

Andersen Construction Company 6712 N. Cutter Circle PO Box 6712 Portland OR 97217 US

PROJECT: Wallowa Memorial Hospital MOB

TO: Clark/Kjos Architects*

TRANSMITTAL

No. 11-0866-0049

DATE: 11/14/2011

RE: 002-211300-Product Data Resubmittal - Fire Sprinkler Systems

ATTN: Matt Kadyk	J	DB: 11-0866
WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
Shop Drawings	🖌 Approval	Approved as Submitted
Letter	Your Use	Approved as Noted
Prints	As Requested	Returned After Loan
Change Order	Review and Comment	Resubmit
		Submit
Samples	SENT VIA:	Returned
Specifications	Attached Separate Cover	Returned for Corrections
Other:		Due Date:
		Other:

Line	Item	Package	Code	Rev.	Qty	Date	Description	Status
1	Submittal	002-211300	002-211300-001			11/14/2011	Product Data Resubmittal - Fire	
							Sprinkler System	

No Exception Taken Make Corrections Noted 🗖 Revise & Rosubmit 🔲 Rejected Reviewed for general conformity with the contract documents. Subcontractor is responsible for all quantities, dimensions, joinery, and complete compliance with contract documents. en coestruction co., inc ANDE Date By Job # Submittal # 00 *: ل ص 0 009 COV

REMARKS: Matt,

Please find the attached product data / material resubmittal for the Fire Sprinkler Systems.

Respectfully,

Kris Anderson Andersen Const. Co.

CC: Clark/Kjos Architects*, Matt Kadyk Andersen Structures, LLC, Randy Garrett Andersen Structures, LLC, Robert Haynes

Signed:

INTUITIVE FIRE

11/2/11

Kris Anderson Anderson Const. Co

Re: Wallowa Memorial Hospital MOB. Enterprise Or.

Mr. Anderson

I have addressed and reviewed the Drawings/Documents. Comments/revisions have been recorded on the resubmitted documents and below.

Comments from Anderson Construction: CK Architects

1) Walkway not in Project.

Sprinkler drawings have been modified. ✓

 Conceal Sprinkler lines in lobby <u>WITHIN</u> the roof ceiling and ABOVE lines at canopy. Sprinkler piping has been installed as shown on the architect drawings for the area.

Comments from Interface Engineering

Drawings:

- Drawings Submitted are not signed and sealed by Professional Engineer.
 Drawing/Calcs have been reviewed and signed.
- 2) Provide method for forward flow testing backflow.
 Testing of backflow is provided through a 2.5" drain line. See riser diagram. ✓
- Sheet FP-2 & FP-3: No sprinkler protection has been provided at combustible construction Exits at gridline 1 between gridlines C&D and between gridlines D&E. Please provide.

Dry Pendants Sprinklers have been added in three locations.

- 4) Sheet FP-4: Dry system routing at Lobby 002 and Vestibule 001 does not coincide with dry system routing shown on sheet P2.11. Verify acceptability of routing with architect.
 Routing of fire main has been modified for coordination and installation vore corridor. Spec section 21.1.04.c only calls out coordination with the architect for area containing exposed piping.
- 5) No method of lateral and vertical branch line restraints (including, but not limited to end of branch line restraints) has been provided per NFPA 13-2007 section 9.3.6 and 9.3.6.3 and Table 9.3.6.4. Please provide.

Branchline restraint notes have been added to drawings. \checkmark



- 6) Longitudinal & lateral sway bracing locations for the wet sprinkler system as required by are not shown on drawings. Please provide per sway brace calculations. Sway bracing calcs, details and notes have been added to drawings.
- 7) Grid system is not provided with pressure relief valve per NFPA13. Please provide. Notes have been added to riser. ✓
- Sprinklers have not been provided under combustible stairs. Please provide.
 Sprinklers have been added to drawings. ✓
- No bell is shown. Please provide.
 Notes for bell have been added to riser. ✓
- 10) Sheet FP-1 does not show dry pipe valve trim, including gauges. Please provide full trim. **Detail has been added to riser.** ✓
- 11) No air compressor is shown Detail and material cut sheets have been added to package. ✓
- 12) No spare sprinkler box is shown. Please provide. **Detail has been added to riser.** ✓
- 13) Fire department connection is not shown to have a ball drip valve for drainage. Please provide, with drain to sewer or daylight.
 Ball drip is show on check valve.
- 14) Length of ½" thru bolt fastening longitudinal and lateral sway bracing is not provided. Please provide. Identify structural members on drawings showing that the member to which the fastener will be attached is thick enough to hold the entire required length of the thru bolt identified in sway brace calculations.
 - See Sway Brace Calculations. ✓
- 15) Hanger detail #1 shows a 2" and a 2.5" Sammy Sidewinder in a 2x6 truss member. A 2x6 truss is actually 1.625" wide. The 2" and 2.5" Sidewinder will just have the excess length extending out the back which will not provide the intended support. Please utilize a hanger that will fit within the structural member it is attached to.
 SWG 10 will be utilized. See Hanger #8. ✓
- 16) Sheet FP-4, the last standard coverage sprinkler at the right-hand end of the canopy is more than 7'6" from the end of the canopy. This area does not meet the criteria of being a "small room" as described in NFPA 13-2007 3.3.15 and so no standard coverage sprinkler may exceed half the allowable distance between sprinklers. Please revise. The walkway is deleted from the fire sprinkler project scope. √

See comments under Hydraulic Calculations, below. If revised calculations require changes in pipe sizes, please provide the

Hydraulic Calculations:

 Hydraulic calcs are not signed and sealed by registered Professional Engineer per specification 210000.1.04.L.2.b and Oregon state law. Please provide.
 Reviewed and signed. ✓

INTUITIVE FIRE

2) Roof pitch exceeds 2 in 12. Design areas are not increased for dry systems and sloped roofs per NFPA 13. Please revise.

Hydraulic calcs utilize 7 sprinklers included with 2 sprinklers on eve. (See Attic Sprinkler cut sheets for direction on remote area. \checkmark

- 3) Canopy calculation provides a minimum of 7 psi at 14.8 gpm. These sprinklers cover 191 sq. ft. each (assuming 13'10" apart x 13'10" wide). Using the area density method each sprinkler needs to provide 0.10 gpm per sq. ft. 191 sq. ft. x 0.10 = 19.1 gpm per sprinkler per NPFA 13-2007 section 22.4.4.5.3. The commentary in the Automatic Sprinkler Systems Handbook is helpful in understanding this concept. Please revise calculations to provide a full 0.10 gpm per sq. ft. of sprinkler coverage.
 Sprinklers have been added/relocated and recalculated. ✓
- 4) Lower Wet calculation provides a minimum of 7 psi at 14.82 gpm at node 101 and 7.426 psi at15.26 gpm at node 103. Node 103 is 12' to the next sprinkler and 6'10" from the wall and thus protects 163.92 sq. ft. Using the area density method each sprinkler needs to provide 0.10 gpm per sq. ft. 163.92 sq. ft. x 0.10 = 16.39 gpm per sprinkler per NPFA 13-2007 section 22.4.4.5.3. Please revise calculations to provide a full 0.10 gpm per sq. ft. of sprinkler coverage.

Sprinklers have been added/respaced and recalculated. ✓

Sway Brace Calculations:

- No sway brace calculations have been provided. When provided they will be evaluated per the following items, which will contain dispositions at that time. Please provide.
 Provided.
- 2) Sway brace calcs are/are not signed and sealed by registered Professional Engineer per specification 210000.1.04.L.2.b

Created, reviewed and signed. ✓

- Building Code chapter 16 calcs determining force factor used in NFPA 13 calcs are/are not provided per specification 210000.
 Calcs Provided. ✓
- 4) Sway brace calcs do/do not appear to conform to NFPA 13. Calcs Provided.
- 5) Lateral sway brace calcs do/do not include branch lines. **Calcs Provided.**
- 6) Pipe type included in calculations matches/ does not match pipes shown on plans. **Calcs Provided.**
- 7) Bracing details shown on plans do/do not match components and configuration used in calculations.

Calcs Provided. ↓



Materials:

 ARGCO – Fire Department Connections (Groove Outlet): No Exception Taken for 2-way straight pattern single clapper model. Two-way 90 degree pattern single clapper REJECTED because it is not UL Listed or FM Approved.

FPPI- FDC. UL/FM Approved

Reference:

1) a. Tyco Attic, K5.6 and K8.0, model BB1, brass, 200 degree, TY4180 and TY3180. No cut sheet provided. Please provide.

See submittal

b. Tyco Attic, K5.6, model SD1, brass, 200 degree, TY3183. No cut sheet provided. Please provide. **See submittal**

c. Tyco Concealed, K5.6, TY3531, model RFII, unknown response, white finish, 155 degree. No cut sheet provided. Please provide.

See submittal

d. Tyco Extended Coverage Pendent, white, model DS-ECC, 155 degree, K5.6, TY3539. No cut sheet provided. Please provide.

See submittal

2) Pipe:

a. Underground: No cut sheet provided. Please provide.

Underground installed under separate contract. (No Materials Included in this submittal)

- 3) Fittings:
 - a. Grooved: No cut sheet provided. Please provide.
 - See submittal
 - b. Threaded: No cut sheet provided. Please provide.

CI Fittings added , See submittal

- c. Flanged: No cut sheet provided. Please provide. See submittal
- 4) Couplings:
 - a. Rigid: No cut sheet provided. Please provide. **See submittal**
 - b. Flexible: No cut sheet provided. Please provide. **See submittal**
- 5) Valves:
 - a. Automatic Ball Drip: No cut sheet provided. Please provide. See submittal
 - b. Pressure Relief: No cut sheet provided. Please provide. See Submittal-Riser Manifold mod. CR option #6



6) Hangers: No cut sheet provided. Please provide.

Hangers in Submittal

- 7) Fasteners for Hangers: No cut sheet provided. Please provide. Sammy Hangers Provided
- 8) Sway Brace Fittings: No cut sheet provided. Please provide. See submittal
- 9) Sway Brace Fasteners: No cut sheet provided. Please provide. See submittal and details.
- 10) Bells: No cut sheet provided. Please provide.

See submittal and details.

- 11) Connections:
 - a. Inspector's Test Connection: No cut sheet provided. Please provide.

See submittal- Riser Manifold mod. CR

- 12) Dry Systems:
 - a. Air Compressor: No cut sheet provided. Please provide. See submittal-General Air
 - b. Accelerator: No cut sheet provided. Please provide.
 - Accelerator not required.
 - c. Air Pressure Maintenance Device: No cut sheet provided. Please provide. See submittal-General Air (231.45 Gallon Air Capacity)

Please feel free to contact me with any questions regarding this letter.

Professional Regards,

Franklin Callfas, P.E. Fire Protection Engineer Intuitive Engineering Services 541-848-1798

Stamp Here

Schedule-10/Schedule-40 - ABFII Submittal Data Sheet

Fully Listed and FM Approved Sprinkler Pipe

When you specify Schedule-10/Schedule-40 - ABFII sprinkler pipe from Allied Tube & Conduit, you get UL listed and FM approved products. Although these products do not require separate approvals, Schedule-10/Schedule-40 - ABFII gives you the extra quality assurance you demand. Our Sch-10 (1-1/4" - 8") pipe and Sch-40 (1" - 2-1/2") pipe have passed the same thorough lab testing as our other listed pipe products, and receive periodic mill inspections from both UL and FM agents to ensure consistent quality.

Galvanized Pipe Schedule-10/Schedule-40 - ABFII product can be "hot-dip" galvanized to meet FM requirements.

Superior Coating Our advanced formula mill coating offers a clean, durable surface that is also paintready for custom color applications without special preparation.

The internal surface of all black Fire Sprinkler pipe up to 4.5000" in diameter shall be coated with Allied Tube & Conduit Antibacterial Formula "ABF".

American Made Able to meet "Buy American" requirements, and is available through distributors in the USA, Canada, Mexico and Latin America.

Specifications & Approvals Schedule-10/Schedule-40 - ABFII pipe are in compliance with the following: ASTM A135, Type E Grade A, and NFPA 13. Both pipe products have a working pressure rating of 300 psi maximum and also meet the stringent requirement for the following tests: Welded Outlets, Hydrostatic Pressure, Side Wall Rupture, Vibration Test.

Harvey, IL 60426

TUBE & CONDUIT®

	Sch-40	- ABFII Spe	cifications	
NPS	Nominal I.D.	Wt.	Wt. (H20 Filled)	CRR
In; mm	ln; mm	Lbs/Ft; kg/m	Lbs/Ft; kg/m	-
1″	1.049	1.680	2.05	1
25	26.6	2.5	3.05	-
1¼″	1.380	2.270	2.93	1
32	35.1	4.36	4.36	-
11/2″	1.610	2.720	3.61	1
40	40.9	4.0	5.37	-
2″	2.067	3.650	5.13	1
50	52.5	5.4	7.63	_
21/2"	2.469	5.790	7.86	1
65	62.7	8.6	11.73	-

	Sch-10	- ABFII Spe	cifications	
NPS	Nominal I.D.	Wt.	Wt. (H20 Filled)	CRR
ln; mm	ln; mm	Lbs/Ft; kg/m	Lbs/Ft; kg/m	-
1¼″	1.442	1.810	2.525	7.0955
32	36.6	2.7	3.75	-
11/2″	1.682	2.080	3.04	5.6570
40	42.7	3.1	4.52	-
2″	2.157	2.640	4.22	4.5827
50	54.8	3.9	6.28	-
21/2"	2.635	3.530	5.89	3.5196
65	66.9	5.3	8.77	-
3″	3.260	4.330	7.94	2.5550
75	82.8	6.4	11.82	-
4″	4.260	5.610	11.78	1.6020
100	108.2	8.3	17.53	-
5″	5.295	7.77	17.33	1.4874
125	134.5	11.56	25.80	-
6″	6.357	9.290	23.03	1.0251
150	161.5	13.8	34.27	-
8″	8.249	16.490	40.15	1.8365
200	209.5	24.5	59.75	_



Project:		Sprinkler Contractor:	Date:	
Engineer:		Specification Reference:		System Type:
Locations:		Comments:		
	Customer Service (• 16100 S Lathrop Ave.	800) 882-5543 Fax: (80) • 11350 Norcom Rd.	0) 659-7730 • 2525 N 27th Ave.	www.alliedtube-sprinkler.com • 600 Dean Sievers Place

• 11350 Norcom Rd. Philadelphia, PA 19154 • 2525 N 27th Ave. Phoenix, AZ 85009 600 Dean Sievers Place Morrisville, PA 19067

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Colt[™] Series C200, C200N



Double Check Valve Assemblies Sizes: 2¹/₂" - 10" (65 - 250mm)



Features

- Extremely Compact Design
- 70% Lighter than Traditional Designs
- 304 (Schedule 40) Stainless Steel Housing & Sleeve
- Groove Fittings Allow Integral
 Pipeline Adjustment
- Patented Tri-Link Check Provides Lowest Pressure Loss
- Unmatched Ease of Serviceability
- Available with Grooved Butterfly Valve Shutoffs
- Available for Horizontal, Vertical or N Pattern Installations
- Replaceable Check Disc Rubber

The Colt C200, C200N Double Check Valve Assemblies are used to prevent backflow of pollutants, that are objectionable but not toxic, from entering the potable water supply system. The Colt C200, C200N may be installed under continuous pressure service and may be subjected to backpressure. The Colt C200, C200N consists of two independently operating check valves, two shutoff valves, and four test cocks. For use in non-health hazard applications.

Specifications

The Colt C200, C200N Double Check Valve Assembly shall consist of two independent Tri-Link Check modules within a single housing, sleeve access port, four test cocks and two drip tight shutoff valves. Tri-Link Checks shall be removable and serviceable, without the use of special tools. The housing shall be constructed of 304 (Schedule 40) stainless steel pipe with groove end connections. Tri-Link checks shall have reversible elastomer discs and in operation shall produce drip tight closure against the reverse flow of liquid caused by backpressure or backsiphonage. Assembly shall be a Colt C200, C200N as manufactured by the Ames Company.

*The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.

Job Name	Contractor
Job Location	Approval
Engineer	Contractor's P.O. No
Approval	Representative

Ames product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Ames Technical Service. Ames reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Ames products previously or subsequently sold.

Configurations

- Horizontal
- Vertical up
- "N" pattern horizontal

Materials

- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM, Silicone and Buna 'N'
- Tri-Link Checks: Noryl®, Stainless Steel
- Check Discs: Reversible Silicone or EPDM
- Test Cocks: Bronze Body Nickel Plated
- Pins & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

Dimensions — Weights

Available Models

Suffix:

- NRS non-rising stem resilient seated gate valves
- OSY UL/FM outside stem and yoke, resilient seated gate valves
- BFG UL/FM grooved gear operated butterfly valves with tamper switch
- *OSY FxG Flanged inlet gate connection and grooved outlet gate connection
- *OSY GxF Grooved inlet gate connection and flanged outlet gate connection
- *OSY GxG Grooved inlet gate connection and grooved outlet gate connection

Available with grooved NRS gate valves - consult factory* Post indicator plate and operating nut available - consult factory* *Consult factory for dimensions

Pressure — Temperature

Temperature Range: 33°F – 140°F (5°C – 60°C) Maximum Working Pressure: 175psi (12.06 bar)



C200, C200N

SIZ	(DN)		DIMENSIONS															WEIGHT									
		A		C (0	ISY)	C (N	RS)	D		G	i	н			I		J	F)	C200	NRS	C200	OSY	C2001	N NRS	C200N	OSY
in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.
2 ¹ / ₂	65	31	787	16¾	416	9 ¾	238	3 ½	89	29 ¹ ⁄16	738	22	559	15½	393	8 ¹³ ⁄16	223	9 ³ ⁄16	234	115	52	125	57	123	56	133	60
3	80	31 ¹¹ /16	805	181/8	479	101/4	260	3 ¹¹ /16	94	301/4	768	22 ³ /4	578	171/8	435	9 ³ /16	233	101/2	267	131	59	145	66	144	65	158	72
_4	100	33 ¹¹ /16	856	22 ³ / ₄	578	12 ³ ⁄16	310	4	102	33	838	24	610	181/2	470	9 ¹⁵ / ₁₆	252	11 ³ ⁄16	284	161	73	161	73	184	83	184	83
6	150	43 ½	1105	30 1⁄/8	765	16	406	5½	140	44 ³ ⁄ ₄	1137	33 ¾	857	23 ³ ⁄16	589	13 ¹ / ₁₆	332	15	381	273	124	295	134	314	142	336	152
8	200	50	1270	37¾	959	19 ¹⁵ /16	506	6 ¹¹ /16	170	541/8	1375	405%	1032	27 ⁷ /16	697	15 ¹ / ₁₆	399	17 ³ ⁄16	437	438	199	480	218	513	233	555	252
10	250	57½	1460	45¾	1162	23 ¹³ ⁄16	605	8 ³ ⁄16	208	66	1676	50	1270	321/2	826	17 5⁄16	440	20	508	721	327	781	354	891	404	951 4	431



C200BFG, C200NBFG

	SIZE	(DN)		DIMEN	SIONS	WEIGH	í i															
			ļ	ł	C		0		G	i		Н	1		J		Р		C200)BFG	C200	NBFG
_	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	in.	тт	lbs.	kgs.	lbs.	kgs.
_	21/2	65	28	711	8	203	31/2	89	291/8	759	22	559	14 ¹⁵ /16	379	8 ¹³ ⁄16	223	9	229	56	25	64	29
_	3	80	28 ½	724	8 ⁵ /16	211	311/16	94	30 ¹¹ / ₁₆	779	223/4	578	157/16	392	9 ³ ⁄16	233	91/2	241	54	24	67	30
	4	100	29 ³ ⁄16	741	8 ¹⁵ /16	227	311/16	94	31 ¹⁵ ⁄16	811	24	610	16¼	412	9 ¹⁵ ⁄16	252	10	254	61	28	84	38
_	6	150	361/2	927	10	254	5	127	43 ³ ⁄16	1097	33¾	857	19 ¹¹ /16	500	13 ½16	332	101/2	267	117	53	157	71
	8	200	43	1092	121⁄4	311	6½	165	51 ½16	1297	405%	1032	235/16	592	15 ¹ / ₁₆	399	14¾16	361	261	118	337	153

Approvals



For additional approval information please contact the factory or visit our website at www.amesfirewater.com

Capacity

UL/FM Certified Flow Characteristics Flow characteristics collected using butterfly shutoff valves. See literatue S-Colt-200/300 for gate valve flow characteristics

* = Rated Flow ** = UL Tested



FOR LOCAL INSTALLATION REQUIREMENTS

gpm

lpm

fps

mps

Ν

н

fps

mps

Ν

fps

mps

For additional information, visit our web site at: www.amesfirewater.com



A Watts Water Technologies Company

www.amesfirewater.com



ES-A-C200/C200N 1006

USA: Backflow- 1427 N. Market Blvd • Suite #9 • Sacramento, CA 95834 • T: 916-928-0123 • F: 916-928-9333 Control Valves- 18550 Hansen Road • Houston, TX 77075 • T: 713-943-0688 • F: 713-944-9445 Canada: 5435 North Service Rd. • Burlington, ONT. L7L 5H7• T: 905-332-4090 • F: 905-332-7068 NIBCO[®] Ahead of the flow[®]

> -4N version is gear operated only Uses NIBCO model #TS-4 Switch Kit. Polymide coating has NSF certification.

300 lb. WWP UL/FM Butterfly Valves

Fire Protection Valve • Grooved Mechanical Style • Nylon Coated Ductile Iron Body • Extended Neck • Elastomer Encapsulated Disc • Accepts Internal Supervisory Switches • Compatible with IPS Pipe

300 PSI/20.7 Bar Non-Shock Cold Water 2½" - 8" 175 PSI/12.1 Bar Non-Shock Cold Water 10"

UL/ULC LISTED • FMRC APPROVED • 2½" - 10" UL LISTED FOR INDOOR AND OUTDOOR SERVICE • CALIFORNIA STATE FIRE MARSHALL APPROVAL NO. 7770-1243:101 • APPROVED BY THE NEW YORK CITY MEA 9-97-E, VOL.2 WHEN ASSEMBLED WITH APPROPRIATE NYC INDICATOR FLAG

	MATERIAL LIST									
	PART	SPECIFICATION								
1.	Upper Stem	Stainless Steel ASTM A 582 Type 416								
2.	Upper Bushing	PTFE Bronze Sintered on Steel								
3.	"O" Ring	Buna-N								
4.	Body	Ductile Iron ASTM A 395 with Polymide Coating								
5.	Disc	Ductile Iron ASTM A 395 with EPDM Encapsulation								
6.	Lower Bushing	PTFE Bronze Sintered on Steel								
7.	Lower Stem	Stainless Steel ASTM A 582 Type 416								
8.	Dust Plug	PVC								
9.	Nameplate	Aluminum								
10.	Gear Operator	Cast Iron and Steel								
11.	Indicator Flag	Cast Iron								
12.	Handwheel	Cast Iron								
*-8N ve	rsion has two factor	v mounted internal supervisory switches.								



GD-1765-8N 10" (not shown)









DIMENSIONS—WEIGHTS—QUANTITIES

	Dimensions																
Size		-	4		В		C		D		E		F		G		
H																	
In.	mm.	ln.	mm.	ln.	mm.	ln.	mm.	ln.	mm.	ln.	mm.	ln.	mm.	ln.	mm.	In.	mm.
21/2	65	2.88	73	2.72	69	0.31	8	0.63	16	3.85	98	2.42	61	11.94	303	2.91	74
30.D.	76.1	3.00	76	2.84	72	0.31	8	0.63	16	3.85	98	2.42	61	11.94	303	2.91	74
3	80	3.50	89	3.34	85	0.31	8	0.63	16	3.85	98	2.86	73	12.48	317	2.91	74
4	100	4.50	114	4.33	110	0.38	10	0.63	16	4.56	116	3.84	98	14.18	360	2.91	74
5	125	5.56	141	5.39	137	0.38	10	0.63	16	5.86	149	4.79	122	15.17	385	2.91	74
6	150	6.63	168	6.45	164	0.38	10	0.63	16	5.86	149	5.73	146	17.54	446	2.91	74
6 O.D.	165.1	6.51	165	6.32	161	0.38	10	0.63	16	5.86	149	5.73	146	17.54	446	2.91	74
8	200	8.63	219	8.44	214	0.44	11	0.75	19	5.26	134	7.71	196	19.42	493	2.91	74
10	250	10.75	273	10.56	268	0.50	13	0.75	19	6.29	160	9.56	243	24.03	610	3.90	99
							Dir	nensio	ns								

	_																		
Siz	ze		J	K		L		N	M		N		P	0		<u>R</u>		Weight	
In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.
21/2	65	3.54	90	2.13	54	5.82	148	5.67	144	4.19	106	3.25	83	5.9	150	3.46	88	22	10.0
30.D.	76.1	3.54	90	2.13	54	5.82	148	5.67	144	4.19	106	3.25	83	5.9	150	3.46	88	22	10.4
3	80	3.54	90	2.13	54	5.82	148	5.94	151	4.44	113	3.54	90	5.9	150	3.97	101	23	10.4
4	100	3.54	90	2.13	54	7.64	194	6.31	173	5.33	135	4.35	110	5.9	150	5.03	128	28	12.7
5	125	3.54	90	2.13	54	7.64	194	7.32	186	5.83	148	4.84	123	5.9	150	6.27	159	31	14.1
6	150	3.54	90	2.13	54	7.64	194	8.62	219	7.11	181	5.93	151	5.9	150	7.25	184	41	18.6
6 O.D.	165.1	3.54	90	2.13	54	7.64	194	8.62	219	7.11	181	5.93	151	5.9	150	7.25	184	41	18.6
8	200	3.54	90	2.13	54	7.91	201	9.80	249	8.05	204	6.87	174	9.8	250	9.25	235	53	24.1
10	250	3.98	101	3.03	77	9.49	241	11.61	295	9.86	250	9.17	233	11.8	300	18.00	457	88	40.0



AHEAD OF THE FLOW*

`||={

250 PSI CWP Iron Body Grooved Silent Check Valve

Fire Protection • Twin Disc • Grooved Style • Bronze Disc • Buna-N Seat • Spring Actuated

250 PSI/17.2 Bar Non-Shock Cold Working Pressure Maximum Temperature to 250°F/121°C @ 220 PSI/15 Bar

CONFORMS TO ANSI/AWWA C606 FOR STEEL IPS PIPE • UL/ULC LISTED • FMRC APPROVED

	MATERIAL LIST										
	PART	SPECIFICATION									
1.	Body	Ductile Iron ASTM A536 Grade 65-45-12									
		w/Buna-N resilient seat molded to body									
2.	Disc	Bronze ASTM B584 Alloy C83600									
3.	Torsion Spring	Stainless Steel T316 ASTM A313									
4.	Disc Hinge Pin	Stainless Steel T316 ASTM A276									
5.	Disc Stop Pin	Stainless Steel T316 ASTM A276									
6.	Disc Thrust Bearing	Stainless Steel T316 ASTM A240									
7.	Hinge Pin Retainer	Steel									
8.	Stop Pin Retainer	Steel									
9.	Stabilization Sphere	Buna-N									
10.	Spacer	High Density Polyethylene									

Sizes 10" and 12" furnished with lifting eyebolt



DIMENSIONS—WEIGHTS—QUANTITIES

		Dimensions									
Size			4	В		C		D	G-92	20-W	
In.	mm.	In.	mm.	ln.	mm.	In.	mm.	In. mm.	Lbs.	Kg.	
2	50	4.66	111	4.13	105	2.38	60	2.00 51	3.30	1.49	
21⁄2	65	4.91	125	4.88	124	2.88	73	2.41 61	4.50	2.04	
3	80	5.31	135	5.38	137	3.50	89	2.94 75	7.30	3.31	
4	100	5.38	137	6.00	152	4.50	114	3.91 99	8.60	3.90	
5	125	5.72	145	7.06	179	5.56	141	4.89 124	13.00	5.90	
6	150	6.00	152	8.13	206	6.63	168	5.92 150	18.00	8.17	
8	200	6.72	171	10.03	255	8.63	219	7.91 201	30.00	13.6	
10	250	7.78	198	12.38	314	10.75	273	10.00 254	56.00	25.4	
12	300	8 1 9	208	14 38	365	12 75	324	11 94 303	81.80	36.7	

Groove dimensions conform to ANSI/AWWA specification C606 Table 4 (Cut Groove Dimensions)

NOTE: Twin Disc Check Valves can be installed horizontally or in the vertical position with flow up.

