GENERAL NOTES:

1. ALL WORK SHALL BE IN FULL COMPLIANCE WITH NFPA 13 (2013) AND THE NORTH CAROLINA STATE FIRE CODE, THE GENERAL CONDITIONS OF THE CONTRACT APPLY.

2. MATERIALS AND INSTALLATION SHALL COMPLY WITH APPLICABLE NFPA CODES, STATE BUILDING CODE, LOCAL AUTHORITY HAVING JURISDICTION, AND INSURANCE UNDERWRITER'S REQUIREMENTS.

3. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED FOR THE INTENDED USE AND SHALL BE INSTALLED IN FULL COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4. ALL SPRINKLER PIPE 2" AND SMALLER IS SCHEDULE-40 BLACK STEEL WITH THREADED ENDS AND FITTINGS. ALL 1¼" BRANCHLINE PIPE SHALL BE SCHEDULE-40 BLACK STEEL WITH GROOVED ENDS AND FITITNGS. ALL SPRINKLER PIPE 2½" AND LARGER IS SCHEDULE-10 BLACK STEEL WITH GROOVED ENDS AND FITTINGS – UNO.

5. SPRINKLER HEAD SPACING IS BASED ON THE NFPA STANDARDS FOR LIGHT HAZARD OCCUPANCIES (OFFICE) ALLOWING A MAXIMUM HEAD SPACING OF 225 S.F. PER HEAD.

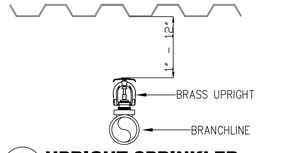
6. SPRINKLER HEAD SPACING IS BASED ON THE NFPA STANDARDS FOR ORDINARY HAZARD OCCUPANCIES (VEHICLE PARKING) ALLOWING A MAXIMUM HEAD SPACING OF 130 S.F. PER HEAD.

7. LOCATIONS OF PIPING AS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD.

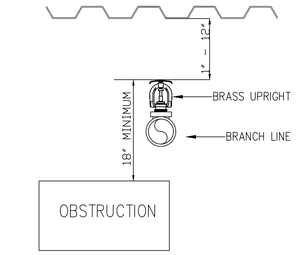
8. A SUFFICIENT SAFETY FACTOR HAS BEEN IMPLEMENTED INTO THIS DESIGN. CSCO IS NOT RESPONSIBLE FOR CHANGES IN THE CITY WATER SUPPLY THAT MAY ADVERSELY AFFECT THIS SYSTEM IN THE FUTURE.

9. THE FIRE FLOW TEST INFORMATION HAS BEEN PROVIDED BY CRAWFORD SPRINKLER DATED 5/9/24 INDICATES THE FOLLOWING...

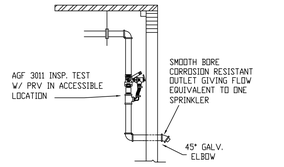
STATIC:	120 PSI
RESIDUAL:	42 PSI
FLOW:	1,270 GPM



5 FP 1 **UPRIGHT SPRINKLER** NTS



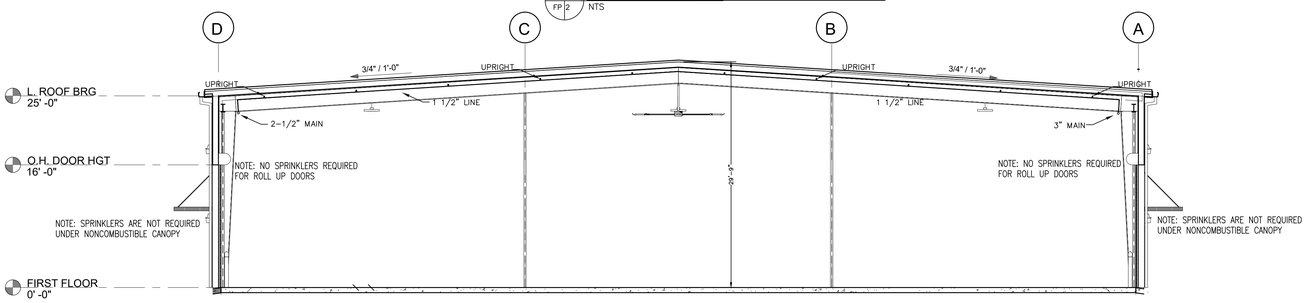
6 FP 1 **UPRIGHT OBSTRUCTION DETAIL** NTS



NOTE: NOT LESS THAN 4FT. OF EXPOSED TEST PIPE IN WARM ROOM BEYOND VALVE WHEN PIPE EXTENDS THROUGH WALL TO OUTSIDE.

WET TEST CONNECTION

3 FP 2 **INSP. TEST AND DRAIN** NTS



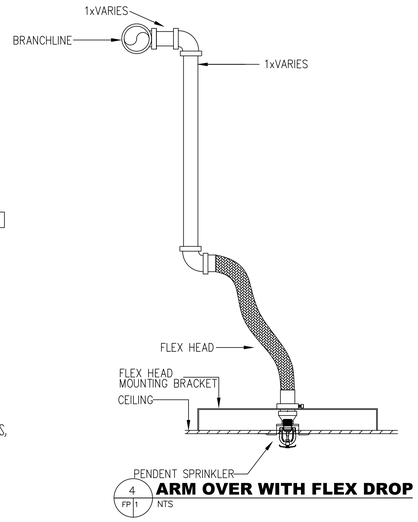
2 FP 1 **BUILDING SECTION DETAIL** NTS

THE INSTALLATION OF HVLS FANS IN BUILDINGS EQUIPPED WITH SPRINKLERS, INCLUDING ESFR SPRINKLERS, SHALL COMPLY WITH THE FOLLOWING:

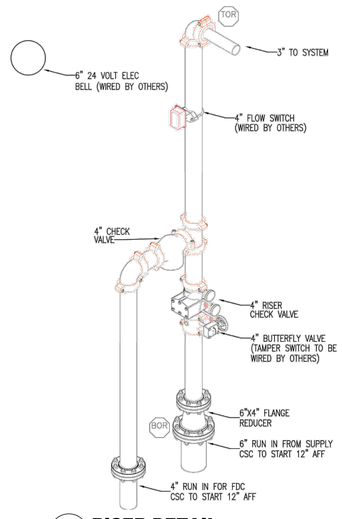
1. THE MAXIMUM FAN DIAMETER SHALL BE 24 FT.
2. THE HVLS FAN SHALL BE CENTERED APPROXIMATELY BETWEEN FOUR ADJACENT SPRINKLERS.
3. THE VERTICAL CLEARANCE FROM THE HVLS FAN TO THE SPRINKLER DEFLECTOR SHALL BE A MIN. OF 3 FT.
4. ALL HVLS FANS SHALL BE INTERLOCKED TO SHUT DOWN IMMEDIATELY UPON RECEIVING A WATER FLOW SIGNAL FROM THE ALARM SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 72. INTERLOCK WIRING IS TO BE BY OTHERS.

HVLS FAN HIGH VOLUME LOW SPEED FAN

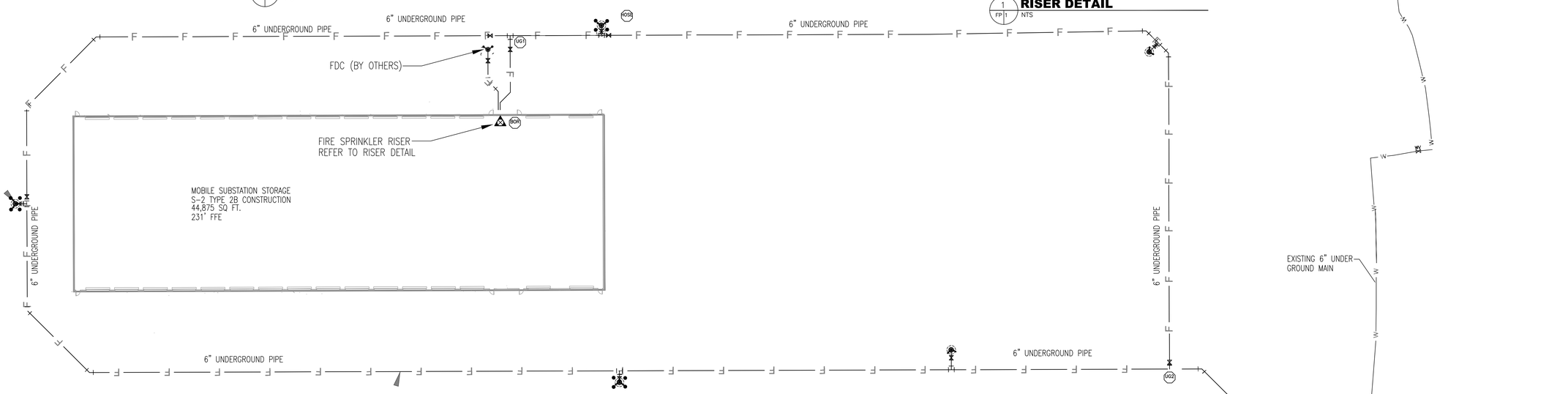
NO SCALE



4 FP 1 **ARM OVER WITH FLEX DROP** NTS



1 FP 1 **RISER DETAIL** NTS



3 FP 1 **SITE PLAN - FOR HYDRAULIC REFERENCE ONLY** NTS

WATER TEST
BY: CRAWFORD SPRINKLER COMPANY
DATE: 5/9/24
STATIC: 120PSI
RESIDUAL: 42 PSI
FLOW: 1270 GPM
ELEVATION: 215'

SPRINKLER DESIGN DATA

PROJECT NAME:	DUNN MOBILE SUBSTATION STORAGE	SYSTEM NO.:	SYSTEM 1
PROJECT LOCATION:	1269 JONESBORO ROAD DUNN, NC 28334	SYS. SQ. FT.:	44,041
		CEILING HGT.:	VARIES
DESIGNED BY:	DOUG JOHNSTON II	PH#: 919-828-9346	TOTAL BLDG. HGT.: VARIES
OCCUPANCY DESCRIPTION:	VEHICLE STORAGE	HAZARD CLASS:	ORDINARY GROUP II

DESIGN SUMMARY

DESIGN METHOD:	CALC
DESIGN AREA NO.:	AREA 1
LOCATION:	TRUCK BAYS
TYPE OF SYSTEM:	WET
HAZARD CLASS:	ORD GRP II
CRITERIA FROM:	NFPA 13
DESIGN AREA:	1500
SPKLR. SPACING:	130 MAX
DENSITY:	.2
K-FACTOR:	8.0
HOSE ALLOWANCE:	250
# DESIGN SPKLR.:	14
REQUIREMENTS @	BASE OF RISER
GPM REQUIRED:	477.82
PSI REQUIRED:	37.56
NODE#	BOR
REQUIREMENTS @	TEST
GPM REQUIRED:	627.82
PSI REQUIRED:	82.47
NODE#	TEST
SAFETY FACTOR PSI	16.34

Reviewed for Fire Code Compliance
Leslie Jackson
11/18/2024 8:16:47 AM

WATER SUPPLY INFORMATION

TESTED BY: CRAWFORD FIRE SPRINKLER
DATE: 5/9/24
LOCATION: 1269 JONESBORO ROAD

STATIC (PSI): 120
RESIDUAL (PSI): 42
FLOW (GPM): 1270

IS COPY OF WATER TEST DATA INCLUDED WITH CALCULATIONS? : ☒ YES ☐ NO

IS STORAGE HEIGHT GREATER THAN 12 FEET? : ☐ YES ☒ NO

SYMBOLS:

- (XXX) DENOTES A HYDRAULIC CALCULATION POINT OF REFERENCE
- DENOTES A HYDRAULIC REMOTE AREA
- DENOTES NEW SPRINKLER PIPE
- DENOTES A WET SYSTEM RISER LOCATION
- [X-X] DENOTES PIPE CENTERLINE ELEVATION AFF
- [XX BTS] DENOTES PIPE CENTERLINE BELOW TOP OF STEEL
- DENOTES FINISHED CEILING ELEVATION
- DENOTES AN EXTERIOR MOUNTED ELECTRIC BELL
- DENOTES FIRE SPRINKLER PIPE HANGER

N

IMPORTANT: IN LOCATIONS SUBJECT TO FREEZING CONDITIONS IT IS THE OWNER'S RESPONSIBILITY TO PROVIDE ADEQUATE HEAT THROUGHOUT WET PIPE SPRINKLER SYSTEM AREAS AND ENCLOSURES FOR DRY-PIPE, DELUGE AND OTHER TYPES OF VALVES CONTROLLING WATER SUPPLIES TO SPRINKLER SYSTEMS.

NICET CERTIFIED

BRIAN THOMAS CRAWFORD
NICET LEVEL III WBSL #107492

Crawford SPRINKLER CO. OF RALEIGH, INC
2725 S. SAUNDERS STREET • RALEIGH, NC 27603
PHONE 919-828-9346 • FAX 919-839-8164

DUKE ENERGY - DUNN MOBILE SUBSTATION STORAGE
SITE PLAN AND DETAILS
1269 JONESBORO ROAD
DUNN, NORTH CAROLINA

UNDERWRITERS:
INDEX NO.
REVISIONS:

DESIGN CRITERIA

SYSTEM TYPE	WET
SYSTEM DESIGN	CALCULATED
DESIGN DENSITY	0.20 gpm/1500 sf
MAX HEAD CVRG	130 s.f.
HOSE ALLOWANCE	250 gpm

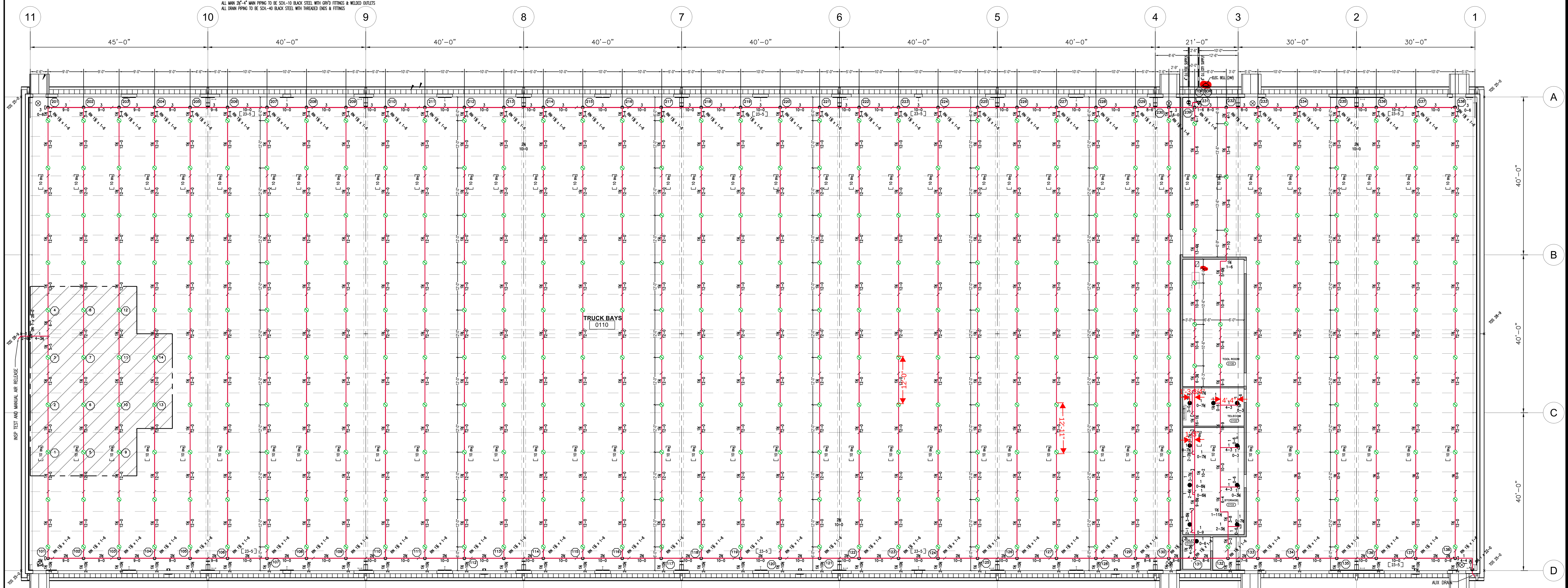
DRAWN BY: DFJ	DATE: 8/23/24
CHECK BY: BTC	DATE:
SCALE: AS NOTED	
CONTRACT NO: J24-6014	
FILE NO:	

DWG. NO: FP 1 OF 2

11/18/24

N.C License No. 29772 FS-I

ALL ARM-OVERS & DROPS TO BE 1" SCH. 40 w/ 48" BRAIDED FLEX DROP.
UNSUPPORTED BREAKOVERS NOT TO EXCEED 12".
ALL 1½" BRANCHLINE PIPING TO BE SCH.-40 BLACK STEEL WITH GRV'D FITTINGS & WELDED OUTLETS
ALL MAIN 2½"-4" MAIN PIPING TO BE SCH.-10 BLACK STEEL WITH GRV'D FITTINGS & WELDED OUTLETS
ALL DRAIN PIPING TO BE SCH.-40 BLACK STEEL WITH THREADED ENDS & FITTINGS

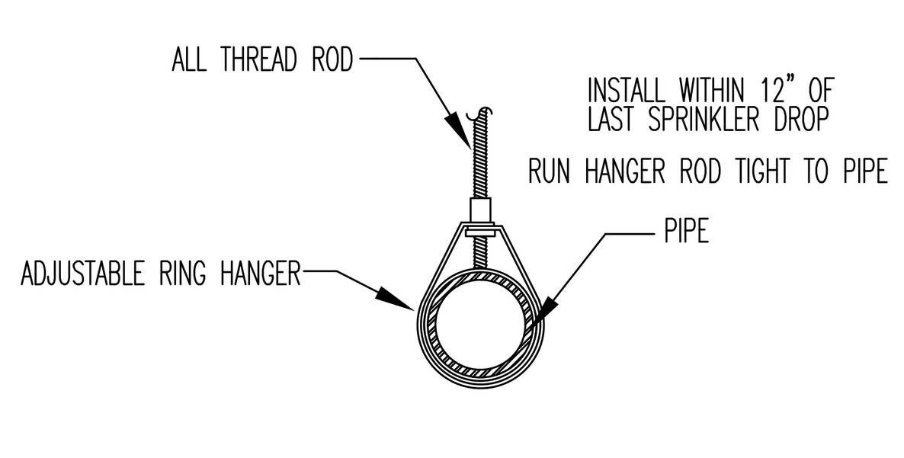


ALL ARM-OVERS & DROPS TO BE 1" SCH. 40 w/ 48" BRAIDED FLEX DROP.
UNSUPPORTED BREAKOVERS NOT TO EXCEED 12".
ALL 1½" BRANCHLINE PIPING TO BE SCH.-40 BLACK STEEL WITH GRV'D FITTINGS & WELDED OUTLETS
ALL MAIN 2½"-4" MAIN PIPING TO BE SCH.-10 BLACK STEEL WITH GRV'D FITTINGS & WELDED OUTLETS
ALL DRAIN PIPING TO BE SCH.-40 BLACK STEEL WITH THREADED ENDS & FITTINGS

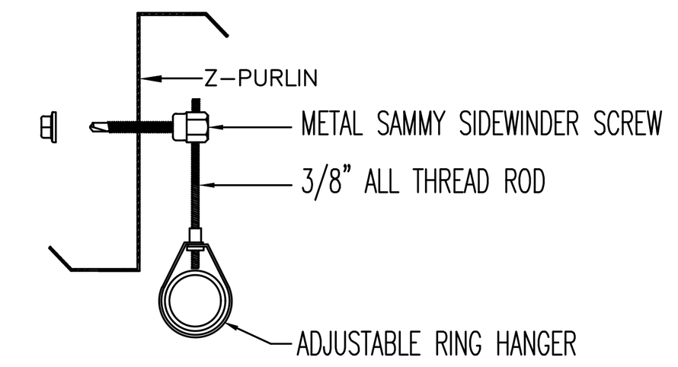
HYDRAULIC DESIGN CRITERIA

AREA NUMBER: 1	CODE REF.: NFPA 13(2013)	HAZARD: ORDINARY HAZARD GROUP II
REMOTE AREA: 1,500 SQ FT	DENSITY: .20 GPM	AREA PER SPRINKLER: 130 S.F.
SYSTEM TYPE: WET	INSIDE HOSE: 100	OUTSIDE HOSE: 150 GPM
TOTAL SYSTEM DEMAND: 477.82 GPM @ 37.56 PSI AT BOR		SAFETY MARGIN: 16.34 PSI

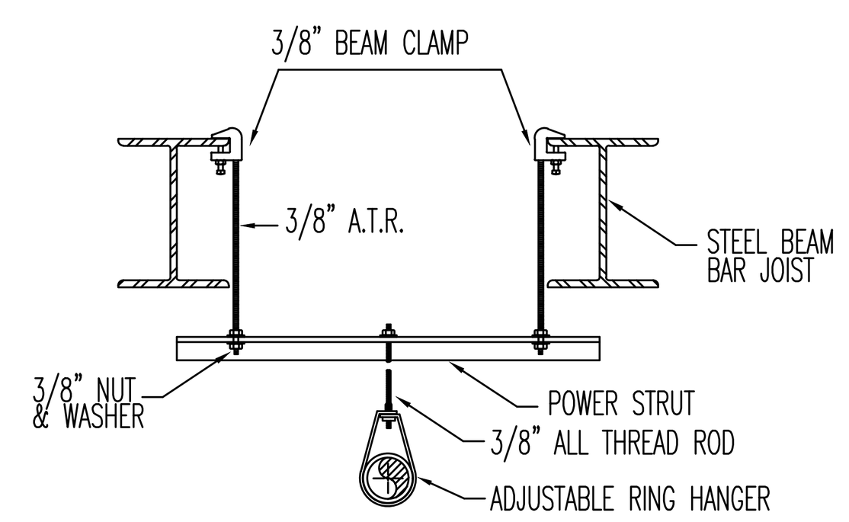
1 PIPING PLAN
FP 2 — 3/32" = 1'-0"



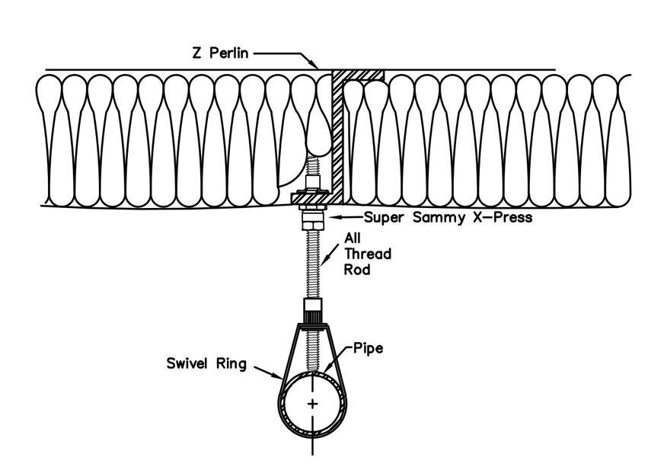
LAST BRANCHLINE SPRINKLER DROP SUPPORT HANGER RING DETAIL
USE WHEN PRESSURE EXCEEDS 100 PSI



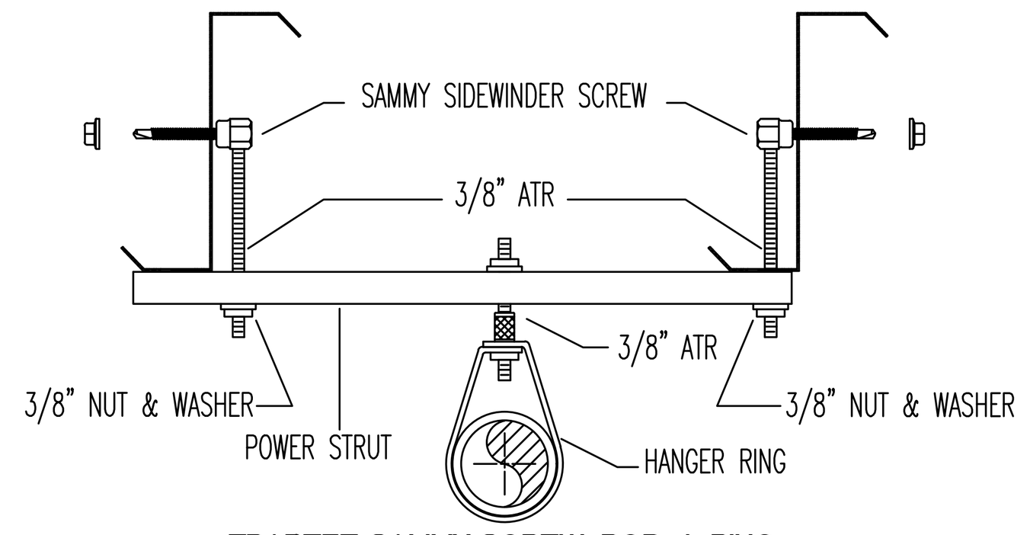
METAL SAMMY SIDEWINDER SCREW
4" AND SMALLER PIPE DIAMETER



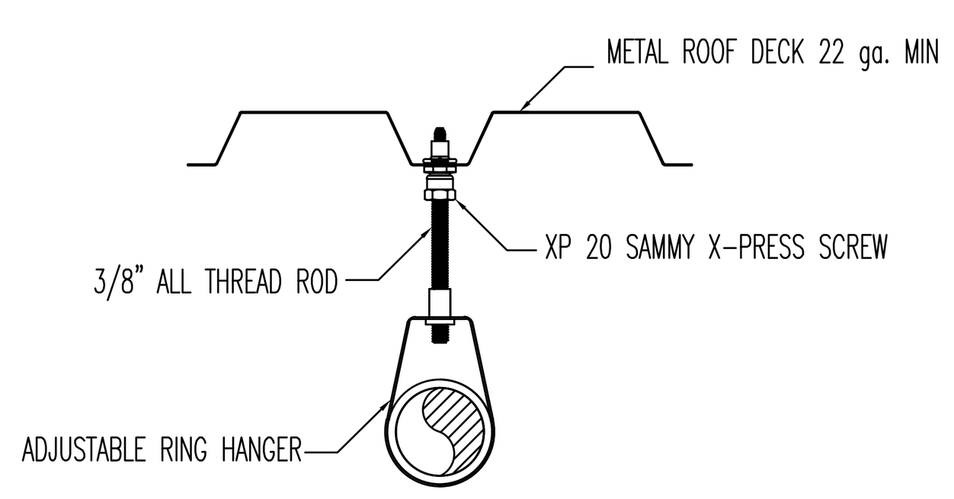
TRAPEZE TOP BEAM CLAMP, ROD + RING
4" AND SMALLER PIPE DIAMETER



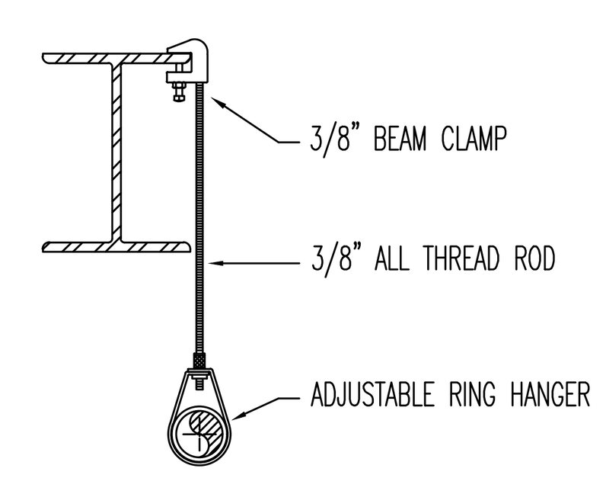
SAMMY X-PRESS SCREW
+ RING FOR BOTTOM OF PURLIN



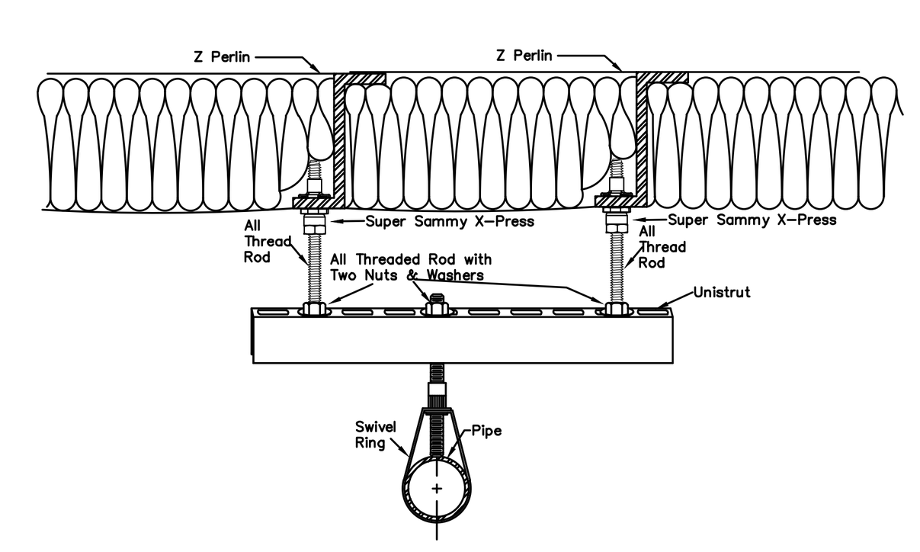
TRAPEZE SAMMY SCREW, ROD + RING
4" AND SMALLER PIPE DIAMETER



SAMMY X-PRESS SCREW
+ RING FOR METAL ROOF DECKING
2" AND SMALLER PIPE



TOP BEAM CLAMP, ROD + RING
4" AND SMALLER PIPE DIAMETER



SAMMY X-PRESS SCREW
+ RING FOR BOTTOM OF PURLIN

HANGER INSTALLATION REQUIREMENTS

MAXIMUM DISTANCE BETWEEN HANGERS												
NOMINAL PIPE SIZE	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	8"
BLAZEMASTER CPVC	5' 6"	6' 0"	6' 6"	7' 0"	8' 0"	9' 0"	10' 0"	N/A	N/A	N/A	N/A	N/A
THREADABLE LIGHTWALL	N/A	12' 0"	12' 0"	12' 0"	12' 0"	12' 0"	12' 0"	N/A	N/A	N/A	N/A	N/A
STEEL PIPE (10/ 40)	N/A	12' 0"	12' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"

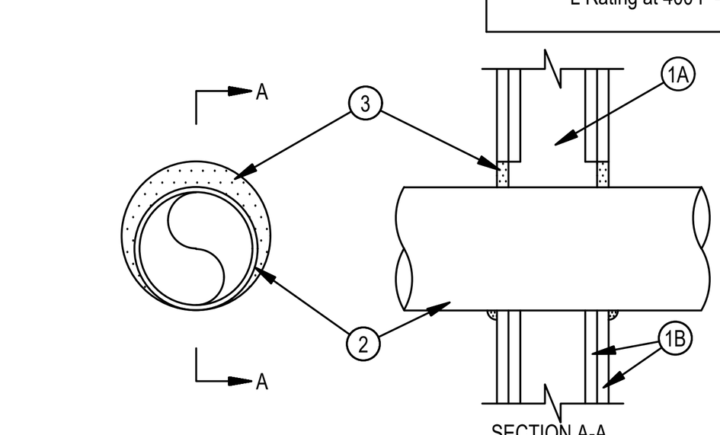
100 PSI STATIC PRESSURE ON SYSTEM REQUIRES UP-LIFT RESTRAINT WITHIN 12 INCHES HORIZONTALLY OF HEAD FOR ARM-OVERS AND END OF BRANCH LINE
THE UNSUPPORTED LENGTH BETWEEN THE END SPRINKLER AND THE LAST HANGER ON THE LINE SHALL NOT EXCEED 36" FOR 1" PIPE, 48" FOR 1¼" PIPE AND 60" FOR 1½" PIPE OR LARGER
THE CUMULATIVE HORIZONTAL LENGTH OF AN UNSUPPORTED ARMOVER TO A SPRINKLER, SPRINKLER DROP, OR SPRIG-UP SHALL NOT EXCEED 24"

System No. W-L-1054

WL 1054

CLASSIFIED C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Items 1 and 3)	F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating at Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Items 1 and 3)
L Rating at 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating at Ambient - Less Than 1 CFM/sq ft
	L Rating at 400 F - Less Than 1 CFM/sq ft

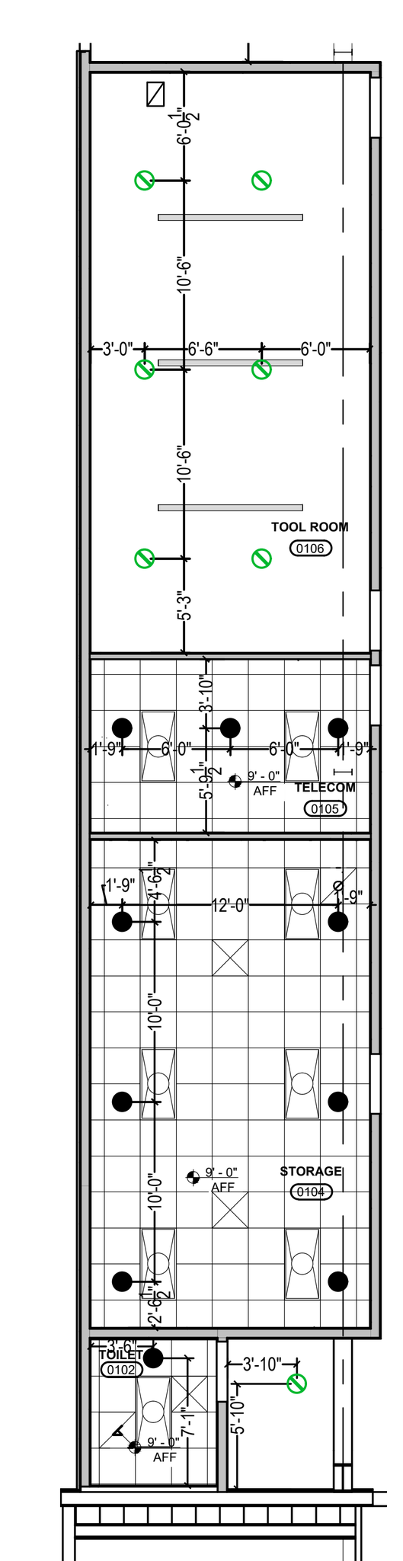


1. Wall Assembly - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* - 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. (819 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.
   The F and FH Ratings of the firestop system are equal to the fire rating of the wall assembly.
2. Through-Penetrants - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. (57 mm). Pipe may be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe - Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe - Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
   C. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) . diam steel conduit.
   D. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-One Sealant or FS-ONE MAX Intumescent Sealant

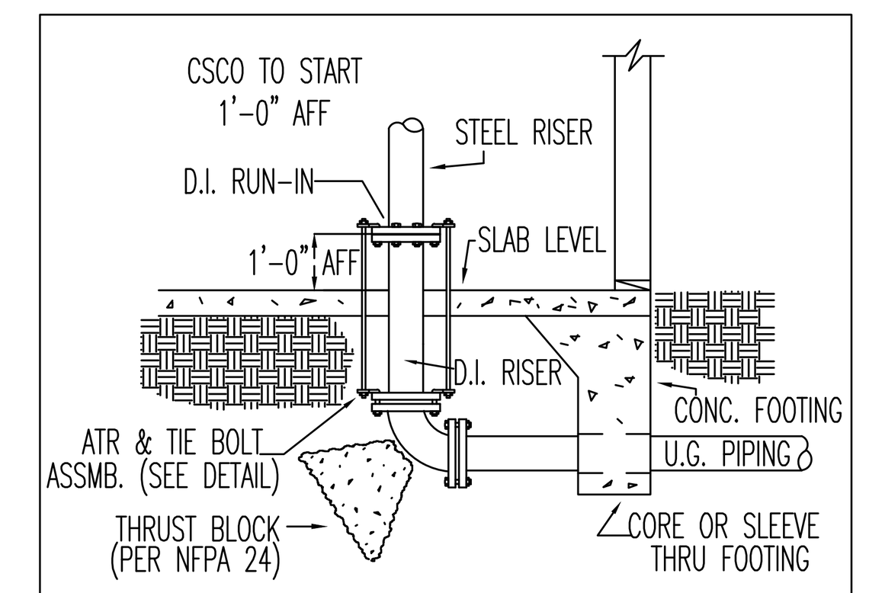
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

HILTI
Hilti Firestop Systems

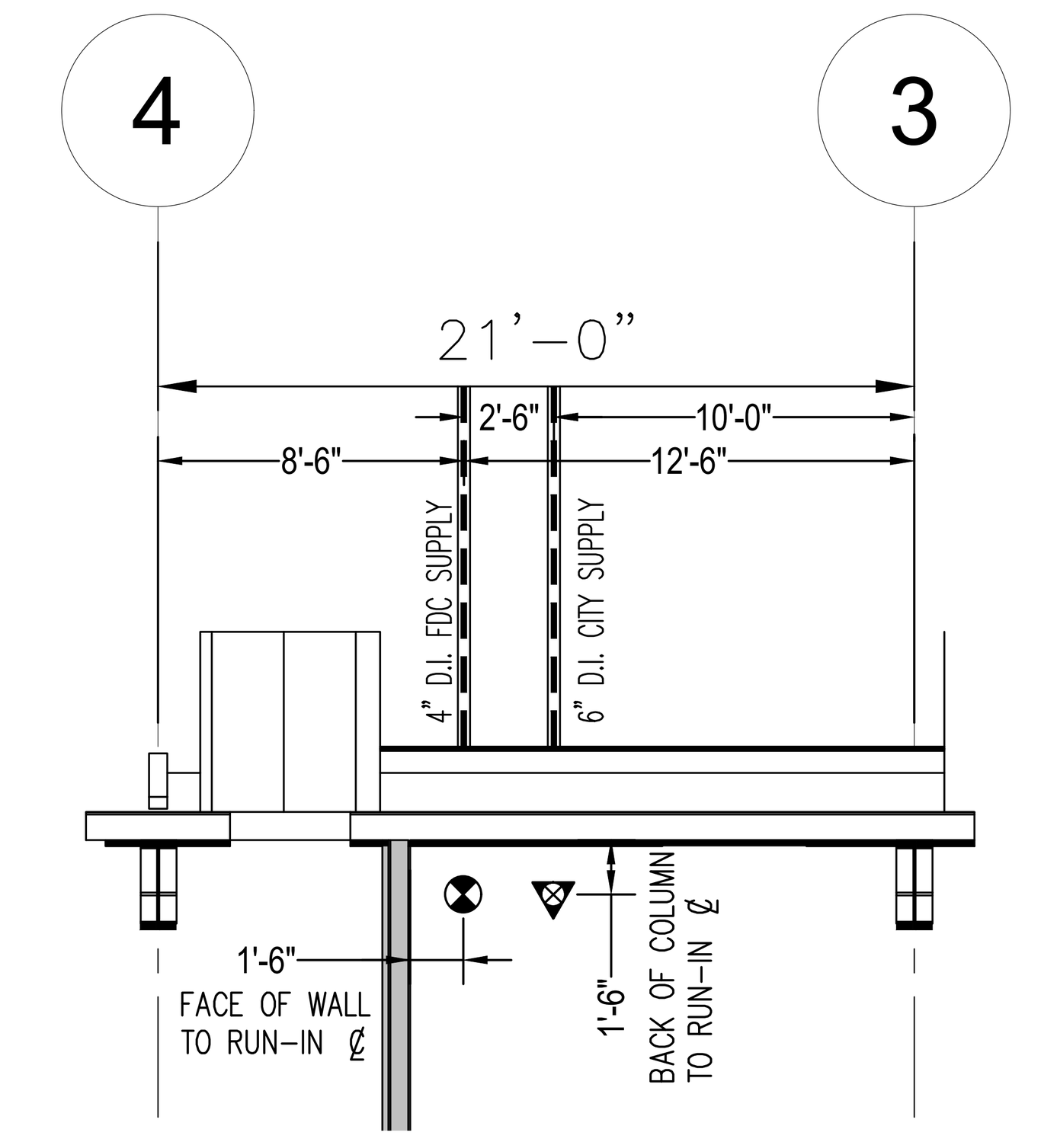
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
October 14, 2015



2 REFLECTED CEILING PLAN
FP 3 — 3/32" = 1'-0"



UNDERGROUND STUB UP W/ ROD



3 RISER & FDC RUN-IN LOCATION
FP 3 — 3/16" = 1'-0"

HEAD LEGEND

SYM	CNT	NAME	FINISH	TEMP	K	NPT	MFG.	MODEL#	MIN. SPACING	MAX. SPACING	ESCUT	RESPONSE
●	10	CONCEALED PENDENT	BRASS	155	5.6	1/2"	VIKING	VK-4621	6'-0"	15'-0"	WHITE PLATE	QUICK
⊘	373	UPRIGHT	BRASS	200	8.0	3/4	VIKING	VK-2001	6'-0"	15'-0"	N/A	STANDARD
TOTAL	383											

N

IMPORTANT: IN LOCATIONS SUBJECT TO FREEZING CONDITIONS IT IS THE OWNER'S RESPONSIBILITY TO PROVIDE ADEQUATE HEAT THROUGHOUT WET PIPE SPRINKLER SYSTEM AREAS AND ENCLOSURES FOR DRY-PIPE, DELUGE AND OTHER TYPES OF VALVES CONTROLLING WATER SUPPLIES TO SPRINKLER SYSTEMS.

NICET CERTIFIED
BRIAN THOMAS CRAWFORD
NICET LEVEL III WBSL #107492

Crawford SPRINKLER CO. OF RALEIGH, INC
2725 S. SAUNDERS STREET-RALEIGH, NC 27603
PHONE 919-828-9346 * FAX 919-839-8164

DUKE ENERGY - DUNN MOBILE SUBSTATION STORAGE
PIPING PLAN
1269 JONESBORO ROAD
DUNN, NORTH CAROLINA

UNDERWRITERS:
INDEX NO.
REVISIONS:

DESIGN CRITERIA

SYSTEM TYPE	WET
SYSTEM DESIGN	CALCULATED
DESIGN DENSITY	0.20 gpm/1500 sf
MAX HEAD CVRG	130 s.f.
HOSE ALLOWANCE	250 gpm

DRAWN BY: DFJ — DATE: 8/23/24
CHECK BY: BTC — DATE:
SCALE: 3/32" = 1'-0"

CONTRACT NO: J24-6014
FILE NO:

DWG. NO: FP 2 OF 2
9/28/24
N.C License No. 29772 FS-I

Crawford SPRINKLER CO.
OF RALEIGH, INC
2725 S. SAUNDERS STREET – RALEIGH, NC 27603 • PHONE 919-828-9346 • FAX 919-839-8164
N.C. STATE FIRE SPRINKLER LICENSE #23634 FS-I • N.C. STATE FIRE ALARM LICENSE #SP.FA/LV.33232
FED. TAX I.D. 56-0842716

DUKE ENERGY
DUNN OPERATIONS
MOBILE SUBSTATION BUILDING
1269 JONESBORO ROAD
DUNN, NC

FIRE SPRINKLER
HYDRAULIC CALCULATIONS

August 23, 2023

REV 01 9/28/24

Hydraulic Calculations by HydraCALC

CRAWFORD SPRINKLER CO.
OF RALEIGH, INC.
2725 SOUTH SAUNDERS STREET
RALEIGH, NC 27603
919-828-9346

BRIAN THOMAS CRAWFORD NC LIC. #29772 FS-I

9/28/24

Job Name	:	Duke Energy Mobile Substation Storage RA1 REV 01
Drawing	:	FP1-2
Location	:	1269 JONESBORO ROAD, DUNN, NC
Remote Area	:	TRUCK BAY
Contract	:	J24-6014
Data File	:	DUKE ENERGY MOBILE SUBSTATION STORAGE RA1 REV 01 9-28-24.wxt

Crawford SPRINKLER CO. OF RALEIGH, INC

Computer Programs by Hydratec Inc. Revision: 50.5520.727

HYDRAULIC CALCULATIONS
for

JOB NAME DUKE ENERGY - DUNN MOBILE SUBSTATION STORAGE
Location 1269 JONESBORO ROAD, DUNN, NC
Drawing # FP1-2
Contract # J24-6014
Date 9/28/24

DESIGN

Remote area # TRUCK BAY
Remote area location TRUCK BAY
Occupancy classification OH II
Density 0.20 - Gpm/SqFt
Area of application 1,500 - SqFt
Coverage/sprinkler 130 - SqFt
Type of sprinkler calculated VK2001
 # Sprinklers calculated 14
In-rack demand 0 - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 627.818 - GPM @ 82.4716 - Psi
Type of system WET GRID
Volume of system (dry or pre-action) NA - Gal

WATER SUPPLY INFORMATION

Test date 5/9/24
Location 1269 JONES ROAD
Source of info CRAWFORD SPRINKLER

CONTRACTOR INFO CRAWFORD SPRINKLER CO.
Address OF RALEIGH, INC. / 2725 SOUTH SAUNDERS STREET / RALEIGH, NC
Phone # 919-828-9346
Name of designer Douglas Johnston II
Authority having jurisdiction HARNETT COUNTY FMO
NOTES:

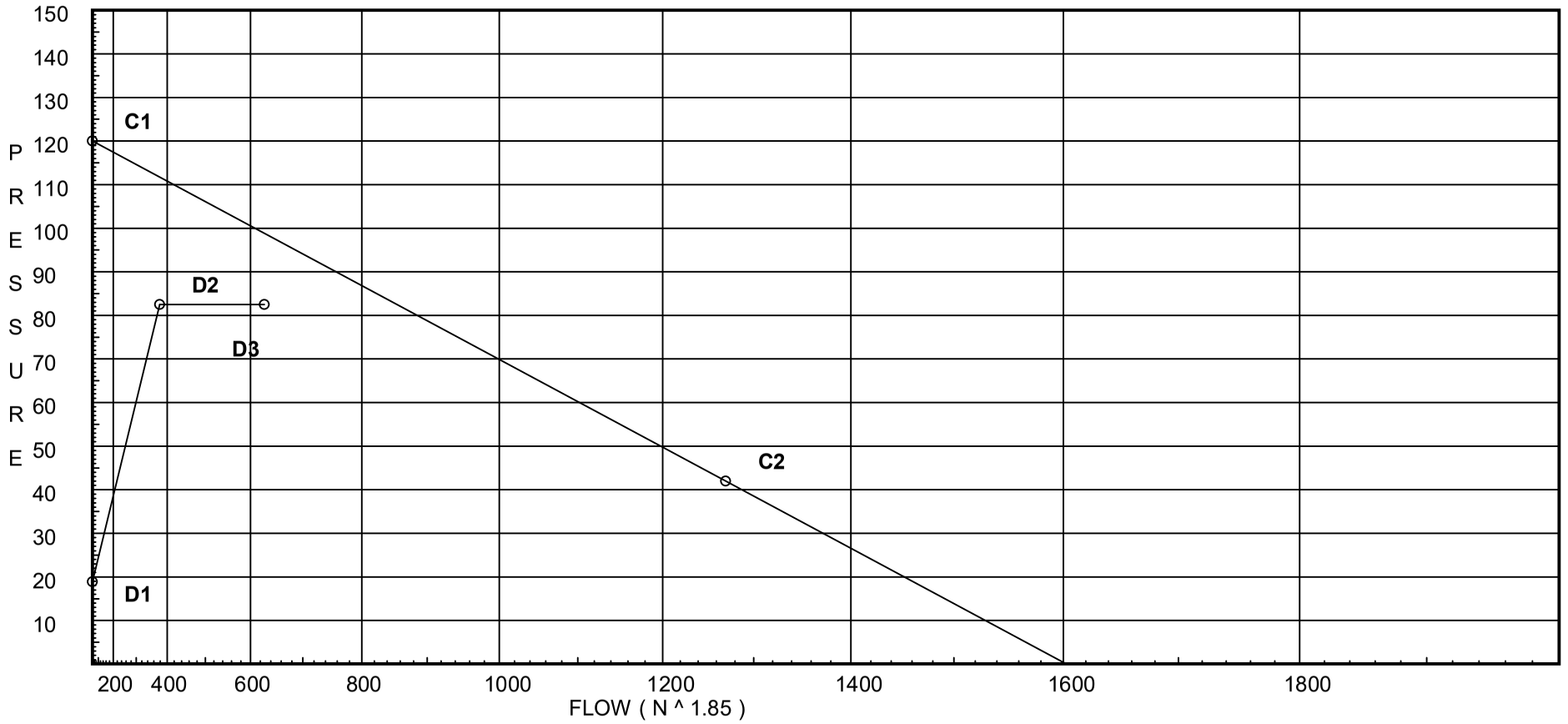
text1(35) - invisible

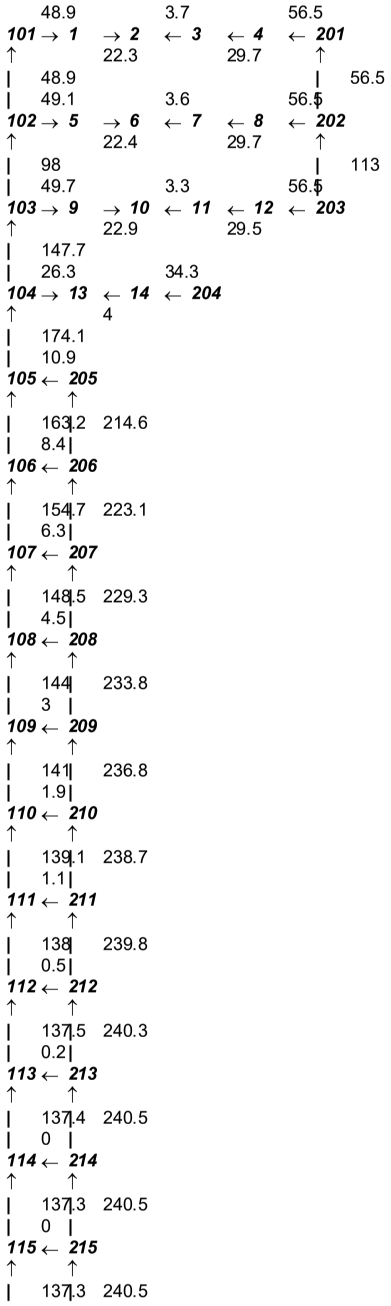
Water Supply Curve

CRAWFORD SPRINKLER CO.
Duke Energy Mobile Substation Storage RA1 REV 01

City Water Supply:
- C1 - Static Pressure : 120
- C2 - Residual Pressure: 42
- C2 - Residual Flow : 1270

Demand:
- D1 - Elevation : 18.876
- D2 - System Flow : 377.818
- D2 - System Pressure : 82.472
- Hose (Demand) : 250
- D3 - System Demand : 627.818
- Safety Margin : 16.342

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3.7
56.5
101 → 1
→ 2
← 3
← 4
← 201
22.3
29.7
48.9
56.5
49.1
3.6
56.5
102 → 5
→ 6
← 7
← 8
← 202
22.4
29.7
98
113
49.7
3.3
56.5
103 → 9
→ 10
← 11
← 12
← 203
22.9
29.5
147.7
26.3
34.3
104 → 13
← 14
← 204
4
174.1
10.9
105 ← 205
163.2
214.6
8.4
106 ← 206
154.7
223.1
6.3
107 ← 207
148.5
229.3
4.5
108 ← 208
144
233.8
3
109 ← 209
141
236.8
1.9
110 ← 210
139.1
238.7
1.1
111 ← 211
138
239.8
0.5
112 ← 212
137.5
240.3
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137.4
240.5
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114 ← 214
137.3
240.5
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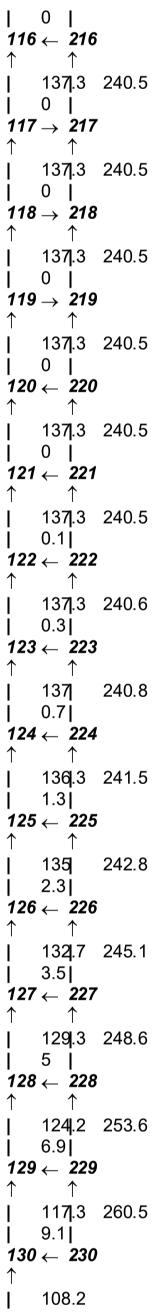
115 ← 215
137.3
240.5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137.3 240.5
0
117 → 217
137.3 240.5
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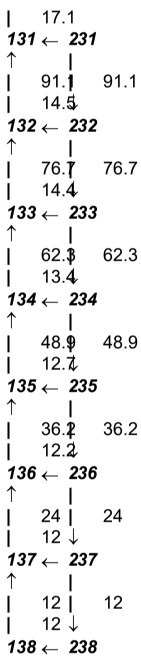
118 → 218
137.3 240.5
0
119 → 219
137.3 240.5
0
120 ← 220
137.3 240.5
0
121 ← 221
137.3 240.5
0.1
122 ← 222
137.3 240.6
0.3
123 ← 223
137 240.8
0.7
124 ← 224
136.3 241.5
1.3
125 ← 225
135 242.8
2.3
126 ← 226
132.7 245.1
3.5
127 ← 227
129.3 248.6
5
128 ← 228
124.2 253.6
6.9
129 ← 229
117.3 260.5
9.1
130 ← 230
108.2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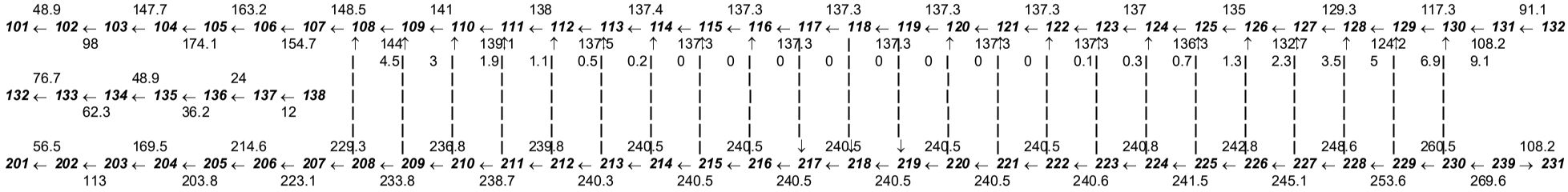
131 ← 231
91.1
91.1
14.5
132 ← 232
76.7
76.7
14.4
133 ← 233
62.3
62.3
13.4
134 ← 234
48.9
48.9
12.7
135 ← 235
36.2
36.2
12.2
136 ← 236
24
24
12
137 ← 237
12
12
12
138 ← 238


48.9 147.7 163.2 148.5 141 138 137.4 137.3 137.3 137.3 137.3 137 135 129.3 117.3 91.1
101 ← 102 ← 103 ← 104 ← 105 ← 106 ← 107 ← 108 ← 109 ← 110 ← 111 ← 112 ← 113 ← 114 ← 115 ← 116 ← 117 ← 118 ← 119 ← 120 ← 121 ← 122 ← 123 ← 124 ← 125 ← 126 ← 127 ← 128 ← 129 ← 130 ← 131 ← 132
98 174.1 154.7 144 139.1 137.5 137.3 137.3 137.3 137.3 137.3 136.3 132.7 124.2 108.2
4.5 3 1.9 1.1 0.5 0.2 0 0 0 0 0 0 0 0 0.1 0.3 0.7 1.3 2.3 3.5 5 6.9 9.1
76.7 48.9 24
132 ← 133 ← 134 ← 135 ← 136 ← 137 ← 138
62.3 36.2 12
56.5 169.5 214.6 229.3 236.8 239.8 240.5 240.5 240.5 240.5 240.5 240.5 240.8 242.8 248.6 260.5 108.2
201 ← 202 ← 203 ← 204 ← 205 ← 206 ← 207 ← 208 ← 209 ← 210 ← 211 ← 212 ← 213 ← 214 ← 215 ← 216 ← 217 ← 218 ← 219 ← 220 ← 221 ← 222 ← 223 ← 224 ← 225 ← 226 ← 227 ← 228 ← 229 ← 230 ← 239 → 231
113 203.8 223.1 233.8 238.7 240.3 240.5 240.5 240.5 240.5 240.6 241.5 245.1 253.6 269.6
91.1 62.3 36.2 12
231 → 232 → 233 → 234 → 235 → 236 → 237 → 238
76.7 48.9 24
108.2
377.8 477.8
239 ← TOR ← BOR ← UG1 ← UG2
477.8 461.4
16.5 627.8 627.8
UG1 ← HOSE ← UG2 ← BF1 ← SRC ← TEST
166.5 627.8

Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Aty	Alarm Tyco AV-1							14			23		24	23							
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zig	Wilkins 375DA	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	120.0	42	1270.0	98.814	627.82	82.472

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
101	23.5		16.99			
1	27.0	8	11.05	26.6	0.2	130
2	27.583	8	10.56	26.0	0.2	130
3	27.583	8	10.57	26.01	0.2	130
4	27.0	8	11.23	26.8	0.2	130
102	23.5		17.06			
5	27.0	8	11.09	26.64	0.2	130
6	27.583	8	10.6	26.04	0.2	130
7	27.583	8	10.61	26.05	0.2	130
8	27.0	8	11.26	26.85	0.2	130
103	23.5		17.31			
9	27.0	8	11.23	26.81	0.2	130
10	27.583	8	10.73	26.2	0.2	130
11	27.583	8	10.73	26.21	0.2	130
12	27.0	8	11.38	26.99	0.2	130
104	23.5		17.84			
13	27.583	8	14.35	30.3	0.2	130
14	27.583	8	14.36	30.31	0.2	130
105	23.5		18.57			
106	23.5		19.24			
107	23.5		19.89			
108	23.5		20.49			
109	23.5		21.05			
110	23.5		21.6			
111	23.5		22.13			
112	23.5		22.65			
113	23.5		23.17			
114	23.5		23.69			
115	23.5		24.21			
116	23.5		24.72			
117	23.5		25.24			
118	23.5		25.76			
119	23.5		26.28			
120	23.5		26.8			
121	23.5		27.31			
122	23.5		27.83			
123	23.5		28.35			
124	23.5		28.87			
125	23.5		29.38			
126	23.5		29.88			
127	23.5		30.36			
128	23.5		30.83			

