286		

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: B

Date: 10/11/2022

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
522	18'-4	11.2	40.07	1	(See Notes)	8'-7½	120	12.800	• • • • • Route 1 • • • • • Sprinkler,
270	22'-6½		40.07	1.0490		9'-0 17'-7½	0.470651	-1.818 8.304	2E(2'-0), PO(5'-0)
270	22'-6½			2	(See Notes)	69'-11	120	19.286	
217	18'-6		16.09	2.1570		36'-11 106'-10	0.002600	1.746 0.278	2E(6'-2), 2PO(12'-3½)
217	18'-6		5.98	4		12'-5½	120	21.310	Flow (q) from Route 8
214	18'-6		22.07	4.2600		 12'-5½	0.000170	 0.002	
214	18'-6		5.42	4		12'-6	120	21.312	Flow (q) from Route 2
199	18'-6		27.49	4.2600		 12'-6	0.000255	 0.003	
199	18'-6		4.92	4		12'-6	120	21.315	Flow (q) from Route 9
168	18'-6		32.41	4.2600		 12'-6	0.000345	 0.004	
168	18'-6		4.57	4		12'-6	120	21.320	Flow (q) from Route 10
154	18'-6		36.98	4.2600		 12'-6	0.000441	 0.006	
154	18'-6		4.38	4		11'-7	120	21.325	Flow (q) from Route 11
143	18'-6		41.36	4.2600		 11'-7	0.000542	 0.006	
143	18'-6		2.51	4		12'-5½	120	21.331	Flow (q) from Route 18
127	18'-6		43.87	4.2600		 12'-5½	0.000605	 0.008	
127	18'-6		2.66	4	(See Notes)	37'-2	120	21.339	Flow (q) from Route 19
89	18'-6		46.54	4.2600		26'-4 63'-6	0.000674	 0.043	2E(13'-2)
89	18'-6		6.21	4	(See Notes)	1'-2	120	21.382	Flow (q) from Route 20
84	18'-6		52.74	4.2600		26'-4 27'-6	0.000850	 0.023	T(26'-4)
84	18'-6		30.67	6	(See Notes)	24'-4	120	21.405	Flow (q) from Route 3
104	3'-0		83.41	6.3570		140'-10 165'-2	0.000283	6.722 0.047	5E(17'-7), CV(40'-3), BV(12'-7), BOR

Pipe Information

Node 1 / Node 2	Elev 1 / Elev 2 (Foot)	K-Factor	Flow added this step / 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.
104	3'-0			6	(See Notes)	1'-6	120	28.174	
109	3'-0		83.41	6.3570		17'-7	0.000283	-0.000	E(17'-7), BFP(-15.000)
						19'-1½		15.005	
109	3'-0			6	(See Notes)	260'-9	140	43.179	
1	-3'-0		83.41	6.2800		66'-2½	0.000225	2.601	3E(22'-1), S
						326'-11½		0.074	
			100.00					45.854	Hose Allowance At Source
1			183.41						Total(Pt) Route 1
521	18'-4	11.2	43.34	1	(See Notes)	2'-8	120	14.973	• • • • • **Route 2** • • • • • Sprinkler,
255	18'-10		43.34	1.0490		9'-0	0.544119	-0.217	2E(2'-0), PO(5'-0)
						11'-8		6.348	
255	18'-10		18.00	4		9'-0	120	21.104	Flow (q) from Route 7
197	18'-10		61.34	4.2600			0.001124		
						9'-0		0.010	
197	18'-10			2	(See Notes)	91'-3½	120	21.115	PO(12'-3½)
214	18'-6		5.42	2.1570		61'-6½	0.000347	0.145	3PO(12'-3½), 2E(6'-2)
						152'-10		0.053	
								21.312	Total(Pt) Route 2
29	18'-6		5.70 + 5.84	4		10'-0	120	21.391	• • • • • **Route 3** • • • • • Flow (q) from Route 4 and 5
41	18'-6		11.54	4.2600			0.000051		
						10'-0		0.001	
41	18'-6		5.78	4		7'-2	120	21.391	Flow (q) from Route 13
57	18'-6		17.32	4.2600			0.000108		
						7'-2		0.001	
57	18'-6		6.55	4		10'-0	120	21.392	Flow (q) from Route 16
69	18'-6		23.87	4.2600			0.000196		
						10'-0		0.002	
69	18'-6		6.79	4	(See Notes)	8'-10	120	21.394	Flow (q) from Route 14
84	18'-6		30.67	4.2600		26'-4	0.000312		T(26'-4)
						35'-2		0.011	
								21.405	Total(Pt) Route 3

