Product Submittal Information for:

Tractor Supply

695 N. Carolina Hwy. 210 S
Lillington, NC 27546

CONTRACTOR
WR Newman Inc.
2854 Logan St.
Nashville, TN 37211

Submittals Prepared by:

BVS Systems Inc.
P.O. Box 1520
Cornelius, NC 28031

From: James R. Saunders <jrsaunders@lillingtonnc.org>
Sent: Wednesday, March 19, 2025 11:53 AM
To: Brian Harris
Cc: John Bethune
Subject: Hydrant data

Mr. Harris,

Here is the hydrant test data for hydrants on HYW 210 near the new tractor supply. I was mistaken about submitting drawings for the sprinkler systems. You will need to submit final drawings to the Harnett County Fire Marshalls Office at the address below.

Harnett County Fire Marshall Office
1005 Edwards Brothers Drive
Lillington, NC 27546
910-893-7580

4311 017A- 680 210 HWY S
Lillington, NC 27546

Static:	82psi
Residual:	66psi
Pitot:	50psi
Gpm at 20psi:	2464gpm

4311 017B- 741 210 HWY S
Lillington, NC 27546

Static:	82psi
Residual:	70psi
Pitot:	48psi
Gpm at 20psi:	2820gpm

Please feel free to reach out if you have any other questions. Cheers!

Respectfully,

James Saunders
Lieutenant, B Shift
Lillington Fire Department

Hydraulic Overview

Job Number: 4366-S
Report Description: Ordinary Group II

Job

Job Number 4366-S	Designer
Job Name: Tractor Supply	Phone / FAX
Address 1 695 N. Carolina Hwy. 210 S.	State Certification/License Number
Address 2 Lillington, NC 27546	AHJ
Address 3	Job Site/Building

System

Density 0.20 gpm/ft²	Area of Application 1500 ft² (Actual 1610 ft²)
Most Demanding Sprinkler Data 5.6 K-Factor 24.71 at 19.470	Hose Streams 250.00
Coverage Per Sprinkler 124 ft²	Number Of Sprinklers Calculated 13 0
System Pressure Demand 51.692	System Flow Demand 326.71
Total Demand 576.71 @ 51.692	Pressure Result +25.937 (33.4%)

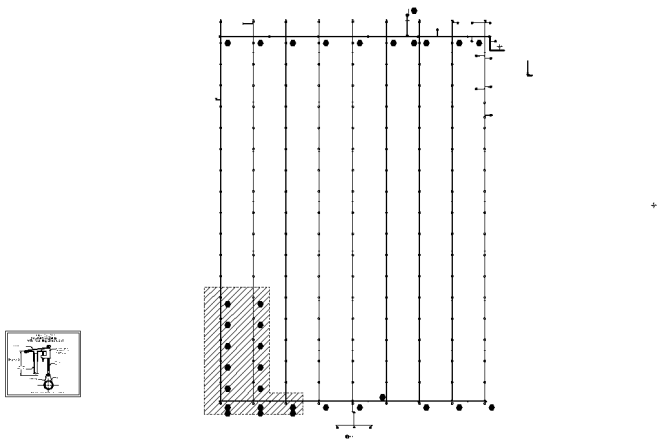
Supplies

Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)
905	Water Supply	1163.00	250.00	82.000	66.000

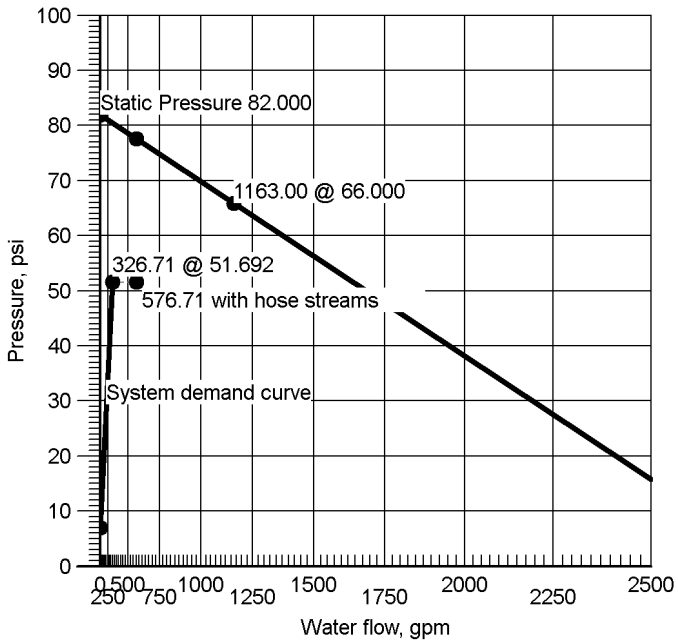
Check Point Gauges

Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)

4366FP.cad



Supply at Node 905 (1163.00, 250.00, 82.000, 66.000)



Hydraulic Summary

Job

Job Number: 4366-S	Designer:
Job Name: Tractor Supply	State Certification/License Number:
Address 1: 695 N. Carolina Hwy. 210 S.	AHJ:
Address 2: Lillington, NC 27546	Job Site/Building:
Address 3:	Drawing Name: 4366FP.cad

System

Most Demanding Sprinkler Data: 5.6 K-Factor 24.71 at 19.470

Hose Allowance At Source: 250.00

Additional Hose Supplies

Node	Flow(gpm)

Total Hose Streams: 250.00

System Flow Demand	Total Water Required (Including Hose Allowance)
326.71	576.71

Maximum Pressure Unbalance In Loops: 0.000

Maximum Velocity Above Ground: 10.57 between nodes 209 and 10

Maximum Velocity Under Ground	
3.86 between nodes 903 and 902	

Volume capacity of Wet Pipes	Volume capacity of Dry Pipes
1332.24 gal	

Remote Area(s)

Occupancy	Job Suffix
Ordinary Group II	

Density	Area of Application
0.20 gpm/ft²	1500 ft² (Actual 1610 ft²)

Number Of Sprinklers Calculated	Number Of Nozzles Calculated	Coverage Per Sprinkler
13	0	124 ft²

AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area

Left: 53.242

Supplies

Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi) @ Flow (gpm)	Available (psi) @ Total Demand (gpm)	Required (psi)	Safety Margin (psi)
905	Water Supply	250.00	82.000	66.000 @ 1163.00	77.629 @ 576.71	51.692	25.937

Contractor

	Contractor Number	Contact Name	Contact Title
	4366-S	Brian Harris	

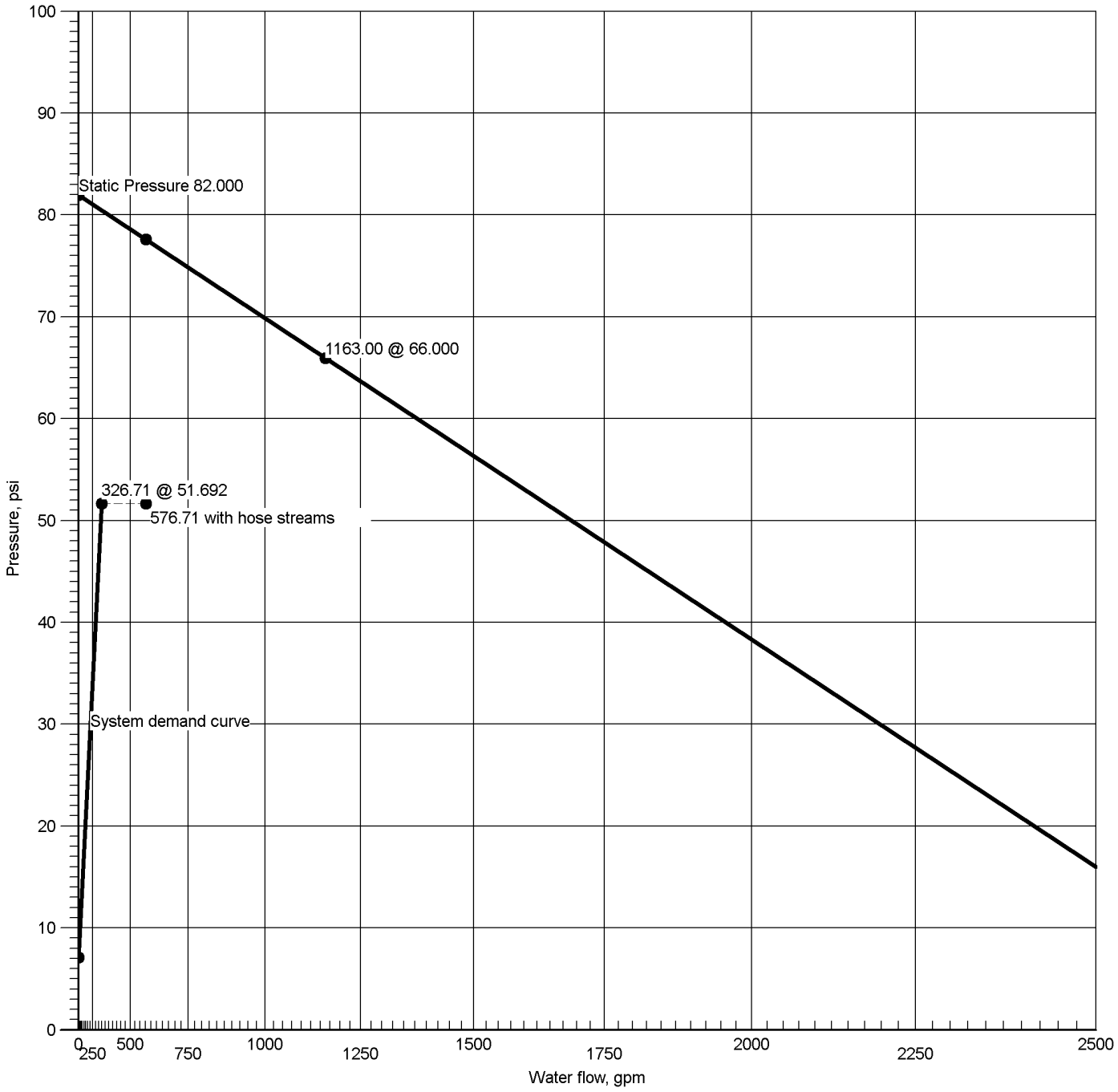
Name of Contractor:	Phone	Extension
BVS Systems Inc.	704.896.9989	206

Address 1	FAX
P.O. Box 1520	704.896.1935

Address 2	E-mail
Cornelius, NC 28031	bharris@bvssystemsinc.com

Address 3	Web-Site
	www.bvssystemsinc.com

Supply at Node 905



Hydraulic Graph	Supply at Node 905
Static: Pressure	82.000
Residual: Pressure	66.000 @ 1163.00
Available Pressure at System Demand	77.629 @ 576.71
Required Pressure at System Demand	51.692 @ 326.71
Required Pressure at System Demand (Including Hose Allowance at Source)	51.692 @ 576.71

Summary Of Outflowing Devices

Job Number: 4366-S
Report Description: Ordinary Group II

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	**1**	**24.71**	**24.71**	**5.6**	**19.470**			
Sprinkler	2	24.75	24.71	5.6	19.535			
Sprinkler	3	24.92	24.71	5.6	19.797			
Sprinkler	4	24.76	24.71	5.6	19.557			
Sprinkler	5	25.09	24.71	5.6	20.076			
Sprinkler	6	24.77	24.71	5.6	19.560			
Sprinkler	7	24.81	24.71	5.6	19.624			
Sprinkler	8	24.97	24.71	5.6	19.882			
Sprinkler	9	24.82	24.71	5.6	19.651			
Sprinkler	10	25.16	24.71	5.6	20.180			
Sprinkler	11	25.84	24.71	5.6	21.287			
Sprinkler	12	25.92	24.71	5.6	21.417			
Sprinkler	13	26.20	24.71	5.6	21.889			

Most Demanding Sprinkler Data

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
• • • • • Route 1 • • • • •								
BL	1.6820	22.85	3.30	120		0.016701	8'-11½	Pf 0.150
1	17'-0	24.71	5.6	19.470		Sprinkler		Pe -0.063
4	17'-1½			19.557			8'-11½	Pv
BL	1.6820	47.61	6.87	120		0.064964	8'-11½	Pf 0.582
4	17'-1½	24.76	5.6	19.557		Sprinkler		Pe -0.063
5	17'-3½			20.076			8'-11½	Pv
BL	1.6820	72.70	10.50	120		0.142156	7'-11	Pf 2.535
5	17'-3½	25.09	5.6	20.076		Sprinkler,	9'-11	Pe -0.056
208	17'-5			22.554		PO(9'-11)	17'-10	Pv
CM	3.2600	98.54	3.79	120		0.009942	13'-9½	Pf 0.137
208	17'-5	25.84		22.554		Flow (q) from Route 5		Pe
209	17'-5			22.691			13'-9½	Pv
CM	3.2600	197.67	7.60	120		0.036037	13'-9½	Pf 0.497
209	17'-5	73.21 + 25.92		22.691		Flow (q) from Route 4 and 6		Pe
210	17'-5			23.189			13'-9½	Pv
CM	3.2600	190.47	7.32	120		0.033647	13'-11½	Pf 0.470
210	17'-5			23.189				Pe
211	17'-5			23.658			13'-11½	Pv
CM	3.2600	158.25	6.08	120		0.023881	14'-3	Pf 0.340
211	17'-5			23.658				Pe
212	17'-5			23.998			14'-3	Pv
BL	1.6820	31.51	4.55	120		0.030268	155'-6½	Pf 5.607
212	17'-5			23.998		PO(9'-11)	29'-8½	Pe 1.737
204	13'-5			31.342		2PO(9'-11)	185'-3	Pv
CM	4.2600	199.98	4.50	120		0.010005	14'-3	Pf 0.143
204	13'-5	168.47		31.342		Flow (q) from Route 2		Pe
205	13'-5			31.485			14'-3	Pv
CM	4.2600	231.23	5.20	120		0.013089	8'-8	Pf 0.458
205	13'-5	31.26		31.485		Flow (q) from Route 9	26'-4	Pe
206	13'-5			31.943		PO(26'-4)	35'-0	Pv
CM	4.2600	326.71	7.35	120		0.024811	20'-10½	Pf 1.727
206	13'-5	95.48		31.943		Flow (q) from Route 8	48'-8½	Pe 5.307
207	1'-2			38.977		E(13'-2), sCV(28'-11½), BV(6'-7)	69'-7	Pv
DY	5.8800	326.71	3.86	150		0.003418	0'-0	Pf 0.000
207	1'-2			38.977				Pe 0.072
900	1'-0			39.050			0'-0	Pv
UG	5.8800	326.71	3.86	150		0.003418	453'-5	Pf 1.878
900	1'-0			39.050			96'-1	Pe 1.734
901	-3'-0			42.662		E(18'-2), T(38'-11½), 3EE(9'-1), LtE(11'-8)	549'-6	Pv
UG	6.4000	326.71	3.26	140		0.002570	8'-0	Pf 10.140
901	-3'-0			42.662			46'-8	Pe
902	-3'-0			52.802		3LtE(15'-6½), BFP(-10.000)	54'-8	Pv
UG	5.8800	326.71	3.86	150		0.003418	8'-1½	Pf 0.161
902	-3'-0			52.802			38'-11½	Pe
903	-3'-0			52.963		T(38'-11½)	47'-1	Pv
UG	7.7100	326.71	2.25	150		0.000913	44'-1½	Pf 0.081
903	-3'-0			52.963			44'-8	Pe
904	-3'-0			53.044		T(44'-8)	88'-9½	Pv
UG	5.8800	326.71	3.86	150		0.003418	93'-8	Pf 0.382
904	-3'-0			53.044			18'-2	Pe -1.734
905	1'-0			51.692		E(18'-2), S	111'-10	Pv
		250.00				Hose Allowance At Source		
905		576.71						
• • • • • Route 2 • • • • •								
BL	1.6820	1.86	0.27	120		0.000162	8'-11½	Pf 0.001
1	17'-0	24.71	5.6	19.470		Sprinkler		Pe 0.063
2	16'-10			19.535			8'-11½	Pv
BL	1.6820	26.61	3.84	120		0.022147	8'-11½	Pf 0.198
2	16'-10	24.75	5.6	19.535		Sprinkler		Pe 0.063
3	16'-8½			19.797			8'-11½	Pv
BL	1.6820	51.53	7.44	120		0.075194	111'-9½	Pf 9.894
3	16'-8½	24.92	5.6	19.797		Sprinkler,	19'-9½	Pe 1.428
200	13'-5			31.118		2PO(9'-11)	131'-7	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	4.2600	51.53	1.16	120	0.000814	13'-9½	Pf 0.011
200	13'-5			31.118			Pe
201	13'-5			31.130		13'-9½	Pv
CM	4.2600	102.85	2.32	120	0.002924	13'-9½	Pf 0.040
201	13'-5	51.32		31.130	Flow (q) from Route 3		Pe
202	13'-5			31.170		13'-9½	Pv
CM	4.2600	136.25	3.07	120	0.004920	13'-11½	Pf 0.069
202	13'-5	33.40		31.170	Flow (q) from Route 7		Pe
203	13'-5			31.239		13'-11½	Pv
CM	4.2600	168.47	3.79	120	0.007286	14'-3	Pf 0.104
203	13'-5	32.22		31.239	Flow (q) from Route 13		Pe
204	13'-5			31.342		14'-3	Pv
• • • • • Route 3 • • • • •							
BL	1.6820	1.54	0.22	120	0.000114	8'-11½	Pf 0.001
6	17'-0	24.77	5.6	19.560	Sprinkler		Pe 0.063
7	16'-10			19.624		8'-11½	Pv
BL	1.6820	26.35	3.80	120	0.021741	8'-11½	Pf 0.195
7	16'-10	24.81	5.6	19.624	Sprinkler		Pe 0.063
8	16'-8½			19.882		8'-11½	Pv
BL	1.6820	51.32	7.41	120	0.074626	111'-9½	Pf 9.819
8	16'-8½	24.97	5.6	19.882	Sprinkler,	19'-9½	Pe 1.428
201	13'-5			31.130	2PO(9'-11)	131'-7	Pv
• • • • • Route 4 • • • • •							
BL	1.6820	23.23	3.35	120	0.017217	8'-11½	Pf 0.154
6	17'-0	24.77	5.6	19.560	Sprinkler		Pe -0.063
9	17'-1½			19.651		8'-11½	Pv
BL	1.6820	48.05	6.94	120	0.066074	8'-11½	Pf 0.592
9	17'-1½	24.82	5.6	19.651	Sprinkler		Pe -0.063
10	17'-3½			20.180		8'-11½	Pv
BL	1.6820	73.21	10.57	120	0.143982	7'-11	Pf 2.567
10	17'-3½	25.16	5.6	20.180	Sprinkler,	9'-11	Pe -0.056
209	17'-5			22.691	PO(9'-11)	17'-10	Pv
• • • • • Route 5 • • • • •							
AO	1.0490	25.84	9.59	120	0.208995	1'-0½	Pf 1.260
11	17'-5	25.84	5.6	21.287	Sprinkler,	5'-0	Pe 0.007
208	17'-5			22.554	PO(5'-0)	6'-0½	Pv
• • • • • Route 6 • • • • •							
AO	1.0490	25.92	9.62	120	0.210175	1'-0½	Pf 1.267
12	17'-5	25.92	5.6	21.417	Sprinkler,	5'-0	Pe 0.007
209	17'-5			22.691	PO(5'-0)	6'-0½	Pv
• • • • • Route 7 • • • • •							
AO	1.0490	26.20	9.73	120	0.214449	1'-0½	Pf 1.293
13	17'-5	26.20	5.6	21.889	Sprinkler,	5'-0	Pe 0.007
210	17'-5			23.189	PO(5'-0)	6'-0½	Pv
BL	1.6820	33.40	4.82	120	0.033710	155'-6½	Pf 6.245
210	17'-5			23.189	PO(9'-11)	29'-8½	Pe 1.737
202	13'-5			31.170	2PO(9'-11)	185'-3	Pv
• • • • • Route 8 • • • • •							
CM	4.2600	31.71	0.71	120	0.000332	13'-9½	Pf 0.005
215	13'-5	31.71		31.842	Flow (q) from Route 12		Pe
213	13'-5			31.846		13'-9½	Pv
CM	4.2600	63.48	1.43	120	0.001198	13'-9½	Pf 0.017
213	13'-5	31.77		31.846	Flow (q) from Route 11		Pe
214	13'-5			31.863		13'-9½	Pv
CM	4.2600	95.48	2.15	120	0.002548	5'-3½	Pf 0.081
214	13'-5	32.00		31.863	Flow (q) from Route 10	26'-4	Pe
206	13'-5			31.943	PO(26'-4)	31'-7½	Pv
• • • • • Route 9 • • • • •							
CM	3.2600	126.74	4.87	120	0.015836	14'-3	Pf 0.226
212	17'-5	31.51		23.998	Flow (q) from Route 1		Pe
216	17'-5			24.224		14'-3	Pv
BL	1.6820	31.26	4.51	120	0.029820	155'-6½	Pf 5.524
216	17'-5			24.224	PO(9'-11)	29'-8½	Pe 1.737
205	13'-5			31.485	2PO(9'-11)	185'-3	Pv
• • • • • Route 10 • • • • •							
CM	3.2600	95.48	3.67	120	0.009378	13'-11½	Pf 0.131
216	17'-5	31.26		24.224	Flow (q) from Route 9		Pe
217	17'-5			24.355		13'-11½	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
BL	1.6820	32.00	4.62	120		0.031153	155'-6½	Pf 5.771
217	17'-5			24.355		PO(9'-11)	29'-8½	Pe 1.737
214	13'-5			31.863		2PO(9'-11)	185'-3	Pv
• • • • • Route 11 • • • • •								
CM	3.2600	63.48	2.44	120		0.004407	13'-9½	Pf 0.061
217	17'-5	32.00		24.355		Flow (q) from Route 10		Pe
218	17'-5			24.416			13'-9½	Pv
BL	1.6820	31.77	4.59	120		0.030736	155'-6½	Pf 5.694
218	17'-5			24.416		PO(9'-11)	29'-8½	Pe 1.737
213	13'-5			31.846		2PO(9'-11)	185'-3	Pv
• • • • • Route 12 • • • • •								
CM	3.2600	31.71	1.22	120		0.001220	13'-9½	Pf 0.017
218	17'-5	31.77		24.416		Flow (q) from Route 11		Pe
219	17'-5			24.433			13'-9½	Pv
BL	1.6820	31.71	4.58	120		0.030620	155'-6½	Pf 5.672
219	17'-5			24.433		PO(9'-11)	29'-8½	Pe 1.737
215	13'-5			31.842		2PO(9'-11)	185'-3	Pv
• • • • • Route 13 • • • • •								
BL	1.6820	32.22	4.65	120		0.031545	155'-6½	Pf 5.844
211	17'-5			23.658		PO(9'-11)	29'-8½	Pe 1.737
203	13'-5			31.239		2PO(9'-11)	185'-3	Pv

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

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

C Value Multiplier

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

Pipe Type	Diameter	Flow	Velocity	HWC		Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend

AO	Arm-Over
BL	Branch Line
CM	Cross Main
DN	Drain
DR	Drop
DY	Dynamic
FM	Feed Main
FR	Feed Riser
MS	Miscellaneous
OR	Outrigger
RN	Riser Nipple
SN	Swing Nipple
SP	Sprig
ST	Stand Pipe
UG	Underground

Units Legend

Diameter	Inch
Elevation	Foot
Flow	gpm
Discharge	gpm
Velocity	fps
Pressure	psi
Length	Foot
Friction Loss	psi/Foot
HWC	Hazen-Williams Constant
Pt	Total pressure at a point in a pipe
Pn	Normal pressure at a point in a pipe
Pf	Pressure loss due to friction between points
Pe	Pressure due to elevation difference between indicated points
Pv	Velocity pressure at a point in a pipe

Fittings Legend

ALV	Alarm Valve
AngV	Angle Valve
b	Bushing
BalV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DelV	Deluge Valve
DPV	Dry Pipe Valve
E	90° Elbow
EE	45° Elbow
Ee1	11¼° Elbow
Ee2	22½° Elbow
f	Flow Device
fd	Flex Drop
FDC	Fire Department Connection
fE	90° FireLock(TM) Elbow
fEE	45° FireLock(TM) Elbow
flg	Flange
FN	Floating Node
fT	FireLock(TM) Tee
g	Gauge
GloV	Globe Valve
GV	Gate Valve
Ho	Hose
Hose	Hose
HV	Hose Valve
Hyd	Hydrant
LtE	Long Turn Elbow
mecT	Mechanical Tee
Noz	Nozzle
P1	Pump In
P2	Pump Out
PIV	Post Indicating Valve
PO	Pipe Outlet
PrV	Pressure Relief Valve
PRV	Pressure Reducing Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
SFx	Seismic Flex
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap

Seismic Bracing Calculations

Project:	Tractor Supply	Contractor:	BVS Systems Inc.
Address::	695 N. Carolina Hwy. 210 S.	Address::	P.O. Box 1520 Cornelius, NC 28031
	Lillington, NC 27546		
		Phone:	704.896.9989 206
		FAX:	704.896.1935

Brace Information

Length of Brace:	7'-0
Diameter of Brace:	1
Type of Brace:	Pipe, Schedule 40
Angle of Brace:	30
Least Radius of Gyration:*	0.42 "
L/R Value:*	200
Maximum Horizontal Load:	926 lb
Maximum Spacing:	30'-0

Fastener Information

Orientation of Connecting Surface:	NFPA Type "D"

Fastener

Construction Type:	Steel
Type:	Machine (Hex) Bolt
Size:	3/8 x 1½
Maximum Load:	800 lb

Seismic Brace Attachments

Structure Attachment Fitting or Tension-only Bracing System

Make: Tolco Inc Model: Universal Swivel Sway Brace Attachmer

Listed Load Rating: 2015 lb Adjusted Load Rating: 1007½ lb

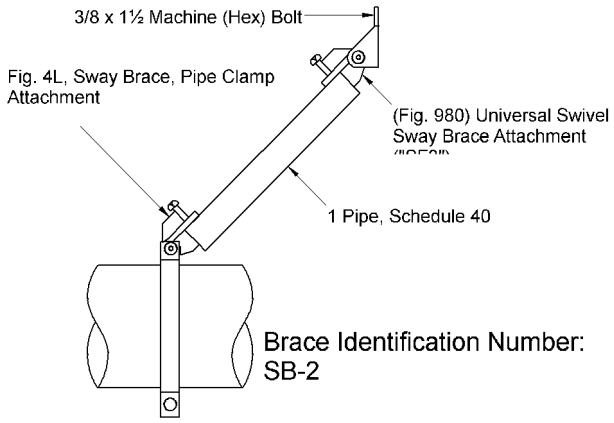
Sway Brace (pipe attachment) Fitting

Make: Tolco Inc Model: g. 4L, Sway Brace, Pipe Clamp Attachme

Listed Load Rating: 2015 lb Adjusted Load Rating: 1007½ lb

Seismic Brace Assembly Detail

(Provide Detail On Plans)