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
129	23.5		31.26		
130	23.5		31.59		
131	23.5		31.8		
132	23.5		32.01		
133	23.5		32.14		
134	23.5		32.26		
135	23.5		32.34		
136	23.5		32.38		
137	23.5		32.4		
138	23.5		32.41		
201	23.5		18.57		
202	23.5		18.61		
203	23.5		18.72		
204	23.5		18.96		
205	23.5		19.31		
206	23.5		19.71		
207	23.5		20.16		
208	23.5		20.63		
209	23.5		21.12		
210	23.5		21.63		
211	23.5		22.14		
212	23.5		22.65		
213	23.5		23.17		
214	23.5		23.69		
215	23.5		24.21		
216	23.5		24.72		
217	23.5		25.24		
218	23.5		25.76		
219	23.5		26.28		
220	23.5		26.8		
221	23.5		27.31		
222	23.5		27.83		
223	23.5		28.35		
224	23.5		28.87		
225	23.5		29.39		
226	23.5		29.92		
227	23.5		30.45		
228	23.5		31.01		
229	23.5		31.58		
230	23.5		32.09		
239	23.5		33.76		
231	23.5		33.51		
232	23.5		33.44		
233	23.5		33.39		
234	23.5		33.34		
235	23.5		33.32		
236	23.5		33.3		
237	23.5		33.29		
TOR	23.0		37.56	100.0	
BOR	1.0		53.58		
UG1	1.0		54.37		

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
HOSE	1.0		54.37	150.0	
UG2	1.0		54.97		
BF1	1.0		61.09		
SRC	1.0		70.87		
TEST	-16.0		82.47		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
101	23.500		-48.90	1.5	E	4.0	40.375	120	16.992	
to					T	8.0	12.000		-1.516	
1	27		-48.9	1.61			52.375	-0.0845	-4.424	Vel = 7.71
1	27	8.00	26.59	1.5			12.000	120	11.052	
to									-0.252	
2	27.583		-22.31	1.61			12.000	-0.0198	-0.238	Vel = 3.52
2	27.583	8.00	26.00	1.5			12.000	120	10.562	
to									0.0	
3	27.583		3.69	1.61			12.000	0.0007	0.009	Vel = 0.58
3	27.583	8.00	26.01	1.5			12.000	120	10.571	
to									0.252	
4	27		29.7	1.61			12.000	0.0336	0.403	Vel = 4.68
4	27	8.00	26.81	1.5	E	4.0	40.833	120	11.226	
to					T	8.0	12.000		1.516	
201	23.500		56.51	1.61			52.833	0.1104	5.831	Vel = 8.91
			0.0							
201			56.51						18.573	K Factor = 13.11
102	23.500		-49.09	1.5	E	4.0	40.375	120	17.061	
to					T	8.0	12.000		-1.516	
5	27		-49.09	1.61			52.375	-0.0851	-4.455	Vel = 7.74
5	27	8.00	26.65	1.5			12.000	120	11.090	
to									-0.252	
6	27.583		-22.44	1.61			12.000	-0.0200	-0.240	Vel = 3.54
6	27.583	8.00	26.04	1.5			12.000	120	10.598	
to									0.0	
7	27.583		3.6	1.61			12.000	0.0007	0.008	Vel = 0.57
7	27.583	8.00	26.05	1.5			12.000	120	10.606	
to									0.252	
8	27		29.65	1.61			12.000	0.0335	0.402	Vel = 4.67
8	27	8.00	26.85	1.5	E	4.0	40.833	120	11.260	
to					T	8.0	12.000		1.516	
202	23.500		56.5	1.61			52.833	0.1103	5.829	Vel = 8.90
			0.0							
202			56.50						18.605	K Factor = 13.10
103	23.500		-49.75	1.5	E	4.0	40.375	120	17.311	
to					T	8.0	12.000		-1.516	
9	27		-49.75	1.61			52.375	-0.0872	-4.566	Vel = 7.84
9	27	8.00	26.81	1.5			12.000	120	11.229	
to									-0.252	
10	27.583		-22.94	1.61			12.000	-0.0209	-0.251	Vel = 3.62
10	27.583	8.00	26.20	1.5			12.000	120	10.726	
to									0.0	
11	27.583		3.26	1.61			12.000	0.0006	0.007	Vel = 0.51
11	27.583	8.00	26.21	1.5			12.000	120	10.733	
to									0.252	
12	27		29.47	1.61			12.000	0.0332	0.398	Vel = 4.64
12	27	8.00	26.99	1.5	E	4.0	40.833	120	11.383	
to					T	8.0	12.000		1.516	
203	23.500		56.46	1.61			52.833	0.1102	5.821	Vel = 8.90

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
			0.0							
203			56.46						18.720	K Factor = 13.05
104	23.500		-26.33	1.5	E	4.0	52.375	120	17.844	
to					T	8.0	12.000		-1.768	
13	27.583		-26.33	1.61			64.375	-0.0269	-1.729	Vel = 4.15
13	27.583	8.00	30.31	1.5			12.000	120	14.347	
to									0.0	
14	27.583		3.98	1.61			12.000	0.0008	0.010	Vel = 0.63
14	27.583	8.00	30.31	1.5	E	4.0	52.833	120	14.357	
to					T	8.0	12.000		1.768	
204	23.500		34.29	1.61			64.833	0.0438	2.839	Vel = 5.40
			0.0							
204			34.29						18.964	K Factor = 7.87
105	23.500		10.89	1.5	2E	8.0	117.208	120	18.567	
to					2T	16.0	24.000		0.0	
205	23.500		10.89	1.61			141.208	0.0052	0.740	Vel = 1.72
			0.0							
205			10.89						19.307	K Factor = 2.48
106	23.500		8.44	1.5	2E	8.0	117.208	120	19.244	
to					2T	16.0	24.000		0.0	
206	23.500		8.44	1.61			141.208	0.0033	0.462	Vel = 1.33
			0.0							
206			8.44						19.706	K Factor = 1.90
107	23.500		6.27	1.5	2E	8.0	117.208	120	19.890	
to					2T	16.0	24.000		0.0	
207	23.500		6.27	1.61			141.208	0.0019	0.267	Vel = 0.99
			0.0							
207			6.27						20.157	K Factor = 1.40
108	23.500		4.47	1.5	2E	8.0	117.208	120	20.488	
to					2T	16.0	24.000		0.0	
208	23.500		4.47	1.61			141.208	0.0010	0.143	Vel = 0.70
			0.0							
208			4.47						20.631	K Factor = 0.98
109	23.500		3.02	1.5	2E	8.0	117.208	120	21.054	
to					2T	16.0	24.000		0.0	
209	23.500		3.02	1.61			141.208	0.0005	0.069	Vel = 0.48
			0.0							
209			3.02						21.123	K Factor = 0.66
110	23.500		1.89	1.5	2E	8.0	117.208	120	21.598	
to					2T	16.0	24.000		0.0	
210	23.500		1.89	1.61			141.208	0.0002	0.029	Vel = 0.30
			0.0							
210			1.89						21.627	K Factor = 0.41
111	23.500		1.06	1.5	2E	8.0	117.208	120	22.128	
to					2T	16.0	24.000		0.0	
211	23.500		1.06	1.61			141.208	0.0001	0.010	Vel = 0.17
			0.0							

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
211			1.06						22.138	K Factor = 0.23
112	23.500		0.49	1.5	2E	8.0	117.208	120	22.650	
to					2T	16.0	24.000		0.0	
212	23.500		0.49	1.61			141.208	0	0.003	Vel = 0.08
			0.0							
212			0.49						22.653	K Factor = 0.10
113	23.500		0.16	1.5	2E	8.0	117.208	120	23.170	
to					2T	16.0	24.000		0.0	
213	23.500		0.16	1.61			141.208	0	0.0	Vel = 0.03
			0.0							
213			0.16						23.170	K Factor = 0.03
114	23.500		0.03	1.5	2E	8.0	117.208	120	23.688	
to					2T	16.0	24.000		0.0	
214	23.500		0.03	1.61			141.208	0	0.0	Vel = 0
			0.0							
214			0.03						23.688	K Factor = 0.01
115	23.500		0.0	1.5	2E	8.0	117.208	120	24.206	
to					2T	16.0	24.000		0.0	
215	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
215			0.0						24.206	K Factor = 0
116	23.500		0.0	1.5	2E	8.0	117.208	120	24.724	
to					2T	16.0	24.000		0.0	
216	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
216			0.0						24.724	K Factor = 0
117	23.500		0.0	1.5	2E	8.0	117.208	120	25.242	
to					2T	16.0	24.000		0.0	
217	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
217			0.0						25.242	K Factor = 0
118	23.500		0.0	1.5	2E	8.0	117.208	120	25.760	
to					2T	16.0	24.000		0.0	
218	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
218			0.0						25.760	K Factor = 0
119	23.500		0.0	1.5	2E	8.0	117.208	120	26.278	
to					2T	16.0	24.000		0.0	
219	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
219			0.0						26.278	K Factor = 0
120	23.500		0.0	1.5	2E	8.0	117.208	120	26.796	
to					2T	16.0	24.000		0.0	
220	23.500		0.0	1.61			141.208	0	0.0	Vel = 0
			0.0							
220			0.0						26.796	K Factor = 0
121	23.500		0.0	1.5	2E	8.0	117.208	120	27.314	
to					2T	16.0	24.000		0.0	
221	23.500		0.0	1.61			141.208	0	0.0	Vel = 0

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
221			0.0 0.0						27.314	K Factor = 0		
122 to 222	23.500 23.500		0.06 0.06	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0	27.832 0.0 0.0	Vel = 0.01		
222			0.0 0.06						27.832	K Factor = 0.01		
123 to 223	23.500 23.500		0.26 0.26	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0	28.349 0.0 0.001	Vel = 0.04		
223			0.0 0.26						28.350	K Factor = 0.05		
124 to 224	23.500 23.500		0.67 0.67	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0	28.865 0.0 0.004	Vel = 0.11		
224			0.0 0.67						28.869	K Factor = 0.12		
125 to 225	23.500 23.500		1.33 1.33	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0.0001	29.376 0.0 0.015	Vel = 0.21		
225			0.0 1.33						29.391	K Factor = 0.25		
126 to 226	23.500 23.500		2.26 2.26	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0.0003	29.878 0.0 0.040	Vel = 0.36		
226			0.0 2.26						29.918	K Factor = 0.41		
127 to 227	23.500 23.500		3.49 3.49	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0.0006	30.364 0.0 0.091	Vel = 0.55		
227			0.0 3.49						30.455	K Factor = 0.63		
128 to 228	23.500 23.500		5.04 5.04	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0.0013	30.828 0.0 0.178	Vel = 0.79		
228			0.0 5.04						31.006	K Factor = 0.91		
129 to 229	23.500 23.500		6.91 6.91	1.5 1.61	2E 2T	8.0 16.0	117.208 24.000 141.208	120 0.0023	31.258 0.0 0.319	Vel = 1.09		
229			0.0 6.91						31.577	K Factor = 1.23		
130 to 230	23.500 23.500		9.09 9.09	1.5 1.61	2E T	8.0 8.0	117.208 16.000 133.208	120 0.0038	31.587 0.0 0.500	Vel = 1.43		
230			0.0 9.09						32.087	K Factor = 1.60		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
131	23.500		17.07	1.5	2E	8.0	117.208	120	31.803	
to					2T	16.0	24.000		0.0	
231	23.500		17.07	1.61			141.208	0.0121	1.702	Vel = 2.69
			0.0							
231			17.07						33.505	K Factor = 2.95
132	23.500		14.47	1.5	6E	24.0	120.738	120	32.010	
to					2T	16.0	40.000		0.0	
232	23.500		14.47	1.61			160.738	0.0089	1.426	Vel = 2.28
			0.0							
232			14.47						33.436	K Factor = 2.50
133	23.500		14.41	1.5	2E	8.0	117.208	120	32.142	
to					2T	16.0	24.000		0.0	
233	23.500		14.41	1.61			141.208	0.0088	1.244	Vel = 2.27
			0.0							
233			14.41						33.386	K Factor = 2.49
134	23.500		13.37	1.5	2E	8.0	117.208	120	32.262	
to					2T	16.0	24.000		0.0	
234	23.500		13.37	1.61			141.208	0.0077	1.082	Vel = 2.11
			0.0							
234			13.37						33.344	K Factor = 2.32
135	23.500		12.66	1.5	2E	8.0	117.208	120	32.338	
to					2T	16.0	24.000		0.0	
235	23.500		12.66	1.61			141.208	0.0069	0.979	Vel = 2.00
			0.0							
235			12.66						33.317	K Factor = 2.19
136	23.500		12.23	1.5	2E	8.0	117.208	120	32.382	
to					2T	16.0	24.000		0.0	
236	23.500		12.23	1.61			141.208	0.0065	0.919	Vel = 1.93
			0.0							
236			12.23						33.301	K Factor = 2.12
137	23.500		12.03	1.5	2E	8.0	117.208	120	32.403	
to					2T	16.0	24.000		0.0	
237	23.500		12.03	1.61			141.208	0.0063	0.891	Vel = 1.90
			0.0							
237			12.03						33.294	K Factor = 2.08
138	23.500		11.97	1.5	2E	8.0	117.208	120	32.409	
to					2T	16.0	24.000		10.178	
238	0		11.97	1.61			141.208	0.0063	0.883	Vel = 1.89
			0.0							
238			11.97						43.470	K Factor = 1.82
101	23.500		48.90	2.5			9.000	120	16.992	
to									0.0	
102	23.500		48.9	2.635			9.000	0.0077	0.069	Vel = 2.88
102	23.500		49.09	2.5			9.000	120	17.061	
to									0.0	
103	23.500		97.99	2.635			9.000	0.0278	0.250	Vel = 5.77
103	23.500		49.75	2.5			9.000	120	17.311	
to									0.0	
104	23.500		147.74	2.635			9.000	0.0592	0.533	Vel = 8.69

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
104	23.500		26.32	2.5			9.000	120	17.844	
to									0.0	
105	23.500		174.06	2.635			9.000	0.0803	0.723	Vel = 10.24
105	23.500		-10.88	2.5			9.500	120	18.567	
to									0.0	
106	23.500		163.18	2.635			9.500	0.0713	0.677	Vel = 9.60
106	23.500		-8.44	2.5			10.000	120	19.244	
to									0.0	
107	23.500		154.74	2.635			10.000	0.0646	0.646	Vel = 9.10
107	23.500		-6.27	2.5			10.000	120	19.890	
to									0.0	
108	23.500		148.47	2.635			10.000	0.0598	0.598	Vel = 8.74
108	23.500		-4.48	2.5			10.000	120	20.488	
to									0.0	
109	23.500		143.99	2.635			10.000	0.0566	0.566	Vel = 8.47
109	23.500		-3.02	2.5			10.000	120	21.054	
to									0.0	
110	23.500		140.97	2.635			10.000	0.0544	0.544	Vel = 8.29
110	23.500		-1.90	2.5			10.000	120	21.598	
to									0.0	
111	23.500		139.07	2.635			10.000	0.0530	0.530	Vel = 8.18
111	23.500		-1.06	2.5			10.000	120	22.128	
to									0.0	
112	23.500		138.01	2.635			10.000	0.0522	0.522	Vel = 8.12
112	23.500		-0.49	2.5			10.000	120	22.650	
to									0.0	
113	23.500		137.52	2.635			10.000	0.0520	0.520	Vel = 8.09
113	23.500		-0.16	2.5			10.000	120	23.170	
to									0.0	
114	23.500		137.36	2.635			10.000	0.0518	0.518	Vel = 8.08
114	23.500		-0.03	2.5			10.000	120	23.688	
to									0.0	
115	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08
115	23.500		0.0	2.5			10.000	120	24.206	
to									0.0	
116	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08
116	23.500		0.0	2.5			10.000	120	24.724	
to									0.0	
117	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08
117	23.500		0.0	2.5			10.000	120	25.242	
to									0.0	
118	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08
118	23.500		0.0	2.5			10.000	120	25.760	
to									0.0	
119	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08
119	23.500		0.0	2.5			10.000	120	26.278	
to									0.0	
120	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
120	23.500		0.0	2.5			10.000	120	26.796			
to									0.0			
121	23.500		137.33	2.635			10.000	0.0518	0.518	Vel = 8.08		
121	23.500		-0.01	2.5			10.000	120	27.314			
to									0.0			
122	23.500		137.32	2.635			10.000	0.0518	0.518	Vel = 8.08		
122	23.500		-0.05	2.5			10.000	120	27.832			
to									0.0			
123	23.500		137.27	2.635			10.000	0.0517	0.517	Vel = 8.08		
123	23.500		-0.26	2.5			10.000	120	28.349			
to									0.0			
124	23.500		137.01	2.635			10.000	0.0516	0.516	Vel = 8.06		
124	23.500		-0.67	2.5			10.000	120	28.865			
to									0.0			
125	23.500		136.34	2.635			10.000	0.0511	0.511	Vel = 8.02		
125	23.500		-1.33	2.5			10.000	120	29.376			
to									0.0			
126	23.500		135.01	2.635			10.000	0.0502	0.502	Vel = 7.94		
126	23.500		-2.26	2.5			10.000	120	29.878			
to									0.0			
127	23.500		132.75	2.635			10.000	0.0486	0.486	Vel = 7.81		
127	23.500		-3.50	2.5			10.000	120	30.364			
to									0.0			
128	23.500		129.25	2.635			10.000	0.0464	0.464	Vel = 7.60		
128	23.500		-5.03	2.5			10.000	120	30.828			
to									0.0			
129	23.500		124.22	2.635			10.000	0.0430	0.430	Vel = 7.31		
129	23.500		-6.91	2.5			8.500	120	31.258			
to									0.0			
130	23.500		117.31	2.635			8.500	0.0387	0.329	Vel = 6.90		
130	23.500		-9.09	2.5			6.500	120	31.587			
to									0.0			
131	23.500		108.22	2.635			6.500	0.0332	0.216	Vel = 6.37		
131	23.500		-17.08	2.5			8.500	120	31.803			
to									0.0			
132	23.500		91.14	2.635			8.500	0.0244	0.207	Vel = 5.36		
132	23.500		-14.47	2.5			7.500	120	32.010			
to									0.0			
133	23.500		76.67	2.635			7.500	0.0176	0.132	Vel = 4.51		
133	23.500		-14.41	2.5			10.000	120	32.142			
to									0.0			
134	23.500		62.26	2.635			10.000	0.0120	0.120	Vel = 3.66		
134	23.500		-13.37	2.5			10.000	120	32.262			
to									0.0			
135	23.500		48.89	2.635			10.000	0.0076	0.076	Vel = 2.88		
135	23.500		-12.65	2.5			10.000	120	32.338			
to									0.0			
136	23.500		36.24	2.635			10.000	0.0044	0.044	Vel = 2.13		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
136	23.500		-12.23	2.5			10.000	120	32.382	
to									0.0	
137	23.500		24.01	2.635			10.000	0.0021	0.021	Vel = 1.41
137	23.500		-12.04	2.5			10.000	120	32.403	
to									0.0	
138	23.500		11.97	2.635			10.000	0.0006	0.006	Vel = 0.70
			0.0							
138			11.97						32.409	K Factor = 2.10
201	23.500		56.51	3			9.000	120	18.573	
to									0.0	
202	23.500		56.51	3.26			9.000	0.0036	0.032	Vel = 2.17
202	23.500		56.50	3			9.000	120	18.605	
to									0.0	
203	23.500		113.01	3.26			9.000	0.0128	0.115	Vel = 4.34
203	23.500		56.46	3			9.000	120	18.720	
to									0.0	
204	23.500		169.47	3.26			9.000	0.0271	0.244	Vel = 6.51
204	23.500		34.29	3			9.000	120	18.964	
to									0.0	
205	23.500		203.76	3.26			9.000	0.0381	0.343	Vel = 7.83
205	23.500		10.88	3			9.500	120	19.307	
to									0.0	
206	23.500		214.64	3.26			9.500	0.0420	0.399	Vel = 8.25
206	23.500		8.44	3			10.000	120	19.706	
to									0.0	
207	23.500		223.08	3.26			10.000	0.0451	0.451	Vel = 8.57
207	23.500		6.27	3			10.000	120	20.157	
to									0.0	
208	23.500		229.35	3.26			10.000	0.0474	0.474	Vel = 8.82
208	23.500		4.47	3			10.000	120	20.631	
to									0.0	
209	23.500		233.82	3.26			10.000	0.0492	0.492	Vel = 8.99
209	23.500		3.03	3			10.000	120	21.123	
to									0.0	
210	23.500		236.85	3.26			10.000	0.0504	0.504	Vel = 9.10
210	23.500		1.89	3			10.000	120	21.627	
to									0.0	
211	23.500		238.74	3.26			10.000	0.0511	0.511	Vel = 9.18
211	23.500		1.06	3			10.000	120	22.138	
to									0.0	
212	23.500		239.8	3.26			10.000	0.0515	0.515	Vel = 9.22
212	23.500		0.50	3			10.000	120	22.653	
to									0.0	
213	23.500		240.3	3.26			10.000	0.0517	0.517	Vel = 9.24
213	23.500		0.16	3			10.000	120	23.170	
to									0.0	
214	23.500		240.46	3.26			10.000	0.0518	0.518	Vel = 9.24
214	23.500		0.03	3			10.000	120	23.688	
to									0.0	
215	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
215	23.500		0.0	3			10.000	120	24.206			
to									0.0			
216	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
216	23.500		0.0	3			10.000	120	24.724			
to									0.0			
217	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
217	23.500		0.0	3			10.000	120	25.242			
to									0.0			
218	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
218	23.500		0.0	3			10.000	120	25.760			
to									0.0			
219	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
219	23.500		0.0	3			10.000	120	26.278			
to									0.0			
220	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
220	23.500		0.0	3			10.000	120	26.796			
to									0.0			
221	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
221	23.500		0.0	3			10.000	120	27.314			
to									0.0			
222	23.500		240.49	3.26			10.000	0.0518	0.518	Vel = 9.24		
222	23.500		0.06	3			10.000	120	27.832			
to									0.0			
223	23.500		240.55	3.26			10.000	0.0518	0.518	Vel = 9.25		
223	23.500		0.26	3			10.000	120	28.350			
to									0.0			
224	23.500		240.81	3.26			10.000	0.0519	0.519	Vel = 9.26		
224	23.500		0.67	3			10.000	120	28.869			
to									0.0			
225	23.500		241.48	3.26			10.000	0.0522	0.522	Vel = 9.28		
225	23.500		1.33	3			10.000	120	29.391			
to									0.0			
226	23.500		242.81	3.26			10.000	0.0527	0.527	Vel = 9.33		
226	23.500		2.26	3			10.000	120	29.918			
to									0.0			
227	23.500		245.07	3.26			10.000	0.0537	0.537	Vel = 9.42		
227	23.500		3.49	3			10.000	120	30.455			
to									0.0			
228	23.500		248.56	3.26			10.000	0.0551	0.551	Vel = 9.55		
228	23.500		5.04	3			10.000	120	31.006			
to									0.0			
229	23.500		253.6	3.26			10.000	0.0571	0.571	Vel = 9.75		
229	23.500		6.91	3			8.500	120	31.577			
to									0.0			
230	23.500		260.51	3.26			8.500	0.0600	0.510	Vel = 10.01		
230	23.500		9.09	3	T	20.159	6.000	120	32.087			
to							20.159		0.0			
239	23.500		269.6	3.26			26.159	0.0640	1.674	Vel = 10.36		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
239	23.500		-377.82	3	T	20.159	1.500	120	33.761	
to							20.159		0.0	
231	23.500		-108.22	3.26			21.659	-0.0118	-0.256	Vel = 4.16
231	23.500		17.08	3			8.000	120	33.505	
to									0.0	
232	23.500		-91.14	3.26			8.000	-0.0086	-0.069	Vel = 3.50
232	23.500		14.47	3			8.000	120	33.436	
to									0.0	
233	23.500		-76.67	3.26			8.000	-0.0062	-0.050	Vel = 2.95
233	23.500		14.41	3			10.000	120	33.386	
to									0.0	
234	23.500		-62.26	3.26			10.000	-0.0042	-0.042	Vel = 2.39
234	23.500		13.37	3			10.000	120	33.344	
to									0.0	
235	23.500		-48.89	3.26			10.000	-0.0027	-0.027	Vel = 1.88
235	23.500		12.65	3			10.000	120	33.317	
to									0.0	
236	23.500		-36.24	3.26			10.000	-0.0016	-0.016	Vel = 1.39
236	23.500		12.23	3			10.000	120	33.301	
to									0.0	
237	23.500		-24.01	3.26			10.000	-0.0007	-0.007	Vel = 0.92
237	23.500		12.04	3			10.000	120	33.294	
to									10.178	
238	0		-11.97	3.26			10.000	-0.0002	-0.002	Vel = 0.46
			0.0							
238			-11.97						43.470	K Factor = -1.82
239	23.500		377.82	3	2E	18.815	11.167	120	33.761	
to							18.815		0.217	
TOR	23		377.82	3.26			29.982	0.1195	3.582	Vel = 14.52
TOR	23	H100	100.00	4	Aty	30.284	23.500	120	37.560	
to					B	15.8	46.084		12.528	* * Fixed Loss = 3
BOR	1		477.82	4.26	Fsp	0.0	69.584	0.0501	3.488	Vel = 10.76
BOR	1		0.0	6	2F	20.084	60.000	140	53.576	
to					G	4.304	67.425		0.0	
UG1	1		477.82	6.16	T	43.037	127.425	0.0063	0.797	Vel = 5.14
UG1	1		-16.46	6	4F	40.168	14.000	140	54.373	
to					T	43.037	87.509		0.0	
UG2	1		461.36	6.16	G	4.304	101.509	0.0059	0.595	Vel = 4.97
			0.0							
UG2			461.36						54.968	K Factor = 62.23
UG1	1		16.46	6			65.000	140	54.373	
to									0.0	
HOSE	1		16.46	6.16			65.000	0	0.001	Vel = 0.18
HOSE	1	H150	150.00	6	2F	20.084	390.000	140	54.374	
to					6T	258.224	278.308		0.0	
UG2	1		166.46	6.16			668.308	0.0009	0.594	Vel = 1.79
UG2	1		461.36	6	3F	30.126	520.000	140	54.968	
to					2E	40.168	70.294		0.0	
BF1	1		627.82	6.16			590.294	0.0104	6.118	Vel = 6.76

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
BF1	1		0.0	6	2E	40.168	25.000	140	61.086	
to					T	43.037	91.812		8.576	* * Fixed Loss = 8.576
SRC	1		627.82	6.16	2G	8.607	116.812	0.0104	1.210	Vel = 6.76
					Zig	0.0				
SRC	1		0.0	6	2G	8.607	360.000	140	70.872	
to					2E	40.168	48.775		7.363	
TEST	-16		627.82	6.16			408.775	0.0104	4.237	Vel = 6.76
			0.0							
TEST			627.82						82.472	K Factor = 69.13

Auto Peaking Summary - List of Pipes for Area Calculated

Left Side			Right Side		
From	To	Length	From	To	Length
101	1	28.375	4	201	52.833
102	5	28.375	8	202	52.833
103	9	28.375	12	203	52.833
104	13	40.375	14	204	64.833
101	1	40.375	4	201	40.833
102	5	40.375	8	202	40.833
103	9	40.375	12	203	40.833
104	13	52.375	14	204	52.833

			Flow Required	Safety Margin	Pressure Differential
Left	24.000	|	627.622	16.398	-0.148
Left	12.000	|	627.761	16.250	0.000
Area Calculated		|	627.818	16.342	-0.092
Right	12.000	|	627.775	16.685	-0.435

Typical Distance Between Heads = 12.000

Split Point Used in Worst Area Peaked = 2

Split Point Used in Area Calculated = 2

Crawford SPRINKLER CO.
OF RALEIGH, INC
2725 S. SAUNDERS STREET – RALEIGH, NC 27603 • PO BOX 26207 – RALEIGH, NC 27611
PHONE 919-828-9346 • FAX 919-839-8164
N.C. STATE LICENSE # 23634, FS-I • FED. TAX I.D. 56-0842716

Fire Hydrant Flow Test Report

Test Location

Address 1269 JONESBORO ROAD

Proposed Tap Location JONESBORO ROAD

Requested Flow Location _____

(Please attach a sketch)

Job Name

Name DUKE ENERGY MOBLIE SUBSTATION STORAGE

Address _____

Contract With SWINERTON CONSTRUCTION

Phone _____ Fax _____

System Analysis

Main Size 6" Elevation of Test Location 215'

Results

Static Pressure 120 psi Flowing Pressure 11 psi

Residual Pressure 42 psi Outlet Size 4.5"

Volume 1,270 GPM gpm Hydrant Coefficient 1.34

Comments _____

Completed by: PHILIP B. & JASON C. Date: 5/9/24

Hydrant Flow Test Report

Test Date 5/9/2024 **Test Time** 9:15 AM

Location

1269 JONESBORO ROAD
DUNN, NC

Tested by

CRAWFORD SPRINKLER CO.
2725 S. SAUNDERS STREET
RALEIGH, NC 27603

Notes

TEST WAS PERFORMED BY PHILIP B. & JASON C.
OF CRAWFORD SPRINKLER CO.

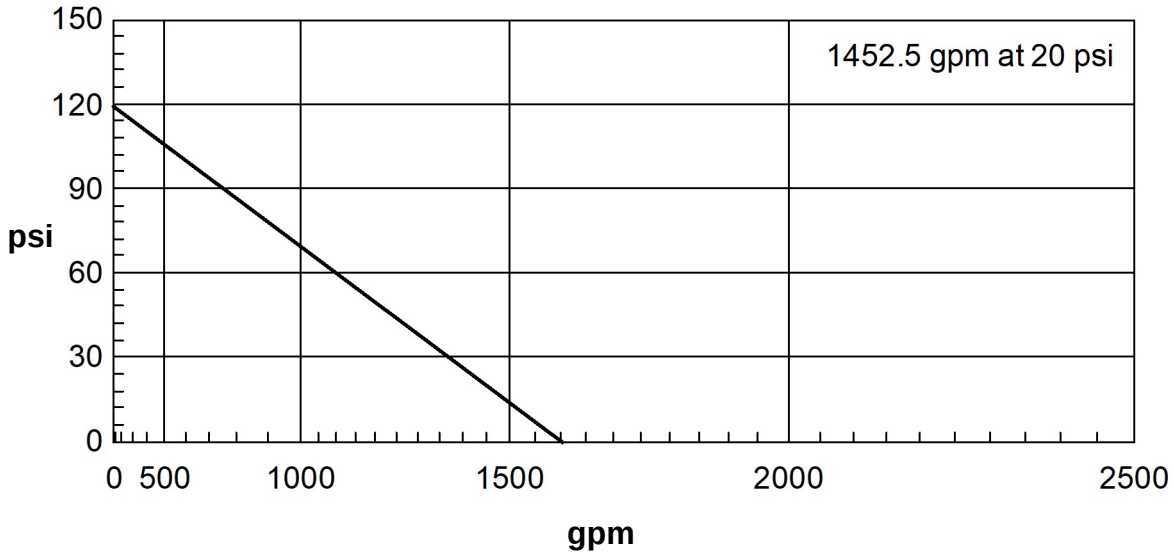
Read Hydrant

120 psi **static pressure**
42 psi **residual pressure**
215 ft **hydrant elevation**

Flow Hydrant(s)

Outlet	Elev	Size	C	Pitot Pressure	Flow
#1	215	3.05	1.34	11	1270 gpm

Flow Graph



Harnett County GIS

NOT FOR LEGAL USE

Harnett COUNTY NORTH CAROLINA

Harnett.org/GIS

May 13, 2024

- County Boundary
- Address Numbers
- Road Centerlines
- Parcels

N
W E
S

Feet
0 340

BIG BOY HOSE MONSTER™
FLOW CHART

PSI	GPM
5	856
6	938
7	1013
8	1083
9	1149
10	1211
11	1270
12	1303
13	1356
14	1407
15	1456
16	1504
17	1550
18	1595
19	1639
20	1682
21	1723
22	1764
23	1803
24	1842
25	1880
26	1917
27	1954
28	1990
29	2025
30	2059

PSI	GPM
31	2093
32	2127
33	2160
34	2192
35	2224
36	2256
37	2287
38	2318
39	2323
40	2353
41	2382
42	2411
43	2439
44	2468
45	2495
46	2523
47	2550
48	2577
49	2604
50	2630
51	2657
52	2683
53	2708
54	2734
55	2759

This device is FM Approved

The pressure vs. flow rate data developed within this flow chart is based on the average K-factor measured during laboratory testing. This data has been determined to be within the acceptable limitations for accuracy.

Additional copies of flow charts are available at: www.hosemonster.com

FM APPROVED

FC-HMBB4.2018.09.21.MA

HOSE MONSTER COMPANY™

MANUFACTURED BY:
The Hose Monster Company
(888) 202-9987 Toll Free
(847) 434-0073 Fax
Service@FlowTest.com
www.HoseMonster.com

Model 375DA

Reduced Pressure Detector Assembly

Application

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

LEAD FREE

NSF/ANSI/CAN 61

Standards Compliance

(Unless otherwise noted, applies to sizes 2 1/2" thru 10")

- ASSE® Listed 1047
- UL® Classified
- AWWA Compliant C550
- CSA® Certified B64.4 (4" & 6")
- C-UL® Classified
- FM® Approved
- NYC MEA 218-01-M VOL 3
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California
- Meets the requirements of NSF/ANSI/CAN 61*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

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

Materials

Main valve body	Ductile Iron ASTM A 536
Access covers	Ductile Iron ASTM A 536
Coatings	NSF Approved fusion epoxy finish
Internals	Stainless steel, 300 Series NORYL™
Fasteners	Stainless Steel, 300 Series
Elastomers	EPDM (FDA approved) Buna Nitrile (FDA approved)
Polymers	NORYL™
Springs	Stainless steel, 300 series
Sensing line	Stainless steel, braided hose

Options (Suffixes can be combined)

- ☐ - with OS & Y gate valves (standard)
- ☐ L - less shut-off valves (flanged body connections)
- ☐ LM - less water meter
- ☐ - with gpm meter (standard)
- ☐ CFM - with cu ft/min meter
- ☐ G - with groove end gate valves
- ☐ FG - with flanged inlet gate connection and grooved outlet gate connection
- ☐ PI - with Post Indicator Gate Valve
- ☐ GF - with flanged inlet connection and grooved outlet connection
- ☐ BG - with grooved end butterfly valves with integral monitor switches (2 1/2" - 10")

Accessories

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

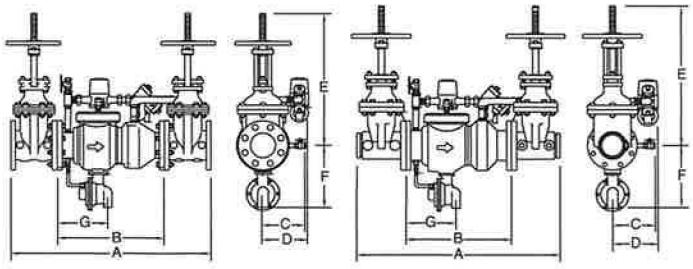
Attention:
Model 375DA (flange body) and
Model 375ADA
(grooved body) have different lay lengths.

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

Features

Sizes: 2 1/2", 3", 4", 6", 8", 10"	
Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel pipe)	AWWA C606
(Flanged bolt pattern)	ASME B16.42 Class 150

Model 375DAG SHOWN BELOW



Dimensions & Weights (do not include pkg.)

MODEL 375DA SIZE		DIMENSION (approximate)																				WEIGHT							
		A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E WITH BUTTERFLY VALVES		F		G		LESS SHUT-OFF VALVES		OS&Y GATE VALVES FLANGED		OS&Y GATE VALVES GROOVED		BUTTERFLY VALVES GROOVED	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	31	787	28	711	15 7/8	403	7 1/4	184	9	229	17 3/4	451	15 3/8	391	13 3/4	349	9 1/2	241	8 3/8	213	75	34	185	84	167	76	147	67
3	80	32	813	28 1/2	724	15 7/8	403	7 1/4	184	9	229	20 1/4	514	17	432	13 3/4	349	9 1/2	241	8 3/8	213	78	35	208	94	160	73	130	59
4	100	37 5/8	956	32 8/9	835	19 1/2	495	8	203	9	229	22 1/2	572	18 1/4	464	17	432	11	279	9 1/4	235	116	53	306	139	292	132	200	91
6	150	44 5/8	1133	37 5/8	956	23 1/2	597	10	254	10 1/2	267	30 1/2	775	24 1/4	616	17 1/2	445	12 3/8	314	9 1/4	235	194	88	494	224	468	212	312	142
8	200	60 7/8	1546	53 7/8	1369	37 3/4	959	11	279	15 1/2	394	37	940	28 1/2	724	16 15/16	430	15 3/8	391	16 3/4	426	382	173	858	389	810	367	556	252
10	250	63 7/8	1622	57 7/8	1470	37 3/4	959	11	279	15 1/2	394	45 5/8	1159	34 3/4	883	16 15/16	430	15 3/8	391	16 3/4	426	412	187	1230	558	1164	528	800	363

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

Rev. P
Date: 08/20
Document No. BF-375DA
Product No. Model 375DA
Patent zurn.com/patents

TECHNICAL DATA SHEET

VK2001 Standard Response Upright Sprinkler K8.0 (115)

1. PRODUCT IDENTIFICATION

This document covers the following product, hereafter referred to as “sprinkler”:

VK2001: Standard Response, Standard Coverage, Upright, K8.0 (115) Sprinkler.

2. INTENDED USE

The sprinkler is intended to be used in automatic fire sprinkler systems as allowed by applicable approval authorities. The sprinkler must be used in accordance with:

1. the sprinkler’s Listings, Approvals, and associated design requirements.
2. the recognized design and installations standards issued, for example NFPA, FM, EN, VdS, or LPCB.
3. the latest revisions of all applicable manufacturer’s documentation.

Governmental codes, ordinances, and standards may apply and may differ from one another.

⚠ WARNING

Cancer and Reproductive Harm www.P65Warnings.ca.gov

3. LISTING AND APPROVALS

Refer to section 5 for details and requirements that must be followed.

cULus Listed

VdS Approved

FM Approved

UKCA Approved

CE

MED Approved

LPCB Approved

China Approved

4. TECHNICAL SPECIFICATIONS

4.1 Definitions

Standard Upright Sprinkler: A sprinkler intended to be oriented with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. These sprinklers are marked “SSU” (Standard Spray Upright) or “UPRIGHT” on the deflector.

Corrosion Resistant Sprinkler: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers. Sprinklers can be ordered as corrosion resistant sprinklers and can be used with escutcheons when allowed by the approval body.

4.2 Ratings and Physical Characteristics

Parameter	Value
Minimum operating pressure	7 psi (0.5 bar)
Maximum rated pressure	175 psi (12 bar)
Factory tested pressure	500 psi (35 bar)
Thread size	3/4" NPT or 20 mm BSPT
Nominal K–factor	8.0 U.S. (115)
Minimum temperature rating (glass bulb)	–65 °F (–55 °C)

4.3 Markings and Dimensions

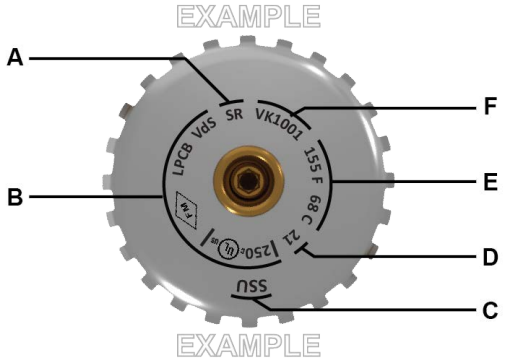


Figure – 1: Markings

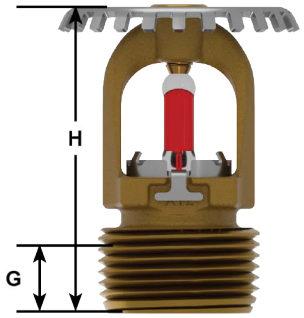


Figure – 2: Dimensions

Ref	Description	Value
A	Response type	SR: Standard Response
B	Listings and Approvals	See sections 3 and 5
C	Sprinkler type	SSU: Standard Spray Upright
D	Manufacture date (year)	See marking
E	Nominal temperature rating	See marking
F	Manufacturers Sprinkler Identification Number (SIN)	VK2001
G	Nominal pipe engagement	7/16” (11 mm)
H	Height	2" (51 mm)

4.4 Materials of Construction

NOTICE: Do not disassemble the sprinkler.

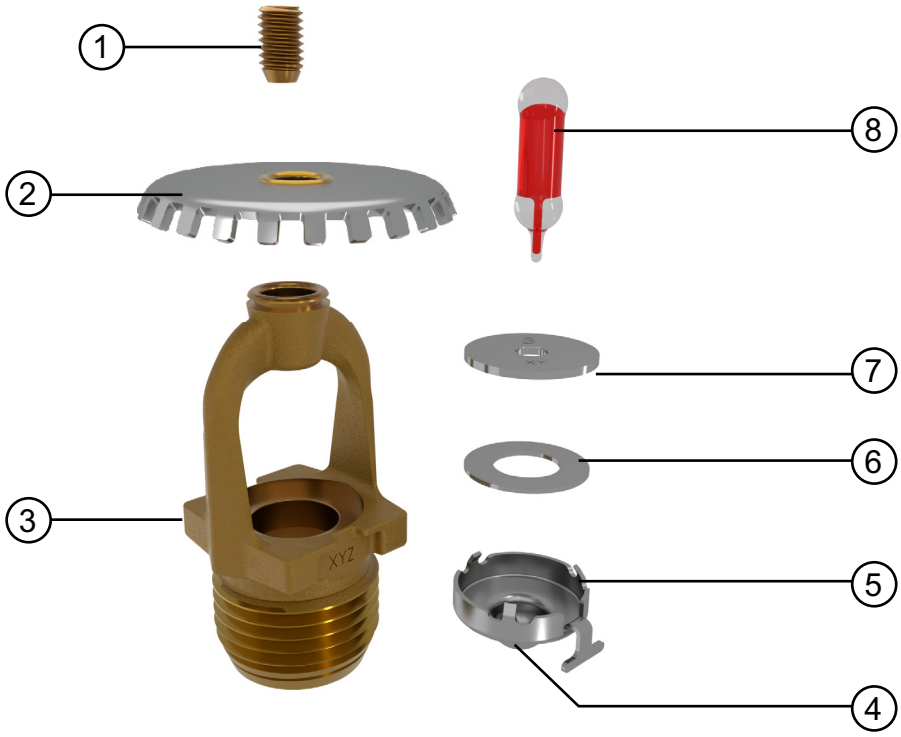


Figure – 3 Sprinkler Components

Ref	Description	Material
1	Compression screw	Brass CW612N, CW508L, UNS–C36000 or UNS–C26000
2	Deflector	Stainless steel UNS S30400
3	Sprinkler body	CW602N, UNS–C84400 or QM brass
4	Pip cap seal	Polytetrafluoroethylene (PTFE)
5	Pip cap shell	Stainless steel UNS–S44400
6	Belleville spring	Nickel alloy
7	Pip cap disc	Stainless steel UNS–S30100
8	Bulb	Glass, nominal 0.20" (5 mm) diameter

5. LISTING AND APPROVAL DESIGN REQUIREMENTS

5.1 Listing and Approval Specifications

Sprinkler Base Part Number[1]	Thread Size		Approval Body							
	NPT	BSPT	cULus	FM	CE	LPCB	VdS	UKCA	MED	China
Maximum WWP PSI (bar) ⟶			**175 (12)**							
23875	3/4"	—	A1	A1	A1	A1	A1	A1	A1	—
23887	—	20 mm	A1	A1	A1	A1	A1	A1	A1	—
26757	—	20 mm	B2	B2	—	—	—	—	—	B2

Approval Specification (Temperature Ratings) Key:

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), 200 °F (93 °C) and 286 °F (141 °C)

Approval Specification (Finishes) Key:

1 = Brass, chrome, white polyester [2,3], black polyester[2,3], and ENT [3,4]

2 = Chrome

1 For complete part number, refer to Viking's current price list.

2 For white polyester and black polyester, other colors are available upon request and will carry the same Listings and Approvals as the standard colors.

3 cULus Listed as corrosion-resistant.

4 FM Approved as corrosion-resistant.

5.2 cULus Listing Requirements and Details

The sprinkler is cULus Listed as indicated in Table 5.1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers. This sprinkler is designed for use in light, ordinary, and extra hazard occupancies.

5.3 FM Approval Requirements and Details

The sprinkler is FM Approved as standard response Non–Storage upright sprinkler as indicated in the FM Approval Guide. The sprinkler is also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of –3 psi (–207 mbar). 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. For specific application and installation requirements, refer to the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2–0).

5.4 Additional Approval Requirements and Details

Refer to Table 5.1 for approved configurations allowed by each of the following approvals.

- CE CPR: Standard EN 12259-1:1999 +A3:2006; Declaration of Performance DOP_VK2001.
- LPCB: Standard EN 12259-1:1999 +A3:2006; Certificate Number 096m.
- VdS: Standard EN 12259-1:1999 +A3:2006; Certificate Number G 422011.
- UKCA: Standard EN12259-1:1999 +A3:2006; Declaration of Conformity UKCA DOC_S5048.
- MED: Standard EN 12259-1:1999 +A3:2006; Declaration of Conformity DOC_MED_XT1.
- China Approval: Approved according to China GB standard.

For specific application and installation requirements, refer to the latest applicable governmental codes, ordinances, and standards for the installation location.

5.5 Corrosion-Resistant Coatings

The corrosion resistant coatings have passed the standard corrosion tests required by the approving agencies and are listed and approved as indicated in Table 5.1. These tests do not represent all possible corrosive environments. The Electro-less Nickel PTFE (ENT) finish passed the UL 199 thirty day corrosion test and is cULus listed and FM Approved as corrosion resistant. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.

Prior to installation, verify that the coatings are compatible with, or suitable for, the proposed environment. The ENT finish has not been evaluated for environments containing chlorine, such as indoor swimming pools. It is not recommended for these applications.

5.6 Sprinkler Guards and Water Shields

The sprinkler is approved for use with the Model XG Sprinkler Guard and the Model XWU upright water shield. Refer to the Guards and Water Shields for XT1 Sprinklers technical data sheet for more information.

5.7 Available Temperature Ratings

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

6. ORDERING PROCEDURE

6.1 Sprinkler

1. Choose a sprinkler base part number with the required thread size and listing or approval (refer to section 5):
2. Add the suffix for the desired finish.
3. Add the suffix for the desired temperature rating.

NOTE: For Polyester, insert the desired temperature rating suffix where the dash (–) is shown.

EXAMPLE: 23875MB/W = VK2001 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C).

NOTE: When ordering sprinklers that will be installed into InstaSeal® IS-W2 fittings, refer to Form No. F_021123 for installation instructions. Use the InstaSeal® alignment tool and NOT the sprinkler wrench for InstaSeal® sprinkler installations.

1. Sprinkler Base Part Number	
See Section 5	
23875	3/4" NPT
23887	20 mm BSPT
26757*	20 mm BSPT

*Only for China

2. Finish	
Description	Suffix
Brass	A
Chrome	F
White Polyester	M–/W
Black Polyester	M–/B
ENT	JN

3. Temperature Rating			
Nominal Temperature Rating	Bulb Color	Maximum Ambient Ceiling Temperature	Suffix
135 °F (57 °C)	Orange	100 °F (38 °C)	A
155 °F (68 °C)	Red	100 °F (38 °C)	B
175 °F (79 °C)	Yellow	150 °F (65 °C)	D
200 °F (93 °C)	Green	150 °F (65 °C)	E
286 °F (141 °C)	Blue	225 °F (107 °C)	G
OPEN	—	—	Z

6.2 Sprinkler Accessories

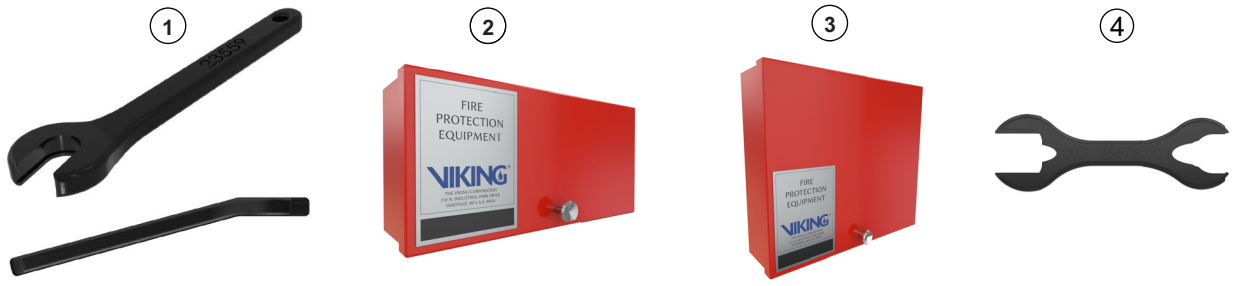


Figure – 4: Sprinkler Accessories

Image Reference	Part Number	Description
1	23559MB	Straight wrench: required for proper installation
2	01724A	Sprinkler cabinet: holds up to 6 sprinklers
3	01725A	Sprinkler cabinet: holds up to 12 sprinklers (not shown)
4	26676	InstaSeal® alignment tool

7. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

Importer EU:

Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

Handling and Installation Instructions

Model XT-1 Upright Sprinklers

	bg	Инсталирайте и пуснете продукта в експлоатация само ако следната инструкция е ясно разбрана.		**lv**	Produkta iemontēšanu un ekspluatācijas sākšanau veikt tikai tad, ja dotā instrukcija ir pilnībā saprasta.
	cs	Namontujte a spusťte do provozu produkt pouze tehdy, když jste jasně pochopili tento návod.		**lt**	Produktą montuokite ir pradėkite eksploatuoti tik tuomet, jei aiškiai suprantate šią instrukciją.
	de	Du må kun montere og idriftsætte produktet, hvis du har forstået følgende vejledning til fulde.		**mt**	Installa u ħaddem il-prodott biss jekk l-istruzzjonijiet li ġejjin jinftiehmu b'mod ċar.
	de	Produkt nur einbauen und in Betrieb nehmen, wenn die nachfolgende Anleitung klar verstanden wird.		**nl**	Product alleen installeren en in gebruik nemen, als de volgende instructies begrepen zijn.
	el	Η εγκατάσταση και θέση σε λειτουργία του προϊόντος επιτρέπονται μόνο εάν οι ακόλουθες οδηγίες έχουν γίνει κατανοητές.		**no**	Ikke installer og ta i bruk produktet uten at følgende anvisninger er tydelig forstått.
	en	Do not install and commission the product unless you have clearly understood the instructions below.		**pl**	Produkt należy montować i uruchamiać tylko wtedy, gdy poniższe instrukcje są w pełni zrozumiałe.
	es	Instalar el producto y ponerlo en funcionamiento solo cuando se hayan comprendido claramente las siguientes instrucciones.		**pt**	Instalar e colocar o produto em funcionamento somente se as instruções a seguir forem claramente compreendidas.
	et	Paigaldage toode ja kasutage seda ainult siis, kui saate alljärgnevast juhendist selgelt aru.		**ro**	Montați produsul și puneți-l în funcțiune numai dacă instrucțiunea următoare este înțeleasă clar.
	fi	Tuotteen saa asentaa ja ottaa käyttöön vain, jos jäljempänä oleva ohje ymmärretään selvästi.		**ru**	Не устанавливайте и не принимайте оборудование в эксплуатацию, если вы четко не поняли инструкции ниже
	fr	N'installer et ne mettre en service le produit que si les instructions suivantes ont été clairement comprises.		**sk**	Namontujte a spustite do prevádzky výrobok iba vtedy, pokiaľ ste jasne pochopili tento návod.
	ga	Ná déan an táirge a shuiteail agus a choimisiunu mura dtuigeann tu na treoracha thios go soileir.		**sl**	Izdelek vgradite in zaženite samo, če ste dobro razumeli navodila v nadaljevanju.
	hr	Ne instalirajte i ne puštajte proizvod u rad ako niste jasno razumjeli donje upute.		**sr**	Не инсталирајте и не пуштајте производ у рад ако нисте јасно разумели упутства у наставку.
	hu	Csak akkor építse be a terméket és helyezze üzembe, ha a következő útmutatót egyértelműen megértette.		**sv**	Montera och driftsätt produkten endast om du förstår den efterföljande instruktionen.
	Is	Settu ekki upp eða taktu vöruna í notkun nema þú hafir skilið greinilega leiðbeiningarnar hér að neðan.		**tr**	Aşağıdaki talimatları açıkça anlamadan ürünü kurmayın ve devreye almayın.
	it	Montare il prodotto e metterlo in funzione solo se si sono comprese appieno le seguenti istruzioni.			

1. PRODUCT IDENTIFICATION

This document covers the following products, hereafter referred to as “sprinkler”:

- VK1001 Standard Response Upright Sprinkler K5.6 (80.6)
- VK2001 Standard Response Upright Sprinkler K8.0 (115)
- VK2002 Standard Response Upright Sprinkler K8.0 (115)
- VK3001 Quick Response Upright Sprinkler K5.6 (80.6)
- VK3501 Quick Response Upright Sprinkler K8.0 (115)
- VK3502 Quick Response Upright Sprinkler K8.0 (115)
- OTHER APPLICABLE DOCUMENTS

2. OTHER APPLICABLE DOCUMENTS

For intended use and relevant conditions for the safe use of the specific sprinkler refer to the appropriate *Technical Data Sheet*.

3. TRANSPORT AND HANDLING

⚠ WARNING

A damaged or compromised sprinkler poses the risk of fatal consequences.

Damaged or compromised sprinklers will not operate properly which could lead to loss of life.

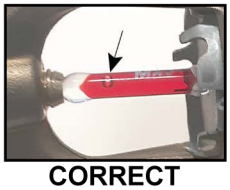
- NEVER use a sprinkler that has been exposed to temperatures exceeding the maximum allowed ambient temperature.
- NEVER use a sprinkler with a loss of liquid from the glass bulb or damage to the fusible element. A small bubble should be visible within the glass bulb; rotate the sprinkler to a horizontal position while observing the bulb to see the bubble.
- NEVER use a sprinkler that has been dropped or damaged.
- ALWAYS Protect the sprinkler from mechanical damage during storage, transport, and handling.
- NEVER use sprinklers that have been painted by anyone other than the manufacturer.
- ALWAYS protect sprinklers from being painted during installation or replacement in accordance with the installation standards.
- NEVER clean sprinklers with anything other than 7 psi or lower compressed air.
- NEVER apply soap, water, ammonia, adhesives, solvents or any other fluids on sprinklers.
- Destroy every damaged or compromised sprinkler.

NOTICE

Protect sprinklers during transport and handling.

- ALWAYS handle the sprinkler with care.
- ALWAYS keep the protective cap on the sprinkler during transport and handling.
- NEVER remove the protective cap until the fire sprinkler system is placed in service and the potential for mechanical damage no longer exists.
- ALWAYS protect the sprinkler from direct sunlight during transport and handling.
- ALWAYS store sprinkler in a cool, dry, protected area.
- ALWAYS use original manufacturer's shipping containers.
- NEVER store a sprinkler loose in a box, bin, bucket, or other type of container.
- ALWAYS keep the sprinkler separated from other sprinklers.
- NEVER allow metal parts to contact the sprinkler operating elements.

NOTE: If the glass bulb included on the sprinkler has been exposed to ultraviolet light, the color inside the bulb may fade. This color change does not affect the operation of the sprinkler.



CORRECT
(Bulb intact, bubble visible)

CORRECT
(Protective caps in place)

CORRECT
Container

INCORRECT
(bulb cracked, fluid missing)

INCORRECT
(Protective caps not in place)

INCORRECT
(Stored loose in a box)

4. INSTALLATION

⚠ WARNING

Installation by insufficiently qualified personnel poses the risk of fatal consequences.

- This sprinkler must be installed properly by qualified personnel familiar with safe practices and applicable and recognized design and installation standards issued, for example, by NFPA, FM, VdS, or LPCB, and trained how to properly perform the installation procedures.

⚠ CAUTION

Cutting Hazard.

Sprinklers, accessories, cabinets, and packaging can have sharp edges that can cause cuts.

- Wear appropriate personal protective equipment (gloves) while handling product.

NOTICE

If the sprinkler will be installed into an IS-W2 InstaSeal™ fitting, refer to F_021123 or F_032219 (CPVC InstaSeal™ adapter) for the proper installation instructions.

Optional Guards, Shields, and Escutcheons: If the sprinkler shall be installed together with a guard, shield, or escutcheon refer to the applicable documents for the products used.

1. Install all required piping in the intended installation location.
2. Verify that the sprinkler model/style, K-factor, temperature rating, and response characteristics are appropriate for the intended installation location. See Table 1 and Figure 4.
3. Inspect the sprinkler for damage. Destroy every damaged or compromised sprinkler.
   The following are examples in which sprinklers are considered damaged or compromised. Replace the sprinkler in the following cases:
   - Sprinkler with a loss of fluid from the glass bulb or damage to the fusible element.
   - Sprinklers that have been field painted, caulked, or mechanically damaged.
   - Sprinklers showing signs of corrosion.
4. Verify that the sprinkler is protected with the protective cap or clip.
5. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only. Do not allow a build-up of compound inside the sprinkler inlet (Figure1).

