Columbia Fire
SPRINKLER SYSTEM SERVICE & REPAIR
WA CL# COLUMFI952MG

MATERIAL SUBMITTAL

AUTOMATIC FIRE SUPPRESSION SYSTEM

Cascade Christian School Gym

815 21st St SE
Puyallup, WA 98372

Authority Having Jurisdiction
City of Puyallup

Absher Construction
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Project Number: 1901322
By: Marco Bellutta

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AUTOMATIC FIRE SUPPRESSION SYSTEM

Fire Sprinkler Pipe

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

Approvals and Specifications
Schedule 10 and Schedule 40 meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1–8 NPS)
- ASTM A795, Type E, Grade A (Schedule 40, 1–2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2–8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1–4 NPS)
- NFPA® 13 and NFPA 14

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 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 hot-dip galvanized, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53.

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

SUBMITTAL INFORMATION

PROJECT: _____

CONTRACTOR: _____

DATE: _____

ENGINEER: _____

SPECIFICATION REFERENCE: _____

SYSTEM TYPE: _____

LOCATIONS: _____

COMMENTS: _____

☐ BLACK

☐ HOT-DIP GALVANIZED

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Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

** 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).*

*** 8 NPS Schedule 40 is FM Approved but not UL Listed.*

WFS-081619

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FIG. 3201

90° Elbow

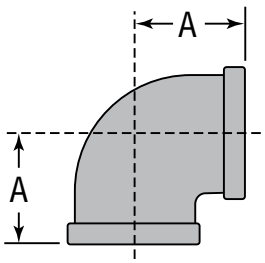

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FIGURE 3201 - 90° ELBOW

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *20*	500 *3450*	1.50 *38.10*	0.62 *0.28*
1¼ *32*	500 *3450*	1.75 *44.45*	0.90 *0.41*
1½ *40*	500 *3450*	1.94 *49.276*	1.20 *0.54*
2 *50*	500 *3450*	2.25 *57.15*	1.85 *0.84*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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

FIG. 3202

45˚ Elbow

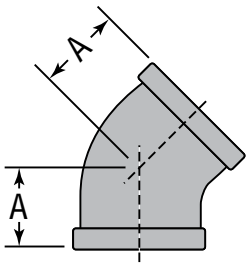

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FIGURE 3202 - 45° ELBOW

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	500 *3450*	1.12 *28.44*	0.46 *0.21*
1¼ *32*	500 *3450*	1.29 *32.76*	0.73 *0.33*
1½ *40*	500 *3450*	1.43 *36.32*	0.92 *0.42*
2 *50*	500 *3450*	1.68 *42.67*	1.50 *0.68*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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Notes 1:	
Notes 2:	

FIG. 3201R

Reducing 90° Elbow

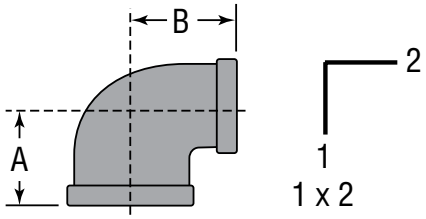

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FIGURE 3201R - REDUCING 90° ELBOW

Nominal Size 1 x 2	Max. Working Pressure▲	Dimensions A	Dimensions B	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1 x ½ *25 x 15*	500 *3450*	1.26 *32.00*	1.36 *34.54*	0.44 *0.20*
1 x ¾ *25 x 20*	500 *3450*	1.37 *34.79*	1.45 *36.83*	0.52 *0.24*
1¼ x ½ *32 x 15*	500 *34550*	1.34 *34.03*	1.53 *38.86*	0.64 *0.29*
1¼ x ¾ *32 x 20*	500 *3450*	1.45 *36.83*	1.62 *41.14*	0.72 *0.33*
1¼ x 1 *32 x 25*	500 *3450*	1.58 *40.13*	1.67 *42.41*	0.75 *0.34*
1½ x 1 *40 x 25*	500 *3450*	1.65 *41.91*	1.80 *45.72*	0.92 *0.42*
1½ x 1¼ *40 x 32*	500 *3450*	1.82 *46.22*	1.88 *47.75*	1.08 *0.49*
2 x ½ *50 x 15*	500 *3450*	1.49 *37.84*	1.88 *47.75*	1.08 *0.49*
2 x ¾ *50 x 20*	500 *3450*	1.60 *40.64*	1.97 *50.03*	1.24 *0.56*
2 x 1 *50 x 25*	500 *3450*	1.73 *43.94*	2.02 *51.30*	1.40 *0.64*
2 x 1¼ *50 x 32*	500 *3450*	1.90 *48.26*	2.10 *53.34*	1.52 *0.70*
2 x 1½ *50 x 40*	500 *3450*	2.02 *51.30*	2.16 *54.86*	1.65 *0.75*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

FIG. 3205R

Reducing Tee

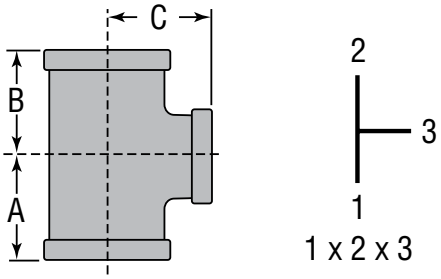

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FIGURE 3205R - REDUCING TEE

Nominal Size 1 x 2 x 3	Max. Working Pressure▲	Dimensions A	B	C	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1 x ½ x 1 *25 x 15 x 25*	500 *3450*	1.50 *38.10*	1.36 *34.54*	1.50 *38.10*	0.64 *0.29*
1 x ¾ x 1 *25 x 20 x 25*	500 *3450*	1.50 *38.10*	1.45 *36.83*	1.50 *38.10*	0.73 *0.33*
1 x 1 x ½ *25 x 25 x 15*	500 *3450*	1.26 *32.00*	1.26 *32.00*	1.36 *34.54*	0.71 *0.32*
1 x 1 x ¾ *25 x 25 x 20*	500 *3450*	1.37 *34.80*	1.37 *34.80*	1.45 *36.83*	0.76 *0.34*
1 x 1 x 1¼* *25 x 25 x 32*	500 *3450*	1.67 *42.41*	1.67 *42.41*	1.58 *40.13*	0.98 *0.44*
1 x 1 x 1½* *25 x 25 x 40*	500 *3450*	1.80 *45.72*	1.80 *45.72*	1.65 *41.91*	1.16 *0.53*
1¼ x 1 x ½* *32 x 25 x 15*	500 *3450*	1.34 *34.04*	1.26 *32.00*	1.53 *38.86*	0.82 *0.37*
1¼ x 1 x ¾ *32 x 25 x 20*	500 *3450*	1.45 *36.83*	1.37 *34.80*	1.62 *41.15*	0.90 *0.41*
1¼ x 1 x 1 *32 x 25 x 25*	500 *3450*	1.58 *40.13*	1.50 *38.10*	1.67 *42.42*	1.00 *0.45*
1¼ x 1 x 1¼ *32 x 25 x 32*	500 *3450*	1.75 *44.45*	1.67 *42.42*	1.75 *44.45*	1.08 *0.49*
1¼ x 1 x 1½ *32 x 25 x 40*	500 *3450*	1.88 *47.75*	1.80 *45.72*	1.82 *46.22*	1.42 *0.64*
1¼ x 1¼ x ½ *32 x 32 x 15*	500 *3450*	1.34 *34.04*	1.34 *34.04*	1.53 *38.86*	0.86 *0.39*

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

FIGURE 3205R - REDUCING TEE

Nominal Size 1 x 2 x 3	Max. Working Pressure▲	Dimensions A	B	C	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1¼ x 1¼ x ¾ *32 x 32 x 20*	500 *3450*	1.45 *36.83*	1.45 *36.83*	1.62 *41.15*	0.92 *0.42*
1¼ x 1¼ x 1 *32 x 32 x 25*	500 *3450*	1.58 *40.13*	1.58 *40.13*	1.67 *42.42*	0.95 *0.43*
1¼ x 1¼ x 1½* *32 x 32 x 40*	500 *3450*	1.88 *47.75*	1.88 *47.75*	1.82 *46.22*	1.45 *0.66*

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

* Part supplied as "Bull Head Tee".

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

FIG. 3205R

Reducing Tee

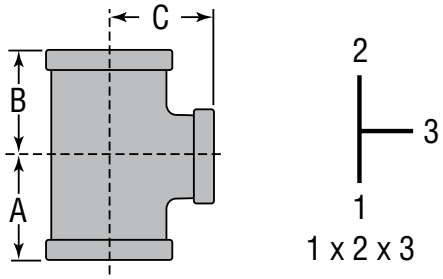

FIGURE 3205R - REDUCING TEE					
Nominal Size	Max. Working Pressure▲	Dimensions			Approx. Wt. Each
1 x 2 x 3		A	B	C	
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1¼ x 1¼ x 2* *32 x 32 x 50*	500 *3450*	2.10 *53.34*	2.10 *53.34*	1.90 *48.26*	1.75 *0.79*
1½ x 1 x ½ *40 x 25 x 15*	500 *3450*	1.41 *35.81*	1.34 *34.04*	1.66 *42.16*	0.95 *0.43*
1½ x 1 x ¾ *40 x 25 x 20*	500 *3450*	1.52 *38.61*	1.37 *34.80*	1.75 *44.45*	1.14 *0.52*
1½ x 1 x 1 *40 x 25 x 25*	500 *3450*	1.65 *41.91*	1.50 *38.10*	1.80 *45.72*	1.17 *0.53*
1½ x 1 x 1¼ *40 x 25 x 32*	500 *3450*	1.82 *46.23*	1.67 *42.42*	1.88 *47.75*	1.34 *0.61*
1½ x 1 x 1½ *40 x 25 x 40*	500 *3450*	1.94 *49.28*	1.80 *45.72*	1.94 *49.28*	1.45 *0.66*
1½ x1¼ x ½ *40 x 32 x 15*	500 *3450*	1.41 *35.81*	1.34 *34.04*	1.66 *42.16*	1.05 *0.48*
1½ x1¼ x ¾ *40 x 32 x 20*	500 *3450*	1.52 *38.61*	1.45 *36.83*	1.75 *44.45*	1.15 *0.5*
1½ x 1¼ x 1 *40 x 32 x 25*	500 *3450*	1.65 *41.91*	1.58 *40.13*	1.80 *45.72*	1.25 *0.57*
1½ x 1¼ x 2* *40 x 32 x 50*	500 *3450*	2.16 *54.86*	2.10 *53.34*	2.02 *51.30*	1.90 *0.86*
1½ x 1½ x ½ *40 x 40 x 15*	500 *3450*	1.41 *35.81*	1.41 *35.81*	1.16 *29.46*	1.15 *0.52*
1½ x 1½ x ¾ *40 x 40 x 20*	500 *3450*	1.52 *38.61*	1.52 *38.61*	1.75 *44.45*	1.24 *0.56*
1½ x 1½ x 1 *40 x 40 x 25*	500 *3450*	1.65 *41.91*	1.65 *41.91*	1.80 *45.72*	1.30 *0.59*
1½ x 1½ x 1¼ *40 x 40 x 32*	500 *3450*	1.82 *46.23*	1.82 *46.23*	1.88 *47.75*	1.48 *0.67*

FIGURE 3205R - REDUCING TEE					
Nominal Size	Max. Working Pressure▲	Dimensions			Approx. Wt. Each
1 x 2 x 3		A	B	C	
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1½ x 1½ x 2* *40 x 40 x 50*	500 *3450*	2.16 *54.86*	2.16 *54.86*	2.02 *51.30*	1.98 *0.90*
2 x 1 x 2 *50 x 25 x 50*	500 *3450*	2.25 *57.15*	2.02 *51.31*	2.25 *57.15*	2.15 *0.98*
2 x 1¼ x 2 *50 x 32 x 50*	500 *3450*	2.25 *57.15*	2.10 *53.34*	2.25 *57.15*	2.30 *1.04*
2 x 1½ x ½ *50 x 40 x 15*	500 *3450*	1.49 *37.85*	1.41 *35.81*	1.88 *47.75*	1.50 *0.68*
2 x 1½ x ¾ *50 x 40 x 20*	500 *3450*	1.60 *40.64*	1.52 *38.61*	1.97 *50.04*	1.62 *0.73*
2 x 1½ x 1 *50 x 40 x 25*	500 *3450*	1.73 *43.94*	1.65 *41.91*	2.02 *51.31*	1.64 *0.74*
2 x 1½ x 1¼ *50 x 40 x 32*	500 *3450*	1.90 *48.26*	1.82 *46.23*	2.10 *53.34*	1.80 *0.82*
2 x 1½ x 1½ *50 x 40 x 40*	500 *3450*	2.02 *51.31*	1.94 *49.28*	2.16 *54.86*	2.00 *0.91*
2 x 1½ x 2 *50 x 40 x 50*	500 *3450*	2.25 *57.15*	2.16 *54.86*	2.25 *57.15*	2.35 *1.07*
2 x 2 x ½ *50 x 50 x 15*	500 *3450*	1.49 *37.85*	1.49 *37.85*	1.88 *47.75*	1.60 *0.73*
2 x 2 x ¾ *50 x 50 x 20*	500 *3450*	1.60 *40.64*	1.60 *40.64*	1.97 *50.04*	1.68 *0.76*
2 x 2 x 1 *50 x 50 x 25*	500 *3450*	1.73 *43.94*	1.73 *43.94*	2.02 *51.31*	1.85 *0.84*
2 x 2 x 1¼ *50 x 50 x 32*	500 *3450*	1.90 *44.45*	1.90 *42.42*	2.10 *44.45*	2.04 *0.93*
2 x 2 x 1½ *50 x 50 x 40*	500 *3450*	2.02 *44.45*	2.02 *42.42*	2.16 *44.45*	2.18 *0.99*

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

* Part supplied as "Bull Head Tee".

FIG. 3205

Straight Tee

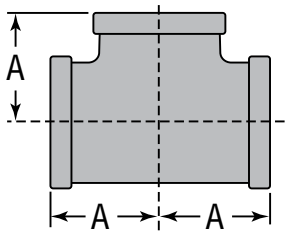

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FIGURE 3205 - STRAIGHT TEE

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	500 *3450*	1.50 *38.10*	0.85 *0.39*
1¼ *32*	500 *3450*	1.75 *44.45*	1.22 *0.55*
1½ *40*	500 *3450*	1.94 *49.27*	1.55 *0.70*
2 *50*	500 *3450*	2.25 *57.15*	2.45 *1.11*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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

FIG. 3221

Coupling

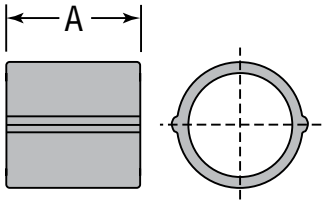

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FIGURE 3221 - COUPLING

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	500 *3450*	1.67 *42.42*	0.40 *0.18*
1¼ *32*	500 *3450*	1.93 *49.02*	0.57 *0.26*
1½ *40*	500 *3450*	2.15 *54.61*	0.75 *0.34*
2 *50*	500 *3450*	2.53 *64.26*	1.15 *0.52*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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

FIG. 3221R

Reducing Coupling

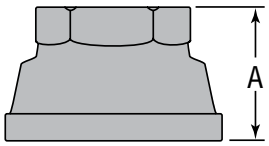

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FIGURE 3221R - REDUCING COUPLING

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 x ½ *25 x 15*	500 *3450*	1.69 *42.92*	0.39 *0.18*
1 x ¾ *25 x 20*	500 *3450*	1.69 *42.92*	0.53 *0.24*
1¼ x ¾ *32 x 20*	500 *3450*	2.06 *52.32*	0.64 *0.29*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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

FIG. 3283

Bushings

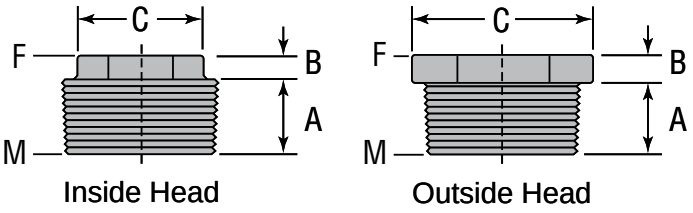

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FIGURE 3283 - BUSHINGS

Nominal Size Male (M) x Female (F)	Max. Working Pressure▲	Dimensions A	Dimensions B	Dimensions C	Style	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*		*Lbs. (kg)*
1 x ½ *25 x 15*	500 *3450*	0.75 *19.05*	0.25 *6.35*	1.42 *36.06*	Outside	0.22 *0.10*
1 x ¾ *25 x 20*	500 *3450*	0.75 *19.05*	0.25 *6.35*	1.42 *36.06*	Outside	0.17 *0.08*
1¼ x 1 *32 x 25*	500 *3450*	0.80 *20.32*	0.28 *7.11*	1.76 *44.70*	Outside	0.28 *0.13*
1½ x 1 *40 x 25*	500 *3450*	0.83 *21.08*	0.31 *7.874*	2.00 *50.80*	Outside	0.45 *0.20*
1½ x 1¼ *40 x 32*	500 *3450*	0.83 *21.08*	0.31 *7.874*	2.00 *50.80*	Outside	0.30 *0.14*
2 x 1 *50 x 25*	500 *3450*	0.88 *22.35*	0.41 *10.414*	1.95 *49.53*	Inside	0.67 *0.30*
2 x 1¼ *50 x 32*	500 *3450*	0.88 *22.35*	0.34 *8.636*	2.48 *62.99*	Outside	0.73 *0.33*
2 x 1½ *50 x 40*	500 *3450*	0.88 *22.35*	0.34 *8.636*	2.48 *62.99*	Outside	0.61 *0.28*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.14

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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

FIG. 3224

Cap

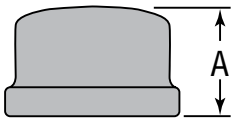

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FIGURE 3224 - CAP

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	500 *3450*	1.16 *29.46*	0.32 *0.15*
1¼ *32*	500 *3450*	1.28 *32.51*	0.43 *0.20*
1½ *40*	500 *3450*	1.33 *33.78*	0.60 *0.27*
2 *50*	500 *3450*	1.45 *36.83*	0.91 *0.41*

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

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.3

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

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

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Address:	☐ **Approved as noted**
Contractor:	☐ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

FIG. 3388

Cored Plug

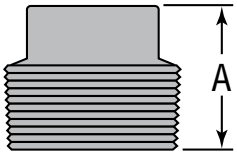

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FIGURE 3388 - CORED PLUG

Nominal Size	Maximum Working Pressure▲	Dimension A	Approx. Wt. Each
In. (mm)	*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
½* *15*	500 *3450*	0.94 *23.87*	0.10 *0.05*
¾ *20*	500 *3450*	1.07 *27.17*	0.17 *0.08*
1 *25*	500 *3450*	1.25 *31.75*	0.28 *0.13*
1¼ *32*	500 *3450*	1.36 *34.54*	0.44 *0.20*
1½ *40*	500 *3450*	1.45 *36.83*	0.62 *0.28*
2 *50*	500 *3450*	1.56 *39.62*	0.91 *0.41*

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

* Part supplied as Solid Plug.

MATERIAL SPECIFICATIONS

Dimensions: ASME B16.14

Material: ASTM A536 Grade 65-45-12

Finish: Black

Threads: NPT per ASME B1.20.1

Agency Approvals: All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

▲ Pressure - Temperature Ratings in accordance with ASME B16.3 Class 150

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

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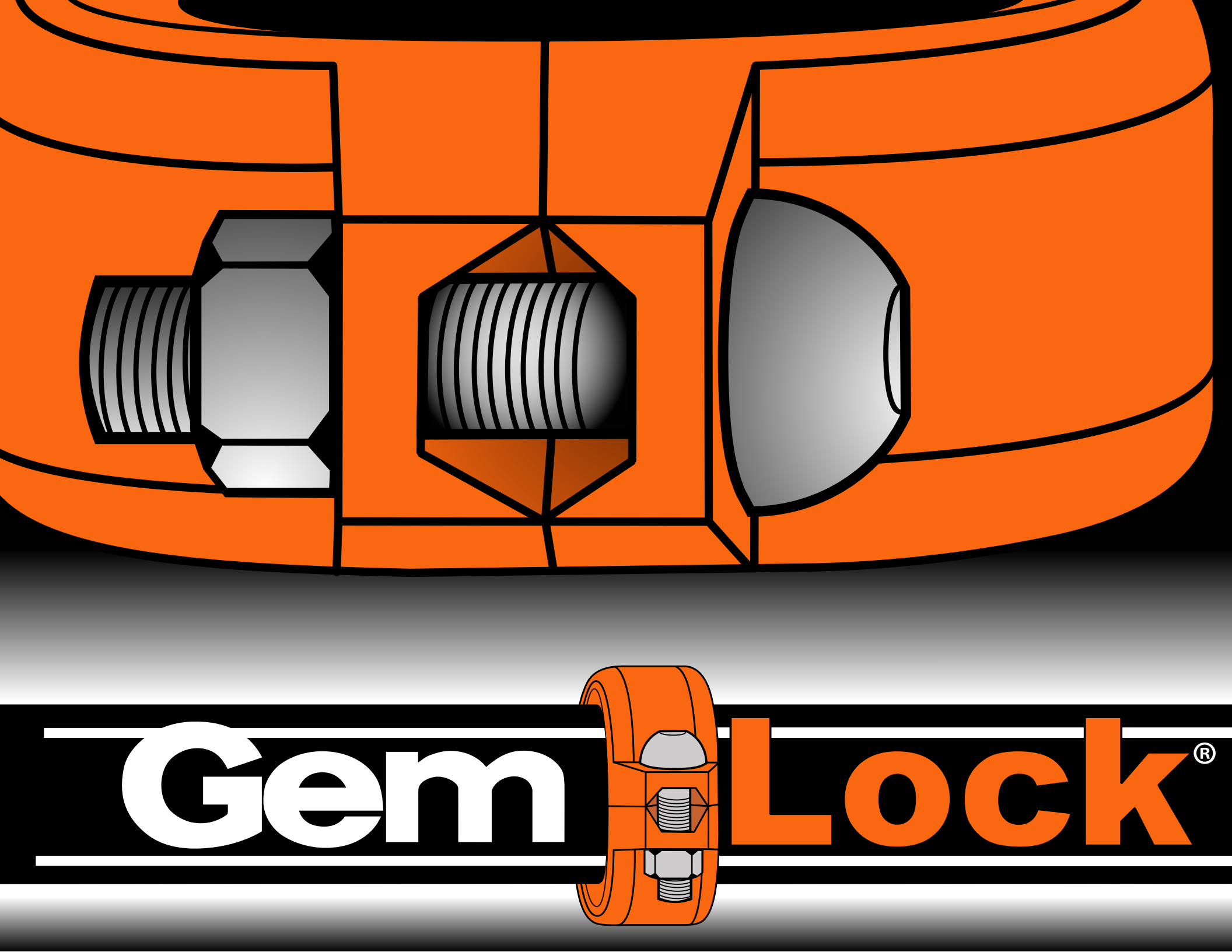
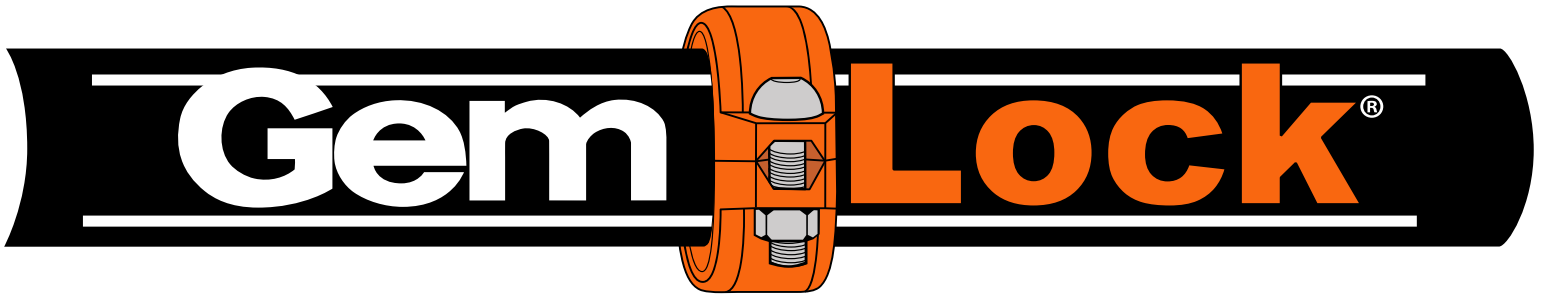
Notes 2:	


Gem Lock®



Find Gemlock Grooved Products at these locations:

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CLEVELAND, NC
10230 Statesville Road Cleveland, NC 27013
Tel: (800) 845-2023 • Fax: (800) 962-3471

TAMPA, FL
1801-B Massaro Blvd. • Tampa, FL 33619
Tel: (813) 626-4904 • Fax: (813) 621-1964

GLEN BURNIE, MD
6711 Baymeadow Drive, Ste E2 • Glen Burnie, MD 21060
Tel: (410) 787-2810 • Fax: (410) 787-2815

RENTON, WA
875 SW 7th Street • Renton, WA 98057
Tel: (800) 270-2235 • Fax: (425) 228-0162

JACKSONVILLE, FL
2463 Lloyd Road • Jacksonville, FL 32254
Tel: (904) 712-1075 • Fax: (904) 712-1080

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Tel: (516) 222-8008 • Fax: (516) 222-9234

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Tel: (718) 456-7877 • Fax: (718) 456-7852

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Tel: (718) 669-7600 • Fax: (718) 669-7601

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Tel: (518) 270-2159 • Fax: (518) 270-8384

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Tel: (860) 688-1780 • Fax: (860) 688-1784

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Tel: (800) 543-4194 • Fax: (602) 484-9248

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Gem Lock

CONTENTS

GemLock is reliable and faster to install than welding, threading or flanging, resulting in lower installed cost. Triple sealing of the C-shaped pressure responsive gasket is made from specially compounded rubber polymers with low compression set properties. Couplings perform equally well under pressure and vacuum. Couplings with Tri-seal gaskets are highly suitable for higher vacuum service and dry systems subject to freezing. Couplings are available for flexible and rigid systems, and are all pre-lubricated.

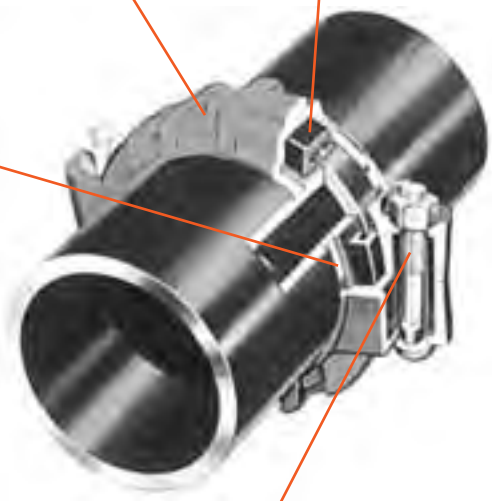
HOUSINGS

Ductile iron housing segments conforming to ASTM-A 536 Grade 65-45-12 which fully enclose the gasket. The housing keys engage into the grooves around the full pipe circumference, securing the pipe ends together with a positive grip. Housings are normally two identical castings for couplings through 12" sizes. The housing is designed to provide the optimum combination of pressure, stress relief and end load conditions while maintaining reasonable weight and manufacturing characteristics. Every grooved pipe coupling, flange adaptor and reducing coupling has a similar key section. This engages fully into the groove tying the joint integrally to the pipe.

GASKETS

The sealing efficiency of gaskets is such that the gasket forms an initial seal as it is stretched over the pipe ends. As the housing segments are installed and secured the pressure responsive gasket is slightly compressed to form a leak-tight joint. The strength of the seal is further enhanced by internal line pressure that creates downward pressure on the lips of the gasket. The gasket also seals well under vacuum conditions up to 10inHg (-0.35 Bar) which may occur when a system is drained. Please refer to the gasket selection guide for additional details and gasket materials. Gaskets are prelubricated for easy assembly of the coupling but should be lightly lubed for further ease of assembly and performance.

Roll or cut grooved standard steel pipe.



BOLTS AND NUTS

Oval neck track bolt conforming to ASTM A183 with minimum tensile strength of 110,000 psi or square neck carriage bolt to ASTM A446 with 120,000 psi minimum tensile strength permits tightening of the nuts from one side with a single wrench. Nuts conform to ASTM A194. Bolts and nuts are electro galvanized.

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FEATURES

REDUCED COSTS

Coupling assembly is quick and easy. Minimal training required. The system is free from contaminates such as weld slag and pipe dope. Installation costs are controllable and estimates are more precise.

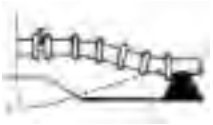
UNION TYPE JOINT

Couplings can be disassembled easily permitting maintenance and servicing of the piping system. It will facilitate periodic rotation of pipe to distribute internal wear from slurries or other abrasive media.

RELIABILITY

The couplings engage the pipe around the entire circumference and restrain the pipe ends from separation due to pressure and other forces, up to the maximum coupling rated working pressure.

DEFLECTION AND MISALIGNMENT



Precise location of pipe openings through walls and floors is unnecessary. Long radius curves may be designed with fewer elbows. Useful for providing pitch for drainage. Facilitates laying pipe on rough or uneven terrain.

EXPANSION AND CONTRACTION

Provides linear movement at each joint. Allows pipe expansion and contraction. Suitable for hot and cold water lines and dual temperature systems.

STRESS FREE JOINT

Flexibility of the joint reduces or eliminates stresses from settlement of burried pipe or induced by seismic tremors.

NOISE AND VIBRATION

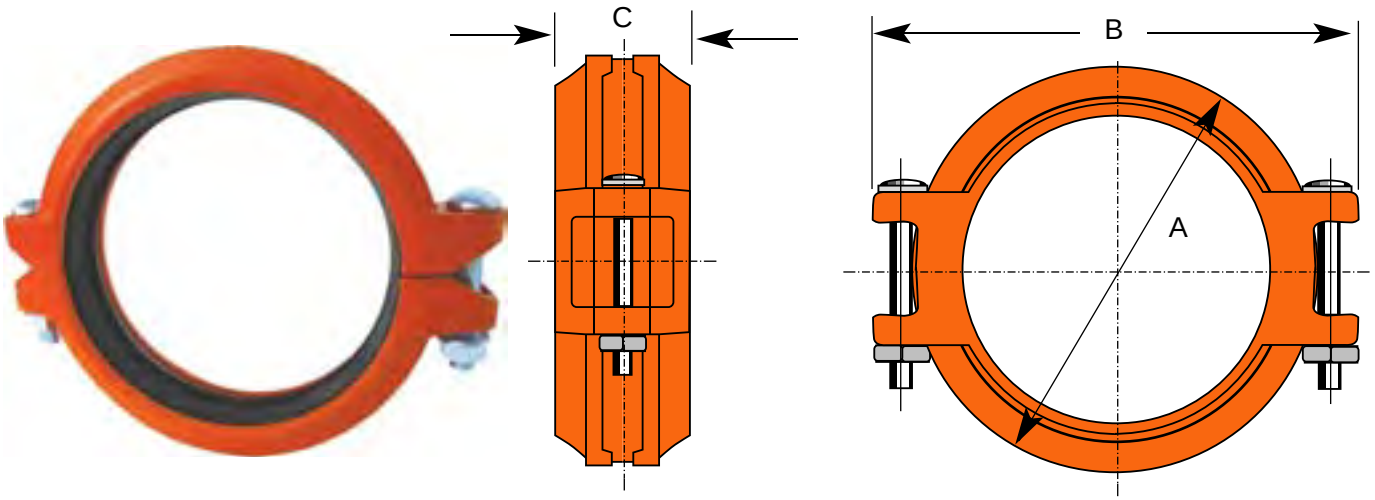
Slight gap between pipe ends isolates noise and vibration. Resilient gasket also helps to absorb noise and vibration. Often permits elimination of noise suppression devices.

RIGIDITY

Couplings available for rigidity at valves, equipment or mechanical rooms. Couplings grip pipe to provide a rigid system used with standard groove specifications.

RIGID COUPLING - STYLE 5

- Provides joint rigidity, for the support and hanging requirements of ANSI B31.1 Power Piping Code; ANSI B31.9 Building Service Pipe Code and NFPA 13 Sprinkler Systems
- Tongue and groove arrangements in housings do not permit expansion, contraction or deflection
- Available with hot dipped galvanized coatings as optional
- Supplied with pre-lubed gasket



Pipe		Max Working Pressure (psi)*	Allow Pipe End Separation (In.)§	Dimensions (In.)			Approx. Weight Each (lb.)
Nominal Size	Actual SIze (In.)			A	B	C	
1¼"	1.660	400	0.10	2.535	3.897	1.732	1.5
1½"	1.900	400	0.10	2.803	3.858	1.732	1.7
2"	2.375	400	0.10	3.283	5.00	1.732	1.9
2½"	2.875	400	0.10	3.842	5.433	1.732	1.9
3"	3.500	400	0.10	4.574	6.535	1.772	2.4
4"	4.500	400	0.16	5.416	7.598	1.889	3.2
5"	5.563	300	0.16	6.771	8.818	1.889	4.5
6"	6.625	300	0.16	7.874	9.921	1.889	5.8
8"	8.625	300	0.19	10.11	12.367	2.362	10.8
10"*	10.75	300	0.19	11.25	15.875	2.500	16.60

* Standard Weight Coupling

UL Listed Under File No. EX15592

NOTES:
Allowable pipe end separation is for cut groove pipe for roll groove, figures will be one-half of the values listed at time of initial pressurization. – Bolts and Nuts are galvanized. * – Maximum pressure including surges and maximum end loads from all internal and external forces, to which a joint could be subject under normal working conditions. This rating provides a nominal safety factor of 1.5 times working pressure based on standard weight steel pipe. Maximum working pressure may be subjected to a one time field test of 1.5 times the figures indicated. Refer to installations and groove specifications when assembling any grooved product. EPDM gasket is supplied as standard. For other gaskets contact us.

