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:

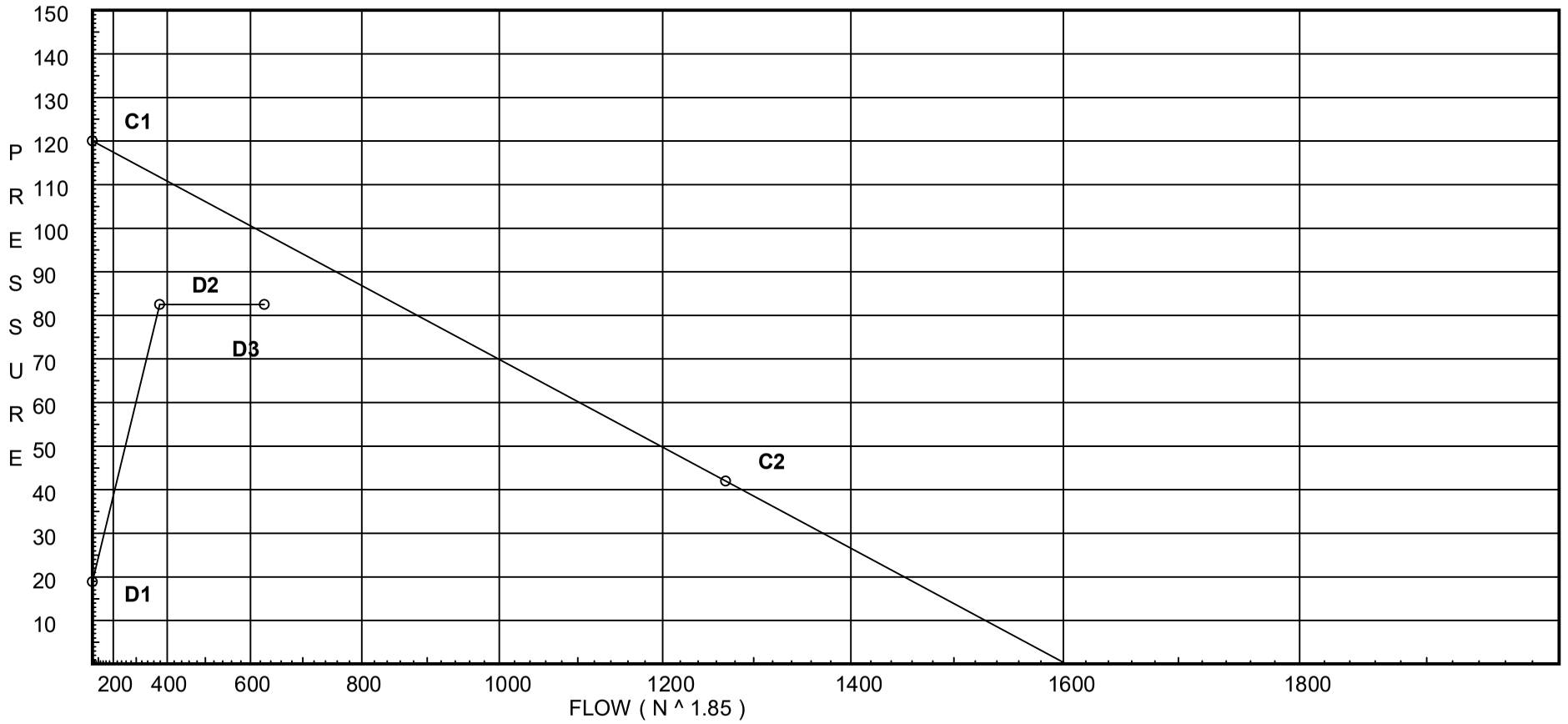
text1(35) - invisible

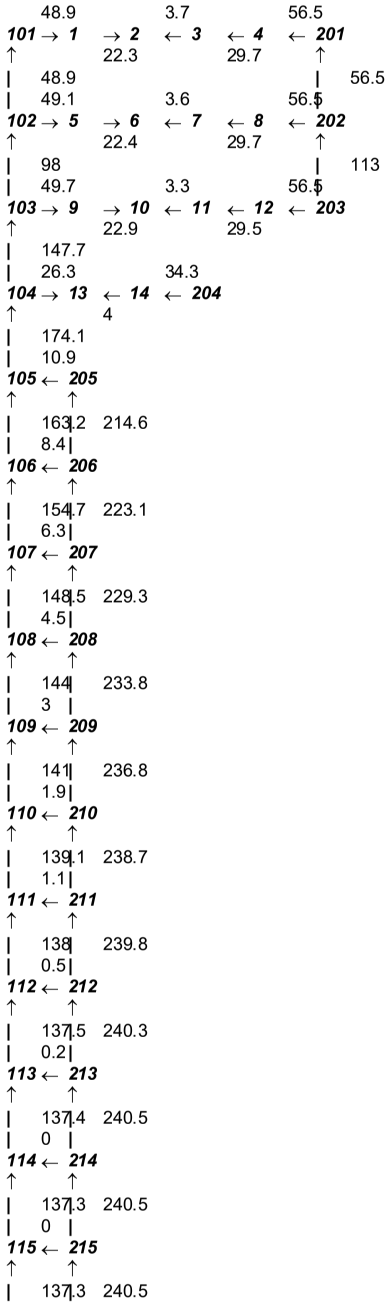
Water Supply Curve

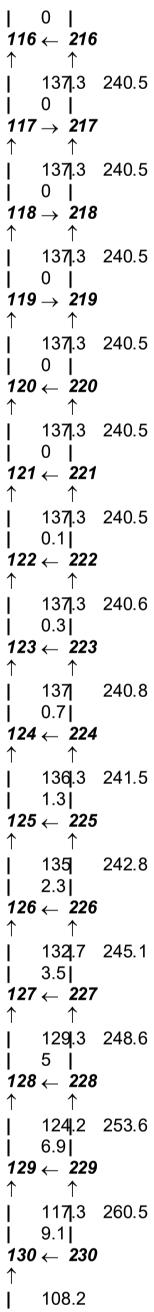
CRAWFORD SPRINKLER CO.
Duke Energy Mobile Substation Storage RA1 REV 01