CAUTION: For horizontal flow applications, the valve must be installed with disc hinge pin in the vertical position to insure proper operation.

WARNING:

- 1. These are not to be used as steam valves
- 2. Valves are not to be used near a reciprocating air compressor
- 3. Install 5 pipe diameters minimum downstream from pump discharge or elbows to avoid flow turbulence. Flow straighteners may be required in extreme cases.
- NOTE: On pump discharge, the preferred check valves are in-line spring loaded, swing design with lever and weight or lever and spring.





KG-900-W Grooved





Available Sizes/Pressure Ratings:

 $1^{1/2}$ "(40mm) and 2"(50mm) Threaded - 250 psi (17,2 bar) Working Pressure

2''(50mm), $2'_{2}''(65mm)$, & 3''(80mm) Grooved - 300 psi (20,7 bar) Working Pressure

4"(100mm), 6"(150mm), & 8"(200mm) Grooved - 300 psi (20,7 bar) Working Pressure

Features

- 1. Cast stainless steel body construction for threaded manifolds.
- 2. Painted, cast ductile iron body construction for grooved manifolds.
- 3. Brass and galvanized Trim.
- 4. Factory assembled and pressure tested.
- Available with Test and Drain Valves in various orifice sizes. Grooved end Test and Drain valves are available as MTO.
- 6. Optional Pressure Relief Valve Kit available for all sizes.
- 7. Same take-out dimensions for the $1^{1}\!/_{2}"(40mm)$ and 2"(50mm) threaded sizes.
- 8. Same end-to-end dimensions for the 2"(50mm) through 8"(200mm) grooved sizes.
- 9. Approved for installation in horizontal or vertical positions.
- 10. Built in drain port allows hydrostatic testing without draining the system.
- 11. ¹/₄" three-way valve allows for easy testing and replacing of pressure gauge.
- 12. Dedicated UL Listed, ULC Listed and FM Approved Waterflow Detector assures optimum sensitivity. See Table 3 for triggering flow rates.

Product Description

The Model CR Commercial Riser comes factory assembled with the necessary accessories for a cost effective, yet complete riser assembly. These assemblies are UL Listed, ULC Listed and FM Approved as a unit.

Cast-on lettering on the manifold identifies manifold pipe size, flow direction, gauge and drain outlets, and UL Listing and FM Approval markings.

The Model CR Commercial Riser is available in four configurations (see Figures 1 and 2):

Basic Trim

Commercial riser manifold assembly includes a cU-Lus Listed pressure gauge, a ¹/₄" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @

Model CR Commercial Riser Riser Manifold for Commercial Applications



24 VDC. See Table 3 for triggering flow rates.

Basic Trim with Pressure Relief Kit

Commercial riser manifold assembly includes a cU-Lus Listed pressure gauge, a ¹/₄" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The nonadj (2) ustable Pressure Relief Kit will maintain system pressures below 175 psi (12,1 bar).

• <u>Basic Trim with Test and Drain Valves Valve</u> Commercial riser manifold assembly includes a cU-Lus Listed pressure gauge, a ¼" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The available test orifice size inside the Test and Drain Valve are

(Choose one):

- ³/₈" (K-2.8) ⁽¹⁾
- ⁷/₁₆" (K-4.2)
- ¹/₂" (K-5.6)
- ¹⁷/₃₂" (K-8.0)
- ⁵/₈" (K-11.2)⁽³⁾
- ³/₄" (K-14.0)⁽³⁾
- ¹⁵/₁₆" (K-16.8)^{(2) (3)}
- 1⁵/₆₄" (K-22.4)^{(2) (3)}
- 1⁹/₆₄" (K-25.2)^{(2) (3)}

⁽¹⁾Not available for 4", 6" and 8" risers.

 $^{(2)}$ Not available for $1^{1}\!/\!\!2"$ to 3" risers.

 $^{(3)}$ Not available for $1^{1}\!/\!{_2}"$ to 2" threaded & 2" grooved risers.

The Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523









Fig. 2

Note:1¹/₄" Grooved end Test and Drain valves are available in various orifice size as Made To Order (MTO).

Table 1			Dimensions & Weights											
Tabl		Bas	ic Asse	mbly			Basic Assembly with Pressure Relief Kit							
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight Ibs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight Ibs (kg)	
Threaded	11/2(40)	11 (279)	11 ¹ /2 (292)	3 (76)	7 ³ / ₄ (197)	8 ¹ / ₄ (210)	8.3 (3.8)	13 ¹ /2 (343)	12 ³ /4 (324)	3 (76)	7 ³ / ₄ (197)	8 ¹ / ₄ (210)	10.4 (4.7)	
(See Fig. 1)	2 (50)	11 (279)	12 ¹ /4 (311)	3 ¹ / ₄ (83)	8 (203)	8 ¹ / ₄ (210)	9.1 (4.1)	13 ¹ /2 (343)	13 ¹ /2 (343)	3 ¹ / ₄ (83)	8 (203)	8 ¹ / ₄ (210)	11.2 (5.1)	
	2 (50)	12 ³ /4 (324)	15 (381)	4 ¹ / ₄ (108)	8 (203)	13 (330)	10.7 (4.9)	16 ³ /4 (425)	16 ³ / ₄ (425)	4 ¹ / ₄ (108)	8 (203)	13 (330)	13.3 (6.0)	
	2 ¹ / ₂ (65)	12 ³ /4 (324)	15 ¹ /2 (394)	4 ¹ / ₂ (114)	8 ¹ / ₄ (210)	13 (330)	12.9 (5.9)	16 ³ / ₄ (425)	17 ¹ / ₄ (438)	4 ¹ /2 (114)	8 ¹ / ₄ (210)	13 (330)	16.7 (7.6)	
Grooved	3 (80)	12 ³ /4 (324)	16 (406)	4 ³ / ₄ (121)	8 ¹ /2 (216)	13 (330)	17.6 (8.0)	16 ³ / ₄ (425)	17 ³ /4 (451)	4 ³ / ₄ (121)	8 ¹ / ₂ (216)	13 (330)	18.3 (8.3)	
(See Fig. 2)	4 (100)	12 ¹ /2 (318)	18 (457)	5 ¹ /4 (133)	9 (229)	13 (330)	21.3 (9.7)	16 ³ /4 (425)	18 ¹ /2 (470)	6 (152)	9 (229)	13 (330)	26.7 (12)	
	6 (150)	12 ¹ / ₂ (318)	20 (508)	6 ¹ / ₄ (159)	10 (254)	13 (330)	26.3 (12)	16 ³ / ₄ (425)	20 ¹ / ₂ (521)	7 (178)	10 (254)	13 (330)	31.8 (14.4)	
	8 (200)	12 ¹ / ₂ (318)	22 (559)	4 ¹ / ₄ (184)	11 (280)	13 (330)	31.0 (14.1)	16 ³ / ₄ (425)	22 ¹ / ₂ (572)	8 (203)	11 (280)	13 (330)	36.5 (16.6)	

Table 2		Dimensions & Weights											
		Basic Assembly with Test and Drain Valve							Basic Assembly				
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight Ibs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight Ibs (kg)
Threaded	1½(40)	11 (279)	16 (406)	3 (76)	7 ³ / ₄ (197)	8 ¹ / ₄ (210)	10.0 (4.5)	15 (381)	16 (406)	3 (76)	7 ³ / ₄ (197)	8 ¹ / ₄ (210)	10.8 (4.9)
(See Fig. 1)	2 (50)	11 (279)	16¹/₂ (419)	3 ¹ / ₄ (83)	8 (203)	8 ¹ / ₄ (210)	10.8 (4.9)	15 (381)	16¹/₂ (419)	3 ¹ /4 (83)	8 (203)	8 ¹ / ₄ (210)	11.6 (5.3)
	2 (50)	12 ³ / ₄ (324)	17¹/₂ (445)	4 ¹ / ₄ (108)	8 (203)	13 (330)	10.7 (4.9)	15 ¹ /2 (394)	17¹/₂ (445)	4 ¹ / ₄ (108)	8 (203)	13 (330)	13.3 (6.0)
	2 ¹ / ₂ (65)	12 ³ /4 (324)	18 (457)	4 ¹ /2 (114)	8 ¹ / ₄ (210)	13 (330)	12.9 (5.9)	15 ¹ /2 (394)	18 (457)	4 ¹ /2 (114)	8 ¹ /4 (210)	13 (330)	16.1 (7.3)
Grooved	3 (80)	12 ³ / ₄ (324)	18³/4 (476)	4 ³ /4 (121)	8 ¹ /2 (216)	13 (330)	17.6 (8.0)	15 ¹ /2 (394)	18³/₄ (476)	4 ³ / ₄ (121)	8 ¹ /2 (216)	13 (330)	17.0 (7.7)
(See Fig. 2)	4 (100)	14 (356)	22 (559)	5 ³ / ₄ (146)	9 (229)	13 (330)	25.8 (11.6)	18¹/₂ (470)	22 (559)	5 ³ / ₄ (146)	9 (229)	13 (330)	26 (11.8)
	6 (150)	14 (356)	25 ¹ /2 (648)	8 (203)	10 (254)	13 (330)	30 (13.6)	18 ¹ / ₂ (470)	25 ¹ / ₂ (648)	8 (203)	10 (254)	13 (330)	31 (14.1)
	8 (200)	14 ¹ / ₄ (362)	27 (686)	9 (229)	11 (280)	13 (330)	35.3 (16)	18 ¹ / ₂ (470)	27 (686)	9 (229)	11 (280)	13 (330)	36.3 (16.5)

 <u>Basic Trim with Test and Drain Valve & Pressure Relief Kit</u> Commercial riser manifold assembly includes a cU-Lus Listed pressure gauge, a ¹/₄" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The non-adjustable Pressure Relief Kit will maintain system pressures below 175 psi (12,1 bar). The available test orifice size inside the Test and Drain Valve are

(Choose one):

- ³/8" (K-2.8) ⁽¹⁾
- ⁷/₁₆" (K-4.2)
- ¹/₂" (K-5.6)
- ¹⁷/₃₂" (K-8.0)
- ⁵/₈" (K-11.2)⁽³⁾
- ³/₄" (K-14.0)⁽³⁾
- ¹⁵/₁₆" (K-16.8)^{(2) (3)}
- 1⁵/₆₄" (K-22.4)^{(2) (3)}
- 1⁹/₆₄" (K-25.2)^{(2) (3)}

⁽¹⁾ Not available for 4", 6" and 8" risers.

⁽²⁾ Not available for 1¹/₂" to 3" risers.

 $^{(3)}$ Not available for $1^{1}\!/\!{_2}"$ to 2" threaded & 2" grooved risers.

Installation

- 1. Attach the pressure gauge as shown in Figures 1-4.
- 2. Install the manifold with the flow arrow pointing towards the SYSTEM side using threaded fittings or grooved pipe couplings.
- 3. Connect the appropriately sized drain line.
- 4. Ensure that the drain valve is in the CLOSED position.
- 5. Place the sprinkler system in service.
- 6. Installation must comply with NFPA 13, Section 8.16.4.2

Caution:

Automatic sprinkler systems having non-fire protection connection (permitting continual water flow) require dielectric fittings, according to NFPA 13 sect. 4-6, when dissimilar metal piping materials are joined.

Note:

Use a non-hardening pipe joint compound, or teflon tape. Follow the manufacturer's instructions when using grooved pipe couplings.

Listings and Approvals

- 1. Listed by Underwriters' Laboratories Inc. and ULC Listed.
- 2. Factory Mutual Approved.
- 3. NYC MEA 258-93-E

Engineering Specification

[Model CR Commercial Riser Assembly] shall be [UL Listed][ULC Listed] [Factory Mutual (FM) Approved] for horizontal or vertical installation as a one-piece, fabricated assembled unit. The [Model CR Commercial Riser Assembly] shall consist of a (choose one):

- 1¹/₂" (40 mm) cast, non-welded stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, ductile iron body with grooved end connections
- 2¹/₂" (65 mm) cast, non-welded, ductile iron body with grooved end connections
- 3" (80 mm) cast, non-welded, ductile iron body with grooved end connections
- 4" (100 mm) cast, non-welded, ductile iron body with grooved end connections
- 6" (150 mm) cast, non-welded, ductile iron body with grooved end connections
- 8" (200 mm) cast, non-welded, ductile iron body with grooved end connections

having all brass and galvanized trim. The manifold piping shall clearly identify the manifold's pipe size, flow direction, UL Listing/ ULC Listing/ FM Approval, drain, and gauge outlets. A built-in drain port shall be available to permit hydrostatic testing without draining the system. This drain port shall be sized per the following:

- 1"(25mm) for 11/2"(40mm) and 2"(50mm) sizes
- 1¹/₄"(32 mm) for 2¹/₂"(65mm), and 3"(80mm) sizes
- 4" (100 mm) cast, non-welded, ductile iron body with grooved end connections
- 6" (150 mm) cast, non-welded, ductile iron body with grooved end connections
- 8" (200 mm) cast, non-welded, ductile iron body with grooved end connections

Take-out dimensions shall be the same for the $1\frac{1}{2}$ " (40mm) and 2" (50mm) threaded sizes. End-to-end dimensions shall be the same for the 2" (50mm) through 3" (80mm) grooved sizes. Assembly shall have a working pressure rating of [250 psi (17,2 bar) (for $1\frac{1}{2}$ " (40mm) and 2" (50mm) threaded manifold assemblies)] [300 psi (20,7 bar) (for 2" through 3" grooved manifold assemblies)].

End-to-end dimensions shall be the same for the 4" (100mm) through 8" (200mm) grooved sizes. Assembly shall have a working pressure rating of [300 psi (20,7 bar) (for 4" (100mm) through 8" (200mm) grooved manifold assemblies)].

Та	bl	е	3
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Manifold Sizes	Triggering Flow Rate - GPM (LPM)					
1½"(40mm), 2"(50mm), 2½"(65mm) & 3"(80mm)	4 (15) to 10 (38)					
4" (100mm), 6"(150mm), & 8"(200mm)	4 (15) to 10 (38)					

Ordering Information:

Model CR Commercial Riser Assembly Part Number Code Key

1.5NT	В	ר ו	0
1.5MT	T28 (K-2.8) ⁽¹⁾		1
2NT	T42 (K-4.2)		2
2MT	T56 (K-5.6)		3
2G	T80 (K-8.0)		
2.5G	T112 (K-11.2) ⁽³⁾		0 = Assembly without Pressure Relief Kit
3G	T140 (K-14.0) ⁽³⁾		Water Detector - OL & FIVI
4G	T168 (K-16.8) ^{(2) (3)}		1 = Assembly with Pressure Relief Kit
6G	T224 (K-22.4) ^{(2) (3)}		Water Detector - UL & FIVI
86	1252 (K-25.2) ^{(2) (3)}		2 = Assembly without Pressure Relief Kit
$1.5NT = 1^{1}/2^{2}$ (40 mm)	B = Basic Assembly		Water Delector - ULC
NPT Threaded Ends Assembly	T28 = W / K-2.8 Test & Drain Valve		3 = Assembly with Pressure Relief Kit Water Detector - ULC
$1.5MT = 1^{1}/2^{"}$ (40 mm) Metric Threaded Ends Assembly	T42 = W / K-4.2 Test & Drain Valve		
2NT = 2" (50 mm)	T56 = W / K-5.6 Test & Drain Valve		
NPT Threaded Ends Assembly	T80 = W / K-8.0 Test & Drain Valve		
2MT = 2" (50 mm)	T112 = W / K-11.2 Test & Drain Valve ⁽³⁾		
Metric Threaded Ends Assembly	T140 = W / K-14.0 Test & Drain Valve ⁽³⁾		
2G = 2" (50 mm) Grooved Ends Assembly	T168 = W / K-16.8 Test & Drain Valve ^{(2) (3)}		
$2.5G = 2^{1}/2^{\circ}$ (65 mm)	T224= W / K-22.4 Test & Drain Valve(2) (3)		
Grooved Ends Assembly	T252 = W / K-25.2 Test & Drain Valve ^{(2) (3)}		
3G = 3" (80 mm) Grooved Ends Assembly	⁽¹⁾ Not available for 4", 6" and 8" risers.		
4G = 4" (100 mm) Grooved Ends Assembly	 ⁽²⁾ Not available for 11/2" to 3" risers. ⁽³⁾ Not available for 11/2" to 2" threaded & 2" grooved risers. 		
6G = 6" (150mm) Grooved Ends Assembly	For Grooved end Test and Drain valves		
8G = 8" (200 mm) Grooved Ends Assembly	(See note 3)		

Example #1: 1.5NT – B – 1

(1½" (40mm) Model CR Commercial Riser Assembly with NPT female inlet and outlet threads, basic trim with installed Pressure Relief Kit).

Example #2: 3G - T56 - 0

(3"(80mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 5.6 K factor, without a Pressure Relief Kit)

Example #3: 6G - T80 - 0

(6"(150mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 8.0 K factor, without a Pressure Relief 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 300 psi (20,7 bar) 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. If required, Pressure Relief Kits may also be installed in the field. Please contact Reliable's Customer Service Department for details.
- 3. 1¹/₄" and 2" Grooved end Test and Drain valves are available in various orifice size K factor as MTO. Please contact Reliable Service Department for details.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Productsmanufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by



The Reliable Automatic Sprinkler Co., Inc.(800) 431-1588Sales Offices(800) 848-6051Sales Fax(914) 829-2042Corporate Officeswww.reliablesprinkler.comInternet Address



Revision lines indicate updated or new data



Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Model DPV-1 Dry Pipe Valve, External Resetting 2-1/2 thru 6 Inch (DN65 thru DN150) 250 psi (17,2 bar)

General Description

The Tyco[®] Model DPV-1 Dry Pipe Valves are differential valves used to automatically control the flow of water into dry pipe fire protection sprinkler systems upon operation of one or more automatic sprinklers. The DPV-1 also provides for actuation of fire alarms upon system operation. The Model DPV-1 features are as follows:

- External reset.
- 250 psi (17,2 bar) pressure rating.
- Unique offset single clapper design enabling a simple compact valve to minimize installation labor.
- Ductile iron construction to ensure a lightweight valve to minimize shipping cost.
- A variety of inlet and outlet connections.
- Compact, semi-preassembled or fully assembled, and easy to operate valve trim.
- Simple reset procedure through the elimination of priming water.

Dry pipe sprinkler systems are used in unheated warehouses, parking garages, store windows, attic spaces, loading docks, and other areas exposed to freezing temperatures, where water filled pipe cannot be utilized. When set for service, the dry pipe sprinkler system is pressurized with air (or nitrogen). The loss of pressure through an operated automatic sprinkler in response to heat from a fire permits the DPV-1 Dry Pipe Valve to open and allow a flow of water into the sprinkler system piping. Table B establishes the minimum required svstem air pressure that includes a safety factor to help prevent false operations that might occur due to water supply fluctuations.



Available End Connections and Sizes								
	Nominal Valve Size							
End Connection	2-1/2 Inch (DN65)	3 Inch (DN80)	4 Inch (DN100)	6 Inch (DN150)				
Flange x Flange	N/A	N/A	•	•				
Flange x Groove	N/A	N/A	•	•				
Groove x Groove		•	•					
Available								

N/A Not Available

WARNING

The Model DPV-1 Dry Pipe Valves described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices. The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.





Technical Data

Approvals:

UL and C-UL Listed. FM Approved. NYC under MEA 172-02-E (4 and 6 inch).

Dry Pipe Valve:

The Model DPV-1 Dry Pipe Valves are for vertical installations (flow going up), and they are rated for use at a maximum service pressure of 250 psi (17,2 bar). The Valve dimensions are shown in Figure 7.

Flanged connections are available drilled per ANSI, ISO, AS, and JIS specifications (Ref. Table A). The grooved outlet connections, as applicable, are cut in accordance with standard groove specifications for steel pipe. They are suitable for use with grooved end pipe couplings that are listed or approved for fire protection system service. Available combinations of inlet and outlet connections are detailed in the Ordering Procedure section.

Threaded port connections of valves having flanges drilled to ANSI, AS, or JIS specifications are NPT threaded per ANSI Standard B1.20.1. Threaded port connections of valves having flanges drilled to ISO are available either threaded per ISO 7/1 or NPT threaded per ANSI Standard B1.20.1. Valves with NPT threaded ports will readily accept the trim arrangements detailed in Figures 4, 5, and 6.

Components of the DPV-1 Valves are shown in Figure 1. The Body and Handhole Cover are ductile iron. The Handhole Cover Gasket is neoprene, and the Clapper Facing is EPDM. The Air/Water Seat Ring is brass, the Clapper is bronze or aluminum bronze, and both the Clapper Retaining Plate and Latch are bronze. The Hinge Pin is aluminum bronze, and the fasteners for the Handhole Cover are carbon steel.

Valve Trim:

Installation dimensions are given in Figure 7, and the Valve Trim is illustrated in Figures 4, 5, and 6. The Valve Trim forms a part of the laboratory listings and approval of the DPV-1 Valve and is necessary for the proper operation of the DPV-1 Valve. Each package of trim includes the following items:

- Water Supply Pressure Gauge
- System Air Pressure Gauge
- Air Supply Connections
- Main Drain Valve
- Low Body Drain Valve
- Alarm Test Valve
- Automatic Drain Valve
- Drip Funnel
- Connections For Optional Quick
 Opening Device (Accelerator)

NOTE

When the system pressure is greater than 175 psi (12,1 bar), provision is to be made to replace the standard order 300 psi (20,7 bar) Water Pressure gauge with a separately ordered 600 psi (41,4 bar) Water Pressure Gauge.

Air Supply:

Table B shows the system air pressure requirements as a function of the water supply pressure. The air (or nitrogen) pressure in the sprinkler system is recommended to be automatically maintained by using one of the following pressure maintenance devices, as appropriate:

- Model AMD-1 Air Maintenance Device (pressure reducing type).
- Model AMD-2 Air Maintenance Device (compressor control type).
- Model AMD-3 Nitrogen Maintenance Device (high pressure reducing type).

The Pressure Relief Valve provided with the valve trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar). If the normal system air pressure is less than or exceeds 40 psi (2,8 bar), then the pressure Relief Valve must be reset to relieve at a pressure that is in accordance with the Authority Having Jurisdiction.

Quick Opening Device:

As an option, the Model DPV-1 Dry Pipe Valve may be equipped with the Model QRS Electronic Dry Pipe Valve Accelerator (4 and 6 inch sizes) as detailed in Technical Data Sheet TFP1100 or the Model ACC-1 Mechanical Dry Pipe Valve Accelerator (2-1/2, 3, 4, and 6 inch sizes) as detailed in Technical Data Sheet TFP1112.

The QRS or the ACC-1 is used to reduce the time to valve actuation following the operation of one or more automatic sprinklers. In some cases the use of a quick opening device such as the QRS or the ACC-1 may be required to meet the requirements of the National Fire Protection Association to meet water delivery times.

Patents:

U.S.A. Patent No. 6,557,645

Flange Drilling Specification												
Naminal	Nominal Dimensions in Inches and (mm)											
Valve	ANSI B16.1 ¹ (Class 125)			ISO 7005-2 (PN16) ²			JIS B 2210 (10K)			AS 2129 (Table E)		
0120	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N
4 Inch (DN100)	7.50 (190,5)	0.75 (19,0)	8	7.09 (180,0)	0.75 (19,0)	8	6.89 (175,0)	0.59 (15,0)	8	7.00 (178,0)	0.71 (18,0)	8
6 Inch (DN150)	9.50 (241,3)	0.88 (22,2)	8	9.45 (240,0)	0.91 (23,0)	8	9.45 (240,0)	0.75 (19,0)	8	9.25 (235,0)	0.87 (22,0)	8
¹ Same drill ² Same drill	ling as for Al ling as for B	NSI B16.5 (0 S 4504 Sect	Class 15 ion 3.2 (0) and ANSI PN16) and [B16.42 (Cla DIN 2532 (P	ass 150) N16).	B C	Dim. A olt Circle — Diameter	A CONTRACTOR		Qty. N — Number Bolt Hol	of es
	DIN FOR SI	T IENSIONA ELECTION	ABLE AL SPE N OF FI	A CIFICATIO LANGE DI	ONS RILLING		E	Dim. B Bolt Hole —				

TFP1020



The approximate friction losses, based on the Hazen and Williams formula and expressed in equivalent length of Schedule 40 pipe with C=100 are as follows:

2.2 feet for the 2-1/2 inch valve at a typical flow rate of 250 GPM 4.9 feet for the 3 inch valve at a typical flow rate of 350 GPM 8.9 feet for the 4 inch valve at at typical flow rate of 600 GPM 22 feet for the 6 inch valve at a typical flow rate of 1500 GPM

> FIGURE 2 MODEL DPV-1 DRY PIPE VALVES — NOMINAL PRESSURE LOSS VERSUS FLOW —

Operating Principles

The Model DPV-1 Dry Pipe Valve is a differential type valve that utilizes a substantially lower system (air or nitrogen) pressure than the supply (water) pressure, to maintain the set position shown in Figure 3A. The differential nature of the DPV-1 is based on the area difference between the air seat and the water seat in combination with the ratio of the radial difference from the Hinge Pin to the center of the Water Seat and the Hinge Pin to the center of the Air Seat. The difference is such that 1 psi (0,07 bar) of system air pressure can hold approximately 5.5 psi (0,38 bar) of water supply pressure.