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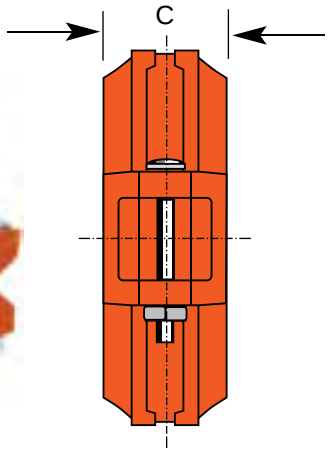
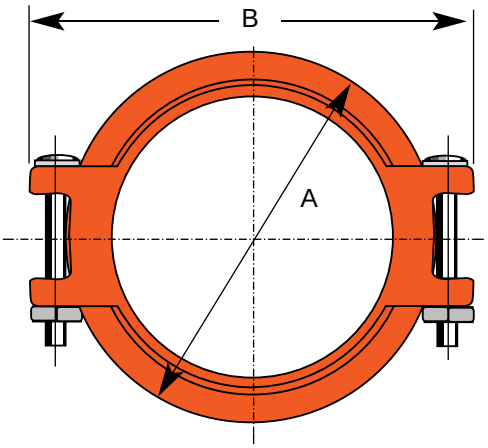
FLEXIBLE COUPLING - STYLE 12

- Provides joint flexibility required in some piping systems
- Conforms to the requirements of ANSI B31.1 Power Piping Code; ANSI B31.9 Building Service Pipe Code and NFPA 13 Sprinkler Systems
- Available with hot dipped galvanized coating as optional
- Supplied with pre-lubed gasket





Pipe		Max Working Pressure (psi)*	Allow Pipe End Separation (in.)§	Max Deflection from Center Line §		Dimensions (In.)			Approx. Weight Each (lb.)
Nominal Size	Actual Size (In.)			Per Coup. Deg.	Pipe (In.)	A	B	C	
1¼"	1.660	400	0.10	4˚-19'	0.90	2.535	3.897	1.732	1.3
1½"	1.900	400	0.10	3˚-46'	0.79	2.803	4.527	1.732	1.5
2"	2.375	400	0.10	3˚-1'	0.62	3.283	5.00	1.732	1.7
2½"	2.875	400	0.10	2˚-29'	0.52	3.842	5.433	1.732	2.0
3"	3.500	400	0.10	2˚-3'	0.43	4.574	6.535	1.772	2.6
4"	4.500	400	0.16	3˚-11'	0.67	5.614	7.598	1.889	4.1
5"	5.563	300	0.16	2˚-35'	0.54	6.771	8.818	1.889	5.7
6"	6.625	300	0.16	2˚-10'	0.46	7.874	9.921	1.889	6.1
8"	8.625	300	0.19	1˚-40'	0.34	10.71	12.637	2.362	11.9
10" *	10.75	300	0.19	0˚-95'	0.13	12.91	16.54	2.52	21.5

*Standard weight coupling

UL Listed Under File No. EX15592

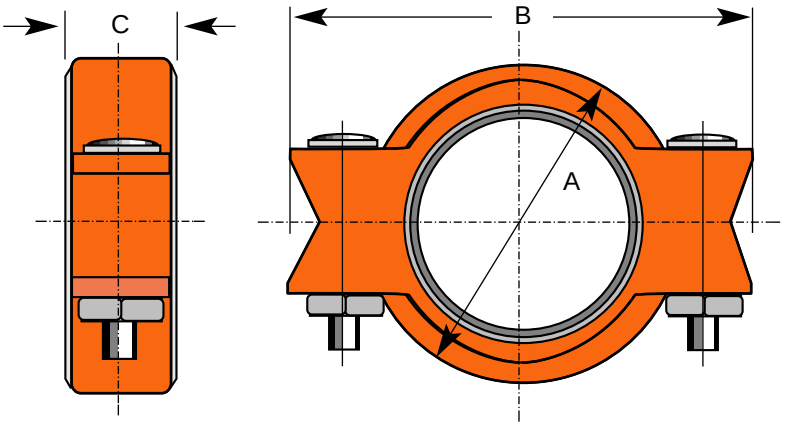
NOTES:
Allowable pipe end separation is for cut groove pipe for roll groove, figures will be one-half of the values listed at time of initial pressurization. – Bolts and Nuts are galvanized. * – Maximum pressure including surges and maximum end loads from all internal and external forces, to which a joint could be subject under normal working conditions. This rating provides a nominal safety factor of 1.5 times working pressure based on standard weight steel pipe. Maximum working pressure may be subjected to a one time field test of 1.5 times the figures indicated. Refer to installations and groove specifications when assembling any grooved product. EPDM gasket is supplied as standard. For other gaskets contact us.

REDUCING COUPLING - STYLE 25

- Replaces two couplings and in-line reducer (concentric or eccentric)
- Available with hot dipped galvanized coating

HEAD LOSS

Size (In.)	Flow Reducing		Flow Expanding	
	C_L Value	Equivalent Pipe Length(Smaller Dia.)	C_L Value	Equivalent Pipe Length(Smaller Dia.)
6" x 4"	0.16	4.5 ft	0.08	2.3 ft
5" x 4"	0.14	3.0 ft	0.14	3.3 ft
4" x 3"	0.37	6.0 ft	0.15	2.5 ft
3" x 2½"	0.30	3.8 ft	0.19	2.5 ft
3" x 2"	0.50	5.5 ft	0.30	3.5 ft
2½" x 2"	0.18	1.9 ft	0.09	1.0 ft
2" x 1½"	0.25	1.9 ft	0.23	2.0 ft



In above table, $C_L = \frac{2GH_L}{V^2}$

H_L = Head Loss in feet

V = Velocity in smaller pipe in feet/sec.

G = Acceleration due to gravity = 32.2 feet/sec.

Pipe Nominal Size	Max Working Pressure (psi)*	Allow Pipe End Separation (in.)§	Max Deflection from Center Line §		Dimensions (In.)			Approx. Weight Each (lb.)
			Per Coup. Deg.	Pipe (In.)	A	B	C	
1½" x 1¼"	300	0.12	1°-53'	0.40	2.88	4.55	1.77	2.2
2" x 1¼"	300	0.12	1°-53'	0.40	3.543	5.079	1.85	2.2
2" x 1½"	300	0.12	1°-33'	0.40	3.543	5.079	1.85	2.0
2½" x 2"	300	0.12	1°-33'	0.32	3.976	5.394	1.8	3.1
3" x 2"	300	0.12	1°-17'	0.26	4.724	6.45	1.89	4.0
3" x 2½"	300	0.12	1°-17'	0.26	4.72	6.457	1.89	3.7
4" x 2"	300	0.25	2°-38'	0.55	5.906	7.677	1.929	6.4
4" x 2½"	300	0.25	2°-38'	0.55	5.906	7.677	1.929	6.2
4" x 3"	300	0.25	2°-38'	0.55	5.906	7.677	1.929	5.5
5" x 4"	300	0.25	2°-5'	0.44	6.969	8.74	1.909	10.8
6" x 4"	300	0.25	1°-44'	0.38	7.992	9.252	1.969	11.0
8" x 6"	300	0.25	1°-15'	0.26	10.394	12.32	2.362	18.5

UL Listed Under File No. EX15592

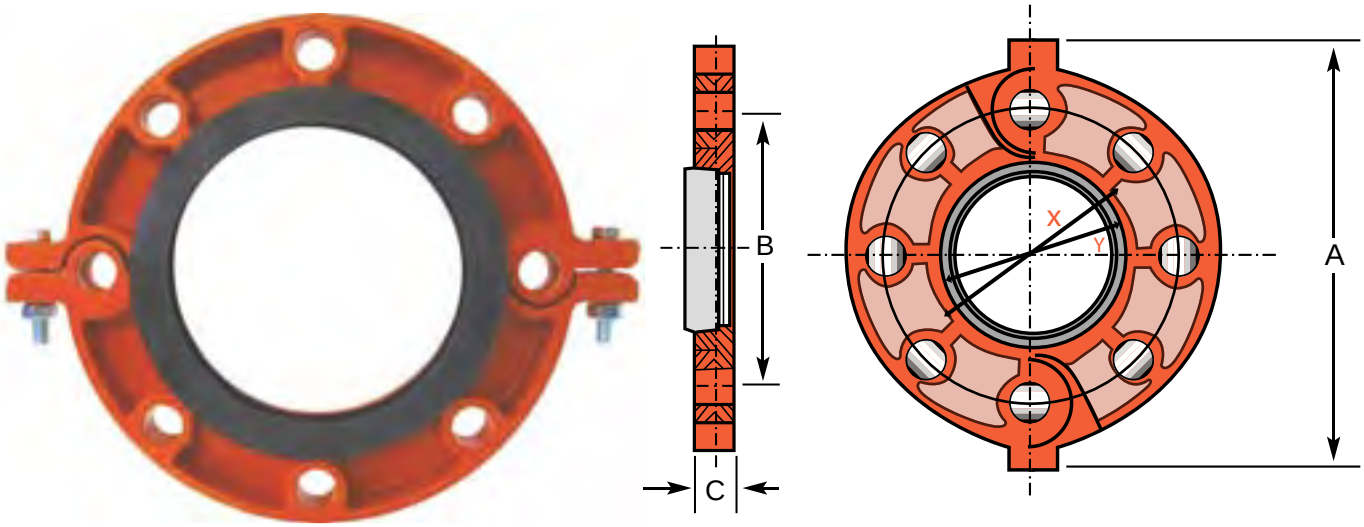
NOTES:

Allowable pipe end separation is for cut groove pipe for roll groove, figures will be one-half of the values listed at time of initial pressurization. – Bolts and Nuts are galvanized. * – Maximum pressure including surges and maximum end loads from all internal and external forces, to which a joint could be subject under normal working conditions. This rating provides a nominal safety factor of 1.5 times working pressure based on standard weight steel pipe. Maximum working pressure may be subjected to a one time field test of 1.5 times the figures indicated. Refer to installations and groove specifications when assembling any grooved product. EPDM gasket is supplied as standard.

60 Cohoes Ave. Green Island, NY 12183 • Ph: (518) 270-2159 • Fax: (518) 270-8384

GROOVED FLANGE - STYLE 14

- Designed to connect ANSI Class 125 or 150 flanged components to a grooved piping system
- Made of a ductile iron conforming to ASTM A-536. Every lot is metallurgically examined to insure compliance
- Provided with EPDM rubber gasket as standard, suitable for -30 ˚ F to 150 ˚ F (-34 ˚ C to 110 ˚ C)
- Available with hot dipped galvanized coating

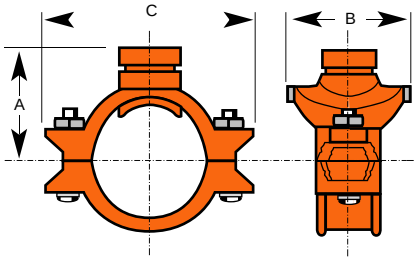


Pipe		Max Working Pressure (psi)*	Number and Bolt Size	Sealing Surface (In.)		Dimensions (In.)			Approx. Wt. Each (lb.)
Nominal Size	Actual Size (In.)			X Min.	Y Max.	A	B	C	
						ANSI	ANSI		
2”	2.375	300	4⅝ x 2½	3.09	2.42	8.110	4.763	0.866	3.0
2½”	2.875	300	4⅝ x 3	3.58	2.92	9.055	5.511	0.866	4.2
3”	3.500	300	4⅝ x 3	4.21	3.56	9.527	5.984	0.944	4.4
4”	4.500	300	8⅝ x 3	5.26	4.57	11.023	7.519	0.944	8.4
5”	5.563	300	8¾ x 3½	6.41	5.65	12.795	8.503	0.964	9.0
6”	6.625	300	8¾ x 3½	7.48	6.71	13.188	9.500	0.866	10.4
8”	8.625	300	8¾ x 3½	9.58	8.70	16.311	11.751	1.181	19.8
10”	10.75	300	12⅞ x 3½	11.91	11.18	19.50	14.375	1.181	23.4

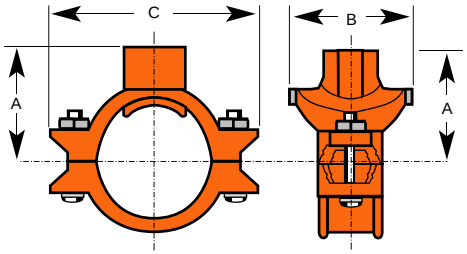
UL Listed Under File No. EX15592

MECHANICAL TEES -
STYLE 15 GROOVED & STYLE 16 THREADED

• Mechanical Branchlet provides a direct branch connection at any location along the pipe run without welding. A hole cut along the center line of pipe will receive the hole locator collar to secure the outlet. A pressure responsive gasket molded to suit the run pipe insures leak tight joints. Cross type connections can be made utilizing upper housings only. Available with hot dipped galvanized coating.



STYLE 15



STYLE 16

UL Listed Under File No. EX15592

Run Size (In.)	Outlet Size (In.)	Max Working Pressure (psi)*	Hole Diameter		Grooved Dimensions (In.)			Threaded Dimensions (In.)			Approx. Weight Each	
			Hole Saw (in.)	Max Perm. (In.)	Grvd. A	B	C	Thrd. A	B	C	Grvd. lb.	Thrd. lb.
2	1/2	300	1.50	1.63	-	-	-	2.36	2.71	2.77	-	2.5
	3/4	300	1.50	1.63	-	-	-	2.36	2.71	2.87	-	2.2
	1	300	1.50	1.63	-	-	-	2.36	2.71	4.57	-	2.4
	1-1/4	300	1.75	1.81	2.32	2.71	4.57	2.36	2.71	4.57	2.5	2.5
	1-1/2	300	1.75	1.81	2.32	2.71	4.57	2.36	2.71	4.57	2.5	2.5
2½	1/2	300	1.50	1.63	-	-	-	2.76	3.03	5.67	-	3.5
	3/4	300	1.50	1.63	-	-	-	2.76	3.03	5.67	-	3.3
	1	300	1.50	1.63	-	-	-	2.76	3.03	5.67	-	3.3
	1-1/4	300	2.00	2.13	3.16	2.76	5.67	2.76	3.27	5.67	-	3.5
	1-1/2	300	2.00	2.13	3.16	2.76	5.67	2.76	3.27	5.67	-	3.5
3	1/2	300	1.50	1.63	-	-	-	3.23	3.03	5.98	-	4.0
	3/4	300	1.50	1.63	-	-	-	3.23	3.03	5.98	-	3.9
	1	300	1.50	1.63	2.76	3.07	5.98	3.23	3.03	5.98	-	3.9
	1-1/4	300	2.00	2.13	2.76	3.23	5.98	3.23	3.27	5.98	4.2	4.2
	1-1/2	300	2.00	2.13	2.76	3.58	5.98	3.23	3.62	5.98	4.2	4.2
	2	300	2.50	2.63	3.23	2.40	5.98	3.23	3.90	5.98	4.2	4.3
4	1/2	300	1.50	1.63	-	-	-	3.43	7.25	6.77	-	5.3
	3/4	300	1.50	1.63	-	-	-	3.43	7.25	6.77	-	5.1
	1	300	1.50	1.63	-	-	-	3.43	3.03	6.77	-	4.9
	1-1/4	300	2.00	2.13	3.66	3.27	7.32	3.43	3.27	6.77	5.4	5.1
	1-1/2	300	2.00	2.13	3.66	3.62	7.32	3.43	3.62	6.77	4.8	5.1
	2	300	2.50	2.63	3.66	3.82	7.40	3.43	3.81	6.77	5.1	4.8
	2-1/2	300	3.00	3.05	3.66	4.41	7.40	3.43	4.41	6.77	5.3	5.1
	3	300	3.50	3.63	3.66	4.80	7.40	3.43	4.80	6.77	6.4	6.4

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MECHANICAL TEES -

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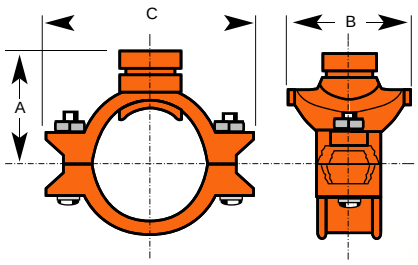
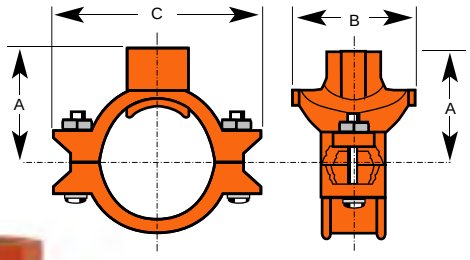


STYLE 15



STYLE 16

Cross Configuration

PERFORMANCE DATA

OUTLET SIZE Nominal Size (In.)	Cv Values	Equiv. Feet of Pipe	
		Grvd.	Female Thrd.
½	15	-	2.0
¾	18	-	4.0
1	22	-	5.0
1¼	39	5.5	6.0
1½	52	7.0	8.0
2	87	9.0	10.5
2½	117	11.0	12.5
3	173	13.5	15.5
4	346	20.0	22.0

Run Size (In.)	Outlet Size (In.)	Max Working Pressure	Hole Diameter		Grooved Dimensions (In.)			Threaded Dimensions (In.)			Approx. Weight Each	
			Hole Saw (in.)	Max Perm. (In.)	A	B	C	A	B	C	Grvd. lb.	Thrd. lb.
5	1¼	300	2.00	2.13	4.21	3.00	8.66	3.94	3.27	8.27	6.0	6.8
	1½	300	2.00	2.13	4.21	3.40	8.66	3.94	3.62	8.27	6.2	6.6
	2	300	2.50	2.63	4.21	3.82	8.66	3.94	3.82	8.27	6.6	6.8
	2½	300	2.75	2.88	4.21	4.41	8.66	3.94	4.41	8.27	7.5	7.9
	3	300	3.50	3.63	4.21	4.80	8.66	3.94	4.80	8.27	8.3	8.2
6	1¼	300	2.00	2.13	5.04	3.29	9.72	4.61	3.27	8.66	8.2	7.7
	1½	300	2.00	2.13	5.04	3.62	9.72	4.61	3.62	8.66	7.5	7.9
	2	300	2.50	2.63	5.04	3.86	9.72	4.61	3.82	8.66	7.7	8.2
	2½	300	3.25	3.35	5.04	4.76	9.72	4.61	4.41	8.66	7.7	8.3
	3	300	3.50	3.63	5.04	5.28	9.72	4.61	4.80	8.66	9.0	8.8
	4	300	4.50	4.63	5.04	6.18	9.72	4.61	5.20	8.66	11.0	12.8
8	2	300	2.50	2.63	5.75	3.82	12.20	5.35	3.82	12.20	11.0	11.5
	2½	300	2.75	2.88	5.75	4.41	12.20	5.35	4.41	12.20	10.0	10.8
	3	300	3.50	3.63	5.75	4.80	12.20	5.35	4.80	12.20	12.3	12.5
	4	300	4.50	4.63	5.75	5.28t	12.20	5.35	5.20	12.20	12.6	13.2

UL Listed Under File No. EX15592

NOTES:

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GROOVED FITTINGS - SHORT PATTERN

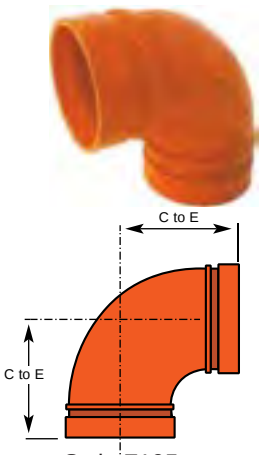
STYLES F105, F106, F107, F135 & F155

- Sized to improve flow
- Designed to Fire Protection Industry standards for short patterned fittings
- Rated for 300 lbs.
- Made of durable, high-strength ductile iron conforming to ASTM A536; every lot is metallurgically tested for compliance
- Available with hot dipped galvanized coating

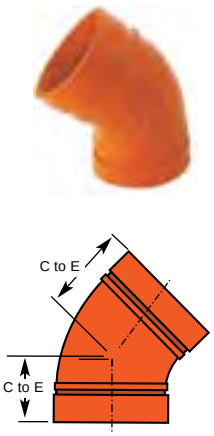
UL Listed Under File No. EX15591

FLOW DATA Frictional Resistance (Expressed as equivalent Straight Pipe in Ft.)								
Nominal Size (In.)	90˚ Elbow		45˚ Elbow		Tee			
					Branch		Run	
	STD	F105	STD	F106	STD	F107	STD	F107
1	1.7	1.4	0.9	0.9	4.4	4.0	1.7	1.4
1¼	2.3	1.8	1.2	1.0	5.8	4.2	2.3	1.8
1½	2.7	2.5	1.3	1.3	6.7	5.5	2.7	2.5
2	3.4	3.2	1.7	1.6	8.6	8.2	3.4	2.5
2½	4.1	3.9	2.1	2.0	10.3	10.1	4.1	3.9
3	5.1	4.8	2.6	2.4	12.8	12.5	5.1	4.8
4	6.7	6.5	3.4	3.2	16.8	16.0	6.7	6.5
5	8.4	8.4	4.2	4.0	21.0	20.5	8.4	8.2
6	10.1	10.0	5.1	4.8	25.3	24.0	10.1	9.6
8	13.3	13.0	6.7	6.5	33.3	33.0	13.3	13.0

Flow data is based upon the pressure drop of Sch. 40 pipe.



Style F105



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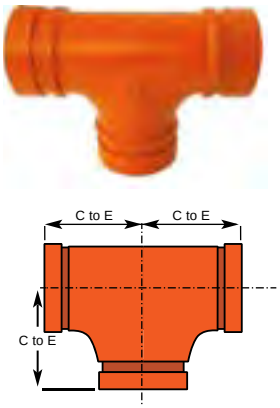

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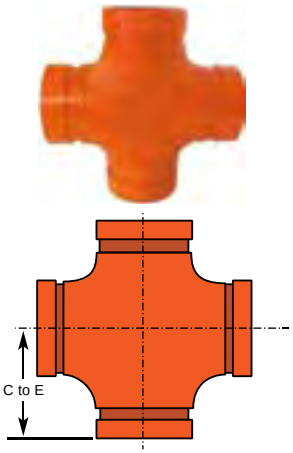
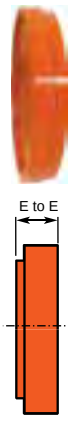


Style F135



Style F155

Pipe		90˚ Elbow - No.F105		45˚ Elbow - No.F106		Equal Tee - No.F107		Cross - No.F135		End Cap - No.F155	
Nominal Size (In.)	Actual Size (In.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	E to E (In.)	Approx. Wgt. Ea. (lb.)
1¼	1.660	2.362	0.9	1.732	0.5	2.362	1.0	-	-	.866	0.4
1½	1.900	2.362	1.1	1.732	0.9	2.362	1.5	-	-	.866	0.5
2	2.375	2.755	1.3	2.007	1.1	2.755	1.9	2.755	2.2	.866	0.6
2½	2.875	3.00	2.0	2.007	1.8	3.00	2.6	3.00	3.3	.866	0.7
3	3.500	3.5	2.6	2.519	2.2	3.5	4.2	3.5	5.1	.866	1.1
4	4.500	4.00	5.1	2.992	4.0	4.00	6.6	4.00	7.5	.99	1.8
5	5.563	4.803	6.8	3.543	6.4	4.803	9.0	4.803	13.7	.99	2.9
6	6.625	5.50	12.8	3.74	9.3	5.50	20.9	5.5	19.7	.99	4.2
8	8.625	6.80	22.7	4.881	16.3	6.95	32.9	7.047	34.4	1.181	7.9

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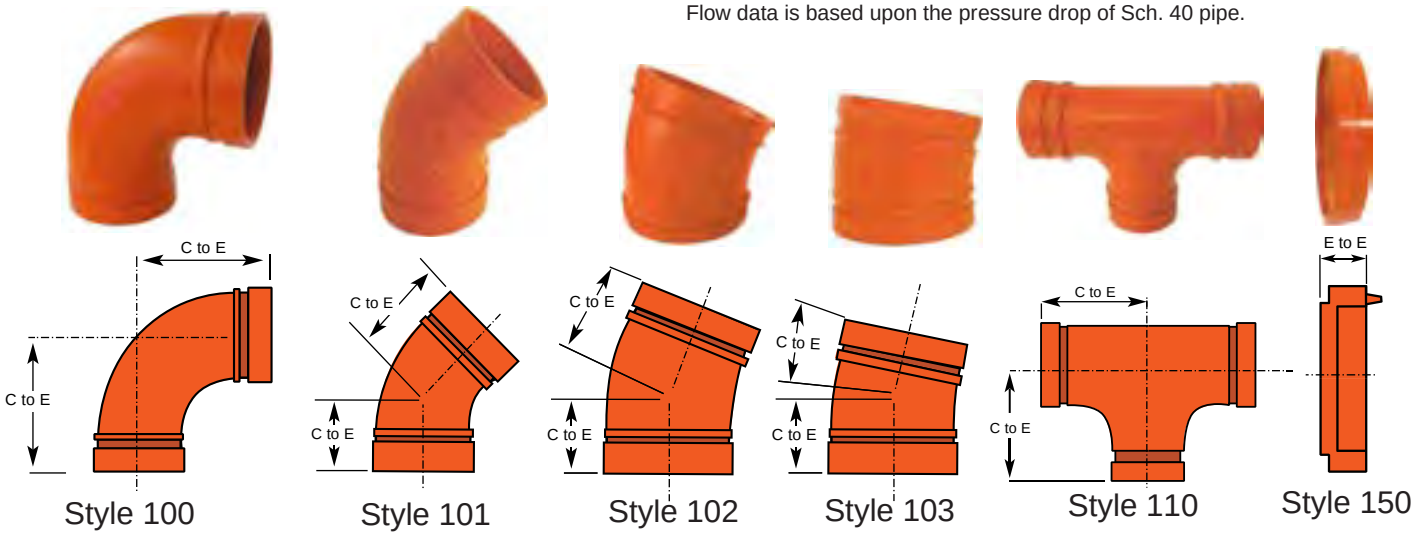
STANDARD GROOVED FITTINGS
STYLES 100, 101, 102, 103, 110 & 150

- All fittings are full flow design
- Specifically for use in HVAC Systems
- Made of durable, high-strength ductile iron conforming to ASTM A536; every lot is metallurgically tested for compliance
- Available with hot dipped galvanized coating
- Suitable for HVAC, plumbing, & fire protection systems

FLOW DATA
Frictional Resistance (Expressed as equivalent Straight Pipe in Ft.)

Nominal Size (In.)	Elbow		Tee		Nominal Size (In.)	Elbow		Tee	
	90˚ Elbow	45˚ Elbow	Branch	Run		90˚ Elbow	45˚ Elbow	Branch	Run
1¼	2.3	1.2	5.8	2.3	5	8.4	4.2	21.0	8.4
1½	2.7	1.3	6.7	2.7	6	10.1	5.1	25.3	10.1
2	3.4	1.7	8.6	3.4	8	13.3	6.7	33.3	13.3
2½	4.1	2.1	10.3	4.1	10	16.7	8.4	41.8	16.7
3	5.1	2.6	12.8	5.1	12	20.0	10.0	50.0	20.0
4	6.7	3.4	16.8	6.7					

Flow data is based upon the pressure drop of Sch. 40 pipe.

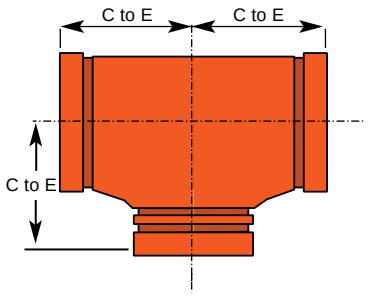


Pipe		90˚ Elbow - No.100		45˚ Elbow - No.101		22½˚ Elbow - No.102		11¼˚ Elbow - No.103		Equal Tee - No.110		End Cap - No.150	
Nominal Size (In.)	Actual Size (In.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	C to E (In.)	Approx. Wgt. Ea. (lb.)	E to E (In.)	Approx. Wgt. Ea. (lb.)
1¼	1.660	2.75	0.9	1.75	0.6	1.75	0.7	1.38	0.5	2.75	1.4	.866	0.12
1½	1.900	2.75	1.1	1.75	1.0	1.75	0.8	1.38	0.7	2.75	1.8	.866	0.16
2	2.375	3.25	1.9	2.00	1.3	1.88	1.5	1.38	0.9	3.25	2.8	.866	0.26
2½	2.875	3.75	3.0	2.00	2.2	2.00	1.9	1.50	1.5	3.75	4.4	.866	0.37
3	3.500	4.25	4.7	2.50	3.2	2.25	3.2	1.50	2.0	4.25	6.5	.866	0.52
4	4.500	5.00	7.8	3.00	5.5	2.87	5.3	1.75	3.3	5.00	11.8	.99	0.70
5	5.563	5.50	12.1	3.25	8.5	2.88	7.2	2.00	5.0	5.50	19.2	.99	1.14
6	6.625	6.50	16.5	3.50	12.5	3.13	11.4	2.00	7.4	6.50	24.0	.99	1.68
8	8.625	7.75	33.1	4.25	21.8	3.88	17.8	2.00	10.0	7.75	51.8	1.181	3.51
10	10.750	9.00	61.1	4.75	28.9	4.38	30.0	2.13	14.5	9.00	77.1	1.259	26.0

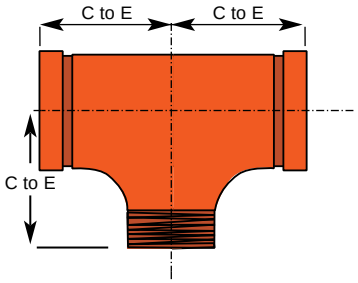
UL Listed Under File No. EX15591

REDUCER TEE - SHORT PATTERN - STYLE 115

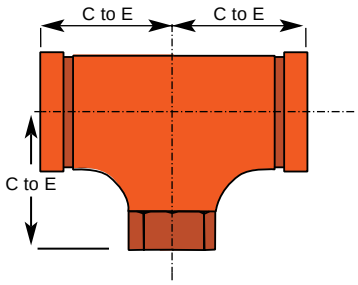
- All fittings are full flow design
- Made of durable, high-strength ductile iron conforming to ASTM A536; every lot is metallurgically tested for compliance
- Available with hot dipped galvanized coating



Style 115



Style 115TM



Style 115TF

FLOW DATA Frictional Resistance (Expressed as equivalent Straight Pipe in Ft.)					
Nominal Size (In.)	Reducer Tee		Nominal Size (In.)	Reducer Tee	
	Branch	Run		Branch	Run
1¼	5.8	2.3	5	21.0	8.4
1½	6.7	2.7	6	25.3	10.1
2	8.6	3.4	8	33.3	13.3
2½	10.3	4.1	10	41.8	16.7
3	12.8	5.1			
4	16.8	6.7			

Flow data is based upon the pressure drop of Sch. 40 pipe.

UL Listed Under File No. EX15591

Reducer Tee - No.115
Add after part number the letters TF for internal or TM for external threaded outlet

Nominal Size (In.)	C to E (In.)	Approx. Wgt. Ea. (lb.)
2 x 2 x 1¼	2.76	2.7
2 x 2 x 1½	2.76	2.7
2½ x 2½ x 1	3.00	4.8
2½ x 2½ x 1¼	3.00	4.8
2½ x 2½ x 1½	3.00	5.1
2½ x 2½ x 2	3.00	5.1
3 x 3 x 1	3.38	5.8
3 x 3 x 1¼	3.38	6.4
3 x 3 x 1½	3.38	7.5
3 x 3 x 2	3.38	8.4
3 x 3 x 2½	3.38	8.6
4 x 4 x 1	4.00	7.8
4 x 4 x 1¼	4.00	9.6
4 x 4 x 1½	4.00	10.2
4 x 4 x 2	4.00	10.4
4 x 4 x 2½	4.00	11.4
4 x 4 x 3	4.00	11.6
5 x 5 x 1½	4.80	14.3
5 x 5 x 2	4.80	14.5
5 x 5 x 2½	4.80	15.2
5 x 5 x 3	4.80	15.4
5 x 5 x 4	4.80	16.1
6 x 6 x 1½	5.60	24.0
6 x 6 x 2	5.60	26.4
6 x 6 x 2½	5.60	26.5
6 x 6 x 3	5.60	26.5
6 x 6 x 4	5.60	29.3
6 x 6 x 5	5.60	30.9
6½ x 6½ x 2	5.60	26.4
6½ x 6½ x 2½	5.60	26.5
6½ x 6½ x 3	5.60	24.0
6½ x 6½ x 4	5.60	25.0
8 x 8 x 1½	7.05	33.0
8 x 8 x 2	7.05	33.5
8 x 8 x 2½	7.05	39.0
8 x 8 x 3	7.05	33.6
8 x 8 x 4	7.05	47.4
8 x 8 x 5	7.05	48.3
8 x 8 x 6	7.05	49.8
8 x 8 x 6½	7.05	50.5
10 x 10 x 2	8.46	84.9
10 x 10 x 2½	8.46	83.8
10 x 10 x 3	8.46	82.7
10 x 10 x 4	8.46	79.4
10 x 10 x 5	8.46	78.9
10 x 10 x 6	8.46	78.3
10 x 10 x 8	8.46	77.2

Style 115TM and 115TF are available up to 8" run size and 2½" outlet size. Max working pressure of Threaded Tee is 300 psi.