Longitudinal Brace

Sprinkler System Load Calculation (Fpw = CpWp)

Cp = 0.35

Diameter	Description	Unit Quantity	Quantity	Unit Weight	Weight (Wp)
4	Pipe, Schedule 10	21'-0+20'-8½	41'-8½	11¾ lb	491¼ lb
				Subtotal Weight (Wp)	491¼ lb
				Wp x 1.150000	565 lb
				Total Load (Fpw)	197¾ lb

Seismic Bracing Calculations

Project:	Tractor Supply	Contractor:	BVS Systems Inc.
Address::	695 N. Carolina Hwy. 210 S.	Address::	P.O. Box 1520 Cornelius, NC 28031
	Lillington, NC 27546		
		Phone:	704.896.9989 206
		FAX:	704.896.1935

Brace Information

Length of Brace:	7'-0
Diameter of Brace:	1
Type of Brace:	Pipe, Schedule 40
Angle of Brace:	30
Least Radius of Gyration:*	0.42 "
L/R Value:*	200
Maximum Horizontal Load:	926 lb
Maximum Spacing:	30'-0

Fastener Information

Orientation of Connecting Surface:	NFPA Type "D"
Fastener	
Construction Type:	Steel
Type:	Machine (Hex) Bolt
Size:	3/8 x 1½
Maximum Load:	800 lb

Seismic Brace Attachments

Structure Attachment Fitting or Tension-only Bracing System

Make: Tolco Inc Model: Universal Swivel Sway Brace Attachmer

Listed Load Rating: 2015 lb Adjusted Load Rating: 1007½ lb

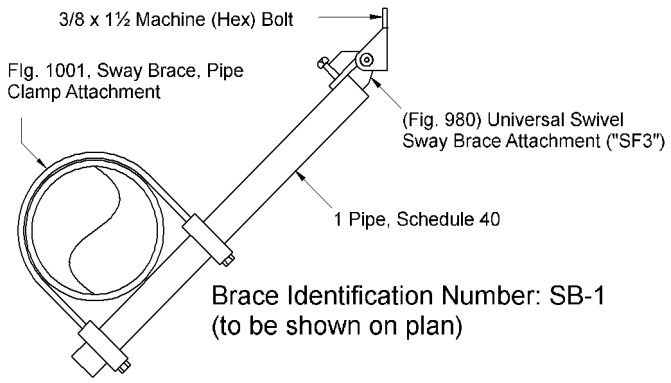
Sway Brace (pipe attachment) Fitting

Make: Tolco Inc Model: 1001, Sway Brace, Pipe Clamp Attachm

Listed Load Rating: 2015 lb Adjusted Load Rating: 1007½ lb

Seismic Brace Assembly Detail

(Provide Detail On Plans)



Brace Identification Number: SB-1
(to be shown on plan)

Lateral Brace

Sprinkler System Load Calculation (Fpw = CpWp)

Cp = 0.35

Diameter	Description	Unit Quantity	Quantity	Unit Weight	Weight (Wp)
4	Pipe, Schedule 10	20'-8½+21'-0	41'-8½	11¾ lb	491¼ lb
1½	Pipe, Schedule 10	(6)21'-0+(2)13'-10½	153'-9	3 lb	467½ lb
				Subtotal Weight (Wp)	958¾ lb
				Wp x 1.150000	1102¾ lb
				Total Load (Fpw)	386 lb

V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

UPRIGHT (V2703 AND V2704)

PENDENT (V2707 AND V2708)

RECESSED PENDENT (V2707 AND V2708)

These Model V27 standard spray sprinklers are designed to produce a hemispherical spray pattern for standard commercial applications. They are available with either standard or quick response bulbs. The design incorporates state-of-the-art, heat responsive, frangible glass bulb design (standard or quick response) for prompt, precise operation.

The die cast frame is more streamlined and attractive than traditional sand cast frames. It is cast with a hex-shaped wrench boss to allow easy tightening from many angles, reducing assembly effort. This sprinkler is available in various temperature ratings (see chart on page 2) and finishes to meet many design requirements.

The recessed pendent should be utilized with a Model V27 recessed escutcheon which provides up to ¾"/19 mm of adjustments.

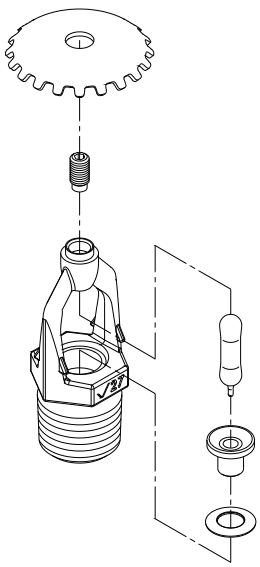
SPRINKLER OPERATION

The operating mechanism is a frangible glass bulb which contains a heat responsive liquid. During a fire, the ambient temperature rises causing the liquid in the bulb to expand. When the ambient temperature reaches the rated temperature of the sprinkler, the bulb shatters. As a result, the waterway is cleared of all sealing parts and water is discharged towards the deflector. The deflector is designed to distribute the water in a pattern that is most effective in controlling the fire.

COVERAGE

For coverage area and sprinkler placement, refer to NFPA 13 standards.

TECHNICAL SPECIFICATIONS



Exaggerated for clarity

Models/S.I.N.: V2703, V2704, V2707, V2708
Style: Pendent, Upright or Recessed Pendent
Nominal Orifice Size: ½"/13 mm
K-Factor: 5.6 Imp./8.1 S.I.^
Nominal Thread Size: ½" NPT/15 mm
Max. Working Pressure:
175 psi/1200 kPa FM Global
250 psi/1725 kPa UL
Factory Hydrostatic Test:
100% @ 500psi/3450 kPa
Min. Operating Pressure: 7 psi/48 kPa
Temperature Rating: See charts on page 2 & 3.

MATERIAL SPECIFICATIONS

Upright Deflector: Bronze per UNS C22000
Pendent Deflector: Bronze per UNS C51000
Bulb: Glass with glycerin solution.
Bulb Nominal Diameter:
- Standard: 5.0 mm
- Quick Response: 3.0 mm

Load Screw: Bronze per UNS C65100
Pip Cap: Bronze per UNS C65100
Spring: Beryllium nickel
Seal: Teflon* tape
Frame: Die cast brass 65-30
Lodgement Spring: Stainless steel per UNS S30200

ACCESSORIES

Installation Wrench:
- Open End: V27
- Recessed: V27-2

Finishes:
- Plain brass
- Chrome plated
- White painted**
- Black painted**
- Custom painted**
- Proprietary nickel Teflon* coating**

For cabinets and other accessories refer to separate sheet.

NOTE: Weather resistant recessed escutcheons available upon request.

^ For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.
* Teflon is a registered trademark of Dupont Co.
**UL Listed for corrosion resistance in all configurations.

JOB/OWNER
System No. _____
Location _____

CONTRACTOR
Submitted By _____
Date _____

ENGINEER
Spec Sect _____ Para _____
Approved _____
Date _____

V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

APPROVALS/LISTINGS	Model					
	V2703	V2707	V2707	V2704	V2708	V2708
Orifice Size (inches)	½"	½"	½"	½"	½"	½"
Orifice Size (mm)	13	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I.^	8.1	8.1	8.1	8.1	8.1	8.1
Response	Standard	Standard	Standard	Quick	Quick	Quick
Deflector Type	Upright	Pendent	Recessed Pendent	Upright	Pendent	Recessed Pendent
Adjustment			up to ¾"			up to ¾"#
Approved Temperature Ratings F°/C° by Agency‡	**Model**					
UL	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
ULC	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
FM #	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
NYC/MEA # 62-99-E	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
CSFM # 7690-0531:112	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
LPCB	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 175°F/79°C 200°F/93°C	None	None
VNIIPO	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C

‡ Listings and Approvals as of printing. All are approved open, except for areas designated "No".
^ For K Factor when pressure is measured in Bar, multiply S.I. units by 10.0
# FM Approved with 1/2" adjustment escutcheon only - quick response

V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

RATINGS

All glass bulbs are rated for temperatures from -67°F/-55°C to those shown in table below.

Sprinkler Temperature Classification	Victaulic Part Identification	Temperature – °F/°C		Glass Bulb Color
		Nominal Temperature Rating	Maximum Ambient Temperature Allowed	
Ordinary	A	135 57	100 38	Orange
Ordinary	C	155 68	100 38	Red
Intermediate	E	175 79	150 65	Yellow
Intermediate	F	200 93	150 65	Green
High	J	286 141	225 ~ 107	Blue
Extra High ‡	K	360 182	300 149	Purple
– ‡	M	Open	—	No Bulb

‡ Standard response only.
All are approved open, except for areas designated "No".
~ 150/65 if wax coated.

ORDERING INFORMATION

Please specify the following when ordering:

Sprinkler Model Number	
Style	
Temperature Rating	
K-Factor	
Thread Size	
Quantity	
Sprinkler Finish	
Escutcheon Finish	
Wrench Model Number	

V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

WARNING

⚠ WARNING

- **Always read and understand installation, care, and maintenance instructions, supplied with each box of sprinklers, before proceeding with installation of any sprinklers.**
- **Always wear safety glasses and foot protection.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Installation rules, especially those governing obstruction, must be strictly followed.**
- **Painting, plating, or any re-coating of sprinklers (other than that supplied by Victaulic) is not allowed.**

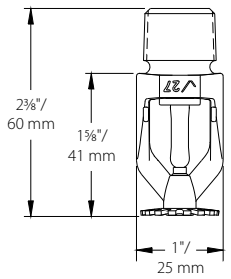
Failure to follow these instructions could result in serious personal injury and/or property damage.

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to the current National Fire Protection Association document NFPA 25 that describes care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

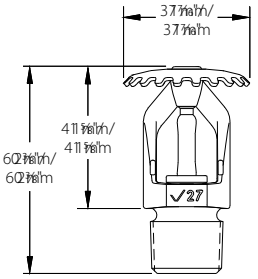
If you need additional copies of this publication, or if you have any questions about the safe installation of this product, contact Victaulic World Headquarters: P.O. Box 31, Easton, Pennsylvania 18044-0031 USA, Telephone: 001-610-559-3300.

DIMENSIONS

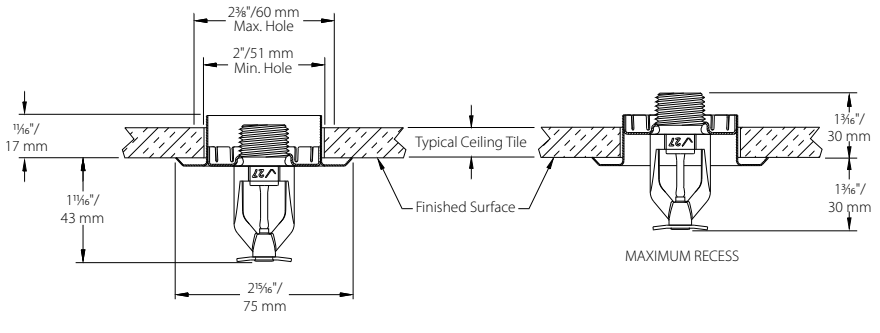
Standard Pendent – V2707, V2708



Standard Upright – V2703, V2704



½" Adjustment Recessed – V2707, V2708 (drawing not to scale)



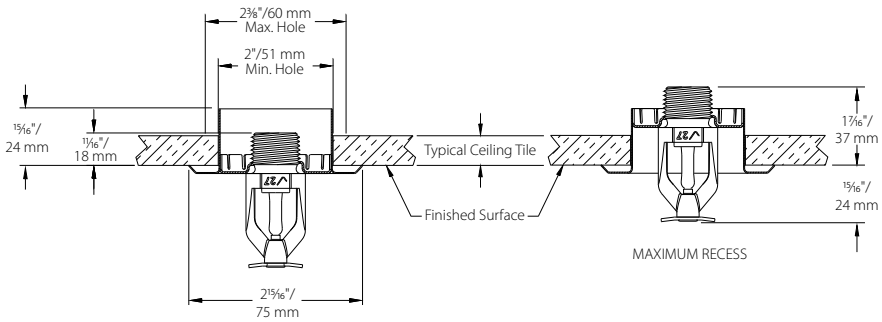
V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

DIMENSIONS

¾" Adjustment Recessed – V2707, V2708 (drawing not to scale)

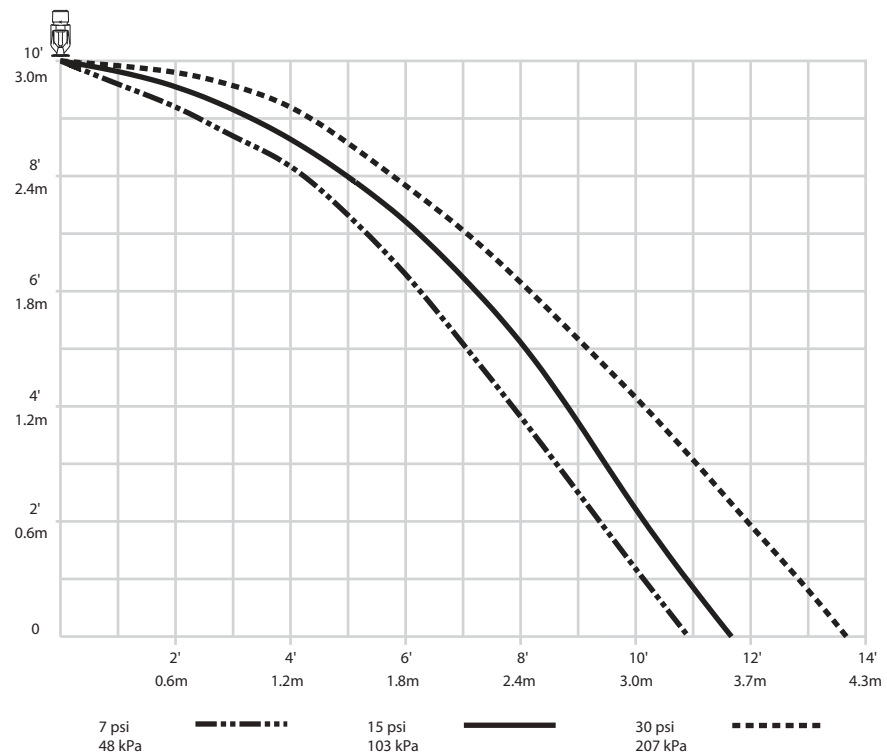


AVAILABLE WRENCHES

Sprinkler Type	V27-2 Recessed	V27 Open End
V2707, V2708 Pendent	yes	yes
V2707, V2708 Recessed Pendent	yes	—
V2703, V2704 Upright	yes	yes

DISTRIBUTION PATTERNS

Models/S.I.N. V2707, V2708
K5.6 standard pendent and recessed pendent distribution patterns – trajectory



See notes on next page.

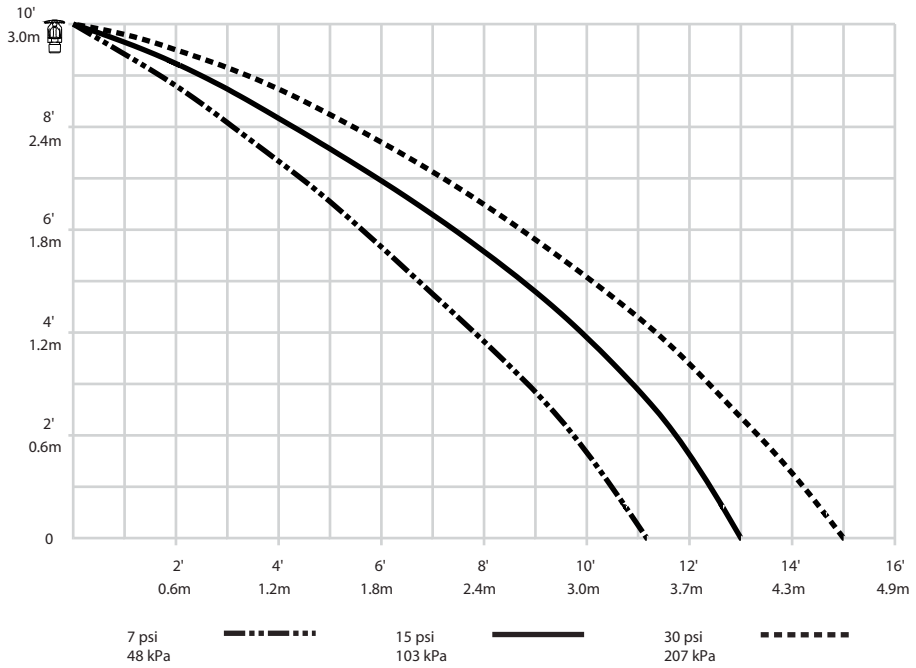
V27, K5.6

Standard Spray; Upright, Pendent and Recessed Pendent

MODELS/S.I.N. V2703 AND V2707 STANDARD RESPONSE
MODELS/S.I.N. V2704 AND V2708 QUICK RESPONSE

DISTRIBUTION PATTERNS

Models/S.I.N. V2703, V2704
K5.6 standard upright distribution patterns – trajectory



NOTES:

1 Data shown is approximate and can vary due to differences in installation.

2 These graphs illustrate approximate trajectories, floor-wetting, and wall-wetting patterns for these specific Victaulic FireLock automatic sprinklers. They are provided as information for guidance in avoiding obstructions to sprinklers and should not be used as minimum sprinkler spacing rules for installation. Refer to the appropriate NFPA National Fire Code or the authority having jurisdiction for specific information regarding obstructions, spacing limitations and area of coverage requirements. Failure to follow these guidelines could adversely affect the performance of the sprinkler and will void all Listings, Approvals and Warranties.

3 All patterns are symmetrical to the centerline of the waterway.

VicFlex™ Sprinkler Fittings
Series AH1, AH2 and AH4 Braided Flexible Hose Assemblies

10.85

Approvals/Listings:

FM c UL us LISTED VdS G412024 LPCB 1041-01

See Victaulic Publication 10.01 for more details.

Product Description:

VicFlex sprinkler fittings provide sprinkler installation on suspended ceiling grids, wood or metal stud/joist or hat furring channel hard-lid ceilings utilizing a flexible, stainless steel hose and steel bracket assembly. Refer to the Installation Manual for all applicable ASTM ceiling material and installation standards.

System Components

- **Hoses**:

Series AH1 Braided Hose

Series AH2 Braided Hose

Series AH4 Braided Hose

Assembly lengths: 31, 36, 48, 60, 72"/790, 914, 1220, 1525, 1830mm. Note: length includes branch-line nipple and 5.75"/140mm straight reducer.

- **Sprinkler Reducers**: ½" and ¾"/15 and 20 mm sprinkler connections and 5.75"/140mm, 9"/230mm, 13"/330mm straight lengths and short, long 90 elbows. Note: The short 90° elbow is typically used with concealed sprinklers while the long 90 elbow is typically used in the installation of recessed pendent sprinklers.

- **Branch Connections**: 1"/25mm NPT or BSPT branch line nipples for attaching to rigid pipe. ¾"/20mm NPT or BSPT available for VdS.

- **Brackets**:

Style AB1 for suspended and hard-lid ceilings, allows installation before ceiling tiles in place

Style AB2 for hard-lid ceilings, allows for vertical sprinkler adjustment

Style AB4 for hard-lid ceilings with hat furring channel grid systems, allows for vertical sprinkler adjustment

Style AB7 for suspended ceilings and hard-lid ceilings

Style AB7 Adjustable for suspended and hard-lid ceilings

Style AB8 for hard-lid ceilings (regionally available)

Style AB9 for hard-lid ceilings with hat furring channel grid systems

Style AB10 for Armstrong® TechZone™ ceilings

Job/Owner

System No.	
Location	

Contractor

Submitted By	
Date	

Engineer

Spec Section	
Paragraph	
Approved	
Date	

Technical Specifications:

Maximum Working Temperature: 225°F/107°C

Maximum Working Pressure:

- 200 psi/1375 kPa (FM Approval)
- 175 psi/1206 kPa (cULus Listed -Series AH1 and AH2 only)
- 1600 kPa/232 psi (VdS/LPCB Approved)

Connections:

To branch line (inlet) via 1"/25.4 mm NPT or BSPT male thread

OR

To branch line (inlet) via ¾"/20 mm BSPT male thread (VdS only)

To sprinkler head (outlet) via ½" or ¾"/15 mm or 20 mm NPT or BSPT female thread

Minimum Bend Radius:

- 7"/178 mm (FM Approval)
- 2"/51 mm (cULus Listed - Series AH2 only)
- 3"/76.2 mm (cULus Listed - Series AH1 only)
- 3"/76.2 mm (VdS/LPCB Approved)

Maximum Allowable Sprinkler K-Factors:

- FM (½"/15mm reducer) K5.6/8,1 (S.I.) (¾"/20mm reducer) K14.0/20,2 (S.I.)
- cULus (½"/15mm reducer) K8.0/11,5 (S.I.) (¾"/20mm reducer) K14.0/20,2 (S.I.)
- VdS/LPCB (½"/15mm reducer) K5.6/8,1 (S.I.) (¾"/20mm reducer) K8.0/11,5 (S.I.)

Material Specifications:

- **Series AH1**

Flexible Hose: 300-series Stainless Steel

Collar/Weld Fitting: 300-series Stainless Steel

Gasket Seal: Victaulic EPDM

Isolation Ring: Nylon

Nut and Nipple: Carbon Steel, Zinc Plated

Reducers (½ or ¾"): Carbon Steel, Zinc-Plated

- **Series AH2**

Flexible Hose: 300-series Stainless Steel

Collar/Weld Fitting: 300-series Stainless Steel

Gasket Seal: Victaulic EPDM

Isolation Ring: Nylon

Nut and Nipple: Carbon Steel, Zinc Plated

Reducers (½ or ¾"): Carbon Steel, Zinc-Plated

- **Series AH4**

Flexible Hose: 300-series Stainless Steel

Collar/Weld Fitting: 300-series Stainless Steel

Gasket Seal: EPDM per ASTM D2000

Isolation Ring: N/A

Nut and Nipple: Carbon Steel, Zinc-Plated

Reducers (½ or ¾"): Carbon Steel, Zinc-Plated

- **Brackets:** Carbon Steel, Zinc-Plated

c UL us LISTED

FRICTION LOSS DATA:
-Series AH2 Braided Hose with Straight 5.75" Reducers
-Style AB1 and AB10 Brackets

Length of Stainless Steel Flexible Hose	Outlet Size	Series AH2 Hose	
		Equivalent Length of 1"/33.7mm Sch. 40 Pipe (C=120)	Maximum Number of 90° Bends at 2"/51mm Bend Radius
inches	inches/type	feet/meters	
31	½"/Straight	16/4.9	4
	¾"/Straight	17/5.2	4
36	½"/Straight	21/6.4	5
	¾"/Straight	23/7.0	5
48	½"/Straight	32/9.8	8
	¾"/Straight	37/11.3	8
60	½"/Straight	46/14.0	10
	¾"/Straight	46/14.0	10
72	½"/Straight	55/16.8	12
	¾"/Straight	53/16.2	12

Series AH2 Braided Hose Equivalent Length Design Guide

Equivalent length values at various numbers of 90 degree bends at 2"/51mm center line bend radius

Length of Stainless Steel Flexible Hose	Outlet Size	1 Bend	2 Bends	3 Bends	4 Bends	5 Bends	6 Bends	7 Bends	8 Bends	9 Bends	10 Bends	11 Bends	12 Bends
inches	inches												
31	½"	8.5/2.6	11.0/3.4	13.0/4.0	16.0/4.9	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	¾"	10.0/3.0	12.5/3.8	14.0/4.3	17.0/5.2	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
36	½"	13.5/4.1	16.0/4.9	18.0/5.5	19.0/5.8	21.0/6.4	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	¾"	14.0/4.3	17.0/5.2	19.5/5.9	20.0/6.1	23.0/7.0	N.A	N.A	N.A	N.A	N.A	N.A	N.A
48	½"	15.5/4.7	17.0/5.2	19.5/5.9	20.0/6.1	21.0/6.4	22.0/6.7	28.0/8.5	32.0/9.8	N.A	N.A	N.A	N.A
	¾"	17.0/5.2	19.0/5.8	21.5/6.6	24.5/7.5	26.0/7.9	27.0/8.2	30.0/9.1	37.0/11.3	N.A	N.A	N.A	N.A
60	½"	21.5/6.6	24.0/7.3	27.0/8.2	28.5/8.7	30.0/9.1	31.0/9.4	37.0/11.3	42.0/12.8	44.0/13.4	46.0/14.0	N.A	N.A
	¾"	23.0/7.0	24.0/7.3	28.0/8.5	29.5/9.0	30.5/9.3	31.0/9.4	38.0/11.6	42.0/12.8	44.0/13.4	46.0/14.0	N.A	N.A
72	½"	30.0/9.1	32.0/9.8	36.5/11.1	37.5/11.4	40.5/12.5	41.0/12.8	42.0/12.8	46.0/14.0	49.0/14.9	52.0/15.8	54.0/16.5	55.0/16.8
	¾"	32.0/9.8	32.5/9.9	35.0/10.7	35.5/10.8	40.0/12.3	40.5/12.3	41.0/12.5	46.0/14.0	50.0/15.2	51.0/15.5	52.0/15.8	53.0/16.2

Note: Values for use with 5.75" straight reducers.

How to use this Design Guide:

1 For some systems, it may be advantageous for the designer to calculate the system hydraulics using shorter equivalent lengths associated with fewer than the maximum allowable number of bends. In this case, the designer may select a design number of bends for the job and use the associated equivalent length from the design guide to determine the system hydraulics.

2 It is possible that the actual installed condition of some of the flexible drops may have more bends than the designer selected. When this happens, the design guide may be used to find equivalent lengths based on the actual installed number of bends for particular sprinkler installations. The system hydraulics can be recalculated using actual equivalent lengths to verify the performance of the system.