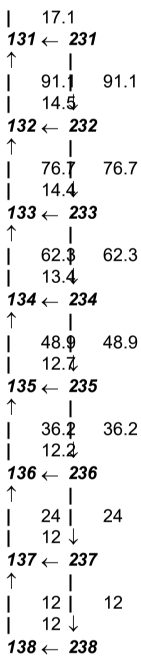
City Water Supply:
- C1 - Static Pressure : 120
- C2 - Residual Pressure: 42
- C2 - Residual Flow : 1270

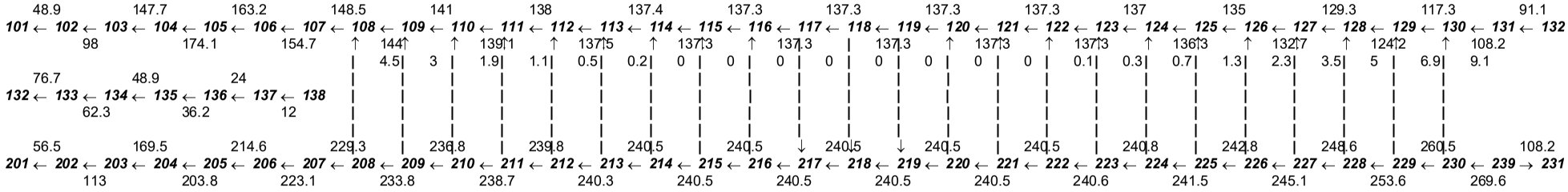
Demand:
- D1 - Elevation : 18.876
- D2 - System Flow : 377.818
- D2 - System Pressure : 82.472
- Hose (Demand) : 250
- D3 - System Demand : 627.818
- Safety Margin : 16.342




48.9
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
0.2
113 ← 213
137.4
240.5
0
114 ← 214
137.3
240.5
0
115 ← 215
137.3
240.5


0
116 ← 216
137.3 240.5
0
117 → 217
137.3 240.5
0
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


17.1
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.

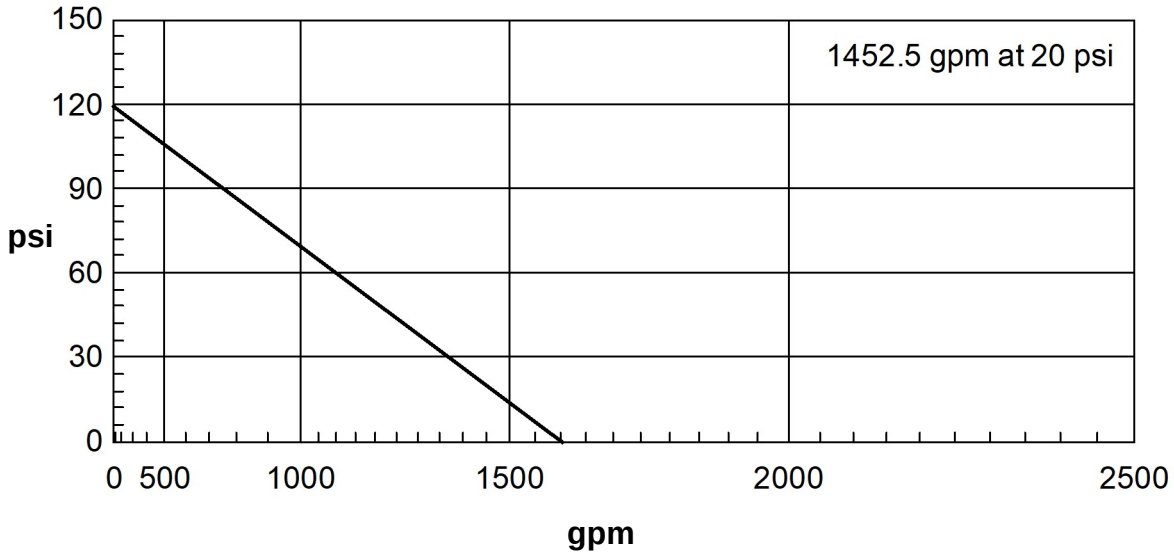
Read Hydrant

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

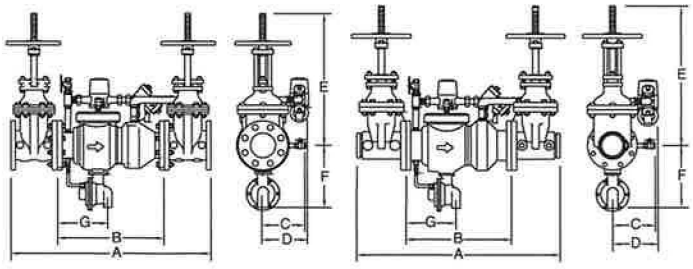
Attention:
Model 375DA (flange body) and
Model 375ADA
(grooved body) have different lay lengths.

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

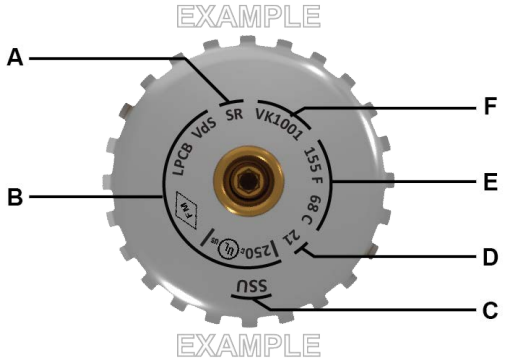


Figure – 1: Markings

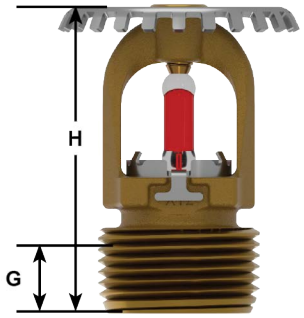


Figure – 2: Dimensions

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.