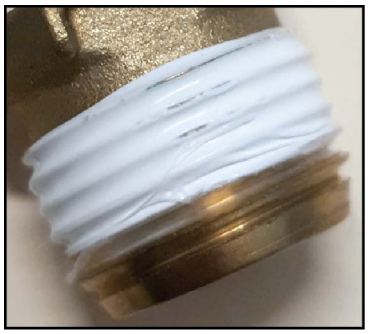


Figure – 1

6. **NOTICE: Do not use the deflector to start threading the sprinkler into a fitting. Use ONLY the approved wrench to install the sprinkler. Refer to the sprinkler's *Technical Data Sheet*.**

   Carefully slide the proper wrench onto the wrench flats (Figure 2).

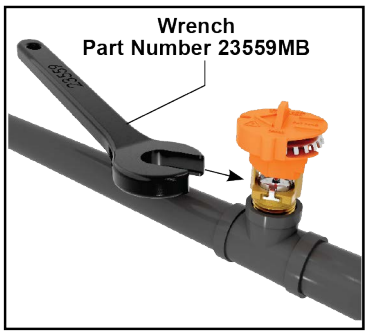


Figure – 2

7. **NOTICE: Over-tightening the sprinkler can cause permanent damage. For 1/2" NPT (or 15 mm BSPT) sprinkler, tighten up to a maximum torque of 14 ft-lbs (19 Nm). For 3/4" NPT (or 20 mm BSPT) sprinkler, tighten up to a maximum of 20 ft-lbs (27,1 Nm).**
   Tighten the sprinkler as necessary (Figure 3). If applicable, install a sprinkler guard and water shield.

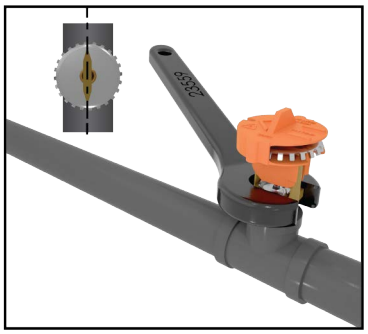


Figure – 3

8. **NOTICE: Sprinkler protective caps/clips must be removed from the sprinkler before placing the system in service. Test the entire sprinkler system.**
   Refer to the applicable system documentation, regulations, and standards to ensure compliance.

Table 1: Sprinkler Markings

Ref	Parameter
A	Response type
B	Listings and approvals
C	Sprinkler type
D	Manufacture date
E	Nominal temperature rating
F	Manufacturer's Sprinkler Identification Number (SIN)

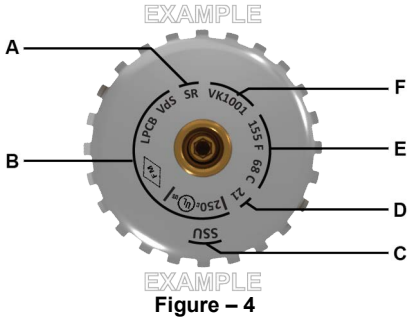


Figure – 4

5. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

Importer EU:

Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

VIKING®

Operation and Maintenance Instructions

Model XT-1 Sprinklers

1. PRODUCT IDENTIFICATION

This document covers the following product, hereafter referred to as “sprinkler” (SR=Standard Response, QR=Quick Response):

- VK1001 SR Upright Sprinkler K5.6 (80.6)
- VK2001 SR Upright Sprinkler K8.0 (115)
- VK2002 SR Upright Sprinkler K8.0 (115)
- VK3001 QR Upright Sprinkler K5.6 (80.6)
- VK3501 QR Upright Sprinkler K8.0 (115)
- VK3502 QR Upright Sprinkler K8.0 (115)
- VK1021 SR Pendent Sprinkler K5.6 (80.6)
- VK2021 SR Pendent Sprinkler K8.0 (115)
- VK2022 SR Pendent Sprinkler K8.0 (115)
- VK3021 QR Pendent Sprinkler K5.6 (80.6)
- VK3521 QR Pendent Sprinkler K8.0 (115)
- VK3522 QR Pendent Sprinkler K8.0 (115)
- VK1181 SR Conventional Sprinkler K5.6 (80.6)
- VK1201 SR Conventional Sprinkler K8.0 (115)
- VK1202 SR Conventional Sprinkler K8.0 (115)
- VK3101 QR Conventional Sprinkler K5.6 (80.6)
- VK3541 QR Conventional Sprinkler K8.0 (115)
- VK3542 QR Conventional Sprinkler K8.0 (115)

⚠ WARNING

Cancer and Reproductive Harm www.P65Warning.ca.gov

2. OTHER APPLICABLE DOCUMENTS

For intended use and relevant conditions for the safe use of the specific sprinkler, refer to the appropriate Technical Data Sheet. In case an installed sprinkler needs to be replaced, refer to the appropriate Handling and Installation Instructions for the installation of the new sprinkler.

3. MAINTAINING OPERATIONAL READINESS

Functionality

During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to control or extinguish the fire.

⚠ WARNING

This section contains important safety information. Read and follow all information.

Damaged or Compromised Sprinklers

Damaged or compromised sprinklers will not operate properly which could lead to loss of life.

- NEVER clean, paint, or caulk sprinklers.
- NEVER apply soap, water, ammonia, adhesives, solvents or any other fluids on sprinklers.
- NEVER expose sprinklers to temperatures exceeding the maximum allowed ambient ceiling temperature. See the Technical Data Sheet.
- ALWAYS replace a compromised or damaged sprinkler.
- NEVER attempt to repair or reassemble a sprinkler.
- ALWAYS replace operated sprinklers and cover assemblies and sprinklers exposed to corrosive products of combustion.
- Replacement of sprinklers must only be performed following the instructions in section 4.

The following are examples in which sprinklers are considered damaged or compromised. Replace the sprinkler in the following cases:

- Sprinkler with a loss of fluid from the glass bulb or damage to the fusible element.
- Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged.
- Sprinklers showing signs of extraordinary corrosion.

Obstructions and obstacles

Obstructions and obstacles may compromise sprinkler discharge patterns which are critical for proper fire protection.

- NEVER attach items to sprinklers or hang items from the ceiling in an area protected with sprinklers.
- NEVER install walls in areas protected with sprinklers without having a specialized company verifying the design of the sprinkler system.
- ALWAYS remove obstructions and obstacles to sprinkler spray patterns.

Sprinkler systems that have been subjected to a fire

Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible.

- After an event of fire, the entire sprinkler system must be inspected for damage and repaired as necessary.
- Refer to the minimum requirements of the Authority Having Jurisdiction for replacement of sprinklers.
- Consider the employment of a fire patrol as long as the sprinkler system is out of service.

Inspections and testing

The owner is responsible for having the sprinklers inspected and tested according to standards of the applicable approval body and to the requirements of the Authority Having Jurisdiction to maintain proper operating condition of the system.

- Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the sprinkler.

The applicable approval body or Authority Having Jurisdiction may require sprinklers to be replaced after a specified term of service.

- Refer to the standards of the applicable approval body, such as NFPA, FM, VdS, or LPCB, and the requirements of the Authority Having Jurisdiction for detailed inspection, testing and replacements requirements.

Sprinklers removed from the system for testing or for any other purpose must be replaced according to section 4.

4. REMOVAL AND REPLACEMENT

⚠ WARNING

Removal and replacement of sprinklers by insufficiently qualified personnel poses the risk of fatal consequences in case of fire.

- Removal or replacement of sprinklers must be performed by qualified personnel familiar with safe practices and applicable and recognized design and installation standards issued, for example, by NFPA, FM, VdS, or LPCB, and trained how to properly perform the installation procedures.

⚠ WARNING

Removal and replacement of sprinklers will temporarily eliminate the fire protection capabilities of the sprinkler system.

- Consider the employment of a fire patrol in the affected area.
- Prior to proceeding, notify all Authorities Having Jurisdiction.

⚠ WARNING

Re-installation of a removed sprinkler may compromise the operational safety of the sprinkler system.

- NEVER reinstall a removed sprinkler.
- ALWAYS use new sprinklers for replacement.

1. Select new sprinklers with identical performance characteristics as well as respective accessories such as escutcheons, cover plates, and protective caps. A stocked spare sprinkler cabinet may be provided for this purpose on site.
2. According to appropriate system description and/or valve instructions, remove the system from service, drain all water, and relieve all pressure on the piping.
3. Only for flush and concealed style sprinklers: Remove the ceiling ring or cover plate assembly of the old sprinkler by gently unthreading or pulling it off the sprinkler body (depends on the sprinkler model used).
4. Use the proper sprinkler wrench for the old sprinkler according to its Technical Data Sheet.
5. Only for flush and concealed style sprinklers, but not for domed concealed sprinklers: Replace the plastic protective cap over the old sprinkler and fit the wrench over the cap.
6. Use the wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.
7. Install the new sprinkler by following its Handling and Installation Instructions.
8. Place the system back in service and secure all valves.
9. Check for and repair all leaks.

5. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system.

6. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

Importer EU:

Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Viking Standard and Quick Response Concealed Pendent Sprinkler VK4621 is a small thermosensitive, glass-bulb sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The low-profile cover assemblies provide up to ½" (13 mm) of vertical adjustment.

Features:

- K5.6 (80.6 metric).
- Quick response glass bulb operating element.
- Integral threaded adapter cup accepts push-on or thread-on cover plates.
- Low-profile, small diameter, removeable cover plates offer almost flush appearance upon installation and allow ease of maintenance.
- Protective cap prevents damage during installation and finishing and keeps errant overspray from coating internal parts.
- Various finishes available to meet design requirements.
- Optional Electroless Nickel PTFE (ENT) coating provides corrosion resistance (see Approval Chart).

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class 2015
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 psi (-207mbar)

VdS Approved: Standard EN 12259-1:199 + A3:2006; Certificate Number G 422002

LPCB Approved: Standard EN 12259-1:199 + A3:2006; Certificate Number 096e

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

CE: Standard EN 12259-1:1999 + A3:2006, Sprinkler, DOP_VK4621, 2831, 2023

MED Approved: Standard EN 12259-1:1999 + A3:2006, DOC_MED_VK4621, 2831.

UKCA Approved: Standard EN 12259-1:1999 + A3:2006, DOC_UKCA_VK4621, 0832, 2023.

China Approval: Approved according to China GB standard.

Refer to the Approval Charts and Design Criteria on for cULus Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 psi (0.5 bar)
Maximum Working Pressure: FM - 175 psi (12 bar). UL - 250 psi (17.2 bar)
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2" NPT or 15 mm BSPT
Nominal K-Factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

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

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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Material Standards:
Sprinkler body: QM Brass or DZR Brass
Deflector: Phosphor Bronze UNS-C51000
Deflector pins: Stainless steel UNS-S43000
Pip cap: Copper UNS-C11000
Pip cap insert: stainless steel UNS-S30400
Pip cap T-hinge ring: Stainless steel UNS-S31600
Compression screw: UNS-C36000
Belleville spring sealing assembly: Nickel alloy, coated on both sides with PTFE tape
Cover adapter: Cold rolled steel JIS G3141 and carbon steel UNS-G10100 (per JIS G3141)
Shipping cap: High density polyethylene

Cover Plate Materials:
Cover plate assembly: Copper UNS-C11000 and brass UNS-C26800 or stainless steel UNS-S30400
Spring: Beryllium nickel
Solder: Eutectic

Ordering Information: Refer to Tables 1 and 2.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards and installation instructions in this document.

5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor contact The Viking Corporation.

8. GUARANTEE

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

VIKING®

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Ordering Instructions - Sprinkler Base

1. Choose a sprinkler base part number with the required thread size and listing or approval (refer to the approval chart).
2. Add the suffix for the desired finish.
3. Add the suffix for the desired temperature rating.
4. Order a cover plate (refer to Ordering Instructions - Cover Plate).

EXAMPLE: **24682AB** = VK4621 with brass finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C).

1. Sprinkler Base Part Numbers

Part Number	Thread Size
24682	½" NPT
22962	15 mm BSPT
26548[7]	15 mm BSPT

2. Available Finishes

Description	Suffix
Brass	A
ENT[2,3,5]	JN

3. Temperature Ratings

Sprinkler Temperature Classification	Temperature Rating	Bulb Color	Maximum Ambient Ceiling Temperature[1]	Suffix
Ordinary	155 °F (68 °C)	Red	100 °F (38 °C)	B
Intermediate	175 °F (79 °C)	Yellow	150 °F (66 °C)	D
Intermediate	200 °F (93 °C)	Green	150 °F (66 °C)	E

Accessories

Part Number	Description
23143	Installation wrench[4,6]
14412	Concealed cover plate installer tool, for use with push-on cover plates only (available since 2007)
14867	Large concealed cover plate installer tool, for use with push-on cover plates only (available since 2007)
01731A	Sprinkler cabinet; holds up to 6 sprinklers (available since 1971)

FOOTNOTES

1. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
2. UL Listed as corrosion resistant.
3. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.
4. Requires a 1/2" ratchet which is not available from Viking.
5. FM Approved as a decorative finish.
6. The installation wrench is intended to be used for a maximum of 500 sprinkler installations at a maximum torque of 14 ft-lbs (19 Nm).
7. See Approval Chart for approval information.

VIKING®

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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

1. Choose a cover plate base part number with the desired shape and style (refer to the approval chart).
2. Add the suffix for the desired finish.
3. Add the suffix for the required temperature rating.

Note: *for stainless steel versions, skip steps 2 and 3 (finishes and paint are not available).*

Example:
23190MC/W = Thread-On style, 165 °F (74 °C) Temperature Rated, 2¾" (70 mm) diameter Round Cover Plate with a Painted White finish.

1. Cover Plate Base Part Numbers[3, 6]

Style	Base Part Number[5]	Size Inches (mm)	Shape (type)
Thread-On Style	23190	2 ¾ (70) diameter	Round
	23174	3 5⁄16 (84) diameter	Round
	23179	3 5⁄16 (84)	Square
	23174-/CR	3 5⁄16 (84) diameter	Round (clean room)
	▼Stainless Steel material[4]		
	23193	2 ¾ (70) diameter	Round
	23183	3 5⁄16 (84) diameter	Round
	23183-/CR	3 5⁄16 (84) diameter	Round (clean room)
Push-On Style	23447	2 ¾ (70) diameter	Round
	23463	3 5⁄16 (84) diameter	Round
	23482	3 5⁄16 (84)	Square
	23463-/CR	3 5⁄16 (84) diameter	Round (clean room)
	▼ Stainless Steel material[4]		
	23455	2 ¾ (70) diameter	Round
	23473	3 5⁄16 (84) diameter	Round
	23473-/CR	3 5⁄16 (84) diameter	Round (clean room)

2. Available Finishes[5]

Description	Suffix
Polished Chrome	F
Brushed Chrome	F_/B
Bright Brass	B
Antique Brass	B_/A
Brushed Brass	B_/A
Brushed Copper	B_/A
Painted White	M_/W
Painted Ivory	M_/I
Painted Black	M_/B

3. Temperature Rating Matrix

IMPORTANT: The required cover plate temperature rating is determinted by the sprinkler's temperature rating.

Sprinkler Temperature Classification[1]	Required Cover Plate Temperature Rating	Corresponding Sprinkler Nominal Temperature Rating	Maximum Ambient Ceiling Temperature[2]	Suffix
Ordinary	139 °F (59 °C)	155 °F (68 °C)	100 °F (38 °C)	A
Intermediate	165 °F (74 °C)	200 °F (93 °C)	150 °F (66 °C)	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. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
4. Stainless Steel versions are not available with any finishes or paint.
5. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
6. For use with gasketed cover plates has been evaluated as part of the UL Listing.

VIKING®

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Concealed Pendent Sprinkler VK4621
1/2" NPT or 15 mm BSPT, Nominal K-factor 5.6 U.S. (80.6 metric[2])

Listings and Approvals[3] (Refer also to Design Criteria)

Sprinkler Base Part No.[1]	cULus[4, 9]	China Approval	FM	VdS	LPCB	CE	MED	UKCA
	Maximum Water Working Pressure 250 psi (17.2 bar)		Maximum Water Working Pressure 175 psi (12 bar)					
Standard Response Applications								
24682A	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1
24682JN[7,8]	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	--	--	--	--	--
22962A	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1
22962JN[7,8]	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	--	--	--	--	--
Quick Response Applications								
24682A	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
24682JN[7,8]	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
22962A	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
22962JN[7,8]	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
26548	AV1, BX1, AS2, BT2, CX1, CT2	AV1, CX1, AS2, CT2	--	--	--	--	--	--

Approved Sprinkler Temperature Rating Key	Approved Cover Plate Assembly Finishes Key[5]	Approved Cover Plate Finishes Key
A = 155 °F (68 °C) **B = 175 °F (79 °C)** **C= 200 °F (93 °C)**	**S = 139 °F (59 °C) Stainless steel covers (23193, 23455, 23183, and 23473)** **T = 165 °F (74 °C) Stainless steel covers (23193, 23455, 23183, and 23473)** **V = 139 °F (59 °C) covers (23190, 23447, 23174, 23463, 23179, and 23482)** **W = 165 °F (59 °C) square covers (23179 and 23482)** **X = 165 °F (74 °C) covers (23190, 23447, 23174, and 23463)**	**1 = Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted[6] White, Painted[6] Ivory, or Painted[6] Black** **2 = Stainless Steel**

Footnotes

1. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
2. Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
3. This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.
4. Listed by Underwriter's Laboratories for use in the U.S. and Canada.
5. The 139 °F (59 °C) covers have an orange label. The 165 °F (74 °C) covers have a white label.
6. Other paint colors are available on request with the same listings as the standard paint colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information.
7. cULus Listed as corrosion-resistant.
8. FM Approved as a decorative finish.
9. Refer to the Cleanroom Sprinkler Cover Assembly technical data sheet for Viking's UL Listed cover plates with built-in gaskets.

NOTE: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 2.

VIKING®	TECHNICAL DATA	STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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DESIGN CRITERIA - UL

(Also refer to Approval Chart)

cULus Listing Requirements:

Concealed Pendent Sprinkler VK4621 is cULus Listed as quick response for installation in accordance with the latest edition of NFPA 13 for standard coverage pendent spray sprinklers as indicated below.

- For hazard occupancies up to and including Ordinary Hazard, Group II.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13. Maximum spacing allowed is 15 ft. (4.6 m).
- Minimum spacing allowed is 6 ft. (1.8 m) unless baffles are installed in accordance with NFPA 13.
- Minimum distance from walls is 4 in. (102 mm).
- Maximum distance from walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler obstruction rules contained in NFPA 13 for standard coverage pendent spray sprinklers must be followed.

NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.

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.

DESIGN CRITERIA - FM

(Also refer to Approval Chart)

FM Approval Requirements:

Viking Concealed Pendent Sprinkler VK4621 is FM Approved as a standard response **Non-Storage** concealed pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from 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, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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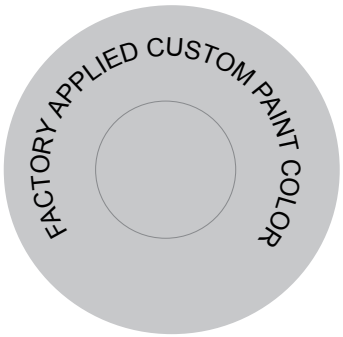
Figure 1: Installation Wrench



All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.

Figure 2: Identification of Custom Paint

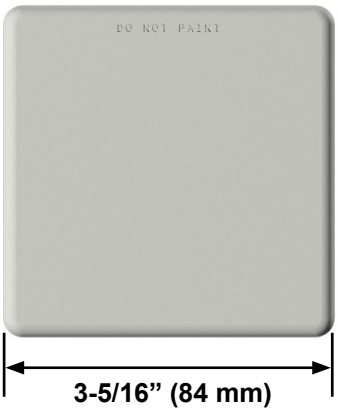


Figure 3: Square Cover Assembly

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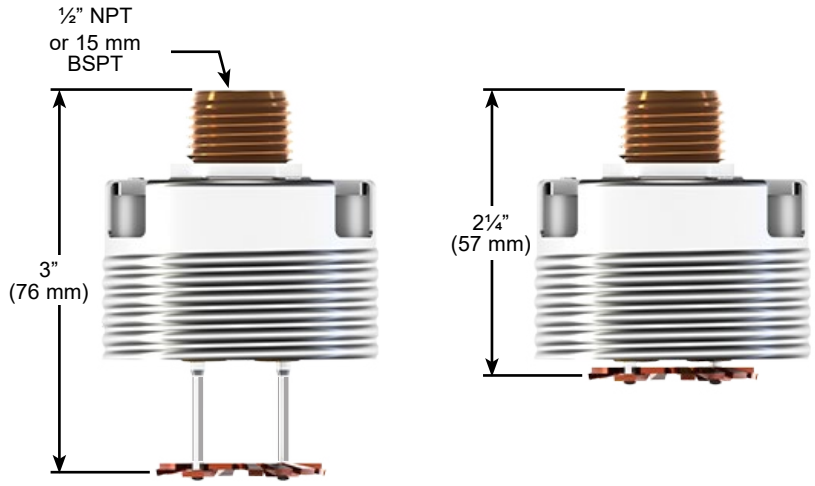
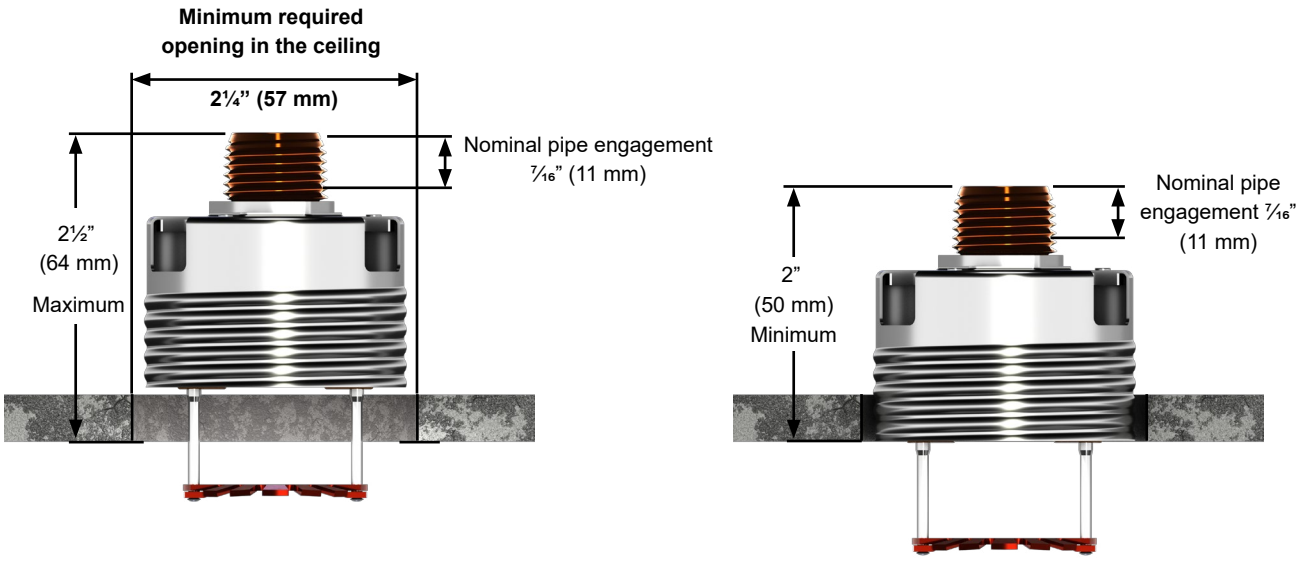


NOTE: *Image is representative only. Actual product may vary.*

Figure 4: Sprinkler Dimensions



NOTE: *Image is representative only. Actual product may vary.*

Figure 5: Sprinkler Installation Dimensions

VIKING®	TECHNICAL DATA	STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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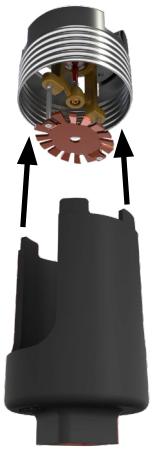
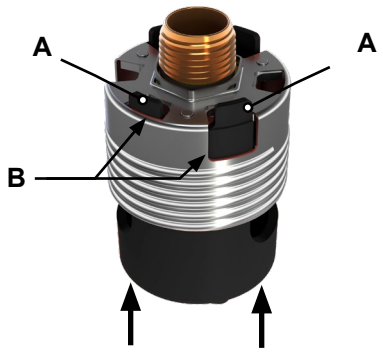
NOTICE: USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly install this sprinkler.

Step 1:
Remove the protective cap.

Step 2:
Insert the wrench into the sprinkler adapter.



Step 3:
Rotate the wrench slightly in either direction until the tines on the wrench (A) line up with the vent openings (B) on the adapter cup and lock into place. NOTE: A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1-½ turns past finger-tight.

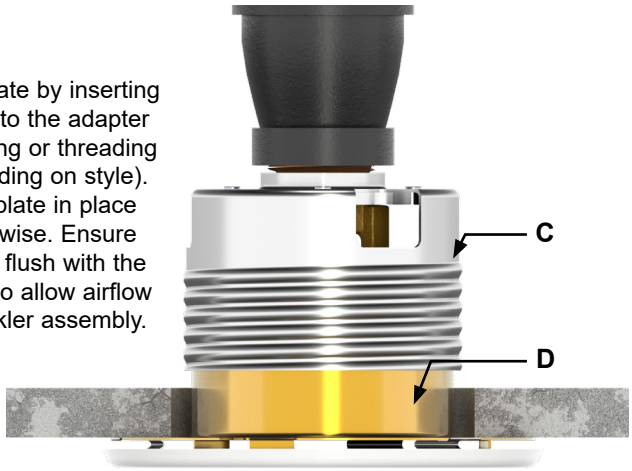


NOTE: *Image is representative only. Actual product may vary.*

Figure 6: Using the Sprinkler Wrench

Install the cover plate by inserting the adpater (D) into the adapter cup (C) and pushing or threading into place (depending on style). Snug the cover plate in place by rotating clockwise. Ensure the cover plate is flush with the ceiling as shown to allow airflow through the sprinkler assembly.

Minimum

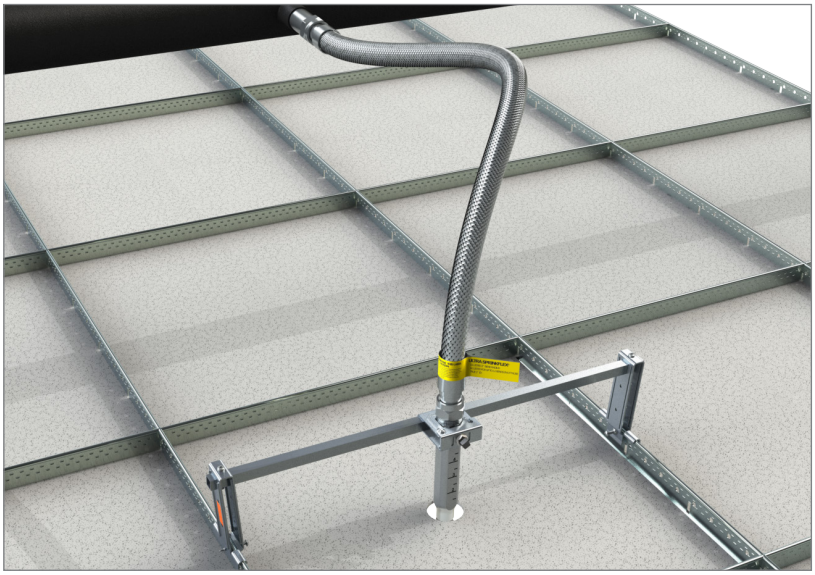


Maximum

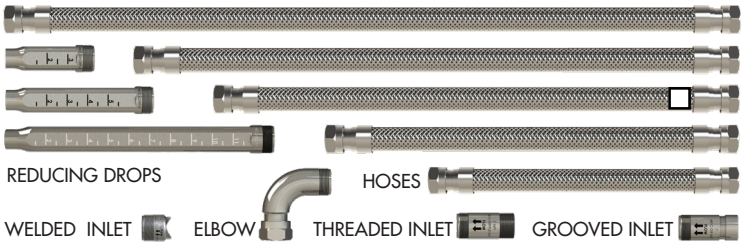
NOTE: *Image is representative only. Actual product may vary.*

Figure 7: Installing the Cover Plate

ULTRA SPRINKFLEX®



HB1 Series Hose Components



Standard Hose come assembled with 1" NPT threaded inlet and 7"reducing drop. Optional component sold separately in box of 20.

Hose lengths 28", 40", 48", 59", & 71"

Hose Inlet Connections

- o Standard: 1" NPT threaded inlet
- o Optional: 1" cut groove Inlet
  1" weld out for 1 - 1 ¼" – 5" branch size.

Hose Reducing Drops

- o Standard: Tall 7" reducing drop, ½" or ¾"
- o Optional: Short 4" reducing drop, ½" or ¾"

Xtra-Long 13" reducing drop ½", ¾"

Elbow - Optional

Ultra SprinkFLEX® is an economical, versatile 1" hose solution for fire sprinkler system engineers, designers, and installers.

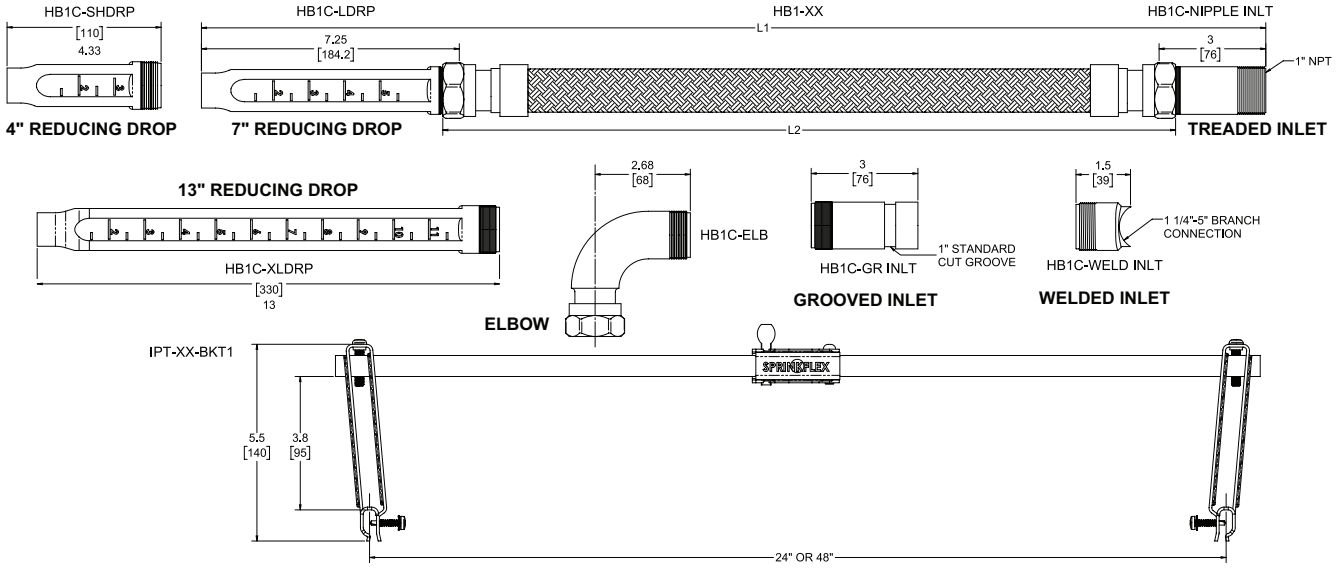
The three piece design is available with interchangeable components to create a flexible fire sprinkler hose solutions for all obstacles encountered in the field. Ultra SprinkFLEX hoses are available in 28", 40", 48", 59", and 71".

The 71" hose is designed to accept up to 12 bends for the longest length, eliminating the need to count or measure bends, leading to faster installs and inspections that lead to quicker occupancy.

Ultra SprinkFLEX® Feature and Benefits

- Fully braided three piece hose design
- Interchangeable components
- UL listed for tight 2-inch Bend Radius
- 71" hose designed to accept up to 12 bends
- High temperature silicone gasket design rated at 250˚ UL, 174˚ FM
- Threaded, groove, and weld inlet components for branch connection
- Accommodates pendant, semi-recessed, and concealed sprinkler heads
- SprinkFLEX® name provides unmatched quality and value

ULTRA SPRINKFLEX®



ULTRA SPRINKFLEX - 1" INTERNAL DIAMETER (I.D.) HB1 HOSE SERIES & COMPONENTS (UL/FM)

MODEL NUMBER	INLET SIZE (INCHES) CM	OUTLET ORIFICE SIZE (INCHES) CM	ASSEMBLY LENGTH [L1] INCHES (mm)	BRAIDED HOSE ASSEMBLY LENGTH (L2)	MINIMUM BEND RADIUS		MAX NUMBER OF 90 BENDS		EQUIVALENT LENGTH OF 1in. DIAMETER SCHEDULE 40 PIPE FT (m)		MAX RATED WORKING PRESSURE	
					FM in. (mm)	UL in.(mm)	UL	FM	(UL)	(FM)	UL PSI (KPA)	FM PSI (KPA)
1" INTERNAL DIAMETER (I.D) HOSE SERIES												
HB1-28-H	1	½ (1.27)	27 (700)	19.15 (486)	7 (203)	2 (50.8)	4	1	15	14.5 (4.4)	175 (1205)	175 (1205)
HB1-40-H			40 (1000)	30.15 (766)			5	2	21	20.8 (6.3)		
HB1-48-H			48 (1200)	38.15 (969)			8	3	29	22.4 (6.8)		
HB1-59-H			59 (1500)	50.15 (1274)			10	3	45	31.4 (9.5)		
HB1-71-H[1]			71 (1800)	62.15 (1325)			12	4	57	36.3 (11.0)		
HB1-28-T	1	¾ (1.90)	27 (700)	19.15 (486)	7 (203)	2 (50.8)	4	1	15	14.(4 .3)	175 (1205)	175 (1205)
HB1-40-T			40 (1000)	30.15 (766)			5	2	21	20.7 (6.3)		
HB1-48-T			48 (1200)	38.15 (969)			8	3	29	22.3 (6.7)		
HB1-59-T			59 (1500)	50.15 (1274)			10	3	45	31.3 (9.5)		
HB1-71-T[1]			71 (1800)	62.15 (1325)			12	4	57	36.2 (11.0)		
1" INTERNAL DIAMETER (I.D) HOSE SERIES COMPONENTS												
HB1-28	1	N/A	19 (486)	N/A	7 (203)	2 (50.8)	4	1	9	4.3 (1.3)	175 (1205)	175 (1205)
HB1-40			30 (766)				5	2	15	10.4 (3.1)		
HB1-48			38 (969)				8	3	23	12.2 (3.7)		
HB1-59			50 (1274)				10	3	40	21.2 (6.4)		
HB1-71			62 (1579)				12	4	57	26.1 (7.9)		
HB1C-ELB[1]	1"	1 (25.4)	3.15 (80)		N/A	N/A	N/A	N/A	2	4 (1.2)	175 (1205)	175 (1205)
HB1C-SHDRP-H		½ (1.27)	4.3 (110)						5	8.4 (2.5)		
HB1C-SHDRP-T		¾ (1.90)	4.3 (110)						5	8.2 (2.4)		
HB1C-LDRP-H		½ (1.27)	7.25 (184)						6	9.2 (2.8)		
HB1C-LDRP-T		¾ (1.90)	7.25 (184)						6	9.1 (2.7)		
HB1C-XLDRP-H		½ (1.27)	13 (330)						6	11.4 (3.4)		
HB1C-XLDRP-T[1]		¾(1.90)	13 (330)						6	11.2 (3.4)		
HB1C-WELD INLT		1 (25.4)	3 (106)						0	0 (0)		
HB1C-NIPPLE INLT		1 (25.4)	3 (106)						0	1 (0.3)		
HB1C-GR INLT		1 (25.4)	3 (106)							1 (0.3)		

[1] NOT EVALUATED BY UL.

INSTALLATION INSTRUCTIONS

IPT24BKT1 & IPT48BKT1 Open Hub Tall Bracket (IPT)

Installation of SPRINKFLEX Commercial Ceiling Flexible Sprinkler Drop System

HOSE MODEL:
HB1 Ultra SprinkFLEX Series; HB1-28, HB1-40, HB1-48, HB1-59, HB1-72, HB1C Components

HB Series: HB-28, HB-40, HB-48, HB-59, HB-71 HBE-28, HBE-40, HBE-48, HBE-59, HBE-71

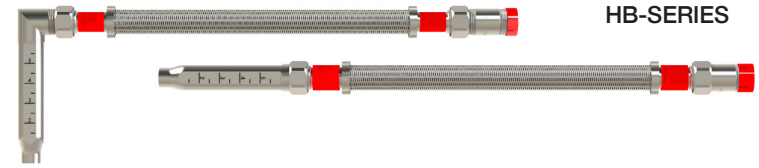
HN Series: HN-28, HN-40, HN-48, HN-59, HN-71 HNE-28, HNE-40, HNE-48, HNE-59, HNE-71

BRACKET MODEL:
IPT24BKT1
IPT48BKT1

c UL us LISTED FM APPROVED

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

HB1- Ultra SprinkFLEX SERIES



HB-SERIES

HN-SERIES

Our SprinkFLEX flexible sprinkler hose fitting are UL approved for limited flexibility and intended to use for direct connection to fire sprinkler in wet / dry systems in accordance with NFPA 13, 13D and 13R. Our SprinkFLEX flexible sprinkler hose fitting can be installed for use in ceilings with grids which meets ASTM C635 and ASTM C636 referenced by IBC, and is approved for use in standard intermediate and heavy duty structural classification.

1 Determine the place where the sprinkler head will be located. The standard bracket IPT24BKT1 is 24 inches (600mm) long and shall be mounted on the 24 inch (600mm) ceiling grid. The long bracket IPT48BKT1 is 48 inches long (1200mm) long and shall be mounted on the 48 inch (1200mm) ceiling grid. The sprinkler should be located as close as possible to the center of the distance between ceiling grids (if necessary).

2 Locate the center of the ceiling tile. Screw 1" offset from the center for the true center of the title installation. Insert one bracket leg at a time, applying a downward pressure on the bracket leg and T-bar. Secure self-drilling screw using a phillips head drive. Place the second screw leg on the T-bar and repeat the process. See Fig 1.

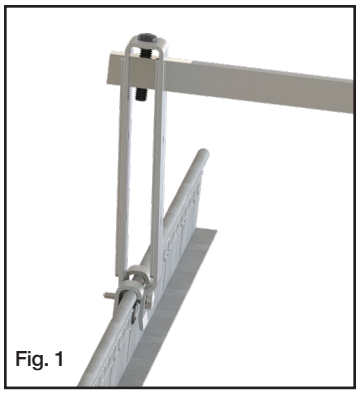


Fig. 1

3 Separate inlet component (if necessary) from the flexible hose and attach the inlet component onto the branch line. Make sure that the arrow is in the appropriate direction of flow to the sprinkler. For threaded connections use pipe sealant and/or Teflon tape the connection to the branch line. For groove coupling installation please refer to the manufacturing installation instructions See Fig. 2. Attach one end of the flexible hose on to the inlet component and tighten the slip nut to hand tight plus 1/2 turn (equivalent to 15 ft-LBS.) Do not twist the flexible hose. See Fig. 3.

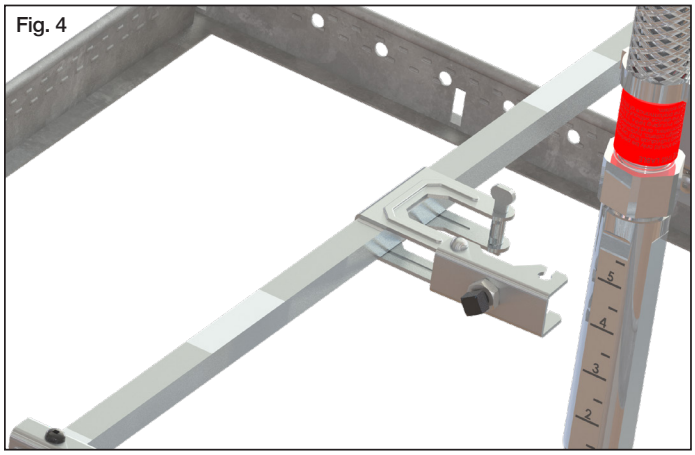
Fig. 2

Fig. 3

4 Manoeuver the flexible sprinkler drop from branch to the IPT bracket. Maneuver the flexible sprinkler drop from branch to the IPT bracket. Review that the hose length, number of bends, and bend radius are applicable for installation per UL, FM, & NFPA guidelines. (See corresponding hose technical data sheet). The tube arc should not be twisted and arc should be as large and smooth as possible. FLEXIBLE HOSES ARE NOT TO BE INSTALLED STRAIGHT (NO BENDS).

Note: The 7/8" HB & HN series hose should not be bent within 2 1/2 inches (64 mm) of the connection nut at both ends.

Fig. 4



5 The IPT bracket has an open hub for ease of installation. Open the hinge apparatus by turning the locking shaft ¼ turn. Slide the flexible hose drop into the hub.Ensure the drop is vertical and has is not applying a substantial moment on the bracket causing sprinkler head misalignment. See Fig. 4.

6 Latch the hinge door closed and adjust the sprinkler drop for desired ceiling height. Tighten the set screw to 130in-lbs (hand tight plus ¾ turn. See Fig 5.

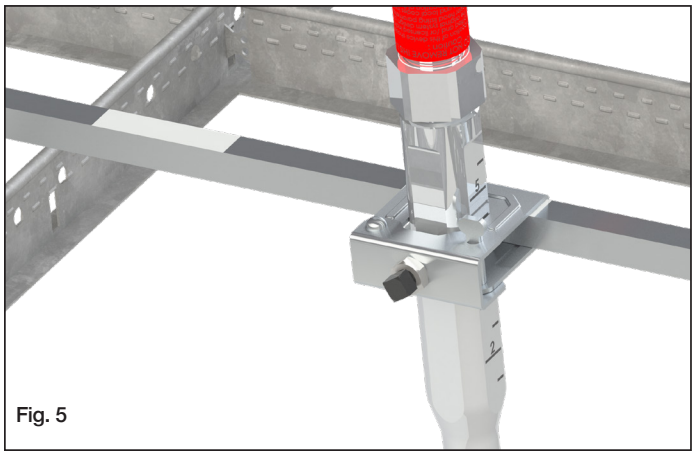
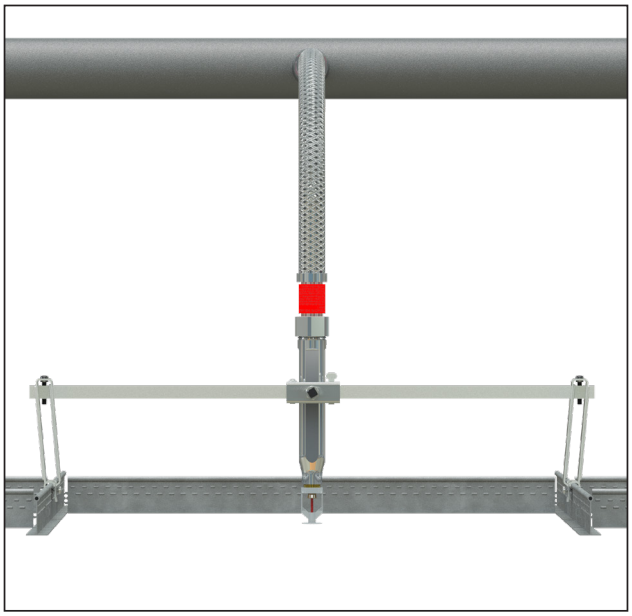


Fig. 5

7 Ceiling tile Installation- The flexible sprinkler drop system with IPT bracket is able to be installed prior to the ceiling tile installation, preventing the need for sprinkler contractor tile adjustment. For ease of tile installation, cut the largest sprinkler hole recommended by sprinkler head manufacturer. The largest hole that is still covered by the sprinkler escutcheon allows for an easier install. Angle the tile at a 45 degree and push the tile through the hole and up above the ceiling T-bar, maneuver the tile and allow it to drop in the proper location. (Fig. 6)

8 Install desired Sprinkler head, per the Sprinkler head manufacturers installation instructions.



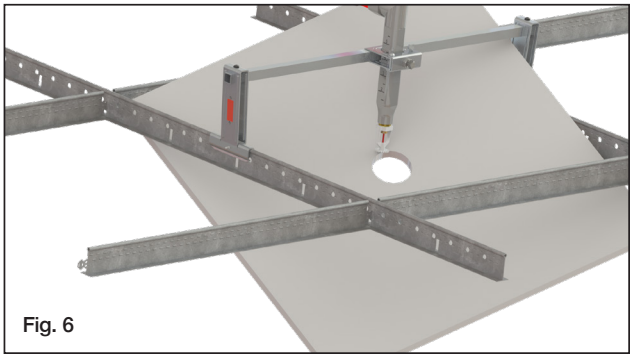


Fig. 6

⚠ WARNING

- Read and understand all instructions before attempting to install any SprinkFLEX® products.
- Wear safety glasses, hardhat, and foot protection during installation.
- These installation instructions are intended for an experienced, trained installer.
- The user must understand the purpose of these products, common industry standards for safety, and the potential consequences of improper product installation.
- De-pressurize the system before performing maintenance on the flexible hose assembly.
- Failure to follow these installation instructions could cause improper sprinkler operation, resulting in serious personal injury and/or property damage. Installation for ASTM C635 metal ceiling suspension systems installed in accordance with ASTM C636 standards.

7/8" ID SPRINKFLEX HOSE (UL & FM) FRICTION LOSS DATA & SPECIFICATIONS

MODEL NUMBER	INLET SIZE (INCHES) CM	OUTLET ORIFICE SIZE (INCHES) CM	HOSE ASSEMBLY LENGTH [L] INCHES (mm)	MINIMUM BEND RADIUS		MAX NUMBER OF 90° BENDS		EQUIVALENT LENGTH OF 1in. DIAMETER SCHEDULE 40 PIPE FT (m)			MAX RATED WORKING PRESSURE	
				FM in. (mm)	UL in. (mm)	UL	FM	(UL)	(FM) 5.6 k-factor	(FM) 8.0 k-factor	UL PSI (KPA)	FM PSI (KPA)
1" INTERNAL DIAMETER (I.D) HOSE SERIES												
HB28H-7	1	1/2 (1.27)	27 (700)	8 (203)	3 (76.2)	2	1	28	18.6 (5.7)	-	200 (1379)	175 (1205)
HB40H-7			40 (1000)			3	1	52	24.6 (7.5)	-		
HB48H-7			48 (1200)			3	3	64	28.5 (8.6)	-		
HB59H-7			59 (1500)			3	3	72	34.4 (10.4)	-		
HB71H-7			71 (1800)			3	4	94	40.4 (12.3)	-		
HB28T-7	1	3/4 (1.90)	27 (700)	8 (203)	3 (76.2)	2	1	28	-	18.8 (5.7)	200 (1379)	175 (1205)
HB40T-7			40 (1000)			3	1	52	-	24.8 (7.6)		
HB48T-7			48 (1200)			3	3	64	-	28.7 (8.7)		
HB59T-7			59 (1500)			3	3	72	-	34.6 (10.5)		
HB71T-7			71 (1800)			3	4	94	-	40.6 (12.4)		
HN28H-7	1	1/2 (1.27)	27 (700)	-	3 (76.2)	2	-	28	-	-	200 (1379)	-
HN40H-7			40 (1000)			3	-	52	-	-		
HN48H-7			48 (1200)			3	-	64	-	-		
HN59H-7			59 (1500)			3	-	72	-	-		
HN71H-7			71 (1800)			3	-	94	-	-		
HN28T-7	1	3/4 (1.90)	27 (700)	-	3 (76.2)	2	-	28	-	-	200 (1379)	-
HN40T-7			40 (1000)			3	-	52	-	-		
HN48T-7			48 (1200)			3	-	64	-	-		
HN59T-7			59 (1500)			3	-	72	-	-		
HN71T-7			71 (1800)			3	-	94	-	-		
HBE28H-6 & HBE28H-7	1	1/2 (1.27)	27 (700)	8 (203)	3 (76.2)	2	1	33	20.6 (6.3)	-	-	175 (1205)
HBE40H-6 & HBE40H-7			40 (1000)			3	1	56	26.6 (8.1)	-		
HBE48H-6 & HBE48H-7			48 (1200)			3	3	67	30.5 (9.3)	-		
HBE59H-6 & HBE59H-7			59 (1500)			3	3	76	36.4 (11.1)	-		
HBE71H-6 & HBE71H-7			71 (1800)			3	4	97	42.4 (12.9)	-		
HBE28T-6 & HBE28T-7	1	3/4 (1.90)	27 (700)	8 (203)	3 (76.2)	2	1	33	-	20.8 (6.3)	-	175 (1205)
HBE40T-6 & HBE40T-7			40 (1000)			3	1	56	-	26.8 (8.2)		
HBE48T-6 & HBE48T-7			48 (1200)			3	3	67	-	30.7 (9.4)		
HBE59T-6 & HBE59T-7			59 (1500)			3	3	76	-	36.6 (11.2)		
HBE71T-6 & HBE71T-7			71 (1800)			3	4	97	-	42.6 (13.0)		
HNE28H-6 & HNE28H-7	1	1/2 (1.27)	27 (700)	-	3 (76.2)	2	-	33	-	-	-	175 (1205)
HNE40H-6 & HNE40H-7			40 (1000)			3	-	56	-	-		
HNE48H-6 & HNE48H-7			48 (1200)			3	-	67	-	-		
HNE59H-6 & HNE59H-7			59 (1500)			3	-	76	-	-		
HNE71H-6 & HNE71H-7			71 (1800)			3	-	97	-	-		
HNE28T-6 & HNE28T-7	1	3/4 (1.90)	27 (700)	-	3 (76.2)	2	-	33	-	-	-	175 (1205)
HNE40T-6 & HNE40T-7			40 (1000)			3	-	56	-	-		
HNE48T-6 & HNE48T-7			48 (1200)			3	-	67	-	-		
HNE59T-6 & HNE59T-7			59 (1500)			3	-	76	-	-		
HNE71T-6 & HNE71T-7			71 (1800)			3	-	97	-	-		

NOTES:

* MODEL NUMBERS: THE FIRST TWO LETTERS "HN" DESIGNATES SPRINKFLEX UNBRAIDED HOSE SERIES. THE FIRST TWO LETTERS "HB" DESIGNATES SPRINKFLEX BRAIDED HOSE SERIES, THE "E" DESIGNATES ELBOW. THE "H" DESIGNATES ½" OUTLET HOSE SERIES. THE "T" DESIGNATES ¾" OUTLET HOSE SERIES. HE "7" DESIGNATES TALL REDUCER.
* MAX AMBIENT TEMPERATURE RATING ON ALL MODEL NUMBERS ARE 300°F (148°C).
* EQUIVALENT LENGTHS ARE SHOWN WITH MAXIMUM NUMBER OF 90 DEGREE BENDS AT THE MINIMUM BEND-RADIUS PER AGENCY. 2- 45 DEGREE OR 3-30 DEGREE BENDS EQUAL 1-90 DEGREE BEND.

DIFFERENT VALUES WERE OBTAINED BY FM AND UL DUE TO THE DIFFERENCE IN MINIMUM BEND RADIUS, TESTING PROTOCOL AND CALCULATION METHODS.

PLEASE SEE INDIVIDUAL STANDARDS FOR MORE INFORMATION RELATIVE TO FRICTION LOSS (EQUIVALENT LENGTH OF PIPE).

* FM EQUIVALENT LENGTH CALCULATION INCLUDES SPRINKLER HEAD FRICTION LOSS.
* SEE LISTING(S) APPROVAL AGENCY FOR THE LATEST APPROVAL DETAILS.

ULTRA SPRINKFLEX®

HB1 FRICTION LOSS TABLE (FM)							
HOSE ASSEMBLIES	INLET SIZE (INCHES)	OUTLET ORIFICE SIZE (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE, FT. (m)	RATED WORKING PRESSURE PSI (KPA)
HB1-28H	1	½	28 (700)	7 (180)	1	14.5 (4.4)	175 (1205)
HB1-40H			40 (1000)	7 (180)	2	20.8 (6.3)	
HB1-48H			48 (1200)	7 (180)	3	22.4 (6.8)	
HB1-59H			59 (1500)	7 (180)	3	31.4 (9.5)	
HB1-71H			71 (1800)	7 (180)	4	36.3 (11.0)	
HB1-28T	1	¾	28 (700)	7 (180)	1	14.4 (4.3)	175 (1205)
HB1-40T			40 (1000)	7 (180)	2	20.7 (6.3)	
HB1-48T			48 (1200)	7 (180)	3	22.3 (6.7)	
HB1-59T			59 (1500)	7 (180)	3	31.3 (9.5)	
HB1-71T			71 (1800)	7 (180)	4	36.2 (11.0)	
HOSE COMPONENTS	INLET SIZE (INCHES)	OUTLET ORIFICE SIZE (INCHES)	DESCRIPTION	MINIMUM BEND RADIUS IN. (mm)	NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE, FT. (m)	RATED WORKING PRESSURE PSI (KPA)
HB1-28	N/A	N/A	28" HOSE BODY	7 (180)	1	4.3 (1.3)	175 (1205)
HB1-40			40" HOSE BODY	7 (180)	2	10.4 (3.1)	
HB1-48			48" HOSE BODY	7 (180)	3	12.2 (3.7)	
HB1-59			59" HOSE BODY	7 (180)	3	21.2 (6.4)	
HB1-71			71" HOSE BODY	7 (180)	4	26.1 (7.9)	
HB1C-ELB	N/A	N/A	90 REDUCER			4 (1.2)	175 (1205)
HB1C-SHDRP-H		½	SHORT REDUCER ½"			8.4 (2.5)	
HB1C-SHDRP-T		¾	SHORT REDUCER ¾"			8.2 (2.4)	
HB1C-LDRP-H		½	STANDARD REDUCER ½"			9.2 (2.8)	
HB1C-LDRP-T		¾	STANDARD REDUCER ¾"			9.1 (2.7)	
HB1C-XLDRP-H		½	LONG REDUCER ½"			11.4 (3.4)	
HB1C-XLDRP-T		¾	LONG REDUCER ¾"			11.2 (3.4)	
HB1C-HANGER	N/A	N/A	HANGER CONNECTION			1 (0.3)	175 (1205)
HB1C-WELD INLT		N/A	WELD INLET			0 (0)	
HB1C-NIPPLE INLT		N/A	THREAD INLET			1 (0.3)	
HB1C-GR INLT		N/A	1" CUT GROOVE INLET			1 (0.3)	

HB1 is a1 in. nominal dia. flexible metal sprinkler hose for providing a connection to automatic sprinklers in commercial ceilings. These flexible sprinkler hose models are available as a three piece style. The three piece style, the reducer and Inlet is threaded to the flexible hose body. Above is listed with standard flexible hose assembly and component level. Approval of the flexible sprinkler hose models listed above are limited for use in commercial suspended ceilings with ceiling bracket systems manufactured by Anvil International, LLC.

- All fricton loss testing was conducted with no sprinkler head, K-factor
- All components were fricton loss tested seperately
- All components such as reducers, hose body and outlets can be combined to provide a total equivalent length value.