FRICTION LOSS DATA:
-Series AH1 Braided Hose with Straight 5.75" Reducers
-Style AB1 and AB10 Brackets

Length of Stainless Steel Flexible Hose	Outlet Size	Series AH1 Hose	
		Equivalent Length of 1"/33.7mm Sch. 40 Pipe (C=120)	Maximum Number of 90° Bends at 3"/76.2mm Bend Radius
inches	inches/type	feet/meters	
31	½"/Straight	52/15.8	3
	¾"/Straight	55/16.8	3
36	½"/Straight	63/19.2	4
	¾"/Straight	66/20.1	4
48	½"/Straight	78/23.8	4
	¾"/Straight	80/24.4	4
60	½"/Straight	88/26.8	4
	¾"/Straight	90/27.4	4
72	½"/Straight	112/34.1	5
	¾"/Straight	118/36.0	5

Series AH1 Braided Hose Equivalent Length Design Guide

Equivalent length values at various numbers of 90 degree bends at 3"/75mm center line bend radius

Length of Stainless Steel Flexible Hose	Outlet Size	1 Bend	2 Bends	3 Bends	4 Bends	5 Bends
inches	inches					
31	½"	32	42	52	N.A	N.A
	¾"	33	44	55	N.A	N.A
36	½"	33	43	53	63	N.A
	¾"	36	46	56	66	N.A
48	½"	46	57	68	78	N.A
	¾"	51	60	71	80	N.A
60	½"	56	67	77	88	N.A
	¾"	58	69	80	90	N.A
72	½"	69	79	91	102	112
	¾"	73	84	95	106	118

Note: Values for use with 5.75" straight reducers.

How to use this Design Guide:

1 For some systems, it may be advantageous for the designer to calculate the system hydraulics using shorter equivalent lengths associated with fewer than the maximum allowable number of bends. In this case, the designer may select a design number of bends for the job and use the associated equivalent length from the design guide to determine the system hydraulics.

2 It is possible that the actual installed condition of some of the flexible drops may have more bends than the designer selected. When this happens, the design guide may be used to find equivalent lengths based on the actual installed number of bends for particular sprinkler installations. The system hydraulics can be recalculated using actual equivalent lengths to verify the performance of the system.

FM FRICTION LOSS DATA:
-Series AH1, AH2 and AH4 Braided Hose
-Various brackets specific to hose

Length of Stainless Steel Flexible Hose*	Sprinkler K-Factor	Outlet Size	Series AH1 Hose		Series AH2 Hose		Series AH4 Hose	
			For use with Style AB1, AB2, AB4, AB7, AB7 Adj., AB8, AB9 and AB10 VicFlex Brackets		For use with Style AB1, AB2, AB4, AB7, AB7 Adj., AB8, AB9 and AB10 VicFlex Brackets		For use with Style AB1, AB7, AB8, and AB9 VicFlex Brackets	
			Equivalent Length of 1"/33.7mm Sch. 40 Pipe	Maximum Number of 90° Bends at 7"/178mm Bend Radius	Equivalent Length of 1"/33.7mm Sch. 40 Pipe	Maximum Number of 90° Bends at 7"/178mm Bend Radius	Equivalent Length of 1"/33.7mm Sch. 40 Pipe	Maximum Number of 90° Bends at 7"/178mm Bend Radius
inches	Imperial/S.I.	inches/type	feet/meters		feet/meters		feet/meters	
31	5.6/8.1	½"/Straight	53.8/16.4	2	23.5/7.1	2	20.6/6.3	2
		½"/90° Elbow	53.8/16.4		23/7.0		21.7/6.6	
36	5.6/8.1	½"/Straight	63.7/19.4	2	27.8/8.5	2	29.7/9.0	2
		½"/90° Elbow	63.1/19.2		27.7/8.4		29.8/9.0	
48	5.6/8.1	½"/Straight	87.9/26.8	3	38.2/11.6	3	27.5/8.3	3
		½"/90° Elbow	85.8/26.1		37.4/11.4		29.2/8.9	
60	5.6/8.1	½"/Straight	112.2/34.1	4	42.4/12.9	4	35.7/10.9	4
		½"/90° Elbow	108.4/33.0		43/13.1		37.2/11.3	
72	5.6/8.1	½"/Straight	136.5/41.6	4	46.6/14.2	4	45.9/14.0	4
		½"/90° Elbow	131.1/39.9		48.5/14.7		47.5/14.5	
31	8.0/11.5	¾"/Straight	44.4/13.5	2	20.7/6.3	2	13.3/4.0	2
		¾"/90° Elbow	47.6/14.5		20.5/6.2		14.6/4.4	
36	8.0/11.5	¾"/Straight	55.6/16.9	2	25.0/7.6	2	21.7/6.6	2
		¾"/90° Elbow	57.5/17.5		24.6/7.5		22.4/6.8	
48	8.0/11.5	¾"/Straight	82.8/25.2	3	35.5/10.8	3	21.2/6.4	3
		¾"/90° Elbow	81.7/24.9		34.7/10.6		22.2/6.7	
60	8.0/11.5	¾"/Straight	110.1/33.5	4	39.6/12.1	4	27.9/8.5	4
		¾"/90° Elbow	105.9/32.2		40.1/12.2		28.9/8.8	
72	8.0/11.5	¾"/Straight	137.3/41.8	4	43.5/13.2	4	38.8/11.8	4
		¾"/90° Elbow	130.2/39.7		45.2/13.7		39.4/12.0	
31	11.2/16.1	¾"/Straight	45.5/13.8	2	17.8/5.4	2	16.4/5.0	2
		¾"/90° Elbow	47.1/14.3		18/5.5		19.9/6.1	
36	11.2/16.1	¾"/Straight	66.3/20.2	2	22.2/6.7	2	21.7/6.6	2
		¾"/90° Elbow	57.5/17.5		22.1/6.7		24.2/7.4	
48	11.2/16.1	¾"/Straight	82.7/25.2	3	32.9/10.0	3	28.5/8.7	3
		¾"/90° Elbow	82.8/25.2		32.1/9.8		29.9/9.1	
60	11.2/16.1	¾"/Straight	109.1/33.2	4	36.8/11.2	4	34.7/10.5	4
		¾"/90° Elbow	108.1/32.9		37.1/11.3		30.3/9.2	
72	11.2/16.1	¾"/Straight	135.5/41.3	4	40.5/12.3	4	38.6/11.6	4
		¾"/90° Elbow	133.4/40.6		41.9/12.7		38.6/11.7	
31	14.0/20.2	¾"/Straight	44.3/13.5	2	14.9/4.5	2	16.3/5.0	2
		¾"/90° Elbow	46.4/14.1		15.5/4.72		19.9/6.1	
36	14.0/20.2	¾"/Straight	55.5/16.9	2	19.4/5.9	2	21.8/6.7	2
		¾"/90° Elbow	56.7/17.3		19.6/5.9		24.2/7.4	
48	14.0/20.2	¾"/Straight	83.0/25.3	3	30.3/9.2	3	28.3/8.6	3
		¾"/90° Elbow	82.1/25.0		29.5/8.9		29.9/9.1	
60	14.0/20.2	¾"/Straight	110.4/33.6	4	33.9/10.3	4	34.9/10.6	4
		¾"/90° Elbow	107.5/32.7		34.1/10.4		30.3/9.2	
72	14.0/20.2	¾"/Straight	137.9/42.0	4	37.5/11.4	4	41.5/12.6	4
		¾"/90° Elbow	132.8/40.4		38.6/11.7		38.6/11.7	

FM Notes:

Series AH1, AH2 and AH4 have been tested and Approved by FM Global for use in wet, dry and preaction systems per NFPA 13, 13R, and 13D and FM data sheets 2-0, 2-5, and 2-8. FM 1637 and Vds standards for safety include, but are not limited to, pressure cycling, corrosion resistance, flow characterisitics, vibration resistance, leakage, mechanical and hydrostatic strength.

Differences in equivalent lengths are due to varying test methods, per FM 1637 and VdS standards. Refer to these standards for additional information regarding friction loss test methods.

EXAMPLE: A 48-inch hose installed with two 30° bends and two 90° bends at a 7-inch bend radius is permitted and considered equivalent to the data in the table shown above. In this example, the total number of degrees is 240°, which is less than the allowable 270°.

VdS FRICTION LOSS DATA:
-Series AH1, AH2 and AH4 Braided Hose
-Style AB1, AB2, AB4, AB7, AB7 Adj., AB8, AB9, and AB10 Brackets

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches type	Series AH1 Hose Equivalent Length of steel pipe according to EN 10255 DN 20 (26,9 x 2,65) and relating to a flow velocity of 5 m/s meters/feet	Series AH2 Hose Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) and relating to a flow velocity of 5 m/s meters/feet	Series AH4 Hose Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) and relating to a flow velocity of 5 m/s meters/feet	Maximum Number of 90 Bends at 3"/76.2mm Bend Radius
790/31	15mm / ½" / Straight	4.0/12.9	5.5/18.0	5.5/18.0	3
	20 mm / ¾" / Straight				
915/36	15mm / ½" / Straight	4.6/15.0	6.4/21.0	6.4/21.0	3
	20 mm / ¾" / Straight				
1220/48	15mm / ½" / Straight	6.1/20.0	8.5/27.9	8.5/27.9	3
	20 mm / ¾" / Straight				
1525/60	15mm / ½" / Straight	7.6/25.0	10.7/35.1	10.7/35.1	4
	20 mm / ¾" / Straight				
1830/72	15mm / ½" / Straight	9.2/30.0	12.8/42.0	12.8/42.0	4
	20 mm / ¾" / Straight				

VdS Ceiling Manufacturers List

AB1, AB2, AB7, AB10

1. AMF
2. Armstrong
3. Chicago Metallic
4. Dipling
5. Durlum
6. Geipel
7. Gema-Armstrong
8. Hilti
9. Knauf
10. Lafarge
11. Linder
12. Odenwald
13. Richter
14. Rigips
15. Rockfon Pagos
16. Suckow & Fischer
17. USG Donn

AB4/9

No specific approval

AB8

1. Hilti
2. Knauf
3. Lafarge
4. Lindner
5. Rigips

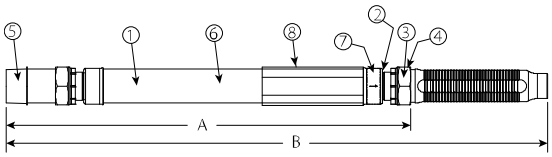
LPCB FRICTION LOSS DATA:
-Series AH2 Braided Hose
-Style AB1 Bracket

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches/type	Series AH2 Hose Equivalent Length of steel pipe according to EN 10255 DN 20 (26,9 x 2,65) and relating to a flow velocity of 5 m/s meters/feet	Maximum Number of 90 Bends at 3"/76.2mm Bend Radius
790/31	15mm / ½" / Straight	12.65/41.5	2
	20 mm / ¾" / Straight		
915/36	15mm / ½" / Straight	14.8/48.6	3
	20 mm / ¾" / Straight		
1220/48	15mm / ½" / Straight	15/49.2	3
	20 mm / ¾" / Straight		
1525/60	15mm / ½" / Straight	15.3/50.2	3
	20 mm / ¾" / Straight		
1830/72	15mm / ½" / Straight	17.5/57.4	3
	20 mm / ¾" / Straight		

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches/type	Series AH2 Hose Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) and relating to a flow velocity of 5 m/s meters/feet	Maximum Number of 90 Bends at 3"/76.2mm Bend Radius
790/31	15mm / ½" / 90° Elbow	14.4/47.2	2
	20 mm / ¾" / 90° Elbow		
915/36	15mm / ½" / 90° Elbow	14.3/46.9	3
	20 mm / ¾" / 90° Elbow		
1220/48	15mm / ½" / 90° Elbow	15.3/50.2	3
	20 mm / ¾" / 90° Elbow		
1525/60	15mm / ½" / 90° Elbow	16.0/52.5	3
	20 mm / ¾" / 90° Elbow		
1830/72	15mm / ½" / 90° Elbow	17.1/56.1	3
	20 mm / ¾" / 90° Elbow		

Product Details - Series AH1 Braided Hose
Series AH2 Braided Hose
Series AH4 Braided Hose

Item	Description
1	Flexible Hose
2	Isolation Ring (Series AH1 and AH2 only)
3	Gasket
4	Nut
5	Branch Line Nipple
6	Braid
7	Collar/Weld Fitting
8	Sleeve (AH2 Only)



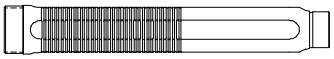
Hose Length Dimensions

Hose Length inches mm	A inches mm	B inches mm
31/790	25.25	31/790
36/915	31.25	36/915
48/1220	42.25	48/1220
60/1525	54.25	60/1525
72/1830	66.25	72/1830

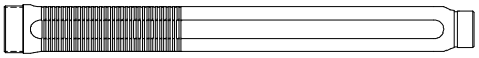
Standard

5.75"/140 mm straight reducer

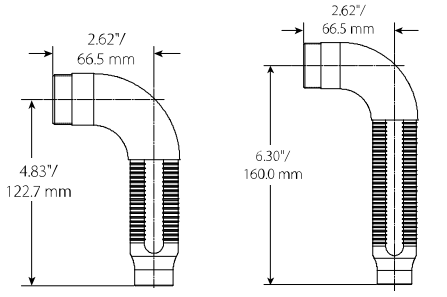
Optional



9.0"/229 mm straight reducer



13.0"/330 mm straight reducer



Short 90° elbow reducer Long 90° elbow reducer

Note: The Short 90° elbow reducer is typically used with concealed sprinklers while the longer 90 elbow is typically used in the installation of recessed pendent sprinklers.

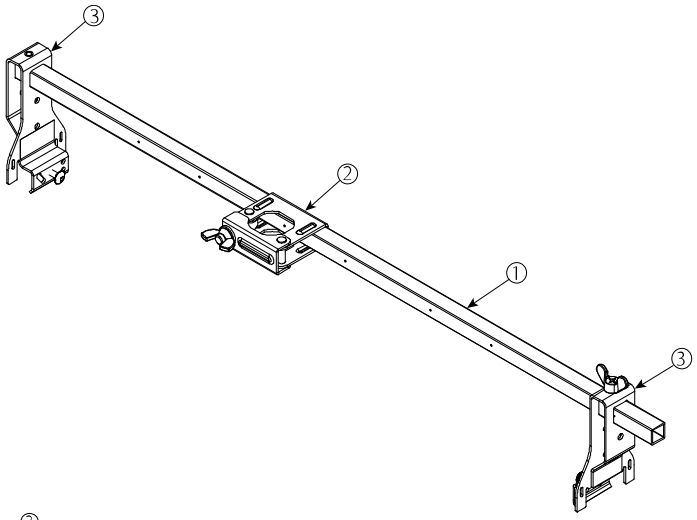
VicFlex Brackets

Style AB1

- Suspended Ceilings
- Hard-Lid Ceilings (FM Only)

Item	Description
1	24"/610mm or 48"/1219mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket

*Both sizes FM/VdS/LPCB approved, cULus listed

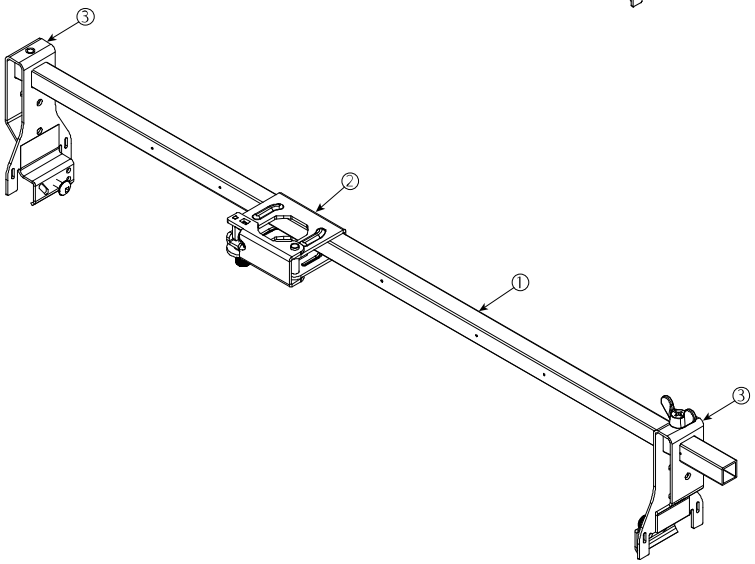


Style AB2

- Hard-Lid Ceilings

Item	Description
1	24"/610mm or 48"/1219mm Square Bar*
2	Patent-Pending adjustable Center bracket
3	End Bracket

*Both sizes FM/VdS approved.
Note: 5⁄32" / 4mm hex key required for adjustment

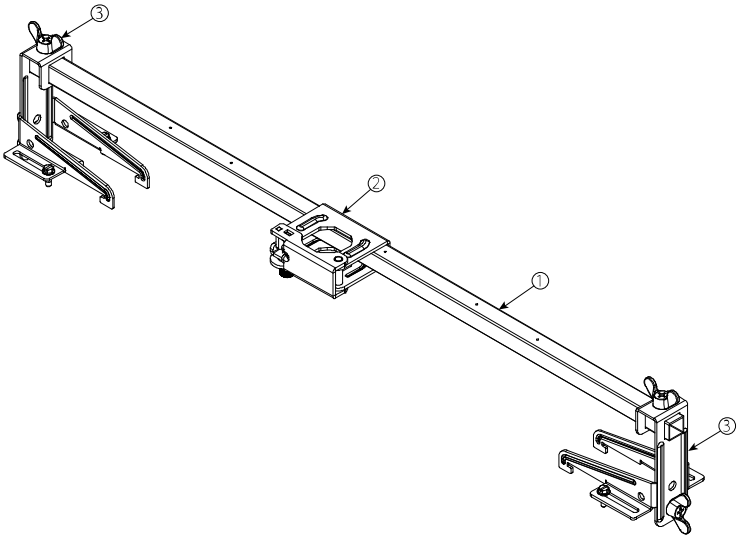


Style AB4

- Hard-Lid Ceilings with Hat furring channel grid system

Item	Description
1	24"/610mm or 48"/1219mm Square Bar*
2	Patent-Pending adjustable Center bracket
3	End Bracket for Hat Furring Channel

*Both sizes FM/VdS approved.
Note: 5⁄32" / 4mm hex key required for adjustment



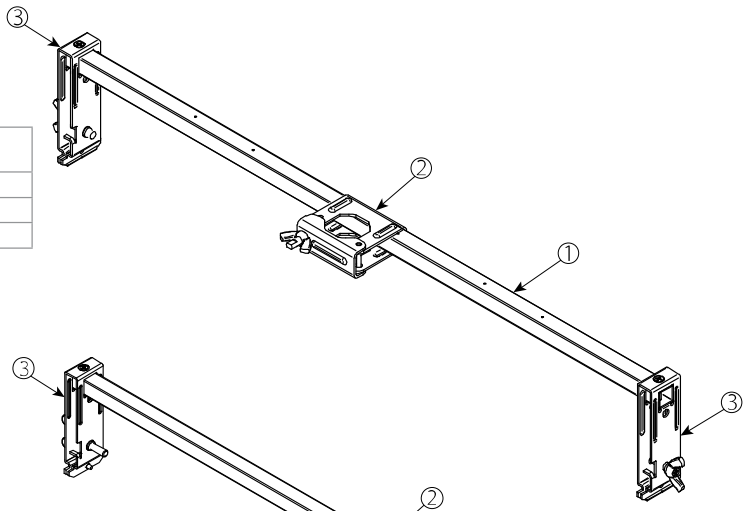
VicFlex Brackets

Style AB7

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	24"/610mm or 48"/1219mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket

*Both sizes FM/VdS approved.

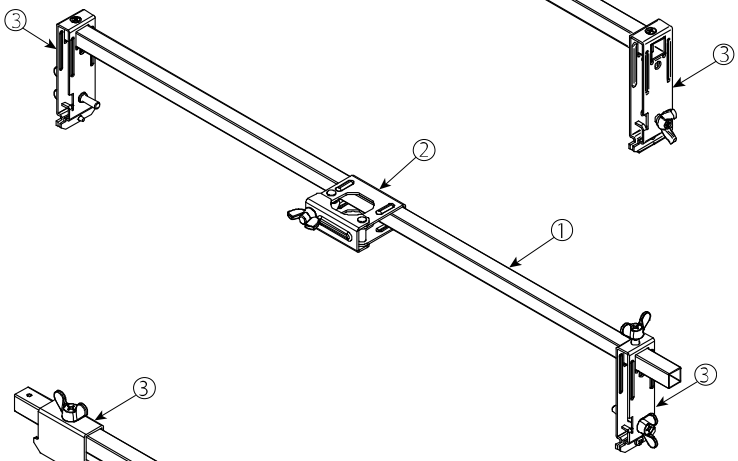


Style AB7 Adjustable

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	700mm or 1400mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket (adjustable)

*Both sizes FM and VDS approved.

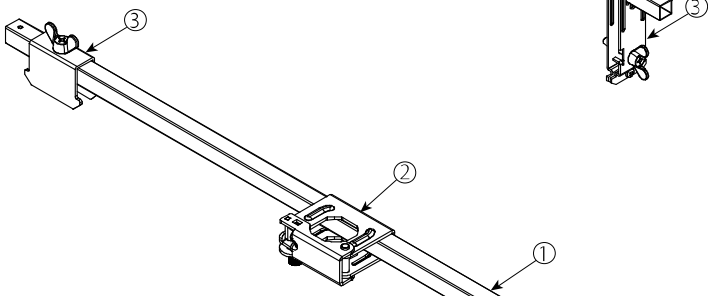


Style AB8

- Hard-Lid Ceilings

Item	Description
1	700mm or 1400mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket (adjustable)

*Both sizes FM/VdS approved.

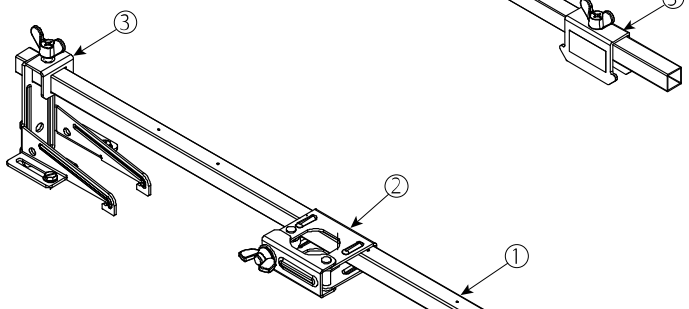


Style AB9

- Hard-Lid ceilings with Hat furring channel grid system

Item	Description
1	24"/610mm or 48"/1219mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket for Hat Furring Channel

*Both sizes FM/VdS approved.

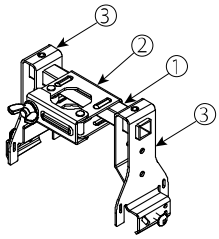


Style AB10

- Suspended ceilings
- Armstrong® TechZone™

Item	Description
1	6"/152mm Square Bar*
2	Patented 1-Bee²® Center Bracket
3	End Bracket

*FM/VdS approved, cULus listed.