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.
39	21'-1½		5.70	2	(See Notes)	65'-0	120	20.200	• • • • • **Route 4** • • • • •
29	18'-6		5.70	2.1570		49'-2½ / 114'-3	0.000382	1.147 / 0.044	T(12'-3½), Flow (q) from Route 21 2E(6'-2), 2PO(12'-3½)
								21.391	Total(Pt) Route 4
10	18'-6		5.84	4		10'-0	120	21.391	• • • • • **Route 5** • • • • •
29	18'-6		5.84	4.2600		10'-0	0.000014	0.000	Flow (q) from Route 6
								21.391	Total(Pt) Route 5
13	21'-1½		5.84	2	(See Notes)	64'-11½	120	20.201	• • • • • **Route 6** • • • • •
10	18'-6		5.84	2.1570		43'-1 / 108'-0½	0.000399	1.147 / 0.043	T(12'-3½), Flow (q) from Route 12 3E(6'-2), PO(12'-3½)
								21.391	Total(Pt) Route 6
220	18'-10		23.98	4		3'-5½	120	21.104	• • • • • **Route 7** • • • • •
255	18'-10		18.00	4.2600		3'-5½	0.000116	0.000	Flow (q) from Route 17
								21.104	Total(Pt) Route 7
220	18'-10		23.98	4		12'-0	120	21.104	• • • • • **Route 8** • • • • •
251	18'-10		5.98	4.2600		12'-0	0.000015	0.000	Flow (q) from Route 17
251	18'-10			2	(See Notes)	91'-3	120	21.104	PO(12'-3½)
248	18'-6		5.98	2.1570		55'-4½ / 146'-7½	0.000417	0.145 / 0.061	3E(6'-2), 2PO(12'-3½)
248	18'-6			4		12'-0	120	21.310	
217	18'-6		5.98	4.2600		12'-0	0.000015	0.000	
								21.310	Total(Pt) Route 8
197	18'-10		5.42	4		12'-6	120	21.115	• • • • • **Route 9** • • • • •
184	18'-10		55.92	4.2600		12'-6	0.000947	0.012	Flow (q) from Route 2
184	18'-10			2	(See Notes)	91'-3½	120	21.126	PO(12'-3½)
199	18'-6		4.92	2.1570		61'-6½ / 152'-10	0.000290	0.145 / 0.044	3PO(12'-3½), 2E(6'-2)
								21.315	Total(Pt) Route 9

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: B

Date: 10/11/2022

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.
184	18'-10		4.92	4		12'-6	120	21.126	• • • • • **Route 10** • • • • • Flow (q) from Route 9
171	18'-10		51.00	4.2600		12'-6	0.000799	0.010	
171	18'-10			2	(See Notes)	91'-3½	120	21.136	PO(12'-3½)
168	18'-6		4.57	2.1570		61'-6½ / 152'-10	0.000253	0.145 / 0.039	3PO(12'-3½), 2E(6'-2)
								21.320	Total(Pt) Route 10
171	18'-10		4.57	4		12'-6	120	21.136	• • • • • **Route 11** • • • • • Flow (q) from Route 10
157	18'-10		46.43	4.2600		12'-6	0.000671	0.008	
157	18'-10			2	(See Notes)	91'-3½	120	21.145	PO(12'-3½)
154	18'-6		4.38	2.1570		61'-6½ / 152'-10	0.000234	0.145 / 0.036	3PO(12'-3½), 2E(6'-2)
								21.325	Total(Pt) Route 11
44	18'-10		17.32	4		10'-0	120	21.196	• • • • • **Route 12** • • • • • Flow (q) from Route 15
32	18'-10		11.54	4.2600		10'-0	0.000051	0.001	
32	18'-10			4		10'-0	120	21.197	
15	18'-10		5.84	4.2600		10'-0	0.000014	0.000	
15	18'-10			2	(See Notes)	2'-4	120	21.197	PO(10'-0)
13	21'-1½		5.84	2.0670		10'-0 / 12'-4	0.000490	-1.003 / 0.006	
								20.201	Total(Pt) Route 12
44	18'-10		17.32	2	(See Notes)	67'-4	120	21.196	• • • • • **Route 13** • • • • • PO(12'-3½), Flow (q) from Route 15
41	18'-6		5.78	2.1570		61'-6½ / 128'-10½	0.000391	0.145 / 0.050	3PO(12'-3½), 2E(6'-2)
								21.391	Total(Pt) Route 13
73	18'-10		30.67	2	(See Notes)	53'-0½	120	21.189	• • • • • **Route 14** • • • • • PO(12'-3½), Flow (q) from Route 23
69	18'-6		6.79	2.1570		61'-6½ / 114'-7	0.000527	0.145 / 0.060	3PO(12'-3½), 2E(6'-2)
								21.394	Total(Pt) Route 14

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.
73	18'-10		30.67	4		10'-0	120	21.189	• • • • • **Route 15** • • • • • Flow (q) from Route 23
61	18'-10		23.87	4.2600		10'-0	0.000196	0.002	
61	18'-10			4	(See Notes)	22'-8	120	21.191	
44	18'-10		17.32	4.2600		26'-4 49'-0	0.000108	0.005	2E(13'-2)
								21.196	Total(Pt) Route 15
61	18'-10			2	(See Notes)	53'-0½	120	21.191	• • • • • **Route 16** • • • • • PO(12'-3½)
57	18'-6		6.55	2.1570		61'-6½ 114'-7	0.000493	0.145 0.056	3PO(12'-3½), 2E(6'-2)
								21.392	Total(Pt) Route 16
270	22'-6½		16.09	2	(See Notes)	21'-4	120	19.286	• • • • • **Route 17** • • • • • Flow (q) from Route 1
220	18'-10		23.98	2.1570		18'-5½ 39'-9½	0.005439	1.601 0.216	E(6'-2), PO(12'-3½)
								21.104	Total(Pt) Route 17
132	18'-10		42.05	2	(See Notes)	76'-9½	120	21.175	• • • • • **Route 18** • • • • • PO(12'-3½), Flow (q) from Route 22
143	18'-6		2.51	2.1570		61'-6½ 138'-4	0.000084	0.145 0.012	3PO(12'-3½), 2E(6'-2)
								21.331	Total(Pt) Route 18
132	18'-10		42.05	4		12'-5½	120	21.175	• • • • • **Route 19** • • • • • Flow (q) from Route 22
116	18'-10		39.54	4.2600		12'-5½	0.000499	0.006	
116	18'-10			2	(See Notes)	76'-10	120	21.181	PO(12'-3½)
127	18'-6		2.66	2.1570		61'-6½ 138'-4	0.000093	0.145 0.013	3PO(12'-3½), 2E(6'-2)
								21.339	Total(Pt) Route 19
93	18'-10		36.87	2	(See Notes)	53'-0½	120	21.186	• • • • • **Route 20** • • • • • PO(12'-3½), Flow (q) from Route 24
89	18'-6		6.21	2.1570		61'-6½ 114'-7	0.000446	0.145 0.051	3PO(12'-3½), 2E(6'-2)
								21.382	Total(Pt) Route 20
32	18'-10			2	(See Notes)	2'-4	120	21.197	• • • • • **Route 21** • • • • • PO(10'-0)
39	21'-1½		5.70	2.0670		10'-0 12'-4	0.000470	-1.002 0.006	