ULTRA SPRINKFLEX®

HB1 FRICTION LOSS TABLE (UL)

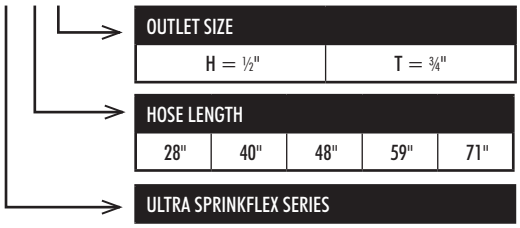
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1-28-SHDRP-H & HB1-GR-28-SHDRP-H	1x½	26.5	2 (51)	4	16	175 (1205)
HB1-40-SHDRP-H & HB1-GR-40-SHDRP-H	1x½	37.5	2 (51)	5	21	
HB1-48-SHDRP-H & HB1-GR-48-SHDRP-H	1x½	45.5	2 (51)	8	34	
HB1-59-SHDRP-H & HB1-GR-59-SHDRP-H	1x½	57.5	2 (51)	10	45	
HB1-71-SHDRP-H & HB1-GR-71-SHDRP-H	1x½	69.5	2 (51)	12	55	
HB1-28-SHDRP-T & HB1-GR-28-SHDRP-T	1x¾	26.5	2 (51)	4	15	175 (1205)
HB1-40-SHDRP-T & HB1-GR-40-SHDRP-T	1x¾	37.5	2 (51)	5	23	
HB1-48-SHDRP-T & HB1-GR-48-SHDRP-T	1x¾	45.5	2 (51)	8	34	
HB1-59-SHDRP-T & HB1-GR-59-SHDRP-T	1x¾	57.5	2 (51)	10	48	
HB1-71-SHDRP-T & HB1-GR-71-SHDRP-T	1x¾	69.5	2 (51)	12	55	
HB1-28-LDRP-H & HB1-GR-28-LDRP-H	1x½	29.5	2 (51)	4	16	175 (1205)
HB1-40-LDRP-H & HB1-GR-40-LDRP-H	1x½	40.5	2 (51)	5	20	
HB1-48-LDRP-H & HB1-GR-48-LDRP-H	1x½	48.5	2 (51)	8	34	
HB1-59-LDRP-H & HB1-GR-59-LDRP-H	1x½	60.5	2 (51)	10	44	
HB1-71-LDRP-H & HB1-GR-71-LDRP-H	1x½	72.5	2 (51)	12	56	
HB1-28-LDRP-T & HB1-GR-28-LDRP-T	1x¾	29.5	2 (51)	4	15	175 (1205)
HB1-40-LDRP-T & HB1-GR-40-LDRP-T	1x¾	40.5	2 (51)	5	23	
HB1-48-LDRP-T & HB1-GR-48-LDRP-T	1x¾	48.5	2 (51)	8	34	
HB1-59-LDRP-T & HB1-GR-59-LDRP-T	1x¾	60.5	2 (51)	10	48	
HB1-71-LDRP-T & HB1-GR-71-LDRP-T	1x¾	72.5	2 (51)	12	56	
HB1-28-XLDRP-H & HB1-GR-28-XLDRP-H	1x½	35.2	2 (51)	4	16	175 (1205)
HB1-40-XLDRP-H & HB1-GR-40-XLDRP-H	1x½	46.2	2 (51)	5	23	
HB1-48-XLDRP-H & HB1-GR-48-XLDRP-H	1x½	54.1	2 (51)	8	35	
HB1-59-XLDRP-H & HB1-GR-59-XLDRP-H	1x½	66.2	2 (51)	10	48	
HB1-28-XLDRP-T & HB1-GR-28-XLDRP-T	1x¾	35.2	2 (51)	4	15	175 (1205)
HB1-40-XLDRP-T & HB1-GR-40-XLDRP-T	1x¾	46.2	2 (51)	5	23	
HB1-48-XLDRP-T & HB1-GR-48-XLDRP-T	1x¾	54.1	2 (51)	8	35	
HB1-59-XLDRP-T & HB1-GR-59-XLDRP-T	1x¾	66.2	2 (51)	10	48	
HB1CE-28-SHDRP-H & HB1CE-GR-28-SHDRP-H	1x½	30.5	2 (51)	4	18	175 (1205)
HB1CE-40-SHDRP-H & HB1CE-GR-40-SHDRP-H	1x½	41.5	2 (51)	5	23	
HB1CE-48-SHDRP-H & HB1CE-GR-48-SHDRP-H	1x½	49.5	2 (51)	8	36	
HB1CE-59-SHDRP-H & HB1CE-GR-59-SHDRP-H	1x½	61.5	2 (51)	10	48	
HB1CE-71-SHDRP-H & HB1CE-GR-71-SHDRP-H	1x½	73.5	2 (51)	12	57	
HB1CE-28-SHDRP-T & HB1CE-GR-28-SHDRP-T	1x¾	30.5	2 (51)	4	17	175 (1205)
HB1CE-40-SHDRP-T & HB1CE-GR-40-SHDRP-T	1x¾	41.5	2 (51)	5	25	
HB1CE-48-SHDRP-T & HB1CE-GR-48-SHDRP-T	1x¾	49.5	2 (51)	8	36	
HB1CE-59-SHDRP-T & HB1CE-GR-59-SHDRP-T	1x¾	61.5	2 (51)	10	49	
HB1CE-71-SHDRP-T & HB1CE-GR-71-SHDRP-T	1x¾	73.5	2 (51)	12	57	
HB1CE-28-LDRP-H & HB1CE-GR-28-LDRP-H	1x½	33.5	2 (51)	4	18	175 (1205)
HB1CE-40-LDRP-H & HB1CE-GR-40-LDRP-H	1x½	44.5	2 (51)	5	22	
HB1CE-48-LDRP-H & HB1CE-GR-48-LDRP-H	1x½	52.5	2 (51)	8	36	
HB1CE-59-LDRP-H & HB1CE-GR-59-LDRP-H	1x½	64.5	2 (51)	10	46	

ULTRA SPRINKFLEX®

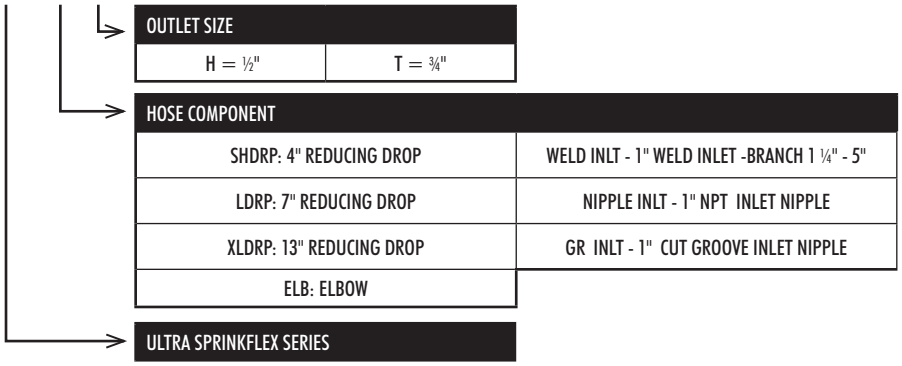
HB1 FRICTION LOSS TABLE (UL) CONTINUTED						
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1CE-28-LDRP-T & HB1CE-GR-28-LDRP-T	1x¾	33.5	2 (51)	4	17	175 (1205)
HB1CE-40-LDRP-T & HB1CE-GR-40-LDRP-T	1x¾	44.5	2 (51)	5	25	
HB1CE-48-LDRP-T & HB1CE-GR-48-LDRP-T	1x¾	52.5	2 (51)	8	36	
HB1CE-59-LDRP-T & HB1CE-GR-59-LDRP-T	1x¾	64.5	2 (51)	10	49	

- Extra-long reducer, 13" reducers=, with HB1-71 length hose has not been evaluated by UL
- HB1Series is rated to be used in temperature of 225˚F UL and 175˚F FM.

HOSE SERIES CONFIGURATION
HB1-XX-X



HOSE SERIES CONFIGURATION
HB1-XX-X



ULTRA SPRINKFLEX®

IMPORTANT INSTALLATION INFORMATION

- SprinkFLEX products must be installed according to current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards or equivalent standards for wet, dry, or pre-action systems. Deviations from these standards or alterations to SprinkFLEX products or sprinklers will void any warrant. In addition, installations must meet provision of the local authority having jurisdiction and local codes, as applicable.
- For suspended ceiling applications, the ends of the SprinkFLEX Bracket must be installed to the rails of an ASTM C635 ceiling installed in accordance with ASTM C636 standards.
- SprinkFLEX Stainless Steel Sprinkler Fittings and/or the SprinkFLEX Bracket must not be intermixed with other manufacturer's products.
- Refer to the specific product submittal for applications and listing information. These submittals are located on the website at www.anvilintl.com.
- Size the piping system to provide the minimum required flow rate for the sprinkler system.
- Flush the system to remove foreign material. Continue to flush the system until water runs clear.
- DO NOT install sprinkler system piping through heating ducts.
- DO NOT connect sprinkler system piping to domestic hot water systems.
- DO NOT install sprinklers where they will be exposed to temperatures that exceed the maximum ambient temperature rating for the sprinkler.
- The flexible stainless steel hose should not be bent or fluctuated up-and-down or side-to-side when it is pressurized for test.
- The HB & HN stainless steel hose should not be bent within 2½ inches/64 mm of the connection nut at both ends.
- Flexible stainless steel hose and fittings have limited flexibility and are intended only to be installed with bends at their respective minimum bend radii.
- Protect wet piping systems for freezing temperatures.
- If construction is altered, refer to applicable standards to determine if additional sprinklers are required.
- The owner is responsible for maintaining the fire protection system in proper operating condition.
- For minimum maintenance and inspection requirements, refer to NFPA 25 and the NFPA pamphlet that describes the care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.
- IPT48BKT1 has not been evaluated by UL.
- HB1 71 with extra long reducing drop has not been evaluated by UL.
- HB1 Elbow with extra long reducing drop has not been evaluated by UL.

POTTER
The Symbol of Protection

BELLS

PBA-AC & MBA-DC

Features

- Listed for indoor and outdoor use
- Outdoor use requires BBK-1 or HC-BB weatherproof back box
- Indoor use mounts directly to standard 4” box
- Low current draw
- High dB output
- AC and DC models
- DC models are motor driven, polarized, and have built in transient protection for supervised alarm circuits
- Available in 6”, 8” and 10” sizes

UL UL* FM APPROVED

* ULC on MBA-DC Only

Description

These vibrating type bells are designed for use as fire or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4” (101mm) square electrical box for indoor use or on a model BBK-1 or HC-BB weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1 or HC-BB, Stock No. 1500001.

Notes

1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C)
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection. * Does not have ULC listing.

Technical Specifications

Dimensions	6” (150mm), 8” (200mm) and 10” (250mm)
Enclosure	Cover: Steel Finish: Red Powder Coat Base: non-corrosive composite material All parts have corrosion resistant finishes Model BBK-1 or HC-BB weatherproof backbox (optional)
Voltages Available	24VAC 120VAC 12VDC (10.2 to 15.6) Polarized 24VDC (20.4 to 31.2) Polarized
Environmental Limitations	Indoor or outdoor use (See Note 1) -40° to 150°F (-40° to 66°C) (Outdoor use requires weatherproof backbox.)
Termination	AC Bells - 4 No. 18 AWG stranded wires DC Bells - Terminal strip
Service Use	NFPA 13, 72, local AHJ

*Specifications subject to change without notice.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or HC-BB. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

Installation

The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.

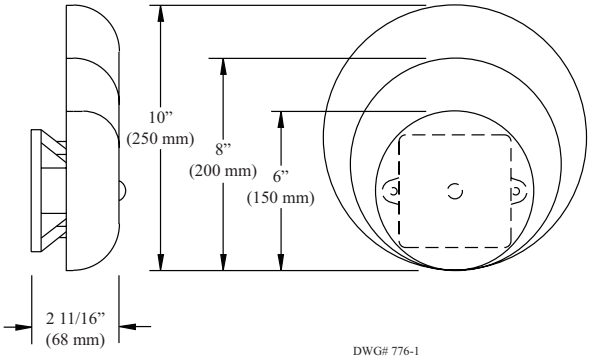
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from ringing.

Bell Dimension Inches (mm)

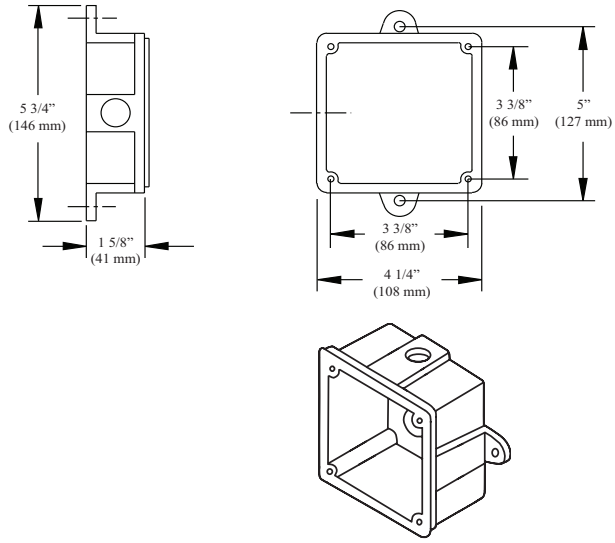
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

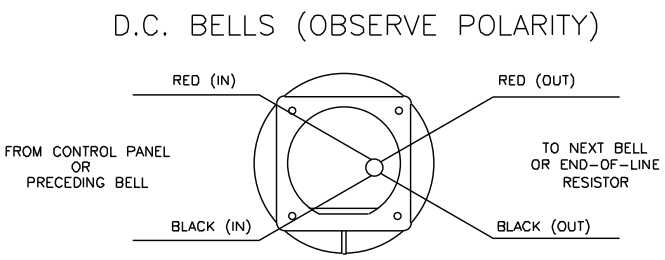
MODEL BBK-1 OR HC-BB

Fig 2



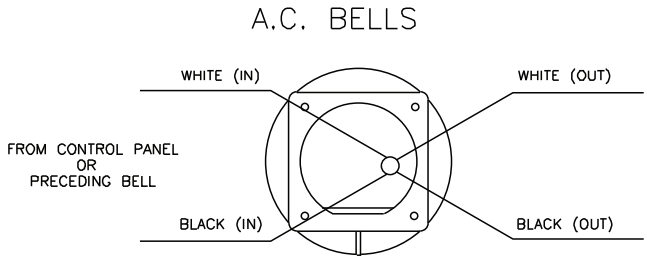
Wiring Rear View

Fig 3



NOTES:

1. OBSERVE POLARITY TO RING D.C. BELLS.
2. RED WIRES POSITIVE (+).
3. BLACK WIRES NEGATIVE (-).
4. EOL RESISTOR IS SUPPLIED BY FIRE ALARM CONTROL PANEL.



NOTES:

1. WHEN USING A.C. BELLS, TERMINATE EACH EXTRA WIRE SEPERATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS .

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

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

Maximum Surge: 18 FPS (5.5 m/s)

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

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

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

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

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

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

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

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

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

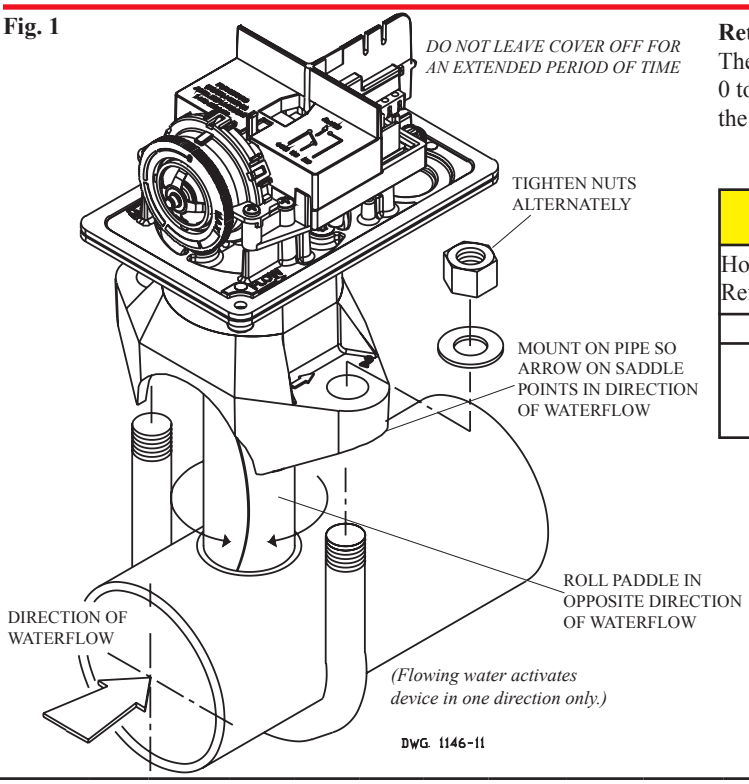
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

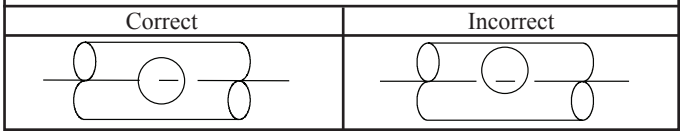


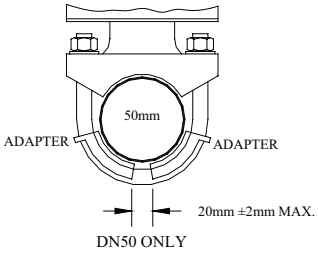
Retard Adjustment

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

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

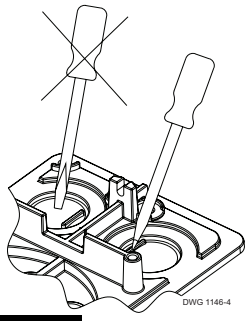
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

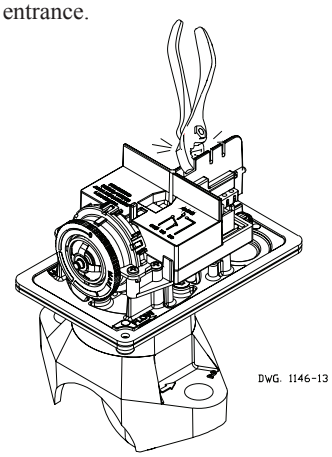
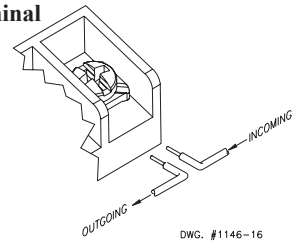


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

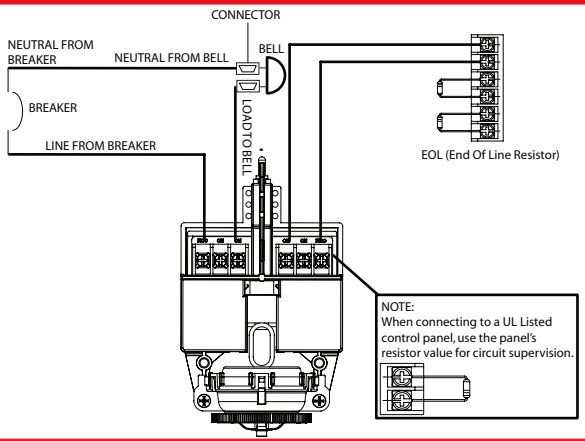


⚠ WARNING

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

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections



Notes:

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

Testing

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

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

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

Fig. 6 Mounting Dimensions

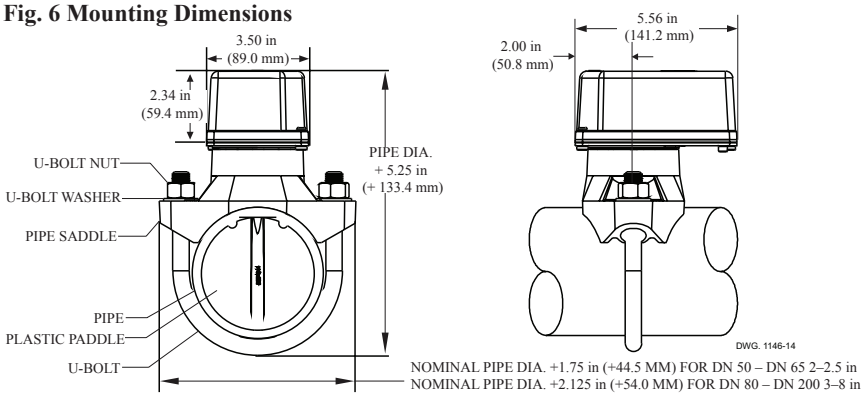
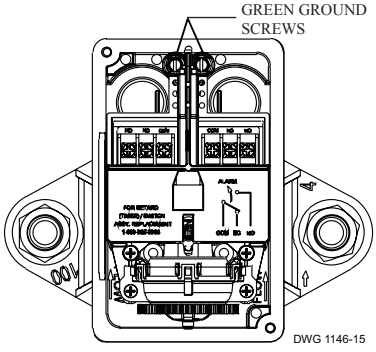


Fig. 7



Maintenance

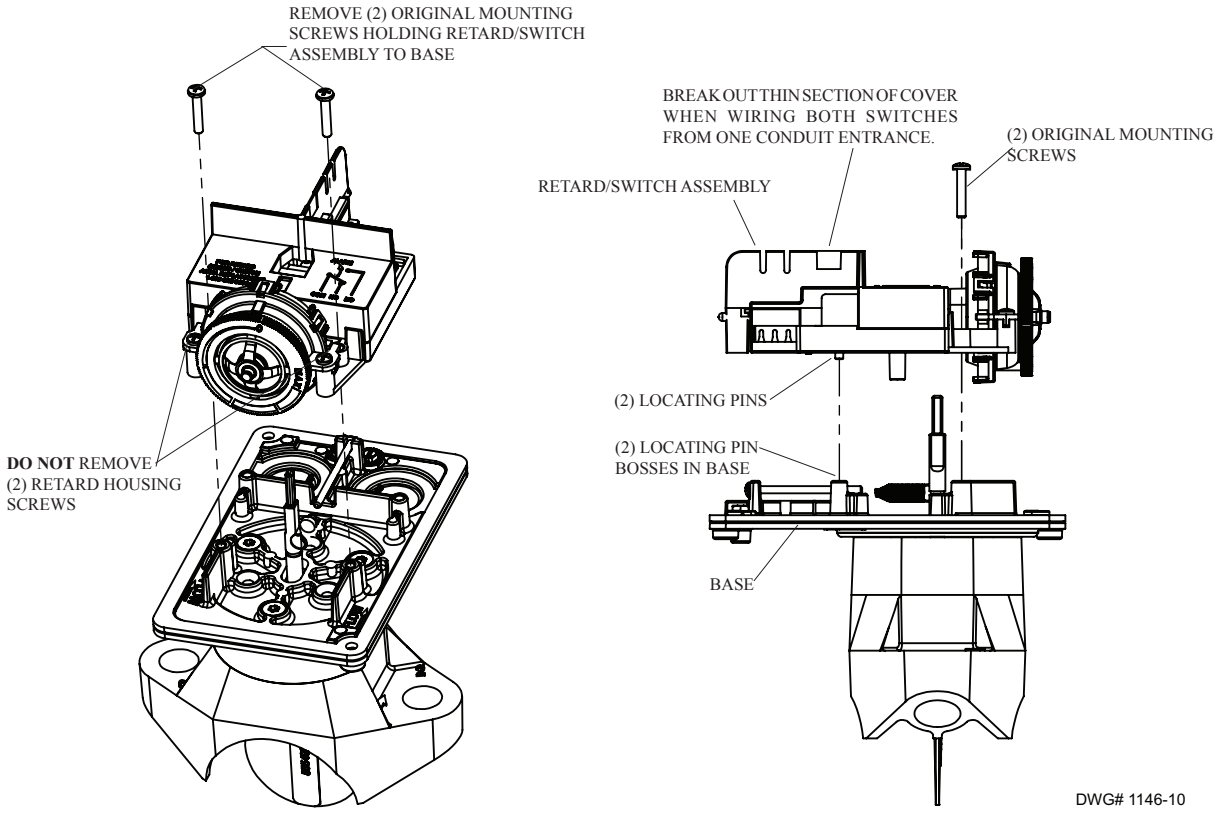
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

Crawford SPRINKLER CO.
OF RALEIGH, INC
2725 S. SAUNDERS STREET – RALEIGH, NC 27603 • PHONE 919-828-9346 • FAX 919-839-8164
N.C. STATE FIRE SPRINKLER LICENSE #23634 FS-I • N.C. STATE FIRE ALARM LICENSE #SP.FA/LV.33232
FED. TAX I.D. 56-0842716

DUKE ENERGY
DUNN OPERATIONS
MOBILE SUBSTATION BUILDING
1269 JONESBORO ROAD
DUNN, NC

FIRE SPRINKLER
MATERIAL SUBMITTAL

August 23, 2023

REV 01 9/28/24

TECHNICAL DATA SHEET

VK2001 Standard Response Upright Sprinkler K8.0 (115)

1. PRODUCT IDENTIFICATION

This document covers the following product, hereafter referred to as “sprinkler”:

VK2001: Standard Response, Standard Coverage, Upright, K8.0 (115) Sprinkler.

2. INTENDED USE

The sprinkler is intended to be used in automatic fire sprinkler systems as allowed by applicable approval authorities. The sprinkler must be used in accordance with:

1. the sprinkler’s Listings, Approvals, and associated design requirements.
2. the recognized design and installations standards issued, for example NFPA, FM, EN, VdS, or LPCB.
3. the latest revisions of all applicable manufacturer’s documentation.

Governmental codes, ordinances, and standards may apply and may differ from one another.

⚠ WARNING

Cancer and Reproductive Harm www.P65Warnings.ca.gov

3. LISTING AND APPROVALS

Refer to section 5 for details and requirements that must be followed.

cULus Listed

VdS Approved

FM Approved

UKCA Approved

CE

MED Approved

LPCB Approved

China Approved

4. TECHNICAL SPECIFICATIONS

4.1 Definitions

Standard Upright Sprinkler: A sprinkler intended to be oriented with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. These sprinklers are marked “SSU” (Standard Spray Upright) or “UPRIGHT” on the deflector.

Corrosion Resistant Sprinkler: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers. Sprinklers can be ordered as corrosion resistant sprinklers and can be used with escutcheons when allowed by the approval body.

4.2 Ratings and Physical Characteristics

Parameter	Value
Minimum operating pressure	7 psi (0.5 bar)
Maximum rated pressure	175 psi (12 bar)
Factory tested pressure	500 psi (35 bar)
Thread size	3/4" NPT or 20 mm BSPT
Nominal K–factor	8.0 U.S. (115)
Minimum temperature rating (glass bulb)	–65 °F (–55 °C)

4.3 Markings and Dimensions

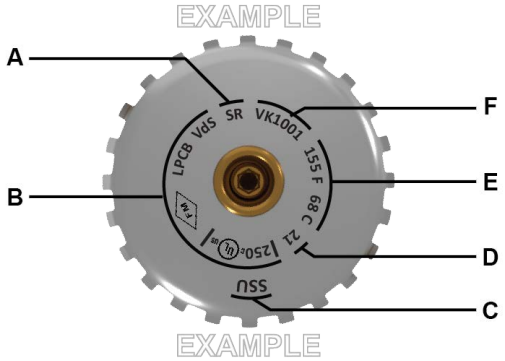


Figure – 1: Markings

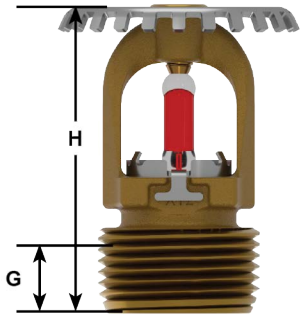


Figure – 2: Dimensions

Ref	Description	Value
A	Response type	SR: Standard Response
B	Listings and Approvals	See sections 3 and 5
C	Sprinkler type	SSU: Standard Spray Upright
D	Manufacture date (year)	See marking
E	Nominal temperature rating	See marking
F	Manufacturers Sprinkler Identification Number (SIN)	VK2001
G	Nominal pipe engagement	7/16” (11 mm)
H	Height	2" (51 mm)

4.4 Materials of Construction

NOTICE: Do not disassemble the sprinkler.

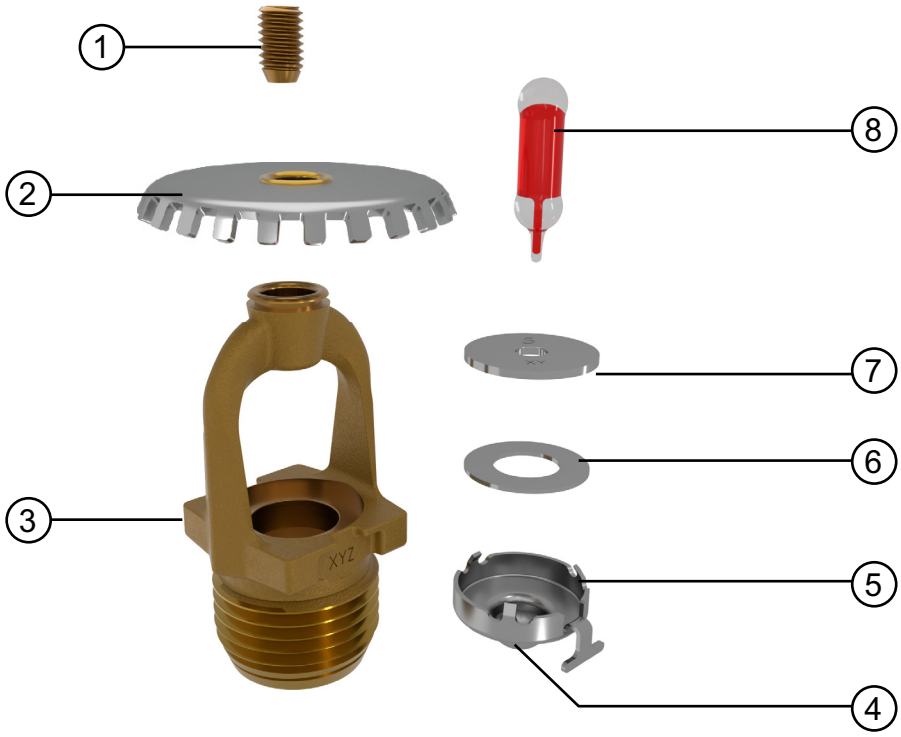


Figure – 3 Sprinkler Components

Ref	Description	Material
1	Compression screw	Brass CW612N, CW508L, UNS–C36000 or UNS–C26000
2	Deflector	Stainless steel UNS S30400
3	Sprinkler body	CW602N, UNS–C84400 or QM brass
4	Pip cap seal	Polytetrafluoroethylene (PTFE)
5	Pip cap shell	Stainless steel UNS–S44400
6	Belleville spring	Nickel alloy
7	Pip cap disc	Stainless steel UNS–S30100
8	Bulb	Glass, nominal 0.20" (5 mm) diameter

5. LISTING AND APPROVAL DESIGN REQUIREMENTS

5.1 Listing and Approval Specifications

Sprinkler Base Part Number[1]	Thread Size		Approval Body							
	NPT	BSPT	cULus	FM	CE	LPCB	VdS	UKCA	MED	China
Maximum WWP PSI (bar) ⟶			**175 (12)**							
23875	3/4"	—	A1	A1	A1	A1	A1	A1	A1	—
23887	—	20 mm	A1	A1	A1	A1	A1	A1	A1	—
26757	—	20 mm	B2	B2	—	—	—	—	—	B2

Approval Specification (Temperature Ratings) Key:

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), 200 °F (93 °C) and 286 °F (141 °C)

Approval Specification (Finishes) Key:

1 = Brass, chrome, white polyester [2,3], black polyester[2,3], and ENT [3,4]

2 = Chrome

1 For complete part number, refer to Viking's current price list.

2 For white polyester and black polyester, other colors are available upon request and will carry the same Listings and Approvals as the standard colors.

3 cULus Listed as corrosion-resistant.

4 FM Approved as corrosion-resistant.

5.2 cULus Listing Requirements and Details

The sprinkler is cULus Listed as indicated in Table 5.1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers. This sprinkler is designed for use in light, ordinary, and extra hazard occupancies.

5.3 FM Approval Requirements and Details

The sprinkler is FM Approved as standard response Non–Storage upright sprinkler as indicated in the FM Approval Guide. The sprinkler is also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of –3 psi (–207 mbar). 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. For specific application and installation requirements, refer to the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2–0).

5.4 Additional Approval Requirements and Details

Refer to Table 5.1 for approved configurations allowed by each of the following approvals.

- CE CPR: Standard EN 12259-1:1999 +A3:2006; Declaration of Performance DOP_VK2001.
- LPCB: Standard EN 12259-1:1999 +A3:2006; Certificate Number 096m.
- VdS: Standard EN 12259-1:1999 +A3:2006; Certificate Number G 422011.
- UKCA: Standard EN12259-1:1999 +A3:2006; Declaration of Conformity UKCA DOC_S5048.
- MED: Standard EN 12259-1:1999 +A3:2006; Declaration of Conformity DOC_MED_XT1.
- China Approval: Approved according to China GB standard.

For specific application and installation requirements, refer to the latest applicable governmental codes, ordinances, and standards for the installation location.

5.5 Corrosion-Resistant Coatings

The corrosion resistant coatings have passed the standard corrosion tests required by the approving agencies and are listed and approved as indicated in Table 5.1. These tests do not represent all possible corrosive environments. The Electro-less Nickel PTFE (ENT) finish passed the UL 199 thirty day corrosion test and is cULus listed and FM Approved as corrosion resistant. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.

Prior to installation, verify that the coatings are compatible with, or suitable for, the proposed environment. The ENT finish has not been evaluated for environments containing chlorine, such as indoor swimming pools. It is not recommended for these applications.

5.6 Sprinkler Guards and Water Shields

The sprinkler is approved for use with the Model XG Sprinkler Guard and the Model XWU upright water shield. Refer to the Guards and Water Shields for XT1 Sprinklers technical data sheet for more information.

5.7 Available Temperature Ratings

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

6. ORDERING PROCEDURE

6.1 Sprinkler

1. Choose a sprinkler base part number with the required thread size and listing or approval (refer to section 5):
2. Add the suffix for the desired finish.
3. Add the suffix for the desired temperature rating.

NOTE: For Polyester, insert the desired temperature rating suffix where the dash (–) is shown.

EXAMPLE: 23875MB/W = VK2001 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C).

NOTE: When ordering sprinklers that will be installed into InstaSeal® IS-W2 fittings, refer to Form No. F_021123 for installation instructions. Use the InstaSeal® alignment tool and NOT the sprinkler wrench for InstaSeal® sprinkler installations.

1. Sprinkler Base Part Number	
See Section 5	
23875	3/4" NPT
23887	20 mm BSPT
26757*	20 mm BSPT

*Only for China

2. Finish	
Description	Suffix
Brass	A
Chrome	F
White Polyester	M–/W
Black Polyester	M–/B
ENT	JN

3. Temperature Rating			
Nominal Temperature Rating	Bulb Color	Maximum Ambient Ceiling Temperature	Suffix
135 °F (57 °C)	Orange	100 °F (38 °C)	A
155 °F (68 °C)	Red	100 °F (38 °C)	B
175 °F (79 °C)	Yellow	150 °F (65 °C)	D
200 °F (93 °C)	Green	150 °F (65 °C)	E
286 °F (141 °C)	Blue	225 °F (107 °C)	G
OPEN	—	—	Z

6.2 Sprinkler Accessories

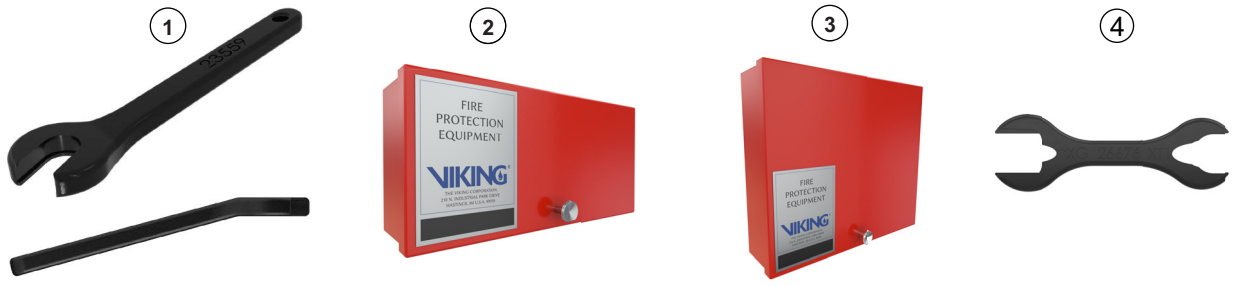


Figure – 4: Sprinkler Accessories

Image Reference	Part Number	Description
1	23559MB	Straight wrench: required for proper installation
2	01724A	Sprinkler cabinet: holds up to 6 sprinklers
3	01725A	Sprinkler cabinet: holds up to 12 sprinklers (not shown)
4	26676	InstaSeal® alignment tool

7. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

Importer EU:

Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

Handling and Installation Instructions

Model XT-1 Upright Sprinklers

	bg	Инсталирайте и пуснете продукта в експлоатация само ако следната инструкция е ясно разбрана.		**lv**	Produkta iemontēšanu un ekspluatācijas sākšanau veikt tikai tad, ja dotā instrukcija ir pilnībā saprasta.
	cs	Namontujte a spusťte do provozu produkt pouze tehdy, když jste jasně pochopili tento návod.		**lt**	Produktą montuokite ir pradėkite eksploatuoti tik tuomet, jei aiškiai suprantate šią instrukciją.
	de	Du må kun montere og idriftsætte produktet, hvis du har forstået følgende vejledning til fulde.		**mt**	Installa u ħaddem il-prodott biss jekk l-istruzzjonijiet li ġejjin jinftiehmu b'mod ċar.
	de	Produkt nur einbauen und in Betrieb nehmen, wenn die nachfolgende Anleitung klar verstanden wird.		**nl**	Product alleen installeren en in gebruik nemen, als de volgende instructies begrepen zijn.
	el	Η εγκατάσταση και θέση σε λειτουργία του προϊόντος επιτρέπονται μόνο εάν οι ακόλουθες οδηγίες έχουν γίνει κατανοητές.		**no**	Ikke installer og ta i bruk produktet uten at følgende anvisninger er tydelig forstått.
	en	Do not install and commission the product unless you have clearly understood the instructions below.		**pl**	Produkt należy montować i uruchamiać tylko wtedy, gdy poniższe instrukcje są w pełni zrozumiałe.
	es	Instalar el producto y ponerlo en funcionamiento solo cuando se hayan comprendido claramente las siguientes instrucciones.		**pt**	Instalar e colocar o produto em funcionamento somente se as instruções a seguir forem claramente compreendidas.
	et	Paigaldage toode ja kasutage seda ainult siis, kui saate alljärgnevast juhendist selgelt aru.		**ro**	Montați produsul și puneți-l în funcțiune numai dacă instrucțiunea următoare este înțeleasă clar.
	fi	Tuotteen saa asentaa ja ottaa käyttöön vain, jos jäljempänä oleva ohje ymmärretään selvästi.		**ru**	Не устанавливайте и не принимайте оборудование в эксплуатацию, если вы четко не поняли инструкции ниже
	fr	N'installer et ne mettre en service le produit que si les instructions suivantes ont été clairement comprises.		**sk**	Namontujte a spustite do prevádzky výrobok iba vtedy, pokiaľ ste jasne pochopili tento návod.
	ga	Ná déan an táirge a shuiteail agus a choimisiunu mura dtuigeann tu na treoracha thios go soileir.		**sl**	Izdelek vgradite in zaženite samo, če ste dobro razumeli navodila v nadaljevanju.
	hr	Ne instalirajte i ne puštajte proizvod u rad ako niste jasno razumjeli donje upute.		**sr**	Не инсталирајте и не пуштајте производ у рад ако нисте јасно разумели упутства у наставку.
	hu	Csak akkor építse be a terméket és helyezze üzembe, ha a következő útmutatót egyértelműen megértette.		**sv**	Montera och driftsätt produkten endast om du förstår den efterföljande instruktionen.
	Is	Settu ekki upp eða taktu vöruna í notkun nema þú hafir skilið greinilega leiðbeiningarnar hér að neðan.		**tr**	Aşağıdaki talimatları açıkça anlamadan ürünü kurmayın ve devreye almayın.
	it	Montare il prodotto e metterlo in funzione solo se si sono comprese appieno le seguenti istruzioni.			

1. PRODUCT IDENTIFICATION

This document covers the following products, hereafter referred to as “sprinkler”:

- VK1001 Standard Response Upright Sprinkler K5.6 (80.6)
- VK2001 Standard Response Upright Sprinkler K8.0 (115)
- VK2002 Standard Response Upright Sprinkler K8.0 (115)
- VK3001 Quick Response Upright Sprinkler K5.6 (80.6)
- VK3501 Quick Response Upright Sprinkler K8.0 (115)
- VK3502 Quick Response Upright Sprinkler K8.0 (115)
- OTHER APPLICABLE DOCUMENTS

2. OTHER APPLICABLE DOCUMENTS

For intended use and relevant conditions for the safe use of the specific sprinkler refer to the appropriate *Technical Data Sheet*.

3. TRANSPORT AND HANDLING

⚠ WARNING

A damaged or compromised sprinkler poses the risk of fatal consequences.

Damaged or compromised sprinklers will not operate properly which could lead to loss of life.

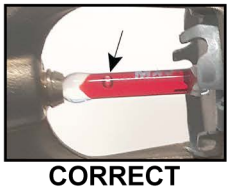
- NEVER use a sprinkler that has been exposed to temperatures exceeding the maximum allowed ambient temperature.
- NEVER use a sprinkler with a loss of liquid from the glass bulb or damage to the fusible element. A small bubble should be visible within the glass bulb; rotate the sprinkler to a horizontal position while observing the bulb to see the bubble.
- NEVER use a sprinkler that has been dropped or damaged.
- ALWAYS Protect the sprinkler from mechanical damage during storage, transport, and handling.
- NEVER use sprinklers that have been painted by anyone other than the manufacturer.
- ALWAYS protect sprinklers from being painted during installation or replacement in accordance with the installation standards.
- NEVER clean sprinklers with anything other than 7 psi or lower compressed air.
- NEVER apply soap, water, ammonia, adhesives, solvents or any other fluids on sprinklers.
- Destroy every damaged or compromised sprinkler.

NOTICE

Protect sprinklers during transport and handling.

- ALWAYS handle the sprinkler with care.
- ALWAYS keep the protective cap on the sprinkler during transport and handling.
- NEVER remove the protective cap until the fire sprinkler system is placed in service and the potential for mechanical damage no longer exists.
- ALWAYS protect the sprinkler from direct sunlight during transport and handling.
- ALWAYS store sprinkler in a cool, dry, protected area.
- ALWAYS use original manufacturer's shipping containers.
- NEVER store a sprinkler loose in a box, bin, bucket, or other type of container.
- ALWAYS keep the sprinkler separated from other sprinklers.
- NEVER allow metal parts to contact the sprinkler operating elements.

NOTE: If the glass bulb included on the sprinkler has been exposed to ultraviolet light, the color inside the bulb may fade. This color change does not affect the operation of the sprinkler.



CORRECT
(Bulb intact, bubble visible)

CORRECT
(Protective caps in place)

CORRECT
Container

INCORRECT
(bulb cracked, fluid missing)

INCORRECT
(Protective caps not in place)

INCORRECT
(Stored loose in a box)

4. INSTALLATION

⚠ WARNING

Installation by insufficiently qualified personnel poses the risk of fatal consequences.

- This sprinkler must be installed properly by qualified personnel familiar with safe practices and applicable and recognized design and installation standards issued, for example, by NFPA, FM, VdS, or LPCB, and trained how to properly perform the installation procedures.

⚠ CAUTION

Cutting Hazard.

Sprinklers, accessories, cabinets, and packaging can have sharp edges that can cause cuts.

- Wear appropriate personal protective equipment (gloves) while handling product.

NOTICE

If the sprinkler will be installed into an IS-W2 InstaSeal™ fitting, refer to F_021123 or F_032219 (CPVC InstaSeal™ adapter) for the proper installation instructions.

Optional Guards, Shields, and Escutcheons: If the sprinkler shall be installed together with a guard, shield, or escutcheon refer to the applicable documents for the products used.

1. Install all required piping in the intended installation location.
2. Verify that the sprinkler model/style, K-factor, temperature rating, and response characteristics are appropriate for the intended installation location. See Table 1 and Figure 4.
3. Inspect the sprinkler for damage. Destroy every damaged or compromised sprinkler.
   The following are examples in which sprinklers are considered damaged or compromised. Replace the sprinkler in the following cases:
   - Sprinkler with a loss of fluid from the glass bulb or damage to the fusible element.
   - Sprinklers that have been field painted, caulked, or mechanically damaged.
   - Sprinklers showing signs of corrosion.
4. Verify that the sprinkler is protected with the protective cap or clip.
5. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only. Do not allow a build-up of compound inside the sprinkler inlet (Figure1).

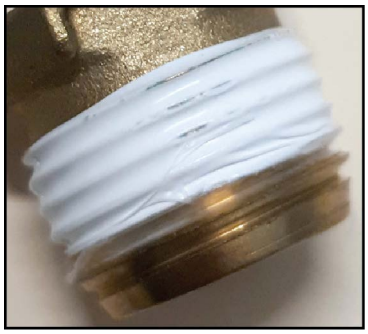


Figure – 1

6. **NOTICE: Do not use the deflector to start threading the sprinkler into a fitting. Use ONLY the approved wrench to install the sprinkler. Refer to the sprinkler's *Technical Data Sheet*.**

   Carefully slide the proper wrench onto the wrench flats (Figure 2).

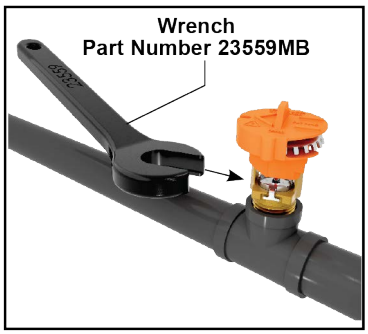


Figure – 2

7. **NOTICE: Over-tightening the sprinkler can cause permanent damage. For 1/2" NPT (or 15 mm BSPT) sprinkler, tighten up to a maximum torque of 14 ft-lbs (19 Nm). For 3/4" NPT (or 20 mm BSPT) sprinkler, tighten up to a maximum of 20 ft-lbs (27,1 Nm).**
   Tighten the sprinkler as necessary (Figure 3). If applicable, install a sprinkler guard and water shield.

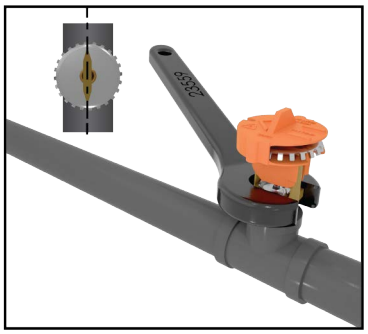


Figure – 3

8. **NOTICE: Sprinkler protective caps/clips must be removed from the sprinkler before placing the system in service. Test the entire sprinkler system.**
   Refer to the applicable system documentation, regulations, and standards to ensure compliance.

Table 1: Sprinkler Markings

Ref	Parameter
A	Response type
B	Listings and approvals
C	Sprinkler type
D	Manufacture date
E	Nominal temperature rating
F	Manufacturer's Sprinkler Identification Number (SIN)

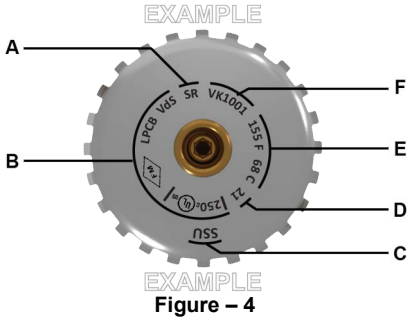


Figure – 4

5. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

Importer EU:

Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

VIKING®

Operation and Maintenance Instructions

Model XT-1 Sprinklers

1. PRODUCT IDENTIFICATION

This document covers the following product, hereafter referred to as “sprinkler” (SR=Standard Response, QR=Quick Response):

- VK1001 SR Upright Sprinkler K5.6 (80.6)
- VK2001 SR Upright Sprinkler K8.0 (115)
- VK2002 SR Upright Sprinkler K8.0 (115)
- VK3001 QR Upright Sprinkler K5.6 (80.6)
- VK3501 QR Upright Sprinkler K8.0 (115)
- VK3502 QR Upright Sprinkler K8.0 (115)
- VK1021 SR Pendent Sprinkler K5.6 (80.6)
- VK2021 SR Pendent Sprinkler K8.0 (115)
- VK2022 SR Pendent Sprinkler K8.0 (115)
- VK3021 QR Pendent Sprinkler K5.6 (80.6)
- VK3521 QR Pendent Sprinkler K8.0 (115)
- VK3522 QR Pendent Sprinkler K8.0 (115)
- VK1181 SR Conventional Sprinkler K5.6 (80.6)
- VK1201 SR Conventional Sprinkler K8.0 (115)
- VK1202 SR Conventional Sprinkler K8.0 (115)
- VK3101 QR Conventional Sprinkler K5.6 (80.6)
- VK3541 QR Conventional Sprinkler K8.0 (115)
- VK3542 QR Conventional Sprinkler K8.0 (115)

⚠ WARNING

Cancer and Reproductive Harm www.P65Warning.ca.gov

2. OTHER APPLICABLE DOCUMENTS

For intended use and relevant conditions for the safe use of the specific sprinkler, refer to the appropriate Technical Data Sheet. In case an installed sprinkler needs to be replaced, refer to the appropriate Handling and Installation Instructions for the installation of the new sprinkler.

3. MAINTAINING OPERATIONAL READINESS

Functionality

During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to control or extinguish the fire.

⚠ WARNING

This section contains important safety information. Read and follow all information.

Damaged or Compromised Sprinklers

Damaged or compromised sprinklers will not operate properly which could lead to loss of life.

- NEVER clean, paint, or caulk sprinklers.
- NEVER apply soap, water, ammonia, adhesives, solvents or any other fluids on sprinklers.
- NEVER expose sprinklers to temperatures exceeding the maximum allowed ambient ceiling temperature. See the Technical Data Sheet.
- ALWAYS replace a compromised or damaged sprinkler.
- NEVER attempt to repair or reassemble a sprinkler.
- ALWAYS replace operated sprinklers and cover assemblies and sprinklers exposed to corrosive products of combustion.
- Replacement of sprinklers must only be performed following the instructions in section 4.

The following are examples in which sprinklers are considered damaged or compromised. Replace the sprinkler in the following cases:

- Sprinkler with a loss of fluid from the glass bulb or damage to the fusible element.
- Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged.
- Sprinklers showing signs of extraordinary corrosion.

Obstructions and obstacles

Obstructions and obstacles may compromise sprinkler discharge patterns which are critical for proper fire protection.

- NEVER attach items to sprinklers or hang items from the ceiling in an area protected with sprinklers.
- NEVER install walls in areas protected with sprinklers without having a specialized company verifying the design of the sprinkler system.
- ALWAYS remove obstructions and obstacles to sprinkler spray patterns.

Sprinkler systems that have been subjected to a fire

Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible.

- After an event of fire, the entire sprinkler system must be inspected for damage and repaired as necessary.
- Refer to the minimum requirements of the Authority Having Jurisdiction for replacement of sprinklers.
- Consider the employment of a fire patrol as long as the sprinkler system is out of service.

Inspections and testing

The owner is responsible for having the sprinklers inspected and tested according to standards of the applicable approval body and to the requirements of the Authority Having Jurisdiction to maintain proper operating condition of the system.

- Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the sprinkler.

The applicable approval body or Authority Having Jurisdiction may require sprinklers to be replaced after a specified term of service.

- Refer to the standards of the applicable approval body, such as NFPA, FM, VdS, or LPCB, and the requirements of the Authority Having Jurisdiction for detailed inspection, testing and replacements requirements.

Sprinklers removed from the system for testing or for any other purpose must be replaced according to section 4.

4. REMOVAL AND REPLACEMENT

⚠ WARNING

Removal and replacement of sprinklers by insufficiently qualified personnel poses the risk of fatal consequences in case of fire.

- Removal or replacement of sprinklers must be performed by qualified personnel familiar with safe practices and applicable and recognized design and installation standards issued, for example, by NFPA, FM, VdS, or LPCB, and trained how to properly perform the installation procedures.

⚠ WARNING

Removal and replacement of sprinklers will temporarily eliminate the fire protection capabilities of the sprinkler system.

- Consider the employment of a fire patrol in the affected area.
- Prior to proceeding, notify all Authorities Having Jurisdiction.

⚠ WARNING

Re-installation of a removed sprinkler may compromise the operational safety of the sprinkler system.

- NEVER reinstall a removed sprinkler.
- ALWAYS use new sprinklers for replacement.

1. Select new sprinklers with identical performance characteristics as well as respective accessories such as escutcheons, cover plates, and protective caps. A stocked spare sprinkler cabinet may be provided for this purpose on site.
2. According to appropriate system description and/or valve instructions, remove the system from service, drain all water, and relieve all pressure on the piping.
3. Only for flush and concealed style sprinklers: Remove the ceiling ring or cover plate assembly of the old sprinkler by gently unthreading or pulling it off the sprinkler body (depends on the sprinkler model used).
4. Use the proper sprinkler wrench for the old sprinkler according to its Technical Data Sheet.
5. Only for flush and concealed style sprinklers, but not for domed concealed sprinklers: Replace the plastic protective cap over the old sprinkler and fit the wrench over the cap.
6. Use the wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.
7. Install the new sprinkler by following its Handling and Installation Instructions.
8. Place the system back in service and secure all valves.
9. Check for and repair all leaks.

5. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system.

6. CONTACT

The sprinkler and accessories are available through Viking distributors only. Contact your local Viking sales office which can be found on our website:

Americas and Asia: www.vikinggroupinc.com/locations OR Europe, Middle East, Africa (EMEA): www.viking-emea.com/contact

Manufacturer:

The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
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Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:

The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Viking Standard and Quick Response Concealed Pendent Sprinkler VK4621 is a small thermosensitive, glass-bulb sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The low-profile cover assemblies provide up to ½" (13 mm) of vertical adjustment.

Features:

- K5.6 (80.6 metric).
- Quick response glass bulb operating element.
- Integral threaded adapter cup accepts push-on or thread-on cover plates.
- Low-profile, small diameter, removeable cover plates offer almost flush appearance upon installation and allow ease of maintenance.
- Protective cap prevents damage during installation and finishing and keeps errant overspray from coating internal parts.
- Various finishes available to meet design requirements.
- Optional Electroless Nickel PTFE (ENT) coating provides corrosion resistance (see Approval Chart).

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class 2015
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 psi (-207mbar)

VdS Approved: Standard EN 12259-1:199 + A3:2006; Certificate Number G 422002

LPCB Approved: Standard EN 12259-1:199 + A3:2006; Certificate Number 096e

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

CE: Standard EN 12259-1:1999 + A3:2006, Sprinkler, DOP_VK4621, 2831, 2023

MED Approved: Standard EN 12259-1:1999 + A3:2006, DOC_MED_VK4621, 2831.

UKCA Approved: Standard EN 12259-1:1999 + A3:2006, DOC_UKCA_VK4621, 0832, 2023.

China Approval: Approved according to China GB standard.

Refer to the Approval Charts and Design Criteria on for cULus Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 psi (0.5 bar)
Maximum Working Pressure: FM - 175 psi (12 bar). UL - 250 psi (17.2 bar)
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2" NPT or 15 mm BSPT
Nominal K-Factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

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

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

Material Standards:
Sprinkler body: QM Brass or DZR Brass
Deflector: Phosphor Bronze UNS-C51000
Deflector pins: Stainless steel UNS-S43000
Pip cap: Copper UNS-C11000
Pip cap insert: stainless steel UNS-S30400
Pip cap T-hinge ring: Stainless steel UNS-S31600
Compression screw: UNS-C36000
Belleville spring sealing assembly: Nickel alloy, coated on both sides with PTFE tape
Cover adapter: Cold rolled steel JIS G3141 and carbon steel UNS-G10100 (per JIS G3141)
Shipping cap: High density polyethylene

Cover Plate Materials:
Cover plate assembly: Copper UNS-C11000 and brass UNS-C26800 or stainless steel UNS-S30400
Spring: Beryllium nickel
Solder: Eutectic

Ordering Information: Refer to Tables 1 and 2.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards and installation instructions in this document.

5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor contact The Viking Corporation.

8. GUARANTEE

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

VIKING®

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Ordering Instructions - Sprinkler Base

1. Choose a sprinkler base part number with the required thread size and listing or approval (refer to the approval chart).
2. Add the suffix for the desired finish.
3. Add the suffix for the desired temperature rating.
4. Order a cover plate (refer to Ordering Instructions - Cover Plate).

EXAMPLE: **24682AB** = VK4621 with brass finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C).

1. Sprinkler Base Part Numbers

Part Number	Thread Size
24682	½" NPT
22962	15 mm BSPT
26548[7]	15 mm BSPT

2. Available Finishes

Description	Suffix
Brass	A
ENT[2,3,5]	JN

3. Temperature Ratings

Sprinkler Temperature Classification	Temperature Rating	Bulb Color	Maximum Ambient Ceiling Temperature[1]	Suffix
Ordinary	155 °F (68 °C)	Red	100 °F (38 °C)	B
Intermediate	175 °F (79 °C)	Yellow	150 °F (66 °C)	D
Intermediate	200 °F (93 °C)	Green	150 °F (66 °C)	E

Accessories

Part Number	Description
23143	Installation wrench[4,6]
14412	Concealed cover plate installer tool, for use with push-on cover plates only (available since 2007)
14867	Large concealed cover plate installer tool, for use with push-on cover plates only (available since 2007)
01731A	Sprinkler cabinet; holds up to 6 sprinklers (available since 1971)

FOOTNOTES

1. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
2. UL Listed as corrosion resistant.
3. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.
4. Requires a 1/2" ratchet which is not available from Viking.
5. FM Approved as a decorative finish.
6. The installation wrench is intended to be used for a maximum of 500 sprinkler installations at a maximum torque of 14 ft-lbs (19 Nm).
7. See Approval Chart for approval information.

VIKING®

TECHNICAL DATA

STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (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

Ordering Instructions - Cover Plate

1. Choose a cover plate base part number with the desired shape and style (refer to the approval chart).
2. Add the suffix for the desired finish.
3. Add the suffix for the required temperature rating.

Note: *for stainless steel versions, skip steps 2 and 3 (finishes and paint are not available).*

Example:
23190MC/W = Thread-On style, 165 °F (74 °C) Temperature Rated, 2¾" (70 mm) diameter Round Cover Plate with a Painted White finish.

1. Cover Plate Base Part Numbers[3, 6]

Style	Base Part Number[5]	Size Inches (mm)	Shape (type)
Thread-On Style	23190	2 ¾ (70) diameter	Round
	23174	3 5⁄16 (84) diameter	Round
	23179	3 5⁄16 (84)	Square
	23174-/CR	3 5⁄16 (84) diameter	Round (clean room)
	▼Stainless Steel material[4]		
	23193	2 ¾ (70) diameter	Round
	23183	3 5⁄16 (84) diameter	Round
	23183-/CR	3 5⁄16 (84) diameter	Round (clean room)
Push-On Style	23447	2 ¾ (70) diameter	Round
	23463	3 5⁄16 (84) diameter	Round
	23482	3 5⁄16 (84)	Square
	23463-/CR	3 5⁄16 (84) diameter	Round (clean room)
	▼ Stainless Steel material[4]		
	23455	2 ¾ (70) diameter	Round
	23473	3 5⁄16 (84) diameter	Round
	23473-/CR	3 5⁄16 (84) diameter	Round (clean room)

2. Available Finishes[5]

Description	Suffix
Polished Chrome	F
Brushed Chrome	F_/B
Bright Brass	B
Antique Brass	B_/A
Brushed Brass	B_/A
Brushed Copper	B_/A
Painted White	M_/W
Painted Ivory	M_/I
Painted Black	M_/B

3. Temperature Rating Matrix

IMPORTANT: The required cover plate temperature rating is determinted by the sprinkler's temperature rating.

Sprinkler Temperature Classification[1]	Required Cover Plate Temperature Rating	Corresponding Sprinkler Nominal Temperature Rating	Maximum Ambient Ceiling Temperature[2]	Suffix
Ordinary	139 °F (59 °C)	155 °F (68 °C)	100 °F (38 °C)	A
Intermediate	165 °F (74 °C)	200 °F (93 °C)	150 °F (66 °C)	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. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
4. Stainless Steel versions are not available with any finishes or paint.
5. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
6. For use with gasketed cover plates has been evaluated as part of the UL Listing.