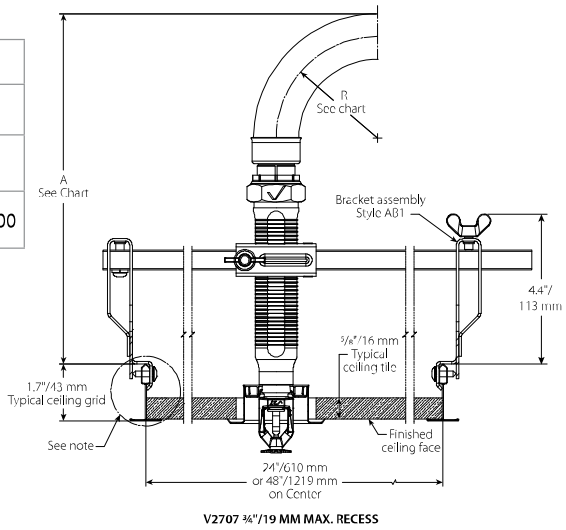


Braided Hose Assembly

Suspended Ceiling Grid with Recessed Sprinkler

- Clearances above ceiling tile at various center-line bend radii

Hose Clearance Chart						
Dimension	inches/mm					
Minimum Bend Radius "R"	2/50	3/80	4/100	5/125	6/150	7/175
Minimum "A"	10.75/273	11.75/298.5	12.75/324	13.75/349	14.75/375	15.75/400

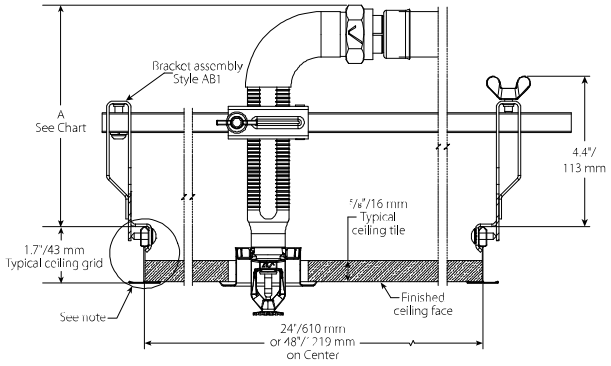


V2707 ¾"/19mm Max. Recess

Suspended Ceiling Grid with 90°Elbow (Long)

Hose Clearance Chart		
Dimension		inches/ mm
A	Min.	8/200

Note: Style AB1 and Series AH2 figures shown. Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

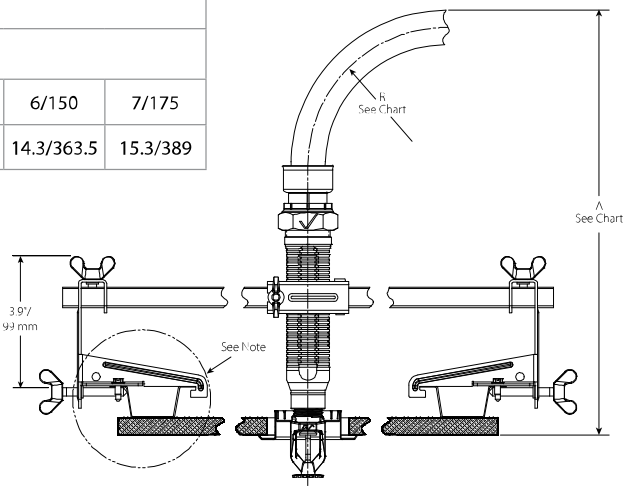


V2707 ¾"/19mm Max. Recess

Series AQB Braided Hose Assembly

Suspended Ceiling Grid with Hat Furring Channel

Hose Clearance Chart						
Dimension	inches/mm					
Minimum Bend Radius "R"	2/50	3/80	4/100	5/125	6/150	7/175
Minimum "A"	10.3/262	11.3/287	12.3/313	13.3/338	14.3/363.5	15.3/389

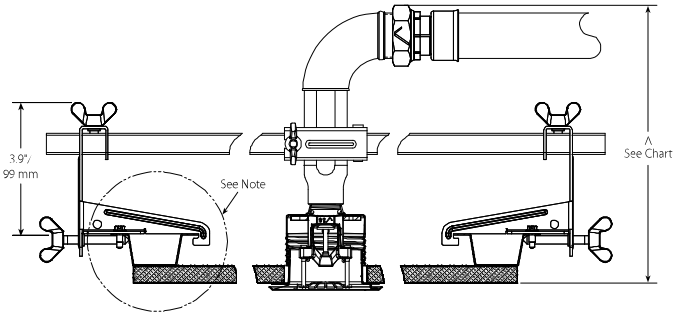


V2708 ½"/12.7mm Max. Recess

Suspended Ceiling Grid with 90°Elbow (Short)

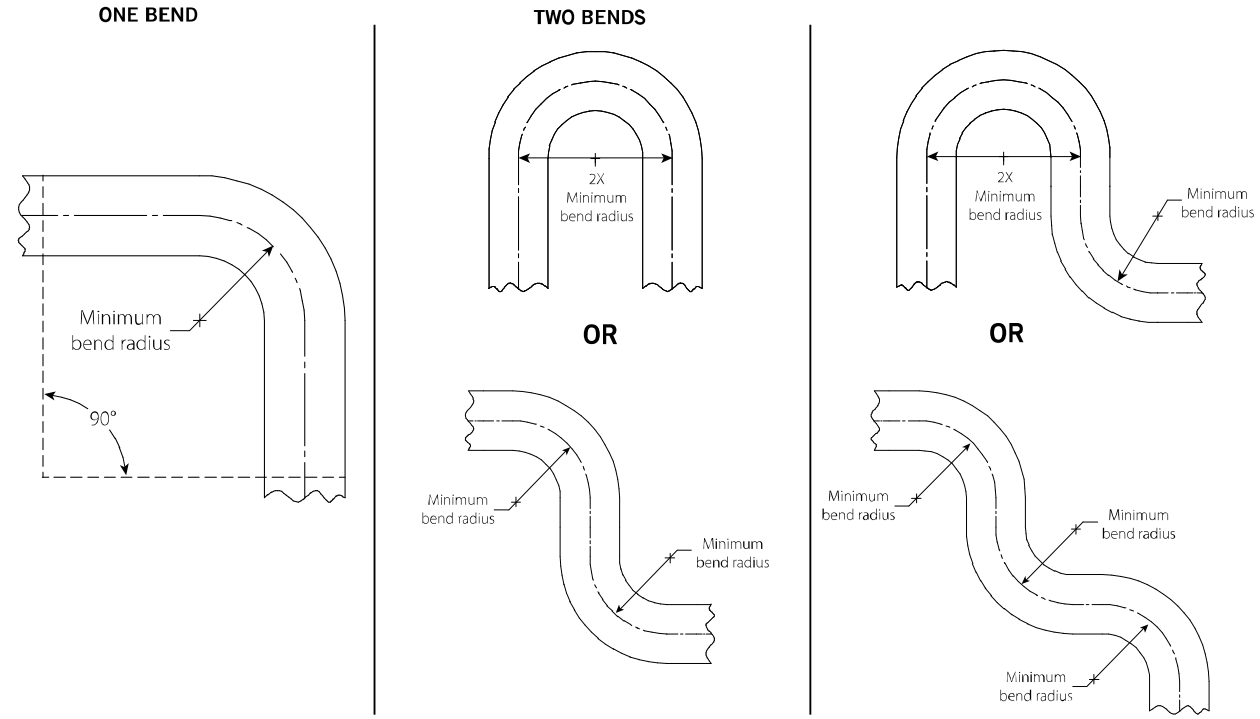
Hose Clearance Chart		
Dimension		inches/ mm
A	Min.	8/200

Note: Style AB9 and Series AH2 figures shown. Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.



V3802 ½"/12.7mm Max. Recess

Flexible Hose In-Plane Bend Characteristics



Note: For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torsional stress on the hose.

Model Number Correlation

VicFlex™ Designation Series AH4 Hose Assembly	Outlet Size inches	AquaFlex® Designation	
		Series AQB Hose Assembly	Series AFB Hose Assembly
AH4-31	½	AQB31HLD	AFB31HLD
	¾	AQB31TLD	AFB31TLD
AH4-36	½	AQB36HLD	AFB36HLD
	¾	AQB36TLD	AFB36TLD
AH4-48	½	AQB48HLD	AFB48HLD
	¾	AQB48TLD	AFB48TLD
AH4-60	½	AQB60HLD	AFB60HLD
	¾	AQB60TLD	AFB60TLD
AH4-72	½	AQB72HLD	AFB72HLD
	¾	AQB72TLD	AFB72TLD

WARNING

- **It is the responsibility of the system designer to verify suitability of 300-series stainless steel flexible hose for use with the intended fluid media within the piping system and external environments.**
- **The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.**

Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

Installation
Reference should always be made to I-VICFLEX-AB1-AB2-AB10, I-VICFLEX-AB4-AB9, I-VICFLEX-AB7, or I-VICFLEX-AB8 for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

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

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

Trademarks
Victaulic and VicFlex are registered trademarks of Victaulic Company.

V27, K5.6

SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

MODELS/S.I.N. V2709 AND V2710

These Model V27, standard spray horizontal sidewall sprinklers are designed for up to ordinary Hazard per NFPA 13, and can be used for standard or recessed installations. The design provides a crescent-shaped water discharge pattern for installation along a wall or under a beam or ceiling. The design incorporates state-of-the-art, heat responsive, frangible glass bulb design (standard or quick response) for prompt, precise operation.

The die cast frame is more streamlined and attractive than traditional sand cast frames. It is cast with a hex-shaped wrench boss to allow easy tightening from many angles, reducing assembly effort. This sprinkler is available in various temperature ratings (see chart on page 2) and finishes to meet many design requirements.

The recessed pendent should be utilized with a Model V27 recessed escutcheon which provides up to ¾"/19 mm of adjustments.

STANDARD HORIZONTAL SIDEWALL
(V2709, V2710)

RECESSED HORIZONTAL SIDEWALL
(V2709, V2710)

SPRINKLER OPERATION:

The operating mechanism is a frangible glass bulb which contains a heat responsive liquid. During a fire, the ambient temperature rises causing the liquid in the bulb to expand. When the ambient temperature reaches the rated temperature of the sprinkler, the bulb shatters. As a result, the waterway is cleared of all sealing parts and water is discharged towards the deflector. The deflector is designed to distribute the water in a pattern that is most effective in controlling the fire.

COVERAGE:

For coverage area and sprinkler placement, refer to NFPA 13 standards.

JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

Approved _____

Date _____

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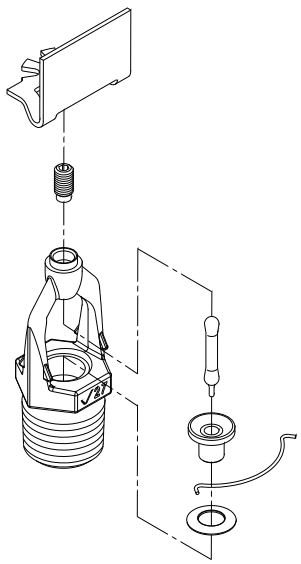
V27, K5.6

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

MODELS V2709 AND V2710

TECHNICAL SPECIFICATIONS:



Exaggerated for clarity

Models/S.I.N.: V2709, V2710
Style: Horizontal Sidewall or Recessed Horizontal Sidewall
Nominal Orifice Size: ½"/13 mm
K-Factor: 5.6 Imp./8.1 S.I.^
Nominal Thread Size: ½"/15 mm
Max. Working Pressure:
175 psi/1200 kPa FM Global
250 psi/1725 kPa UL
Factory Hydrostatic Test: 100% @ 500 psi/3450 kPa
Min. Operating Pressure: 7 psi/48 kPa
Temperature Rating: See chart on page 2.

MATERIAL SPECIFICATIONS
Horizontal Deflector: Commercial bronze per UNS C22000
Bulb: Glass with glycerin solution.
Bulb Nominal Diameter:
- Standard: 5.0 mm
- Quick Response: 3.0 mm

Load Screw: Low Silicon bronze per UNS C65100
Pip Cap: Low Silicon bronze per UNS C65100
Seal: Teflon* tape
Spring: Beryllium nickel
Frame: Die cast brass 65-30
Lodgement Spring: Stainless steel per UNS S30200

ACCESSORIES
Installation Wrench:
- Open End: V27
- Recessed: V27-2

Sprinkler Finishes:
- Plain brass
- Chrome plated
- White painted**
- Flat black painted**
- Custom painted**
- Proprietary Nickel/Teflon* Coating**

For cabinets and other accessories refer to separate sheet.
NOTE: Weather resistant recessed escutcheon available upon request.
^ For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.
* Teflon is a registered trademark of Dupont Co.
** Also, UL Listed for corrosion resistance in all configurations.

V27, K5.6

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

MODELS V2709 AND V2710

APPROVALS/LISTINGS	Model				
	V2709	V2709 Recessed	V2710	V2710 Recessed	V2710 Recessed
Orifice Size (inches)	½"	½"	½"	½"	½"
Orifice Size (mm)	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I.^	8.1	8.1	8.1	8.1	8.1
Response	Standard	Standard	Quick	Quick	Quick
Deflector Type	Horizontal Sidewall	Recessed Horizontal Sidewall*	Horizontal Sidewall	Recessed Horizontal Sidewall (up to ½" adjustment)	Recessed Horizontal Sidewall (up to ¾" adjustment)
Approved Temperature Ratings F°C° by Agency‡	**Model**				
UL	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC
ULC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC
FM#	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	None
NYC/MEA # 62-99-E	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC
CSFM # 7690-0531:112	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC
LPCB # 104b/01 # 104b/02	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	None	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	None	None
VNIIPO	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC 360ºF/182ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC 286ºF/141ºC	135ºF/57ºC 155ºF/68ºC 175ºF/79ºC 200ºF/93ºC	None

‡ Listings and Approvals as of printing. All standard responses are approved open.
^ For K Factor when pressure is measured in Bar, multiply S.I. units by 10.0
# Light Hazard ONLY

V27, K5.6

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

Models V2709 and V2710

RATINGS

All glass bulbs are rated for temperatures from –67°F/–55°C to those shown in table below.

Sprinkler Temperature Classification	Victaulic Part Identification	Temperature – °F/°C		Glass Bulb Color
		Nominal Temperature Rating	Maximum Ambient Temperature Allowed	
Ordinary	A	135 57	100 38	Orange
Ordinary	C	155 68	100 38	Red
Intermediate	E	175 79	150 65	Yellow
Intermediate	F	200 93	150 65	Green
High	J	286 141	225 107	Blue
Extra High ‡	K	360 182	300 149	Purple
– ‡	M	Open	—	No Bulb

‡ Standard response only.

All standard responses are approved open.

ORDERING INFORMATION

Please specify the following when ordering:

Sprinkler Model Number	
Style	
Temperature Rating	
K-Factor	
Thread Size	
Quantity	
Sprinkler Finish	
Escutcheon Finish	
Wrench Model Number	

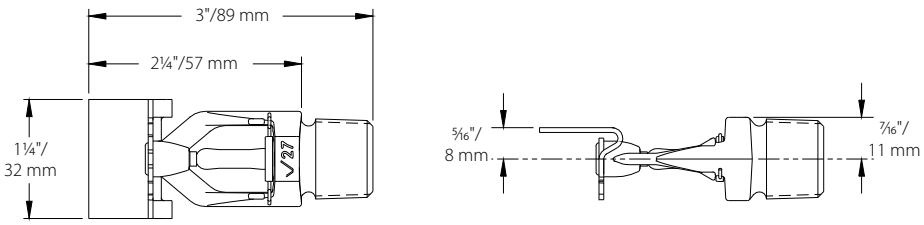
V27, K5.6

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

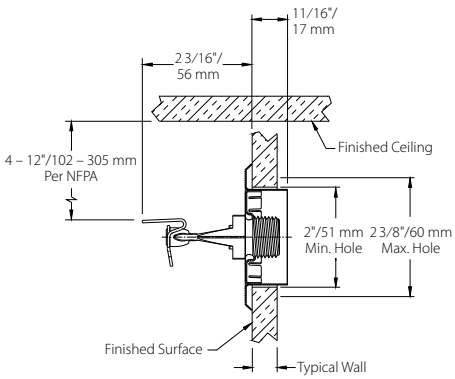
MODELS V2709 AND V2710

DIMENSIONS

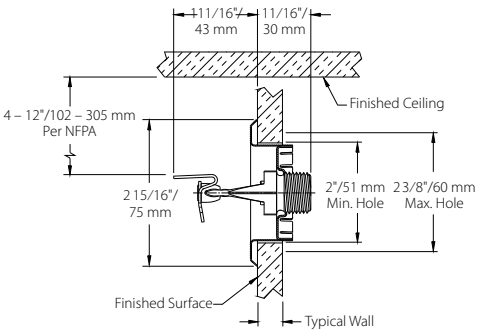
Standard HSW – V2709, V2710



½" Adjustment Recessed – V2709, V2710 (drawing not to scale)

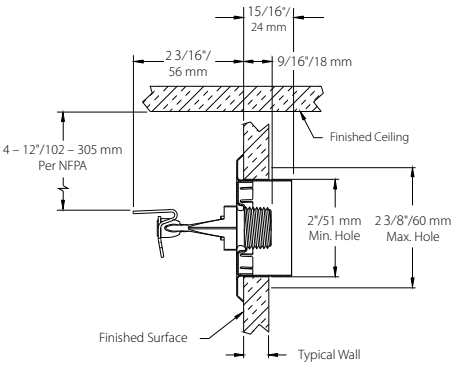


MAXIMUM EXTENSION

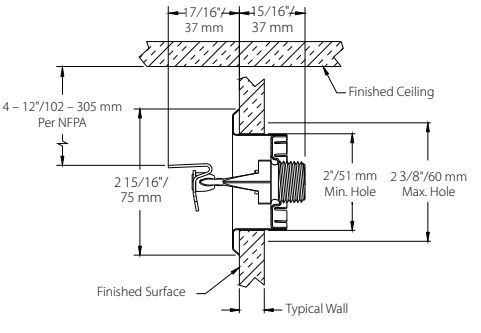


MAXIMUM RECESS

¾" Adjustment Recessed – V2709, V2710 (drawing not to scale)



MAXIMUM EXTENSION



MAXIMUM RECESS

V27, K5.6

Standard Spray Horizontal Sidewall and Recessed Horizontal Sidewall Standard and Quick Response

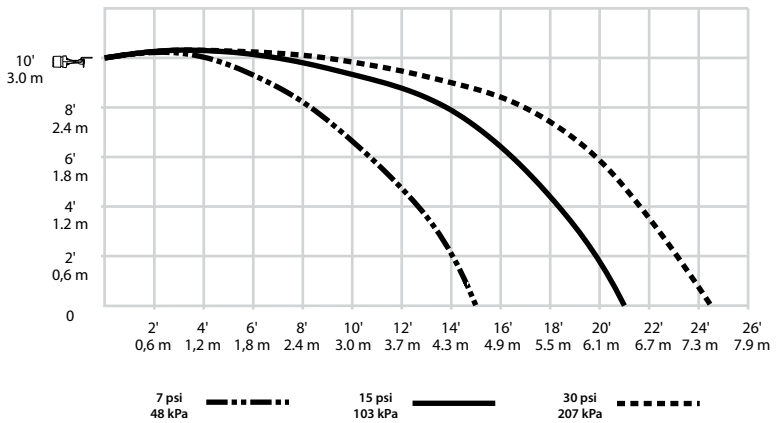
MODELS V2709 AND V2710

AVAILABLE WRENCHES

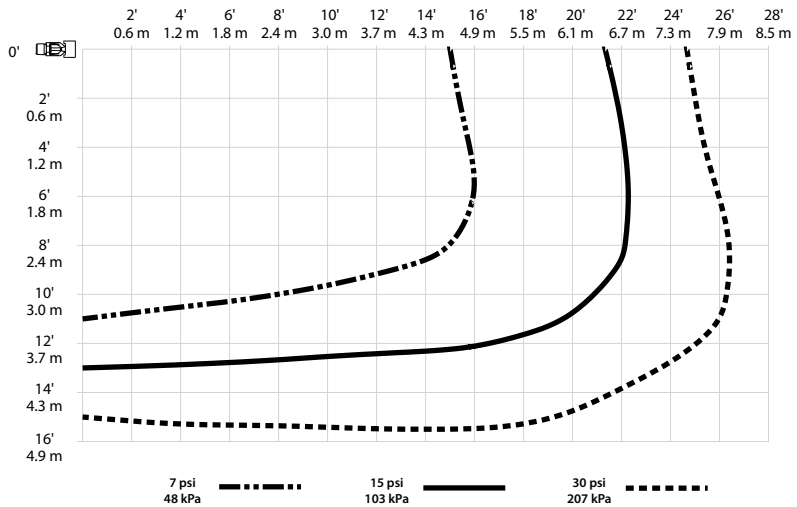
Sprinkler Type	V27-2 Recessed	V27 Open End
No escutcheon	yes	yes
With escutcheon	yes	—

DISTRIBUTION PATTERNS

Models V2709, V2710
K5.6 Standard Horizontal Sidewall and Recessed Horizontal Sidewall Distribution Patterns – Trajectory



Models V2709, V2710
K5.6 Standard and Recessed Horizontal Sidewall Distribution Patterns – Plan View



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MODEL UMC UNIVERSAL MANIFOLD CHECK ASSEMBLY

(With or Without Control Valve)

1¼", 1½", 2", 2½", 76.1mm, 3", 4", 6", 165.1mm, 8"

GENERAL DESCRIPTION

The Globe Series "UMC" Universal Manifold Check is a first of its kind, UL Listed and FM Approved, complete floor control station or shotgun riser assembly. It is pressure rated for 300 psi (20,6 bar). It provides the most compact "footprint" while delivering all of the necessary components for your floor control station as required by the NFPA Standards. With its multiple available configurations, it allows the contractor to order the suitable configuration for the site specific needs. The "UMC" Universal Manifold Check is more than just a traditional stand-alone manifold. It serves as a complete floor control station as well as a complete shotgun riser assembly inclusive of Control Valve with Internal Supervisory Switch; Check Valve; Flow Switch; Test and Drain Assembly; Adjustable Pressure Relief Valve Assembly pre-piped to drain; supply gauge (4", 6" and 8") and system gauge (1 1/4" through 8"). The "UMC" Universal Manifold Check replaces the need to order individual "Riser Manifolds" plus control valves, check valves, and relief valve kits as all of these components are integrated into the one compact design, saving space as well as the labor to connect these separate components. For sizes 3" and smaller, an 18" long stainless steel braided flexible hose is included with the UMC for connecting the Test and Drain valve to a drain stack. The design takes into account both "left-hand" and "right-hand" orientations. (8" version available preassembled in right-hand orientation only)

FLOOR CONTROL ASSEMBLY

The UMC may be utilized to meet the NFPA 13 requirements for Floor Control Valve Assemblies where there are multistory buildings exceeding two stories in height requiring zoning by floor or whenever separate control and floor zoning is specified. The UMC has been engineered with space savings in mind for those commonly installed applications in stairwell landings and small alcoves. All UMC assemblies include the NFPA 13 required Listed Pressure Relief Valve which is pre-piped to drain. The relief valve is preset for 175 psi and is adjustable to 310 psi for high pressure system conditions. In addition to the relief valve, the UMC is equipped with a Test and Drain Valve. The Test and Drain Valve contains a test orifice of K2.8 so that it may be utilized for flow testing any system with sprinklers having K-Factors of 2.8 or larger.

Note: NFPA 13 requires that a test connection providing a flow rate equal to or less than one sprinkler of a type having the smallest orifice on the system is to be provided.

A pressure gauge is provided above the check valve clapper for sizes 1¼" through 3" to meet the gauge requirement per NFPA 13 for Floor Control Assemblies. Typically the supply side gauge is not required for multistory buildings with floor control stations as a system gauge would be on the main feed/riser but all Model UMC Manifold Check Valves are equipped with a 1/4" (DN 8) port below the clapper to accommodate a second gauge if desired.

MODEL UMC UNIVERSAL MANIFOLD CHECK ASSEMBLY

SHOTGUN RISER ASSEMBLY

"Shotgun Riser Assemblies" are those assemblies which are typically installed in vertical orientations on individual system Risers. The Globe "Shotgun" Riser Manifold Assembly is available in 4 inch (DN 100), 6 inch (DN 150), and 8 inch (DN 200) sizes and is equipped with a control valve; check valve; flow switch; test and drain valve with NFPA required pressure relief valve; 2 gauges (system and supply). Sizes 4 inch (DN 100), 6 inch (DN 150), and 8 inch (DN 200) are equipped with a pressure gauge on both system side and supply side of the check valve clapper. The 8" UMC consists of a Universal Manifold, a Victaulic Series 717 Grooved Check Valve and an optional Victaulic Series 705 Grooved Butterfly Valve.

TECHNICAL DATA

Approvals

- cULus
- FM

Maximum System Working Pressure

- 300 psi (20.6 Bar)

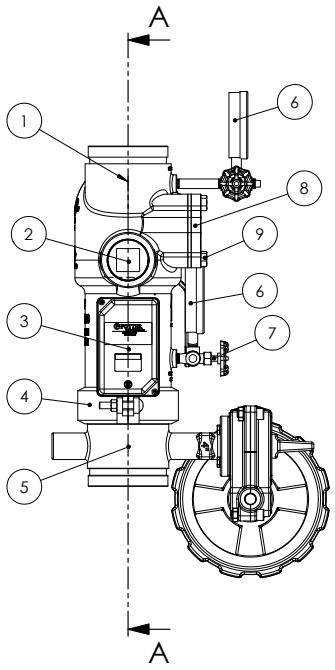
End Connections

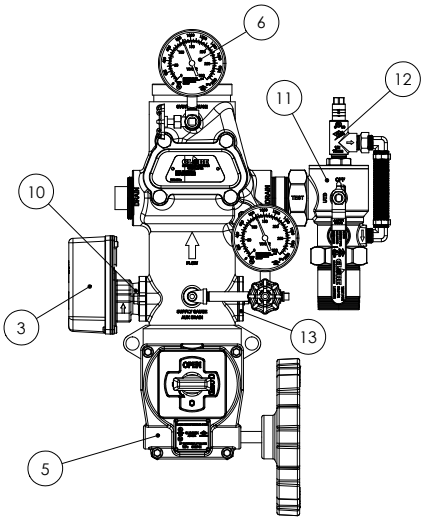
- See Table A

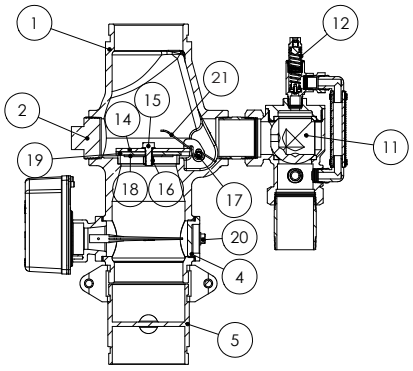
Materials of Construction

- See Figure 1

***Multiple Patents Pending**







SECTION A-A

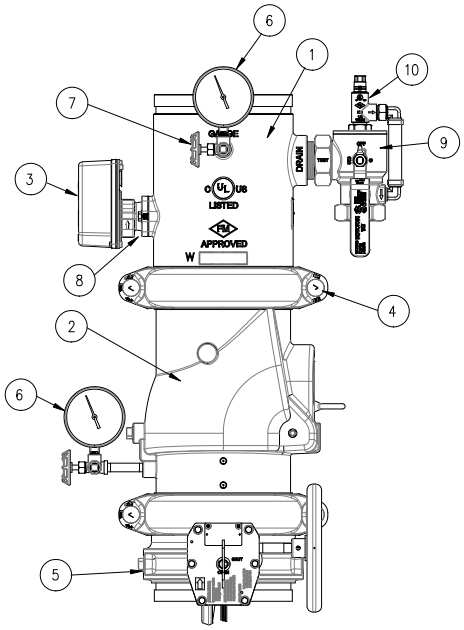
SIDE VIEW **FRONT VIEW**

ITEM NO.	DESCRIPTION	MATERIAL
1	UMC VALVE BODY	DUCTILE IRON
2	RECESSED HEX PLUG	STAINLESS STEEL
3	FLOW SWITCH	SEE FLOW SWITCH TECHNICAL LITERATURE
4	RIGID COUPLING	SEE COUPLING TECHNICAL LITERATURE
5	BUTTERFLY CONTROL VALVE WITH INTERNAL SUPERVISORY SWITCH	SEE GLOBE BUTTERFLY CONTROL VALVE TECHNICAL LITERATURE
6	PRESSURE GAUGE	PLASTIC
7	THREEWAY VALVE	BRONZE
8	UMC COVER PLATE	DUCTILE IRON
9	BOLT	STAINLESS STEEL
10	FLOW SWITCH ADAPTER	DUCTILE IRON
11	MODEL UTD TEST AND DRAIN	SEE GLOBE TECHNICAL DATASHEET GFV570
12	MODEL ARV ADJUSTABLE RELIEF VALVE	SEE GLOBE TECHNICAL DATASHEET GFV575
13	FLOW SWITCH PLUG	DUCTILE IRON
14	UMC VALVE CLAPPER	STAINLESS STEEL
15	UMC VALVE CLAPPER RETAINING BOLT	STAINLESS STEEL
16	UMC VALVE CLAPPER RETAINING NUT	STAINLESS STEEL
17	UMC VALVE HINGE PIN	STAINLESS STEEL
18	CLAPPER FACING RETAINING RING	STAINLESS STEEL
19	CLAPPER FACING	EDPM
20	FLOW SWITCH PLUG BOLT	STAINLESS STEEL
21	CLAPPER SPRING	STAINLESS STEEL