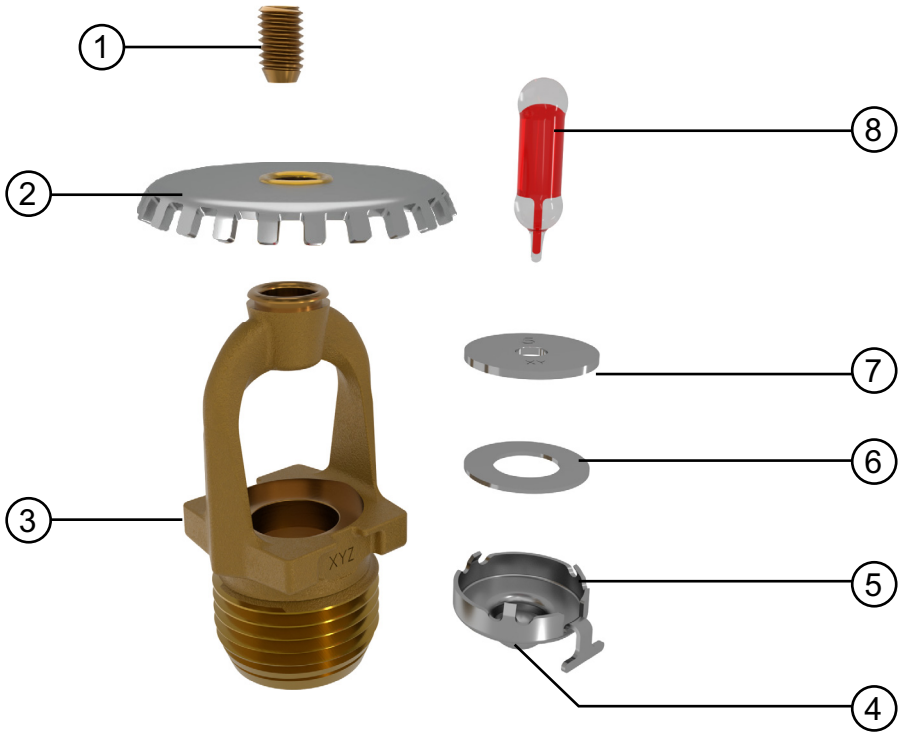


Figure – 3 Sprinkler Components

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

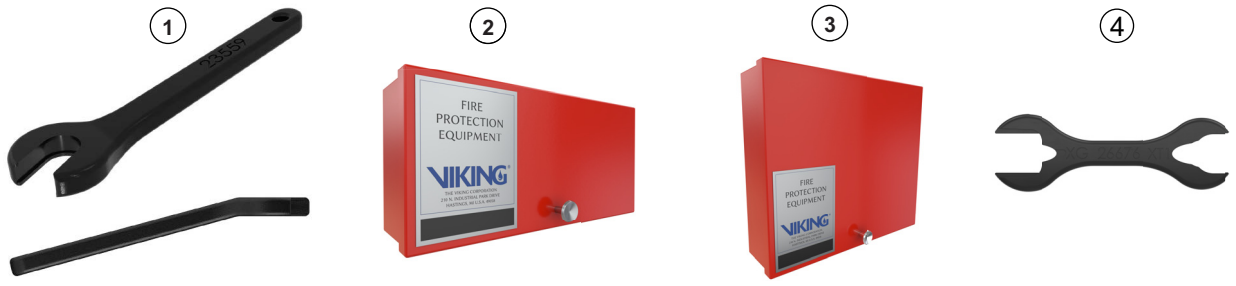


Figure – 4: Sprinkler Accessories

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.

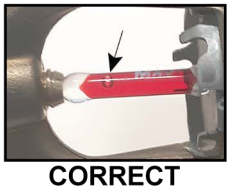
- NEVER use a sprinkler that has been exposed to temperatures exceeding the maximum allowed ambient temperature.
- NEVER use a sprinkler with a loss of liquid from the glass bulb or damage to the fusible element. A small bubble should be visible within the glass bulb; rotate the sprinkler to a horizontal 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).

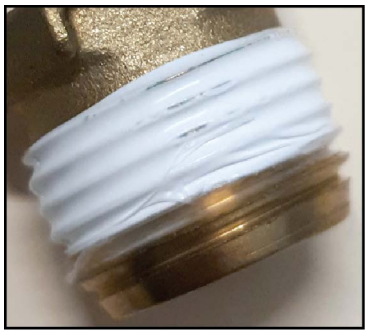


Figure – 1

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).

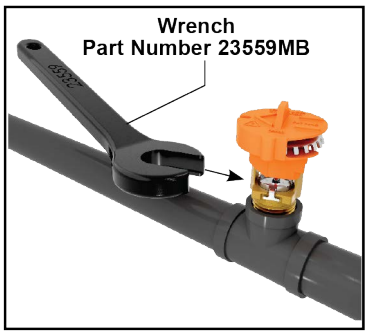


Figure – 2

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.

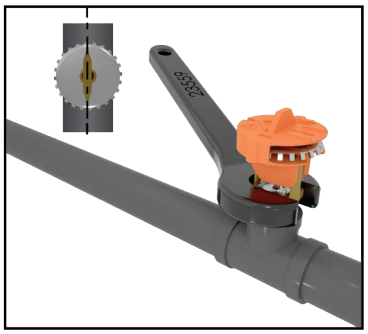


Figure – 3

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)

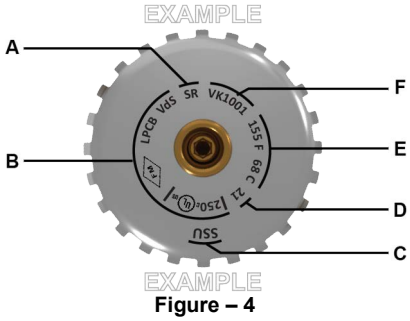


Figure – 4

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
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.

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)

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

DESIGN CRITERIA - 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.

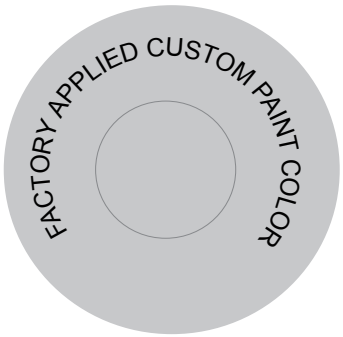
NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

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.

