Columbia Fire
SPRINKLER SYSTEM SERVICE & REPAIR
WA CL# COLUMFL795NJ

MATERIAL SUBMITTAL

WET AUTOMATIC FIRE SUPPRESSION SYSTEM

CIMCO WAREHOUSE

2315 Inter Ave
Puyallup, WA 98372

Authority Having Jurisdiction
City of Puyallup

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By: Sau Lam

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AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

1. PIPING

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

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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2. FITTINGS / COUPLINGS

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

FIG. 3201

90° Elbow

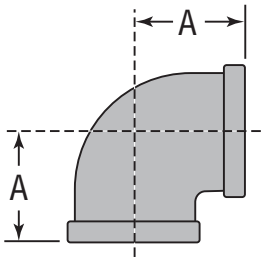

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FIGURE 3201 - 90° ELBOW

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

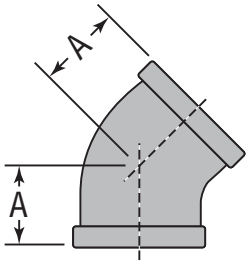

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FIGURE 3202 - 45° ELBOW

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

FIG. 3201R

Reducing 90° Elbow

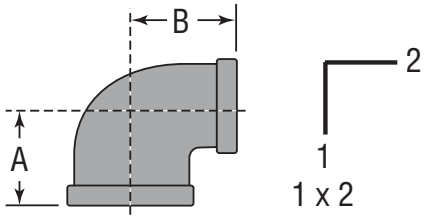

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FIGURE 3201R - REDUCING 90° ELBOW

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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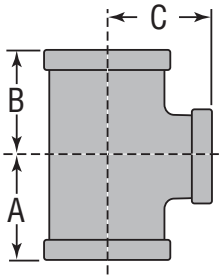
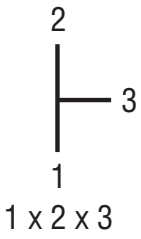
Contractor:	☐ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

FIG. 3205R

Reducing Tee





1 x 2 x 3

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FIGURE 3205R - REDUCING TEE

Nominal Size 1 x 2 x 3	Max. Working Pressure▲	Dimensions A	Dimensions B	Dimensions 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	Dimensions B	Dimensions 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

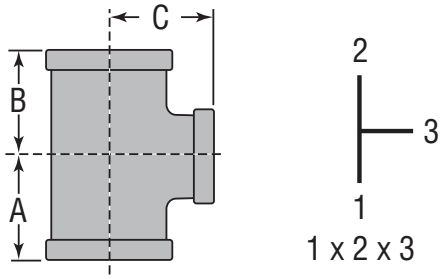

FIGURE 3205R - REDUCING TEE					
Nominal Size	Max. Working Pressure▲	Dimensions			Approx. Wt. Each
1 x 2 x 3		A	B	C	
In. (mm)	*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1¼ x 1¼ x 2* *32 x 32 x 50*	500 *3450*	2.10 *53.34*	2.10 *53.34*	1.90 *48.26*	1.75 *0.79*
1½ x 1 x ½ *40 x 25 x 15*	500 *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

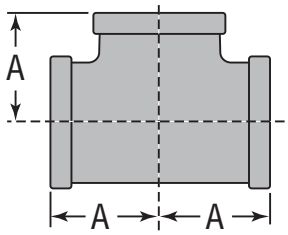

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FIGURE 3205 - STRAIGHT TEE

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

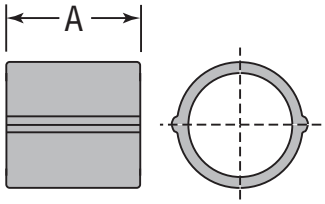

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FIGURE 3221 - COUPLING

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

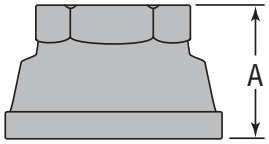

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FIGURE 3221R - REDUCING COUPLING

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

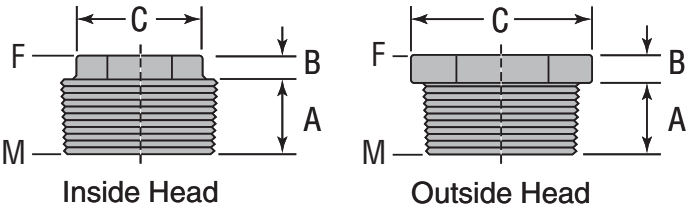

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FIGURE 3283 - BUSHINGS

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

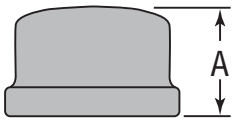

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FIGURE 3224 - CAP

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.

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

FIG. 3388

Cored Plug

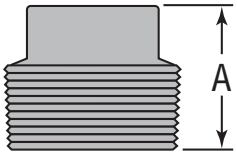

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FIGURE 3388 - CORED PLUG

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

PRODUCTS FOR GROOVED PIPING SYSTEM

The Gruvlok® System has been manufactured since the late 1960's. The Gruvlok product line has grown from standard couplings and fittings to today's extensive range of grooved product, plain-end product, butterfly valves, check valves, pump protection components, pipe preparation tools and various accessories.

Gruvlok is part of our overall commitment to provide today's piping industry with tomorrow's products.

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Certified to NSF/ANSI 61-G

ISO 9001:2008

INDUSTRY & GOVERNMENT STANDARDS & APPROVALS

ANSI American National Standards Institute

API American Petroleum Institute: API Std. 5L, Sect. 7.5

ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers

ASME American Society of Mechanical Engineers: Power Piping, B 31.1; Chemical Plant and Petroleum Refinery Piping, B 31.3; Refrigeration Piping, B 31.5; Building Services Piping, B 31.9; Slurry Pipelines, B 31.11

ASTM American Society of Testing and Materials: F 1476, F 1387

AWWA American Water Works Association: C 606

BV Bureau Veritas

CDF California State Fire Marshal

COE Corps of Engineers: CEGS 15000

CSA Canadian Standards Association: B 242

DNV Det Norske Veritas
Hong Kong Fire Services Board
New Zealand Insurance Council
New Zealand Building Act. (1991)

FAA Federal Aviation Administration: HVAC, Plumbing, Fire Protection

FHA Federal Housing Administration

FM Factory Mutual Engineering Corp.

GSA General Services Administration: 15000 Series

IAPMO International Association of Plumbing & Mechanical Officials

LPC Loss Prevention Council

MEA Materials & Equipment Acceptance

MIL Military Specifications: MILP-10388 Fittings; MIL-C-10387 Couplings; MIL-P-11087A(CE) Steel Pipe, Grooved MIL-I-45208 Inspection Procedure

NASA National Aeronautics and Space Administration: 15000 Series

NAVFAC Naval Facilities Engineering Command: NFGS 15000 Series

NFPA National Fire Protection Association

NIH National Institute of Health (Dept. of Health): 15000 Series

NSF NSF International

NY-BSA New York Board of Standards and Appeals

NYC New York City

TVA Tennessee Valley Authority: Fire protection, storm drains

UL Underwriter's Laboratories, Inc.

ULC Underwriter's Laboratories of Canada
Bureau of Marine Inspection: Salt and fresh water, oil transfer
Bureau of Public Roads; Div. of Bridges: Drain lines and bridge crossings
Canadian Coast Guard
U.S. Coast Guard –Approves each vessel individually

USGBC United States Green Building Council

VA Veterans Affairs : 15000 Series

VdS Verband der Sachversicherer e.V.

Note: Please refer to product specific pages for exact listings and approvals related to a specific size for a specific product.

GRUVLOK® – THE ENGINEERED COUPLING

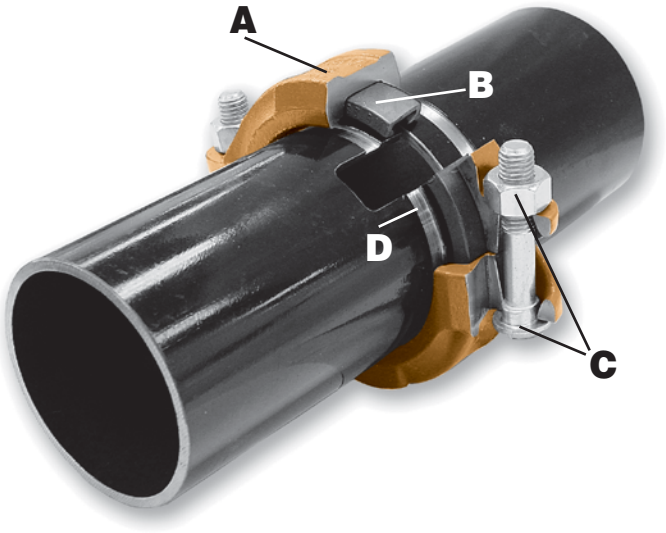
HOUSING (A) FLEXIBLE OR RIGID

The Gruvlok Coupling housing is designed to self-center around the pipe. The housing encircles and retains the gasket against the application of internal system pressure or vacuum.

The housing key sections fit into and engage the pipe-end grooves around the entire pipe circumference, thus restraining the pipe ends from separation due to the application of internal pressure.

Flexible Couplings provide designed-in clearances between the housing key sections and the pipe grooves to permit both angular and longitudinal movement of the pipe. Rigid couplings grip the pipe and lock the joint into position.

All housings are coated with paint for general service applications. The paint serves to provide protection against normal atmospheric corrosion. However, for couplings used in corrosive environments, hot-dip galvanizing, and stainless steel are available.

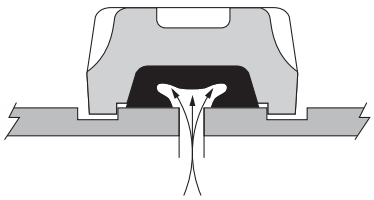


GASKET (B)

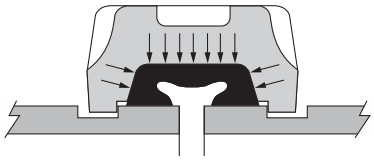
The unique single piece "C" style design of the gasket has been engineered to provide a pressure responsive, leak-tight seal in both pressure and vacuum applications without the aid of external forces. The "lips" of the gasket are molded so that upon installation onto the pipe ends they provide compression against the pipe surface to establish the leak-tight seal.

The gasket cavity functions as a "pressure reservoir". Pressure within the pipe system is applied to the internal surfaces of the gasket which increases the sealing force and enhances the leak-tight seal. In vacuum systems, non-pressure-responsive seals tend to "lift off" the pipe, producing leak paths. However, the Gruvlok gasket reacts to the negative pressure (higher outside atmospheric pressure) as to improve the sealing capability of the gasket.

Gasket Reaction to Pressure



Gasket Reaction to Vacuum



BOLTS AND NUTS (C)

Heat treated oval neck track head bolts serve to connect and secure the housing segments together. The oval neck design prevents turning of the bolt while tightening the hex nut with a single wrench. The bolt size and corresponding wrench (or socket) size for the hex nuts are shown in the chart below.

ANSI

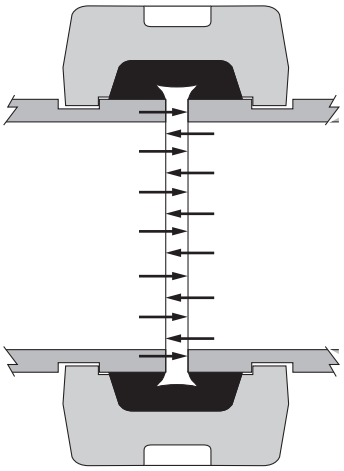
Bolt Size	3/8	1/2	5/8	3/4	7/8	1	1 1/4
Wrench Size	11/16	7/8	1 1/16	1 1/4	1 7/16	1 5/8	2

METRIC

Bolt Size	M10	M12	M16	M20	M22
Wrench Size	16	22	24	30	34

GROOVED PIPE ENDS (D)

The ends of the pipe must have a groove in them which may be either cut grooved or roll grooved. The grooved pipe ends engage the coupling keys, thus, providing a self-restraining, mechanical joint capable of resisting the separation of the pipe ends due to the application of system pressure. The groove diameters must be dimensionally accurate to obtain the maximum benefit of the Gruvlok Coupling.



THE GRUVLOK® PIPING METHOD

Gruvlok couplings and grooved-end fittings are widely used for joining pipe in a wide variety of piping systems. Gruvlok couplings for grooved-end pipe are designed to provide a self-centering joint which accommodates the application of pressure, vacuum and other external forces, while limiting the burdensome need for special supports, expansion joints, etc.

The Gruvlok piping method offers many mechanical design features which benefit the design engineer, the contractor, and the end user. Utilization of the functional characteristics of the Gruvlok coupling will aid in pipe system design and must be considered for proper installation, assembly and performance.

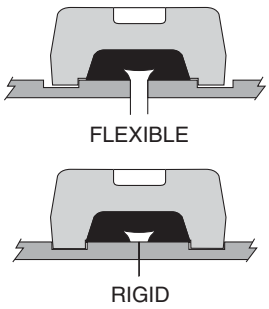
The design factors presented in the Gruvlok technical data section should always be referenced to when designing any grooved piping system to obtain the maximum benefit of the Gruvlok piping method.

GRUVLOK FEATURES

RIGIDITY OR FLEXIBILITY

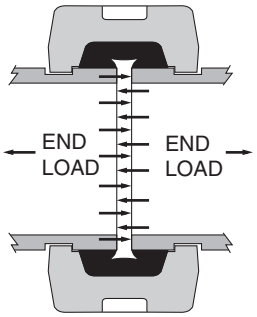
Couplings are available where rigid connections are required. Rigid couplings are clearly marked with an "X" for identification.

Couplings with flexible design allow for pipe expansion and contractions with temperature changes. The need for an expansion joint is minimized or eliminated.



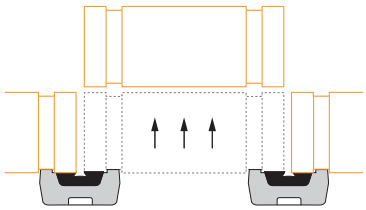
SELF RESTRAINED JOINT

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.



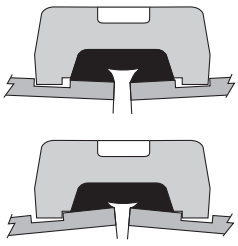
UNION AT EVERY JOINT

Gruvlok 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.



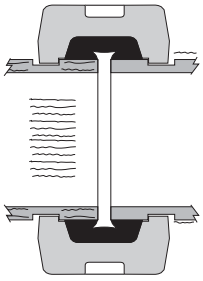
STRESS-FREE SYSTEM

Flexibility designed in the Gruvlok coupling absorbs and eliminates stress from settlement of buried pipe or those induced by seismic tremors.



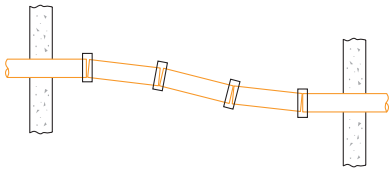
MINIMIZES NOISE & VIBRATION

The resilient elastomeric gasket and pre-designed gap of the Gruvlok coupling help isolate and absorb noise and vibration, this minimizes vibration transmission.



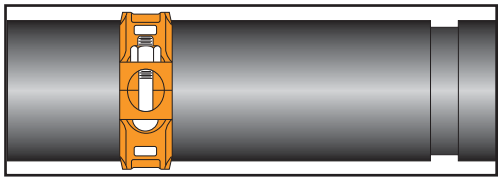
ACCOMMODATES MISALIGNMENT AND JOINT DEFLECTION

The flexibility designed into the Gruvlok coupling will accommodate misalignments caused by imprecise location of pipe opening through walls and floors, will provide pitch for drainage piping systems and facilitate laying pipe on uneven terrain, thus permitting deflection in any direction.



GRUVLOK® COUPLINGS FOR GROOVED-END PIPE

Gruvlok couplings for grooved-end pipe are available in nominal pipe sizes 1" thru 60" and metric sizes. The variety of coupling designs provide a universal means for the connection of pipe, fittings and pipe system components. The wide assortment of Gruvlok couplings and gaskets permit selection of the most suitable combination for a specific application, thus providing the most versatile and economical pipe system installation.



MATERIAL SPECIFICATIONS

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

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

STAINLESS STEEL BOLTS & NUTS:
Stainless steel bolts and nuts are available for the Fig. 7001, 7401, 7401-2, 7001-2, 7004, 7000 and 7400 couplings in standard 304SS, (316SS available as special order)

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

COATINGS:
Rust inhibiting paint Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other Coating requirements contact an Anvil Representative.

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

GRADE "EP" EPDM (Green/Red color code) NSF-61 Certified
-40°F to 250°F (Service Temperature Range)(-40°C to 121°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

GRADE "E" EPDM (Green color code) NSF-61 Certified
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

GRADE "T" Nitrile (Orange color code)
-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)
Recommended for petroleum applications. Air with oil vapors and vegetable and mineral oils.
NOT FOR USE IN HOT WATER OR HOT AIR

GRADE "O" Fluoro-Elastomer (Blue color code)
Size Range: 1" - 12" (C style only)
20°F to 300°F (Service Temperature Range)(-29°C to 149°C)
Recommended for high temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halogenated hydrocarbons and lubricants

GRADE "L" Silicone (Red color code)
Size Range: 1" - 12" (C style only)
-40°F to 350°F (Service Temperature Range)(-40°C to 177°C)
Recommended for dry, hot air and some high temperature chemical services

GASKET TYPE:
Standard C Style
Flush Gap: 1" - 24"
End Guard: 1" - 12" (Fig. 7004 and 7377)
SlideLOK: 2" - 8"

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ (Do Not use with Grade "L")

WORKING PRESSURE, END LOAD, PIPE END SEPARATION & DEFLECTION FROM CENTER LINE:
Based on standard wall steel pipe with cut or roll grooves in accordance with Gruvlok specifications. Pressure ratings for light wall, stainless steel, aluminum, and ISO pipe available. See technical data section.

COUPLING DATA CHART NOTES

COUPLING DATA CHART NOTES														
Nominal Size	O.D.	Max. Work. Pressure	Max. End Load	Range of Pipe End Separation	Deflection from ℄		Coupling Dimensions			Coupling Bolts		Specified Torque		Approx. Wt. Ea.
					Per Coupling	of Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees(°)-Minutes(')*	*In./ft-mm/m*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs/N-m*		*Lbs./kg*
1	2	3	4	5	6		7			8		9		10

1 Gruvlok Couplings are identified by either the nominal ANSI pipe size in inches or pipe O.D. in millimeters (see column 2).

2 Nominal Outside Diameter of Pipe.

3 Maximum line pressure, including surge, to which a joint can be subjected. Working pressure ratings are based on standard wall steel pipe with standard cut or roll grooves in accordance with Gruvlok specifications. For Performance Data on other than standard wall pipe, refer to Technical data section. **NOTE: For one time field test only, the maximum joint working pressure may be increased to 1.5 times the figure shown unless otherwise noted.**

4 Maximum end load from all interior and/or exterior forces to which the joint can be subjected are based on standard wall steel pipe with standard cut or roll grooves in accordance with Gruvlok specifications.

5 Range of pipe end separation for roll grooved pipe, Double values shown when using cut groove pipe; see page 274 for details.

6 Maximum allowable angular deflection values from centerline when using standard roll grooved pipe; Double values shown when using cut groove pipe; see page 274 for details.

7 "X", "Y", and "Z" are external dimensions for reference purposes only.

8 The quantity of bolts per coupling.

9 Nuts must be tightened alternating and evenly to the specified bolt torque. See individual product installation instructions for additional important information.

10 Approximate weight for a fully assembled coupling with gasket, bolts, and nuts.

FIG. 7000

Lightweight Flexible Coupling

c UL us LISTED FM APPROVED

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The Fig. 7000 Lightweight Flexible Coupling is designed for applications where system flexibility is desired.

The Fig. 7000 Coupling is approximately 30% lighter in weight than the Fig. 7001 Coupling, and allows for working pressure ratings up to 600 psi (41.4 bar).

The Figure 7000 Lightweight Flexible Coupling is intended for use in several applications. See Gasket Grade Index for gasket recommendations.

See technical data section for design factors.

MATERIAL SPECIFICATIONS

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

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

STAINLESS STEEL BOLTS & NUTS:
304SS bolts and nuts are available as a standard option.
(316SS are available for special order).

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

COATINGS:
Rust inhibiting paint – Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other Coating requirements contact an Anvil Representative.

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

Grade "EP" EPDM (Green and Red color code)
-40°F to 250°F (Service Temperature Range)(-40°C to 121°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

For hot water applications the use of Gruvlok Extreme Temperature lubricant is recommended. NSF-61 Certified for cold and hot water applications up through 12".

Grade "T" Nitrile (Orange color code)
20°F to 180°F (Service Temperature Range)(-29°C to 82°C)
Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.
NOT FOR USE IN HOT WATER OR HOT AIR

Grade "O" Fluoro-Elastomer (Blue color code)
Size Range: 1" - 8" (C style only)
-20°F to 300°F (Service Temperature Range)(-29°C to 149°C)
Recommended for high temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halogenated hydrocarbons and lubricants.

Grade "L" Silicone (Red color code)
Size Range: 1" - 8" (C style only)
-40°F to 350°F (Service Temperature Range)(-40°C to 177°C)
Recommended for dry, hot air and some high temperature chemical services.

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

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ (Do Not use with Grade "L")

FIG. 7000

Lightweight Flexible Coupling

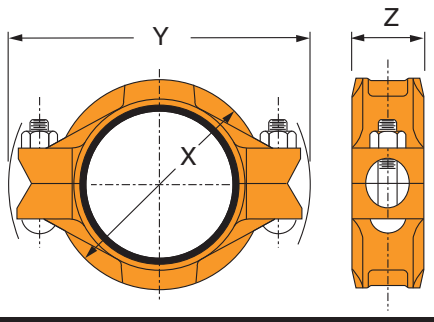


FIGURE 7000 COUPLING

Nominal Size	O.D.	Max. Working Pressure†	Max. End Load	Range of Pipe End Separation	Deflection from ℄		Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					Per Coupling	of Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees(°)-Minutes(')*	*In./ft-mm/m*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
1 25	1.315 33.4	600 41.4	815 3.62	0-1/32 0-0.79	1° 22'	0.29 23.8	2 3/8 60	4 1/4 108	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.3 0.6
1 1/4 32	1.660 42.2	600 41.4	1,299 5.78	0-1/32 0-0.79	1° 5'	0.23 18.8	2 3/4 70	4 3/8 111	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.4 0.6
1 1/2 40	1.900 48.3	600 41.4	1,701 7.57	0-1/32 0-0.79	0° 57'	0.20 16.5	3 76	4 5/8 117	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.5 0.7
2 50	2.375 60.3	600 41.4	2,658 11.82	0-1/32 0-0.79	0° 45'	0.16 13.1	3 1/2 89	5 1/2 140	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.7 0.8
2 1/2 65	2.875 73.0	600 41.4	3,895 17.33	0-1/32 0-0.79	0° 37'	0.13 10.9	4 102	5 3/4 146	1 3/4 44	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.9 0.9
3 O.D. 76.1	*2.996* 76.1	*600* 41.4	*4,230* 18.82	*0-1/32* *0-0.79*	*0° 36'*	*0.13* 10.4	*4* 102	*6 1/8* 156	*1 3/4* 44	*2*	*3/8 x 2 1/4* M10 x 57	*30* 40	*45* 60	*2.3* 1.0
3 80	3.500 88.9	600 41.4	5,773 25.68	0-1/32 0-0.79	0° 31'	0.11 8.9	4 5/8 117	6 3/4 171	1 3/4 44	2	1/2 x 2 3/4 M12 x 70	80 110	100 150	2.9 1.3
3 1/2 90	4.000 101.6	600 41.4	7,540 33.54	0-1/32 0-0.79	0° 27'	0.09 7.8	5 1/8 130	7 5/8 194	1 3/4 44	2	1/2 x 3 M12 x 76	80 110	100 150	3.1 1.4
4 1/4 O.D. 108.0	*4.250* 108.0	*600* 41.4	*8,512* 37.86	*0-3/32* 0-2.38	*1° 16'*	*0.26* 22.0	*5 1/2* 140	*7 3/4* 197	*2* 51	*2*	*1/2 x 3* M12 x 76	*80* 110	*100* 150	*4.0* 1.8
4 100	4.500 114.3	600 41.4	9,543 42.45	0-3/32 0-2.38	1° 12'	0.25 20.8	5 7/8 149	8 1/8 206	2 51	2	1/2 x 3 M12 x 76	80 110	100 150	4.6 2.1
5 1/4 O.D. 133.0	*5.236* 133.0	*500* 34.5	*10,766* 47.89	*0-3/32* 0-2.38	*1° 2'*	*0.21* 17.9	*6 1/2* 165	*9 1/8* 232	*2* 51	*2*	*5/8 x 3 1/2* M16 x 85	*100* 135	*130* 175	*5.7* 2.6
5 1/2 O.D. 139.7	*5.500* 139.7	*500* 34.5	*11,879* 52.84	*0-3/32* 0-2.38	*0° 59'*	*0.20* 17.0	*6 3/4* 171	*9 3/8* 238	*2* 51	*2*	*5/8 x 3 1/2* M16 x 85	*100* 135	*130* 175	*6* 2.7
5 125	5.563 141.3	500 34.5	12,153 54.06	0-3/32 0-2.38	0° 58'	0.20 16.8	7 178	9 5/8 244	2 51	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	6.1 2.8
6 1/4 O.D. 159.0	*6.259* 159.0	*500* 34.5	*15,384* 68.43	*0-3/32* 0-2.38	*0° 51'*	*0.18* 14.9	*7 1/2* 191	*10 3/8* 264	*2* 51	*2*	*5/8 x 3 1/2* M16 x 85	*100* 135	*130* 175	*6.7* 3.0
6 1/2 O.D. 165.1	*6.500* 165.1	*500* 34.5	*16,592* 73.80	*0-3/32* 0-2.38	*0° 50'*	*0.17* 13.1	*7 3/4* 197	*10 3/4* 273	*2* 51	*2*	*5/8 x 3 1/2* M16 x 85	*100* 135	*130* 175	*7.0* 3.2
6 150	6.625 168.3	500 34.5	17,236 76.67	0-3/32 0-2.38	0° 49'	0.17 14.1	8 203	11 279	2 51	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	8.1 3.7
8 200	8.625 219.1	500 34.5	29,213 129.95	0-3/32 0-2.38	0° 37'	0.13 10.9	10 1/2 264	12 13/16 337	2 1/2 60	2	3/4 x 4 1/2 M20 x 110	130 175	180 245	14.2 6.4

NOTES:

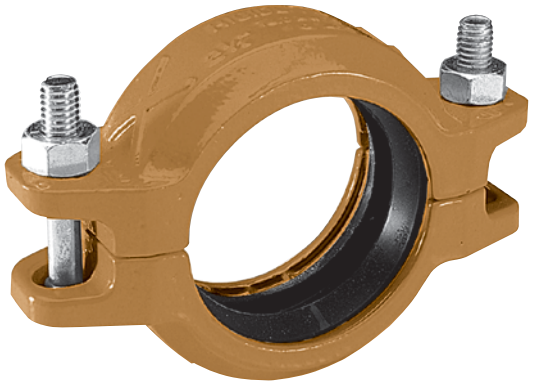
Range of Pipe End Separation and Angular Deflection values are for roll grooved pipe and may be doubled for cut groove pipe. See page 274 for details. Refer to page 280 for Misalignment & Deflection Calculations and page 281 for Curve Layout Calculations.

†Maximum Working Pressure Rating is for schedule 40 steel pipe. For light wall, stainless steel, aluminum and ISO pipe pressure ratings, please refer to the technical data section.

For additional details see "Coupling Data Chart Notes" on page 19.
§ – For additional Bolt Torque information, see page 274.
See Installation & Assembly directions on page 239.
Not for use in copper systems.

FIG. 7400

Rigidlite® Coupling



The Fig. 7400 Rigidlite Coupling from Gruvlok is specially designed to provide a rigid, locked-in pipe connection to meet the specific demands of rigid design steel pipe systems. Fast and easy swing-over installation of the rugged lightweight housing produces a secure, rigid pipe joint.

The galvanized Fig. 7400 is ideal for stainless steel piping application where the external corrosion properties of stainless steel is not required. For Gruvlok coupling pressure ratings on stainless steel pipe, please refer to the technical data section of the Gruvlok catalog.

MATERIAL SPECIFICATIONS

BOLTS:
SAE J429, Grade 5, Zinc Electroplated (standard)

HEAVY HEX NUTS:
SAE A563, Grade A, Zinc Electroplated (standard)

HARDWARE KITS:
304 Stainless Steel (available in sizes up to 3/4")
Kit includes: (2) Bolts per ASTM A193, Grade B8 and
(2) Heavy Hex Nuts per ASTM A194, Grade 8.

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

COATINGS:
Rust inhibiting paint – Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other Coating requirements contact an Anvil Representative.

GASKETS:
Properties as designated in accordance with ASTM D 2000

Grade "EP" EPDM (Green and Red color code)
-40°F to 250°F (Service Temperature Range)(-40°C to 121°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

For hot water applications the use of Gruvlok Xtreme™ Temperature lubricant is recommended. NSF-61 Certified.

Grade "T" Nitrile (Orange color code)
NOT FOR USE IN DRINKING WATER
-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)
Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.
NOT FOR USE IN HOT WATER OR HOT AIR

Grade "O" Fluoro-Elastomer (Blue color code)
NOT FOR USE IN DRINKING WATER
Size Range: 1" - 8" (C style only)
20°F to 300°F (Service Temperature Range)(-29°C to 149°C)
Recommended for high temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halogenated hydrocarbons and lubricants.

Grade "L" Silicone (Red color code)
NOT FOR USE IN DRINKING WATER
Size Range: 1" - 8" (C style only)
-40°F to 350°F (Service Temperature Range)(-40°C to 177°C)
Recommended for dry, hot air and some high temperature chemical services.