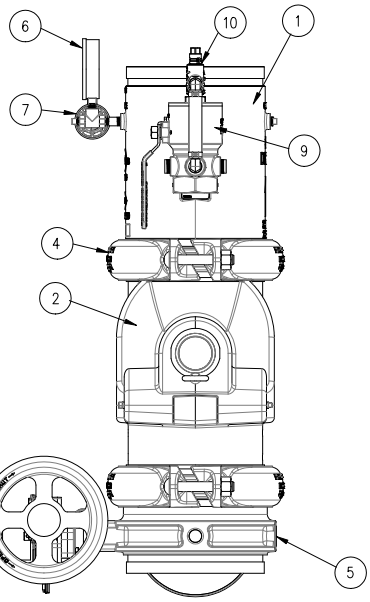
NOTE:

- 4" (DN100) shown as reference
- See ordering procedure for replacement part kits and Table A through G for part numbers for all sizes and configurations
- Flow switch rotated 90 degrees on 1-1/4" through 2 1/2" sizes

FIGURE 1: MODEL UMC MANIFOLD CHECK ASSEMBLY MATERIALS OF CONSTRUCTION (1¼" - 6")



FRONT VIEW



SIDE VIEW

ITEM NO.	DESCRIPTION	MATERIAL
1	UM VALVE BODY	DUCTILE IRON
2	SERIES 717 CHECK VALVE	DUCTILE IRON BODY SEE VICTAULIC SUBMITTAL 10.08
3	FLOW SWITCH	SEE FLOW SWITCH TECHNICAL LITERATURE
4	RIGID COUPLING	SEE COUPLING TECHNICAL LITERATURE
5	BUTTERFLY CONTROL VALVE WITH INTERNAL SUPERVISORY SWITCH	SEE VICTAULIC SUBMITTAL 10.81
6	PRESSURE GAUGE	PLASTIC
7	3-WAY SOG VALVE	BRONZE
8	FLOW SWITCH ADAPTER	DUCTILE IRON
9	MODEL UTD TEST AND DRAIN	SEE GLOBE TECHNICAL DATASHEET GFV570
10	MODEL ARV ADJUSTABLE RELIEF VALVE	SEE GLOBE TECHNICAL DATASHEET GFV575

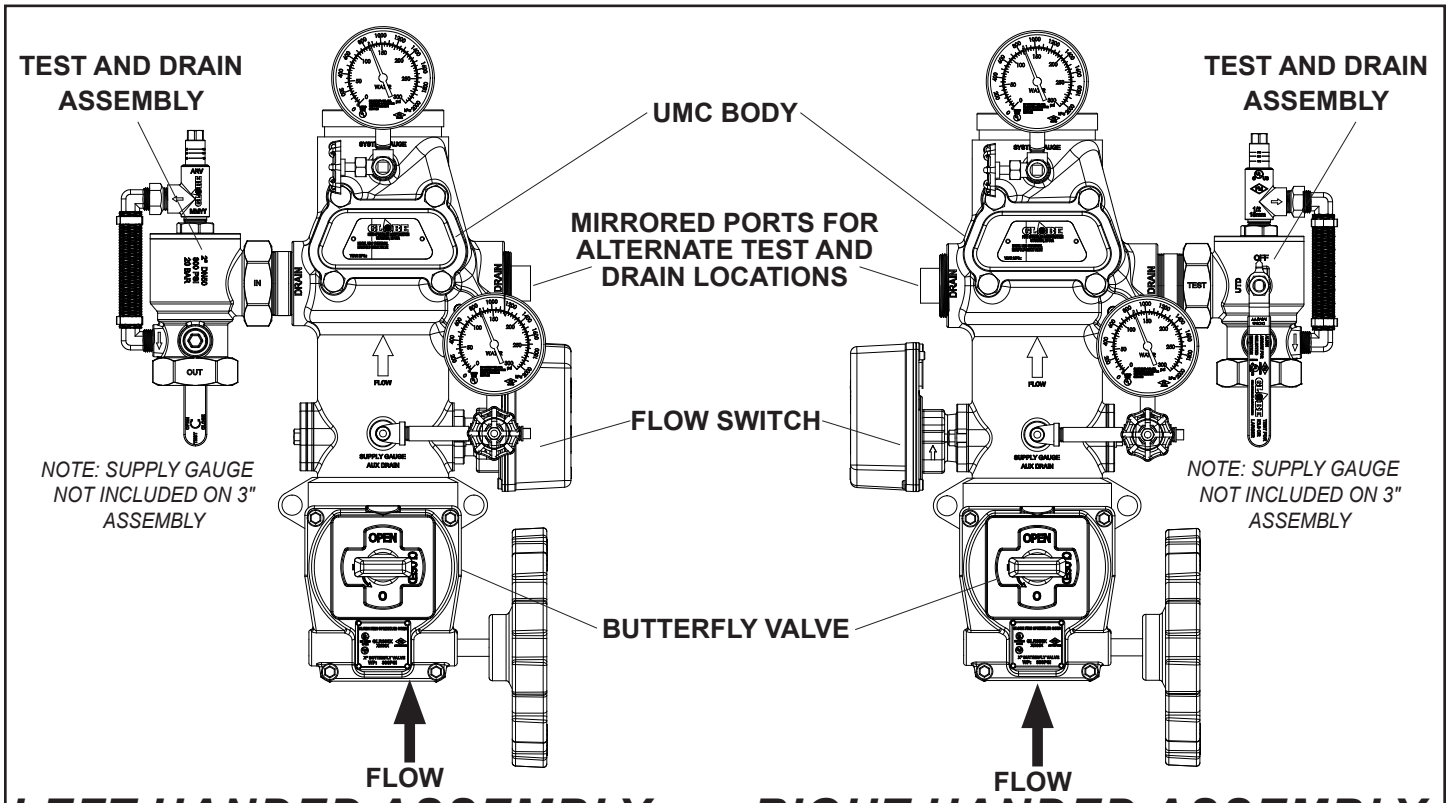
NOTE:

- See ordering procedure for replacement part kits and Table A through G for part numbers for all sizes and configurations

FIGURE 2: MODEL UMC MANIFOLD CHECK ASSEMBLY MATERIALS OF CONSTRUCTION (8")

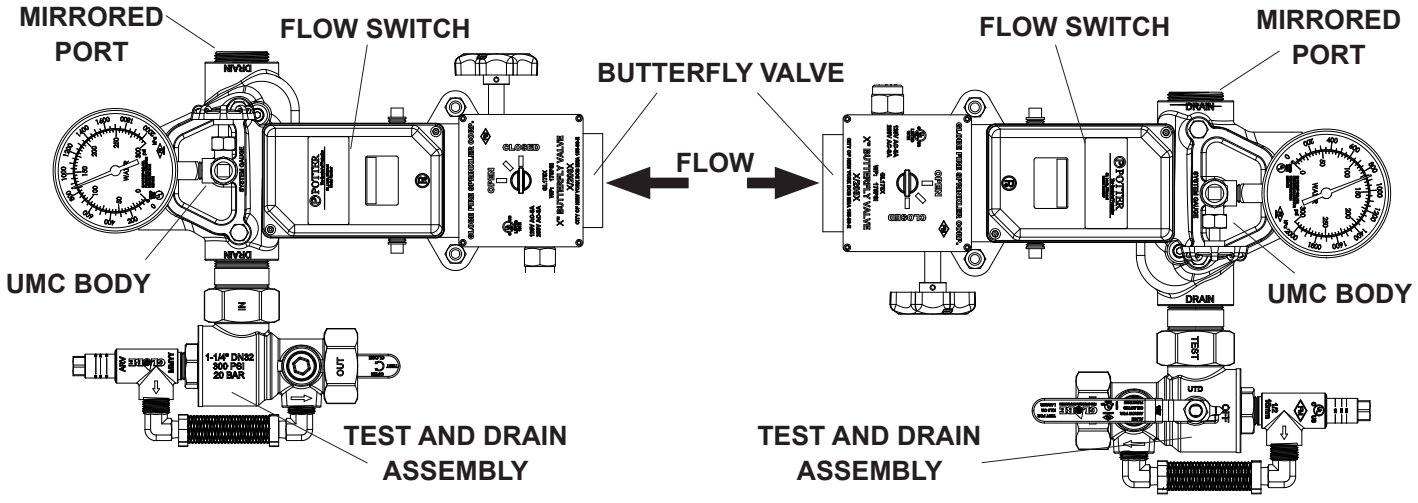
MODEL UMC MANIFOLD CHECK VALVE ASSEMBLY LEFT HANDED VS RIGHT HANDED

Both the shotgun riser assembly and the floor control station assembly are available as left handed or right handed assembly. The determining factor of the left handed vs right handed is the position of the Model UTD Test and Drain. While looking at the faceplate with the Model UMC valve in the vertical orientation and flow upward (shotgun riser orientation), the position of the Model UTD Test and Drain determines the "Hand" of the valve. If the Model UTD Test and Drain is connected to the port on the right side of the valve body, it is considered a right handed assembly. If the Model UTD Test and Drain is connected to the port on the left side of the Model UMC valve the assembly is considered left handed.



LEFT HANDED ASSEMBLY ***RIGHT HANDED ASSEMBLY***

CONFIGURATION REPRESENTATIVE OF SIZES 3" THROUGH 6"



LEFT HANDED ASSEMBLY ***RIGHT HANDED ASSEMBLY***

CONFIGURATION REPRESENTATIVE OF SIZES 1 1/4" THROUGH 2 1/2"

FIGURE 3: MODEL UMC MANIFOLD CHECK VALVE ASSEMBLY LEFT HANDED VS RIGHT HANDED

TABLE A: 1¼" MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
1 1/4"	R	GL300T	MXF THREADED	1"	317800-R-B-H	24.0 (10.9)
1 1/4"	R	NONE	MXF THREADED	1"	317800-R-H	19.0 (8.6)
1 1/4"	L	GL300T	MXF THREADED	1"	317800-L-B-H	24.0 (10.9)
1 1/4"	L	NONE	MXF THREADED	1"	317800-L-H	19.0 (8.6)
1 1/4"	R	NONE	GXG	1"	317843-R-H	19.0 (8.6)
1 1/4"	R	GL300G	GXG	1"	317843-R-B-H	24.0 (10.9)
1 1/4"	R	SERIES 728	GXG	1"	317843-R-V-H	24.0 (10.9)
1 1/4"	L	NONE	GXG	1"	317843-L-H	19.0 (8.6)
1 1/4"	L	GL300G	GXG	1"	317843-L-B-H	24.0 (10.9)
1 1/4"	L	SERIES 728	GXG	1"	317843-L-V-H	24.0 (10.9)

TABLE B: 1½" MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
1 1/2"	R	GL300T	MXF THREADED	1"	317803-R-B-H	24.0 (10.9)
1 1/2"	R	NONE	MXF THREADED	1"	317803-R-H	18.3 (8.3)
1 1/2"	L	GL300T	MXF THREADED	1"	317803-L-B-H	24.0 (10.9)
1 1/2"	L	NONE	MXF THREADED	1"	317803-L-H	18.3 (8.3)
1 1/2"	R	NONE	GXG	1"	317844-R-H	18.3 (8.3)
1 1/2"	R	GL300G	GXG	1"	317844-R-B-H	24.0 (10.9)
1 1/2"	R	SERIES 728	GXG	1"	317844-R-V-H	24.0 (10.9)
1 1/2"	L	NONE	GXG	1"	317844-L-H	18.3 (8.3)
1 1/2"	L	GL300G	GXG	1"	317844-L-B-H	24.0 (10.9)
1 1/2"	L	SERIES 728	GXG	1"	317844-L-V-H	24.0 (10.9)

TABLE C: 2" MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
2"	R	GL300G	GXG	1"	317806-R-B-H	26.0 (11.8)
2"	R	SERIES 705	GXG	1"	317806-R-V-H	26.0 (11.8)
2"	R	NONE	GXG	1"	317806-R-H	19.2 (8.7)
2"	L	GL300G	GXG	1"	317806-L-B-H	26.0 (11.8)
2"	L	SERIES 705	GXG	1"	317806-L-V-H	26.0 (11.8)
2"	L	NONE	GXG	1"	317806-L-H	19.2 (8.7)

TABLE D: 2½" (DN65)/76.1 MM MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
2 1/2"	R	GL300G	GXG	1 1/4"	317809-R-B-H	31.0 (14.1)
2 1/2"	R	SERIES 705	GXG	1 1/4"	317809-R-V-H	31.0 (14.1)
2 1/2"	R	NONE	GXG	1 1/4"	317809-R-H	23.5 (10.7)
2 1/2"	L	GL300G	GXG	1 1/4"	317809-L-B-H	31.0 (14.1)
2 1/2"	L	SERIES 705	GXG	1 1/4"	317809-L-V-H	31.0 (14.1)
2 1/2"	L	NONE	GXG	1 1/4"	317809-L-H	23.5 (10.7)
76.1 mm	R	GLR300G	GXG	1 1/4"	317809-D-R-B-H	31.0 (14.1)
76.1 mm	R	NONE	GXG	1 1/4"	317809-D-R-H	23.5 (10.7)
76.1 mm	L	GLR300G	GXG	1 1/4"	317809-D-L-B-H	31.0 (14.1)
76.1 mm	L	NONE	GXG	1 1/4"	317809-D-L-H	23.5 (10.7)

TABLE E: 3" MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
3"	R	GLR300G	GXG	1 1/4"	317812-R-B-H	59.0 (26.8)
3"	R	SERIES 705	GXG	1 1/4"	317812-R-V-H	59.0 (26.8)
3"	R	NONE	GXG	1 1/4"	317812-R-H	35.4 (16.1)
3"	L	GLR300G	GXG	1 1/4"	317812-L-B-H	59.0 (26.8)
3"	L	SERIES 705	GXG	1 1/4"	317812-L-V-H	59.0 (26.8)
3"	L	NONE	GXG	1 1/4"	317812-L-H	35.4 (16.1)

TABLE F: 4" MODEL UMC ASSEMBLY CONFIGURATIONS

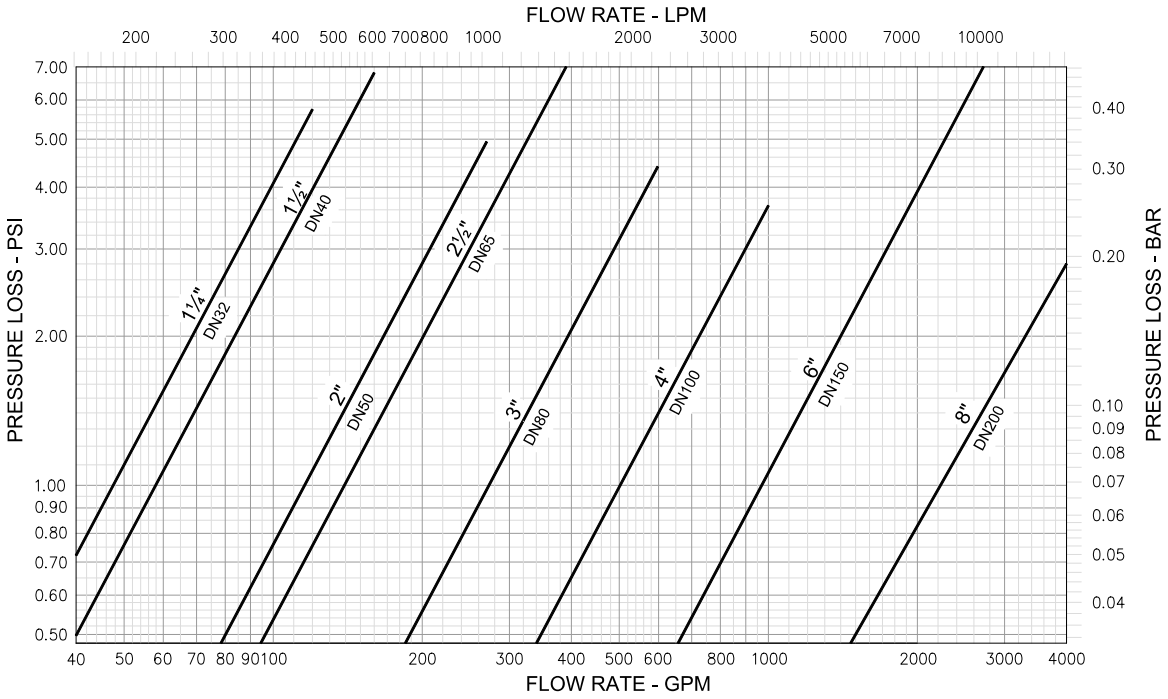
SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
4"	R	GLR300G	GXG	2"	317817-R-B	87.5 (39.7)
4"	R	SERIES 705	GXG	2"	317817-R-V	87.5 (39.7)
4"	R	NONE	GXG	2"	317817-R	58.9 (26.7)
4"	L	GLR300G	GXG	2"	317817-L-B	87.5 (39.7)
4"	L	SERIES 705	GXG	2"	317817-L-V	87.5 (39.7)
4"	L	NONE	GXG	2"	317817-L	58.9 (26.7)

TABLE G: 6" (DN150)/165.1MM MODEL UMC ASSEMBLY CONFIGURATIONS

SIZE	ASSEMBLY R-RIGHT L-LEFT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE SHIPPING WEIGHTS LBS. (kg)
6"	R	GLR300G	GXG	2"	317818-R-B	124.5 (56.5)
6"	R	SERIES 705	GXG	2"	317818-R-V	124.5 (56.5)
6"	R	NONE	GXG	2"	317818-R	80.0 (36.3)
6"	L	GLR300G	GXG	2"	317818-L-B	124.5 (56.5)
6"	L	SERIES 705	GXG	2"	317818-L-V	124.5 (56.5)
6"	L	NONE	GXG	2"	317818-L	80.0 (36.3)
165.1 mm	R	GLR300G	GXG	2"	317818-D-R-B	124.5 (56.5)
165.1 mm	R	NONE	GXG	2"	317818-D-R	80.0 (36.3)
165.1 mm	L	GLR300G	GXG	2"	317818-D-L-B	124.5 (56.5)
165.1 mm	L	NONE	GXG	2"	317818-D-L	80.0 (36.3)

TABLE H: 8" MODEL UMC ASSEMBLY CONFIGURATIONS

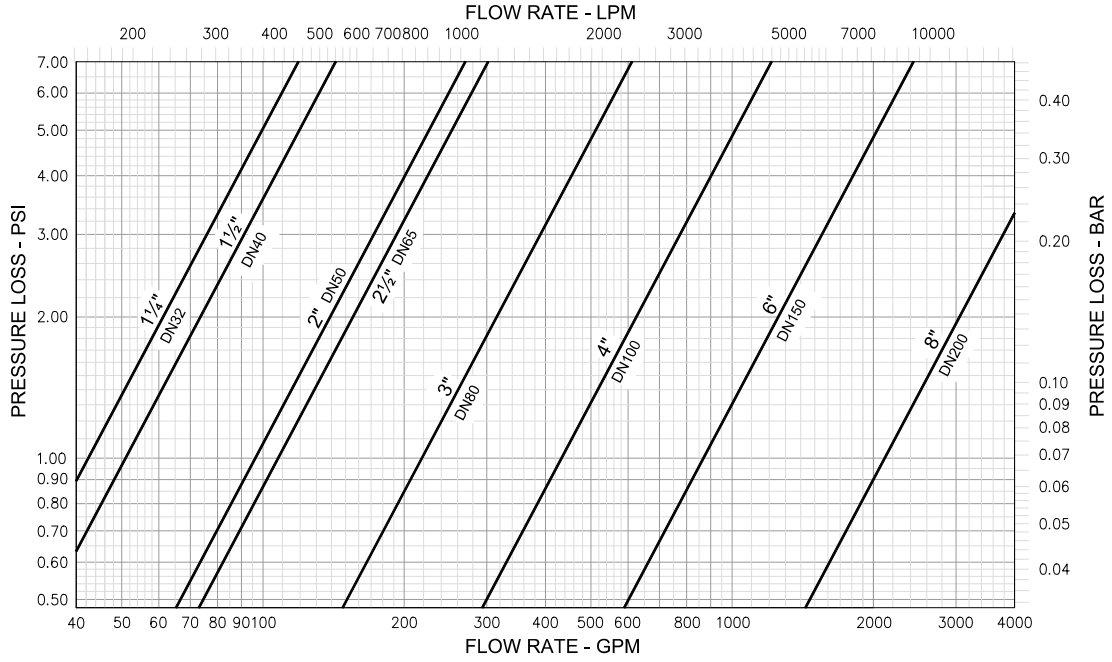
SIZE	ASSEMBLY R-RIGHT	CONTROL VALVE	UMC BODY END CONNECTIONS	MODEL UTD TEST AND DRAIN SIZE	PART NUMBER	APPROXIMATE WEIGHTS LBS. (kg)
8"	R	Series 705	GXG	2"	317798-01	177 (80.3)
8"	R	NONE	GXG	2"	317798-02	123 (55.8)



UMC Equivalent Length of Piping for Friction Losses Through Schedule 40 Pipe

- 1¼" = 6 feet
- 1½" = 9 feet
- 2" = 8 feet
- 2½" = 14 feet
- 3" = 11 feet
- 4" = 14 feet
- 6" = 30 feet
- 8" = 23 feet

FIGURE 4: MODEL UMC MANIFOLD CHECK (WITHOUT BFV) FRICTION LOSS CURVES 1¼" TO 8"



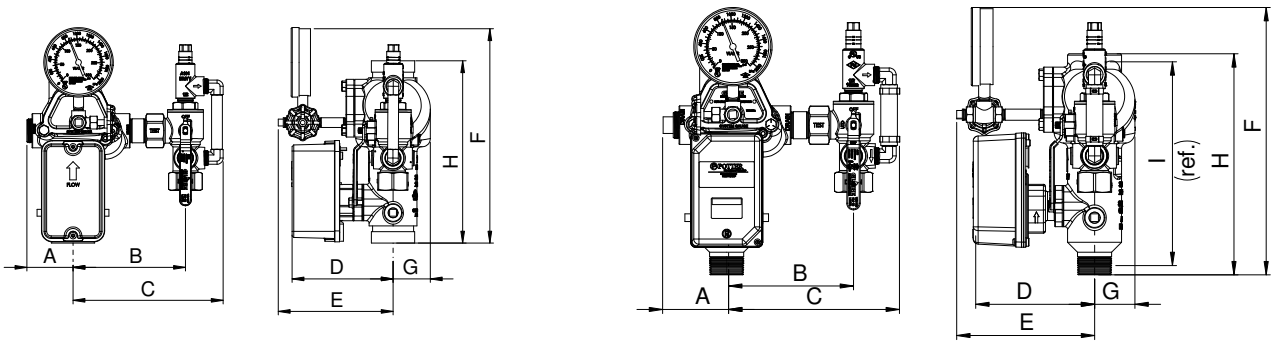
UMC Equivalent Length of Piping for Friction Losses Through Schedule 40 Pipe

- 1¼" = 8 feet
- 1½" = 11 feet
- 2" = 12 feet
- 2½" = 22 feet
- 3" = 17.5 feet
- 4" = 18.5 feet
- 6" = 38 feet
- 8" = 27 feet

FIGURE 5: MODEL UMC MANIFOLD CHECK (WITH BFV) ASSEMBLY FRICTION LOSS CURVES 1¼" TO 8"

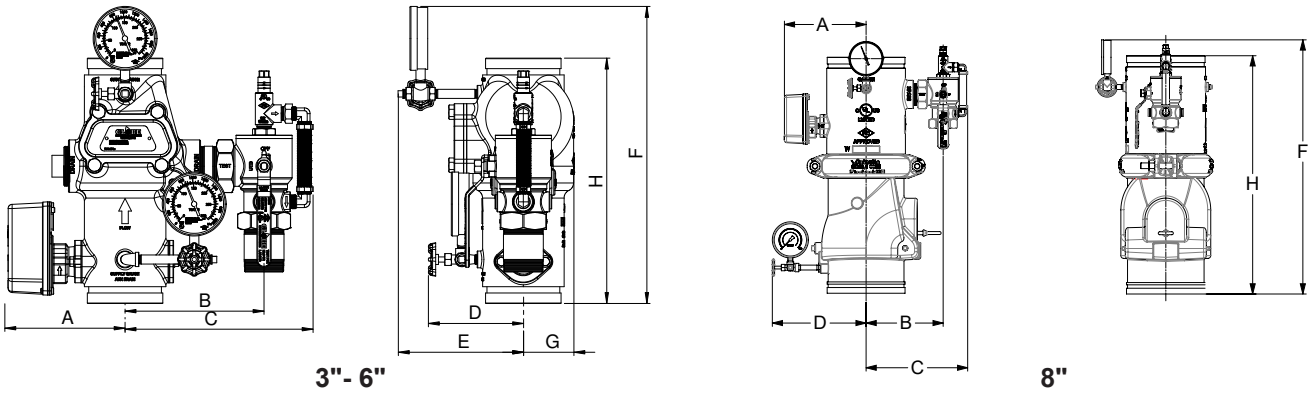
TABLE I: MODEL UMC AND BUTTERFLY VALVE END TO END DIMENSIONS

Size	Butterfly Valve Model	Butterfly Control Valve End to End Dimension inches (mm)	End to End Dimension Without Butterfly Control Valve inches (mm)	End to End Dimension With Butterfly Control Valve inches (mm)
1 1/4" MT x FT	GL300T	2.64 (67.9)	10.75 (273)	12.89 (327)
1 1/4" G x G	GL300G	4 (101.6)	11.4 (290)	15.4 (391)
	SERIES 728	7.25 (184)		18.65 (474)
1 1/2" MT x FT	GL300T	2.87 (73)	10.75 (273)	13.12 (333)
1 1/2" G x G	GL300G	4.1 (104)	11.4 (290)	15.5 (394)
	SERIES 728	7.25 (184)		18.65 (474)
2" G x G	GL300G	4.49 (114)	10 (254)	14.49 (368)
	SERIES 705	4.25 (108.0)		14.25 (362)
2 1/2" G x G	GL300G	4.49 (114)	10.63 (270)	15.12 (384)
	SERIES 705	3.77 (95.8)		14.4 (365.8)
76.1 mm G x G	GL300G	4.49 (114)	10.63 (270)	15.12 (384)
3" G x G	GLR300G	3.8 (96.4)	12.75 (324)	16.55 (420)
	SERIES 705	3.77 (95.8)		16.52 (419.6)
4" G x G	GLR300G	4.5 (115.4)	14.63 (371)	19.13 (486)
	SERIES 705	4.63 (117.6)		19.26 (488.6)
6" G x G	GLR300G	5.2 (132.4)	17.44 (443)	22.64 (575)
	SERIES 705	5.88 (149.4)		23.32 (592.4)
165.1 mm G x G	GLR300G	5.2 (132.4)	17.44 (443)	22.64 (575)
8" G x G	SERIES 705	5.33 (135.4)	26.0 (660.4)	31.71 (805.4)



SIZE	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	F Inches (mm)	G Inches (mm)	H Inches (mm)	I Inches (mm)
1 1/4" TXT	3.1 (79)	6.2 (157)	8.4 (214)	6 (150)	6.7 (170)	13 (328)	2 (50)	10.7 (272)	9.5 (241)
1 1/4" GXG	3.1 (79)	6.2 (157)	8.4 (214)	6 (150)	6.7 (170)	11.9 (301)	2 (50)	11.4 (290)	—
1 1/2" TXT	3.1 (79)	6.2 (157)	8.4 (214)	6 (150)	6.7 (170)	13 (328)	2 (50)	10.7 (272)	9.5 (241)
1 1/2" GXG	3.1 (79)	6.2 (157)	8.4 (214)	6 (150)	6.7 (170)	11.9 (301)	2 (50)	11.4 (290)	—
2"	3.9 (99)	5.4 (136)	7.6 (193)	6 (150)	6.8 (173)	11.9 (301)	2.1 (53)	10 (254)	—
2 1/2"	3.3 (84)	6.7 (171)	9.2 (233)	6.2 (157)	7.2 (182)	12.3 (312)	2.3 (58)	10.6 (269)	—
76.1 mm	3.3 (84)	6.7 (171)	9.2 (233)	6.2 (157)	7.2 (182)	12.3 (312)	2.3 (58)	10.6 (269)	—

FIGURE 6: MODEL UMC ASSEMBLY WITHOUT BFV DIMENSIONAL DRAWING FOR SIZES 1¼" TO 2½"



3"- 6" 8"

SIZE	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	E inches (mm)	F inches (mm)	G inches (mm)	H inches (mm)
3"	6.5 (165)	6.9 (176)	9.4 (238)	—	6.4 (161)	16 (406)	2.4 (61)	12.7 (324)
4"	7 (177)	8.3 (210)	11.2 (284)	5.6 (143)	7 (178)	17.7 (449)	3 (76)	14.6 (371)
6"	8 (203)	9.5 (241)	12.4 (315)	6.4 (163)	7.9 (201)	19.9 (504)	3.9 (99)	17.5 (444)
165.1 mm	8 (203)	9.5 (241)	12.4 (315)	6.4 (163)	7.9 (201)	19.9 (504)	3.9 (99)	17.5 (444)
8"	9.1 (230)	8.6 (217)	11.3 (286)	10.4 (264)	NA	27.9 (709)	NA	26.2 (665)

FIGURE 7: MODEL UMC ASSEMBLY WITHOUT BFV DIMENSIONAL DRAWING FOR SIZES 3" TO 8"

FLOW SWITCH REQUIREMENTS

The Model UMC Floor Control/ Shotgun Riser assembly is sold inclusive of a Potter VSR flow switch. The flow switch utilizes exactly the same electrical and switch components as the Potter VSR flow switch but includes an adapter which attaches directly to the Model UMC Manifold Check assembly. This adapter has been tested as part of the UMC assembly to ensure the hydrostatic strength as well as the placement and sensitivity of the paddle is within the criteria set forth by UL and FM.