Table B establishes the minimum required system air pressure that includes a safety factor to help prevent false operations that occur due to water supply fluctuations.

The Intermediate Chamber of the DPV-1 is formed by the area between the Air Seat and Water Seat as shown in Figure 3B. The Intermediate Chamber normally remains at atmospheric pressure through the Alarm Port connection and the valve trim to the normally open Automatic Drain Valve (Fig. 4, 5, or 6). Having the Intermediate Chamber, Figure 3B, open to atmosphere is critical to the DPV-1 Valve remaining set, otherwise the full resulting pressure of the System air pressure on top of the Clapper Assembly cannot be realized.

For example and assuming a water supply pressure of 100 psi (6,9 bar), if the system air pressure is 25 psi (1,7 bar) and there was 15 psi (1,0 bar) pressure trapped in the Intermediate Chamber, the resulting pressure across the top of the Clapper would only be 10 psi (0,7 bar). This pressure would be insufficient to hold the Clapper Assembly closed against a water supply pressure of 100 psi (6,9 bar). It is for this reason that the plunger of the Automatic Drain Valve must be depressed during several of the resetting steps, as well as during inspections, making certain that the Automatic Drain Valve is open.

When one or more automatic sprinklers operate in response to a fire, air pressure within the system piping is relieved through the open sprinklers. When the air pressure is sufficiently reduced, the water pressure overcomes the differential holding the Clapper Assembly closed and the Clapper Assembly swings clear of the water seat, as shown in Figure 3C, This action permits water flow into the system piping and subsequently to be discharged from any open sprinklers. Also, with the Clapper Assembly open, the intermediate chamber is pressurized and water flows through the alarm port (Ref. Figure 3B) at the rear of the DPV-1 Valve to actuate system water flow alarms. The flow from the alarm port is also sufficient to close the otherwise normally open Automatic Drain Valve in the valve trim.

After a valve actuation and upon subsequent closing of a system main control valve to stop water flow, the Clapper Assembly will latch open as shown in Figure 3D. Latching open of the DPV-1 will permit complete draining of the system (including any loose scale) through the main drain port.

During the valve resetting procedure and after the system is completely drained, the external reset knob can be easily depressed to externally unlatch the Clapper Assembly as shown in Figure 3E. As such, the Clapper Assembly is returned to its normal set position to facilitate setting of the dry pipe sprinkler system, without having to remove the Handhole Cover.

Maximum Water Supply Pressure, psi	System Air Pressure Range, psi
20	10
60	15 - 23
80	20 - 28
100	25 - 33
120	30 - 38
145	35 - 43
165	40 - 48
185	45 - 53
205	50 - 58
225	55 - 63
250	60 - 68
TAI	BLE B

SYSTEM AIR PRESSURE REQUIREMENTS











FIGURE 5 — Part 1 of 2 4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVES — EXPLODED VIEW OF VALVE TRIM —





FIGURE 6 — Part 1 of 2 6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVES — EXPLODED VIEW OF VALVE TRIM





Installation

NOTES

Proper operation of the Model DPV-1 Dry Pipe Valve depends upon its trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the appropriate trim diagram may prevent the DPV-1 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

Failure to latch open the Clapper Assembly prior to a system hydrostatic test may result in damage to the Clapper Assembly.

The DPV-1 Valve must be installed in a readily visible and accessible location.

The DPV-1 Valve and associated trim must be maintained at a minimum temperature of 40°F/4°C.

Heat tracing of the DPV-1 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

The Model DPV-1 Dry Pipe Valve is to be installed in accordance with the following criteria:

Step 1. All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.

Step 2. The DPV-1 Valve must be trimmed in accordance with Figures 4, 5, or 6, as applicable. If the DPV-1 is to be equipped with a Dry Pipe Valve Accelerator, refer to the Technical Data Sheet TFP1100 for the Model QRS Electronic Dry Pipe Valve Accelerator or TFP1112 for the Model ACC-1 Mechanical Dry Pipe Valve Accelerator.

Step 3. Care must be taken to make sure that check valves, strainers, globe valves, etc. are installed with the flow arrows in the proper direction.

Step 4. Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.

Step 5. The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel. The Low Body Drain Valve (Fig. 4, 5, or 6) may be piped so as to discharge into the Drip Funnel or to a separate drain.

Step 6. Suitable provision must be made for disposal of drain water. Drainage water must be directed such

that it will not cause accidental damage to property or danger to persons.

Step 7. Unused pressure alarm switch and/or water motor alarm connections must be plugged.

Step 8. The Pressure Relief Valve provided with the Valve Trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar), which can typically be used for a maximum normal system air pressure of 40 psi (2,8 bar). The Pressure Relief Valve may be reset to a lower or higher pressure; however, it must be be reset to relieve at a pressure which is in accordance with the requirements of the Authority Having Jurisdiction.

To reset the Pressure Relief Valve, first loosen the jam nut and then adjust the cap accordingly — clockwise for a higher pressure setting or counterclockwise for a lower pressure setting. After verifying the desired pressure setting, tighten the jam nut.

Step 9. Installation of an Air Maintenance Device, as described in the Technical Data Section, is recommended.

Step 10. An Inspector's Test Connection as required By NFPA 13 must be provided on the system piping at the most remote location from the Model DPV-1 Valve.

Step 11. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

Step 12. Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the Clapper Assembly is to be manually latched open (Ref. Fig. 3D); the Automatic Drain Valve (Fig. 4, 5, or 6) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (Item 13, Fig. 4; Item 15, Fig. 5; or Item 15, Fig. 6) is to be temporarily replaced with a 1/4 inch NPT plug, and the Handhole Cover Bolts are to be tightened using a crossdraw sequence.

Valve Setting Procedure

Steps 1 through 11 are to be performed when initially setting the Model DPV-1 Dry Pipe Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

NOTES

If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, refer to its resetting instructions before resetting the DPV-1. Refer to TFP1100 for the QRS or TFP1112 for the ACC-1.

Based on the instructions provided, reset the Accelerator at the appropriate time during the resetting of the DPV-1.

Step 1. Close the Main Control Valve, and close the Air Supply Control Valve (Fig. 4, 5, or 6). If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, remove the Dry Pipe Valve Accelerator from service in accordance with its Technical Data Sheet (Refer to TFP1100 for the QRS or TFP1112 for the ACC-1).

Step 2. Open the Main Drain Valve (Fig. 4, 5, or 6) and all auxiliary drains in the system. Close the auxiliary drain valves after water ceases to discharge. Leave the Main Drain Valve open.

Step 3. Depress the plunger of the Automatic Drain Valve (Fig. 4, 5, or 6) to verify that it is open and that the DPV-1 Valve is completely drained.

Step 4. Open the Optional Alarm Control Valve (Fig. 4, 5, or 6), as applicable, if it was closed to silence local alarms.

Step 5. As necessary, replace all sprinklers that have operated. Replacement sprinklers must be of the same type and temperature rating as those which have operated.

NOTE

In order to prevent the possibility of a subsequent operation of an overheated solder type sprinkler, any solder type sprinklers which were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

Step 6. Push down on the Reset Knob (Fig. 3E) to allow the Clapper Assembly to reseat.

Step 7. Pressurize the system with air (or nitrogen) to 10 psi (0,7 bar), and then individually open all auxiliary drain valves in the system piping to drain any remaining water in trapped sections. Close each drain valve as soon as water ceases to discharge. Also partially open the Low Body Drain Valve (Fig. 4, 5, or 6) to assure that the riser is completely drained. Close the Low Body Drain Valve as soon as water ceases to discharge.

Step 8. Refer to Table B and then restore the system to the normal system air pressure as necessary to hold the DPV-1 Valve closed.

Step 9. Depress the plunger on the Automatic Drain Valve to make sure it is open and that there is no air discharging.

The absence of air discharging from the Automatic Drain Valve is an indication of a properly set air seat within the DPV-1 Valve. If air is discharging, refer to the Care and Maintenance section under Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

Step 10. Partially open the Main Control Valve. Slowly close the Main Drain Valve as soon as water discharges from the drain connection.

Depress the plunger on the Automatic Drain Valve to make sure that it is open and that there is no water discharging. The absence of water discharging from the Automatic Drain Valve is an indication of a properly set water seat within the DPV-1 Valve. If water is discharging, refer to the Care and Maintenance section under the Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

If there are no leaks, the DPV-1 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

NOTE

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

Step 11. Once a week after a valve is reset following an operational test or system operation, the Low Body Drain Valve (and any low point drain valves) should be partially opened (and then subsequently closed) to relieve drainback water. Continue this procedure until drain-back water is no longer present.

Care and Maintenance

The following procedures and inspections should be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected.

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

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

NOTES

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

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

Annual Operation Test Procedure

Proper operation of the DPV-1 Valve (i.e., opening of the DPV-1 Valve during a fire condition) should be verified at least once a year as follows:

Step 1. If water must be prevented from flowing beyond the riser, perform the following steps.

- Close the Main Control Valve.
- Open the Main Drain Valve.
- Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
- Close the Main Drain Valve.

Step 2. Open the system's Inspector's Test Connection.

Step 3. Verify that the DPV-1 Valve

has operated, as indicated by the flow of water into the system and that all waterflow alarms operate properly.

Step 4. Close the system's Main Control Valve.

Step 5. Reset the DPV-1 Valve in accordance with the Valve Setting Procedure.

NOTE

It is recommended that the requirement of NFPA 25 to annually inspect the inside of the valve be performed at this time and prior to resetting the DPV-1 Valve. Refer to the Automatic Drain Valve Inspection sub-section Steps 2 through 5 for instructions with regard to the inspection of the Clapper Facing.

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms should be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Waterflow Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Water Pressure Inspection

The Water Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system water pressure is being maintained.

Air Pressure Inspection

The Air Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system air pressure is being maintained.

Automatic Drain Valve Inspection

The Automatic Drain Valve should be inspected monthly (per NFPA 25) by depressing the plunger and checking to ensure that the Automatic Drain Valve is not discharging water and/or air. A discharge of water and/or air is an indication that the air and/or air is eats are leaking, which could subsequently cause a false operation should the intermediate chamber become inadvertently pressurized.

If leakage is present, take the DPV-1 Valve out of service (i.e., close the main control valve, open the main drain valve, close the air supply control valve, remove the Dry Pipe Valve Accelerator from service, as applicable, in accordance with its Technical Data Sheet (Refer to TFP1100 for the QRS or TFP1112 for the ACC-1), and open the Inspector's Test Connection to relieve the system air pressure to 0 psig as indicated on the System Air Pressure Gauge), and then after removing
the Handhole Cover, perform the following steps:

Step 1. Make sure that the Seat Ring is clean and free of any nicks or significant scratches.

Step 2. Remove the Clapper Assembly from the valve by first pulling out the Hinge Pin.

Step 3. Disassemble the Clapper Facing Retainer from the Clapper so that the Clapper Facing can be removed and inspected. Make sure that the Clapper Facing does not show signs of compression set, damage, etc. Replace the Clapper Facing if there is any signs of wear.

Step 4. Clean the Clapper Facing, Clapper, and Clapper Facing Retainer, and then reassemble the Clapper Assembly.

Step 5. Reinstall the Clapper Assembly with its Hinge Pin and then reinstall the Handhole Cover.

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

NOTE

Refer to Table A for Flange Drilling Specifications.

Part Numbers for factory pre-trimmed Model DPV-1 Valves are provided in the Price Book.

Standard DPV-1 Dry Pipe Valve (American Standard Flange Drilling, Threaded Ports, and Groove Outside Diameter, as applicable):

Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify inlet x outlet) end connections, P/N (specify).

2-1/2 Inch (DN65)

G x G,	
2.88 inch (73,1	
mm) O.D.	
Groove x 2.88	

inch (73,1 mm) O.D. Groove P/N 52-310-1-925

3 Inch (DN80) G x G.

ЭхG,	
3.50 inch (88,9	
mm) O.D.	
Groove x 3.50	
inch (88,9 mm)	
O.D. Groove	P/N 52-310-1-930

4 Inch (DN100)

GxG,		
4 5 4	 / 4 4	0

4.50 Inch (114,3	
mm) O.D.	
Groove x 4.50	
inch (114,3 mm)	
O.D. Groove	P/N 52-310-1-940
F x G.	
ANSI Drilled	
Flange x 4.50	
inch (114.3 mm)	
O.D. Groove	P/N 52-310-1-440
F x F.	
ANSI Drilled	
Flange x ANSI	
Drilled Flanged	P/N 52-310-1-040
Dillou Flangou	

6 Inch (DN150)

P/N 52-310-1-960
P/N 52-310-1-460
P/N 52-310-1-060

Standard Galvanized DPV-1 Trim (Ref. Figure F):

Specify: 2-1/2 and 3 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-005.

Specify: 4 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-001.

Specify: 6 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-002.

Optional Accelerator:

Model QRS Electronic Accelerator (Details provided in TFP1100)

Specify: Model QRS Electronic Dry Pipe Valve Accelerator Package, P/N 52-312-2-101.

Model ACC-1 Mechanical Accelerator (Details provided in TFP1112)

Specify: Model ACC-1 Dry Pipe Accelerator, P/N 52-311-1-001, and

Galvanized Accelerator Trim for Model DPV-1 Dry Pipe Valve, P/N 52-311-2-010.

Optional 600 PSI Water Pressure Gauge:

Specify: 600 PSI Water Pressure Gauge, P/N 92-343-1-004.

Accessories:

Order the Technical Data Sheets for the following, as applicable, for details and additional accessories:

Model PS10-2A Potter Electric Waterflow	
Pressure Alarm Switch Model WMA1	P/N 54-281-1-002
Water Motor Alarm	P/N 52-630-1-001
Air Maintenance Device	P/N 52-324-2-002
Model AMD-2 Air Maintenance Device	P/N 52-326-2-001
Model AMD-3 Nitrogen Maintenance De-	
vice	P/N 52-328-2-001

Replacement Valve Parts:

Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figure 1A and 1B).

Replacement Trim Parts :

Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figure 4, 5, or 6, as applicable).

Weights:

The following are the nominal weights for the valves and trim:

2-1/2 Inch (DN65) Model DPV-1 G x G Dry Pipe Valve 3 Inch (DN80) Model DPV-1	37 lbs. (17 kg)
G x G Dry Pipe Valve	38 lbs. (18 kg)
2-1/2 & 3 Inch (DN65/80) Valve Trin	23 lbs. (11 kg)
4 Inch (DN100)	
Model DPV-1	
G x G Dry Pipe Valve	57 lbs. (26 kg)
4 Inch (DN100) Model DRV 1	
F x G Drv Pipe Valve	67 lbs. (31 ka)
4 Inch (DN100)	er
Model DPV-1	
F x F Dry Pipe Valve	77 lbs. (36 kg)
4 Inch (DIN100) Valve Trim	30 lbs. (14 kg)
6 Inch (DN150)	
Model DPV-1	
G x G Dry Pipe Valve	95 lbs. (44 kg)
6 Inch (DN150) Model DDV (1	
F x G Dry Pipe Valve	108 lbs (50 kg)
6 Inch (DN150)	(oo ng)
Model DPV-1	
F x F Dry Pipe Valve	121 lbs. (56 ka)

Other DPV-1 Dry Pipe Valves:

NOTES

6 Inch (DN150) Valve Trim 30 lbs. (14 kg)

Other DPV-1 Dry Pipe Valves are valves ordered with a any combination of flange, threaded ports, or groove outside diameter not offered under "Standard DPV-1 Dry Pipe Valve" offerings.

Valves with NPT threaded ports are intended for use with the "Standard Galvanized DPV-1 Valve Trim" offered and detailed in this document. Valves with ISO threaded ports are intended for use with special order trim that is provided by local distributors to meet the specific needs of certain localities. Please contact your local distributor regarding valves and valve trim for specific localities.

Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify inlet x outlet) connections with (specify NPT or ISO) threaded ports, P/N (specify).

Part Numbers For Other 2-1/2 Inch (DN65) Dry Pipe Valves:
Valves with NPT Ports G x G, 3.00"(76,1 mm) Outside Dia. Groove x 3.00"(76,1 mm) Outside Dia. Groove
Valves with ISO Ports G x G, 2.88"(73,0 mm) Outside Dia. Groove x 2.88"(73,0 mm) Outside Dia. Groove P/N 52-309-1-920 G x G, 3.00"(76,1 mm) Outside Dia. Groove x 3.00"(76,1 mm) Outside Dia. Groove

Part Numbers For Other 3 Inch (DN80) Dry Pipe Valves:

Valves with ISO Ports G x G,

x G,
3.50"(88,9
mm) Outside
Dia. Groove x
3.50"(88,9
mm) Outside
Dia. Groove P/N 52-309-1-922

Part Numbers For Other 4 Inch (DN100) Dry Pipe Valves:			
Valves with NPT Ports F x G, ISO Flange x 4.50"(114,3 mm) Outside Dia. GrooveP/N 52-309-1-253 F x G, AS Flange x 4.50"(114,3 mm) Outside Dia. GrooveP/N 52-309-1-613 F x G, JIS Flange x 4.50"(114,3 mm) Outside Dia. GrooveP/N 52-309-1-813 F x F, ISO Flange x ISO Flange x ISO Flange x AS Flange x			
JIS Flange x JIS FlangeP/N 52-309-1-713			
Valves with ISO Ports G x G, 4.50"(114,3 mm) Outside Dia. Groove x 4.50"(114,3 mm) Outside Dia. GrooveP/N 52-309-1-923 F x G, ISO Flange x 4.50"(114,3 mm) Outside			
mm) Outside Dia. GrooveP/N 52-309-1-213 F x F, ISO Flange x ISO FlangeP/N 52-309-1-113			

Part Numbers For Other 6 Inch (DN150) Dry Pipe Valves:

Valves with NPT Ports
G x G,
6.50"(165,1
mm) Outside
Dia. Groove x
6.50"(165,1
Dia Granica P/N 52 300 1 035
Ex G
ANSI Flange x
6.50"(165,1
mm) Outside
Dia. Groove
F x G,
150 Flange x 6.62"(168.3
mm) Outside
Dia. Groove
F x G,
ISO Flange x
6.50"(165,1
mm) Outside Dia Crassia D/N 52 200 1 225
F x G
AS Flance x
6.62"(168,3
mm) Outside
Dia. Groove
F x G,
AS Flange X 6 50"(165 1
mm) Outside
Dia. Groove
F x G,
JIS Flange x
6.62"(168,3
mm) Outside
Dia. Groove
IS Flance v
6.50"(165.1
mm) Outside
Dia. Groove
F x F,
ISO Flange x
ISO Flange
AS Flange x
AS Flange
F x F,
JIS Flange x
JIS Flange
Valves with ISO Ports
G X G, 6 62"/168 2
mm) Outside
Dia. Groove x
6.62"(168,3
mm) Outside
Dia. Groove
G x G,
6.50"(165,1
nim) Outside Dia Groove x
6.50"(165.1
mm) Outside
Dia. Groove
F x G,
ISO Flange x
0.02 (168,3 mm) Outside
Dia Groove P/N 52-309-1-215
F x G,
ISO Flange x
6.50"(165,1
mm) Outside
Dia. Groove
ISO Flange v
ISO Flange P/N 52-309-1-115



Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Series TY-FRB — 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The Tyco[®] Series TY-FRB, 2.8, 4.2, 5.6, and 8.0 K-factor, Upright and Pendent Sprinklers described in this data sheet are quick response - standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. It uses either a two-piece Style 10 (1/2 inch NPT) or Style 40 (3/4 inch NPT) Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush pendent position, or a two-piece Style 20 (1/2 inch NPT) or Style 30 (3/4 inch NPT) Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush pendent position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be ob-

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

tained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

An intermediate level versions of the Series TY-FRB Pendent Sprinklers are detailed in Technical Data Sheet TFP356, and Sprinkler Guards are detailed in Technical Data Sheet TFP780

WARNINGS

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.





Model/Sprinkler Identification Numbers

TY1131 -	Upright	2.8K,	1/2"	NPT
TY1231 -	Pendent	2.8K,	1/2"	NPT
TY2131 -	Upright	4.2K,	1/2"	NPT
TY2231 -	Pendent	4.2K,	1/2"	NPT
TY3131 -	Upright	5.6K,	1/2"	NPT
TY3231 -	Pendent	5.6K,	1/2"	NPT
TY4131 -	Upright	8.0K,	3/4"	NPT
TY4231 -	Pendent	8.0K,	3/4"	NPT
TY4831-	Upright	8.0K,	1/2"	NPT
TY4931-	Pendent	8.0K,	1/2"	NPT













Technical Data

Approvals

UL and C-UL Listed. FM, LPCB, and NYC Approved. (Refer to Table A and B for complete approval information including corrosion resistant status.)

Maximum Working Pressure Refer to Table C.

Discharge Coefficient

K = 2.8 ĞPM/psi^{1/2} (40,3 LPM/bar^{1/2}) K = 4.2 GPM/psi^{1/2} (60,5 LPM/bar^{1/2}) K = 5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2}) K = 8.0 GPM/psi^{1/2} (115,2 LPM/bar^{1/2})

Temperature Ratings

Refer to Table A and B

Finishes

Sprinkler: Refer to Table A and B. Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated.

Physical Characteristics

Frame Bronze
Button Brass/Copper
Sealing Assembly
Beryllium Nickel w/Teflon†
Bulb Glass
Compression Screw Bronze
Deflector Copper/Bronze
Bushing (K=2.8) Bronze

Operation

The glass Bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The Series TY-FRB Pendent and Upright Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, is to be used for recessed pendent installations.

				SPRINKLER FINISH (See Note 7)					
К	TYPE	TEMP.	BULB LIQUID	NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER			
		135°F/57°C	Orange						
	PENDENT (TV1231)	155°F/68°C	Red	1, 2, 3, 5					
	and	175°F/79°C	Yellow						
	UPRIGHT (TV1131)	200°F/93°C	Green						
2.8	(111131)	286°F/141°C	Blue						
NPT		135°F/57°C	Orange						
	PENDENT	155°F/68°C	Red						
	(TY1231)*	175°F/79°C	Yellow						
	Figure 6	200°F/93°C	Green		1, 2, 5				
	RECESSED PENDENT (TY1231)** Figure 7	135°F/57°C	Orange						
		155°F/68°C	Red						
		175°F/79°C	Yellow						
		200°F/93°C	Green						
		135°F/57°C	Orange						
	PENDENT (TY2231) and	155°F/68°C	Red						
		175°F/79°C	Yellow						
	UPRIGHT (TY2131)	200°F/93°C	Green						
4.2	(112131)	286°F/141°C	Blue	1.2					
NPT		135°F/57°C	Orange		,				
	PENDENT	155°F/68°C	Red						
	(TY2231)*	175°F/79°C	Yellow						
	Figure 8	200°F/93°C	Green						
		135°F/57°C	Orange						
	PENDENT	155°F/68°C	Red						
	(TY2231)** Figure 9	175°F/79°C	Yellow						
		200°F/93°C	Green						

Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers.
 Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Re-

sponse Sprinklers. 3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.

5. Approved by the City of New York under MEA 354-01-E.

7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprin-

klers are UL and C-UL Listed as Corrosion Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.
** Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment

Recessed Escutcheon, as applicable. *** Frame and Deflector only. Listings and approvals apply to color (Special Order). N/A: Not Available

TABLE A LABORATORY LISTINGS AND APPROVALS 2.8 AND 4.2 K-FACTOR SPRINKLERS

				SPRINKLER FINISH (See Note 8)			
к	TYPE	TEMP.	BULB LIQUID	NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER	LEAD COATED
		135°F/57°C	Orange			-	
	PENDENT (TY3231)	155°F/68°C	Red		0 0 4 5 0	7	4.0.0.5
	and	175°F/79°C	Yellow		, 2, 3, 4, 5, 6,	1	1, 2, 3, 5
		200°F/93°C	Green				
5.6	(113131)	286°F/141°C	Blue				
NPT		135°F/57°C	Orange				
		155°F/68°C	Red		4045		N1/A
	(TY3231)*	175°F/79°C	Yellow		1, 2, 4, 5		IN/A
	Figure 10	200°F/93°C	Green				
		135°F/57°C	Orange				
		155°F/68°C	Red				N1/A
	(TY3231)** Figure 11	175°F/79°C	Yellow	1, 2, 3, 4, 5		IN/A	
		200°F/93°C	Green				
	PENDENT (TY4231) and UPRIGHT (TY4131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			
		155°F/68°C	Red			1 2 5	
		175°F/79°C	Yellow		7	1, 2, 5	
		200°F/93°C	Green				
8.0 3/4"		286°F/141°C	Blue				
NPT		135°F/57°C	Green	4 2 4 5			
	PENDENT	155°F/68°C	Orange			NI/A	
	(TY4231)*	175°F/79°C	Red		1, 2, 4, 5		IN/A
	Figure 12	200°F/93°C	Yellow				
		135°F/57°C	Orange				
	PENDENT	155°F/68°C	Red		1 2 2 4 5		NI/A
	(TY4231)**	175°F/79°C	Yellow		1, 2, 3, 4, 5		IN/A
	Figure 13	200°F/93°C	Green				
		135°F/57°C	Orange				
80	(TY4931)	155°F/68°C	Red				1 2 5
0.0 1/2"	and	175°F/79°C	Yellow		1, 2, 4, 5, 6		1, 2, 3
NPT	UPRIGHT	200°F/93°C	Green				
	(114031)	286°F/141°C	Blue				

1. Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers.

2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Response Sprinklers.

3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.

4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007k/04) as Quick Response Sprinklers; however, the LPCB does not rate the thermal sensitivity of recessed sprinklers.

5. Approved by the City of New York under MEA 354-01-E.

VdS Approved (For details contact Tyco Fire & Building Products, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-53-428-3377).
 Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.

8. Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as a Corrosion Resistant Sprinklers.

Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.

* Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.

*** Frame and Deflector only. Listings and approvals apply to color (Special Order).

N/A: Not Available

TABLE B LABORATORY LISTINGS AND APPROVALS 5.6 AND 8.0 K-FACTOR SPRINKLERS

				SPRIN	KLER FINISH	
к	ТҮРЕ	NATURAL BRASS	CHROME PLATED	WHITE POLYESTER	LEAD COATED	
2.8	PENDENT (TY3231) and UPRIGHT (TY3131)	17	5 PSI (12,1 B <i>i</i>	AR)	N/A	
1/2" NPT	RECESSED PENDENT (TY323)					
4.2	PENDENT (TY4231) and UPRIGHT (TY4131)	17:	5 PSI (12,1 B/	AR)	N/A	
3/4" NPT	RECESSED PENDENT (TY4231)					
5.6	PENDENT (TY3231) and UPRIGHT (TY3131)	250 PSI (17,2 BAR) OR		AR)	175 PSI (12,1 BAR)	
1/2" NPT	RECESSED PENDENT (TY3231)	175 PSI (12,1 BAR) (SEE NOTE 1)			N/A	
8.0	PENDENT (TY4231) and UPRIGHT (TY4131)	17	5 PSI (12,1 B/	AR)	175 PSI (12,1 BAR)	
3/4" NPT	RECESSED PENDENT (TY4231)				N/A	
8.0 1/2" NPT	PENDENT (TY4931) and UPRIGHT (TY4831)	17	5 PSI (12,1 B/	AR)	175 PSI (12,1 BAR)	

1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and , the Approval by the City of New York.

TABLE C, MAXIMUM WORKING PRESSURE

Installation

The Series TY-FRB Sprinklers must be installed in accordance with the following instructions:

NOTES

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 286°F/141°C temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. A leak tight 3/4 inch NPT sprinkler joint should be obtained with a torque of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install sprinklers with 3/4 NPT connections. Higher levels of torque may distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

The Series TY-FRB Pendent and Upright Sprinklers must be installed in accordance with the following instructions.

Step 1. Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed in the upright position.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten

the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 14). With reference to Figures 1, 2, 3, 4, and 5, the W-Type 6 Sprinkler Wrench is to be applied to the sprinkler wrench flats.

The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

Step A. After installing the Style 10. 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and with pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 15). With reference to Figure 1, 2, 3, and 4, the W-Type 7 Recessed



Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step C. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The Series TY-FRB Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

Before closing a fire protection system main control valve for maintenance

work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

The owner must assure that the sprinklers are not used for hanging of any objects; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise

altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been com-



	P/N 57 —	· XXX — X ·	— XX
		MODEL/SIN	
330	2.8K UPRIGHT (1/2"NPT)	TY1131	
331	2.8K PENDENT (1/2"NPT)	TY1231	
340	4.2K UPRIGHT (1/2"NPT)	TY2131	
341	4.2K PENDENT (1/2"NPT)	TY2231	
370	5.6K UPRIGHT (1/2"NPT)	TY3131	
371	5.6K PENDENT (1/2"NPT)	TY3231	
390	8.0K UPRIGHT (3/4"NPT)	TY4131	
391	8.0K PENDENT (3/4"NPT)	TY4231	
360	8.0K UPRIGHT (1/2"NPT)	TY4831*	
361	8.0K PENDENT (1/2"NPT)	TY4931*	

_			_	
_				
	SPRINKI FR	l		TEMPERATURE RATING
	OFRINKLER		135	135°F/57°C
1	NATURAL BRASS		155	155°F/68°C
4	WHITE POLYESTER		175	175°F/79°C
3	WHITE (RAL9010)*		200	200°F/93°C
9	CHROME PLATED		286	286°F/141°C
7	LEAD COATED	-		

* Eastern Hemisphere sales only.

TABLE D PART NUMBER SELECTION SERIES TY-FRB PENDENT AND UPRIGHT SPRINKLERS

Х

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties. express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connections:

Specify: (Specify Model/SIN), Quick Response, (specify K-factor), (specify temperature rating), Series TY-FRB (specify Pendent or Upright) Sprinkler with (specify type of finish or coating), P/N (specify from Table D).

Recessed Escutcheon:

Specify: Style (10, 20, 30, or 40) Recessed Escutcheon with (specify*) finish, P/N (specify*).

* Refer to Technical Data Sheet TFP770.

Sprinkler Wrench:

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001.

tuco Fire Suppression & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500 Email: techserv@tycofp.com

Series RFII — 5.6 K-factor "Royal Flush II" Concealed Pendent Sprinklers Quick & Standard Response, Standard Coverage

General Description

The Tyco[®] Series RFII Quick Response (3-mm bulb) and Standard Response (5-mm bulb), 5.6 K-Factor, "Royal Flush II" Concealed Pendent Sprinklers are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. These sprinklers are optimal for architecturally sensitive areas such as hotel lobbies, office buildings, churches, and restaurants.

Each sprinkler includes a Cover Plate/ Retainer Assembly and a Sprinkler/ Support Cup Assembly. The separable, two-piece assembly design provides the following benefits:

- Allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling.
- Permits the removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers.
- Provides for 1/2 inch (12,7 mm) of vertical adjustment to allow a measure of flexibility in determining the length of fixed piping to cut for the sprinkler drops.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely. The Series RFII Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed during installation and replaced to help protect the sprinkler during ceiling installation or finish. The tip of the Protective Cap can be used to mark the center of the ceiling hole into plaster board or ceiling tiles by gently pushing the ceiling product against the Protective Cap. When ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed.

As an option, the Series RFII Standard Response (5-mm bulb) "Royal Flush II" Concealed Pendent Sprinklers can be fitted with a silicone Air and Dust Seal. (Refer to Figure 5.) The Air and Dust Seal is intended for sensitive areas where it is desirable to prevent air and dust from the area above the ceiling to pass through the cover plate.

NOTICE

The Series RFII Concealed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.



Sprinkler Identification Number (SIN)

 $\begin{array}{l} TY3531 - 3 \text{ mm bulb} \\ TY3551 - 5 \text{ mm bulb} \end{array}$

Technical Data

Sprinkler Approvals

Approvals apply only to the service conditions indicated in the Design Criteria section.

- TY3531 (3-mm Bulb) is UL Listed, C-UL Listed, LPCB Approved (Ref. No. 094a/10), VdS Approved (Certificate No. G 4090007), and NYC Approved (MEA 353-01-E) as Quick Response.
- TY3531 (3-mm Bulb) is FM Approved as Standard Response.

Factory Mutual does not approve any concealed sprinklers for quick response.

 TY3551 (5-mm Bulb) is UL Listed, C-UL Listed, FM Approved, LPCB Approved (Ref. No. 094a/9), and NYC Approved (MEA 353-01-E) as Standard Response.

Approvals for Air and Dust Seal

UL and C-UL Listed for use with the RFII Standard Response Concealed Sprinkler (TY3551).

Maximum Working Pressure

Maximum 250 psi (17,3 bar) by UL, C-UL, and NYC

Maximum 175 psi (12,1 bar) by FM, VdS, and LPCB

Temperature Rating

155°F/68°C Sprinkler with 139°F/59°C Plate

200°F/93°C Sprinkler with 165°F/74°C Plate

Discharge Coefficient

K= 5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Adjustment

1/2 inch (12,7 mm)

Finishes

See the Ordering Procedure section.

Physical Characteristics

Frame Bronze
Support Cup Chrome Plated Steel
Guide Pins Stainless Steel
Deflector Bronze
Compression Screw Brass
BulbGlass
CapBronze or Copper
Sealing AssemblyBeryllium
Nickel w/ Teflon [†]
Cover Plate Brass
Retainer Brass
Ejection Spring Stainless Steel



Design Criteria

The Tyco[®] Series RFII Concealed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 and VdS Approval is based on the CEA 4001.

For more information on LPCB and VdS Approvals, contact Tyco Fire Suppression & Building Products at the following office:

Enschede, Netherlands Telephone: 31-53-428-4444 Fax: 31-53-428-3377

The Series RFII Concealed Pendent Sprinklers are only listed and approved with the Series RFII Concealed Cover Plates having a factory applied finish.

NOTICE

Do not use the Series RFII in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Sprinkler/Support Cup Assembly can delay sprinkler operation in a fire situation.





Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector—supported by the Guide Pins—then drops down to its operational position.

The glass Bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb, activating the sprinkler and allowing water to flow.



Installation

The Tyco[®] Series RFII must be installed in accordance with the following instructions.

NOTICE

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 155°F/68°C and 3/32 inch (2,4 mm) for the 200°F/93°C temperature ratings.

Obtain a 1/2 inch NPT sprinkler joint by applying a minimum to maximum torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Sprinkler by under- or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

Step 1. Install the sprinkler only in the pendent position with the center-line of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

Step 3. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 4. Wrench-tighten the sprinkler using only the RFII Sprinkler Wrench. (Refer to Figure 3.) Apply the RFII Sprinkler Wrench to the Sprinkler as shown in Figure 3.

Step 5. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. (Refer to Figure 4.) The Protective Cap helps prevent damage to the Deflector and Arms during ceiling installation and/or finish. You can also use the Protective Cap to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

NOTICE

As long as the Protective Cap remains in place, the system is considered "Out of Service".

Step 6. After the ceiling has been completed with the 2-1/2 inch (63,5 mm) diameter clearance hole and in preparation for installing the Cover Plate/Retainer Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely.

If the Sprinkler is damaged and the Deflector does not move up and down freely, replace the entire Sprinkler.

Do not attempt to modify or repair a damaged sprinkler.

Step 7. When installing an Air and Dust Seal, refer to Figure 5; otherwise, proceed to Step 8. To attach the Air and Dust Seal, verify the angle of the outside edge of the seal is oriented according to Figure 5. Start the edge of the Retainer in the grooved slot of the Air and Dust Seal and continue around the retainer until the entire Air and Dust Seal is engaged.

Step 8. Screw on the Cover Plate/ Retainer Assembly until the Retainer (shown in Figure 2) or the Air and Dust Seal (shown in Figure 5) contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If you cannot engage the Cover Plate/Retainer Assembly with the Support Cup or you cannot engage the Cover Plate/Retainer Assembly sufficiently to contact the ceiling, you must reposition the Sprinkler Fitting.

Care and Maintenance

The Tyco[®] Series RFII must be maintained and serviced in accordance with the following instructions.

NOTICE

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

Absence of the Cover Plate/Retainer Assembly can delay sprinkler operation in a fire situation.

When properly installed, there is a nominal 3/32 inch (2,4 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 2. This air gap is necessary for proper operation of the sprinkler. If the ceiling requires repainting after sprinkler installation, ensure that the new paint does not seal off any of the air gap.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Replace sprinklers that:

- are leaking or exhibiting visible signs of corrosion.
- were modified or over-heated.

Never paint, plate, coat, or otherwise alter automatic sprinklers after they leave the factory. Never repaint factory-painted Cover Plates. If necessary, replace them with factory-painted units. Non-factory applied paint can adversely delay or prevent sprinkler operation in the event of a fire.

Exercise care to avoid damage to sprinklers before, during, and after installation. Replace sprinklers damaged by dropping, striking, wrench twisting, wrench slipping, or the like. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Refer to the Installation section.)

If you must remove a sprinkler, do not reinstall it or a replacement without reinstalling the Cover Plate/Retainer Assembly. If a Cover Plate/Retainer Assembly becomes dislodged during service, replace it immediately.

Responsibility lies with sprinkler owners for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (for example, NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national code.



Limited Warranty

Products manufactured by Tyco Fire Suppression & Building Products (TFSBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFSBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFSBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFSBP was informed about the possibility of such damages, and in no event shall TFSBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name.

Sprinkler/Support Cup Assembly

Specify: (SIN), (temperature rating from below) Series RFII Concealed Pendent Sprinkler, P/N (specify).

	155°F/68°C	200°F/93°C
TY3531	51-792-1-155	51-792-1-200
TY3551	51-790-1-155	51-790-1-200

Separately Ordered Cover Plate/ Retainer Assembly:

Specify: (temperature rating from below) Series RFII Concealed Cover Plate with (finish), P/N (specify).

	139°F/59°C(a)	165°F/74°C(b)
Brass	. 56-792-1-135	56-792-1-165
Chrome	. 56-792-9-135	56-792-9-165
Signal White (RAL 9003)	. 56-792-4-135	56-792-4-165
Grey White (RAL 9002)	. 56-792-0-135	56-792-0-165
Pure White (c) (RAL 9010)	. 56-792-3-135	56-792-3-165
Custom	. 56-792-X-135	56-792-X-165

(a) For use with 155°F/68°C sprinklers.
(b) For use with 200°F/93°C sprinklers.
(c) For use with 200°F/93°C sprinklers.

(c) Eastern Hemisphere sales only.

Sprinkler Wrench

Specify: RFII Sprinkler Wrench, P/N 56-000-1-075.

Air and Dust Seal

Specify: Air and Dust Seal, P/N 56-908-1-001.

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Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Models BB, SD, HIP, and AP "Specific Application Sprinklers for Protecting Attics"

General Description

The Tyco[®] PeakTM Performance Models BBTM (Back to Back), SDTM (Single Directional), HIPTM, and APTM (Attic Plus) "Specific Application Sprinklers for Protecting Attics" are fire sprinklers for combustible and non-combustible sloped attic spaces. The Model BB, SD, and HIP are Specific Application Attic Sprinklers, whereas the Model AP is a Specific Application Combustible Concealed Space Sprinkler having specific application criteria for its use with the Model BB, SD, and HIP in attic spaces. Specific Application Attic Sprinklers provide superior fire protection in attic spaces and, when com-pared to Standard Spray Sprinklers, cost savings are achieved by eliminating branchline materials and the associated installation labor. "The Specific Application Sprinklers for Protecting Attics" have undergone the most extensive fire testing ever performed for sloped attic spaces. They are UL Listed with their specific application guidelines for use as special sprinklers as defined by the NFPA.

The Specific Application Attic Sprinklers provide an extended coverage spacing alternative to the restricted spacing of Standard Spray Sprinklers. The restricted spacings of Standard Spray Sprinklers used within attics is described in the 2007 edition of NFPA

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely. 13, Table 8.6.2.2.1(a) and Section 8.6.4.1.4.

The Specific Application Attic Sprinklers are the first sprinklers to be:

- Listed for extended coverage in combustible construction.
- Full-scale fire tested in both wet and dry system scenarios.
- Full-scale fire tested, for use in wood truss construction.
- Listed for specific roof slopes (Refer to Table A).

The Specific Application Attic Sprinklers provide the best level of protection and control cost by eliminating the need for additional sprinklers and branchline piping. In many cases, an attic can be entirely protected with just one line of piping located below the peak of the roof using Model BB (Back to Back) Sprinklers. If there is a need for Model SD (Single Directional) or Model HIP Sprinklers, one line of either of these sprinkler types is usually sufficient at each area being covered. For example and assuming the use of Standard Spray Sprinklers, a system in a 60 foot (18,3 m) wide attic, with up to a 12:12 roof pitch, designed to the 2007 edition of NFPA 13, would require seven branchlines to cover the main portion of the attic and several additional branchlines to cover the hip areas. With the Specific Application Attic Sprinklers, the required coverage can be obtained with just one branchline below the peak and one down each slope of the hip beam. This would result in approximately 90% less pipe needed for installation. This reduction in the number of branchlines saves the cost of the pipe, fittings, hangers, and associated labor by eliminating up to five branchlines.

Another important aspect of the Specific Application Attic Sprinkler technology is the reduction in system volume. This volume reduction may result in reducing the size of a dry pipe valve (and air compressor) and possibly al-













low for quicker water delivery times, eliminating the need for an accelerator.

The other cost reduction is the Listing of BlazeMaster* CPVC for use in attic spaces to supply the wet system "Specific Application Sprinklers for Protecting Attics", as well as the wet system sprinklers below the ceiling. Traditionally BlazeMaster CPVC has been used on the lower floors in the joist space above a ceiling that does not require sprinklers. The savings of using CPVC on those floors can now be translated to the upper floor even if sprinklers are required in the attic.

There are four (4) models of the "Specific Application Sprinklers for Protecting Attics" — BBTM (Back to Back Dual Directional), SDTM (Single Directional), HIPT^M, and APTM (Attic Plus). The BB and SD Sprinklers have three separate versions that are used for different roof pitches. The pitches, as applicable, can vary from a minimum of 3:12 to a maximum of 12:12 (Ref. Table A).

BB Sprinkler (Back to Back Dual Directional)

The Tyco[®] Model BB[™] Specific Application Attic Sprinkler (Figure A, B & C) throws a narrow but long pattern. The

narrow spacing along the ridge serves two purposes. The response time is reduced by placing the sprinklers no farther than 6 feet (1,8 m) apart, and the spray can be concentrated in the throw direction to obtain a pattern that will cover up to 30 feet (9,1m) in each direction when measured horizontally. There are three different models (i.e., BB1, BB2 & BB3) that account for different roof slopes, and each model is available in one of three different orifice sizes (K=4.2, 5.6, or 8.0).

SD Sprinkler (Single Directional)

The Tyco[®] Model SD[™] Specific Application Attic Sprinkler (Figure D), like the Model BB, throws a narrow but long pattern. However, unlike the Model BB the Model SD only discharges in one direction. These sprinklers are primarily used where shear walls or draft curtains have been installed within an attic space. Another use is when the framing direction is parallel with the outside wall in the hip area (Ref. Figure 13). In this case, the SD would be used on one side of the slope, and AP Sprinklers or Standard Spray Sprinklers would be used to protect the other side. The Model SD Sprinklers must be installed in a vertical upright orientation and not angled with the slope. (Achieving the vertical upright orientation may require the use of a swing joint if the SD Sprinklers are being supplied from a line running along and parallel to the roof hip.) Three different models (i.e., SD1, SD2 & SD3) are available for different roof slopes.

HIP Sprinkler

The Tyco[®] Model HIP™ Specific Application Attic Sprinkler (Figure E) covers the area of the hip in the attic. This is a slightly different concept than the BB (Back to Back) or SD (Single Directional). The HIP Sprinkler is located along the slope running down the hip, and throws a 90° pattern toward the outside eaves. This pattern allows the water to "corner" and control the fire. The HIP Sprinkler does not discharge much water directly up or down the hip, but rather it discharges most of the pattern out to each side (90°) down the slope of the roof. This sprinkler is typically spaced 6 feet (1,8 m) to 3 feet (0,9 m) on center down the slope. To use the HIP Sprinkler, the framing must be perpendicular to the outside wall (Ref. Figure 12) and the maximum throw cannot exceed 28 feet (8,5 m) measured horizontally. The HIP, unlike the BB and SD, is installed with the deflector parallel with the slope. A single model is available with flow and

pressure requirements for two different spacings.

AP Sprinkler (Attic Plus)

Installed in the upright orientation with their deflector parallel to the roof, the Tyco[®] Model AP[™] Sprinklers (Figure F) are intended to be used to provide protection of attic areas outside the scope of application for the BB, SD, or HIP Sprinklers. When used, the AP Sprinklers in most cases will provide a hydraulic advantage over Standard Spray Sprinklers for the protection of attic areas outside the scope of application for the BB, SD, or HIP Sprinklers (Ref. Figures 21 and 22 for examples).

WARNING

The "Specific Application Sprinklers for Protecting Attics" described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

Sprinkler Identification Number

TY4180* - BB1, K=8.0
TY4181* - BB2, K=8.0
TY4182* - BB3, K=8.0
TY3180* - BB1, K=5.6
TY3181* - BB2, K=5.6
TY3182* - BB3, K=5.6
TY2180 - BB1, K=4.2
TY2181 - BB2, K=4.2
TY2182 - BB3, K=4.2
TY3183* - SD1, K=5.6
TY3184* - SD2, K=5.6
TY3185* - SD3, K=5.6
TY3187* - HIP, K=5.6
TY3190 - AP, K=5.6
TY2190 - AP, K=4.2

*The "TY" prefix is a redesignation of the previous "C" prefix (e.g., TY4180 is a redesignation for C4180).

Technical Data

Approvals

UL & C-UL Listed. (The approvals only apply to the service conditions indicated in the Design Criteria section on Page 6 and the Design Guidelines section on Page 8.)

Pipe Thread Connection

1/2 inch NPT for K=4.2 & 5.6 3/4 inch NPT for K=8.0

Discharge Coefficient

K = 4.2 GPM/psi^{1/2} (60,5 LPM/bar^{1/2}) K = 5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2}) K = 8.0 GPM/psi^{1/2} (115,5 LPM/bar^{1/2})

Temperature Rating

Intermediate Temperature as follows: - 200°F/93°C for BB (K4.2 & K8.0), HIP, AP - 212°F/100°C for BB (K5.6), SD

Finish

Natural Brass

Physical Characteristics (Figures A, C & E)

Frame Bronze Button Bronze/Copper Sealing Assembly Beryllium Nickel w/Teflon† Bulb Glass (3 mm dia.) Link Monel Compression Screw Brass Deflector Brass/Bronze † DuPont Registered Trademark

Physical Characteristics (Figures B & D)

Body
Cap Bronze
Sealing Assembly
Beryllium Nickel w/Teflon†
Saddle Brass
Link Assembly Nickel
Compression Screw Brass
Deflector Brass/Bronze
Lever Bronze
Deflector Frame Bronze
Diffuser Brass
Rivet Brass
+ DuPont Registered Trademark

† DuPont Registered Trademark

Physical Characteristics (Figure F)

 Frame
 Brass

 Button
 Bronze

 Sealing Assembly
 Bronze

 Sealing Assembly
 Bronze

 Stainless Steel w/Teflon†

 Bulb
 Glass (3 mm dia.)

 Compression Screw
 Brass

 Deflector
 Bronze

 † DuPont Registered Trademark

Patents

U.S.A. 5,669,449; patent pending

Operation

BB (K=8.0 & 4.2), HIP (K=5.6) & AP (5.6 & 4.2)

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

BB (K=5.6) & SD (K=5.6)

The fusible link assembly is comprised of two link halves which are joined by a thin layer of solder. When the rated temperature is reached, the solder melts and the two link halves separate, allowing the sprinkler to activate and water to flow.

Installation

The Tyco[®] Peak[™] Performance Models BB[™], SD[™], HIP[™], and AP[™] "Specific Application Attic Sprinklers for Protecting Attics" must be installed in accordance with the following instructions:

NOTES

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm).

A 1/2 inch NPT sprinkler joint should be obtained with a minimum to maximum torque range of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A 3/4 inch NPT sprinkler joint should be obtained with a minimum to maximum torque range of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Step 1. Sprinklers must be oriented correctly:

- Model BB Sprinklers are to be installed in the upright vertical position with the flow arrows on the deflector pointing down the two opposing slopes.
- Model SD Sprinklers are to be installed in the upright vertical position with the flow direction arrow on the deflector pointing down the slope.
- The Model HIP Sprinklers are to be installed with the deflector at the top and with the sprinkler centerline perpendicular to the ridge of the hip roof and with the flow direction arrows on the deflector pointing down the two opposing slopes. (Unlike the Model BB and Model SD, the Model HIP is installed at an angle so that its deflector is parallel with the slope of hip ridge line.)
- The Model AP Sprinklers are to be installed in the upright position with the deflector parallel to the roof slope.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting. *With reference to Figure G, do not grasp the sprinkler by the deflector.*

Step 3. Wrench tighten the sprinkler using only the wrenches shown in Figures H thru M. Wrenches are only to be applied to the sprinkler wrench flats or wrench hex, as applicable.





Design Criteria

Area Of Use:

Roof structures, combustible and noncombustible, including wood joist/rafters and wood trussed attics, with a ceiling below.

System Type for

BB, SD, HIP, or AP: Wet using CPVC pipe. Wet or dry using steel pipe.

NOTE

Use of the 4.2 K sprinklers in dry pipe systems is permitted by section 8.3.4.3 of NFPA 13 (2007 edition) where piping is corrosion resistant or internally galvanized.

Hazard:

Light hazard.

BB, SD, or HIP Allowable Roof Span (Coverage) and Roof Pitch:

Refer to Table A for allowable roof spans and roof pitches, as well as for the associated minimum sprinkler flows and pressures. Figures 1, 2, 11, and 12 illustrate where the roof span is to be measured.

Coverage Beyond BB, SD or HIP Allowable Roof Spans:

Up to 10 feet (3,1 m) of coverage at the eave(s) beyond the allowable roof spans for BB, SD, or HIP Sprinklers may be obtained by using a single row of AP Sprinklers (Ref. Figures 14A, 14B, and 15).

BB, SD, HIP, or AP Minimum Distance Between Sprinklers:

4 feet (1,2 m) as measured along branchline for BB and SD (Ref. Figure 3).

3 feet (0,9 m) as measured along branch line for HIP (Ref. Figure 12).

7 feet (2,1 m) between AP Sprinklers.

BB, SD, HIP, or AP Maximum Distance Between Sprinklers:

6 feet (1,8 m) on center along the branch line (Ref. Figure 3 and 12) for BB, SD, and HIP.

For AP, the maximum spacing is 10 feet (3,1 m) perpendicular to slope and 12 feet (3,6 m) parallel to slope. When there is more than one row of AP Sprinklers, the sprinklers must be staggered per Figure 20-B-3.

BB, SD, HIP, or AP Minimum Distance To AP Sprinklers or Standard Spray Sprinklers:

As measured along the peak/ridge direction (Ref. Figure 4), 6 feet (1,8 m) from BB, SD, and HIP to Standard Spray Sprinklers. As measured along the peak/ridge direction (Ref. Figure 4), 7 feet (2,1 m) from AP to Standard Spray Sprinklers.

In the slope direction (Ref. Figure 6), 26 feet (7,9 m) from BB, SD, or HIP Sprinklers to AP Sprinklers or Standard Spray Sprinklers.

BB, SD, or HIP Deflector Installation Position Below Peak/Ridge or Deck: For roof pitches of 4:12 (33%) to 12:12 (100%), 22 inches (558,8 mm) maximum, 16 inches (406,4 mm) minimum (Ref. Figures 2 and 5).

For roof pitches of 3:12 (25%) up to 4:12 (33%) [only 4.2K Model BB], 12 inches (304,8 mm) maximum below the peak and a minimum of 1 inch (25,4 mm) below the bottom of top chord or solid wood rafter.

AP Deflector Position and Roof Pitch:

1 to 3 inches (25,4 to 75,6 mm) below the bottom of the top chord or bottom of solid wood rafter, where the roof pitch is 3:12 to 12:12 and the top chord or solid wood rafter is nominal 12 inch (600 mm) or less.

