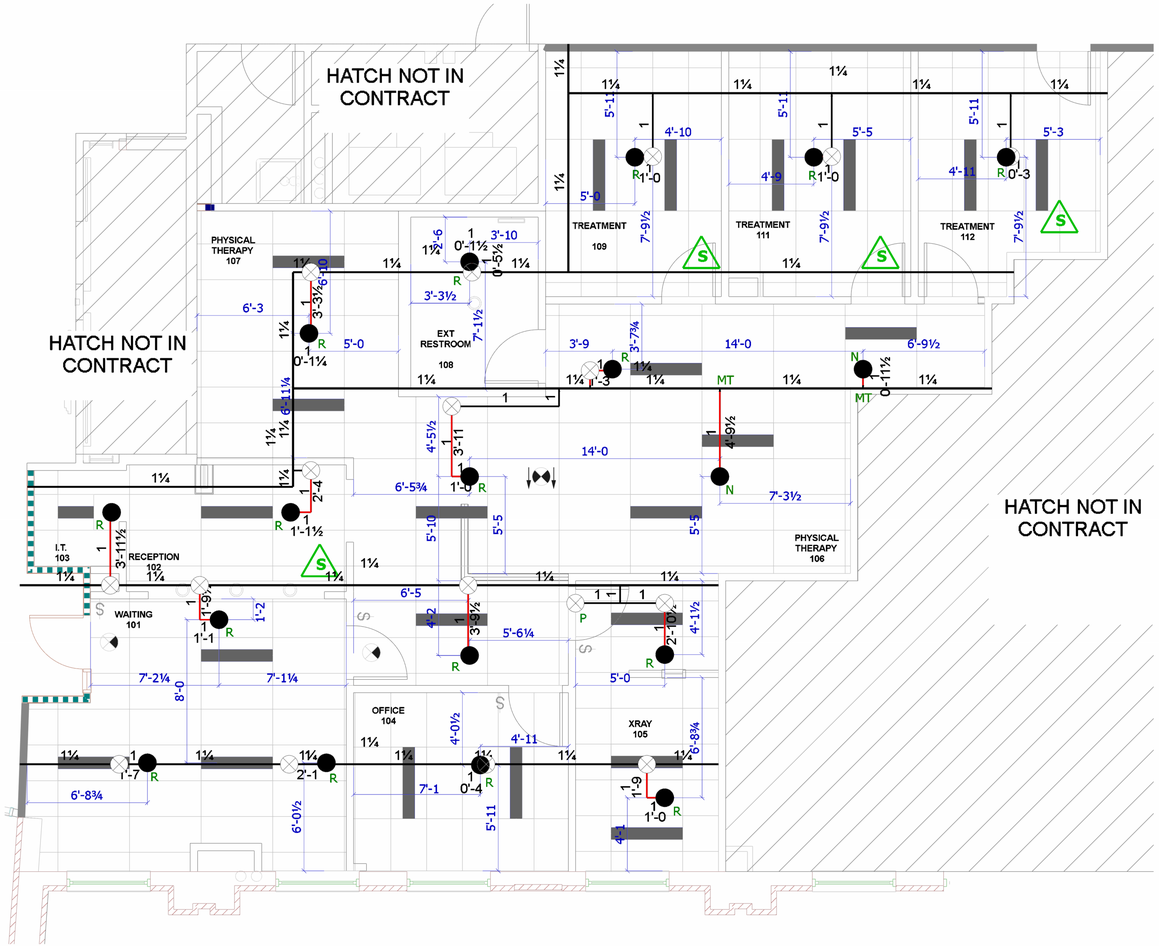
RSN: 1773851
Permit # 2024-2406949-CT
Sheet 1 of 66



FIRE PROTECTION LAYOUT
1/4"=1'-0"
0' 1' 2' 4' 8'
NORTH

City of Aurora Building Division
Counter Permit intake by: G. Pough
Date: Jan 04, 2024
RSN: 1773851
Permit: 2024-2406949-CT
2021 INTERNATIONAL CODES & 2020 NEC Scope of permit to be field verified.

Provide a full size set of legible approved construction documents **PRINTED IN COLOR** for review by the Field Inspector.

COA Adopted Codes for this project:
ICC-2021 - NEC-2023
NFPA 13-2019 - NFPA 72-2019
COA Amendments 22 & 66

GENERAL NOTES:

1. THIS IS A TENANT FINISH TO THE EXISTING WET PIPE SPRINKLER SYSTEM AT 1444 SOUTH POTOMAC, SUITE 170 AURORA, CO 80012 CONSISTING OF THE METRO DENVER ACCIDENT AND INJURY TENANT IMPROVEMENT.

2. NEW AND RELOCATED SPRINKLERS SHALL COMPLY WITH THE CITY OF AURORA BUILDING DIVISION AND NFPA 13 2019.

3. THE SCOPE OF WORK SHALL CONSIST OF ADDING NEW VIKING PENDENT HEADS IN HARD LID AND ACOUSTIC CEILINGS TO ACCOMMODATE THE NEW TENANT LAYOUT.

4. THE EXISTING OVERHEAD SPRINKLER SYSTEM HAS BEEN DESIGNED FOR A .20/2,000 FOR AN ORDINARY HAZARD (GROUP II) OCCUPANCY. NEW TENANT WILL NOT BE ALTERING ANY OF THE HYDRAULIC DESIGN AREAS. THE NEW TENANT DOES NOT EXCEED THE DEMAND FOR THE EXISTING SPRINKLERS AND SHALL NOT NEGATIVELY IMPACT THE HYDRAULIC PERFORMANCE OF THE SPRINKLER SYSTEM.

5. INSTALL PIPE HANGERS PER NFPA 13 2019 SECTION 17.4.2.1

6. SPACING LEGEND:

MAXIMUM 225 SQ.FT. (15'x15'), SPRINKLER SPACING FOR STANDARD COVERAGE SPRINKLERS IN LIGHT HAZARD AREAS (NEW OFFICE)
MAXIMUM 130 SQ.FT. (10'x13'), SPRINKLER SPACING FOR STANDARD COVERAGE HEADS IN ORDINARY HAZARD AREAS (SALES FLOOR, STORAGE ROOMS MECHANICAL ROOMS ETC...)

7. NEW SPRINKLER FITTINGS AND PIPE ARE AS FOLLOWS:
THREADED ARMOVERS: 1" - BULLMOOSE SCH. 30 WITH THREADED FITTINGS.

8. PLAN KEY:
"R" = RELOCATE EXISTING SPRINKLER TO NEW LOCATION FOR ADEQUATE COVERAGE.
"E" = EXISTING SPRINKLER THAT SHALL REMAIN.
"N" = NEW SPRINKLER TO BE ADDED.
"P" = REMOVE EXISTING SPRINKLER AND PLUG THE OUTLET.
"MT" = INSTALL A MECHANICAL TEE FOR NEW OUTLET TO A SPRINKLER.

9. ALL PIPE LENGTHS SHOWN REFLECT FITTING TAKE-OUT

10. ALL FIRE ALARM WORK AND WIRING SHALL BE BY OTHERS.

11. FREEDOM FIRE PROTECTION'S SCOPE OF WORK SHALL BEGIN AT THE EXISTING FIRE SPRINKLER PIPING IN THE TENANT SPACE.

12. EXISTING PIPE TO REMAIN SHOWN AS A SOLID BLACK LINE.

EXISTING PIPE AND SPRINKLERS THAT SHALL BE RELOCATED ARE SHOWN AS RED WITH CUT LENGTHS.

13. ALL PENDENT SPRINKLERS TO BE LOCATED A MINIMUM OF 1'-0" FROM ALL DOWNWARD DISCHARGE MECHANICAL DIFFUSERS.

14. ⚠3 - INDICATES AREAS THAT HAVE BEEN PROTECTED PER THE SMALL ROOM PROVISION AS STATED IN NFPA 13 2019 SECTION 10.2.5.2.3.1

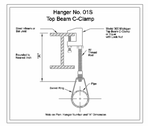
15. TOTAL NUMBER OF RELOCATED SPRINKLERS: 16
TOTAL NUMBER OF ADDED SPRINKLERS: 2
TOTAL NUMBER OF PLUGGED SPRINKLERS: 1

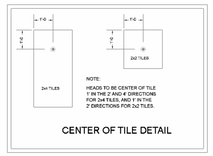
Sprinkler Legend

Symbol	Manufacturer	SIN	Model	Quantity	K-Factor	Type	Size	Response	Finish	Temperature
●	Viking	VK302	Microfast	18	5.6	Pendent	½	Quick	Chrome	200 °F
				Total = 18						

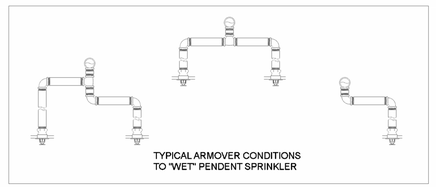
HANGER SPACING LEGEND — PER NFPA 13 TABLE 9.2.2.1

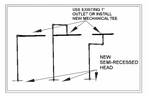
NOMINAL PIPE SIZE (IN.)	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
STEEL PIPE (NOT THREADED LW)	N/A	12-0	12-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0
THREADED LW	N/A	12-0	12-0	12-0	12-0	12-0	N/A	N/A	N/A	N/A
COPPER	8-0	8-0	10-0	10-0	12-0	12-0	15-0	15-0	15-0	15-0
CPVC	5-6	6-0	6-6	7-0	8-0	9-0	10-0	N/A	N/A	N/A



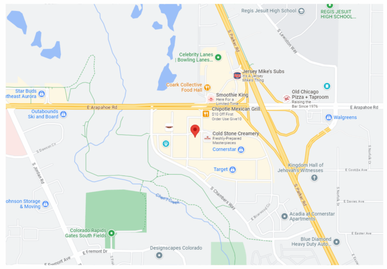


CENTER OF TILE DETAIL

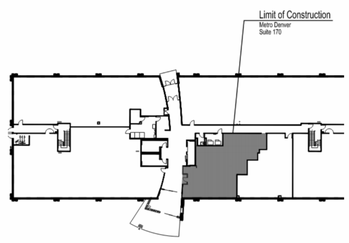

TYPICAL ARMOVER CONDITIONS
TO "WET" PENDENT SPRINKLER



TYPICAL ARMOVER CONDITIONS
NOT TO SCALE



FIRE PROTECTION VICINITY MAP
NOT TO SCALE
NORTH



FIRE PROTECTION VICINITY MAP
NOT TO SCALE
NORTH

City of AURORA
Applicable Codes

2021 IBC	(International Building Code) with Amendments
2021 IEBC	(International Existing Building Code)
2021 IPC	(International Plumbing Code)
2021 IMC	(International Mechanical Code)
2021 IFC	(International Fire Code)
2021 IECC	(International Energy Conservation Code)
[redacted] NEC	(National Electric Code)

2009 ICC/ANSI A117.1 Accessibility Standard
Construction Classification: II-B

Paul Morison
PAUL MORISON
NICET III #109398
EXPIRES: 9/1/2024

METRO DENVER ACCIDENT& INJURY
1444 S. POTOMAC, SUITE 170, AURORA, CO 80012
FIRE SPRINKLER PLAN

FREEDOM FIRE PROTECTION, LLC
4026 MULLIGAN DRIVE, LONGMONT, CO. 80504
- PHONE 303.827.2060 - FAX 303.827.2070 -
STATE LICENSE# 23-5-05265

DATE: 9/8/23
SCALE: 1/4" = 1'-0"
JOB # FT23147
DRAWN BY: TROBISON
SHEET # FP 1 of 1
CHECKED BY: P. MORRISON
FILE NUMBER: FT23147
NICET LEVEL III: 109398
EXP: 9/24

FREEDOM FIRE PROTECTION, LLC
"INSTALLING CONFIDENCE"
COMPLETE FIRE SPRINKLER SYSTEMS FROM DESIGN CONSULTATION THROUGH FINISHED INSTALLATION

AUTHORITY: AURORA BUILDING DIVISION
15151 E. ALAMEDA PKWY, AURORA CO 80012

REVISION

DATE	DESCRIPTION	BY

- IMPORTANT -
IT IS THE RESPONSIBILITY OF OWNER TO PROVIDE SUFFICIENT HEATING TO PREVENT WATER IN PIPING FROM FREEZING.

PROJECT SUMMARY

	QTY.
SQUARE FOOTAGE PER FLOOR: SPRINKLERS PER FLOOR	
METRO DENVER ACCIDENT & INJURY	1,524
TOTAL SQ FT	1,524
METRO DENVER ACCIDENT & INJURY	18
TOTAL SPRINKLERS	18

MISCELLANEOUS SPECIALTIES

GENERAL CONTRACTOR
NAME: SABARRA CONSTRUCTION WEST, INC.
ADDRESS: PO BOX 1645, CASTLE ROCK, CO 80104
SUPERINTENDENT: PHONE:

FT23147-METRO DENVER ACCIDENT& INJURY

11/17/23 11:53:08

COMPLETE FIRE SPRINKLER SYSTEMS FROM DESIGN
CONSULTATION THROUGH FINISHED INSTALLATION

Product Data Index For:

FC21007 - 1689 Skyway

1.) Sprinkler Heads

2.) Grooved Fittings

3.) Threaded Fittings

4.) Flanged Fittings

5.) Steel Pipe

6.) Hanger Material

7.) Riser & Backflow

Section 1.) Fire Sprinkler Heads

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Permit # 2024-2406949-CT
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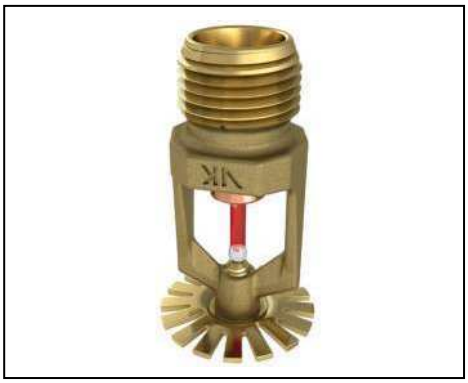
TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (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 Pendent Sprinkler VK302 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 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 G414009, G414010, G4040095, and 4880045

LPCB Approved: Certificate 096e/06

CE Certified: Standard EN 12259-1, certificate of constancy of performance 0832-CPR-S0021

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

Refer to Approval Chart 1 and Design Criteria cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria for FM 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)
Thread size: 1/2" NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4" (58 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 or QM Brass
Deflector: Phosphor Bronze UNS-C51000 or 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 Quick Response Pendent Sprinklers 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, 286 °F (141 °C) = G

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

For example, sprinkler VK302 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 12979AB

Available Finishes And Temperature Ratings: Refer to Table 1.

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

Sprinkler Wrenches:

A. Standard Wrench: Part No. 21475M/B.
B. Wrench for Recessed Pendent Sprinklers: Part No. 13655W/B** (available since 2006)
C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool*** Part No. 15915 (available since 2010)

**A ½" ratchet is required (not available from Viking).

***Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

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 Pendent Sprinkler VK302 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.

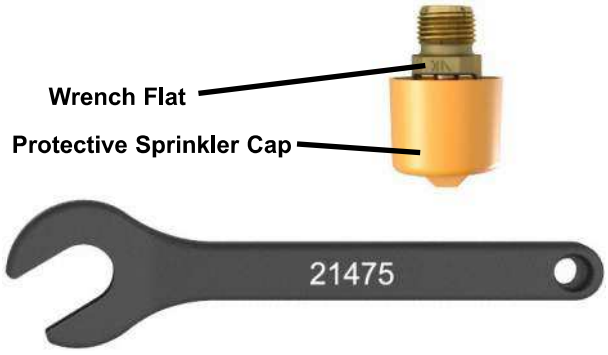


Figure 1:
Standard Sprinkler Wrench 21475M/B

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Permit # 2024-2406949-CT
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VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (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, and Black Polyester. 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 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. Note that the spring is exposed on sprinklers with Polyester and ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.

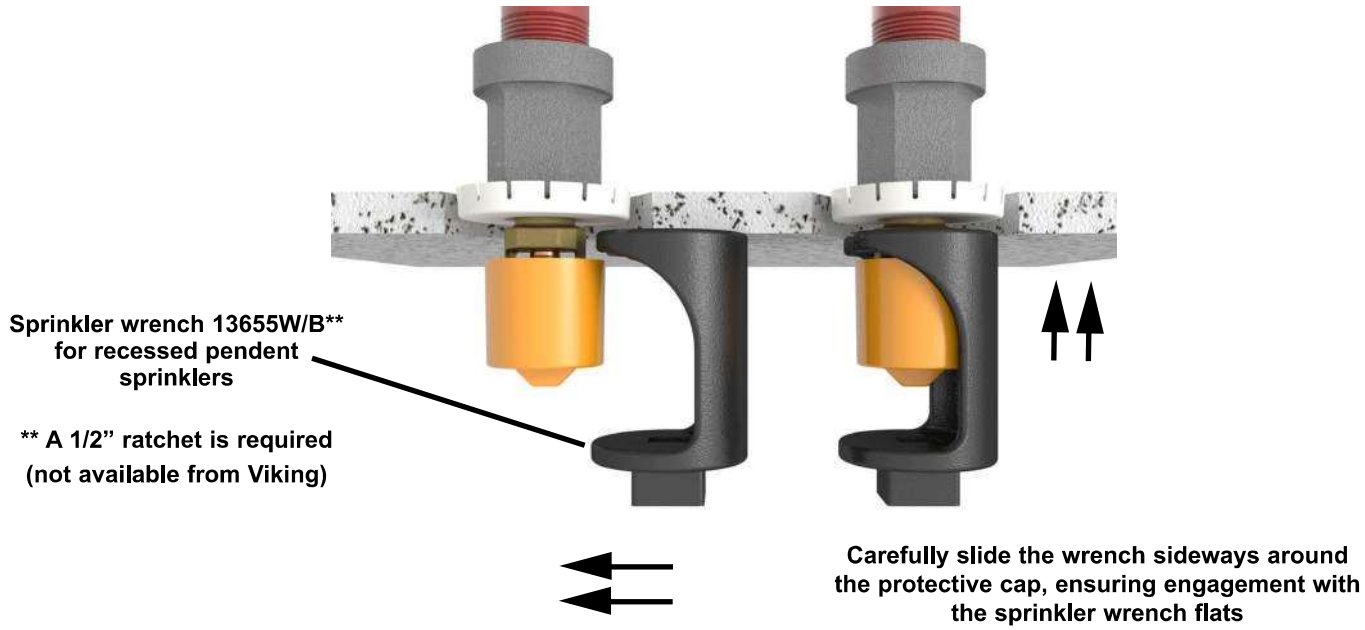


Figure 2: Wrench 13655W/B for Recessed Pendent Sprinklers

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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Approval Chart 1 (UL)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	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[7]	[8]	
12979	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	A1	A1Z, B1Y	D1Z, C1Y	D1	–
19780	VK302	Pendent	1/2"	--	5.6	80.6	2-1/4	58	–	--	–	--	–	D3
21354	VK302	Pendent	–	15 mm	5.6	80.6	2-1/4	58	–	--	–	--	–	D3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)														
06662B	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	--	–	--	–	–
18021	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1X, B1Y	A1	A1X, B1Y	D1X, C1Y[7]	D1	–

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

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

Approved Escutcheons
X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Z - Standard surface-mounted 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 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.
[7] CE Certified, Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021.
[8] MED Certified, Standard EN 12259-1, EC-0832-MED-1003.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

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

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to 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.