The part number for the flow switch assembly can be found in the replacement parts section of the technical literature.

The Potter VSR Flow switch includes 2 sets of switches, one set can be used to activate the central fire alarm system while the other set can be utilized to activate a local alarm (if necessary). See figure 8 for a typical wiring diagram for the Model VSR Flow switch.

Note: For more information on the flow switch see www.pottersignal.com.

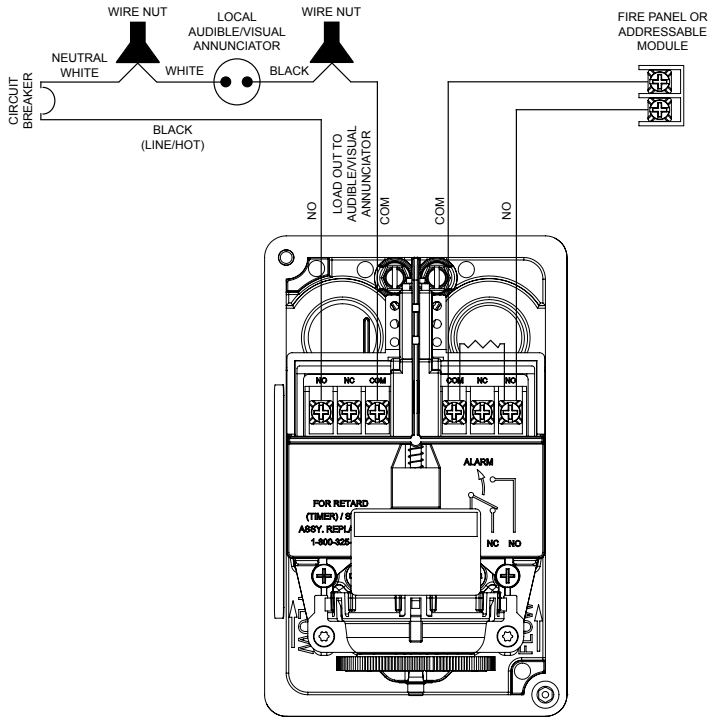


FIGURE 8: MODEL VSR-M FLOW SWITCH TYPICAL WIRING DIAGRAM

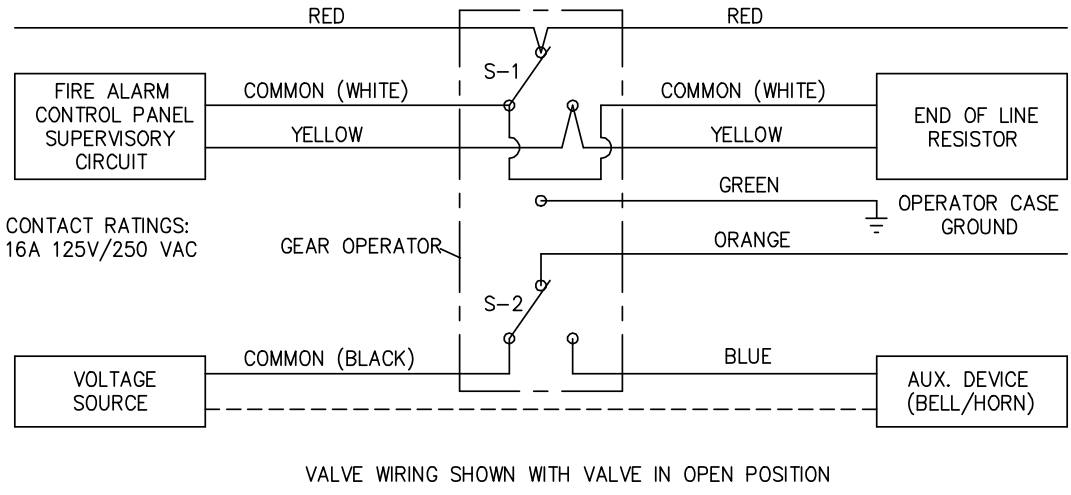


FIGURE 9: GL300T, GL300G, AND GLR300G BUTTERFLY VALVE WIRING DIAGRAM

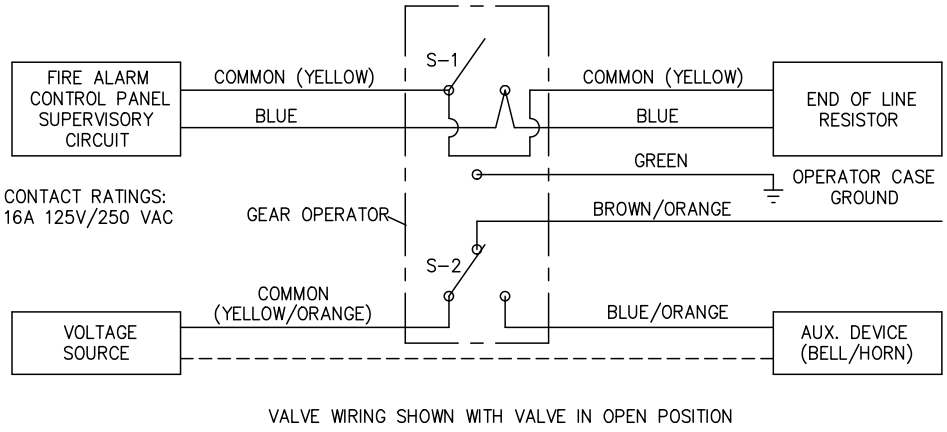


FIGURE 10:SERIES 728 AND 705 BUTTERFLY VALVE WIRING DIAGRAM

SWITCH AND WIRING

1. The supervisory switch contains two single pole, double throw, prewired switches.
2. Switches are rated:
   10 amps @ 125 or 250 VAC/60 Hz
   0.50 amps @ 125 VDC
   0.25 amps @ 250 VDC
3. Switches supervise the valve in the "OPEN" position.
4. One switch has two #18 insulated wires per terminal, which permit complete supervision of leads (refer to diagrams and notes below). The second switch has one #18 insulated wire per terminal. This double circuit provides flexibility to operate two electrical devices at separate locations, such as an indicating light and an audible alarm, in the area that the valve is installed.
5. A #14 insulated ground lead (green) is provided.
   Switch #1 = S1

   For connection to the supervisory circuit of a UL Listed alarm control panel
   Switch #2 = S2

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

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

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

INSTALLATION

The Model UMC Floor Control/ Shotgun Riser assembly is sold as a complete unit, assembled and shipped in a single box.

The Model UMC Manifold Check Valve must be installed in an accessible and visible location, which is maintained at or above a minimum temperature of 40ºF (4ºC). The UMC may be installed in the horizontal or vertical (flow upward) orientation.

All valves must be installed in accordance with the appropriate installation standard (i.e. NFPA 13 or other). All electrical connections must be made per the applicable installation standard and/or the National Electric Code (i.e. NFPA 70, NFPA 72 or other).

Proper hydrostatic test procedure must be followed per NFPA 13.

It is not necessary to remove the ARV Relief Valve prior to system hydrostatic test. The Adjustable ARV may simply be temporarily adjusted to a pressure above the test pressure during the hydrostatic test. Be sure to return the ARV Relief Valve to it's normal setting after the completion of the hydrostatic test.

MODEL ARV RELIEF VALVE SETTING PROCEDURE

The Globe 1/2 inch Model ARV, 300 psi Adjustable Pressure Relief Valve, is factory set to relieve at a pressure of approximately 175 psi (12 bar).

The Pressure Relief Valve may be reset to a higher pressure; however, it must be reset to relieve at a pressure which is in accordance with the requirements of the authority having jurisdiction, typically nominal 10 psi (.7 bar) above the expected normal system pressure.

To reset the Model ARV pressure relief valve, use an adjustable crescent wrench, to turn the hex cap clockwise for a higher pressure setting or counter-clockwise for a lower pressure setting. Use the calibrated lines on the stem for an approximate relief pressure setting. 1 full turn of the hex cap will result in approximately 25 psi increase or decrease.

To verify the new setting, isolate the Model ARV relief valve and use a small hydrostatic pump attached to the supply. Increase the pressure at the relief valve to 10 psi above the expected normal system pressure. Readjust the ARV as needed to maintain a 10 psi higher relief setting.

TESTING

Reference NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.

Before proceeding with any tests involving water flow, the following precautions need to be taken:

STEP 1. Check the location where the test connection discharges to make sure that all is clear and that there is no possibility of the water flow causing damage or injury.

STEP 2. Check the end of the test connection to make sure that it is unobstructed. To achieve a satisfactory test, there must be an unrestricted flow of water when the test valve is wide open.

STEP 3. Check for alarm connections to a central station or fire department. If such connections are found, give proper notice to the signal receiving station before proceeding with the test.

Note: A main drain test may also operate local fire alarms unless they are temporarily disabled.

MAINTENANCE

The owner is responsible for the Inspection, Testing and Maintenance of their fire protection system.

System inspection, testing and maintenance shall be performed in accordance with this section as well as NFPA 25 or other applicable Standard to insure the integrity of the entire system, including alarm functions as well as other system components. Any impairments must be immediately corrected.

Before closing a system main control valve for maintenance work on the fire protection system, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected.

Note:

All valves should be carefully inspected, tested, and maintained in accordance with NFPA 25 or other applicable Standard.

It is important to ensure a clean water supply free of debris and solid particles such as sand, gravel, or mud.

If, during an inspection of a water control valve, sediment or free particles of matter are noted, a further examination of internal valve parts is necessary.

All deposits should be removed from all operating parts and ports.

Where difficulty in performance is experienced, the manufacturer or its authorized representative shall be contacted before any field adjustment is to be made.

UMC Clapper Facing. The rubber clapper facing should be checked for wear or damage and to determine that it is free of dirt and other foreign substances. If found to be worn or damaged (e.g., foreign matter embedded in the surface; cut or torn facing), the facing should be replaced. If it is dirty, it should be cleaned. Compounds which could damage the rubber facing must never be used. Should clapper facing replacement become necessary, the following steps should be performed;

Note: Before performing the following steps, insure that the system has been depressurized and drained.

Clapper Removal

STEP 1. Remove handhole cover.

STEP 2. Remove hinge pin plugs from front and back of UMC.

STEP 3. Using allen wrench, push hinge pin from back of UMC towards front.

STEP 4. Once hinge pin is accessible, carefully grab with pliers or similar to pull hinge pin out of body.

Note: Care must be taken to confine clapper spring while extracting hinge pin from body. Spring is under tension around hinge pin. It is also recommended to cover drain port to minimize the possibility of spring inadvertently dropping into drain piping.

STEP 5. Carefully remove clapper assembly from UMC.

Clapper Replacement. When replacing clapper, be sure clapper spring has been properly positioned around hinge pin such that tension is applied to the clapper by the spring.

Seat Ring. The seat ring should be checked for nicks and for stones, dirt or other foreign matter. It should be cleaned thoroughly. If the seat ring is found to be damaged, UMC should be replaced.

Water Flow Switch (VSR-M). There is no maintenance required, only periodic testing and inspection. Should switch be found to be malfunctioning, refer to Potter Signal Technical Literature for guidance.

Model ARV Adjustable Relief Valve. Valve is not field serviceable. If inadvertent leakage is observed, first test the pressure setting utilizing the procedure outlined in the ARV Relief Valve Setting Procedure. If valve does not respond to field adjustments, valve shall be replaced.

Note:

Visual calibration lines on valve are used for approximate adjustment. Verify pressure setting with pressure gauge.

Model UTD Universal Test & Drain Valve: The Globe Model UTD Universal Test and Drain Valve does not require any regularly scheduled maintenance. The UTD is not field serviceable.

ORDERING INFORMATION

MODEL UMC UNIVERSAL MANIFOLD CHECK VALVE ASSEMBLY

Specify: MODEL UMC MANIFOLD CHECK VALVE ASSEMBLY,SIZE (1¼", 1½", 2", 2½", 76.1 mm, 3", 4", 6", 165.1 mm, 8") PN (see Part Number in Table A-G)

Note:

Control Valve Model based on availability at time of order. See appropriate Tables for end-to-end dimensional information.

REPLACEMENT PARTS

MODEL UMC UNIVERSAL MANIFOLD CHECK VALVE REPLACEMENT PARTS/KITS

VSR-M FLOW SWITCH with ADAPTER (includes gasket)

SIZE	PART NUMBER
1¼" - 2"	91144802-A-G
2½"	91144825-A-G
3"	91144803-A-G
4"	91144804-A-G
6"	91144806-A-G
8"	91144808-A-G

MODEL UTD TEST AND DRAIN

(SEE GFV-570 for more information)

Specify: MODEL UTD TEST AND DRAIN WITH RELIEF VALVE,SIZE (1", 1¼", or 2") PN:

SIZE	PART NUMBER
1" (DN25)	311729
1¼"(DN32)	311730
2" (DN50)	311731

Specify: MODEL UTD TEST AND DRAIN,SIZE (1", 1¼", or 2") PN:

SIZE	PART NUMBER
1" (DN25)	311704
1¼"(DN32)	312368
2" (DN50)	311708

MODEL ARV RELIEF VALVE

(SEE GFV-575 for more information)

Specify: MODEL ARV 1/2" ADJ RELIEF VALVE PN.

. 317900

Note:

300 psi (20.6 Bars) Pressure Gauges Standard (600 psi (41.2 Bars) Ordered Separately

PN 300121-D

GLOBE® PRODUCT WARRANTY

Globe agrees to repair or replace any of its manufactured products found to be defective in material or workmanship for a period of one year from date of shipment.

For specific details of our warranty please refer to Price List Terms and Conditions of Sale (Our Price List).

Figure No. 6405

SINGLE CLAPPER TWO-WAY INLETS
4 x 2 1/2 x 2 1/2

An exposed auxiliary inlet connection with 500 G.P.M. inlet capacity to supplement fire protection water supply. Exposed design provides an economical method of satisfying Fire Dept. inlet requirements.

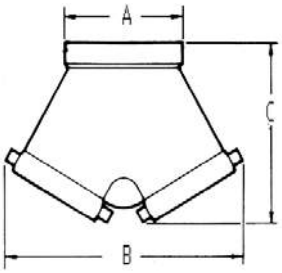
STANDARD EQUIPMENT: Cast brass two-way inlet body only with single swing clapper and pin lug swivel back or angle outlet connection as selected by figure number.

SPECIFY THREAD.

BRANDING: "Auto Spkr." **FINISH:** Cast Brass

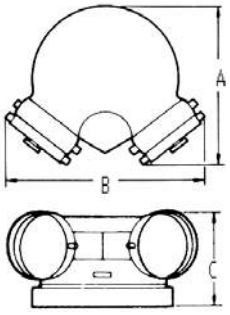
***U/L LISTED**

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



6405 Back Outlet

Figure No. 6407



6407 Angle Outlet

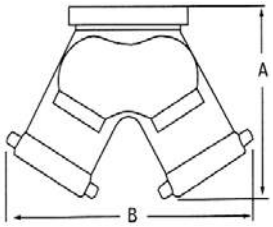
Model	Outlet Style	Dimensions A	B	C
6405	Back	5 1/4	8 5/64	6 1/2
6407	Angle	6 5/16	7 11/16	4 3/4

DOUBLE CLAPPER TWO-WAY INLETS

Figure No. 6410-6415

An exposed auxiliary inlet connection with 500 G.P.M. Inlet capacity to supplement fire protection water supply. Exposed design provides an economical method of satisfying Fire Department Inlet requirements.

STANDARD EQUIPMENT: Cast brass two-way inlet body only with double drop clappers and pin lug swivels; back or angle outlet connection as selected by figure number. Branding as selected. **SPECIFY THREAD AND BRANDING.**



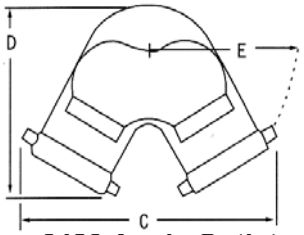
6410 Back Outlet

Figure No. 6420-6425

BRANDING: "Standpipe", "Auto Spkr."

FINISH: Cast Brass

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



6420 Angle Outlet

***U/L LISTED**
NY BSA-MEA APPROVED

Outlet Style Back	Outlet Style Angle	Size	Dimensions A	B	C	D	E
*6410		4 X 2 1/2 X 2 1/2	9 5/8	12 1/4			
	6420	4 X 2 1/2 X 2 1/2			11 3/4	9 5/8	7 1/4
6412		6 X 2 1/2 X 2 1/2	10 1/4	11 3/4			
	6422	6 X 2 1/2 X 2 1/2			12 1/2	10 1/8	7 1/2
6413		4 X 3 X 3	10	12 1/2			
	6423	4 X 3 X 3			12 1/2	10 1/8	7 1/2
6414		5 X 3 X 3	10 1/8	12 1/2			
	6424	5 X 3 X 3			12 1/4	10 1/2	7 1/2
6415		6 X 3 X 3	10 3/8	12 1/2			
	6425	6 X 3 X 3			12 1/4	10 7/8	7 1/4

ANGLE VALVES 300LB. RATED

Fire Department Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet and male hose thread outlet cast brass valve with wheel handle.

Figure No. 5010-5015

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

STANDARD EQUIPMENT: Female NPT inlet and outlet cast brass valve with wheel handle

Figure No. 5020-5025

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

U/L LISTED
NY BSA/MEA APPROVED

SPECIFY THREAD

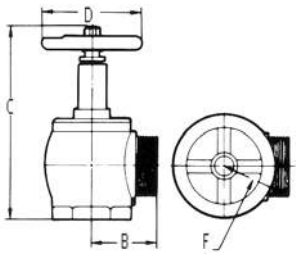
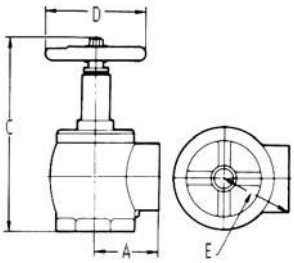


Figure No.	5010 5020	5015 5025
Size	1 1/2"	2 1/2"
A	2 11/64	3 3/16
B	2 7/32	3 3/16
C-Closed	6 5/8	9 1/4
C-Open	7 21/22	11
D	3 3/4	5
E	2 7/16	3 19/32
F	2 13/16	3 19/32
U/L Listed	Yes	Yes
FM Approved	Yes	Yes
NYC Approved	Yes	Yes
2 13/16	3 19/32	



ANGLE VALVES 300LB. RATED

Fire Department Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet and male hose thread outlet cast brass valve with wheel handle.

Figure No. 5030-5035

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

STANDARD EQUIPMENT: Female NPT inlet and outlet cast brass valve with wheel handle

Figure No. 5040-5045

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

U/L LISTED
NY BSA/MEA APPROVED

SPECIFY THREAD

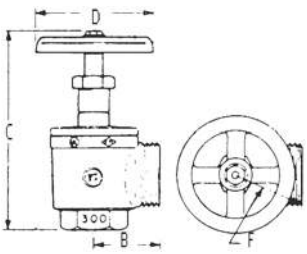
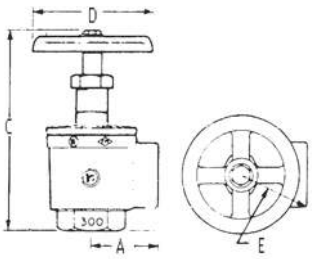


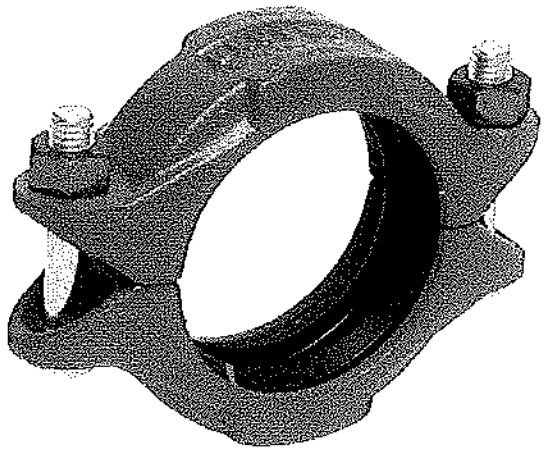
Figure No.	5030 5040	5035 5045
Size	1 1/2"	2 1/2"
A	2 9/64	3 5/32
B	2 17/64	3 3/16
C-Closed	6 1/2	8 3/4
C-Open	7 11/16	10 9/16
D	4 1/64	5 1/8
E	2 7/10	3 1/2
F	2 3/8	3 3/8
U/L Listed	Yes	Yes



The Gruvlok® Figure 7000 Lightweight Coupling is designed for applications where system flexibility is desired.

The Figure 7000 Lightweight Coupling is approximately 30% lighter in weight than the Figure 7001 Coupling. Working pressure ratings shown are for reference only and are based on Schedule 40 pipe. For the latest UL/ULC listed and FM approved pressure ratings versus pipe schedule, see www.anvilstar.com or contact your local AnvilStar Representative.

The Figure 7000 Lightweight Coupling with a Pre-Lubricated Grade "E" EPDM, Type "A" gasket (coupling is easily identified by purple nuts) is intended for use in fire protection systems installed in accordance with NFPA Standard 13 "Sprinkler Systems".



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

– Available galvanized.