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: B

Date: 10/11/2022

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 / Total	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.
								20.200	Total(Pt) Route 21
157	18'-10		4.38	4	(See Notes)	28'-3	120	21.145	• • • • • **Route 22** • • • • • Flow (q) from Route 11
						26'-4	0.000559		
132	18'-10		42.05	4.2600		54'-7		0.030	2E(13'-2)
								21.175	Total(Pt) Route 22
93	18'-10		36.87	4		10'-0	120	21.186	• • • • • **Route 23** • • • • • Flow (q) from Route 24
							0.000312		
73	18'-10		30.67	4.2600		10'-0		0.003	
								21.189	Total(Pt) Route 23
116	18'-10		2.66	4		10'-6	120	21.181	• • • • • **Route 24** • • • • • Flow (q) from Route 19
							0.000438		
93	18'-10		36.87	4.2600		10'-6		0.005	
								21.186	Total(Pt) Route 24

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 Connectic	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				

Hydraulic Overview

Job Number: JM22197 - CDT
Report Description: Light Hazard (C)

Job

Job Number: JM22197	Design Engineer: BKB
Job Name: CAROLINA DIESEL TRUCKS	Phone: 919.243.2464 FAX:
Address 1: 62 PROGRESS DRIVE	State Certification/License Number: 16269FS
Address 2: FUQUAY VARINA, NC 27526	AHJ: TOWN OF FUQUAY VARINA
Address 3:	Job Site/Building:

System

Density: 0.10gpm/ft²	Area of Application: 1500ft² (Actual 1069ft²)
Most Demanding Sprinkler Data: 5.6 K-Factor 18.20 at 10.563	Hose Streams: 100.00
Coverage Per Sprinkler: 182ft²	Number Of Sprinklers Calculated: 12 0
System Pressure Demand: 43.858	System Flow Demand: 238.88
Total Demand: 338.88 @ 43.858	Pressure Result: +12.854 (22.7%)

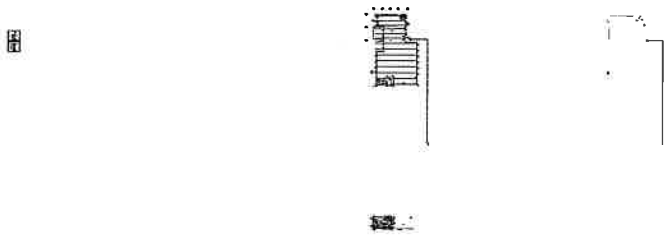
Supplies

Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)
1	Water Supply	1130.00	100.00	57.100	53.500

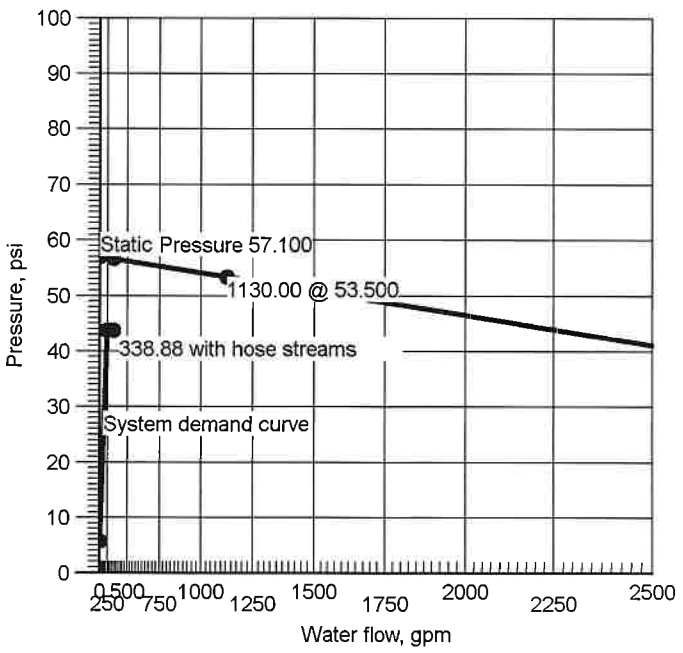
Check Point Gauges

Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
BOR	25.703	47.12	238.88

PIPING plan corrected



Water Supply at Node 1 (1130.00, 250.00, 57.100, 53.500)