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (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)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
12979	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)									
06662B	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
18021	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y

Approved Temperature Ratings

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

Approved Finishes

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

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or recessed with the Viking Micromatic® Model E-1 or E-2 Recessed Escutcheon
Z - Standard surface-mounted 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] Other colors are available on request with the same Approvals as the standard colors.
[5] FM approved as corrosion proofing for corrosive environments.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is FM Approved as quick response **Non-storage** pendent sprinklers 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 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.

RSN: 1773851
Permit # 2024-2406949-CT
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VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (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

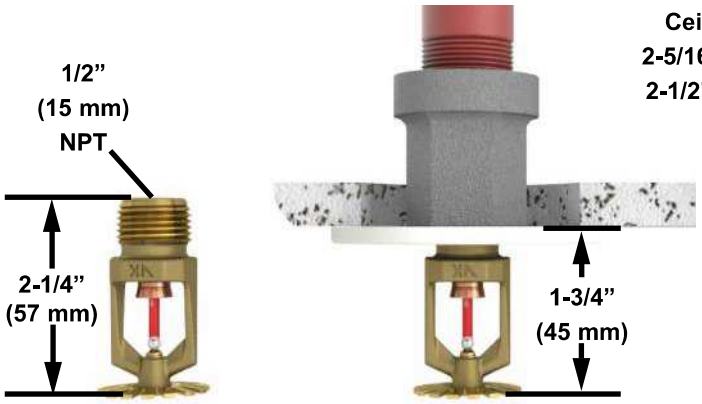


Figure 3: Sprinkler Dimensions with a Standard Escutcheon

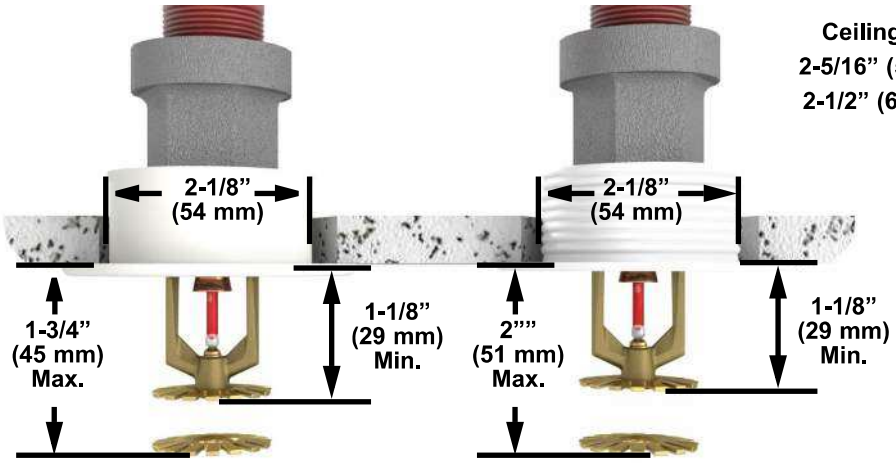


Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

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

TECHNICAL DATA

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, thermosensitive, 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 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: Standard EN 12259-1,DOP Sprinklers_VdS_23-5-13, DOP Sprinklers_LPCB_5-2-19 & DOP_VK350ENT_6-11-19

China Approval: Approved according to China GB standard

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 BSPT, 3/4” NPT, or 20 mm BSPT
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

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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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For example, sprinkler VK350 with a 1/2" thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 18259AB
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

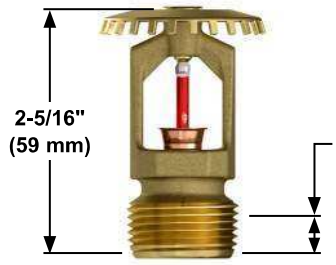


Figure 2: Sprinkler Dimensions

TECHNICAL DATA

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

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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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	BSPT	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE	MED[10]	China Approval
18257	VK350	3/4"	–	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B2, B4[7]	B1	--
18278	VK350	–	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B2, B4[7]	B1	--
18259[9]	VK350	1/2"	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	B2, B4[7]	--	--
20237[11]	VK350	–	20 mm	8.0	115.2	2-5/16	59	C3	--	--	--	--	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
4 - Brass, Chrome, White Polyester[5,6], and Black Polyester[5,6], and ENT

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: Standard EN 12259-1, Declaration of Performance DOP Sprinklers_LPCB_5-2-19 & DOP_VK350ENT_6-11-19.
8. CE: Standard EN 12259-1, Declaration of Performance DOP Sprinklers_VdS_23-5-13.
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.
11. Approved according to China GB Standard.

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.

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

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	BSPT	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"	--	8.0	115.2	2-5/16	59	A1, B2
20237[7]	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
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)
C - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]
2 - ENT[6]
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 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 resistant.
7. Approved according to China GB Standard.

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.

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VIKING®

TECHNICAL DATA

QUICK RESPONSE EXTRA-LARGE ORIFICE UPRIGHT SPRINKLER

VK531 (STORAGE-DENSITY/AREA)

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 Quick Response Extra-Large Orifice Upright Sprinkler VK531 is a thermosensitive glass bulb spray sprinkler available in several different finishes and temperature ratings to meet design requirements. The special Polyester, Electroless Nickel PTFE (ENT), and PTFE 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 indicated in the Approval Charts.

The extra-large orifice provides greater flows at lower pressures than standard orifice or large orifice sprinklers. This feature allows reduced pipe sizing for hydraulically calculated sprinkler systems, which require high densities of water. Viking Standard Response Extra-Large Orifice Sprinklers may eliminate the need for a fire pump or reduce the size of the pump if it is required. On existing systems, replacing large orifice sprinklers with extra-large orifice sprinklers may provide the higher densities required to allow an increase in the hazard classification of an occupancy.

Viking Quick Response Extra-Large Orifice Upright Sprinkler VK531 may be ordered and/or used as an open sprinkler (glass bulb and pip cap assembly removed) on deluge systems. Refer to Ordering Instructions below.



NOTE: As of May 2018 all logos have been removed from the wrench boss.

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

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class 2020

VdS Approved: Certificate G413059, G413060

LPCB Approved: Certificate 096e/14

Refer to Approval Chart 1 and Design Criteria on page 3 for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 4 for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Available since 2000.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: See Approval Charts
Nominal K-Factor: 11.2 U.S. (161.3 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.

Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-5/16" (58.7 mm)

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

Ordering Information: (Also refer to the current Viking price list.)
Order Quick Response Extra-Large Orifice Upright Sprinkler VK531 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.

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Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, ENT = JN
Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °F) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G, OPEN = Z (PTFE only).
For example, sprinkler VK531 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 10633AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 05118CW/B (available since 1981).
B. Wrench for coated sprinklers: 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)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

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 and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extin- guish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking Quick Response Extra-Large Orifice Upright Sprinkler 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	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, and Black Polyester in all temperature ratings. 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 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. Note that the spring is exposed on sprinklers with Polyester, and ENT. For all ENT coated sprinklers, the waterway is coated.

VIKING®

TECHNICAL DATA

QUICK RESPONSE EXTRA-LARGE ORIFICE UPRIGHT SPRINKLER

VK531 (STORAGE-DENSITY/AREA)

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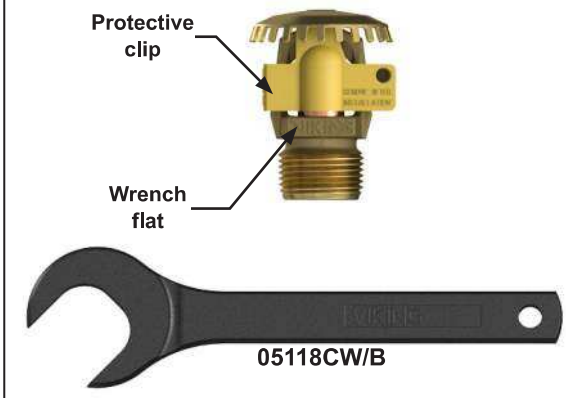


Figure 1: Sprinkler VK531 and Wrench

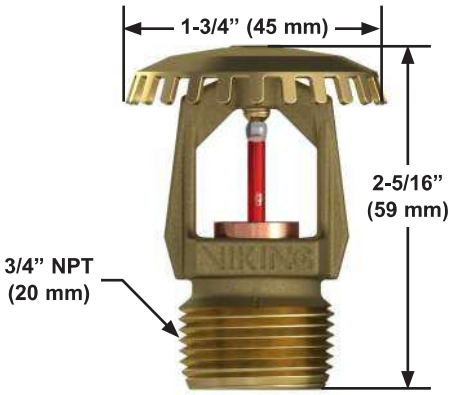


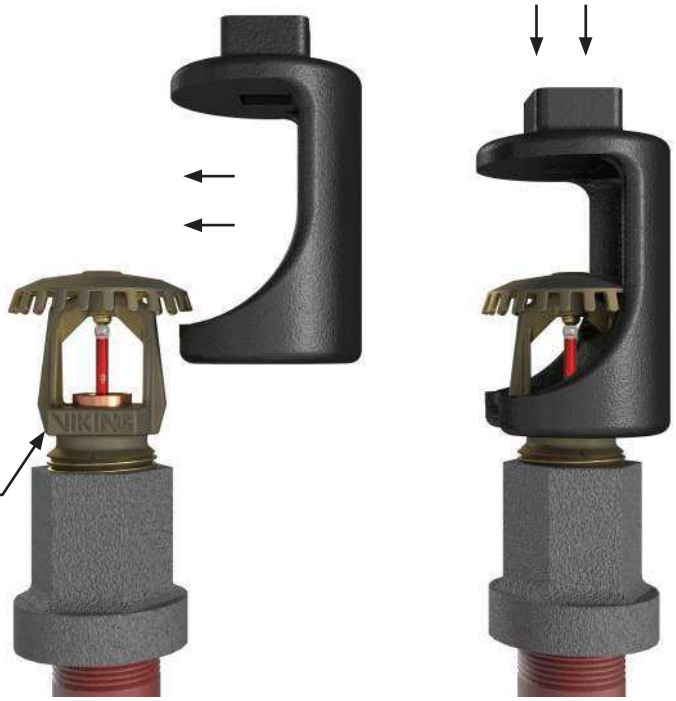
Figure 2: Sprinkler VK531 Dimensions

Sprinkler wrench 11663W/B** must be used for installing coated sprinklers.

Step 1: Carefully slide the wrench sideways around the deflector, ensuring engagement with the sprinkler wrench flats.

Coated Upright Sprinkler

** A 1/2" ratchet is required (not available from Viking)



Step 2: Carefully press the wrench downward and ensure engagement with the sprinkler wrench flats.

Figure 3: Wrench 11663W/B for Coated Sprinkler VK531

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VIKING®

TECHNICAL DATA

QUICK RESPONSE EXTRA-LARGE ORIFICE UPRIGHT SPRINKLER

VK531 (STORAGE-DENSITY/AREA)

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Approval Chart 1 (UL)

Quick Response Extra-Large Orifice Upright Sprinkler VK531
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria below.)			
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4,5]	NYC	VdS	LPCB
10633	VK531	Upright	3/4"	20 mm	11.2	161.3	2-5/16	58.7	A1	See Footnote 6.	--	--
19304	VK5311	Upright	3/4"	20 mm	11.2	161.3	2-5/16	58.7	--	--	A2	A2
19305	VK5311	Upright	1/2"	15 mm	11.2	161.3	2-5/16	58.7	--	--	A2	A2

Approved Temperature Ratings

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

Approved Finishes

1 - Brass, Chrome, White Polyester[7], Black Polyester[7], and ENT[7]
2 - Brass, Chrome, White Polyester[7], and Black Polyester[7]

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 only for use in wet pipe sprinkler systems (or preaction systems qualifying as wet systems).

[6] Meets New York City requirements, effective July 1, 2008.

[7] cULus Listed as corrosion-resistant.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

Quick Response Extra-Large Orifice Upright Sprinkler VK531 is cULus Listed for installation in accordance with the latest edition of NFPA 13 for standard upright spray sprinklers:

- Designed for use in hazard occupancies up to and including Ordinary Hazard Group II with a minimum operating pressure of 7 PSI (0.5 bar).
- Also Listed for use in High-Piled Storage Occupancies as defined in NFPA 13 with a minimum operating pressure of 7 PSI (0.5 bar).
- Listed only for use in wet pipe sprinkler systems (or preaction systems qualifying as wet systems).
- The sprinkler installation and obstruction 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 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.

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TECHNICAL DATA

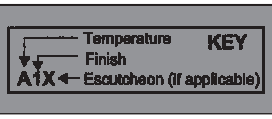
QUICK RESPONSE EXTRA-LARGE ORIFICE UPRIGHT SPRINKLER

VK531 (STORAGE-DENSITY/AREA)

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 Extra-Large Orifice Upright Sprinkler VK531
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
10633	VK531	Upright	3/4"	20 mm	11.2	161.3	2-5/16	58.7	A1

Approved Temperature Ratings	Approved Finishes
A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)	1 - Brass, Chrome, and ENT[4]

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] FM Approved as corrosion-resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

Quick Response Extra-Large Orifice Upright Sprinkler VK531 is FM Approved as a quick response upright **Non-Storage** sprinkler and as a quick response upright **Storage** sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0 and 8-9). 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 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.

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TECHNICAL DATA

QUICK RESPONSE DRY PENDENT ELO SPRINKLERS

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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1. DESCRIPTION

Viking Quick Response Dry Pendent Extra-Large Orifice (ELO) Sprinklers are thermosensitive spray sprinklers suitable for use in areas subject to freezing. These dry pendent ELO sprinklers are FM Approved for storage and non-storage applications. In certain FM cold storage installations, the dry ELO sprinklers can provide a design advantage with lower overall water demands. In these applications, the dry ELO must be installed on a wet pipe system, per FM data sheet 8-9. In non-storage applications, when used in dry or preaction systems, the sprinklers are designed to prevent water or condensation from entering the drop nipple before the sprinkler operates. Viking Standard Response Dry Pendent ELO Sprinklers are available in various finishes and temperature ratings to meet design requirements.

The optional dry sprinkler boot assembly is intended to slow the exchange of air between the inside and outside of the freezer (or any dry sprinkler installation) to help prevent humidity and temperature differential in the area around the sprinkler. Condensation can lead to ice build-up, which could inhibit sprinkler operation or cause premature operation.

If using the insulating boot assemblies included with your sprinklers (optional for installation), follow the installation instructions in this technical data page. Insulating boot assemblies, if used, shall be installed on smooth, flat, and clean surfaces. There are specific installation situations, as with corrugated ceiling panels, where alternative penetration sealing methods may be utilized. For additional information contact Viking Technical Services.



Thread Size	K-Factor
1-1/4" NPT (32 mm BSPT)	11.2 (161.3 Metric)
SIN	**Style**
VK547	Plain Barrel
VK548	Adjustable Recessed
VK549	Adjustable Standard

2. LISTINGS AND APPROVALS

FM Approved: Classes 2013 and 2015

Refer to Approval Chart and Design Criteria on page 4 for 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). Factory tested pneumatically to 100 psi (6.89 bar)

Thread size: 1-1/4" NPT or 32 mm BSPT

Nominal K-Factor: 11.2 U.S. (161.3 metric**) for all listed and approved lengths.

Covered by the following U.S. Patents: 10,220,231

* FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar).

**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.

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

Material Standards:

Frame Casting: Brass UNS-C84400

Deflector: Brass

Fusible Link Assembly: Beryllium Nickel, coated with Polyurethane

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape

Compression Screw: Brass UNS-C36000

Pip Cap: Brass UNS-C36000

Pip Cap Adapter: Brass UNS-C36000

Orifice: Brass UNS-C36000

Tube: ERW Hydraulic Steel Tube

Barrel End and Threads: QM Brass

Support (Internal): QM Brass

Barrel: Steel Pipe UNS-G10260, Electrodeposited Epoxy Base finish

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Sleeve (for Adjustable Standard style only): Brass UNS-C26000 or UNS-C26800
Dry Barrel Seals: (NOTE: 2 seals included with each VK544 and 1 with each VK545 or VK546):
Seal:
ASTM D1056 2A0/1 4015-EL EPDM-Butyl-PE Foam Rubber OR
ASTM D1056 2A1 Neoprene/EPDM/SBR OR
ASTM D1056 2C1 Neoprene/EPDM
Over Seal Ring and Under Seal Ring: Cold Rolled Steel
Finish: White Paint
#10 Screws: Stainless Steel
Escutcheon Materials:
Adjustable Standard Dry Escutcheons: Brass UNS-C26000 or UNS-C26800
Recessed Dry Escutcheons: Cold Rolled Steel UNS-G10080

Ordering Information: Refer to Table 1.

4. INSTALLATION

Refer to the applicable FM Loss Prevention data sheets.
Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive fusible element assembly disengages, releasing the internal parts to open the waterway. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to suppress the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking Quick Response Dry Pendent Sprinkler 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.