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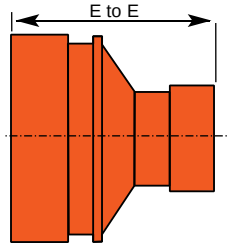
STANDARD CONCENTRIC REDUCER - STYLE 140

- All fittings are full flow design
- Made of durable, high-strength ductile iron conforming to ASTM A536. Every lot is metallurgically tested for compliance
- Available with hot dipped galvanized coating



Style 140

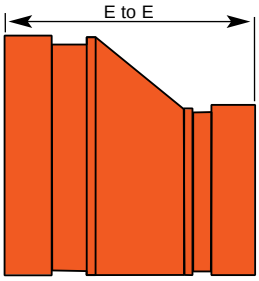
See Style 140TM and 140TF for threaded outlet.

Concentric Reducer - No.140		
Nominal Size (In.)	E to E (in.)	Approx. Wgt. Ea. (lb.)
1¼ x 1	2.50	0.6
1½ x 1	2.50	0.8
2 x 1	2.50	0.7
2 x 1¼	2.50	1.2
2 x 1½	2.50	1.0
2½ x 1	2.50	3.6
2½ x 1¼	2.50	3.3
2½ x 1½	2.50	3.6
2½ x 2	2.50	3.9
3 x 1	2.50	1.3
3 x 1¼	2.50	3.0
3 x 1½	2.50	5.1
3 x 2	2.50	1.6
3 x 2½	2.50	1.8
4 x 1	3.00	3.0
4 x 1¼	3.00	4.6
4 x 1½	3.00	6.9
4 x 2	3.00	2.4
4 x 2½	3.00	2.7
4 x 3	3.00	3.2
5 x 2	4.02	4.6

Concentric Reducer - No.140		
Nominal Size (In.)	E to E (in.)	Approx. Wgt. Ea. (lb.)
5 x 2½	4.02	4
5 x 3	4.02	4
5 x 4	4.02	4
6 x 2	4.02	4
6 x 2½	4.02	4
6 x 3	4.02	4
6 x 4	4.02	4
6 x 5	4.02	4
8 x 3	5.00	9.3
8 x 4	5.00	10.4
8 x 5	5.00	13.7
8 x 6	5.00	14.3
10 x 3	6.10	2.8
10 x 4	6.10	13.0
10 x 5	6.10	13.2
10 x 6	6.10	14.1
10 x 8	6.10	16.5

UL Listed Under File No. EX15591

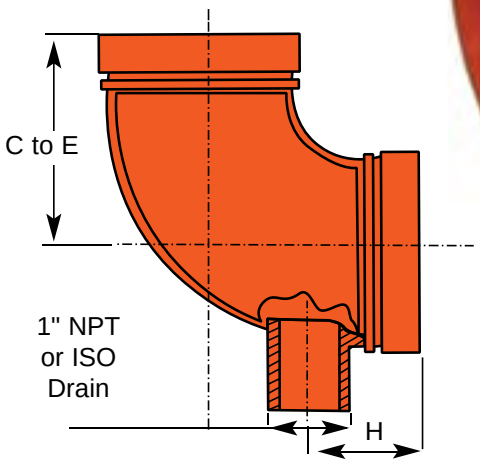
ECCENTRIC REDUCER - STYLE 145



Eccentric Reducer - No.145 Add TF after part number for Internal or TM for External threaded outlet.		
Nominal Size (In.)	E to E (in.)	Approx. Wgt. Ea. (lb.)
2 x 1¼	9	4.6
2 x 1½	9	4.6
2½ x 2	9.5	1.4
3 x 1¼	9.5	4.8
3 x 1½	9.5	5.0
3 x 2	9.5	1.8
3 x 2½	9.5	1.6
4 x 2	10	2.6
4 x 2½	10	2.8
4 x 3	10	3.3
5 x 2	11	5.2
5 x 2½	11	10.8
5 x 3	11	11.0
5 x 4	11	5.1
6 x 2	11.5	14.5
6 x 2½	11.5	14.1
6 x 3	11.5	14.9
6 x 4	11.5	6.6
6 x 5	11.5	9.4
8 x 3	12	22.0
8 x 4	12	22.9
8 x 5	12	26.5
8 x 6	12	30.8
10 x 3	13	29.7
10 x 4	13	31.9
10 x 5	13	34.6
10 x 6	13	36.5
10 x 8	13	38

STANDARD DRAIN ELBOW - STYLE F100D & F105D

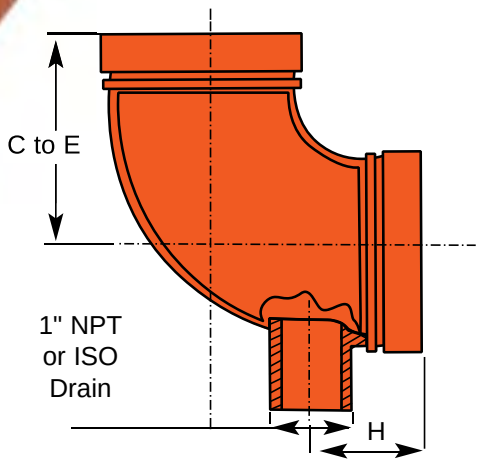
- Provides 1" NPT drain required on some fire protection stand pipes
- Smoother flow than fabricated segmented steel elbows
- Made of ductile iron conforming to ASTM A536
- Every lot is metallurgically tested to insure compliance
- Available with hot dipped galvanized coating
- Pressure rating of 300 lbs.



Drain Elbow-Standard
Style F100D

FLOW DATA Equivalent Feet of Straight Pipe		
Nominal Size (In.)	90˚ Elbow	
	STD	Short Pattern
2	3.5	3.2
2½	4.3	3.9
3	5.0	4.8
4	6.8	6.5
6	10.0	10.0

Flow data is based upon the pressure drop of Sch. 40 pipe.



Drain Elbow-Short Pattern
Style F105D

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Drain Elbow-Standard - Style F100D

Pipe		Dimensions (In.)		Approx. Wgt. Ea. (lb.)
Nominal Size (In.)	Actual Size (In.)	C to E	H	
2	2.375	3.25	2.75	3.8
2½	2.875	3.75	2.75	5.2
3	3.500	4.25	2.75	5.3
4	4.500	5.00	2.75	8.8
6	6.625	6.50	2.75	18.7

Drain Elbow-Short Pattern - Style F105D

Pipe		Dimensions (In.)		Approx. Wgt. Ea. (lb.)
Nominal Size (In.)	Actual Size (In.)	C to E	H	
2	2.375	2.75	2.00	1.0
2½	2.875	3.00	2.00	1.7
3	3.500	3.50	2.00	2.5
4	4.500	4.00	2.00	5.3
6	6.625	5.50	2.00	13.9

UL Listed Under File No. EX15591

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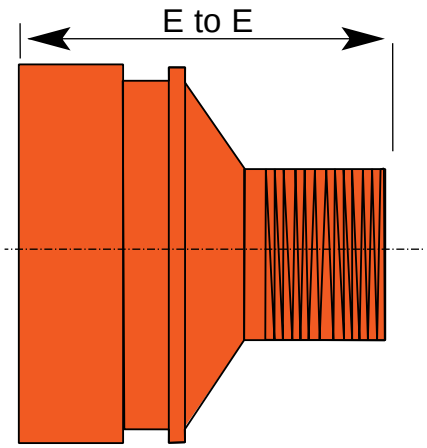
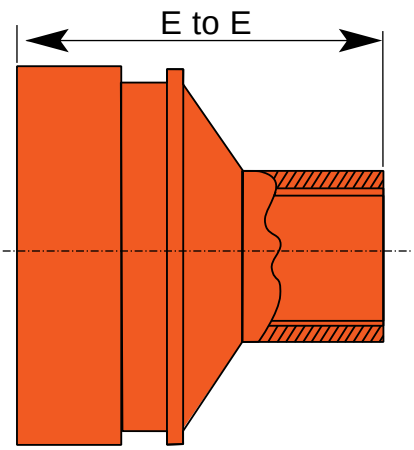
CONCENTRIC REDUCER - STYLE 140 TF, TM



Style 140 TM



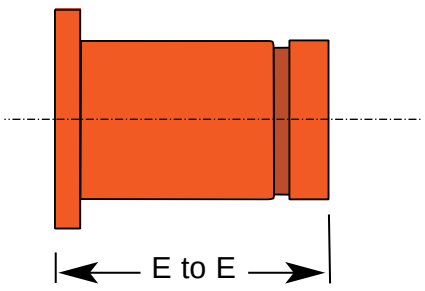
Style 140 TF

Nominal Size (In.)	E to E (In.)	Approx. Wgt. Each (lb.)
2 x 1	2.5	1.39
2 x 1¼	2.5	0.74
2 x 1½	2.5	0.74
2½ x 1	2.5	1.14
2½ x 1¼	2.5	1.14
2½ x 1½	2.5	1.14
2½ x 2	2.5	1.14
3 x 1	2.5	1.59
3 x 1¼	2.5	1.59
3 x 1½	2.5	1.59
3 x 2	2.5	1.38
4 x 1	3	2.28
4 x 1¼	3	2.28
4 x 1½	3	2.28
4 x 2	3	2.28
6 x 1	4	6.92
6 x 1¼	4	6.92
6 x 1½	4	6.92
6 x 2	4	6.92

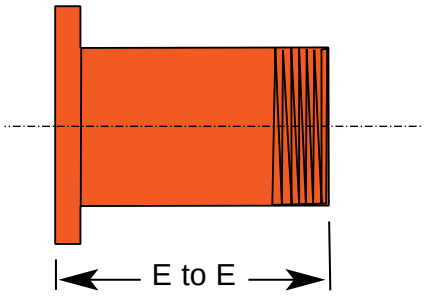
UL Listed Under File No. EX15591

FLANGE ADAPTERS - STYLE F190 & STYLE F190 TM

- Conforms to Class ANSI 125 lb. flange
- Available with an external threaded or grooved end
- Every lot is metallurgically tested for compliance
- Available with hot dipped galvanized coating
- Pressure ratings of fittings conform to those of Style 5, Style 12, and Style 25 couplings



Style 190



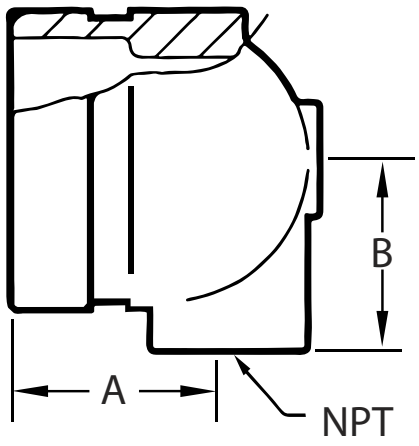
Style 190TM

Nominal Size (In.)	Actual Size (In.)	E to E (In.)	Approx. Wgt. Ea. (lb.)
2	2.375	4.0	6.6
2½	2.875	4.0	8.8
3	3.500	4.0	11.0
4	4.500	6.0	19.8
5	5.563	6.0	22.0
6	6.625	6.0	28.6
8	8.625	6.0	43.0
10	10.750	8.0	60.5

UL Listed Under File No. EX15591

90º ADAPTER ELL
- STYLE 105TL

- Transitions From Grooved to Threaded Connection
- Direct Connection to Sprinkler Heads
- Available in Rust Inhibitive Black Paint & Galvanized Finish
- UL/FM Rated for 500psi.



Nominal Size Inch	Max. Work Press. psi	Dimensions in.	
		A	B
1¼ x ½	500	1.77	1.20
1¼ x ¾	500	1.77	1.20
1¼ x 1	500	1.91	1.24
1½ x ½	500	1.77	1.32
1½ x ¾	500	1.77	1.32
1½ x 1	500	1.91	1.32
2 x ½	500	1.75	1.57
2 x ¾	500	1.77	1.57
2 x 1	500	1.91	1.63
2½ x ½	500	1.75	1.75
2½ x ¾	500	1.75	1.75
2½ x 1	500	1.91	1.81

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UL Listed Under File No. EX15591

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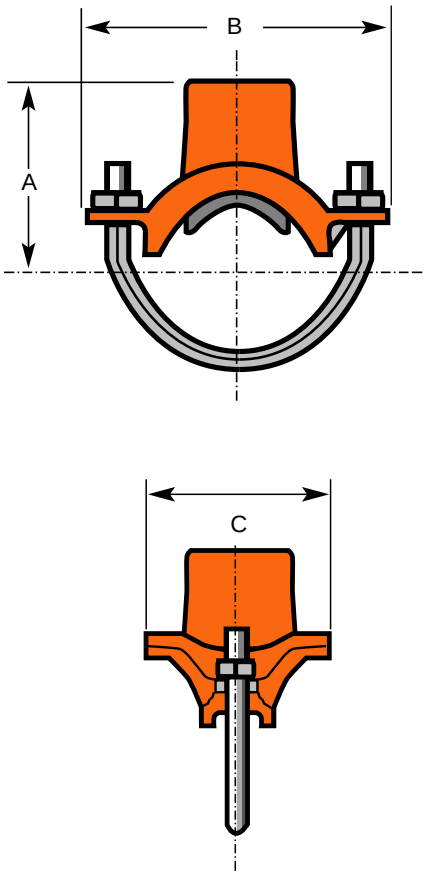
TEE LOCK - STYLE 13

- Molded gasket for each header size is made to last and insure a leak tight connection
- Wrap around casting is combined with a high tensile U-bolt flattened to prevent pipe deformation
- Rated for 300 psi. UL Listed and FM Approved
- Manufactured from Ductile Iron, per ASTM A536
- Grade E EPDM gasket rated for -30ºF to 150ºF*



Nominal Size Inch	Max. Work Press. psi	Hole Saw inch	Dimensions inches		
			A	B	C
1¼ x ½	300	1 3/16	1.693	3.543	2.205
1¼ x ¾	300	1 3/16	1.772	3.543	2.205
1¼ x 1	300	1 3/16	1.969	3.543	2.20
1½ x ½	300	1 3/16	1.693	3.661	2.323
1½ x ¾	300	1 3/16	2.126	3.661	2.323
1½ x 1	300	1 3/16	2.283	3.661	2.323
2 x ½	300	1 3/16	2.126	3.780	2.323
2 x ¾	300	1 3/16	2.205	3.780	2.323
2 x 1	300	1 3/16	2.598	3.780	2.323
2½ x ½	300	1 3/16	2.362	4.331	2.323
2½ x ¾	300	1 3/16	2.480	4.331	2.323
2½ x 1	300	1 3/16	2.756	4.331	2.323
3 x ½	300	1 3/16	2.402	4.331	2.323
3 x ¾	300	1 3/16	2.638	4.331	2.323
3 x 1	300	1 3/16	2.913	4.331	2.323

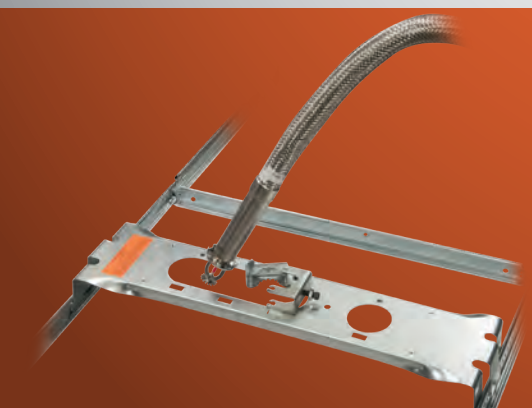
*Tee Lock gaskets should not be lubricated.

c UL us LISTED FM APPROVED

UL Listed Under File No. EX15591

SUBMITTAL PACKAGE

TRUST THE ORIGINAL.™



FBC SYSTEM COMPATIBLE

FM APPROVED

FLEXHEAD®
INDUSTRIES

A PART OF atkore INTERNATIONAL

We invented the concept of flexible fire protection™

The FlexHead® Advantage

FLEXHEAD® QUALITY

- **Best corrosion resistance**
  Made from 100% 304 stainless steel
- **Excellent friction loss values**
  One-inch true-bore ID reducing the need to upsize mains and branch lines, 1¼" available
- **Pressure surge protection**
  Fully braided connection improves pressure capability and prevents hose damage
- **Highest maximum working pressure**
  Rated up to 300 psig
- **No o-rings or gaskets**
  Welded connections reduce potential leak points at the inlet and outlet fitting
- **Tightest thread tolerances**
  Outlet fitting threads are machined from solid bar stock reducing potential leaks at the sprinkler head fit-up
- **Extra stability**
  Bracket has a full 6-inch base to stabilize the sprinkler head during installation, pressurization or activation

FLEXHEAD® FEATURES

- Is **seismically qualified** for use, eliminating the need for an oversized ring around the sprinkler head in seismic areas
- Has the same product design that is **dual listed** by both UL and FM
- Can be **produced domestically** to meet all your project requirements
- Has **serial identification** with complete audit tracking of finished goods
- Has a **comprehensive limited warranty** backed by an A++ insurance company
- Offers a variety of flexible fire sprinkler connections, suspended ceilings, gypsum board ceilings, institutional applications, cleanroom and duct applications
- Offers 1.25" FlexHead® hose for superior friction loss numbers

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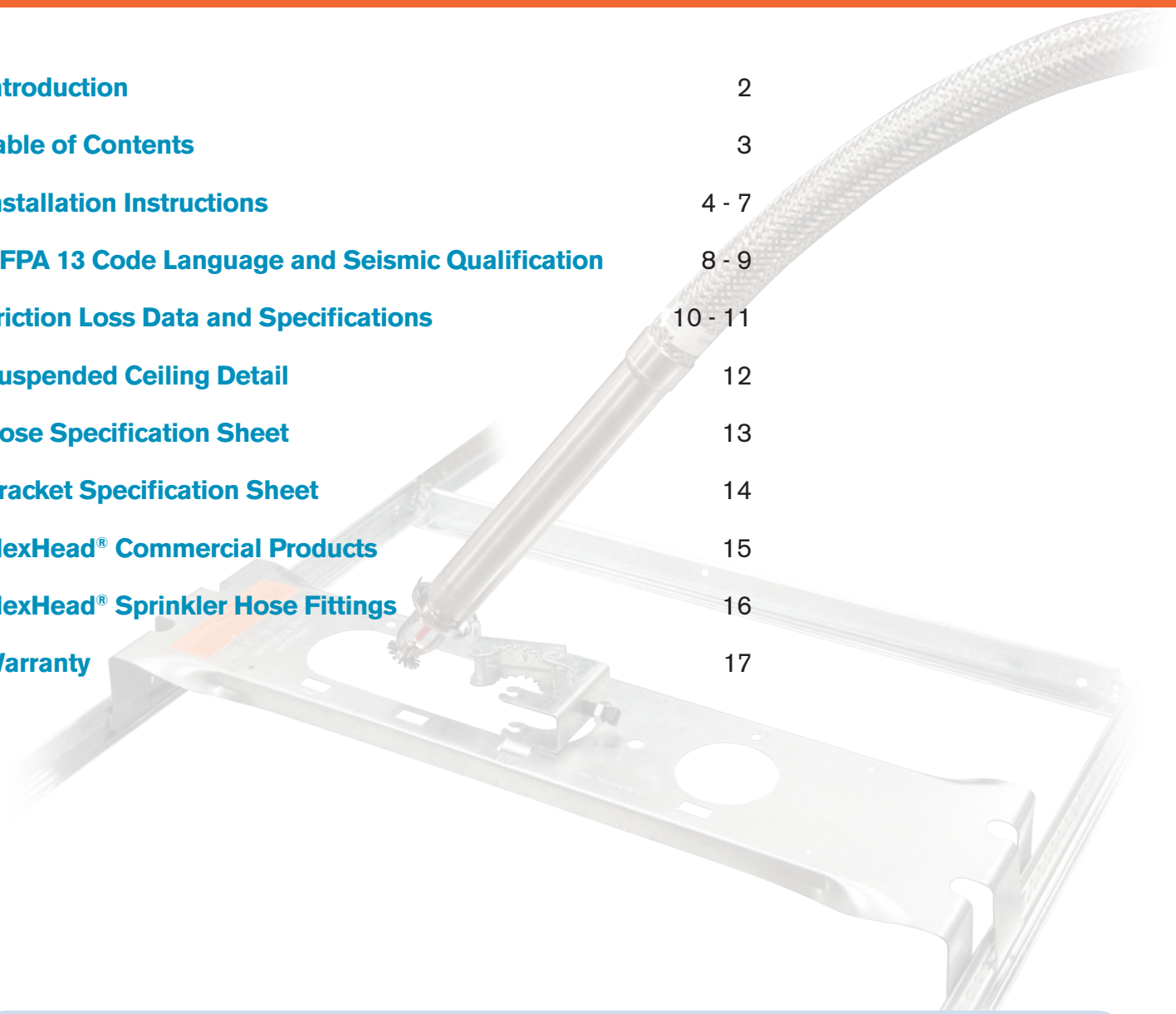

Whether your application is commercial, industrial, clean room, or institutional, FlexHead® flexible sprinkler systems can save you time and money by offering reliable, highly efficient, seismically qualified, and environmentally responsible products.

INSTALLATION INSTRUCTIONS – MPT-24-BKT1

Installation of FlexHead Commercial Ceiling Flexible Sprinkler Drop System

Recommend the use of proper PPE for installation. MPT-24-BKT1 is approved for use with the standard FlexHead® and SuperFlex™ Flexible Sprinkler Hose in accordance to NFPA 13, 13D, & 13R for use in wet and dry sprinkler system. The Standard & SuperFlex™ Flexible sprinkler hoses are UL approved for Limited flexibility and are intended for direct sprinkler connection.

FlexHead® Standard Tall
2024T, 2036T, 2048T, 2060T, 2072T

FlexHead® Standard Tall Elbow
2024ET, 2036ET, 2048ET, 2060ET, 2072ET

SuperFlex™
2036SF, 2048SF, 2072SF

The MPT bracket is set for 24" center of tile installation.

(See back side for additional installation configurations)

*Intended for use on ASTM C 635 intermediate or heavy duty ceilings systems installed in accordance to ASTM C 636.

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T Bar Ceiling Grid Installation

The MPT bracket is designed for use on ceiling grids conforming to ASTM C 635*.

A. Locate the center of the ceiling tile marking, align the offset screw with that marking for true center of tile installation. Insert one bracket leg at a time, applying a downward pressure on the bracket leg and T-Bar. Screw the self tapping screw using a #2 square head driver. Place the second leg on the T-Bar and repeat process. **(Fig. 1)**

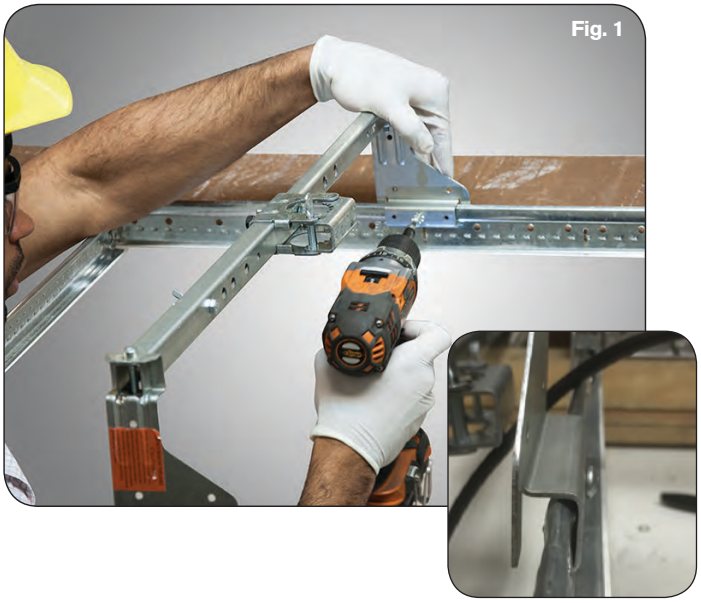


Fig. 1

FlexHead Flexible Hose Installation

A. Apply Teflon® tape and pipe sealant to the 1" NPT thread. Install into branch outlet. Any direction is acceptable, ensure the hose is allowed at least one bend per installation to allow for seismic movement. (See Friction Loss Chart on page 3 for details.)

B. Tighten hose using the pipe drop section, never apply a wrench to the braided hose for installation. **(Fig. 2)**

Fig. 2

Do not wrench on braided hose

Secure the FlexHead Sprinkler Drop to MPT Bracket

A. Maneuver the flexible sprinkler drop from the branch to the MPT bracket. Review that the hose length, number of bends, and bend radius are applicable for the installation per NFPA guidelines. (See Corresponding hose technical data sheet for installation information.)

B. The MPT bracket has an open hub for ease of installation. Open the hinge apparatus by turning the locking shaft ¼ turn. Slide the flexible hose drop into the hub. Ensure the drop is vertical, and the SS Flexible® hose is not applying a substantial moment on the bracket causing sprinkler misalignment. Latch the hinge door close and adjust the sprinkler drop for desired ceiling height. Tightening the set screw till hand tight plus two full revolutions, (130 in-lbs). **(Fig. 3a and 3b)**

C. Install desire sprinkler head, per the manufacturers installation instructions.


Fig. 3a

Fig. 3b

Ceiling Tile Installation

A. The flexible sprinkler drop system with MPT Bracket is able to be installed prior to the ceiling tile installation, preventing the need for sprinkler contractor tile adjustment.

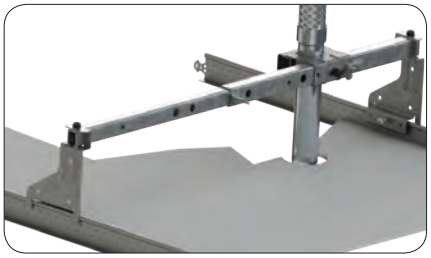
B. For ease of tile installation, cut the largest sprinkler hole recommended by the manufacture. The largest hole that is still covered by the sprinkler escutcheon allows for an easier install.

C. Angle the tile at 45 degrees and push the tile through the hole and up above the ceiling T-bar, maneuver the tile and allow it to drop in the proper location. **(Fig. 4)**

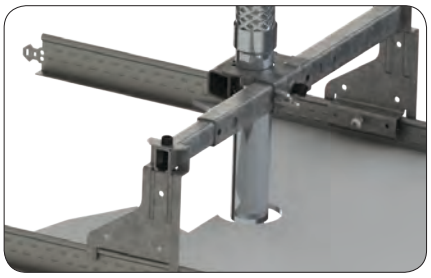

Fig. 4

Installation Complete

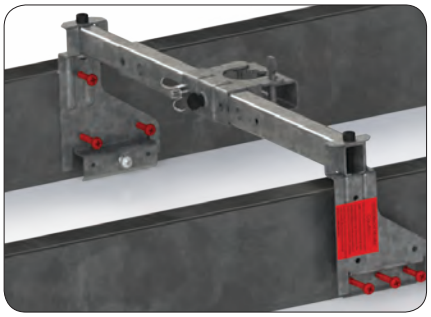
Installation Configuration



24" Tile – 24/4 Quarter Mark Position



16" Tile – 16/2 Center Position



16" Metal Stud (Web Size > 5") Center Position*

14 ½" Wood Stud Center Position*

U.S. and International Patent Pending: #6,123,154, #6,119,784, #6,752,218, #7,032,680, #6,488,097

*FM Approved, Installation has not been evaluated by UL

20XXET with MPT-24BKT1 bracket has not been evaluated by UL.

INSTALLATION INSTRUCTIONS – MPO & ADO BRACKET

Installation of FlexHead® Commercial Ceiling Flexible Sprinkler Drop System

For use with FlexHead® hoses; 2024T, 2036T, 2048T, 2060T, 2072T 2024ET, 2036ET, 2048ET, 2060ET, 2072ET

T-Bar Ceiling Grid Installation

The bracket is designed for use on ceiling grids conforming to ASTM C635.

1. Locate the center of the ceiling tile marking, then align the screw hole for true center of tile installation.
2. Clip the bracket on the T-Bar Ceiling Grid.
3. Center of the leg section must be on the outside of the T-Bar **(Fig. 1)**.
4. Secure each bracket leg to the T-Bar with #2 Head self tapping screw.

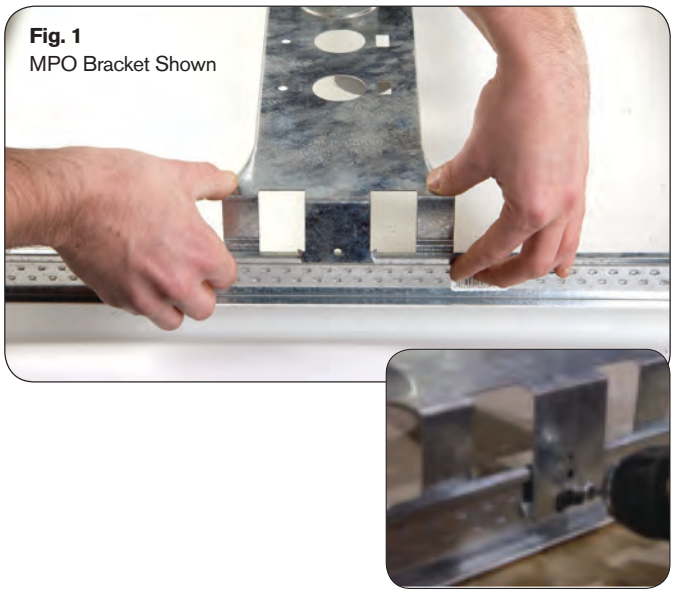


Fig. 1
MPO Bracket Shown

FlexHead® Flexible Hose Installation

1. Apply Teflon® tape and pipe sealant to the 1" NPT thread. Install into branch outlet. Any direction is acceptable, ensure the hose is allowed at least one bend per installation to allow for seismic movement.
2. Tighten hose using the pipe drop section, never apply a wrench to the braided hose for installation.

Fig. 2

Do not wrench on braided hose

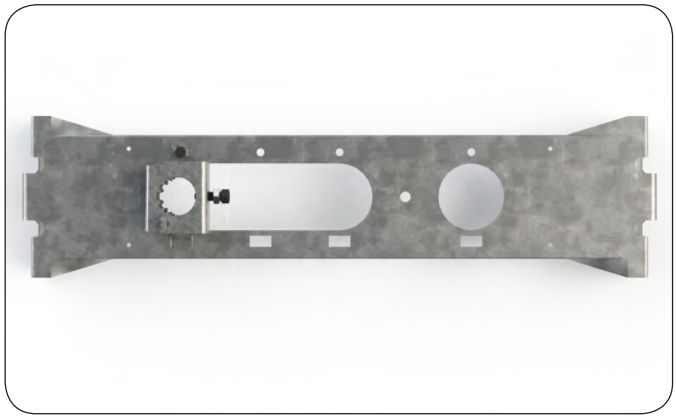
Secure the FlexHead® Sprinkler Drop to the Bracket

1. Maneuver the flexible sprinkler drop from the branch to the bracket. Review that the hose length, number of bends, and bend radius are applicable for the installation per NFPA guidelines. (See corresponding hose technical data sheet for installation information on pages 10-11.)
2. The bracket has an open hub for ease of installation. Open the hinge apparatus by turning the locking shaft ¼ turn. Slide the flexible hose into the hub. Ensure the drop is vertical and the SS Flexible® hose is not applying a substantial moment on the bracket, causing sprinkler misalignment. Latch the hinge door close and adjust the sprinkler drop for desired ceiling height. Tightening the set screw till hand tight plus 1 full revolution, (100 in-lbs).
3. Install desired sprinkler head per the manufacturer's installation instructions.

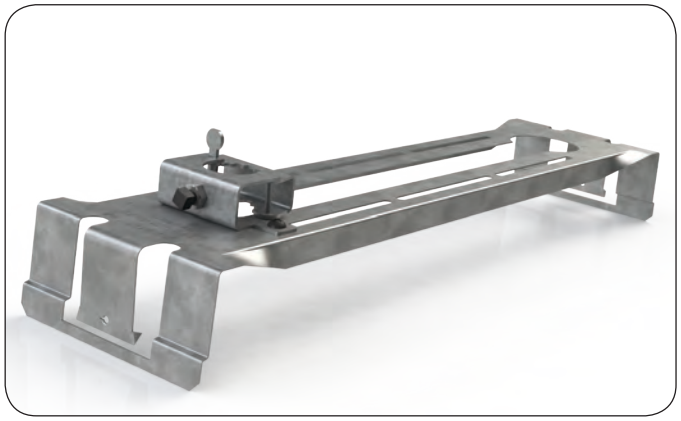
Fig. 3
MPO Bracket Shown

Bracket Adjustment for Multiple Positions

1. **MPO Hub Adjustment** - Remove the nut and screw on the hub assembly. Slide out the tab and move to desired position. Insert tab into square opening at desired position and install screw from below. Install nut and tighten to hand tight plus one turn.



2. **ADO Hub Adjustment** - Loosen screw and nut on each side of the hub, do not remove. Slide the hub to the desired position and tighten screw on each side. Tighten the nut to hand tight plus one turn.



U.S. and International Patent Pending: #6,123,154, #6,119,784, #6,752,218, #7,032,680, #6,488,097

NFPA 13 CODE LANGUAGE & SEISMIC QUALIFICATION

NFPA 13 STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS 2016 EDITION

9.2.1.3.3 Flexible® Sprinkler Hose Fittings.

9.2.1.3.3.1 Listed flexible sprinkler hose fittings and their anchoring components intended for use in installations connecting the sprinkler system piping to sprinklers shall be installed in accordance with the requirements of the listing, including any installation instructions.