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TECHNICAL DATA

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Approval Chart

Concealed Pendent Sprinkler VK4621
1/2" NPT or 15 mm BSPT, Nominal K-factor 5.6 U.S. (80.6 metric[2])

Listings and Approvals[3] (Refer also to Design Criteria)

Sprinkler Base Part No.[1]	cULus[4, 9]	China Approval	FM	VdS	LPCB	CE	MED	UKCA
	Maximum Water Working Pressure 250 psi (17.2 bar)		Maximum Water Working Pressure 175 psi (12 bar)					
Standard Response Applications								
24682A	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1
24682JN[7,8]	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	--	--	--	--	--
22962A	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1	AV1, CX1
22962JN[7,8]	--	--	AV1, BX1, AS2, BT2, BW1, CX1, CT2, CX1	--	--	--	--	--
Quick Response Applications								
24682A	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
24682JN[7,8]	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
22962A	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
22962JN[7,8]	AV1, BX1, AS2, BT2, CX1, CT2	--	--	--	--	--	--	--
26548	AV1, BX1, AS2, BT2, CX1, CT2	AV1, CX1, AS2, CT2	--	--	--	--	--	--

Approved Sprinkler Temperature Rating Key	Approved Cover Plate Assembly Finishes Key[5]	Approved Cover Plate Finishes Key
A = 155 °F (68 °C) **B = 175 °F (79 °C)** **C= 200 °F (93 °C)**	**S = 139 °F (59 °C) Stainless steel covers (23193, 23455, 23183, and 23473)** **T = 165 °F (74 °C) Stainless steel covers (23193, 23455, 23183, and 23473)** **V = 139 °F (59 °C) covers (23190, 23447, 23174, 23463, 23179, and 23482)** **W = 165 °F (59 °C) square covers (23179 and 23482)** **X = 165 °F (74 °C) covers (23190, 23447, 23174, and 23463)**	**1 = Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted[6] White, Painted[6] Ivory, or Painted[6] Black** **2 = Stainless Steel**

Footnotes

1. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
2. Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
3. This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.
4. Listed by Underwriter's Laboratories for use in the U.S. and Canada.
5. The 139 °F (59 °C) covers have an orange label. The 165 °F (74 °C) covers have a white label.
6. Other paint colors are available on request with the same listings as the standard paint colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information.
7. cULus Listed as corrosion-resistant.
8. FM Approved as a decorative finish.
9. Refer to the Cleanroom Sprinkler Cover Assembly technical data sheet for Viking's UL Listed cover plates with built-in gaskets.

NOTE: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 2.

VIKING®	TECHNICAL DATA	STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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DESIGN CRITERIA - UL

(Also refer to Approval Chart)

cULus Listing Requirements:

Concealed Pendent Sprinkler VK4621 is cULus Listed as quick response for installation in accordance with the latest edition of NFPA 13 for standard coverage pendent spray sprinklers as indicated below.

- For hazard occupancies up to and including Ordinary Hazard, Group II.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13. Maximum spacing allowed is 15 ft. (4.6 m).
- Minimum spacing allowed is 6 ft. (1.8 m) unless baffles are installed in accordance with NFPA 13.
- Minimum distance from walls is 4 in. (102 mm).
- Maximum distance from walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler obstruction rules contained in NFPA 13 for standard coverage pendent spray sprinklers must be followed.

NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.

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.

DESIGN CRITERIA - FM

(Also refer to Approval Chart)

FM Approval Requirements:

Viking Concealed Pendent Sprinkler VK4621 is FM Approved as a standard response **Non-Storage** concealed pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from 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, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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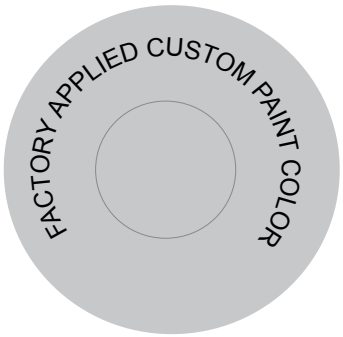
Figure 1: Installation Wrench



All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.

Figure 2: Identification of Custom Paint

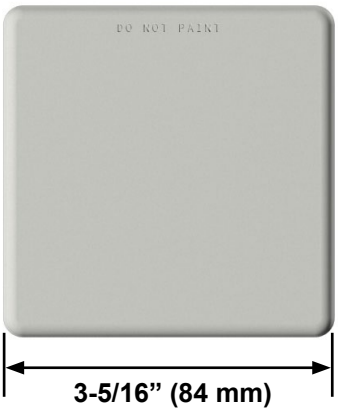


Figure 3: Square Cover Assembly

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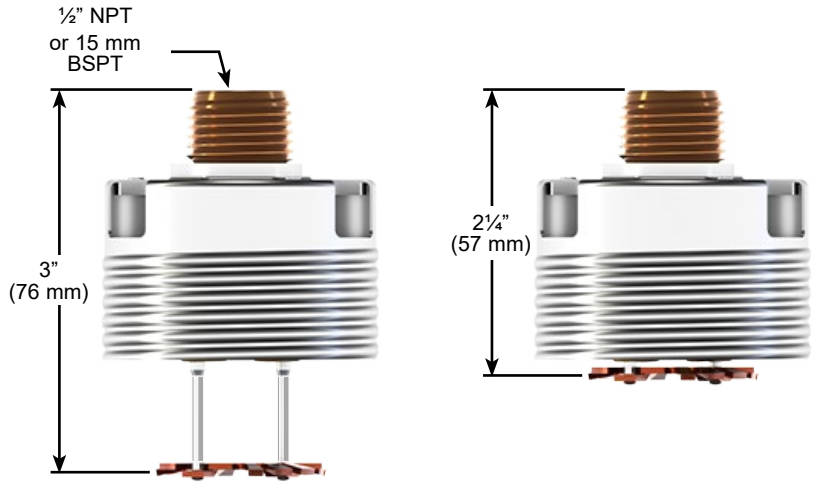
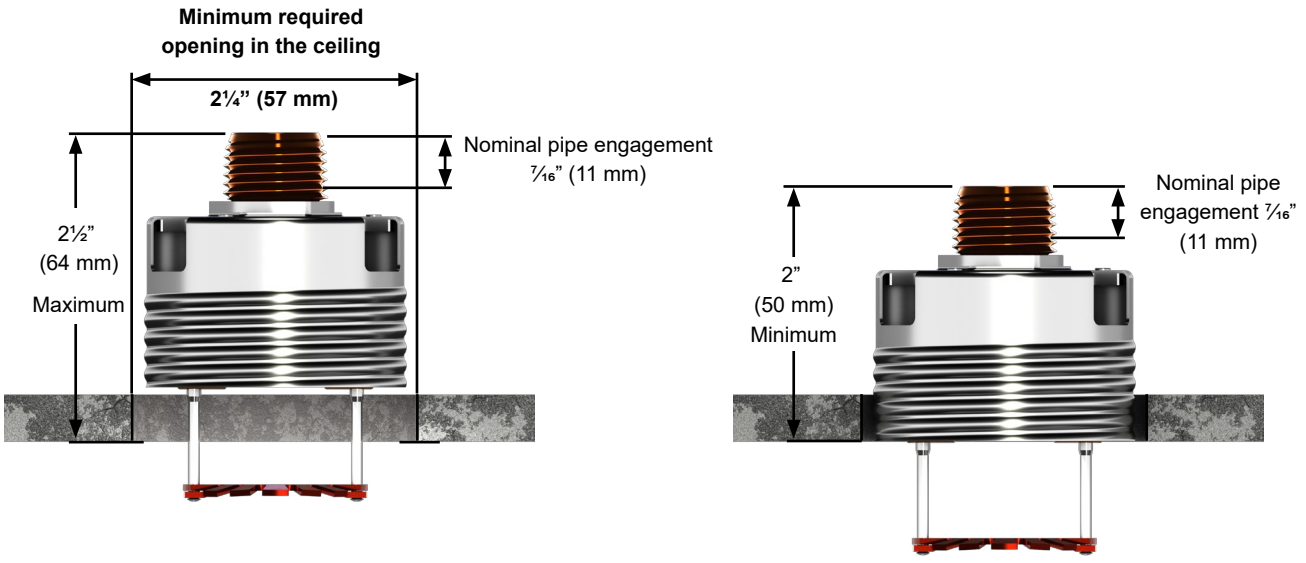


NOTE: *Image is representative only. Actual product may vary.*

Figure 4: Sprinkler Dimensions



NOTE: *Image is representative only. Actual product may vary.*

Figure 5: Sprinkler Installation Dimensions

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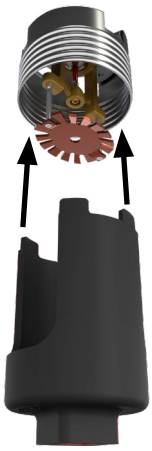
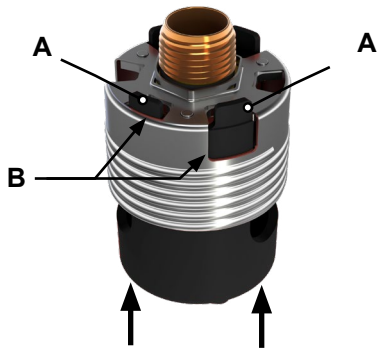
NOTICE: USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly install this sprinkler.

Step 1:
Remove the protective cap.

Step 2:
Insert the wrench into the sprinkler adapter.



Step 3:
Rotate the wrench slightly in either direction until the tines on the wrench (A) line up with the vent openings (B) on the adapter cup and lock into place. NOTE: A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1-½ turns past finger-tight.

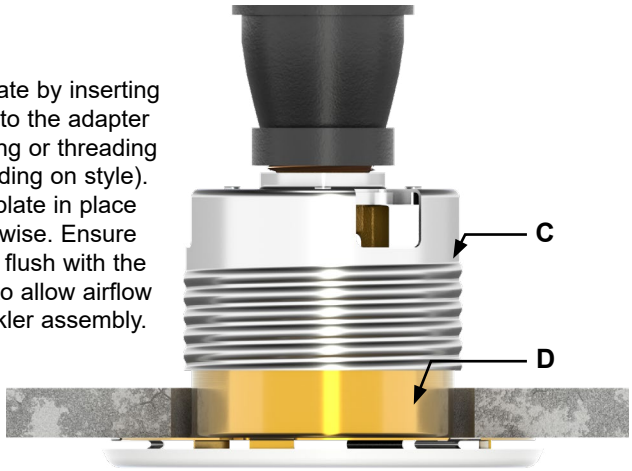


NOTE: *Image is representative only. Actual product may vary.*

Figure 6: Using the Sprinkler Wrench

Install the cover plate by inserting the adpater (D) into the adapter cup (C) and pushing or threading into place (depending on style). Snug the cover plate in place by rotating clockwise. Ensure the cover plate is flush with the ceiling as shown to allow airflow through the sprinkler assembly.

Minimum

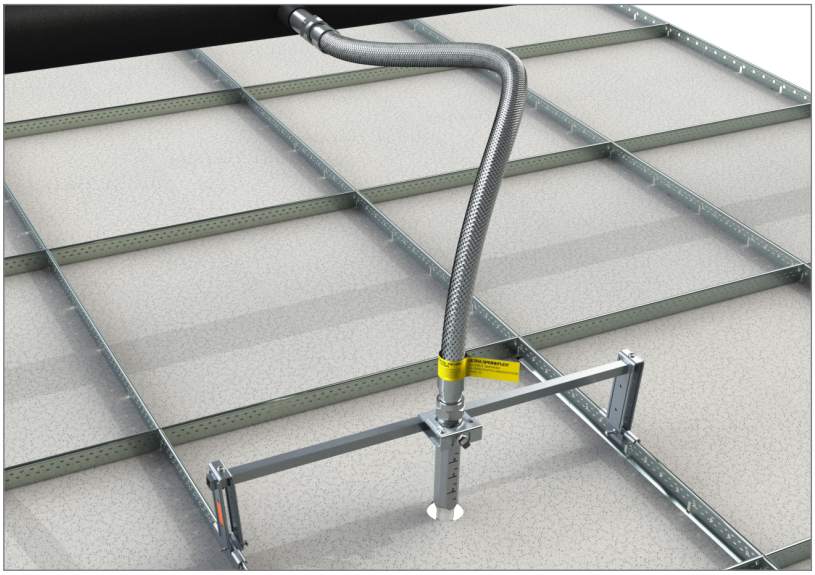


Maximum

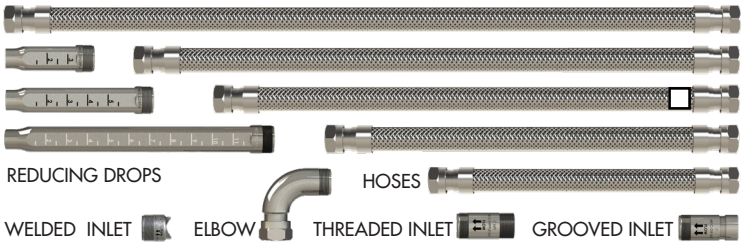
NOTE: *Image is representative only. Actual product may vary.*

Figure 7: Installing the Cover Plate

ULTRA SPRINKFLEX®



HB1 Series Hose Components



Standard Hose come assembled with 1" NPT threaded inlet and 7"reducing drop. Optional component sold separately in box of 20.

Hose lengths 28", 40", 48", 59", & 71"

Hose Inlet Connections

- o Standard: 1" NPT threaded inlet
- o Optional: 1" cut groove Inlet
  1" weld out for 1 - 1 ¼" – 5" branch size.

Hose Reducing Drops

- o Standard: Tall 7" reducing drop, ½" or ¾"
- o Optional: Short 4" reducing drop, ½" or ¾"

Xtra-Long 13" reducing drop ½", ¾"

Elbow - Optional

Ultra SprinkFLEX® is an economical, versatile 1" hose solution for fire sprinkler system engineers, designers, and installers.

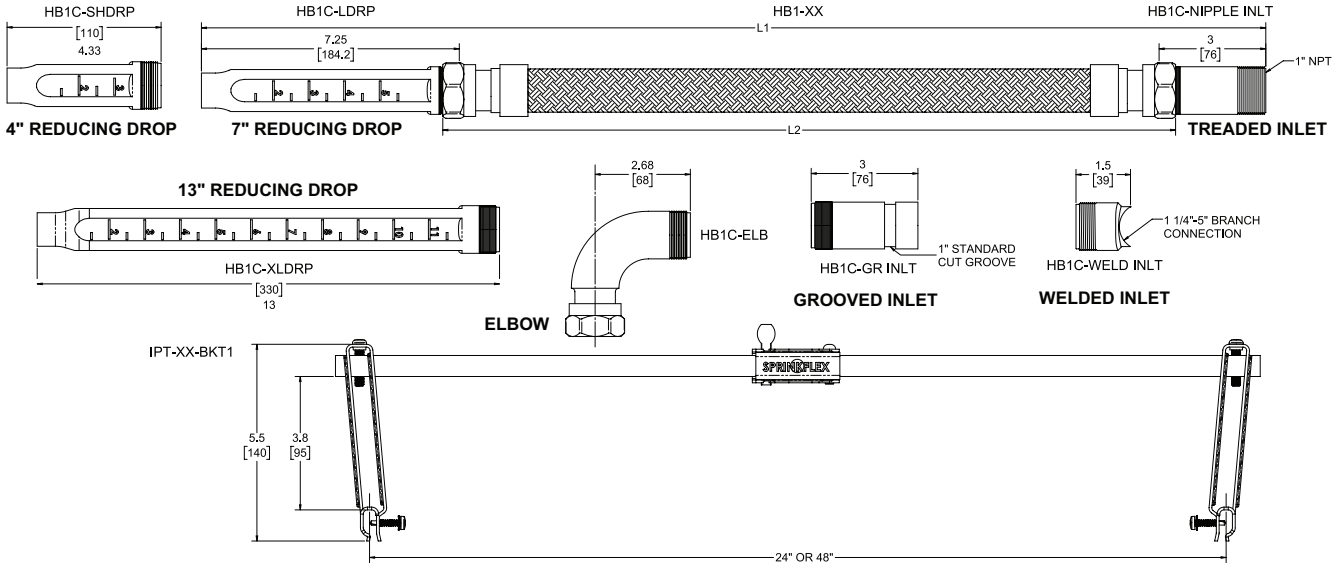
The three piece design is available with interchangeable components to create a flexible fire sprinkler hose solutions for all obstacles encountered in the field. Ultra SprinkFLEX hoses are available in 28", 40", 48", 59", and 71".

The 71" hose is designed to accept up to 12 bends for the longest length, eliminating the need to count or measure bends, leading to faster installs and inspections that lead to quicker occupancy.

Ultra SprinkFLEX® Feature and Benefits

- Fully braided three piece hose design
- Interchangeable components
- UL listed for tight 2-inch Bend Radius
- 71" hose designed to accept up to 12 bends
- High temperature silicone gasket design rated at 250˚ UL, 174˚ FM
- Threaded, groove, and weld inlet components for branch connection
- Accommodates pendant, semi-recessed, and concealed sprinkler heads
- SprinkFLEX® name provides unmatched quality and value

ULTRA SPRINKFLEX®



ULTRA SPRINKFLEX - 1" INTERNAL DIAMETER (I.D.) HB1 HOSE SERIES & COMPONENTS (UL/FM)

MODEL NUMBER	INLET SIZE (INCHES) CM	OUTLET ORIFICE SIZE (INCHES) CM	ASSEMBLY LENGTH [L1] INCHES (mm)	BRAIDED HOSE ASSEMBLY LENGTH (L2)	MINIMUM BEND RADIUS		MAX NUMBER OF 90 BENDS		EQUIVALENT LENGTH OF 1in. DIAMETER SCHEDULE 40 PIPE FT (m)		MAX RATED WORKING PRESSURE	
					FM in. (mm)	UL in.(mm)	UL	FM	(UL)	(FM)	UL PSI (KPA)	FM PSI (KPA)
1" INTERNAL DIAMETER (I.D) HOSE SERIES												
HB1-28-H	1	½ (1.27)	27 (700)	19.15 (486)	7 (203)	2 (50.8)	4	1	15	14.5 (4.4)	175 (1205)	175 (1205)
HB1-40-H			40 (1000)	30.15 (766)			5	2	21	20.8 (6.3)		
HB1-48-H			48 (1200)	38.15 (969)			8	3	29	22.4 (6.8)		
HB1-59-H			59 (1500)	50.15 (1274)			10	3	45	31.4 (9.5)		
HB1-71-H[1]			71 (1800)	62.15 (1325)			12	4	57	36.3 (11.0)		
HB1-28-T	1	¾ (1.90)	27 (700)	19.15 (486)	7 (203)	2 (50.8)	4	1	15	14.(4 .3)	175 (1205)	175 (1205)
HB1-40-T			40 (1000)	30.15 (766)			5	2	21	20.7 (6.3)		
HB1-48-T			48 (1200)	38.15 (969)			8	3	29	22.3 (6.7)		
HB1-59-T			59 (1500)	50.15 (1274)			10	3	45	31.3 (9.5)		
HB1-71-T[1]			71 (1800)	62.15 (1325)			12	4	57	36.2 (11.0)		
1" INTERNAL DIAMETER (I.D) HOSE SERIES COMPONENTS												
HB1-28	1	N/A	19 (486)	N/A	7 (203)	2 (50.8)	4	1	9	4.3 (1.3)	175 (1205)	175 (1205)
HB1-40			30 (766)				5	2	15	10.4 (3.1)		
HB1-48			38 (969)				8	3	23	12.2 (3.7)		
HB1-59			50 (1274)				10	3	40	21.2 (6.4)		
HB1-71			62 (1579)				12	4	57	26.1 (7.9)		
HB1C-ELB[1]	1"	1 (25.4)	3.15 (80)		N/A	N/A	N/A	N/A	2	4 (1.2)	175 (1205)	175 (1205)
HB1C-SHDRP-H		½ (1.27)	4.3 (110)						5	8.4 (2.5)		
HB1C-SHDRP-T		¾ (1.90)	4.3 (110)						5	8.2 (2.4)		
HB1C-LDRP-H		½ (1.27)	7.25 (184)						6	9.2 (2.8)		
HB1C-LDRP-T		¾ (1.90)	7.25 (184)						6	9.1 (2.7)		
HB1C-XLDRP-H		½ (1.27)	13 (330)						6	11.4 (3.4)		
HB1C-XLDRP-T[1]		¾(1.90)	13 (330)						6	11.2 (3.4)		
HB1C-WELD INLT		1 (25.4)	3 (106)						0	0 (0)		
HB1C-NIPPLE INLT		1 (25.4)	3 (106)						0	1 (0.3)		
HB1C-GR INLT		1 (25.4)	3 (106)							1 (0.3)		

[1] NOT EVALUATED BY UL.

INSTALLATION INSTRUCTIONS

IPT24BKT1 & IPT48BKT1 Open Hub Tall Bracket (IPT)

Installation of SPRINKFLEX Commercial Ceiling Flexible Sprinkler Drop System

HOSE MODEL:
HB1 Ultra SprinkFLEX Series; HB1-28, HB1-40, HB1-48, HB1-59, HB1-72, HB1C Components

HB Series: HB-28, HB-40, HB-48, HB-59, HB-71 HBE-28, HBE-40, HBE-48, HBE-59, HBE-71

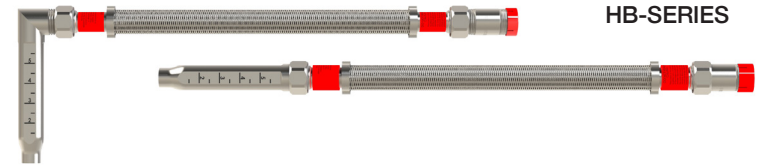
HN Series: HN-28, HN-40, HN-48, HN-59, HN-71 HNE-28, HNE-40, HNE-48, HNE-59, HNE-71

BRACKET MODEL:
IPT24BKT1
IPT48BKT1

c UL us LISTED FM APPROVED

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

HB1- Ultra SprinkFLEX SERIES



HB-SERIES

HN-SERIES

Our SprinkFLEX flexible sprinkler hose fitting are UL approved for limited flexibility and intended to use for direct connection to fire sprinkler in wet / dry systems in accordance with NFPA 13, 13D and 13R. Our SprinkFLEX flexible sprinkler hose fitting can be installed for use in ceilings with grids which meets ASTM C635 and ASTM C636 referenced by IBC, and is approved for use in standard intermediate and heavy duty structural classification.

1 Determine the place where the sprinkler head will be located. The standard bracket IPT24BKT1 is 24 inches (600mm) long and shall be mounted on the 24 inch (600mm) ceiling grid. The long bracket IPT48BKT1 is 48 inches long (1200mm) long and shall be mounted on the 48 inch (1200mm) ceiling grid. The sprinkler should be located as close as possible to the center of the distance between ceiling grids (if necessary).

2 Locate the center of the ceiling tile. Screw 1" offset from the center for the true center of the title installation. Insert one bracket leg at a time, applying a downward pressure on the bracket leg and T-bar. Secure self-drilling screw using a phillips head drive. Place the second screw leg on the T-bar and repeat the process. See Fig 1.

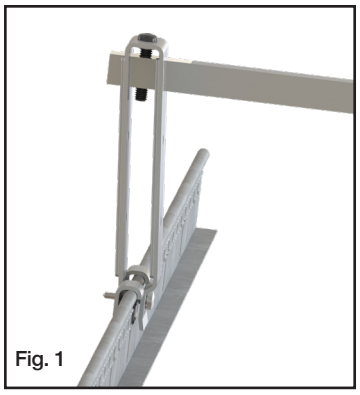


Fig. 1

3 Separate inlet component (if necessary) from the flexible hose and attach the inlet component onto the branch line. Make sure that the arrow is in the appropriate direction of flow to the sprinkler. For threaded connections use pipe sealant and/or Teflon tape the connection to the branch line. For groove coupling installation please refer to the manufacturing installation instructions See Fig. 2. Attach one end of the flexible hose on to the inlet component and tighten the slip nut to hand tight plus 1/2 turn (equivalent to 15 ft-LBS.) Do not twist the flexible hose. See Fig. 3.

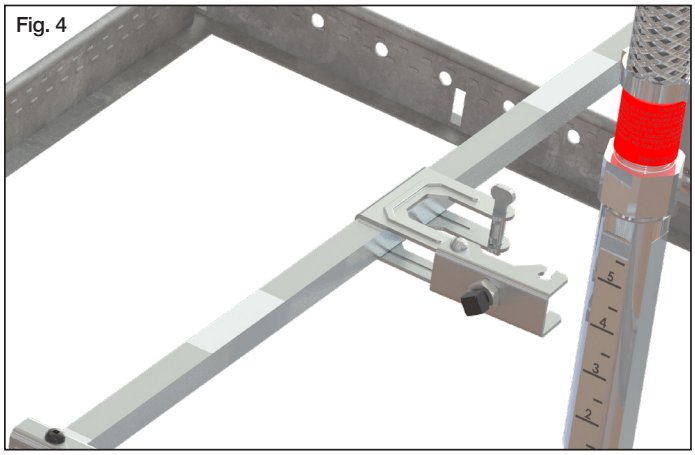
Fig. 2

Fig. 3

4 Manoeuver the flexible sprinkler drop from branch to the IPT bracket. Maneuver the flexible sprinkler drop from branch to the IPT bracket. Review that the hose length, number of bends, and bend radius are applicable for installation per UL, FM, & NFPA guidelines. (See corresponding hose technical data sheet). The tube arc should not be twisted and arc should be as large and smooth as possible. FLEXIBLE HOSES ARE NOT TO BE INSTALLED STRAIGHT (NO BENDS).

Note: The 7/8" HB & HN series hose should not be bent within 2 1/2 inches (64 mm) of the connection nut at both ends.

Fig. 4



5 The IPT bracket has an open hub for ease of installation. Open the hinge apparatus by turning the locking shaft ¼ turn. Slide the flexible hose drop into the hub.Ensure the drop is vertical and has is not applying a substantial moment on the bracket causing sprinkler head misalignment. See Fig. 4.

6 Latch the hinge door closed and adjust the sprinkler drop for desired ceiling height. Tighten the set screw to 130in-lbs (hand tight plus ¾ turn. See Fig 5.

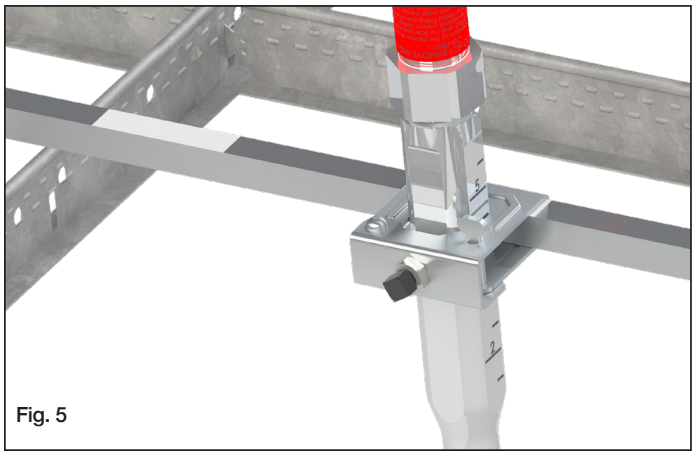
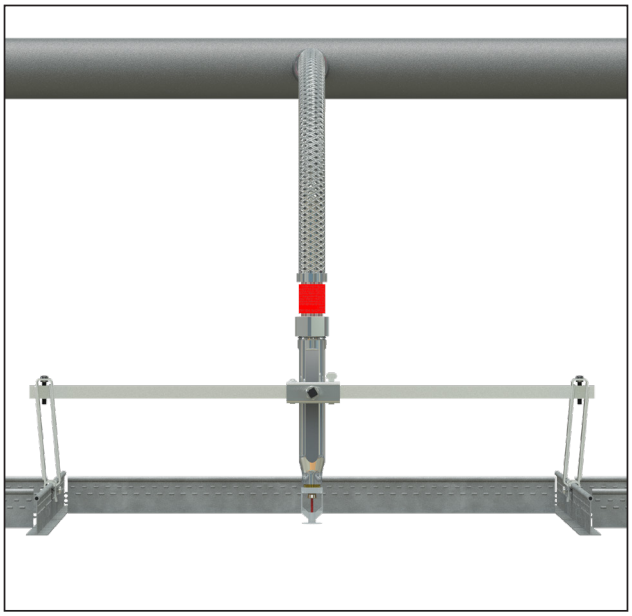


Fig. 5

7 Ceiling tile Installation- The flexible sprinkler drop system with IPT bracket is able to be installed prior to the ceiling tile installation, preventing the need for sprinkler contractor tile adjustment. For ease of tile installation, cut the largest sprinkler hole recommended by sprinkler head manufacturer. The largest hole that is still covered by the sprinkler escutcheon allows for an easier install. Angle the tile at a 45 degree and push the tile through the hole and up above the ceiling T-bar, maneuver the tile and allow it to drop in the proper location. (Fig. 6)

8 Install desired Sprinkler head, per the Sprinkler head manufacturers installation instructions.



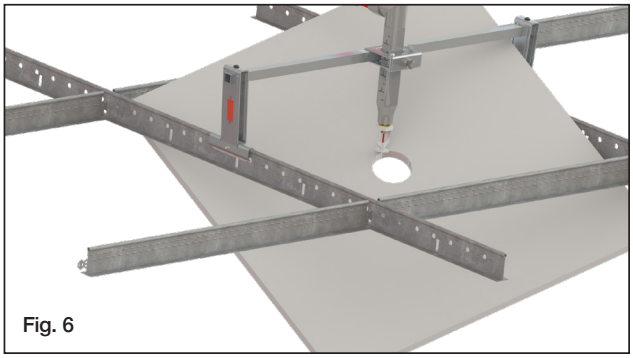


Fig. 6

⚠ WARNING

- Read and understand all instructions before attempting to install any SprinkFLEX® products.
- Wear safety glasses, hardhat, and foot protection during installation.
- These installation instructions are intended for an experienced, trained installer.
- The user must understand the purpose of these products, common industry standards for safety, and the potential consequences of improper product installation.
- De-pressurize the system before performing maintenance on the flexible hose assembly.
- Failure to follow these installation instructions could cause improper sprinkler operation, resulting in serious personal injury and/or property damage. Installation for ASTM C635 metal ceiling suspension systems installed in accordance with ASTM C636 standards.

7/8" ID SPRINKFLEX HOSE (UL & FM) FRICTION LOSS DATA & SPECIFICATIONS

MODEL NUMBER	INLET SIZE (INCHES) CM	OUTLET ORIFICE SIZE (INCHES) CM	HOSE ASSEMBLY LENGTH [L] INCHES (mm)	MINIMUM BEND RADIUS		MAX NUMBER OF 90° BENDS		EQUIVALENT LENGTH OF 1in. DIAMETER SCHEDULE 40 PIPE FT (m)			MAX RATED WORKING PRESSURE	
				FM in. (mm)	UL in. (mm)	UL	FM	(UL)	(FM) 5.6 k-factor	(FM) 8.0 k-factor	UL PSI (KPA)	FM PSI (KPA)
1" INTERNAL DIAMETER (I.D) HOSE SERIES												
HB28H-7	1	1/2 (1.27)	27 (700)	8 (203)	3 (76.2)	2	1	28	18.6 (5.7)	-	200 (1379)	175 (1205)
HB40H-7			40 (1000)			3	1	52	24.6 (7.5)	-		
HB48H-7			48 (1200)			3	3	64	28.5 (8.6)	-		
HB59H-7			59 (1500)			3	3	72	34.4 (10.4)	-		
HB71H-7			71 (1800)			3	4	94	40.4 (12.3)	-		
HB28T-7	1	3/4 (1.90)	27 (700)	8 (203)	3 (76.2)	2	1	28	-	18.8 (5.7)	200 (1379)	175 (1205)
HB40T-7			40 (1000)			3	1	52	-	24.8 (7.6)		
HB48T-7			48 (1200)			3	3	64	-	28.7 (8.7)		
HB59T-7			59 (1500)			3	3	72	-	34.6 (10.5)		
HB71T-7			71 (1800)			3	4	94	-	40.6 (12.4)		
HN28H-7	1	1/2 (1.27)	27 (700)	-	3 (76.2)	2	-	28	-	-	200 (1379)	-
HN40H-7			40 (1000)			3	-	52	-	-		
HN48H-7			48 (1200)			3	-	64	-	-		
HN59H-7			59 (1500)			3	-	72	-	-		
HN71H-7			71 (1800)			3	-	94	-	-		
HN28T-7	1	3/4 (1.90)	27 (700)	-	3 (76.2)	2	-	28	-	-	200 (1379)	-
HN40T-7			40 (1000)			3	-	52	-	-		
HN48T-7			48 (1200)			3	-	64	-	-		
HN59T-7			59 (1500)			3	-	72	-	-		
HN71T-7			71 (1800)			3	-	94	-	-		
HBE28H-6 & HBE28H-7	1	1/2 (1.27)	27 (700)	8 (203)	3 (76.2)	2	1	33	20.6 (6.3)	-	-	175 (1205)
HBE40H-6 & HBE40H-7			40 (1000)			3	1	56	26.6 (8.1)	-		
HBE48H-6 & HBE48H-7			48 (1200)			3	3	67	30.5 (9.3)	-		
HBE59H-6 & HBE59H-7			59 (1500)			3	3	76	36.4 (11.1)	-		
HBE71H-6 & HBE71H-7			71 (1800)			3	4	97	42.4 (12.9)	-		
HBE28T-6 & HBE28T-7	1	3/4 (1.90)	27 (700)	8 (203)	3 (76.2)	2	1	33	-	20.8 (6.3)	-	175 (1205)
HBE40T-6 & HBE40T-7			40 (1000)			3	1	56	-	26.8 (8.2)		
HBE48T-6 & HBE48T-7			48 (1200)			3	3	67	-	30.7 (9.4)		
HBE59T-6 & HBE59T-7			59 (1500)			3	3	76	-	36.6 (11.2)		
HBE71T-6 & HBE71T-7			71 (1800)			3	4	97	-	42.6 (13.0)		
HNE28H-6 & HNE28H-7	1	1/2 (1.27)	27 (700)	-	3 (76.2)	2	-	33	-	-	-	175 (1205)
HNE40H-6 & HNE40H-7			40 (1000)			3	-	56	-	-		
HNE48H-6 & HNE48H-7			48 (1200)			3	-	67	-	-		
HNE59H-6 & HNE59H-7			59 (1500)			3	-	76	-	-		
HNE71H-6 & HNE71H-7			71 (1800)			3	-	97	-	-		
HNE28T-6 & HNE28T-7	1	3/4 (1.90)	27 (700)	-	3 (76.2)	2	-	33	-	-	-	175 (1205)
HNE40T-6 & HNE40T-7			40 (1000)			3	-	56	-	-		
HNE48T-6 & HNE48T-7			48 (1200)			3	-	67	-	-		
HNE59T-6 & HNE59T-7			59 (1500)			3	-	76	-	-		
HNE71T-6 & HNE71T-7			71 (1800)			3	-	97	-	-		

NOTES:

* MODEL NUMBERS: THE FIRST TWO LETTERS "HN" DESIGNATES SPRINKFLEX UNBRAIDED HOSE SERIES. THE FIRST TWO LETTERS "HB" DESIGNATES SPRINKFLEX BRAIDED HOSE SERIES, THE "E" DESIGNATES ELBOW. THE "H" DESIGNATES ½" OUTLET HOSE SERIES. THE "T" DESIGNATES ¾" OUTLET HOSE SERIES. HE "7" DESIGNATES TALL REDUCER.
* MAX AMBIENT TEMPERATURE RATING ON ALL MODEL NUMBERS ARE 300°F (148°C).
* EQUIVALENT LENGTHS ARE SHOWN WITH MAXIMUM NUMBER OF 90 DEGREE BENDS AT THE MINIMUM BEND-RADIUS PER AGENCY. 2- 45 DEGREE OR 3-30 DEGREE BENDS EQUAL 1-90 DEGREE BEND.

DIFFERENT VALUES WERE OBTAINED BY FM AND UL DUE TO THE DIFFERENCE IN MINIMUM BEND RADIUS, TESTING PROTOCOL AND CALCULATION METHODS.

PLEASE SEE INDIVIDUAL STANDARDS FOR MORE INFORMATION RELATIVE TO FRICTION LOSS (EQUIVALENT LENGTH OF PIPE).

* FM EQUIVALENT LENGTH CALCULATION INCLUDES SPRINKLER HEAD FRICTION LOSS.
* SEE LISTING(S) APPROVAL AGENCY FOR THE LATEST APPROVAL DETAILS.

ULTRA SPRINKFLEX®

HB1 FRICTION LOSS TABLE (FM)							
HOSE ASSEMBLIES	INLET SIZE (INCHES)	OUTLET ORIFICE SIZE (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE, FT. (m)	RATED WORKING PRESSURE PSI (KPA)
HB1-28H	1	½	28 (700)	7 (180)	1	14.5 (4.4)	175 (1205)
HB1-40H			40 (1000)	7 (180)	2	20.8 (6.3)	
HB1-48H			48 (1200)	7 (180)	3	22.4 (6.8)	
HB1-59H			59 (1500)	7 (180)	3	31.4 (9.5)	
HB1-71H			71 (1800)	7 (180)	4	36.3 (11.0)	
HB1-28T	1	¾	28 (700)	7 (180)	1	14.4 (4.3)	175 (1205)
HB1-40T			40 (1000)	7 (180)	2	20.7 (6.3)	
HB1-48T			48 (1200)	7 (180)	3	22.3 (6.7)	
HB1-59T			59 (1500)	7 (180)	3	31.3 (9.5)	
HB1-71T			71 (1800)	7 (180)	4	36.2 (11.0)	
HOSE COMPONENTS	INLET SIZE (INCHES)	OUTLET ORIFICE SIZE (INCHES)	DESCRIPTION	MINIMUM BEND RADIUS IN. (mm)	NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE, FT. (m)	RATED WORKING PRESSURE PSI (KPA)
HB1-28	N/A	N/A	28" HOSE BODY	7 (180)	1	4.3 (1.3)	175 (1205)
HB1-40			40" HOSE BODY	7 (180)	2	10.4 (3.1)	
HB1-48			48" HOSE BODY	7 (180)	3	12.2 (3.7)	
HB1-59			59" HOSE BODY	7 (180)	3	21.2 (6.4)	
HB1-71			71" HOSE BODY	7 (180)	4	26.1 (7.9)	
HB1C-ELB	N/A	N/A	90 REDUCER			4 (1.2)	175 (1205)
HB1C-SHDRP-H		½	SHORT REDUCER ½"			8.4 (2.5)	
HB1C-SHDRP-T		¾	SHORT REDUCER ¾"			8.2 (2.4)	
HB1C-LDRP-H		½	STANDARD REDUCER ½"			9.2 (2.8)	
HB1C-LDRP-T		¾	STANDARD REDUCER ¾"			9.1 (2.7)	
HB1C-XLDRP-H		½	LONG REDUCER ½"			11.4 (3.4)	
HB1C-XLDRP-T		¾	LONG REDUCER ¾"			11.2 (3.4)	
HB1C-HANGER	N/A	N/A	HANGER CONNECTION			1 (0.3)	175 (1205)
HB1C-WELD INLT		N/A	WELD INLET			0 (0)	
HB1C-NIPPLE INLT		N/A	THREAD INLET			1 (0.3)	
HB1C-GR INLT		N/A	1" CUT GROOVE INLET			1 (0.3)	

HB1 is a1 in. nominal dia. flexible metal sprinkler hose for providing a connection to automatic sprinklers in commercial ceilings. These flexible sprinkler hose models are available as a three piece style. The three piece style, the reducer and Inlet is threaded to the flexible hose body. Above is listed with standard flexible hose assembly and component level. Approval of the flexible sprinkler hose models listed above are limited for use in commercial suspended ceilings with ceiling bracket systems manufactured by Anvil International, LLC.

- All fricton loss testing was conducted with no sprinkler head, K-factor
- All components were fricton loss tested seperately
- All components such as reducers, hose body and outlets can be combined to provide a total equivalent length value.

ULTRA SPRINKFLEX®

HB1 FRICTION LOSS TABLE (UL)

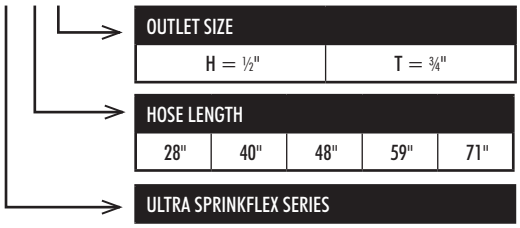
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1-28-SHDRP-H & HB1-GR-28-SHDRP-H	1x½	26.5	2 (51)	4	16	175 (1205)
HB1-40-SHDRP-H & HB1-GR-40-SHDRP-H	1x½	37.5	2 (51)	5	21	
HB1-48-SHDRP-H & HB1-GR-48-SHDRP-H	1x½	45.5	2 (51)	8	34	
HB1-59-SHDRP-H & HB1-GR-59-SHDRP-H	1x½	57.5	2 (51)	10	45	
HB1-71-SHDRP-H & HB1-GR-71-SHDRP-H	1x½	69.5	2 (51)	12	55	
HB1-28-SHDRP-T & HB1-GR-28-SHDRP-T	1x¾	26.5	2 (51)	4	15	175 (1205)
HB1-40-SHDRP-T & HB1-GR-40-SHDRP-T	1x¾	37.5	2 (51)	5	23	
HB1-48-SHDRP-T & HB1-GR-48-SHDRP-T	1x¾	45.5	2 (51)	8	34	
HB1-59-SHDRP-T & HB1-GR-59-SHDRP-T	1x¾	57.5	2 (51)	10	48	
HB1-71-SHDRP-T & HB1-GR-71-SHDRP-T	1x¾	69.5	2 (51)	12	55	
HB1-28-LDRP-H & HB1-GR-28-LDRP-H	1x½	29.5	2 (51)	4	16	175 (1205)
HB1-40-LDRP-H & HB1-GR-40-LDRP-H	1x½	40.5	2 (51)	5	20	
HB1-48-LDRP-H & HB1-GR-48-LDRP-H	1x½	48.5	2 (51)	8	34	
HB1-59-LDRP-H & HB1-GR-59-LDRP-H	1x½	60.5	2 (51)	10	44	
HB1-71-LDRP-H & HB1-GR-71-LDRP-H	1x½	72.5	2 (51)	12	56	
HB1-28-LDRP-T & HB1-GR-28-LDRP-T	1x¾	29.5	2 (51)	4	15	175 (1205)
HB1-40-LDRP-T & HB1-GR-40-LDRP-T	1x¾	40.5	2 (51)	5	23	
HB1-48-LDRP-T & HB1-GR-48-LDRP-T	1x¾	48.5	2 (51)	8	34	
HB1-59-LDRP-T & HB1-GR-59-LDRP-T	1x¾	60.5	2 (51)	10	48	
HB1-71-LDRP-T & HB1-GR-71-LDRP-T	1x¾	72.5	2 (51)	12	56	
HB1-28-XLDRP-H & HB1-GR-28-XLDRP-H	1x½	35.2	2 (51)	4	16	175 (1205)
HB1-40-XLDRP-H & HB1-GR-40-XLDRP-H	1x½	46.2	2 (51)	5	23	
HB1-48-XLDRP-H & HB1-GR-48-XLDRP-H	1x½	54.1	2 (51)	8	35	
HB1-59-XLDRP-H & HB1-GR-59-XLDRP-H	1x½	66.2	2 (51)	10	48	
HB1-28-XLDRP-T & HB1-GR-28-XLDRP-T	1x¾	35.2	2 (51)	4	15	175 (1205)
HB1-40-XLDRP-T & HB1-GR-40-XLDRP-T	1x¾	46.2	2 (51)	5	23	
HB1-48-XLDRP-T & HB1-GR-48-XLDRP-T	1x¾	54.1	2 (51)	8	35	
HB1-59-XLDRP-T & HB1-GR-59-XLDRP-T	1x¾	66.2	2 (51)	10	48	
HB1CE-28-SHDRP-H & HB1CE-GR-28-SHDRP-H	1x½	30.5	2 (51)	4	18	175 (1205)
HB1CE-40-SHDRP-H & HB1CE-GR-40-SHDRP-H	1x½	41.5	2 (51)	5	23	
HB1CE-48-SHDRP-H & HB1CE-GR-48-SHDRP-H	1x½	49.5	2 (51)	8	36	
HB1CE-59-SHDRP-H & HB1CE-GR-59-SHDRP-H	1x½	61.5	2 (51)	10	48	
HB1CE-71-SHDRP-H & HB1CE-GR-71-SHDRP-H	1x½	73.5	2 (51)	12	57	
HB1CE-28-SHDRP-T & HB1CE-GR-28-SHDRP-T	1x¾	30.5	2 (51)	4	17	175 (1205)
HB1CE-40-SHDRP-T & HB1CE-GR-40-SHDRP-T	1x¾	41.5	2 (51)	5	25	
HB1CE-48-SHDRP-T & HB1CE-GR-48-SHDRP-T	1x¾	49.5	2 (51)	8	36	
HB1CE-59-SHDRP-T & HB1CE-GR-59-SHDRP-T	1x¾	61.5	2 (51)	10	49	
HB1CE-71-SHDRP-T & HB1CE-GR-71-SHDRP-T	1x¾	73.5	2 (51)	12	57	
HB1CE-28-LDRP-H & HB1CE-GR-28-LDRP-H	1x½	33.5	2 (51)	4	18	175 (1205)
HB1CE-40-LDRP-H & HB1CE-GR-40-LDRP-H	1x½	44.5	2 (51)	5	22	
HB1CE-48-LDRP-H & HB1CE-GR-48-LDRP-H	1x½	52.5	2 (51)	8	36	
HB1CE-59-LDRP-H & HB1CE-GR-59-LDRP-H	1x½	64.5	2 (51)	10	46	

ULTRA SPRINKFLEX®

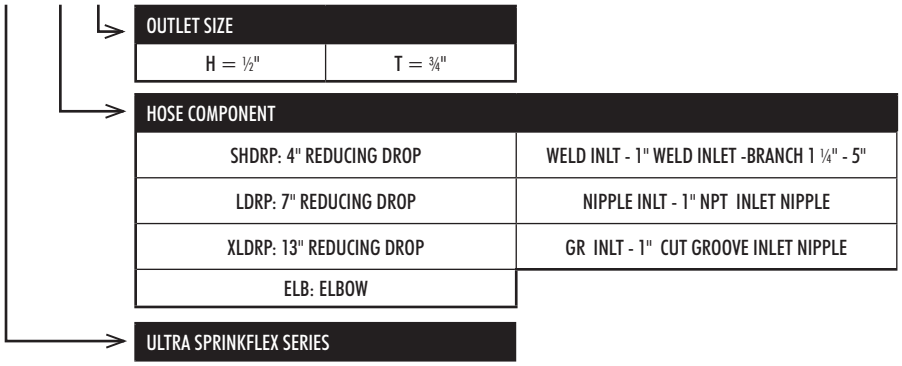
HB1 FRICTION LOSS TABLE (UL) CONTINUTED						
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1CE-28-LDRP-T & HB1CE-GR-28-LDRP-T	1x¾	33.5	2 (51)	4	17	175 (1205)
HB1CE-40-LDRP-T & HB1CE-GR-40-LDRP-T	1x¾	44.5	2 (51)	5	25	
HB1CE-48-LDRP-T & HB1CE-GR-48-LDRP-T	1x¾	52.5	2 (51)	8	36	
HB1CE-59-LDRP-T & HB1CE-GR-59-LDRP-T	1x¾	64.5	2 (51)	10	49	

- Extra-long reducer, 13" reducers=, with HB1-71 length hose has not been evaluated by UL
- HB1Series is rated to be used in temperature of 225˚F UL and 175˚F FM.

HOSE SERIES CONFIGURATION
HB1-XX-X



HOSE SERIES CONFIGURATION
HB1-XX-X



ULTRA SPRINKFLEX®

IMPORTANT INSTALLATION INFORMATION

- SprinkFLEX products must be installed according to current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards or equivalent standards for wet, dry, or pre-action systems. Deviations from these standards or alterations to SprinkFLEX products or sprinklers will void any warrant. In addition, installations must meet provision of the local authority having jurisdiction and local codes, as applicable.
- For suspended ceiling applications, the ends of the SprinkFLEX Bracket must be installed to the rails of an ASTM C635 ceiling installed in accordance with ASTM C636 standards.
- SprinkFLEX Stainless Steel Sprinkler Fittings and/or the SprinkFLEX Bracket must not be intermixed with other manufacturer's products.
- Refer to the specific product submittal for applications and listing information. These submittals are located on the website at www.anvilintl.com.
- Size the piping system to provide the minimum required flow rate for the sprinkler system.
- Flush the system to remove foreign material. Continue to flush the system until water runs clear.
- DO NOT install sprinkler system piping through heating ducts.
- DO NOT connect sprinkler system piping to domestic hot water systems.
- DO NOT install sprinklers where they will be exposed to temperatures that exceed the maximum ambient temperature rating for the sprinkler.
- The flexible stainless steel hose should not be bent or fluctuated up-and-down or side-to-side when it is pressurized for test.
- The HB & HN stainless steel hose should not be bent within 2½ inches/64 mm of the connection nut at both ends.
- Flexible stainless steel hose and fittings have limited flexibility and are intended only to be installed with bends at their respective minimum bend radii.
- Protect wet piping systems for freezing temperatures.
- If construction is altered, refer to applicable standards to determine if additional sprinklers are required.
- The owner is responsible for maintaining the fire protection system in proper operating condition.
- For minimum maintenance and inspection requirements, refer to NFPA 25 and the NFPA pamphlet that describes the care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.
- IPT48BKT1 has not been evaluated by UL.
- HB1 71 with extra long reducing drop has not been evaluated by UL.
- HB1 Elbow with extra long reducing drop has not been evaluated by UL.

VIKING®

TECHNICAL DATA

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

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

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

1-A Features

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

1-B Accessories

300 PSI (20.7 bar) Trim Package including:
A. All necessary nipples and fittings
B. Main Drain Ball Valve
C. Necessary gauges

2. LISTINGS AND APPROVALS:.

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

3. TECHNICAL DATA

Specifications:

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

Standard Grooved Connections: ANSI/AWWA C606

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

Gauge Outlets: two 1/4” (8 mm) NPT

Other Outlets: two 1/2” (15 mm) NPT

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

Material Standards:

Refer to Figure 1.

Ordering Information:

See Table 1 for part numbers and shipping weights.

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

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

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

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

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

Hydrostatic Test:

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

5. OPERATION (Refer to Figure 1.)

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

6. INSPECTIONS, TESTS, AND MAINTENANCE

NOTICE

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

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

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

⚠ WARNING

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

6-A. Five-Year Internal Inspection

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

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

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⚠ CAUTION

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

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

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

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

VIKING®

TECHNICAL DATA

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

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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7. AVAILABILITY

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

8. GUARANTEES

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

Table 1 - Valve Part Numbers and Specifications

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

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

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

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

Table 3 - Trim Package Part Numbers

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

TECHNICAL DATA

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

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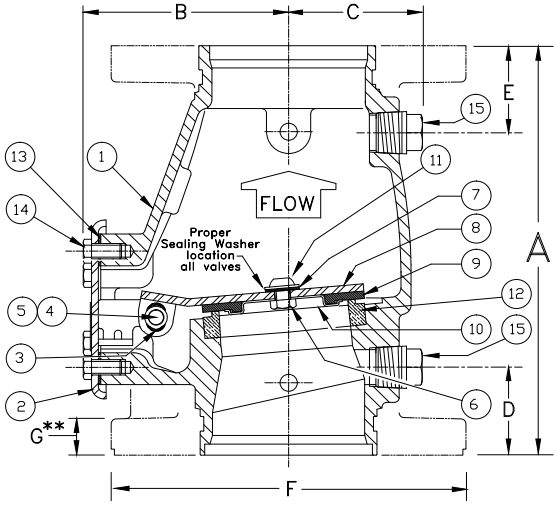

SIZE	A	B	C	D	E	F	G**
2-1/2" (65mm)	9" (228,6)	4-1/2" (114,3)	2-5/8" (66,7)	2" (50,8)	2" (50,8)	Flg-Flg Not Available	
3" (80mm)	10-1/8" (257)	4-13/16" (122,2)	2-11/16" (68,3)	2-9/32" (58.1)	2-9/32" (58.1)	7-7/8" (200)	25/32" (20)
4" (100mm)	10-5/8" (269,9)	5-3/16" (131,8)	3-1/8" (79.4)	2-1/4" (57.2)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

Dimensions shown in parentheses are millimeter.

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

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

Figure 1 - Replacement Parts

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

-- Indicates replacement part is not available

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

Sub-Assemblies

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

TECHNICAL DATA

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

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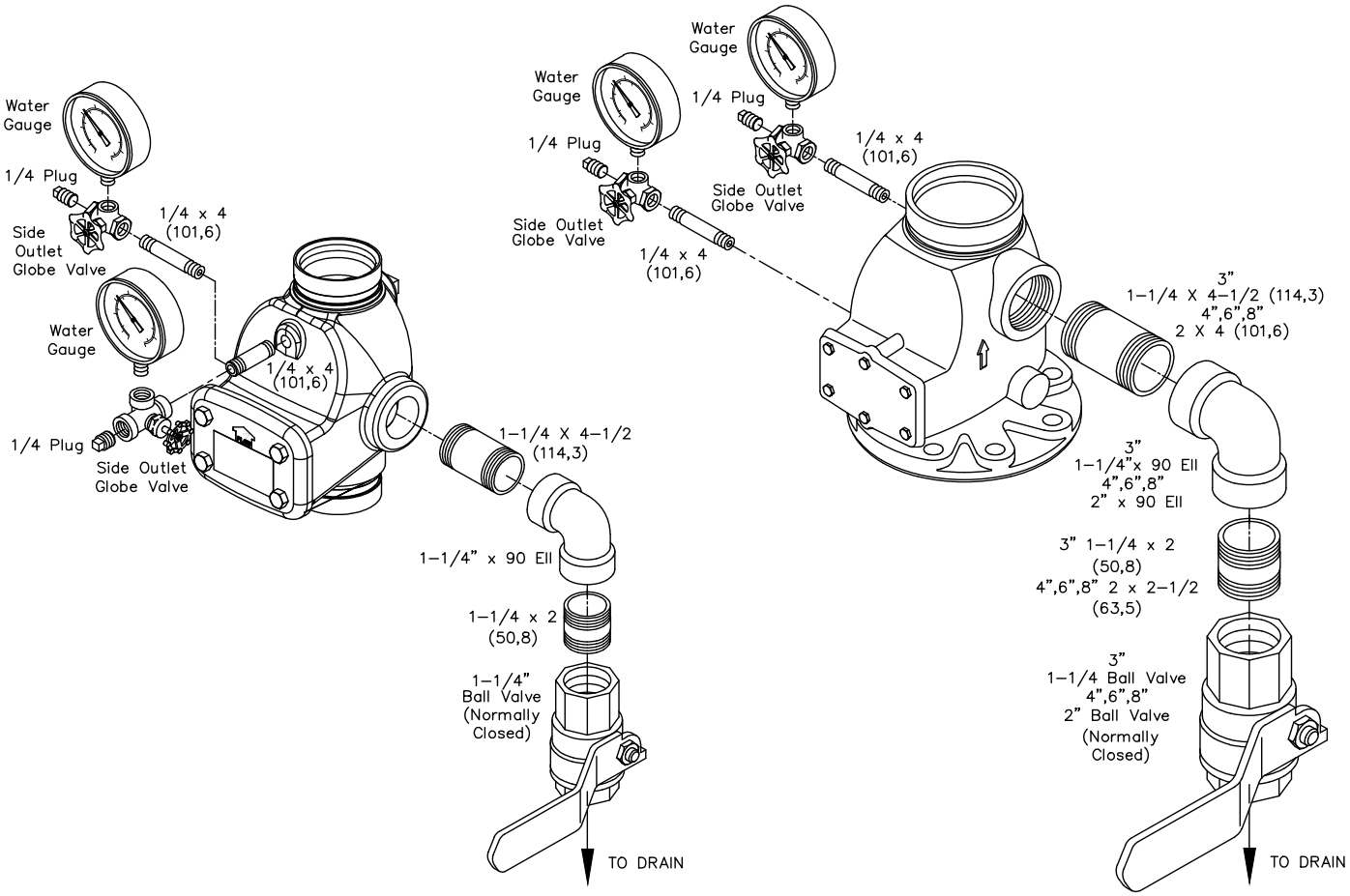

2-1/2" Model E-1 Easy Riser Check Valve Trim Chart

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

Figure 2

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

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

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

TECHNICAL DATA

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

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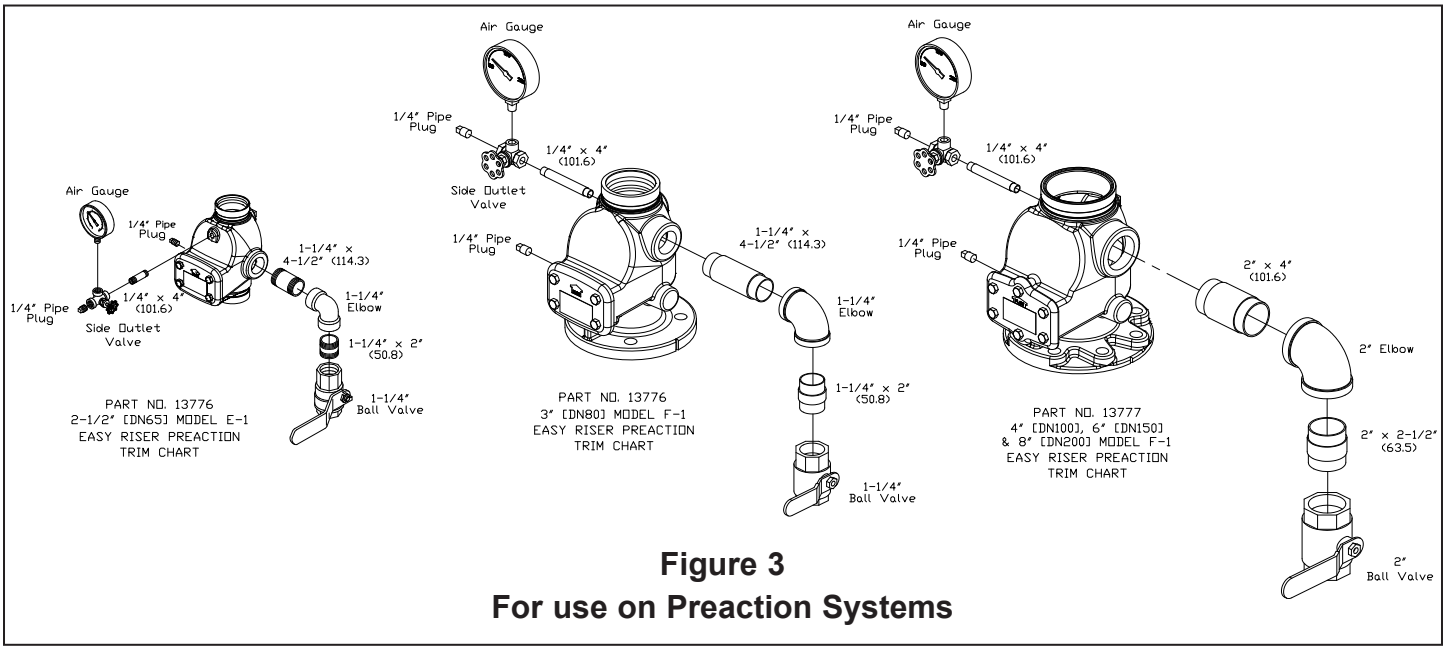
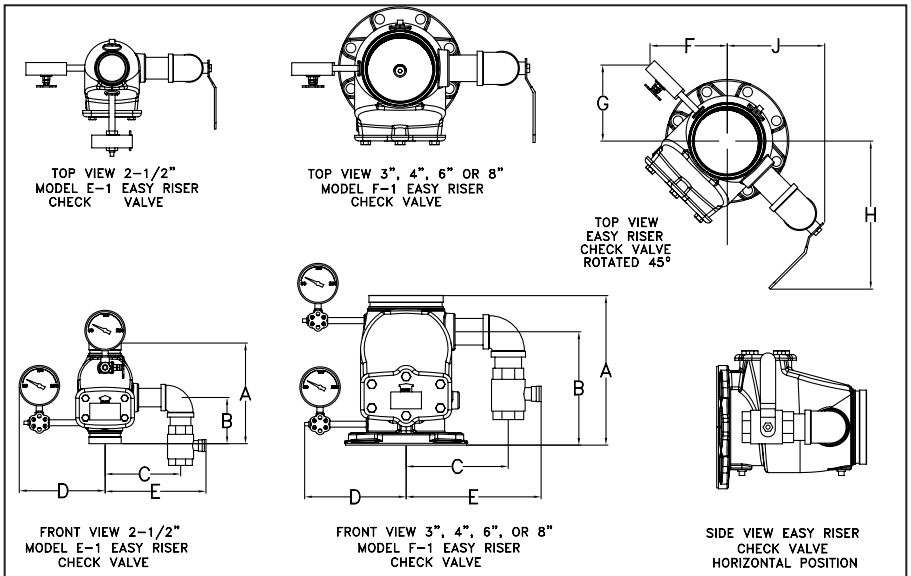


Figure 3
For use on Preaction Systems



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

Figure 4

Dimensions in parentheses are millimeter.
Dimensions are approximate.