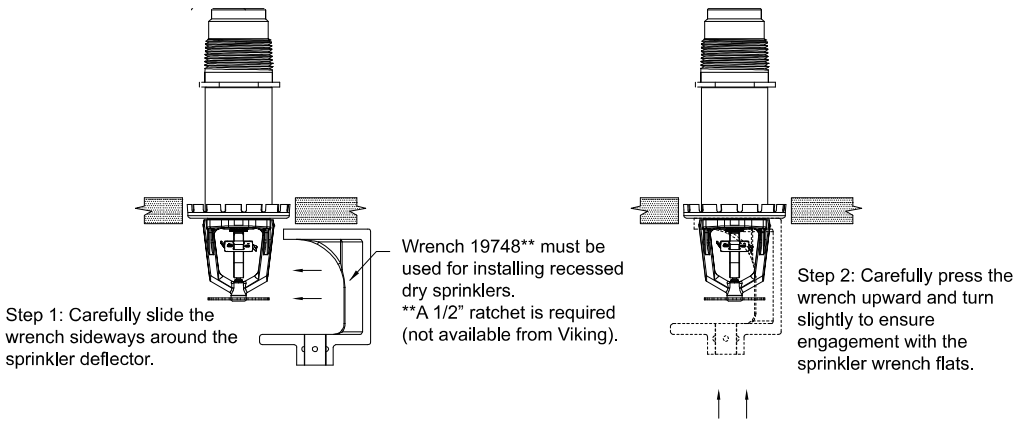


Figure 1: Wrench 19748W/B for Adjustable Recessed Dry Pendent Sprinklers

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TECHNICAL DATA

QUICK RESPONSE DRY PENDENT ELO SPRINKLERS

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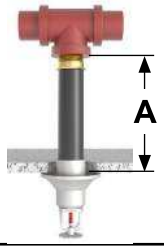
TABLE 1: ORDERING INFORMATION

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

Model	Sprinkler Base Part No.	Size		1: Finishes		2: Temperature Ratings			
		NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating[4]	Frame Paint Color	Max. Ambient Ceiling Temperature[2]	Suffix
VK547	19828	1-1/4	--	Brass[3]	A	165 °F (74 °C)	None	100 °F (38 °C)	C
	19829	--	32	Chrome	F	205 °F (96 °C)	White	150 °F (65 °C)	E
VK548	19833	1-1/4	--	White Polyester	M-/W	280 °F (138 °C)	Blue	225 °F (107 °C)	G
	19834	--	32						
VK549	19838	1-1/4	--						
	19839	--	32						

3. Available "A" Lengths Inches (mm)	
	12 (305) 18 (457) 24 (610) 30 (762) 36 (914) 42 (1067) 48 (1219)

The "A" Dimension is the distance as measured from the face of the fitting in which the sprinkler will be installed to the face of the finished ceiling in the protected area. See Figures 2, 3, and 4



Example: 19833FC12 is a VK548 with a Chrome finish and a 165 temperature rating with "A" dimension of 12 inches. 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 Wrench[5] :
Socket Wrench (for Recessed sprinklers): Part No. 19748W/B - requires a 1/2" ratchet (not available from Viking)
Replacement Escutcheons:
A. Adjustable Standard Dry Escutcheon: Base Part No. 19730.
B. Recessed Dry Escutcheon Cup: Base Part No. 19728.
Dry Barrel Seals: (NOTE: 2 seals are included with each VK547 and 1 with each VK548 or VK549)
Part No. 22089M/B

Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix.
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 VK547 is the only sprinkler available with a brass finish.
4. The VK548 is not available with a 280 °F (138 °C) temperature rating.
5. For Standard Adjustable and Plain Barrel sprinklers, use a pipe wrench applied on the inlet housing.

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QUICK RESPONSE DRY PENDENT ELO SPRINKLERS

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Approval Chart FM

Quick Response ELO Dry Pendent Sprinklers
Maximum 175 PSI (12 bar) WWP

Sprinkler Base Part No.[1]	SIN	Style	Thread Size		Nominal K-Factor[2]		Order Length Increment		FM Approvals[4] (Refer also to Design Criteria below.)
			NPT	BSPT	U.S.	Metric[3]	Inches	mm	
19828	VK547	Plain Barrel	1-1/4"	--	11.2	--	6"	--	A1
19829			--	32 mm	--	161.3	--	153	A1
19833	VK548	Adjustable Recessed	1-1/4"	--	11.2	--	6"	--	B2
19834			--	32 mm	--	161.3	--	153	B2
19838	VK549	Adjustable Standard	1-1/4"	--	11.2	--	6"	--	A3
19839			--	32 mm		161.3	--	153	A3

Approved Temperature Ratings

A - 165 °F (74 °C), 205 °F (96°C) and 280 °F (138 °C)
B - 165 °F (74 °C) and 205 °F (96°C)

Approved Finishes and "A" Dimensions

1 - Brass, Chrome, and White Polyester, with "A" dimensions 12" to 48" (305 to 1,22 m)
2 - Chrome and White Polyester, with "A" dimensions 12" to 48" (305 to 1,22 m)
3 - Chrome, and White Polyester iwth a Chrome or White Polyester Sleeve and Escutcheon with "A" dimensions 12" to 48" (305 to 1,22 m)

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
[2] K-Factor applies for standard lengths ("A" Dimensions indicated above).
[3] 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.
[4] This chart shows the FM Approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.

DESIGN CRITERIA - FM

(Also refer to Approval Chart above.)

FM Approval Requirements:

ELO Dry Pendent Sprinklers in the Approval Chart above are FM Approved as quick response standard spray storage sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0) and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins 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 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.

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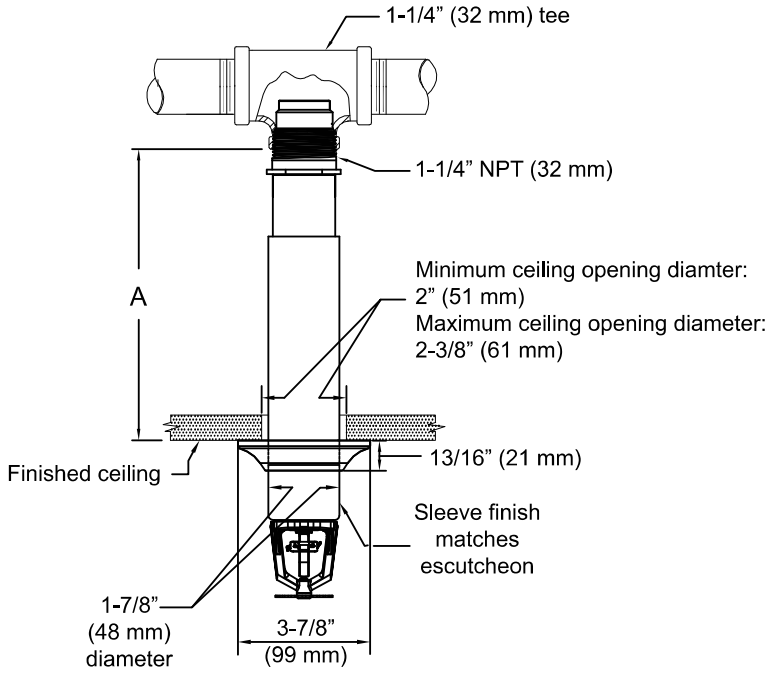
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QUICK RESPONSE DRY PENDENT ELO SPRINKLERS

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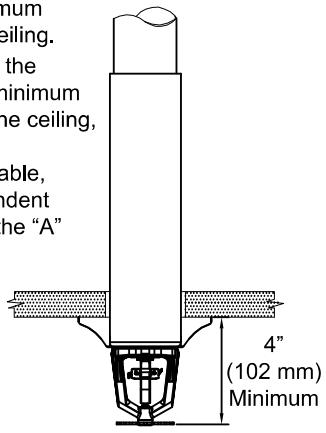
For "A" Dimension:

1. Determine the distance from the face of the tee to the finished ceiling.
2. Round to the nearest 6" (153 mm) increment between 12" and 48" (305 mm and 1,22 m).
3. Per "A" dimension, the deflector will be located approximately 4" (102 mm) below the ceiling.



Deflector at minimum distance below ceiling.

NOTE: To locate the deflector at the minimum distance below the ceiling, with no upward adjustment available, order the dry pendent sprinkler as per the "A" dimension.



Deflector at maximum distance below ceiling.

NOTE: To locate the deflector at the maximum distance below the ceiling, with no downward adjustment available, order the dry pendent sprinkler 6" (153 mm) longer than the "A" dimension.

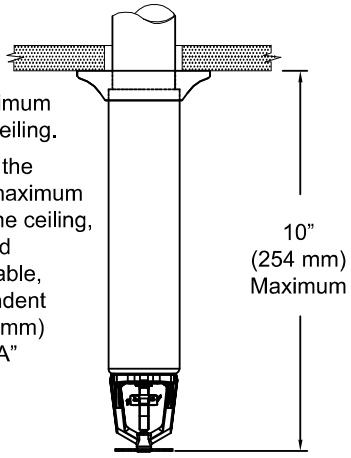


Figure 2: Adjustable Standard Dry Pendent Sprinkler

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TECHNICAL DATA

QUICK RESPONSE
DRY PENDENT
ELO SPRINKLERS

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For “A” Dimension:
1. Determine the distance from the face of the tee to the finished ceiling.
2. For adjustable recessed the “A” dimension must be a minimum of 12” (305 mm) up to 48” (1,22 m) in 6” (153 mm) increments.

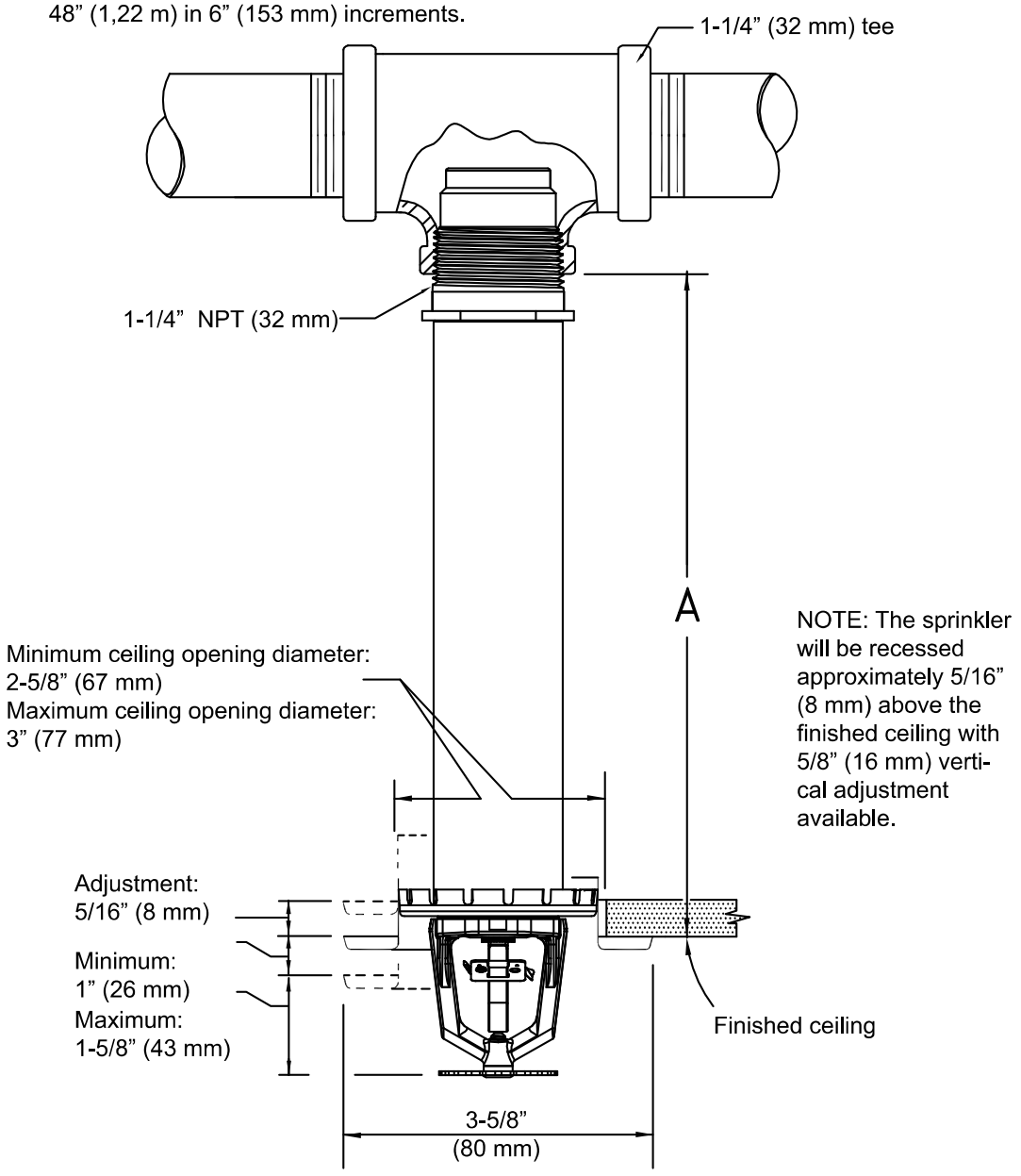


Figure 3: Adjustable Recessed Dry Pendent Sprinkler

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For “A” Dimension:
1. Determine the distance from the face of the tee to the base of the sprinkler.
2. Round up to the next higher 6” (153 mm) increment between 12” and 48” (305 mm and 1,22 m)

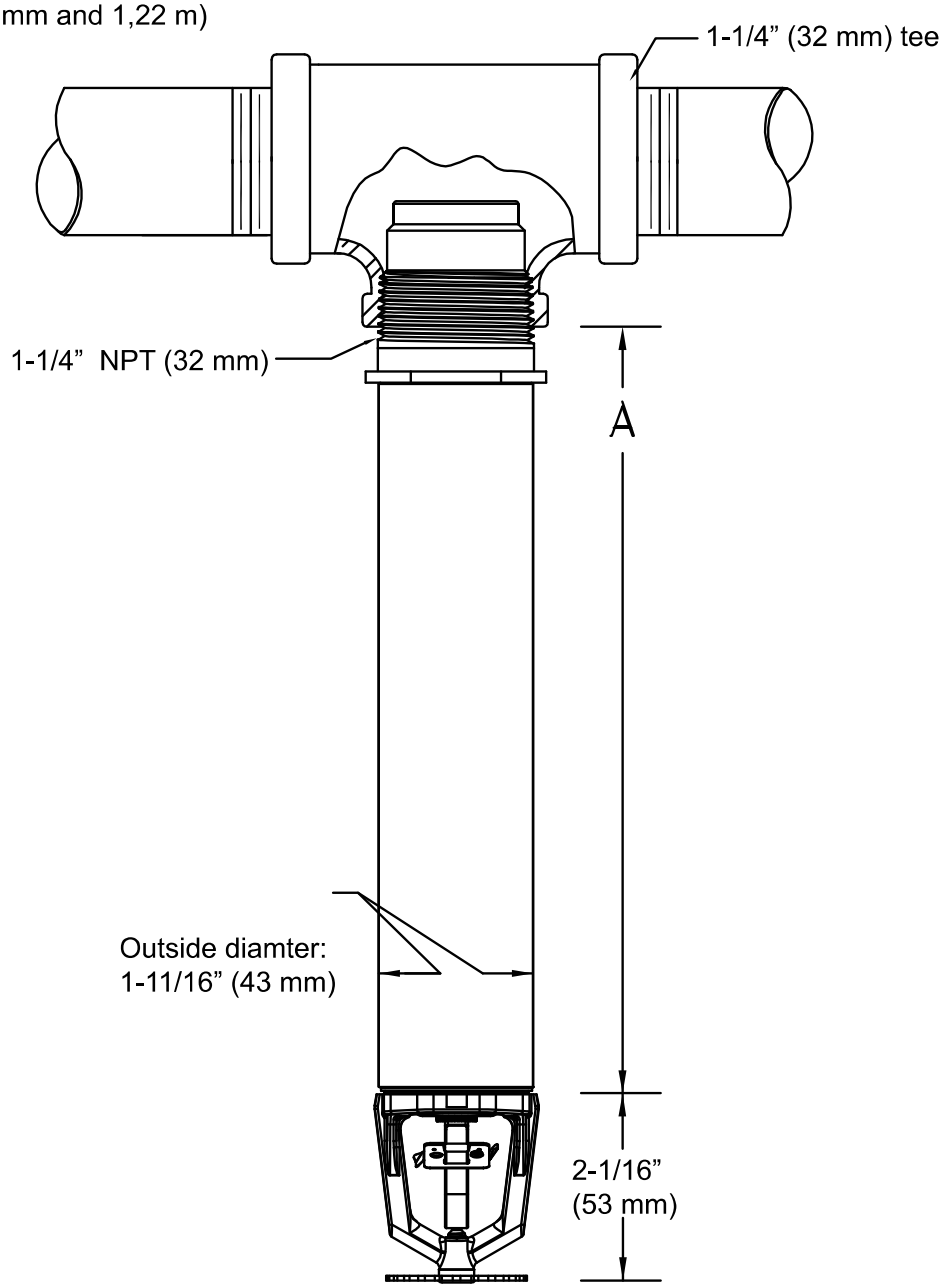


Figure 4: Plain Barrel Dry Pendent Sprinkler

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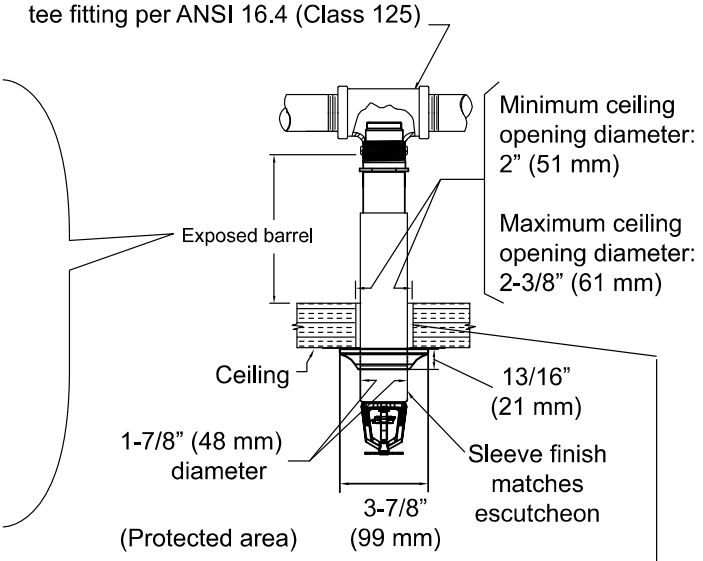
TECHNICAL DATA

QUICK RESPONSE DRY PENDENT ELO SPRINKLERS

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Ambient Temperature of Protected Area* at the Discharge End of the Sprinkler	Exposed Barrel Ambient Temperature		
	40°F(4°C)	50°F(10°C)	60°F(16°C)
	Exposed Minimum Barrel Length** Face of Tee to Top of Ceiling In. (mm)		
40 °F(4 °C)	0	0	0
30 °F(-4 °C)	0	0	0
20 °F(-7 °C)	4 (102)	0	0
10 °F(-12 °C)	8 (203)	1 (26)	0
0 °F(-18 °C)	12 (305)	3 (76)	0
-10 °F(-23 °C)	14 (356)	4 (102)	1 (26)
-20 °F(-29 °C)	14 (356)	6 (152)	3 (76)
-30 °F(-34 °C)	16 (406)	8 (203)	4 (102)
-40 °F(-40 °C)	18 (457)	8 (203)	4 (102)
-50 °F(-46 °C)	20 (508)	10 (254)	6 (152)
-60 °F(-51 °C)	20 (508)	10 (254)	6 (152)

Install 1-1/4" NPT (32 mm BSP) threaded end of dry pendent sprinkler into the 1-1/4" NPT (32 mm BSP) outlet of a malleable iron tee fitting per ANSI B 16.3 (Class 150) or cast iron threaded tee fitting per ANSI 16.4 (Class 125)

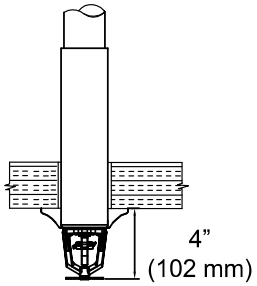


Seal the clearance space around the sprinkler to avoid leakage of air into the protected area and consequent formation of condensate around the frame, which could inhibit operation or cause premature operation. Refer to Figure 6 below.