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

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ (Do Not use with Grade "L")

FIG. 7400

Rigidlite® Coupling

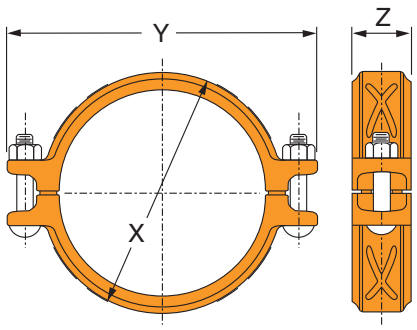


FIGURE 7400 RIGIDLITE COUPLING

Nominal Size	O.D.	Max. Working Pressure†	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Coupling Bolts		Approx. Wt. Ea.
					X	Y	Z	Qty.	Size	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	300 *20.7*	407 *1.81*	0-1/32 *0-0.79*	2 1/4 *57*	4 1/2 *114*	1 3/4 *44*	2	3/8 x 2 1/4 *M10 x 57*	1.2 *0.5*
1 1/4 *32*	1.660 *42.2*	300 *20.7*	649 *2.89*	0-1/32 *0-0.79*	2 5/8 *67*	4 3/4 *121*	1 3/4 *44*	2	3/8 x 2 1/4 *M10 x 57*	1.3 *0.6*
1 1/2 *40*	1.900 *48.3*	300 *20.7*	851 *3.78*	0-1/32 *0-0.79*	2 7/8 *73*	4 7/8 *124*	1 3/4 *44*	2	3/8 x 2 1/4 *M10 x 57*	1.4 *0.6*
2 *50**	2.375 *60.3*	300 *20.7*	1,329 *5.91*	0-1/32 *0-0.79*	3 1/4 *83*	5 1/2 *140*	1 3/4 *44*	2	3/8 x 2 1/4 *M10 x 57*	1.6 *0.7*
2 1/2 *65*	2.875 *73.0*	300 *20.7*	1,948 *8.66*	0-1/32 *0-0.79*	3 7/8 *98*	6 *152*	1 3/4 *44*	2	3/8 x 2 1/4 *M10 x 57*	1.9 *0.9*
3 O.D. 76.1	*2.996* 76.1	*300* 20.7	*2,115* 9.41	*0-1/32* 0-0.79	*4* 102	*5 7/8* 149	*1 3/4* 44	*2*	*3/8 x 2 1/4* M10 x 57	*1.9* 0.9
3 *80*	3.500 *88.9*	300 *20.7*	2,886 *12.84*	0-1/32 *0-0.79*	4 1/2 *114*	6 3/4 *171*	1 3/4 *44*	2	3/8 x 2 3/4 *M10 x 70*	2.1 *1.0*
4 *100*	4.500 *114.3*	300 *20.7*	4,771 *21.22*	0-3/32 *0-2.38*	5 5/8 *143*	7 3/4 *197*	1 7/8 *48*	2	3/8 x 2 3/4 *M10 x 70*	3.1 *1.4*
5 1/2 O.D. 139.7	*5.500* 139.7	*300* 20.7	*7,127* 31.70	*0-3/32* 0-2.38	*6 3/4* 171	*9 1/4* 235	*2* 51	*2*	*1/2 x 3* M12 x 76	*4.5* 2.0
5 *125*	5.563 *141.3*	300 *20.7*	7,292 *32.44*	0-3/32 *0-2.38*	6 7/8 *175*	9 1/4 *235*	2 *51*	2	1/2 x 3 *M12 x 76*	4.6 *2.1*
6 1/2 O.D. 165.1	*6.500* 165.1	*300* 20.7	*9,955* 44.28	*0-3/32* 0-2.38	*7 3/4* 200	*10 3/8* 264	*2* 51	*2*	*1/2 x 3* M12 x 76	*5.5* 2.5
6 *150*	6.625 *168.3*	300 *20.7*	10,341 *46.00*	0-3/32 *0-2.38*	7 7/8 *200*	10 3/8 *264*	2 *51*	2	1/2 x 3 *M12 x 76*	5.5 *2.5*
8 *200**	8.625 *219.1*	300 *20.7*	17,528 *77.97*	0-3/32 *0-2.38*	10 1/4 *260*	12 3/4 *324*	2 3/8 *60*	2	1/2 x 3 *M12 x 76*	8.4 *3.8*

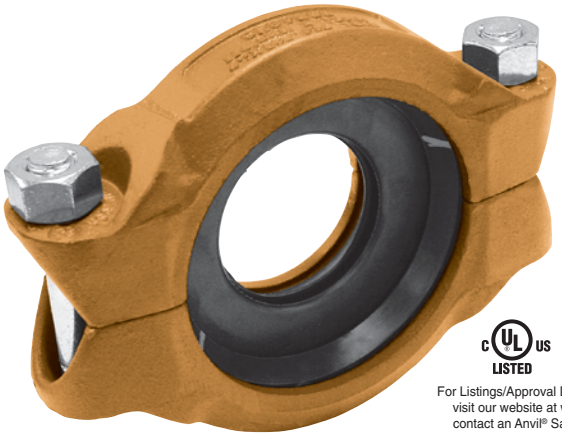
NOTES:

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

†Maximum Working Pressure Rating is for schedule 40 steel pipe. For light wall, stainless steel, aluminum and ISO pipe pressure ratings, please refer to the technical data section.

For additional details see "Coupling Data Chart Notes" on page 19.
§ – For additional Bolt Torque information, see page 274.
See Installation & Assembly directions on page 240.

FIG. 7010
Reducing Coupling



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The Fig. 7010 Reducing Coupling makes it possible to directly connect two different pipe sizes, eliminating the need for two couplings and a reducing fitting. The specially designed reducing coupling gasket with a center rib assures proper positioning of the gasket and prevents the smaller pipe from telescoping into the larger during assembly. Fig. 7010 Reducing Coupling allows for working pressure ratings up to 500 PSI (34.5 bar). Not recommended for vacuum applications.

MATERIAL SPECIFICATIONS

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

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

HOUSING:
Ductile Iron conforming to ASTM A 536, Grade 65-45-12, or
Malleable Iron conforming to ASTM A 47, Grade 32510.

COATINGS:
Rust inhibiting paint – Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other Coating requirements contact an Anvil Representative.

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

Grade "E" EPDM (Green color code)
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

Grade "T" Nitrile (Orange color code)
-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)
Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.
NOT FOR USE IN HOT WATER OR HOT AIR.

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ (Do Not use with Grade "L")

FIG. 7010
Reducing Coupling

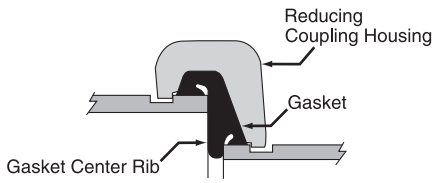


Fig. 7010
Coupling with Gasket

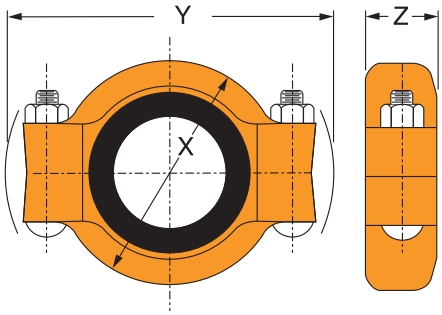


FIGURE 7010 REDUCING COUPLING

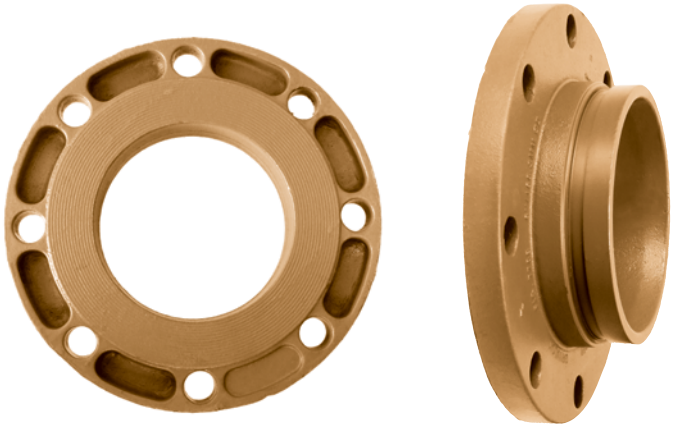
Nominal Size	Larger O.D.	Smaller O.D.	Max. Working Pressure†	Max. End Load	Range of Pipe End Separation	Deflection from ℄		Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
						Per Coupling	of Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees(°)-Minutes(')*	*In./ft-mm/m*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
2 x 1½	2.375	1.900	500	2,215	0-1/32	0° 45'	0.16	3 5/8	5 7/8	1 7/8	2	½ x 2¾	80	100	2.0
50 x 40	*60.3*	*48.3*	*34.5*	*9.85*	*0-0.79*		*13.1*	*92*	*149*	*48*		*M12 x 76*	*110*	*150*	*0.9*
2½ x 2	2.875	2.375	500	3,246	0-1/32	0° 37'	0.13	4¼	6 3/8	1 7/8	2	½ x 2¾	80	100	3.5
65 x 50	*73.0*	*60.3*	*34.5*	*14.44*	*0-0.79*		*10.9*	*108*	*162*	*48*		*M12 x 76*	*110*	*150*	*1.6*
3 x 2	3.500	2.375	500	4,811	0-1/32	0° 31'	0.11	4 7/8	7 1/8	1 7/8	2	½ x 2¾	80	100	4.4
80 x 50	*88.9*	*60.3*	*34.5*	*21.40*	*0-0.79*		*8.9*	*124*	*181*	*48*		*M12 x 76*	*110*	*150*	*2.0*
3 x 2½	3.500	2.875	500	4,811	0-1/32	0° 31'	0.11	4 7/8	7 1/8	1 7/8	2	½ x 2¾	80	100	4.1
80 x 65	*88.9*	*73.0*	*34.5*	*21.40*	*0-0.79*		*8.9*	*124*	*181*	*48*		*M12 x 76*	*110*	*150*	*1.9*
4 x 2	4.500	2.375	500	7,952	0-3/32	1° 12'	0.25	6¼	8 7/8	2	2	5/8 x 3½	100	130	8.9
100 x 50	*114.3*	*60.3*	*34.5*	*35.37*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*4.0*
4 x 2½	4.500	2.875	500	7,952	0-3/32	1° 12'	0.25	6¼	8 7/8	2	2	5/8 x 3½	100	130	7.9
100 x 65	*114.3*	*73.0*	*34.5*	*35.37*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*3.6*
4 x 3	4.500	3.500	500	7,952	0-3/32	1° 12'	0.25	6¼	8 7/8	2	2	5/8 x 3½	100	130	6.7
100 x 80	*114.3*	*88.9*	*34.5*	*35.37*	*0-2.38*		*20.8*	*159*	*225*	*51*		*M16 x 95*	*135*	*175*	*3.0*
5 x 4	5.563	4.500	500	12,153	0-3/32	1° 58'	0.20	7¼	10 5/8	2 1/8	2	¾ x 4½	130	180	11.4
125 x 100	*141.3*	*114.3*	*34.5*	*54.06*	*0-2.38*		*16.8*	*184*	*270*	*54*		*M20 x 115*	*175*	*245*	*5.2*
6 x 4	6.625	4.500	500	17,236	0-3/32	0° 49'	0.17	8¼	11 5/8	2 1/8	2	¾ x 4½	130	180	13.4
150 x 100	*168.3*	*114.3*	*34.5*	*76.67*	*0-2.38*		*14.1*	*210*	*295*	*54*		*M20 x 115*	*175*	*245*	*6.1*
6 x 5	6.625	5.562	500	17,236	0-3/32	0° 49'	0.17	8½	11 5/8	2 1/8	2	¾ x 4½	130	180	13.5
150 x 125	*168.3*	*141.3*	*34.5*	*76.67*	*0-2.38*		*14.1*	*216*	*295*	*54*		*M20 x 115*	*175*	*245*	*6.1*
8 x 6	8.625	6.625	500	29,213	0-3/32	0° 37'	0.13	10½	14	2¼	2	¾ x 4½	130	180	17.7
200 x 150	*219.1*	*168.3*	*34.5*	*129.95*	*0-2.38*		*10.9*	*267*	*356*	*57*		*M20 x 115*	*175*	*245*	*8.0*

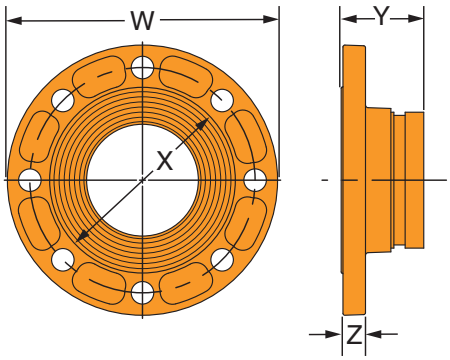
NOTES:
Fig. 7010 Reducing Coupling should not be used with end caps in systems where a vacuum may be developed. Contact your Anvil Representative for details.
Range of Pipe End Separation and Angular Deflection values are for roll grooved pipe and may be doubled for cut groove pipe. See page 274 for details.
Refer to page 280 for Misalignment & Deflection Calculations and page 281 for Curve Layout Calculations.
†Maximum Working Pressure Rating is for schedule 40 steel pipe. For light wall, stainless steel, aluminum and ISO pipe pressure ratings, please refer to the technical data section.

For additional details see "Coupling Data Chart Notes" on page 19.
§ – For additional Bolt Torque information, see page 274.
See Installation & Assembly directions on page 247.
Not for use in copper systems.

FIG. 7788

Gruvlok® Flange Adapter





The Gruvlok Fig. 7788 Flange Adapter allows for direct connection of Class 125 or Class 150 flanged components to a grooved piping system. The Gruvlok Flange Adapter provides an alternative method of connecting to flanged components than the traditional Fig. 7012 Gruvlok Flange. The Gruvlok Flange Adapter provides a raised serrated face flange connection with a shorter overall length than Anvil's Fig. 7084 Flange x Groove Nipple.

MATERIAL SPECIFICATIONS

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

COATINGS:
Rust inhibiting paint – Color: ORANGE (standard), Red (optional)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other coating requirements, contact an Anvil Representative for more information.

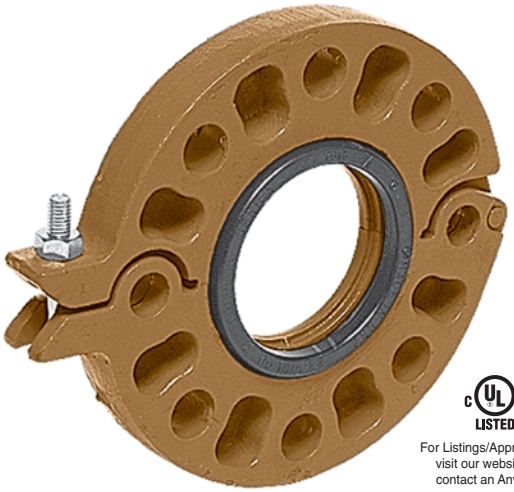
FIGURE 7788 GRUVLOK FLANGE ADAPTER

Nominal Size	O.D.	Max. Working Pressure	Dimensions				Mating Flange Bolts						Approx. Wt. Ea.
			W	X	Y	Z	Qty.	Size	Bolt Circle Diameter	Bolt Hole Diameter	Specified Torque Min.	Specified Torque Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*In./mm*	*In./mm*	*In./mm*	*In./mm*	*PN(10) (16)*	*In. (ISO)/mm*	*In./mm*	*In./mm*	*Ft.-Lbs/N-M*		*Lbs./kg*
2 *50*	2.375 *60.3*	300 *20.7*	6 *152.4*	3⅝ *91.9*	2½ *63.5*	11/16 *17.5*	4 *4*	⅝ x 2¾ *M16 x 70*	4¾ *120.7*	¾ *19.1*	110 *149*	140 *190*	4.39 *2.0*
2½ *65*	2.875 *73.0*	300 *20.7*	7 *177.8*	4⅛ *104.6*	2½ *63.5*	¾ *19.1*	4 *4*	⅝ x 2¾ *M16 x 70*	5½ *139.7*	¾ *19.1*	110 *149*	140 *190*	6.17 *2.8*
3 *80*	3.500 *88.9*	300 *20.7*	7½ *190.5*	5 *127.0*	2½ *63.5*	¾ *19.1*	4 *4*	⅝ x 2¾ *M16 x 70*	6 *152.4*	¾ *19.1*	110 *149*	140 *190*	7.19 *3.3*
4 *100*	4.500 *114.3*	300 *20.7*	9 *228.6*	6 3/16 *157.2*	2¾ *69.9*	¾ *19.1*	8 *8*	⅝ x 2¾ *M16 x 70*	7½ *190.5*	¾ *19.1*	110 *149*	140 *190*	10.68 *4.9*
5 *125*	5.563 *141.3*	300 *20.7*	10 *254.0*	7 5/16 *185.7*	2¾ *69.9*	⅞ *22.1*	8 *8*	¾ x 2⅞ *–*	8½ *215.9*	⅞ *22.2*	220 *298*	250 *339*	13.99 *6.4*
6 *150*	6.625 *168.3*	300 *20.7*	11 *279.4*	8½ *215.9*	2¾ *69.9*	⅞ *22.1*	8 *8*	¾ x 3⅛ *M20 x 80*	9½ *241.1*	⅞ *22.2*	220 *298*	250 *339*	16.47 *7.5*
8* *200*	8.625 *219.1*	300 *20.7*	13½ *342.9*	10⅝ *269.7*	3 *76.2*	61/64 *24.1*	8 *8*	¾ x 3¼ *M20 x 80*	11¾ *298.5*	⅞ *22.2*	220 *298*	250 *339*	24.79 *11.3*
10* *250*	10.750 *273.1*	300 *20.7*	16 *406.4*	12¾ *323.9*	3⅜ *85.7*	1 *25.4*	12 *12*	⅞ x 3½ *M20 x 90*	14¼ *362.0*	1 *25.4*	320 *439*	400 *542*	36.75 *16.7*
12* *300*	12.750 *323.9*	300 *20.7*	19 *482.6*	15 *381.0*	3½ *88.9*	1 13/64 *30.5*	12 *12*	⅞ x 3¾ *–*	17 *431.8*	1 *25.4*	320 *439*	400 *542*	56.31 *25.6*

NOTE: 8", 10" and 12" Flange Adapters have a machined raise face. 2" through 6" Flange Adapters have a cast raised face.

FIG. 7013

Gruvlok Flanges (300# Flange)



The Gruvlok Fig. 7013 300# Flange allows direct connection of Class 250 or Class 300 flanged components to a Gruvlok piping system. The two halves of the 2" thru 12" sizes of both Gruvlok Flanges are drawn together by a latch bolt which eases assembly on the pipe. A specially designed gasket provides a leak-tight seal on both the pipe and the mating flange face.

Gruvlok Flanges have designed-in anti-rotation tines which bite into and grip the side of the pipe groove to provide a secure, rigid connection.

Gruvlok flange adapter insert required when mating to rubber surfaces or serrated faced mating flanges.

*** The 7013 Gruvlok adapter flange should not be used with the 78FP or 7800 check valve.**

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

MATERIAL SPECIFICATIONS

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

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

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

COATINGS:
Rust inhibiting paint – Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other Colors Available (IE: RAL3000 and RAL9000)
For other Coating requirements contact an Anvil Representative.

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

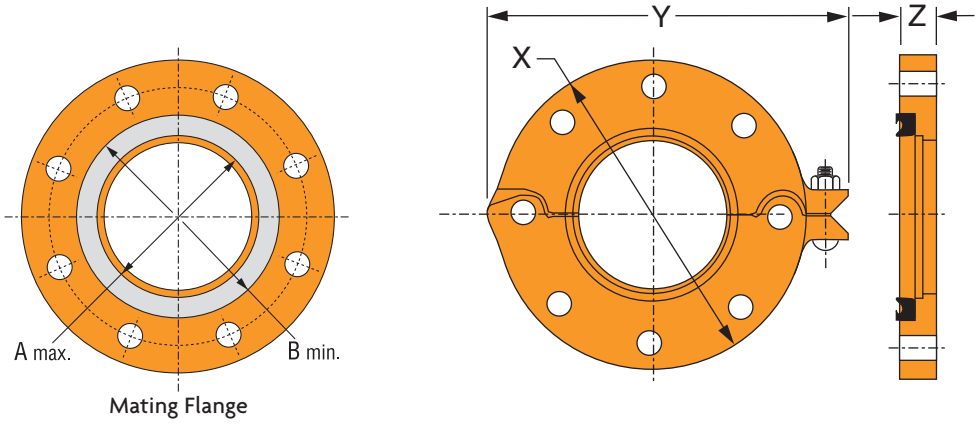
Grade "E" EPDM (Green color code)
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.
NOT FOR USE IN PETROLEUM APPLICATIONS.

Grade "T" Nitrile (Orange color code)
-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)
Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.
NOT FOR USE IN HOT WATER OR HOT AIR.

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ (Do Not use for Grade "L")

FIG. 7013

Gruvlok Flanges (300# Flange)



GRUVLOK FIGURE 7013 FLANGE: ANSI CLASS 250 AND 300 BOLT PATTERN

Nominal Size	O.D.	Max. Wk. Pressure†	Max. End Load ▼	Latch* Bolt Size	Specified Torque §		Dimensions			Sealing Surface		Mating Flange Bolts				Approx. Wt. Ea.
					Min.	Max.	X	Y	Z	A Max.	B Min.	Qty. ANSI	Size (ANSI) in.	Bolt Circle Dia.	Bolt Hole Dia.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In.*	*Ft.-Lbs/N-m*		*In./mm*	*In./mm*	*In./mm*	*In./mm*	*In./mm*		*(ISO) mm*	*In./mm*	*In./mm*	*Lbs./Kg*
2 50	2.375 60.3	750 51.7	3,323 14.78	⅜ x 2½ -	30 -	45 -	6½ 165	8 203	1 25	2⅜ 60	3 7/16 87	8 -	⅝ x 3 -	5 127.0	¾ 19.1	5.0 2.3
2½ 65	2.875 73.0	750 51.7	4,869 21.66	⅜ x 2½ -	30 -	45 -	7½ 191	9⅛ 232	1 25	2⅞ 73	4 102	8 -	¾ x 3¼ -	5⅞ 149.2	⅞ 22.2	6.9 3.1
3 80	3.500 88.9	750 51.7	7,216 32.10	⅜ x 2½ -	30 -	45 -	8¼ 210	9⅞ 251	1⅛ 29	3½ 89	4 9/16 116	8 -	¾ x 3½ -	6⅝ 168.3	⅞ 22.2	9.4 4.3
4 100	4.500 114.3	750 51.7	11,928 53.06	⅜ x 2½ -	30 -	45 -	10 254	11⅜ 289	1¼ 32	4½ 114	5⅝ 143	8 -	¾ x 3¾ -	7⅞ 200.0	⅞ 22.2	14.4 6.5
5 125	5.563 141.3	750 51.7	18,229 81.09	⅜ x 2½ -	30 -	45 -	11 279	12⅝ 321	1⅜ 35	5 9/16 141	6¾ 171	8 -	¾ x 4½ -	9¼ 235.0	⅞ 22.2	18.3 8.3
6 150	6.625 168.3	750 51.7	25,854 115.00	⅜ x 2½ -	30 -	45 -	12½ 318	14⅛ 359	1½ 38	6⅝ 168	7 13/16 198	12 -	¾ x 4½ -	10⅝ 269.9	⅞ 22.2	24.9 11.3
8 200	8.625 219.1	750 51.7	43,820 194.92	½ x 3½ -	80 -	100 -	15 381	16⅞ 429	1⅝ 41	8⅝ 219	10 254	12 -	⅞ x 4¾ -	13 330.2	1 25.4	35.4 16.1
10 250	10.750 273.1	750 51.7	68,072 302.80	½ x 3½ -	80 -	100 -	17½ 445	19⅜ 492	1⅞ 48	10¾ 273	12⅛ 308	16 -	1 x 5 -	15¼ 387.4	1⅛ 28.6	54.0 24.5
12 300	12.750 323.9	600 41.4	76,605 333.79	½ x 3½ -	80 -	100 -	20½ 521	22½ 572	2 51	12¾ 324	14 3/16 360	16 -	1⅛ x 5¾ -	17¾ 450.9	1¼ 31.8	74.8 33.9

NOTES:

†Maximum Working Pressure Rating is for schedule 40 steel pipe. For light wall, stainless steel, aluminum and ISO pipe pressure ratings, please refer to the technical data section.

Effective sealing area of mating flange must be free from gouges, undulations or deformities of any type to ensure proper sealing of the gasket.

Flange cannot be assembled directly to Series 7700 butterfly valve. Flange can be assembled to one side of series 7500 and 7600 valve.

For additional details see "Coupling Data Chart Notes" on page 19.

* Available in ANSI or metric bolt sizes only as indicated.

▼ Based on use with standard wall pipe.

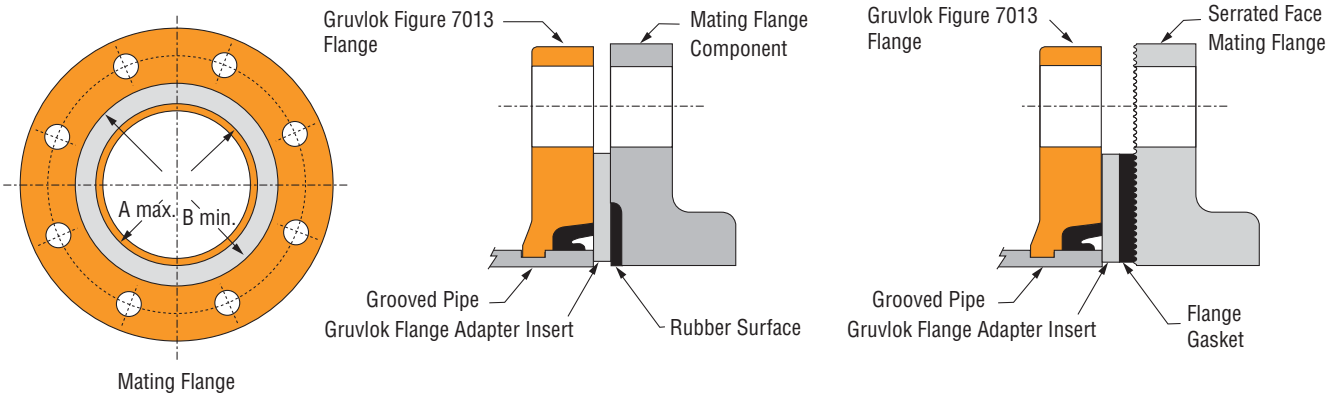
§ – For additional Bolt Torque information, see page 274.

See Installation & Assembly directions or contact your Anvil Representative

Not for use with copper systems.

FIG. 7013

Gruvlok Flanges (300# Flange)



A. The sealing surfaces A Max. to B Min. of the mating flange must be free from gouges, undulations and deformities of any type to ensure proper sealing of the gasket.

B. Gruvlok Flanges are to be assembled on butterfly valves so as not to interfere with actuator or handle operation.

C. Do not use Gruvlok Flanges within 90 degrees of one another on standard fittings because the outside dimensions may cause interference.

D. Gruvlok Flanges should not be used as anchor points for tierods across non-restrained joints.

E. Fig. 7013 Gruvlok Flange sealing gaskets require a hard flat surface for adequate sealing. The use of a Gruvlok Flange Adapter Insert is required for applications against rubber faced valves or other equipment. The Gruvlok Flange Adapter Insert is installed between the Gruvlok Flange sealing gasket and the mating flange or surface to provide a good sealing surface area.

F. Gruvlok Flanges are not recommended for use against formed rubber flanges.

G. Contact an Anvil Representative for Di-Electric Flange connections.

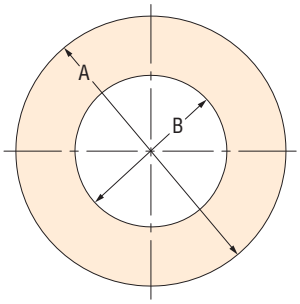
Applications which require a Gruvlok Flange Adapter Insert (page 49):

1. When mating to a wafer valve (lug valve), if the valve is rubber faced in the area designated by the sealing surface dimensions (A Max. to B Min.), place the Gruvlok Flange Adapter Insert between the valve and the Gruvlok flange.
2. When mating to a rubber-faced metal flange, the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the rubber-faced flange.
3. When mating to a serrated flange surface, a standard fullfaced flange gasket is installed against the serrated flange face and the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the standard Flange gasket.
4. When mating to valves or other component equipment where the flange face has an insert, use procedure described in note 3.

FLANGED SEAL RINGS

Flange Adapter Inserts for use with Fig. 7012/7013 Flanges

The Gruvlok flange adapter insert is designed for use with the Gruvlok 7012 & 7013. The flange adapter is required when mating the Gruvlok 7012 & 7013 to a rubber line valve or serrated face flange surface. The flange adapter ring is used in combination with a rubber lined valve or flange gasket to provide a smooth sealing surface for the 7012 & 7013 flange gasket.



MATERIAL SPECIFICATIONS

Carbon steel conforming to ASTM A 1011
Carbon steel rings come zinc electroplated standard
Ring thickness: 0.120" (all sizes and styles)

FLANGED SEAL RINGS

Nominal Size	O.D.	Fig. 7012 ANSI		Fig. 7012 PN 10/16			Fig. 7013 ANSI	
		A	B	PN	A	B	A	B
In./DN(mm)	*In./mm*	*In./mm*	*In./mm*	–	*In./mm*	*In./mm*	*In./mm*	*In./mm*
2 *50*	2.375 *60.3*	4 *102*	2¼ *57*	10/16	*4 11/64* 106	*2¼* 57	4⅛ *105*	2¼ *57*
2½ *65*	2.875 *73.0*	4¾ *121*	2¾ *70*	–	– –	– –	5 *127*	2¾ *70*
3 O.D. 76.1	*2.996* 76.1	– –	– –	10/16	*4 31/32* 126	*2⅞* 73	– –	– –
3 *88.9*	3.500 *88.9*	5¼ *133*	3⅜ *86*	10/16	*5 5/64* 141	*3⅜* 89	5¾ *146*	3⅜ *86*
4 *100*	4.500 *114.3*	6¾ *171*	4⅜ *111*	10/16	*6 11/32* 161	*4⅜* 111	7 *178*	4⅜ *111*
5½ O.D. 139.7	*5.500* 139.7	– –	– –	10/16	*7 33/64* 191	*5⅜* 137	– –	– –
5 *125*	5.563 *141.3*	7⅝ *194*	5 7/16 *138*	–	– –	– –	8⅜ *213*	5 7/16 *138*
6½ O.D. 165.1	*6.500* 165.1	– –	– –	10/16	*8 33/64* 216	*6⅜* 162	– –	– –
6 *150*	6.625 *168.3*	8⅝ *219*	6½ *165*	10/16	*8 33/64* 216	*6⅜* 162	9¾ *248*	6½ *165*
8 *200*	8.625 *219.1*	10⅞ *276*	8½ *216*	10/16	*10 31/32* 272	*8½* 216	12 *305*	8½ *216*
10 *250*	10.750 *273.1*	13¼ *337*	10⅝ *270*	10/16	*12⅞* 327	*10⅝* 270	14⅛ *359*	8½ *216*
12 *300*	12.750 *323.9*	16 *406*	12⅝ *321*	–	– –	– –	16½ *419*	8½ *216*
12 (PN10) 300	*12.750* 323.9	– –	– –	10	*14 21/32* 377	*12⅝* 321	– –	– –
12 (PN16) 300	*12.750* 323.9	– –	– –	16	*15 5/64* 383	*12⅝* 321	– –	– –
14 *350*	14.000 *355.6*	17⅝ *448*	13¾ *349*	–	– –	– –	– –	– –
16 *400*	16.000 *406.4*	20⅛ *511*	15¾ *400*	–	– –	– –	– –	– –
18 *450*	18.000 *457.2*	21½ *546*	17¾ *451*	–	– –	– –	– –	– –
20 *500*	20.000 *508.0*	23¾ *603*	19¾ *502*	–	– –	– –	– –	– –
24 *600*	24.000 *609.6*	28⅛ *714*	23¾ *603*	–	– –	– –	– –	– –

GRUVLOK FITTINGS FOR GROOVED-END PIPE

Gruvlok fittings are available through 24" nominal pipe size in a variety of styles. Use the Fitting Size Table to convert nominal pipe size to corresponding pipe O.D.

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

Depending on styles and size, Gruvlok fittings are provided in various materials including ductile iron, forged steel or fabricated steel.

Pressure ratings of Gruvlok standard fittings conform to those of Fig. 7001 Gruvlok coupling.