9.2.1.3.3.2 When installed and supported by suspended ceilings, the ceiling shall meet ASTM C 635, *Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings,* and shall be installed in accordance with ASTM C 636, *Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.*

9.2.1.3.3.3 When flexible sprinkler hose fittings exceed 6 ft (1.83 m) in length and are supported by a suspended ceiling in accordance with 9.2.1.3.3.2, a hanger(s) attached to the structure shall be required to ensure that the maximum unsupported length does not exceed 6 ft. (1.83 m).

9.2.1.3.3.4 Where flexible sprinkler hose fittings are used to connect sprinklers to branch lines in suspended ceilings, a label limiting relocation of the sprinkler shall be provided on the anchoring component.

A. 9.2.1.3.3.3 The committee evaluation of flexible sprinkler hose fittings supported by suspended ceilings was based on a comparison of the weight of a 6 ft, 1 in (1.8 m) diameter Schedule 40 water-filled unsupported armover weighing approximately 13 lb (5.9 kg) to the weight of a 6 ft, 1 in. (1.8 m) diameter water-filled flexible hose fitting weighing approximately 9 lb (4.1 kg). The information provided to the committee showed that the maximum load shed to the suspended ceiling by the flexible hose fitting was approximately 6 lb (2.7 kg) and that a suspended ceiling meeting ASTM C 635, *Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems of Acoustical Tile and Lay-In Panel Ceilings,* and installed in accordance with ASTM C 636, *Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels,* can substantially support that load. In addition, the supporting material showed that the flexible hose connection can be attached to the suspended ceilings because it allow the necessary deflections under seismic conditions.

A.9.2.1.3.3.4 An example of language for the label is as follows:

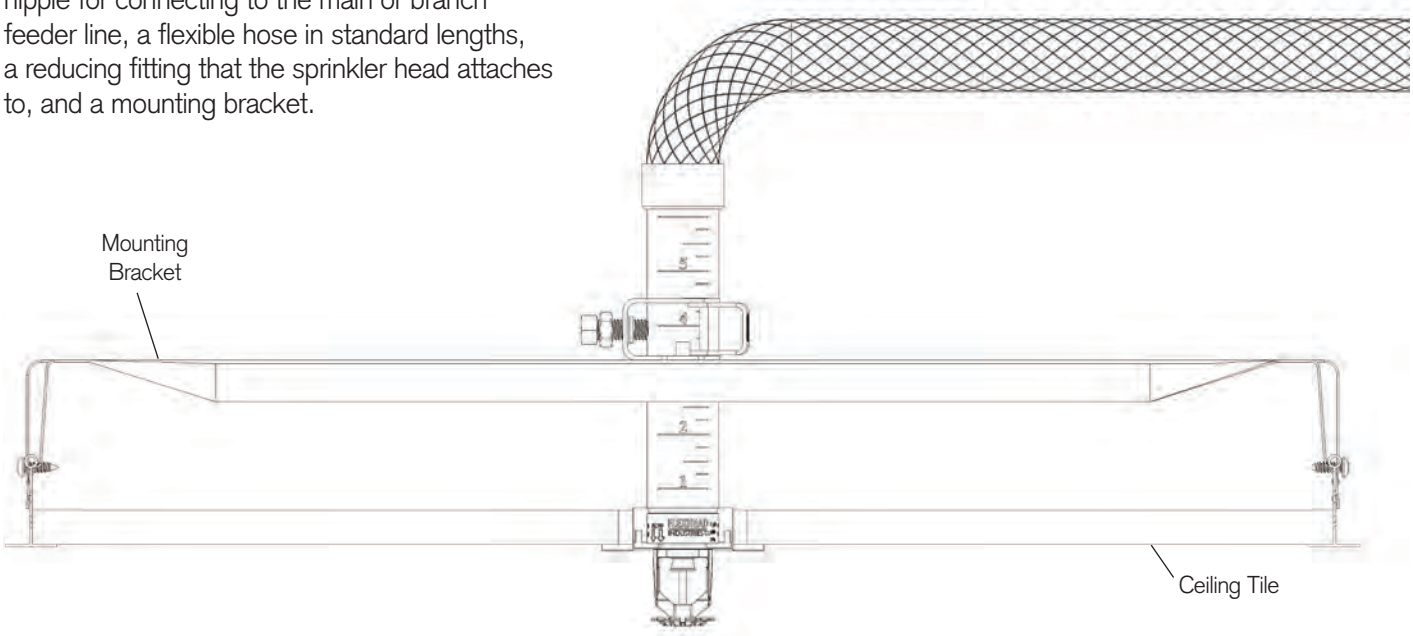
CAUTION: DO NOT REMOVE THIS LABEL.

Relocation of this device should only be performed by qualified and/or licensed individuals that are aware of the original system design criteria, hydraulic criteria, sprinkler head listing parameters, and knowledge of the state and local codes including NFPA 13 installation standards. Relocation of the device without this knowledge could adversely affect the performance of this fire protection and life safety system.

FLEXHEAD® SATISFIES SEISMIC CODE REQUIREMENTS

Typically, each unit consists of a threaded pipe nipple for connecting to the main or branch feeder line, a flexible hose in standard lengths, a reducing fitting that the sprinkler head attaches to, and a mounting bracket.

The FlexHead® hose allows the head to move in any direction during a seismic event without causing damage to the sprinkler system.



FlexHead® Industries recently satisfactorily completed full-scale seismic qualification testing at the Structural Engineering Earthquake Simulation Laboratory located at the State University of New York at Buffalo. Tests were conducted using the International Code Council (ICC) acceptance criteria "ICC-ES AC-156 Seismic Qualification Testing of Nonstructural Components".

- More than 90% of the states in the U.S. are adopting the International Building Code (IBC) that address, among other things, the installation of fire sprinkler systems in seismic zones.
- The latest version of the IBC defers to ASCE 7 for the sprinkler/ceiling design in Seismic Design Categories 9SDC) C and D, E & F.
- In Seismic Design Category C, suspended ceilings are to be designed and installed in accordance with Ceilings & Interior Systems Construction Association (CISCA) recommendations for Zones 0-2; and sprinkler heads and other penetrations shall have a minimum of ¼ inch clearance on all sides.
- In Seismic Design Categories D, E & F, suspended ceilings are to be designed and installed in accordance with CISCA recommendations for seismic Zones 3 and 4 with some additional requirements. Except where rigid braces are used to limit lateral deflections, sprinkler heads and other penetrations shall have a 2-inch oversized ring, sleeve, or adapter through the ceiling to allow for free movement of at least 1 inch of ceiling movement in all horizontal directions.
- Flexible sprinkler connection provide characteristics that exceed the most stringent seismic code requirements. The flexibility of the hose allows the head to move with the ceiling in any direction during a seismic event without causing damage to the sprinkler system.

FRICTION LOSS DATA & SPECIFICATIONS

Model Number	Outlet Orifice Size *in (cm)*	Hose Assembly Length *in (mm)*	Minimum Bend Radius		Maximum Number of 90° Bends		Equivalent Length of 1in. Diameter Schedule 40 Pipe (Ft)							Max Rated Pressure *PSI (Kpa)*	
			FM *in (mm)*	UL *in (mm)*	UL	FM	(UL) *Ft (m)*	(FM) 5.6k-factor *Ft (m)*	(FM) 8.0k-factor *Ft (m)*	(FM) 11.2k-factor *Ft (m)*	(FM) 14.0k-factor *Ft (m)*	(FM) 16.8k-factor *Ft (m)*	(FM) 22.4k-factor *Ft (m)*	UL *PSI (Kpa)*	FM *PSI (Kpa)*
SUPERFLEX™ 1" INTERNAL DIAMETER (I.D.) HOSE SERIES															
2036SF-50	½ (1.27)	36 (914)	7 (178)	2 (50.8)	5	2	30 (9.1)	16.2 (4.9)	16.9 (5.1)	11.5 (3.5)	–	–	–	175 (1205)	175 (1205)
2048SF-50		48 (1219)			8	3	47 (14.3)	28.7 (8.7)	29.3 (8.9)	15.4 (4.7)	–	–	–		
2072SF-50		72 (1828)			12	4	71 (21.6)	53.9 (16.4)	54.3 (16.5)	23.2 (7)	–	–	–		
2036SF-75	¾ (1.90)	36 (914)	7 (178)	2 (50.8)	5	2	29 (8.8)	–	21.5 (6.5)	21.6 (6.5)	21.8 (6.6)	22 (6.7)	–	175 (1205)	175 (1205)
2048SF-75		48 (1219)			8	3	44 (13.4)	–	30.5 (9.2)	30.6 (9.3)	31.1 (9.4)	30.8 (9.3)	–		
2072SF-75		72 (1828)			12	4	70 (21.3)	–	48.5 (14.7)	48.8 (14.8)	49.9 (15.2)	48.6 (14.8)	–		
FLEXHEAD® STANDARD/ TALL COMMERCIAL 1" INTERNAL DIAMETER (I.D.) HOSE SERIES															
2024T-50	½ (1.27)	24 (610)	8 (200)	3 (76.2)	3	1	11	18.4 (5.6)	7.7 (2.3)	7.6 (2.3)	–	–	–	175 (1205)	175 (1205)
2036T-50		36 (914)			3	2	16	26.6 (8.1)	11.5 (3.5)	11.5 (3.5)	–	–	–		
2048T-50		48 (1219)			4	3	24	30.3 (9.2)	15.3 (4.6)	15.4 (4.7)	–	–	–		
2060T-50		60 (1524)			4	4	29	35.8 (10.9)	19.1 (5.8)	19.3 (5.8)	–	–	–		
2072T-50		72 (1828)			4	4	35	45.6 (13.9)	23.0 (7)	23.2 (7)	–	–	–		
2024T-75	¾ (1.90)	24 (610)	8 (200)	3 (76.2)	3	1	12	–	–	–	14.7 (4.5)	7.1 (2.1)	–	175 (1205)	175 (1205)
2036T-75		36 (914)			3	2	18	–	21.5 (6.5)	21.6 (6.6)	21.8 (6.6)	10.9 (3.3)	–		
2048T-75		48 (1219)			4	3	23	–	30.5 (9.3)	30.6 (9.3)	29 (8.8)	14.8 (4.5)	–		
2060T-75		60 (1524)			4	4	29	–	39.5 (12)	39.6 (12)	36.1 (11)	18.7 (5.6)	–		
2072T-75		72 (1828)			4	4	32	–	48.5 (14.7)	48.8 (14.9)	43.2 (13.1)	22.6 (6.8)	–		
FLEXHEAD® TALL ELBOW SERIES															
2024ET-50	½ (1.27)	24 (610)	8 (200)	3 (76.2)	3	1	19	26.4 (8.0)	6.8 (2)	7.4 (2.2)	–	–	–	175 (1205)	175 (1205)
2036ET-50		36 (914)			3	2	23	30.1 (9.1)	11.8 (3.6)	12.5 (3.8)	–	–	–		
2048ET-50		48 (1219)			4	3	27	33.8 (10.3)	16.9 (5.1)	17.6 (5.3)	–	–	–		
2060ET-50		60 (1524)			4	4	32	37.5 (11.4)	21.9 (6.6)	22.7 (6.9)	–	–	–		
2072ET-50		72 (1828)			4	4	35	41.2 (12.5)	27.0 (8.2)	27.8 (8.4)	–	–	–		
2024ET-75	¾ (1.90)	24 (610)	8 (200)	3 (76.2)	3	1	18	–	–	–	14.7 (4.5)	8.2 (2.5)	–	175 (1205)	175 (1205)
2036ET-75		36 (914)			3	2	23	–	25.2 (7.7)	26 (7.9)	21.8 (6.6)	13 (3.9)	–		
2048ET-75		48 (1219)			4	3	23	–	32.9 (10)	33 (10)	29 (8.8)	17.8 (5.4)	–		
2060ET-75		60 (1524)			4	4	29	–	40.6 (12.3)	40 (12.1)	36.1 (11.0)	22.6 (6.8)	–		
2072ET-75		72 (1828)			4	4	32	–	48.5 (14.7)	47 (14.3)	43.2 (13.1)	27.5 (8.3)	–		
FLEXHEAD® STANDARD ELBOW															
2024E-50	½ (1.27)	24 (610)	8 (200)	3 (76.2)	3	1	19	26.4 (8.0)	–	–	–	–	–	175 (1205)	175 (1205)
2036E-50		36 (914)			3	2	23	30.1 (9.2)	–	–	–	–	–		
2048E-50		48 (1219)			4	3	27	33.8 (10.3)	–	–	–	–	–		
2060E-50		60 (1524)			4	4	32	37.5 (11.4)	–	–	–	–	–		
2072E-50		72 (1828)			4	4	35	41.2 (12.6)	–	–	–	–	–		
2024E-75	¾ (1.90)	24 (610)	8 (200)	3 (76.2)	3	1	18	–	14.7 (4.5)	–	–	–	–	175 (1205)	175 (1205)
2036E-75		36 (914)			3	2	23	–	21.8 (6.6)	–	–	–	–		
2048E-75		48 (1219)			4	3	23	–	29.0 (8.8)	–	–	–	–		
2060E-75		60 (1524)			4	4	29	–	36.1 (11.0)	–	–	–	–		
2072E-75		72 (1828)			4	4	32	–	43.2 (13.2)	–	–	–	–		

Chart continued on the next page

Notes:
- Model Numbers: The "SF" designates SuperFlex™ Hose series. The "50" designates ½" Outlet Hose series. The "75" designates ¾" Outlet Hose series. Inlet size 1".
- Model Numbers: The "T" designates tall drops length hose series. The "ET" designates tall elbow drop hose series. The "E" designates elbow drop hose series. The "H" designates high pressure 300PSI working pressure hose series. THE "HE" designates high pressure 300PSI elbow hose series. The "F" designates high flow rate using 1 ¼ I.D. hose series. The "DPS" designates dry pendent system hose series.
- Max ambient temperature rating on all model numbers are 300 F (148 C)
- Equivalent lengths are shown with maximum number of 90° bends at the minimum bend radius per agency. 2-45° or 3-30° bends equal 1-90° bend. Different values were obtained by FM and UL due to the difference in minimum bend radius testing protocol and calculation methods. Please see individual standards for more information relative to Friction Loss (equivalent length of pipe)
- All hoses require a minimum of one bend for installation. Bend radius tool available for "T" hose, "SF" hose does not require bend radius tool.
- 20XX, SuperFlex™ Hose, is UL Listed with MPT-24-BKT1 Bracket with largest k-factor of 16.8.
- FM Equivalent length calculation includes Sprinkler Head friction loss. UL equivalent length calculation include the hose only.
- FlexHead products are intended for use in hydraulically designed wet, pre-action, deluge or dry pendent sprinkler connections per NFPA 13, 13R and 13D guidelines.
- See listing(s) approval agency for latest approval details.

FRICTION LOSS DATA & SPECIFICATIONS (cont'd)

Model Number	Outlet Orifice Size *in (cm)*	Hose Assembly Length *in (mm)*	Minimum Bend Radius		Maximum Number of 90° Bends		Equivalent Length of 1in. Diameter Schedule 40 Pipe (Ft)							Max Rated Pressure *PSI (Kpa)*	
			FM *in (mm)*	UL *in (mm)*	UL	FM	(UL) *Ft (m)*	(FM) 5.6k-factor *Ft (m)*	(FM) 8.0k-factor *Ft (m)*	(FM) 11.2k-factor *Ft (m)*	(FM) 14.0k-factor *Ft (m)*	(FM) 16.8k-factor *Ft (m)*	(FM) 22.4k-factor *Ft (m)*	UL *PSI (Kpa)*	FM *PSI (Kpa)*
FLEXHEAD® HIGH PRESSURE 1" INTERNAL DIAMETER (I.D.) HOSE SERIES															
2024H-50	½ (1.27)	24 (610)	8 (200)	3 (76.2)	3	2	11	18.4 (5.6)	7.7 (2.3)	7.6 (2.3)	-	-	-	300 PSI (2068Kpa)	300 PSI (2068Kpa)
2036H-50		36 (914)			3	3	16	26.6 (8.1)	11.5 (3.5)	11.5 (3.5)	-	-	-		
2048H-50		48 (1219)			4	4	24	30.3 (9.2)	15.3 (4.6)	15.4 (4.7)	-	-	-		
2060H-50		60 (1524)			4	4	29	35.8 (10.9)	19.1 (5.8)	19.3 (5.8)	-	-	-		
2072H-50		72 (1828)			4	4	35	45.6 (13.9)	23 (7)	23.2 (7)	-	-	-		
2024H-75	¾ (1.90)	24 (610)	8 (200)	3 (76.2)	3	2	12	-	14.7 (4.5)	14.7 (4.5)	14.7 (4.5)	7.1 (2.1)	-	300 PSI (2068Kpa)	300 PSI (2068Kpa)
2036H-75		36 (914)			3	3	18	-	21.8 (6.6)	21.6 (6.6)	21.8 (6.6)	10.9 (3.3)	-		
2048H-75		48 (1219)			4	4	23	-	29 (8.8)	30.6 (9.3)	29 (8.8)	14.8 (4.5)	-		
2060H-75		60 (1524)			4	4	29	-	36.1 (11.0)	39.6 (12)	36.1 (11.0)	18.7 (5.7)	-		
2072H-75		72 (1828)			4	4	32	-	43.2 (13.1)	48.8 (14.8)	43.2 (13.1)	22.6 (6.8)	-		
FLEXHEAD® HIGH PRESSURE ELBOW															
2024HE-50	½ (1.27)	24 (610)	8 (200)	3 (76.2)	3	2	19	14.7 (4.5)	6.8 (2)	7.4 (2.2)	-	-	-	300 PSI (2068Kpa)	300 PSI (2068Kpa)
2036HE-50		36 (914)			3	3	23	21.8 (6.6)	11.8 (3.6)	12.5 (3.8)	-	-	-		
2048HE-50		48 (1219)			4	4	27	29.0 (8.8)	16.9 (5.1)	17.6 (5.3)	-	-	-		
2060HE-50		60 (1524)			4	4	32	36.1 (11)	21.9 (6.6)	22.8 (6.9)	-	-	-		
2072HE-50		72 (1828)			4	4	35	43.2 (13.1	27 (8.2)	27.8 (8.4)	-	-	-		
2024HE-75	¾ (1.90)	24 (610)	8 (200)	3 (76.2)	3	2	18	-	14.7 (4.5)	-	14.7 (4.5)	8.2 (2.5)	-	300 PSI (2068Kpa)	300 PSI (2068Kpa)
2036HE-75		36 (914)			3	3	23	-	21.8 (6.6)	26 (7.9)	21.8 (6.6)	13 (3.9)	-		
2048HE-75		48 (1219)			4	4	23	-	29 (8.8)	33 (10)	29 (8.8)	17.8 (5.4)	-		
2060HE-75		60 (1524)			4	4	29	-	36.1 (11.0)	40 (12.2)	36.1 (11.0)	22.6 (6.8)	-		
2072HE-75		72 (1828)			4	4	32	-	43.2 (13.1)	47 (14.3)	43.2 (13.1)	27.5 (8.3)	-		
FLEXHEAD® DRY PENDENT SYSTEM															
2024-DPS	½ (2.54)	24 (610)	7 (180)	-	-	1	-	18.4 (5.6)	7.7 (2.3)	7.6 (2.3)	-	7.1 (2.1)	10.7 (3.3)	-	175 (1205)
2036-DPS		36 (914)			-	2	-	26.6 (8.1)	11.5 (2.3)	11.5 (3.5)	-	10.9 (3.3)	15.1 (4.6)		
2048-DPS		48 (1219)			-	3	-	30.3 (9.2)	15.3 (3.5)	15.4 (4.7)	-	14.8 (4.5)	21.5 (6.5)		
2060-DPS		60 (1524)			-	4	-	35.8 (10.9)	19.1 (5.8)	19.3 (5.9)	-	18.7 (5.7)	25.3 (7.7)		
2072-DPS		72 (1828)			-	4	-	45.6 (13.9)	23 (7)	23.2 (7)	-	22.6 (6.9)	26.9 (8.1)		
1.25" INTERNAL DIAMETER (I.D.) HOSE SERIES															
2036F-50	½ (1.27)	36 (914)	7 (180)	-	-	1	-	4.1 (1.2)	4.1 (1.2)	4.1 (1.2)	-	-	-	-	175 (1205)
2048F-50		48 (1219)			-	2	-	5.4 (1.6)	5.6 (1.7)	5.7 (1.7)	-	-	-		
2072F-50		72 (1828)			-	4	-	8.0 (2.4)	8.6 (2.6)	9.1 (2.7)	-	-	-		
2036F-75	¾ (1.90)	36 (914)	7 (180)	-	-	1	-	-	-	-	3.4 (1.0)	3.4 (1.0)	-	-	175 (1205)
2048F-75		48 (1219)			-	2	-	-	-	-	4.8 (1.5)	4.8 (1.4)	-		
2072F-75		72 (1828)			-	4	-	-	-	-	7.6 (2.3)	7.6 (2.3)	-		
2036F-100	1 (2.54)	36 (914)	7 (180)	-	-	2	-	-	-	-	-	-	3.4 (1.0)	-	175 (1205)
2048F-100		48 (1219)			-	3	-	-	-	-	-	-	4.8 (1.4)		
2072F-100		72 (1828)			-	4	-	-	-	-	-	-	7.6 (2.3)		

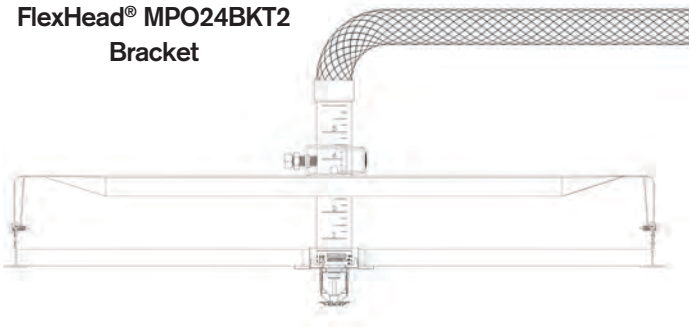
Notes:

- Model Numbers: The "SF" designates SuperFlex™ Hose series. The "50" designates ½" Outlet Hose series. The "75" designates ¾" Outlet Hose series. Inlet size 1".
- Model Numbers: The "T" designates tall drops length hose series. The "ET" designates tall elbow drop hose series. The "E" designates elbow drop hose series. The "H" designates high pressure 300PSI working pressure hose series. THE "HE" designates high pressure 300PSI elbow hose series. The "F" designates high flow rate using 1-¼ I.D. hose series. The "DPS" designates dry pendent system hose series.
- Max ambient temperature rating on all model numbers are 300 F (148 C)
- Equivalent lengths are shown with maximum number of 90° bends at the minimum bend radius per agency. 2-45° or 3-30° bends equal 1-90° bend. Different values were obtained by FM and UL due to the difference in minimum bend radius testing protocol and calculation methods. Please see individual standards for more information relative to Friction Loss (equivalent length of pipe)
- All hoses require a minimum of one bend for installation. Bend radius tool available for "T" hose, "SF" hose does not require bend radius tool.
- 20XX, SuperFlex™ Hose, is UL Listed with MPT-24-BKT1 Bracket with largest k-factor of 16.8.
- FM Equivalent length calculation includes Sprinkler Head friction loss. UL equivalent length calculation include the hose only.
- FlexHead products are intended for use in hydraulically designed wet, pre-action, deluge or dry pendent sprinkler connections per NFPA 13, 13R and 13D guidelines.
- See listing(s) approval agency for latest approval details.

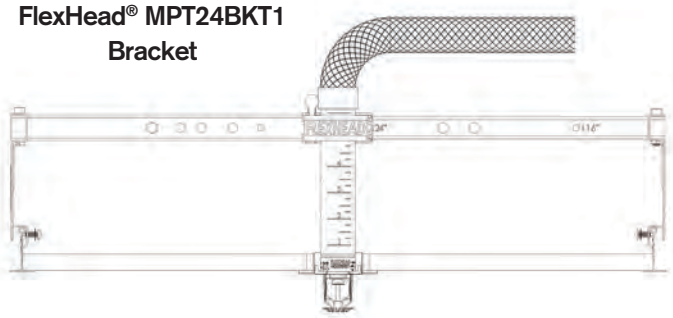
FLEXHEAD® CEILING DETAIL

FlexHead® Suspended Ceiling Detail

FlexHead® MPO24BKT2 Bracket



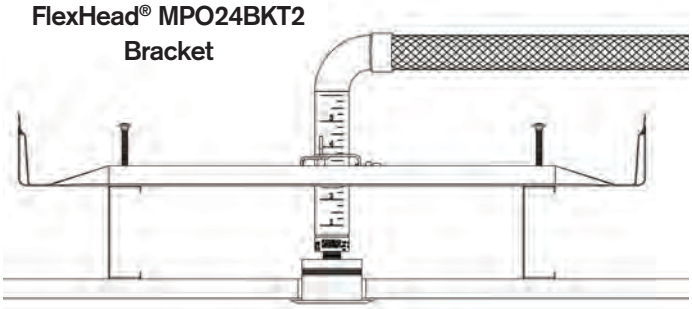
FlexHead® MPT24BKT1 Bracket



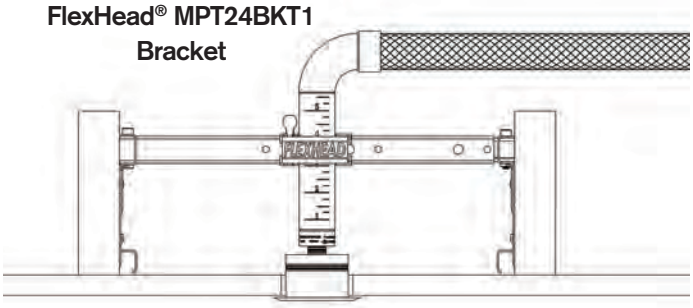
*Allows for bracket installation without pre-installing the ceiling tile

FlexHead® Sheetrock Ceiling Detail

FlexHead® MPO24BKT2 Bracket



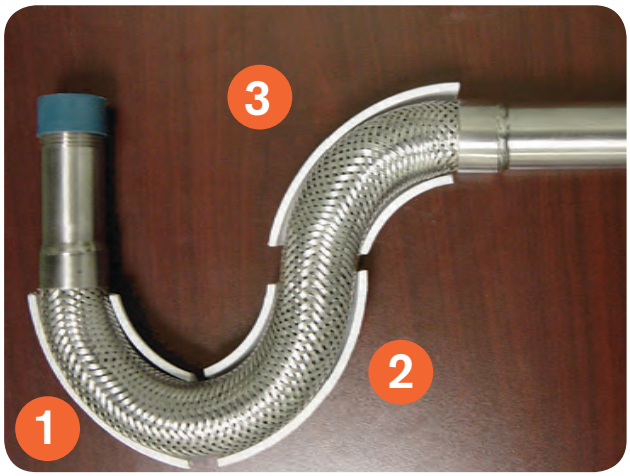
FlexHead® MPT24BKT1 Bracket



Each FM approved and UL listed unit is ready to install, pressure- and leak-tested, and comes complete with a flexible stainless steel hose and mounting bracket with adjustable hub.

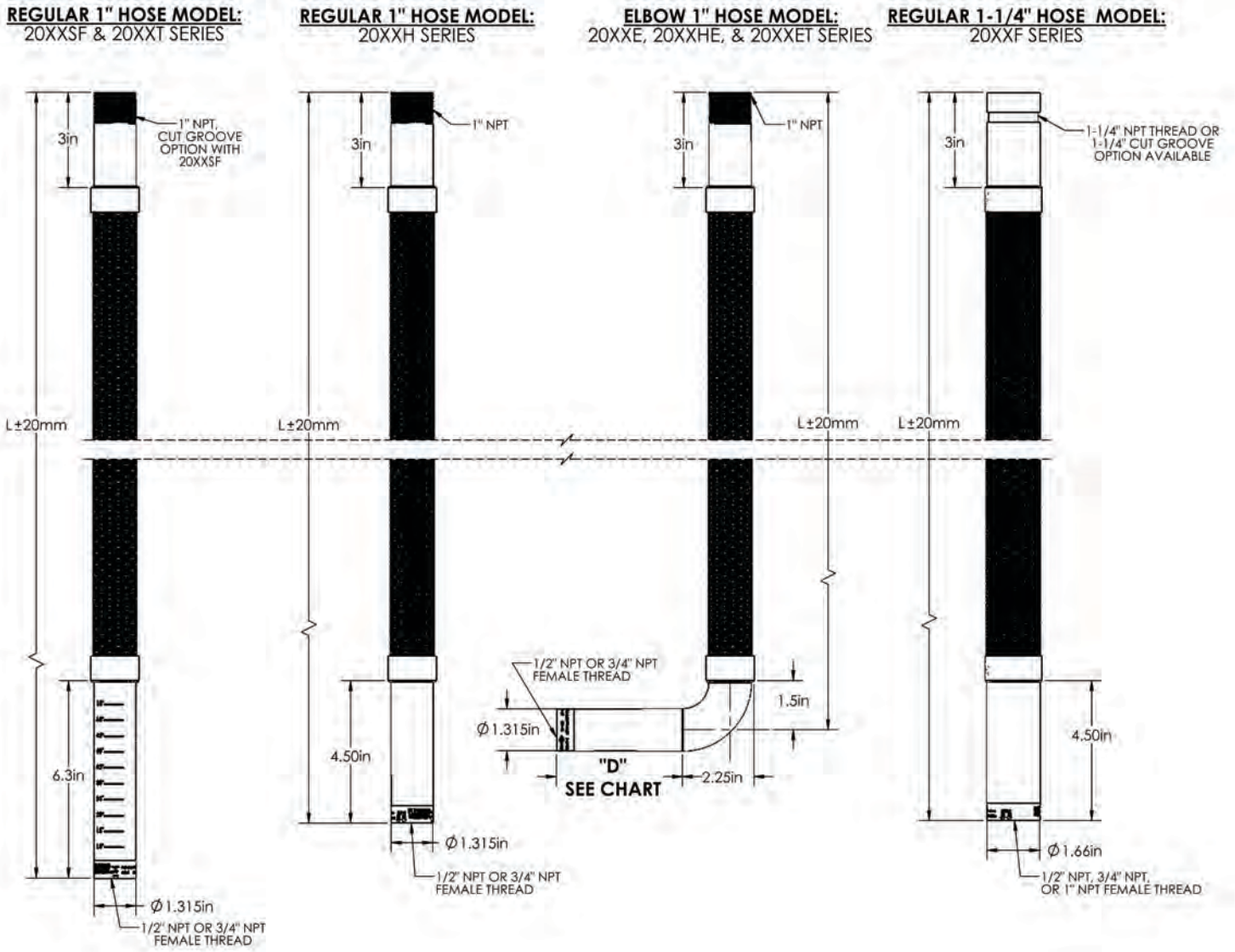
FlexHead® Standard Hose 3" Bend Radius per UL Guidelines (2 Bends Shown)

FlexHead® Standard Hose Shown with 3 Bends



Notes:
See SuperFlex™ bend radius information on page 9. SuperFlex™ 2" bend radius eliminates the need to count or measure the bends.