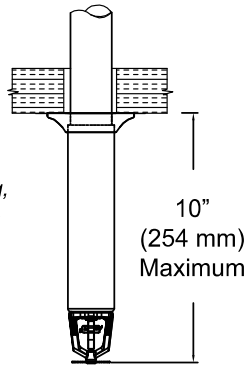
If humidity and temperature differential causes condensation on the exposed dry sprinkler, consider wrapping the exposed barrel with insulation, foam insulating tape, or equivalent.

Deflector at minimum distance below ceiling.

NOTE: *To locate the deflector at the minimum distance below the ceiling, with no upward adjustment available, order the dry pendent as per the "A" dimension.*



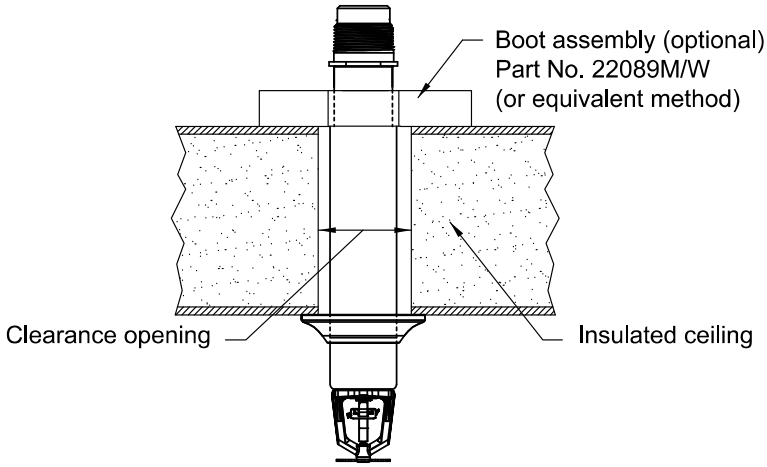
NOTE: *To locate the deflector at the maximum distance below the ceiling, with no downward adjustment available, order the dry pendent sprinkler 6" (153 mm) longer than the "A" dimension.*



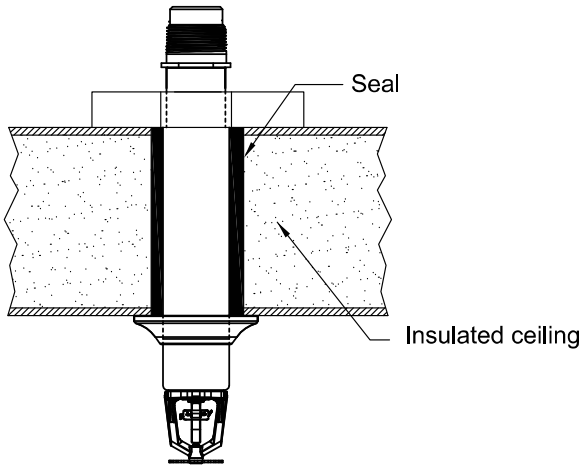
*The protected area refers to the area below the ceiling. The ambient temperature is the temperature at the discharge end of the sprinkler. For protected area temperatures that occur between the values listed, use the next cooler temperature.
**The minimum required barrel length is not the same as the "A" dimension. Refer to Figures 2 - 4 for the "A" dimension.
NOTE: Exposed minimum barrel lengths are inclusive up to 30 mph wind velocities.

Figure 5: Dry Pendent Sprinkler Required Minimum Barrel Length Based on Ambient Temperature in the Protected Area (Adjustable Standard Dry Pendent Sprinkler is shown)

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Dry Sprinkler Seal on the Exterior of the ceiling



Dry Sprinkler Seal Within the ceiling

Figure 6: Dry Sprinkler Seal (Adjustable Standard Dry Pendent Sprinkler is Shown)

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ARGCO

FIRE SPRINKLER SPARE HEADBOXES



Heavy duty 20 gauge steel construction

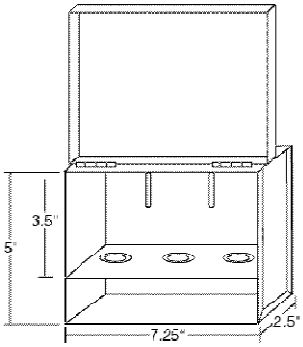
Red powder coated finish

Knockouts and shelf to accommodate any 1/2” or 3/4” sprinkler head

All-welded construction and full length hinge

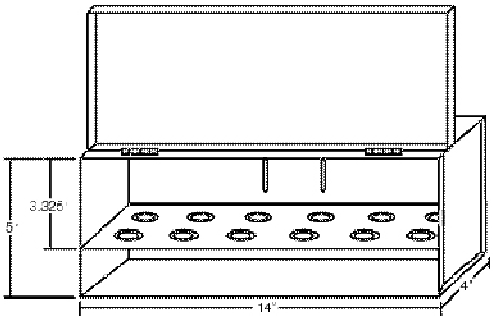
Slotted for easy mounting with screws, rivets or strapping

3 Head Box



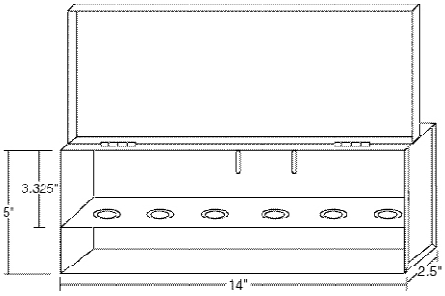
(6510152)

12 Head Box



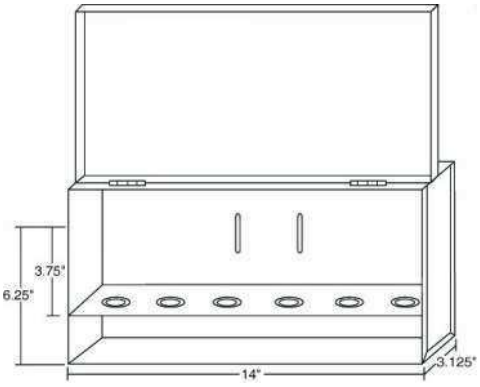
(6510150)

6 Head Box



(6510151)

6 Large Head Box



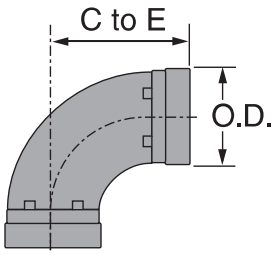
(6510151A)

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FOR MORE INFORMATION CALL ARGCO AT 1-800-854-1015
OR LOG ONTO WWW.ARGCO.COM

Section 2.) Grooved Fittings

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FIGURE 7050S* STANDARD 90° ELBOW

Nominal Size	O.D.	Max. Rated Pressure	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*PSI/bar*	*In./mm*	*Lbs./Kg*
1¼	1.660	300	2¾	1.0
32	*42.2*	*20.7*	*70*	*0.5*
1½	1.900	300	2¾	1.2
40	*48.3*	*20.7*	*70*	*0.5*
2	2.375	300	3¼	1.7
50	*60.3*	*20.7*	*83*	*0.8*
2½	2.875	300	3¾	2.6
65	*73.0*	*20.7*	*95*	*1.2*
3	3.500	300	4¼	4.0
80	*88.9*	*20.7*	*108*	*1.8*
4	4.500	300	5	7.7
100	*114.3*	*20.7*	*127*	*3.5*
5	5.563	300	5½	11.1
125	*141.3*	*20.7*	*140*	*5.0*
6	6.625	300	6½	16.5
150	*168.3*	*20.7*	*165*	*7.5*
8	8.625	300	7¾	30.6
200	*219.1*	*20.7*	*197*	*13.9*

For additional sizes, see Fig. 7050 in the Gruvlok Catalog or contact an AnvilStar Representative.

– Available galvanized.

* When ordering, refer to product as FP7050S.

These fittings are designed to provide minimal pressure drop and uniform strength.

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile Iron conforming to ASTM A-536
Malleable Iron conforming to ASTM A-47

COATINGS:

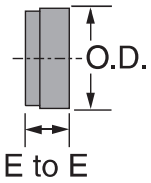
Rust inhibiting paint Color: ORANGE (standard) or
Hot Dipped Zinc Galvanized conforming to ASTM A-153 (optional)
Other available options: Example: RAL3000 or RAL9000 Series

Not for use in copper systems.

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

FIG. 7074* Cap

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FIGURE 7074 CAP

Nominal Size	O.D.	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1¼ 32	1.660 42.2	1¼ 32	0.4 0.2
1½ 40	1.900 48.3	1¼ 32	0.5 0.2
2 50	2.375 60.3	1 25	0.5 0.2
2½ 65	2.875 73.0	1 25	0.7 0.3
3 80	3.500 88.9	1 25	1.1 0.5
4 100	4.500 114.3	1⅛ 29	2.8 1.3
5 125	5.563 141.3	1⅛ 29	4.0 1.8
6 150	6.625 168.3	1 5/16 33	6.0 2.7
8 200	8.625 219.1	1½ 38	12.5 5.7
10 250	10.750 273.1	1½ 38	21.9 9.9
12 300	12.750 323.9	1½ 38	33.8 15.3

Additional sizes available, see Gruvlok Catalog or contact an AnvilStar Representative.

– Available galvanized.

* When ordering, refer to product as FP7074.

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Cast Iron conforming to ASTM A-536
Ductile Iron conforming to ASTM A-536
Malleable Iron conforming to ASTM A-47

COATINGS:

Rust inhibiting paint Color: ORANGE (standard) or
Hot Dipped Zinc Galvanized conforming to ASTM A-153 (optional)
Other available options: Example: RAL3000 or RAL9000 Series

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

FIG. 7400* Rigidlite® Coupling

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The Gruvlok® Figure 7400 Rigidlite Coupling is specially designed to provide a rigid, locked-in pipe connection to meet the specific demands of rigid design steel pipe. Fast and easy swing-over installation of the rugged lightweight housing produces a secure, rigid pipe joint. The Figure 7400 Rigidlite Coupling is UL/ULC Listed and FM Approved for fire protection service in both wet and dry systems, with roll grooved or cut grooved steel pipe prepared in accordance with Gruvlok grooving specifications. Working pressure ratings shown are for reference only and are based on Schedule 40 pipe. For the latest UL/ULC listed and FM approved pressure ratings versus pipe schedule, see www.anvilstar.com or contact your local AnvilStar Representative.

The Figure 7400 Rigidlite Coupling with a Pre-Lubricated Grade "E" EPDM, Type "A" gasket (coupling is easily identified by purple nuts) is intended for use in fire protection systems installed in accordance with NFPA Standard 13 "Sprinkler Systems".



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VdS

DN 50 and DN200 sizes are VdS approved.

– Available galvanized.

* When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

HOUSING:
Ductile Iron conforming to ASTM A-536, Grade 65-45-12

ANSI BOLTS & HEAVY HEX NUTS:
Heat treated, oval-neck track head bolts conforming to ASTM A-183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A-563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

COATINGS:
Rust inhibiting paint Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other available options: Example: RAL3000 or RAL9000 Series
For other coating requirements contact an AnvilStar Representative.

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ required for dry pipe systems and freezer applications.

GASKETS: Materials
Properties as designated in accordance with ASTM D-2000.

Pre-Lubricated Grade "E" EPDM, Type A Gasket (Violet color code)
-40°F to 150°F (Service Temperature Range)(-40°C to 66°C)
Recommended for wet and dry (oil free air) pipe fire protection sprinkler systems. For dry pipe systems and freezer applications, Gruvlok Xtreme™ Lubricant is required.

Grade "E" EPDM (Green color code)
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:
Standard C Style
Flush Gap ($1^{1}/_{4}$" - 8")

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

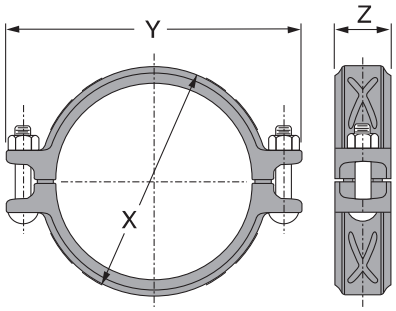


FIGURE 7400 RIGIDLITE® COUPLING

Nominal Size	Pipe O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
1¼	1.660	300	649	0-⅛	2⅝	4¾	1¾	2	⅜ x 2¼	30	45	1.3
32	*42.2*	*20.7*	*2.89*	*0-3.2*	*67*	*121*	*44*		*M10 x 57*	*40*	*60*	*0.6*
1½	1.900	300	851	0-⅛	2⅞	4⅞	1¾	2	⅜ x 2¼	30	45	1.4
40	*48.3*	*20.7*	*3.78*	*0-3.2*	*73*	*124*	*44*		*M10 x 57*	*40*	*60*	*0.6*
2	2.375	300	1,329	0-⅛	3¼	5½	1¾	2	⅜ x 2¼	30	45	1.6
*50**	*60.3*	*20.7*	*5.91*	*0-3.2*	*83*	*140*	*44*		*M10 x 57*	*40*	*60*	*0.7*
2½	2.875	300	1,948	0-⅛	3⅞	6	1¾	2	⅜ x 2¼	30	45	1.9
65	*73.0*	*20.7*	*8.66*	*0-3.2*	*98*	*152*	*44*		*M10 x 57*	*40*	*60*	*0.9*
3 O.D.	*2.996*	*300*	*2,115*	*0-⅛*	*4*	*5⅛*	*13⁄4*	*2*	*3⁄8 x 21⁄4*	*30*	*45*	*1.9*
76.1	76.1	20.7	9.41	0-3.2	102	149	44		M10 ax 57	40	60	0.9
3	3.500	300	2,886	0-⅛	4½	6¾	1¾	2	⅜ x 2¾	30	45	2.1
80	*88.9*	*20.7*	*12.84*	*0-3.2*	*114*	*171*	*44*		*M10 x 70*	*40*	*60*	*1.0*
4	4.500	300	4,771	0-¼	5⅝	7¾	1⅞	2	⅜ x 2¾	30	45	3.1
100	*114.3*	*20.7*	*21.22*	*0-6.4*	*143*	*197*	*48*		*M10 x 70*	*40*	*60*	*1.4*
5½ O.D.	*5.500*	*300*	*7,127*	*0-¼*	*6¾*	*9¼*	*2*	*2*	*1⁄2 x 3*	*80*	*100*	*4.5*
139.7	139.7	20.7	31.70	0-6.4	171	235	51		M12 x 76	110	150	2.0
5	5.563	300	7,292	0-¼	6⅞	9¼	2	2	½ x 3	80	100	4.6
125	*141.3*	*20.7*	*32.44*	*0-6.4*	*175*	*235*	*51*		*M12 x 76*	*110*	*150*	*2.1*
6½ O.D.	*6.500*	*300*	*9,955*	*0-¼*	*7¾*	*10⅜*	*2*	*2*	*½ x 3*	*80*	*100*	*5.5*
165.1	165.1	20.7	44.28	0-6.4	200	264	51		M12 x 76	110	150	2.5
6	6.625	300	10,341	0-¼	7⅞	10⅜	2	2	½ x 3	80	100	5.5
150	*168.3*	*20.7*	*46.00*	*0-6.4*	*200*	*264*	*51*		*M12 x 76*	*110*	*150*	*2.5*
8	8.625	300	17,528	0-⅛	10¼	12¾	2⅜	2	½ x 3	80	100	8.4
*200**	*219.1*	*20.7*	*77.97*	*0-3.2*	*260*	*324*	*60*		*M12 x 76*	*110*	*150*	*3.8*

Note: 7400 Grade "E" EPDM gasket is required for use in copper system.

* DN 50 and DN 200 sizes are VdS approved.

§ – For additional Bolt Torque information see Technical Data Section.

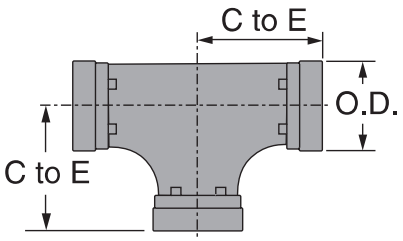
Other sizes available, see Gruvlok Catalog or contact an AnvilStar Representative.

⚠ WARNING

For dry pipe systems and freezer applications lubrication of the gasket is required, Gruvlok® Xtreme™ Lubricant is required.