NSF/ANSI 61 UPC

Galvanized Gruvlok Fittings are NSF-61 and Low Lead Approved

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

FLOW DATA – FRICTIONAL RESISTANCE (EXPRESSED AS EQUIVALENT STRAIGHT PIPE)

Nom. Size	O.D.	Pipe Wall Thickness	Elbow		Tee	
			90°	45°	Branch	Run
In./DN(mm)	*In./mm*	*In./mm*	*Ft./m*	*Ft./m*	*Ft./m*	*Ft./m*
1 *25*	1.315 *33.4*	0.133 *3.4*	1.7 *0.5*	0.9 *0.3*	4.4 *1.3*	1.7 *0.5*
1¼ *32*	1.660 *42.2*	0.140 *3.6*	2.3 *0.7*	1.2 *0.4*	5.8 *1.8*	2.3 *0.7*
1½ *40*	1.900 *48.3*	0.145 *3.7*	2.7 *0.8*	1.3 *0.4*	6.7 *2.0*	2.7 *0.8*
2 *50*	2.375 *60.3*	0.154 *3.9*	3.4 *1.0*	1.7 *0.5*	8.6 *2.6*	3.4 *1.0*
2½ *65*	2.875 *73.0*	0.203 *5.2*	4.1 *1.2*	2.1 *0.6*	10.3 *3.1*	4.1 *1.2*
3 O.D. 76.1	*2.996* 76.1	*0.197* 5.0	*4.3* 1.3	*2.2* 0.7	*10.8* 3.3	*4.3* 1.3
3 *80*	3.500 *88.9*	0.216 *5.5*	5.1 *1.6*	2.6 *0.8*	12.8 *3.9*	5.1 *1.6*
4¼ O.D. 108.0	*4.250* 108.0	*0.220* 5.6	*6.4* 2.0	*3.2* 1.0	*16.1* 4.9	*6.4* 2.0
4 *100*	4.500 *114.3*	0.237 *6.0*	6.7 *2.0*	3.4 *1.0*	16.8 *5.1*	6.7 *2.0*
5¼ O.D. 133.0	*5.236* 133.0	*0.248* 6.3	*8.0* 2.4	*4.0* 1.2	*20.1* 6.1	*8.0* 2.4
5½ O.D. 139.7	*5.500* 139.7	*0.248* 6.3	*8.3* 2.5	*4.2* 1.3	*20.9* 6.4	*8.3* 2.5
5 *125*	5.563 *141.3*	0.258 *6.6*	8.4 *2.6*	4.2 *1.3*	21.0 *6.4*	8.4 *2.6*
6¼ O.D. 159.0	*6.259* 159.0	*0.280* 7.1	*9.7* 3.0	*4.9* 1.5	*24.3* 7.4	*9.7* 3.0
6½ O.D. 165.1	*6.500* 165.1	*0.280* 7.1	*10.0* 3.0	*5.0* 1.5	*24.9* 7.6	*10.0* 3.0
6 *150*	6.625 *168.3*	0.280 *7.1*	10.1 *3.1*	5.1 *1.6*	25.3 *7.7*	10.1 *3.1*
8 *200*	8.625 *219.1*	0.322 *8.2*	13.3 *4.1*	6.7 *2.0*	33.3 *10.1*	13.3 *4.1*
10 *250*	10.750 *273.1*	0.365 *9.3*	16.7 *5.1*	8.4 *2.6*	41.8 *12.7*	16.7 *5.1*
12 *300*	12.750 *323.9*	0.375 *9.5*	20.0 *6.1*	10.0 *3.0*	50.0 *15.2*	20.0 *6.1*
14 *350*	14.000 *355.6*	0.375 *9.5*	22.2 *6.8*	17.7 *5.4*	64.2 *19.6*	22.9 *7.0*
16 *400*	16.000 *406.4*	0.375 *9.5*	25.5 *7.8*	20.4 *6.2*	73.9 *22.5*	26.4 *8.0*
18 *450*	18.000 *457.2*	0.375 *9.5*	28.9 *8.8*	23.1 *7.0*	87.2 *26.6*	31.1 *9.5*
20 *500*	20.000 *508.0*	0.375 *9.5*	32.2 *9.8*	25.7 *7.8*	97.3 *29.7*	34.8 *10.6*
24 *600*	24.000 *609.6*	0.375 *9.5*	38.9 *11.9*	31.1 *9.5*	113.0 *34.4*	40.4 *12.3*

For the reducing tee and branches, use the value that is corresponding to the branch size. For example: for 6" x 6" x 3" tee, the branch value of 3" is 12.8 ft (3.9).

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile iron conforming to ASTM A 536, Grade 65-45-12
Malleable iron conforming to ASTM A 47

FABRICATED FITTINGS:

1-12" Carbon steel, Schedule 40, conforming to ASTM A 53, Grade B
14-24" Carbon steel, 0.375 wall, conforming to ASTM A 53, Grade B

COATINGS:

Rust inhibiting paint – Color: ORANGE (standard)
Hot Dipped Zinc Galvanized conforming to ASTM A 153 (optional)
Other Colors Available (IE: RAL3000 and RAL9000)

FITTING SIZE

Nominal Size	O.D.	Nominal Size	O.D.
In./DN(mm)	*In./mm*	*In./DN(mm)*	*In./mm*
1 *25*	1.315 *33.4*	5 *140*	5.563 *141.3*
1¼ *32*	1.660 *42.4*	*6¼ O.D.* 159.0	*6.259* 159.0
1½ *40*	1.900 *48.3*	*6½ O.D.* 165.1	*6.500* 165.1
2 *50*	2.375 *60.3*	6 *150*	6.625 *168.3*
2½ *65*	2.875 *73.0*	8 *200*	8.625 *219.1*
3 O.D. 76.1	*2.996* 76.1	10 *250*	10.750 *273.0*
3 *80*	3.500 *88.9*	12 *300*	12.750 *323.9*
3½ *90*	4.000 *101.6*	14 *350*	14.000 *355.6*
4¼ O.D. 108.0	*4.250* 108.0	16 *400*	16.000 *406.4*
4 *100*	4.500 *114.3*	18 *450*	18.000 *457.2*
5¼ O.D. 133.0	*5.236* 133.0	20 *500*	20.000 *508.0*
5½ O.D. 139.7	*5.500* 139.7	24 *600*	24.000 *609.6*

The Fitting Size Chart is used to determine the O.D. of the pipe that the fittings is to be used with. Gruvlok Fittings are identified by either the Nominal size in inches or the Pipe O.D. in/mm.

FIG. 7050

90° Elbow*

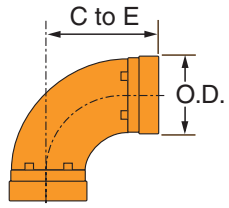

FIGURE 7050
90° ELBOW*

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2¼ C *57*	0.6 *0.3*
1¼ *32*	1.660 *42.2*	2¾ C *70*	1.0 *0.5*
1½ *40*	1.900 *48.3*	2¾ C *70*	1.2 *0.5*
2 *50*	2.375 *60.3*	3¼ C *83*	1.7 *0.8*
2½ *65*	2.875 *73.0*	3¾ C *95*	2.6 *1.2*
3 O.D. 76.1	*2.996* 76.1	*4 C* 102	*3.6* 1.6
3 *80*	3.500 *88.9*	4¼ C *108*	4.0 *1.8*
3½ *90*	4.000 *101.6*	4½ C *114*	5.5 *2.5*
4¼ O.D. 108.0	*4.250* 108.0	*4¾ C* 121	*7.7* 3.5
4 *100*	4.500 *114.3*	5 C *127*	7.7 *3.5*
5¼ O.D. 133.0	*5.236* 133.0	*5¼ C* 133	*10.4* 4.7
5½ O.D. 139.7	*5.500* 139.7	*5¼ C* 133	*10.9* 4.9
5 *125*	5.563 *141.3*	5½ C *140*	11.1 *5.0*
6¼ O.D. 159.0	*6.259* 159.0	*6 C* 152	*15.2* 6.9
6½ O.D. 165.1	*6.500* 165.1	*6½ C* 165	*17.4* 7.9
6 *150*	6.625 *168.3*	6½ C *165*	16.5 *7.5*
8 *200*	8.625 *219.1*	7¾ C *197*	30.6 *13.9*
10 *250*	10.750 *273.1*	9 C *229*	53.5 *24.3*
12 *300*	12.750 *323.9*	10 C *254*	82.0 *37.2*
14* *350*	14.000 *355.6*	21 C *533*	176.0 *79.8*
16* *400*	16.000 *406.4*	24 C *610*	230.0 *104.3*
18* *450*	18.000 *457.2*	27 C *686*	293.0 *132.9*
20* *500*	20.000 *508.0*	30 C *762*	362.0 *164.2*
24* *600*	24.000 *609.6*	36 C *914*	520.0 *235.9*

FIG. 7051

45° Elbow*

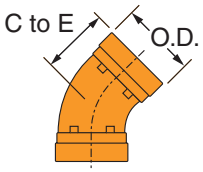

FIGURE 7051
45° ELBOW*

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	1¾ C *44*	0.5 *0.2*
1¼ *32*	1.660 *42.2*	1¾ C *44*	0.7 *0.3*
1½ *40*	1.900 *48.3*	1¾ C *44*	0.9 *0.4*
2 *50*	2.375 *60.3*	2 C *51*	1.5 *0.7*
2½ *65*	2.875 *73.0*	2¼ C *57*	1.9 *0.9*
3 O.D. 76.1	*2.996* 76.1	*2½ C* 64	*2.2* 1.0
3 *80*	3.500 *88.9*	2½ C *64*	3.3 *1.5*
3½ *90*	4.000 *101.6*	2¾ C *70*	4.3 *2.0*
4¼ O.D. 108.0	*4.250* 108.0	*2⅞ C* 83	*4.4* 2.0
4 *100*	4.500 *114.3*	3 C *76*	5.4 *2.4*
5¼ O.D. 133.0	*5.236* 133.0	*3¼ C* 83	*7.3* 3.3
5½ O.D. 139.7	*5.500* 139.7	*3¼ C* 83	*7.8* 3.5
5 *125*	5.563 *141.3*	3¼ C *83*	9.0 *4.1*
6¼ O.D. 159.0	*6.259* 159.0	*3½ C* 89	*10.1* 4.6
6½ O.D. 165.1	*6.500* 165.1	*3½ C* 89	*11.1* 5.0
6 *150*	6.625 *168.3*	3½ C *89*	11.2 *5.1*
8 *200*	8.625 *219.1*	4¼ C *108*	19.8 *9.0*
10 *250*	10.750 *273.1*	4¾ C *121*	34.3 *15.6*
12 *300*	12.750 *323.9*	5¼ C *133*	50.0 *22.7*
14* *350*	14.000 *355.6*	8¾ C *222*	89.0 *40.4*
16* *400*	16.000 *406.4*	10 C *254*	125.0 *56.7*
18* *450*	18.000 *457.2*	11¼ C *286*	158.0 *71.7*
20* *500*	20.000 *508.0*	12½ C *317*	194.0 *88.0*
24* *600*	24.000 *609.6*	15 C *381*	277.0 *125.6*

FIG. 7052

22 ½° Elbow

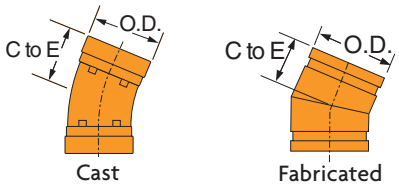

FIGURE 7052
22½° ELBOW*

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	3¼ *83*	0.5 *0.2*
1¼ *32*	1.660 *42.2*	1¾ *44*	0.7 *0.3*
1½ *40*	1.900 *48.3*	1¾ *44*	0.8 *0.4*
2 *50*	2.375 *60.3*	1⅞ C *48*	1.5 *0.7*
2½ *65*	2.875 *73.0*	2 *51*	1.9 *0.9*
3 *80*	3.500 *88.9*	2¼ C *57*	3.2 *1.5*
3½ *90*	4.000 *101.6*	2½ *64*	4.0 *1.8*
4 *100*	4.500 *114.3*	2⅝ C *67*	5.3 *2.4*
5 *125*	5.563 *141.3*	2⅞ *73*	7.2 *3.3*
6 *150*	6.625 *168.3*	3⅛ C *79*	8.2 *3.7*
8 *200*	8.625 *219.1*	3⅞ C *98*	17.8 *8.1*
10 *250*	10.750 *273.1*	4⅜ *111*	30.0 *13.6*
12 *300*	12.750 *323.9*	4⅞ *124*	40.4 *18.3*
14 *350*	14.000 *355.6*	5 *127*	46.0 *20.9*
16 *400*	16.000 *406.4*	5 *127*	52.2 *23.7*
18 *450*	18.000 *457.2*	5½ *140*	65.0 *29.5*
20 *500*	20.000 *508.0*	6 *152*	80.0 *36.3*
24 *600*	24.000 *609.6*	7 *178*	112.0 *50.8*

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C - Cast ductile iron, all others are fabricated steel.
* 14"-24" Standard Radius 90° & 45° Elbows are 1½ Long Radius.
Center to end dimensions and weights may differ from those shown in chart, contact an Anvil Representative for more information.

FIG. 7053

11 ¼° Elbow

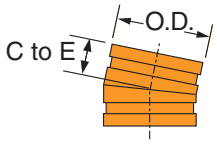

FIGURE 7053
11¼° ELBOW

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	1⅜ *35*	0.3 *0.1*
1¼ *32*	1.660 *42.2*	1⅜ *35*	0.5 *0.2*
1½ *40*	1.900 *48.3*	1⅜ *35*	0.7 *0.3*
2 *50*	2.375 *60.3*	1⅜ *35*	0.9 *0.4*
2½ *65*	2.875 *73.0*	1½ *38*	1.5 *0.7*
3 *80*	3.500 *88.9*	1½ *38*	2.0 *0.9*
3½ *90*	4.000 *101.6*	1¾ *44*	2.8 *1.3*
4 *100*	4.500 *114.3*	1¾ *44*	3.3 *1.5*
5 *125*	5.563 *141.3*	2 *51*	5.0 *2.3*
6 *150*	6.625 *168.3*	2 *51*	6.5 *2.9*
8 *200*	8.625 *219.1*	2 *51*	10.0 *4.5*
10 *250*	10.750 *273.1*	2⅛ *54*	14.5 *6.6*
12 *300*	12.750 *323.9*	2¼ *57*	18.7 *8.5*
14 *350*	14.000 *355.6*	3½ *89*	32.1 *14.6*
16 *400*	16.000 *406.4*	4 *102*	42.0 *19.1*
18 *450*	18.000 *457.2*	4½ *114*	53.2 *24.1*
20 *500*	20.000 *508.0*	5 *127*	65.7 *29.8*
24 *600*	24.000 *609.6*	6 *152*	96.0 *43.5*

FIG. 7050LR

90° Long Radius Elbow

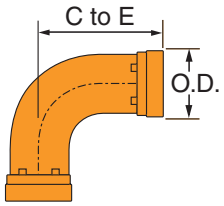

FIGURE 7050 LR
LONG RADIUS 90° ELBOW

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	3½ *89*	0.9 *0.4*
1¼ *32*	1.660 *42.2*	3⅞ *98*	1.3 *0.6*
1½ *40*	1.900 *48.3*	4¼ *108*	1.7 *0.8*
2 *50*	2.375 *60.3*	4⅜ *136*	2.5 *1.1*
2½ *65*	2.875 *73.0*	5¾ *146*	4.9 *2.2*
3 *80*	3.500 *88.9*	5⅞ *181*	6.5 *2.9*
3½ *90*	4.000 *101.6*	7¼ *184*	9.7 *4.4*
4 *100*	4.500 *114.3*	7½ *191*	11.5 *5.2*
5 *125*	5.563 *141.3*	9½ *241*	20.9 *9.5*
6 *150*	6.625 *168.3*	10¾ *273*	29.1 *13.2*
8 *200*	8.625 *219.1*	15 *381*	59.2 *26.9*
10 *250*	10.750 *273.1*	18 *457*	104.0 *47.2*
12 *300*	12.750 *323.9*	21 *533*	147.0 *66.7*
14 *350*	14.000 *355.6*	21 C *533*	176.0 *79.8*
16 *400*	16.000 *406.4*	24 C *610*	230.0 *104.3*
18 *450*	18.000 *457.2*	27 C *686*	293.0 *132.9*
20 *500*	20.000 *508.0*	30 C *762*	362.0 *164.2*
24 *600*	24.000 *609.6*	36 C *914*	520.0 *235.9*

FIG. 7051LR

45° Long Radius Elbow

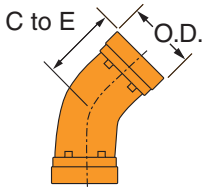

FIGURE 7051 LR
LONG RADIUS 45° ELBOW

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2½ *64*	0.7 *0.3*
1¼ *32*	1.660 *42.2*	2½ *64*	1.0 *0.5*
1½ *40*	1.900 *48.3*	2½ *64*	1.2 *0.5*
2 *50*	2.375 *60.3*	2¾ *70*	1.7 *0.8*
2½ *65*	2.875 *73.0*	3 *76*	2.9 *1.3*
3 *80*	3.500 *88.9*	3⅜ *86*	4.3 *2.0*
3½ *90*	4.000 *101.6*	3½ *89*	5.3 *2.4*
4 *100*	4.500 *114.3*	4 *102*	7.2 *3.3*
5 *125*	5.563 *141.3*	5 *127*	12.2 *5.5*
6 *150*	6.625 *168.3*	5½ *140*	17.4 *7.9*
8 *200*	8.625 *219.1*	7¼ *184*	34.0 *15.4*
10 *250*	10.750 *273.1*	8½ *216*	57.4 *26.0*
12 *300*	12.750 *323.9*	10 *254*	82.6 *37.5*
14 *350*	14.000 *355.6*	8¾ C *222*	89.0 *40.4*
16 *400*	16.000 *406.4*	10 C *254*	125.0 *56.7*
18 *450*	18.000 *457.2*	11¼ C *286*	158.0 *71.7*
20 *500*	20.000 *508.0*	12½ C *317*	194.0 *88.0*
24 *600*	24.000 *609.6*	15 C *381*	277.0 *125.6*

C - Cast ductile iron, all others are fabricated steel.
Center to end dimensions and weights may differ from those shown in chart, Contact an Anvil Representative for more information.

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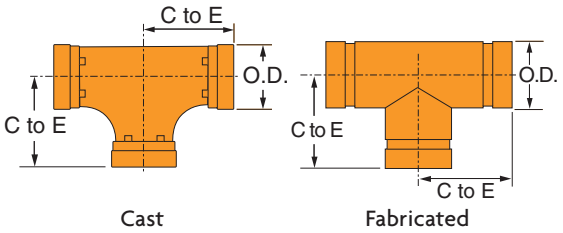
FIG. 7060

Tee



Cast Fabricated

FIGURE 7060 TEE

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2¼ C *57*	0.9 *0.4*
1¼ *32*	1.660 *42.2*	2¾ C *70*	1.5 *0.7*
1½ *40*	1.900 *48.3*	2¾ C *70*	1.8 *0.8*
2 *50*	2.375 *60.3*	3¼ C *83*	2.4 *1.1*
2½ *65*	2.875 *73.0*	3¾ C *95*	4.0 *1.8*
3 O.D. 76.1	*2.996* 76.1	*4 C* 101	*4.6* 2.1
3 *80*	3.500 *88.9*	4¼ C *108*	5.8 *2.6*
3½ *90*	4.000 *101.6*	4½ C *114*	9.8 *4.4*
4¼ O.D. 108.0	*4.250* 108.0	*4¾ C* 121	*9.3* 4.2
4 *100*	4.500 *114.3*	5 C *127*	10.3 *4.7*
5¼ O.D. 133.0	*5.236* 133.0	*5¼ C* 133	*14.1* 6.4
5½ O.D. 139.7	*5.500* 139.7	*5½ C* 140	*16.1* 7.3
5 *125*	5.563 *141.3*	5½ C *140*	16.2 *7.3*
6¼ O.D. 159.0	*6.259* 159.0	*6 C* 152	*20.8* 9.4
6½ O.D. 165.1	*6.500* 165.1	*6½ C* 165	*24.4* 11.1
6 *150*	6.625 *168.3*	6½ C *165*	25.7 *11.7*
8 *200*	8.625 *219.1*	7¾ C *197*	41.1 *18.6*
10 *250*	10.750 *273.1*	9 C *229*	74.5 *33.8*
12 *300*	12.750 *323.9*	10 C *254*	94.7 *43.0*
14 *350*	14.000 *355.6*	11 C *279*	181.0 *82.1*
16 *400*	16.000 *406.4*	12 C *305*	223.0 *101.2*
18 *450*	18.000 *457.2*	13½ C *343*	334.0 *151.5*
20 *500*	20.000 *508.0*	15 C *381*	413.0 *187.3*
24 *600*	24.000 *609.6*	17 C *432*	609.0 *276.2*

C - Cast ductile iron, all others are fabricated steel.

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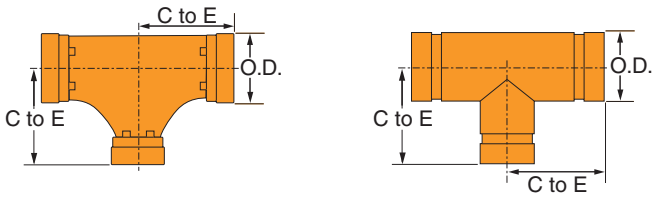
FIG. 7061

Reducing Tee Standard



Cast Fabricated

FIGURE 7061 STANDARD REDUCING TEE

Nominal Size	Center to End	Approx. Wt. Ea.	Nominal Size	Center to End	Approx. Wt. Ea.	Nominal Size	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*Lbs./Kg*	*In./DN(mm)*	*In./mm*	*Lbs./Kg*	*In./DN(mm)*	*In./mm*	*Lbs./Kg*
1¼ x 1¼ x 1 *32 x 32 x 25*	2¾ *70*	1.5 *0.7*	5 x 5 x 2 *125 x 125 x 50*	5½ *140*	14 *6.4*	10 x 10 x 8 *250 x 250 x 200*	9 *229*	64.7 *29.3*
1½ x 1½ x 1 *40 x 40 x 25*	2¾ *70*	1.8 *0.8*	5 x 5 x 2½ *125 x 125 x 65*	5½ *140*	14.3 *6.5*	12 x 12 x 4 *300 x 300 x 100*	10 *254*	75.1 *34.1*
1½ x 1½ x 1¼ *40 x 40 x 32*	2¾ *70*	1.8 *0.8*	5 x 5 x 3 *125 x 125 x 80*	5½ *140*	14.6 *6.6*	12 x 12 x 5 *300 x 300 x 125*	10 *254*	75.6 *34.3*
2 x 2 x 1 *50 x 50 x 25*	3¼ C *83*	2.6 *1.2*	5 x 5 x 4 *125 x 125 x 100*	5½ C *140*	17.9 *8.1*	12 x 12 x 6 *300 x 300 x 150*	10 *254*	76.2 *34.6*
2 x 2 x 1¼ *50 x 50 x 32*	3¼ *83*	1.7 *0.8*	6 x 6 x 1 *150 x 150 x 25*	6½ *165*	20.5 *9.3*	12 x 12 x 8 *300 x 300 x 200*	10 *254*	76.3 *34.6*
2 x 2 x 1½ *50 x 50 x 40*	3¼ C *83*	2.7 *1.2*	6 x 6 x 1¼ *150 x 150 x 32*	6½ *165*	20.7 *9.4*	12 x 12 x 10 *300 x 300 x 250*	10 *254*	77.6 *35.2*
2½ x 2½ x 1 *65 x 65 x 25*	3¾ *95*	4.1 *1.9*	6 x 6 x 1½ *150 x 150 x 40*	6½ *165*	21.0 *9.5*	14 x 14 x 6 *350 x 350 x 150*	11 *279*	101 *45.8*
2½ x 2½ x 1¼ *65 x 65 x 32*	3¾ *95*	4.2 *1.9*	6 x 6 x 2 *150 x 150 x 50*	6½ C *165*	26.4 *12.0*	14 x 14 x 8 *350 x 350 x 200*	11 *279*	103 *46.7*
2½ x 2½ x 1½ *65 x 65 x 40*	3¾ *95*	4.3 *2.0*	6 x 6 x 2½ *150 x 150 x 65*	6½ C *165*	26.5 *12.0*	14 x 14 x 10 *350 x 350 x 250*	11 *279*	104 *47.2*
2½ x 2½ x 2 *65 x 65 x 50*	3¾ *95*	4.4 *2.0*	6 x 6 x 3 *150 x 150 x 80*	6½ C *165*	26.5 *12.0*	14 x 14 x 12 *350 x 350 x 300*	11 *279*	105 *47.6*
3 x 3 x 1 *80 x 80 x 25*	4¼ C *108*	7.0 *3.2*	6 x 6 x 4 *150 x 150 x 100*	6½ C *165*	26.5 *12.0*	16 x 16 x 10 *400 x 400 x 250*	12 *305*	129 *58.5*
3 x 3 x 1¼ *80 x 80 x 32*	4¼ *108*	5.8 *2.6*	6 x 6 x 5 *150 x 150 x 125*	6½ C *165*	28.0 *12.7*	16 x 16 x 12 *400 x 400 x 300*	12 *305*	130 *59.0*
3 x 3 x 1½ *80 x 80 x 40*	4¼ *108*	5.9 *2.7*	8 x 8 x 2 *200 x 200 x 50*	7¾ *197*	32.7 *14.8*	16 x 16 x 14 *400 x 400 x 350*	12 *305*	132 *59.9*
3 x 3 x 2 *80 x 80 x 50*	4¼ C *108*	5.5 *2.5*	8 x 8 x 2½ *200 x 200 x 65*	7¾ *197*	33.0 *15.0*	18 x 18 x 10 *450 x 450 x 250*	15½ *394*	194 *88.0*
3 x 3 x 2½ *80 x 80 x 65*	4¼ *108*	6.3 *2.9*	8 x 8 x 3 *200 x 200 x 80*	7¾ *197*	33.5 *15.2*	18 x 18 x 12 *450 x 450 x 300*	15½ *394*	196 *88.9*
4 x 4 x 1 *100 x 100 x 25*	3¾ *95*	7.0 *3.2*	8 x 8 x 4 *200 x 200 x 100*	7¾ C *197*	50.0 *22.7*	18 x 18 x 14 *450 x 450 x 350*	15½ *394*	201 *91.2*
4 x 4 x 1¼ *100 x 100 x 32*	5 *127*	9.6 *4.4*	8 x 8 x 5 *200 x 200 x 125*	7¾ *197*	34.7 *15.7*	18 x 18 x 16 *450 x 450 x 400*	15½ *394*	203 *92.1*
4 x 4 x 1½ *100 x 100 x 40*	5 *127*	10.2 *4.6*	8 x 8 x 6 *200 x 200 x 150*	7¾C *197*	54.0 *24.5*	20 x 20 x 12 *500 x 500 x 300*	17¼ *438*	246 *111.6*
4 x 4 x 2 *100 x 100 x 50*	5 C *127*	10.2 *4.6*	10 x 10 x 2 *250 x 250 x 50*	9 *229*	52.2 *23.7*	20 x 20 x 14 *500 x 500 x 350*	17¼ *438*	248 *112.5*
4 x 4 x 2½ *100 x 100 x 65*	5 C *127*	11.2 *5.1*	10 x 10 x 2½ *250 x 250 x 65*	9 *229*	52.6 *23.9*	20 x 20 x 16 *500 x 500 x 400*	17¼ *438*	250 *113.4*
4 x 4 x 3 *100 x 100 x 80*	5 C *127*	11.4 *5.2*	10 x 10 x 3 *250 x 250 x 80*	9 *229*	53.0 *24.0*	20 x 20 x 18 *500 x 500 x 450*	17¼ *438*	252 *114.3*
5 x 5 x 1 *125 x 125 x 25*	5½ *140*	13.6 *6.2*	10 x 10 x 4 *250 x 250 x 100*	9 *229*	53.6 *24.3*	24 x 24 x 16 *600 x 600 x 400*	20 *508*	342 *155.1*
5 x 5 x 1¼ *125 x 125 x 32*	5½ *140*	13.7 *6.2*	10 x 10 x 5 *250 x 250 x 125*	9 *229*	54.2 *24.6*	24 x 24 x 18 *600 x 600 x 450*	20 *508*	345 *156.5*
5 x 5 x 1½ *125 x 125 x 40*	5½ *140*	13.8 *6.3*	10 x 10 x 6 *250 x 250 x 150*	9 *229*	55.0 *24.9*	24 x 24 x 20 *600 x 600 x 500*	20 *508*	347 *157.4*

Center to end dimensions and weights may differ from those shown in chart, contact an Anvil Representative for more information.

See Fitting Size chart on page 61 for O.D.

FIG. 7076

Gr x Thd Concentric Reducers

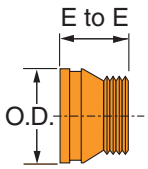


FIGURE 7076 – CONCENTRIC REDUCER GROOVE BY THREAD

Nominal Size	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*Lbs./Kg*
1½ x 1 *40 x 25*	2½ *6 4*	0.6 *0.3*
2 x ¾ *50 x 80*	2½ *64*	1.0 *0.5*
2 x 1 *50 x 25*	2½ *64*	0.8 *0.4*
2 x 1¼ *50 x 32*	2½ *64*	1.3 *0.6*
2 x 1½ *50 x 40*	2½ *64*	1.3 *0.6*
2½ x 1 *65 x 25*	2½ *64*	1.0 *0.5*
2½ x 1¼ *65 x 32*	2½ *64*	1.0 *0.5*
2½ x 1½ *65 x 40*	2½ *64*	1.3 *0.6*
2½ x 2 *65 x 50*	2½ *64*	1.2 *0.5*
3 x ¾ *80 x 80*	2½ *64*	1.2 *0.5*
3 x 1 *80 x 25*	2½ *64*	1.2 *0.5*
3 x 1¼ *80 x 32*	2½ *64*	1.3 *0.6*
3 x 1½ *80 x 40*	2½ *64*	1.3 *0.6*
3 x 2 *80 x 50*	2½ *64*	1.3 *0.6*
3 x 2½ *80 x 65*	2½ *64*	1.5 *0.7*
4 x 1 *100 x 25*	3 *76*	2.2 *1.0*
4 x 1¼ *100 x 32*	3 *76*	2.3 *1.0*
4 x 1½ *100 x 40*	3 *76*	2.3 *1.0*
4 x 2 *100 x 50*	3 *76*	2.3 *1.0*
4 x 2½ *100 x 65*	3 *76*	2.3 *1.0*
4 x 3 *100 x 80*	3 *76*	2.6 *1.2*
5 x 4 *125 x 100*	3½ *89*	4.5 *2.0*
6 x 1 *150 x 25*	4 *102*	6.0 *2.7*
6 x 1¼ *150 x 32*	4 *102*	6.0 *2.7*
6 x 1½ *150 x 40*	4 *102*	6.0 *2.7*
6 x 2 *150 x 50*	4 *102*	6.0 *2.7*
6 x 3 *150 x 80*	4 *102*	6.0 *2.7*
6 x 4 *150 x 100*	4 *102*	5.9 *2.7*

All are Fabricated Steel.
See Fitting Size chart on page 61 for O.D.

FIG. 7073 & FIG. 7097

Eccentric Reducers

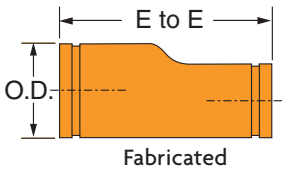


Fig. 7073– Gr. x Gr.

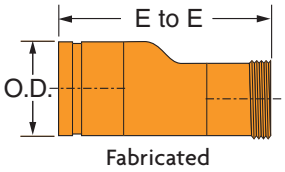


Fig. 7097 – Gr. x Thd.