BB or SD Deflector Installation Position Above Scissor Truss

18 inches (457,2 mm) minimum (Ref. Figure 5).

BB, SD, or HIP Minimum Distance Away From Trusses:

Attic Sprinklers must be installed 6 inches (152,4 mm) from the face of trusses (Ref. Figure 7).

SD Distance From Shear Wall Or Draft Curtain:

4 to 6 inches (101,6 to 152,4 mm) from face, and minimum 8 inches (203,2 mm) above bottom of draft curtain (Ref. Figure 2).

Draft Curtains:

Draft curtains installed to permit the installation of Attic Sprinklers shall be constructed so as to not allow heat to escape through or above the draft curtain. The draft curtain may be constructed of 1/2 inch (12,7 mm) plywood.

BB Or HIP Maximum Distance From The Center Line Of The Ridge:

6 inches (152,4 mm) (Ref. Figure 8) with the deflector located 16 inches (406,4 mm) to 22 inches (558,8 mm) from the peak.

Use Of UL Listed BlazeMaster CPVC Piping With "Specific Application Sprinklers For Protecting Attics" (Wet Systems Only):

TFPB BlazeMaster CPVC piping may be used in a combustible concealed attic space requiring sprinklers when installed in accordance with the following guidelines:

NOTES

Where the use of non-combustible insulation is specified, verify with the insulation manufacturer as to the noncombustibility of the insulation. The non-combustible insulation (e.g., fiberglass) may be faced or unfaced. Where faced, the facing need not be non-combustible. The insulation is to have a flame spread index of not more than 25.

Verify chemical compatibility of the insulation with BlazeMaster CPVC by consulting www.lubrizol.com.

- TFBP BlazeMaster CPVC may be used to supply the wet system ceiling sprinklers on the floor below. There must be 6 inches (152,4 mm) of non-combustible insulation covering the pipe extending 12 inches (304,8 mm) on each side away from the centerline of the pipe, and the area above the CPVC must be protected by Model BB, SD, HIP, or AP Sprinklers (Ref. Figure 9A). If the pipe is located inside the ceiling joist, the joist channel must be covered or filled with 6 inches (152,4 mm) of non-combustible insulation on top of the pipe and the area above must be protected by BB, SD, HIP, or AP Sprinklers (Ref. Figure 9B). Insulation is for fire protection purposes. It is not freeze protection. BlazeMaster CPVC must be installed in accordance with the BlazeMaster installation guide instructions.
- With reference to Figure 19, TFBP BlazeMaster CPVC may be used exposed to supply wet system BB, SD, or HIP Sprinklers where
 - Risers are vertical and protected by a BB, SD, or HIP Sprinkler located at a maximum lateral distance of 12 inches (300 mm) from the riser centerline.
 - * BB, SD, or HIP Sprinklers are directly mounted on the branchline.
 - * BB, SD, or HIP Sprinklers are on armovers and located at a maximum lateral distance of 6 inches (150 mm) from the branchline centerline.
 - * BB, SD, or HIP Sprinklers are on vertical sprigs attached to the branchline.
 - * BB, SD, or HIP Sprinklers are on armover or angled sprigs, and located at a maximum lateral distance of 6 inches (150 mm) from the branchline centerline.
 - A minimum lateral distance of 18 inches (450 mm) is maintained between the CPVC pipe and a

MODEL	к	SIN	ALLOWABLE ROOF SPAN, ^{(a) (b) (e)} Feet (m)	MINIMUM FLOW, GPM (lpm)	MINIMUM PRESSURE, PSI (bar)	PITCH, Rise Over Run (%)	DRY PIPE SYSTEM MAXIMUM WATER DELIVERY TIME, Seconds
BB1	8.0	TY4180	≤60 (18,3)	38 (144)	22.6 (1,5)	4:12 (33) to less than 7:12 (58)	(C)
BB2	8.0	TY4181	≤60 (18,3)	38 (144)	22.6 (1,5)	7:12 (58) to less than 10:12 (83)	(C)
BB3	8.0	TY4182	≤60 (18,3)	40 (152)	25.0 (1,7)	10:12 (83) to 12:12 (100)	(C)
BB1	5.6	TY3180	>40 (12,2) to ≤60 (18,3)	38 (144)	46.0 (3,2)	4:12 (33) to less than 7:12 (58)	(C)
BB2	5.6	TY3181	>40 (12,2) to ≤60 (18,3)	38 (144)	46.0 (3,2)	7:12 (58) to less than 10:12 (83)	(C)
BB3	5.6	TY3182	>40 (12,2) to ≤60 (18,3)	38 (144)	46.0 (3,2)	10:12 (83) to 12:12 (100)	(C)
BB1	5.6	TY3180	≤40 (12,2)	25 (95)	20.0 (1,4)	4:12 (33) to less than 7:12 (58)	(C)
BB2	5.6	TY3181	≤40 (12,2)	25 (95)	20.0 (1,4)	7:12 (58) to less than 10:12 (83)	(C)
BB3	5.6	TY3182	≤40 (12,2)	25 (95)	20.0 (1,4)	10:12 (83) to 12:12 (100)	(C)
BB1	4.2	TY2180	≤20 (6,1)	13 (49)	9.6 (0,7)	3:12 (25) to less than 7:12 (58)	45 (d)
BB2	4.2	TY2181	≤20 (6,1)	13 (49)	9.6 (0,7)	7:12 (58) to less than 10:12 (83)	45 (d)
BB3	4.2	TY2182	≤20 (6,1)	13 (49)	9.6 (0,7)	10:12 (83) to 12:12 (100)	45 (d)
SD1	5.6	TY3183	>30 (9,1) to ≤40 (12,2)	35 (132)	39.0 (2,7)	4:12 (33) to less than 7:12 (58)	(C)
SD2	5.6	TY3184	>30 (9,1) to ≤40 (12,2)	35 (132)	39.0 (2,7)	7:12 (58) to less than 10:12 (83)	(C)
SD3	5.6	TY3185	>30 (9,1) to ≤40 (12,2)	35 (132)	39.0 (2,7)	10:12 (83) to 12:12 (100)	(C)
SD1	5.6	TY3183	>10 (3,0) to ≤30 (9,1)	25 (95)	20.0 (1,4)	4:12 (33) to less than 7:12 (58)	(C)
SD2	5.6	TY3184	>10 (3,0) to ≤30 (9,1)	25 (95)	20.0 (1,4)	7:12 (58) to less than 10:12 (83)	(c)
SD3	5.6	TY3185	>10 (3,0) to ≤30 (9,1)	25 (95)	20.0 (1,4)	10:12 (83) to 12:12 (100)	(c)
SD1	5.6	TY3183	≤10 (3,0)	19 (72)	11.5 (0,8)	4:12 (33) to less than 7:12 (58)	(C)
SD2	5.6	TY3184	≤10 (3,0)	19 (72)	11.5 (0,8)	7:12 (58) to less than 10:12 (83)	(C)
SD3	5.6	TY3185	≤10 (3,0)	19 (72)	11.5 (0,8)	10:12 (83) to 12:12 (100)	(c)
HIP	5.6	TY3187	>20 (6,1) to ≤28 (8,5)	34 (129)	36.9 (2,5)	4:12 (33) to 12:12 (100)	(c)
HIP	5.6	TY3187	≤20 (6,1)	25 (95)	20.0 (1,4)	4:12 (33) to 12:12 (100)	(c)
AP	5.6	TY3190	10 (3,1) x 12 (3,6)	Minimum 7 ps	i (0,48 bar)	3:12 (25) to 12:12 (100)	60 (d)
AP	4.2	TY2190	See note (e) -	(4,1 mm/min.) Design Density		3:12 (25) to 12:12 (100)	60 (d)

(a) The BB and SD roof span is measured horizontally (not along the slope) as shown in Figure 1 and 2.

(b) The HIP roof span is measured horizontally as shown in Figure 12.

(c) Refer to 2007 edition of NFPA 13, Section 7.2.3.

(d) Maximum water delivery time for all size of systems.

(e) The AP roof span is measured along the slope. Maximum 10 feet (3,1 m) perpendicular to slope by maximum 12 feet (3,6 m) parallel to slope.

TABLE A ALLOWABLE ROOF SPAN, FLOW, PRESSURE, AND PITCH FOR "SPECIFIC APPLICATION SPRINKLERS FOR PROTECTING ATTICS"

heat producing device such as heat pumps, fan motors, lights, and heat lamps.

- TFBP BlazeMaster CPVC may be used exposed to provide wet system, vertical or angled, sprigs to AP Sprinklers (Ref. Figures 17A and 17B) where
 - The exposed portion of an angled sprig is a maximum length of 3 feet (0,9 m), the sprig is supported

within 12 inches (0,3 m) of the AP Sprinkler, and pipe hangers are provided using the CPVC hanger support for horizontal pipe runs.

- * Vertical sprigs have a maximum exposed length of 10 feet (3,05 m), the AP Sprinkler is located at a maximum lateral distance of 12 inches (300 mm) from the sprig centerline, and the sprig is supported at the swing joint to the AP Sprinkler.
- * A minimum 6 inches (152,4 mm) deep of non-combustible insulation extending 12 inches (304,8 mm) on each side away from the centerline of the CPVC branchline feeding the AP sprigs (Ref. Figures 17A). If the CPVC branchline is located inside the ceiling joist, the joist channel must be covered or filled with a minimum of 6 inches (152,4 mm) deep of noncombustible insulation on top of

the branchline supplying the AP sprigs (Ref. Figure 17B). Insulation is for fire protection purposes. It is not freeze protection. Additional depth of non-combustible insulation may be added to reduce the exposed length of the AP sprigs.

* A minimum lateral distance of 18 inches (450 mm) is maintained between the CPVC pipe and a heat producing device such as heat pumps, fan motors, lights and heat lamps.

Mismatched Slopes:

For mismatched slopes refer to Figure 10.

Obstructions:

For BB, SD, and HIP, refer to Figure 16. For AP Sprinklers, refer to Figure 18. BB, SD, HIP, and AP Sprinklers may be installed directly on maximum 2-1/2 inch NPS (DN65) branchlines without the need for sprigs. See the 2007 edition of NFPA 13, 8.8.5.2 for requirements when installed on pipe greater than 2-1/2 inch NPS (DN65).

Hydraulic Requirements:

For hydraulic requirements refer to Figure 20.

To Determine The Correct Flow And Pressure:

For BB, SD, or HIP Sprinklers, determine the roof span (measured horizontally) and the slope of the roof, and refer to Table A. There is no interpolation of the flow and pressure shown. Round all cases to the next higher spacing. For example, a 45 feet (13,7 m) span with the BB1 (K=8.0) would be calculated at the 60 feet (18,3 m) span.

For the AP Sprinklers, the minimum design pressure is 7 psi, and the minimum design density is 0.10 gpm/ft² (4,1 mm/min). *The NFPA 13, 20 psi* (1,4 bar) minimum operating pressure for Standard Spray Sprinkler spacings parallel to the ridge that are above 8 feet (2,4 m) does not apply to the AP.

Coverage Area:

• Coverage area for **BB (Back to Back) Sprinklers** is determined by twice the distance of the furthest throw measured along the slope, multiplied by the distance along the branchline (maximum distance along branchline is 6 feet (1,8 m) regardless of the length of the throw).

NOTE

The distance along the branchline may have to be reduced to less than the maximum of 6 feet (1,8 m) to remain under 400 ft² $(37,2 \text{ m}^2)$ maximum depending on the slope and the span. In

no case can the span exceed 60 feet (18,3 m) without the use of additional Model AP Sprinklers or Standard Spray Sprinklers.

- Coverage area for the **SD** (Single **Directional)** Sprinklers is the distance along the branchline multiplied by the distance of the throw down the slope. Regardless of the throw, the maximum distance along the branchline is 6 feet (1,8 m), the maximum throw, measured horizontally is 40 feet (12,2 m), and the maximum coverage per sprinkler is 400 ft² (37,2 m²).
- Coverage area for the **HIP Sprinklers** is the distance down the larger slope multiplied by two, then multiplied by the distance between the sprinklers as measured along the slope of the hip.
- Coverage area for the AP (Attic Plus) Sprinklers is the distance along the branchline multiplied by the distance between the branchlines. The maximum spacing is 10 feet (3,1 m) perpendicular to the slope and 12 feet (3,6 m) parallel to slope, and as measured on the slope. When there is more than one row of AP Sprinklers, the sprinklers must be staggered per Figure 20-B-3. The maximum spacing per sprinkler is 120 ft² (11,1 m²).

Design Guidelines

To design a project with attic sprinklers use these steps as a guideline:

- Determine if Model BB, SD, or HIP Sprinkler is needed.
- Determine if the roof slope is between 3:12 to 12:12. If more than one slope is being used on a project, select the correct sprinkler for each area.
- Follow the guidelines for each type of sprinkler.
- Calculate the sprinkler system in accordance with the appropriate flow and pressure information provided in Table A, as well as Figure 20. There is no interpolation of the flows and pressures shown on the chart.

For BB Sprinklers (Back to Back Dual Directional)

 Determine the throw needed (see spacing requirements in Table A). If over 20 feet (6,1 m) and up to 60 feet (18,3 m) is required, use the 8.0 K-factor, BB Sprinklers to reduce the pressure required. If pressure is not a concern, use the 5.6 K-factor, BB Sprinklers to minimize over discharge.

- If less than 20 feet (6,1 m) is required, use the 4.2 K-factor, Back to Back Dual Directional to minimize pressure and flow requirements
- Determine the distance along the slope. If the distance is not equal, use the longer side. Multiply the longer side by two to determine the spacing down the slope. Four hundred divided by this value will determine the maximum spacing along the ridge. The maximum distance is 6 feet (1,8 m). For example, a 12:12 slope at the maximum span of 60 feet (18,3 m) will produce a slope length of approximately 42.5 feet (13,0 m). That number multiplied by two produces an 85 feet (25,9 m) throw. Four hundred square feet maximum divided by an 85 feet (25,9 m) throw only allows a 4 feet - 8 inches (1,4 m) spacing along the ridge. Using the maximum spacing, space the sprinklers along the ridge.
- Avoid obstructions as shown in Figure 16. If necessary, add Model AP Sprinklers or Standard Spray Sprinklers to maintain coverage around obstructions.

For SD Sprinklers (Single Directional)

- Determine the throw needed.
- As the 400 ft² (37,2 m²) is not a factor with the SD Sprinklers, the maximum spacing is 6 feet (1,8 m) and the minimum is 4 feet (1,2 m) (Ref. Figures 2 &11). (400 ft² is not an issue with the single directional because at its maximum spacing of 6 foot (1,8 m) on center/covering 40 feet (12,2 m) flat / a 12:12 slope / and the discharge being 56.5 feet (17,2 m), the 400 ft² (37,2 m2) maximum would not be exceeded.)
- Avoid obstructions as shown in Figure 16. If necessary, add Model AP Sprinklers or Standard Spray Sprinklers to maintain coverage around obstructions.

For HIP Sprinklers

- Verify framing direction is perpendicular to outside wall (Ref. Figure 12). If not, protect that area with AP Sprinklers or Standard Spray Sprinklers (Ref. Figure 13)
- From the intersection of the top of the hip and the ridge, the maximum

distance down the slope of the hip is 3 feet (0,9 m). Start the layout with the first sprinkler as close to that point as possible, but no further, while staying 6 inches (152,4 mm) away from the face of the trusses. Remember the slope of the hip is not equal to the slope of the roof from the ridge to the outside wall. Continue to space sprinklers down the hip at a maximum of 6 feet (1.8 m) on center as measured along the slope of the hip. When the bottom of the hip is reached, the last sprinkler must be within 7-1/2 feet (2,3 m) of the outside wall as measured flat (plan view). If this pipe is "cut to fit", the different slopes of the hip and the roof, as well as distances measured along the slope verses horizontal in plan view, must be accounted for.

 Avoid obstructions as shown in Figure 16. If necessary, add Model AP Sprinklers or Standard Spray Sprinklers to maintain coverage around obstructions.

Care and Maintenance

The Tyco[®] Peak[™] Performance Models BB[™], SD[™], HIP[™], and AP[™] "Specific Application Sprinklers for Protecting Attics" must be maintained and serviced in accordance with the following instructions:

NOTE

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

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced.

Over-heated solder type sprinklers must be replaced. Bulb-type sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

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

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

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price. The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connections:

Specify: Model (specify), K-factor (specify), SIN (specify), Specific Application Attic Sprinkler, P/N (specify).

BB1 (K=8.0), TY4180 P/N 51-623-1-200
BB2 (K=8.0), TY4181 P/N 51-621-1-200
BB3 (K=8.0), TY4182 P/N 51-622-1-200
BB1 (K=5.6),
BB2 (K=5.6)
TY3181 P/N 50-602-1-212
TY3182 P/N 50-603-1-212
BB1 (K=4.2),
I Y 2180 P/N 50-620-1-200 BB2 (K=4 2)
TY2181 P/N 50-621-1-200
BB3 (K=4.2), TY2182 P/N 50-622-1-200
SD1 (K=5.6)
TY3183 P/N 50-611-1-212
TY3184 P/N 50-612-1-212
SD3 (K=5.6), TY3185 P/N 50-613-1-212
HIP (K=5.6),
TY3187 P/N 51-620-1-200
AP (K=5.6),
AP (K=4.2).
TY2190 P/N 50-624-1-200

Sprinkler Wrench:

Specify: W-Type 3 Sprinkler Wrench, P/N 56-895-1-001.

Specify: W-Type 20 Sprinkler Wrench, P/N 56-000-1-106.

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.







Coverage Beyond BB, SD, or HIP Allowable Roof Spans

A. For single ridge construction (Ref. Figure 14A), AP Sprinklers can be used to protect up to 10 feet (3,1 m) of width at the eaves beyond the maximum allowable 60 foot (18,3 m), 40 foot (12,2 m), or 20 foot (6,1 m) spans of the BB Sprinklers (Ref. Table A).

B. Where SD Sprinklers are used (Ref. Figure 14B), AP Sprinklers can be used to protect up to 10 feet (3,1 m) of width at the eaves beyond the maximum allowable 40 foot (12,2 m), 30 foot (9,1 m), or 10 foot (3,0 m) spans of the SD Sprinklers (Ref. Table A).

C. Where HIP Sprinklers are used for hip roof construction (Ref. Figure 15), use BB Sprinklers in the center portion and HIP Sprinklers down the entire hip. AP Sprinklers can then used to protect the eaves beyond the BB Sprinklers as described in Paragraph A. Also, AP Sprinklers can be used to protect up to 10 feet (3,1 m) of width beyond the maximum allowable 28 foot (8,5 m) or 20 foot (6,1 m) horizontal coverage of the HIP Sprinklers (Ref. Table A). Spacing of the AP Sprinklers is to be as detailed for their use with the BB Sprinklers in Figure 14A.

NOTE: The use of Attic Sprinklers CANNOT be considered for attics over 80 feet (24,4 m) wide.





FIGURE 16 — PART 1 of 2 — OBSTRUCTIONS TO WATER DISTRIBUTION — BB, SD & HIP (Obstructions to water distribution for Attic Sprinklers differ from standard sprinklers as shown)

FIGURE 16F Area Outside Of Mechanical Space Or Similar Compartmented Space

When a BB Sprinkler is 36 inches (914,4 mm) or greater above the space, and 36 inches (914,4 mm) or greater clearance above the space is present, additional sprinklers are not needed.

When a BB Sprinkler is a 36 inches (914,4 mm) or greater above the space, and a 12 to 36 inches (304,8 mm to 914,4 mm) clearance above the space is present, Intermediate Level Standard Sprinklers are to be installed to protect the obstructed area.

Otherwise, the area beyond the mechanical space is to be protected as shown by installing Standard Spray Sprinklers as necessary — OR — by constructing a shear wall and installing SD Sprinklers.

NOTE: In all cases, the mechanical space or similar compartmented space is to be sprinklered per its respective hazard rating and separated from the light hazard attic space by construction that has a fire resistance rating based on the water supply duration required for the hazard rating within the mechanical space or similar compartmented space.



FIGURE 16G Piggyback Trusses

When a BB Sprinkler can be installed below or between stiffeners and maintain the 16 to 22 inch (404,4 to 558,8 mm) distance to the peak, as well as the "V" and "H" clearance to the stiffeners, additional sprinklers are not required.

When the stiffeners are located a minimum of 12 inches (304,8 mm) below the BB Sprinkler, the stiffeners are 7-1/2 inches (190,5 mm) maximum in width, the openings are 12 inches (304,8 mm) minimum, and there is 70% minimum open area, additional sprinklers are not reauired.

Otherwise, additional sprinklers are required as shown.







HYDRAULIC CALCULATIONS

Attic sprinklers must be calculated in conformance with these guidelines. In all cases, the design area shall include the most hydraulically demanding sprinklers. More than one set of calculations may be required to prove different situations.

For individual areas requiring more than four AP Sprinklers, the maximum area of attic protected by AP Sprinklers is limited to 3000 ft² (279 m²) in any single area. Areas must be separated by a minimum of 15 feet (4,6 m) by an area protected by BB, SD, or HIP Sprinklers, in order to be considered separate areas.

The hydraulic calculations have been divided into three parts as follows:

• FIGURE 20-A: "Attics Protected Entirely By BB, SD, and HIP Attic Sprinklers".

20-A-1 (Page 18) BB Sprinklers 20-A-2 (Page 18) BB and HIP Sprinklers 20-A-3 (Page 19) BB and SD Sprinklers 20-A-4 (Page 19) SD Sprinklers 20-A-5 (Page 19) SD and HIP Sprinklers 20-A-6 (Page 19) HIP Sprinklers

• FIGURE 20-B: "Attics Protected With A Mixture Of BB. SD, and HIP Attic Sprinklers And AP Sprinklers".

20-B-1 (Page 20) SD Sprinklers & AP Sprinklers At The Ridge 20-B-2 (Page 20) BB Sprinklers & AP Sprinklers At The Eaves or Beyond An Obstruction 20-B-3 (Page 21) BB Sprinklers & AP Sprinklers At The Hip 20-B-4 (Page 21) BB Sprinklers, SD Sprinklers, HIP Sprinklers, & AP Sprinklers At The Hip 20-B-5 (Page 22) BB, SD, or HIP Sprinklers & AP Sprinklers in a Dormer, at a Cross, or at an Ell 20-B-6 (Page 22) BB,SD, or HIP Sprinklers & AP Sprinklers Separated By Compartmentalization

• FIGURE 20-C: "Attics Protected With A Mixture Of BB. SD, and HIP Attic Sprinklers And Standard Spray Sprinklers".

20-C-1 (Page 23) SD Sprinklers & Standard Spray Sprinklers At The Ridge 20-C-2 (Page 23) BB Sprinklers & Standard Spray Sprinklers At The Eaves or Beyond An Obstruction 20-C-3 (Page 24) BB Sprinklers & Standard Spray Sprinklers At The Hip 20-C-4 (Page 25) BB Sprinklers, SD Sprinklers, HIP Sprinklers, & Standard Spray Sprinklers At The Hip 20-C-5 (Page 26) BB, SD, or HIP Sprinklers & Standard Spray Sprinklers in a Dormer, at a Cross, or at an Ell 20-C-6 (Page 26) BB, SD, or HIP Sprinklers & Standard Spray Sprinklers Separated By Compartmentalization



FIGURE 20 — HYDRAULIC CALCULATIONS
- Wet Systems Calculate the most demanding five sprinklers.
- Dry Systems Calculate the most demanding seven sprinklers (see adjacent figure).



Figure 20-A-2. BB and HIP Sprinklers

- Wet Systems Calculate the most demanding five sprinklers.
- Dry Systems Calculate the most demanding seven sprinklers, and then calculate the most demanding contiguous nine sprinklers with a maximum of seven to be BB Sprinklers (see adjacent figures). Use the most demanding calculation.



DRY SYSTEM SHOWN



TFP610



Figure 20-B-1. SD Sprinklers & AP Sprinklers At The Ridge

- Wet Systems Calculate the most demanding five sprinklers of one type. Use the most demanding calculation.
- Dry Systems Calculate the most demanding nine SD Sprinklers, and then calculate the most demanding seven AP Sprinklers. Use the most demanding calculation (see adjacent figure).



Figure 20-B-2. BB or SD Sprinklers & AP Sprinklers At The Eaves or Beyond An Obstruction

- Wet Systems Calculate the most demanding five BB or SD Sprinklers plus up to two most demanding AP Sprinklers.
- Dry Systems Calculate the most demanding seven BB or SD Sprinklers plus up to two most demanding AP Sprinklers (see adjacent figures).





DRY SYSTEM SHOWN



Figure 20-B-3. BB Sprinklers & AP Sprinklers At The Hip

Where the total number of AP Sprinklers at the hip is greater than four:

- Wet Systems Calculate the most demanding five BB Sprinklers plus the two most demanding AP Sprinklers, and then calculate the most demanding area up to 1500 ft² (137 m²) having AP Sprinklers (e.g., Area 2 in adjacent upper figure). Use the most demanding calculation.
- Dry Systems Calculate the most demanding seven BB Sprinklers plus the two most demanding AP Sprinklers, and then calculate the most demanding area up to 1950 ft² (181 m²) having AP Sprinklers(e.g., Area 2 in adjacent upper figure). Use the most demanding calculation.

Figure 20-B-4. BB Sprinklers, SD Sprinklers, HIP Sprinklers, & AP Sprinklers At The Hip

Where the total number of AP Sprinklers at the hip is four or less:

- Wet Systems Calculate the most demanding five BB, SD, or HIP Sprinklers plus up to two most demanding AP Sprinklers.
- Dry Systems Calculate the most demanding nine BB, SD, or HIP Sprinklers plus up to two most demanding AP Sprinklers (Of the nine BB, SD, or HIP Sprinklers, calculate up to a maximum of seven BB Sprinklers, see adjacent upper figure).

Where the total number of AP Sprinklers at the hip is greater than four:

- Wet Systems Calculate up to the most demanding five BB, SD, or HIP Sprinklers plus the two most demanding AP Sprinklers, and then calculate the most demanding area up to 1500 ft² (137 m²) having AP Sprinklers(e.g., Area 2). Use the most demanding calculation.
- Dry Systems Calculate up to the most demanding nine BB, SD, or HIP Sprinklers plus the two most demanding AP Sprinklers, and then calculate the most demanding area up to 1950 ft² (181 m²) having AP Sprinklers (e.g., Area 2). Use the most demanding calculation.