FIG. 7060S* Standard Tee for Fire Protection

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FIGURE 7060S* STANDARD TEE

Nominal Size	O.D.	Max. Rated Pressure	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*PSI/bar*	*In./mm*	*Lbs./Kg*
1¼	1.660	300	2¾	1.5
32	*42.2*	*20.7*	*70*	*0.7*
1½	1.900	300	2¾	1.8
40	*48.3*	*20.7*	*70*	*0.8*
2	2.375	300	3¼	2.4
50	*60.3*	*20.7*	*83*	*1.1*
2½	2.875	300	3¾	4.0
65	*73.0*	*20.7*	*95*	*1.8*
3	3.500	300	4¼	5.8
80	*88.9*	*20.7*	*108*	*2.6*
4	4.500	300	5	10.3
100	*114.3*	*20.7*	*127*	*4.7*
5	5.563	300	5½	16.2
125	*141.3*	*20.7*	*140*	*7.3*
6	6.625	300	6½	25.7
150	*168.3*	*20.7*	*165*	*11.7*
8	8.625	300	7¾	41.1
200	*219.1*	*20.7*	*197*	*18.6*

Additional sizes available, see Gruvlok Catalog or contact an AnvilStar Representative.

– Available galvanized.

* When ordering, refer to product as FP7060S.

These fittings are designed to provide minimal pressure drop and uniform strength.

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile Iron conforming to ASTM A-536
Malleable Iron conforming to ASTM A-47

COATINGS:

Rust inhibiting paint Color: ORANGE (standard) or
Hot Dipped Zinc Galvanized conforming to ASTM A-153 (optional)
Other available options: Example: RAL3000 or RAL9000 Series

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

Section 3.) Threaded Fittings

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90° ELBOW

SPF/ANVIL

Malleable Iron Screwed Fittings (Class 300)



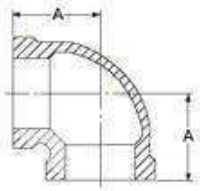
MATERIAL SPECIFICATIONS

Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading:* ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

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90° ELBOW		
Size	A	Weight
in	in	lbs
¼	0.94	0.20
⅜	1.06	0.29
½	1.25	0.47
¾	1.44	0.66
1	1.63	1.20
1¼	1.94	1.90
1½	2.13	2.50
2	2.50	4.20
2½	2.94	5.30
3	3.38	9.70
4	4.50	16.00



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90° REDUCING ELBOW

SPF/ANVIL

Malleable Iron Screwed Fittings (Class 300)



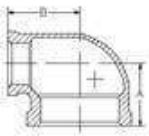
MATERIAL SPECIFICATIONS

Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading: * ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

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90° REDUCING ELBOW			
Size	A	B	Weight
in	in	in	lbs
½ x ¼	1.19	1.19	0.41
1 x ¾	1.50	1.56	1.00



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CAP

SPF/ANVIL

ANVIL INTERNATIONAL

Malleable Iron Screwed Fittings (Class 300)



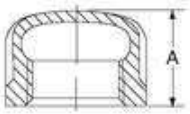
MATERIAL SPECIFICATIONS

Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading:* ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

UL ULC FM APPROVED

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CAP		
Size	A	Weight
in	in	lbs
¼	0.78	0.10
⅜	0.81	0.15
½	1.00	2.23
¾	1.06	0.35
1	1.25	0.58
1¼	1.38	0.94
1½	1.44	1.20
2	1.69	1.90
2½	2.06	3.30
3	2.19	4.70



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REDUCING COUPLINGS

SPF/ANVIL

Malleable Iron Screwed Fittings (Class 300)



MATERIAL SPECIFICATIONS

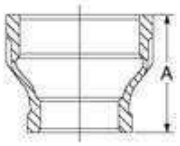
Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading:* ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

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REDUCING COUPLINGS

Size	A	Weight
in	in	lbs
⅛ x ¼	1.44	0.21
⅛ x ⅜	1.69	0.31
¼ x ⅜	1.69	0.34
¼ x ½	1.75	0.47
⅜ x ½	1.75	0.50
1 x ⅜	2.00	0.71
1 x ½	2.00	0.79
1¼ x ⅜	2.38	1.10
1¼ x ½	2.38	1.20
1¼ x 1	2.38	1.30
1½ x ⅜	2.69	1.50
1½ x ¾	2.69	1.60
1½ x 1	2.69	1.60
1½ x 1¼	2.69	1.80
2 x ⅜	3.19	2.40
2 x ½	3.19	2.40
2 x 1	3.19	2.50
2 x 1¼	3.19	2.70
2 x 1½	3.19	2.70
2½ x 1½	3.69	4.10
2½ x 2	3.69	4.30
3 x 2	4.06	5.80
3 x 2½	4.06	6.50
4 x 3	4.38	10.00



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REDUCING TEE

SPF/ANVIL

Malleable Iron Screwed Fittings (Class 300)



MATERIAL SPECIFICATIONS

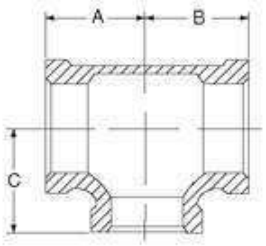
Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading:* ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

APPROVED

For Listing/Approval Details and Limitations visit our Web Site www.anvilintl.com or contact an Anvil® Representative.

REDUCING TEE

Size			A	B	C	Weight
in			in	in	in	lbs
¾	¾	½	1.31	1.31	1.38	0.90
1	1	½	1.44	1.44	1.50	1.30
		¾	1.50	1.50	1.56	1.30
1¼	1¼	½	1.50	1.50	1.69	1.70
		¾	1.63	1.63	1.75	1.90
		1	1.75	1.75	1.81	2.10
1½	1½	½	1.63	1.63	1.81	2.30
		¾	1.69	1.69	1.88	2.50
		1	1.81	1.81	2.00	2.60
		1¼	2.00	2.00	2.06	3.00
2	2	½	1.75	1.75	2.06	3.40
		¾	1.81	1.81	2.13	3.60
		1	2.00	2.00	2.25	4.00
		1¼	2.13	2.13	2.31	4.20
		1½	2.25	2.25	2.38	4.60
2½	2½	2	2.69	2.69	2.75	7.60
3	3	2	2.81	2.81	3.13	9.60



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TEE

SPF/ANVIL

Malleable Iron Screwed Fittings (Class 300)



MATERIAL SPECIFICATIONS

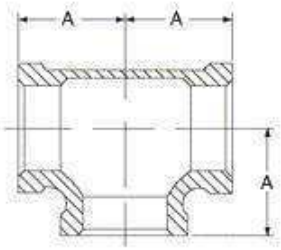
Dimensional: Fittings: ASME B16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Material: ASTM A-197
Galvanizing: ASTM A-153 (Hot Dip Galvanizing)
Threading: * ASME B 1.20.1
Pressure Rating: Fittings: ASME B 16.3
Unions: ASME B 16.39
Bushings/Plugs: ASME B 16.14
Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.
Agency Approvals: All malleable iron fittings and unions are UL Listed and FM Approved.

FM APPROVED

For Listing/Approval Details and Limitations visit our Web Site www.anvilintl.com or contact an Anvil® Representative.

TEE

Size	A	Weight
in	in	lbs
⅛	1.31	0.27
¼	1.06	0.42
⅜	1.25	0.65
½	1.44	1.10
¾	1.63	1.60
1	1.63	1.60
1¼	1.94	2.50
1½	2.13	3.40
2	2.50	5.20
2½	2.94	8.00
3	3.38	13.00
4	4.50	24.00



Section 4.) Flanged Fittings

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FLANGED FITTINGS

STAR® PIPE PRODUCTS

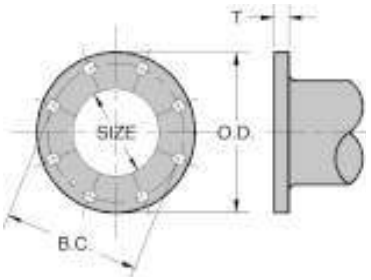
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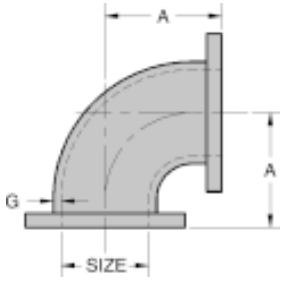
For fire protection services request submittal GRS 1.3

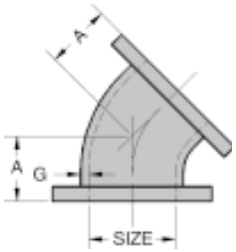
Ductile iron per ASTM A536. Pressure rated for 250 psi. Gray iron per ASTM A126. Pressure rated for 175 psi. Dimensions in accordance with ANSI/AWWA C110/A21, 10 and ANSI B16.1. Drilling in accordance with ANSI B16.1 Class 125/150 flanges.

FLANGE DETAILS

SIZE (IN.)	FLANGE DIAMETER OD	BOLT CIRCLE BC	FLANGE THICKNESS T (MIN.)	BOLT HOLE DIA	NUMBER OF BOLTS	BOLTS SIZE
3	7.50	6.00	0.75	0.75	4	0.62x2.50
4	9.00	7.50	0.94	0.75	8	0.62x3.00
6	11.00	9.50	1.00	0.88	8	0.75x3.50
8	13.50	11.75	1.12	0.88	8	0.75x3.50
10	16.00	14.25	1.19	1.00	12	0.88x4.00
12	19.00	17.00	1.25	1.00	12	0.88x4.00





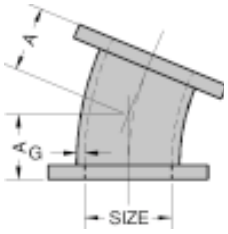


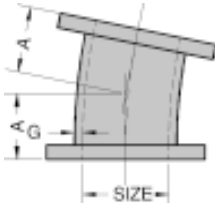
FBD90 FLANGED 90º ELBOW

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	5.50	0.48	24
4	6.50	0.52	40
6	8.00	0.55	66
8	9.00	0.60	105
10	11.00	0.68	170
12	12.00	0.75	250

FBD45 FLANGED 45º ELBOW

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	3.00	0.48	20
4	4.00	0.52	35
6	5.00	0.55	57
8	5.50	0.60	92
10	6.50	0.68	143
12	7.50	0.75	215





FBD22 FLANGED 22 1/2º ELBOW

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	3.00	0.48	20
4	4.00	0.52	35
6	5.00	0.55	55
8	5.50	0.60	90
10	6.50	0.68	140
12	7.50	0.75	215

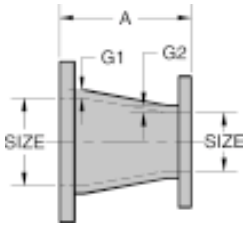
FBD11 FLANGED 11 1/4º ELBOW

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	3.00	0.48	20
4	4.00	0.52	35
6	5.00	0.55	55
8	5.50	0.60	90
10	6.50	0.68	140
12	7.50	0.75	214

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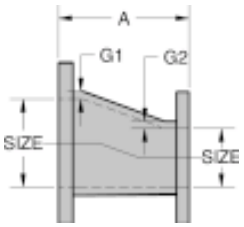
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For fire protection services request submittal GRS 1.3



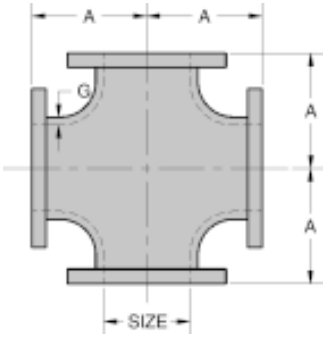
FRD FLANGED CONCENTRIC REDUCER

NOMINAL PIPE SIZE (IN.)	FACE TO FACE A	1st WALL THICKNESS G1 (MIN.)	2nd WALL THICKNESS G2 (MIN.)	WEIGHT LBS.
4X3	7.00	0.52	0.48	29
6X3	9.00	0.55	0.48	42
6X4	9.00	0.55	0.52	48
8X4	11.00	0.60	0.52	70
8X6	11.00	0.60	0.55	80
10X6	12.00	0.68	0.55	104
10X8	12.00	0.68	0.60	120
12X6	14.00	0.75	0.55	145
12X8	14.00	0.75	0.60	160
12X10	14.00	0.75	0.60	180



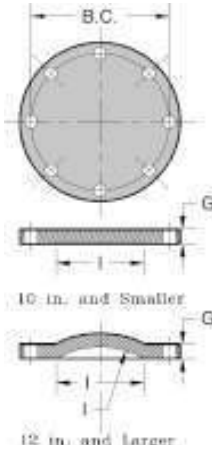
FERD FLANGED ECCENTRIC REDUCER

NOMINAL PIPE SIZE (IN.)	FACE TO FACE A	1st WALL THICKNESS G1 (MIN.)	2nd WALL THICKNESS G2 (MIN.)	WEIGHT LBS.
4X3	7.00	0.52	0.48	26
6X3	9.00	0.55	0.48	44
6X4	9.00	0.55	0.52	46
8X4	11.00	0.60	0.52	70
8X6	11.00	0.60	0.55	75
10X6	12.00	0.68	0.55	112
10X8	12.00	0.68	0.60	120
12X6	14.00	0.75	0.55	130
12X8	14.00	0.75	0.60	145
12X10	14.00	0.75	0.60	170



FXD FLANGED CROSS

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	5.50	0.48	47
4	6.50	0.52	77
6	8.00	0.55	125
8	9.00	0.60	200
10	11.00	0.68	280
12	12.00	0.75	430



FLBD BLIND FLANGE

NOMINAL PIPE SIZE (IN.)	DIAMETER OF PORT I	BOLT CIRCLE BC	WALL THICKNESS G (MIN.)	WEIGHT LBS.
3	3.00	6.00	0.75	9
4	4.00	7.50	0.94	16
6	6.00	9.50	1.00	25
8	8.00	11.75	1.12	42
10	10.00	14.25	1.19	63
12	12.00	17.00	1.25	85

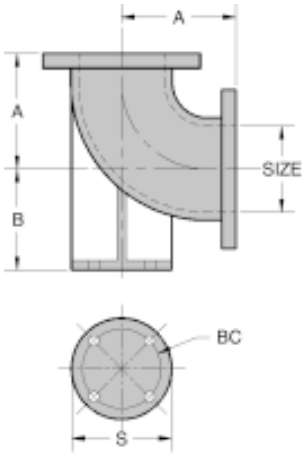
STAR® PIPE PRODUCTS

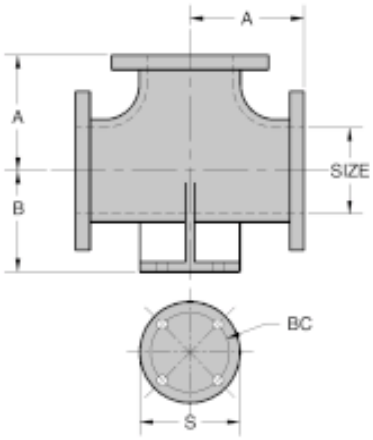
FLANGED FITTINGS

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For fire protection services request submittal GRS 1.3





FBBD90 FLANGED BASE 90º ELBOW

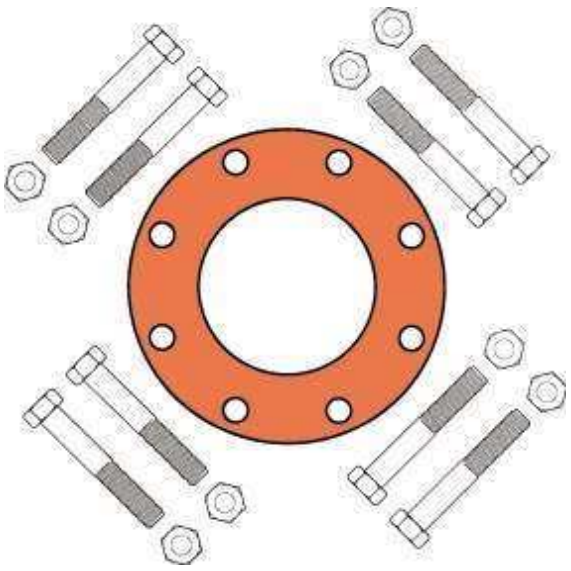
NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	HEIGHT OF BASE B	BASE DIA. S	BOLT CIRCLE BC	WEIGHT LBS.
3	5.50	4.88	5.00	3.88	32
4	6.50	5.50	6.00	4.75	53
6	8.00	7.00	7.00	5.50	89
8	9.00	8.38	9.00	7.50	153
10	11.00	9.75	9.00	7.50	225
12	12.00	11.25	11.00	9.50	340

FBTD FLANGED BASE TEE

NOMINAL PIPE SIZE (IN.)	CENTER TO FACE A	HEIGHT OF BASE B	BASE DIA. S	BOLT CIRCLE BC	WEIGHT LBS.
3	5.50	4.88	5.00	3.88	47
4	6.50	5.50	6.00	4.75	73
6	8.00	7.00	7.00	5.50	120
8	9.00	8.38	9.00	7.50	210
10	11.00	9.75	9.00	7.50	300
12	12.00	11.25	11.00	9.50	430

Flange accessory packs with 1/8" thick rubber (ASTM D2000 type a) gasket & hex bolts & nuts

Nom. Size	BOLTS	QTY	Weight
3	5/8 x 2 1/2	4	2
4	5/8 x 3	8	3
6	3/4 x 3 1/2	8	5
8	3/4 x 3 1/2	8	6
10	7/8 x 4	12	12
12	7/8 x 4	12	13
14	1 x 4 1/2	12	19
16	1 x 4 1/2	16	25
18	1 1/8 x 5	16	35
20	1 1/8 x 5	20	45
24	1 1/4 x 5 1/2	20	63
30	1 1/4 x 6 1/2	28	95
36	1 1/2 x 7	32	170
42	1 1/2 x 8	36	215
48	1 1/2 x 8	44	265
54	1 3/4 x 8 1/2	44	390

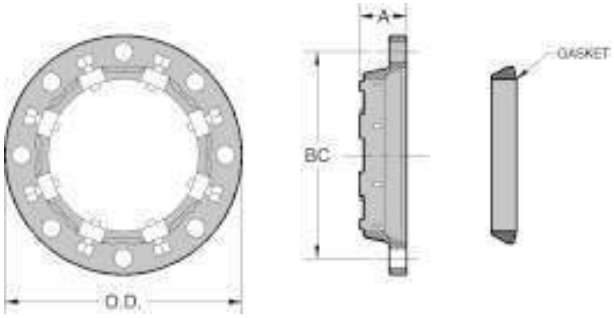


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For fire protection services request submittal GRS 1.3

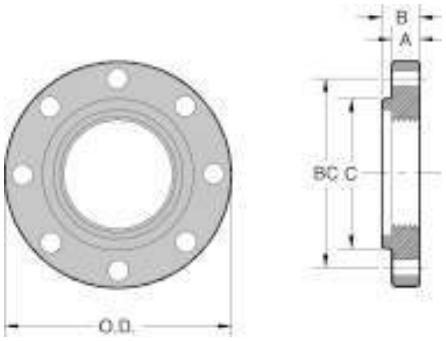
Series 200 adapter flange conveniently joins plain end steel or ductile iron pipe to flanged end equipment, valves or pipe. Eliminates threading, welding or grooving the pipe ends. Sizes 3"-12" are UL/ULC listed. Size 3"-10" are FM approved.