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

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

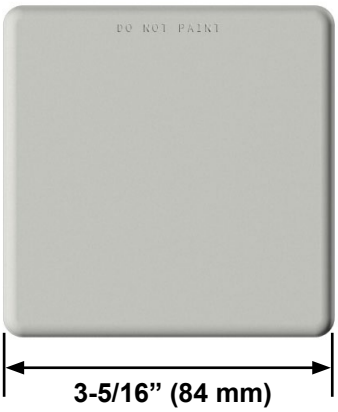
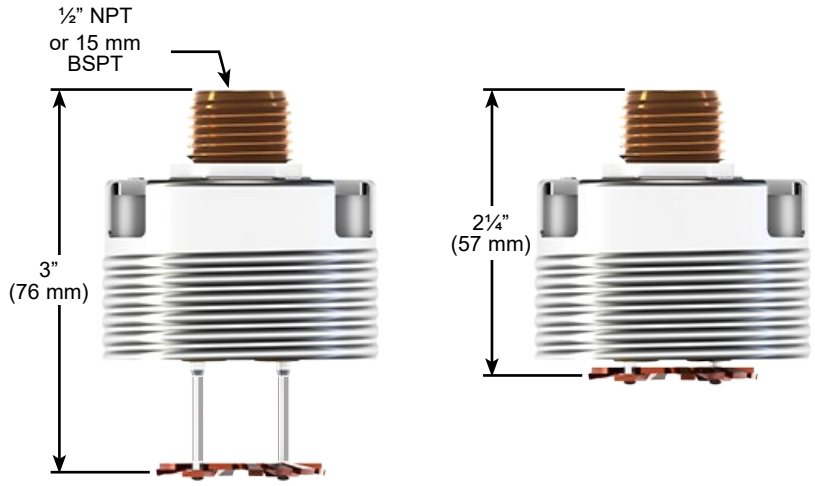


Figure 3: Square Cover Assembly

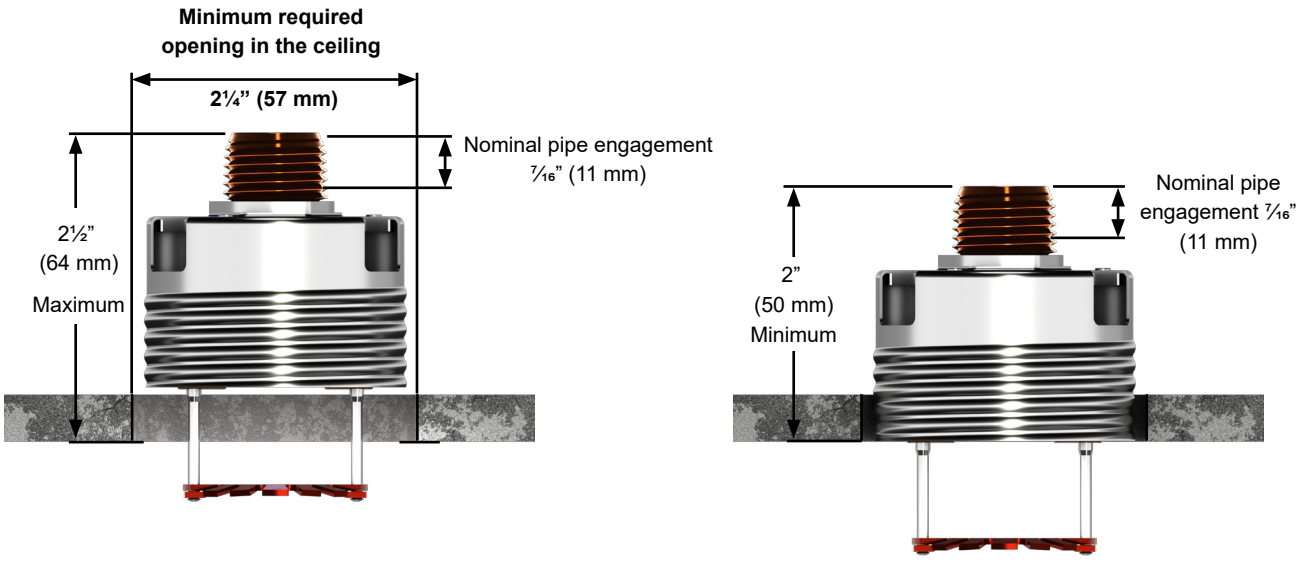
VIKING®	TECHNICAL DATA	STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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



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

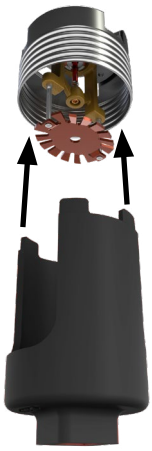
VIKING®	TECHNICAL DATA	STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK4621 (K5.6)

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

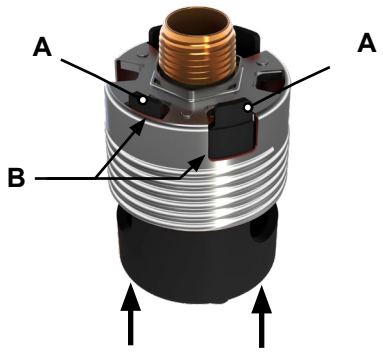
NOTICE: USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to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