FIGURE 7073 & 7097 ECCENTRIC REDUCER

Nominal Size	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*Lbs./Kg*
1¼ x 1 *32 x 25*	8½ *216*	1.5 *0.7*
1½ x ¾ *40 x 20*	8½ *216*	1.6 *0.7*
1½ x 1 *40 x 25*	8½ *216*	1.7 *0.8*
1½ x 1¼ *40 x 32*	8½ *216*	4.5 *2.0*
2 x ¾ *50 x 80*	9 *229*	2.1 *1.0*
2 x 1 *50 x 25*	9 *229*	2.2 *1.0*
2 x 1¼ *50 x 32*	9 *229*	2.4 *1.1*
2 x 1½ *50 x 40*	9 *229*	2.5 *1.1*
2½ x 1 *65 x 25*	9½ *241*	3.2 *1.5*
2½ x 1¼ *65 x 32*	9½ *241*	3.4 *1.5*
2½ x 1½ *65 x 40*	9½ *241*	3.6 *1.6*
2½ x 2 *65 x 50*	9½ *241*	4.0 *1.8*
3 x 1 *80 x 25*	9½ *241*	4.0 *1.8*
3 x 1¼ *80 x 32*	9½ *241*	4.3 *2.0*
3 x 1½ *80 x 40*	9½ *241*	4.5 *2.0*
3 x 2 *80 x 50*	9½ *241*	4.8 *2.2*
3 x 2½ *80 x 65*	9½ *241*	5.6 *2.5*
3½ x 3 *90 x 80*	9½ *241*	6.6 *3.0*
4 x 1 *100 x 25*	10 *254*	5.9 *2.7*
4 x 1½ *100 x 40*	10 *254*	6.4 *2.9*
4 x 2 *100 x 50*	10 *254*	6.7 *3.0*
4 x 2½ *100 x 65*	10 *254*	7.3 *3.3*
4 x 3 *100 x 80*	10 *254*	7.9 *3.6*
5 x 2 *125 x 50*	11 *279*	9.3 *4.2*
5 x 2½ *125 x 65*	11 *279*	9.9 *4.5*
5 x 3 *125 x 80*	11 *279*	10.7 *4.9*
5 x 4 *125 x 100*	11 *279*	11.9 *5.4*
6 x 1 *150 x 25*	11½ *292*	12.0 *5.4*
6 x 1½ *150 x 40*	11½ *292*	12.1 *5.5*
6 x 2 *150 x 50*	11½ *292*	12.2 *5.5*
6 x 2½ *150 x 65*	11½ *292*	12.8 *5.8*
6 x 3 *150 x 80*	11½ *292*	13.6 *6.2*
6 x 4 *150 x 100*	11½ *292*	14.9 *6.8*
6 x 5 *150 x 125*	11½ *292*	16.2 *7.3*
8 x 3 *200 x 80*	12 *305*	17.9 *8.1*
8 x 4 *200 x 100*	12 *305*	19.7 *8.9*
8 x 5 *200 x 125*	12 *305*	21.4 *9.7*
8 x 6 *200 x 150*	12 *305*	23.2 *10.5*
10 x 4 *250 x 100*	13 *330*	29.7 *13.5*
10 x 5 *250 x 125*	13 *330*	31.7 *14.4*
10 x 6 *250 x 150*	13 *330*	34.0 *15.4*
10 x 8 *250 x 200*	13 *330*	34.4 *15.6*
12 x 6 *300 x 150*	14 *356*	45.2 *20.5*
12 x 8 *300 x 200*	14 *356*	47.7 *21.6*
12 x 10 *300 x 250*	14 *356*	52.0 *23.6*
14 x 6 *350 x 150*	13 *330*	78 *35.4*
14 x 8 *350 x 200*	13 *330*	80 *36.3*
14 x 10 *350 x 250*	13 *330*	84 *38.1*
14 x 12 *350 x 300*	13 *330*	88 *39.9*
16 x 8 *400 x 200*	14 *356*	91 *41.3*
16 x 10 *400 x 250*	14 *356*	96 *43.5*
16 x 12 *400 x 300*	14 *356*	99 *44.9*
16 x 14 *400 x 350*	14 *356*	104 *47.2*
18 x 10 *450 x 250*	15 *381*	110 *49.9*
18 x 12 *450 x 300*	15 *381*	113 *51.3*
18 x 14 *450 x 350*	15 *381*	117 *53.1*
18 x 16 *450 x 400*	15 *381*	121 *54.9*
20 x 10 *500 x 250*	20 *508*	145 *65.8*
20 x 12 *500 x 300*	20 *508*	149 *67.6*
20 x 14 *500 x 350*	20 *508*	152 *68.9*
20 x 16 *500 x 400*	20 *508*	156 *70.8*
20 x 18 *500 x 450*	20 *508*	160 *72.6*
24 x 12 *600 x 300*	20 *508*	179 *81.2*
24 x 14 *600 x 350*	20 *508*	184 *83.5*
24 x 16 *600 x 400*	20 *508*	189 *85.7*
24 x 18 *600 x 450*	20 *508*	194 *88*
24 x 20 *600 x 500*	20 *508*	199 *90.3*

Fabricated Steel *Figure 7097 is available in sizes 1¼ x 1 through 12 x 10.
Center to end dimensions may differ from those shown above. Contact an Anvil Representative for more information.
See Fitting Size chart on page 61 for O.D.

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FIG. 7077, FIG. 7078 & FIG. 7079

Swaged Nipples

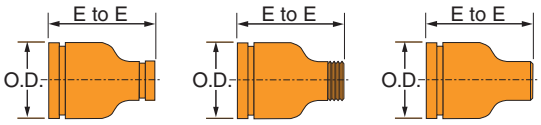

Fig. 7077 Gr x Gr | Fig. 7078 Gr x Thd | Fig. 7079 Gr x Bev

FIGURE 7077, 7078 & 7079 SWAGED NIPPLES

Nominal Size	End to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	Lbs./Kg
2 x 1 50 x 25	6½ C 165	2.0 0.9
2 x 1¼ 50 x 32	6½ 165	2.0 0.9
2 x 1½ 50 x 40	6½ 165	2.0 0.9
2½ x 1 65 x 25	7 178	3.5 1.6
2½ x 1¼ 65 x 32	7 178	3.5 1.6
2½ x 1½ 65 x 40	7 178	3.5 1.6
2½ x 2 65 x 50	7 178	3.5 1.6
3 x 1 80 x 25	8 203	5.0 2.3
3 x 1¼ 80 x 32	8 203	5.0 2.3
3 x 1½ 80 x 40	8 203	5.0 2.3
3 x 2 80 x 50	8 203	5.0 2.3
3 x 2½ 80 x 65	8 203	5.0 2.3
3½ x 3 90 x 80	8 203	7.0 3.2
4 x 1 100 x 25	9 229	8.0 3.6
4 x 1¼ 100 x 32	9 229	8.0 3.6
4 x 1½ 100 x 40	9 229	8.0 3.6
4 x 2 100 x 50	9 229	8.0 3.6
4 x 2½ 100 x 65	9 229	8.0 3.6
4 x 3 100 x 80	9 229	8.0 3.6
4 x 3½ 100 x 90	9 229	8.0 3.6
5 x 2 125 x 50	11 279	12.0 5.4
5 x 2½ 125 x 65	11 279	12.0 5.4
5 x 3 125 x 80	11 279	12.0 5.4
5 x 4 125 x 100	11 279	12.0 5.4
6 x 1 150 x 25	12 305	19.0 8.6
6 x 1¼ 150 x 32	12 305	19.0 8.6
6 x 1½ 150 x 40	12 305	19.0 8.6
6 x 2 150 x 50	12 305	19.0 8.6
6 x 2½ 150 x 65	12 305	19.0 8.6
6 x 3 150 x 80	12 305	19.0 8.6
6 x 3½ 150 x 90	12 305	17.0 7.7
6 x 4 150 x 100	12 305	19.0 8.6
6 x 5 150 x 125	12 305	19.0 8.6

This product is not ULC Listed.
See Fitting Size chart on page 61 for O.D.

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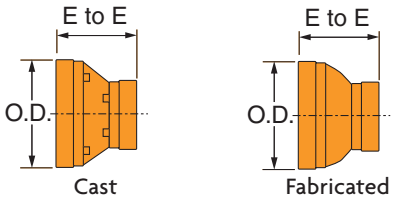
FIG. 7072

Gr x Gr Concentric Reducer



Cast | Fabricated

FIGURE 7072 CONCENTRIC REDUCER

Nominal Size	End to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	Lbs/Kg
1¼ x 1 32 x 25	2½ 64	0.6 0.3
1½ x 1 40 x 25	2½ 64	0.6 0.3
1½ x 1¼ 40 x 32	2½ 64	0.6 0.3
2 x 1 50 x 25	2½ 64	0.8 0.4
2 x 1¼ 50 x 32	2½ C 64	1.3 0.6
2 x 1½ 50 x 40	2½ C 64	1.3 0.6
2½ x 1 65 x 25	2½ 64	1.0 0.5
2½ x 1¼ 65 x 32	2½ 64	1.0 0.5
2½ x 1½ 65 x 40	2½ 64	1.3 0.6
2½ x 2 65 x 50	2½ C 64	1.6 0.7
3 x 1 80 x 25	2½ 64	1.2 0.5
3 x 1¼ 80 x 32	2½ 64	1.3 0.6
3 x 1½ 80 x 40	2½ 64	1.3 0.6
3 x 2 80 x 50	2½ C 64	1.4 0.6
3 x 2½ 80 x 65	2½ C 64	1.5 0.7
3½ x 3 90 x 80	3 76	1.8 0.8
4 x 1 100 x 25	3 76	2.2 1.0
4 x 1¼ 100 x 32	3 76	2.2 1.0
4 x 1½ 100 x 40	3 76	2.3 1.0
4 x 2 100 x 50	3 C 76	2.4 1.1
4 x 2½ 100 x 65	3 C 76	2.6 1.2
4 x 3 100 x 80	3 C 76	3.2 1.5
4 x 3½ 100 x 90	3 76	3.6 1.6
5 x 2 125 x 50	3½ 89	4.6 2.1
5 x 2½ 125 x 65	3½ 89	4.5 2.0
5 x 3 125 x 80	3½ 89	4.4 2.0
5 x 4 125 x 100	3½ C 89	4.5 2.0
6 x 1 150 x 25	4 102	6.8 3.1
6 x 1½ 150 x 40	4 102	6.9 3.1
6 x 2 150 x 50	4 C 102	6.0 2.7
6 x 2½ 150 x 65	4 102	6.0 2.7
6 x 3 150 x 80	4 C 102	5.4 2.4
6 x 4 150 x 100	4 C 102	5.6 2.5
6 x 5 150 x 125	4 C 102	6.0 2.7
8 x 3 200 x 80	5 127	12.0 5.5
8 x 4 200 x 100	5 C 127	9.0 4.1
8 x 5 200 x 125	5 127	11.5 5.2
8 x 6 200 x 150	5 C 127	10.6 4.8
10 x 4 250 x 100	6 152	20 9.1
10 x 5 250 x 125	6 152	20 9.1
10 x 6 250 x 150	6 C 152	20 9.1
10 x 8 250 x 200	6 152	23.9 10.8
12 x 4 300 x 100	7 178	25 11.3
12 x 6 300 x 150	7 178	29 13.2
12 x 8 300 x 200	7 178	29 13.2
12 x 10 300 x 250	7 178	32.4 14.7
14 x 6 350 x 150	13 330	54.3 24.6
14 x 8 350 x 200	13 330	54.5 24.7
14 x 10 350 x 250	13 330	55.7 25.3
14 x 12 350 x 300	13 330	57.3 26.0
16 x 8 400 x 200	14 356	65.4 29.7
16 x 10 400 x 250	14 356	66.7 30.3
16 x 12 400 x 300	14 356	68.1 30.9
16 x 14 400 x 350	14 356	71.0 32.2
18 x 10 450 x 250	15 381	82.3 37.3
18 x 12 450 x 300	15 381	83.6 37.9
18 x 14 450 x 350	15 381	86.2 39.1
18 x 16 450 x 400	15 381	87.2 39.6
20 x 10 500 x 250	20 508	123.0 55.8
20 x 12 500 x 300	20 508	125.0 56.7
20 x 14 500 x 350	20 508	129.0 58.5
20 x 16 500 x 400	20 508	131.0 59.4
20 x 18 500 x 450	20 508	133.0 60.3
24 x 10 600 x 250	20 508	147.0 66.7
24 x 12 600 x 300	20 508	149.0 67.6
24 x 14 600 x 350	20 508	152.0 68.9
24 x 16 600 x 400	20 508	153.0 69.4
24 x 18 600 x 450	20 508	154.0 69.9
24 x 20 600 x 500	20 508	155.0 70.3

C - Cast ductile iron, all others are fabricated steel.

c UL US LISTED FM APPROVED

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

3. SPRINKLER HEADS AND ACCESSORIES

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

Reliable®

Model GXLO Series Sprinklers

Storage and Non-Storage Sprinklers
K11.2 (160 metric)

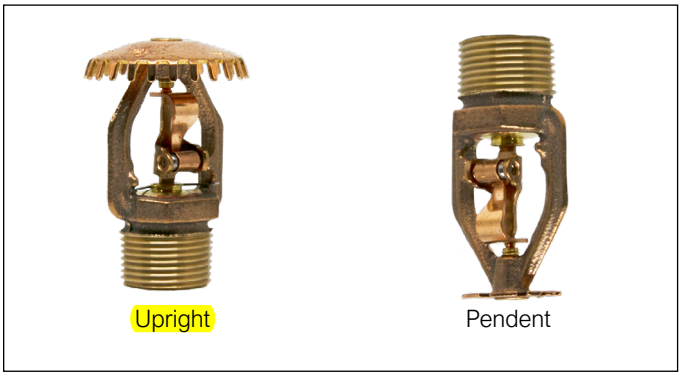
Product Description

Reliable Model GXLO (extra-large orifice) upright and pendent sprinklers are standard coverage standard-response sprinklers that utilize a robust center strut, solder in compression thermal element. These sprinklers are intended for use in hydraulically calculated control mode density area (CMDA) storage and non-storage occupancies in accordance with the area/density curves of NFPA 13 or other applicable standards.

The Model GXLO sprinkler is FM Approved as a standard-response storage and non-storage sprinkler when used in accordance with FM Global Property Loss Prevention Data Sheets.

For new installations, the sprinkler is provided with either 3/4-inch NPT or ISO 7-R3/4 threads. The upright version is also available with 1/2-inch NPT or ISO 7-R1/2 threads for retrofit installations only. Sprinklers without guards are installed using the Model H wrench.

For use as an intermediate level sprinkler, the Model GXLO upright sprinkler is available with a factory installed water shield. Various other water shields, guards, or guard/shield options are also available for both upright and pendent models (please refer to Technical Specifications on following pages). Sprinkler guards or guard/shields may be installed in the field or factory installed. Use of the Model JV sprinkler wrench is required for installation where a guard is added to the sprinkler prior to threading the assembly into a fitting.



Model GXLO Series Sprinklers

Upright with Factory Installed Shield
(Factory Installed water shield)

Model GXLO Specifications — **Table A**

Style	Sprinkler Identification Number (SIN)	Listings and Approvals	Sensitivity	K-Factor
Upright Intermediate Upright	R2921	cULus, FM	Standard Response	11.2 (160 metric)
Pendent	R2916	FM		

Model GXLO Upright Sprinkler — SIN R2921

Technical Specifications
Style: Upright, Intermediate Upright
Threads: 3/4" NPT or ISO 7-1R3/4*
Nominal K-Factor: 11.2 (160 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Solder Capsule
Sprinkler Frame: Brass Alloy
Button/Cup: Brass Alloy
Sealing Assembly: Brass with PTFE
Load Screw: Bronze
Deflector: Bronze Alloy
Levers: Bronze Alloy
Ejection Spring: Stainless Steel

Sprinkler Finishes
See Table C

Sensitivity
Standard Response

Temperature Ratings
See Table D

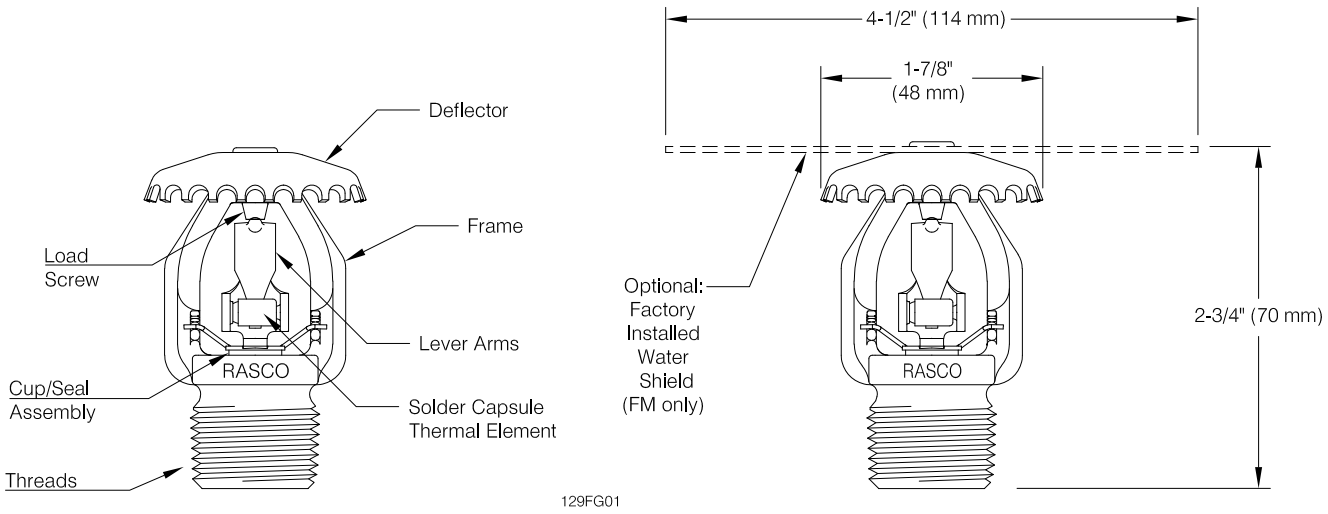
Guards & Shields
D-6 Guard & Water Shield (cULus)
D-7 Guard & Water Shield (FM)
D-8 Guard (FM)
Water Shield (factory installed; FM)

Sprinkler Wrench
Model H
Model W15 (with guard installed)

Listings and Approvals
cULus Listed
FM Approved

***Note:** 1/2" NPT and ISO 7-R1/2 threads available for RETROFIT APPLICATIONS ONLY on upright sprinkler. This sprinkler will be identified with a pintle on the deflector. Not available on intermediate upright sprinkler.

Model GXLO Upright Components and Dimensions — **Figure 1**



COMPONENTS **DIMENSIONS**

Model GXLO Pendent Sprinkler — SIN R2916

Technical Specifications
Style: Pendent
Threads: 3/4” NPT or ISO 7-1R3/4
Nominal K-Factor: 11.2 (160 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel Solder Link
Sprinkler Frame: Brass Alloy
Button/Cup: Brass Alloy
Sealing Assembly: Brass Alloy with PTFE
Load Screw: Bronze
Deflector: Bronze Alloy
Levers: Bronze Alloy

Sprinkler Finishes
See Table C

Sensitivity
Standard Response

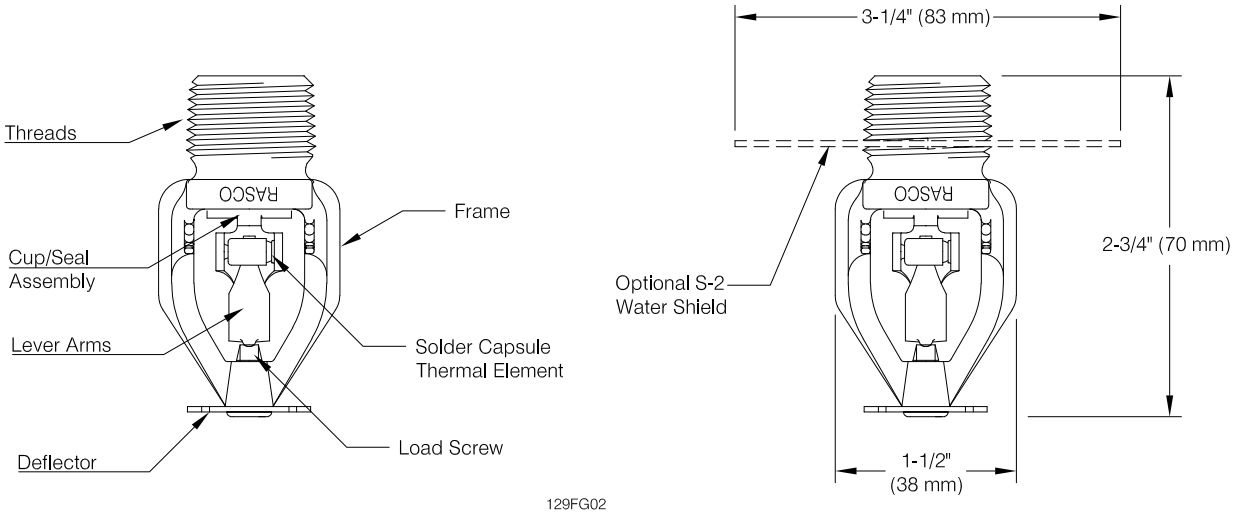
Temperature Ratings
See Table D

Guards & Shields
D-8 Guard
D-9 Guard & Water Shield
S-2 Water Shield

Sprinkler Wrench
Model H
Model W15 (with guard installed)

Listings and Approvals
FM Approved

Model GXLO Pendent Components and Dimensions — **Figure 2**



COMPONENTS **DIMENSIONS**

Model GXLO Commodity Selection and Design Criteria Overview **Table B**

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	CMDA	Storage
Response Type	SR	SR
System Type	Pendent - Wet Upright - Wet, Dry, Preaction	Pendent - Wet Upright - Wet, Dry, Preaction
Temperature Rating °F (°C)	165, 212, 286 (74, 100, 141)	165, 212, 286 (74, 100, 141)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0,8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 8-3
Rolled Paper Storage	See NFPA 13	Pendent - N/A Upright - See FM 8-21
Flammable Liquid Storage	See NFPA 30	See FM 7-29 and 8-9
Aerosol Storage	See NFPA 13	See FM 7-31
Auto Components in Portable Racks	See NFPA 13	See FM 2-0 and 8-9

Finishes **Table C**

Upright (R2921)	Pendent (R2916)
Bronze	Bronze
Chrome [1]	
Lead[1][2]	
Wax[1][2][3]	
Wax over Lead[1][2][3]	

Notes:
1. Not available with factory attached water shield
2. cULus listed as corrosion resistant
3. Clear wax used on ordinary temperature rated sprinklers. Brown wax used on intermediate temperature rated sprinklers. Brown wax may be used on high temperature rated sprinklers where the ambient temperature does not exceed 150°F (66°C).

Temperature Ratings **Table D**

Classification	Sprinkler Rating		Maximum Ambient Temperature		Frame Color
	°F	°C	°F	°C	
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

Installation

Model GXLO sprinklers must be installed according to appropriate NFPA Standards, FM Global Loss Prevention Data Sheets, and/or the requirements of the authority having jurisdiction.

Use only the Model H sprinkler wrench for sprinkler installation or use the Model W15 wrench to install the sprinkler/guard assembly (Figure 3). Any other type of wrench may damage the sprinkler. Damaged sprinklers must be replaced immediately.

A leak tight joint should be obtained with a torque of 14 to 20 lb-ft (19 to 27 N.m) for 3/4 inch NPT and ISO 7-R3/4 thread sprinklers. For 1/2 inch NPT and ISO 7-R1/2 thread sprinklers the recommended installation torque is 8 to 18 lb-ft (11 to 24 N.m). Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Wrenches **Figure 3**

Model H Wrench (sprinkler)

Model W15 Wrench (with guard installed)

Maintenance

Reliable Model GXLO sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering.

Model GXLO Sprinkler
- Upright
- Intermediate Upright
- Pendent

Threads
- 3/4" NPT
- ISO 7-R3/4
- 1/2" NPT (Retrofit installations only, upright only)
- ISO 7-R1/2 (Retrofit installations only, upright only)

Temperature Rating
- 165°F (74°C)
- 212°F (100°C)
- 286°F (141°C)

Finish
See Table C

Guards/Shields
See Technical Specifications

Wrench
- Model H
- Model W15 (with guards installed)

P/N 9999970286

Reliable®

F1FR80 Series Quick Response Extended Coverage QREC Sprinklers

K-factor 8.0 (115)

Features

- Extended coverage quick-response sprinklers
- cULus 250psi (17.2 bar) rated
- Pendent and horizontal sidewall (EC-9) deflectors
- Low profile, compact design
- Available in a wide variety of finishes

Product Description

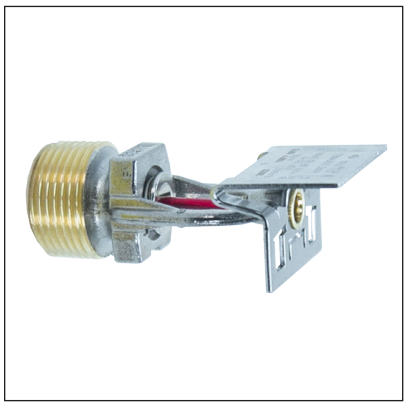
Reliable Model F1FR80 QREC series sprinklers are quick-response extended coverage automatic fire sprinklers utilizing a sensitive 3.0 mm glass bulb thermal element for use in light hazard occupancies.

Pendent and horizontal sidewall sprinklers may be installed exposed or surface mounted using escutcheons such as the Reliable Models B, C, or HB (reference Technical Bulletin 204). When installed recessed or concealed, Model F1FR80 QREC series sprinklers are specifically listed with and may only be installed with listed Reliable recessed escutcheons and cover plates. Refer to the technical information on the following pages for specific listings for recessed and concealed installations and refer to Figures 3 and 4 for dimensional information.

Table A provides a summary of the approvals and availability of specific Model F1 series sprinkler configurations. Additional technical information for each sprinkler model is provided on the following pages.

Note: The EC-9 horizontal sidewall deflector is also available on the cULus Listed 300 psi (20.7 bar) Model SWC concealed sidewall sprinkler. Please reference Technical Bulletin 163.

Model F1FR80 QREC Pendent



Model F1FR80 QREC Sidewall

Note: Not all versions of product are shown.

Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (lpm/bar$^{1/2}$)	Orientation	Listings & Approvals(1)	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
F1FR80 QREC	8.0 (115)	Pendent	cULus FM(2)	250 (17.2) cULus 175 (12.0) FM	R4842
		Horizontal Sidewall			R4862

Note:

1. Listed and approved for light hazard occupancies only.
2. When recessed, FM approved with F2 escutcheon only. Concealed pendent (CCP) not approved by FM.

Model F1FR80 QREC Pendent Sprinkler — SIN R4842

Technical Specifications
Style:
Pendent
Recessed Pendent
Concealed Pendent
Threads: 3/4" NPT or ISO 7-R3/4
Nominal K-Factor: 8.0 (115)
Max. Working Pressure:
175 psi (12.0 bar)
250 psi (17.2 bar)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table E)

Sensitivity
Quick response

Temperature Ratings
135°F (57°C)
155°F (68°C)(1)

Recessed Escutcheons
Model F1
Model F2

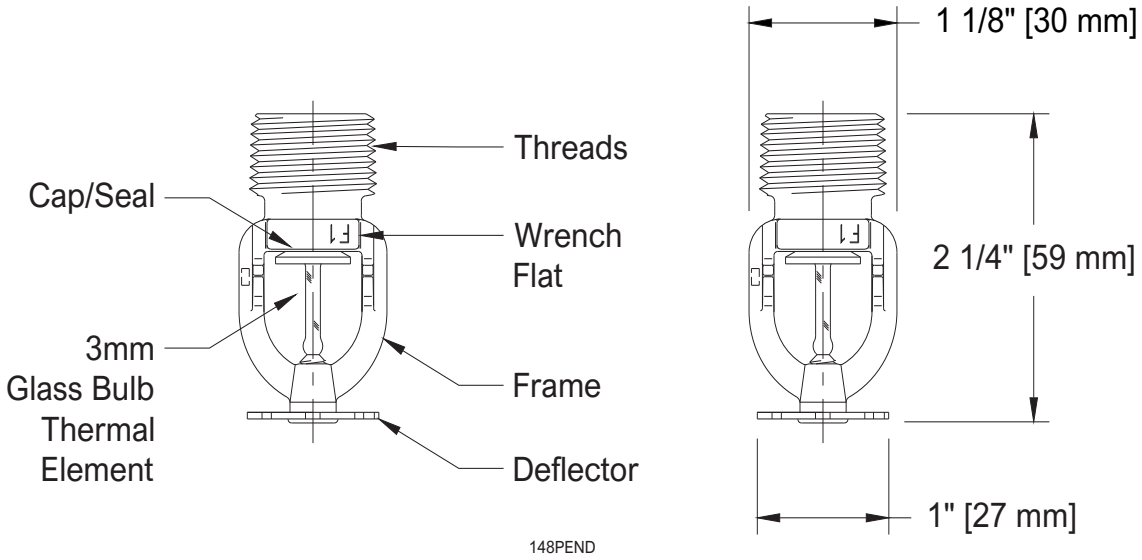
Cover Plates
CCP (Conical)(2)

Sprinkler Wrenches
Model W2 (non-recessed)
Model W4 (recessed and concealed)

Listings and Approvals
cULus
FM

Notes:
1. 155°F (68°C) sprinkler is not cULus listed for 20' x 20' (6m x 6m) coverage area.
2. cULus only; 135°F (57°C) cover plate.

Model F1FR80 QREC Pendent Sprinkler Components and Dimensions — **Figure 1**



Note: Please refer to Figure 3 for recessed and concealed installations.

F1FR80 QREC Pendent Required Minimum Flow and Pressure — **Table B**

Coverage Area ft x ft (m x m)	Flow gpm (L/min)	Pressure psi (bar)
16 x 16 (4.9 x 4.9)	26 (98.4)	10.6 (0.7)
18 x 18 (5.5 x 5.5)	33 (125.0)	17.0 (1.2)
20 x 20 (6.0 x 6.0) (1)	40 (151.4)	25.0 (1.7)

Note: cULus Listing for 20' x 20' (6.0 m x 6.0 m) coverage area is for 135°F (57°C) sprinkler only. 155°F (68°C) sprinkler is not cULus Listed for 20' x 20' (6.0 m x 6.0 m) coverage area.

Model F1FR80 QREC Horizontal Sidewall Sprinkler — SIN R4862

Technical Specifications
Style:
Horizontal Sidewall
Recessed Horizontal Sidewall
Threads: 3/4" NPT or ISO 7-R3/4
Nominal K-Factor: 8.0 (115)
Max. Working Pressure:
175 psi (12.0 bar) (FM)
250 psi (17.2 bar) (cULus)

Material Specifications
Thermal Sensor: 3 mm Glass Bulb
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Finishes
(See Table E)

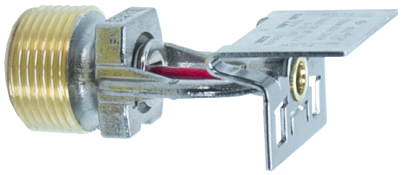
Sensitivity
Quick response

Temperature Ratings[1]
135°F (57°C)
155°F (68°C)
175°F (79°C)

Recessed Escutcheons
Model F1[2]
Model F2

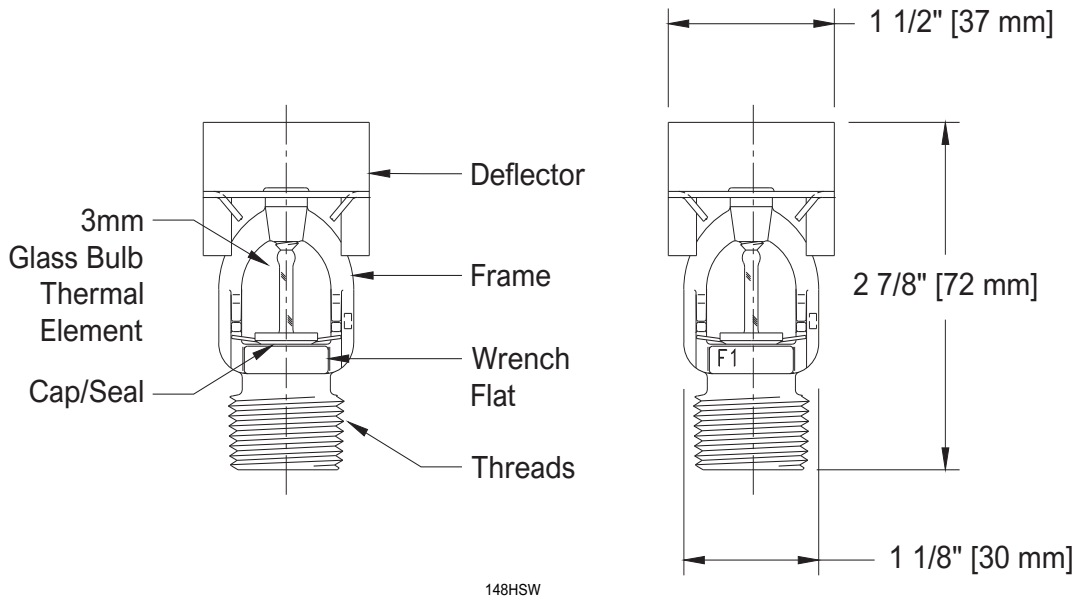
Sprinkler Wrenches
Model W2 (non-recessed)
Model W4 (recessed)

Listings and Approvals[3]
cULus
FM



Notes:
1. Temperature ratings may vary depending on coverage area selected. See Tables C and D.
2. Not approved by FM for recessed installation; must use Model F2.
3. Approvals may vary depending on coverage area selected. See Tables C and D.