* When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

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

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

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

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

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

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

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

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:
Standard C Style
Flush Gap (1¼"-8")

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

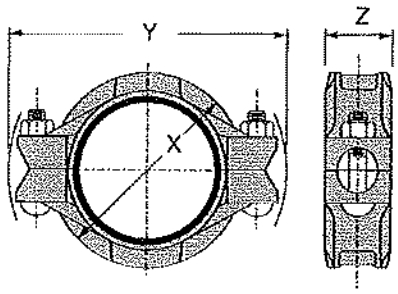


FIGURE 7000 LIGHTWEIGHT COUPLING

Nominal Size	Pipe O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Deflection From ℄		Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					Per Coupling	Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees*	*In./Ft.*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
1¼	1.660	600	1,299	0-⅛	4° 19'	0.90	2⅞	4⅛	1¾	2	⅜ x 2¼	30	45	1.4
32	*42.2*	*41.4*	*5.78*	*0-3.2*		*75.3*	*70*	*111*	*44*		*M10 x 57*	*40*	*60*	*0.6*
1½	1.900	600	1,701	0-⅛	3° 46'	0.79	3	4⅛	1¾	2	⅜ x 2¼	30	45	1.5
40	*48.3*	*41.4*	*7.57*	*0-3.2*		*65.7*	*76*	*117*	*44*		*M10 x 57*	*40*	*60*	*0.7*
2	2.375	600	2,658	0-⅛	3° 1'	0.63	3½	5⅛	1¾	2	⅜ x 2¼	30	45	1.7
50	*60.3*	*41.4*	*11.82*	*0-3.2*		*52.6*	*89*	*140*	*44*		*M10 x 57*	*40*	*60*	*0.8*
2½	2.875	600	3,895	0-⅛	2° 29'	0.52	4	5¾	1¾	2	⅜ x 2¼	30	45	1.9
65	*73.0*	*41.4*	*17.33*	*0-3.2*		*43.3*	*102*	*146*	*44*		*M10 x 57*	*40*	*60*	*0.9*
3 O.D.	*2.996*	*600*	*4,230*	*0-⅛*	*2° 23'*	*0.50*	*4*	*6⅛*	*1¾*	*2*	*⅜ x 2¼*	*80*	*100*	*2.3*
76.1	76.1	41.4	18.82	0-3.2		41.6	102	156	44		M10 x 57	110	150	1.0
3	3.500	600	5,773	0-⅛	2° 3'	0.43	4½	6⅛	1¾	2	½ x 2¼	80	100	2.9
80	*88.9*	*41.4*	*25.68*	*0-3.2*		*35.8*	*117*	*171*	*44*		*M12 x 70*	*110*	*150*	*1.3*
4½ O.D.	*4.250*	*600*	*8,512*	*0-¼*	*3° 22'*	*0.70*	*5½*	*7⅛*	*2*	*2*	*½ x 3*	*80*	*100*	*4.0*
108.0	108.0	41.4	37.86	0-6.4		58.7	140	197	51		M12 x 76	110	150	1.8
4	4.500	600	9,543	0-¼	3° 11'	0.67	5⅛	8⅛	2	2	½ x 3	80	100	4.6
100	*114.3*	*41.4*	*42.45*	*0-6.4*		*55.5*	*149*	*206*	*51*		*M12 x 76*	*110*	*150*	*2.1*
5¼ O.D.	*5.236*	*500*	*10,766*	*0-¼*	*2° 44'*	*0.57*	*6⅛*	*9⅛*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*5.7*
133.0	133.0	34.5	47.89	0-6.4		47.7	165	232	51		M16 x 85	135	175	2.6
5½ O.D.	*5.500*	*500*	*11,879*	*0-¼*	*2° 36'*	*0.54*	*6⅝*	*9⅛*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*6*
139.7	139.7	34.5	52.84	0-6.4		45.4	171	238	51		M16 x 85	135	175	2.7
5	5.563	500	12,153	0-¼	2° 35'	0.54	7	9⅛	2	2	⅝ x 3½	100	130	6.1
125	*141.3*	*34.5*	*54.06*	*0-6.4*		*45.1*	*178*	*244*	*51*		*M16 x 85*	*135*	*175*	*2.8*
6½ O.D.	*6.259*	*500*	*15,384*	*0-¼*	*2° 17'*	*0.48*	*7⅞*	*10⅛*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*6.7*
159.0	159.0	34.5	68.43	0-6.4		39.8	191	264	51		M16 x 85	135	175	3.0
6½ O.D.	*6.500*	*500*	*16,592*	*0-¼*	*2° 12'*	*0.46*	*7⅞*	*10⅞*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*7.0*
165.1	165.1	34.5	73.80	0-6.4		34.8	197	273	51		M16 x 85	135	175	3.2
6	6.625	500	17,236	0-¼	2° 10'	0.45	8	11	2	2	⅝ x 3½	100	130	8.1
150	*168.3*	*34.5*	*76.67*	*0-6.4*		*37.8*	*203*	*279*	*51*		*M16 x 85*	*135*	*175*	*3.7*
8	8.625	500	29,213	0-¼	1° 40'	0.35	10	13¾	2⅜	2	¾ x 4½	130	180	14.2
200	*219.1*	*34.5*	*129.95*	*0-6.4*		*29.1*	*264*	*337*	*60*		*M20 x 110*	*175*	*245*	*6.4*

Not for use in copper system.

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

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

⚠ WARNING

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

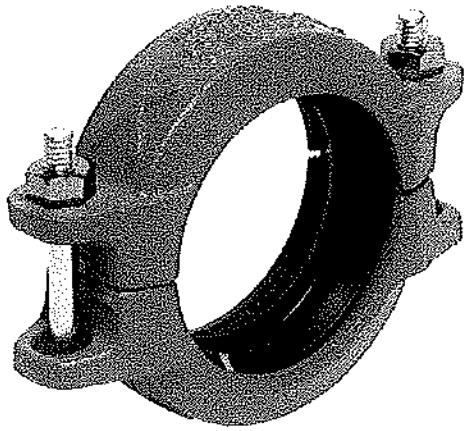
AnvilStar™
Fire Products Division of Anvil International

FIG. 7400* Rigidlite® Coupling

ANVIL INTERNATIONAL

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

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



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For listing/approval details and limitations, visit our website at www.anvilstar.com or contact an Anvil/AnvilStar™ Sales Representative.

VdS

DN 50 and DN200 sizes are VdS approved.

– Available galvanized.

* When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

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

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

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

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

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

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

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

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:
Standard C Style
Flush Gap (1 1/4" - 8")

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

FIG. 7400* Rigidlite® Coupling

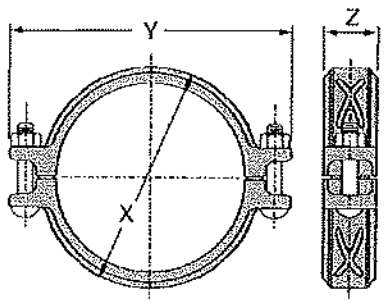


FIGURE 7400 RIGIDLITE® COUPLING

Nominal Size	Pipe O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm		In./mm	Ft.-Lbs./N-m		Lbs./Kg
1¼	1.660	300	649	0-⅛	2⅝	4¾	1¾	2	⅜ x 2¼	30	45	1.3
32	42.2	20.7	2.89	0-3.2	67	121	44		M10 x 57	40	60	0.6
1½	1.900	300	851	0-⅛	2⅞	4¾	1¾	2	⅜ x 2¼	30	45	1.4
40	48.3	20.7	3.78	0-3.2	73	124	44		M10 x 57	40	60	0.6
2	2.375	300	1,329	0-⅛	3¼	5½	1¾	2	⅜ x 2¼	30	45	1.6
50*	60.3	20.7	5.91	0-3.2	83	140	44		M10 x 57	40	60	0.7
2½	2.875	300	1,948	0-⅛	3¾	6	1¾	2	⅜ x 2¼	30	45	1.9
65	73.0	20.7	8.66	0-3.2	98	152	44		M10 x 57	40	60	0.9
3 O.D.	2.996	300	2,315	0-⅛	4	5⅛	13/4	2	3/8 x 21/4	30	45	1.9
76.1	76.1	20.7	9.41	0-3.2	102	149	44		M10 ax 57	40	60	0.9
3	3.500	300	2,886	0-½	4⅛	6¼	1¾	2	⅜ x 2¼	30	45	2.1
80	88.9	20.7	12.84	0-3.2	114	171	44		M10 x 70	40	60	1.0
4	4.500	300	4,771	0-¼	5⅝	7⅜	1¾	2	⅜ x 2¼	30	45	3.1
100	114.3	20.7	21.22	0-6.4	143	197	46		M10 x 70	40	60	1.4
5⅛ O.D.	5.500	300	7,127	0-¼	6¾	9¾	2	2	1-2 x 3	80	100	4.5
139.7	139.7	20.7	31.70	0-6.4	171	235	51		M12 x 76	110	150	2.0
5	5.563	300	7,292	0-¼	6⅞	9¼	2	2	½ x 3	80	100	4.6
125	141.3	20.7	32.44	0-6.4	175	235	51		M12 x 76	110	150	2.1
6⅛ O.D.	6.500	300	9,955	0-¼	7⅞	10⅜	2	2	½ x 3	80	100	5.5
165.1	165.1	20.7	44.28	0-6.4	200	264	51		M12 x 76	110	150	2.5
6	6.625	300	10,341	0-¼	7⅞	10⅜	2	2	½ x 3	80	100	5.5
150	168.3	20.7	46.00	0-6.4	200	264	51		M12 x 76	110	150	2.5
8	8.625	300	17,528	0-⅛	10¼	12¾	2¼	2	½ x 3	80	100	8.4
200*	219.1	20.7	77.97	0-3.2	260	324	60		M12 x 76	110	150	3.8

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

* DN 50 and DN 200 sizes are VdS approved.

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

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

⚠ WARNING

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

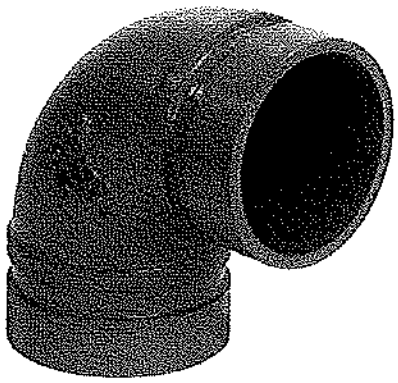
AnvilStar™ FIG. SE-1 Short Pattern 90° Elbow

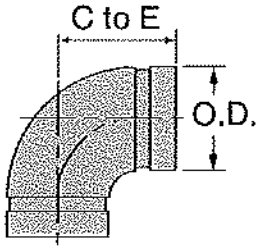
Fire Products Division of Anvil International

ANVIL INTERNATIONAL

SPF/ANVIL

SE-1 are short pattern products and are specifically designed for use in Fire Protection applications where economy is a factor. All products are UL & ULC listed as well as FM approved. Maximum working pressure for these products is 300 PSI.





VdS

LPCB UKAS

Assessed to ISO 9001:2000

c UL us APPROVED

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

SE-1 90° ELBOW

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
2 50	2.375 60.3	2½ 70	1.5 0.7
2½ 65	2.875 73.0	3 76	2.1 1.0
3 80	3.500 88.9	3⅛ 86	3.6 1.6
4 100	4.500 114.3	4 102	5.8 2.6
6 150	6.625 168.3	5⅛ 140	11.8 5.3
8 200	8.625 219.1	6⅛ 175	21.1 9.6

Additional sizes available, contact an AnvilStar Representative.

MATERIAL SPECIFICATIONS

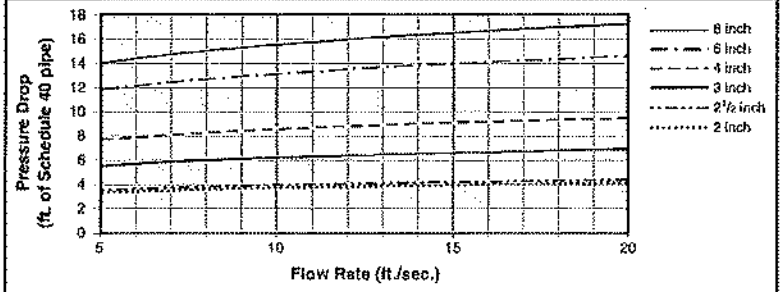
CAST FITTINGS:

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

COATINGS:

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

SE-1 90° ELBOW SHORT PATTERN FITTING – PRESSURE DROP



SPF™ short pattern fittings exceed the headloss requirements of NFPA 13.

For Fig. SE-1 90° grooved end elbows use the value shown.

Note: Above values are shown for Schedule 40 pipe to be consistent with industry practices.

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

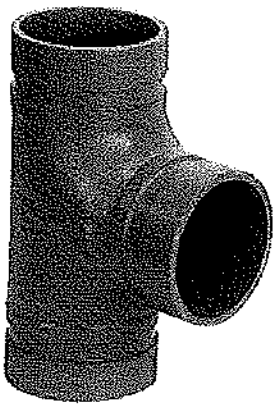
AnviLStar™ FIG. ST-1 Short Pattern Tee

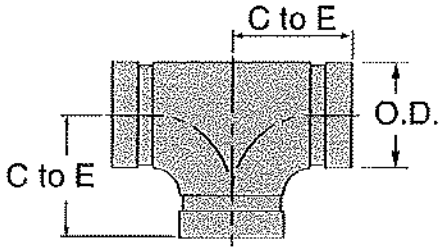
Fire Products Division of Anvil International

ANVIL INTERNATIONAL

SPF/ANVIL

ST-1 are short pattern products and are specifically designed for use in Fire Protection applications where economy is a factor. All products are UL & ULC listed as well as FM approved. Maximum working pressure for these products is 300 PSI.





VdS

LPCB UKAS

Assessed to ISO 9001:2000

c UL us FM APPROVED

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

ST-1 TEE

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	lbs./Kg
2	2.375	2¼	2.9
50	60.3	70	1.3
2½	2.875	3	4.6
65	73.0	76	2.1
3	3.500	3⅜	6.9
80	88.9	86	3.1
4	4.500	4	10.9
100	114.3	102	4.9
6	6.625	5⅛	25.0
150	168.3	140	11.3
8	8.625	6⅞	42.1
200	219.1	175	19.1

MATERIAL SPECIFICATIONS

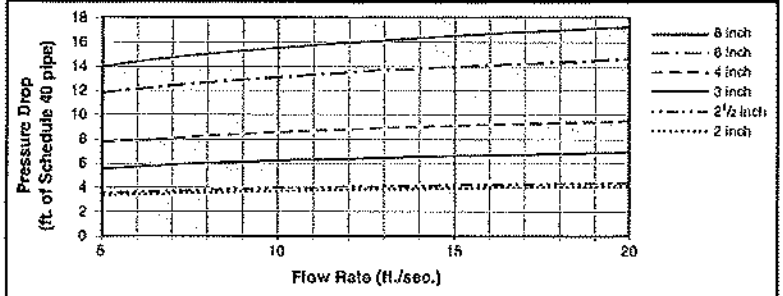
CAST FITTINGS:

Ductile Iron conforming to ASTM A-536

COATINGS:

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

ST-1 90° TEE SHORT PATTERN FITTING – PRESSURE DROP



SPF™ short pattern fittings exceed the headloss requirements of NFPA 13.

For Fig. ST-1 grooved end tee branch use 2½ times the value shown.

For Fig. ST-1 grooved end tee run use the value shown.

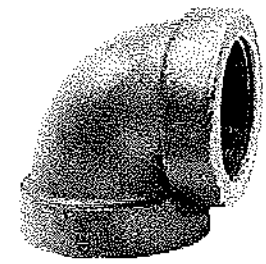
Note: Above values are shown for Schedule 40 pipe to be consistent with industry practices.

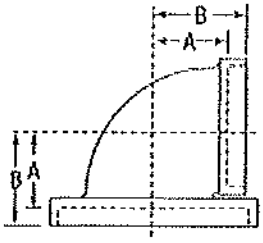
PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Cast Iron Threaded Fittings

Class 125 (Standard)

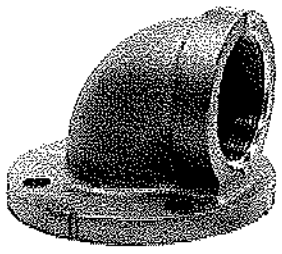
FIGURE 351
90° Elbow

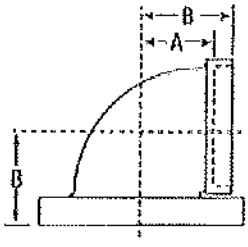




Size		A		B		Unit We Blac
NPS	DN	in	mm	in	mm	lbs
1/4	8	1/2	13	13/16	22	0.16
3/8	10	9/16	14	15/16	24	0.25
1/2	15	11/16	17	1 1/8	29	0.40
3/4	20	13/16	22	1 15/16	33	0.60
1	25	15/16	24	1 1/2	38	0.92
1 1/4	32	1 1/8	29	1 3/4	44	1.44
1 1/2	40	1 5/16	33	1 15/16	49	1.95
2	50	1 9/16	40	2 1/4	57	3.13
2 1/2	65	1 13/16	47	2 11/16	68	4.94
3	80	2 3/16	56	3 1/8	79	7.21
3 1/2	90	2 7/16	62	3 7/16	87	9.67
4	100	2 11/16	68	3 13/16	98	12.17
5	125	3 5/16	84	4 1/2	114	21.46
6	150	3 7/8	98	5 1/8	130	31.33
8	200	5 3/16	132	6 7/16	167	64.56

FIGURE 371
90° Elbow,
Flange & Screw





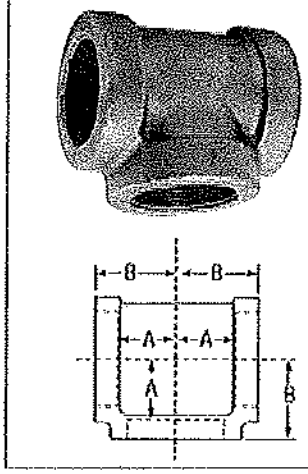
Size		A		B		Unit B
NPS	DN	in	mm	in	mm	lbs
2 1/2	65	1 13/16	47	2 11/16	68	10.22
3	80	2 3/16	56	3 1/8	79	13.25
4	100	2 11/16	68	3 13/16	98	21.56
6	150	3 7/8	98	5 1/8	130	40.50

Nominal Pipe Sizes of 4" (100 DN) and larger have two holes tapped for stud or cap bolts.

Cast Iron Threaded Fittings

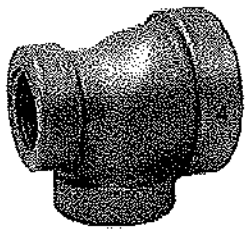
Class 125 (Standard)

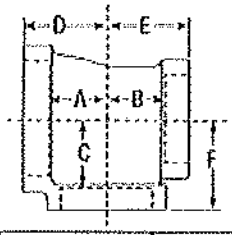
FIGURE 358
Tee



Size		A		B		Unit We Blac
NPS	DN	in	mm	in	mm	lbs
1/4	8	1/2	13	13/16	22	0.22
3/8	10	5/8	16	1	25	0.35
1/2	15	11/16	17	1 1/8	29	0.56
3/4	20	13/16	22	1 5/16	33	0.84
1	25	15/16	24	1 1/2	38	1.25
1 1/4	32	1 1/8	29	1 3/4	44	2.03
1 1/2	40	1 5/16	33	1 15/16	49	2.70
2	50	1 9/16	40	2 1/4	57	4.23
2 1/2	65	1 13/16	47	2 11/16	68	6.67
3	80	2 3/16	56	3 1/8	79	10.00
3 1/2	90	2 7/16	62	3 7/16	87	13.29
4	100	2 11/16	68	3 3/4	95	16.33
5	125	3 5/16	84	4 1/2	114	27.33
6	150	3 7/8	98	5 1/8	130	40.85
8	200	5 3/16	132	6 9/16	167	79.00

FIGURE 359
Tee Reducing





Size						A		B		C		D		E		F		U
NPS	DN	NPS	DN	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
1/2	15	1/2	15	1/4	8	11/16	17	11/16	17	13/16	22	1 1/8	29	1 1/8	29	1 1/8	29	0.
				3/8	10	11/16	17	11/16	17	3/4	19	1 1/8	29	1 1/8	29	1 1/8	29	0.
				3/4	20	13/16	22	13/16	22	11/16	17	1 1/4	32	1 1/4	32	1 5/16	22	0.
				1	25	1	25	1	25	13/16	22	1 7/16	37	1 7/16	37	1 3/8	35	1.
3/4	20	1/4	8	3/4	20	13/16	22	15/16	24	13/16	22	15/16	24	1 1/4	32	15/16	24	0.
		1/2	15	1/2	15	11/16	17	11/16	17	13/16	22	13/16	22	1 1/8	29	1 1/4	32	0.
				3/4	20	13/16	22	13/16	22	13/16	22	15/16	24	1 1/4	32	15/16	24	0.
		3/4	20	1/4	8	9/16	14	9/16	14	7/8	22	11/16	17	11/16	17	13/16	22	0.
				3/8	10	11/16	17	11/16	17	15/16	24	13/16	22	13/16	22	1 1/4	32	0.
				1/2	15	11/16	17	11/16	17	13/16	22	13/16	22	13/16	22	1 1/4	32	0.
				1	25	1 5/16	24	15/16	24	13/16	22	1 7/16	37	1 7/16	37	1 3/8	35	0.
1	25	1/4	8	1	25	1 5/16	24	15/16	24	15/16	24	1 1/2	38	1 1/4	32	1 1/2	38	1.
		1/2	15	1/2	15	1 1/16	17	3/4	19	15/16	24	1 1/4	32	13/16	22	1 3/8	35	0.
				3/4	20	13/16	22	13/16	22	15/16	24	1 3/8	35	1 1/4	32	1 7/16	37	0.
				1	25	1 5/16	24	15/16	24	15/16	24	1 1/2	38	1 3/8	35	1 1/2	38	1.
		3/4	20	1/2	15	1 1/16	17	11/16	17	15/16	24	1 1/4	32	13/16	22	1 3/8	35	0.
				3/4	20	13/16	22	13/16	22	15/16	24	1 3/8	35	15/16	24	1 7/16	37	1.
				1	25	1 5/16	24	15/16	24	15/16	24	1 1/2	38	1 7/16	37	1 1/2	38	1.
		1	25	1/4	8	1 1/16	17	11/16	17	1 1/8	29	1 1/8	29	1 1/4	32	1 3/8	35	1.
				1/2	15	1 1/16	17	11/16	17	15/16	24	1 1/4	32	1 1/4	32	1 3/8	35	1.
				3/4	20	13/16	22	13/16	22	15/16	24	1 3/8	35	1 3/8	35	1 7/16	37	1.
				1 1/4	32	1 1/8	29	1 1/8	29	15/16	24	1 15/16	43	1 11/16	43	1 9/16	40	1.
				1 1/2	40	1 1/4	32	1 1/4	32	1	25	1 13/16	47	1 13/16	47	1 5/8	41	1.
				2	50	1 7/16	37	1 7/16	37	1	25	2	50	2	50	1 3/4	44	2.

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

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

Approvals and Specifications
Both products meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10)
- ASTM A795, Type E, Grade A (Schedule 40)
- NFPA 13

Manufacturing Protocols
Schedule 10 and Schedule 40 are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings
All Wheatland black steel fire sprinkler pipe up to 6" receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted, without special preparation. Schedule 10 and Schedule 40 can be ordered in black, or with hot-dip galvanizing, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53. All Wheatland galvanized material is also UL Listed.

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

SCHEDULE 10 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1¼	1.660	42.2	1.442	36.6	.109	2.77	1.81	2.69	7.3	61
1½	1.900	48.3	1.682	42.7	.109	2.77	2.09	3.11	5.8	61
2	2.375	60.3	2.157	54.8	.109	2.77	2.64	3.93	4.7	37
2½	2.875	73.0	2.635	66.9	.120	3.05	3.53	5.26	3.5	30
3	3.500	88.9	3.260	82.8	.120	3.05	4.34	6.46	2.6	19
4	4.500	114.3	4.260	108.2	.120	3.05	5.62	8.37	1.6	19
5	5.563	141.3	5.295	134.5	.134	3.40	7.78	11.58	1.5	13
6	6.625	168.3	6.357	161.5	.134	3.40	9.30	13.85	1.0	10
8	8.625	219.1	8.249	209.5	.188	4.78	16.96	25.26	2.1	7

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY.*
** The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

SCHEDULE 40 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1	1.315	33.4	1.049	26.6	.133	3.38	1.68	2.50	1.00	70
1¼	1.660	42.2	1.380	35.1	.140	3.56	2.27	3.39	1.00	51
1½	1.900	48.3	1.610	40.9	.145	3.68	2.72	4.05	1.00	44
2	2.375	60.3	2.067	52.5	.154	3.91	3.66	5.45	1.00	30

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY.*
** The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

SUBMITTAL INFORMATION

PROJECT: _____

CONTRACTOR: _____

DATE: _____

ENGINEER: _____

SPECIFICATION REFERENCE: _____

SYSTEM TYPE: _____

LOCATIONS: _____

COMMENTS: _____

☐ BLACK

☐ HOT-DIP GALVANIZED

Wheatland Tube 700 South Dock Street Sharon, PA 16146
P 800.257.8182 | **F** 724.346.7260 | info@wheatland.com | wheatland.com

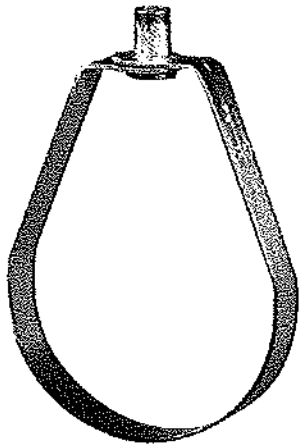
Wheatland Tube
JMC STEEL GROUP

Fig. 69 Adjustable Swivel Ring, Tapped Per NFPA Standards

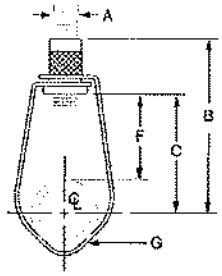
Size Range: ½" through 8"
Material: Carbon steel
Finish: Galvanized
Service: Recommended for suspension of non-insulated **stationary** pipe line.
Maximum Temperature: 650° F
Approvals: Complies with Federal Specification A-A-1192A (Type 10), *WW-H-171-E (Type 10)*, ANSI/MSS SP-69 and MSS SP-58 (Type 10). UL Listed and FM Approved (Sizes ¾" - 8").
Features:

- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the ½" through 6" sizes. The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but not allowing the nut to fall completely out.

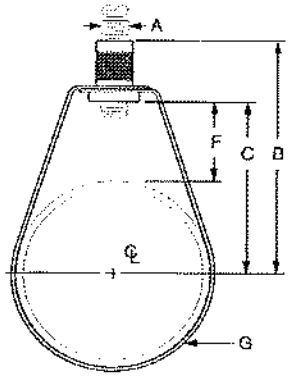
Ordering: Specify size, figure number and name.
Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.
Metric nut available upon request. Non-captured nut also available upon request.



LISTED APPROVED



½" through 1" pipe



1¼" through 8" pipe

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

Pipe Size	Max Load	Weight	Rod Size A	B	C	F	G Width
½	300	0.10	⅜	2⅞	2	1⁹⁄₁₆	⅝
¾		0.10		2¾	1⅞	1⁵⁄₁₆	
1		0.10		2⁹⁄₁₆	1¹¹⁄₁₆	1	
1¼		0.10		2⅝	1¾	⅞	
1½		0.10		2¾	1⅞		
2		0.11		3¼	2⅜	1⅛	
2½	525	0.20		4	2¾	1⁵⁄₁₆	¾
3		0.20		3¹³⁄₁₆	2¹⁵⁄₁₆	1³⁄₁₆	
4	650	0.30		4¹¹⁄₁₆	3¹³⁄₁₆	1⁹⁄₁₆	
5	1,000	0.54	½	5⁵⁄₁₆	4⅜		
6		0.65		6¹¹⁄₁₆	5⅜₁₆	2¼	
8		1.00		8	7	2¹¹⁄₁₆	1

Note: Reflects changes in rod diameter from previously published data per recent revisions in MSS-SP-58 & 69

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

Fig. 69 - Beam Clamp Retaining Strap

Component of State of California OSHPD Approved Seismic Restraints System

Size Range — 3/8" thru 7/8" rod by 4" thru 16" length.*

Material — Pre-Galvanized Steel

Function — To offer more secure fastening of various types of beam clamps to beam where danger of movement might be expected. NFPA 13 requires the use of retaining straps with all beam clamps installed in earthquake areas. Satisfies requirements of NFPA 13 (1999) 6-4.7.1.