SF200 STAR ADAPTER FLANGE (200 SERIES)

NOMINAL PIPE SIZE (IN.)	STEEL PIPE O.D.	FLANGE DIAMETER OD	END TO END A	BOLT CIRCLE BC	SET SCREWS QTY	SET SCREWS SIZE	RECOMMENDED SET-SCREW TORQUE (LB.FT.) SCH 20	SCH 30	SCH 40+	WEIGHT LBS.
3	3.50	7.50	2.00	6.00	2	1/2 X 1 1/4	-	-	70	5
4	4.50	9.00	2.07	7.50	4	1/2 X 1 1/4	-	-	70	7
6	6.63	11.00	2.19	9.50	8	1/2 X 1 1/4	-	-	70	10
8	8.63	13.50	2.31	11.75	8	5/8 X1 1/2	50	50	90	15
10	10.75	16.00	2.50	14.25	12	5/8 X1 1/2	50	50	90	25
12	12.75	19.00	2.50	17.00	12	5/8 X1 1/2	50	60	90	33

Companion flanges are produced from ductile iron per ASTM A536.
Drilling is in accordance with ANSI B16.1 Class 125/150.
Threads are NPT per ANSI/ASME B1.20.1

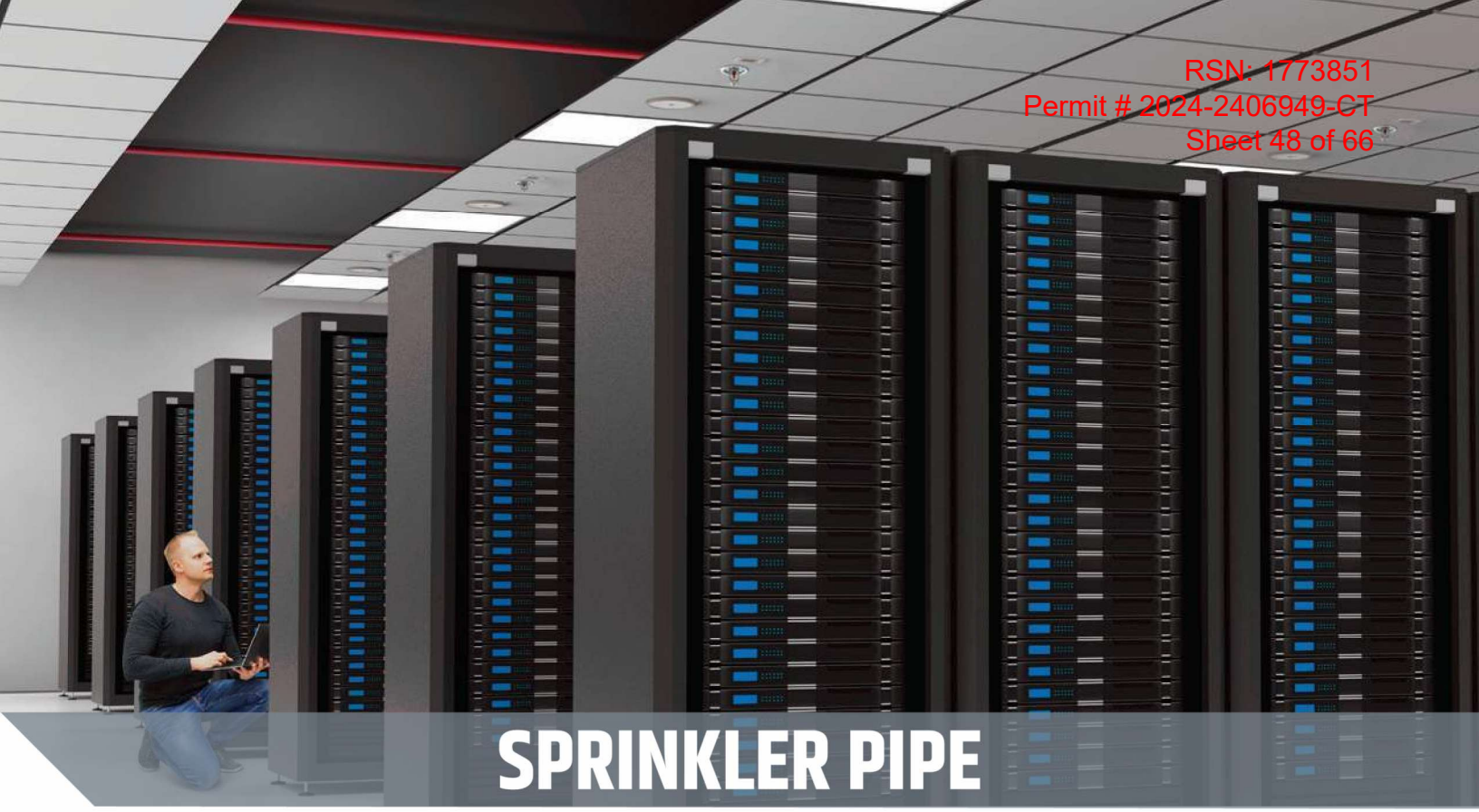


FLDC COMPANION FLANGE

NOMINAL PIPE SIZE (IN.)	STEEL PIPE O.D.	FLANGE DIAMETER OD	THICKNESS A	END TO END B	HUB DIA C	BOLT CIRCLE BC	BOLT HOLE DIA	QTY OF BOLTS	BOLTS SIZE	WEIGHT LBS
4	4.50	9.00	0.94	1.38	5.32	7.50	0.75	8	0.62X3.00	14
5	5.56	10.00	0.94	1.38	6.44	8.50	0.88	8	0.75X3.00	18
6	6.63	11.00	1.00	1.56	7.56	9.50	0.88	8	0.75X3.50	19
8	8.63	13.50	1.12	1.87	9.75	11.75	0.88	8	0.75X3.50	30

Section 5.) Steel Pipe

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SPRINKLER PIPE

Trust Bull Moose when it comes to protecting your most valuable assets.

As the leading manufacturer 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 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

Exclusive maker of Reddi-Pipe® red painted pipe.

OTHER BENEFITS/SERVICES:

- We have the most stocking locations in 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 pipe to eliminate field painting
- Compatible for use in wet, dry, preaction and deluge sprinkler systems

c UL us LISTED FM APPROVED NFPA AFSA American Fire Sprinkler Association



BULL MOOSE TUBE

800.325.4467
sales@bullmooseindustries.com
BullMooseTube.com

Bull Moose Fire Sprinkler Pipe Product Information

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	Nominal Pipe Size (Inches)	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
EDDY FLOW	O.D. (in)		1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)		1.530	1.728	2.203	2.705	3.334	4.310		
	Empty Weight (lb/ft)		1.222	1.844	2.330	2.809	3.361	4.968		
	Water Filled Weight (lb/ft)		2.019	2.860	3.982	5.299	7.144	11.290		
	C.R.R.		1.98	3.44	2.78	1.66	1.00	1.00		
	Pieces per Lift		61	61	37	30	19	19		
	Lift Weight (lbs) 21' lengths		1,565	2,362	1,810	1,770	1,341	1,982		
	Lift Weight (lbs) 24' lengths		1,789	2,700	2,069	2,022	1,533	2,265		
	Lift Weight (lbs) 25' lengths		1,864	2,812	2,155	2,107	1,596	2,360		
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		
EDDYTHREAD 40	O.D. (in)	1.295	1.650	1.900	2.375					
	I.D. (in)	1.083	1.418	1.645	2.123					
	Empty Weight (lb/ft)	1.461	2.070	2.547	3.308					
	Water Filled Weight (lb/ft)	1.860	2.754	3.468	4.842					
	C.R.R.	1.00	1.00	1.00	1.00					
	Pieces per Lift	70	51	44	30					
	Lift Weight (lbs) 21' lengths	2,148	2,217	2,353	2,084					
	Lift Weight (lbs) 24' lengths	2,454	2,534	2,690	2,382					
	Lift Weight (lbs) 25' lengths	2,557	2,639	2,802	2,481					
SCHEDULE 40	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)	1.049	1.380	1.610	2.067	2.469	3.068	4.026		
	Empty Weight (lb/ft)	1.680	2.270	2.720	3.660	5.800	7.580	10.800		
	Water Filled Weight (lb/ft)	2.055	2.918	3.602	5.114	7.875	10.783	16.316		
	C.R.R.	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
	Pieces per Lift	70	51	44	30	30	19	19		
	Lift Weight (lbs) 21' lengths	2,470	2,431	2,513	2,306	3,654	3,024	4,309		
	Lift Weight (lbs) 24' lengths	2,822	2,778	2,872	2,635	4,176	3,456	4,925		
	Lift Weight (lbs) 25' lengths	2,940	2,894	2,992	2,745	4,350	3,601	5,130		

BULL MOOSE TUBE
800.325.4467
sales@bullmooseindustries.com
BullMooseTube.com

Section 6.) Hanger Material

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HARDWARE THREADED STUD 51



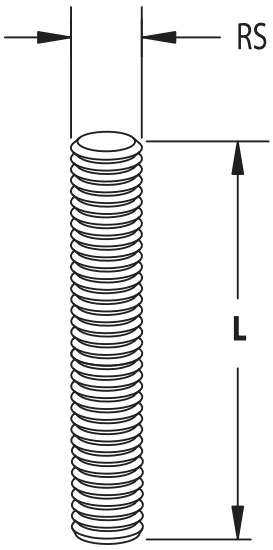
Threaded Studs

- Size Range: 3/8" and 1/2" rod sizes
- Surface Finish: Plain
- Attaches hangers to structural attachments without threading or cutting the rod, UNC Thread Form

NOTE: Low carbon: tensile: 58,000 psi; yield: 36,000 psi

Part Number	RS	L	Max. Rec. Load (lbs)*
0513702PL	3/8"	2"	610
0513703PL	3/8"	3"	610
0513704PL	3/8"	4"	610
0513705PL	3/8"	5"	610
0513706PL	3/8"	6"	610
0515004PL	1/2"	4"	1130
0515005PL	1/2"	5"	1130
0515006PL	1/2"	6"	1130
0515010PL	1/2"	10"	1130
0515012PL	1/2"	12"	1130

*Load based on Max. 650 F



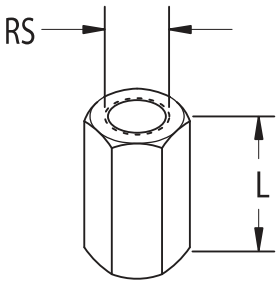
HARDWARE ROD COUPLING 25



Steel Rod Coupling

- Size Range: 1/4" thru 7/8" rod sizes
- Surface Finish: Electro-zinc Plated
- Intermediate accessory designed to join two lengths of similar UNC threaded rod

Part Number	RS	L	Max. Rec. Load (lbs)
0250025EG	1/4"	7/8"	240
0250037EG	3/8"	1-3/4"	610
0250050EG	1/2"	1-3/4"	1130
0250062EG	5/8"	2-1/8"	1810
0250075EG	3/4"	2-1/4"	2710
0250087EG	7/8"	2-1/2"	3770



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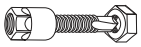
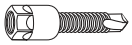
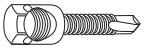
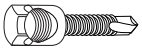
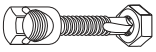
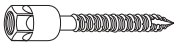
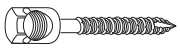
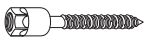
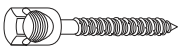
HARDWARE ANCHORS HMZ

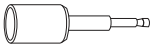
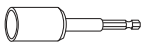
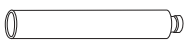


HangerMate® Anchors

- Used for supporting/anchoring threaded rod in wood, steel or concrete structural members

NOTE: For use on horizontal and vertical surfaces

	Part Number	RS	Description
Steel Applications – Vertical Mount (End-drilled Head)			
	HMZG471	3/8-16	3/8" rod anchor for steel and purlin
	HMZG550	3/8-16	Self drilling anchor for steel 16 ga. - 1/4"
Steel Applications – Horizontal Mount (Cross-drilled Head)			
	HMZH455	3/8-16	3/8" rod anchor for sidewall (.125" max)
	HMZH475	3/8-16	3/8" rod anchor for steel (.25" max)
	HMZH476	3/8-16	3/8" rod anchor sidewall, steel and purlin
Wood Applications – Vertical Mount (End-drilled Head)			
	HMZG660	3/8-16	Self drilling 3/8" rod anchor for wood
Wood Applications – Horizontal Mount (Cross-drilled Head)			
	HMZH665	3/8-16	3/8" rod anchor for sidewall/wood
Concrete Applications – Vertical Mount (End-drilled Head)			
	HMZG730	3/8-16	3/8" rod anchor for concrete
Concrete Applications – Horizontal Mount (Cross-drilled Head)			
	HMZG735	3/8-16	5/16" x 2-1/4" HangerMate Anchor

	Part Number	Description
Installation Tools		
	HMZE200	Recessed drive socket for metal and wood side-mount applications
	HMZE215	Vertical recessed drive socket for metal and wood vertical-mount applications
	HMZE220	Concrete recessed drive socket sleeve
	HMZE230	Carbide countersink tool – use with HMZG730 for concrete/masonry applications
	HMZE380	SDS Hex Shank Drill Bit

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SWIVEL LOOP HANGER 100

Heavy Duty Adjustable Band Hanger

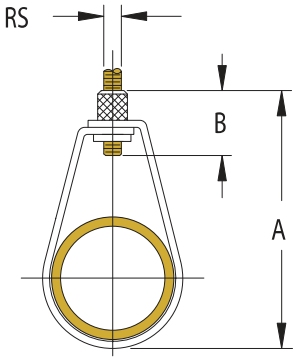
- Size Range: 1/2" through 8"
- Surface Finish: Electro-zinc plated
- Recommended for the suspension of stationary non-insulated pipe lines
- Features a retained insert nut to ensure that the loop hanger and insert nut stay together
- Conforms with Federal Specification WW-H-171 (Type 10), Manufacturers Standardization Society (MSS) SP-58 and SP-69 (Type 10)



Part Number	Nominal Pipe Size	RS	A	B	Max. Rec. Load (lbs)
1000050EG	1/2"	3/8"	2-3/4"	1"	300
1000075EG	3/4"	3/8"	3-1/16"	1"	300
1000100EG	1"	3/8"	3-5/16"	1"	300
1000125EG	1-1/4"	3/8"	3-9/16"	1"	300
1000150EG	1-1/2"	3/8"	3-13/16"	1"	300
1000200EG	2"	3/8"	4-1/4"	1"	300
1000250EG	2-1/2"	1/2"	5-5/8"	1-1/4"	1000
1000300EG	3"	1/2"	6-9/16"	1-1/4"	1000
1000350EG	3-1/2"	1/2"	7"	1-1/4"	1000
1000400EG	4"	5/8"	7-3/4"	1-5/16"	1100
1000500EG	5"	5/8"	9-1/8"	1-5/16"	1100
1000600EG	6"	3/4"	10-5/8"	1-9/16"	1250
1000800EG	8"	7/8"	13-1/8"	1-5/8"	1250

3/4" - 8" FM APPROVED

1/2" - 8" c UL us



LOOP HANGER SURGE RESTRAINT LHSR6

Heavy Duty Adjustable Band Hanger

- Size Range: fits 1/2" through 2" model 100 loop hangers
- Surface Finish: CADDY® COAT Black
- Restricts the upward surge movement of activated fire sprinkler systems
- Meets NFPA® 13 requirements
- One size fits 1/2" thru 2" sizes of the model 100 loop hanger
- Grips the loop hanger – not the nut – allowing fine tuning for height adjustment
- Installs without tools



c UL us

Section 7.) Backflow & FDC

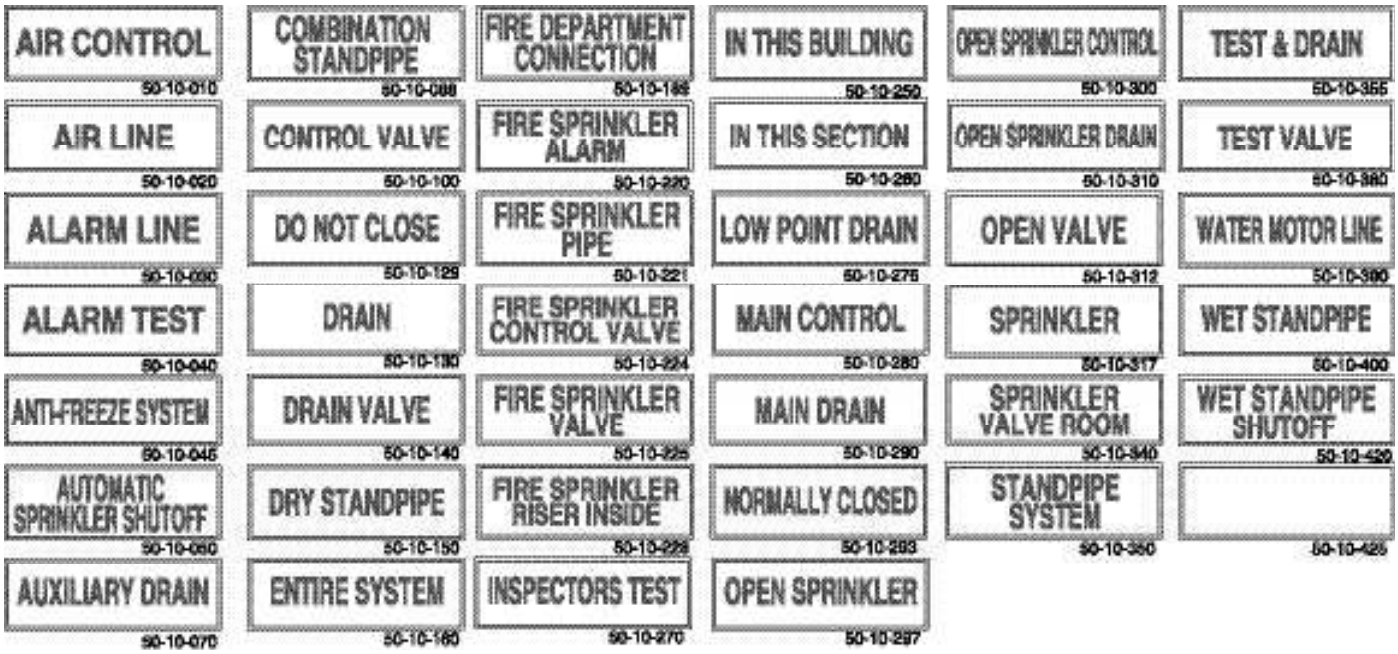
data sheet

ARGCO

GUARANTEED

6” x 2”
ALUMINUM SPRINKLER IDENTIFICATION SIGNS

SPECIFICATIONS:
Manufactured from 21 gage (.0285" thick) Aluminum
Powder Coated White printed with fade resistant red Ink
4 Holes Drilled in corners for easy installation & plastic coated for shipping
Designed in accordance with NFPA-13
Available as generic signs or personalized



Many other generic signs in stock. Call for details.