Hydraulic Calculations

for

Project Name: CAROLINA DIESEL TRUCKS
Location: 62 PROGRESS DRIVE, FUQUAY VARINA, NC 27526,
Drawing Name: PIPING plan corrected

Calculation Date: 10/11/2022

Design

Remote Area Number:	C
Remote Area Location:	SEE PLAN
Occupancy Classification:	Light Hazard
Commodity Classification:	N/A
Density	0.10gpm/ft²
Area of Application:	1500ft² (Actual 1069ft²)
Coverage per Sprinkler:	182ft²
Type of sprinklers calculated:	Upright, Pendent
No. of sprinklers calculated:	12
No. of nozzles calculated:	0

In-rack Demand:	N/A gpm	at Node:	N/A		
Hose Streams:	100.00	at Node:	1	Type:	Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 338.88 @ 43.858 (Safety Margin = 12.854)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherA N/A

Name of Contractor:
Address: ,
Phone Number:
Name of designer: BKB
Authority Having Jurisdiction:TOWN OF FUQUAY VARINA

Notes:

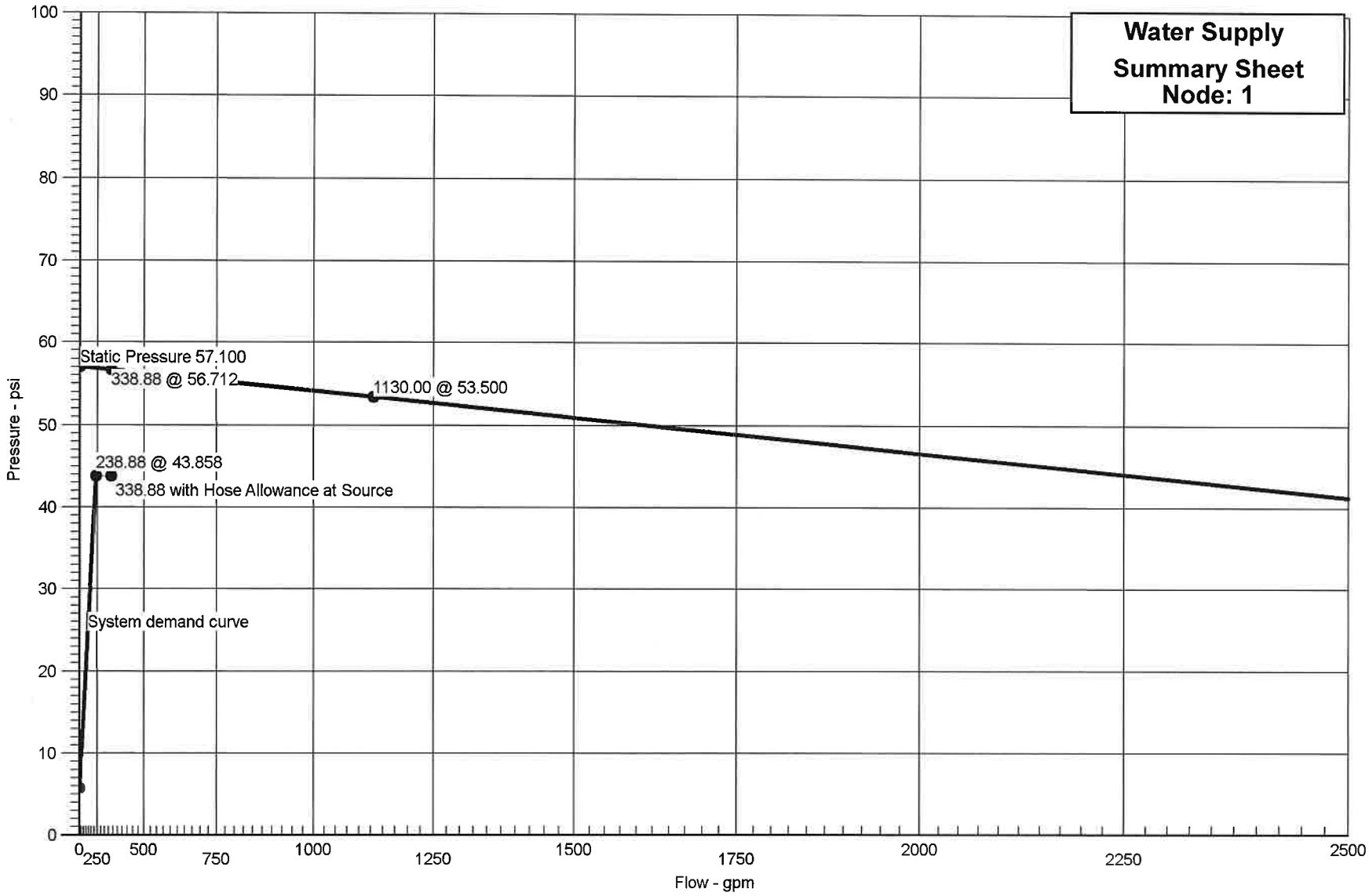
Automatic peaking results Left: N/A Right: N/A