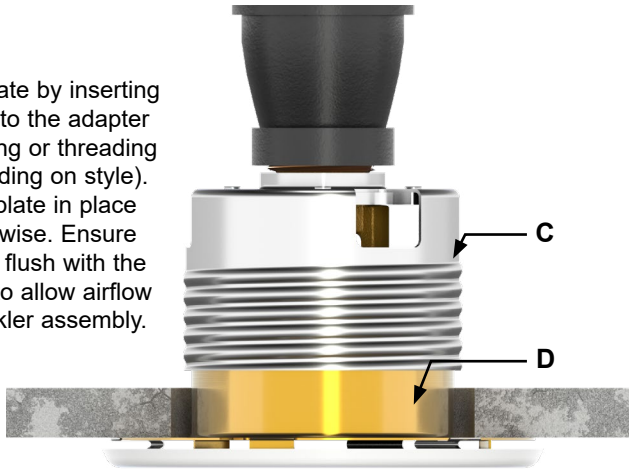


NOTE: *Image is representative only. Actual product may vary.*

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

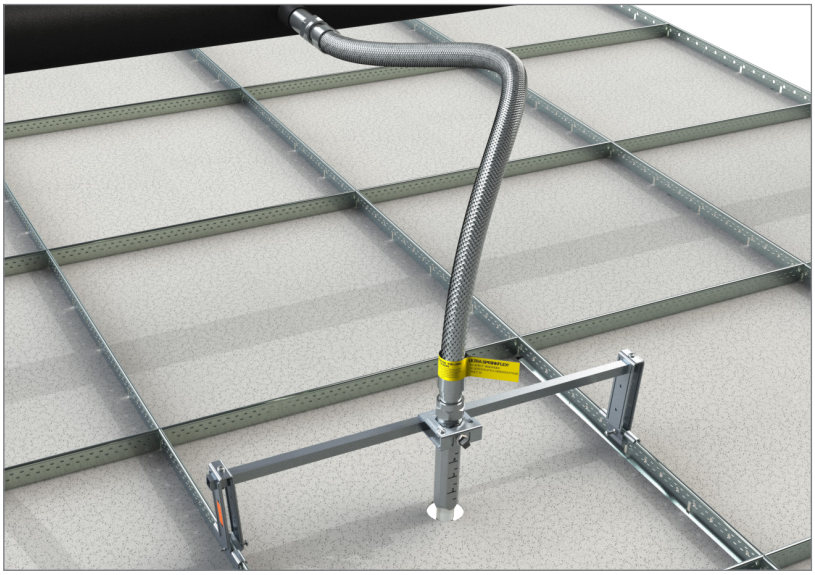


Maximum

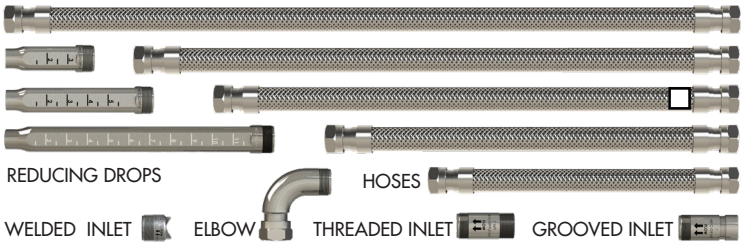
NOTE: *Image is representative only. Actual product may vary.*

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.

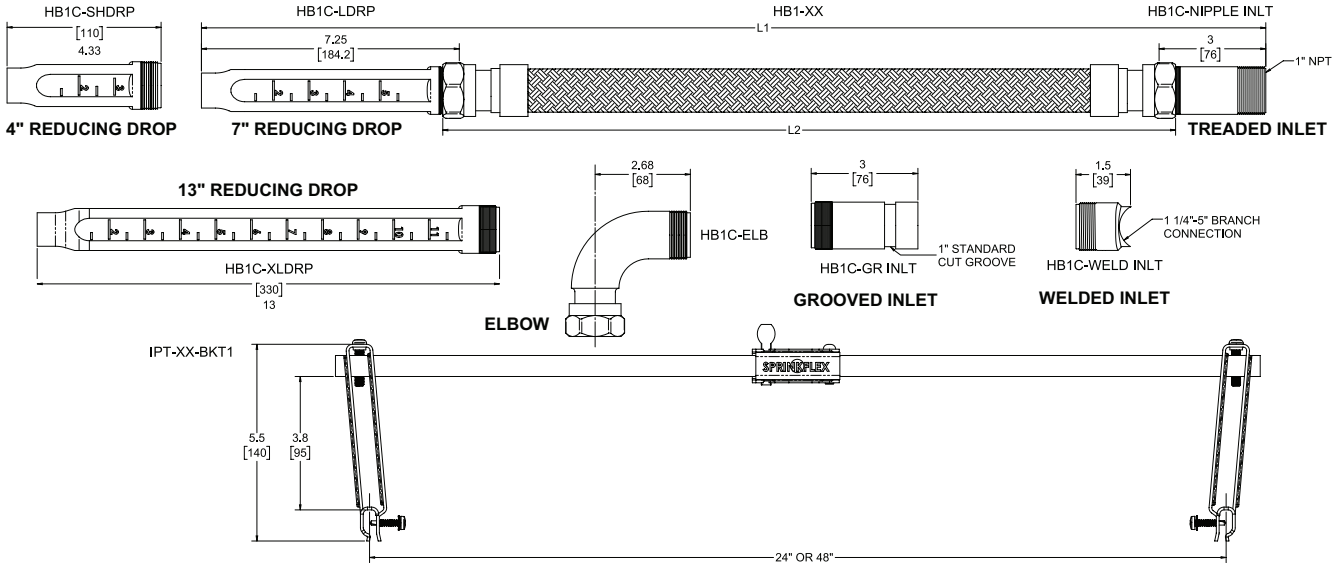
The three piece design is available with interchangeable components to create a flexible fire sprinkler hose solutions for all obstacles encountered in the field. Ultra SprinkFLEX hoses are available in 28", 40", 48", 59", and 71".

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

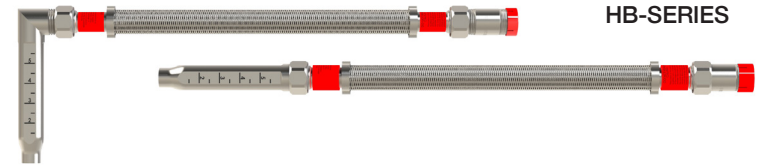
HN Series: HN-28, HN-40, HN-48, HN-59, HN-71 HNE-28, HNE-40, HNE-48, HNE-59, HNE-71

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.

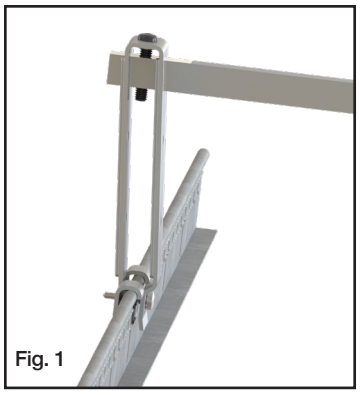


Fig. 1

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.