Model F1FR80 QREC Horizontal Sidewall (EC-9) Components and Dimensions — **Figure 2**



Note: Please refer to Figure 3 for recessed installations.

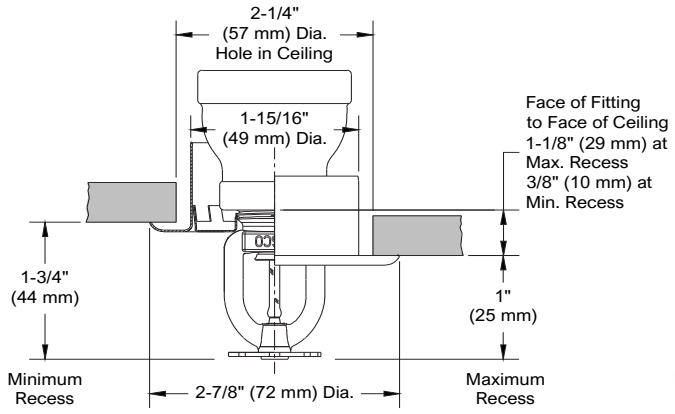
F1FR80 QREC Horizontal Sidewall Required Minimum Flow and Pressure: cULus **Table C**

Coverage Area ft x ft (m x m)	Deflector Distance Inches (mm)	Temperature Rating	Flow gpm (L/min)	Pressure psi (bar)
14 x 26 (4.3 x 7.9)	4 – 6 (100 – 150)	135°F (57°C)	39 (147.6)	23.8 (1.6)
14 x 26 (4.3 x 7.9)	6 – 12 (150 – 300)	135°F (57°C) 155°F (68°C)	46 (174.1)	33.1 (2.3)
16 x 16 (4.9 x 4.9)	4 – 12 (100 – 300)	All	29 (109.8)	13.1 (0.9)
16 x 16 (4.9 x 4.9)	6 – 12 (150 – 300)	All	26 (98.4)	10.6 (0.7)
16 x 18 (4.9 x 5.5)	4 – 12 (100 – 300)	All	29 (109.8)	13.1 (0.9)
16 x 20 (4.9 x 6.0)	4 – 12 (100 – 300)	All	32 (121.1)	16.0 (1.1)
16 x 22 (4.9 x 6.7)	4 – 12 (100 – 300)	All	36 (136.3)	20.2 (1.4)
16 x 24 (4.9 x 7.3)	4 – 12 (100 – 300)	All	39 (147.6)	23.8 (1.6)
18 x 18 (5.5 x 5.5)	4 – 12 (100 – 300)	135°F (57°C) 155°F (68°C)	33 (124.9)	17.0 (1.2)
18 x 22 (5.5 x 6.7)	4 – 12 (100 – 300)	135°F (57°C) 155°F (68°C)	40.0 (151.4)	25.0 (1.7)

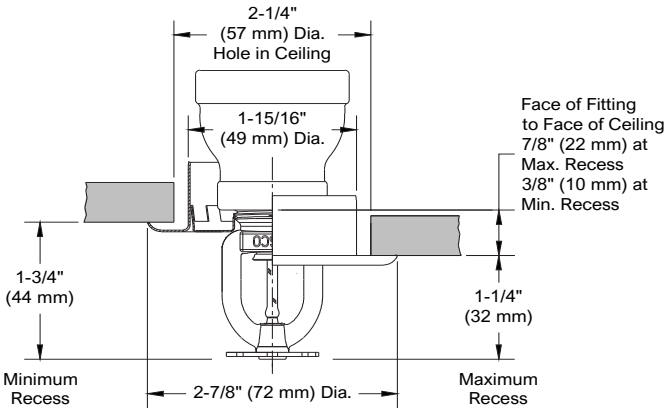
F1FR80 QREC Horizontal Sidewall Required Minimum Flow and Pressure: FM **Table D**

Coverage Area ft x ft (m x m)	Deflector Distance Inches (mm)	Temperature Rating	Flow gpm (L/min)	Pressure psi (bar)
16 x 16 (4.9 x 4.9)	4 – 12 (100 – 300)	All	32 (121.1)	16.0 (1.1)
16 x 18 (4.9 x 5.5)	4 – 12 (100 – 300)	All	36 (136.3)	20.2 (1.4)
16 x 20 (4.9 x 6.0)	4 – 12 (100 – 300)	All	40 (151.4)	25.0 (1.7)
16 x 22 (4.9 x 6.7)	4 – 12 (100 – 300)	All	44 (166.6)	30.2 (2.1)
16 x 24 (4.9 x 7.3)	4 – 12 (100 – 300)	All	48 (181.7)	36.0 (2.5)

Note: 175°F (79°C) temperature rated sprinklers not FM approved for recessed installations.

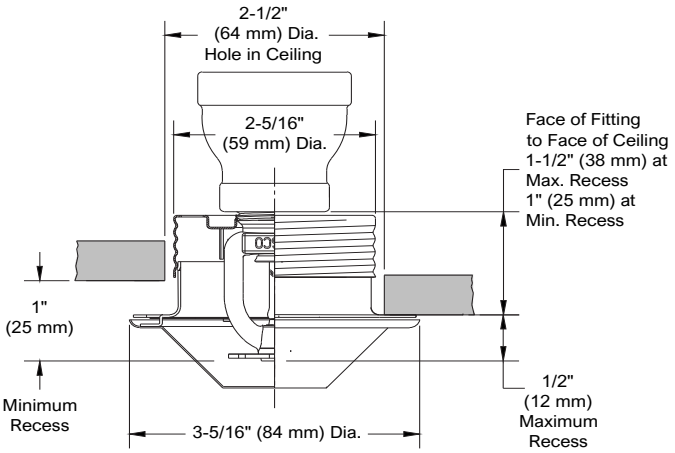


Model F1FR80 EC Pendent Sprinkler
with Model F1 Recessed Escutcheon
(3/4" [19mm] adjustment)



Model F1FR80 EC Pendent Sprinkler
with Model F2 Recessed Escutcheon
(1/2" [13mm] adjustment)

148RECPEND

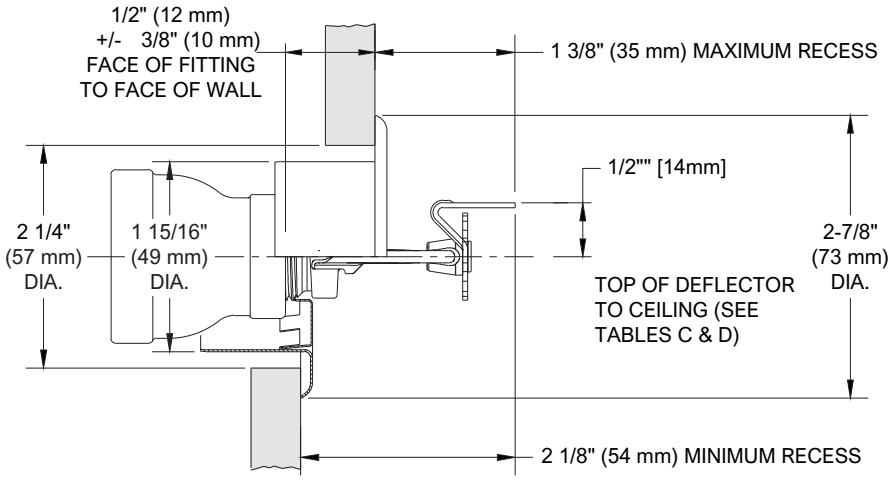


Model F1FR80 EC Pendent Sprinkler
with Conical Concealed Cover Plate
(1/2" [13mm] adjustment)

Note: Model CCP concealed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model CCP cup are unobstructed following installation.

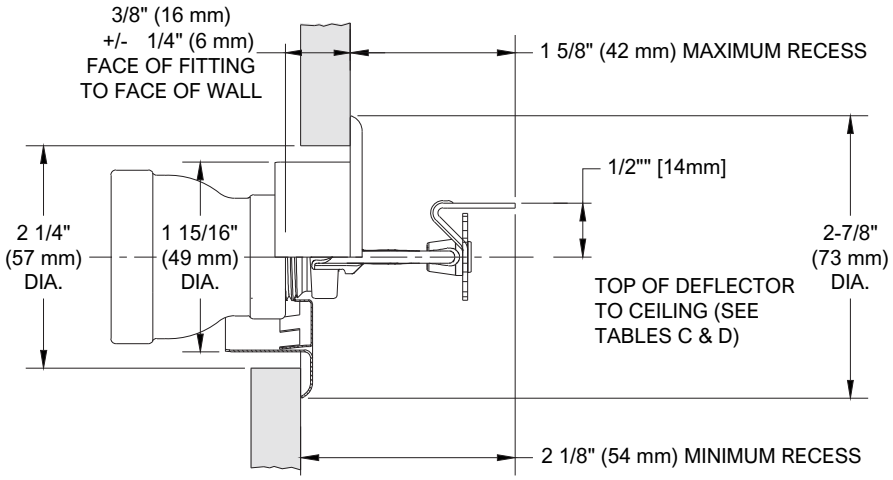
Pendent with Model F1
Recessed Escutcheon
(F2 similar)

Pendent with Model CCP
Cover Plate (Conical)

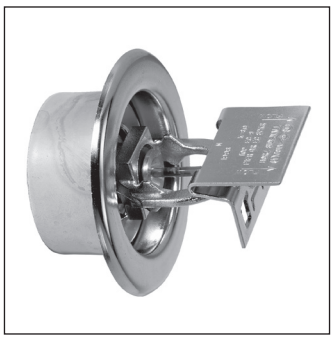


Model F1FR80 EC Horizontal Sidewall Sprinkler
with Model F1 Recessed Escutcheon
(3/4" [19mm] adjustment)

148RECHSW



Model F1FR80 EC Horizontal Sidewall Sprinkler
with Model F2 Recessed Escutcheon
(1/2" [13mm] adjustment)



Horizontal Sidewall with Model
F1 Recessed Escutcheon
(F2 similar)

Wrenches

Model W2 (non-recessed)

Model W4 (recessed, concealed)

Finishes[1]

Table E

Standard Finishes			Special Application Finishes		
Sprinkler	**F1 and F2 Escutcheons**	**CCP Cover Plate[2]**	**Sprinkler**	**F1 and F2 Escutcheons**	**CCP Cover Plate[2]**
Bronze	Brass	Chrome	Electroless Nickel PTFE[3][4]	Bright Brass	Bright Brass
Chrome	Chrome	White Paint	Bright Brass	Satin Chrome	Satin Chrome
White Polyester[3]	White Polyester		Satin Chrome	Custom Color Polyester	Custom Color Paint
			Custom Color Polyester[3]		

Notes:
1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. The CCP assembly consists of a bronze sprinkler mounted in a galvanized steel cup with a finished cover plate.
3. cULus Listed as corrosion resistant.
4. FM Approved as corrosion resistant.

Installation

Reliable Model F1FR80 QREC series sprinklers must be installed in accordance with NFPA 13 and the requirements of all authorities having jurisdiction using the Reliable sprinkler installation wrench specified in this bulletin. Any other wrench may damage the sprinkler. The Models W2 and W4 wrenches have two sets of jaws. Use the smallest set of jaws that fit on the wrench flats of the sprinkler. A leak free 3/4" (R3/4) sprinkler joint can be obtained with a torque of 14-20 lb-ft (19 - 27 N.m) after applying a thread sealant to the male threads of the sprinkler. Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Maintenance

Reliable Model F1FR80 QREC series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model
- F1FR80 QREC

Deflector/Orientation
- Pendent
- CCP Pendent
- Horizontal Sidewall (EC-9)

Temperature Rating
- See sprinkler technical specifications

Sprinkler Finish
- See Table B

Recessed Escutcheon
- F1
- F2

Escutcheon Finish
- See Table E

Pendent Cover Plate
- CCP (Conical, 135°F [57°C] only)

Cover Plate Finish
- See Table E

Sprinkler Wrench
- Model W2 (non-recessed)
- Model W4 (recessed or concealed)

P/N 9999970627

Reliable®

Sprinkler Wrenches

Standard Wrenches

Model DS56 Wrench

- DS56

Model F3R Wrench

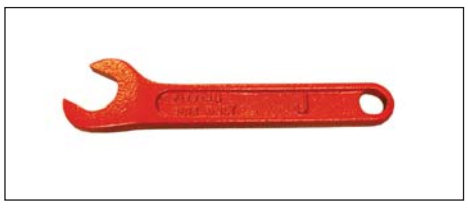
- F3
- F3QR
- F3Res
- DH Dry

Model H Wrench

- GL112
- GXLO
- GVELO
- GFR VELO
- MBEC

Model J1 Wrench

- J
- JL

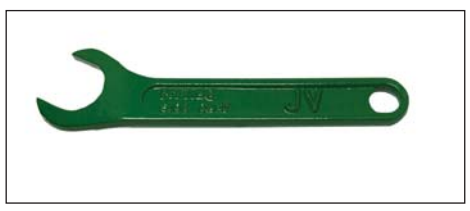


Model J Wrench

- K8.0 sprinklers with pre-installed D-1, D-3, D-4, and D-5 guards
- Sprinklers with pre-installed F series guards

Model JD Wrench

- K5.6 sprinklers with pre-installed D-1, D-3, D-4, and D-5 guards

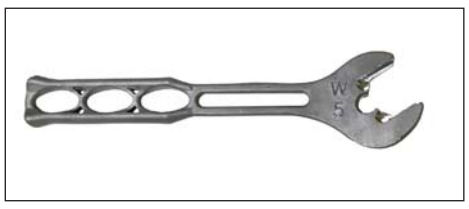


Model JV Wrench

- Sprinklers with pre-installed D-6, D-7, D-8, and D-9 guards

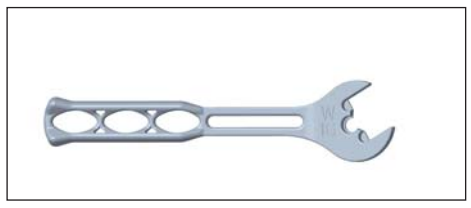
Model W2 Wrench

- AH
- DD
- DH, except Dry
- F1
- F1FR
- F1Res
- F1S
- G
- GFR
- GP
- KFR
- LT56, LT56L
- KRes
- WP56
- WP56L



Model W5 Wrench

- HL-22
- N25
- N252EC
- TNL280
- P22
- P25



Model W16 Wrench

- P22 with pre-installed D-14 guard
- P25 with pre-installed D-14 guard

Recessed/Concealed Wrenches

Model FC Wrench

- G5-56 Dry
- G5 without cap
- RFC without cap
- LT56C without cap
- WP56C

Model G4 Wrench

- F4FR
- G4
- G4XLO

Model G6 Wrench

- G6
- RFS

Model N Wrench

- N252EC

Model RC1 Wrench

- G Recessed

Model RJ Wrench

- J
- JL

Model W1 Wrench

- KFR
- KRes

Model W3 Wrench

- G5 with wrench-able cap
- RFC with wrench-able cap
- LT56C with wrench-able cap

Model W4 Wrench

- F1Res
- F1, F1LL, F1SS
- F1FR, F1FRLL, F1FRSS
- F1S
- LT56, LT56L
- GFR
- KFR
- KRes

Model W8 Wrench

- Plastic limited-use wrench for spare sprinkler cabinet - RFC without cap

Model XLO2 Wrench

- F3
- F3QR
- F3Res
- DH Dry
- GFR VELO

Model ZX Wrench

- XL Pendent

Model ZX-HSW Wrench

- XL HSW

P/N 999997003G

Reliable®

Spare Sprinkler Cabinets

Features

- Red enamel finish
- Constructed of lightweight steel
- Mounting holes provided
- Five models available

Product Description

Reliable Spare Sprinkler Cabinets are designed to meet the requirements of NFPA 13 and NFPA 13R that state: “A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced.” These lightweight steel, red enamel finished cabinets are quickly mounted using the holes provided.

Table 1

Part Number	Capacity	Max. Sprinkler Thread Size (inches)	Size of Cabinet inches (mm)		
			Width	Depth	Height
6803200000	12	1	16-3/4 (425)	4 (101)	14-1/4 (361)
6999991473	3	3/4	7-3/8 (187)	2-3/8 (60)	5-1/4 (133)
6999991470	6	3/4	14-1/4 (361)	2-3/8 (60)	5-1/4 (133)
6999991472	6	1	14-1/4 (361)	3-1/8 (79)	6-1/2 (165)
6999991471	12	3/4	14-1/4 (361)	4 (101)	5-1/4 (133)
6990015802	24	3/4	14-1/4 (361)	4 (101)	8-7/16 (214)
6990015201	36	3/4	12-5/16 (313)	4 (101)	11-3/4 (298)

Installation

Location must be coordinated with, and installation made in accordance with, the requirements of NFPA 13 or NFPA 13R, and all authorities having jurisdiction.

Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Part Number

PN 6803200000 (12 Capacity)

PN 6999991473
(3 Capacity)

PN 6999991470 (6 Capacity)

PN 6999991472 (6 Capacity)

PN 6999991471 (12 Capacity)

Note: Not all versions of the product are shown.

P/N 9999970529

4. VALVES

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

Reliable®

Model CR Commercial Riser

1-1/2” through 8” (40-200 mm) Sizes

cULus Listed, FM Approved

Features

- Cast stainless steel body for 1-1/2” models and 2” threaded model
- Schedule 10 welded body for 2” - 8” grooved versions
- Optional schedule 40 manifold for 2” - 4” sizes
- Approved for vertical or horizontal installation

Product Description

The Reliable Model CR Commercial Riser arrives factory assembled with water flow switch, pressure gauge, and main drain for a cost-effective system riser or floor control assembly. The Model CR is cULus listed (VEOY.EX5980) and FM approved as a unit. The main drain is available with a ball valve or Reliable Test and Drain valve, which is available with a wide selection of test orifice K-factor choices. An optional pressure relief valve kit, available in 175, 185, 210, 260, and 310 psi (12, 13, 14, 18, and 21 bar) rating, is also available.

3” (80mm) welded Commercial Riser
w/ 175psi Pressure Relief Kit and Test & Drain Valve (K5.6)

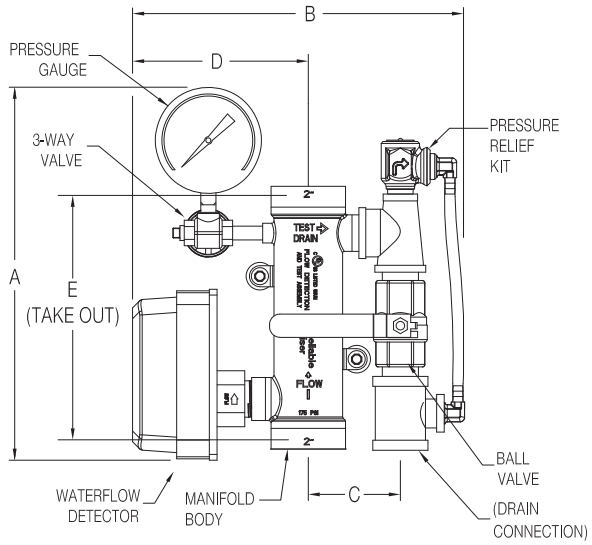
Model CR Commercial Riser

Table A

Valve Size	End Connections	Pressure Rating	Material	End-to-End Take Out	Drain Size	K-Factor for Optional Test and Drain Valve*
1-1/2” (40mm)	Threaded (NPT or BSPT)	250 psi (17.2 bar)	Cast Stainless	8-1/4” (210mm)	1” (25mm)	2.8 (40) 4.2 (60) 5.6 (80)
	Grooved		Cast Stainless	9-1/2” (241mm)	1” (25mm)	
2” (50mm)	Threaded (NPT or BSPT)		Cast Stainless	8-1/4” (210mm)	1” (25mm)	
2” (50mm)	Grooved	300 psi (20.7 bar)	S10, S40 Steel	13” (330mm)	1” (25mm)	
2-1/2” (65mm)	Grooved		S10, S40 Steel	13” (330mm)	1-1/4” (32mm)	2.8 (40) 4.2 (60) 5.6 (80) 8.0 (115) 11.2 (160)
3” (80mm)	Grooved		S10, S40 Steel	13” (330mm)	1-1/4” (32mm)	
4” (100mm)	Grooved		S10, S40 Steel	13” (330mm)	2” (50mm)	2.8 (40) 4.2 (60) 5.6 (80) 8.0 (115), 11.2 (160) 16.8 (240)
6” (150mm)	Grooved		S10 Steel	13” (330mm)	2” (50mm)	
8” (200mm)	Grooved		S10 Steel	13” (330mm)	2” (50mm)	

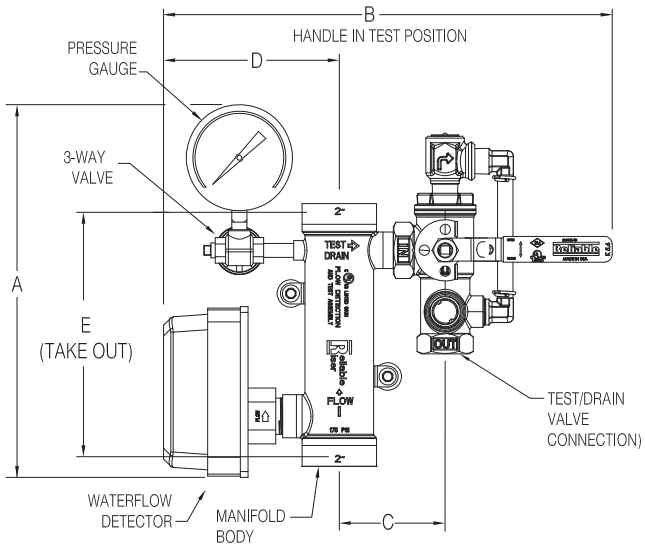
***Note:** K-factor must be equal to or less than the K-factor of the smallest K-factor installed on the sprinkler system. For sprinkler systems where the smallest K-factor sprinkler on the system is greater than the largest available valve K-factor, use any valve K-factor that will provide a minimum flow of 10gpm (38 lpm) as required to operate a UL Listed Waterflow Switch.

Model CR Commercial Riser Threaded End Assemblies (1-1/2" [40mm] & 2" [50mm]) **Figure 1**



BASIC ASSEMBLY (2" [50MM] VERSION SHOWN) WITH OPTIONAL PRESSURE RELIEF KIT

621FG01C



BASIC ASSEMBLY (2" [50MM] VERSION SHOWN) WITH TEST AND DRAIN VALVE & OPTIONAL PRESSURE RELIEF KIT
(TEST AND DRAIN SHOWN IN "TEST" POSITION)

Threaded End Basic Assembly w/ Pressure Relief Valve **Table B**

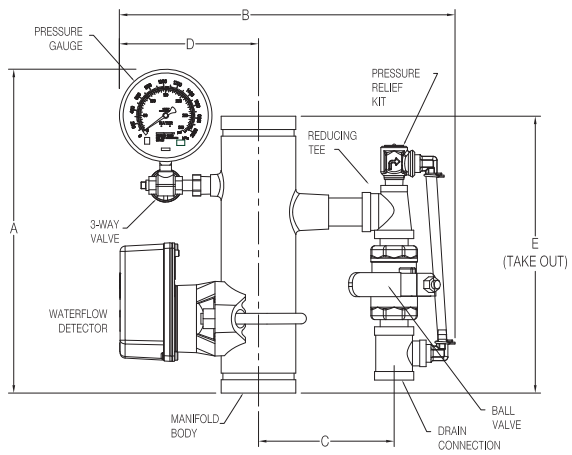
End Connection	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1-1/2 (40)	12-1/8 (308)	10-1/2 (267)	3 (80)	5-1/2 (140)	8-1/4 (210)	8.3 (3.8)
	2 (50)	12-1/8 (308)	10-3/4 (273)	3-1/4 (83)	5-3/4 (146)	8-1/4 (210)	9.1 (4.1)

Threaded End w/ Test & Drain Valve and Pressure Relief Kits **Table C**

End Connection	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1-1/2 (40)	12-1/8 (308)	14-1/4 (362)	3 (80)	5-1/2 (140)	8-1/4 (210)	8.3 (3.8)
	2 (50)	12-1/8 (308)	14-1/2 (368)	3-1/4 (83)	5-3/4 (146)	8-1/4 (210)	9.1 (4.1)

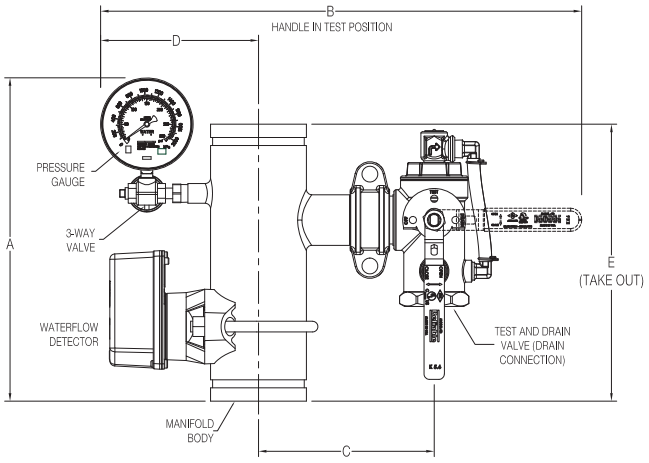
Model CR Commercial Riser Grooved End Assemblies (2” [50mm] - 8” [200mm])

Figure 2



BASIC ASSEMBLY (3" [80MM] VERSION SHOWN)
WITH OPTIONAL PRESSURE RELIEF KIT

621FG02D



BASIC ASSEMBLY (4" [100MM] VERSION SHOWN)
WITH TEST AND DRAIN VALVE
& OPTIONAL PRESSURE RELIEF KIT
(TEST AND DRAIN SHOWN IN "TEST" POSITION)

Notes:

1. 1-1/2” grooved version will be cast in stainless steel.
2. 1-1/2” and 2” models will have threaded test and drain valve.

Grooved End Basic Assembly w/ Pressure Relief Valve

Table D

End Connection	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Grooved Ends (See Fig. 2)	1-1/2 (40)	13-1/2 (343)	10-1/2 (267)	3 (76)	5-1/2 (140)	9-1/2 (241)	8.3 (3.8)
	2 (50)	15-1/4 (387)	14-1/2 (368)	5-1/4 (133)	6 (152)	13 (330)	10.7 (4.9)
	2-1/2 (65)	15-1/4 (387)	15 (381)	6-3/4 (171)	6-1/4 (159)	13 (330)	12.9 (5.9)
	3 (80)	15-1/4 (387)	16-1/4 (413)	7 (178)	6-1/2 (165)	13 (330)	17.6 (8.0)
	4 (80)	15-1/4 (387)	19 (483)	8-1/4 (210)	7 (178)	13 (330)	21.3 (9.7)
	6 (150)	15-1/4 (387)	21-1/2 (546)	9-1/4 (235)	8 (203)	13 (330)	26.3 (11.9)
	8 (200)	15-1/4 (387)	23 (584)	10-1/4 (260)	9 (229)	13 (330)	31.0 (14.1)

Grooved End w/ Test & Drain Valve and Pressure Relief Kits

Table E

End Connection	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Grooved Ends (See Fig. 2)	1-1/2 (40)	13-1/2 (343)	11-1/2 (292)	3-1/2 (89)	5-3/4 (146)	9-1/2 (241)	8.3 (3.8)
	2 (50)	15-1/4 (387)	16 (406)	5-1/4 (133)	6 (152)	13 (330)	10.7 (4.9)
	2-1/2 (65)	15-1/4 (387)	16-1/2 (419)	6-3/4 (171)	6-1/4 (159)	13 (330)	12.9 (5.9)
	3 (80)	15-1/4 (387)	17-1/4 (438)	7 (178)	6-1/2 (165)	13 (330)	17.6 (8.0)
	4 (80)	15-1/4 (387)	20-1/2 (521)	8-1/4 (210)	7 (178)	13 (330)	21.3 (9.7)
	6 (150)	15-1/4 (387)	23 (584)	9-1/4 (235)	8 (203)	13 (330)	26.3 (11.9)
	8 (200)	15-1/4 (387)	24-1/2 (622)	10-1/4 (260)	9 (229)	13 (330)	31.0 (14.1)

Installation

The Model CR Commercial Riser shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. When installed vertically, the direction of flow shall be up through the assembly. For horizontal installations, the water flow indicator must be located to the top and drain opening to the bottom. Failure to follow installation instructions may void the warranty and/or listing of the valve. Verify compatibility of the Model CR Commercial Riser materials with the water supply and the environment where the valve will be installed prior to installation.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system out of service may eliminate the fire protection that is provided by the fire protection system. Notify any required authorities having jurisdiction and implement appropriate precautions prior to proceeding.

The Reliable Model CR Commercial Riser shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Replace any components found to be corroded, damaged, worn or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials and/or operation of the assembly.

Note: The water flow switch for the 1-1/2" and 2" cast stainless steel manifold uses a proprietary paddle. This paddle is only available for purchase from Reliable. When replacing water flow switch, order part number 96556923.

Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

1. Reliable Model CR Commercial Riser
2. Size
3. End Connections
4. (Optional) Schedule 40 (2" through 4" grooved end only)
5. Drain Option (Ball valve or Test and Drain valve)
6. Test orifice K-factor (if ordering Test and Drain valve)
7. (Optional) Pressure Relief Valve Kit

Notes:

1. All Model CR Commercial Riser Assemblies come with a 300 psi (20.7 bar) UL Listed and FM Approved pressure gauge for 175 psi (12.1 bar) applications. If the Model CR Commercial Riser Assembly is to be installed in a higher pressure application, please purchase a 600 psi (41.4 bar) (P/N 98248005) pressure gauge. This gauge may or may not be UL Listed and/or FM Approved at the time of purchase.
2. Unless specified at the time of ordering, pressure relief kits are installed at the factory.