Hydraulic Graph

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: C

N 1.85

Date: 10/11/2022



Summary Of Outflowing Devices

Job Number: JM22197 - CDT
Report Description: Light Hazard (C)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	544	20.64	18.20	5.6	13.586		
Sprinkler	545	18.84	18.20	5.6	11.322		
Sprinkler	546	19.14	18.20	5.6	11.676		
Sprinkler	547	19.37	18.20	5.6	11.961		
Sprinkler	548	19.43	18.20	5.6	12.039		
Sprinkler	549	22.04	18.20	5.6	15.489		
Sprinkler	550	20.40	18.20	5.6	13.270		
Sprinkler	551	20.34	18.20	5.6	13.186		
⇨ **Sprinkler**	**552**	**18.20**	**18.20**	**5.6**	**10.563**		
Sprinkler	553	20.04	18.20	5.6	12.812		
Sprinkler	554	21.56	18.20	5.6	14.817		
Sprinkler	555	18.89	18.20	5.6	11.375		

⇨ 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	57.100	53.500	1130.00	56.712	338.88	43.858

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1	-3'-0	Supply	43.858	238.88	
544	8'-0	Sprinkler	13.586	20.64	
545	10'-6	Sprinkler	11.322	18.84	
546	10'-6	Sprinkler	11.676	19.14	
547	8'-0	Sprinkler	11.961	19.37	
548	8'-0	Sprinkler	12.039	19.43	
549	8'-0	Sprinkler	15.489	22.04	
550	8'-0	Sprinkler	13.270	20.40	
551	8'-0	Sprinkler	13.186	20.34	
552	8'-0	Sprinkler	10.563	18.20	
553	8'-0	Sprinkler	12.812	20.04	
554	8'-0	Sprinkler	14.817	21.56	
555	8'-0	Sprinkler	11.375	18.89	
10	18'-6		18.548		
13	21'-1½		17.083		
15	18'-10		18.041		
29	18'-6		18.550		
32	18'-10		18.040		
39	21'-1½		17.080		

Job Name: CAROLINA DIESEL TRUCKS
Remote Area Number: C

Date: 10/11/2022

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
41	18'-6		18.553		
44	18'-10		18.036		
57	18'-6		18.559		
61	18'-10		17.997		
69	18'-6		18.574		
73	18'-10		17.983		
84	18'-6		18.655		
89	18'-6		18.496		
93	18'-10		17.960		
104	3'-0	Gauge	25.703		
109	3'-0		40.741		
116	18'-10		17.925		
127	18'-6		18.210		
132	18'-10		17.878		
143	18'-6		18.162		
154	18'-6		18.123		
157	18'-10		17.637		
168	18'-6		18.091		
171	18'-10		17.570		
184	18'-10		17.488		
197	18'-10		17.390		
199	18'-6		18.068		
214	18'-6		18.053		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
217	18'-6		18.045		
220	18'-10		17.271		
248	18'-6		18.043		
251	18'-10		17.134		
338	10'-6		13.537		
341	10'-11		11.664		
344	10'-0		17.647		
346	10'-0		16.789		
347	10'-0		20.327		
348	10'-0		16.646		
350	10'-0		16.389		
353	10'-0		15.968		
354	10'-0		15.894		
356	10'-0		15.809		
358	10'-0		15.749		
360	10'-0		15.699		
362	10'-0		15.696		

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.
552	8'-0	5.6	18.20	1	(See Notes)	15'-7½	120	10.563	••••• Route 1 ••••• Sprinkler,
341	10'-11		18.20	1.0490		6'-0 21'-7½	0.109297	-1.264 2.366	3E(2'-0)
341	10'-11		18.89	1	(See Notes)	1'-11	120	11.664	Flow (q) from Route 3
360	10'-0		37.09	1.0490		7'-0 8'-11	0.407880	0.397 3.638	E(2'-0), PO(5'-0)
360	10'-0		19.43	2½		5'-0	120	15.699	Flow (q) from Route 6
358	10'-0		56.52	2.6350		5'-0	0.010023	0.050	
358	10'-0		19.37	2½		3'-6	120	15.749	Flow (q) from Route 5
356	10'-0		75.89	2.6350		3'-6	0.017288	0.060	
356	10'-0		20.04	2½		3'-2	120	15.809	Flow (q) from Route 7
354	10'-0		95.93	2.6350		3'-2	0.026673	0.084	
354	10'-0		21.56	2½		1'-11	120	15.894	Flow (q) from Route 11
353	10'-0		117.49	2.6350		1'-11	0.038808	0.074	
353	10'-0		19.14	2½		8'-2½	120	15.968	Flow (q) from Route 4
350	10'-0		136.62	2.6350		8'-2½	0.051305	0.421	
350	10'-0		20.34	2½		3'-10½	120	16.389	Flow (q) from Route 8
348	10'-0		156.96	2.6350		3'-10½	0.066320	0.258	
348	10'-0		22.04	2½		1'-8½	120	16.646	Flow (q) from Route 12
346	10'-0		179.00	2.6350		1'-8½	0.084569	0.143	
346	10'-0		20.40	2½		8'-4	120	16.789	Flow (q) from Route 9
344	10'-0		199.40	2.6350		8'-4	0.103258	0.858	
344	10'-0		39.48	2½	(See Notes)	2'-1½	120	17.647	Flow (q) from Route 2
347	10'-0		238.88	2.6350		16'-5½ 18'-7	0.144239	2.680	PO(16'-5½)