FLEXHEAD® CEILING DETAIL

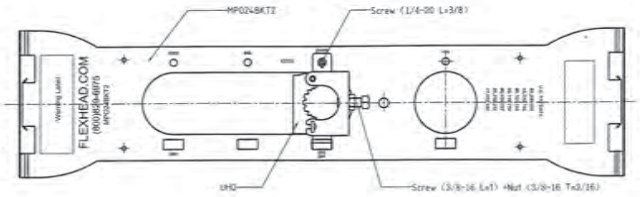


MODEL #	"Hose Assembly (L) Length Inches (mm)"	"Drop ""D"" Size (Inches)"
2024E/2024HE	24 (610)	1.5, 3.0, & 4.0
2036E/2036HE	36 (914)	
2048E/2048HE	48 (1219)	
2060E/2060HE	60 (1524)	
2072E/2072HE	72 (1828)	
2024ET	24 (610)	5.71
2036ET	36 (914)	
2048ET	48 (1219)	
2060ET	60 (1524)	
2072ET	72 (1828)	

BRACKET SPECIFICATION SHEET

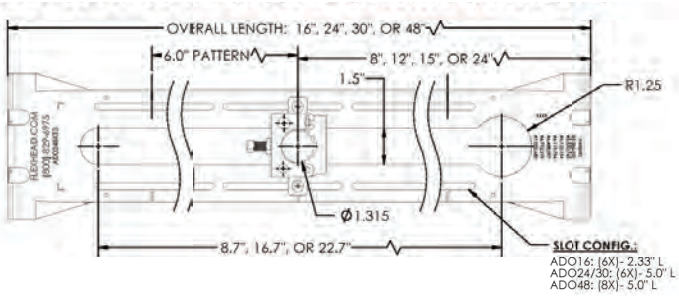
Multiport Design (For use with T-bar and Metal Stud Applications)

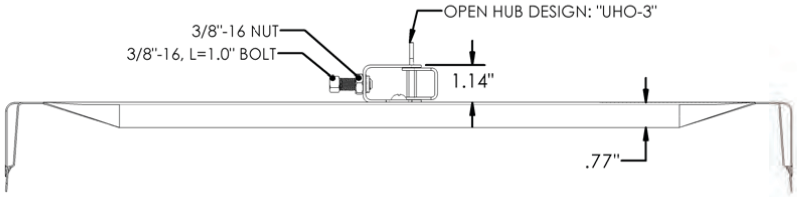
Model # MP024BKT2



Adjustable Design (For use with T-bar, Metal Stud and Chicago Grid Applications): standard sizes are 16", 24", 30" and 48" long

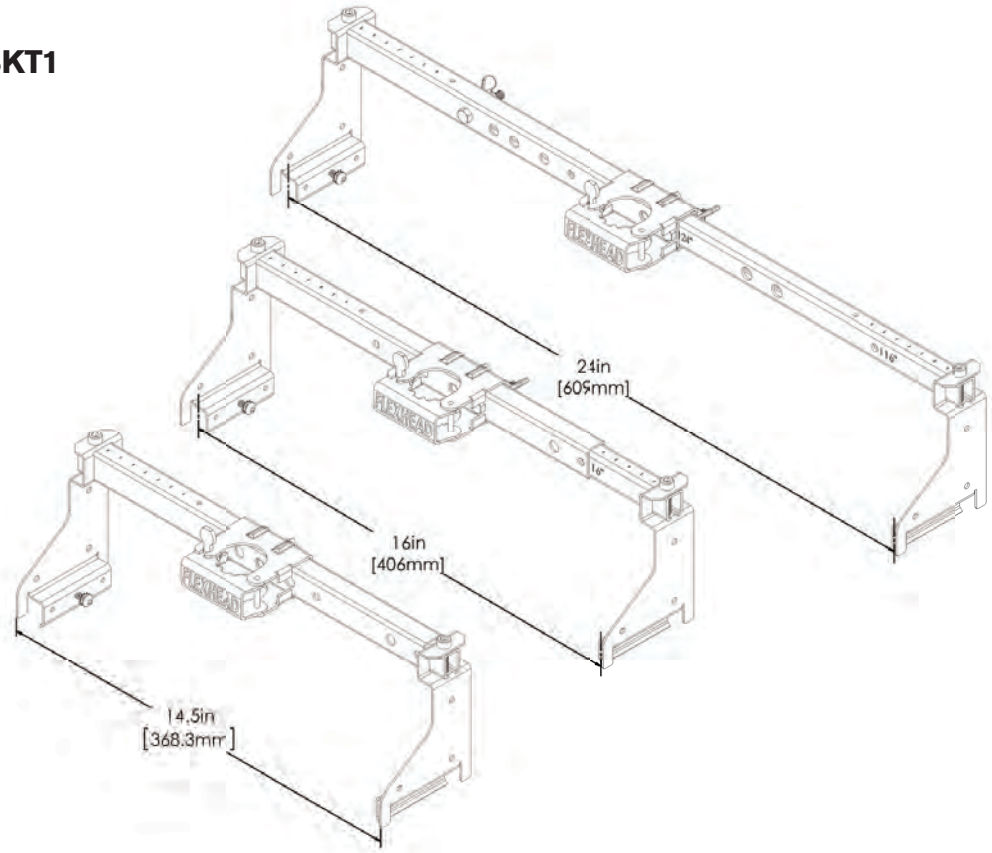
Model # AD016BKT3, AD024BKT3, AD030BKT3, AD048BKT3





Multi-Position Tall Bracket (For use with T-bar, Wood and Metal Studs): 24" standard size collapsible to 14.5" and 16" long.

Model # MPT24BKT1

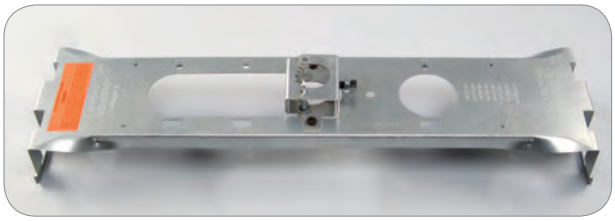


FLEXHEAD® COMMERCIAL PRODUCTS

24", 36", 48", 60", 72" hose lengths,
Rated working pressure 175psi, optional 300psi.
Straight model,
Standard 1" I.D., optional 1¼" I.D.

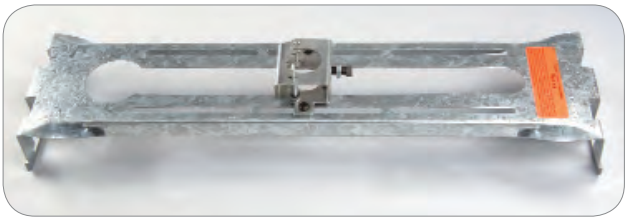
SuperFlex™ Hose Lengths: 36", 48" and 72"

24", 36", 48", 60", 72" hose lengths.
Rated working pressure 175psi, optional 300psi.
Elbow model.



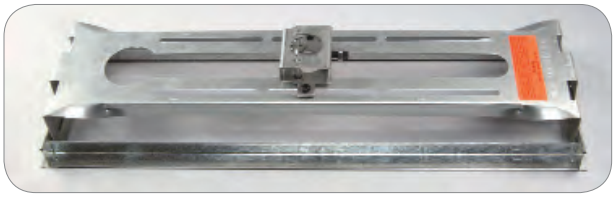
24" Multiport Bracket for T-bar Grid or Metal Stud applications.

Model #: MP024BKT2



16"/24"/30"/48" Adjustable Bracket for T-bar Grid, Chicago Grid or Metal Stud applications.

Model #s: AD016BKT3/AD024BKT3/AD030BKT3/ ADO48BKT3

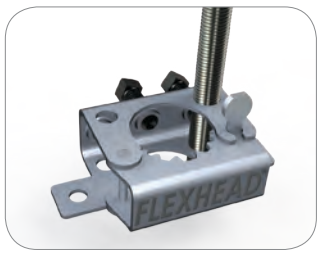


Hat Channel Bracket System for Metal Stud or Hat Channel applications.

Model #: ADO24BKT3 with BKT-HTA

24" Multi-Position Tall Bracket

Model #: MPT24BKT1

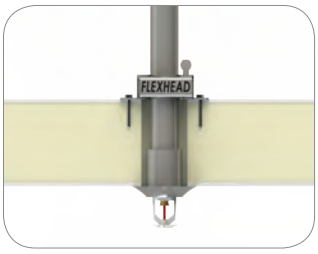


Bracket for Confined Space applications having a concrete deck above the ceiling.

Model #: UHO-3

Armstrong® TechZone Ceiling Bracket for use with Armstrong TechZone Ceiling systems.
Available in 6" long.

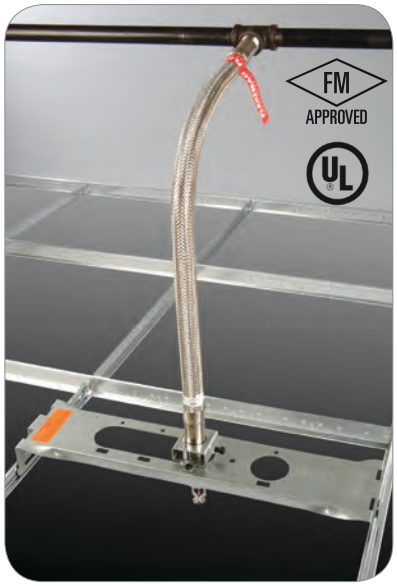
Model #: SP06TZBKT2



Dry Pendent System for Freezer and Cold Storage applications

Model #: 20XX-DPS-UH03

FLEXIBLE SPRINKLER HOSE FITTINGS USE EXAMPLES

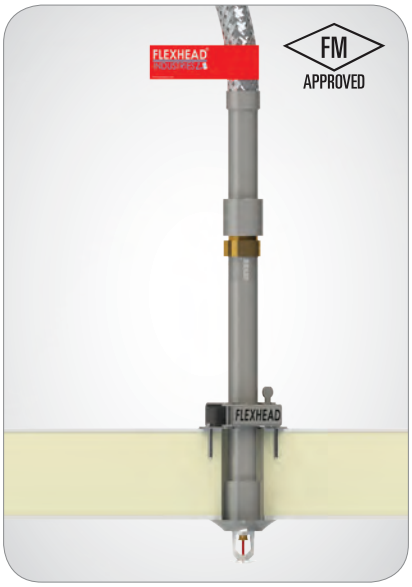


Suspended Ceilings

SuperFlex™

Exhaust Ducts

Institutional



Cold Storage and Freezer Applications

Cleanroom Ceilings

Flexible Sprinkler Hose Fittings were developed to satisfy specific needs of the industry, save the industry millions in losses, provide superior seismic protection and promote the installation of sprinklers. They have been evaluated for use by both Underwriters Laboratory and FM approvals and are tested to approval standards that were independently developed by the testing laboratories. The first listing for a Flexible Sprinkler Hose Fitting was in 1990.

WARRANTY

FLEXHEAD® PRODUCTS LIMITED WARRANTY

Flexhead Industries, Inc. warrants that its products will be free from defects in materials and workmanship under normal conditions of use and service when properly installed for a period of one year from date of sale. Our obligation under this warranty is limited to repairing or replacing any product that is returned to us with transportation charges prepaid within one year after the date of original sale and that our examination shows to our satisfaction to have been defective in materials or workmanship under normal conditions of use and service. The decision as to whether to repair or to replace any product shall be made by us, and any repair shall be made at our facility. Notwithstanding the foregoing, the following are specifically excluded from the coverage of this warranty:

(a) Any product not manufactured by Flexhead Industries, Inc., including any sprinkler head(s) installed with or attached to a Flexhead Industries, Inc. product, provided, however, Flexhead Industries Inc. hereby assigns the right to enforce any original manufacturer's warranty of such product to the original purchaser of the Flexhead Industries, Inc. product(s). For the avoidance of doubt, Flexhead Industries, Inc. does not manufacture sprinkler heads and, therefore, does not warrant any such products.

(b) defects resulting from ordinary wear and tear, including, without limitation, the replacement of the so-called poly bag components of any Flexhead Industries, Inc. product

(c) products that have been altered in any manner by the buyer or by anyone other than Flexhead Industries, Inc.

(d) products that have been subjected to misuse, abusive use, or damage by accident or casualty

(e) products that have been installed or used in a manner contrary to our specifications, instructions or recommendation

(f) products that have been installed or used in a manner that is not in compliance with all applicable requirements of any code, law, regulation or rule of any federal, state or local governmental or industry authority; and

(g) products that have not been inspected and maintained in accordance with our specifications, instructions or recommendations, including, without limitation, our recommendations as to following the inspection and maintenance standards published by Factory Mutual Research Corporation (FMRC) and the National Fire Protection Association (NFPA); and

(h) products that have been affected by Microbiologically Influenced Corrosion (MIC).

This warranty is not assignable and shall benefit only the original purchaser of a Flexhead Industries, Inc. product. If any provision hereof or any portion of any provision shall be held invalid, the remainder of this Limited Warranty shall not be affected thereby, and all provisions of this Limited Warranty shall remain valid and in full force and effect to the fullest extent permitted by law. THIS WARRANTY IS IN LIEU OF ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NOTWITHSTANDING ANY PROVISION TO THE CONTRARY HEREIN OR ANY APPLICABLE LAW TO THE CONTRARY, IN NO EVENT SHALL FLEXHEAD INDUSTRIES, INC. BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES UNDER ANY CIRCUMSTANCES WHATSOEVER, WHETHER ARISING FROM ANY BREACH OF THIS LIMITED WARRANTY OR OTHERWISE ARISING FROM OR IN CONNECTION WITH THE USE OR OPERATION OF, OR ANY DEFECT IN, ANY FLEXHEAD INDUSTRIES, INC. PRODUCT, OR OTHERWISE. The risk of damages from any breach of warranty with respect to injury to any person will be born by the purchaser of Flexhead Industries, Inc. product.

NOTES

NOTES

56 Lowland Street
Holliston, MA 01746
PHONE / 508-893-9596
TOLL FREE / 800-829-6975

www.flexhead.com

2. SPRINKLER HEADS AND ACCESSORIES

AUTOMATIC FIRE SUPPRESSION SYSTEM

TECHNICAL DATA

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

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

1. DESCRIPTION

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

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

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

2. LISTINGS AND APPROVALS

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

3. TECHNICAL DATA

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

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

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

Available Finishes And Temperature Ratings:
Refer to Table 1.

Accessories: (Also refer to the Viking website)

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

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

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

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

5. OPERATION

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

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

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

8. GUARANTEE

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

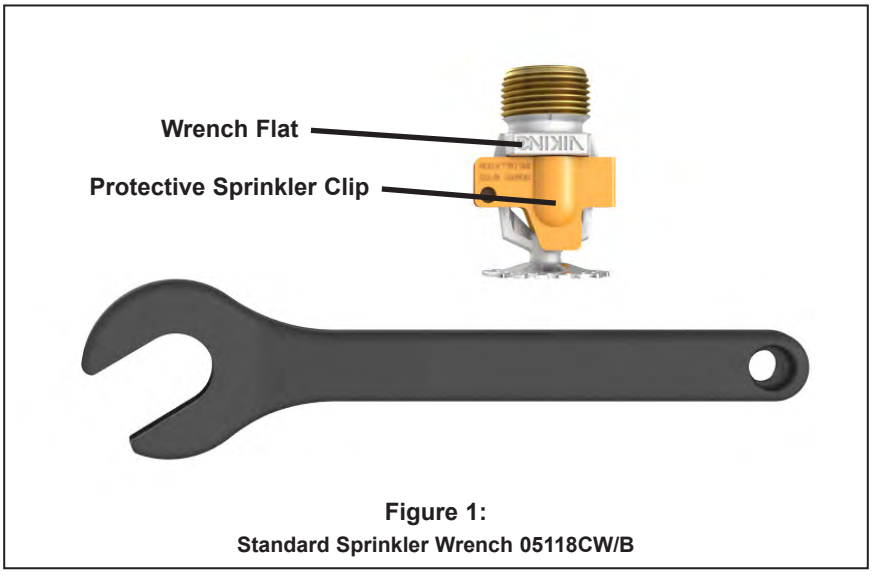


Figure 1:
Standard Sprinkler Wrench 05118CW/B

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

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

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

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

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

Corrosion-Resistant Coatings[4]: ENT

Footnotes

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

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

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

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

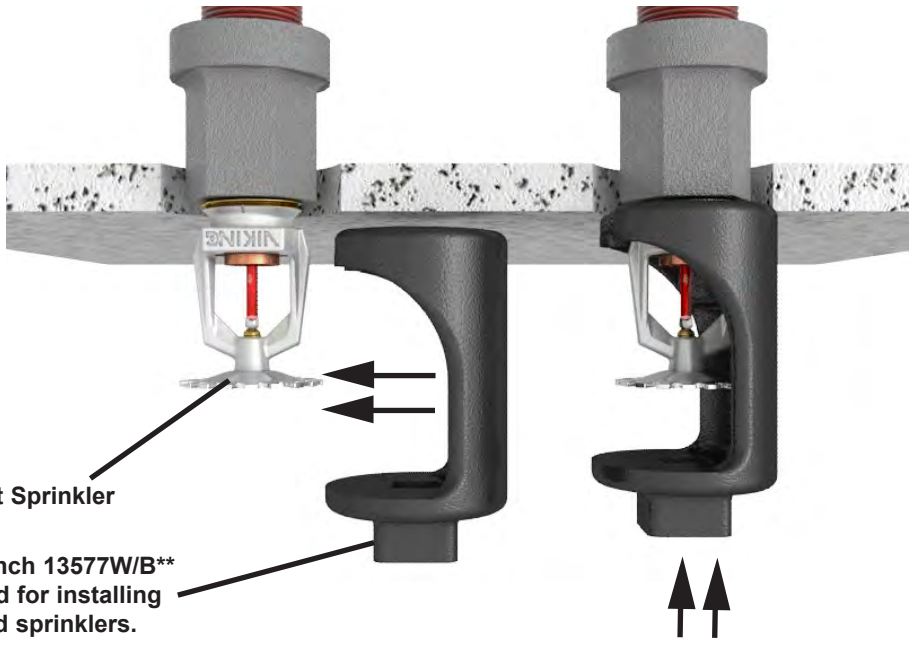


Figure 2: Wrench 11663W/B for Recessed Pendent Sprinkler VK534

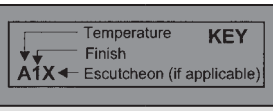
TECHNICAL DATA

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

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

Approval Chart 1 (UL)

SR/QR EC Pendent Sprinkler VK534



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

Max. Sprinkler Spacing (L x W[7])	Maximum Area per Sprinkler	Minimum Water Supply Requirements[5]			Listings and Approvals[3] (Refer also to UL Design Criteria)
		Light Hazard	Ordinary Hazard Group I	Ordinary Hazard Group II	
		Flow / Pressure	Flow / Pressure	Flow / Pressure	cULus[4]
Standard Response					
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft² (23.8 m²)	--	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)	51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)	C1W, D1Y, D2Z, C2W
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft² (30.1 m²)	--	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)	65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)	C1W, D1Y, D2Z, C2W
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft² (37.2 m²)	--	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	C1W, D1Y, D2Z, C2W
Quick Response					
12 ft. x 12 ft. (3.7 m x 3.7 m)	144 ft² (13.4 m²)	--	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	E1Y, E2Z
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft² (18.2 m²)	--	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	E1Y, E2Z
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft² (23.8 m²)	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	--	--	B1Y, F2Z
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft² (30.1 m²)	33 gpm @ 8.7 psi (124.9 L/min @ .60 Bar)	--	--	B1Y, F2Z
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft² (37.2 m²)	40 gpm @ 12.8 psi (151.4 L/min @ .88 Bar)	--	--	A1Y, G2Z

Approved Temperature Ratings

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

Approved Finishes

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

Approved Escutcheons

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

Footnotes

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

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

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

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

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

[6] cULus Listed as corrosion-resistant.

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

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

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

cULus Listing Requirements:

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

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

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

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

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

TECHNICAL DATA

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

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

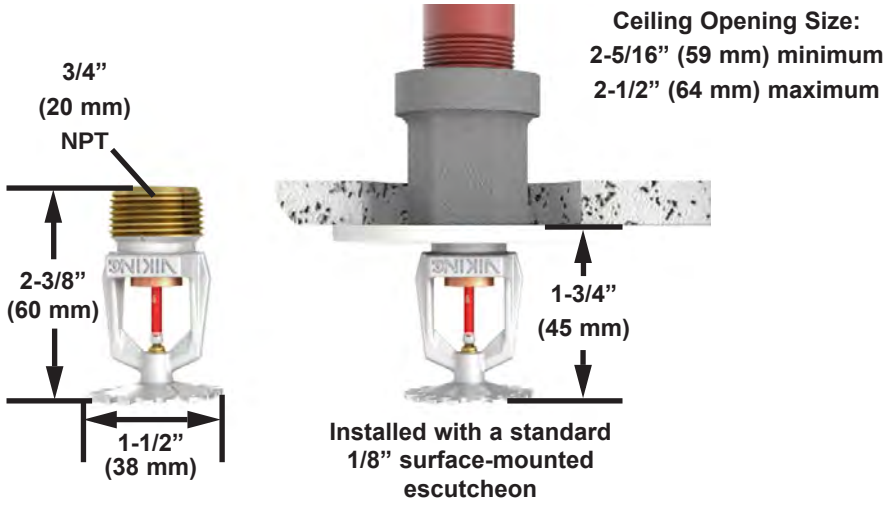


Figure 3: Sprinkler Dimensions with a Standard Escutcheon

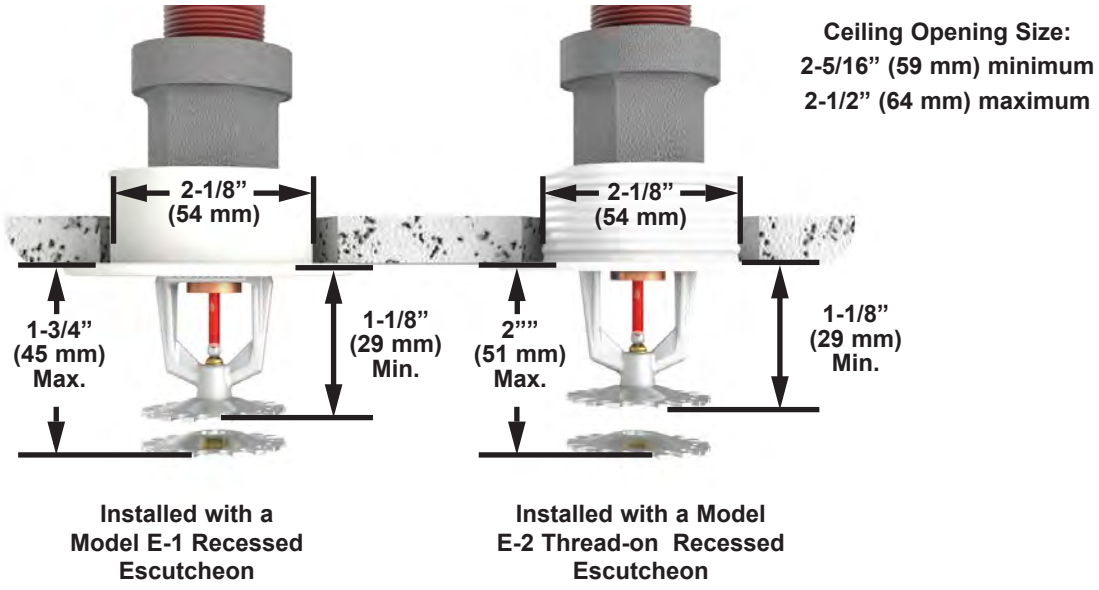


Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

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

1. DESCRIPTION

The Viking Microfast® Quick Response Upright Sprinkler VK300 is a small, thermosensitive, glass-bulb spray sprinkler available in several different finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: **FM global approves the ENT coating as corrosion resistant.** FM Global has no approval classification Polyester coatings as corrosion resistant.)

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

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV
FM Approved: Classes 2002 and 2020

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

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)*
Maximum Working Pressure: 175 psi (12 bar) wwp.
Factory tested hydrostatically to 500 psi (34.5 bar)
Testing: U.S.A. Patent No. 4,831,870
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-3/16” (56 mm)

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

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000 or Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated

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

Order Viking Microfast® Quick Response Upright Sprinkler VK300 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix (°F/°C): 135°/57° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, and 286°/141° = G
For example, sprinkler VK300 with a 1/2” NPT thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 12978AB
Available Finishes And Temperature Ratings: Refer to Table 1.

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

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

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

5. OPERATION

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

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking Microfast® Quick Response Upright Sprinkler VK300 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

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

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

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

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

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

Footnotes

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

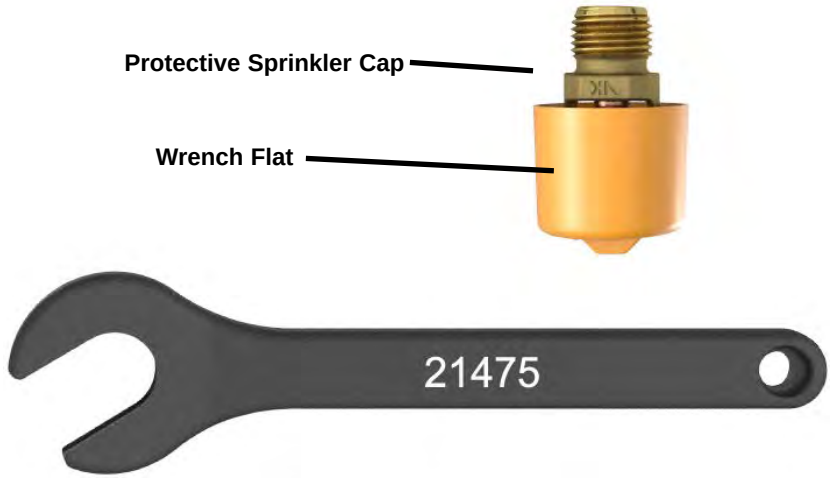


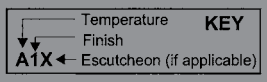
Figure 1:
Standard Sprinkler Wrench 21475M/B

VIKING®	TECHNICAL DATA	MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

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

Approval Chart 1 (UL)

Microfast® Quick Response Upright Sprinkler VK300
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3]				
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus	VdS	LPCB	NYC[8]	CE
12978	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2	--	--	See footnote 7.	--
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)												
06661B	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2	--	--	See footnote 7.	--

Approved Temperature Ratings

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

Approved Finishes

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

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] Listed by Underwriters Laboratories Inc. for us in the U.S. and Canada
[5] Other colors are available on request with the same Listings and Approvals as the standard colors.
[6] cULus Listed as corrosion resistant.
[7] Meets New York City requirements, effective July 1, 2008
[8] Accepted for use, City of New York Board of Standards and Appeals, Calendar Number 219-76-SA and City of New York Department of Buildings, MEA 89-92-E, Vol. 16.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Viking Microfast® Quick Response Upright Sprinkler VK300 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

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

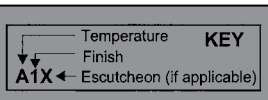
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards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

VIKING®	TECHNICAL DATA	MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

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

Approval Chart 2 (FM)

Microfast® Quick Response Upright Sprinkler VK300
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
12978	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
06661B	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2

Approved Temperature Ratings

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

Approved Finishes

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

Footnotes

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

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

[3] This table shows the FM Approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[5] Other colors are available on request with the same Approvals as the standard colors.
[6] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Microfast® Quick Response Upright Sprinkler VK300 is FM Approved as a quick response **Non-Storage** upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

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

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

TECHNICAL DATA

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

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

1. DESCRIPTION

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are Listed and Approved as indicated in the Approval Charts.

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

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414009, G414010, G4040095, and 4880045

LPCB Approved: Certificate 096e/06

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

China Approval: Approved according to China GB standard

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

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

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

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

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Phosphor Bronze UNS-C51000 or Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

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

Order Quick Response Pendent Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F (57 °C) = A, 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G

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

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

Available Finishes And Temperature Ratings: Refer to Table 1.

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

Sprinkler Wrenches:

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

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

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

Sprinkler Cabinets:

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

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

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

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

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

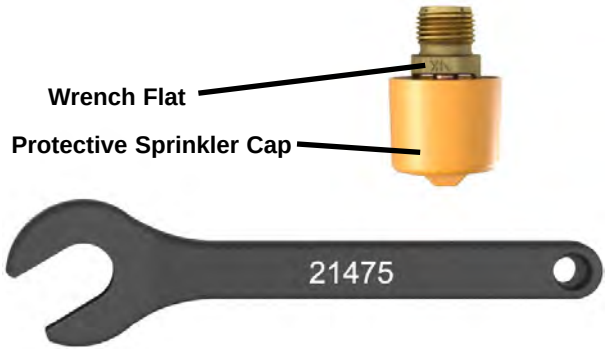


Figure 1:
Standard Sprinkler Wrench 21475M/B

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

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

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

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

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

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

Footnotes

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

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

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

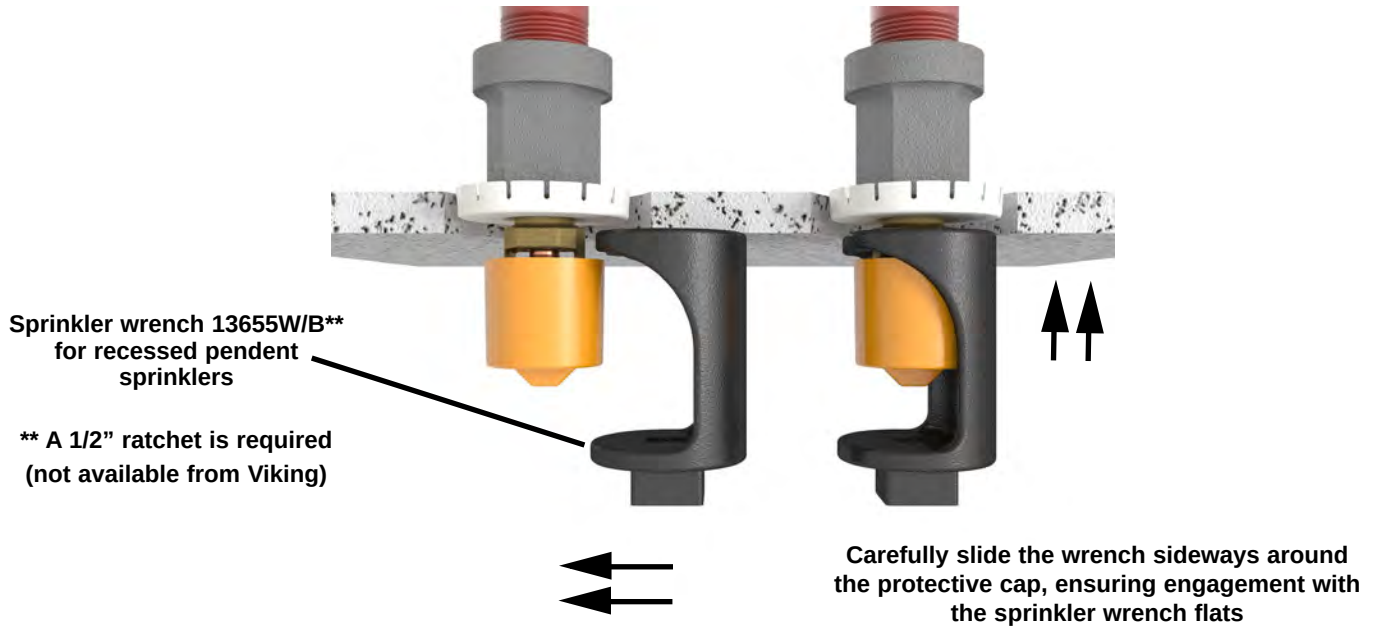


Figure 2: Wrench 13655W/B for Recessed Pendent Sprinklers

TECHNICAL DATA

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

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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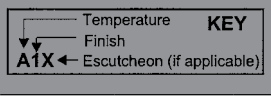
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Approval Chart 1 (UL)

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



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)					
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE[7]	[8]	China Approval
12979	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	A1	A1Z, B1Y	D1Z, C1Y	D1	--
21354[9]	VK302	Pendent	--	15 mm	5.6	80.6	2-1/4	58	D3	--	--	--	--	D3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)														
06662B	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	--	--	--	--	--
18021	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1X, B1Y	A1	A1X, B1Y	D1X, C1Y[7]	D1	--

Approved Temperature Ratings

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

Approved Finishes

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

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Z - Standard surface-mounted escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion-resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.
[7] CE Certified, Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021.
[8] MED Certified, Standard EN 12259-1, EC-0832-MED-1003.
[9] Approved according to China GB Standard.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

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

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

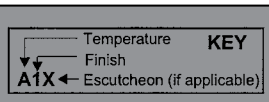
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards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

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

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

Approval Chart 2 (FM)

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



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
12979	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
21354[6]	VK302	Pendent	--	15 mm	5.6	80.6	2-1/4	58	C3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)									
06662B	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
18021	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y

Approved Temperature Ratings

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

Approved Finishes

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

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or recessed with the Viking Micromatic® Model E-1 or E-2 Recessed Escutcheon
Z - Standard surface-mounted escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.
[4] Other colors are available on request with the same Approvals as the standard colors.
[5] FM approved as corrosion resistant.
[6] Approved according to China GB Standard.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is FM Approved as quick response **Non-storage** pendent sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

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

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

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

TECHNICAL DATA

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

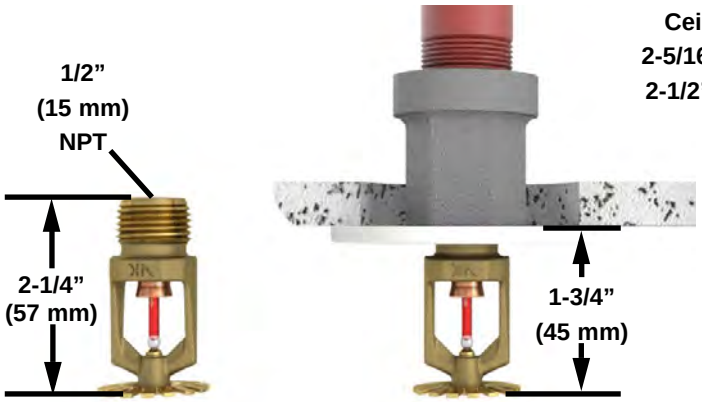


Figure 3: Sprinkler Dimensions with a Standard Escutcheon

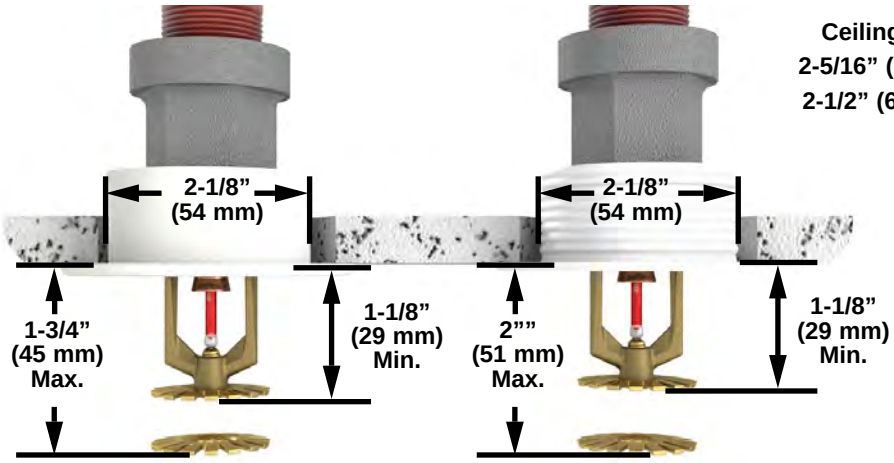


Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

3. FIRE PROTECTION VALVES

AUTOMATIC FIRE SUPPRESSION SYSTEM

Model RM-1 Riser Manifold Commercial and Residential

General Description

The TYCO commercial and residential Model RM-1 Riser Manifold provide the necessary waterflow alarm, pressure gauge, alarm test orifice, drain, and sight glass equipment in a single assembly for use in NFPA 13 commercial sprinkler systems and in NFPA 13D/13R residential sprinkler systems as follows:

NFPA 13*
- 1-1/2 Inch (DN40)
  Male Thread x Female Thread
- 2–6 Inch (DN50–DN150)
  Groove x Groove

NFPA 13D
- 1 Inch (DN25)
  Female Thread x Female Thread

NFPA 13R
- 1-1/2 Inch (DN40)
  Male Thread x Female Thread
- 2 Inch (DN50)
  Groove x Groove

* Although the Riser Manifold described in this technical data sheet is intended for NFPA 13 sprinkler systems, it may be used for NFPA 13D or 13R residential sprinkler systems, where a test orifice of 2.8K or 4.2K is acceptable.