Commercial Riser Ordering Information Part Number **Figure 3**

6A XX 0C P YY Z

Riser Manifold Size & End Connections XX	Option Drain Valve/K-Factor YY	Pressure Relief Valve Z
04 = 1-1/2" BSPT Female SS 05 = 1-1/2" Grooved SS 07 = 2" BSPT Female SS 08 = 1-1/2" NPT Female SS 09 = 2" NPT Female SS 10 = 2" Grooved SCH10 11 = 2" Grooved SCH40	00 = 1" Ball Valve 03 = 1" RASCO T&D Valve K2.8 04 = 1" RASCO T&D Valve K4.2 05 = 1" RASCO T&D Valve K5.6	0 = None 1 = 175 psi (12.1 bar) 2 = 185 psi (12.8 bar) 3 = 210 psi (14.5 bar) 4 = 260 psi (17.9 bar) 5 = 310 psi (21.4 bar)
12 = 2-1/2" Grooved SCH10 13 = 2-1/2" Grooved SCH40 14 = 3" Grooved SCH10 15 = 3" Grooved SCH40	01 = 1-1/4" Ball Valve 26 = 1-1/4" RASCO T&D Valve K2.8 06 = 1-1/4" RASCO T&D Valve K4.2 07 = 1-1/4" RASCO T&D Valve K5.6 08 = 1-1/4" RASCO T&D Valve K8.0 09 = 1-1/4" RASCO T&D Valve K11.2	
16 = 4" Grooved SCH10 17 = 4" Grooved SCH40 18 = 6" Grooved SCH10 19 = 8" Grooved SCH10	02 = 2" Ball Valve 27 = 2" RASCO T&D Valve K2.8 28 = 2" RASCO T&D Valve K4.2 10 = 2" RASCO T&D Valve K5.6 11 = 2" RASCO T&D Valve K8.0 12 = 2" RASCO T&D Valve K11.2 13 = 2" RASCO T&D Valve K16.8	

Notes:
1. 1-1/2" and 2" manifolds have a 1" threaded drain outlet.
2. 2-1/2" and 3" manifolds have a 1-1/4" grooved outlet for Test & Drain valve or a 1-1/4" threaded outlet for ball valve drain.
3. 4", 6", and 8" manifolds have a 2" grooved outlet for Test & Drain valve or 2" threaded outlet for ball valve drain

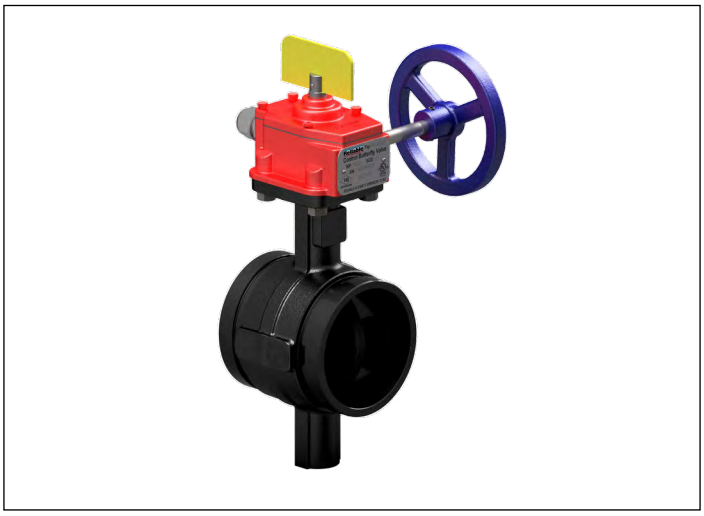
Reliable®

Model REL300GT & REL300GTC
Butterfly Valve / Grooved Tapped Body

cULus Listed, FM Approved
300 psi (20.7 bar)

Product Description

The Reliable Supervised Butterfly valves are cULus Listed and FM Approved for fire protection systems. Reliable Supervised Butterfly Valves valves have AWWA C606 grooved end connections. They are available in 2-1/2" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 5" (125 mm), 6" (150 mm), 165 mm, 8" (200 mm), and 10" (250 mm) nominal sizes. The valves are listed for 300 psi (20.7 bar) working pressure. The maximum working temperature for the valves is 212°F (100°C). The valve bodies come equipped with a plugged, tapped port on the supply and discharge side of the disc. These valves are available with two options for the wire harness: a standard 9" (0.23 m) set of wire leads, and a 39" (1 m) extended-length set of wire leads where required for international use. Verify compatibility of the Model REL300GT and REL300GTC butterfly valve materials with the water supply and the environment where the valve will be installed prior to installation.



Model REL300GT Butterfly Valve - Supervised Normally Open

Model REL300GTC Butterfly Valve - Supervised Normally Closed

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Supervised Butterfly valves and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements.

Ordering Information

Specify the following when ordering:

Supervision
- REL300GT (Normally Open Valve)
- REL300GTC (Normally Closed Valve)

Valve Size
- 2" (50 mm)
- 2-1/2" (65 mm)
- 76 mm
- 3" (80 mm)
- 4" (100 mm)
- 5" (125 mm)
- 6" (150 mm)
- 165 mm
- 8" (200 mm)
- 10" (250 mm)

Wire Harness Length
- Standard: 9" (0.23 m)
- Optional [EMEA and APAC Only]: 39" (1 m)

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Reliable Model REL300GT and REL300GTC Butterfly Valve

Technical Specifications

Pressure Rating:
300 psi (20.7 bar)

Material Specifications

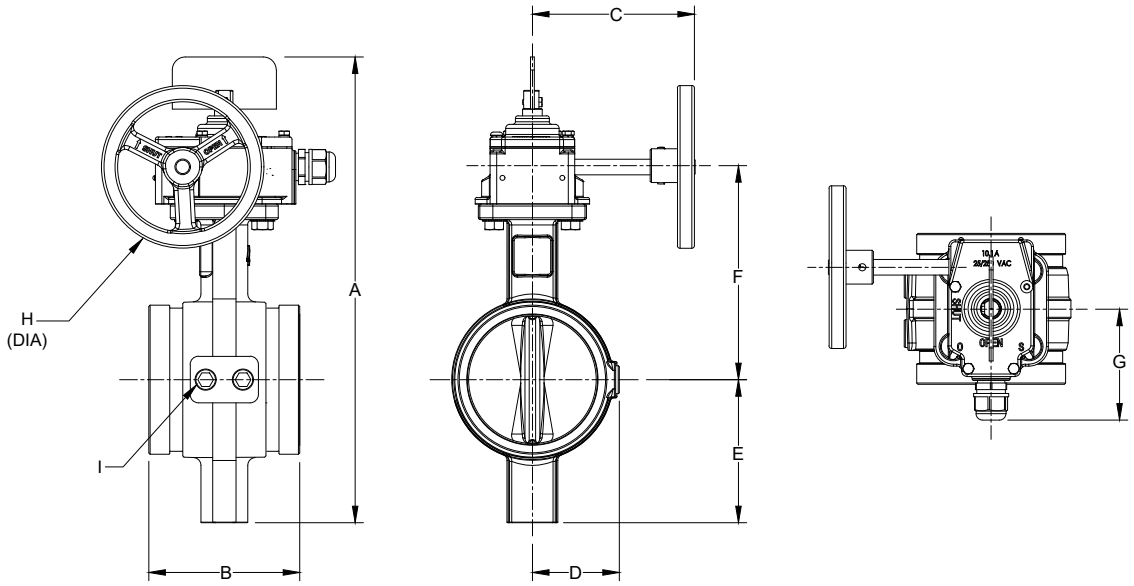
Upper Stem: Stainless Steel ASTM A 276 Type 420
Upper Bearing: PTFE Bronze Sintered on Steel
O-Ring: EPDM
Body: Ductile Iron ASTM A 395, Epoxy Coated
Disc: Ductile Iron ASTM A 395 with EPDM Encapsulation
Lower Bearing: PTFE Bronze Sintered on Steel
Lower Stem: Stainless Steel ASTM A 276 Type 420
Dust Plug: PVC
Name Plate: Aluminum
Gear Operator: Cast Iron and Steel
Indicator Flag: Steel
Handwheel: Cast Iron
Cable Gland: Nickel plated brass
Plug: Carbon Steel (Zinc-plated)

Specifications
Groove Inlet: AWWA C 606

Listings and Approvals
cULus Listed
FM Approved

Reliable Model REL300GT and REL300GTC Butterfly Valve Dimensions

Figure 1

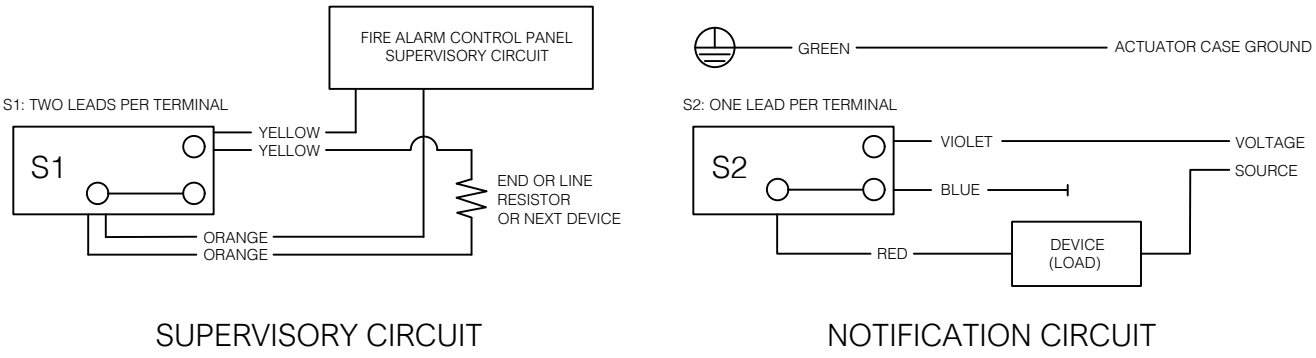


Grooved Dimensions - in. (mm)

Table A

Nominal Size	A	B	C	D	E	F	G	H	I	Weight lb (kg)
2” (50)	9-15/16 (252)	3-7/8 (98)	4-15/16 (125)	1-9/16 (40)	2-3/8 (60)	4-1/4 (108)	3-3/8 (85)	4-1/4 (108)	3/8 NPT	9 (4.1)
2-1/2” (65) 76 mm	11-1/4 (285)	3-7/8 (98)	4-15/16 (125)	1-3/4 (45)	2-15/16 (75)	4-15/16 (125)	3-3/8 (85)	4-1/4 (108)	3/8 NPT	11 (5)
3” (80)	12-3/16 (310)	3-7/8 (98)	4-15/16 (125)	2 (52)	3-9/16 (90)	5-1/4 (134)	3-3/8 (85)	4-1/4 (108)	3/8 NPT	12.5 (5.7)
4” (100)	14-3/16 (360)	4-9/16 (116)	4-15/16 (125)	2-1/2 (63)	4-5/16 (110)	6-7/16 (164)	3-3/8 (85)	4-15/16 (125)	1/2 NPT	17.5 (7.9)
5” (125)	15-5/16 (390)	5-7/8 (149)	6-5/8 (168)	3-1/8 (79)	5 (127)	7-3/16 (182)	3-5/8 (92)	5-7/8 (150)	1/2 NPT	30 (13.6)
6” (150) 165 mm	16-3/4 (425)	5-7/8 (149)	6-5/8 (168)	3-9/16 (91)	5-11/16 (145)	7-13/16 (199)	3-5/8 (92)	5-7/8 (150)	1/2 NPT	33.3 (15.1)
8” (200)	19-7/16 (493)	5-1/4 (134)	6-5/8 (168)	4-5/8 (118)	6-7/8 (175)	9-3/8 (238)	3-5/8 (92)	5-7/8 (150)	1/2 NPT	45.2 (20.5)
10” (250)	22-3/4 (578)	6-5/16 (160)	9-7/16 (240)	5-5/8 (144)	8-1/4 (210)	11-3/16 (284)	3-15/16 (100)	9-13/16 (250)	1/2 NPT	79.9 (36.3)

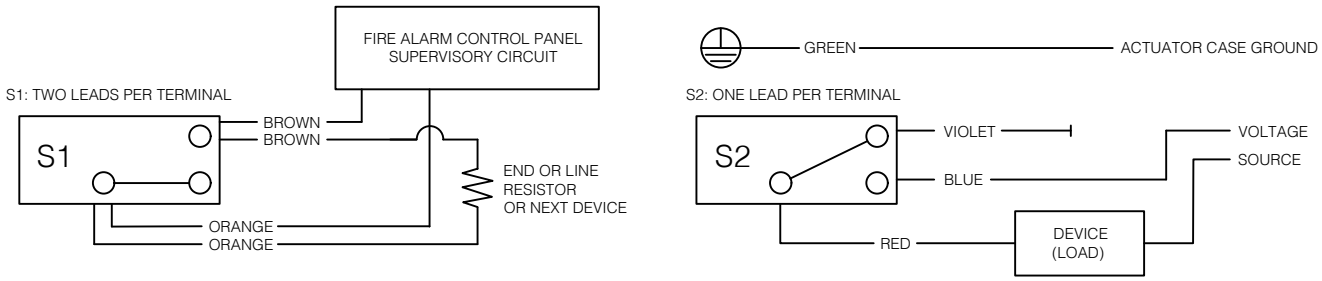
Reliable Model REL300GT Wiring Diagram - Supervised Normally Open **Figure 2**



SUPERVISORY CIRCUIT NOTIFICATION CIRCUIT

NOTES:
1. WIRING SHOWN IS FOR NORMALLY OPEN CIRCUITS.
2. CAP ALL ENDS OF UNUSED WIRES.

Reliable Model REL300GT Wiring Diagram - Supervised Normally Closed **Figure 3**



SUPERVISORY CIRCUIT NOTIFICATION CIRCUIT

NOTES:
1. WIRING SHOWN IS FOR NORMALLY OPEN CIRCUITS.
2. CAP ALL ENDS OF UNUSED WIRES.

P/N 9999970659

Reliable®

Model AAV Automatic Air Vent

cULus Listed,
FM Approved

Features

- Stainless Steel Construction
- 175 psi (12 bar) and 300 psi (20.7 bar) option

Product Description

The Reliable Model AAV Automatic Air Vent is designed to reduce the amount of trapped air in a wet pipe fire sprinkler system. Reducing the amount of air in the system reduces internal corrosion of piping by limiting the supply of oxygen and can also reduce the incidence of false alarms. The Model AAV is designed to automatically vent air from a high point in the system as the piping is filled and will automatically close when water reaches the vent. Air that subsequently migrates to the Model AAV will also be vented. The Model AAV is provided with a ½" NPT inlet for connection to the system, and a ½" NPT outlet connection for routing to drain (if desired).

Installation

The Model AAV shall be installed in accordance with the requirements of NFPA 13 and any applicable local codes or standards. The recommended location is near a high point of the wet pipe system. The Model AAV must be installed in the upright, vertical position on top of the pipe, in a location that does not obstruct the distribution pattern of any fire sprinkler. If desired, a ball valve (not included) may be installed in line with the device to facilitate inspection and servicing. Immediately after filling the wet pipe system, inspect the Model AAV for leaks and proper operation.

Maintenance

The owner is responsible for maintaining all parts of the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system component out of service may eliminate the fire protection that is provided by the fire protection system.

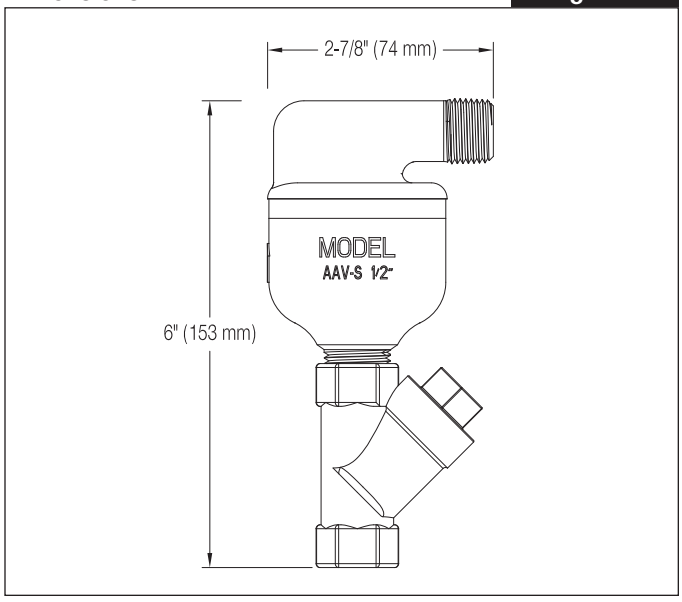
The Reliable Model AAV Automatic Air Vent shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. System components shall be tested, operated, cleaned and inspected at least annually and parts replaced as required.

Listings and Approvals

- UL Listed to Subject 2573, Automatic Air Release Valves and Air/Vacuum Valves for Fire Protection Service
- FM Approved to Approval Standard for Air Release Valves, Class 1344

Model AAV Automatic Air Vent

Dimensions **Figure 1**



Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:
Model AAV Automatic Air Vent

- 175 psi (12 bar)
- 300 psi (20.7 bar)

P/N 9999970535

For Commercial and Industrial Applications

Job Name _____

Job Location _____

Engineer _____

Approval _____

Contractor _____

Approval _____

Contractor's P.O. No. _____

Representative _____

LEAD FREE*

G2 Series
LFB6080G2, LFB6081G2
2-Piece, Full Port, Lead Free* Bronze Ball Valves

Sizes: ¼" – 2"

The G2 series ball vale is a 2-Piece, Full Port, Lead Free, Bronze Ball valve. These products can be used in both commercial and industrial applications. This series features a blowout proof stem and a full-port orifice to ensure minimal pressure drop. The G2 series is available with solder or NPT end-connections.

Features

- Lead Free*, forged bronze body and adapter
- Full-port flow
- Full range of sizes from ¼" – 2" (8 - 50mm)
- Certified to NSF 372
- Minimal pressure drop due to large ports
- Blowout proof, pressure retaining stem
- Adjustable stem packing gland
- White handles for easy Lead Free* identification
- BAA Compliant
- 100% Factory tested in USA
- Used in commercial and industrial applications for a full range of liquids and gasses.

Models

LFB6080G2 ¼" – 2" threaded NPT end connections
LFB6081G2 ⅜" – 2" solder end connections**

Pressure — Temperature

Temperature Range:
0°F - 400°F (-18°C – 205°C) @ 50psi (3.4 bar)

Pressure Range:
¼" – 2" 600psi (41 bar) WOG, non-shock;
150psi (10.3 bar) WSP

Specifications

A 2-piece full port Lead Free* bronze ball valve to be installed as indicated on the plans. Valves with top loaded stems or valves without adjustable packing are not acceptable. Pressure rating no less than 600psi (41 bar) WOG non-shock and 150psi (10 bar) WSP. The valve shall be constructed using Lead

Free* bronze. Lead Free* ball valves shall comply with state codes and standards, where applicable, requiring reduced lead content. Valve must conform to NSF 372 and shall be a Watts Series LFB6080G2 (threaded) or LFB6081G2 (solder).

Standards

Tested and Certified by NSF International
NSF 372 Lead Free.

NSF Certified to NSF/ANSI 372

Applications

- Full range of fluids
- Hydronic Heating (90% glycol max)
- Low Pressure Steam, 15 psi max
- Not applicable for flammable gas installations
- Not compatible with soft annealed copper tubing

NOTICE

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

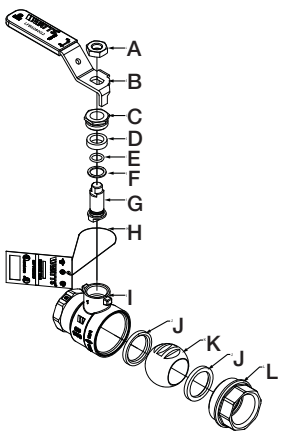
***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

NOTICE

Apply heat with the flame directed **AWAY** from the center of the valve body. Excessive heat can harm the seats. After soldering, the packing nut may have to be tightened.

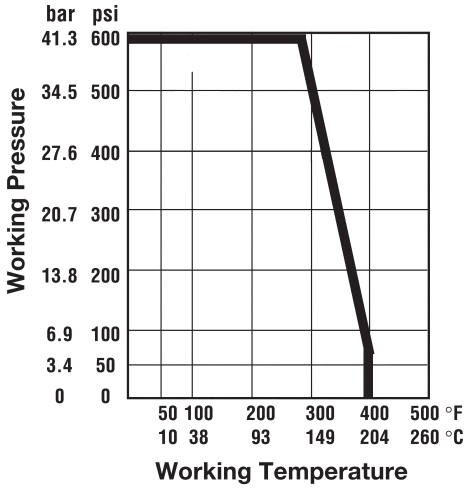
WATTS®

Materials

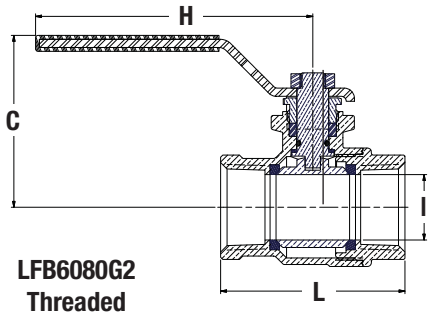


A.	**Handle Nut**	Zinc-plated carbon steel
B.	**Handle Assembly**	Zinc-plated carbon steel with vinyl insulator
C.	**Packing Nut**	Brass
D.	**Stem Packing**	Virgin PTFE
E.	**O-ring**	Fluorocarbon elastomer (FKM)
F.	**Thrust Washer**	Virgin PTFE
G.	**Stem**	Lead Free* Brass
H.	**Tag**	Cardboard, Mylar coated both sides
I.	**Body**	Forged Lead Free* bronze
J.	**Seats**	Virgin PTFE
K.	**Ball**	Chrome-plated Lead Free* brass
L.	**Adapter**	Forged Lead Free* bronze

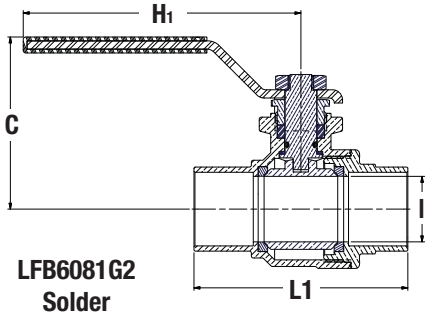
Temperature – Pressure



Dimensions – Weights



LFB6080G2
Threaded



LFB6081G2
Solder

SIZE	DIMENSIONS										WEIGHT			
	C		H, H1		I		L		L1		LFB6080		LFB6081	
in	*in*	*mm*	*in*	*mm*	*in*	*mm*	*in*	*mm*	*in*	*mm*	*lbs.*	*kg*	*lbs.*	*kg*
1/4"	1 13/16	46	3 7/16	87	7/16	11	1 3/4	47	-	-	0.4	0.2	-	-
3/8"	1 13/16	46	3 7/16	87	1/2	13	1 7/8	48.3	1 15/16	49	0.4	0.2	0.4	0.18
1/2"	1 13/16	46	3 7/16	87	1/2	13	2	57	2 1/8	54	0.5	0.22	0.4	0.18
3/4"	2 1/4	58	3 15/16	101	3/4	19	2 1/4	58	3	76	0.9	0.41	0.8	0.36
1"	2 5/8	67	4 1/4	108	1	26	3	77	3 1/2	89	1.4	0.65	1.3	0.57
1-1/4"	2 13/16	72	4 1/4	108	1 1/4	32	3 3/8	86	3 7/8	98	2.1	0.94	1.8	0.82
1-1/2"	3 3/16	80	5 5/16	135	1 1/2	38	3 11/16	93	4 5/16	109	3.1	1.4	2.7	1.23
2"	3 1/2	89	6	153	2	51	4 1/4	108	5 3/8	136	4.9	2.25	4.4	2.02

Ordering Chart

	Valve			Locking Handle Kit			Stem Extension		
	Ordering Code	Decription	Connection Type	EDP	Description	Size	EDP	Description	Size
LFB6080G2-SS	0450115	1/4 LFB6080G2-SS	Threaded	88005484	#1 LL-HK LFB6080/1 G2-SS	Fits 1/4" - 1/2"	0789542	SXI-HK-1A StemExtension	1/4"-1/2" 3C/3CM1/G2
	0450116	3/8 LFB6080G2-SS	Threaded	88005484	#1 LL-HK LFB6080/1 G2-SS	Fits 1/4" - 1/2"	0789542	SXI-HK-1A StemExtension	1/4"-1/2" 3C/3CM1/G2
	0450117	1/2 LFB6080G2-SS	Threaded	88005484	#1 LL-HK LFB6080/1 G2-SS	Fits 1/4" - 1/2"	0789542	SXI-HK-1A StemExtension	1/4"-1/2" 3C/3CM1/G2
	0450118	3/4 LFB6080G2-SS	Threaded	88005485	#2 LL-HK LFB6080/1 G2-SS	Fits 3/4"	0789550	SXI-HK-9A StemExtension	3/4" 3C/G2
	0450119	1 LFB6080G2-SS	Threaded	88005486	#3 LL-HK LFB6080/1 G2-SS	Fits 1" -1 1/4"	0789551	SXI-HK-10A StemExtension	1" - 1 1/4" 3C/G2
	0450120	1 1/4 LFB6080G2-SS	Threaded	88005486	#3 LL-HK LFB6080/1 G2-SS	Fits 1" -1 1/4"	0789551	SXI-HK-10A StemExtension	1" - 1 1/4" 3C/G2
	0450121	1 1/2 LFB6080G2-SS	Threaded	88005487	#4 LL-HK LFB6080/1 G2-SS	Fits 1 1/2"	0789552	SXI-HK-11A StemExtension	1 1/2" 3C/G2
	0450122	2 LFB6080G2-SS	Threaded	88005488	#5 LL-HK LFB6080/1 G2-SS	Fits 2"	0789546	SXI-HK-5A StemExtension	2" 3C/3CM1/G2
	0422015	2 1/2 LFB6080G2-SS	Threaded	88005490	#6 LL-HK LFB6080/1 G2-SS	Fits 2 1/2"	0789547	SXI-HK-6A StemExtension	2 1/2" 3C/3CM1/G2
	0422016	3 LFB6080G2-SS	Threaded	88005491	#7 LL-HK LFB6080/1 G2-SS	Fits 3"	0789548	SXI-HK-7A StemExtension	3" 3C/3CM1/G2
	0422017	4 LFB6080G2-SS	Threaded	88005492	#8 LL-HK LFB6080/1 G2-SS	Fits 4"	0789549	SXI-HK-8A StemExtension	4" 3C/3CM1/G2
LFB6081G2-SS	0450123	3/8 LFB6081G2-SS	Solder	88005484	#1 LL-HK LFB6080/1 G2-SS	Fits 1/4" - 1/2"	0789542	SXI-HK-1A StemExtension	1/4"-1/2" 3C/3CM1/G2
	0450124	1/2 LFB6081G2-SS	Solder	88005484	#1 LL-HK LFB6080/1 G2-SS	Fits 1/4" - 1/2"	0789542	SXI-HK-1A StemExtension	1/4"-1/2" 3C/3CM1/G2
	0450125	3/4 LFB6081G2-SS	Solder	88005485	#2 LL-HK LFB6080/1 G2-SS	Fits 3/4"	0789550	SXI-HK-9A StemExtension	3/4" 3C/G2
	0450126	1 LFB6081G2-SS	Solder	88005486	#3 LL-HK LFB6080/1 G2-SS	Fits 1" -1 1/4"	0789551	SXI-HK-10A StemExtension	1" - 1 1/4" 3C/G2
	0450127	1 1/4 LFB6081G2-SS	Solder	88005486	#3 LL-HK LFB6080/1 G2-SS	Fits 1" -1 1/4"	0789551	SXI-HK-10A StemExtension	1" - 1 1/4" 3C/G2
	0450128	1 1/2 LFB6081G2-SS	Solder	88005487	#4 LL-HK LFB6080/1 G2-SS	Fits 1 1/2"	0789552	SXI-HK-11A StemExtension	1 1/2" 3C/G2
	0450129	2 LFB6081G2-SS	Solder	88005488	#5 LL-HK LFB6080/1 G2-SS	Fits 2"	0789546	SXI-HK-5A StemExtension	2" 3C/3CM1/G2
	0422021	2 1/2 LFB6081G2-SS	Solder	88005490	#6 LL-HK LFB6080/1 G2-SS	Fits 2 1/2"	0789547	SXI-HK-6A StemExtension	2 1/2" 3C/3CM1/G2
	0422022	3 LFB6081G2-SS	Solder	88005491	#7 LL-HK LFB6080/1 G2-SS	Fits 3"	0789548	SXI-HK-7A StemExtension	3" 3C/3CM1/G2

USA: T: (978) 689-6066 • F: (978) 975-8350 • Watts.com
Canada: T: (905) 332-4090 • F: (905) 332-7068 • Watts.ca
Latin America: T: (52) 81-1001-8600 • Watts.com

5. ELECTRICAL / FIRE ALARM COMPONENTS

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

VSR

Vane Type Waterflow Alarm Switch W/ Retard

Features

- Assembled in USA
- 0-90 second field replaceable time delay retard
- Easy to read retard time delay adjustment knob
- UL Listed models for 2"-6" steel pipe schedules 5 through 40
- UL Listed and FM approved models for 2"-8" steel pipe schedules 10 through 40
- Two SPDT (form C) contacts
- Weatherproof
- Easy to read wire terminal designations

⚠ 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.

Description

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 weather/UV/flame resistant high impact composite plastic. 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.

NOTICE

This document contains important information on the installation and operation of the VSR. Please read all instructions carefully and notify the building owner or their authorized representative before any work is done on the fire sprinkler or fire alarm system. A copy of this document is required by NFPA 72 to be maintained on site.

Technical Specifications

Conduit Entrances	Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages
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
Enclosure	Cover - Weather/UV/Flame Resistant High Impact Composite Base - Die-cast aluminum
Environmental Specifications	NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket 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.
Flow Sensitivity Range for Signal	4-10 GPM (15-38 LPM) - UL
Maximum Surge	18 FPS (5.5 m/s)
Service Pressure	450 PSI (31 BAR) - UL
Service Use	Automatic Sprinkler NFPA-13 One or two family dwelling NFPA-13D Residential occupancy up to four stories NFPA-13R National Fire Alarm Code NFPA-72

Specifications subject to change without notice.

VSR

Vane Type Waterflow Alarm Switch W/ 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.

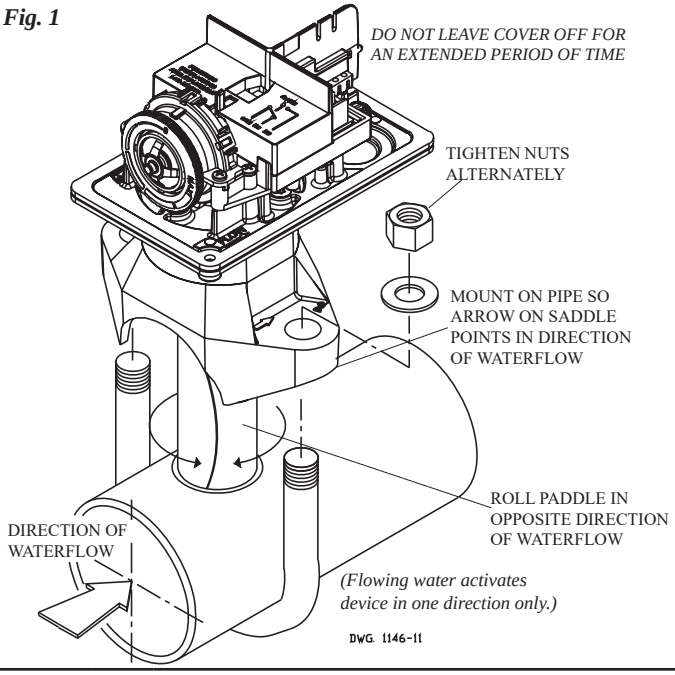
NOTE: Do not leave cover off for an extended period of time.

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

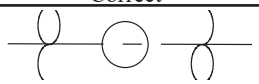
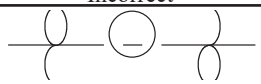


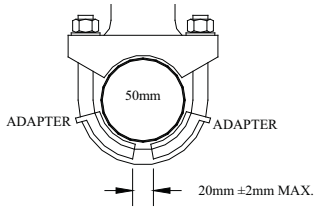
Retard Adjustment

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.

Correct	Incorrect
	

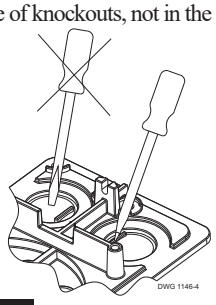


USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

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				

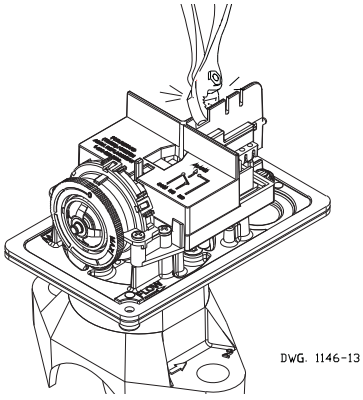
Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE

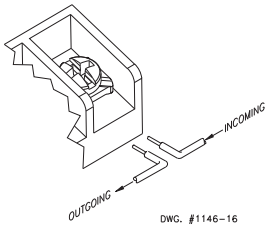
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

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



Switch Terminal Connections Clamping Plate Terminal

Fig. 4



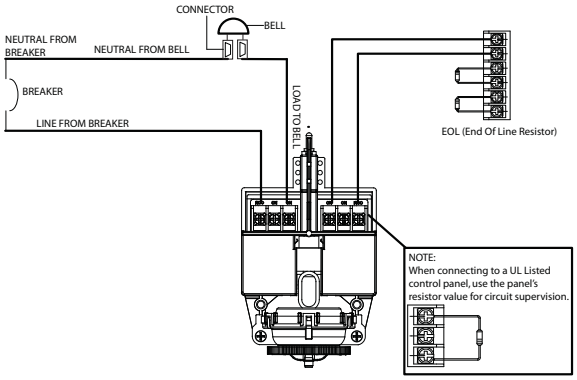
⚠ WARNING

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.