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
347	10'-0			4	(See Notes)	19'-5	120	20.327	
						26'-4	0.013901	-3.829	2E(13'-2)
251	18'-10		238.88	4.2600		45'-9		0.636	
251	18'-10			2	(See Notes)	91'-3	120	17.134	PO(12'-3½)
						55'-4½	0.005218	0.145	
248	18'-6		23.45	2.1570		146'-7½		0.765	3E(6'-2), 2PO(12'-3½)
248	18'-6			4		12'-0	120	18.043	
							0.000190		
217	18'-6		23.45	4.2600		12'-0		0.002	
217	18'-6		21.10	4		12'-5½	120	18.045	Flow (q) from Route 26
							0.000622		
214	18'-6		44.55	4.2600		12'-5½		0.008	
214	18'-6		18.59	4		12'-6	120	18.053	Flow (q) from Route 17
							0.001186		
199	18'-6		63.14	4.2600		12'-6		0.015	
199	18'-6		16.90	4		12'-6	120	18.068	Flow (q) from Route 18
							0.001839		
168	18'-6		80.05	4.2600		12'-6		0.023	
168	18'-6		15.63	4		12'-6	120	18.091	Flow (q) from Route 19
							0.002558		
154	18'-6		95.68	4.2600		12'-6		0.032	
154	18'-6		14.82	4		11'-7	120	18.123	Flow (q) from Route 20
							0.003339		
143	18'-6		110.50	4.2600		11'-7		0.039	
143	18'-6		9.64	4		12'-5½	120	18.162	Flow (q) from Route 27
							0.003898		
127	18'-6		120.14	4.2600		12'-5½		0.049	
127	18'-6		9.68	4	(See Notes)	37'-2	120	18.210	Flow (q) from Route 28
						26'-4	0.004499		2E(13'-2)
89	18'-6		129.82	4.2600		63'-6		0.286	
89	18'-6		18.66	4	(See Notes)	1'-2	120	18.496	Flow (q) from Route 29
						26'-4	0.005768		T(26'-4)
84	18'-6		148.48	4.2600		27'-6		0.159	

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.
84	18'-6		90.40	6	(See Notes)	24'-4	120	18.655	Flow (q) from Route 13
104	3'-0		238.88	6.3570		140'-10	0.001979	6.722	
						165'-2		0.327	5E(17'-7), CV(40'-3), BV(12'-7), BOR
104	3'-0			6	(See Notes)	1'-6	120	25.703	
109	3'-0		238.88	6.3570		17'-7	0.001979	-0.000	
						19'-1½		15.038	E(17'-7), BFP(-15.000)
109	3'-0			6	(See Notes)	260'-9	140	40.741	
1	-3'-0		238.88	6.2800		66'-2½	0.001579	2.601	
						326'-11½		0.516	3E(22'-1), S
			100.00					43.858	Hose Allowance At Source
1			338.88						Total(Pt) Route 1
545	10'-6	5.6	18.84	1	(See Notes)	19'-0	120	11.322	• • • • • **Route 2** • • • • •
338	10'-6		18.84	1.0490			0.116543		Sprinkler
						19'-0		2.215	
338	10'-6		20.64	1	(See Notes)	1'-6	120	13.537	Flow (q) from Route 10
344	10'-0		39.48	1.0490		7'-0	0.457983	0.217	
						8'-6		3.894	E(2'-0), PO(5'-0)
								17.647	Total(Pt) Route 2
555	8'-0	5.6	18.89	1	(See Notes)	4'-3½	120	11.375	• • • • • **Route 3** • • • • •
341	10'-11		18.89	1.0490		9'-0	0.117050	-1.264	Sprinkler,
						13'-3½		1.553	2E(2'-0), T(5'-0)
								11.664	Total(Pt) Route 3
546	10'-6	5.6	19.14	1	(See Notes)	21'-0	120	11.676	• • • • • **Route 4** • • • • •
353	10'-0		19.14	1.0490		13'-0	0.119916	0.217	Sprinkler,
						34'-0		4.075	4E(2'-0), PO(5'-0)
								15.968	Total(Pt) Route 4
547	8'-0	5.6	19.37	1	(See Notes)	24'-11½	120	11.961	• • • • • **Route 5** • • • • •
358	10'-0		19.37	1.0490		13'-0	0.122623	-0.867	Sprinkler,
						37'-11½		4.655	4E(2'-0), PO(5'-0)
								15.749	Total(Pt) Route 5