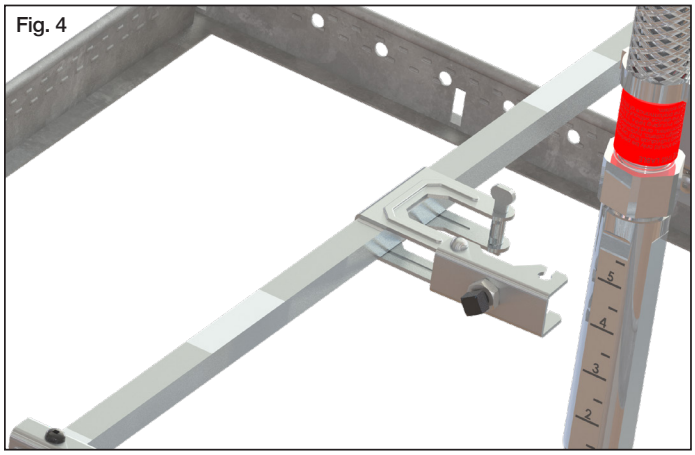
Fig. 2

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.

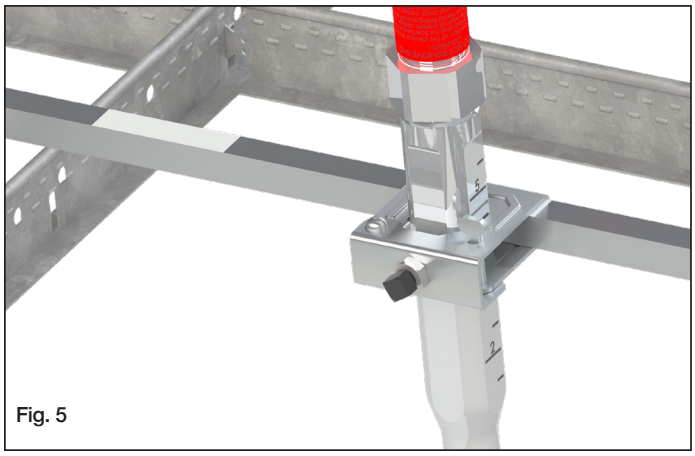
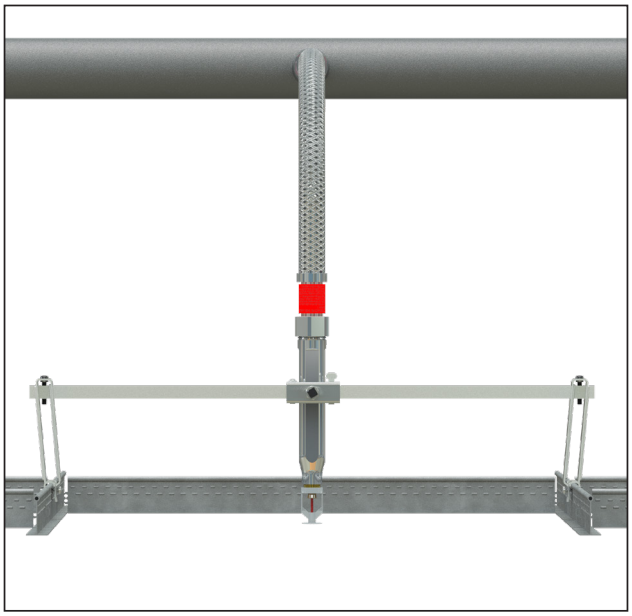


Fig. 5

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.



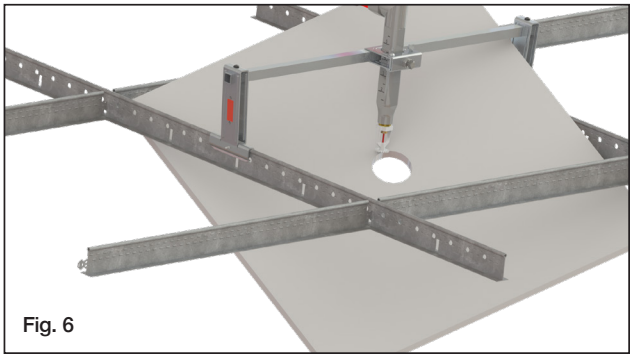


Fig. 6

⚠ 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)

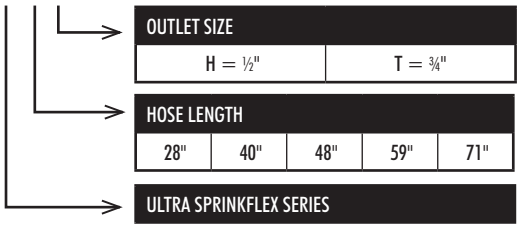
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1-28-SHDRP-H & HB1-GR-28-SHDRP-H	1x½	26.5	2 (51)	4	16	175 (1205)
HB1-40-SHDRP-H & HB1-GR-40-SHDRP-H	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®

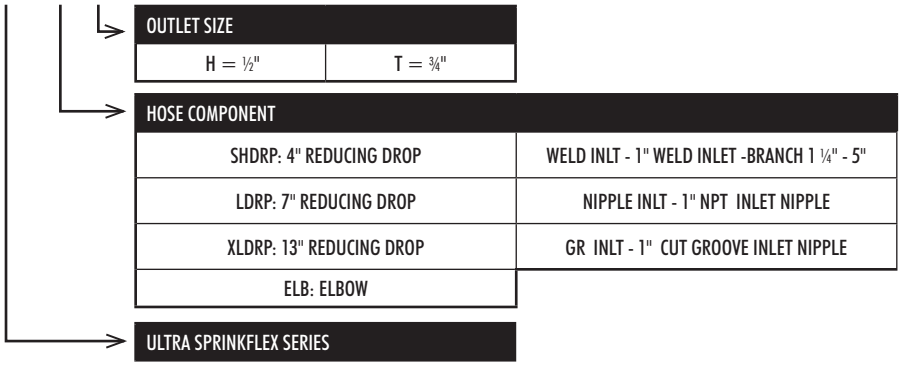
HB1 FRICTION LOSS TABLE (UL) CONTINUTED						
HOSE ASSEMBLIES	INLET BY OUTLET (INCHES)	HOSE ASSEMBLY LENGTH IN. (mm)	MINIMUM BEND RADIUS IN. (mm)	MAX NUMBER OF 90° BENDS	EQUIVALENT LENGTH OF 1 IN. SCHEDULE 40 PIPE FT. (m)	MAX RATED WORKING PRESSURE PSI (KPA)
HB1CE-28-LDRP-T & HB1CE-GR-28-LDRP-T	1x¾	33.5	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.