Figure 20-B-5. BB, SD, or HIP Sprinklers & AP Sprinklers in a Dormer, at a Cross, at a Hip, or at an Ell

Where the quantity of AP Sprinklers in each dormer, cross, or ell is four or less (see adjacent figure) and all of the dormers, crosses and ells meet the maximum four AP Sprinkler criteria, calculate the BB, SD, or HIP Sprinkler demand as described in Part A-1 thru A-6 or Part B-1 thru B-4, plus up to two of the most demanding AP Sprinklers in the dormer, cross, or ell that is adjacent to the BB, SD, or HIP Sprinklers that are being included in the demand calculation.

Where the quantity of AP Sprinklers in any dormer, cross, or ell is greater than four, refer to Figure B-3.



Figure 20-B-6. BB,SD, or HIP Sprinklers & AP Sprinklers Separated By Compartmentalization

- Wet Systems— Calculate the BB, SD, or HIP Sprinkler demand as described in Part A-1 thru A-6 or Part B-1 thru B-4, and then calculate the most demanding area up to 1500 ft² (137 m²) having AP Sprinklers. Use the most demanding calculation (see adjacent figure).
- Dry Systems— Calculate the BB, SD, or HIP Sprinkler demand as described in Part A-1 thru A-6 or Part B-1 thru B-4, and then calculate the most demanding area up to 1950 ft² (181 m²) having AP Sprinklers. Use the most demanding calculation (see adjacent figure).



Figure 20-C-1. SD Sprinklers & Standard Spray Sprinklers At The Ridge

- Wet Systems Calculate the most demanding five sprinklers of one type. Use the most demanding calculation.
- Dry Systems Calculate the most demanding nine SD Sprinklers, and then calculate the most demanding seven Standard Spray Sprinklers. Use the most demanding calculation (see adjacent fig-



Figure 20-C-2. BB Sprinklers & Standard Spray Sprinklers Beyond An Obstruction

- Wet Systems Calculate the most demanding five BB Sprinklers plus up to two most demanding Standard Spray Sprinklers.
- Dry Systems Calculate the most demanding seven BB Sprinklers plus up to two most demanding Standard Spray Sprinklers (see adjacent figures).



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Figure 20-C-3. BB Sprinklers & Standard Spray Sprinklers At The Hip

Where the total number of standard spray sprinklers at the hip is greater than four:

- Wet Systems Calculate the most demanding five BB Sprinklers plus up to two most demanding Standard Spray Sprinklers, and then calculate the most demanding remote design area (Including all sprinklers types) per NFPA 13 (i.e., area reduction for quick response & 30% increase for sloped ceilings). Use the most demanding calculation.
- Dry Systems Calculate the most demanding seven BB Sprinklers plus up to two most demanding Standard Spray Sprinklers, and then calculate the most demanding design area (including all sprinkler types) per NFPA 13 (i.e., 30% increase for sloped ceilings & 30% increase for dry systems). Include all sprinklers types within this area (see adjacent figure). Use the most demanding calculation.





SEE ALSO FIGURES 21 AND 22

Figure 20-C-4. BB Sprinklers, SD Sprinklers, HIP Sprinklers, & Standard Spray Sprinklers At The Hip

Where the total number of Standard Spray Sprinklers at the hip is four or less:

- Wet Systems Calculate the most demanding five BB, SD, or HIP Sprinklers plus up to two most demanding Standard Spray Sprinklers.
- Dry Systems Calculate the most demanding nine BB, SD, or HIP Sprinklers plus up to two most demanding Standard Spray Sprinklers (Of the nine BB,SD, or HIP Sprinklers, calculate up to a maximum of seven BB Sprinklers, see adjacent upper figure).

Where the total number of standard spray sprinklers at the hip is greater than four:

- Wet Systems Calculate the most demanding five BB, SD, or HIP Sprinklers plus up to two most demanding Standard Spray Sprinklers, and then calculate the most demanding remote design area (Including all sprinklers types) per NFPA 13 (i.e., area reduction for quick response & 30% increase for sloped ceilings). Use the most demanding calculation.
- Dry Systems Calculate the most demanding nine BB, SD, or HIP Sprinklers plus up to two most demanding Standard Spray Sprinklers (Of the nine BB,SD, or HIP Sprinklers, calculate up to a maximum of seven BB Sprinklers, see adjacent upper figure), and then calculate the most demanding design area (including all sprinkler types) per NFPA 13 (i.e., 30% increase for sloped ceilings & 30% increase for dry systems). Include all sprinklers types within this area (see adjacent figure).



Dry Pipe = 1500 SQ. FT. (NFPA Light Hazard) x 1.3 x 1.3 = 2535 SQ. FT.

Figure 20-C-5. BB, SD, or HIP Sprinklers & Standard Spray Sprinklers in a Dormer, at a Cross, at a Hip, or at an Ell

Where the quantity of standard spray sprinklers in each dormer, cross, or ell is four or less (see adjacent figure) and all of the dormers, crosses and ells meet the maximum four standard sprinkler criteria, calculate the Attic Sprinkler demand as described in Part A-1 thru A-6 or Part B-1 thru B-4, plus up to two of the most demanding standard spray sprinklers in the dormer, cross, or ell that is adjacent to the Attic Sprinklers that are being included in the demand calculation.

Where the quantity of standard spray sprinklers in any dormer, cross, or ell is greater than four, refer to Figure C-3.





Calculate the Attic Sprinkler demand as described in Part A-1 thru A-6 or Part C-1 thru C-4, and then calculate the Standard Spray Sprinklers per NFPA 13. Use the most demanding calculation (see adjacent figure).





WHERE MODEL AP OR STANDARD SPRAY SPRINKLERS ARE USED IN HIP AREAS OUTSIDE THE SCOPE OF APPLICATION FOR MODEL BB BACK-TO-BACK SPRINKLERS

WET PIPE SYSTEM

(Ref. Figure 20-B-3)

Calculate the most demanding five BB Sprinklers plus the two most demanding AP Sprinklers.

Calculate the most demanding area up to 1500 ft² having AP Sprinklers. In this case the design area will be 800 ft² (40

Use the most demanding calculation (i.e., for proving the adequacy of the

Where AP Sprinklers are utilized, CPVC pipe may be used to supply the AP Sprinklers, as well as the ceiling sprinklers below the AP Sprinklers

STANDARD SPRAY SPRINKLERS

WET PIPE SYSTEM

(Ref. Figure 20-C-3)

Calculate the most demanding five BB Sprinklers plus the two most demanding Standard Spray Sprinklers.

Calculate the most demanding remote design area (Including all sprinklers types) per NFPA 13 (i.e., area reduction for quick response & 30% increase for sloped ceilings). In this case the theoretical design area is 1463 ft² (1500 ft² x 0.75^* x 1.3). The actual design area, however, will need to be 1520 ft² to pick up the entire coverage area of the last BB Sprinkler.

Use the most demanding calculation (i.e., for proving the adequacy of the

Where Standard Sprinklers are util-ized, CPVC pipe CANNOT be used to supply the Standard Spray Sprinklers or the ceiling sprinklers below the

* A 25% reduction for 20 ft. ceiling.

Standard Spray Sprinklers. EXAMPLE FOR A WET PIPE SYSTEM HYDRAULIC DESIGN AREA COMPARISON OF MODEL AP SPRINKLERS VERSES STANDARD SPRAY SPRINKLERS



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Series DS-ECC Dry-Type Sprinklers 5.6K Pendent Concealed Quick Response, Extended Coverage

General Description

TYCO Series DS-ECC Dry-Type Sprinklers, 5.6K Pendent Concealed, Quick Response (3 mm Bulb) and Extended Coverage, are decorative bulb-type sprinklers featuring a flat cover plate designed to conceal the sprinkler. This type of sprinkler is typically used to provide a sprinkler drop from an unheated attic into an area where aesthetics is a concern, such as nursing homes, restaurants, and schools.

They are intended for use in automatic sprinkler systems designed in accordance with standard installation rules (for example, NFPA 13). The fast response thermal sensitivity rating of Series DS-ECC Dry-Type Sprinklers (TY3539) provides for a quick response extended coverage (QREC) rating up to an 18 ft. x 18 ft. coverage area.

Each unit includes a Cover Plate Assembly that conceals the sprinkler operating components above the ceiling. The separable two-piece design of the Cover Plate and Support Cup Assemblies allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling. They also permit removal of suspended ceiling panels for access

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely. to building service equipment without having to first shut down the fire protection system and remove sprinklers. Also, the separable two-piece design of the Sprinkler provides for 1/2 inch (12,7 mm) of vertical adjustment.

Each Series DS-ECC Dry-Type Sprinkler is shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed for installation, and then it can be replaced to help protect the sprinkler while the ceiling is being installed or finished. The tip of the Protective Cap can also be used to mark the center of the ceiling hole into plaster board and ceiling tiles by gently pushing the ceiling product against the Protective Cap. When the ceiling installation is complete, the Protective Cap is removed and the Cover Plate Assembly installed.

NOTICE

Series DS-ECC Dry-Type Pendent Concealed Sprinklers described herein must be installed and maintained in compliance with this document and the applicable standards of the National Fire Protection Association, in addition to the standards of any Authorities Having Jurisdiction. Failure to do so may impair the performance of these devices.

Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Series DS-ECC Dry-Type Pendent Concealed Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.



Model/Sprinkler Identification Numbers (SINs)

TY3539 - 3 mm Bulb

Technical Data

Approvals UL and C-UL Listed NYC Approved under MEA 352-01-E-2 Refer to Design Criteria section.

Maximum Working Pressure 175 psi (12,1 bar)

Inlet Thread Connections 1-inch NPT (Standard Order) ISO 7-R1

Discharge Coefficient K=5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Temperature Ratings 155°F (68°C) Sprinkler with 139°F (59°C) Cover Plate

200°F (93°C) Sprinkler with 165°F (74°C) Cover Plate

Adjustment 1/2 inch (12,7 mm)

Finishes Refer to Ordering Procedure section.

Physical Characteristics





Response Rating	Spacing	Minimum Flow/Pressure										
Quick	16' x 16' (4,9 m x 4,9 m)	26.0 GPM/21.6 psi (98,4 LPM/1,49 bar)										
Quick	18' x 18' (5,5 m x 5,5 m)	33.0 GPM/34,7 psi (124,9 LPM/2,39 bar)										
SERIES DS-ECC EXTENDED (TY: -	TABLE A SERIES DS-ECC EXTENDED COVERAGE DRY-TYPE PENDENT CONCEALED SPRINKLERS (TY3539) 155°F (68°C) AND 200°F (93°C) — HYDRAULIC DESIGN CRITERIA —											





Operation

When Series DS-ECC Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the Plug and Gasketed Spring Plate Seal (Figure 1) in the Inlet of the Sprinkler.

When exposed to heat from a fire, the Cover Plate, which is normally soldered to the Retainer at three points, falls away to expose the Sprinkler Assembly. At this point the Deflector supported by the Guide Pins drops down to its operational position.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, and the Bulb Seat is released. The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls inward on the Yoke, withdrawing the Plug and Gasketed Spring Plate Seal from the Inlet allowing the sprinkler to activate and flow water.

Design Criteria

TYCO Series DS-ECC, Extended Coverage, Dry-Type Pendent Concealed Sprinklers (TY3539) are UL and C-UL Listed for use in light hazard occupancies, using the design criteria in Table A, in addition to the requirements specified in the current NFPA 13 for extended coverage pendent sprinklers.

Series DS-ECC Dry-Type Sprinklers are only listed when installed with Series RFII Concealed Cover Plates having a factory applied painted or metallic finish.

NOTICE

Series DS-ECC Sprinklers must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Support Cup could delay sprinkler operation in a fire situation.

Sprinkler Fittings

Install 1-inch NPT Series DS-ECC Dry-Type Sprinklers are to be installed in the 1-inch NPT outlet or run of the following fittings:

- malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150).
- cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125).

Do not install Series DS-ECC Dry-Type Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow.

The unused outlet of the threaded tee is plugged as shown in Figures 4.

You can also install Series DS-ECC Dry-Type Sprinklers in the 1-inch NPT outlet of a GRINNELL Figure 730 Mechanical Tee. However, the use of the Figure 730 Tee for this arrangement is limited to wet pipe systems.

The configuration shown in Figure 3 is only applicable for wet pipe systems where the sprinkler fitting and waterfilled pipe above the sprinkler fitting are not subject to freezing and where the length of the Dry-Type Sprinkler has the minimum exposure length depicted in Figure 5. Refer to the Exposure Length section.

Ambient Temperature	Temperatures for Heated Area ¹							
Exposed to Discharge End of	40°F (4°C)	50°F (10°C)	60°F (16°C)					
Sprinkler	Minimu	m Exposed Barrel Length, Inche	es (mm)²					
40°F (4°C)	0	0	0					
30°F (-1°C)	0	0	0					
20°F (-7°C)	4 (100)	0	0					
10°F (-12°C)	8 (200)	1 (25)	0					
0°F (-18°C)	12 (305)	3 (75)	0					
-10°F (-23°C)	14 (355)	4 (100)	1 (25)					
-20°F (-29°C)	14 (355)	6 (150)	3 (75)					
-30°F (-34°C)	16 (405)	8 (200)	4 (100)					
-40°F (-40°C)	18 (455)	8 (200)	4 (100)					
-50°F (-46°C)	20 (510)	10 (255)	6 (150)					
-60°F (-51°C)	20 (510)	10 (255)	6 (150)					

Notes

1. For protected area temperatures that occur between values listed above, use the next cooler temperature.

2. These lengths are inclusive of wind velocities up to 30 mph (18,6 kph).

TABLE B EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS — MINIMUM RECOMMENDED LENGTHS —

For wet pipe system installations of 1-inch NPT Series DS-ECC Dry-Type Sprinklers connected to CPVC piping, use only the following TYCO CPVC fittings:

- 1" x 1" NPT Female Adapter (P/N 80145)
- 1" x 1" x 1" NPT Sprinkler Head Adapter Tee (P/N 80249).

For dry pipe system installations, use only the side outlet of maximum 2-1/2inch reducing tee when locating Series DS-ECC Dry-Type Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 4 to assure complete water drainage from above Series DS-ECC Dry-Type Sprinklers and the branch line. Failure to do so may result in pipe freezing and water damage.

NOTICE

Do not install Series DS-ECC Dry-Type Sprinklers into any other type fitting without first consulting the Technical Services Department. Failure to use the appropriate fitting may result in one of the following:

- Failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug.
- Insufficient engagement of the Inlet pipe-threads with consequent leakage.

Drainage

In accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems, branch, cross, and feed-main piping connected to Dry Sprinklers and subject to freezing temperatures must be pitched for proper drainage.

Exposure Length

When using Dry Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table B to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken from the face of the sprinkler fitting to the surface of the structure or insulation that is exposed to the heated area. Refer to Figure 3 for an example.

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

Clearance Space

In accordance with Section 8.4.9.2 of the 2010 edition of NFPA 13, when connecting an area subject to freezing and an area containing a wet pipe sprinkler system, the clearance space around the sprinkler barrel of Dry-Type Sprinklers must be sealed. Due to temperature differences between two areas, the potential for the formation of condensation in the sprinkler and subsequent ice build-up is increased. If this condensation is not controlled, ice build-up can occur that might damage the dry-type sprinkler and/or prevent proper operation in a fire situation.

Use of the Model DSB-2 Dry Sprinkler Boot, described in technical data sheet TFP591 and shown in Figure 6, can provide the recommended seal.





Installation

Series DS-ECC Extended Coverage Dry-Type Pendent Concealed Sprinklers must be installed in accordance with the following instructions.

NOTICE

Series DS-ECC Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. Refer to the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm).

Obtain a 1-inch NPT sprinkler joint with a minimum-to-maximum torque of 20 to 30 ft. lbs. (26,8 to 40,2 Nm). Higher levels of torque may distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Sprinkler Assembly by under or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

- 1. Install pendent sprinklers only in the pendent position and with the centerline of the sprinkler perpendicular to the mounting surface.
- With a non-hardening pipe-thread sealant such as Teflon^{*} applied to the Inlet threads, hand-tighten the sprinkler into the sprinkler fitting.
- 3. Wrench-tighten the sprinkler using either:
 - a pipe wrench on the Inlet Band or the Casing (Figure 1).
 - the RFII Sprinkler Wrench (Figure 7) on the Wrench Flat.

Note: If sprinkler removal becomes necessary, remove the sprinkler using the same wrenching method noted above. Sprinkler removal is easier when a non-hardening sealant was used and torque guidelines were followed. After removal, inspect the sprinkler for damage.

When using the RFII Sprinkler Wrench, temporarily remove the Protective Cap. Replace the Protective Cap (Figure 8) by pushing it upwards until it bottoms out against the Support Cup. The

^{*}DuPont Registered Trademark

Protective Cap helps prevent damage to the Deflector and Arms during ceiling installation and/ or during application of the finish coating of the ceiling. It may also be used to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

NOTICE

As long as the Protective Cap remains in place, the system is considered to be "Out of Service".

- 4. After the ceiling has been completed with the 2-1/2 inch (63,5 mm) diameter hole and in preparation for installing the Cover Plate Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely. If the Sprinkler has been damaged and the Deflector does not move up and down freely, replace the entire Sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.
- 5. Screw on the Cover Plate/Retainer Assembly until the Retainer (Figure 2) contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If the Cover Plate/Retainer Assembly cannot be engaged with the Support Cup or the Cover Plate/Retainer Assembly cannot be engaged sufficiently to contact the ceiling, reposition the Sprinkler Fitting.

Care and Maintenance

TYCO Series DS-ECC Dry-Type Sprinklers must be maintained and serviced in accordance with the following instructions.

NOTICE

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action. Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

A Vent Hole is provided in the Bulb Seat (Figure 1) to indicate if the Dry Sprinkler is remaining dry. Evidence of leakage from the Vent Hole indicates potential leakage past the Inlet seal and the need to remove the sprinkler to determine the cause of leakage; for example, an improper installation or an ice plug. Close the fire protection system control valve and drain the system before removing the sprinkler.

Exercise care to avoid damage before, during, and after installation. Never paint, plate, coat, or otherwise alter automatic sprinklers after they leave the factory.

Never repaint factory-painted Cover Plates. When necessary, replace cover plates with factory-painted units. Non-factory applied paint can adversely delay or prevent sprinkler operation in the event of a fire.

Replace sprinklers that:

- were damaged by dropping, striking, wrench twisting, wrench slippage, or the like.
- were modified or over-heated.
- have cracked bulbs or have lost liquid from the bulbs. Refer to the Installation Section in this data sheet.
- are leaking or exhibiting visible signs of corrosion.

Responsibility lies with owners for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (for example, NFPA 25), in addition to the standards of any other Authorities Having Jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

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

Limited Warranty

Products manufactured by Tyco Fire Suppression and Building Products (TFSBP) are warranted solely to the original Buyer against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire twelve (12) months from installation or eighteen (18) months from delivery, whichever occurs first. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFSBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFSBP was informed about the possibility of such damages, and in no event shall TFSBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.



TABLE C SERIES DS-ECC EXTENDED COVERAGE, DRY-TYPE PENDENT CONCEALED SPRINKLERS WITH 1-INCH NPT CONNECTION – PART NUMBER SELECTION –

Ordering Procedure

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

Dry Sprinklers

When ordering 5.6 K-Factor Series DS-ECC Extended Coverage Dry-Type Concealed Pendent Sprinkler, specify the following information:

- Model/SIN TY3539
- Temperature Rating
- Order Length

Dry-Type Sprinklers are furnished based upon Order Length as measured from the face of the wall to the face of the sprinkler fitting (Figure 2). After the measurement is taken, round it to the nearest 1/4 inch increment.

- Inlet Connections
 1-inch NPT or ISO 7-R1
- Part Number from Table C.

Separate Cover Plate

Specify Series RFII Concealed Cover Plate with (temperature), (finish), and P/N (below).

BrassP/N 56-792-1-135
Chrome P/N 56-792-9-135
Signal White ^(a) (RAL9003)
Grey White ^(b) (RAL9002)P/N 56-792-0-135
Custom
(a) Previously known as Bright White (b) Previously known as Standard White
165°F (74°C) Cover Plate BrassP/N 56-792-1-165
Chrome P/N 56-792-9-165
Chrome P/N 56-792-9-165 Signal White ^(a) (RAL9003)
Chrome P/N 56-792-9-165 Signal White ^(a) (RAL9003) P/N 56-792-4-165 Grey White ^(b) (RAL9002) P/N 56-792-0-165
Chrome P/N 56-792-9-165 Signal White ^(a) (RAL9003) P/N 56-792-4-165 Grey White ^(b) (RAL9002)

Sprinkler Wrench

Specify RFII Sprinkler Wrench, P/N 56-000-1-075.

Sprinkler Boot

Specify Model DSB-2 Dry Sprinkler Boot, P/N 63-000-0-002. This Part Number includes one Boot, two Strap Ties, and 1/3 oz. of Adhesive (quantity of adhesive is sufficient for installing one Boot).

Fire Department

Connection, Straight Pattern



Description

The Straight Pattern Fire Department Connection is Underwriters' Laboratories listed and Factory Mutual Approved. Manufactured from solid brass* components to increase service life. The single clapper design features brass clapper and brass seats within a cast brass* body. The 2 1/2" swivels are pin lug design for ease of use and compatibility with local fire service districts. Swivel gaskets are included. Breakable caps or plugs should be installed to protect swivels and prevent debris from being accidently introduced into the water way.

Installation

Installation of the Fire Department Connection is achieved with readily available jobsite tools. Prior to installation make sure the proper identification sign has been installed on the nipple. Coat male threads of 4" IPS nipple liberally with a suitable pipe thread sealant such as **Pipefit**[®]. Tighten FDC one

full turn past hand tight. Make sure FDC is aligned according to requirements.

DO NOT OVER TIGHTEN. OVERTIGHTENING MAY CAUSE SEVERE STRETCH-ING AND POSSIBLE CRACKING OF THE OF THE FDC BODY.

Specifications

Size: 4" IPS Outlet (2) 2 1/2" Swivel Inlets Type: Straight Pattern Material: Brass* *Swivels: NST 3.0686 x 7.5T CF 2.9900 x 7.5T 3.0000 x 8 TP BCT NYFD 3.0300 x 8 TP QST 3.0310 x 7 TP CIN-new 3.0580 x 6 TP PHX 3.0620 x 6 TP TEM 3.0750 x 6 TP CLV 3.0780 x 8 TP CIN-old 3.0930 x 6 TP ONT 3.1250 x 5 TP DET 3.1250 x 7.5T NovaSco 3.2300 x 5 TP Dayton 3.2340 x 6 TP Richmon 3.3120 x 8 TP Raleigh 3.3400 x 6 TP **Approvals:** UL Listed 300psi FM Approved 300psi

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



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AUTOMATIC DRIP CHECK

1. PRODUCT NAME

Automatic Drip Check, 34" Model D-1 (Deluge & Flow Control Valves) Part Number 10730 Model D-2 (Dry Valve Replacement with Model B-1 Accelerator) Part Number 10731 Model D-3 (Dry Valve) Part Number 10732 Model D-4 (Deluge, Electroless Nickel Plated) Part Number 10733 Manufactured since 1980

2. MANUFACTURER

The Viking Corporation 210 N Industrial Park Drive Hastings MI 49058 U.S.A. Telephone: (269) 945-9501 (877) 384-5464 (269) 945-4495 Fax: Email: techsvcs@vikingcorp.com



3. PRODUCT DESCRIPTION

The Automatic Drip Checks are designed to drain water automatically, which may leak past a normally closed dry valve or deluge valve. They close, however, against an increase in flow pressure and will open automatically at a predetermined decrease in pressure. The devices are used with dry and deluge valves to drain any water that may seep by the valve clapper.

Model D-1 and D-4 Drip Check is used with a valve that does not have an automatic alarm line drain. It has a notched seat so that a slight amount of water will discharge through the Drip Check when the valve trips. When the control valve is closed, the alarm line will automatically drain through the Drip Check. This unit is normally used with the Viking Deluge Valves.

Model D-2 Drip Check is normally used with Viking Model C dry valves with iron trim. The Drip Check has a 3/8" pipe plug installed for use with the Model B-1 Accelerator. When the valve trips, no water will discharge through the Drip Check. When the control valve is closed and the system is drained, the Drip Check will open and drain off any excess water in the valve.

Model D-3 Drip Check is used with a Model D or E dry valve that has an automatic drain for the alarm line. When the valve trips, no water will discharge through the Drip Check. When the control valve is closed and the system is drained, the Drip Check will open and drain off any excess water in the valve.

4. TECHNICAL DATA

Designed to Underwriter's Laboratory and Factory Mutual requirements. Working water pressure: 250 PSI (17.2 bar) Materials:

Body: Brass casting UNS-C84400 Ball: Stainless Steel Spring: Phosphor Bronze Retaining Ring: Stainless Steel Model D-4: Electroless Nickel Plated

Viking Technical Data may be found on The Viking Corporation's Web site at http://www.vikingcorp.com. The Web site may include a more recent

5. AVAILABILITY

The Viking Automatic Drip Check is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

6. GUARANTEES

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

7. MAINTENANCE

During each inspection of valve, push plunger to make sure no water is trapped.

8. INSTALLATION

A. Install in outlet provided in valve trim.

B. Unit should be level.

edition of this Technical Data Page.

August 31, 2006



AUTOMATIC BALL **DRIP VALVE MODEL B-1**

1. PRODUCT NAME

Automatic Ball Drip Valve, 1/2" Model B-1 Manufactured since 1978 Part Number 04292B

2. MANUFACTURER

The Viking Corporation 210 N Industrial Park Drive Hastings MI 49058 U.S.A. (269) 945-9501 Telephone: (877) 384-5464 Fax: (269) 945-4495 Email: techsvcs@vikingcorp.com

3. PRODUCT DESCRIPTION

The Automatic Ball Drip Valve is designed to drain water automatically which may leak past a normally closed check valve or gate valve. It closes, however, against an increase in flow pressure and will open automatically at a predetermined decrease in pressure. Automatic ball drip valves are used, for example, on the inlet side of fire department check valve or pumper connections to prevent water from collecting and freezing.

4. TECHNICAL DATA

Designed to Underwriter's Laboratory and Factory Mutual requirements.

Working water pressure: 250 PSI (17.2 bar)

Materials:

Bar: Brass UNS-C36000

Spring: Stainless Steel UNS-S30200 Retaining Ring: Stainless Steel UNS-S15700 Closing pressure: 13.5 PSI (93 kPa) with increasing pressure Opening pressure: 12.5 PSI (86 kPa) with decreasing pressure

6. AVAILABILITY

The Viking Automatic Ball Drip Valve is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

7. GUARANTEES

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

7. MAINTENANCE

The Automatic Ball Drip Valve should be inspected annually.