Typical Electrical Connections

Fig. 5



Notes:

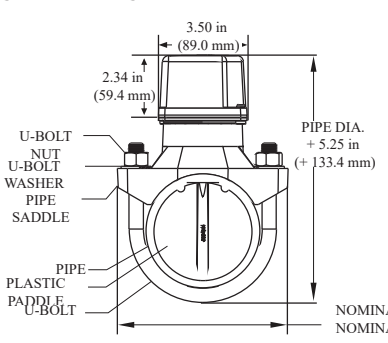
1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

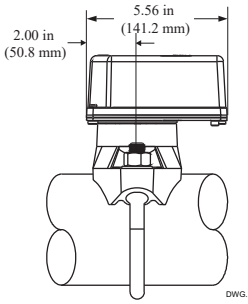
Testing

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.

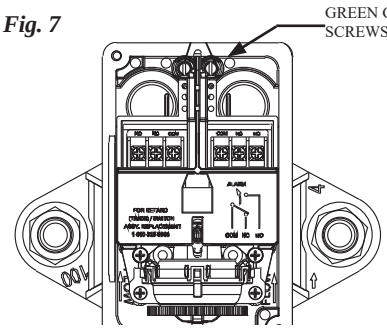
Fig. 6 Mounting Dimensions





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



NOTICE

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

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.

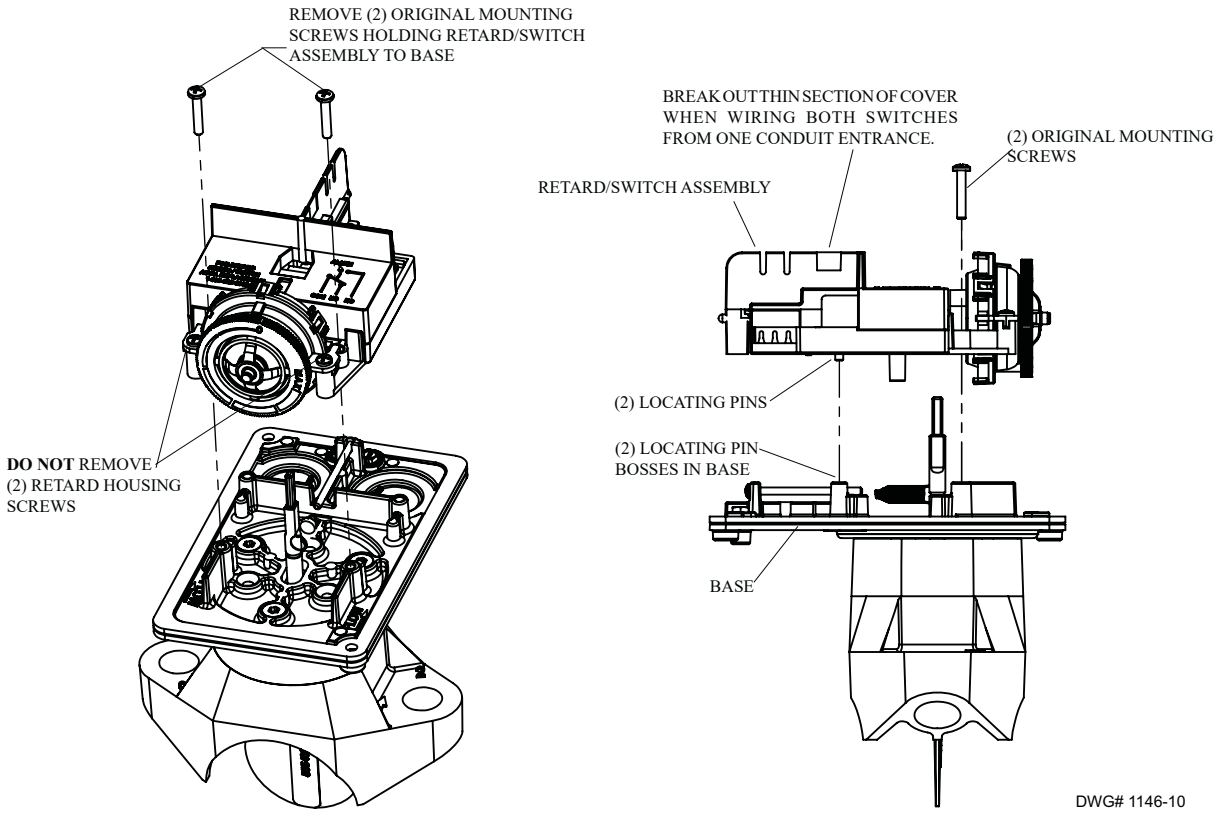
Retard/Switch Assembly Replacement (See Fig. 8)

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.

NOTICE

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

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.

NOTICE

Flow switches have a normal service life of 10-15 years. However, the service life may be significantly reduced by local environmental conditions.

Ordering Information

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

Optional: Cover Tamper Switch Kit, stock no. 0090148
FSBS-FLOWSWITCH BYPASS SWITCH, stock no. 3001006

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

POTTER
The Symbol of Protection

BELLS

PAC-AC & PDC-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

* ULC on PDC-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 PDC-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	PDC-6-12	1750500	200mA	96	76
8 (200)	12VDC	PDC-8-12	1750502	.200mA	96	77
10 (250)	12VDC	PDC-10-12	1750504	.200mA	96	78
6 (150)	24VDC	PDC-6-24	1750501	.20mA	95	77
8 (200)	24VDC	PDC-8-24	1750503	20mA	83	79
10 (250)	24VDC	PDC-10-24	1750505	20mA	85	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	PAC1206	1826120	.05A	98	83
8 (200)	120VAC	PAC1208	1828120	.05A	98	84
10 (250)	120VAC	PAC12010	1821120	.05A	98	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 - 18 AWG stranded wire
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.

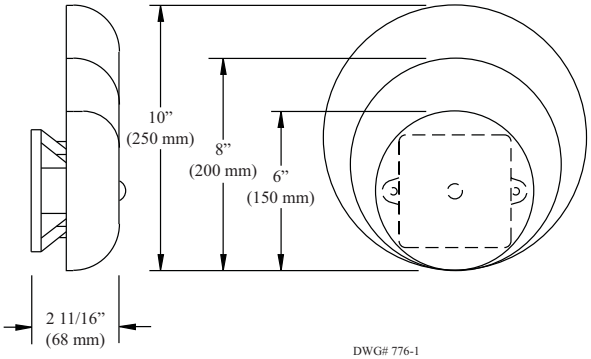
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation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

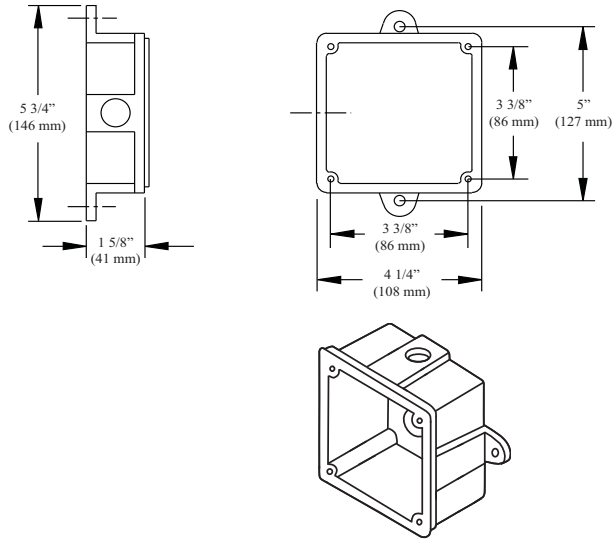
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

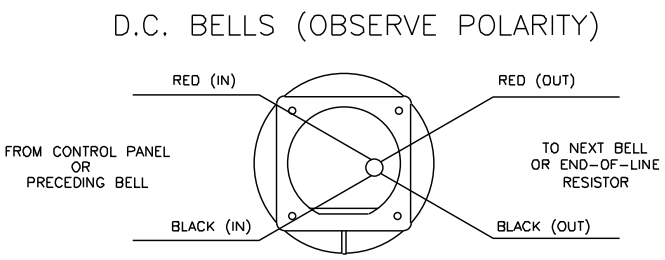
MODEL BBK-1 OR HC-BB

Fig 2



Wiring Rear View

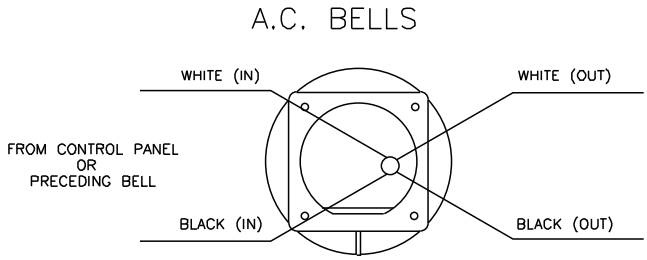
Fig 3



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

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.



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

NOTES:

1. WHEN USING A.C. BELLS, TERMINATE EACH EXTRA WIRE SEPERATELY AFTER LAST BELL.

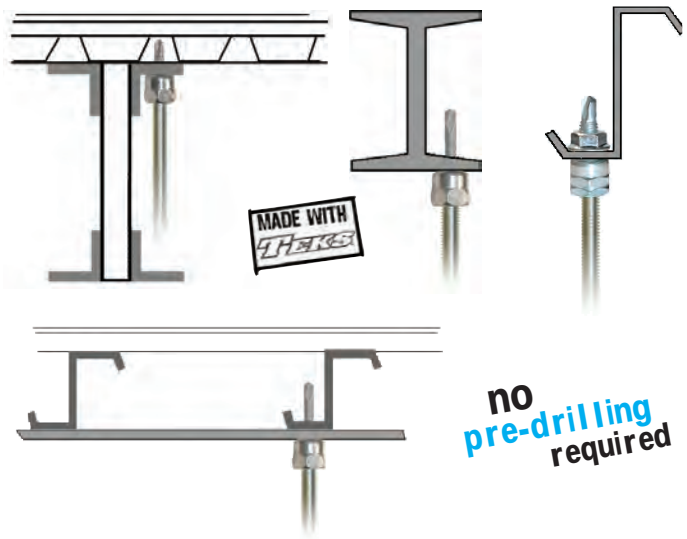
6. PIPE HANGERS

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

SAMMYS® FOR STEEL - Vertical Application

Application



Product Features

- Made with Teks® self-drilling fasteners - no pre-drilling required.
- Installs into steel range from 20 gauge – 1/2" thicknesses.
- Saves time from traditional methods.
- Reduces installation costs.
- Quick to install using the Sammys Nut Driver with an 18V cordless drill/driver.
- A standard screwgun with a depth sensitive nosepiece should be used to install Teks. For optimal fastener performance, the screwgun should be a minimum of 6 amps and have an RPM range of 0-2500.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thick	Max Thick	Box Qty	Case Qty
VERTICAL MOUNT											
	1/4"	8024957	DSTR 100 *	1/4-20 x 1" TEKS 3	1510 (20 ga.)			.036"-20 ga	3/16"	25	125
	1/4"	8025957	DST 100	1/4-14 x 1" TEKS 3	446 (20 ga.)			.036"-20 ga	3/16"	25	125
	1/4"	8026957	DST 150	1/4-14 x 1-1/2" TEKS 3	970 (16 ga.)			.036"-20 ga	3/16"	25	125
	1/4"	8027957	DST 200	1/4-14 x 2" TEKS 3	446 (20 ga.)			.036"-20 ga	3/16"	25	125
	1/4"	8030957	TEK 500	12-24 x 1-1/2" TEKS 5	3125 (3/16")			.188"-3/16"	1/2"	25	125
UL FM	3/8"	8038957	DSTR 1 *	1/4-20 x 1" TEKS 3	1510 (20 ga.)	1500	1475	.036"-20 ga	3/16"	25	125
UL FM	3/8"	8037957	DSTR 1-1/2 *	12-24 x 1-1/2" TEKS 5	1510 (3/16")	1500	1475	.060"-16 ga.	1/2"	25	125
UL FM	3/8"	8039957	DSTR 516 *	5/16-18 x 1-1/4" TEKS 3	2200 (20 ga.)	1500	1475	.036"-20 ga	3/16"	25	125
	3/8"	8040957	DST 10	1/4-14 x 1" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8077925	DST 10-SS	1/4-14 x 1" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8041957	DST 15	1/4-14 x 1-1/2" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8078925	DST 15-SS	1/4-14 x 1-1/2" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8042957	DST 20	1/4-14 x 2" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8043957	DST 25	1/4-14 x 2-1/2" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8044957	DST 30	1/4-14 x 3" TEKS 3	446 (20 ga.) 970 (16 ga.)			.036"-20 ga	3/16"	25	125
UL FM	3/8"	8045957	DST 516	5/16-18 x 1-1/4" TEKS 3	1500 (3/16")	1500	1475	.125"-1/8"	3/16"	25	125
UL FM	3/8"	8046957	TEK 50	12-24 x 1-1/2" TEKS 5	3125 (3/16")	1500	1475	.250"-1/4"	1/2"	25	125
	1/2"	8031925	DST 2.0	1/4-14 x 2" TEKS 3	446 (20 ga.) 970 (16 ga.)			.188"-3/16"	1/4"	25	125
	1/2"	8033925	DSTR 1.0 *	1/4-20 x 1" TEKS 3	1510 (20 ga.)			.036"-20 ga	3/16"	25	125
	1/2"	8034925	DSTR 5.16 *	5/16-18 x 1-1/4" TEKS 3	2220 (20 ga.)			.036"-20 ga	3/16"	25	125
	1/2"	8035925	DST 5.16	5/16-18 x 1-1/4" TEKS 3	1500 (3/16")			.125"-1/8"	3/16"	25	125
	1/2"	8036925	TEK 5.0	12-24 x 1-1/2" TEKS 5	3125 (3/16")			.188"-3/16"	1/2"	25	125

#14 Black Nut Driver Part # 8113910

#14 SW Red Nut Driver Part # 8114910

*Includes retaining nut

MADE IN U.S.A.

RoHS Compliant

SPECIAL NUT DRIVER SYSTEM: The nut drivers were designed with a unique spin-off feature which provides a fast and safe installation each time. When the face of the driver comes into contact with the material you are installing into, continue drilling until nut driver spins free. Installation is then complete. Warranty requires the use of the appropriate nut driver for installations.

SIDEWINDER® FOR STEEL - Horizontal Application

Application

Product Features

- Made with Teks® self-drilling fasteners - no pre-drilling required.
- Installs into steel range from 20 gauge – 1/2" thicknesses.
- A standard screwgun with a depth sensitive nosepiece should be used to install Teks. For optimal fastener performance, the screwgun should be a minimum of 6 amps and have an RPM range of 0-2500.
- Saves time from traditional methods.
- Reduces installation costs.
- Quick to install using the Sammys Nut Driver with an 18V cordless drill/driver.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thickness	Max Thickness	Box Qty	Case Qty
HORIZONTAL MOUNT											
	1/4"	8047957	SWD 100	1/4-14 x 1" TEKS 3	1477 (16 ga.)			.060"-16 ga	3/16"	25	125
	1/4"	8049957	SWDR 100 *	1/4-20 x 1" TEKS 3	1900 (20 ga.)			.036"-20 ga	3/16"	25	125
	3/8"	8050957	SWD 10	1/4-14 x 1" TEKS 3	1477 (16 ga.)			.060"-16 ga	3/16"	25	125
	3/8"	8080925	SWD 10-SS	1/4-14 x 1" TEKS 3	1477 (16 ga.)			.060"-16 ga	3/16"	25	125
	3/8"	8051957	SWD 15	1/4-14 x 1-1/2" TEKS 3	1477 (16 ga.)			.060"-16 ga	3/16"	25	125
	3/8"	8052957	SWD 20	1/4-14 x 2" TEKS 3	1477 (16 ga.)			.060"-16 ga	3/16"	25	125
	3/8"	8053957	SWD 516	5/16-18 x 1-1/4" TEKS 3	2480 (20 ga.)			.036"-20 ga	3/16"	25	125
UL FM	3/8"	8055957	SWDR 1 *	1/4-20 x 1" TEKS 3	1900 (20 ga.)	1500	1475	.036"-20 ga	3/16"	25	125
UL FM	3/8"	8054957	SWDR 1-1/2 *	12-24 x 1-1/2" TEKS 5	2375 (3/16")	1500	1475	.188"-3/16"	1/2"	25	125
UL FM	3/8"	8056957	SWDR 516 *	5/16-18 x 1-1/4" TEKS 3	2480 (20 ga.)	1500	1475	.036"-20 ga	3/16"	25	125
	3/8"	8057957	SWT 15	12-24 x 1-1/2" TEKS 5	2375 (3/16")			.188"-3/16"	1/2"	25	125

#14 SW Red Nut Driver Part # 8114910

*Includes retaining nut

SAMMYS SWIVEL HEAD™ FOR STEEL - Swivel Application

Application

Product Features

- Eliminates distortion of threaded rod in sloped roof applications.
- Accommodates 3-1/2 x 12 pitch.
- Installs into angled z-purlin; allows threaded rod to hang plumb.
- Allows 17° deflection from vertical.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thick	Max Thick	Box Qty	Case Qty
SWIVEL MOUNT											
UL FM	3/8"	8137957	SH-DSTR 1*	1/4-20 X 1" TEKS 3	3220 (3/16")	1500	1475	.035"	3/16"	25	125
UL	3/8"	8268957	SH-TEK 50	12-24 x 1-3/4" TEKS 5	2368 (1/2" steel Vertical) 1306 (45° off Vertical) 2281 (3/16" HSS) 1585 (3/16" HSS 45° off Vertical)	1500 (Vertical) 850 (45° off Vertical)	4" 2-1/2"	3/16"	1/2"	25	125
	1/2"	8270957	SH-TEK 5.0	12-24 x 1-3/4" TEKS 5	2368 (1/2" steel Vertical) 1306 (45° off Vertical) 2281 (3/16" HSS) 1585 (3/16" HSS 45° off Vertical)			3/16"	1/2"	25	125

#14 Black Nut Driver Part # 8113910

#14 SH Orange Nut Driver Part # 8273910

*Does not comply with ROHS requirements / Includes retaining nut

TOLCO™ Fig. 65 - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

Size Range:

Fig. 65 - 1/2"-13 rod sizes, and 5/8"-11 rod sizes
Fig. 65XT - 3/8"-16 rod size (see below)

Material: 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).

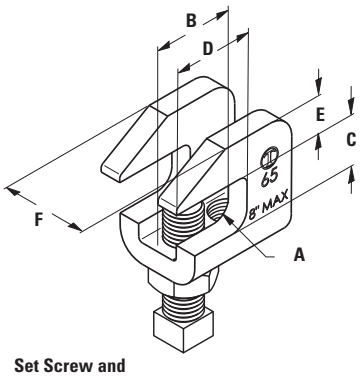
Features: All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. Open design permits inspection of thread engagement.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL).** Exceeds requirements of the National Fire Protection Association **(NFPA)**, pamphlet 13,
3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe
1/2"-13 rod will support thru 8" (200mm) pipe

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

Order By: Figure number and finish

Fig. 65 Patent #4,570,885



Set Screw and Locknut Included

Part No.	Rod Size A	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E in.	E (mm)
65-1/2	1/2"-13	1 1/2"	(38.1)	3/4"	(19.0)	1"	(25.4)	9/16"	(14.3)
65-5/8	5/8"-11	1 1/2"	(38.1)	3/4"	(19.0)	1"	(25.4)	9/16"	(14.3)

Part No.	F in.	F (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
65-1/2	1 1/4"	(31.7)	55	(24.9)
65-5/8	1 1/4"	(31.7)	55	(24.9)

TOLCO™ Fig. 65XT - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

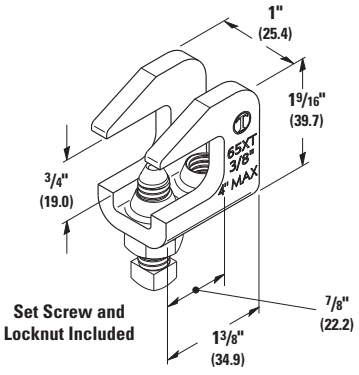
Feature: Extruded holes allows for more thread engagement of threaded rod and set screw.

Finish: Plain or Electro-Galvanized

Order By: Figure number and finish

Approvals: Underwriters Laboratories Listed **(cULus)** and FM Approved **(FM)** for up to 4" (100mm) pipe.

Designed to meet or exceed requirements of FM DS 2-0 and NFPA 13.



Set Screw and Locknut Included

Part No.	For Rod Size	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
65XT	3/8"-16	28.0	(12.7)

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

TOLCO™ Fig. 69 - Beam Clamp Retaining Strap

Size Range: 3/8"-16 thru 3/4"-10 rod
4" (101,6mm) thru 16" (406.4mm) lengths
Note: longer lengths are available consult factory

Material: Pre-Galvanized Steel

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

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

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

Finish: Pre-Galvanized

Order By: Part number, length (L), and finish.

Note: Minimum return on strap is 1" (25.4mm)
Lengths over 16" (406mm) are not UL Listed

c UL us LISTED

Component of State of California OSHPD Approved Seismic Restraints System

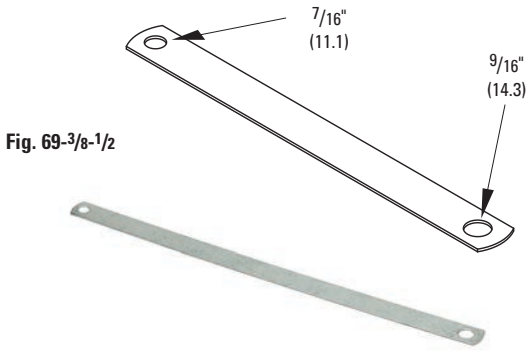


Fig. 69-3/8-1/2

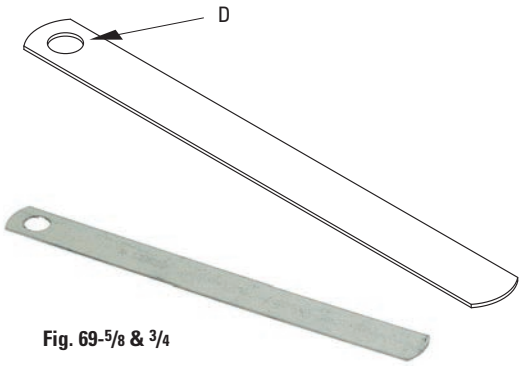


Fig. 69-5/8 & 3/4

Part No.	Hole Dia. D in.	(mm)	For Use With	Length
69-3/8-1/2-L	see drawing		B3033-3/8, B3034-3/8, B3031-3/8, 65-3/8, 65XT-3/8, 66-3/8 B3033-1/2, B3034-1/2, 65-1/2, 66-1/2	Specify
69-5/8-L	11/16"	(17.5)	B3033-5/8, 65-5/8, 66-5/8	Specify
69-3/4-L	13/16"	(20.6)	B3033-3/4	Specify

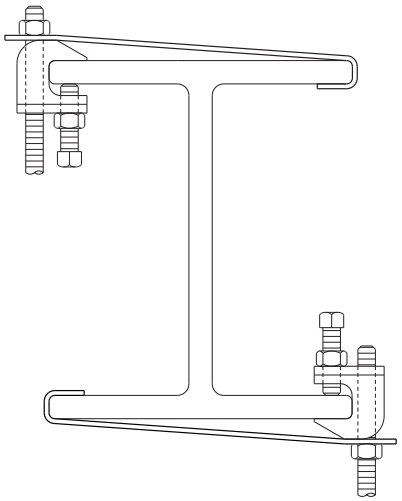


Fig. 25 - Surge Restrainer

c UL US LISTED

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

Material — Pre-Galvanized Steel

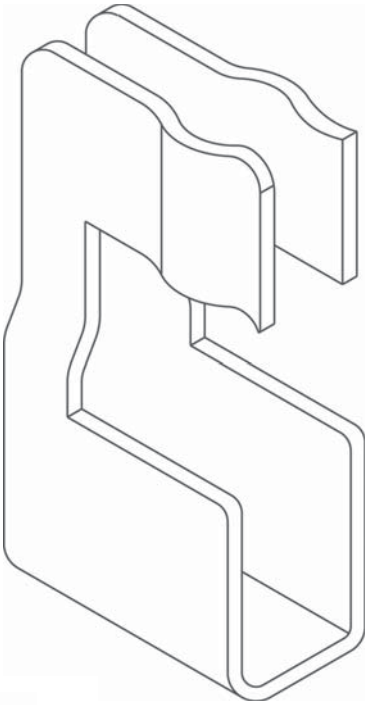
Function — Designed to be used in conjunction with TOLCO® Band Hangers to restrict the upward movement of piping as it occurs during sprinkler head activation or earthquake type activity. The surge restrainer is easily and efficiently installed by snapping into a locking position on the band hanger.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

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

Finish — Pre-Galvanized

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

Patent #5,344,108



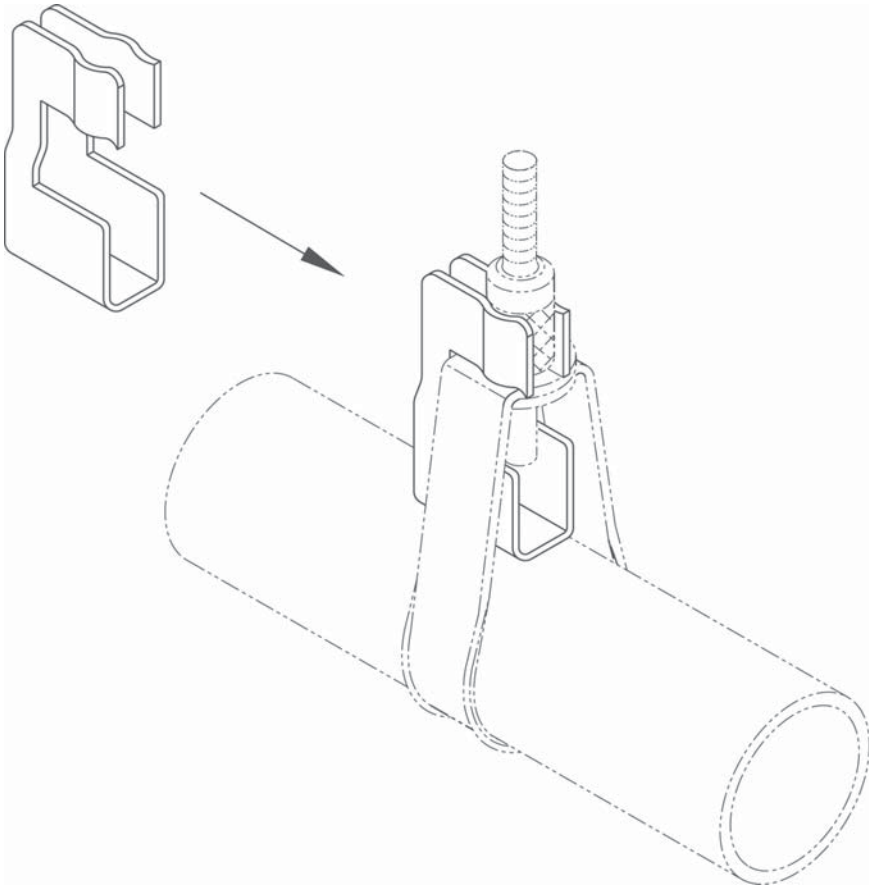


Fig. 75 - Swivel Attachment

c UL us LISTED

Size Range — 3/8" Rod Attachment

Material — Carbon Steel

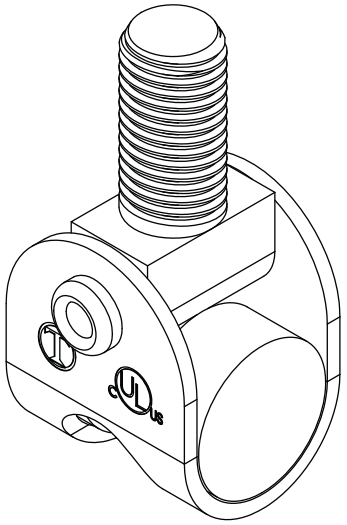
Function — There are three recommended applications for this product: May be used as a Branch Line Restraint for structural attachment to anchor bolt, beam clamp, etc. May be used in a pitched or sloped roof application, to meet requirements of NFPA 13 (2010) 9.1.2.6. May be used as an upper attachment with short hanger rod to omit seismic bracing (per UBC97).

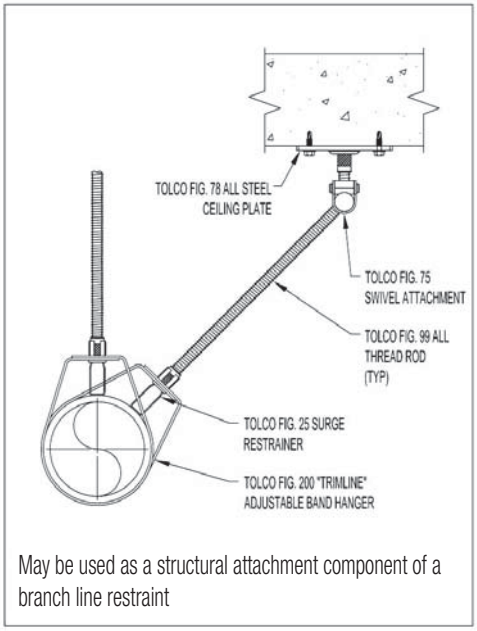
Approvals — Underwriters' Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support up to 4" pipe. Meets requirements of Uniform Building Code (UBC) 1997 Table O, Section 3.B.

Finish — Electro-Galvanized

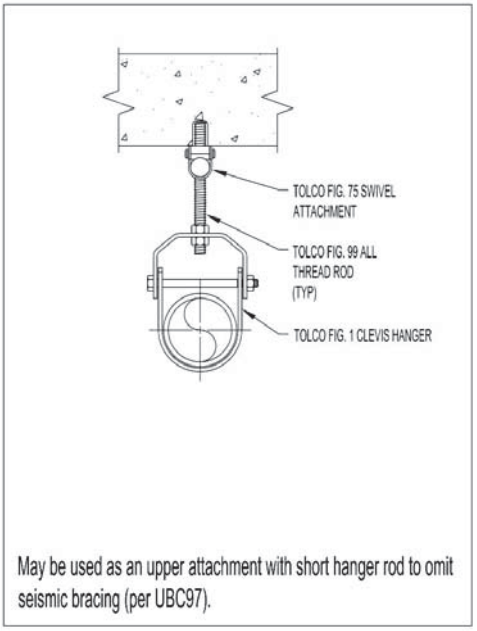
Order By — Figure number

PATENT PENDING

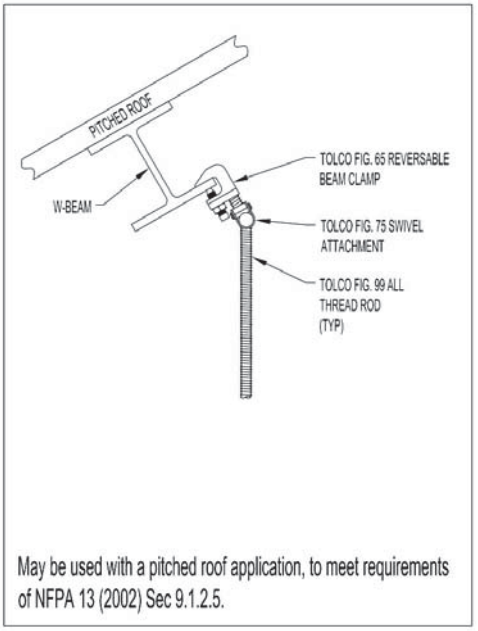




May be used as a structural attachment component of a branch line restraint



May be used as an upper attachment with short hanger rod to omit seismic bracing (per UBC97).