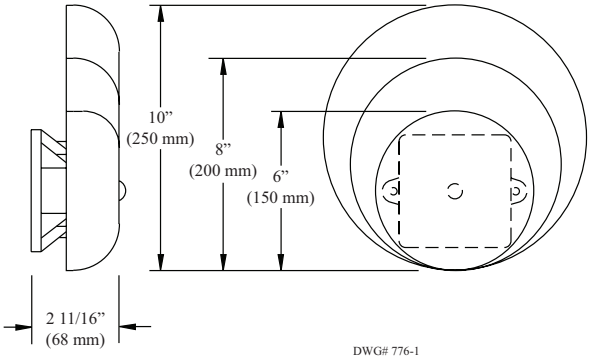
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation 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)

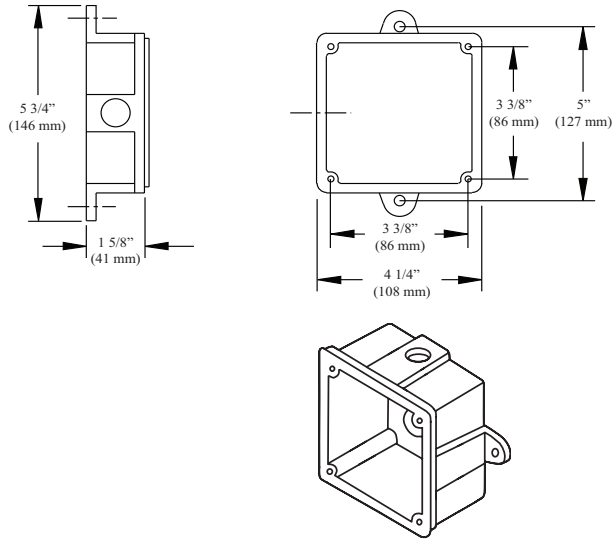
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

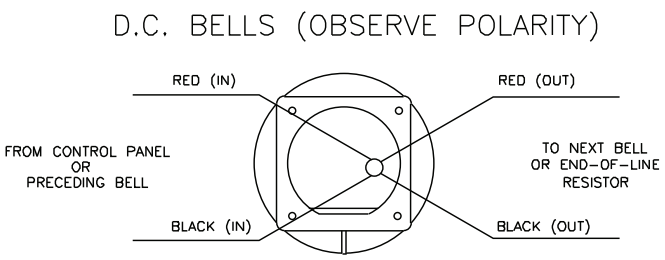
MODEL BBK-1 OR HC-BB

Fig 2



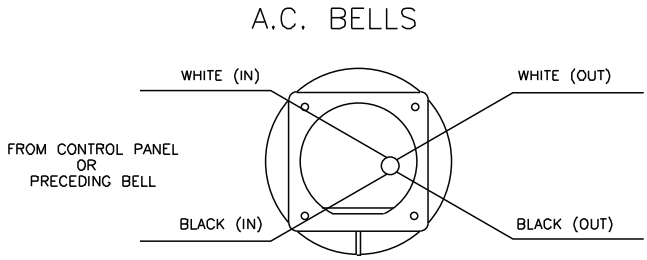
Wiring Rear View

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.

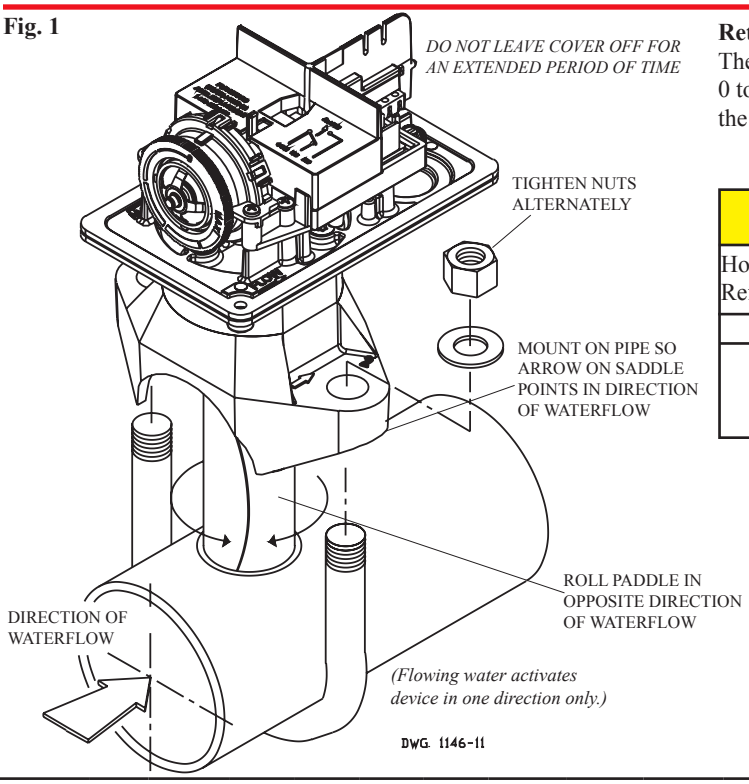
NOTE: Do not leave cover off for an extended period of time.

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

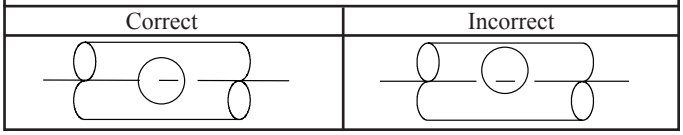


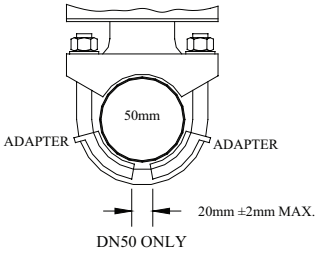
Retard Adjustment

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

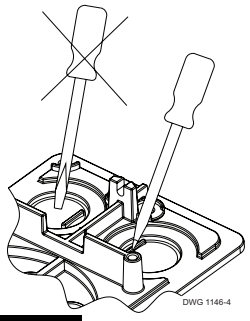
DWG# 1146-1F

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.