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
548	8'-0	5.6	19.43	1	(See Notes)	23'-8	120	12.039	• • • • • **Route 6** • • • • •
						13'-0	0.123363	-0.867	Sprinkler,
362	10'-0		19.43	1.0490		36'-8		4.523	4E(2'-0), PO(5'-0)
362	10'-0			2½		2'-4	120	15.696	
							0.001390		
360	10'-0		19.43	2.6350		2'-4		0.003	
								15.699	Total(Pt) Route 6
553	8'-0	5.6	20.04	1	(See Notes)	16'-7	120	12.812	• • • • • **Route 7** • • • • •
						13'-0	0.130667	-0.867	Sprinkler,
356	10'-0		20.04	1.0490		29'-7		3.864	4E(2'-0), PO(5'-0)
								15.809	Total(Pt) Route 7
551	8'-0	5.6	20.34	1	(See Notes)	17'-4	120	13.186	• • • • • **Route 8** • • • • •
						13'-0	0.134197	-0.867	Sprinkler,
350	10'-0		20.34	1.0490		30'-4		4.069	4E(2'-0), PO(5'-0)
								16.389	Total(Pt) Route 8
550	8'-0	5.6	20.40	1	(See Notes)	19'-6	120	13.270	• • • • • **Route 9** • • • • •
						13'-0	0.134987	-0.867	Sprinkler,
346	10'-0		20.40	1.0490		32'-6		4.386	4E(2'-0), PO(5'-0)
								16.789	Total(Pt) Route 9
544	8'-0	5.6	20.64	1	(See Notes)	2'-6	120	13.586	• • • • • **Route 10** • • • • •
						5'-0	0.137953	-1.084	Sprinkler,
338	10'-6		20.64	1.0490		7'-6		1.035	T(5'-0)
								13.537	Total(Pt) Route 10
554	8'-0	5.6	21.56	1	(See Notes)	4'-0	120	14.817	• • • • • **Route 11** • • • • •
						9'-0	0.149479	-0.867	Sprinkler,
354	10'-0		21.56	1.0490		13'-0		1.944	2E(2'-0), PO(5'-0)
								15.894	Total(Pt) Route 11
549	8'-0	5.6	22.04	1	(See Notes)	4'-0	120	15.489	• • • • • **Route 12** • • • • •
						9'-0	0.155734	-0.867	Sprinkler,
348	10'-0		22.04	1.0490		13'-0		2.025	2E(2'-0), PO(5'-0)
								16.646	Total(Pt) Route 12

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.
29	18'-6		16.81 + 17.21	4		10'-0	120	18.550	• • • • • **Route 13** • • • • • Flow (q) from Route 14 and 15
41	18'-6		34.03	4.2600		10'-0	0.000378	0.004	
41	18'-6		17.04	4		7'-2	120	18.553	Flow (q) from Route 22
57	18'-6		51.07	4.2600		7'-2	0.000801	0.006	
57	18'-6		19.31	4		10'-0	120	18.559	Flow (q) from Route 25
69	18'-6		70.38	4.2600		10'-0	0.001449	0.014	
69	18'-6		20.02	4	(See Notes)	8'-10	120	18.574	Flow (q) from Route 23
84	18'-6		90.40	4.2600		26'-4 35'-2	0.002303	0.081	T(26'-4)
								18.655	Total(Pt) Route 13
39	21'-1½		16.81	2	(See Notes)	65'-0	120	17.080	• • • • • **Route 14** • • • • • T(12'-3½), Flow (q) from Route 30 2E(6'-2), 2PO(12'-3½)
29	18'-6		16.81	2.1570		49'-2½ 114'-3	0.002820	1.147 0.322	
								18.550	Total(Pt) Route 14
10	18'-6		17.21	4		10'-0	120	18.548	• • • • • **Route 15** • • • • • Flow (q) from Route 16
29	18'-6		17.21	4.2600		10'-0	0.000107	0.001	
								18.550	Total(Pt) Route 15
13	21'-1½		17.21	2	(See Notes)	64'-11½	120	17.083	• • • • • **Route 16** • • • • • T(12'-3½), Flow (q) from Route 21 3E(6'-2), PO(12'-3½)
10	18'-6		17.21	2.1570		43'-1 108'-0½	0.002945	1.147 0.318	
								18.548	Total(Pt) Route 16
251	18'-10		23.45	4		12'-0	120	17.134	• • • • • **Route 17** • • • • • Flow (q) from Route 1
220	18'-10		215.43	4.2600		12'-0	0.011483	0.138	
220	18'-10			4		12'-5½	120	17.271	
197	18'-10		194.33	4.2600		12'-5½	0.009489	0.118	

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.
197	18'-10			2	(See Notes)	91'-3½	120	17.390	PO(12'-3½)
214	18'-6		18.59	2.1570		61'-6½ / 152'-10	0.003396	0.145 / 0.519	3PO(12'-3½), 2E(6'-2)
								18.053	Total(Pt) Route 17
197	18'-10		18.59	4		12'-6	120	17.390	• • • • • **Route 18** • • • • • Flow (q) from Route 17
184	18'-10		175.74	4.2600		12'-6	0.007878	0.098	
184	18'-10			2	(See Notes)	91'-3½	120	17.488	PO(12'-3½)
199	18'-6		16.90	2.1570		61'-6½ / 152'-10	0.002848	0.145 / 0.435	3PO(12'-3½), 2E(6'-2)
								18.068	Total(Pt) Route 18
184	18'-10		16.90	4		12'-6	120	17.488	• • • • • **Route 19** • • • • • Flow (q) from Route 18
171	18'-10		158.83	4.2600		12'-6	0.006534	0.082	
171	18'-10			2	(See Notes)	91'-3½	120	17.570	PO(12'-3½)
168	18'-6		15.63	2.1570		61'-6½ / 152'-10	0.002465	0.145 / 0.377	3PO(12'-3½), 2E(6'-2)
								18.091	Total(Pt) Route 19
171	18'-10		15.63	4		12'-6	120	17.570	• • • • • **Route 20** • • • • • Flow (q) from Route 19
157	18'-10		143.20	4.2600		12'-6	0.005394	0.067	
157	18'-10			2	(See Notes)	91'-3½	120	17.637	PO(12'-3½)
154	18'-6		14.82	2.1570		61'-6½ / 152'-10	0.002233	0.145 / 0.341	3PO(12'-3½), 2E(6'-2)
								18.123	Total(Pt) Route 20
44	18'-10		51.07	4		10'-0	120	18.036	• • • • • **Route 21** • • • • • Flow (q) from Route 24
32	18'-10		34.03	4.2600		10'-0	0.000378	0.004	
32	18'-10			4		10'-0	120	18.040	
15	18'-10		17.21	4.2600		10'-0	0.000107	0.001	