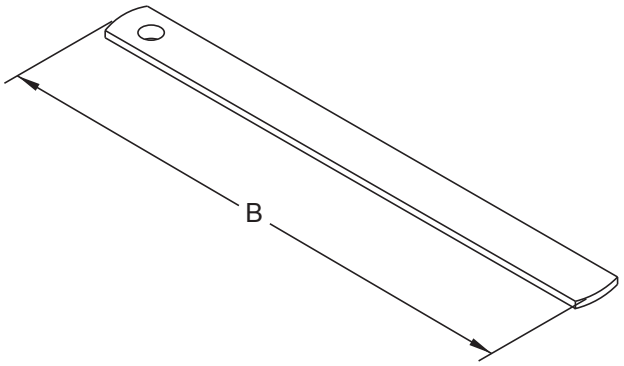
Important Note — Good installation practice of a retaining strap requires that the strap be held tightly and securely to all component parts of the assembly. Therefore a locking mechanism of some kind such as a hex nut or the beveled locking slot on the TOLCO® Fig. 69R will provide a more secure reliable installation.

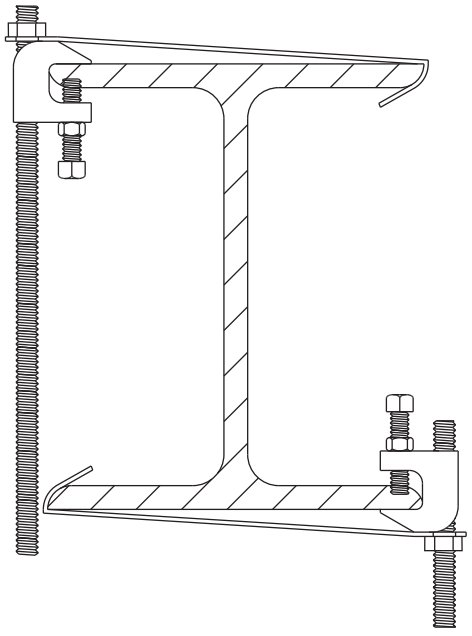
Approvals — Underwriters' Laboratories listed in the USA **(UL)** and Canada **(cUL)**. Approved for use with any listed beam clamp. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Finish — Pre-Galvanized

Order By — Figure number, type, length "B" and rod size being used with beam clamp

Note — Minimum return on Strap: 1".





Dimensions

Type	Rod Size A	Hole Size	B
1	3/8	7/16	Specify
	1/2	9/16	Specify
2	5/8	11/16	Specify
	3/4	13/16	Specify
3	3/8 - 7/8	Specify	Specify

* Longer lengths are available, consult factory.

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Fig. 825 - Bar Joist Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System

c UL US LISTED

FM APPROVED

Size Range — One size accommodates all TOLCO Fig. 900 Series sway brace attachments. Maximum Horizontal Design Load 2015 lbs.

Material — Carbon Steel

Function — To attach sway bracing and hanger assemblies to steel open web structural members.

Features — This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of **concentric** loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique design reinforces point of connection to joist. Break off head bolt design assures verification of proper installation torque (min. 31 ft.-lbs.).

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Installation Instructions — The Fig. 825 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment, to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 825 on the steel beam, tighten the cone point set bolts until bolt heads break off. Attach other TOLCO transitional attachment fitting, Fig. 909, 910 or 980. Transitional fitting attachment can pivot for adjustment to proper brace angle.

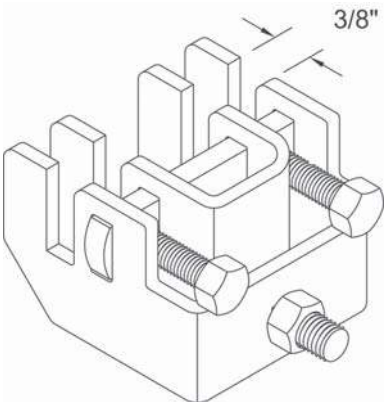
Important Structural Note:

The TOLCO Fig. 825 has significant UL established design loads, however, structural issues related to the steel joist member require restricted location installation for all bracing. Steel Joist Manufacturers require that all earthquake bracing connections be within 6" of the cord panel point. Installation of the Fig. 825 must be limited to the outer third sections of the joist span. For installations within the center third section of the joist span, use **UL** Listed TOLCO Fig. 825A.

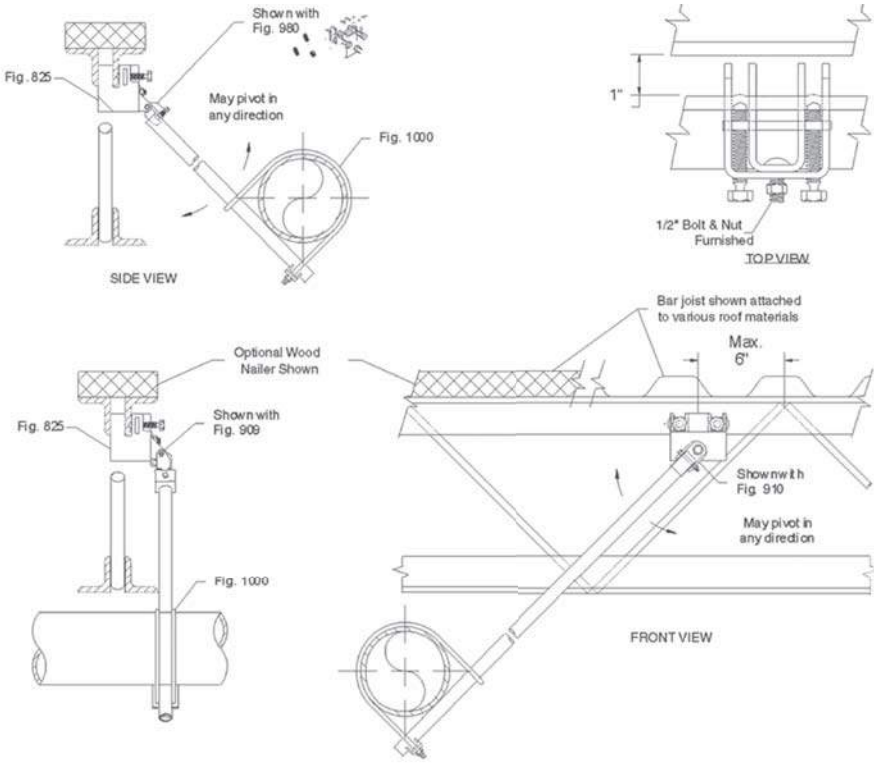
Finish — Plain, Electro-Galvanized and HDG

Order By — Figure number and finish

US Patent #6,098,942, Canada Patent #2,286,659



Maximum Design Load 2015 Lbs. Weight/100 237.5 Lbs.
UL Listed as Hanger Attachment 6" Pipe Max.
FM Approved Design Loads* 2900 - Across Beam 1350 - Along Beam



* Load shown is allowable with brace installed, between 30° - 90°. No reduction of load based on brace angle is required.

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

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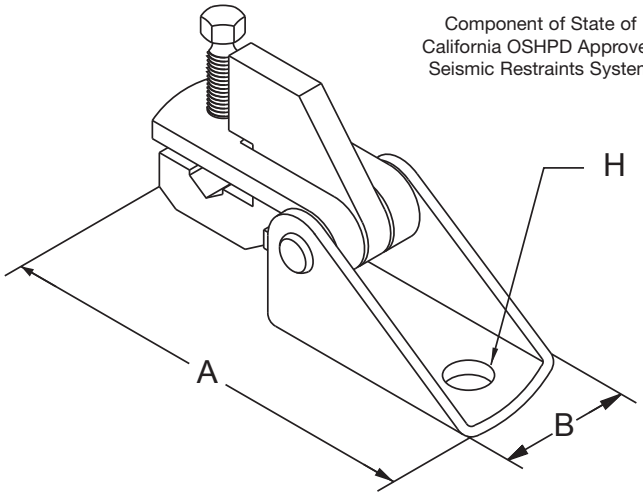
Fig. 980 - Universal Swivel Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — One size fits bracing pipe 1" thru 2", TOLCO 12 gauge channel, and all structural steel up to 1/4" thick.

Material — Carbon Steel

Function — Multi-functional attachment to structure or braced pipe fitting.

Features — This product's design incorporates a **concentric** attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2002) Figure 9.3.5.9.1 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. Break off bolt head assures verification of proper installation.

Installation — The Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 2002, 4L, 4A or 4B to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 980 onto the "bracing pipe". Tighten the set bolt until set bolt head breaks off. Attachment can pivot for adjustment to proper brace angle.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

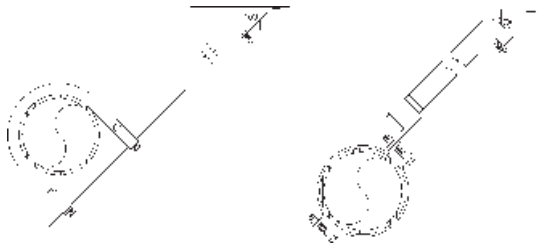
Note — The Fig. 980 Swivel Attachment and the Fig. 1001, Fig. 1000 , Fig. 2001 or Fig. 4A Pipe Clamp make up a sway brace system of **UL** Listed attachments and bracing materials which satisfies the requirements of Underwriters' Laboratories and the National Fire Protection Association **(NFPA)**

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish.

PATENT #6,273,372



Lateral Brace

Dimensions • Weights

A	B	H*	Max. Design Load Lbs. (cULus)	**Max. Design Load Lbs. (FM)	Approx. Wt./100
5¼	1⅞	17/32	2765	2800	132

* Available with hole sizes to accommodate up to 3/4" fastener. Consult factory.

** Load shown is allowable with brace installed, between 30° - 90°. No reduction of load based on brace angle is required.

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

TOLCO™ Fig. 1001 - Sway Brace Attachment

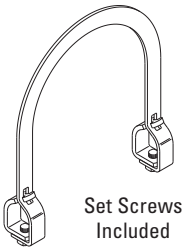
Component of State of California OSHPD Approved Seismic Restraints System

Size Range: Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS.
* Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.
The pipe attachment component of a sway brace system:
Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

Features: Can be used to brace schedules 7 through 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a four-way riser brace. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.



Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set screws until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Underwriters Laboratories Listed in the USA and Canada **(cULus)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines, OPA-0300-10.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Indicate pipe size to be braced followed by pipe size used for bracing, figure number and finish.

Important Note: Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.

Pipe Size		Max. Horizontal Design Load (UL) - Lbs. For Brace Pipe Size 1" / 1¼"		
		Sch. 7	Sch. 10	Sch. 40
in.	(mm)	1" / 1¼"	1" / 1¼"	1" / 1¼"
1"	(25)	-- / --	1000 / 1000	1000 / 1000
1¼"	(32)	1000 / 1000	1000 / 1000	1000 / 1000
1½"	(40)	1000 / 1000	1500 / 1500	1500 / 1500
2"	(50)	1000 / 1000	2015 / 2015	2015 / 2015
2½"	(65)	1600 / 1600	2015 / 2765	2015 / 2765
3"	(80)	1600 / 1600	2015 / 2765	2015 / 2765
4"	(100)	1600 / 1600	2015 / 2765	2015 / 2765
6"	(150)	1600 / 1600	2015 / 2765	2015 / 2765
8"	(200)	1600 / 1600	2015 / 2765	2015 / 2765

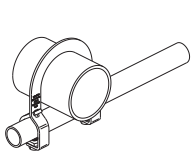
Pipe Size		Part Number & Approx. Wt./100						Max. Horizontal Design Load (FM) For Sch. 7, Sch. 10, & Sch. 40 Pipe [1,2,3]							
		1" (24mm) Brace Pipe			1¼" (32mm) Brace Pipe			30°-44°		45°-59°		60°-74°		75°-90°	
in.	(mm)		Lbs.	(kg)		Lbs.	(kg)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)
1"	(25)	**1001-1 X 1**	100.0	(45.3)	**1001-1 X 1¼**	118.0	(53.5)	1800	(8.00)	2550	(11.34)	3120	(13.88)	3490	(25.52)
1¼"	(32)	**1001-1¼ X 1**	100.0	(45.3)	**1001-1¼ X 1¼**	114.0	(51,7)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
1½"	(40)	**1001-1½ X 1**	100.0	(45.3)	**1001-1½ X 1¼**	115.0	(52.1)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
2"	(50)	**1001-2 X 1**	108.0	(49.0)	**1001-2 X 1¼**	121.0	(54.9)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
2½"	(65)	**1001-2½ X 1**	138.6	(62.8)	**1001-2½ X 1¼**	160.4	(72.7)	800	(3.56)	1130	(5.02)	1380	(6.14)	1540	(6.85)
3"	(80)	**1001-3 X 1**	147.2	(66.7)	**1001-3 X 1¼**	168.7	(76,5)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.29)
4"	(100)	**1001-4 X 1**	160.9	(73.0)	**1001-4 X 1¼**	182.4	(82.7)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.29)
6"	(150)	**1001-6 X 1**	190.0	(86.2)	**1001-6 X 1¼**	211.4	(95.9)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)
8"	(200)	**1001-8 X 1**	217.4	(98.6)	**1001-8 X 1¼**	238.8	(108.3)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)

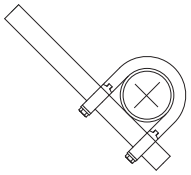
[1] FM Approved when used with 1 or 1¼ inch NPS Schedule 40 GB/T 3091,EN 10255H, or JIS G3451 steel pipe as the brace member.

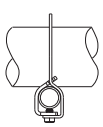
[2] Load rating for LW above refers to FM Approved Lightwall Pipe commonly referred to as "Schedule 7". These ratings may also be applied when EN 10220 and GB/T 8163 steel pipe.

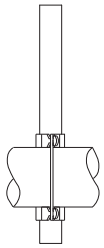
[3] Load rating for Schedule 10 above may be applied to GB/T 3092,EN 10255M and H, or JIS G3454, FM Approved Thinwall, or Schedule 40 steel pipes.

Note: See UL load ratings in UL Listed Design Load chart shown under drawing.









All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO

Fig. 4L Longitudinal "In-Line" Sway Brace Attachment

Size Range — 2" through 8" IPS.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance.

Approvals — Underwriter's Laboratories Listed in the USA (UL) and Canada (cUL) 2" - 8". Approved by Factory Mutual Engineering (FM), 2½" - 8" pipe.

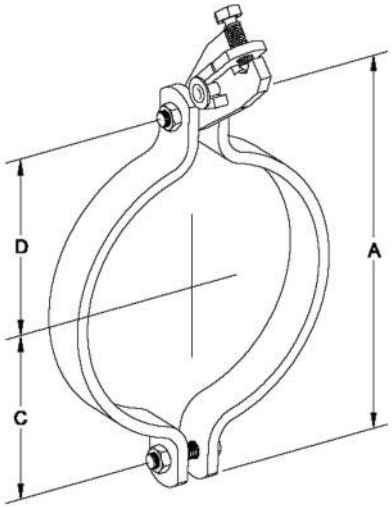
Installation Instructions — The Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

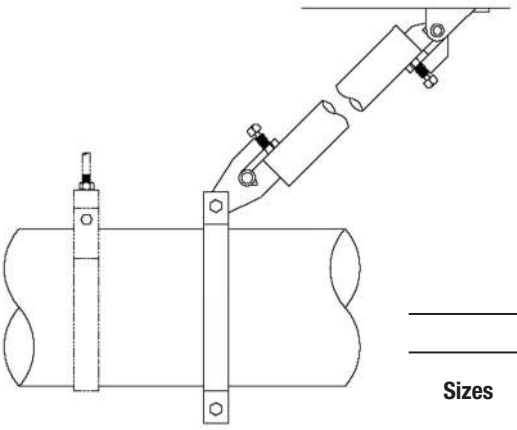
To Install — Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until hex head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

Finish — Plain

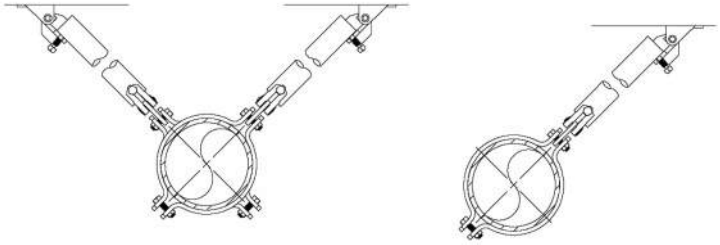
Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, pipe size and finish.





Longitudinal Brace



4-Way Riser Brace
(Plan View)

Dimensions • Weights

Sizes	A	C	D	Bolt Size	Max. Rec. Load Lbs. (cULus)	*Max. Rec. Load Lbs. (FM)	Approx. Wt./100
2	5 3/8	2 1/16	2 1/16	½	2015	—	247
2 ½	6 7/16	2 ½	2 ¾	½	2015	3000	253
3	7	2 ¾	3 1/16	½	2015	1550	268
4	8 ½	3 3/8	3 11/16	½	2015	1550	348
5	9 ¾	3 7/8	4 3/8	½	2015	1450	380
6	11 ½	5	5 1/8	½	2015	1450	640
8	13 ¼	5 5/8	5 5/8	½	2015	1450	728

* Load shown is allowable with brace installed, between 30° - 90°. No reduction of load based on brace angle is required.
FM approved when used with 1", 1¼", 1½" or 2" Sch. 40 brace pipe

Cooper B-Line, Inc.'s ("Cooper B-Line") seismic bracing components are designed to be compatible only with other Cooper B-Line bracing components, resulting in a listed seismic bracing assembly. Cooper B-Line's warranty for seismic bracing components will be the warranty provided in Cooper B-Line's standard terms and conditions of sale made available by Cooper B-Line, except that, in addition to the other exclusions from Cooper B-Line's warranty, Cooper B-Line makes no warranty relating to Cooper B-Line's seismic bracing components that are combined with products not provided by Cooper B-Line.

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Fig. 25 - Surge Restrainer

c UL US LISTED

Size Range — One size fits 3/4" thru 2" pipe.

Material — Pre-Galvanized Steel

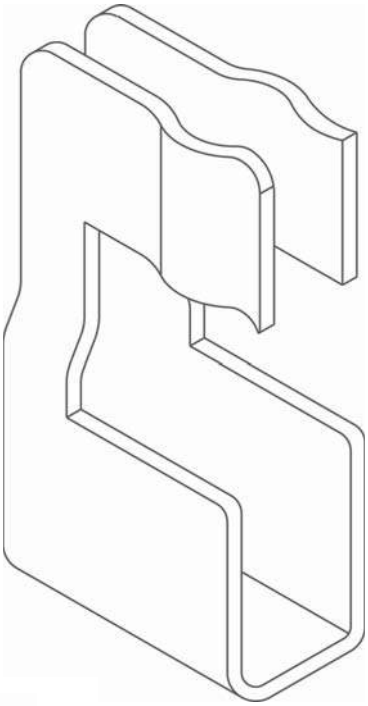
Function — Designed to be used in conjunction with TOLCO® Band Hangers to restrict the upward movement of piping as it occurs during sprinkler head activation or earthquake type activity. The surge restrainer is easily and efficiently installed by snapping into a locking position on the band hanger. This product is intended to satisfy the requirements as indicated in the National Fire Protection Association NFPA 13, 2010 edition, 9.2.3.4.4.1 and 9.2.3.4.4.4 Can be used to restrain either steel pipe or CPVC plastic Pipe.

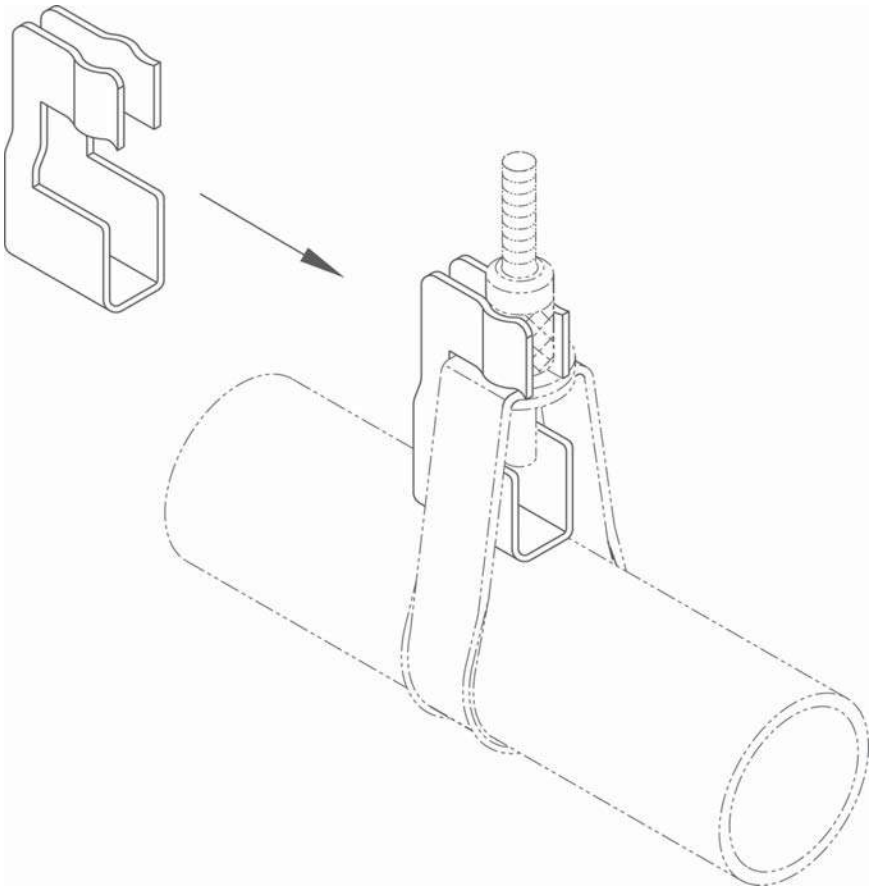
Approvals — Underwriters' Laboratories Listed **only** when used with TOLCO band hangers Fig. 2, 2NFPA and 200, in the USA **(UL)** and Canada **(cUL)**.

Finish — Pre-Galvanized

Order By — Figure number and TOLCO band hanger, size from 3/4" thru 2".

Patent #5,344,108





POTTER
The Symbol of Protection

BELLS
PBA-AC & MBA-DC

UL, ULC, and FM Approved
Sizes Available: 6" (150mm), 8" (200mm) and 10" (250mm)
Voltages Available: 24VAC
120VAC
12VDC (10.2 to 15.6) Polarized
24VDC (20.4 to 31.2) Polarized
Service Use: Fire Alarm
General Signaling
Burglar Alarm
Environment: 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
Finish: Red powder coating
Optional: Model BBK-1 weatherproof backbox
Model BBX-1 deep weatherproof backbox

These vibrating type bells are designed for use as fire, burglar 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 weatherproof backbox or BBX-1 deep weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1, 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	MBA126	1750070	.12A	85	76
8 (200)	12VDC	MBA128	1750080	.12A	90	77
10 (250)	12VDC	MBA1210	1750060	.12A	92	78
6 (150)	24VDC	MBA246	1750100	.06A	87	77
8 (200)	24VDC	MBA248	1750110	.06A	91	79
10 (250)	24VDC	MBA2410	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

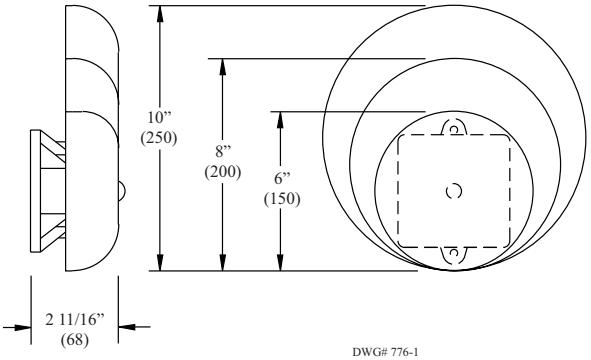
All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or BBX-1. 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.

Potter Electric Signal Company, LLC • 2081 Craig Road, St. Louis, MO, 63146-4161 • Phone: 800-325-3936/Canada 888-882-1833 • www.pottersignal.com

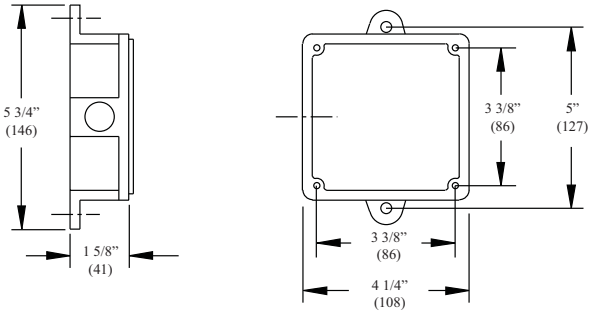
Bells Dimensions Inches (mm)
Fig. 1



DWG# 776-1

Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

Box has one threaded 1/2" conduit entrance



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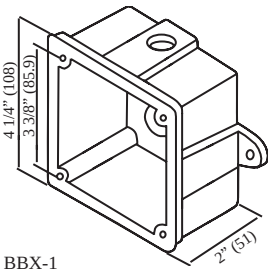
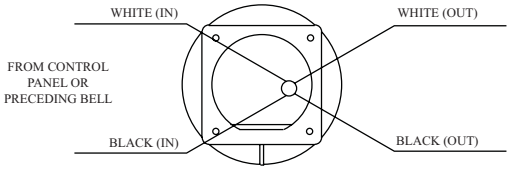


BBX-1

Wiring (rear view)
Fig. 3

A.C. BELLS



CAUTION:
WHEN ELECTRICAL SUPERVISION IS REQUIRED USE IN AND OUT LEADS AS SHOWN.

NOTES:

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

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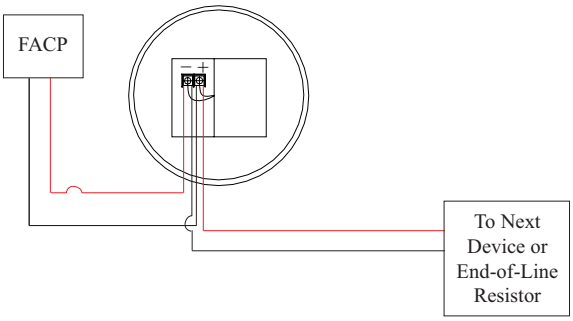

Installation

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