FireLock® Butterfly Valve
Series 705 with Weatherproof Actuator

10.81

1.0 PRODUCT DESCRIPTION

- Available Sizes: 2 – 12"/50 – 300 mm
- cULus Listed, LPCB Listed, FM and VdS Approved for service up to 300 psi/2068 kPa /20 bar.
- Designed for fire protection services only.
- Features a weatherproof actuator housing Approved for indoor and outdoor use.
- Actuation options: Hand wheel (2 – 12”/50 – 300 mm)
- Exclusively for use with pipe and Victaulic products which feature ends formed with the Victaulic Original Groove System (OGS) groove profile (see section 7.0 for Reference Materials).

2.0 CERTIFICATION/LISTINGS

G410001 104j/04

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

2.1 CERTIFICATION/LISTINGS

Size	Approval/Listing Service Pressures Series 705 Butterfly Valve cULus	FM	Vds	LPCB
2 50	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
2½ 65	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
76.1 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
3 80	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
4 100	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
5 125	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
139.7 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
6 150	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
165.1 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
8 200	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
10 250	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
12 300	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa

3.0 SPECIFICATIONS – MATERIAL

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

End Face, 2 – 6"/50 – 150 mm: Ductile Iron conforming to ASTM A-536, Grade 65-45-12

Seal Retainer, 8 – 12"/200 – 300 mm: Ductile Iron conforming to ASTM A-536, Grade 65-45-12

Body Coating: Black alkyd enamel

Disc: Ductile Iron conforming to ASTM A-536, Grade 65-45-12, with electroless nickel coating conforming to ASTM B-733

Seat: Grade "E" EPDM

Stems: 416 stainless steel conforming to ASTM A-582

Stem Seal Cartridge: C36000 brass

Bearings: Stainless steel with TFE lining

Stem Seals: EPDM

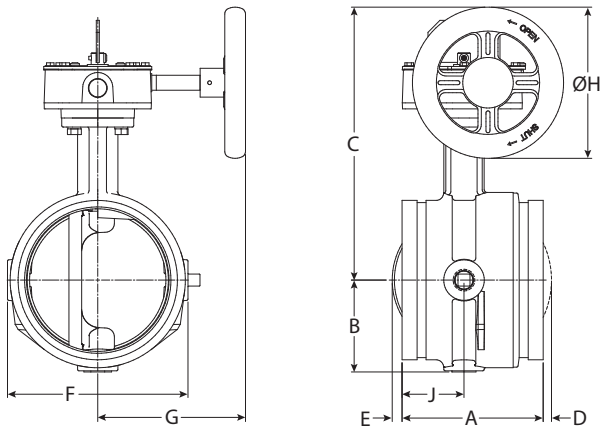
Stem Retaining Ring: Carbon steel

Actuator:

- ☐ 2 – 8"/50 – 200 mm: Brass or bronze traveling nut on a steel lead screw, in a ductile iron housing
- ☐ 10 – 12"/250 – 300 mm: Steel worm and cast iron quadrant gear, in a cast iron housing

4.0 DIMENSIONS

Series 705



Size		Dimensions								
Nominal inches mm	**Actual Outside Diameter** inches mm	**E to E A** inches mm	**B** inches mm	**C** inches mm	**D** inches mm	**E** inches mm	**F** inches mm	**G** inches mm	**DIA H** inches mm	**J** inches mm
2 60.3	2.375 60.3	4.25 108.0	2.28 57.9	6.41 162.8	–	–	4.00 101.6	4.22 107.2	4.50 114.3	2.12 53.8
2½ 73	2.875 73.0	3.77 95.8	2.28 57.9	7.54 191.5	–	–	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
76.1 mm	3.000 76.1	3.77 95.8	2.28 57.9	7.54 191.5	–	–	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
3 88.9	3.500 88.9	3.77 95.8	2.53 64.3	7.79 197.9	–	–	4.50 114.3	4.22 107.2	4.50 114.3	1.77 45.0
108 mm	4.250 108.0	4.63 117.6	2.88 73.2	8.81 223.8	–	–	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
4 114.3	4.500 114.3	4.63 117.6	2.88 73.2	8.81 223.8	–	–	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
133 mm	5.250 133.0	5.88 149.4	3.35 85.1	10.88 276.4	–	–	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
139.7 mm	5.500 139.7	5.88 149.4	3.35 85.1	10.88 276.4	–	–	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.6
5 141.3	5.563 141.3	5.88 149.4	3.35 85.1	10.88 276.4	–	–	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
159 mm	6.250 159.0	5.88 149.4	3.84 97.5	11.38 289.1	–	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
165.1mm	6.500 165.1	5.88 149.4	3.84 97.5	11.38 289.1	–	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
6 168.3	6.625 168.3	5.88 149.4	3.84 97.5	11.38 289.1	–	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	1.90 48.3
8 219.1	8.625 219.1	5.33 135.4	5.07 128.8	13.53 343.6	0.80 20.3	1.47 37.3	10.00 254.0	6.19 157.2	8.10 205.7	2.33 59.2
10 273	10.750 273.0	6.40 162.6	6.37 161.8	15.64 397.3	1.41 35.8	1.81 46.0	12.25 311.2	8.10 205.7	9.00 228.6	–
12 323.9	12.750 323.9	6.50 165.1	7.36 186.9	16.64 422.7	2.30 58.4	2.80 71.1	14.25 362.0	8.10 205.7	9.00 228.6	–

NOTE

- Optional ½"/15 mm tap available. Contact Victaulic for details.

5.0 PERFORMANCE

Series 705

The chart expresses the frictional resistance of Victaulic Series 705 Butterfly Valve in equivalent feet/meters of straight pipe.

Nominal Size mm inches	**Outside Diameter** mm inches	**Equivalent** Feet/m of pipe
2 50	2.375 60.3	6 1.8
2½ 65	2.875 73.0	6 1.8
76.1 mm	3.000 76.1	6 1.8
3 80	3.500 88.9	7 2.1
4 100	4.500 114.3	8 2.4
108 mm	108 mm	8 2.4
5 125	5.563 141.3	12 3.7
133 mm	133 mm	12 3.7
139.7 mm	5.500 139.7	12 3.7
6 150	6.625 168.3	14 4.2
159 mm	159 mm	14 4.3
165.1 mm	6.500 165.1	14 4.2
8 200	8.625 219.1	16 4.9
10 250	10.750 273.0	18 5.5
12 300	12.750 323.9	19 5.8

5.1 PERFORMANCE

Series 705

C_V values for flow of water at +60°F/+16°C through a fully open valve are shown in the table below. For additional details, contact Victaulic.

Formulas for C_v values

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

Formulas for K_v values

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

Valve Size		Full Open
Nominal Size inches mm	**Actual Outside Diameter** inches mm	**Flow Coefficient** C_v
2 50	2.375 60.3	170
2½ 65	2.875 73.0	260
76.1 mm	3.000 76.1	260
3 80	3.500 88.9	440
4 100	4.500 114.3	820
108 mm	108 mm	820
5 125	5.563 141.3	1200
133 mm	133 mm	1200
139.7 mm	5.500 139.7	1200
6 150	6.625 168.3	1800
159 mm	159 mm	1800
165.1 mm	6.500 165.1	1800
8 200	8.625 219.1	3400
10 250	10.750 273.0	5800
12 300	12.750 323.9	9000

Valve Size		Full Open
Nominal Size inches mm	**Actual Outside Diameter** inches mm	**Flow Coefficient** K_v
2 50	2.375 60.3	147
2½ 65	2.875 73.0	225
76.1 mm	3.000 76.1	225
3 80	3.500 88.9	380
4 100	4.500 114.3	710
108 mm	108 mm	710
5 125	5.563 141.3	1040
133 mm	133 mm	1040
139.7 mm	5.500 139.7	1040
6 150	6.625 168.3	1560
159 mm	159 mm	1560
165.1 mm	6.500 165.1	1560
8 200	8.625 219.1	2940
10 250	10.750 273.0	5020
12 300	12.750 323.9	7790

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

Switch and Wiring

1. The supervisory switch contains two single pole, double throw, pre-wired switches.
2. Switches are rated:

   10 amps @ 125 or 250 VAC/60 Hz

   0.50 amps @ 125 VDC

   0.25 amps @ 250 VDC
3. Switches supervise the valve in the “OPEN” position.
5. One switch has two #18 insulated wires per terminal, which permit complete supervision of leads (refer to diagrams and notes below). The second switch has one #18 insulated wire per terminal. This double circuit provides flexibility to operate two electrical devices at separate locations, such as an indicating light and an audible alarm, in the area that the valve is installed.
6. A #14 insulated ground lead (green) is provided.

   Switch #1 = S1

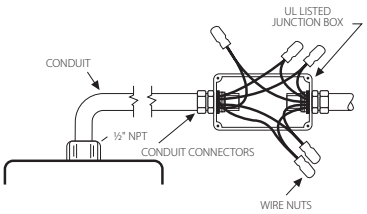
   For connection to the supervisory circuit of a UL Listed alarm control panel

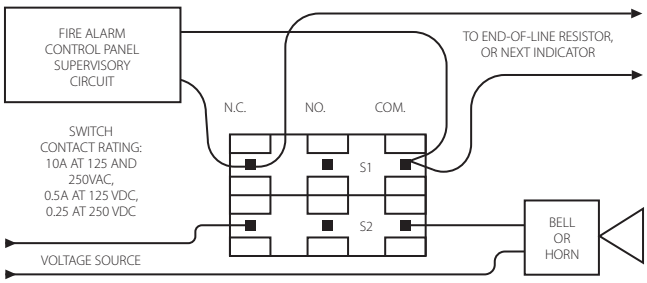
   Switch #2 = S2

   Auxiliary switch that may be connected to auxiliary devices, per the authority having jurisdiction

S1
- Normally Closed: (2) Blue
- Common: (2) Yellow

S2
- Normally Closed: Blue with Orange Stripe
- Normally Open: Brown with Orange Stripe
- Common: Yellow with Orange Stripe





Switch 1: 2 leads per terminal
Switch 2: 1 lead per terminal

NOTES

- The above diagram shows a connection between the common terminal (yellow – S1 and yellow-with-orange stripe – S2) and the normally closed terminal (blue – S1 and blue-with-orange stripe – S2). In this example, the indicator light and alarm will stay on until the valve is fully open. When the valve is fully open, the indicator light and alarm will go out. Cap off any unused wires (e.g. brown with orange stripe).
- Only S1 (two leads per terminal) may be connected to the fire alarm control panel.
- The connection of the alarm switch wiring shall be in accordance with NFPA 72 and the auxiliary switch per NFPA 70 (NEC).

7.1 REFERENCE MATERIALS

10.01: Regulatory Approval Reference Guide

29.01: Terms and Conditions/Warranty

I-100: Field Installation Handbook

SCHEDULE 10 & 40 SPRINKLER PIPE SUBMITTAL DATA SHEET

APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

FINISHES AND COATINGS

- Schedule 10 & 40 Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Schedule 10 & 40 Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Schedule 10 & 40 Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

	Nominal Pipe Size (inches)	1	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
Schedule 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.800	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
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		

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

REV01

2-1/2" & LARGER

(X) Schedule 10 - Black ( ) Schedule 10 - Hot Dip Galvanized

2" & SMALLER

(X) Schedule 40 - Black ( ) Schedule 40 - Hot Dip Galvanized

BULLMOOSETUBE.COM
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VIKING®

TECHNICAL DATA

SPRINKLER WRENCHES AND CABINETS

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

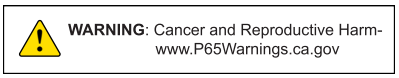
A. Sprinkler Cabinets

Viking sprinkler cabinets are metal enclosures constructed to store an emergency supply of spare sprinklers and a sprinkler installation wrench.

NFPA 13 requires a representative number of each type and temperature rating of sprinkler head to be kept in a cabinet on the premises. NFPA 13 also requires a special sprinkler wrench to be provided in the cabinet. This allows for immediate removal and replacement of sprinklers that have operated or that have become damaged.

Stock of spare sprinklers should include sprinklers of all the types and temperature ratings as are installed in the sprinkler system, in the following quantities:

Number of Sprinklers in the System	Minimum Number of Spare Sprinklers Required
Under 300	6
300-1,000	12
Over 1,000	24



B. Sprinkler Wrenches

Viking sprinkler wrenches are special installation tools specifically designed for use with the various Viking sprinklers and spray nozzles. The appropriate wrenches must be used with the indicated sprinklers and nozzles to provide the proper leverage when tightening sprinklers or nozzles and to minimize slippage during installation.

Using wrenches other than the ones designated for installation may damage the sprinkler. Refer to Tables 2a and 2b and the appropriate sprinkler or spray nozzle data page for the correct installation wrenches that must be used.

Wrenches 21475M/B, 10896W/B, 07297W/B, 05118CW/B, 13635W/B, and 16888M/B provide the amount of leverage needed to tighten sprinklers and spray nozzles into pipe fittings while preventing sprinkler damage. No additional tools are necessary with these wrenches.

The following wrenches require a separate ½" ratchet (not available from Viking) to provide the correct amount of leverage: 08336W/B, 10366W/B, 07565W/B, 11663W/B, 13032W/B, 13577W/B, 13619, 15466, 13623W/B, 15467W/B, 15209W/R, 13655W/B, 14031, 14047W/B, 16208W/R, and 16267.

The internal diameters of sprinkler wrenches 08336W/B, 10366W/B, 15209W/R, 16208W/R, and 16267 are designed for use with the sprinkler contained in the protective shell. (A protective shell should be retained in the spare sprinkler cabinet.)

Wrench part number 10551W/B is required for threading institutional escutcheon plates onto institutional sprinklers. Wrench part number 10729 is a 2-1/2" (63.5 mm) C-C face spanner wrench used for removing institutional escutcheon plates from institutional sprinklers (refer to the DISASSEMBLY section of institutional sprinkler technical data pages).

Wrench part number 15915 is optional for removing protective sprinkler caps and for installing E-1 and F-1 Escutcheons on frame style pendent sprinklers from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Refer to Technical Bulletin Form No. 051808.

2. LISTINGS AND APPROVALS

Refer to the specific sprinkler or spray nozzle technical data pages for sprinkler listings and approvals.

3. TECHNICAL DATA

Specifications:

Sprinkler Cabinets: Designed with four 3/16" diameter holes in back. Spacing of mounting holes: 3-1/2" (88.9 mm) length, 3-1/2" (88.9 mm) height. The sprinkler cabinet should be located adjacent to the main system riser.

Material Standards:

Sprinkler Cabinets: Cold Rolled Steel. Finish: Painted high-gloss red enamel interior and exterior, chrome plated door knob.
Wrenches: Ductile Iron, Steel, Acetal, or 50% glass filled nylon (for head cabinet wrenches)

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

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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A. Sprinkler Cabinets

1. Determine appropriate cabinet from Table 1 on this page for use with the specific model/number of sprinklers to be contained in the cabinet.
2. Specify cabinet part number and quantity needed.

B. Sprinkler Wrenches

1. Determine the appropriate wrench for use with the given sprinkler or spray nozzle model from Tables 2a and 2b.
2. Specify the wrench part number and quantity needed.

NOTE: Sprinklers and sprinkler wrenches are not supplied with the cabinets; they must be ordered separately.

4. INSTALLATION

Refer to the appropriate sprinkler or spray nozzle technical data page.

5. OPERATION

Refer to the sprinkler or spray nozzle techical data page for the particular model used.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking sprinkler wrenches and cabinets are 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: Sprinkler Cabinet Ordering Information and Dimensions

For Sprinkler Models:	Cabinet Capacity	Cabinet Part No.	Size		
			Length	Height	Depth
Viking frame style sprinklers	6 sprinklers	01724A Available since 1971.	10-3/16" (259 mm)	4-11/16" (103 mm)	2-9/16" (65 mm)
Viking frame style sprinklers, ESFR K14 sprinklers, K16.8 pendent sprinklers, and K25.2 EC sprinklers	12 sprinklers (6 K25.2 EC sprinklers)	01725A Available since 1971.	10-3/16" (259 mm)	8-9/16" (217 mm)	2-9/16 (65 mm)
Viking concealed and flush style sprinklers, ESFR K25.2 and K22.4 pendent sprinklers, and K19.6 CMSA sprinklers	5-6 sprinklers	01731A Available since 1971.	13-13/16" (351 mm)	5-11/16" (144 mm)	3" (76 mm)
High Challenge® Sprinklers, upright ESFR sprinklers, and Intermediate Level Sprinklers	6 sprinklers	03985A Available since 1977	12-5/8" (321 mm)	9-1/8" (232 mm)	4-1/8" (105 mm)

TECHNICAL DATA

SPRINKLER WRENCHES AND CABINETS

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IMPORTANT NOTES

The sprinkler cabinet should be easily accessible.

The sprinkler cabinet must not be exposed to corrosive atmospheres or temperatures above 100 °F (38 °C).

The stock of spare sprinklers should include an adequate number of sprinklers of each type and temperature rating.

The stock of sprinklers must be in good condition.

A sprinkler wrench of the appropriate type must be included in the cabinet.

Orient sprinklers and sprinkler wrench as indicated in Figure 1 below.

CAUTION: When replacing automatic sprinklers in an existing system, be sure to replace with sprinklers of the correct type, thread size, orifice size, temperature rating, and finish.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to the appropriate sprinkler data page. Viking sprinklers and spray nozzles are designed to be installed in accordance with the latest edition of Viking technical data, the latest 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. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

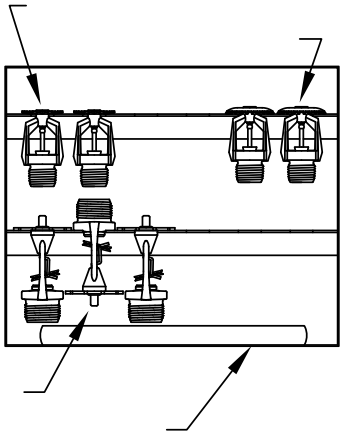

Figure 1: Correct orientation of sprinklers and wrench inside cabinet. (12-head cabinet shown)

Figure 2: Sprinkler Cabinet 01724A (Sprinklers and wrench not included)

Figure 3: Sprinkler Cabinet 01725A (Sprinklers and wrench not included)

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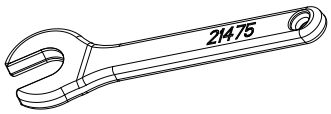
Table 2a: Sprinkler Wrenches

For Sprinkler Models:	Use Wrench:
Frame-style sprinklers and spray nozzles	21475M/B Available since 2017
Wax coated Frame-style sprinklers and spray nozzles	10896W/B Available since 2000 or 05000CW/B*
Wax coated sprinklers and domed concealed pendent sprinklers	13577W/B Available since 2006 replaces 07398W*
Recessed horizontal sidewall sprinklers with protective shields, domed concealed horizontal sidewall sprinklers, and recessed pendent sprinklers	13655W/B Available since 2006
Coated and recessed ECOH K14 sprinkler	13032W/B Available since 2004
Standard adjustable and plain barrel dry sprinklers, K16.8 and ECOH K14 sprinklers	07297W/B Available since 1991
Recessed and domed concealed dry sprinklers	07565W/B Available since 1991
High Challenge® sprinklers, upright ESFR sprinklers, and ELO sprinklers**	05118CW/B Available since 1981
Coated, recessed, and domed concealed ELO sprinklers	11663W/B Available since 2001
Pendent K14 and K16.8 ESFR sprinklers	13635W/B double ended (use Side A) Available since 2006, or 10285W/B*
Pendent K25.2, K22.4 ESFR sprinklers and K19.6 CMSA Sprinkler VK592	13635W/B double ended (use Side B) Available since 2006, or 12143W/B*
Upright EC K25.2 sprinklers	16888M/B Available since 2011
QR and EC Concealed Sprinklers VK461, VK462, VK463, VK464, VK465, VK632, and VK634 (also optional for cap removal)	14031† Available since 2006
QR and EC Concealed Sprinklers VK461, VK462, VK463, VK464, VK465, VK632, and VK634	14047W/B (heavy duty) Available since 2006
Residential Concealed Sprinklers VK456, VK457, VK474, and VK488 (also optional for removal of protective caps)	13619† (red) Available since 2006

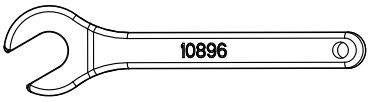
*Wrench no longer available. May still be used until wrench replacement is necessary.

**ELO sprinklers manufactured before Dec. 2001 use wrench part number 07297W/B (07565W/B for coated and recessed).

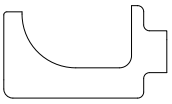
†Ideal for sprinkler cabinets.



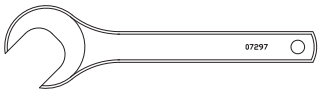
Part No. 21475M/B



Part No. 10896W/B



Part No. 13577W/B & 13032W/B



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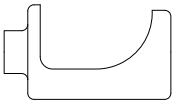
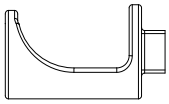
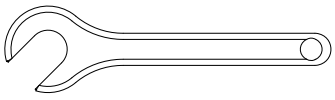


Part Nos. 07565W/B & 11663W/B



Part No. 13655W/B



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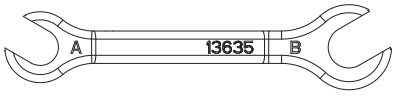
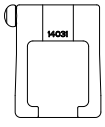
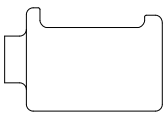


Part No. 13635W/B

Part No. 16888M/B



Part No. 14031



Part No. 14047W/B

Figure 4a: Sprinkler Wrenches

VIKING®

TECHNICAL DATA

SPRINKLER WRENCHES AND CABINETS

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 2b: Sprinkler Wrenches	
For Sprinkler Models:	**Use Wrench:**
Residential Concealed Sprinklers VK456, VK457, VK474, and VK488	13623W/B (heavy duty) Available since 2006
Residential Concealed HSW Sprinkler VK480	16267† or 16208W/R (heavy duty) Available since 2010
Mirage® QR ELO Concealed Sprinklers VK636 and VK469 (also optional for removal of protective caps)	15466† Available since 2009
Mirage® QR ELO Concealed Sprinklers VK636 and VK469	15467W/B (heavy duty) Available since 2009
Mirage® Concealed and flush style sprinklers	08336W/B (heavy duty) Available since 1993
Mirage® Concealed and flush style sprinklers	10366W/B† Available since 1998
Residential Flush Pendent Sprinklers VK476 and VK478	15209W/R (heavy duty) Available since 2009
Recessed Flush Dry Sprinklers VK482	18315 (heavy duty) Available since 2014
Mirage® and Freedom® Concealed Sprinklers VK461, VK462, VK463, VK464, VK465, VK469, VK474, VK632, VK634, VK636, and VK488 (optional concealed cover installer tool)	14412†, or 14867 for the large diameter cover, Available since 2007
Shipping Cap Remover/ Escutcheon Installer (optional***)	15915† Available since 2010
Institutional style flush sprinklers (for installation of the escutcheon plate)	10551W/B Available since 1999
Institutional style flush sprinklers (spanner wrench for escutcheon plate removal)	10729 Available since 1999

***Allows removal of sprinkler caps and installation of E-1 and F-1 escutcheons on frame style pendent sprinklers from the floor.
†Ideal for sprinkler cabinets.

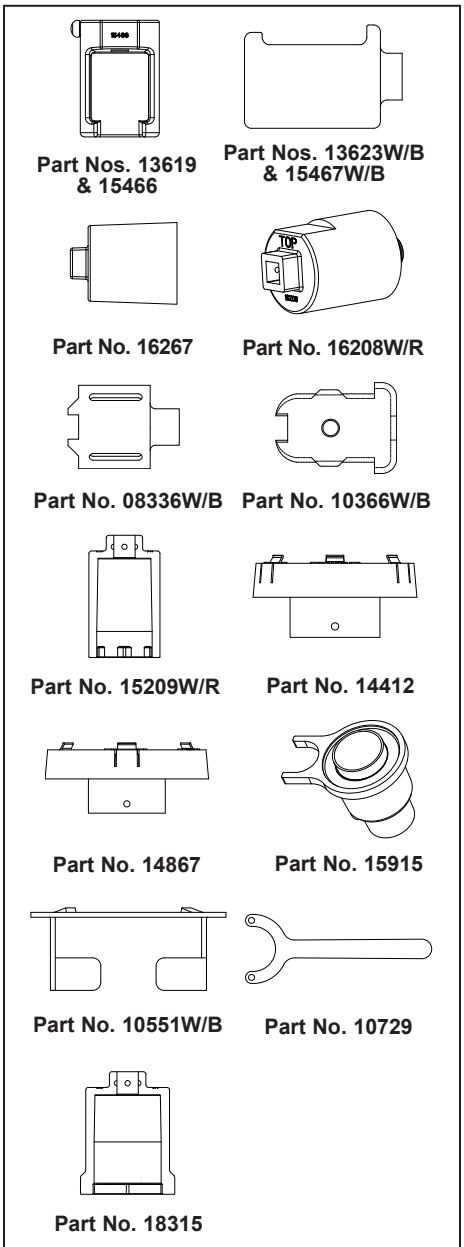


Figure 4b: Sprinkler Wrenches

SPARE SPRINKLER HEAD STORAGE CABINET

Description

Fire Protection Products, Inc. Spare Sprinkler Head Cabinets are designed to allow for spare sprinkler head storage as required by NFPA guidlines. The Spare Sprinkler Head Cabinets are available in four configurations. Three head, six head, six head ESFR and twelve head. All four styles are manufactured with "knockouts" to accomodate the most common size sprinklers. The shelf is located to allow for the storage of a typical sprinkler head wrench. Each cabinet is finished with a red enamel finish. Each spare head cabinet comes with a hinged door the remains closed to protect the spare sprinklers from the elements and features two holes on the back panel to allow for attachment to most surfaces utilizing the approriate fasteners.

Installation

Select the correct Spare Sprinkler Head Cabinet in accordance with the Automatic Sprinkler Systems Handbook. As per the 1989 Edition the correct number of spare sprinkler is as follows:

"0-300 sprinklers, not less than 6
300-1000, not less than 12
1000 or more, not less than 24.

Stock of spare sprinklers shall include all types and ratings installed."*

Once the correct Spare Sprinkler Head Cabinet has been selected, installation is accomplished by inserting the correct fastener in each of the two holes inside the cabinet , securing the cabinet securely to the wall. The insert the correct number and type of sprinklers in accordance with the "handbook".

***final determination is subject to approval by the Authority Having Jurisdiction (AHJ).**

Specs

Material:

Painted plain steel

Finish:

Red enamel

Styles:

3 Spare sprinkler, 1/2 or 3/4
6 Spare sprinklers, 1/2 or 3/4
6 Spare, ESFR, 1/2 , 3/4 or 1"
12 Spare sprinklers 1/2 or 3/4

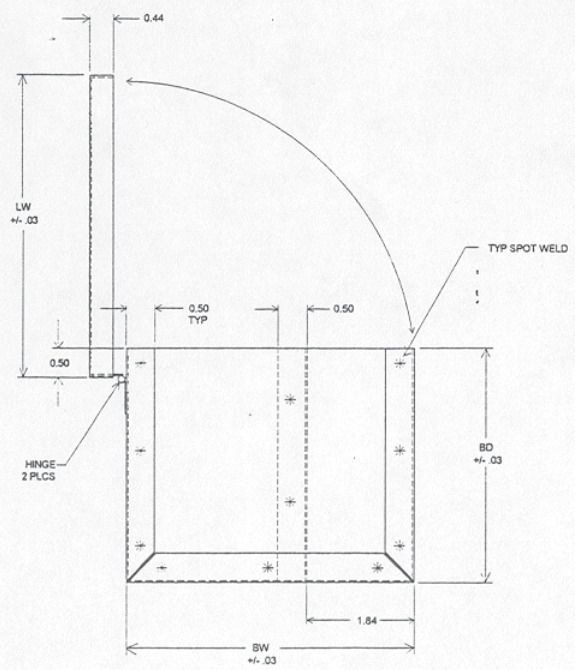
For questions:
1 800 344-1822
1 800 344-3775 fax
http://www.fppi.com
sales@fppi.com

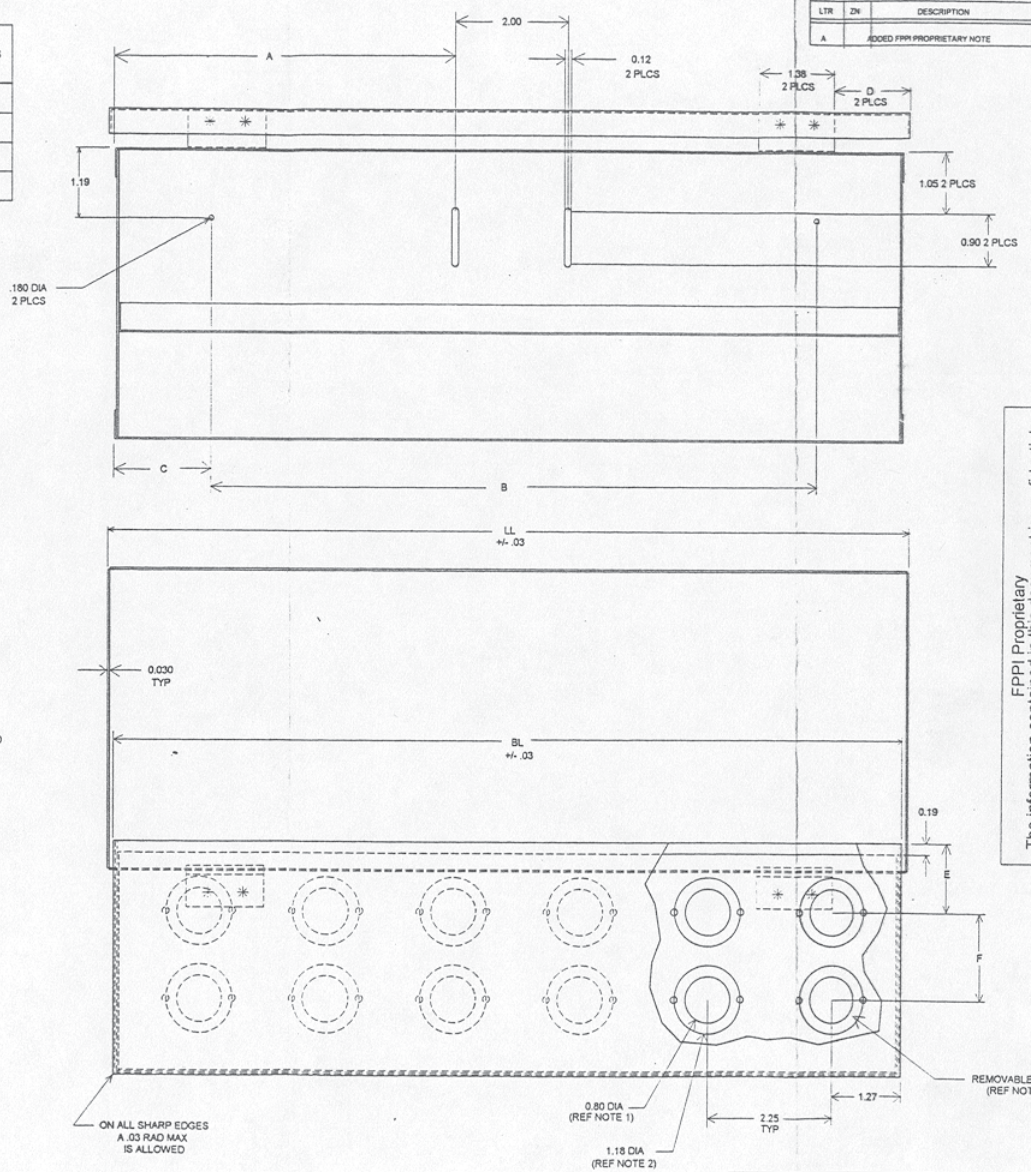
PART NO.	DIMENSIONS											SPRINKLER STORAGE CAPACITY	ROWS
	BL	BW	BD	LL	LW	A	B	C	D	E	F		
02-400	14.03	5.00	4.00	14.25	5.19	6.00	10.75	1.69	1.38	1.19	1.50	12	2
02-401	14.03	5.00	2.31	14.25	5.19	6.00	10.75	1.69	1.38	1.00	N/A	6	1
02-402	7.12	5.00	2.37	7.31	5.25	2.50	4.94	1.12	.65	1.00	N/A	3	1
02-403	14.03	6.25	3.12	14.25	6.50	6.00	10.75	1.69	1.12	1.50	N/A	6 (ESFR) *	1

* ESFR OR ANY OTHER LARGE FRAMED SPRINKLERS

NOTES:

1. THIS HOLE (.80 DIA) ALLOWS FOR 1/2" IPS SPRINKLER JEADS.
2. THIS HOLE (1.180 DIA) ALLOWS FOR 3/4" IPS SPRINKLER JEADS.
3. REMOVABLE INSERTS ARE FOR LARGE ORFICE (3/4" IPS) SPRINKLER JEADS.
4. THIS DRAWING SHOWS PART NO. 02-400 AT FULL SCALE





REVISION				
LTR	ZN	DESCRIPTION	DWN	DATE
A		ADDED FPPI PROPRIETARY NOTE	J.D.	6/20/94

TOLERANCE			DRAWN		
XXX	±	.005	J. DUNN	4/94	FIRE PROTECTION PRODUCTS
XX	±	.01	CHECKED		
X	±	1	ENGINEER		TITLE
ANGLE	±	2 DEG	R. GREENSLATE	4/94	BOX, STORAGE, SPRINKLER HEAD
MATERIAL			FINISH		
.03 THK COLD ROLL STEEL			FIRE ENGINE RED BAKED ENAMEL		SIZE D DWG NO FPP-042194 REV A
					DO NOT SCALE SHEET 1 OF 1

Sprinkler Gauge

Model FPPI-PG

INSIST ON FPPI®

Description

Model FPPI-PG pressure gauges feature an impact and corrosion resistant case made from ABS (plastic) or powder coated steel. Features phosphor bronze bourdon tube movement with white enameled brass dial face with large numbers for easy reading. Dual scale to 300 PSI/2000Kpa. UL/ULc Listed (EX26630) and FM Approved.

Applications

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

Special Features

- UL-listed (UL-393), EX26630
- Factory Mutual (FM) approved
- Reliable and economical

Standard Features

Design
EN 837-1 & ASME B40.100

Sizes
4” (100 mm)

Accuracy class
± 3⅔% of span
(ASME B40.100 Grade B)
The tolerance is reflected in the box associated with the zero mark on the face of the gauge. The value is considered zero when the pointer falls anywhere within this box.

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

Working Pressure
Steady: ¾ of full scale value
Fluctuating: ½ of full scale value
Short time: full scale value

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

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

Specifications

Bourdon Tube
Material: copper alloy C-type

Pressure Connection
Material: copper alloy
¼“ NPT lower mount (LM)

Movement
Copper alloy

Dial
White aluminum with stop pin; black and red lettering

Pointer
Black aluminum

Case
Black polycarbonate
Powder coated steel (Air/Water Gauge only)

Window
Snap-in clear polycarbonate

Item Numbers/Descriptions
11-550-00 Water Gauge
11-551-00 Air Gauge
11-552-00 Air Gauge w/Retard
11-553-00 Air/Water Gauge
11-553-10 Air/Water Gauge w/ Steel Case
11-558-00 Water Gauge, Personalized
11-559-00 Air/Water Gauge, Personalized
11-561-00 Air Gauge w/Retard, Personalized

c UL us LISTED
FM APPROVED

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CARLSBAD, CA 92010
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+ 1 (800) 344-1822
+ 1 (800) 344-3775 FAX

Identification Signs

INSIST ON FPPI®

Description

Manufactured from .020” white coated aluminum. All sign types are screen printed with a fade resistant red ink. Each sign is shipped with a clear protective plastic coating which can be re- moved at time of installation. Each sign type meets or exceeds NFPA13 requirements. All signs (except 7” round) are drilled in four corners to allow for easy installation. All signs (except 7” round) may be installed with sign chain or with any fastener that is suitable for the material that the sign is being attached. The 7” round bell signs are center drilled to allow for installation directly to the bell gong assembly. Type “A” 9” x 7” Control valve signs are drilled with the same four hole pattern as Type “B” 6” x 2” signs to allow for attachment of Type “B” to Type “A”.

Installation

Installation of aluminum signs is accomplished by several methods. The most common installation procedure is to use #16 Single Jack chain to hang the sign on the area being identified. Since all of the above mentioned signs are predrilled at all four corners, the last link of the chain can be opened and hooked through the top holes on the signs and hung on the appropriate valve or piping. The signs may also be fastened to a flat surface with fasteners appropriate to the base material. (The 9” x 7” Fire Alarm Bell sign must be drilled with a ⅜” hole if it is to be attached directly to the bell gong.)

Specifications

Material:
.020” aluminum with removable plastic coating

Sizes:
6” x 2”
4” x 6”
5” x 7”
9” x 7”
12” x 10”
8.5” x 11”
7” Round

See current catalog for a full listing of all available signs.

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Plastic Wall Plates Floor/Ceiling

INSIST ON FPPI®

Description

FPPI Plastic Floor and Ceiling Plates are manufactured from light weight injection molded plastic and are of single piece construction and rustproof. They are suitable for both interior and exterior uses and are highly recommended in corrosive environments. Available in IP sizes ½" through 8".

Installation

The plastic wall plates may be installed by two methods. The first is by placing the wall plate over the pipe while the pipe is being installed. The second is by splitting the wall plate at the area on the back of the wall plates that has been molded to break apart. Carefully bend the wall plate a this weakened area until fully separated. Then carefully twist the wall plate open just enough to be placed around the pipe. Allow the two ends of the separated wall plate to "spring" back into shape. Slide the wall plate up against the base material to finish the installation. The wall plates should not be painted. Certain chemicals contained in paint may cause the wall plates to deteriorate.

Specifications

Size(IP)*	ID	OD
½"	.827	2.787
¾"	1.037	2.997
1"	1.298	3.210
1¼"	1.640	3.580
1½"	1.900	3.900
2"	2.380	4.450
2½"	2.900	5.280
3"	3.535	5.925
4"	4.575	6.935
5"	5.655	9.655
6"	6.740	9.820
8"	8.790	13.010

Depth:
3/16"

Finish:
Chrome
White

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Swing Check Valve

INSIST ON FPPI®

Full Floating Clapper Assembly

Description

The bronze* swing check valve features a full floating clapper assembly that provides for a positive seal each time the valve is cycled. This feature improves the swing check valves ability to “clear” any debris that may be present in the water supply. The seat material is NBR which provides for a positive seal even under light residual pressures.

Installation

For horizontal installation only. The female by female swing check valve should be installed in accordance with commonly used installation practices for the fire sprinkler industry. Proper seal of the threads can be accomplished by applying a liberal amount of PTFE based thread sealant such as PipeFit® Thread Sealant Paste or PTFE Tape. Never use tape and paste together. This will cause excessive stress on the threaded connection leading to failure of the valve. Do not exceed one full turn past hand tight when installing male threads into the check valve.

Warning

DO NOT OVER TIGHTEN. Over tightening during installation will crack the valve body. Evidence of overtightening may not be readily visible or apparent upon pressurization.

No user serviceable parts.

Specifications

Valve Body:
Cast Bronze*
(85-5-5-5)

Clapper Assembly:
Forged Brass

Seat:
NBR (Chloramine Resistant)

Sizes:
½” IPS
2” IPS
Female by female

Rated Pressure:
250 psi

*Contains lead. Not for use in water systems intended for human consumption.

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TrimFit® Globe Valve with PTFE

INSIST ON FPPI®

UL/ULC Listed 300 psi

Description

FPPI® TrimFit® Bronze* Globe Valves are precision cast then machined using state of the art facilities. Each valve features a full floating seat holder for reduced seat wear when closing the valve. Seat is made of pure virgin PTFE for longer seat life and reduced maintenance as compared to rubber seat valves. TrimFit trim valves are suitable for use in regular (175psi) and high pressure (300psi) sprinkler systems. Standard configuration is FNPT x FNPT and is available in ¼" IPS through 2" IPS sizes. Each valve carries the UL Listing UL/ ULC Listed 2R97

Installation

Install in accordance with usual and customary installation techniques for fire sprinkler systems. Use a suitable thread sealant on the male threads of the pipe being threaded into the valve body. We recommend either FPPI PTFE Thread Sealing Tape or PipeFit® Thread Sealing Paste with PTFE. **NEVER USE BOTH. DO NOT OVERTIGHTEN. OVERTIGHTENING MAY CAUSE CRACKS OR LEAKS.**

Specifications

Material:
Brass* or Bronze*
Seat-PTFE
Hand wheel-JIS FC 20 painted red.

Sizes:
06-798-00 ¼" IPS FNPT
06-800-00 ½"
06-802-00 ¾"
06-804-00 1"
06-806-00 1¼"
06-808-00 1½"
06-810-00 2"

*Contains lead. Not for use in water systems intended for human consumption.

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UL LISTED c UL LISTED

Three-way Brass Valve

INSIST ON FPPI®

¼" IPS UL/ULC Listed* 300 psi

Description

The ¼" IPS three-way female threaded valve is used to facilitate the installation of sprinkler system pressure gauges. The valve provides for one inlet and two outlets. This design allows for replacement of the system gauge without shutting down the water supply to the sprinkler system. This design also allows Authorities' Having Jurisdiction to test system pressure with an additional gauge through the second outlet. (The second outlet is normally plugged during installation with a ¼" IPS pipe plug.)

Installation

Installation of the three-way valve can be accomplished with normal field installation tools. Make sure the valve is installed according to the flow indication arrow that has been cast into the valve body. The most common installation allows for a ¼" IPS nipple between the valve and the water supply being measured. This assures there will be ad- equate spacing for the sprinkler system gauge from the riser. Use either PTFE Pipe Thread Sealing Tape or a suitable pipe thread sealant such as PipeFit® Thread Sealant Paste with PTFE when installing the valve.

DO NOT OVERTIGHTEN THREADS. OVERTIGHTENING MAY CAUSE VALVE FAILURE.

*UL/ULC Listed 2R97

Specifications

Materials:
Seat - Brass
Body - Brass
Handwheel - Iron

Sizes:
¼" IPS

Working Pressure:
400 WOG

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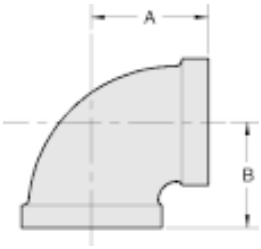
UL LISTED c UL LISTED

D.I. THREADED FITTINGS

STAR® PIPE PRODUCTS

LISTED LISTED APPROVED

For fire protection services request submittal GRS 1.3

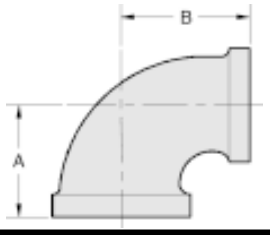


Ductile iron threaded fittings are UL, ULC listed and factory mutual approved for 500 psi service. Ductile iron per ASTM A 536 grade 65-45-12. Dimensions conform to ANSI B16.3 class 150. Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittingd should be tightened theree turns beyond hand tight, but no more than four turns.

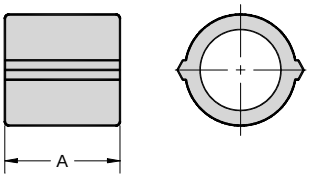
DUCTILE IRON 90 DEG. ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	DB90033	500	1.50	1.50	0.62
1 1/4	DB90044	500	1.75	1.75	0.90
1 1/2	DB90055	500	1.94	1.94	1.20
2	DB90066	500	2.25	2.25	1.85



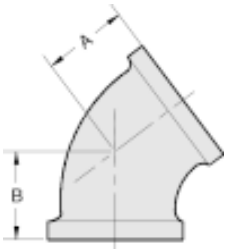
DUCTILE IRON RED.90 DEG. ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1X1/2	DB90031	500	1.26	1.36	0.44
1X3/4	DB90032	500	1.37	1.45	0.52
1 1/4X1/2	DB90041	500	1.34	1.53	0.64
1 1/4X3/4	DB90042	500	1.45	1.62	0.72
1 1/4X1	DB90043	500	1.58	1.67	0.75
1 1/2X1	DB90053	500	1.65	1.80	0.92
1 1/2X1 1/4	DB90054	500	1.82	1.88	1.08
2X1/2	DB90061	500	1.49	1.88	1.08
2X3/4	DB90062	500	1.60	1.97	1.24
2X1	DB90063	500	1.73	2.02	1.40
2X1 1/4	DB90064	500	1.90	2.10	1.52
2X1 1/2	DB90065	500	2.02	2.16	1.65



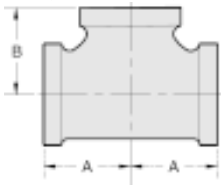
DUCTILE IRON COUPLING

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSION A	WEIGHT EACH PIECE
1	DCL033	500	1.67	0.40
1 1/4	DCL044	500	1.93	0.57
1 1/2	DCL055	500	2.15	0.75
2	DCL066	500	2.53	1.15



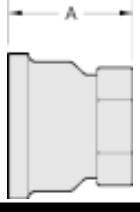
DUCTILE IRON 45 DEG. ELBOW

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	DB45033	500	1.12	1.12	0.46
1 1/4	DB45044	500	1.29	1.29	0.73
1 1/2	DB45055	500	1.43	1.43	0.92
2	DB45066	500	1.68	1.68	1.50



DUCTILE IRON STRAIGHT TEE

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	DIMENSIONS B	WEIGHT EACH PIECE
1	DT333	500	1.50	1.50	0.85
1 1/4	DT444	500	1.75	1.75	1.22
1 1/2	DT555	500	1.94	1.94	1.55
2	DT666	500	2.25	2.25	2.45



DUCTILE IRON RED. COUPLING

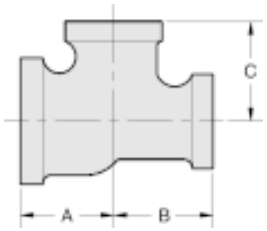
NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSION A	WEIGHT EACH PIECE
1X1/2	DRC031	500	1.69	0.39
1X3/4	DRC032	500	1.69	0.53

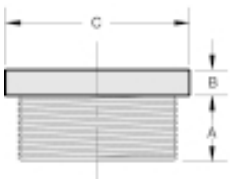
D.I. THREADED FITTINGS

STAR® PIPE PRODUCTS

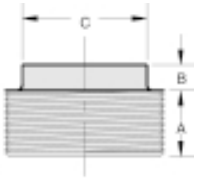
LISTED LISTED APPROVED

For fire protection services request submittal GRS 1.3





OUTSIDE HEAD



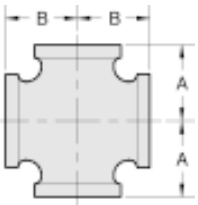
INSIDE HEAD

DUCTILE IRON BUSHINGS

NOMINAL SIZE (INCH)	ITEM CODE #	DIMENSIONS A	B	C	STYLE	WT. EACH
1x1/2	DBUSH31	0.75	0.25	1.42	OUT	0.22
1x3/4	DBUSH32	0.75	0.25	1.42	OUT	0.17
1 1/4x1	DBUSH43	0.80	0.28	1.76	OUT	0.28
1 1/2x1	DBUSH53	0.83	0.31	2.00	OUT	0.44
1 1/2x1 1/4	DBUSH54	0.83	0.31	2.00	OUT	0.30
2x1	DBUSH63	0.88	0.41	1.95	IN	0.66
2x1 1/4	DBUSH64	0.88	0.34	2.48	OUT	0.72
2x1 1/2	DBUSH65	0.88	0.34	2.48	OUT	0.61

DUCTILE IRON REDUCING TEE

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSIONS A	B	C	WEIGHT EACH PIECE
1X1X1/2	DT331	500	1.26	1.26	1.36	0.64
1X1X3/4	DT332	500	1.37	1.37	1.45	0.73
1X1/2X1	DT313	500	1.50	1.36	1.50	0.71
1X3/4X1	DT323	500	1.50	1.45	1.50	0.76
1X1X1 1/4	DT334	500	1.67	1.67	1.58	0.98
1X1X1 1/2	DT335	500	1.80	1.80	1.65	1.16
1 1/4X1X1/2	DT431	500	1.34	1.26	1.53	0.82
1 1/4X1X3/4	DT432	500	1.45	1.37	1.62	0.90
1 1/4X1X1	DT433	500	1.58	1.50	1.67	1.00
1 1/4X1X1 1/4	DT434	500	1.75	1.67	1.75	1.08
1 1/4X1X1 1/2	DT435	500	1.88	1.80	1.82	1.42
1 1/4X1 1/4X1/2	DT441	500	1.34	1.34	1.53	0.86
1 1/4X1 1/4X3/4	DT442	500	1.45	1.45	1.62	0.92
1 1/4X1 1/4X1	DT443	500	1.58	1.58	1.67	0.95
1 1/4X1 1/4X1 1/2	DT445	500	1.88	1.88	1.82	1.45
1 1/4X1 1/4X2	DT446	500	2.10	2.10	1.90	1.75
1 1/2X1X1/2	DT531	500	1.41	1.34	1.66	0.95
1 1/2X1X3/4	DT532	500	1.52	1.37	1.75	1.14
1 1/2X1X1	DT533	500	1.65	1.50	1.80	1.17
1 1/2X1X1 1/4	DT534	500	1.82	1.67	1.88	1.34
1 1/2X1X1 1/2	DT535	500	1.94	1.80	1.94	1.45
1 1/2X1 1/4X1/2	DT541	500	1.41	1.34	1.66	1.05
1 1/2X1 1/4X3/4	DT542	500	1.52	1.45	1.75	1.15
1 1/2X1 1/4X1	DT543	500	1.65	1.58	1.80	1.25
1 1/2X1 1/4X2	DT546	500	2.16	2.10	2.02	1.90
1 1/2X1 1/2X1/2	DT551	500	1.41	1.41	1.16	1.15
1 1/2X1 1/2X3/4	DT552	500	1.52	1.52	1.75	1.24
1 1/2X1 1/2X1	DT553	500	1.65	1.65	1.80	1.30
1 1/2X1 1/2X1 1/4	DT554	500	1.82	1.82	1.88	1.48
1 1/2X1 1/2X2	DT556	500	2.16	2.16	2.02	1.98
2X1X2	DT636	500	2.25	2.02	2.25	2.15
2X1 1/4X2	DT646	500	2.25	2.10	2.25	2.30
2X1 1/2X1/2	DT651	500	1.49	1.41	1.88	1.50
2X1 1/2X3/4	DT652	500	1.60	1.52	1.97	1.62
2X1 1/2X1	DT653	500	1.73	1.65	2.02	1.64
2X1 1/2X1 1/4	DT654	500	1.90	1.82	2.10	1.80
2X1 1/2X1 1/2	DT655	500	2.02	1.94	2.16	2.00
2X1 1/2X2	DT656	500	2.25	2.16	2.25	2.35
2X2X1/2	DT661	500	1.49	1.49	1.88	1.60
2X2X3/4	DT662	500	1.60	1.60	1.97	1.68
2X2X1	DT663	500	1.73	1.73	2.02	1.85
2X2X1 1/4	DT664	500	1.90	1.90	2.10	2.04
2X2X1 1/2	DT665	500	2.02	2.02	2.16	2.18
2X2X2 1/2	DT667	500	2.60	2.60	2.39	3.61
2 1/2X2X3/4	DT762	500	1.74	1.60	2.32	2.28



DUCTILE IRON CROSS

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I	DIMENSIONS A	B	WEIGHT EACH PIECE
1	DX033	500	1.50	1.50	0.98
1 1/4	DX044	500	1.75	1.75	1.50
1 1/2	DX055	500	1.94	1.94	1.90
2	DX066	500	2.25	2.25	2.95
1 1/4X1	DX043	500	1.58	1.67	1.27
1 1/2X1	DX053	500	1.65	1.80	1.48
2X1	DX063	500	1.73	2.02	2.10

DUCTILE IRON CAP

NOMINAL SIZE (INCH)	ITEM CODE #	MAX. WORKING P.S.I.	DIMENSION A	WEIGHT EACH PIECE
1	DCP003	500	1.16	0.32
1 1/4	DCP004	500	1.28	0.43
1 1/2	DCP005	500	1.33	0.60
2	DCP006	500	1.45	0.91

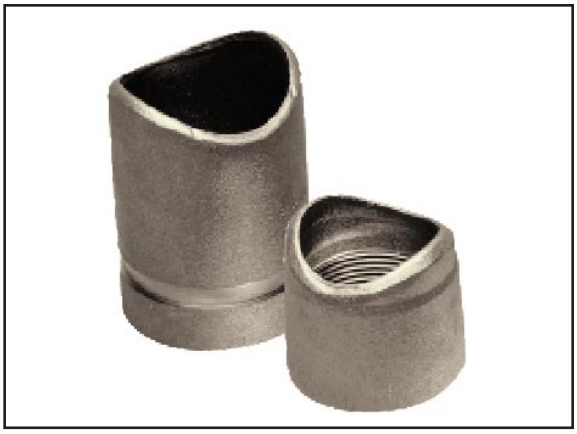
MERIT MANUFACTURING CORPORATION
319 Circle of Progress • Pottstown, Pennsylvania 19464-3811
Tel 610-327-4000 • Fax 610-970-9282
Fax Toll Free 800-543-7013 • www.meritmfg.com

SUBMITTAL SHEET

Merit Weld-Miser™ Tee-Let® Welding Outlet Fittings

Merit Weld-Miser™ Tee-Let® Welding Branch Outlet Fittings offer the user a high strength, low cost forged threaded and grooved line of fittings specifically designed and manufactured to be installed on schedules 5 thru 10, proprietary thin wall flow pipe and standard wall pipe.