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FOR MORE INFORMATION CALL ARGCO AT 1-800-854-1015
OR LOG ONTO WWW.ARGCO.COM

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Reliable®

Model G 2½" (65 mm), 76mm 3" (80 mm), 4" (100 mm), 6" (150 mm) & 165 mm Swing Check Valves

Features

1. Grooved end connections.
2. Compact, lightweight design.
3. Non–slamming, spring loaded clapper to minimize water hammer.
4. Approved for horizontal and vertical installation.
5. Streamlined body design provides very low friction loss.
6. Elastomer faced clapper provides leak–free, non–sticking sealing.



Figure 1

General

Reliable Model G Swing Check Valves are multiple purpose valves performing regular check valve duties with very low friction loss. All four sizes are approved for use in fire protection systems. Typical applications include connections between public water supplies and private fire systems, at the discharge from fire pumps, at gravity tank connections and at fire department pumper connections.

All Model G Check Valves are provided with a ½" NPT (R½) supply side connection (Item 12, Fig.2).

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

Swing Check Valves and associated equipment should periodically be given a thorough inspection and test. NFPA 25 provides minimum maintenance requirements. Check valves should be inspected and operated at least annually. Parts should be replaced as required.

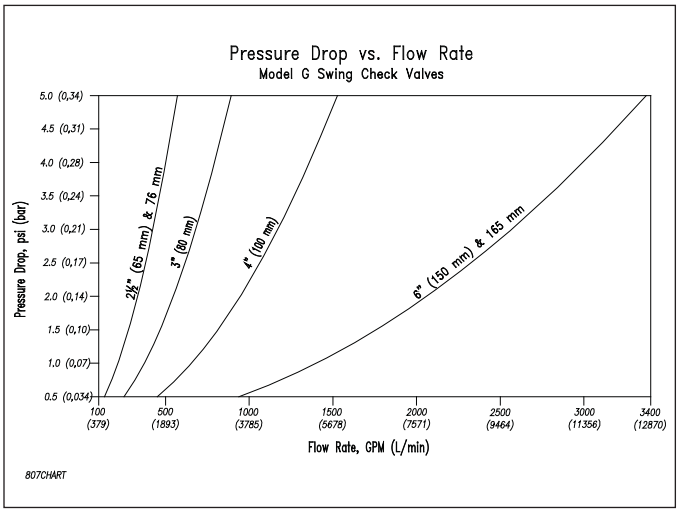
When Model G Swing Check Valves are installed vertically, the direction of the flow arrow must point upward. For horizontal installations, the hinge pin must be located at the top.

Valve Description

1. Rated working pressure 250 psi (17,25 bar).
2. Factory hydrostatic test pressure 500 psi (34,5 bar).
3. Friction loss, expressed in equivalent length of Sch. 40 pipe with C = 120 (based on Hazen and Williams formula):
   2½" (65mm) & 76mm - 7 ft (2.13 m)
   3" (80mm) - 7 ft (2.13 m)
   4" (100mm) - 10 ft (3.05 m)
   6" (150mm) & 165mm - 16 ft (4.88 m)
4. Standard grooved end dimensions per ANSI/AWWA C606.

Technical Data

Valve Size	Face–to–Face Dimensions	Shipping weight
2½" (65mm) & 76mm	7.03" (178mm)	9 lbs. (4kg)
3" (80mm)	7.62" (193mm)	11 lbs. (5kg)
4" (100mm)	8.44" (214mm)	17 lbs. (7.7kg)
6" (150mm) & 165mm	10.25" (260mm)	38 lbs. (17.25kg)



Approvals

1. Listed by Underwriters Laboratories, Inc.
2. Underwriters' Laboratories certified for Canada.
3. Approved by Factory Mutual Research Corp.*
4. NYC MEA 258-93-E

* FM Approved as both a "Single" check valve and as an "Anti-Water Hammer" check valve.

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Refer to figure 2.

Item No.	Part Name	Material	Qty.	Part Number					
				2½" (65mm)	76mm	3" (80mm)	4" (100mm)	6" (150mm)	165mm
1*	Valve Body	Gray Iron, ASTM–A48 Class 30A	1	91005012	91005011	91005013	91005014	91005016	91006015
2*	Seat	Bronze C83600 or C93200, ASTM–B505	1	96020200	96020200	96020300	96020400	96020600	96020600
3	Clapper	Stainless Steel 304, ASTM–A240	1	91816112	91816112	91816113	91816114	91816116	91816116
4	Facing Seal **	EPDM Rubber	1	95520200	95520200	95520300	95520400	95520600	95520600
5	Clamping Ring	Stainless Steel 304, ASTM–A240	1	95290300	95290300	95290300	95290400	95290600	95290600
6	Gasket **	EPDM Rubber	1	93720604	93720604	93720604	93720604	93720604	93720604
7	Spring	Stainless Steel 302, ASTM–A313	1	96400300	96400300	96400300	96400400	96400600	96400600
8	Hinge Pin	Stainless Steel 303, ASTM–A582	1	95000280	95000280	95000300	95006824	95000600	95000600
9	Bolt	Stainless Steel 304, ASTM–F593	1	91090600	91090600	91090600	91090600	91090600	91090600
10	Locknut **	Stainless Steel 303, ASTM–F594	1	94913816	94913816	94913816	94913816	94913816	94913816
11	Plug, ¼" NPT	Steel	1	95201800	95201800	95201800	95201800	95201800	95201800
12	Plug, ½" NPT	Steel	1	98604402	98604402	98604402	98604402	98604402	98604402
**	Replacement Seal Kit		1	6888040025	6888040025	6888040030	6888040040	6888040060	6888040060

* Not field replaceable.

Valve Disassembly

1. Close the main water supply valve and drain the system.
2. Remove the check valve from the piping system.
3. Inspect the Seat (2) for any cuts, scrapes and dents. Replace the valve if any damage is found.
4. To replace the Facing Seal (4), remove the Clapper (3), unscrew the Locknut (10) and remove the Retention Bolt (9).

Valve Reassembly

1. Thoroughly clean the Clapper (3). Insert the Retention Bolt (9) with a new Gasket (6).
2. Place the new Facing Seal (4) and the Clamping Ring (5) against the Clapper (3). Tighten the new Locknut (10) to 21 in.-lbs. (2.37 N•m) torque in 2½" (65mm), 76mm & 3" (80mm) sizes and to 52 in.-lbs. (5.87 N•m) in 4" (100mm), 6" (150mm) & 165mm sizes.
3. Insert the clapper assembly into the valve through the downstream opening. Reinsert the Hinge Pin (8) while holding the coils of the properly oriented Spring (7) in place. Install the hinge pin Plug (11).
4. Reinstall the check valve in the system.
5. Place the system back in service.

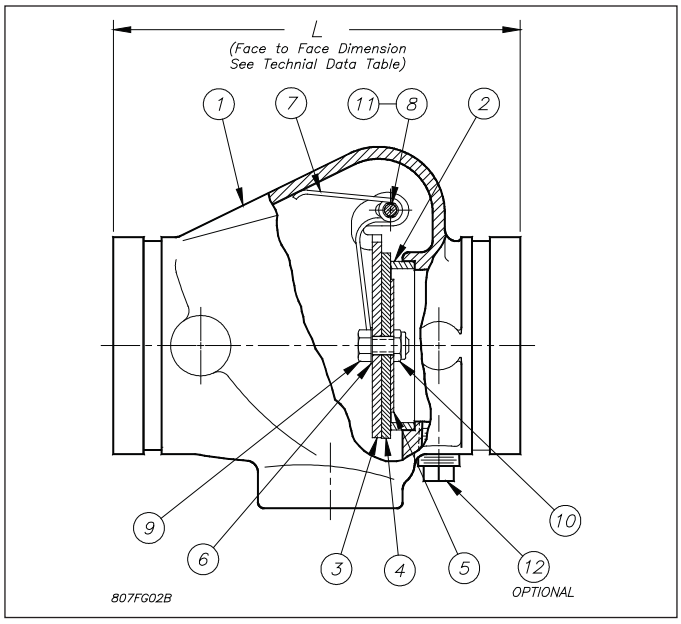


Figure 2

Ordering Information

Specify:

1. Model G Right–Check™ Valve.
2. Size.

Contact the installing contractor or Reliable if any difficulties are experienced. Should replacement parts be needed, use only genuine Reliable parts.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Productsmanufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
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400 PSI WWP Bronze Side Outlet Globe Valves

Dezincification Resistant

Fire Protection Valve • 3-Way Valve • Screw-in Bonnet • Integral Seat • Renewable Disc

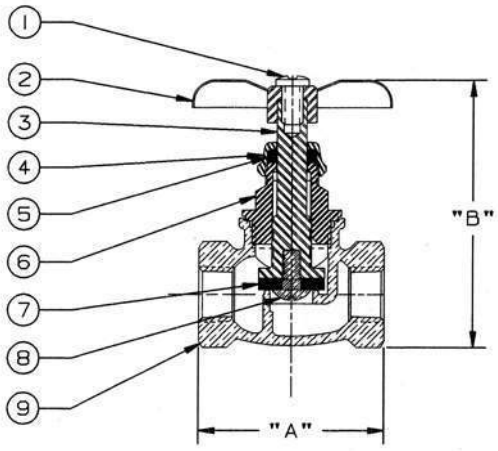
400 PSI/27.6 Bar Non-Shock Cold Water



KT-291-W3
Threaded

MATERIAL LIST

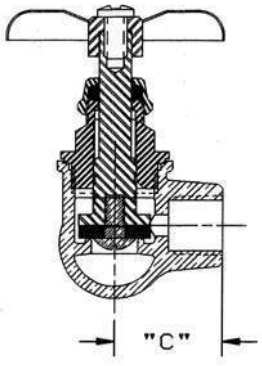
	PART	SPECIFICATION
1.	Handwheel Screw	Zinc Plated Steel
2.	Handwheel	Aluminum ASTM B85 Alloy C38000
3.	Stem	ASTM B133 Alloy C10200
4.	Packing Nut	ASTM B16 Alloy C36000
5.	Packing	Non Asbestos Aramid Fibers w/Graphite
6.	Bonnet	Bronze ASTM B584 Alloy C84400
7.	Disc	Nitrile
8.	Disc Screw	Stainless Steel ASTM A276 Alloy S43000
9.	Body	Bronze ASTM B584 Alloy C84400



KT-291-W3
NPT x NPT x NPT

DIMENSIONS—WEIGHTS—QUANTITIES

Size		Dimensions A		B		C		Weight		Box Qty.	Master Ctn. Qty.
In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.		
¼	8	1.75	44	2.25	57	.94	24	.41	.19	10	100



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175 PSI WWP Bronze Angle Valves

Fire Protection Valve • Screw-in Bonnet • Integral Seat • Renewable Disc

Dezincification Resistant

175 PSI/12.1 Bar Non-Shock Cold Water

CONFORMS TO MSS SP-80 • UL/ULC LISTED*

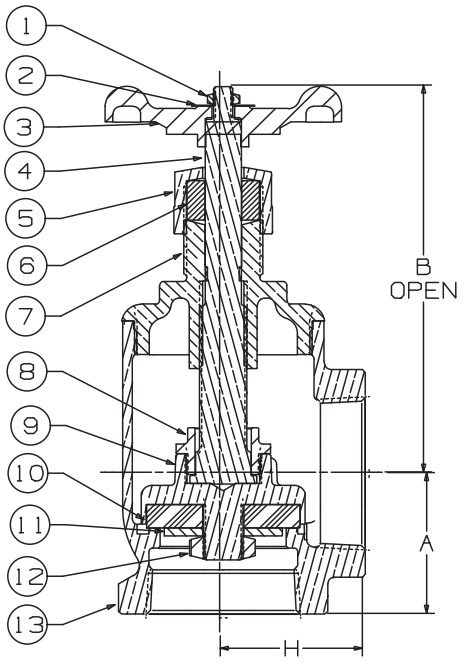


T-301-W
Threaded

MATERIAL LIST

	PART	SPECIFICATION
1.	Handwheel Nut	300 Series Stainless Steel
2.	Identification Plate	Aluminum
3.	Handwheel	Aluminum Commercial Alloy C38000
4.	Stem	Silicon Bronze ASTM B371 Alloy C69430
5.	Packing Gland	Bronze ASTM B62/ ASTM B16†/ ASTM B584 Alloy C84400
6.	Packing Nut	Bronze ASTM B62/ ASTM B584 Alloy C84400/ASTM B16
7.	Packing	Non Asbestos Aramid Fibers w/Graphite
8.	Bonnet	Bronze ASTM B62 Alloy C83600
9.	Disc Holder Nut	Bronze ASTM B62 Alloy C83600
10.	Disc Holder	Bronze ASTM B62 Alloy C83600
11.	Seat Disc	Nitrile (W) (1¼" - 2") PTFE (Y) (2½" - 3")
12.	Seat Disc Nut	Bronze ASTM B62‡/ ASTM B96 Alloy C65100 w/SS Washer
13.	Body	Bronze ASTM B62/B584 Alloy C83600

‡ 2½" and 3" size only.
† Not on 2"



T-301-W
NPT x NPT

DIMENSIONS—WEIGHTS—QUANTITIES

Size		Dimensions A		B		H		Weight		Box	Master
In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Qty.	Ctn. Qty.
1¼	32	2.19	56	6.13	156	2.19	56	3.71	1.69	1	10
1½	40	2.38	60	7.19	183	2.38	60	5.54	2.52	1	10
2	50	2.25	57	7.25	184	2.25	57	6.72	3.05	1	10
**2½	65	3.19	81	10.56	268	3.19	81	16.13	7.33	1	2
**3	80	3.88	86	11.13	283	3.88	86	21.72	9.87	1	2

*** UL/ULC Listed for sizes for trim and drain use (Subject 258) - Sizes 1¼", 1½", 2".**
**** Sizes 2½" and 3" supplied as T-311-Y with PTFE seat disc.**

NIBCO INC. WORLD HEADQUARTERS • 1516 MIDDLEBURY ST. • ELKHART, IN 46516-4740 • USA • PH: 1.800.234.0227
TECH SERVICES PH: 1.888.446.4226 • FAX: 1.888.336.4226 • INTERNATIONAL OFFICE PH: +1.574.295.3327 • FAX: +1.574.295.3455
www.nibco.com

SYSTEM SENSOR®

WFD Series Waterflow Detector



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

Features

- Two-inch mounting hole provided in new WFD30-2 models
- UL-listed models are NEMA 4 rated
- Sealed retard mechanism immune to dust and other contaminants
- Visual switch activation
- Field-replaceable retard mechanism and SPDT switches
- Rugged, dual SPDT switches enclosed in a durable terminal block
- Accommodates up to 12 AWG wire
- Designed for both indoor and outdoor use
- 100 percent synchronization activates both alarm panel and local bell
- Tamper-resistant cover screws

Robust Construction. The WFD series consists of a rugged, NEMA 4-rated enclosure. Designed for both indoor and outdoor use, the WFD series operates across a wide temperature range, from 32°F to 120°F.

Reliable Performance. UL-listed models are equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block to assure reliable performance.

False Alarm Immunity. The WFD series incorporates a mechanical retard feature, which minimizes the risk of false alarm due to pressure surges or air trapped in the sprinkler system. In addition, the mechanical retard's unique sealed design is immune to dust and other contaminants.

Simplified Operation. The WFD series is designed to simplify installation. Two conduit openings permit easy attachment to the local alarm system. The retard mechanism and dual SPDT switches are field-replaceable.