The variety of sizes and grooved end connections allow cost effective and easy transition to check valves, control valves, and system piping. The Model RM-1 Riser Manifolds may be installed either horizontally (flow switch on top) or vertically (flow going up) orientation, for both single sprinkler rises and floor control in high-rises.

Optional Pressure Relief Kits feature a 175 psi pressure relief valve and trim components for convenient integration into commercial and residential riser manifold assemblies.

The pressure relief valve, installed in manifold assemblies above the normally closed test and drain or drain valve, automatically bleeds system pressure exceeding 175 psi through a flexible hose connected to the manifold drain outlet (Ref. Figure 5), reducing system pressure to 175 psi.

NOTICE

The Model RM-1 Riser Manifolds described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Technical Data

Approvals
UL and ULC Listed
FM Approved
Listed by California State Fire Marshall

Maximum Working Pressure
300 psi (20,7 bar)

Test Orifice
1–3 Inch (DN25–DN80) Manifolds: 2.8K
4–6 Inch (DN100–DN150) Manifolds: 4.2K

Finish
Red Painted

Nominal Riser Size Inches (DN)	End Connections		Nominal Dimensions Inches (mm)							Nominal Drain Size Inches (DN)
	Inlet	Outlet	A	B	C	D	E	F	G	H
1-1/2 (40)	Thread MNPT	Thread FNPT	10 (254)	15-1/2 (394)	2-1/4 (57)	5-5/8 (143)	8-3/8 (213)	15 (381)	4-3/8 (111)	1-1/4 (32)
2 (50)	Groove	Groove	13 (330)	18 (457)	2-1/16 (53)	5-5/8 (143)	8-3/8 (213)	15-1/4 (388)	4-3/8 (111)	1-1/4 (32)
2-1/2 (65)	Groove	Groove	13 (330)	18-1/16 (460)	2-1/16 (53)	5-5/8 (143)	8-3/8 (213)	15-1/4 (388)	4-3/8 (111)	1-1/4 (32)
3 (80)	Groove	Groove	13 (330)	18-1/16 (460)	2-1/16 (53)	5-7/8 (150)	8-5/8 (219)	15-3/4 (400)	4-3/8 (111)	1-1/4 (32)
4 (100)	Groove	Groove	13 (330)	20-1/4 (514)	4-1/4 (108)	6-3/4 (172)	10-3/4 (273)	18-3/8 (467)	5-3/16 (132)	2 (50)
6 (150)	Groove	Groove	13 (330)	20-1/4 (514)	4-1/4 (108)	7-3/4 (197)	11-3/4 (300)	21 (533)	6-3/4 (172)	2 (50)

NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Test and Drain Valve, Model TD-1: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4", 2.8K Orifice	A61G0420
	4–6 Inch (DN100–DN150) Size Manifolds, 2", 4.2K Orifice	A61G0601
3	Flow Switch, VSR-M:	
	1-1/2" (DN40)	91144815
	2" (DN50)	91144802
	2-1/2" (DN65)	91144825
	3" (DN80)	91144803
	4" (DN100)	91144804
	6" (DN150)	91144806
4	Field Replaceable Retard/Switch	91144800

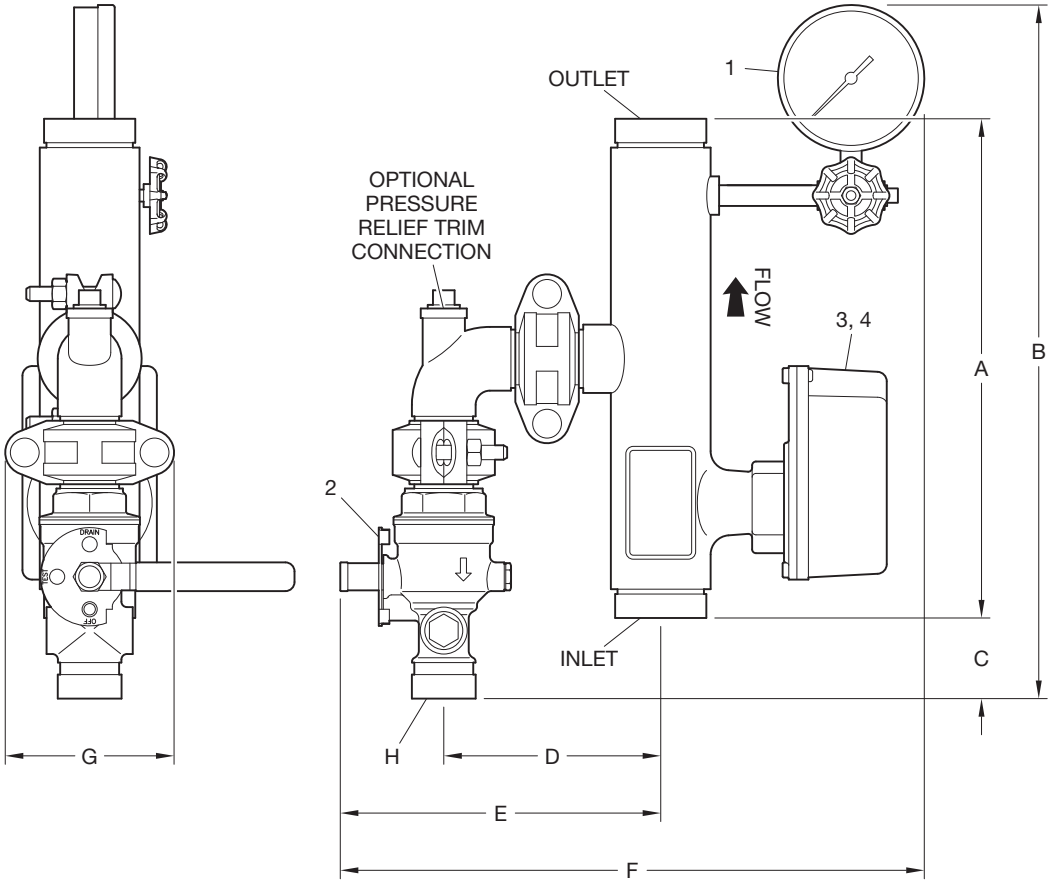
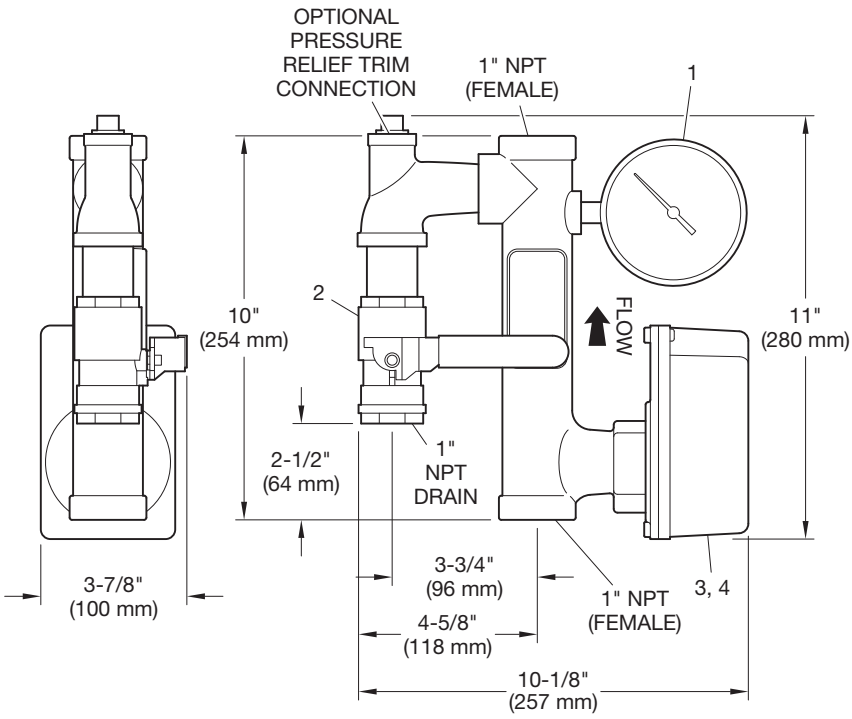
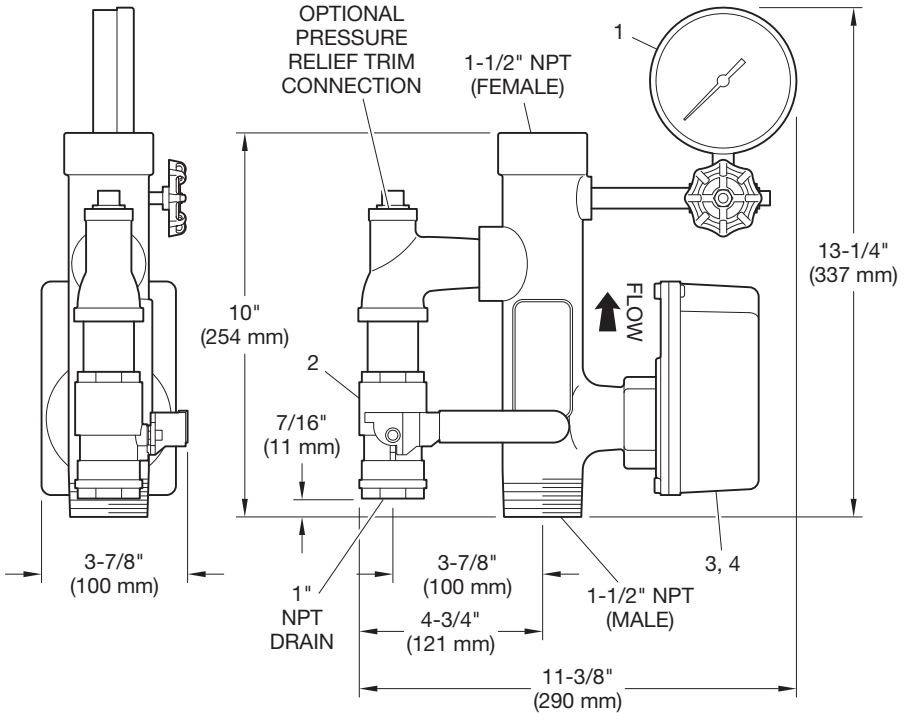


FIGURE 1
MODEL RM-1 COMMERCIAL RISER MANIFOLDS
1-1/2–6 INCH (DN40–DN150)



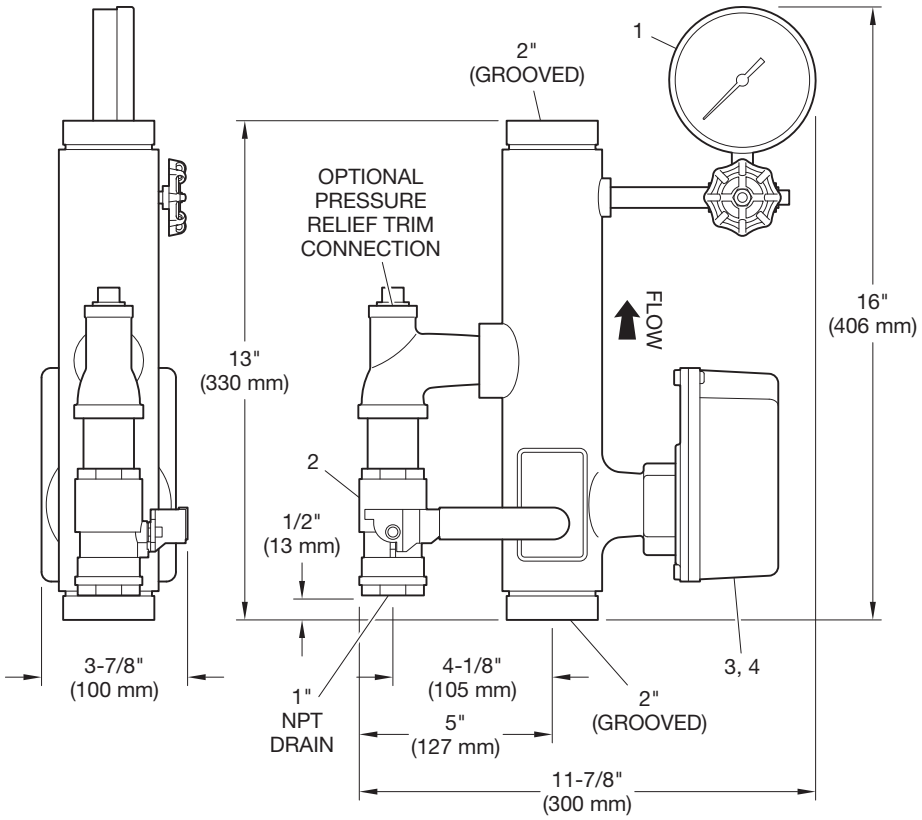
NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 1" (DN25)	91144801
4	Field Replaceable Retard/Switch	91144800

FIGURE 2
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
1 INCH (DN25)



NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 1-1/2" (DN40)	91144815
4	Field Replaceable Retard/Switch	91144800

FIGURE 3
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
1-1/2 INCH (DN40)



NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 2" (DN50)	91144802
4	Field Replaceable Retard/Switch	91144800

FIGURE 4
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
2 INCH (DN50)

Manifold Installation

TYCO Model RM-1 Riser Manifold must be installed in accordance with this section.

The Model RM-1 Riser Manifold may be installed either horizontally (flow switch on top) or vertically (flow going up). The inlet of the Riser Manifold may be connected directly to a shut-off control valve.

Notes:

Where applicable pipe thread sealant is to be applied sparingly. Use of a non-hardening pipe thread sealant is recommended.

Never remove any piping component nor correct or modify any piping deficiencies without first depressurizing and draining the system.

Provisions for an alarm test flow on Residential Models must be made. The alarm test flow is to be through an orifice having a flow capacity equal to or smaller than the smallest orifice sprinkler in the system. One of two options can be considered. The first option is to temporarily install a test orifice in the outlet of the drain line prior to performing the alarm test. The second option is to install an Inspector's Test Connection downstream of the Waterflow Alarm Switch.

Step 1. Install the manifold body with the flow arrow pointing in the downstream position using threaded connections and/or listed mechanical grooved connections, as applicable.

Step 2. Connect the drain line and on commercial manifolds set the Model TD-1 Test and Drain Valve to the OFF position or on residential manifolds close the drain valve.

Step 3. Refer to Figure 6 for wiring guidance. All wiring must be performed in accordance with the authority having jurisdiction and/or the National Electrical Code.

Step 4. Refer to Figure 5 for Optional Pressure Relief Trim installation.

Step 5. Place the system in service by filling the system with water. When filling the system, partially open the control valve to slowly fill the system. Filling the system slowly will help avoid damaging the waterflow alarm switch.

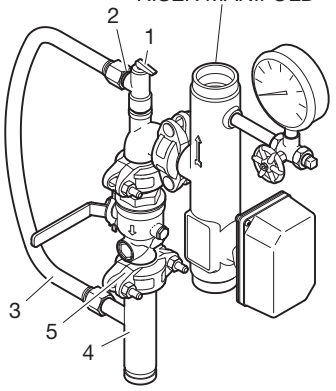
After the system is fully pressurized, completely open the control valve.

Step 6. Secure all supply valves open.

Commercial Riser Manifolds

NO	DESCRIPTION	P/N
1	Pressure Relief Valve, 175 psi, 1/2" NPT	1001184-01
2	1/2" x Close Nipple	1001023-01
3	Flexible Hose: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1/2" x 24"	1001266-02
	4–6 Inch (DN100–DN150) Size Manifolds, 1/2" x 30"	1001266-01
4	Figure 323 Reducing Tee, Grooved x NPT Threaded: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4" x 1-1/4" x 1/2"	3231305GS
	4–6 Inch (DN100–DN150) Size Manifolds, 2" x 2" x 1/2"	3232005GS
5	Figure 577 Rigid Grooved Coupling: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4"	57713AGCP
	4–6 Inch (DN100–DN150) Size Manifolds, 2"	57720AGCP

MODEL RM-1
COMMERCIAL
RISER MANIFOLD



Residential Riser Manifolds

NO	DESCRIPTION	P/N
1	Pressure Relief Valve, 175 psi, 1/2" NPT	1001184-01
2	1/2" x Close Nipple, Qty 2	1001023-01
3	Flexible Hose, 1/2" x 16"	1001266-03
4	Figure 815 Threaded Reducing Tee, 1" x 1" x 1/2" NPT	1001259-07
5	1" x Close Nipple	1001025-01

MODEL RM-1
RESIDENTIAL
RISER MANIFOLD

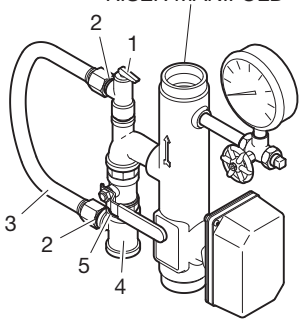


FIGURE 5
MODEL RM-1 COMMERCIAL AND RESIDENTIAL RISER MANIFOLDS
OPTIONAL PRESSURE RELIEF TRIM INSTALLATION

Optional Pressure Relief Trim Installation

Model RM-1 commercial and residential riser manifold assemblies are designed to accommodate an optional pressure relief valve and trim components (Ref. Figure 5).

Optional pressure relief trim must be installed in accordance with the following procedures.

Notes:

For assembly in Riser Manifolds installed and in service, verify the fire protection system is de-pressurized and drained. Close the system supply control valve, set commercial manifold test and drain valve to DRAIN or open residential drain valve to relieve residual pressure and drain system. Make certain that drainage water will not cause any damage or injury.

Refer to Care and Maintenance section for other requirements when closing a fire protection system control valve and placing system in service.

Apply thread sealant or TEFLON tape on all threaded connections, with the exception of internally sealed flexible hose connections.

Commercial Manifolds

Refer to Figure 1 for commercial riser manifold features and Figure 5 for pressure relief trim components described in this procedure.

Step 1. Remove 1/2 inch pipe plug from manifold tee. Inspect exposed female tee threads, remove thread sealant remnants or debris as necessary.

Step 2. Install Pressure Relief Valve (1) in manifold tee, orienting valve outlet port perpendicular to and facing away from manifold body.

Step 3. Install 1/2 inch x Close Nipple (2) in pressure relief valve outlet port.

Step 4. Disconnect drain piping from grooved outlet of manifold TD-1 test and drain valve as applicable and install Figure 323 Grooved Reducing Tee (4) on valve outlet by securing with Figure 577 Grooved Coupling (5), aligning tee threaded branch outlet parallel with pressure relief valve outlet port. Reconnect drain piping to Figure 323 tee drain outlet as necessary.

Note: *Refer to Technical Data Sheet G901 for Figure 577 Grooved Coupling installation and assembly instructions.*

Step 5. Install Flexible Hose (3) by threading female ends onto 1/2 inch x close nipple installed on relief valve outlet port and onto Figure 323 reducing tee branch outlet.

Note: *Assure Flexible Hose is not susceptible to being caught or snagged by other moving equipment.*

Residential Manifolds

Refer to Figures 2, 3 or 4 for residential riser manifold features and Figure 5 for pressure relief trim components described in this procedure.

Step 1. Remove 1/2 inch pipe plug from manifold tee. Inspect exposed female tee threads, remove thread sealant remnants or debris as necessary.

Step 2. Install Pressure Relief Valve (1) in manifold tee, orienting valve outlet port perpendicular to and facing away from manifold body.

Step 3. Disconnect drain piping from threaded outlet of manifold drain valve as applicable and install 1 inch x Close Nipple (5) in valve outlet.

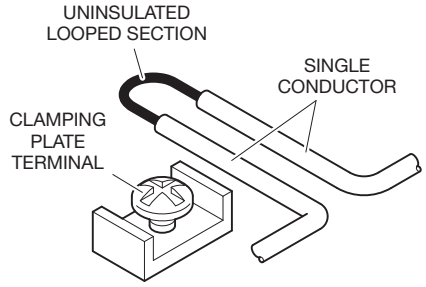
Step 4. Install Figure 815 Reducing Tee (4) onto 1 inch x close nipple, aligning tee branch outlet parallel with pressure relief valve outlet port. Reconnect drain piping to Figure 815 tee drain outlet as necessary.

Step 5. Install 1/2 inch x Close Nipples (2) in pressure relief valve outlet port and in Figure 815 reducing tee branch outlet.

Step 6. Install Flexible Hose (3) by threading female ends onto 1/2 inch x close nipples installed on relief valve outlet port and Figure 815 reducing tee branch outlet.

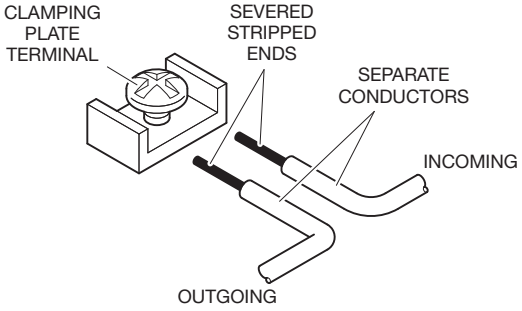
Note: *Assure Flexible Hose is not susceptible to being caught or snagged by other moving equipment.*

SWITCH TERMINAL CONNECTIONS

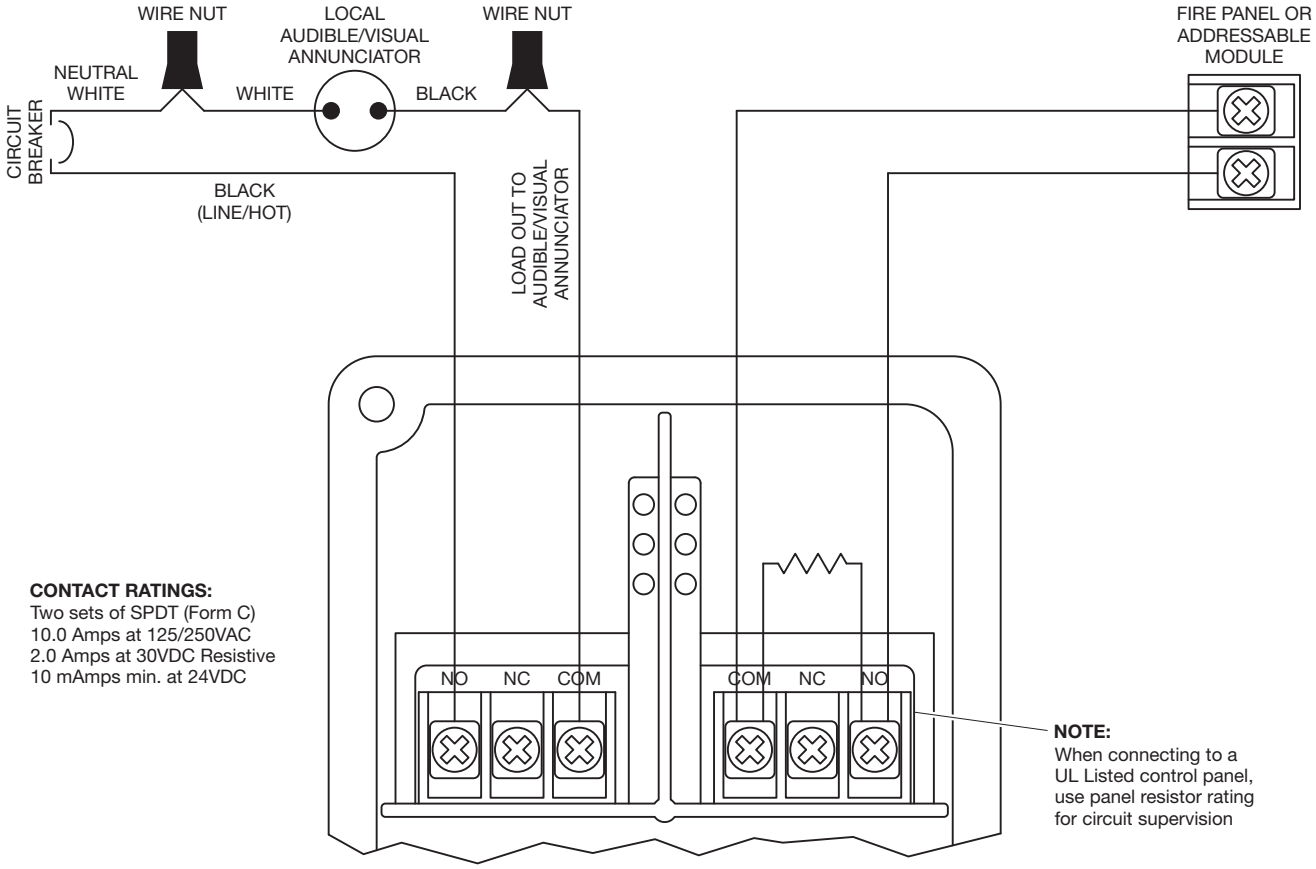


IMPROPER CONNECTION METHOD

CAUTION:
An uninsulated section of a single conductor is not permitted to be looped around the terminal and serve as two separate connections. The wire must be severed to serve as two separate connections, thereby providing supervision of the connection in the event that the wire becomes dislodged from the terminal.



PROPER CONNECTION METHOD



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

NOTE:
When connecting to a UL Listed control panel, use panel resistor rating for circuit supervision

NOTE:
For supervised circuits, see "Switch Terminal Connections" above. The Waterflow Alarm Switch has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.

FIGURE 6
MODEL RM-1 COMMERCIAL AND RESIDENTIAL RISER MANIFOLD WIRING GUIDANCE

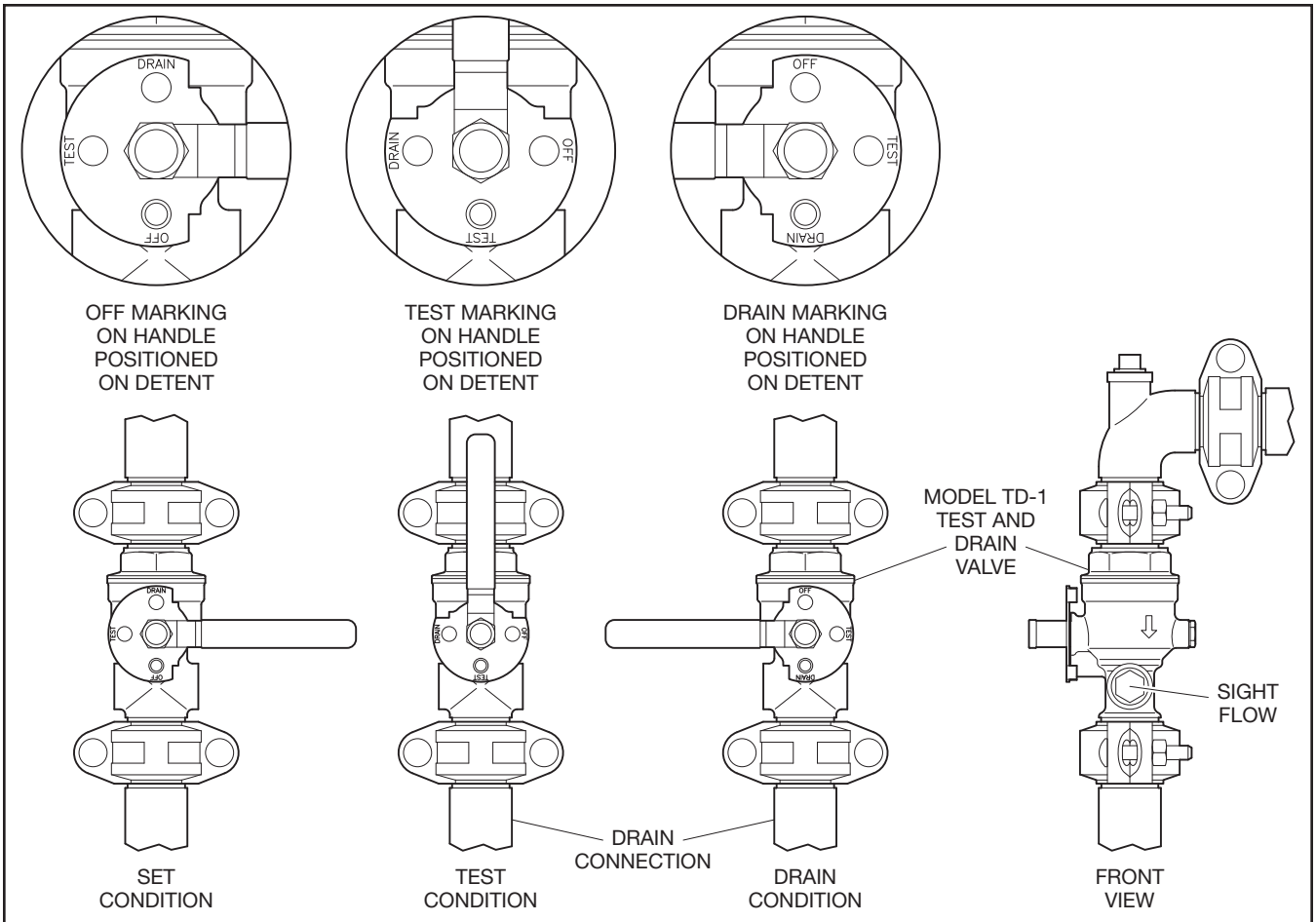


FIGURE 7
MODEL RM-1 COMMERCIAL RISER MANIFOLD
TD-1 TEST AND DRAIN VALVE OPERATION

Care and Maintenance

TYCO Riser Manifolds RM-1 must be serviced and maintained in accordance with this section.

Before closing a fire protection system control valve for inspection or maintenance work on the fire protection system that it controls, permission to shut down the effected fire protection system must first be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Note: *No attempt is to be made to repair any Riser Manifold component in the field. Only the pressure gauge, waterflow alarm switch, or relief valve can be replaced. If any other problems are encountered the entire riser manifold must be replaced.*

The alarm/flow test procedure will result in operation of the associated alarms. Consequently, notification must be given to the owner and the fire department, central station, or other signal station to which the alarms are connected, and notification must be given to the building occupants.

The following inspection procedure must be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected:

Alarm/Flow Test Procedure

Step 1. Place the Model TD-1 Test and Drain Valve in the TEST position (Ref. Figure 7). On residential assemblies without a test orifice, temporarily install a test orifice in the drain outlet and fully open the Drain Valve. Make certain that drainage water will not cause any damage or injury.

Step 2. Verify operation of associated alarms.

Step 3. Verify that the residual (i.e., flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

Step 4. Close the Drain Valve on the Residential models and the Test and Drain valve on commercial models.

Step 5. Verify that the static (i.e., not flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name, including description and part number (P/N).

Riser Manifolds
Specify: Size (specify) Connection Type (specify inlet x outlet) Model RM-1 Riser Manifold, P/N (specify):

Commercial
1-1/2 Inch (DN40) MT x FT. 40551
2 Inch (DN50) G x G. 40601
2-1/2 Inch (DN65) G x G. 40611
3 Inch (DN80) G x G. 40621
4 Inch (DN100) G x G. 40651
6 Inch (DN150) G x G. 40661

Residential
1 Inch (DN25) FT x FT 40671
1-1/2 Inch (DN40) MT x FT. 40571
2 Inch (DN50) G x G. 40591

Optional 175 psi Pressure Relief Kit
Specify: Pressure Relief Kit, Model RM-1 Riser Manifold, (specify Commercial or Residential application), (specify size range), P/N (specify):

Commercial
1-1/2–3 Inch (DN40–DN80). 40721
4–6 Inch (DN100–DN150) 40731

Residential
1–2 Inch (DN25–DN50). 40711

Replacement Parts
Specify: Model RM-1 Riser Manifold (specify part description), P/N (specify from Figures 1, 2, 3, 4 or 5)

tyco Fire Protection Products

Model CV-1F Grooved End Swing Check Valves

General Description

The TYCO Model CV-1F Grooved End Swing Check Valves are compact and rugged swing-type units that allow water flow in one direction and prevent flow in the opposite direction. A resilient elastomer seal facing on the spring-loaded clapper ensures a leak-tight seal and non-sticking operation. The Model CV-1F Check Valves are designed to minimize water hammer caused by flow reversal.

The Model CV-1F Grooved End Swing Check Valves are furnished with grooved ends and can be installed using GRINNELL Grooved Couplings or GRINNELL Figure 71 Flange Adapters. The Model CV-1F Check Valves have been designed with a removable cover for ease of field maintenance. These valves can be installed horizontally (with cover in the upward position) or vertically with the flow in the upward direction (Ref. Figure 3).

A check valve maintenance kit is available to allow backflushing through a fire department connection without removing the Model CV-1F Grooved End Swing Check Valve from the riser. Refer to technical data sheet TFP1555.