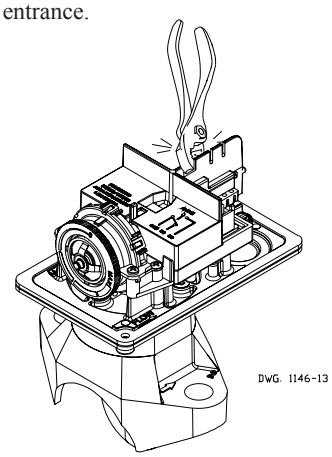
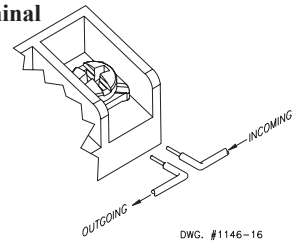


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

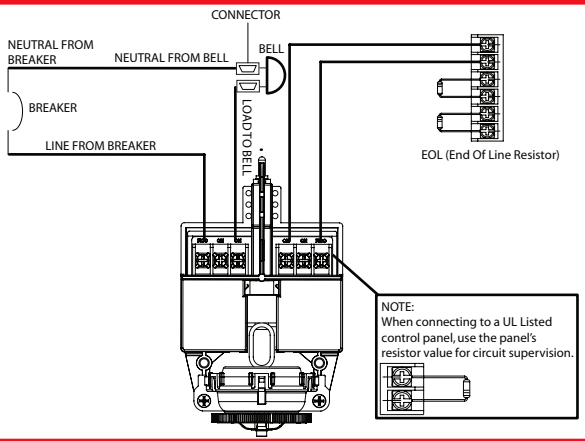


⚠ WARNING

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

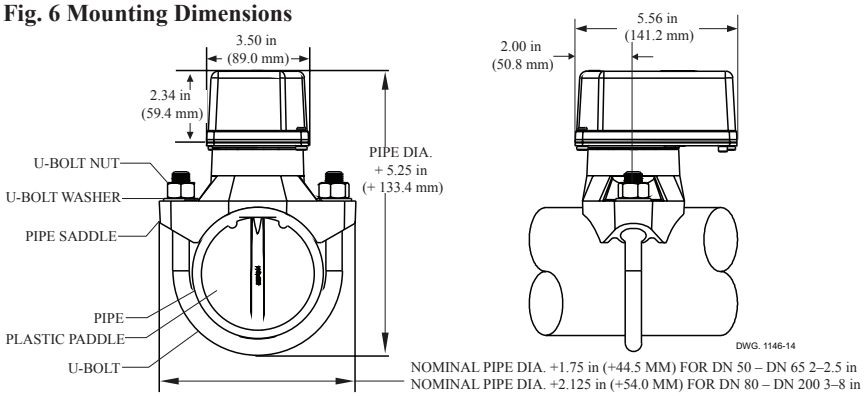
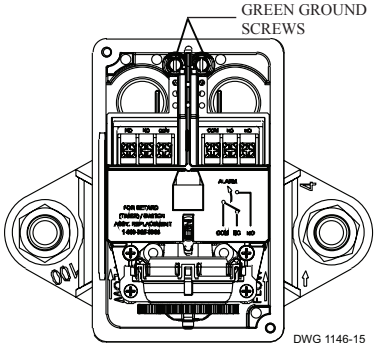


Fig. 7



Maintenance

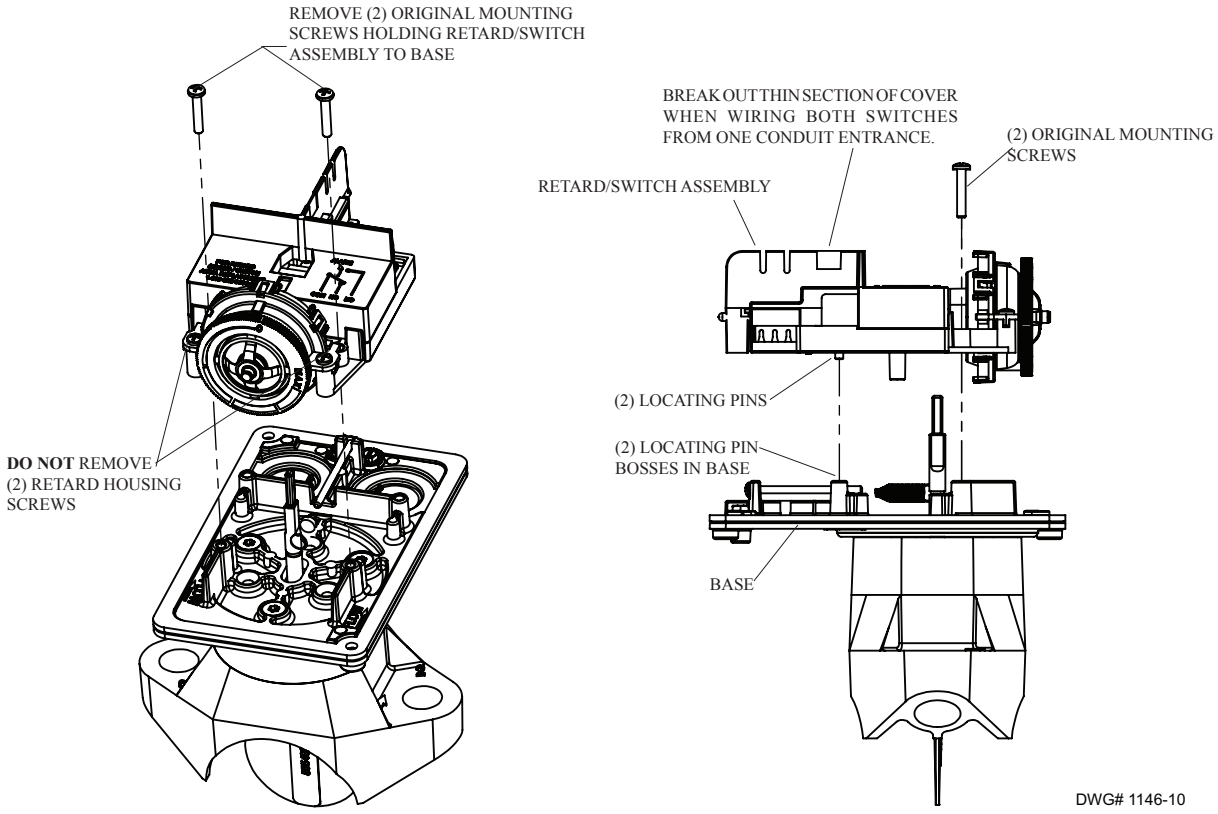
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard 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.