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.
15	18'-10			2	(See Notes)	2'-4	120	18.041	PO(10'-0)
13	21'-1½		17.21	2.0670		10'-0	0.003624	-1.003	
						12'-4		0.045	
								17.083	Total(Pt) Route 21
44	18'-10		51.07	2	(See Notes)	67'-4	120	18.036	• • • • • **Route 22** • • • • • PO(12'-3½), Flow (q) from Route 24 3PO(12'-3½), 2E(6'-2)
41	18'-6		17.04	2.1570		61'-6½	0.002891	0.145	
						128'-10½		0.373	
								18.553	Total(Pt) Route 22
73	18'-10		90.40	2	(See Notes)	53'-0½	120	17.983	• • • • • **Route 23** • • • • • PO(12'-3½), Flow (q) from Route 32 3PO(12'-3½), 2E(6'-2)
69	18'-6		20.02	2.1570		61'-6½	0.003896	0.145	
						114'-7		0.446	
								18.574	Total(Pt) Route 23
73	18'-10		90.40	4		10'-0	120	17.983	• • • • • **Route 24** • • • • • Flow (q) from Route 32
61	18'-10		70.38	4.2600		10'-0	0.001449	0.014	
61	18'-10			4	(See Notes)	22'-8	120	17.997	
44	18'-10		51.07	4.2600		26'-4	0.000801		2E(13'-2)
						49'-0		0.039	
								18.036	Total(Pt) Route 24
61	18'-10			2	(See Notes)	53'-0½	120	17.997	• • • • • **Route 25** • • • • • PO(12'-3½)
57	18'-6		19.31	2.1570		61'-6½	0.003643	0.145	3PO(12'-3½), 2E(6'-2)
						114'-7		0.417	
								18.559	Total(Pt) Route 25
220	18'-10			2	(See Notes)	91'-3	120	17.271	• • • • • **Route 26** • • • • • PO(12'-3½)
217	18'-6		21.10	2.1570		55'-4½	0.004294	0.145	3E(6'-2), 2PO(12'-3½)
						146'-7½		0.630	
								18.045	Total(Pt) Route 26
132	18'-10		128.38	2	(See Notes)	76'-9½	120	17.878	• • • • • **Route 27** • • • • • PO(12'-3½), Flow (q) from Route 31 3PO(12'-3½), 2E(6'-2)
143	18'-6		9.64	2.1570		61'-6½	0.001008	0.145	
						138'-4		0.139	
								18.162	Total(Pt) Route 27

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.
132	18'-10		128.38	4		12'-5½	120	17.878	• • • • • **Route 28** • • • • • Flow (q) from Route 31
116	18'-10		118.74	4.2600		12'-5½	0.003814	0.048	
116	18'-10			2	(See Notes)	76'-10	120	17.925	PO(12'-3½)
127	18'-6		9.68	2.1570		61'-6½ 138'-4	0.001015	0.145 0.140	3PO(12'-3½), 2E(6'-2)
								18.210	Total(Pt) Route 28
93	18'-10		109.06	2	(See Notes)	53'-0½	120	17.960	• • • • • **Route 29** • • • • • PO(12'-3½), Flow (q) from Route 33
89	18'-6		18.66	2.1570		61'-6½ 114'-7	0.003420	0.145 0.392	3PO(12'-3½), 2E(6'-2)
								18.496	Total(Pt) Route 29
32	18'-10			2	(See Notes)	2'-4	120	18.040	• • • • • **Route 30** • • • • • PO(10'-0)
39	21'-1½		16.81	2.0670		10'-0 12'-4	0.003471	-1.002 0.043	
								17.080	Total(Pt) Route 30
157	18'-10		14.82	4	(See Notes)	28'-3	120	17.637	• • • • • **Route 31** • • • • • Flow (q) from Route 20
132	18'-10		128.38	4.2600		26'-4 54'-7	0.004407	0.240	2E(13'-2)
								17.878	Total(Pt) Route 31
93	18'-10		109.06	4		10'-0	120	17.960	• • • • • **Route 32** • • • • • Flow (q) from Route 33
73	18'-10		90.40	4.2600		10'-0	0.002303	0.023	
								17.983	Total(Pt) Route 32
116	18'-10		9.68	4		10'-6	120	17.925	• • • • • **Route 33** • • • • • Flow (q) from Route 28
93	18'-10		109.06	4.2600		10'-6	0.003259	0.034	
								17.960	Total(Pt) Route 33

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

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

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 Connectic	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				

WATER TEST

Hydrant Flow Test Report

Test Date 8/3/2022 **Test Time** 10 AM

Location

Progress Dr
Fuquay Varina

Tested by

J & D Sprinkler Co.

Notes

Test conducted by Jim Mattocks and Farrin Dunn with J&D Sprinkler Co.

Read Hydrant

57.1 psi **static pressure**
53.5 psi **residual pressure**
hydrant elevation

Flow Hydrant(s)

Outlet	Elev	Size	C	Pitot Pressure	Flow
#1		2.5			1130 gpm

Flow Graph