8. INSTALLATION

Install the automatic ball drip in a horizontal position. If desirable, pipe discharge to an open drain. ¼" NPT is provided in the drain outlet.

NOTE: THIS VALVE IS NOT DESIGNED TO SHUT COMPLETELY AND WILL CONTINUE TO DRIP WHEN PRESSURIZED.



Viking Technical Data may be found on

The Viking Corporation's Web site at

http://www.vikingcorp.com. The Web site may include a more recent

edition of this Technical Data Page.



The Leading Manufacturer of Air Compressors for the Fire Protection Industry



OILLESS TANK MOUNTED COMPRESSORS

for Dry Pipe Sprinkler Systems



- A.S.M.E. Coded Tanks
- 1/2" Outlet Connections
- Thermal Overload Protection
- Fills System to 40 PSI in 30 Minutes (NFPA 13)
- Fully Automatic
- Direct Drive
- Air Intake Filter(s)
- Oil Less Piston Compressor
- UL Listed Pressure Switch
- Bubble Tight Air Check Valve
- Permanently Lubricated Bearings

60 Cycle Units - 50 Cycle Available, Consult Factory

System Capacity (gallons)**	Model Number	Average CFM*	Motor H.P.	Min. Wire Size ++	Dim L	nensio W	ons H	Weight (lbs.)	Tank Capacity (gallons)
110†	OL11016ACT	1.33	1/6	12	32	13.5	22.5	94	10
215†	OL21533ACT	2.61	1/3	10	32	13.5	23	98	10
335	OL33550ACT	4.06	1/2	8	32	13.5	23	114	10
425	OL42575ACT	5.27	3/4	8	32	14	24	120	10
610	OL610V100ACT	7.40	1	8	32	14	24	124	10
900	OL900V100ACT	10.91	1	6	35	17	32	165	20
1200‡	OL1200V200ACT	14.55	2	10	35	17	32	165	20





Magnetic Line Starters - Thermal Overload Protection

		ingic i na	30		
	115V	230V	Size	Model	
	1/3 HP	1 HP	00	MG00A*	
Maximum	1 HP	2 HP	0	MGX0A*	
HP	2 HP	3 HP	1	MG01A*	
	3 HP	5 HP	1P	MG15A*	

When Ordering a Magnetic Line Starter you <u>must</u> specify HP, Voltage and Phase that is supplied to the motor.

* Average CFM is the average free air delivery from 0 to 40 PSIG.

++ Based on 100 foot run.

Consult Factory for longer or shorter runs.

** Based on 70 degree F system temp. For other conditions consult factory for pump up times.

+ - 115 volt only, + - 230 volt only, all other units 115/230 volt.
3 Phase Units available - Consult Factory.



Air Maintenance Device Part # AMD-1

The AMD-1 is used when compressed air is supplied through an existing factory air supply or when using tank mounted units.

Call 1-800-345-8207 Fax: 610-524-8965 E-Mail: genairpro@generalairproducts.com Remember - You can find this sheet and more at

www.GENERALAIRPRODUCTS.com



PART NUMBERS LISTED ARE FOR ACCESSORY ITEMS RECOMMENDED FOR COMPLETE INSTALLATION - CONSULT YOUR LOCAL DISTRIBUTOR FOR AVAILABILITY

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FIG. 7012* Gruvlok Flange

The Gruvlok[®] Fig. 7012 Flange allows direct connection of Class 125 or Class 150 flanged components to a grooved piping system. The two interlocking halves of the 2" thru 12" sizes of the Gruvlok Flange are hinged for ease of handling, and are drawn together by a latch bolt which eases assembly on the pipe. Precision machined bolt holes, key and mating surfaces assure concentricity and flatness to provide exact fit-up with flanged, lug, and wafer styles of pipe system equipment. A specially designed gasket provides a leak-tight seal on both the pipe and the mating flange face.

Working pressure ratings shown are for reference only and are based on Schedule 40 pipe. For the latest UL/ULC listed and FM approved pressure ratings versus pipe schedule, see www.anvilstar.com or contact your local AnvilStar Representative.

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

The Gruvlok Fig. 7012 Flange requires the use of a steel adapter insert when used against rubber faced surfaces, wafer/lug design valves and serrated or irregular sealing surfaces. In copper systems a phenolic adapter insert is required, in place of the steel adapter insert. (See Installation and Assembly Instructions Section or contact your AnvilStar Rep. for details.)

Flange comes complete with Grade "E" EPDM Gasket.



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

Available galvanized.
 * When ordering, refer to product as FP7012.

MATERIAL SPECIFICATIONS

HOUSING:

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

LATCH BOLT/NUT (2"-12"):

Heat treated, zinc electroplated, carbon steel oval neck track bolts conforming to ASTM A-183 and zinc electroplated heavy hex nuts of carbon steel conforming to ASTM A-563 Grade A or Grade B, or J995 Grade 2.

COATINGS:

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

LUBRICATION:

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

GASKETS: Materials

Properties as designated in accordance with ASTM D-2000.

Grade "E" EPDM (Green color code)

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

NOT FOR USE IN PETROLEUM APPLICATIONS.

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









FIGURE 7012 FLANGE: ANSI CLASS 125 & 150																
Newtral	D:	Max.	Mary Fuel	Latc	h Bolt			Dimensions	5	Sealing	Surface	Mating Flange Bolts				A
Size	O D	Working	Max. Ena	I	Specified	Torque §	v	v	V 7		D 44:	Matin	g Flange Bolts	Specified Torque §		Approx. Wt Fa
5120	0.0.	Pressure v	Loud ¥	Latch Rolt Size.	Min.	Max.	X	ľ	L _	A Max.	B Min.	Qty.	Size (ANSI)	Min.	Max.	III. Eu.
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	FtLb	s/N-m	In./mm	In./mm	In./mm	In./mm	In./mm		in. (ISO) mm	FtLb	s/N-m	Lbs./Kg
2	2.375	300	1,329	3% x 2¾	30	45	61/4	83/8	3/4	23/8	37/16	4	5% x 23/4	110	140	4.2
50	60.3	20.7	5.91	M10 x 70	40	60	159	213	19	60	87	4	M16 x 70	149	190	1.9
21/2	2.875	300	1,948	3% x 2¾	30	45	7	9 ½	3/4	21/8	4	4	5% x 23/4	110	140	4.6
65	73.0	20.7	8.66	M10 x 70	40	60	178	241	19	73	102	-	M16 x 70	149	190	2.1
3 O.D.	2.996	300	2,115	-	30	45	71/4	9 ³ /4	3/4	3	4 1/8	-	-	110	140	4.8
76.1	76.1	20.7	9.41	M10 x 70	40	60	184	248	19	76	105	4	M16 x 70	149	190	2.2
3	3.500	300	2,886	³ / ₈ x 2 ³ / ₄	30	45	71/8	10½	3/4	31/2	4%16	4	5% x 23/4	110	140	6.0
88.9	88.9	20.7	12.84	M10 x 70	40	60	200	267	19	89	116	8	M16 x 70	149	190	2.7
4	4.500	300	4,771	3% x 2¾	30	45	9	11½	3/4	41/2	5%16	8	5% x 23/4	110	140	6.3
100	114.3	20.7	21.22	M10 x 70	40	60	229	292	19	114	141	8	M16 x 70	149	190	2.9
5½ O.D.	5.500	300	7,127	-	30	45	97/8	12%	7/8	5 ⁹ /16	6 ³ /4	-	-	220	250	15.6
139.7	139.7	20.7	31.70	M10 x 70	40	60	251	327	22	141	171	8	M16 x 75	298	339	7.1
5	5.563	300	7,292	3/8 x 23/4	30	45	10	121/2	7/8	5%16	63/4	8	³ ⁄4 x 2 ⁷ ⁄8	220	250	8.8
125	141.3	20.7	32.44	M10 x 70	40	60	254	318	22	141	171	-	-	298	339	4.0
6½ O.D.	6.500	300	9,955	-	30	45	111/4	14	7/8	6 5/8	7 ¹³ /16	-	-	220	250	9.7
165.1	165.1	20.7	44.28	M10 x 70	40	60	286	356	22	168	198	8	M20 x 80	298	339	4.4
6	6.625	300	10,341	3% x 2¾	30	45	11	14	7/8	65%	713/16	8	³ ⁄ ₄ x 3 ¹ ⁄ ₈	220	250	9.6
150	168.3	20.7	46.00	M10 x 70	40	60	279	356	22	168	198	8	M20 x 80	298	339	4.4
8	8.625	300	17,528	³ / ₈ x 2 ³ / ₄	30	45	131/2	16½	1	85%	10	8	³ ⁄ ₄ x 3 ¹ ⁄ ₄	220	250	15.6
200	219.1	20.7	77.97	M10 x 70	40	60	343	419	25	219	254	8 (12)	M20 x 80	298	339	7.1
10	10.750	300	27,229	3% x 2¾	30	45	16	19	1	10¾	121/8	12	½ x 3½	320	400	18.2
250	273.1	20.7	121.12	M10 x 70	40	60	406	483	25	273	308	12	M20 x 90	439	542	8.3
12	12.750	300	38,303	3/8 x 23/4	30	45	19	21¾	11/4	123/4	141%	12	⁷ ∕8 x 3³∕₄	320	400	29.9
300	323.9	20.7	170.38	M10 x 70	40	60	483	552	32	324	359	12	-	439	542	13.6
12 (PN)	12.750	300	38,303	-	30	45	18½	211/4	1	123/4	141/8	12	-	320	400	20.9
300	323.9	20.7	170.38	M10 x 70	40	60	460	540	25	324	359	12	M20 x 90	439	542	9.5

+ PN 16 uses M24 x 90 (PN) Dimensions for bolt circle PN 10 & 16 Flange.

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

ullet Based on use with standard wall pipe.

 $\ensuremath{\S}$ – For additional Bolt Torque information, see Technical Data Section.

The Gruvlok Flange bolt hole pattern conforms to ANSI Class 150 and Class 125 flanges.

To avoid interference issues, flanges cannot be assembled directly to Series 7700 butterfly valve. Flange can be assembled to one side of series 7500 and 7600 valve only.

Mating flange bolts must be at least Intermediate Strength Bolting per ASME B16.5. Bolts with material properties equal or greater than SAE J429 Grade 5 are acceptable.

Refer to Gruvlok Products Catalog or AnvilStar's web site for more information on installing this flange.

 $300\ \text{Lb}$ Flange is available, Fig. 7013, see Gruvlok Catalog or contact your AnvilStar Rep. for more information.

Other sizes available, contact an AnvilStar Representative.

WARNING

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

FIG. 7012* Gruvlok Flange





Mating Flange

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- 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 tie-rods across non-restrained joints.
- E. Fig. 7012 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. An additional bolt is recommended for the hinge side of the 2" 12" Figure 7012 when connecting to lug valves.
- H. Contact an AnvilStar Representative for Di-Electric Flange connections.

Applications which require a Gruvlok Flange Adapter Insert:

- 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 full-faced 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.



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

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

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





visit our website at www.anvilstar.com or contact an Anvil®/AnvilStar™ Sales Representative.

Available galvanized.
 * When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

HOUSING:

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

ANSI BOLTS & HEAVY HEX NUTS:

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

COATINGS:

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

LUBRICATION:

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

GASKETS: Materials

Properties as designated in accordance with ASTM D-2000.

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

Grade "E" EPDM (Green color code)

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

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:

Standard C Style Flush Gap (1¹/₄"-8")

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





FIGURE 7000 LIGHTWEIGHT COUPLING															
Nominal	Pipe	Max.	Max. Fnd	Range of	Deflection	n From 🕑	Coupling Dimensions			Coupling Bolts		Specified	Torque §	Approx.	
Size	0.D.	Working Pressure	Load	Pipe End Separation	Per Coupling	Pipe	X	Y	Z	Qty.	Size	Min.	Max.	Wt. Ea.	
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	Degrees	In./Ft.	In./mm	In./mm	In./mm		In./mm	FtLbs	s./N-m	'N-m Lbs./Kg	
11/4	1.660	600	1,299	0-1/8	4° 19'	0.90	23/4	43/8	13⁄4	2	3% x 21⁄4	30	45	1.4	
32	42.2	41.4	5.78	0-3.2		75.3	70	111	44		M10 x 57	40	60	0.6	
11/2	1.900	600	1,701	0-1/8	3° 46'	0.79	3	45%	13/4	2	3∕8 x 21⁄4	30	45	1.5	
40	48.3	41.4	7.57	0-3.2		65.7	76	117	44		M10 x 57	40	60	0.7	
2	2.375	600	2,658	0-1/8	3° 1'	0.63	31/2	51/2	13⁄4	2	3∕8 x 2¼	30	45	1.7	
50	60.3	41.4	11.82	0-3.2		52.6	89	140	44		M10 x 57	40	60	0.8	
21/2	2.875	600	3,895	0-1/8	2° 29'	0.52	4	53/4	13⁄4	2	3∕8 x 2¼	30	45	1.9	
65	73.0	41.4	17.33	0-3.2		43.3	102	146	44		M10 x 57	40	60	0.9	
3 O.D.	2.996	600	4,230	0-1/8	2° 23'	0.50	4	6 ¹ /8	13/4	2	³ /8 x 2 ¹ /4	80	100	2.3	
76.1	76.1	41.4	18.82	0-3.2		41.6	102	156	44		M10 x 57	110	150	1.0	
3	3.500	600	5,773	0-1/8	2° 3'	0.43	45/8	63/4	13⁄4	2	1⁄2 x 2³⁄4	80	100	2.9	
80	88.9	41.4	25.68	0-3.2		35.8	117	171	44		M12 x 70	110	150	1.3	
4½ O.D.	4.250	600	8,512	0-1/4	3° 22'	0.70	5½	73/4	2	2	1/2 x 3	80	100	4.0	
108.0	108.0	41.4	37.86	0-6.4		58.7	140	197	51		M12 x 76	110	150	1.8	
4	4.500	600	9,543	0-1/4	3° 11'	0.67	51%	81/8	2	2	½ x 3	80	100	4.6	
100	114.3	41.4	42.45	0-6.4		55.5	149	206	51		M12 x 76	110	150	2.1	
5¼ O.D.	5.236	500	10,766	0-1/4	2° 44′	0.57	61/2	<i>91/8</i>	2	2	5∕8 x 3¹∕₂	100	130	5.7	
133.0	133.0	34.5	47.89	0-6.4		47.7	165	232	51		M16 x 85	135	175	2.6	
5½ O.D.	5.500	500	11,879	0-1/4	2° 36'	0.54	63/4	<i>93/8</i>	2	2	5∕8 x 3¹∕₂	100	130	6	
139.7	139.7	34.5	52.84	0-6.4		45.4	171	238	51		M16 x 85	135	175	2.7	
5	5.563	500	12,153	0-1/4	2° 35'	0.54	7	9 5%	2	2	5∕8 x 3½	100	130	6.1	
125	141.3	34.5	54.06	0-6.4		45.1	178	244	51		M16 x 85	135	175	2.8	
61/4 O.D.	6.259	500	15,384	0-1/4	2° 17'	0.48	71/2	103/8	2	2	5∕8 x 3¹∕₂	100	130	6.7	
159.0	159.0	34.5	68.43	0-6.4		39.8	191	264	51		M16 x 85	135	175	3.0	
6½ O.D.	6.500	500	16,592	0-1/4	2° 12'	0.46	73/4	10¾	2	2	5∕8 x 3¹∕₂	100	130	7.0	
165.1	165.1	34.5	73.80	0-6.4		34.8	197	273	51		M16 x 85	135	175	3.2	
6	6.625	500	17,236	0-1/4	2° 10'	0.45	8	11	2	2	5% x 3½	100	130	8.1	
150	168.3	34.5	76.67	0-6.4		37.8	203	279	51		M16 x 85	135	175	3.7	
8	8.625	500	29,213	0-1/4	1° 40'	0.35	10	131/4	23/8	2	³ ⁄ ₄ x 4 ¹ ⁄ ₂	130	180	14.2	
200	219.1	34.5	129.95	0-6.4		29.1	264	337	60		M20 x 110	175	245	6.4	

Not for use in copper system.

Fire Products Division of Anvil International

\$ – For additional Bolt Torque information see Technical Data Section.

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

A WARNING

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





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

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





DN 50 and DN200 sizes are VdS approve

Available galvanized.
 * When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

HOUSING:

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

ANSI BOLTS & HEAVY HEX NUTS:

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

COATINGS:

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

LUBRICATION:

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

GASKETS: Materials

Properties as designated in accordance with ASTM D-2000.

Pre-Lubricated Grade "E" EPDM, Type A Gasket (Violet color code)

-40°F to 150°F (Service Temperature Range)(-40°C to 66°C) Recommended for wet and dry (oil free air) pipe fire protection sprinkler systems. For dry pipe systems and freezer applications, Gruvlok Xtreme™ Lubricant is required.

Grade "E" EPDM (Green color code)

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

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:

Standard C Style Flush Gap (1¹/₄" - 8")

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





	FIGURE 7400 RIGIDLITE® COUPLING												
Nominal	Pine	Max.	Max.	Range of	Ca	oupling Dimension	ons	Co	upling Bolts	Specified	Approx.		
Size	0.D.	Working Pressure	End Load	Pipe End Separation	Х	Y	Z	Qty.	Size	Min.	Max.	Wt. Ea.	
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm		In./mm	FtLb	s./N-m	Lbs./Kg	
11/4	1.660	300	649	0-1/8	25%	43⁄4	13/4	2	3∕8 x 21∕4	30	45	1.3	
32	42.2	20.7	2.89	0-3.2	67	121	44		M10 x 57	40	60	0.6	
1½	1.900	300	851	0-1/8	21/8	41/8	13/4	2	3% x 21/4	30	45	1.4	
40	48.3	20.7	3.78	0-3.2	73	124	44		M10 x 57	40	60	0.6	
2	2.375	300	1,329	0-1/8	31⁄4	51/2	13/4	2	3% x 21⁄4	30	45	1.6	
50*	60.3	20.7	5.91	0-3.2	83	140	44		M10 x 57	40	60	0.7	
21/2	2.875	300	1,948	0-1/8	31/8	6	13/4	2	3% x 21/4	30	45	1.9	
65	73.0	20.7	8.66	0-3.2	98	152	44		M10 x 57	40	60	0.9	
3 O.D.	2.996	300	2,115	0-1/8	4	51/8	13/4	2	3⁄8 x 21/4	30	45	1.9	
76.1	76.1	20.7	9.41	0-3.2	102	149	44		M10 ax 57	40	60	0.9	
3	3.500	300	2,886	0-1/8	41/2	63/4	13/4	2	3% x 2¾	30	45	2.1	
80	88.9	20.7	12.84	0-3.2	114	171	44		M10 x 70	40	60	1.0	
4	4.500	300	4,771	0-1/4	5%	7¾	11/8	2	3% x 2¾	30	45	3.1	
100	114.3	20.7	21.22	0-6.4	143	197	48		M10 x 70	40	60	1.4	
5½ O.D.	5.500	300	7,127	0-1/4	63/4	91/4	2	2	1/2 x 3	80	100	4.5	
139.7	139.7	20.7	31.70	0-6.4	171	235	51		M12 x 76	110	150	2.0	
5	5.563	300	7,292	0-1/4	61/8	9 ¹ / ₄	2	2	½ x 3	80	100	4.6	
125	141.3	20.7	32.44	0-6.4	175	235	51		M12 x 76	110	150	2.1	
6½ O.D.	6.500	300	9,955	0-1/4	73/4	103/8	2	2	1/2 x 3	80	100	5.5	
165.1	165.1	20.7	44.28	0-6.4	200	264	51		M12 x 76	110	150	2.5	
6	6.625	300	10,341	0-1/4	7%	10%	2	2	½ x 3	80	100	5.5	
150	168.3	20.7	46.00	0-6.4	200	264	51		M12 x 76	110	150	2.5	
8	8.625	300	17,528	0-1/8	10¼	12¾	23/8	2	½ x 3	80	100	8.4	
200*	219.1	20.7	77.97	0-3.2	260	324	60		M12 x 76	110	150	3.8	

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

 * DN 50 and DN 200 sizes are VdS approved.

Fire Products Division of Anvil International

 $\ensuremath{\$}$ – For additional Bolt Torque information see Technical Data Section.

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

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







Fire Products Division of Anvil International

FIGURE 7050S* STANDARD 90° ELBOW

Nominal Size	0.D.	Max. Rated Pressure	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	PSI/bar	In./mm	Lbs./Kg
11⁄4	1.660	300	23/4	1.0
32	42.2	20.7	70	0.5
11/2	1.900	300	23/4	1.2
40	48.3	20.7	70	0.5
2	2.375	300	31⁄4	1.7
50	60.3	20.7	83	0.8
21/2	2.875	300	3¾	2.6
65	73.0	20.7	95	1.2
3	3.500	300	4 ¹ / ₄	4.0
80	88.9	20.7	108	1.8
4	4.500	300	5	7.7
100	114.3	20.7	127	3.5
5	5.563	300	51/2	11.1
125	141.3	20.7	140	5.0
6	6.625	300	6½	16.5
150	168.3	20.7	165	7.5
8	8.625	300	7¾	30.6
200	219.1	20.7	197	13.9

For additional sizes, see Fig. 7050 in the Gruvlok Catalog or contact an AnvilStar Representative.



- Available galvanized.

* When ordering, refer to product as FP7050S.

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

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile Iron conforming to ASTM A-536 Malleable Iron conforming to ASTM A-47

COATINGS:

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

Not for use in copper systems.

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







Fire Products Division of Anvil International





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

FIGUR	E 7060)s * st/	ANDAR	D TEE
Nominal Size	0.D.	Max. Rated Pressure	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	PSI/bar	In./mm	Lbs./Kg
11/4	1.660	300	23/4	1.5
32	42.2	20.7	70	0.7
11/2	1.900	300	23/4	1.8
40	48.3	20.7	70	0.8
2	2.375	300	31⁄4	2.4
50	60.3	20.7	83	1.1
2 ¹ / ₂	2.875	300	3¾	4.0
65	73.0	20.7	95	1.8
3	3.500	300	4¼	5.8
80	88.9	20.7	108	2.6
4	4.500	300	5	10.3
100	114.3	20.7	127	4.7
5	5.563	300	51/2	16.2
125	141.3	20.7	140	7.3
6	6.625	300	61/2	25.7
150	168.3	20.7	165	11.7
8	8.625	300	7¾	41.1
200	219.1	20.7	197	18.6

- Available galvanized.

* When ordering, refer to product as FP7060S.

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

MATERIAL SPECIFICATIONS

CAST FITTINGS:

Ductile Iron conforming to ASTM A-536 Malleable Iron conforming to ASTM A-47

COATINGS:

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

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

PROJECT INFORMATION	APPROVAL STAMP
Project:	Approved
Address:	Approved as noted
Contractor:	Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	
5/09	







FIG	JURE 70	50DR 9	90° DRA		ow	
Nominal		Max.	Dime	Dimensions		
Size	0.D.	Working Pressure	Center to End	Н	Wt. Ea.	
In./DN(mm)	In./mm	PSI/bar	In./mm	In./mm	Lbs./Kg	
11/4	1.660	300	23/4	13⁄4	2.1	
32	42.2	20.7	70	44	1.0	
11/2	1.900	300	23/4	13/4	2.5	
40	48.3	20.7	70	44	1.1	
2	2.375	300	31/4	13/4	2.9	
50	60.3	20.7	83	44	1.3	
21/2	2.875	300	3¾	11/8	5.2	
65	73.0	20.7	95	48	2.4	
3	3.500	300	41⁄4	2	7.5	
80	88.9	20.7	108	51	3.4	
4	4.500	300	5	21/4	12.2	
100	114.3	20.7	127	57	5.5	
5	5.563	300	51/2	23/8	17.6	
125	141.3	20.7	140	60	8.0	
6	6.625	300	6½	23/8	28.3	
150	168.3	20.7	165	60	12.8	
8	8.625	300	73/4	21/2	48.0	
200	219.1	20.7	197	64	21.8	
10	10.750	300	9	23⁄4	70.0	
250	273.1	20.7	229	69	31.8	
12	12.750	300	10	23⁄4	110	
300	323.9	20.7	254	69	49.9	

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



- Available galvanized. Available fabricated Schedule 10 only. Drain elbow has a standard 1" female NPT outlet.

MATERIAL SPECIFICATIONS

FABRICATED FITTINGS:

1¹/4" - 6" are Carbon Steel, A-135, Schedule 10 8" - 12" are Carbon Steel, A-795/A-135/.188 Wall

COATINGS:

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

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

STAR®PIPE PRODUCTS

C.I. THREADED FITTINGS



LISTED LISTED APPROVED For fire protection services request submittal GRS 1.3

(FM)

Cast iron threaded fittings are UL, ULC listed and factory mutual approved for 300 psi service. Gray iron per ASTM A126 class B. Dimensions conform to ANSI B16.4 class 125 except plugs conform to ASME B16.14. Threads are NPT per ANSI/ASME B1.20.1.