Model CV-1F is a re-designation for Central Figure 590F and GRINNELL Figure 590F Grooved End Swing Check Valves.

NOTICE

The TYCO Model CV-1F Grooved End Swing Check Valves described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Technical Data

Approvals
Compliance with CE Pressure Equipment Directive (PED) and Standards of Engineering Practice

- 2 in. to 12 in. (DN50 to DN300): UL and C-UL Listed, FM Approved, Bureau Veritas
- 2-1/2 in. to 10 in. (DN65 to DN250): VdS Approved
  Certificate No. G4060018

Sizes
2 in. to 12 in. (DN50 to DN300)

Maximum Working Pressure
UL/FM - 300 psi (20,7 bar)
VdS - 16 bar

Valve Assembly Finish
Red, non-lead paint

For fire protection pressure rating, listing and approval information, contact your TYCO representative.

Installation

The Model CV-1F Grooved End Swing Check Valves are to be installed in accordance with this section:

Step 1. The arrow cast on the body must point in the direction of the flow.

Step 2. Valves installed vertically must be positioned with the flow in the upward direction.

Step 3. Valves installed horizontally must be positioned with the cover facing up (Ref. Figure 3).

Step 4. Grooved end pipe couplings used with the Model CV-1F Grooved End Swing Check Valves must be installed in accordance with manufacturer's instructions.

Note: *Valves should be installed a reasonable distance downstream from pumps, elbows, expanders, reducers, or other similar devices to extend the valve life. Standard piping practices call for a minimum of five (5) times the pipe diameter for general use.*

Nominal Pipe Size		Nominal Dimensions Inch (mm)							Cover Bolt Torque Lbs.-ft. (Nm)	Approx. Weight Lbs. (kg)
Valve Size Inch (DN)	Pipe O.D. Inch (mm)	A	B	C	D	E	F	J		
2 (50)	2.37 (60,3)	6.75 (171,5)	1.96 (49,8)	1.96 (49,8)	2.57 (65,3)	3.25 (82,3)	4.75 (120,7)	1.62 (41,5)	18 (25)	9.0 (4,5)
2-1/2 (65)	2.88 (73,0)	8.00 (203,2)	5.38 (136,7)	2.63 (66,7)	3.09 (78,5)	3.87 (98,3)	5.87 (149,1)	1.63 (41,7)	39 (54)	10.0 (4,5)
76,1 mm (65)	3.00 (76,1)	8.00 (203,2)	5.38 (136,7)	2.63 (66,7)	3.09 (78,5)	3.87 (98,3)	5.87 (149,1)	1.63 (41,7)	39 (54)	10.0 (4,5)
3 (80)	3.50 (88,9)	8.37 (212,6)	5.72 (145,3)	2.81 (71,4)	3.31 (84,1)	3.87 (98,3)	5.87 (149,1)	1.63 (41,7)	39 (54)	11.0 (5,0)
4 (100)	4.50 (114,3)	9.63 (244,6)	6.68 (169,7)	3.80 (96,5)	3.63 (92,2)	4.53 (115,4)	7.13 (181,1)	1.84 (46,7)	50 (69)	25.0 (11,3)
139,7 mm (125)	5.50 (139,7)	10.50 (266,7)	7.40 (188,0)	4.46 (113,3)	4.13 (104,9)	4.90 (124,5)	7.50 (190,5)	1.75 (44,5)	39 (54)	29.0 (13,2)
5 (125)	5.56 (141,3)	10.50 (266,7)	7.40 (188,0)	4.46 (113,3)	4.13 (104,9)	4.90 (124,5)	7.50 (190,5)	1.75 (44,5)	39 (54)	29.0 (13,2)
165,1 mm (150)	6.50 (165,1)	11.50 (292,1)	8.00 (203,2)	4.62 (117,3)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.85 (47,0)	60 (82)	47.0 (21,3)
6 (150)	6.63 (168,3)	11.50 (292,1)	8.00 (203,2)	4.62 (117,3)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.85 (47,0)	60 (82)	47.0 (21,3)
8 (200)	8.63 (219,1)	14.00 (355,6)	10.14 (257,8)	6.67 (169,4)	5.52 (140,2)	5.46 (138,7)	8.46 (214,9)	2.13 (54,1)	120 (164)	66.0 (29,9)
10 (250)	10.75 (273,1)	18.00 (457,2)	12.38 (314,5)	8.62 (218,9)	6.41 (162,8)	7.50 (190,5)	10.50 (266,7)	3.00 (76,2)	130 (178)	109.7 (49,4)
12 (300)	12.75 (323,9)	21.00 (533,4)	14.28 (362,7)	9.93 (252,2)	7.27 (184,7)	7.62 (193,5)	10.62 (269,7)	2.75 (69,9)	130 (178)	151.0 (68,0)

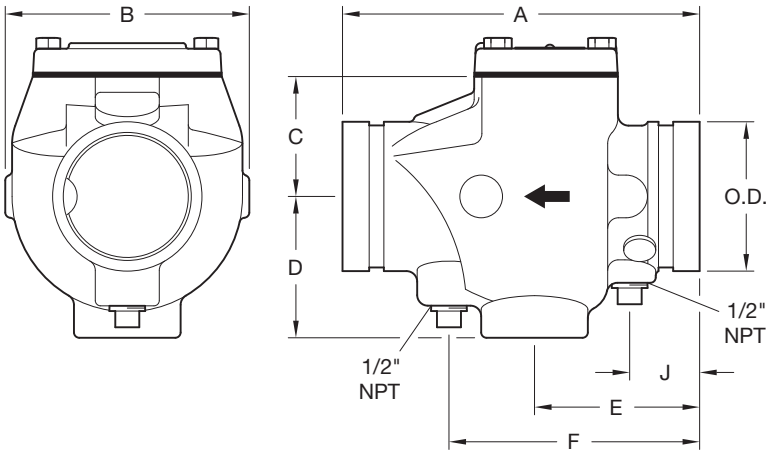


FIGURE 1
MODEL CV-1F GROOVED END SWING CHECK VALVES
NOMINAL DIMENSIONS

Care and Maintenance

The TYCO Model CV-1F Grooved End Swing Check Valves must be maintained and serviced in accordance with this section.

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

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions. Any impairments must be immediately corrected.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

No.	Part	Material	Qty.
1	Body	Ductile Iron	1
2	Cover	Ductile Iron	1
3	Cover Gasket	Nitrile Rubber	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper, 2"-8" (DN50-200)	Stainless Steel	1
	Clapper, 10"-12" (DN250-300)	Ductile Iron	

No.	Part	Material	Qty.
6	Clapper Facing	EPDM Grade "E"	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
11	Retention Bolt	Stainless Steel	1
13	Retaining Disc	Stainless Steel	1

No.	Part	Material	Qty.
14	Locknut	Stainless Steel	1
15	Plug 1/2" NPT	Cast Iron	2
16	Adhesive	Thread Sealer	AR
17	Nameplate	Aluminum	1
18	Rivet	Steel	2
19	Spacer	Stainless Steel	1

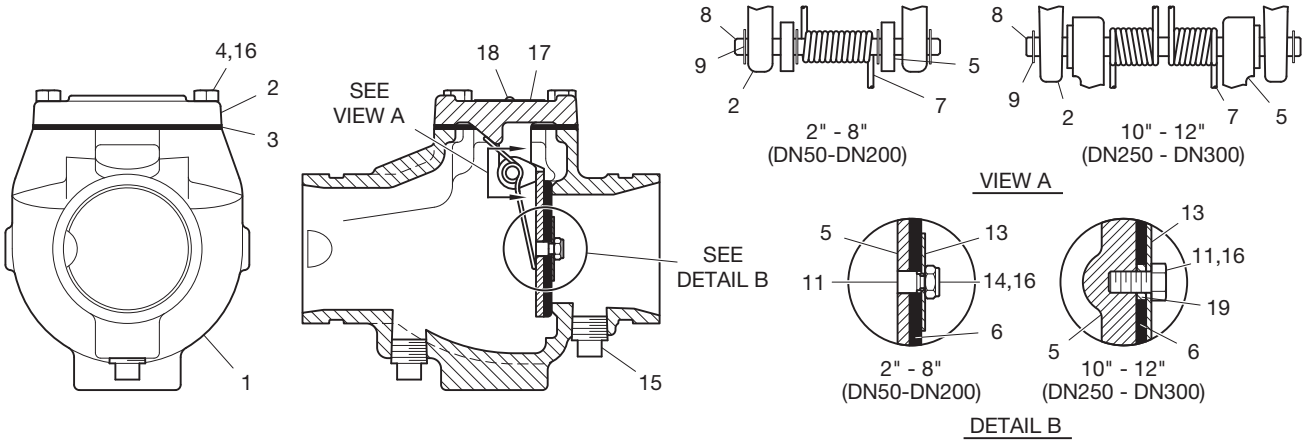
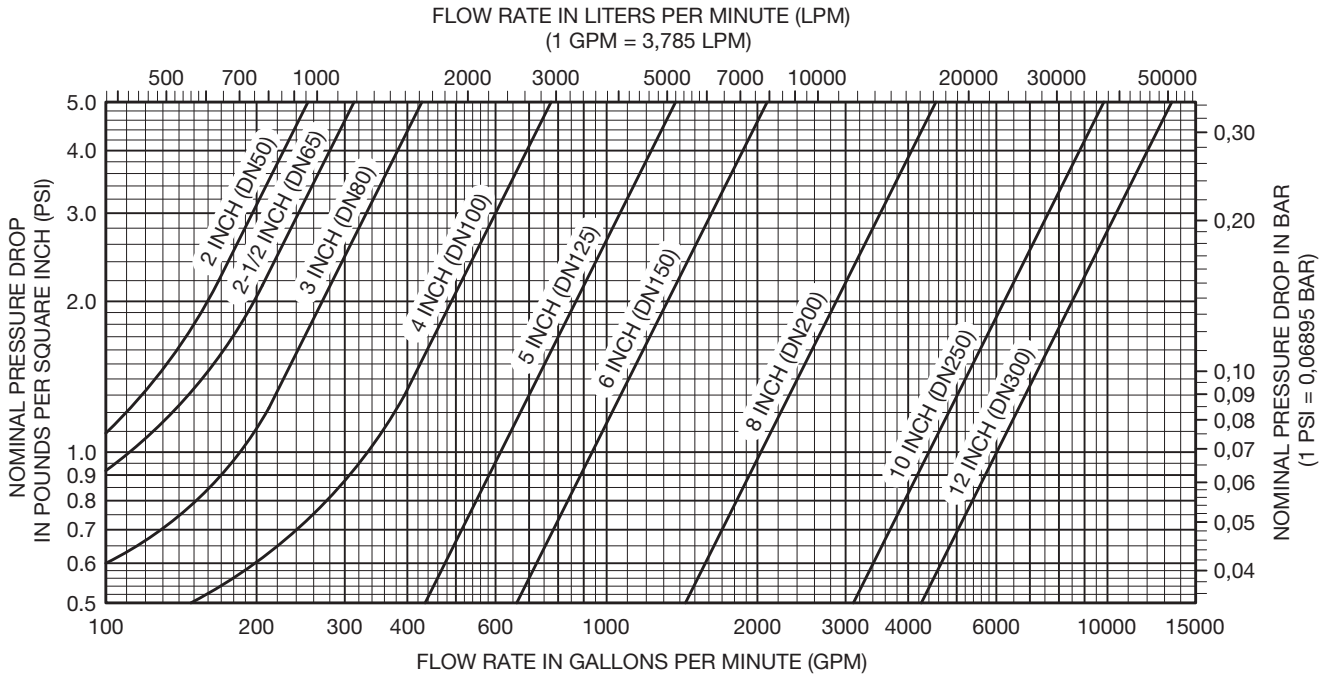


FIGURE 2
MODEL CV-1F GROOVED END SWING CHECK VALVES
ASSEMBLY



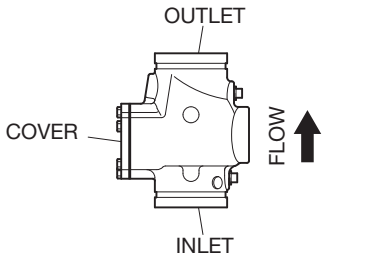
GRAPH A
MODEL CV-1F GROOVED END SWING CHECK VALVES
NOMINAL PRESSURE LOSS VS. FLOW

Valve Size Inch (DN)	Pipe O.D. Inch (mm)	Part Number
2 (50)	2.37 (60,3)	59-590-0-020
2-1/2 (65)	2.88 (73,0)	59-590-0-025
76,1 mm (65)	3.00 (76,1)	59-590-0-076
3 (80)	3.50 (88,9)	59-590-0-030
4 (100)	4.50 (114,3)	59-590-0-040
139,7 mm (125)	5.50 (139,7)	59-590-0-139
5 (125)	5.56 (141,3)	59-590-0-050
165,1 mm (150)	6.50 (165,1)	59-590-0-165
6 (150)	6.63 (168,3)	59-590-0-060
8 (200)	8.63 (219,1)	59-590-0-080
10 (250)	10.75 (273,1)	59-590-0-100
12 (300)	12.75 (323,9)	59-590-0-120

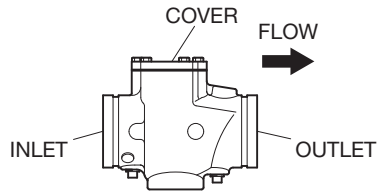
TABLE A
MODEL CV-1F GROOVED END SWING CHECK VALVES
PART NUMBER SELECTION

Valve Size Inch (DN)	Pipe O.D. Inch (mm)	Cover Gasket Part Number		Clapper Facing Part Number		Clapper Assembly Part Number	
		Americas Only	EMEA/APAC	Americas Only	EMEA/APAC	Americas Only	EMEA/APAC
2 (50)	2.37 (60,3)	595907020	97670501	59020EPDM	59020EPDM	97670201A	97670201
2-1/2 (65)	2.88 (73,0)	595907030	97561801	59025EPDME	59025EPDM	97562801A	97562065
76,1 mm (65)	3.00 (76,1)	595907030	97561801	59025EPDME	59025EPDM	—	97562801
3 (80)	3.50 (88,9)	595907030	97561801	59030EPDME	59030EPDM	97562201A	97562201
4 (100)	4.50 (114,3)	595907040	97512001	59040EPDME	59040EPDM	97549001A	97549001
139,7 mm (125)	5.50 (139,7)	595907040	97512001	59050EPDME	59050EPDM	—	97565501
5 (125)	5.56 (141,3)	595907040	97512001	59050EPDME	59050EPDM	97565501A	97562125
165,1 mm (150)	6.50 (165,1)	595907060	97521801	59060EPDME	59060EPDM	—	97524101
6 (150)	6.63 (168,3)	595907060	97521801	59060EPDME	59060EPDM	97524101A	97562150
8 (200)	8.63 (219,1)	595907080	97547901	59080EPDME	59080EPDM	97592201A	97592201
10 (250)	10.75 (273,1)	595907100	97600001	59100EPDM	59100EPDM	97598001A	97598001
12 (300)	12.75 (323,9)	595907120	97600002	59120EPDM	59120EPDM	97647701A	97647701

TABLE B
MODEL CV-1F GROOVED END SWING CHECK VALVES REPLACEMENT VALVE PARTS
PART NUMBER SELECTION



VERTICAL ORIENTATION



HORIZONTAL ORIENTATION

FIGURE 3
MODEL CV-1F GROOVED END SWING CHECK VALVES PROPER ORIENTATION

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Model CV-1F Check Valve

Specify: Model CV-1F Grooved End Swing Check Valve, size (specify), P/N (specify per Table A)

Replacement Valve Parts

Refer to Figure 2 to identify Parts.

Cover Gasket

Specify: Model CV-1F Grooved End Swing Check Valve, Cover Gasket, size (specify), P/N (specify per Table B)

Clapper Facing

Specify: Model CV-1F Grooved End Swing Check Valve, Clapper Seal Facing, EPDM Grade “E”, size (specify), P/N (specify per Table B)

Clapper Assembly

Includes items 2, 3, 5-14, and 17-19.

Specify: Model CV-1F Grooved End Swing Check Valve, Clapper Assembly, size (specify), P/N (specify per Table B)

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Johnson Controls

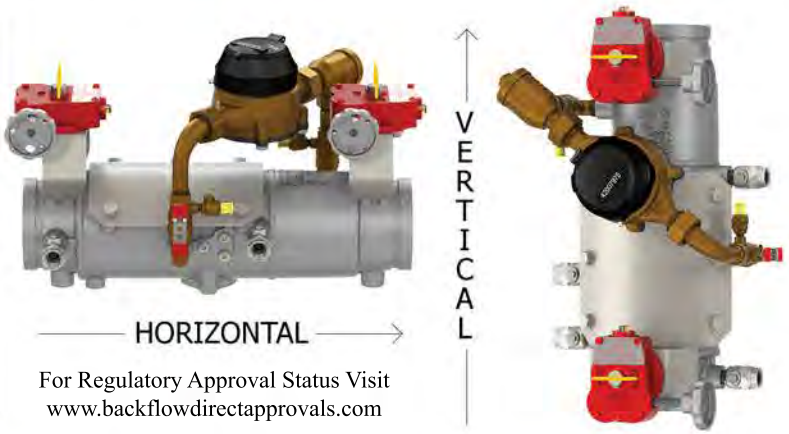
BACKFLOW DIRECT

Deringer 30 DCDA

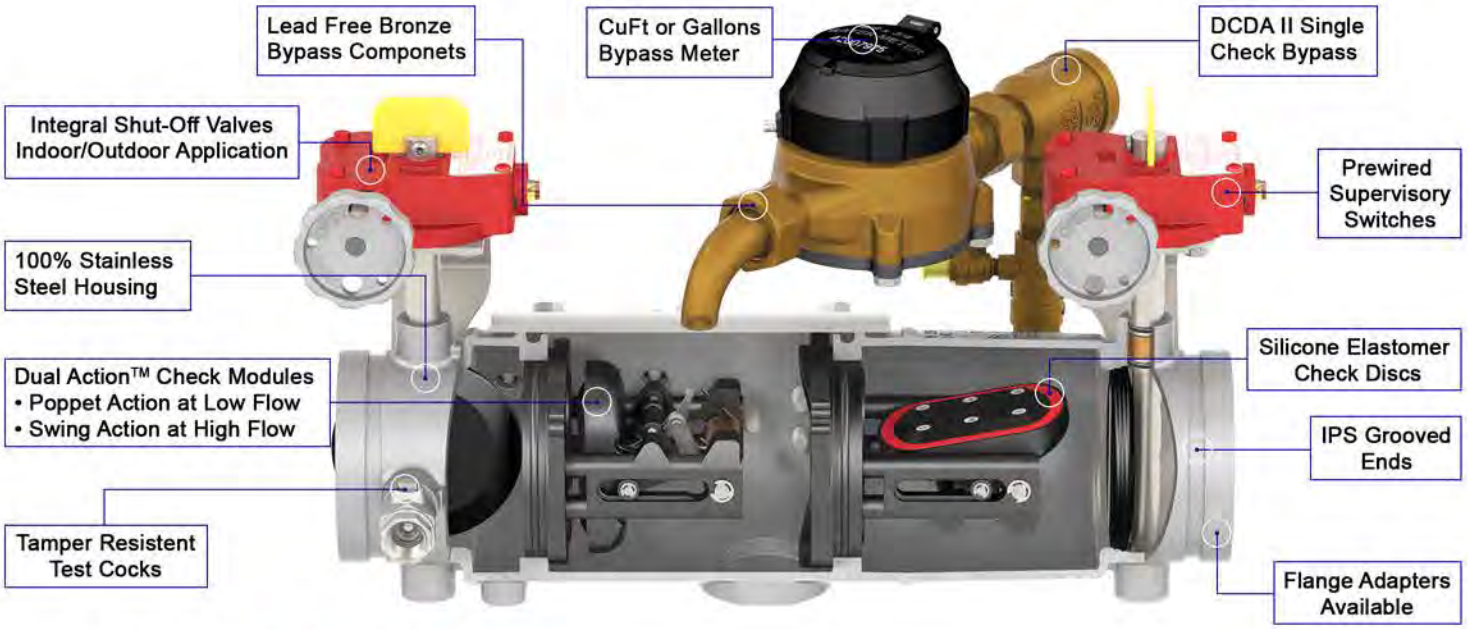
Double Check Detector Assembly

The Deringer 30 Double Check Detector Assembly prevents non-health hazard pollutants from entering a potable water supply system when backpressure and/or backsiphonage conditions occur. Used primarily on fire sprinkler systems when monitoring of unathorized water use is required.

Sizes:	*2½" , 3", 4", 6", 8"*
Working Pressure:	*10-175psi (0.7-12.1 bar)*
Temperature Range:	*33°-140°F (1°-60°C)*
End Connections	
- IPS Groove for Steel Pipe:	*AWWA C606*
- Flange Adapters:	*ANSI B16.1 Class 125*
Lead Free:	*0.25% Maximum by Weight*



For Regulatory Approval Status Visit
www.backflowdirectapprovals.com



Engineering Specifications

The Deringer 30 Double Check Detector Assembly shall utilize two independent Dual Action Check modules and two integral resiliently seated shut-off valves all of which shall be contained within a single rigid valve housing constructed entirely of 304 stainless steel. Both integral shutoff valves shall include pre-wired supervisory tamper switches contained within a weatherproof actuator housing approved for both indoor and outdoor use. Dual Action Check modules shall operate as a "poppet style" check under low flow conditions, operate as a "swing style" check under high flow conditions and utilize replaceable silicone elastomer sealing discs. Assembly test cocks shall be handle-less and operate via a tamper resistant actuator. Assembly shall have a single full access service port and cover with an "inline" replaceable elastomer seal. The bypass assembly shall include a meter registering either gallons or cubic feet, a single check valve and required test cocks. Assembly shall be serviceable without special tools and approved for both horizontal and vertical applications.

Job Name: _____ **Contractor:** _____

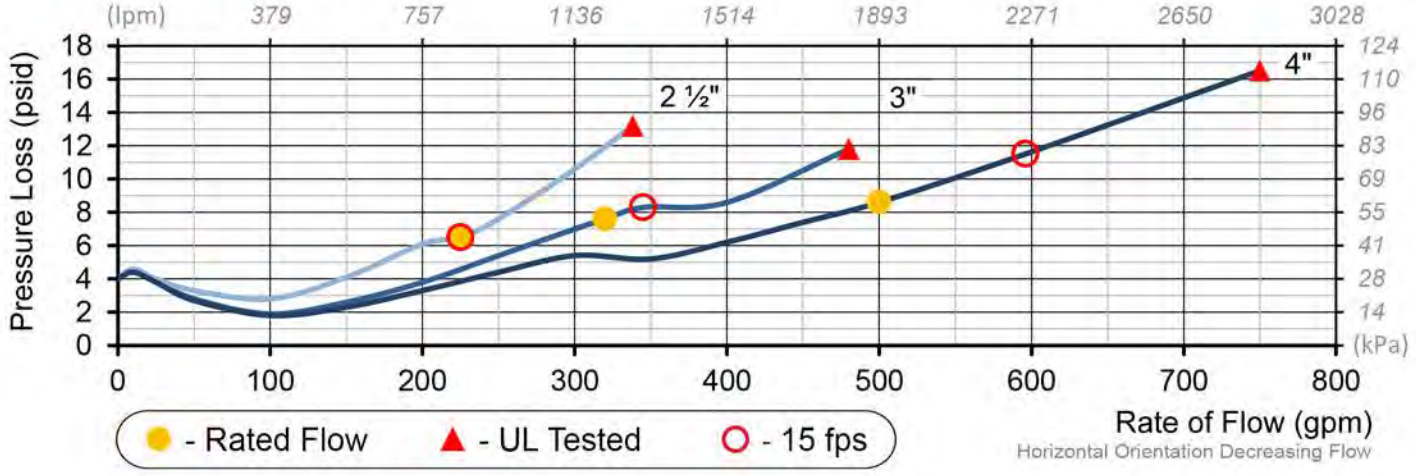
Job Location: _____ **Approval:** _____

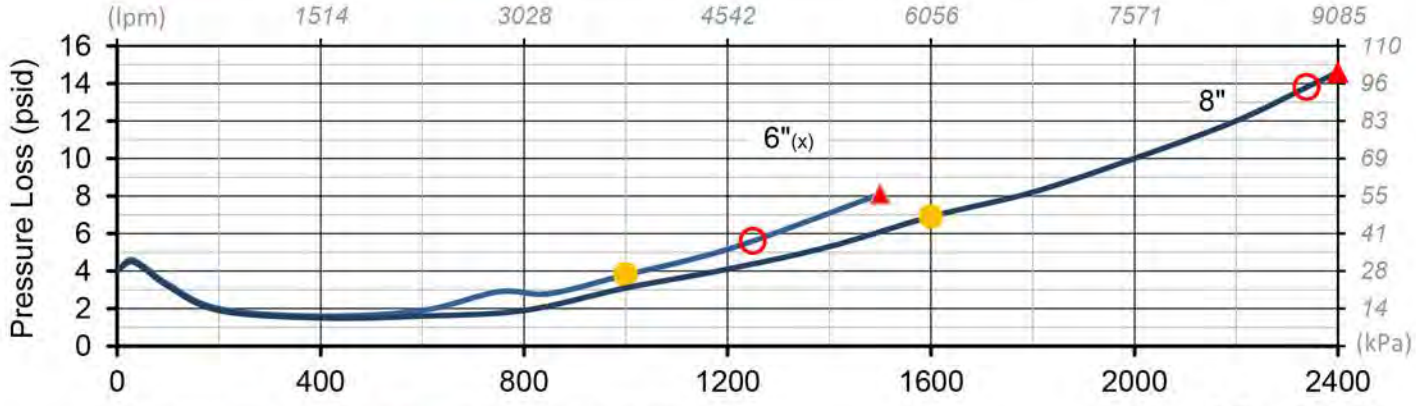
Engineer: _____ **Contractor's P.O. No:** _____

Approval: _____ **Representative:** _____

Backflow Direct, LLC • 3290 Monier Circle • Rancho Cordova • California • 95742 • United States of America
Phone: 916-760-4524 Website: www.backflowdirect.com

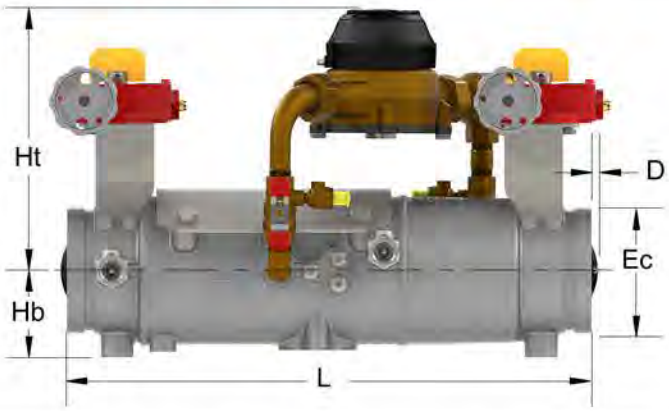
Flow Performance

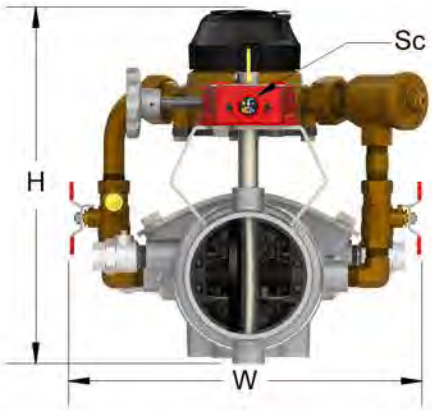




*Specific orientation & agency flow characteristics available on website

Measures & Materials





Size		Ht		Hb		L		Ec		D		H		W		Weight		Sc
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg	NPT
2 ½	65	7.1	180	2.9	74	18.7	475	2½	65	0.0	0	10.0	254	11.0	279	47	21	½"
3	80	7.4	188	2.9	74	18.7	475	3	80	0.0	0	10.3	262	11.0	279	49	22	½"
4	100	7.9	201	3.1	79	18.7	475	4	100	0.2	5	11.0	279	11.0	279	51	23	½"
6	150	8.7	221	4.8	122	28.4	721	6	150	1.0	25	13.5	343	13.8	351	131	59	½"
8	200	10.4	264	5.4	137	30.7	780	8	200	1.8	46	15.8	401	13.8	351	150	68	½"

Valve Housing: *304 Stainless Steel*
Valve Cover: *304 Stainless Steel*
SOV Disks: *EPDM/304SS*
SOV Shafts: *304 Stainless Steel*
Bypass Spring: *302 Stainless Steel*
SOV Bearings: *Teflon/Bronze*
Non Wetted Bolts: *Grade 8 Zinc Plated*
Wetted Fasteners: *18-8 Stainless Steel*
All Check Disks: *Silicone (NSF)*
Bypass Components: *Lead Free Bronze*
Check Springs: *17-7 Stainless Steel*
Check Pins: *17-7/18-8 Stainless Steel*
Check Seats: *Noryl Polymer (NSF)*
O-Rings: *Buna-N (NSF)*
Bypass Internals: *ABS Polymer (NSF)*

Backflow Direct, LLC • 3290 Monier Circle • Rancho Cordova • California • 95742 • United States of America
Phone: 916-760-4524 Website: www.backflowdirect.com

4. ELECTRICAL / FIRE ALARM COMPONENTS

AUTOMATIC FIRE SUPPRESSION SYSTEM

POTTER
The Symbol of Protection

BELLS

PBA-AC & MBA-DC

Features

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

UL UL* FM APPROVED

* ULC on MBA-DC Only

Description

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

Notes

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

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

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

Technical Specifications

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

*Specifications subject to change without notice.

⚠ WARNING

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

⚠ WARNING

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

Installation

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

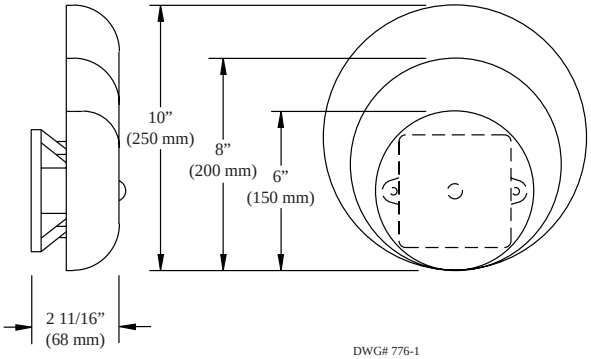
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation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

⚠ WARNING

Failure to install striker down will prevent bell from ringing.

Bell Dimension Inches (mm)

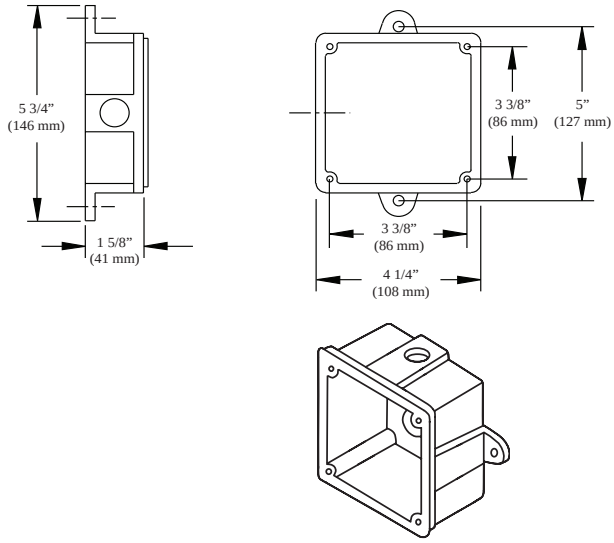
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

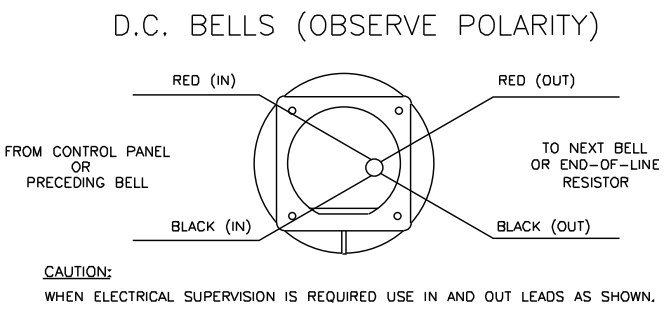
MODEL BBK-1 OR HC-BB

Fig 2



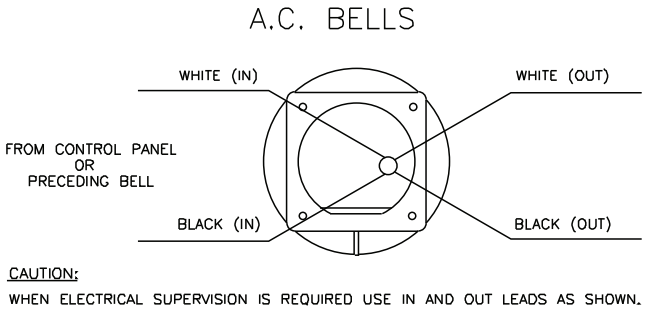
Wiring Rear View

Fig 3



NOTES:

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



NOTES:

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

VSR

VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Specifications subject to change without notice.