Merit Tee-Lets are forged steel welding outlet fittings. The material used in manufacture meets the chemical and physical requirements of ASTM A 53, Grades A or B, Type E, Tee-Lets employ a low weld volume design to provide for either a partial or full penetration weld employing a single pass with minimum burn-through and pipe distortion. Weld Miser Tee-Lets are recommended for use on proprietary thin wall, schedules 5, 10 and 40 pipe. Threads comply with ANSI B1.20.1 or ISO7/1. They are UL Listed and FM Approved for use conforming to the requirements of Bulletin 13 1999 of the National Fire Protection Association. When used in fire sprinkler systems, Tee-Lets are rated for 300 psi. When used in mechanical systems, maximum pressures are calculated using criteria developed for ASME B31 piping code. Send for details if required.



c UL LISTED Factory Mutual System APPROVED

PRODUCT APPROVALS

Tee-Let Welded Outlet Fitting (UL VIZU — EX3788, FM Approval Guide Chapter 1 – Pipe Fittings)

Outlet Model	Outlet Pipe Size (Inch)	Header Pipe Size (Inch)	Rated Pressure (psig)
Tee-Let Type A (F-Threaded End)	½, ¾, 1	½ - 8 (Sch. 10, 40)	300
	1¼, 1½, 2, 2½, 3, 4	½ - 4 (Sch. 5, DynaFlow)	
	2	4 (EZ-Flow)	
	2, 4	6 (EZ-Flow)	
Tee-Let Type C (Grooved End)	1¼ - 8	1¼ - 8 (Sch. 10, 40)	300
	2½ - 8	½ - 4 (Sch. 5, DynaFlow)	
Tee-Let Type C/R (Roll Grooved End)	1¼ - 6	1¼ - 8 (All Schedules)	300

1) Size on size (ie 2 x 2) Tee-Lets are not FM Approved 2) FM rated working pressure when welded on Sch. 5 or nonthreadable lightwell pipe is 175 psi.

PROJECT:

ARCHITECT / ENGINEER:

CONTRACTOR: **PHONE:**

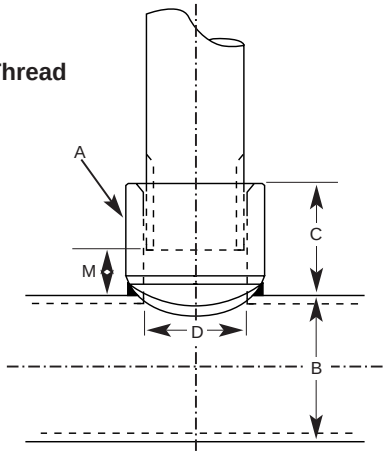
ADDRESS:

NOTES:

APPROVAL:

Merit Weld-Miser Tee-Let Welding Outlet Fittings

Type A
Female Thread

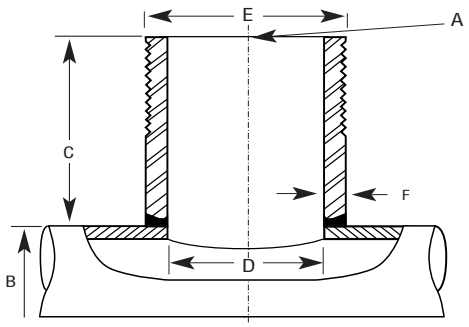


Part Number BSPT	Nominal Outlet Size A	Nominal Header Size B	Outlet Length Size C	Inside Diameter Size D In. / mm	Make up Size M	Weight Each Lb. / kgs
1002002	1/4 x	1-1/4 - 8				0.080
–	6 x	6 - 200				0.04
1005012	1/2 x	1-1/4 - 1-1/2	1.063	0.700	0.500	0.171
–	13 x	32 - 40	27.0	17.8	12.7	0.08
1005015		1-1/2 - 2	1.063	0.700	0.500	0.171
–		40 - 50	27.0	17.8	12.7	0.08
1005020		2 - 2-1/2	1.063	0.700	0.500	0.171
–		50 - 65	27.0	17.8	12.7	0.08
1005025		2-1/2 - 8	1.063	0.700	0.500	0.169
–		65 - 200	27.0	17.8	12.7	0.08
1007012	3/4 x	1-1/4 - 1-1/2	1.125	0.900	0.500	0.260
–	19 x	32 - 40	28.6	22.9	12.7	0.12
1007015		1-1/2 - 2	1.125	0.900	0.500	0.260
–		40 - 50	28.6	22.9	12.7	0.12
1007020		2 - 2-1/2	1.125	0.900	0.500	0.260
–		50 - 65	28.6	22.9	12.7	0.12
1007025		2-1/2 - 8	1.125	0.900	0.500	0.256
–		65 - 200	28.6	22.9	12.7	0.12
1010012	1 x	1-1/4 - 1-1/2	1.250	1.145	0.500	0.331
1110012	25 x	32 - 40	31.8	29.1	12.7	0.15
1010015		1-1/2 - 2	1.250	1.145	0.500	0.331
1110015		40 - 50	31.8	29.1	12.7	0.15
1010020		2 - 2-1/2	1.250	1.145	0.500	0.320
1110020		50 - 65	31.8	29.1	12.7	0.15
1010025		2-1/2 - 3	1.250	1.145	0.500	0.314
1110025		65 - 80	31.8	29.1	12.7	0.14
1010030		3 - 4	1.250	1.145	0.500	0.309
1110030		80 - 100	31.8	29.1	12.7	0.14
1010050		5 - 8	1.250	1.145	0.500	0.291
1110050		125 - 200	31.8	29.1	12.7	0.13
1012012	1- 1/4 x	1-1/4 - 1-1/2	1.375	1.490	0.500	0.432
1112012	32 x	32 - 40	34.9	37.8	12.7	.019
1012015		1-1/2 - 2	1.375	1.490	0.500	0.421
1112015		40 - 50	34.9	37.8	12.7	.019
1012020		2 - 2-1/2	1.375	1.490	0.500	0.421
1112020		50 - 65	34.9	37.8	12.7	.019
1012025		2-1/2 - 3	1.375	1.490	0.500	0.411
1112025		65 - 80	34.9	37.8	12.7	.019
1012030		3 - 4	1.375	1.490	0.500	0.389
1112030		80 - 100	34.9	37.8	12.7	.018
1012050		5 - 8	1.375	1.490	0.500	0.389
1112050		125 - 200	34.9	37.8	12.7	.018
1015015	1- 1/2 x	1-1/2	1.625	1.610	0.875	0.477
1115015	40 x	40	41.3	40.9	22.2	.022
1015020		2	1.625	1.610	0.875	0.477
1115020		50	41.3	40.9	22.2	.022
1015025	2-1/2	1.625	1.610	0.875	0.477	
1115025		65	41.3	40.9	22.2	.022
1015030		3 - 4	1.625	1.610	0.875	0.477
1115030		80 - 100	41.3	40.9	22.2	.022

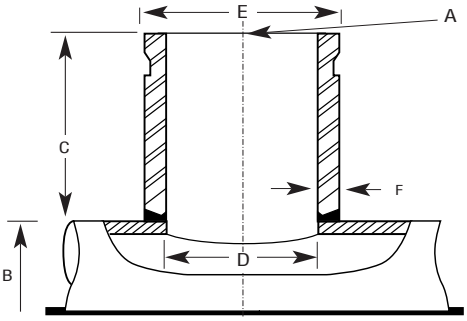
Part Number BSPT	Nominal Outlet Size A	Nominal Header Size B	Outlet Length Size C	Inside Diameter Size D In. / mm	Make up Size M	Weight Each Lb. / kgs
1015040	2- 1/2 x	4	1.625	1.610	0.875	0.477
1115040		100	41.3	40.9	22.2	.022
1015050		5 - 8	1.625	1.610	0.875	0.477
1115050		125 - 200	41.3	40.9	22.2	.022
1020020	2 x	2	1.750	2.067	0.875	0.857
1120020	50 x	50	44.5	52.5	22.2	0.38
1020025		2-1/2	1.750	2.067	0.875	0.829
1120025		65	44.5	52.5	22.2	0.38
1020030		3	1.750	2.067	0.875	0.829
1120030		80	44.5	52.5	22.2	0.39
1020040		4	1.750	2.067	0.875	0.800
1120040		100	44.5	52.5	22.2	0.36
1020050		5	1.750	2.067	0.875	0.743
1120050		125	44.5	52.5	22.2	0.34
1020060		6	1.750	2.067	0.875	0.743
1120060		150	44.5	52.5	22.2	0.34
1020080		8	1.750	2.067	0.875	0.743
1120080		200	44.5	52.5	22.2	0.34
1025025	2-1/2 x	2-1/2	2.215	2.469	1.125	1.250
1125025	65 x	65	54.0	62.7	28.6	0.55
1025030		3	2.215	2.469	1.125	1.200
1125030		80	54.0	62.7	28.6	0.55
1025040		4	2.215	2.469	1.125	1.150
1125040		100	54.0	62.7	28.6	0.52
1025050		5	2.215	2.469	1.125	1.150
1125050		125	54.0	62.7	28.6	0.52
1025060		6	2.215	2.469	1.125	1.150
1125060		150	54.0	62.7	28.6	0.52
1025080		8	2.215	2.469	1.125	1.150
1125080		200	54.0	62.7	28.6	0.52
1025030	3 x	3	2.500	3.068	1.500	3.100
–	80 x	80	63.5	77.9	38.1	1.41
1025040		4	2.500	3.068	1.500	3.100
–		100	63.5	77.9	38.1	1.41
1025050		5	2.500	3.068	1.500	3.100
–		125	63.5	77.9	38.1	1.412
1025060		6	2.500	3.068	1.500	3.100
–		150	63.5	77.9	38.1	1.412
1025080		8	2.500	3.068	1.500	3.100
–		200	63.5	77.9	38.1	1.41
1040040	4 x	4	3.000	4.026	2.000	5.000
–	4 x	100	76.2	102.3	50.8	2.27
1040050		5	3.000	4.026	2.000	5.000
–		125	76.2	102.3	50.8	2.27
1040060		6	3.000	4.026	2.000	5.000
–		150	76.2	102.3	50.8	2.27
1040080		8	3.000	4.026	2.000	5.000
–		200	76.2	102.3	50.8	2.27

Merit Weld-Miser Tee-Let Welding Outlet Fittings

Type B
Male Thread
Standard Weight



Type C
Cut Groove
Standard Weight

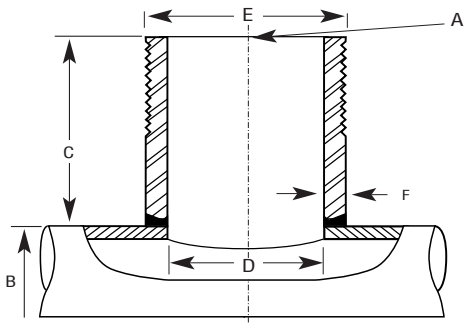


Male Thread Std. Wt.	Cut Groove Std. Wt.	Roll Groove Sch. 10	Nominal Outlet Size A	Nominal Header Size B	Outlet Length Size C	In. / mm Inside Diameter Size D	Outside Diameter Size E	F Wall Thickness Std. Wt.	Weight Each Lb. / kgs
1310012	2010012	2210012	1 x	1-1/4 - 1-1/2	3	1.049	1.315	0.133	1.500
			25 x	32 - 40	80	26.6	33.4	3.4	30
1310015	2010015	2210015		1-1/2 - 2	3	1.049	1.315	0.133	1.500
				40 - 50	80	26.6	33.4	3.4	30
1210020	2010020	2210020		2 - 2-1/2	3	1.049	1.315	0.133	1.500
				50 - 65	80	26.6	33.4	3.4	30
1310025	2010025	2210025		2-1/2 - 4	3	1.049	1.315	0.133	1.500
				65 - 100	80	26.6	33.4	3.4	30
1310050	2010050	2210050		5 - 8	3	1.049	1.315	0.133	1.500
				125 - 200	80	26.6	33.4	3.4	30
1312012	2012012	2212012	1-1/4 x	1-1/4	3	1.368	1.660	0.140	1.500
			32 x	32	80	34.7	42.2	3.6	30
1312015	2012015	2212015		1-1/2	3	1.368	1.660	0.140	1.500
				40	80	34.7	42.2	3.6	30
1212020	2012020	2212020		2 - 2-1/2	3	1.368	1.660	0.140	1.500
				50 - 65	80	34.7	42.2	3.6	30
1312025	2012025	2212025		3 - 4	3	1.368	1.660	0.140	1.500
				80 - 100	80	34.7	42.2	3.6	30
1312050	2012050	2212050		5 - 8	3	1.368	1.660	0.140	1.500
				125 - 200	80	34.7	42.2	3.6	30
1315015	2015015	2215015	1-1/2 x	1-1/2	3	1.610	1.900	0.145	1.500
			40 x	40	80	40.9	48.3	3.7	30
1215020	2015020	2215020		2	3	1.610	1.900	0.145	1.500
				50	80	40.9	48.3	3.7	30
1315025	2015025	2215025		2-1/2	3	1.610	1.900	0.145	1.500
				65	80	40.9	48.3	3.7	30
1315030	2015030	2215030		3 - 4	3	1.610	1.900	0.145	1.500
				80 - 100	80	40.9	48.3	3.7	30
1315050	2015050	2215050		5 - 8	3	1.610	1.900	0.145	1.500
				125 - 200	80	40.9	48.3	3.7	30
1320020	2020020	–	2 x	2	3	2.067	2.375	0.154	1.500
			50 x	50	80	52.5	60.3	3.9	30
1320025	2020025	–		2-1/2	3	2.067	2.375	0.154	1.500
				65	80	52.5	60.3	3.9	30
1320030	2020030	–		3	3	2.067	2.375	0.154	1.500
				80	80	52.5	60.3	3.9	30
1320035	2020040	–		4	3	2.067	2.375	0.154	1.500
				100	80	52.5	60.3	3.9	30
1320050	2020050	–		5	3	2.067	2.375	0.154	1.500
				125	80	52.5	60.3	3.9	30
1320060	2020060	–		6	3	2.067	2.375	0.154	1.500
				150	80	52.5	60.3	3.9	30
1320080	2020080	–		8	3	2.067	2.375	0.154	1.500
				200	80	52.5	60.3	3.9	30

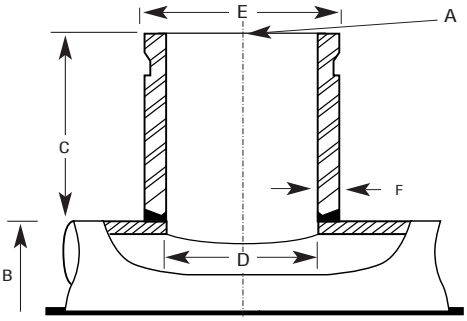
Note: Tee-lets are manufactured to fit size-on-size, that is the contoured shape on a given Tee-Let is made to fit perfectly on the first listed header size. If installed on the second header size marked on the fitting, a slight gap of approximately 1/32" will appear along the longitudinal centerline of the header. For example, a 1" x 2 - 2-1/2" Tee-Let, is a 1" outlet fitting manufactured to fit perfectly on the 2" header size listed, while leaving a 1/32" gap along the longitudinal centerline of the 2-1/2" size. If a perfect fit is required for a 2-1/2" header pipe, then a 1" x 2-1/2 - 3" Tee-let would be ordered. Size consolidations are employed to reduce inventory and provide for greater flexibility.

Merit Weld-Miser Tee-Let Welding Outlet Fittings

Type B
Male Thread
Standard Weight



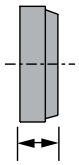
Type C
Cut Groove
Standard Weight



Male Thread Std. Wt.	Cut Groove Std. Wt. Metric	Roll Groove Sch. 10	Nominal Outlet Size A	Nominal Header Size B	Outlet Length Size C	Inside Std. Wt. Size D	Inside Schedule Size D	Inside Diameter Size E	F Wall Thickness Std.	F Wall Thickness Sch. 10	Weight Each Lb. / kgs
						In. / mm					
1325025	2025025	2225025	2-1/2 x	2-1/2	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125025		65 x	65	80	62.7	67.0	76.2	5.0	3.0	30
1325030	2025030	2225030		3	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125030			80	80	62.7	67.0	76.2	5.0	3.0	30
1325035	2025040	2225035		4	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125040			100	80	62.7	67.0	76.2	5.0	3.0	30
1325050	2025050	2225050		5	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125050			125	80	62.7	67.0	76.2	5.0	3.0	30
1325060	2025060	2225060		6	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125060			175	80	62.7	67.0	76.2	5.0	3.0	30
1325080	2025080	2225080		8	3	2.469	2.635	2.875	0.203	0.120	1.500
	2125080			200	80	62.7	67.0	76.2	5.0	3.0	30
1330025	2030025	2230025	3 x	3	3	3.068	3.260	3.500	0.216	0.120	1.500
			80 x	80	80	78.0	83.0	88.0	5.0	3.0	30
1330030	2030030	2230030		3-1/2	3	3.068	3.260	3.500	0.216	0.120	1.500
				85	80	78.0	83.0	88.0	5.0	3.0	30
1330035	2030035	2230035		4	3	3.068	3.260	3.500	0.216	0.120	1.500
				100	80	78.0	83.0	88.0	5.0	3.0	30
1330050	2030050	2230050		5	3	3.068	3.260	3.500	0.216	0.120	1.500
				125	80	78.0	83.0	88.0	5.0	3.0	30
1330060	2030060	2230060		6	3	3.068	3.260	3.500	0.216	0.120	1.500
				150	80	78.0	83.0	88.0	5.0	3.0	30
1330080	2030080	2230080		8	3	3.068	3.260	3.500	0.216	0.120	1.500
				200	80	78.0	83.0	88.0	5.0	3.0	30
1340040	2040040	2240040	4 x	4	4	4.026	4.260	4.500	0.237	0.120	1.500
			100 x	100	100	102.0	108.0	114.0	6.0	3.0	30
1340050	2040050	2240050		5	4	4.026	4.260	4.500	0.237	0.120	1.500
				125	100	102.0	108.0	114.0	6.0	3.0	30
1340060	2040060	2240060		6	4	4.026	4.260	4.500	0.237	0.120	1.500
				150	100	102.0	108.0	114.0	6.0	3.0	30
1340080	2040080	2240080		8	4	4.026	4.260	4.500	0.237	0.120	1.50
				200	100	102.0	108.0	114.0	6.0	3.0	30
–	2060060	2260060	6 x	6	4	6.065	6.357	6.625	0.280	0.134	1.500
			150 x	150	100	155.0	161.5	168.3	7.1	3.0	30
–	2060080	2260080		8	4	6.065	6.357	6.625	0.280	0.134	1.50
				200	100	155.0	161.5	168.3	7.1	3.0	30
–	2080080	2280080	8 x	8	4	7.981	8.329	8.625	0.322	0.148	1.50
			200 x	200	100	203.0	212.0	213.0	8.0	3.0	30

Note: Tee-lets are manufactured to fit size-on-size, that is the contoured shape on a given Tee-Let is made to fit perfectly on the first listed header size. If installed on the second header size marked on the fitting, a slight gap of approximately 1/32" will appear along the longitudinal centerline of the header. For example, a 1" x 2 - 2-1/2" Tee-Let, is a 1" outlet fitting manufactured to fit perfectly on the 2" header size listed, while leaving a 1/32" gap along the longitudinal centerline of the 2-1/2" size. If a perfect fit is required for a 2-1/2" header pipe, then a 1" x 2-1/2 - 3" Tee-let would be ordered. Size consolidations are employed to reduce inventory and provide for greater flexibility.

FIG. SK-1 Cap



SK-1 GROOVED CAP

Nominal Size	O.D.	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	1¼ *25*	0.3 *0.1*
1¼ *32*	1.660 *42.2*	1 *25*	0.4 *0.2*
1½ *40*	1.900 *48.3*	1 *25*	0.5 *0.2*
2 *50*	2.375 *60.3*	1 *25*	0.7 *0.3*
2½ *65*	2.875 *73.0*	1 *25*	1.0 *0.4*
3 *80*	3.500 *88.9*	1 *25*	1.5 *0.7*
4 *100*	4.500 *114.3*	1 1/16 *27*	2.7 *1.2*
5 *125*	5.563 *141.3*	1 1/16 *27*	4.4 *2.0*
6 *150*	6.625 *168.3*	1 1/16 *27*	6.6 *3.0*
8 *200*	8.625 *219.1*	1 3/16 *30*	11.3 *5.1*
10* *250*	10.750 *273.1*	1¼ *32*	21.0 *9.5*
12* *300*	12.750 *323.9*	1¼ *32*	35.5 *16.1*

*Supplied as Style K-1 only.

c UL us LISTED FM APPROVED VdS

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

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile Iron conforming to ASTM-A536

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

ASC Engineered Solutions

Concentric Reducer
Fig. 7072

– Available galvanized

Material Specifications

Cast Fittings
Ductile Iron conforming to ASTM A536

Fabricated Fittings
1"–10" Carbon Steel, Schedule 40, conforming to ASTM A53, Grade B

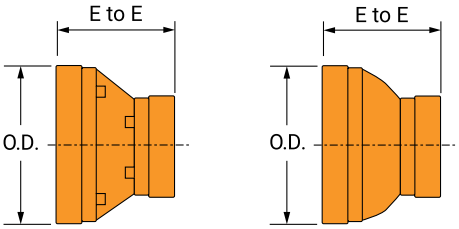
12" and above Carbon Steel, Standard Wall, conforming to ASTM A53, Grade B

Coatings
- ☐ Rust inhibiting paint
  Color: Orange (Standard)
- ☐ Hot Dipped Zinc Galvanized conforming to ASTM A153 (Optional)
- ☐ Other available options
  (Example: RAL3000 or RAL9000 Series)

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Sales Representative.

GRUVLOK
An ASC Engineered Solution

Concentric Reducer
Fig. 7072



Cast Fabricated

Nominal Size	O.D. - 1	O.D. -2	End to End	Approx. Wt. Ea.	Nominal Size	O.D.–1	O.D.–2	End to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	In./mm	Lbs./kg	In./DN(mm)	In./mm	In./mm	In./mm	Lbs./kg
1¼ x 1 32 x 25	1.660 42.2	1.315 33.4	2½ 64	0.6 0.3	3 x 1½ 80 x 40	3.500 88.9	1.900 48.3	2½ 64	1.3 0.6
1½ x 1 40 x 25	1.900 48.3	1.315 33.4	2½ 64	0.6 0.3	3 x 2 ■ 80 x 50	3.500 88.9	2.375 60.3	2½ 64	1.4 0.6
1½ x 1¼ 40 x 32	1.900 48.3	1.660 42.2	2½ 64	0.6 0.3	3 x 2½ ■ 80 x 65	3.500 88.9	2.875 73.0	2½ 64	1.6 0.7
2 x 1 50 x 25	2.375 60.3	1.315 33.4	2½ 64	0.8 0.4	3½ x 3 90 x 80	4.000 101.6	3.500 88.9	3 76	1.8 0.8
2 x 1¼ ■ 50 x 32	2.375 60.3	1.660 42.2	2½ 64	1.3 0.6	4 x 1 100 x 25	4.500 114.3	1.315 33.4	3 76	2.2 1.0
2 x 1½ ■ 50 x 40	2.375 60.3	1.900 48.3	2½ 64	1.3 0.6	4 x 1¼ 100 x 32	4.500 114.3	1.660 42.2	3 76	2.2 1.0
2½ x 1 65 x 25	2.875 73.0	1.315 33.4	2½ 64	1.0 0.5	4 x 1½ 100 x 40	4.500 114.3	1.900 48.3	3 76	2.3 1.0
2½ x 1¼ 65 x 32	2.875 73.0	1.660 42.2	2½ 64	1.0 0.5	4 x 2 ■ 100 x 50	4.500 114.3	2.375 60.3	3 76	2.4 1.1
2½ x 1½ 65 x 40	2.875 73.0	1.900 48.3	2½ 64	1.3 0.6	4 x 2½ ■ 100 x 65	4.500 114.3	2.875 73.0	3 76	2.6 1.2
2½ x 2 ■ 65 x 50	2.875 73.0	2.375 60.3	2½ 64	1.6 0.7	4 x 3 ■ 100 x 80	4.500 114.3	3.500 88.9	3 76	3.2 1.5
3 x 1 80 x 25	3.500 88.9	1.315 33.4	2½ 64	1.2 0.5	4 x 3½ 100 x 90	4.500 114.3	4.000 101.6	3 76	3.6 1.6
3 x 1¼ 80 x 32	3.500 88.9	1.660 42.2	2½ 64	1.3 0.6	5 x 2 125 x 50	5.563 141.3	2.375 60.3	3½ 89	4.6 2.1

Note:

Additional sizes available, see Gruvlok Catalog or contact an ASC Engineered Solutions Representative.

■ Cast fittings, all others are fabricated steel.

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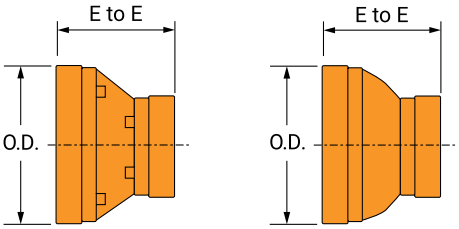
Building connections that last™

Concentric Reducer
Fig. 7072



Cast Fabricated

Nominal Size	O.D.–1	O.D.–2	End to End	Approx. Wt. Ea.	Nominal Size	O.D.–1	O.D.–2	End to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	In./mm	Lbs./kg	In./DN(mm)	In./mm	In./mm	In./mm	Lbs./kg
5 x 2½ 125 x 65	5.563 141.3	2.875 73.0	3½ 89	4.5 2.0	8 x 4 ■ 200 x 100	8.625 219.1	4.500 114.3	5 127	9.0 4.1
5 x 3 125 x 80	5.563 141.3	3.500 88.9	3½ 89	4.4 2.0	8 x 5 200 x 125	8.625 219.1	5.563 141.3	5 127	11.5 5.2
5 x 4 ■ 125 x 100	5.563 141.3	4.500 114.3	3½ 89	4.5 2.0	8 x 6 ■ 200 x 150	8.625 219.1	6.625 168.3	5 127	15.5 7.0
6 x 1 150 x 25	6.625 168.3	1.315 33.4	4 102	6.8 3.1	10 x 4 250 x 100	10.750 273.1	4.500 114.3	6 152	20.0 9.1
6 x 1½ 150 x 40	6.625 168.3	1.900 48.3	4 102	6.9 3.1	10 x 5 250 x 125	10.750 273.1	5.563 141.3	6 152	20.0 9.1
6 x 2 ■ 150 x 50	6.625 168.3	2.375 60.3	4 102	6.0 2.7	10 x 6 ■ 250 x 150	10.750 273.1	6.625 168.3	6 152	20.0 9.1
6 x 2½ 150 x 65	6.625 168.3	2.875 73.0	4 102	6.0 2.7	10 x 8 ■ 250 x 200	10.750 273.1	8.625 219.1	6 152	23.9 10.8
6 x 3 ■ 150 x 80	6.625 168.3	3.500 88.9	4 102	5.4 2.4	12 x 4 300 x 100	12.750 323.9	4.500 114.3	7 178	25.0 11.3
6 x 4 ■ 150 x 100	6.625 168.3	4.500 114.3	4 102	5.6 2.5	12 x 6 300 x 150	12.750 323.9	6.625 168.3	7 178	29.0 13.2
6 x 5 ■ 150 x 125	6.625 168.3	5.563 141.3	4 102	6.0 2.7	12 x 8 300 x 200	12.750 323.9	8.625 219.1	7 178	29.0 13.2
8 x 3 200 x 80	8.625 219.1	3.500 88.9	5 127	12.0 5.5	12 x 10 300 x 250	12.750 323.9	10.750 273.1	7 178	32.4 14.7

Note:

Additional sizes available, see Gruvlok Catalog or contact an ASC Engineered Solutions Representative.

■ Cast fittings, all others are fabricated steel.

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Building connections that last™

FLANGE ADAPTER
Model 802

The Model 007A1 Flange Adapter allows for direct connection of a grooved system to ANSI class 12/150 flanged components

Pipe Material
- Carbon steel, Schedule 10, Schedule 40.
  For use with alternative materials and wall thicknesses please contact ARGCO.

Maximum Working Pressure
- Up to 300 psi/17 bar

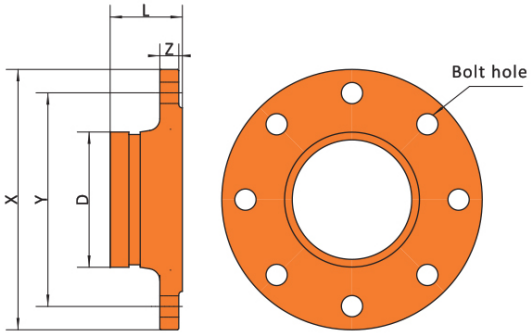
Function
- Joins carbon grooved pipe system to flange components

CERTIFICATIONS/LISTINGS
Underwriters Laboratories, Underwriters Laboratories Canada, Factory Mutual.

SPECIFICATIONS - MATERIAL
Housing Sections: Ductile Iron conforming to ASTM A 536, Grade 65-45-12.

Housing Coating:
Standard: Orange Enamel

FLANGE ADAPTER
Model 802



Item #	Nominal Size in/mm	Pipe O.D. in/mm	Max. Working Pressure PSI/Bar	Dimensions X inches mm	Y inches mm	Z inches mm	L inches mm	Bolt Holes No.	Bolt Size in/mm
	2	2.375	300	6.10	4.74	0.63	2.56	4	5/8
	50	60.3	20	155	120.5	16	65	4	M16
7010630	2-1/2	2.875	300	7.09	5.51	0.63	2.56	4	5/8
	65	73.0	20	180	140	16	65	4	M16
7010631	3	3.50	300	7.48	6.02	0.71	2.65	4	5/8
	80	88.90	20	190	153	18	65	4	M16
7010632	4	4.50	300	9.06	7.52	0.87	2.76	8	5/8
	100	114.30	20	230	191	22	70	8	M16
7010633	5	5.563	300	10.04	8.50	0.87	2.76	8	3/4
	125	141.3	20	255	216	22	70	8	M20
7010634	6	6.625	300	11.02	9.49	0.87	2.76	8	3/4
	150	168.30	20	280	241	22	70	8	M20
7010635	8	8.625	300	13.58	11.77	0.98	3.15	8	3/4
	200	219.1	20	345	299	25	80	8	M20
7010636	10	10.75	300	15.94	14.25	1.02	3.95	12	1
	250	273	20	405	362	26	85	12	M24
7010637	12	12.75	300	19.09	17.01	1.10	3.95	12	1
	300	323.9	20	485	432	28	90	12	M24

User Responsibility for Product Selection and Suitability
Each user bears final responsibility for making a determination as to the suitability of ARGCO products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as ARGCO performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any ARGCO employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer.

Note
All products to be installed in accordance with current ARGCO installation/assembly instructions. ARGCO reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation
Reference should always be made to the ARGCO installation instructions of the product you are installing.

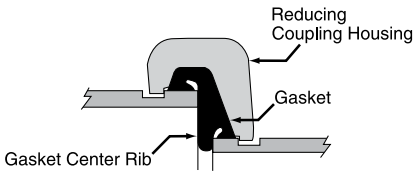
Warranty
Refer to the Warranty section of the current Price List or contact ARGCO for details.

FIG. RC-2 Reducing Coupling

The RC-2 Reducing Coupling makes it possible to directly connect two different pipe sizes, eliminating the need for two couplings and a reducing fitting. The specially designed reducing coupling gasket with a center rib assures proper positioning of the gasket and prevents the smaller pipe from telescoping into the larger during assembly.

Working pressure ratings shown are for reference only and are based on schedule 40 pipe. For the latest UL/ULC listed, LPCB, VdS and FM Approved pressure ratings versus pipe schedule, see www.anvilintl.com or contact your local Anvil Representative.

Fig. RC-2 Coupling complete with Grade "E" EPDM Gasket.



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

LPS 1219: Issue 3.1
Cert/LPCB ref. 519a/24

MATERIAL SPECIFICATIONS

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

BOLTS:
SAE J429, Grade 5, Zinc Electroplated
ISO 898-1, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

HEAVY HEX NUTS:
ASTM A563, Grade A, Zinc Electroplated
ISO 898-2, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

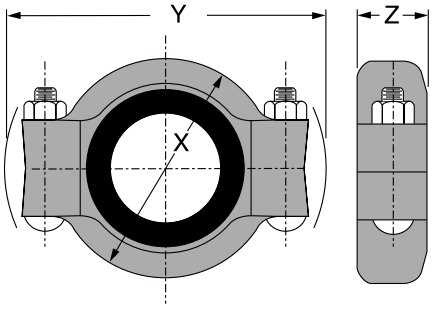
COATINGS:
☐ Rust inhibiting paint Color: ORANGE (standard)
☐ Hot Dipped Zinc Galvanized (optional)
☐ Other available options: Example: RAL3000 or RAL9000 Series
For other coating requirements contact an Anvil Representative.

LUBRICATION:
☐ Standard Gruvlok
☐ Gruvlok Xtreme™ required for freezer applications.

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

☐ **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.

FIG. RC-2 Reducing Coupling



RC-2 REDUCING COUPLING

Nominal Size	Larger O.D.	Smaller O.D.	Max. Working Pressure▲	Max. End Load	Range of Pipe End Separation	Deflection From ℄		Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
						Per Coupling	Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees*	*In./Ft. - mm/m*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
2 x 1½	2.375	1.900	300	1,329	0-1/32	0° 45'	0.16	3⅝	5⅞	1⅞	2	½ x 2¾	80	110	2.0
50 x 40	*60.3*	*48.3*	*20.7*	*5.19*	*0-0.79*		*13.1*	*92*	*149*	*48*		*M12 x 76*	*110*	*150*	*0.9*
2½ x 2	2.875	2.375	300	1,948	0-1/32	0° 37'	0.13	4¼	6⅜	1⅞	2	½ x 2¾	80	110	3.5
65 x 50	*73.0*	*60.3*	*20.7*	*8.67*	*0-0.79*		*10.9*	*108*	*162*	*48*		*M12 x 76*	*110*	*150*	*1.6*
3 O.D. x 2	*2.996*	*2.375*	*300*	*2,115*	*0-1/8*	*0° 36'*	*0.12*	*4¼*	*6⅜*	*1⅞*	*2*	*½ x 2¾*	*80*	*110*	*3.3*
76 x 60	76.1	60.3	20.7	9.41	0-3.2		9.9	108	162	48		M12 x 76	110	150	1.5
3 x 2	3.500	2.375	300	2,886	0-1/32	0° 31'	0.11	4⅞	7⅛	1⅞	2	½ x 2¾	80	110	4.4
80 x 50	*88.9*	*60.3*	*20.7*	*12.84*	*0-0.79*		*8.9*	*124*	*181*	*48*		*M12 x 76*	*110*	*150*	*2.0*
3 x 2½	3.500	2.875	300	2,886	0-1/32	0° 31'	0.11	4⅞	7⅛	1⅞	2	½ x 2¾	80	110	4.1
80 x 65	*88.9*	*73.0*	*20.7*	*12.84*	*0-0.79*		*8.9*	*124*	*181*	*48*		*M12 x 76*	*110*	*150*	*1.9*
3 x 3 O.D.	*3.500*	*2.996*	*300*	*2,886*	*0-1/8*	*0° 31'*	*0.11*	*4⅞*	*7⅛*	*1⅞*	*2*	*½ x 2¾*	*80*	*110*	*4.0*
88 X 76	88.9	76.1	20.7	12.84	0-3.2		8.9	124	181	48		M12 x 76	110	150	1.8
4 x 2	4.500	2.375	300	4,771	0-3/32	1° 12'	0.25	6¼	8⅞	2	2	⅝ x 3½	100	130	8.9
100 x 50	*114.3*	*60.3*	*20.7*	*21.22*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*4.0*
4 x 2½	4.500	2.875	300	4,771	0-3/32	1° 12'	0.25	6¼	8⅞	2	2	⅝ x 3½	100	130	7.9
100 x 65	*114.3*	*73.0*	*20.7*	*21.22*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*3.6*
4 x 3	4.500	3.500	300	4,771	0-3/32	1° 12'	0.25	6¼	8⅞	2	2	⅝ x 3½	100	130	6.7
100 x 80	*114.3*	*88.9*	*20.7*	*21.22*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*3.0*
4 x 3 O.D.	*4.500*	*2.996*	*300*	*4,771*	*0-3/16*	*1° 12'*	*0.25*	*6¼*	*8⅞*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*7.6*
114 X 76	114.3	76.1	20.7	21.22	0-4.8		20.8	159	225	51		M16 x 95	135	175	3.5
5½ O.D. x 4	*5.500*	*4.500*	*300*	*7,128*	*0-3/16*	*1° 58'*	*0.20*	*7¼*	*10⅝*	*2⅛*	*2*	*¾ x 4½*	*100*	*130*	*11.4*
139 X 114	139.7	114.3	20.7	31.71	0-4.8		10.8	184	270	54		M20 x 115	135	175	5.2
5 x 3	5.563	3.500	300	7,292	0-1/4	1° 58'	0.20	7¼	10⅝	2⅛	2	¾ x 4½	130	180	10.4
125 x 80	*141.3*	*88.9*	*20.7*	*32.44*	*0-6.4*		*16.8*	*184*	*270*	*54*		*M20 x 115*	*175*	*245*	*4.7*
5 x 4	5.563	4.500	300	7,292	0-3/32	1° 58'	0.20	7¼	10⅝	2⅛	2	¾ x 4½	130	180	11.4
125 x 100	*141.3*	*114.3*	*20.7*	*32.44*	*0-2.38*		*16.8*	*184*	*270*	*54*		*M20 x 115*	*175*	*245*	*5.2*
6½ O.D. x 3	*6.500*	*3.500*	*300*	*9,955*	*0-1/4*	*1° 20'*	*0.26*	*8¼*	*11⅝*	*2⅛*	*2*	*¾ x 4½*	*130*	*180*	*15.0*
165 X 88	165.1	88.9	20.7	44.28	0-6.4		18.2	210	295	54		M20 x 115	175	245	6.8
6½ O.D. x 4	*6.500*	*4.500*	*300*	*9,955*	*0-1/4*	*1° 20'*	*0.26*	*8¼*	*11⅝*	*2⅛*	*2*	*¾ x 4½*	*130*	*180*	*13.6*
165 X 114	165.1	114.3	20.7	44.28	0-6.4		18.2	210	295	54		M20 x 115	175	245	6.2
6 x 4	6.625	4.500	300	10,341	0-3/32	0° 49'	0.17	8¼	11⅝	2⅛	2	¾ x 4½	130	180	13.4
150 x 100	*168.3*	*114.3*	*20.7*	*46.00*	*0-2.38*		*14.1*	*210*	*295*	*54*		*M20 x 115*	*175*	*245*	*6.1*
6 x 5	6.625	5.562	300	10,341	0-3/32	0° 49'	0.17	8½	11⅝	2⅛	2	¾ x 4½	130	180	13.5
150 x 125	*168.3*	*141.3*	*20.7*	*46.00*	*0-2.38*		*14.1*	*216*	*295*	*54*		*M20 x 115*	*175*	*245*	*6.1*
8 x 6	8.625	6.625	300	17,528	0-3/32	0° 37'	0.13	10½	14	2¼	2	¾ x 4½	130	180	17.7
200 x 150	*219.1*	*168.3*	*20.7*	*77.97*	*0-2.38*		*10.9*	*267*	*365*	*57*		*M20 x 115*	*175*	*245*	*8.0*
8 x 6½ O.D.	*8.625*	*6.500*	*300*	*17,528*	*0-1/4*	*0° 37'*	*0.13*	*10½*	*14*	*2¼*	*2*	*¾ x 4½*	*130*	*180*	*18.3*
219 X 165	219.1	165.1	20.7	77.97	0-6.4		10.9	267	365	57		M20 x 115	175	245	8.3

Not for use in copper systems.

Range of Pipe End Separation and Angular Deflection values are for roll grooved pipe and may be doubled for cut groove pipe.

See technical data section for coupling data chart notes.

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

▲ – Working Pressure Ratings are for reference only and based on Sch. 10 and Sch. 40 pipe. For the latest UL/ULC, FM, VdS and LPCB pressure ratings versus pipe schedule, please visit anvilintl.com or contact your local Anvil Representative.

Other sizes available, contact an Anvil Representative.

FIG. RC-2 Reducing Coupling

The instructions are based on pipe grooved in accordance with SPF® grooving specifications. Check pipe ends for proper groove dimensions and to assure that the pipe ends are free of indentations and projections which would prevent proper sealing.

ALWAYS USE A GRUVLOK® SPF/ANVIL® LUBRICANT FOR PROPER COUPLING ASSEMBLY. Thorough lubrication of the external surface of the gasket is essential to prevent pinching and possible damage to the gasket. For temperatures above 150°F (65˚C) and below 32°F (0˚C) use Gruvlok® SPF/Anvil® Xtreme Lubricant™ and lubricate all gasket surfaces, internal and external. See Gruvlok SPF/Anvil Lubricants in the Technical Data section of the Anvil SPF catalog for additional important information.

1 Check and lubricate gasket

Check gasket to be sure it is compatible for the intended service. Apply a thin coating of Gruvlok SPF/Anvil Xtreme Lubricant to the outside and sealing lips of the gasket. Be careful that foreign particles do not adhere to lubricated surfaces.

2 Gasket installation

Place the smaller opening of the gasket over the smaller pipe. Angle the gasket over the pipe end and pull the gasket lip open around the circumference of the pipe. The center leg of the gasket should make flush contact with the pipe end and will prevent telescoping of the smaller pipe inside the larger.

3 Alignment

Align the adjoining pipe center lines, and insert the larger pipe end into the gasket. Angle the pipe end slightly to the face of the gasket and tilt the pipe into the gasket to ease assembly.

4 Housings

Place the coupling housing halves over the gasket, making sure the housing keys engage the grooves. Insert bolts and turn nuts finger tight.

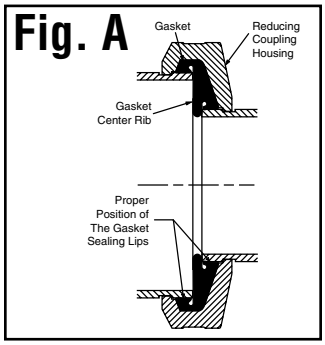
5 Tighten nuts

Tighten the nuts alternately and equally to the specified bolt torque. The housing bolt pads must make metal-to-metal contact.

Caution: Uneven tightening may cause the gasket to pinch.

6 Assembly complete

Visually inspect the pipe joint to assure the coupling keys are fully engaged in the pipe grooves and the bolt pads are in firm even metal-to-metal contact on both sides of the coupling.



Note: Fig. A illustrates the correct position of the Reducing Coupling gasket and housing properly assembled onto adjacent pipe ends.

Caution: In vertical installations the pipes must be supported to prevent telescoping during installation.

Specified Bolt Torque

Specified bolt torque is for the oval neck track bolts used on SPF® couplings. The nuts must be tightened alternately and evenly until fully tightened.

Caution: Proper torquing of coupling bolts is required to obtain specified performance. **Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation.** Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

ANSI Specified Bolt Torque

Bolt Size	Wrench Size	Specified Bolt Torque*
In.	*In.*	*Ft.-Lbs*
1/2	7/8	80-100
5/8	1 1/16	100-130
3/4	1 1/4	130-180

* Non-lubricated bolt torque

Metric Specified Bolt Torque

Bolt Size	Wrench Size	Specified Bolt Torque*
mm	*mm*	*N-M*
M12	22	110-150
M16	24	135-175
M20	30	175-245

* Non-lubricated bolt torque

FIG. C-4 Rigid Coupling

The C-4 Rigid Coupling is our standard coupling and is designed for rigid piping applications. The C-4 is specially designed to provide a rigid, locked-in pipe connection to meet the specific demands of rigid design steel pipe.

For the latest UL/ULC listed, LPCB, VdS and FM Approved pressure ratings versus pipe schedule, see www.anvilintl.com or contact your local Anvil Representative.

c UL us LISTED
FM APPROVED
VdS
LPCB UKAS PRODUCT CERTIFICATION 0007

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

LPS 1219: Issue 3.1
Cert/LPCB ref. 519a/02

MATERIAL SPECIFICATIONS

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

BOLTS:
SAE J429, Grade 5, Zinc Electroplated
ISO 898-1, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

HEAVY HEX NUTS:
ASTM A563, Grade A, Zinc Electroplated
ISO 898-2, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

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 Anvil Representative.

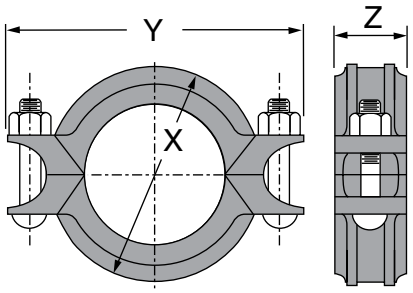
LUBRICATION:
☐ Standard Gruvlok
☐ Gruvlok Xtreme™ required for dry pipe systems and freezer applications.

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 65°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.

GASKET TYPE:
☐ Standard C Style
☐ Flush Gap

FIG. C-4 Rigid Coupling



C-4 RIGID 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*
1 25	1.315 33.4	300 20.7	407 1.81	0-1/32 0-0.79	2 3/8 60	4 102	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.2 0.5
1 1/4 32	1.660 42.2	300 20.7	649 2.89	0-1/32 0-0.79	2 5/8 67	4 1/4 108	1 23/32 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.4 0.6
1 1/2 40	1.900 48.3	300 20.7	851 3.78	0-1/32 0-0.79	2 7/8 73	4 1/2 114	1 23/32 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.5 0.7
2 50	2.375 60.3	300 20.7	1,329 5.91	0-1/32 0-0.79	3 11/32 85	5 3/16 132	1 23/32 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.7 0.8
2 1/2 65	2.875 73.0	300 20.7	1,948 8.66	0-1/32 0-0.79	3 7/8 98	5 11/16 144	1 23/32 44	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	1.9 0.9
3 O.D. 76.1	*2.996* 76.1	*300* 20.7	*2,115* 9.41	*0-1/32* 0-0.79	*4 1/8* 105	*6 1/8* 156	*1 7/8* 48	*2*	*3/8 x 2 1/2* M10 x 63	*30* 40	*45* 60	*2.2* 1.0
3 80	3.500 88.9	300 20.7	2,886 12.84	0-1/32 0-0.79	4 3/4 121	6 5/8 168	2 51	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	2.4 1.1
4 100	4.500 114.3	300 20.7	4,771 21.22	0-3/32 0-2.38	5 7/8 149	7 3/4 197	2 1/8 54	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	3.2 1.4
5 1/2 O.D. 139.7	*5.500* 139.7	*300* 20.7	*7,127* 31.70	*0-3/32* 0-2.38	*6 1/8* 175	*9 1/4* 235	*2 1/16* 52	*2*	*1/2 x 3* M12 x 76	*80* 110	*100* 150	*5* 2.2
5 125	5.563 141.3	300 20.7	7,292 32.44	0-3/32 0-2.38	6 15/16 176	9 1/16 230	2 1/16 52	2	1/2 x 3 M12 x 76	80 110	100 150	4.5 2.0
6 1/2 O.D. 165.1	*6.500* 165.1	*300* 20.7	*9,955* 44.28	*0-3/32* 0-2.38	*8 1/8* 207	*10 3/8* 264	*2 1/8* 54	*2*	*1/2 x 3* M12 x 76	*80* 110	*100* 150	*5.8* 2.6
6 150	6.625 168.3	300 20.7	10,341 46.00	0-3/32 0-2.38	8 1/4 210	10 3/8 264	2 1/8 54	2	1/2 x 3 1/4 M12 x 82	80 110	100 150	5.8 2.6
8 200	8.625 219.1	300 20.7	17,528 77.97	0-3/32 0-2.38	10 1/2 267	13 1/4 337	2 1/2 64	2	5/8 x 3 1/2 M16 x 89	100 130	130 175	10.8 4.9
10 250	10.750 273.1	300 20.7	27,229 121.12	0-3/32 0-2.38	13 331	16 3/4 425	2 5/8 67	2	7/8 x 5 M22 x 125	180 245	220 298	21.5 9.8
12 300	12.750 323.9	300 20.7	38,303 170.38	0-3/32 0-2.38	15 3/8 391	19 1/4 489	2 5/8 67	2	7/8 x 5 1/2 M22 x 140	180 245	220 298	27.4 12.4

Range of Pipe End Seperation values are for roll grooved pipe and may be doubled for cut groove pipe.

1. Working pressure and/or end load are total allowable, based on standard weight steel pipe, roll or cut grooved.

2. One time field test pressure may be increased to 1.5 times the figures listed above.

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

▲ – Working Pressure Ratings are for reference only and based on Sch. 10 and Sch. 40 pipe. For the latest UL/ULC, FM, VdS and LPCB pressure ratings versus pipe schedule, please visit anvilintl.com or contact your local Anvil Representative.

Other sizes available, contact an Anvil Representative.

⚠ WARNING

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

FIG. C-4 Rigid Coupling

SPF/ANVIL

The instructions are based on pipe grooved in accordance with SPF® grooving specifications. Check pipe ends for proper groove dimensions and to assure that the pipe ends are free of indentations and projections which would prevent proper sealing.

ALWAYS USE A GRUVLOK® SPF/ANVIL® LUBRICANT FOR PROPER COUPLING ASSEMBLY. Thorough lubrication of the external surface of the gasket is essential to prevent pinching and possible damage to the gasket. For temperatures above 150°F (65˚C) and below 32°F (0˚C) use Gruvlok® SPF/Anvil® Xtreme Lubricant™ and lubricate all gasket surfaces, internal and external. See Gruvlok SPF/Anvil Lubricants in the Technical Data section of the Anvil SPF catalog for additional important information.

1 Check and lubricate gasket

Check gasket to be sure it is compatible for the intended service. Apply a thin coating of Gruvlok SPF/Anvil Xtreme Lubricant to the outside and sealing lips of the gasket. Be careful that foreign particles do not adhere to lubricated surfaces.

2 Gasket installation

Slip the gasket over the one pipe, making sure the gasket lip does not overhang the pipe end.

3 Alignment

After aligning the two pipe ends together, pull the gasket into position, centering it between the grooves on each pipe. The gasket should not extend into the groove on either pipe.

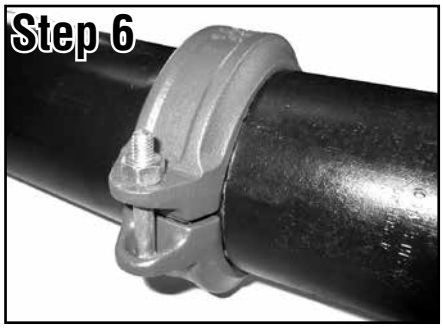
4 Housings

Remove one nut and bolt and loosen the other nut. Place one housing over the gasket, making sure the housing keys fit into the pipe grooves. Swing the other housing over the gasket and into the grooves on both pipes, making sure the tongue and recess of each housing is properly mated. Re-insert the bolt and run-up both nuts finger tight.

5 Tighten nuts

Securely tighten nuts alternately and equally to the specified bolt torque, keeping the gaps at the bolt pads evenly spaced.

Caution: Uneven tightening may cause the gasket to pinch. Gasket should not be visible between segments after bolts are tightened.



6 Assembly is complete

Visually inspect the pipe joint to assure the coupling keys are fully engaged in the pipe grooves. The bolt pads are to have equal gaps on each side of the coupling.

Specified Bolt Torque

Specified bolt torque is for the oval neck track bolts used on SPF® couplings. The nuts must be tightened alternately and evenly until fully tightened.

Caution: Proper torquing of coupling bolts is required to obtain specified performance. **Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation.** Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

ANSI Specified Bolt Torque

Bolt Size	Wrench Size	Specified Bolt Torque*
In.	*In.*	*Ft.-Lbs*
3/8	11/16	30-45
1/2	7/8	80-100
5/8	1 1/16	100-130
7/8	1 7/16	180-220

* Non-lubricated bolt torque

Metric Specified Bolt Torque

Bolt Size	Wrench Size	Specified Bolt Torque*
mm	*mm*	*N-M*
M10	16	40-60
M12	22	110-150
M16	24	135-175
M22	34	245-300

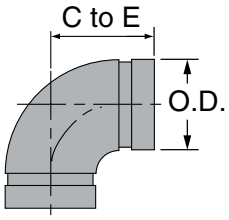
* Non-lubricated bolt torque

FIG. SE-1 Short Pattern 90° Elbow

SPF/ANVIL

SE-1 are short pattern products and are specifically designed for use in Fire Protection applications where economy is a factor. All products are is UL/ULC Listed, LPCB, VdS and FM Approved.

Maximum working pressure for these products is 300 PSI. For the latest UL/ULC listed, LPCB, VdS and FM Approved pressure ratings versus pipe schedule, see www.anvilintl.com or contact your local Anvil Representative.



c UL us LISTED
FM APPROVED
VdS

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

LPCB
UKAS PRODUCT CERTIFICATION 0007

LPS 1219: Issue 3.1
Cert/LPCB ref. 519a/20

SE-1 90° ELBOW

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
2 *50*	2.375 *60.3*	2¾ *70*	1.5 *0.7*
2½ *65*	2.875 *73.0*	3 *76*	2.1 *1.0*
3 *80*	3.500 *88.9*	3⅜ *86*	3.6 *1.6*
4 *100*	4.500 *114.3*	4 *102*	5.8 *2.6*
6 *150*	6.625 *168.3*	5½ *140*	11.8 *5.3*
8 *200*	8.625 *219.1*	6⅞ *175*	21.1 *9.6*

Additional sizes available, contact an Anvil Representative.

MATERIAL SPECIFICATIONS

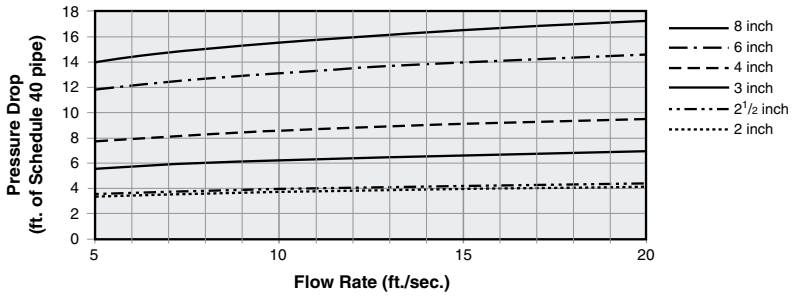
CAST FITTINGS:

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

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

SE-1 90° ELBOW SHORT PATTERN FITTING – PRESSURE DROP



SPF™ short pattern fittings exceed the headloss requirements of NFPA 13.

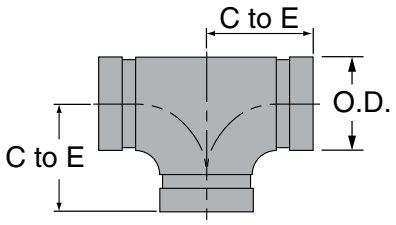
For Fig. SE-1 90° grooved end elbows use the value shown.

Note: Above values are shown for Schedule 40 pipe to be consistent with industry practices.

FIG. ST-1 Short Pattern Tee

ST-1 are short pattern products that are specifically designed for use in Fire Protection applications where economy is a factor. All products are UL/ULC Listed, LPCB, VdS and FM Approved.

Maximum working pressure for these products is 300 PSI. For the latest UL/ULC listed, LPCB, VdS and FM Approved pressure ratings versus pipe schedule, see www.anvilintl.com or contact your local Anvil Representative.



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

LPS 1219: Issue 3.1
Cert/LPCB ref. 519a/21

ST-1 TEE

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
2 *50*	2.375 *60.3*	2¾ *70*	2.9 *1.3*
2½ *65*	2.875 *73.0*	3 *76*	4.6 *2.1*
3 *80*	3.500 *88.9*	3⅜ *86*	6.9 *3.1*
4 *100*	4.500 *114.3*	4 *102*	10.9 *4.9*
6 *150*	6.625 *168.3*	5½ *140*	25.0 *11.3*
8 *200*	8.625 *219.1*	6⅞ *175*	42.1 *19.1*

MATERIAL SPECIFICATIONS

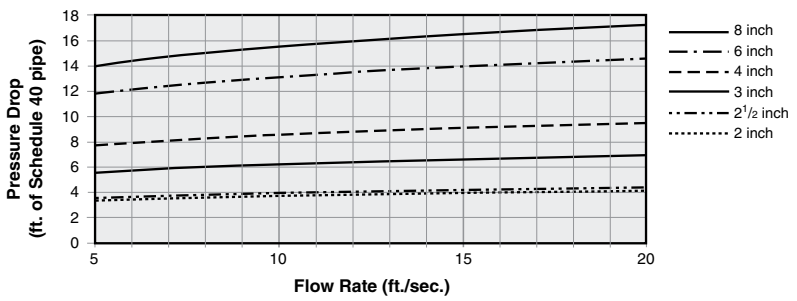
CAST FITTINGS:

Ductile Iron conforming to ASTM A-536

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

ST-1 90° TEE SHORT PATTERN FITTING – PRESSURE DROP



SPF™ short pattern fittings exceed the headloss requirements of NFPA 13.

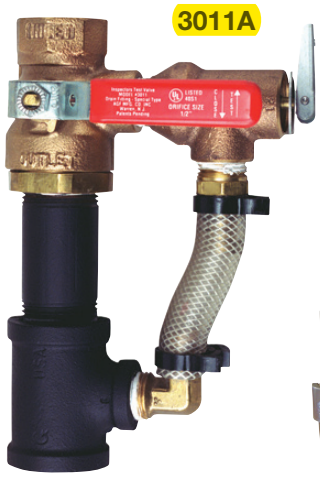
For Fig. ST-1 grooved end tee branch use 2½ times the value shown.

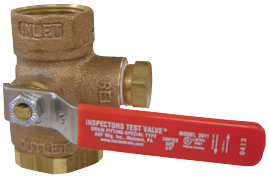
For Fig. ST-1 grooved end tee run use the value shown.

Note: Above values are shown for Schedule 40 pipe to be consistent with industry practices.