CAST IRON 90 DEGREE ELBOW						
NOMINAL	ITEM	MAX.	DIMEN	ISIONS	WEIGHT	
SIZE	CODE	WORKING			EACH	
(INCH)	#	P.S.I.	Α	В	PIECE	
1	CB90033	300	1.50	1.50	0.95	
1 1/4	CB90044	300	1.75	1.75	1.34	
1 1/2	CB90055	300	1.94	1.94	1.80	
2	CB90066	300	2.25	2.25	2.90	
2 1/2	CB90077	300	2.70	2.70	4.75	



CAST IRON RED. COUPLING						
NOMINAL ITEM MAX. DIMENSION WEIGHT						
SIZE	CODE	WORKING		EACH		
(INCH)	#	P.S.I.	Α	PIECE		
1X1/2	CRC031	300	1.70	0.62		
1X3/4	CRC032	300	1.70	0.80		



CAST IRON RED. 90 DEG. ELBOW					
NOMINAL	ITEM	MAX.	DIMEN	SIONS	WEIGHT
SIZE	CODE	WORKING			EACH
(INCH)	#	P.S.I.	Α	в	PIECE
1X1/2	CB90031	300	1.26	1.36	0.64
1X3/4	CB90032	300	1.37	1.45	0.87
1 1/4X1/2	CB90041	300	1.34	1.53	0.96
1 1/4X3/4	CB90042	300	1.45	1.62	1.13
1 1/4X1	CB90043	300	1.58	1.67	1.16
1 1/2x1 1/2	CB90051	300	1.41	1.66	1.17
1 1/2x3/4	CB90052	300	1.52	1.75	1.28
1 1/2X1	CB90053	300	1.65	1.80	1.51
1 1/2X1 1/4	CB90054	300	1.82	1.88	1.62
2X1/2	CB90061	300	1.49	1.88	2.00
2X3/4	CB90062	300	1.60	1.97	2.05
2X1	CB90063	300	1.73	2.02	2.10
2X1 1/4	CB90064	300	1.90	2.10	2.30
2X1 1/2	CB90065	300	2.02	2.16	2.60



CAST IRON STRAIGHT TEE						
NOMINAL	ITEM	MAX.	DIMEN	ISIONS	WEIGHT	
SIZE	CODE	WORKING			EACH	
(INCH)	#	P.S.I.	Α	в	PIECE	
1	CT333	300	1.50	1.50	1.21	
1 1/4	CT444	300	1.75	1.75	1.87	
1 1/2	CT555	300	1.94	1.94	2.51	
2	CT666	300	2.25	2.25	3.96	
2 1/2	CT777	300	2.70	2.70	6.45	



CAST IRON 45 DEGREE ELBOW						
NOMINAL	IAL ITEM MAX. DIMENSIONS			WEIGHT		
SIZE	CODE	WORKING			EACH	
(INCH)	#	P.S.I.	Α	В	PIECE	
1	CB45033	300	1.12	1.12	0.84	
1 1/4	CB45044	300	1.29	1.29	1.40	
1 1/2	CB45055	300	1.43	1.43	1.80	
2	CB45066	300	1.68	1.68	2.79	



CAST IRON PLUGS								
NOMINAL	ITEM	MAX.	DIM ENSION	WEIGHT				
SIZE	CODE	WORKING		EACH				
(INCH)	#	P.S.I.	Α	PIECE				
1/2	CPL001	300	0.94	0.10				
3/4	CPL002	300	1.07	0.17				
1	CPL003	300	1.25	0.28				
1 1/4	CPL004	300	1.36	0.44				
1 1/2	CPL005	300	1.45	0.62				
2	CPL006	300	1.56	0.91				



C.I. THREADED FITTINGS





LISTED LISTED APPROVED For fire protection services request submittal GRS 1.3



CAST IRON CROSS								
NOMINAL	ITEM	MAX.	DIM ENSIONS		WEIGHT			
SIZE	CODE	WORKING			EACH			
(INCH)	#	P.S.I.	Α	В	PIECE			
1	CX033	300	1.50	1.50	1.54			
1 1/4	CX044	300	1.75	1.75	2.40			
1 1/2	CX055	300	1.94	1.94	3.10			
2	CX066	300	2.25	2.25	4.00			
1 1/4X1	CX043	300	1.58	1.67	2.05			
1 1/2X1	CX053	300	1.65	1.80	2.40			
2X1	CX063	300	1.73	2.02	2.75			



CAST IRON REDUCING TEE								
NOMINAL	ITEM	MAX.	DIM ENSIONS		WEIGHT			
SIZE	CODE	WORKING				EACH		
(INCH)	#	P.S.I.	Α	В	С	PIECE		
1X1X1/2	CT331	300	1.26	1.26	1.36	0.95		
1X1X3/4	CT332	300	1.37	1.37	1.45	1.10		
1X1/2X1	CT313	300	1.50	1.36	1.50	1.08		
1X3/4X1	CT323	300	1.50	1.45	1.50	1.18		
1X1X1 1/4	CT334	300	1.67	1.67	1.58	1.52		
1X1X1 1/2	CT335	300	1.80	1.80	1.65	1.73		
1 1/4X1X1/2	CT431	300	1.34	1.26	1.53	1.17		
1 1/4X1X3/4	CT432	300	1.45	1.37	1.62	1.38		
1 1/4X1X1	CT433	300	1.58	1.50	1.57	1.47		
1 1/4X1X1 1/4	CT434	300	1.75	1.67	1.75	1.80		
1 1/4X1X1 1/2	CT435	300	1.88	1.80	1.82	2.05		
1 1/4X1 1/4X1/2	CT441	300	1.34	1.34	1.53	1.37		
1 1/4X1 1/4X3/4	CT442	300	1.45	1.45	1.62	1.54		
1 1/4X1 1/4X1	CT443	300	1.58	1.58	1.67	1.65		
1 1/4X1 1/4X1 1/2	CT445	300	1.88	1.88	1.82	2.21		
1 1/4X1 1/4X2	CT446	300	2.10	2.10	1.90	2.55		
1 1/2X1X1/2	CT531	300	1.41	1.34	1.66	1.41		
1 1/2X1X3/4	CT532	300	1.52	1.37	1.75	1.65		
1 1/2X1X1	CT533	300	1.65	1.50	1.80	1.65		
1 1/2X1X1 1/4	CT534	300	1.82	1.67	1.88	2.00		
1 1/2X1X1 1/2	CT535	300	1.94	1.80	1.94	2.30		
<u>1 1/2X1 1/4X1/2</u>	CT541	300	1.41	1.34	1.66	1.58		
<u>1 1/2X1 1/4X3/4</u>	CT542	300	1.52	1.45	1.75	1.72		
<u>1 1/2X1 1/4X1</u>	CT543	300	1.65	1.58	1.80	1.85		
<u>1 1/2x1 1/4x1 1/4</u>	CT544	300	1.82	1.75	1.88	2.22		
<u>1 1/2x1 1/4x1 1/2</u>	CT545	300	1.94	1.88	1.94	2.45		
<u>1 1/2X1 1/4X2</u>	CT546	300	2.16	2.10	2.02	2.80		
<u>1 1/2X1 1/2X1/2</u>	CT551	300	1.41	1.41	1.66	1.76		
<u>1 1/2X1 1/2X3/4</u>	C1552	300	1.52	1.52	1.75	1.87		
1 1/2X1 1/2X1	C1553	300	1.65	1.65	1.80	1.94		
<u>1 1/2X1 1/2X1 1/4</u>	C1554	300	1.82	1.82	1.88	2.29		
	CT 556	300	2.16	2.16	2.02	3.28		
2X1X2	C1636	300	2.25	2.02	2.25	3.40		
2X1 1/4X2	CT646	300	2.25	2.10	2.25	2.80		
	C1651	300	1.49	1.41	1.88	2.09		
2X1 1/2X3/4	CT652	300	1.60	1.52	1.97	2.40		
	CT053	300	1.73	1.00	2.02	2.54		
	CT654	300	1.90	1.82	2.10	2.85		
2X1 1/2X1 1/2	CT055	300	1.49	1.41	1.00	2.24		
2X2X1/2	CT661	300	1 /0	1 /0	1 99	3.73		
2X2X3/4	CT662	300	1.49	1.49	1.00	2.00		
28283/4	CT662	300	1.00	1.00	2.02	2.71		
28281 1/4	CT664	300	1 00	1.73	2.02	2.31		
28281 1/2	CT665	300	2.02	2.02	2.10	3.72		
2x2x2 1/2	CT667	300	2.60	2.02	2 30	5.12		
<u> </u>		300	2.00	2.00	4.55	3.10		

Page 20
Spare Sprinkler Head

Storage Cabinet



Description

Fire Protection Products, Inc. Spare Sprinkler Head Cabinets are designed to allow for spare sprinkler head storage as required by NFPA guidelines. The Spare Sprinkler Head Cabinets are available in six configurations. Three head, six head, six head ESFR, twelve head, twenty-four head and thirty-six head. All six styles are manufactured with "knockouts" to accommodate the most common size sprinklers. The shelf is located to allow for the storage of a typical sprinkler head wrench. Each cabinet is finished with a red enamel fi nish. Each spare head cabinet comes with a hinged door which remains closed to protect the spare sprinklers from the elements and features two holes on the back panel to allow for attachment to most surfaces utilizing the appropriate fasteners. Not intended for exposed or harsh environments.

Installation

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

"0-300 sprinklers, not less than 6 300-1000, not less than 12 1000 or more, not less than 24. Stock of spare sprinklers shall include all types and ratings installed."* Once the correct Spare Sprinkler Head Cabinet has been selected, installation is accomplished by inserting the correct fastener in each of the two holes inside the cabinet, securing the cabinet securely to the wall. The insert the correct number and type of sprinklers in accordance with the "handbook".

*Final determination is subject to approval by the AHJ.

Specifications

Material: Painted plain steel

Finish: Red enamel

Styles:

3 Spare sprinklers, 1/2 or 3/4

6 Spare sprinklers, 1/2 or 3/4

6 Spare, ESFR, 1/2 , 3/4 or 1"

12 Spare sprinklers 1/2 or 3/4

24 Spare sprinklers

36 Spare sprinklers



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Fire Protection Products, Inc 6241 Yarrow Dr., Suite A, Carlsbad, CA 92011-1541 For guestions: 1 800 344-1822 • 1 800 344-3775 fax • www.fppi.com



SSM/SSV Series Alarm Bells

System Sensor's SSM and SSV series alarm bells are low current, high decibel notification appliances for use in fire and burglary systems or other signaling applications.



Features

- Approved for indoor and outdoor use
- Low current draw
- High dB output
- Available in six-inch, eight-inch, and ten-inch sizes
- AC and DC models
- DC models polarized for use with supervision circuitry
- Mount directly to standard four-inch square electrical box indoors
- SSM and SSV series come pre-wired

Reliable Performance. The SSM and SSV series provide loud resonant tones. The SSM series operates on 24VDC and are motor driven, while the SSV series operates on 120VAC utilizing a vibrating mechanism.

Simplified Installation. For indoor use, the SSM and SSV series mount to a standard four-inch square electrical box. For outdoor applications, weatherproof back box, model number WBB, is used.

The SSM and SSV series come pre-wired, to reduce installation time. The SSM series incorporates a polarized electrical design for use with supervision circuitry.

Agency Listings









7135-1653-0217

SSM/SSV Specifications

Architectural/Engineering Specifications

Model shall be a SSM or SSV Series alarm bell. Bells shall have underdome strikers and operating mechanisms. Gongs on said bells shall be no smaller than nominal 6"/8"/10" (specify size) with an operating voltage of 24VDC or 120VAC (specify by part number). Bells shall be suitable for surface or semi-flush mounting. Outdoor surface mounted installations shall be weatherproof (using optional WBB weatherproof electrical box). Otherwise bells shall mount to a standard 4" square electrical box having a maximum projection of 2½". Bells shall be located as shown on the drawings or as determined by the Authority Having Jurisdiction. Bells shall be listed for indoor/outdoor use by Underwriters Laboratories and the California State Fire Marshal, and approved by Factory Mutual and MEA.

Physical/Operating Specifications										
Operating Tempe	erature Range	–31°F to 140°F								
Operating Voltage		SSM series: 24 VDC								
		SSV series: 120 VAC								
Termination		Provided with 2 sets of le	eads for in/out wiring							
Service Use		Fire Alarm, General Signa	aling, Burglar Alarm							
Warranty		3 years								
Electrical Specifications										
Model	Gong Diameter (inches)	Nominal Voltage	Operating Voltage Limit	Maximum Current	Sound Output (dBA)					
SSM24-6	6	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	82					
SSM24-8	8	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	80					
SSM24-10	10	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	81					
SSV120-6	6	Regulated 120VAC	96 to 132VAC	53mA	85					
SSV120-8	8	Regulated 120VAC	96 to 132VAC	53mA	82					
SSV120-10	10	Regulated 120VAC	96 to 132VAC	53mA	82					

* Sound output measured at Underwriter Laboratories, as specified in UL464

Ordering Information

UL/FM Model No.	ULC/Canadian Model No.	Description
SSM24-6	SSM24-6A	Bell, 6", 24VDC, Polarized, 82dBA
SSM24-8	SSM24-8A	Bell, 8", 24VDC, Polarized, 80dBA
SSM24-10	SSM24-10A	Bell, 10″, 24VDC, Polarized, 81dBA
SSV120-6	SSV120-6A	Bell, 6", 120VAC, 85dBA
SSV120-8	SSV120-8A	Bell, 8", 120VAC, 82dBA
SSV120-10	SSV120-10A	Bell, 10″, 120VAC, 82dBA
WBB		Weatherproof back box for SSM and SSV series, when installed outdoors





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Revision 3/10/2010

Fig. 909 - No-Thread Swivel Sway Brace Attachment

Size Range -1" bracing pipe. For brace pipe sizes larger than 1", use TOLCO Fig. 980.

Material - Carbon Steel, hardened cone point engaging screw

Function — The structural component of a sway and seismic bracing system.

Features — This product's design incorporates a <u>concentric</u> 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. No threading of the bracing pipe is required. Open design allows for easy inspection of pipe engagement.

Application Note — The Fig. 909 is used in conjunction with the TOLCO Fig. 1000, Fig. 1001, Fig. 4 (A) or Fig. 4L pipe clamp, and joined together with bracing pipe. Sway brace assemblies are intended to be installed in accordance with NFPA 13 (or TOLCO State of California OSHPD Approved Seismic Restraint Manual) and the manufacturer's installation instructions. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13 and/or OSHPD.

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

Installation Instructions — The Fig. 909 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, 4A, 4B or 4L to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 909 onto the bracing pipe. Tighten the set bolt until head bottoms out on surface. 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.

Dimensions • Weights									
Pipe Size	Α	В	Hole Size H*	Max. Design. Load Lbs.	Max. Design Load Lbs. w/Washer	Approx. Wt./100			
1	6	1 5⁄8	17/32	2015	2765	91			
* Available with hole sizes to accommodate up to 3/4" fastener. Consult Factory.									

TOLCO[®] brand bracing components are desgined to be compatible <u>ONLY</u> with other TOLCO[®] brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does <u>NOT</u> 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 <u>NOT</u> 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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Revision 5/27/2008

Component of State of

California OSHPD Approved Seismic Restraints System

Fig. 1000 - "Fast Clamp" Sway Brace Attachment

Size Range — Pipe size to be braced: 1" thru 6" Schedule 10 thru 40 IPS.* Pipe size used for bracing: 1" and 1¹/₄" Schedule 40 IPS.

* Additionally **(UL)** approved for use to brace Schedule 7 sprinkler pipe up to 4" (maximum horizontal design load 655 lbs.) Torque requirement 6 – 8 ft. lbs.

Material – Carbon Steel

Function — For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1000 is used in conjunction with a TOLCO Fig. 900 Series Fitting and joined together with bracing pipe per NFPA 13* or TOLCO OSHPD Approved Seismic Manual, forming a complete sway brace assembly.

Features — Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a 4-way riser brace. Can be used as longitudinal brace with Fig. 907. Comes assembled and individually packaged with illustrated installation instructions — sizes are clearly marked. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

Installation — The Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980, 910 or 909 to form a complete bracing assembly. Follow NFPA 13 and/or OSHPD guidelines.

To Install — Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

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.

Application Note — Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

Finish - Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

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



Maximum Design Load 1" thru 4" pipe size — 2015 lbs. 6" size — 1265 lbs.

FM Approved Design Loads* 1" - 2½" - 600 lbs. 3" - 4" - 700 lbs.



 $TOLCO^{\$}$ brand bracing components are desgined to be compatible <u>**ONLY**</u> with other $TOLCO^{\$}$ brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does <u>**NOT**</u> 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 <u>**NOT**</u> 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.



Fig. 4 - Standard Pipe Clamp Fig. 4F - Standard Pipe Clamp Felt Lined Fig. 4PVC - Standard Pipe Clamp PVC Coated

Size Range - (Fig. 4) Size 1/2" thru 30" pipe.

Size Range - (Fig. 4F) Size 1/2" thru 2¹/2" copper tubing

Material - Carbon Steel

Function – Recommended for the suspension of non-insulated pipe or insulated pipe with Fig. 220 shields. (Use Fig. 330 Weldless Eye Nut, Fig. 102 Eye Rod or Fig. 101 Welded Eye Rod.) Also recommended for attachment of sway bracing up to 31/2" pipe size, for larger pipe sizes use Fig. 4A. Fig. 4F and Fig. 4PVC are designed to reduce noise and vibration and/or prevent electrolysis.

Approvals - Underwriters' Laboratories Listed in the USA (UL), Canada (cUL) 1/2" - 8", and approved by Factory Mutual Engineering, 3/4" - 8". Federal Specification WW-H-171E, Type 4, 1¹/2" thru 24" and Manufacturers Standardization Society SP-69, Type 4. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spac-

ing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Note — When the Fig. 4 is used as a sway brace, to ensure performance, the UL Listing requires that it must be used with other TOLCO® brace products.

Maximum Temperature - 750°F

Finish – Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, pipe size and finish.

Order Note — When ordering Fig. 4F allow for 3/16" felt on each half of clamp.

Component of State of California OSHPD Approved Seismic Restraints System









			Dim	ensions	Weights			
Pipe Size	А	в	с	D	Polt Size	Max. Design For Servi	n Load Lbs. ice Temp.	Approx
					BOIL SIZE	050	/50 F	
1/2	37/16	1/4	11/8	11/8	5/16	500	445	29
3/4	3 %16	1/4	11/4	11/4	5/16	500	445	31
1	3 %16	1/4	1 1⁄4	1 ^{5/16}	5/16	500	445	35
1 1⁄4	43⁄16	3/8	1 3⁄8	1 11⁄16	5/16	500	445	40
1 ½	49⁄16	3/8	15⁄8	17⁄8	5/16	800	715	42
2*	5%16	3/8	2	21⁄4	3/8	1040	930	93
21/2*	6 ⁷ /16	3/8	21/2	23⁄4	1/2	1040	930	126
3*	7	3/8	23⁄4	31/16	1/2	1040	930	141
31⁄2*	711/16	3/8	31⁄8	33⁄8	1/2	1040	930	154
4	81⁄2	5/8	3 ⁵ /16	3 ¹ ¹ /16	1/2	1040	930	229
5	93⁄4	3/4	37⁄8	43⁄8	5/8	1040	930	261
6	115⁄8	3/4	47⁄8	51⁄8	3/4	1615	1440	537
8	13 ⁵ /16	1	55/8	6	3/4	1615	1440	625
10	16 ½	1	71⁄4	71⁄4	7/8	2490	2220	1378
12	181⁄2	1	81⁄4	81⁄4	7/8	2490	2220	1574
14	20	1 1⁄8	9	9	7/8	2490	2220	2103
16	23	1 1⁄8	101/4	101⁄4	7/8	2490	2220	2314
18	251/8	1 1⁄4	11 ½	11 ½	1	3060	2730	3276
20	28	13⁄8	12 ½	12 ½	1 1⁄8	3060	2730	3863
24	331/2	1 5⁄8	151/4	151⁄4	1 1⁄4	3060	2730	5222
30	417/8	2	19	19	13⁄4	3500	3360	10511



www.tolco.com

Revision 3/10/2010

Fig. 906 - Sway Brace Multi-Fastener Adapter

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — Use with 1" and 1¹/₄" TOLCO UL listed Fig. 900 Series Earthquake Brace Attachments. **Material** — Carbon Steel

Application — Allows sway brace fittings to develop greater load carrying ability by providing multiple fastener attachments. The National Fire Protection (NFPA) provides

information on fastener loads to various structures. Refer to NFPA 13 (2010) 9.3.5.9.1.

Approvals — Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) only when used with TOLCO 900 Series Earthquake Brace Attachments. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Installation Instructions — The Fig. 906 is a multiple fastener structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Attach the Fig. 906 to the structural surface as per fastener design guidelines. Attach other TOLCO transitional attachment fitting Fig. 909, 910, 980 or 986. Transitional fitting attachment can pivot for adjustment to proper brace angle.



Finish - Plain

Note – Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By - Figure number and specify dimensions H1 and H2.

Dimensions • Weights								
Α	B C D		H1	H2	Approx Wt./100			
12	9	2	1/4	Specify	Specify	Varies		

TOLCO[®] brand bracing components are desgined to be compatible <u>ONLY</u> with other TOLCO[®] brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does <u>NOT</u> 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 <u>NOT</u> 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.

US LISTED

Fig. 200 - "Trimline" Adjustable Band Hanger Fig. 200R (Import) - "Trimline" Adjustable Band Hanger w/Retainer Ring

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-69, Type 10.

Maximum Temperature - 650°F

Finish — Mil. Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nub.

Order By - Figure number and pipe size

Note — Figure 200R (import) with retainer ring and non-captured knurl nut.



Dimensions • Weights											
Pipe Size	F Inch	Rod Size Metric	А	В	Max. Rec. Load Lbs.	Approx. Wt./100					
1/2	3/8	8mm or 10mm	31/8	25⁄8	400	11					
3/4	3/8	8mm or 10mm	31/8	21/2	400	11					
1	3/8	8mm or 10mm	33/8	25⁄8	400	12					
1 1⁄4	3/8	8mm or 10mm	3 ¾	21/8	400	13					
1 ½	3/8	8mm or 10mm	37/8	27/8	400	14					
2	3/8	8mm or 10mm	41/2	3	400	15					
21/2	3/8	10mm	55%	41⁄8	600	27					
3	3/8	10mm	51/8	4	600	29					
31⁄2	3/8	10mm	73⁄8	51⁄4	600	34					
4	3/8	10mm	73⁄8	5	1000	35					
5	1/2	12mm	91/8	61⁄4	1250	66					
6	1/2	12mm	101//8	6¾	1250	73					
8	1/2	12mm	131/8	83/4	1250	136					

VERTICAL MOUNT



SAMMYS[®] for Wood Installs VERTICALLY into the bottom of wood structures easily and quickly!



Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (Ibs)	UL Test Load (Ibs)	FM Test Load (Ibs)	Box Qty	Case Qty	
	1/4"	8002957	GST 100	1/4 x 1"	210 (7/16" OSB) 670 (3/4" Ply)			25	125]
	1/4"	8003957	GST 200	1/4 x 2"	1760 (Fir)			25	125	
	1/4"	8004957	GST 300	1/4 x 3"	2060 (Fir)			25	125	
	3/8"	8006957	GST .75	1/4 x 3/4"	564 (3/4" Ply)			25	125	
U) III	3/8"	8007957	GST 10	1/4 x 1"	210 (7/16" OSB) 670 (3/4" Ply)	300		25	125	
	3/8"	8008957	GST 20	1/4 x 2"	1760 (Fir)	850	1475	25	125	
U) III	3/8"	8068925	GST 20-SS	1/4 x 2"	1760 (Fir)	850		25	125	
UL)es	3/8"	8009925	GST 25-380	3/8 x 2-1/2"	2113 (Fir)	1500		25	125	
	3/8"	8010957	GST 30	1/4 x 3"	2060 (Fir)	1500	1475	25	125	
	3/8"	8069925	GST 30-SS	1/4 x 3"	2060 (Fir)			25	125	Pa
	3/8"	8011925	GST 40	1/4 x 4"	2180 (Fir)			25	125	
	3/8"	8012925	GST 60	1/4 x 6"	2230 (Fir)			25	125	
	1/2"	8013925	GST 2	1/4 x 2"	1760 (Fir)			25	125	٦.
	1/2"	8014925	GST 2.5-380	3/8 x 2-1/2"	2113 (Fir)			25	125	
	1/2"	8015925	GST 3	1/4 x 3"	2275 (Fir)			25	125	
	1/2"	8016925	GST 4	1/4 x 4"	2180 (Fir)			25	125	
	1/2"	8017925	GST 6	1/4 x 6"	2230 (Fir)			25	125	#14
									-	- N

Nut Drive

Part # 8114910

SAMMY Swivel Head[®] for Wood Installs VERTICALLY and swivels up to 17° in wood structure

Product Features

- · Eliminates distortion of threaded rod.
- Accommodates up to 3 ¹/₂" x 12 pitch roof.
- Allows 17° deflection from vertical.
- Reduces installation cost. Made in the U.S.A.

Saves time from traditional methods

Ultimate **UL** Test FM Test Min Box Case Rod Part Screw Approvals Model Thickness Size Number Descriptions Pullout (lbs) Load (lbs) Load (lbs) Qty Qty 3/8" 8139957 1/4 x 2" 1475 125 125 SH-GST 20 1257 (Fir) 1050 25 3/8" 8141957 SH-GST 30 1/4 x 3" 1720 (Fir) 1500 1475 25 125

#14 Black Nut Driver Part # 8113910

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.









HORIZONTAL MOUNT

SIDEWINDERS® for Wood Installs HORIZONTALLY into the side of wood structures easily and quick



	Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (Ibs)	Box Qty	Case Qty
		1/4"	8018957	SWG 100	1/4 x 1"	622 (Fir)		25	125
		1/4"	8019957	SWG 200	1/4 x 2"	1725 (Fir)		25	125
	United States	3/8"	8020957	SWG 10	1/4 x 1"	622 (Fir)	300	25	125
- I.		3/8"	8021957	SWG 20	1/4 x 2"	1725 (Fir)	1050	25	125
	Lump	3/8"	8073925	SWG 20-SS	1/4 x 2"	1725 (Fir)	850	25	125
4 SW Red	UL US	3/8"	8022925	SWG 25-380	3/8 x 2-1/2"	2249 (Fir)	1500	25	125
lut Driver		3/8"	8023925	SWG 30	1/4 x 3"	1884 (Fir)		25	125
rt # 8114910 🗖									

INSTALLATION STEPS - VERTICAL INTO WOOD & STEEL:

- 1. Insert the appropriate nut driver into a 3/8" or 1/2" portable drill.
- Insert the SAMMYS into the #14 (black) nut driver (p/n 8113910). Drill should be in a vertical position.
- 3. Push the face of the nut driver tight to the member. When the nut driver spins freely on the SAMMYS, stop drill and remove.
- The SAMMYS is now ready to receive 1/4", 3/8", 1/2" or metric all thread rod, bolt stock. (The 1/2" requires the #14SW red nut driver)

Note: When installing DSTR, follow the above instructions, then add retainer nut and torque to 20 foot lbs. for maximum pullout in purlin steel.



INSTALLATION STEPS - HORIZONTAL INTO WOOD & STEEL

- 1. Insert the appropriate nut driver into a 3/8" or 1/2" portable drill.
- Insert the SAMMYS into the #14SW (red) nut driver (p/n 8114910). With drill unit in a horizontal position and at a right angle to the structural member, begin installation.
- 3. When the nut driver spins free on the SAMMYS, stop the drill and remove.
- The unit is now ready to receive 1/4", 3/8" or metric all thread rod or bolt stock.

Note: When installing SWDR, follow the above instructions, then add retainer nut and torque to 20 foot lbs. for maximum pullout in purlin steel.



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.

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