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

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

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU
Service Pressure: 450 PSI (31 BAR) - UL
Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL
Maximum Surge: 18 FPS (5.5 m/s)
Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC
Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.
Environmental Specifications:

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

Service Use:

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

WARNING

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

CAUTION

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

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

General Information

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

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

Enclosure

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

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

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

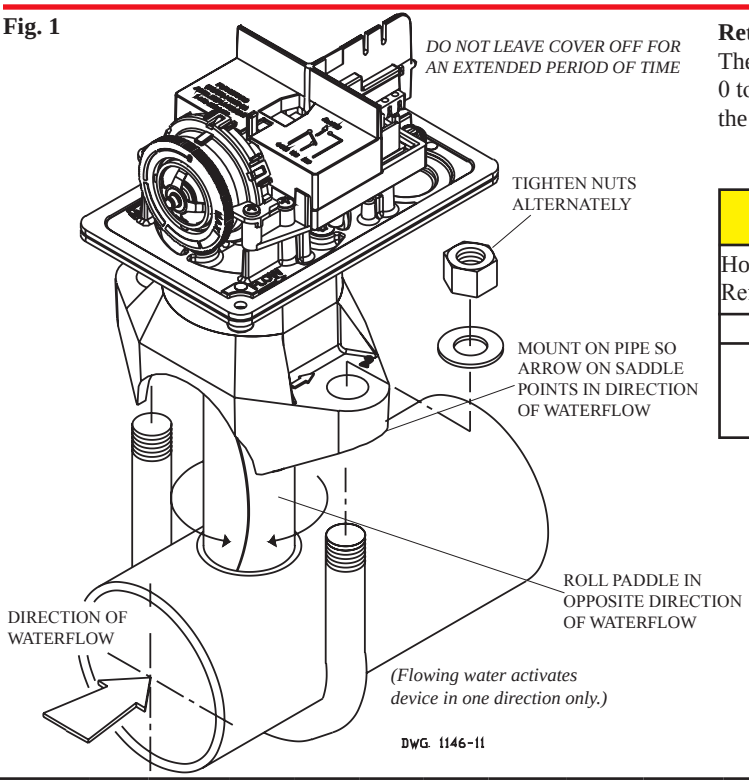
NOTE: Do not leave cover off for an extended period of time.

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

⚠ CAUTION

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

Fig. 1

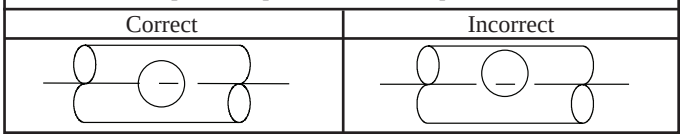


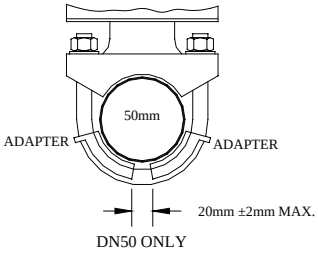
Retard Adjustment

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

CAUTION

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





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

DWG# 1146-1F

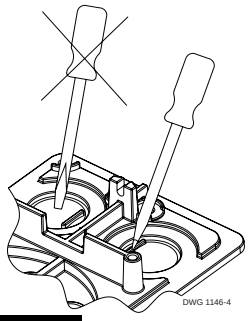
Compatible Pipe/ Installation Requirements

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

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

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

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



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

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

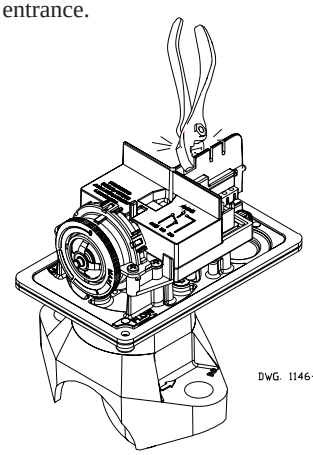
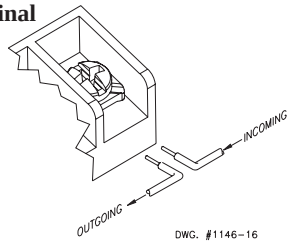


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

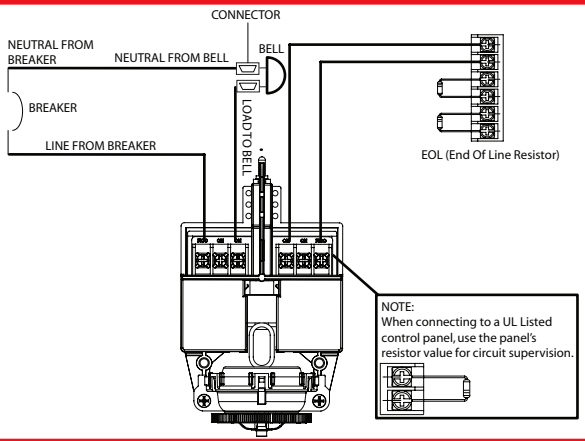


⚠ WARNING

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

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

Fig. 5 Typical Electrical Connections



Notes:

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

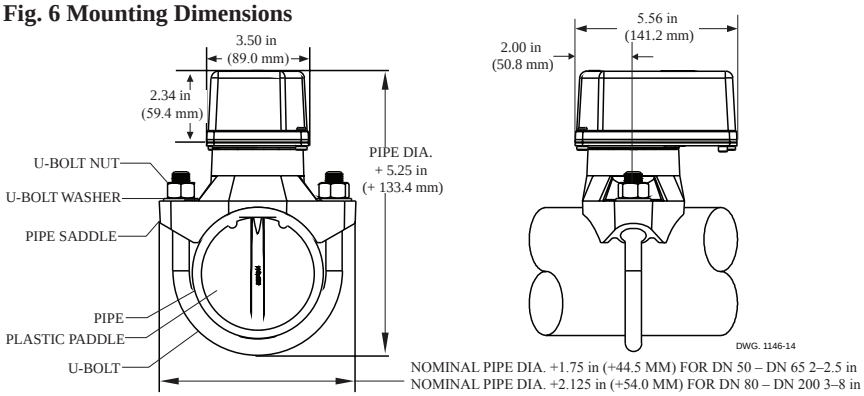
Testing

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

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

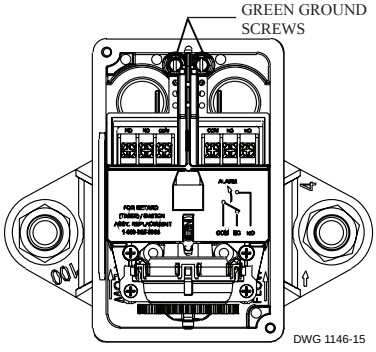
NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 6 Mounting Dimensions



NOMINAL PIPE DIA. +1.75 in (+44.5 MM) FOR DN 50 – DN 65 2–2.5 in
NOMINAL PIPE DIA. +2.125 in (+54.0 MM) FOR DN 80 – DN 200 3–8 in

Fig. 7



Maintenance

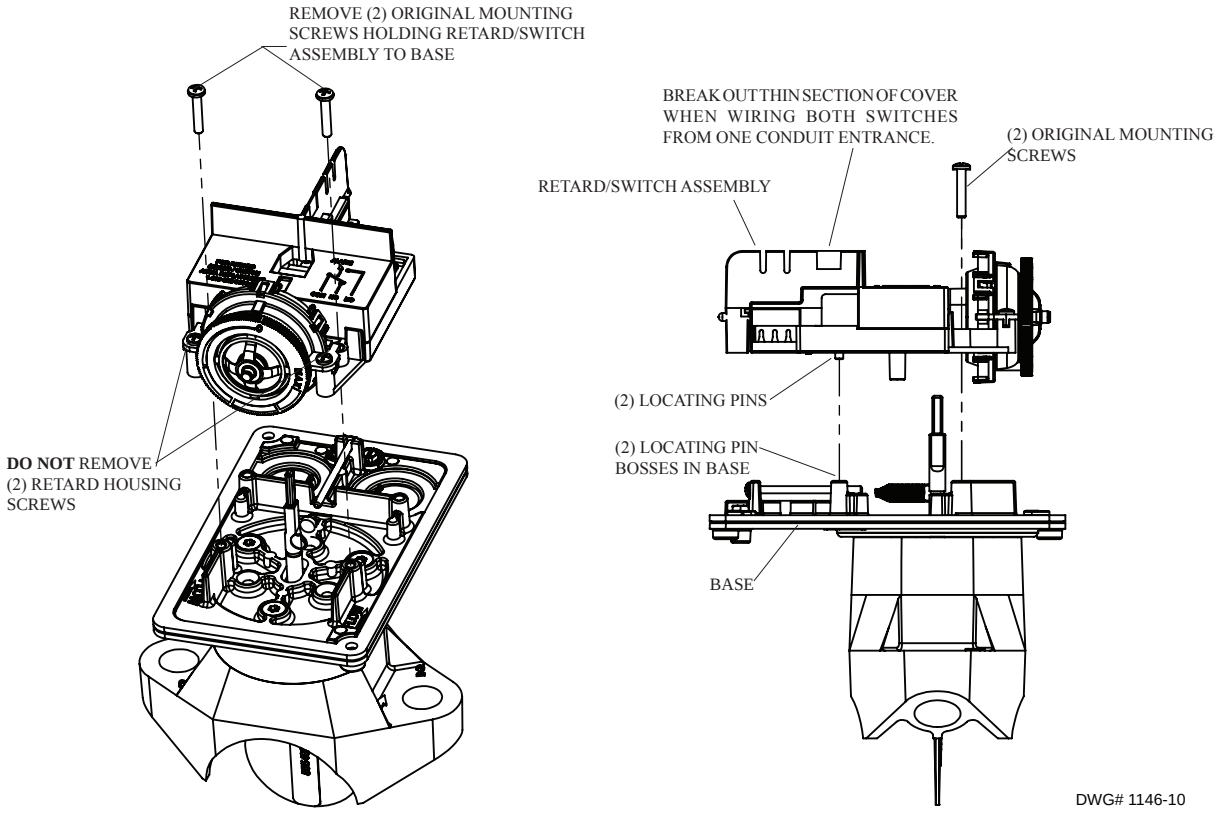
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard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

Retard/Switch Assembly Replacement (See Fig. 8)

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

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

Fig. 8



Removal of Waterflow Switch

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

5. PIPE HANGERS

AUTOMATIC FIRE SUPPRESSION SYSTEM

B3034 - C-Clamp

Size Range: 3/8"-16 thru 3/4"-10 rod

Material: Cast Malleable Steel with hardened cup point set screw and jam nut

Function: Recommended for hanging from steel beam where flange thickness does not exceed 3/4" (19.0mm).

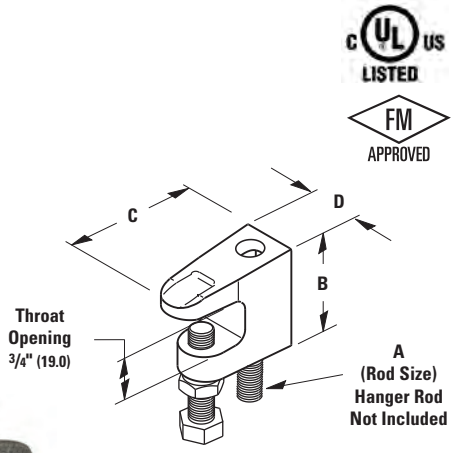
Features: May be used on top or bottom flange of the beam. Beveled lip allows hanging from top flange where clearance is limited. May be installed with the set screw in the up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. The rear window design permits inspection of thread engagement.

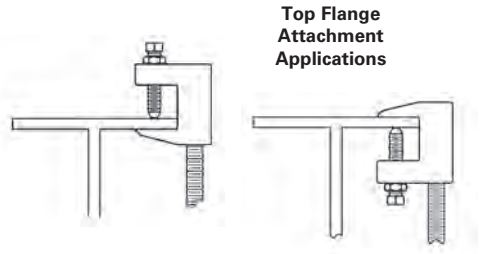
Approvals: Underwriters Laboratories Listed **(cULus)** and Factory Mutual Engineering Approved **(FM)** for 3/8"-16 and 1/2"-13 rod sizes. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 23 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19.
3/8"-16 is **(cULus)** Listed to support up to 4" (100mm) pipe with the set screw in the down position, up to 3" (75mm) pipe with the set screw in the up position.
1/2"-13 is **(cULus)** Listed to support up to 8" (200mm) pipe with the set screw in the down position, up to 6" (150mm) pipe with the set screw in the up position.
Factory Mutual Engineering Approved only with the setscrew in the down position.

Finish: Plain. Contact customer service for alternative finishes and materials.

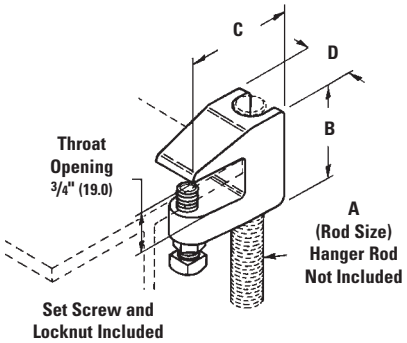
Order By: Figure number, rod size and finish

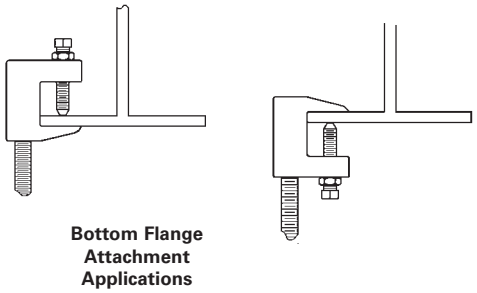
Setscrew Torque: Per MSS SP-58 14.2.5
3/8" -16 set screws = 5 ft./lbs. (7 Nm)
1/2" -13 set screws = 11 ft./lbs. (15 Nm)
Caution should be taken not to over-tighten set screws.





B3034-5/8" and B3034-3/4" sizes Attach only as shown.

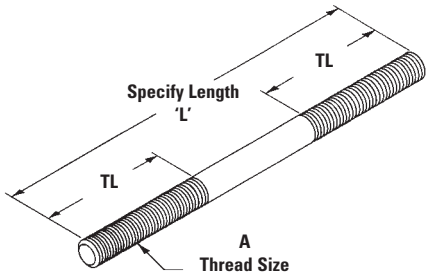




Part No.	Rod Size A	Set Screw Size	B		C		D		Maximum Iron Pipe Size Per UL		Approx. Wt./100	
			in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
B3034-3/8	3/8"-16	3/8"-16 x 1 1/2"	1 5/8"	(41.3)	2"	(50.8)	7/8"	(19.0)	4"	(100)	30	(13.6)
B3034-1/2	1/2"-13	1/2"-13 x 1 1/2"	1 13/16"	(46.0)	2 3/16"	(55.6)	1 3/16"	(30.2)	8"	(200)	47	(21.3)
B3034-5/8	5/8"-11	1/2"-13 x 2"	1 3/4"	(44.5)	2 1/8"	(54.0)	1 1/4"	(31.7)	--	--	58	(26.3)
B3034-3/4	3/4"-10	1/2"-13 x 2"	2"	(50.8)	2 1/4"	(57.2)	1 1/4"	(31.7)	--	--	77	(35.0)

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

B3205 - Threaded Rod (right-hand threads - both ends)
B3205L - Threaded Rod (right & left hand threads)



Size Range: 3/8"-16 thru 7/8"-9 rod

Material: Steel

Function: Recommended for use as a hanger support in hanger assemblies. Rod is threaded on both ends with right hand threads of the length shown. Also available with left and right hand threads - specify Fig. B3205L when ordering.

Maximum Temperature: 750°F (399°C)

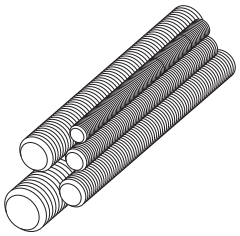
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number, rod size, length and finish

Part No.	Thread Size A	Standard Thread Length TL in.	(mm)	Design Load 650°F (343°C) Lbs.	(kN)	750°F (399°C) Lbs.	(kN)
B3205-3/8 x 'L'	3/8"-16	2 1/2"	(63.5)	730	(3.25)	572	(2.54)
B3205-1/2 x 'L'	1/2"-13	2 1/2"	(63.5)	1350	(6.00)	1057	(4.70)
B3205-5/8 x 'L'	5/8"-11	2 1/2"	(63.5)	2160	(9.61)	1692	(7.52)
B3205-3/4 x 'L'	3/4"-10	3"	(76.2)	3230	(14.37)	2530	(11.25)
B3205-7/8 x 'L'	7/8"-9	3 1/2"	(88.9)	4480	(19.93)	3508	(15.60)

For larger sizes consult full line pipe hanger catalog.

ATR - All Threaded Rod - 120" (3.05m) Lengths
TOLCO™ Fig. 99 - All Threaded Rod Cut To Length



OPM

Size Range: 1/4"-20 thru 7/8"-9 rod in 120" lengths or cut to length

Material: Steel

Maximum Temperature: 750°F (399°C)

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

Approvals: Included in our Seismic Engineering Guidelines 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 our Seismic Engineering Guidelines, OPM-0052-13.

Order By: Figure number, rod size, length and finish

Part No. - Size x Length ATR	Fig. 99	Threads Per Inch	Recommended Load Lbs.	(kN)	Approx. Wt./100 Ft. Lbs.	(kg)
ATR 1/4" x 120	99-1/4" x length	20	240	(1.07)	12	(5.44)
ATR 3/8" x 120	99-3/8" x length	16	730	(3.24)	29	(13.15)
ATR 1/2" x 120	99-1/2" x length	13	1350	(6.00)	53	(24.04)
ATR 5/8" x 120	99-5/8" x length	11	2160	(9.60)	89	(40.37)
ATR 3/4" x 120	99-3/4" x length	10	3230	(14.37)	123	(55.79)
ATR 7/8" x 120	99-7/8" x length	9	4480	(19.93)	170	(77.11)

For larger sizes consult full line pipe hanger catalog.

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

TOLCO™ Fig. 200 - "Trimline" Adjustable Band Hanger
TOLCO™ Fig. 200F - "Trimline" Adjustable Band Hanger with Felt Lining for Copper Tubing
TOLCO™ Fig. 200C - "Trimline" Adjustable Band Hanger with Plastic Coated
TOLCO™ Fig. 200S - "Trimline" Adjustable Band Hanger with Removable Nut (For sizes 1" thru 2")

Size Range:
Fig. 200 - 1/2" (15mm) thru 8" (200mm) pipe

Material: Steel, Pre-Galvanized

Function: For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation.

Features:

- 1/2" (15mm) thru 2" (50mm) sizes have flared edges for ease of installation on all pipe types and protects CPVC plastic pipe from abrasion. Captured knurled nut design (flared top) on 1" thru 2" sizes keep nut from separating with hanger. Hanger is easily installed around pipe.
- 1/2" (15mm), 3/4" (20mm), and 2 1/2" (65mm) thru 8" (200mm)) Spring tension on nut holds it securely in hanger before installation. Knurled nut is easily removed.
- For 1/2" (15mm) and 3/4" (20mm) sizes with non-captured knurl nuts order Fig. 200S

Approvals: Underwriters Laboratories listed (1/2" (15mm) thru 8" (200mm)) in the USA **(UL)** and Canada **(cUL)** for steel and CPVC plastic pipe and Factory Mutual Engineering Approved **(FM)** (3/4" (20mm) thru 8" (200mm)). Conforms to Federal Specifications WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

Maximum Temperature: 650°F (343°C)

Finish: Pre-Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nut.

Order By: Part number and pipe size

**** Note:** For metric hanger rod sizes add the metric rod size to the figure number. Example: 200M8-1 1/2 or 200M10-1 1/2

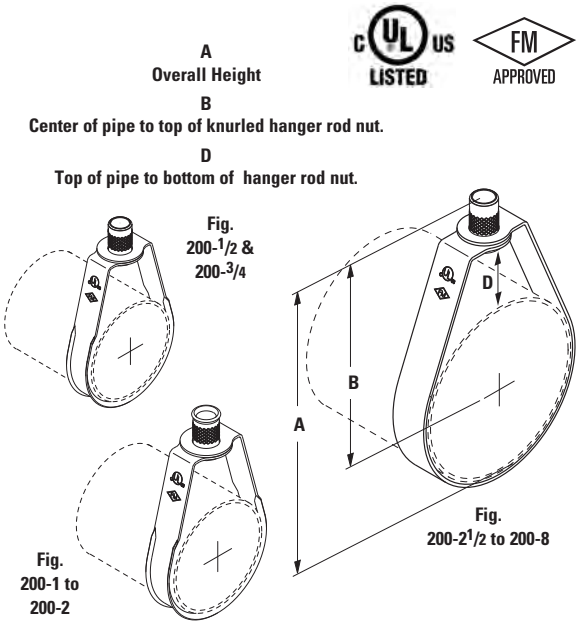


Fig. 200C
200C-1 1/2 shown

Fig. 200F
200F-1 1/2 shown

Fig. 200
shown with captured nut
1" thru 2" sizes only

Fig. 200 & Fig. 200S
shown with
non-captured nut

Part No.**	Pipe Size in.	(mm)	Rod Size in.	mm**	A in.	(mm)	B in.	(mm)	D in.	(mm)	Max. Rec. Load lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
200-1/2	1/2"	(15)	3/8"-16	M8 or M10	3 1/8"	(79.4)	2 5/8"	(66.7)	1 11/32"	(34.1)	400	(1.78)	11	(5.0)
200-3/4	3/4"	(20)	3/8"-16	M8 or M10	3 1/8"	(79.4)	2 1/2"	(63.5)	1 1/16"	(27.0)	400	(1.78)	11	(5.0)
200-1	1"	(25)	3/8"-16	M8 or M10	3 3/8"	(85.7)	2 5/8"	(66.7)	1 1/8"	(28.6)	400	(1.78)	12	(5.5)
200-1 1/4	1 1/4"	(32)	3/8"-16	M8 or M10	3 3/4"	(94.0)	2 7/8"	(73.0)	1 5/32"	(29.3)	400	(1.78)	13	(5.9)
200-1 1/2	1 1/2"	(40)	3/8"-16	M8 or M10	3 7/8"	(98.4)	2 7/8"	(73.0)	1 3/16"	(30.2)	400	(1.78)	14	(6.4)
200-2	2"	(50)	3/8"-16	M8 or M10	4 1/2"	(114.3)	3"	(76.3)	1 3/16"	(30.2)	400	(1.78)	15	(6.9)
200-2 1/2	2 1/2"	(65)	3/8"-16	M10	5 5/8"	(142.9)	4 1/8"	(104.7)	1 7/16"	(36.5)	600	(2.67)	27	(12.3)
200-3	3"	(75)	3/8"-16	M10	5 7/8"	(149.1)	4"	(101.6)	1 1/4"	(31.7)	600	(2.67)	29	(13.3)
200-3 1/2	3 1/2"	(90)	3/8"-16	M10	7 3/8"	(187.3)	5 1/4"	(133.3)	2 3/16"	(55.6)	600	(2.67)	34	(15.6)
200-4	4"	(100)	3/8"-16	M10	7 3/8"	(187.3)	5"	(127.0)	1 3/8"	(34.9)	1000	(4.45)	35	(16.0)
200-5	5"	(125)	1/2"-13	M12	9 1/8"	(231.8)	6 1/4"	(158.7)	3 11/32"	(84.9)	1250	(5.56)	66	(30.2)
200-6	6"	(150)	1/2"-13	M12	10 1/8"	(257.2)	6 3/4"	(171.4)	2 7/32"	(56.3)	1250	(5.56)	73	(33.4)
200-8	8"	(200)	1/2"-13	M12	13 1/8"	(333.4)	8 3/4"	(222.2)	3 7/32"	(81.7)	1250	(5.56)	136	(62.3)

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

6. SEISMIC BRACING COMPONENTS

AUTOMATIC FIRE SUPPRESSION SYSTEM

TOLCO™ Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4" (UL Listed)

OPM

Size Range: One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line series 12 gauge (2.6mm) channel, and all structural steel up to 1/4" (31.7mm) thick.

Material: 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 (2016) 9.3.5.8.4 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: 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, 3000, 4L, 4LA, 4A or approved attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

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

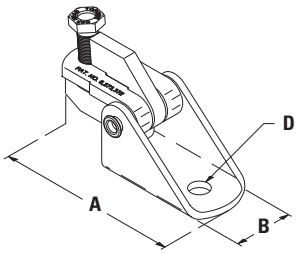
Approvals: —Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 61.

Note: Fig. 980 Swivel Attachment and Fig. 1001, 1000, 2002, 4A, 4L, 4LA, or approved attachment to pipe that 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, Electro-Galvanized or Stainless Steel. Contact customer service for alternative finishes.

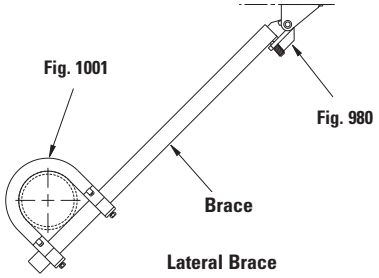
Order By: Figure number and finish.

Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174, Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730, Pat. #7,669,806

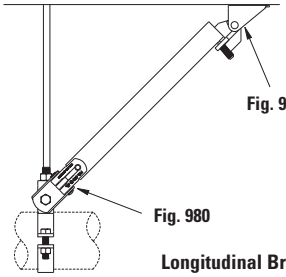


Set Bolt Included

Mounting Hardware Is Not Included



Lateral Brace



Longitudinal Brace

Fig. 4B shown

Part Number	Mtg. Hdw. Size in. (mm)	A in. (mm)	B in. (mm)	Mounting Hole D in. (mm)	Max. Design Load (cULus) in. (mm)	Approx. Wt./100 lbs. (kg)
980-3/8	3/8" (9.5)	5 1/4" (133.3)	1 7/8" (47.6)	13/32" (10.3)	2015 (8.96)	149 (67.6)
980-1/2 *	1/2" (12.7)	5 1/4" (133.3)	1 7/8" (47.6)	17/32" (13.5)	2015 (8.96)	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	1 7/8" (47.6)	11/16" (17.5)	2015 (8.96)	147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	1 7/8" (47.6)	13/16" (20.5)	2015 (8.96)	146 (66.2)

* Standard size.

Important! - For load information when using Fig. 980 with pre-installed or post-installed concrete anchors in compliance with NFPA 13 (2016) or ASCE 7-10, including prying factors, see load tables on pages AL-1 thru AL-21.

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

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

TOLCO™ Fig. 1001 - Sway Brace Attachment (UL Listed)

OPM

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 schedule 7 through schedule 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

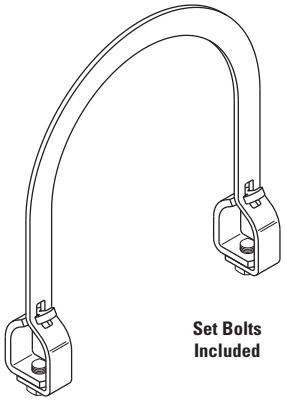
Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines 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 our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 67.

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

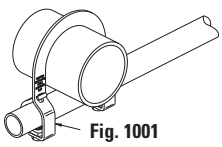
Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)), and finish.

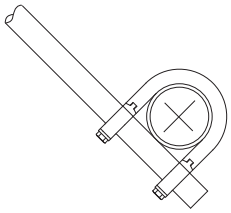
Important Note: Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.

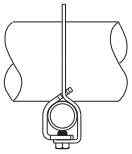


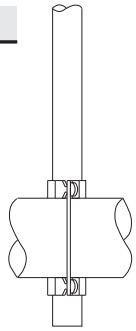
Pipe Size	Part Number & Approx. Wt./100				Design Load - Lbs. For Brace Pipe Size 1" / 1¼"		
	1" (24mm) Brace Pipe		1¼" (32mm) Brace Pipe		Sch. 7	Sch. 10	Sch. 40
in. (mm)		Lbs. (kg)		Lbs. (kg)	1" / 1¼"	1" / 1¼"	1" / 1¼"
1" (25)	**1001-1 X 1**	100.0 (45.3)	**1001-1 X 1¼**	118.0 (53.5)	-- / --	1000 / 1000	1000 / 1000
1¼" (32)	**1001-1¼ X 1**	100.0 (45.3)	**1001-1¼ X 1¼**	114.0 (51.7)	1000 / 1000	1000 / 1000	1000 / 1000
1½" (40)	**1001-1½ X 1**	100.0 (45.3)	**1001-1½ X 1¼**	115.0 (52.1)	1000 / 1000	1500 / 1500	1500 / 1500
2" (50)	**1001-2 X 1**	108.0 (49.0)	**1001-2 X 1¼**	121.0 (54.8)	1000 / 1000	2015 / 2015	2015 / 2015
2½" (65)	**1001-2½ X 1**	138.6 (62.8)	**1001-2½ X 1¼**	160.4 (72.7)	1600 / 1600	2015 / 2765	2015 / 2765
3" (80)	**1001-3 X 1**	147.2 (66.7)	**1001-3 X 1¼**	168.7 (76,5)	1600 / 1600	2015 / 2765	2015 / 2765
4" (100)	**1001-4 X 1**	160.9 (73.0)	**1001-4 X 1¼**	182.4 (82.7)	1600 / 1600	2015 / 2765	2015 / 2765
6" (150)	**1001-6 X 1**	190.0 (86.2)	**1001-6 X 1¼**	211.4 (95.9)	1600 / 1600	2015 / 2765	2015 / 2765
8" (200)	**1001-8 X 1**	217.4 (98.6)	**1001-8 X 1¼**	238.8 (108.3)	1600 / 1600	2015 / 2765	2015 / 2765

Note: Metric sizes are available, contact factory.









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 (UL Listed)

OPM

Size Range: 2" (50mm) through 8" (200mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** 2 1/2" (65mm) through 8" (200mm) pipe.
For FM Approval information refer to FM Approved page 75.
Included in our Seismic Engineering Guidelines 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 our Seismic Engineering Guidelines, OPM-0052-13.

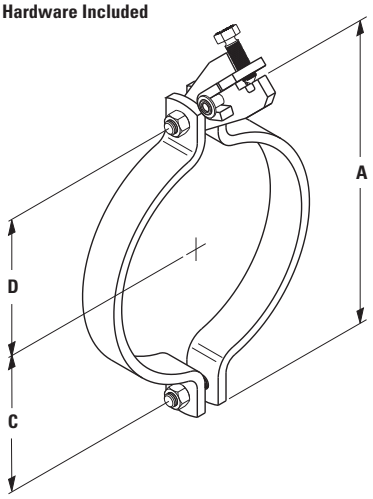
Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 guidelines should be followed.

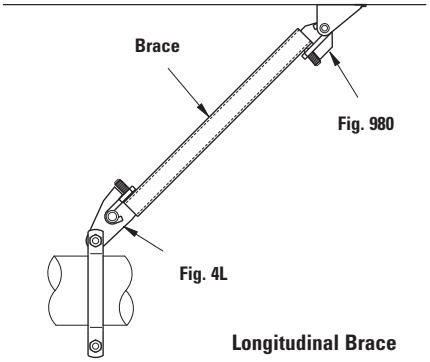
To Install: Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

Finish: Plain. Contact customer service for alternative finishes and materials.

Order By: Figure number, pipe size and finish.

Set Bolt & Hardware Included





Longitudinal Brace

Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	Max. Rec. Load (cULus) lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
4L-2	2"	(50)	5 3/8"	(136.5)	2 1/16"	(52.4)	2 1/16"	(52.4)	1/2"-13	2015	(8.96)	243	(110.2)
4L-2 1/2	2 1/2"	(65)	6 7/16"	(163.5)	2 1/2"	(63.5)	2 3/4"	(69.8)	1/2"-13	2015	(8.96)	253	(114.7)
4L-3	3"	(80)	7"	(177.8)	2 3/4"	(69.8)	3 1/16"	(77.8)	1/2"-13	2015	(8.96)	268	(121.5)
4L-4	4"	(100)	8 1/2"	(215.9)	3 3/8"	(85.7)	3 11/16"	(93.7)	1/2"-13	2015	(8.96)	348	(157.8)
4L-5	5"	(125)	9 3/4"	(247.6)	3 7/8"	(98.4)	4 3/8"	(111.1)	1/2"-13	2015	(8.96)	380	(172.3)
4L-6	6"	(150)	11 1/2"	(292.1)	5"	(127.0)	5 1/8"	(130.2)	1/2"-13	2015	(8.96)	640	(290.3)
4L-8	8"	(200)	13 1/4"	(336.5)	5 5/8"	(142.8)	5 5/8"	(142.9)	1/2"-13	2015	(8.96)	728	(330.2)

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

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

7. MISCELLANEOUS EQUIPMENTS

AUTOMATIC FIRE SUPPRESSION SYSTEM

data sheet

ARGCO

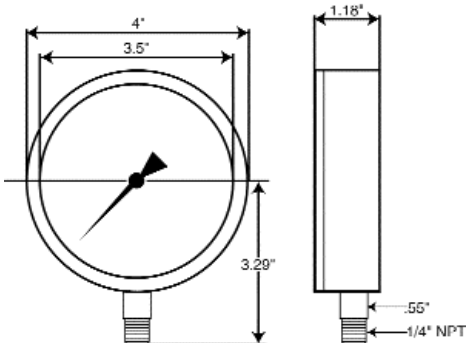
Quality PD GUARANTEED

Fire Sprinkler Pressure Gauges

0-300 psi water

0-300 psi air

0-300 psi air/water



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

Size: 4" (100 mm)

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

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

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

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

Standard Features

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

Bourdon Tube: Material: copper alloy C-type

Movement: Copper alloy, silicone dampened

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

Pointer: Black aluminum

Case: Black polycarbonate

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

Standard Scale
PSI

Window
Acrylic, ultrasonically welded to case

Standard Series • Type 110.10sp

Order Options
water
air/water
air

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