May be used with a pitched roof application, to meet requirements of NFPA 13 (2002) Sec 9.1.2.5.

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Fig. 98 - Rod Stiffener
Fig. 98B - Rod Stiffener w/Break-off Bolt Head

Component of State of California OSHPD Approved Seismic Restraints System

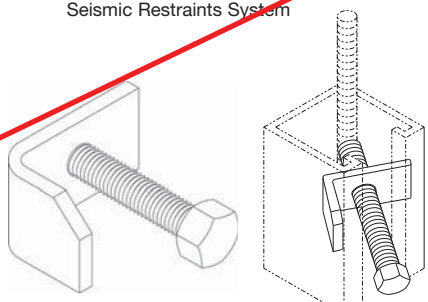


FIG. 98

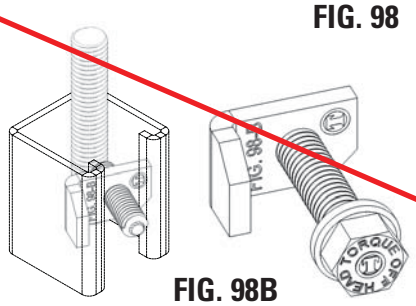
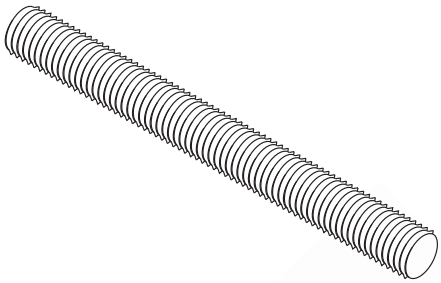


FIG. 98B

Size Range — Secures 3/8" thru 7/8" hanger rod
Material — Carbon Steel
Function — Secures channel to hanger rod for vertical seismic bracing.
Approvals — Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines
Finish — Electro Galvanized
Note — Available in HDG finish or Stainless Steel materials.
Order By — Figure number

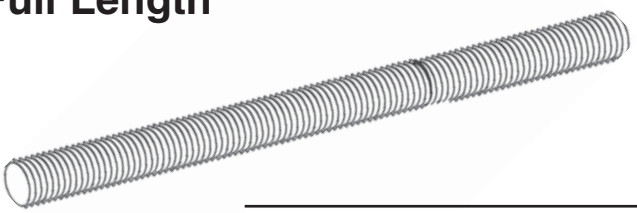
Fig. 99 - All Thread Rod Cut to Length



Size Range — Secures 3/8" thru 7/8" rod in 1" increments
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter, rod length and finish

Dimensions	
Rod Size	**Max. Rec. Load Lbs. For Service Temp 650°F**
3/8	730
1/2	1350
5/8	2160
3/4	3230
7/8	4480

Fig. 100 - All Thread Rod Full Length



Size Range — Secures 3/8" thru 1½" rod in 10' lengths
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter and finish

Dimensions • Weights		
Rod Size	**Max Rec. Load Lbs. For Service Temps 650°F**	**Approx. Wt./100**
1/4	240	12
3/8	730	29
1/2	1350	53
5/8	2160	84
3/4	3230	123
7/8	4480	169
1	5900	222
1¼	9500	360
1½	13800	510

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Fig. 200 - "Trimline" Adjustable Band Hanger

Size Range — 1/2" thru 8" pipe

Material — Carbon Steel, Mil. Galvanized to G90 specifications

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

Features —

- (1/2" thru 2") Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- (2½" thru 8") Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

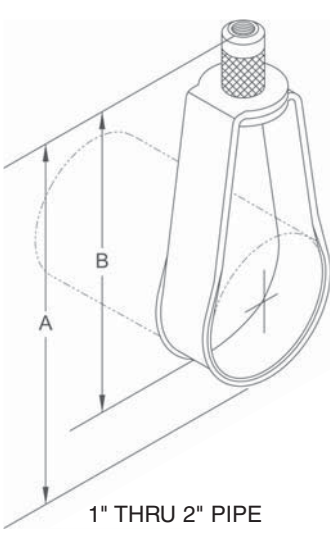
Approvals — Underwriters' Laboratories listed (1/2" thru 8") in the USA **(UL)** and Canada **(cUL)** for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (3/4" thru 8"). Conforms to Federal Specifications WW-H-171E, Type 10 and Manufacturers Standardization Society SP-58, Type 10.

Maximum Temperature — 650°F

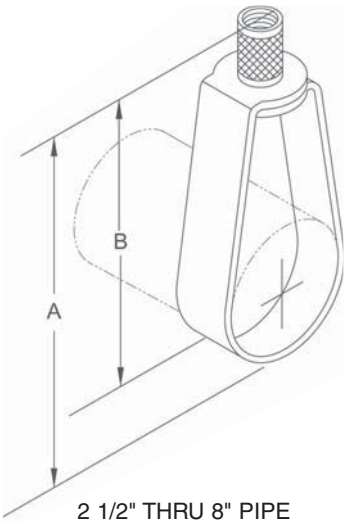
Finish — Mil. Galvanized. For Stainless Steel materials, order TOLCO® Fig. 200WON.

Order By — Figure number and pipe size

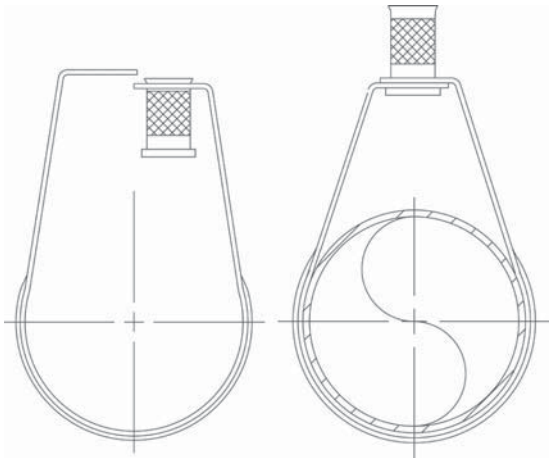
Note — For removable nut feature, order Fig. 200 S



1" THRU 2" PIPE



2 1/2" THRU 8" PIPE



Dimensions • Weights

Pipe Size	Rod Size Inch	Rod Size Metric	A	B	Max. Rec. Load Lbs.	Approx. Wt./100
1/2	3/8	8mm or 10mm	3⅛	2⅝	400	11
3/4	3/8	8mm or 10mm	3⅛	2½	400	11
1	3/8	8mm or 10mm	3⅜	2⅝	400	12
1¼	3/8	8mm or 10mm	3¾	2⅞	400	13
1½	3/8	8mm or 10mm	3⅞	2⅞	400	14
2	3/8	8mm or 10mm	4½	3	400	15
2½	3/8	10mm	5⅝	4⅛	600	27
3	3/8	10mm	5⅞	4	600	29
3½	3/8	10mm	7⅜	5¼	600	34
4	3/8	10mm	7⅜	5	1000	35
5	1/2	12mm	9⅛	6¼	1250	66
6	1/2	12mm	10⅛	6¾	1250	73
8	1/2	12mm	13⅛	8¾	1250	136

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Fig. 70 (Formerly Afcon Fig. 303) Trapeze Pipe Hanger

Size Range: 1½" through 4" Trapeze Pipe
Material: Carbon steel
Finish: Pre-Galvanized per ASTM A653
Service: Allows for the hanging of piping systems between structural attachments.
Approvals: cULus Listed
Ordering: Specify trapeze size, rod size, figure number and finish.

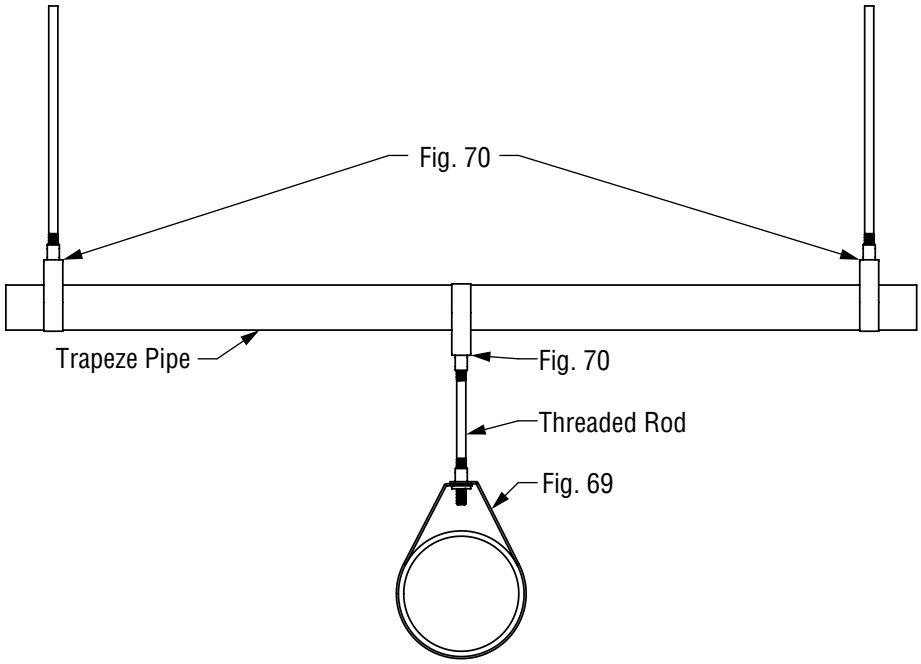


FIG. 70: DIMENSIONS (IN)		
Trapeze Pipe Size	Rod Size	Max Service Pipe Size
1½	⅜	4
2		
2	½	8
2½		
3		
3½		
4		

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

7. SEISMIC BRACING COMPONENTS

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

Fig. 980 - Universal Swivel Sway Brace Attachment

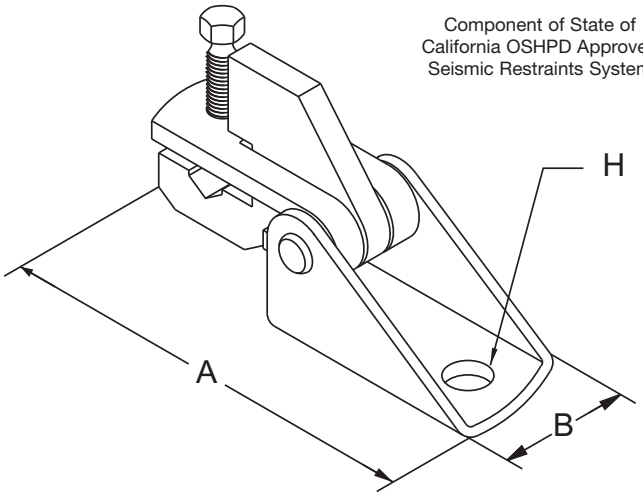
Component of State of California OSHPD Approved Seismic Restraints System

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

Material — Carbon Steel

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

Features — This product's design incorporates a **concentric** attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2010) 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 — The Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 2002, 4L, 4A or 4B to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

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

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

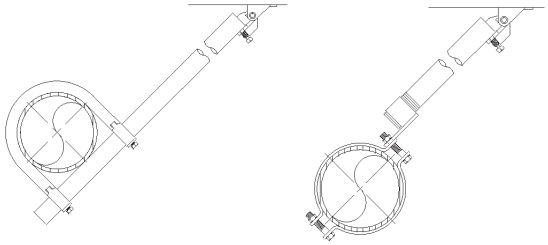
Note — The Fig. 980 Swivel Attachment and the Fig. 1001, Fig. 1000, Fig. 2002, Fig. 4A, Fig. 4B or Fig. 4L Pipe Clamp make up a sway brace system of **UL** Listed attachments and bracing materials which satisfies the requirements of Underwriters' Laboratories and the National Fire Protection Association **(NFPA)**

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish.

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



Lateral Brace

Dimensions • Weights

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

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

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

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

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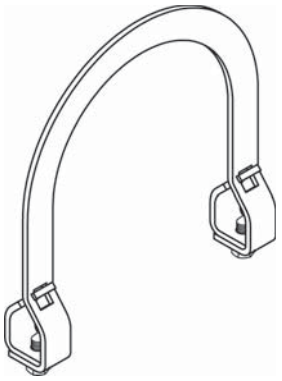
Fig. 1001 - Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System

c UL us LISTED

FM APPROVED



Size Range — Pipe size to be braced: 2½" thru 8" IPS.* Pipe size used for bracing: 1" and 1¼" Schedule 40 IPS.

Material — Carbon Steel

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

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

Installation Note — Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" 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)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

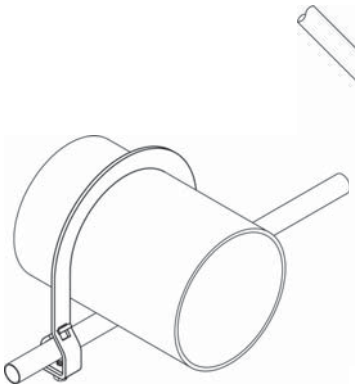
Order By — Indicate pipe size to be braced followed by pipe size used for bracing, figure number and finish.

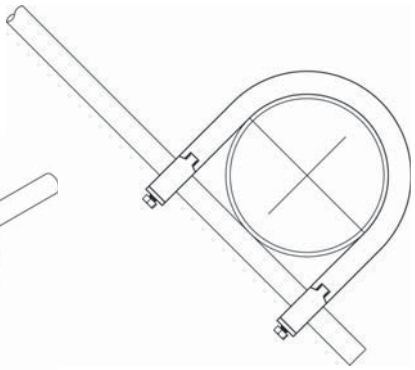
Important Note — The Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. **To ensure performance, the UL Listing requires that the Fig. 1001 must be used only with other TOLCO bracing products. The Fig 1001 is not intended for use with the Fig. 907 4-Way Longitudinal Brace Attachment.**

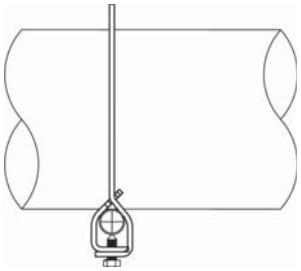
US AND INTERNATIONAL PATENT APPLICATION IN PROCESS

Maximum Design Load
Sch. 7 - 1600 lbs.
Sch. 10 & 40 w/1" Brace Pipe - 2015 lbs.
Sch. 10 & 40 w/1¼" Brace Pipe - 2765 lbs.

FM Approved Design Loads*
2½" - 2400 lbs.
3" - 4" - 2550 lbs.
5" - 8" - 1550 lbs.







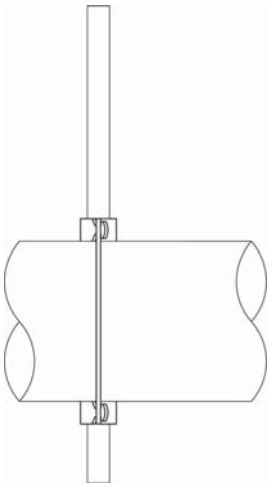


Fig. 4L
Longitudinal "In-Line" Sway Brace Attachment

c UL US LISTED
FM APPROVED

Size Range — 2½" through 8" IPS.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance.

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

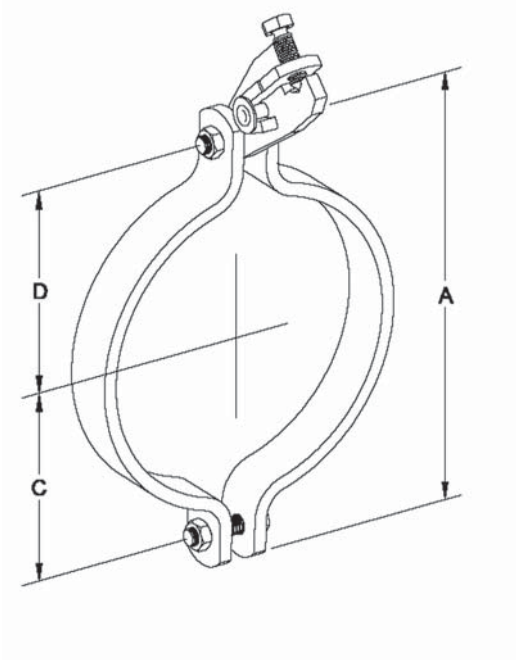
Installation Instructions — The Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

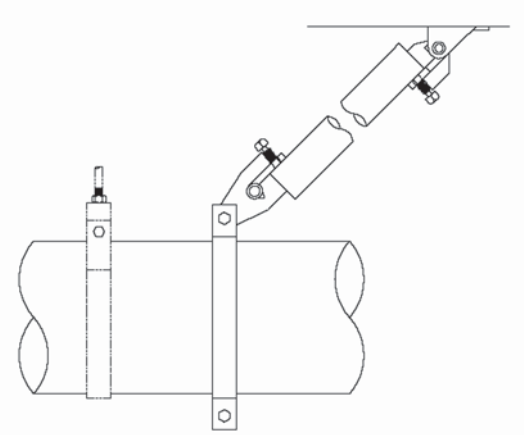
To Install — Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until hex head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

Finish — Plain

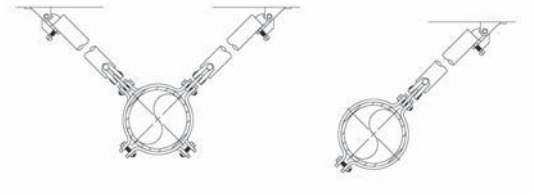
Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, pipe size and finish.





Longitudinal Brace



4-Way Riser Brace
(Plan view)

Dimensions • Weights

Sizes	A	C	D	Bolt Size	Max. Rec. Load Lbs. (cULus)	*Max Rec. Load Lbs. (FM)	Approx. Wt./100
2½	6 7/16	2½	2¾	1/2	2015	3000	253
3	7	2¾	3 1/16	1/2	2015	1550	268
4	8½	3⅜	3 11/16	1/2	2015	1550	348
5	9¾	3⅞	4⅜	1/2	2015	1450	380
6	11½	5	5⅛	1/2	2015	1450	640
8	13¼	5⅝	5⅝	1/2	2015	1450	728

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

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

OFFICE/MANUFACTURING FACILITY • 1375 SAMPSON AVE. • CORONA, CA 92879 • PH: 951.737.5599 • FAX: 951.737.0330
CUSTOMER SERVICE • 800.786.5266
www.tolco.com

8. MISCELLANEOUS EQUIPMENT

AUTOMATIC FIRE SUPPRESSION SYSTEM

SPEC SECTION: 21 13 13

data sheet

ARGCO

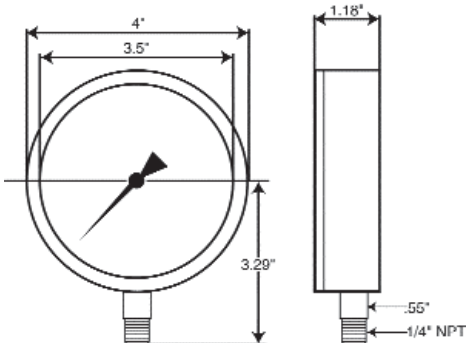
Quality PT GUARANTEED

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

NOTES:

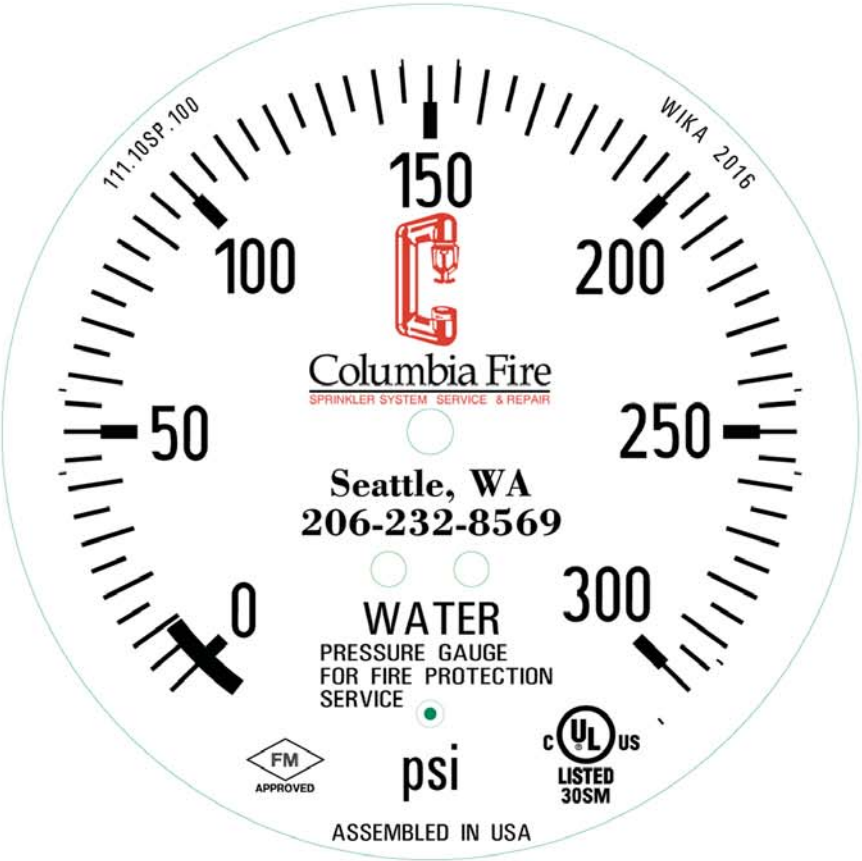
SINGLE SCALE ARC = 270.0°
SCALE = 300 psi
MINOR INCREMENTS = 5 psi
INTER. INCREMENTS = 10 psi
MAJOR INCREMENTS = 50 psi
ALL MARKINGS = BLACK

= RED (PMS032)

Columbia Fire
SPRINKLER SYSTEM SERVICE & REPAIR — BLACK

RED (PMS032)

Seattle, WA
206-232-8569 = BLACK



D4001419

CERTIFICATE OF COMPLIANCE

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

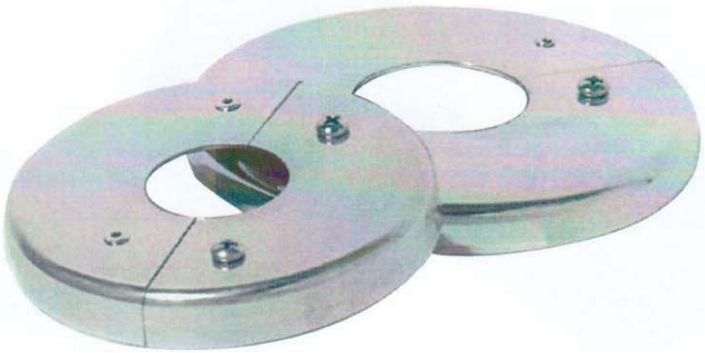
WIKA Instrument, LP
1000 Wiegand Boulevard
LAWRENCEVILLE, GA 30043
Tel : (+1) 770-513 8200
Fax : (+1) 770-338 5118
http://www.wika.com
info@wika.com

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

WIKA INSTRUMENT, LP
CERTIFICATE of COMPLIANCE
ANSI/ASQ Q9001-2008

ADDITIONAL PRODUCTS

We've got what it takes to finish the job! Based on your particular requirements, we can provide you with specific dimensions. Just give us a call.

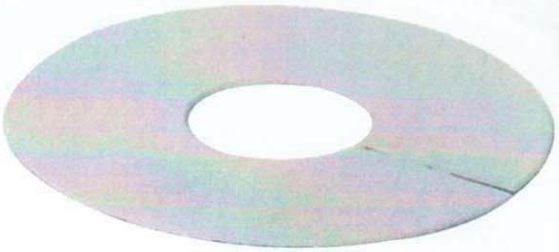


Wall & Ceiling Plate

Dimensions vary per IPS required.
Contact us for specific information.

Deep Canopy - *1-piece*

Diameter:	Varies per depth
Depth:	3" to 15"

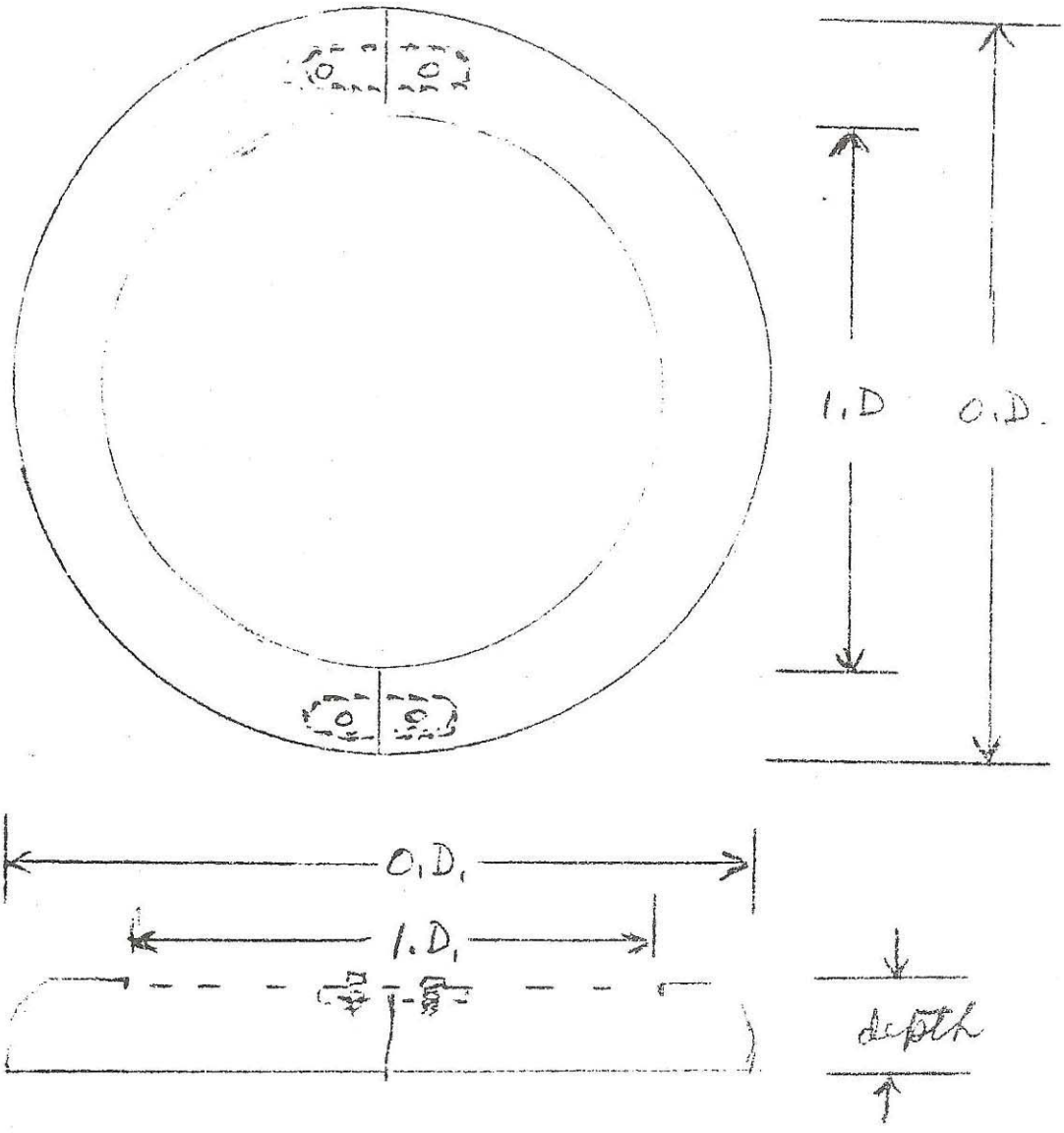


Disc or Ring - *Fire resistant plastic*

Use for slipping between top of canopy and ceiling, and cover exposed hole.

- Covers errors.
- Use when installing new ceiling without needing to shut down system.

Contact us for specific application and we will provide to your requirements.



NOTE: DIMENSIONS VARY WITH I.P.S. REQUIRED

Hieter Manufacturing,LLC
12162 Severn Way
Riverside,CA 92503
PH# 951 582 0574
Fax# 951-582-9835

To whom it may concern;

All parts produced by Hieter Manufacturing,LLC are made soley in Riverside,CA USA. Products conform to the Buy America Act.

Thank You

Oscar Hieter

Fire Sprinkler Plates

The National Board of Fire Underwriters (NBFU) has a number of mandates that apply to fire and alarm signs to ensure facilities are as safe as possible in the event of an emergency. NBFU Standard Number 13 applies to facilities that have a Fire Sprinkler System and mandates that a variety of Fire Sprinkler Signs and Fire Sprinkler System Plates be placed throughout the building.

Through SafetySign.com, you can find all the Fire Sprinkler System Plates and Fire Sprinkler Signs needed to comply with NBFU No. 13 standards. These Fire Signs are clearly marked and are constructed with durable materials and are made to last., Browse our selection of Fire Sprinkler System Plates and Fire Sprinkler Signs, and then order these and other Fire Department Signs to remain in compliance today.

Fire / Exit / Emergency

- Custom Emergency Signs
- Emergency Signs
- Exit Signs
- Fire Department Connection Signs
- Fire Door Signs
- Fire Extinguisher Signs
- Fire Sprinkler Signs
  - Fire Alarm Sprinkler Signs
  - Fire Sprinkler Pipe Markers
  - NFPA 170 Symbol Signs
  - SPRINKLER SYSTEM PLATES
  - Sprinkler System Signs
- Flammable and Hazmat Signs
- NFPA Signs
- Accessories

Sprinkler System Plates

Sort by Relevance

Hydraulic System Plate
Item SPR-1ALM

Automatic Sprinkler Plate
Item SPR-2ALM

Sprinkler Alarm Plate
Item SPR-15

Alarm Line Plate
Item SPR-3ALM

Alarm Test Plate
Item SPR-4ALM

Auxiliary Drain Plate
Item SPR-5ALM

Control Valve Plate
Item SPR-6ALM

Drain Plate
Item SPR-7ALM

Filling Line Plate
Item SPR-8ALM

Anti-Freeze Plate
Item SPR-9ALM

Inspection Test Plate
Item SPR-10ALM

Main Control Plate
Item SPR-11ALM

Main Drain Plate
Item SPR-12ALM

Shut-Off Valve Plate
Item SPR-13ALM

Water Motor Line Plate
Item SPR-14ALM

Alarm Line Plate
Item 25745

Alarm Test Plate
Item 25746

Anti-Freeze Plate
Item 25747

Auxiliary Drain Plate
Item 25748

Shut-Off Valve Plate
Item 25749

Drain Valve Plate
Item 25750

Test Valve Plate
Item 25751

Main Drain Plate
Item 25752

Main Control Plate
Item 25753

Dry Standpipe Plate
Item 25754

Wet Standpipe Plate Item 25755	Standpipe System Plate Item 25756	Standpipe Plate Item 25757	Inspection Test Plate Item 25758	Sprinkler Room Plate Item 25759
 Control Valve Plate Item 25760	 Sprinkler Riser Plate Item 25761	 Sprinkler Alarm Plate Item 25762	 Sprinkler System Sign Item 25656	 Sprinkler System Sign Item 25653
 Sprinkler Valve Sign Item 25654	 Sprinkler Sign Item 25655	 Emergency Gas Shut-Off Sign Item 25657		

Low Price Guarantee
We sell high quality safety signs at the lowest prices. If you can find our signs at a lower price, we'll match it!

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All our safety signs are manufactured by us in New Jersey. We are a veteran owned and operated company.

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Thousands of products ready to ship same day at low discounted UPS® and FedEx® rates.

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