Agency Listings

UL LISTED S739 | ULC CS169 | 7770-1653:114 | MEA approved 167-93-E | FM APPROVED 3006195

Waterflow Detector Specifications

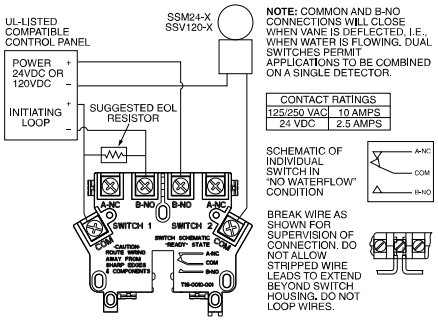
Engineering Specifications

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

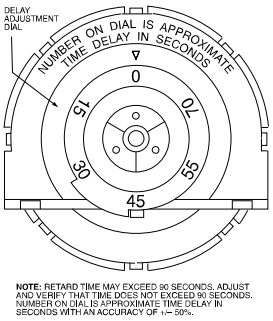
Standard Specifications

Static Pressure Rating	450 PSI*	**Operating Temperature Range**	32°F to 120°F (0°C to 49°C)
Maximum Surge	18 Feet Per Second (FPS)	**Enclosure Rating***	NEMA 4 – suitable for indoor/outdoor use
Triggering Threshold Bandwidth (Flow Rate)	4–10 GPM	**Cover Tamper Switch**	Standard with ULC models, optional for UL models, part no. 546-7000
Conduit Entrances	Two openings for ½″ conduit. One open, one knock-out type	**Service Use**	Automatic Sprinkler: NFPA-13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA-72
Contact Ratings	Two sets of SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	**U.S. Patent Numbers**	5,213,205
Compatible Pipe	Steel water pipe, schedule 10 through 40	**Warranty**	3 Years

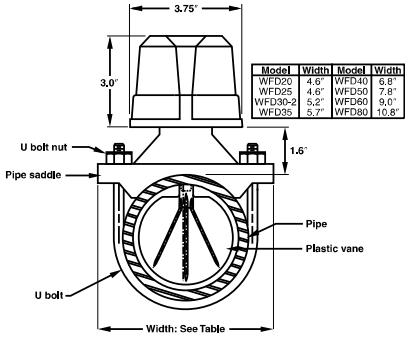
WFD Field Wiring Diagram



Delay Adjustment Dial



Overall Dimensions, Installed



Model	Width	Model	Width
WFD20	4.6″	WFD40	6.8″
WFD25	4.6″	WFD50	7.8″
WFD30-2	5.2″	WFD60	9.0″
WFD35	5.7″	WFD80	10.8″

Ordering Information

UL Model	ULC Model	Pipe Size	Hole Size	Shipping Weight
WFD20	WFD20A	2″	1¼″	4.2 lbs.
WFD25	WFD25A	2½″	1¼″	4.3 lbs.
WFD30-2	WFD30-2A	3″	2″	4.5 lbs.
WFD35	WFD35A	3½″	1¼″	4.7 lbs.
WFD40	WFD40A	4″	2″	5.2 lbs.
WFD50	WFD50A	5″	2″	6.3 lbs.
WFD60*	WFD60A	6″	2″	6.8 lbs.
WFD80*	WFD80A	8″	2″	7.5 lbs.
Accessories				
A3008-00	Retard mechanism			
A77-01-02	Terminal block			
546-7000	Tamper-proof switch kit			
WFDW	Tamper-proof wrench for cover			
WFDN4	Gasket kit			

*Maximum pressure rating 400 psi as approved by Factory Mutual.

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

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Product specifications subject to change without notice. Visit systemsensor.com for current product information, including the latest version of this data sheet.
A05-0180-013 • 1/09 • #1922

RSN: 1773851
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Sheet 62 of 66

Job Name _____ Contractor _____

Job Location _____ Approval _____

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

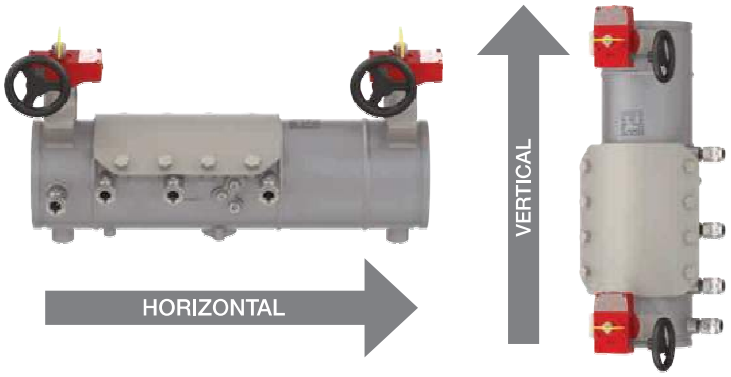
Approval _____ Representative _____

LEAD FREE*

Deringer™ 20

Double Check Valve Assembly

Sizes: 2"**– 8"



The Deringer™ 20 Double Check Valve Assembly is designed to prevent non-health hazard pollutants from entering the potable water supply system caused by backpressure and/or backsiphonage conditions

Features

- Intergral shutoff valves indoor/outdoor application
- 100% stainless steel housing
- Tamper-resistant test cocks
- Patented Dual-action™ check modules
  - Poppet action at low flow
  - Swing action at high flow
- Silicone elastomer check discs
- Prewired supervisory switches
- Flange adapters available
- IPS grooved ends

Specifications

The Deringer 20 Double Check Valve shall utilize two independent Dual-action check modules and two integral resiliently seated shut-off valves all of which shall be contained within a single rigid valve housing constructed entirely of 304 stainless steel. Both integral shutoff valves shall include pre-wired supervisory tamper switches contained within a weatherproof actuator housing approved for both indoor and outdoor use. Dual-action check modules shall operate as a "poppet style" check under low flow conditions, operate as a "swing style" check under high flow conditions and utilize replaceable silicone elastomer sealing discs. Assembly test cocks shall be handle-less and operate via a tamper resistant actuator. Assembly shall have a single full access service port and cover with an "inline" replaceable elastomer seal. Assembly shall be serviceable without special tools and approved for both horizontal and vertical applications.

Approved for Fire Protection, Waterworks, Plumbing, and Irrigation Applications.

Materials

Valve Housing:	304 Stainless Steel
Valve Cover:	304 Stainless Steel
SOV Disks:	EPDM/304SS
SOV Shafts:	304 Stainless Steel
SOV Bearings:	Teflon® fluoropolymer/Bronze
Non-wetted Bolts:	Grade 8 Zinc Plated
Check Disks:	Silicone (NSF)
Wetted Fasteners:	18-8 Stainless Steel
Check Springs:	17-7 Stainless Steel
Check Pins:	17-7/18-8 Stainless Steel
Check Seats:	Noryl® Polymer (NSF)
O-rings:	Buna-N (NSF)

Pressure — Temperature

Temperature Range: 33°F – 140°F

Working Pressure: 10 – 175psi

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Teflon® is a registered trademark of The Chemours Company.

Noryl® is a registered trademark of SABIC Global Technologies B.V.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

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

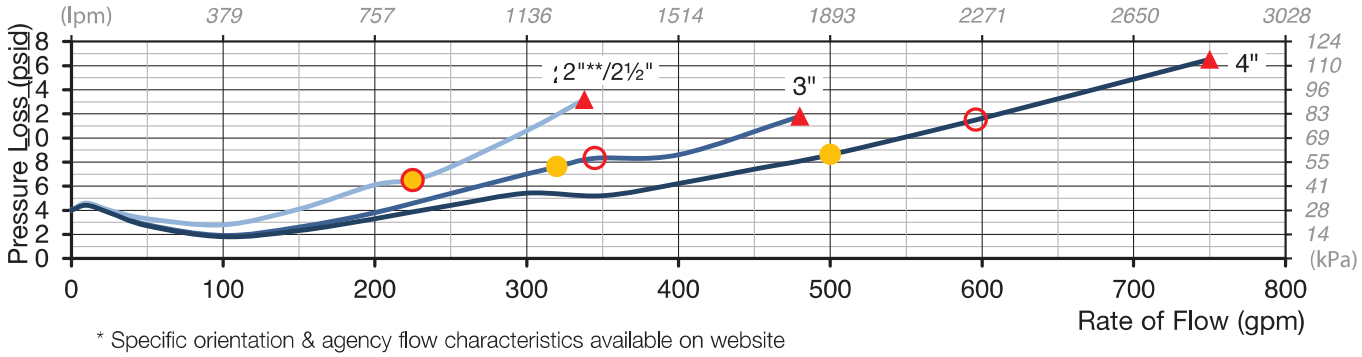
AMES FIRE & WATERWORKS

A WATTS Brand

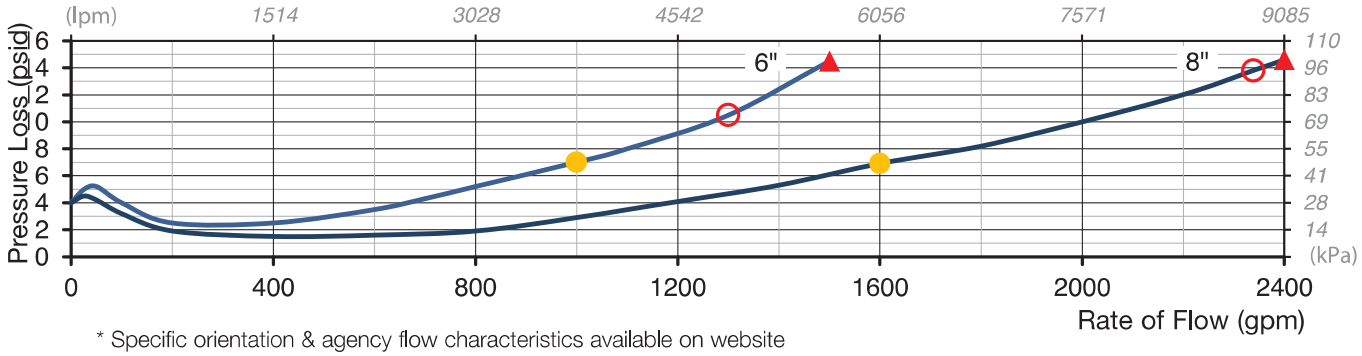
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Flow Performance

● = Rated Flow ▲ = UL Tested ⊖ = 1.5 fps



* Specific orientation & agency flow characteristics available on website



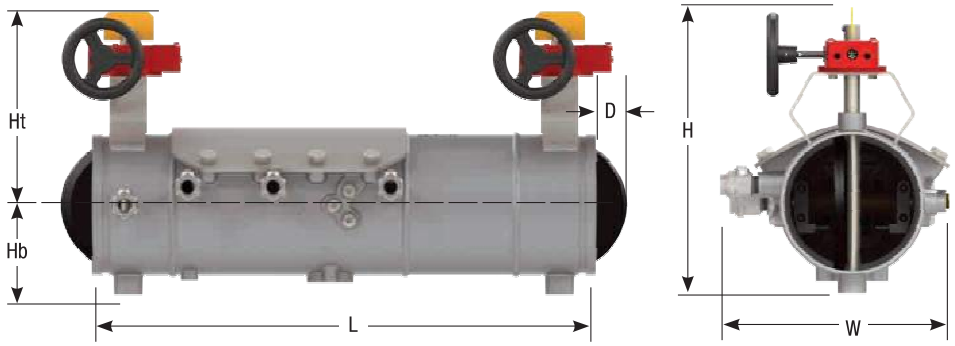
* Specific orientation & agency flow characteristics available on website

Standards

AWWA C510-07 Compliant
NSF/ANSI 372, UL CERTIFIED
LEAD FREE
End Connections
- IPS Groove for Steel Pipe: AWWA C606
- Flange Adapters: ANSI B16.1 Class 125

CLASSIFIED UL C US
FM APPROVED
ASSE 1015
USC APPROVED

Dimensions — Weights



Size	Model	Ht		Hb		L		D		H		W		Weight	
in.		*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs*	*kg*
2 (2½)**	20	7.1	180	2.9	74	22.3	566	0.0	0	10.0	254	11.0	279	52	24
2½	20	7.1	180	2.9	74	18.7	475	0.0	0	10.0	254	11.0	279	38	17
3	20	7.4	188	2.9	74	18.7	475	0.0	0	10.3	262	11.0	279	40	18
4	20	7.9	201	2.9	74	18.7	475	0.2	5	10.3	262	11.0	279	42	19
6	20	10.1	257	4.5	114	25	726	1.0	25	14.6	370	13.8	351	90	41
8	20	10.4	264	5.4	137	30.7	780	1.8	46	15.8	401	13.8	351	141	64

**2" size utilizes a 2 ½" assembly with 2 ½" groove to 2" female NPT adapter and couplings. Adapter and couplings ship unassembled.

AMES FIRE & WATERWORKS

A WATTS Brand

USA: Backflow T: (978) 689-6066 • F: (978) 975-8350 • AmesFireWater.com
USA: Control Valves T: (713) 943-0688 • F: (713) 944-9445 • AmesFireWater.com
Canada: T: (905) 332-4090 • F: (905) 332-7068 • AmesFireWater.ca
Latin America: T: (52) 55-4122-0138 • AmesFireWater.com

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Permit # 2024-2406949-CT
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DOUBLE CLAPPER TWO-WAY INLET

Brass Body * Overall Height: 24"

500 G.P.M. minimum inlet capacity auxiliary inlet connection.

STANDARD EQUIPMENT: Cast brass bottom outlet body with double clappers, outlet and inlet sizes as selected by figure number, 18" high brass seamless tubing; brass branded plate; cast brass plugs and chains. Branding as selected.

***U/L LISTED**

SPECIFY THREAD AND BRANDING.

BRANDING: "Standpipe", "Auto Spkr."

Special lettering available.

OPTIONAL FINISHES:
PB - Polished Brass
RC - Rough Chrome Plated
PC - Polished Chrome Plated

Figure No.	Size
*6510	4 X 2 1/2 X 2 1/2
6512	6 X 2 1/2 X 2 1/2
6513	4 X 3 X 3
6514	5 X 3 X 3
6515	6 X 3 X 3

OVERALL HEIGHT: 24"
BODY SWING RADIUS: 7 1/4"



Figure No. 6510

TRIPLE CLAPPER THREE-WAY INLET

Brass Body * Overall Height: 24"

750 G.P.M. minimum inlet capacity auxiliary inlet connection.

STANDARD EQUIPMENT: Cast Brass bottom outlet body with triple clappers, outlet size as selected by figure number; 18" high brass seamless tubing brass branded plate; cast brass plugs and chains. Branded as selected. **SPECIFY THREAD AND BRANDING.**

PLATE BRANDING: "Standpipe", "Auto Spkr", "Standpipe-Sprinkler". Special lettering available.

OPTIONAL FINISHES:
PB - Polished Brass
RC - Rough Chrome Plated
PC - Polished Chrome Plated

Figure No.	Size
6526	4 X 2 1/2 X 2 1/ 2 X 2 1/2
6527	6 X 2 1/2 X 2 1/ 2 X 2 1/2

OVERALL HEIGHT: 24"
BODY SWING RADIUS: 8"

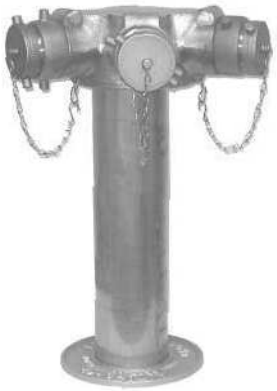


Figure No. 6527

FOUR-WAY CLAPPER SNOOT STYLE INLET

Brass Body* Overall Height: 24"

A free standing auxiliary inlet connection with 1,000 G.P.M. minimum inlet capacity to supplement fire protection water water supply.

6 X 2 1/2 X 2 1/2 X 2 1/2 X 2 1/2

STANDARD EQUIPMENT: Cast Brass bottom outlet body with clapper snoots on each inlet; 18" high brass seamless: brass branded plate; cast brass plugs and chains. Branding as selected. **SPECIFY THREAD AND BRANDING.**

PLATE BRANDING: "Standpipe", "Auto Spkr", "Standpipe-Sprinkler". Special lettering available.

FINISH: Cast Brass Body, Polished Brass Trim

OPTIONAL FINISH: PC- Polished Chrome Plated trim, Rough Chrome Body



Figure No. 6530



Figure No. 6532

data sheet

ARGCO

GUARANTEED

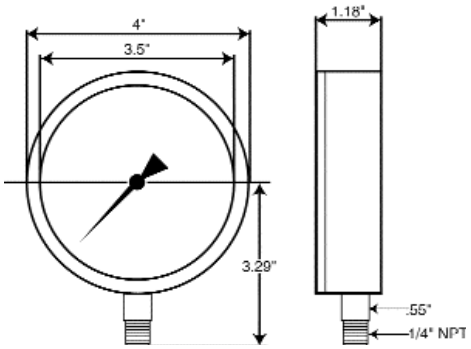
Fire Sprinkler Pressure Gauges



0-300 psi water

0-300 psi air

0-300 psi air/water



Application: Fluid medium which does not clog connection port or corrode copper alloy. Specifically designed for the fire sprinkler industry.

Size: 4" (100 mm)

Accuracy ± 3/2/3% of span (ASME B40.1 Grade B)

Working Range
Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

Operating Temperature
Ambient: -40°F to 140°F (-40°C to 60°C)
Media: max. 140°F (+60°C)

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

Standard Features

Connection Material: copper alloy
Lower mount (LM) - not available for 1½" size
1/4" NPT limited to wrench flat area

Bourdon Tube: Material: copper alloy C-type

Movement: Copper alloy, silicone dampened

Dia: White plastic with stop pin - black & red lettering

Pointer: Black aluminum

Case: Black polycarbonate

Approvals
UL listed (UL-393)
FM approved
Meets NFPA 25 Standards

Standard Scale
PSI

Window
Acrylic, ultrasonically welded to case

Standard Series • Type 110.10sp

Order Options
water
air/water
air

The information contained herein is produced in good faith and is believed to be reliable but is for guidance only. ARGCO and its agents cannot assume liability or responsibility for results obtained in the use of its product by persons whose methods are outside or beyond our control. It is the user's responsibility to determine the suitability of any of the products, methods of use, or preparation prior to use, mentioned in our literature. It is the user's responsibility to observe and adapt such precautions as may be advisable for the protection of personnel and property in the handling and use of any of our products.

FOR MORE INFORMATION CALL ARGCO AT 1-800-854-1015
OR LOG ONTO WWW.ARGCO.COM

CERTIFICATE OF COMPLIANCE

Wika Instrument, LP Certifies that the products specified herein have been manufactured in accordance with established technical standards, and comply with the requirements of ANSI/ASME B40.100

WIKA Instrument, LP
1000 Wiegand Boulevard
LAWRENCEVILLE, GA 30043
Tel : (+1) 770-513 8200
Fax : (+1) 770-338 5118
http://www.wika.com
info@wika.com

CUSTOMER	Allied Rubber & Gasket Co 5400 S 66 St FORT SMITH, AR 72903
CUSTOMER P.O. NO.	41945
ORDER NO.	2018647
ORDER DATE	04/14/2015
CUSTOMER P/N	6510161
WIKA P/N	4276192
DESCRIPTION	111.10SP 4 300IPS 1/4 L WATER ARGCO
QUANTITY	4,800
AUTHORIZED SIGNATURE	Bernadette H. Biggs
DATE	04/15/2015

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