Model 3011
INSPECTOR'sTEST®
Remote Inspector's Test

For Single Story and Other Applications Including Systems Requiring Pressure Relief Valve





Size:

1"

The AGF **Model 3011 INSPECTOR'sTEST®** family of valves are designed to perform the remote inspector's test function on single story systems and other applications with the benefit of locating the orifice indoors. The Inspector'sTEST is available in four different models (M3011BV, M3011SG, M3011A, and M3011ASG) with optional orifice sizes (3/8" 2.8K, 7/16" 4.2K, 1/2" 5.6K, 17/32" 8.0K, and 5/8" 11.2K ELO).

The **Model 3011A** and **3011ASG** feature a **Model 7000 Pressure Relief Valve** rated at 175 PSI with drainage piping designed to relieve excess system pressure caused by surges or temperature changes. Both models solve the difficult problem of providing the relief valve with a drainage piping outlet while complying with NFPA 13 requiring installation of a pressure relief valve on all grided systems and downstream of all pressure reducing valves.

To expedite system testing every Inspector'sTEST model is shipped semi-assembled with relief valve and bypass drain ports plugged.

- Complies with NFPA 13
- Compact, Single-Handle Ball Valve
- Tamper-Resistant Test Orifice
- Tamper-Resistant Sight Glass
- 300 PSI rated ball valve.
- 175 PSI rated pressure relief valve
- Specifiable orifice sizes
- UL Listed and FM Approved

NOTE: UL and FM standards for sprinkler system pressure relief valves require relief valves to operate within a range of their ratings. FM requires a relief valve to OPEN at a pressure no less than 85% of their rating and UL requires OPENING at a pressure no greater than 105% of their rating. Both standards require the relief valves to CLOSE within a percentage below OPEN. Choose the relief valve comparing static pressure to 90% of the relief valve's rating to determine the estimated minimum OPENING and 80% of the relief valve's rating for approximate maximum CLOSING. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

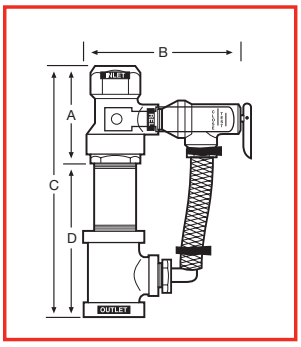
Reliability, Versatility, Code Compatibility

Model 3011
INSPECTOR'S TEST®

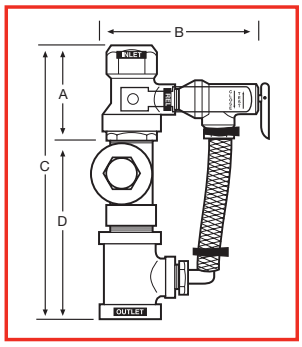
300 PSI Bronze Ball Valve

UL LISTED
FM APPROVED

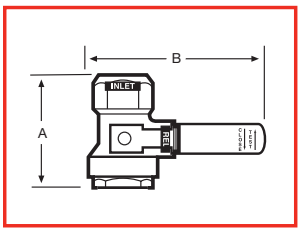
Model 3011A



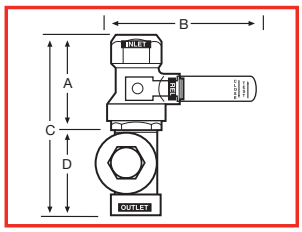
Model 3011ASG



Model 3011BV



Model 3011SG



Orifice Sizes

3/8", 7/16", 1/2", 17/32", and 5/8" ELO

Approvals

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

Materials

Handle	Steel
Stem	Rod Brass
Ball	C.P. Brass
Body	Bronze
Valve Seat	Virgin Teflon®
Relief Valve	Bronze
Bypass Fittings	Brass
Bypass Tubing	Nylobraid
Sight Glass	Bronze & Glass

Dimensions

SIZE	A	B	C	D
3011A	3 1/16" (75 mm)	4 11/16" (118 mm)	7 7/8" (200 mm)	4 7/8" (124 mm)
3011BV	3 1/16" (75 mm)	4 11/16" (118 mm)	—	—
3011ASG	3 1/16" (75 mm)	4 11/16" (118 mm)	9 5/16" (237 mm)	6 1/4" (159 mm)
3011SG	3 1/16" (75 mm)	4 11/16" (118 mm)	6 3/16" (157 mm)	3 1/8" (79 mm)

From the 2013 Edition of NFPA 13

Models 3011A, 3011BV, 3011ASG, and 3011SG, depending on the variant chosen, provide some or all requirements listed below:

Chapter 8.16.2.4.1*	Provisions shall be made to properly drain all parts of the system.
Chapter 8.16.2.4.2 & 8.16.2.4.3	Drain connections, interior sectional or floor control valve(s) – shall be provided with a drain connection having a minimum size as shown in Table 8.16.2.4.2.
Chapter 8.16.2.4.4	Drains shall discharge outside or to a drain capable of handling the flow of the drain.
Chapter 8.16.2.4.6	The test connection shall be permitted to be used as main drain connection.
Chapter A.8.17.4.2	(Wet Pipe System) test connection is permitted to terminate into a drain capable of accepting full flow… using an approved sight test connection containing a smooth bore corrosion-resistant orifice giving a flow equivalent to one sprinkler…
Chapter 8.17.4.2.2	The test connection valve shall be accessible.
Chapter 8.17.4.2.4	shall be permitted to be installed in any location… downstream of the waterflow alarm.
Chapter 7.1.2	- a gridded wet pipe system shall be provided with a relief valve set to operate at 175 PSI or 10 PSI in excess of the maximum system pressure, whichever is greater.
Chapter 8.16.1.2.3*	A relief valve of not less that ½" in size shall be provided on the discharge side of the pressure-reducing valve set to operate at a pressure not exceeding 175 psi.
Chapter A8.16.1.2.3	- consideration should be given to piping the discharge from the (pressure relief) valve
Chapter 8.17.4.3.1	(Dry Pipe System) a trip test connection not less than 1" in diameter, terminating in a smooth bore corrosion-resistant orifice, to provide a flow equivalent to one sprinkler…
Chapter 8.17.4.3.2	The trip test connection… with a shutoff valve and plug not less than 1", at least one of which shall be brass.

MADE IN U.S.A.

USA Patent # 4971109 and Other Patents Pending

AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355

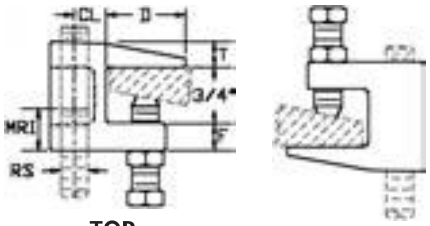
Phone: 610-240-4900
Fax: 610-240-4906

www.agfmfg.com

Model #300
Domestic Beam Clamp
Universal/Reversible (Double Rod Hole)

Model #300I
**Import Beam Clamp

May be mounted in either position.



APPLICATION: Structural attachment (with infinite adjustment) to top or bottom of metal beams, purlins, channel or angle iron to support hanger rod.

NOTE: Set screw must be tightened onto the sloped side of the **I**-Beam, channel or angle iron flange and torqued to 60 inch pounds. Set screw and locknut supplied are hardened steel.
Available with a HD finish by special order. For corresponding retainer strap see Models 300C and 300R

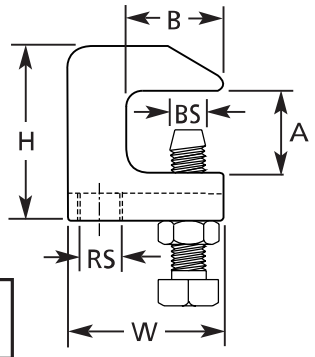
Part No.	RS	Max Pipe Size	CL	D	MRI	F	T	Max. Recom. Load (lbs)		Finish*
								Top	Bottom	
3000037EG	3/8	4	7/16	1-1/8	1/2	3/8	3/8	500	250	EG
3000037PL	3/8	4	7/16	1-1/8	1/2	3/8	3/8	500	250	PL
3000050EG	1/2	8	9/16	1-1/16	11/16	1/2	1/2	950	760	EG
3000050PL	1/2	8	9/16	1-1/16	11/16	1/2	1/2	950	760	PL
3000062EG	5/8	8	9/16	1-1/16	11/16	1/2	1/2	950	760	EG
3000062PL	5/8	8	9/16	1-1/16	11/16	1/2	1/2	950	760	PL
3000075EG	3/4	8	9/16	1-1/8	13/16	5/8	3/8	950	760	EG
3000075PL	3/4	8	9/16	1-1/8	13/16	5/8	3/8	950	760	PL
3000087EG	7/8	8	9/16	1-1/8	13/16	5/8	3/8	950	760	EG
3000087PL	7/8	8	9/16	1-1/8	13/16	5/8	3/8	950	760	PL
**300I0037EG	3/8	4	7/16	1-1/8	1/2	3/8	3/8	500	250	EG
**300I0037PL	3/8	4	7/16	1-1/8	1/2	3/8	3/8	500	250	PL

Conforms With: Federal Specification **WW-H-171** (Type 23), Manufacturers Standardization Society **ANSI/MSS-SP-58** (Type 19 & 23), install in accordance with **ANSI/MSS-SP-69.**

Model #305
Steel Top Beam Clamp

APPLICATION: For attachment to the top of flange of structural shapes or for use under roof installations with bar joist type construction where the thickness of flange does not exceed 5/8".

NOTE: Specify Carbon Steel or Stainless Steel (316).



Part No.	RS	A	B	W	H	BS	Max. Recom. Load (lbs.)	Finish*
3050037PL	3/8	3/4	31/32	1-13/32	1-21/32	3/8	500	PL
3050037S6	3/8	3/4	31/32	1-13/32	1-21/32	3/8	500	S6
3050050PL	1/2	3/4	29/32	1-15/32	1-23/32	3/8	1130	PL
3050050S6	1/2	3/4	29/32	1-15/32	1-23/32	3/8	1130	S6

Conforms With: Manufacturers Standardization Society **SP-69** (Type 23).

All dimensions are in inches unless otherwise noted.
*See page 2 for finish and material descriptions. All material is Carbon Steel unless otherwise noted.

F P P I
FIRE PROTECTION PRODUCTS INC.

Installation instructions for Drop-in Anchors

Step 1
Using a masonry bit suitable for the material being drilled, drill an appropriate diameter hole at the correct depth according to the table below.

Anchor size	Drill size	Minimum Hole Depth
¼”	3/8”	1”
3/8”	½”	1 9/16”
½”	5/8”	2”
5/8”	27/32”	2 ½”
¾”	1”	3 1/8”

Step 2
Insert the anchor into the hole until the edge of the anchor is flush* with the surface of the material the anchors is being installed.

*The anchor may be installed at a greater depth by drilling the hole to the desired depth and threading the correct size bolt for the size anchor being installed and tapping the anchor into the drilled hole.

Step 3
After inserting the anchor to the desired depth, insert the correct size setting tool into the anchor and drive the plug into the anchor until the shoulder of the setting tool meets the edge of the anchor. The anchor is now installed and ready to be used.

Note: It is recommended that when used in cinder block, that he anchor be placed between the cells.

Average Pullout values for 4000psi concrete:

Part Number	Bolt Size	Pullout Value
	¼”	2,220
05-470	3/8”	5,530
05-471	½”	8,080
	5/8”	10,850
	¾”	16,580

Fire Protection Products, Inc.
6241 Yarrow Drive, Suite A
Carlsbad, CA 92011-1541
1 760 931-1168 • 1 760 931-8080 Fax
http://www.fppi.com

SAMMYS®

ITW Buildex

Sammy X-Press®

Expands to provide direct attachment in Metal Deck (22-20 ga.) and Purlin or Metal Deck (18-16 ga.)

	Approvals	Steel Ga.	Part #	Model	Screw Description	Rod Size	Max Pipe Size	Application
Pipe Hanger	FM	12 ga	8150922	XP 20	Sammy X-Press 20	3/8-16	4"	Metal Deck
	FM	12 ga	8153922	XP 35	Sammy X-Press 35	3/8-16	4"	Purlin
	UL	22-12 ga	8150922	XP 20	Sammy X-Press 20	3/8-16	2.5"	Metal Deck
	UL	18-12 ga	8153922	XP 35	Sammy X-Press 35	3/8-16	3.5"	Purlin

		Approvals	Concrete	Part #	Model	Screw Description	Rod Size	Max Pipe Size	Thickness
Pipe Hanger	NEW!	UL	Structural	8150922	XP 20	Sammy X-Press 20	3/8-16	2.5"	3000 PSI
	NEW!	UL	Lightweight Concrete	8150922	XP 20	Sammy X-Press 20	3/8-16	2.5"	≤ 35 PCF

	Approvals	Steel Ga.	Part #	Model	Screw Description	Load Rating
Luminaire Fitting	UL	Min. 22 ga	8150922	XP 20	Sammy X-Press 20	187 Lbs.
	UL	Min. 22 ga	8153922	XP 35	Sammy X-Press 35	187 Lbs.
	UL	Min. 22 ga	8181922	XP 200	Sammy X-Press 200	187 Lbs.
	UL	Min 16 ga	8150922	XP 20	Sammy X-Press 20	250 Lbs.
	UL	Min 16 ga	8153922	XP 35	Sammy X-Press 35	250 Lbs.
	UL	Min 16 ga	8181922	XP 200	Sammy X-Press 200	250 Lbs.

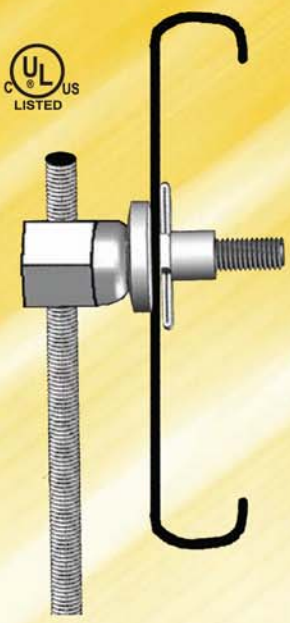
	Part #	Model	Description
Tools	8194910	UXPIT	Universal X-Press It Installation Tool
	8195910	RXPIT	Retrofit X-Press It Installation Tool
	8152910	XPDB	25/64" Drill Bit

XP 20 and XP 35 tested in accordance with NFPA 13 standards.
XP 20, XP 35, and XP 200 are tested in accordance with NEC standards.

Patent Pending

Sammy X-Press® Sidewinder

Expands to provide horizontal attachment in Purlin (16-12 ga.)



	Approvals	Steel Ga.	Part #	Model	Screw Description	Rod Size	Max Pipe Size	Application
Pipe Hanger	UL	16-12 ga	8293957	SWXP 35	Sidewinder X-Press 35	3/8-16	3.5"	Purlin

	Part #	Model	Description
Tools	8194910	UXPIT	Universal X-Press It Installation Tool
	8195910	RXPIT	Retrofit X-Press It Installation Tool
	8152910	XPDB	25/64" Drill Bit

SWXP 35 tested in accordance with NFPA 13 standards.

Patent Pending

SSS36

ARGCO
1-800-854-1015
www.argco.com

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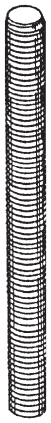
650

ALL THREADED ROD 10' - 0' LENGTHS



ROD SIZE	MAX. REC. LOAD LBS. FOR SERVICE TEMP.	
	650°F	750°F
1/4	240	215
3/8	610	540
1/2	1130	1010
5/8	1810	1610
3/4	2710	2420
7/8	3770	3360
1	4960	4420
1 1/4	8000	7140
1 1/2	11630	10370

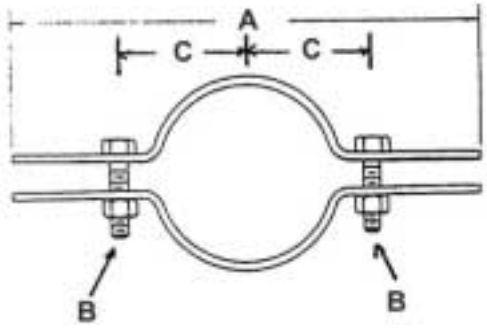
NOTE; maximum Temperature: 750°F

SIZE - 1/4 thru 1 1/2 inch rod in 10' - 0" lengths.
MATERIAL - Carbon Steel.
FINISH - Plain and E.G.,
ORDERING - Part #, rod diameter and finish.

CAD

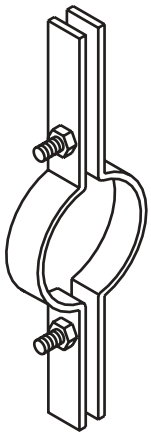
400

RISER CLAMP IRON PIPE



PIPE SIZE	A	B	C	STOCK SIZE	MAX. REC. LOAD LBS.
1 1/2"	10 3/8"	3/8"	1 1/2"	3/16"x1 1/4"	255
2"	10 3/4"	3/8"	2"	3/16"x1 1/4"	255
2 1/2"	11"	3/8"	2 1/8"	1/4"x1 1/4"	390
3"	12"	3/8"	3	1/4"x1 1/4"	530
3 1/2"	13"	1/2"	3 5/16"	1/4"x1 1/4"	670
4"	13 1/2"	1/2"	3 3/8"	1/4"x1 1/4"	810
5"	14 1/2"	1/2"	4"	1/4"x1 1/2"	1160
6"	15 1/8"	1/2"	4 1/2"	1/4"x2"	1570
8"	18 1/2"	5/8"	5 13/16"	3/8x2"	2500

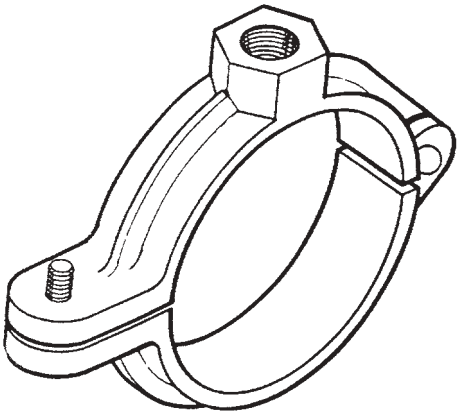
NOTE: MAXIMUM TEMPERATURE: 650°F

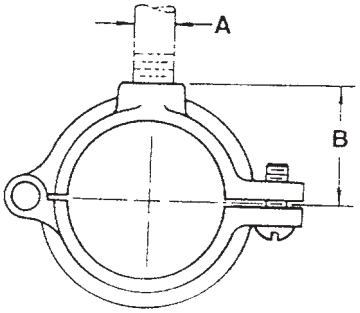


SIZE - 1/2 thru 20 inch pipe.
MATERIAL - Carbon Steel.
FINISH - Plain, Electro-Galvanized, H.D.G. and Stainless Steel.
LISTINGS - c UL us **EX 2551** 11/2"- 8" pipe.
CONFORMS WITH: Federal Specification WW-H-171E, type 8, 3/4 thru 20 inch, and Manufacturers Standardization Society SP-69, type 8.
FUNCTION - Used for supporting vertical piping.
ORDERING - Part #, pipe size and finish.

350

SPLIT RING - EXTENSION





PIPE SIZE	ROD SIZE		MAX REC. LOAD LBS. *
	A	B	
1	3/8	1 1/8	180
1 1/4	3/8	1 5/16	180
1 1/2	3/8	1 3/8	180
2	3/8	1 11/16	180
2 1/2	1/2	2 3/16	300
3	1/2	2 1/2	300

NOTE: Maximum Temperature: 450°F

SIZE - 1 thru 3 inch pipe.
MATERIAL - Ductile Iron.
FINISH - Plain and Electro-Galvanized.
LISTING - Conforms to Federal Specification WW-H-171E, type 25, and Manufacturers Standardization Society SP-69, type 12.
FUNCTION - A rigid support to hold pipe away from mounting surface.
ORDERING - Part #, pipe size and finish.

CAD

FIG. 69 Pipe Rings

ANVILSTAR™
Fire Products Division of Anvil® International

Adjustable Swivel Ring, Tapped Per NFPA Standard Submittal Sheet

SIZE RANGE: ½" through 8"

MATERIAL: Carbon steel

FINISH: Galvanized

SERVICE: Recommended for suspension of non-insulated stationary pipe line.

MAXIMUM TEMPERATURE: 650° F

APPROVALS: Complies with Federal Specification A-A-1192A (Type 10), WW-H-171-E (Type 10) and MSS-SP-69 (Type 10).
UL Listed and FM Approved (Sizes ¾" - 8").

FEATURES:

- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the ½" through 3" sizes.

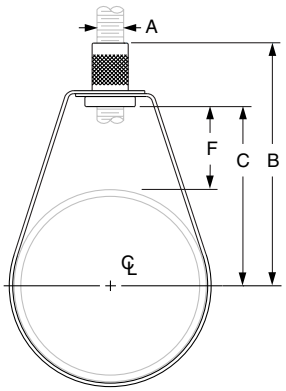


FIG. 69						
Pipe Size	Max Load	Weight	Rod Size A	B	C	F
In.	*Lbs.*	*Lbs.*	*In.*	*In.*	*In.*	*In.*
½	300	0.10	⅜	2 7/8	2	1 9/16
¾		0.10		2 3/4	1 7/8	1 15/16
1		0.10		2 9/16	1 11/16	1
1 ¼		0.10		2 5/8	1 ¾	⅞
1 ½		0.10		2 ¾	1 7/8	
2		0.11		3 ¼	2 3/8	1 ⅛
2 ½	525	0.20		4	2 ¾	1 5/16
3		0.20		3 13/16	2 15/16	1 3/16
4	650	0.30		4 11/16	3 13/16	1 9/16
5	1,000	0.54	½	5 5/16	4 3/8	
6		0.65		6 11/16	5 9/16	2 ¼
8		1.00		8	7	2 11/16

Refer to the Pipe Hanger Catalog for Additional Parts available on Anvil's Web Site www.anvilintl.com

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

POTTER
The Symbol of Protection

BELLS

PBA-AC & MBA-DC

Features

- Listed for indoor and outdoor use
- Outdoor use requires BBK-1 or HC-BB weatherproof back box
- Indoor use mounts directly to standard 4” box
- Low current draw
- High dB output
- AC and DC models
- DC models are motor driven, polarized, and have built in transient protection for supervised alarm circuits
- Available in 6”, 8” and 10” sizes

UL UL* FM APPROVED

* ULC on MBA-DC Only

Description

These vibrating type bells are designed for use as fire or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4” (101mm) square electrical box for indoor use or on a model BBK-1 or HC-BB weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1 or HC-BB, Stock No. 1500001.

Notes

1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C)
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection. * Does not have ULC listing.

Technical Specifications

Dimensions	6” (150mm), 8” (200mm) and 10” (250mm)
Enclosure	Cover: Steel Finish: Red Powder Coat Base: non-corrosive composite material All parts have corrosion resistant finishes Model BBK-1 or HC-BB weatherproof backbox (optional)
Voltages Available	24VAC 120VAC 12VDC (10.2 to 15.6) Polarized 24VDC (20.4 to 31.2) Polarized
Environmental Limitations	Indoor or outdoor use (See Note 1) -40° to 150°F (-40° to 66°C) (Outdoor use requires weatherproof backbox.)
Termination	AC Bells - 4 No. 18 AWG stranded wires DC Bells - Terminal strip
Service Use	NFPA 13, 72, local AHJ

*Specifications subject to change without notice.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or HC-BB. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

Installation

The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.

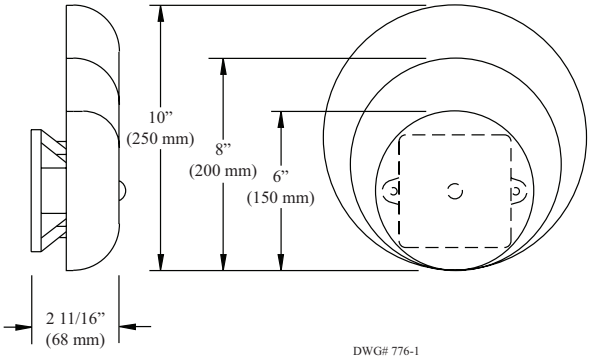
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from ringing.

Bell Dimension Inches (mm)

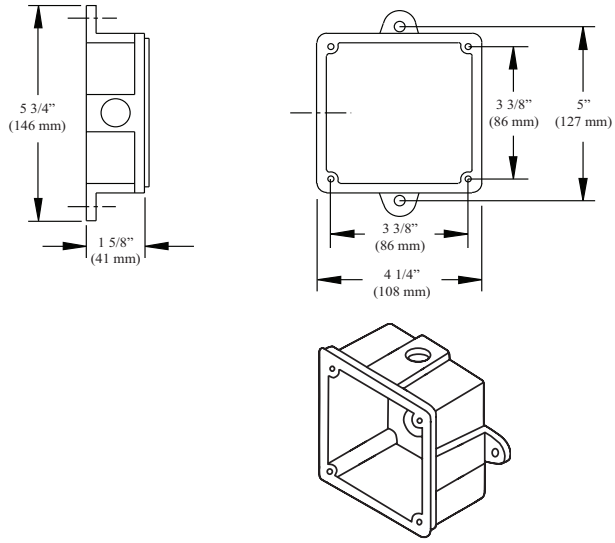
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

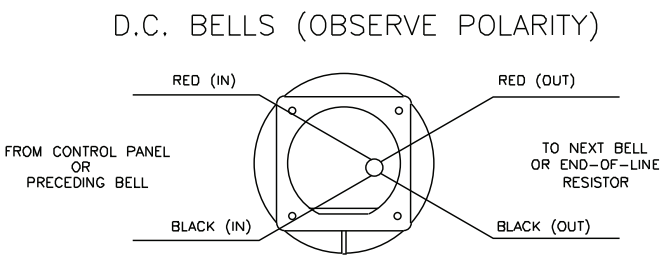
MODEL BBK-1 OR HC-BB

Fig 2



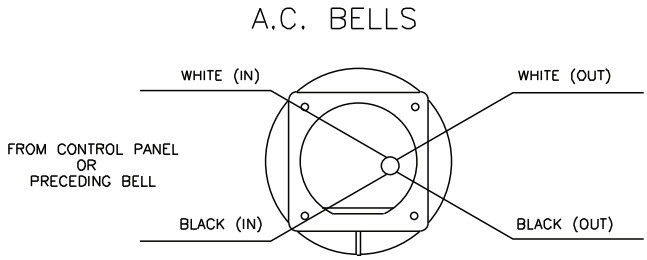
Wiring Rear View

Fig 3



NOTES:

1. OBSERVE POLARITY TO RING D.C. BELLS.
2. RED WIRES POSITIVE (+).
3. BLACK WIRES NEGATIVE (-).
4. EOL RESISTOR IS SUPPLIED BY FIRE ALARM CONTROL PANEL.



NOTES:

1. WHEN USING A.C. BELLS, TERMINATE EACH EXTRA WIRE SEPERATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS .

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

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

Maximum Surge: 18 FPS (5.5 m/s)

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

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

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

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

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

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

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

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

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

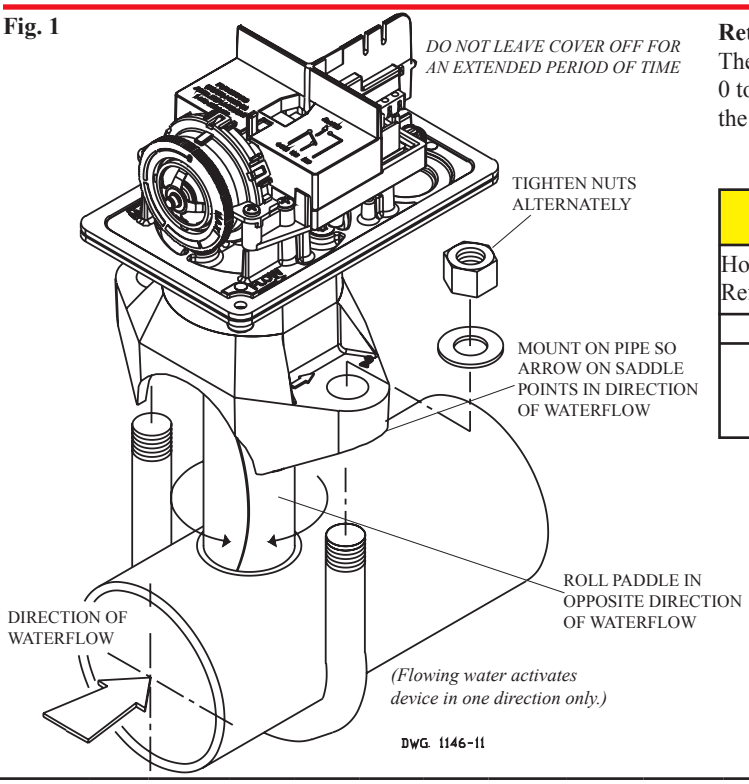
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

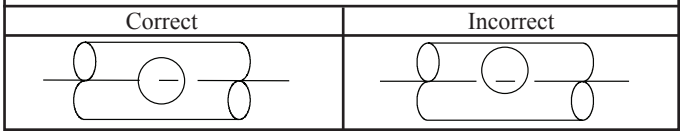


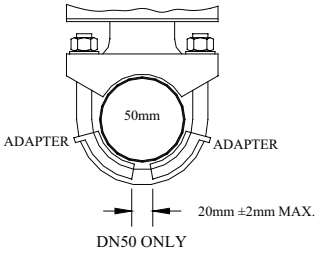
Retard Adjustment

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

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

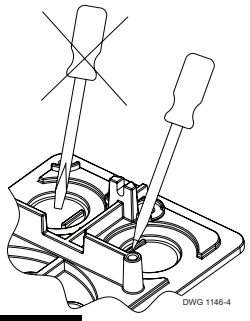
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

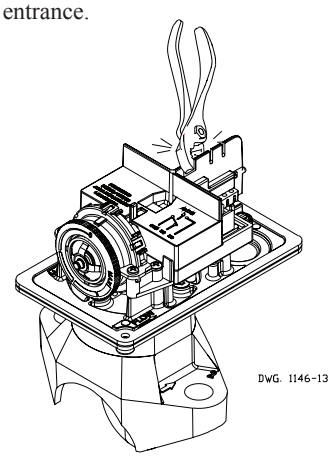
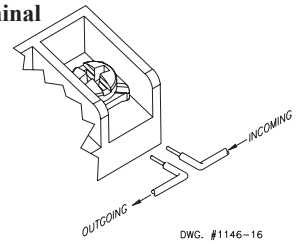


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

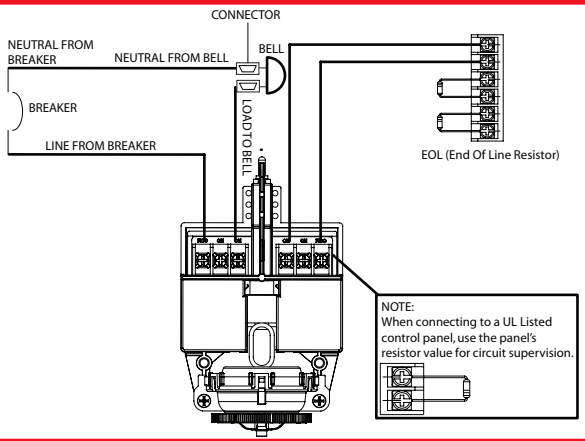


⚠ WARNING

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

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections



Notes:

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

Testing

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

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

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

Fig. 6 Mounting Dimensions

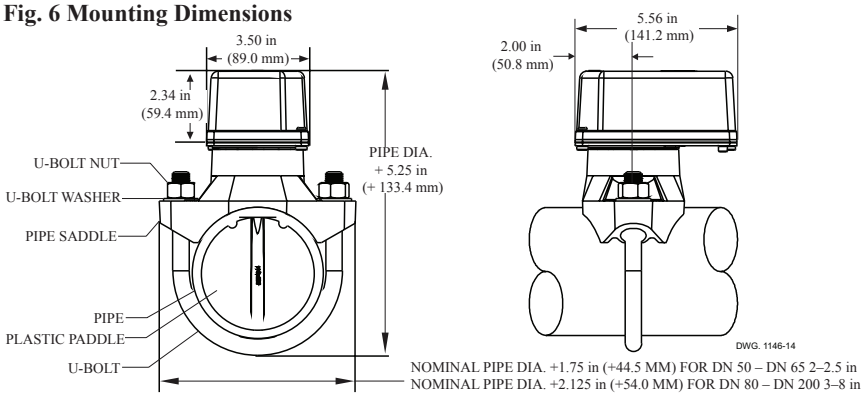
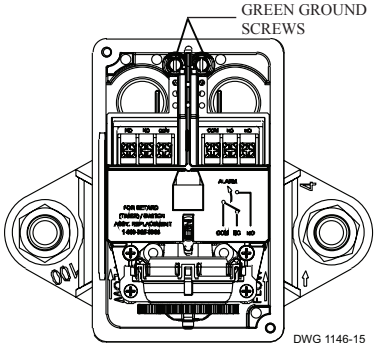


Fig. 7



Maintenance

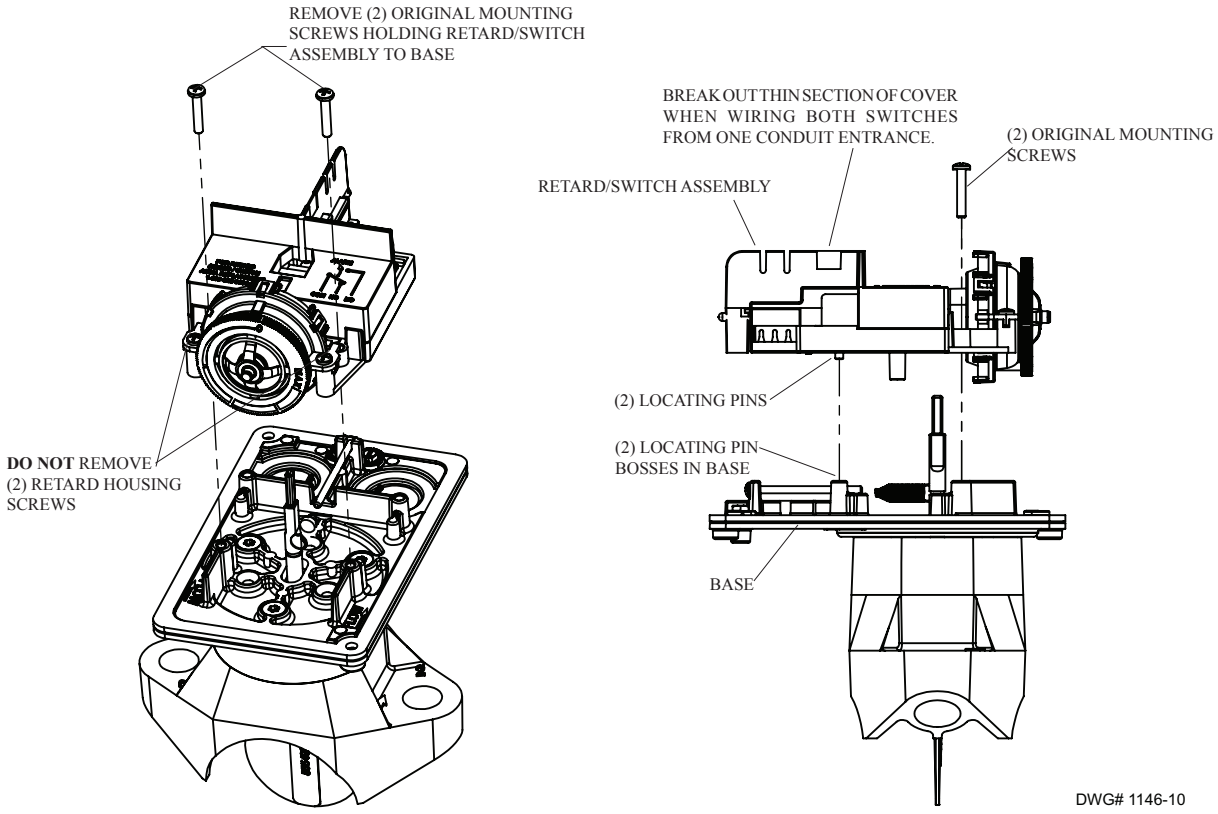
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

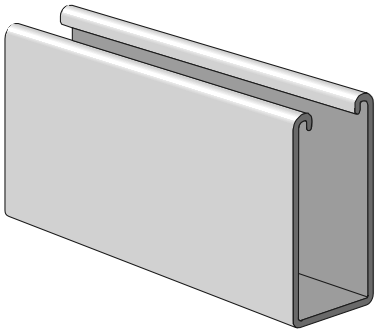
Fig. 8

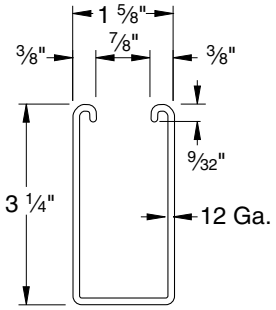


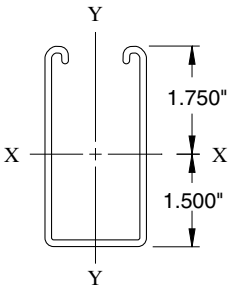
Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

PS 100 - Steel Channel (1 5/8" x 3 1/4" x 12 ga.)



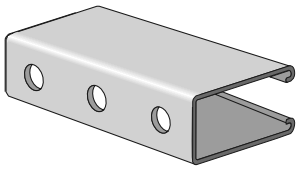


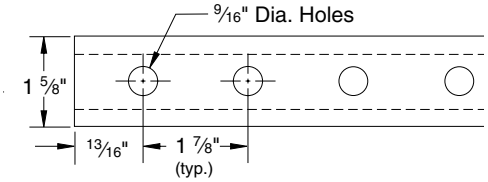


ELEMENTS OF SECTION

Weight (lbs./100 ft.)	Area of Section (Inch²)	X-X Axis			Y-Y Axis		
		Moment of Inertia (Inch⁴)	Section Modulus (Inch³)	Radius of Gyration (Inch)	Moment of Inertia (Inch⁴)	Section Modulus (Inch³)	Radius of Gyration (Inch)
305	0.897	1.099	0.628	1.107	0.359	0.442	0.695

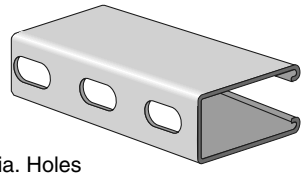
PS 100 H - Channel with Holes

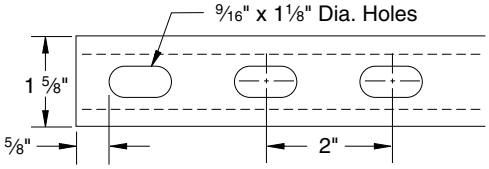




Weight: 300 lbs./100 ft.

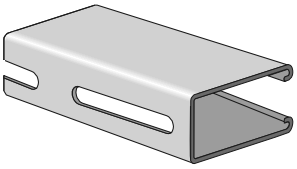
PS 100 EH – Channel with Elongated Holes

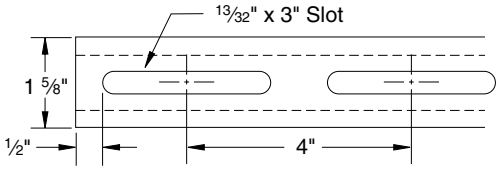




Weight: 300 lbs./100 ft.

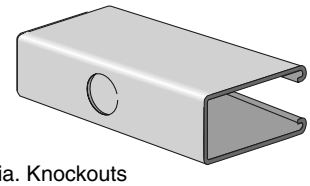
PS 100 S - Channel with Slots

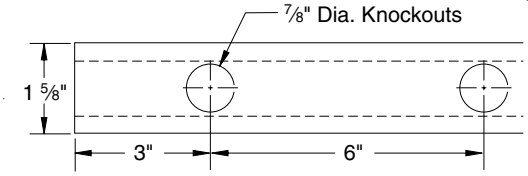




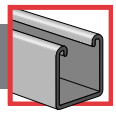
Weight: 300 lbs./100 ft.

PS 100 K06 – Channel with Knockouts





Weight: 305 lbs./100 ft.



Finish: Plain, Painted Green, or Pregalvanized **Order By:** No., Length and Finish

BEAM LOADING – PS 100

Span	Max Allowable Uniform Load	Defl. at Uniform Load	Uniform Loading at Deflection		
			Span/180	Span/240	Span/360
In	*Lbs*	*In*	*Lbs*	*Lbs*	*Lbs*
24	5,260	0.03	5,260	5,260	5,260
36	3,510	0.07	3,510	3,510	3,510
48	2,630	0.12	2,630	2,630	2,630
60	2,110	0.18	2,110	2,110	1,920
72	1,750	0.26	1,750	1,750	1,330
84	1,500	0.36	1,500	1,470	980
96	1,320	0.47	1,320	1,130	750
108	1,170	0.59	1,170	890	590
120	1,050	0.73	960	720	480
144	880	1.05	670	500	330
168	750	1.43	490	370	250
192	660	1.87	380	280	190
216	580	2.37	300	220	150
240	530	2.92	240	180	120

* Bearing load may govern capacity.

For concentrated load at center of span, divide uniform load by 2 and multiply corresponding deflection by 0.8. This load table is based on a solid channel section.

For Pierced Channels, reduce beam load values as follows:

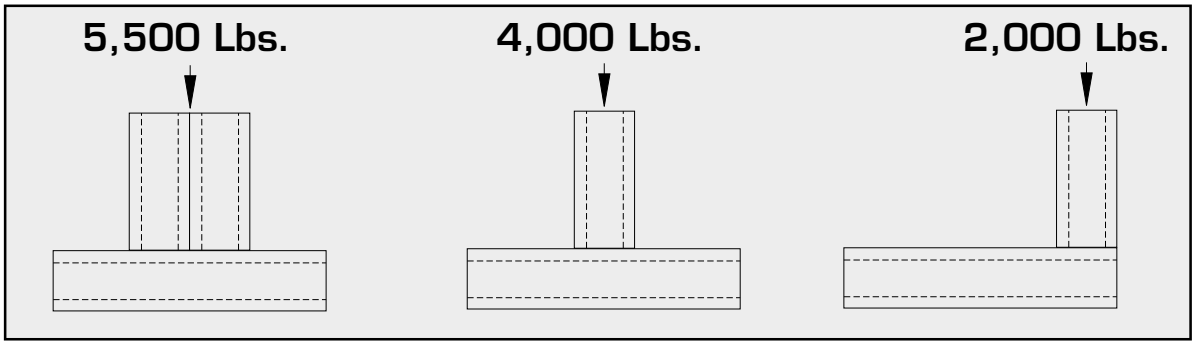
PS-100-EH	15%	PS-100-S	15%
PS-100-H	10%	PS-100-K06	5%

COLUMN LOADING – PS 100

Unbraced Height	Maximum Allowable Load at Slot Face	Maximum Column Load Applied at C.G.			
		K = 0.65	K = 0.80	K =1.0	K = 1.2
In	*Lbs*	*Lbs*	*Lbs*	*Lbs*	*Lbs*
24	4,430	13,050	12,000	11,180	9,590
36	4,030	11,380	9,590	7,390	5,560
48	3,400	8,830	6,730	4,700	3,560
60	2,780	6,580	4,700	3,360	2,620
72	2,330	4,890	3,560	2,620	2,090
84	2,010	3,860	2,870	2,160	1,750
96	1,770	3,180	2,410	1,850	1,510
108	1,590	2,710	2,090	1,620	1,330
120	1,440	2,370	1,850	1,450	**

Column loads are for allowable axial loads and must be reduced for eccentric loading.

PS 100 – Crush Loads

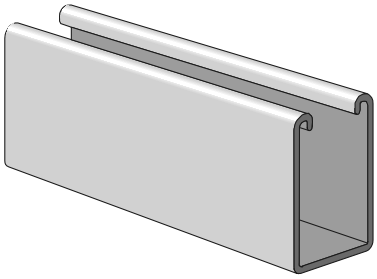


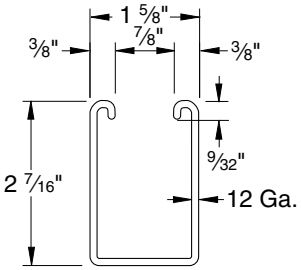
Resistance to Slip – 1,500 lbs. per bolt when ½" PS NS channel nuts are used.

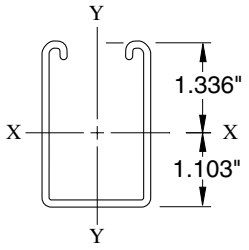
Pull Out Strength – 2,000 lbs. per bolt when ½" PS NS channel nuts are used.

Finish: Plain, Painted Green, or Pregalvanized **Order By:** No., Length and Finish

PS 150 – Steel Channel (1 5/8" x 2 7/16" x 12 ga.)



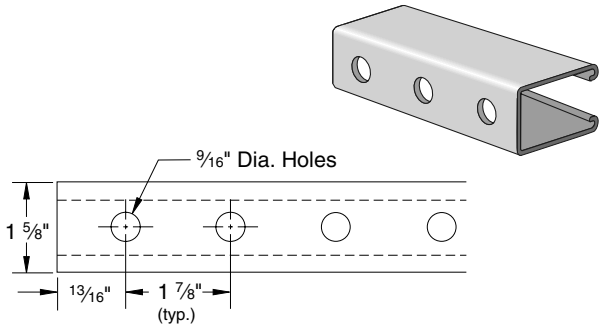




ELEMENTS OF SECTION

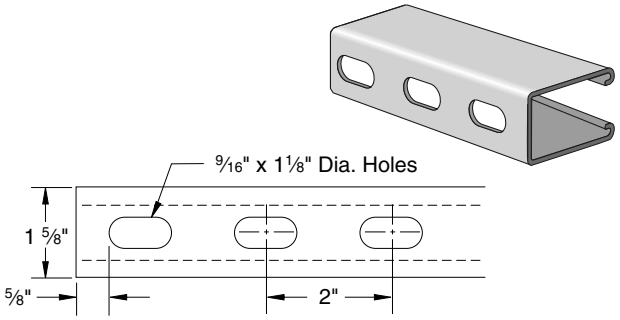
Weight (lbs./100 ft.)	Area of Section (Inch²)	X-X Axis			Y-Y Axis		
		Moment of Inertia (Inch⁴)	Section Modulus (Inch³)	Radius of Gyration (Inch)	Moment of Inertia (Inch⁴)	Section Modulus (Inch³)	Radius of Gyration (Inch)
247	0.726	0.523	0.391	0.848	0.335	0.412	0.679

PS 150 H - Channel with Holes



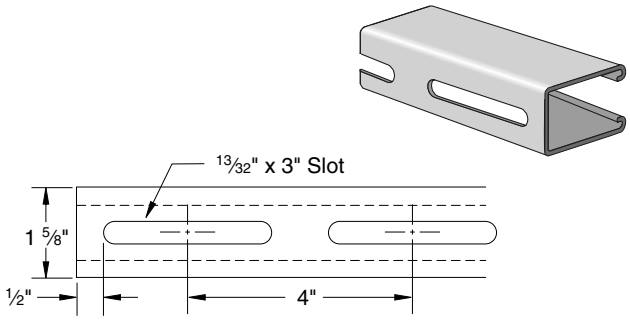
Weight: 242 lbs./100 ft.

PS 150 EH – Channel with Elongated Holes



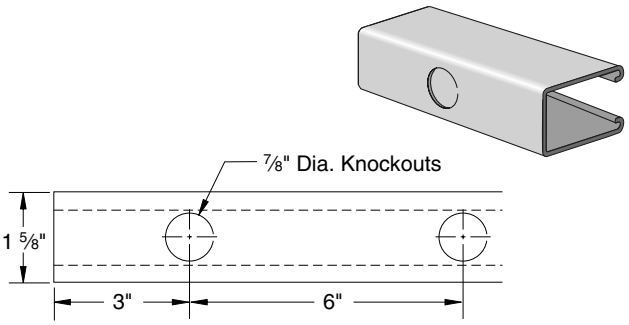
Weight: 242 lbs./100 ft.

PS 150 S - Channel with Slots



Weight: 242 lbs./100 ft.

PS 150 KO6 – Channel with Knockouts



Weight: 247 lbs./100 ft.

CHANNEL

Finish: Plain, Painted Green, or Pregalvanized **Order By:** No., Length and Finish

BEAM LOADING – PS 150

Span	Max Allowable Uniform Load	Defl. at Uniform Load	Uniform Loading at Deflection		
			Span/180	Span/240	Span/360
In	*Lbs*	*In*	*Lbs*	*Lbs*	*Lbs*
24	3,280	0.04	3,280	3,280	3,280
36	2,190	0.09	2,190	2,190	2,190
48	1,640	0.15	1,640	1,640	1,430
60	1,310	0.24	1,310	1,310	910
72	1,090	0.34	1,090	950	630
84	940	0.47	930	700	470
96	820	0.61	710	540	360
108	730	0.77	560	420	280
120	660	0.96	460	340	230
144	550	1.38	320	240	160
168	470	1.87	230	170	120
192	410	2.45	180	130	90
216	360	3.10	140	110	70
240	330	3.82	110	90	60

* Bearing load may govern capacity.

This load table is based on a solid channel section.

For concentrated load at center of span, divide uniform load by 2 and multiply corresponding deflection by 0.8.

For Pierced Channels, reduce beam load values as follows:

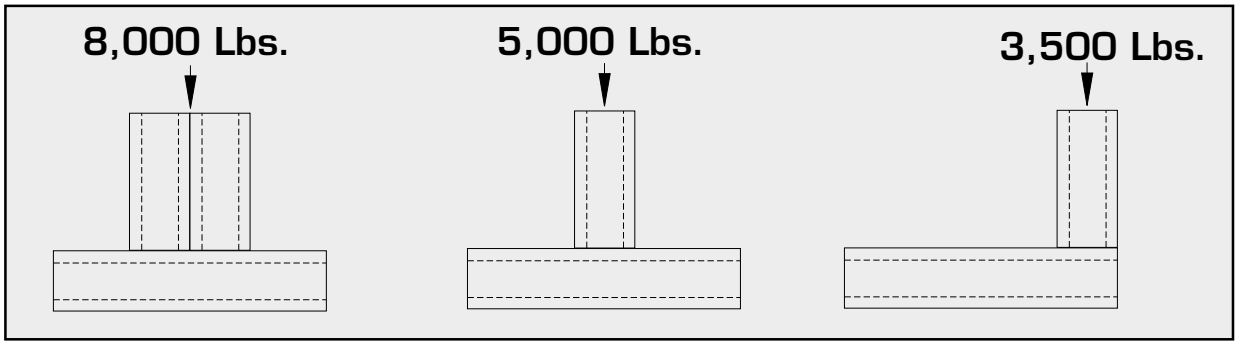
PS-150-EH 15%
PS-150-S 15%
PS-150-H 10%
PS-150-K06 5%

COLUMN LOADING – PS 150

Unbraced Height	Maximum Allowed Load at Slot Face	Max. Column Load Applied at C.G.			
		K = 0.65	K = 0.80	K =1.0	K = 1.2
In	*Lbs*	*Lbs*	*Lbs*	*Lbs*	*Lbs*
24	4,580	13,860	12,610	10,910	9,300
36	4,010	11,120	9,300	7,190	5,550
48	3,370	8,550	6,580	4,800	3,800
60	2,810	6,430	4,800	3,610	2,920
72	2,410	4,970	3,800	2,920	2,390
84	2,120	4,060	3,160	2,460	2,020
96	1,900	3,450	2,720	2,130	1,740
108	1,720	3,000	2,390	1,870	1,520
120	1,570	2,670	2,130	1,660	**

Column loads are for allowable axial loads and must be reduced for eccentric loading.

PS 150 – Crush Loads



Resistance to Slip – 1,500 lbs. per bolt when ½" PS NS channel nuts are used.

Pull Out Strength – 2,000 lbs. per bolt when ½" PS NS channel nuts are used.

Minimum Size Power-Strut Channel - To Comply with NFPA 13 Table 2-6.1 5(a) 1996 Edition

Channel Size	Sect. Mod. (in^3)
PS-200 1⅝" x 1⅝" x 12 ga.	.202
PS-150 1⅝" x 2 7/16" x 12 ga.	.391
PS-100 1⅝" x 3¼" x 12 ga.	.628

Channel Size	Sect. Mod. (in^3)
PS-150 2T3 1⅝" x 4⅞" x 12 ga.	1.153
PS-100 2T3 1⅝" x 6½" x 12 ga.	1.716

Section Modulus Required for Trapeze Members ($in.^3$)

Span of Trapeze	*Pipe Size* 1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	8"	10"
1 ft. 6 in.	0.08	0.09	0.09	0.09	0.10	0.11	0.12	0.13	0.15	0.18	0.24	0.32
	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.15	0.18	0.22	0.30	0.41
2 ft. 0 in.	0.11	0.12	0.12	0.13	0.13	0.15	0.16	0.17	0.20	0.24	0.32	0.43
	0.11	0.12	0.12	0.13	0.15	0.16	0.18	0.20	0.24	0.29	0.40	0.55
2 ft. 6 in.	0.14	0.14	0.15	0.16	0.17	0.18	0.20	0.21	0.25	0.30	0.40	0.54
	0.14	0.15	0.15	0.16	0.18	0.21	0.22	0.25	0.30	0.36	0.50	0.68
3 ft. 0 in.	0.17	0.17	0.18	0.19	0.20	0.22	0.24	0.26	0.31	0.36	0.48	0.65
	0.17	0.18	0.18	0.20	0.22	0.25	0.27	0.30	0.36	0.43	0.60	0.82
4 ft. 0 in.	0.22	0.23	0.24	0.25	0.27	0.29	0.32	0.34	0.41	0.48	0.64	0.87
	0.22	0.24	0.24	0.26	0.29	0.33	0.36	0.40	0.48	0.58	0.80	1.09
5 ft. 0 in.	0.28	0.29	0.30	0.31	0.34	0.37	0.40	0.43	0.51	0.59	0.80	1.08
	0.28	0.29	0.30	0.33	0.37	0.41	0.45	0.49	0.60	0.72	1.00	1.37
6 ft. 0 in.	0.33	0.35	0.36	0.38	0.41	0.44	0.48	0.51	0.61	0.71	0.97	1.30
	0.34	0.35	0.36	0.39	0.44	0.49	0.54	0.59	0.72	0.87	1.20	1.64
7 ft. 0 in.	0.39	0.40	0.41	0.44	0.47	0.52	0.55	0.60	0.71	0.83	1.13	1.52
	0.39	0.41	0.43	0.46	0.51	0.58	0.63	0.69	0.84	1.01	1.41	1.92
8 ft. 0 in.	0.44	0.46	0.47	0.50	0.54	0.59	0.63	0.68	0.81	0.95	1.29	1.73
	0.45	0.47	0.49	0.52	0.59	0.66	0.72	0.79	0.96	1.16	1.61	2.19
9 ft. 0 in.	0.50	0.52	0.53	0.56	0.61	0.66	0.71	0.77	0.92	1.07	1.45	1.95
	0.50	0.53	0.55	0.59	0.66	0.74	0.81	0.89	1.08	1.30	1.81	2.46
10 ft. 0 in.	0.56	0.58	0.59	0.63	0.68	0.74	0.79	0.85	1.02	1.19	1.61	2.17
	0.56	0.59	0.61	0.65	0.74	0.82	0.90	0.99	1.20	1.44	2.01	2.74

Exceeds Section Modulus for Channel Shown Above

Top values are for Schedule 10 pipe; bottom values are for Schedule 40 Pipe.

High-performance intumescent firestop sealant FS-ONE MAX

Applications

- For effectively sealing most common through penetrations in a variety of base materials
- For use on concrete, masonry and drywall
- Mixed and multiple penetrations
- Metal pipe penetrations: copper, steel and EMT
- Insulated metal pipe penetrations: steel and copper
- Plastic pipe penetrations: closed or vented

Advantages

- US-produced: “Buy American” compliant
- One product for a variety of common through penetrations
- Cost-effective, easy-to-use solution
- Water-based and paintable
- Industry-leading VOC results
- Ethylene glycol-free

Chemical resistant

Mold and mildew resistant

FILL, VOID OR CAVITY MATERIAL FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS SEE UL FIRE RESISTANCE DIRECTORY 66Y7

Technical data	
Chemical basis	Water-based acrylic dispersion
Approx. Density	84.3 lb/ft³
Color	Red
Application temperature range	41 - 104 °F
Approx. cure time[1)]	4 mm/3 days
Temperature resistance range	-4 to 212 °F
Mold and mildew performance	Class 0 (ASTM G21-96)
Mold and mildew resistance	Yes
Surface burning characteristics UL 723 (ASTM E84)	Flame spread: 0 Smoke development: 10
Tested in accordance with	UL 1479, ASTM E814, ASTM E84, CAN/ ULC-S115, ASTM G21, ASTM E90
California State fire marshal approval	CSFM Listing 4485-1200:0108 for FS-ONE MAX Intumescent Firestop Sealant
Expansion ratio (unrestricted, up to)	1:5

[1)] at 75°F/24°C, 50% relative humidity

Order Designation	Package Content	Item number
FS-ONE MAX 20oz foil (3 case + disp)	1x Foil pack dispenser manual CS 270-P1, 75x Firestop sealant FS-ONE MAX 20 oz foil	**3530252**
FS-ONE MAX 10oz tube (1 case)	12x Firestop sealant FS-ONE MAX 10 oz cartridge	**3530249**
FS-ONE MAX 5 gallon (18 pails)	18x Firestop sealant FS-ONE MAX 5 gallon pail	**3530263**
FS-ONE MAX 20oz foil (1 case)	25x Firestop sealant FS-ONE MAX 20 oz foil	**3530250**
FS-ONE MAX 20oz foil (3 cases)	75x Firestop sealant FS-ONE MAX 20 oz foil	**3530251**
FS-ONE MAX 20oz Foil-Pallet	600x FSONE-MAX 20 oz foil, 290x Bulk Shipping Condition	**3534713**
FS-ONE MAX 10 oz cartridge		**2101531**
FS-ONE MAX 5 gallon pail		**2101533**

12/16 DBS