



Model G5 Series Sprinklers

Standard Spray, Flat Concealed Pendent

Available with Gasketed Cover Plate

Features

- Standard Coverage, Concealed Pendent (K2.8, 4.2, 5.6, & 8.0 [40, 60, 80, & 115 metric])
- Flat concealed cover plate available in a variety of finishes.
- Available with Stainless Steel Clad cover plate (see Table I).
- 3/4-inch (19 mm) cover plate adjustment.
- Cover plate available with optional gasket.

Product Description

Model G5 series sprinklers are standard coverage, flat plate concealed sprinklers designed for installation in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets. The sprinklers are offered with a standard Model G4/G5 cover plate, a Model G4/G5 cover plate with a Quick-response (QR) gasket, or a Model G4/G5 cover plate with a Standard-response (SR) gasket. Model G5 sprinklers with a gasketed cover plate are intended for use in dust free environments such as clean rooms. Model G5 sprinklers must only be used with the Model G4/G5 cover plate listed or approved with the sprinkler. All Model G5 series sprinklers use a fusible-link operating element. Table A provides a summary of available Model G5 series sprinklers, along with Listing and Approval in-formation for each sprinkler and cover plate combination.



Model G4/G5 Cover Plate



Model G4/G5 QR Gasket Cover Plate



Model G4/G5 SR Gasket Cover Plate

Model G4/G5 Series Sprinkler Cover Plates

Model G5 Series Sprinkler Summary

Table A

Sprinkler Model	K-Factor gpm/psi ^{1/2} (L/min/bar ^{1/2})	Cover Plate Model	Listings and Approvals	Sensitivity	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
G5-28	2.8 (40)	G4/G5	cULus	QR	175 (12)	RA3411
			FM	SR		
		G4/G5 QR Gasket	cULus	QR		
		G4/G5 SR Gasket	cULus, FM	SR		
G5-42	4.2 (60)	G5	cULus	QR	175 (12)	RA3413
		G4/G5 QR Gasket		QR		
		G4/G5 SR Gasket		SR		
G5-56	5.6 (80)	G5	cULus	QR	250 (17)	RA3415
			FM, LPCB, VdS, CE	SR	175 (12)	
		G4/G5 QR Gasket	cULus	QR	250 (17)	
		G4/G5 SR Gasket	cULus	SR	250 (17)	
			FM	SR	175 (12)	
G5-56 300	5.6 (80)	G5	cULus	QR	300 (21)	RA4014
		G4/G5 QR Gasket		QR		
		G4/G5 SR Gasket		SR		
G5-80	8.0 (115)	G5	cULus	QR	175 (12)	RA3412
		G4/G5 QR Gasket		QR		
		G4/G5 SR Gasket		SR		
G5-80F	8.0 (115)	G5	FM	SR	175 (12)	RA3417
		G4/G5 SR Gasket				

Model G5-28 Standard Coverage, Concealed Pendent Sprinkler

SIN RA3411

Technical Specifications

Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 2.8 (40 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings

165°F (74°C)
212°F (100°C)

Sensitivity

(See Table B)

Cover Plates

Model G4/G5
Model G4/G5 QR Gasket (cULus only)
Model G4/G5 SR Gasket

Cover Plate Finishes

(See Table I)

Sprinkler Wrench

Model W3
Model FC

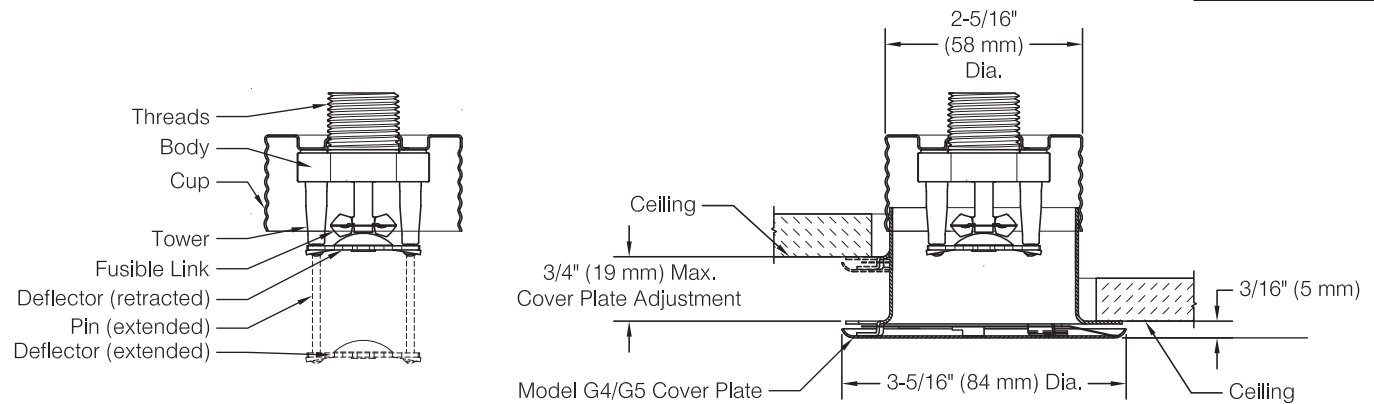
Listings and Approvals

cULus Listed (Light Hazard only)
FM Approved



Model G5-28 Sprinkler Components and Dimensions

Figure 1




Model G5-28 Sprinkler Sensitivity

Table B

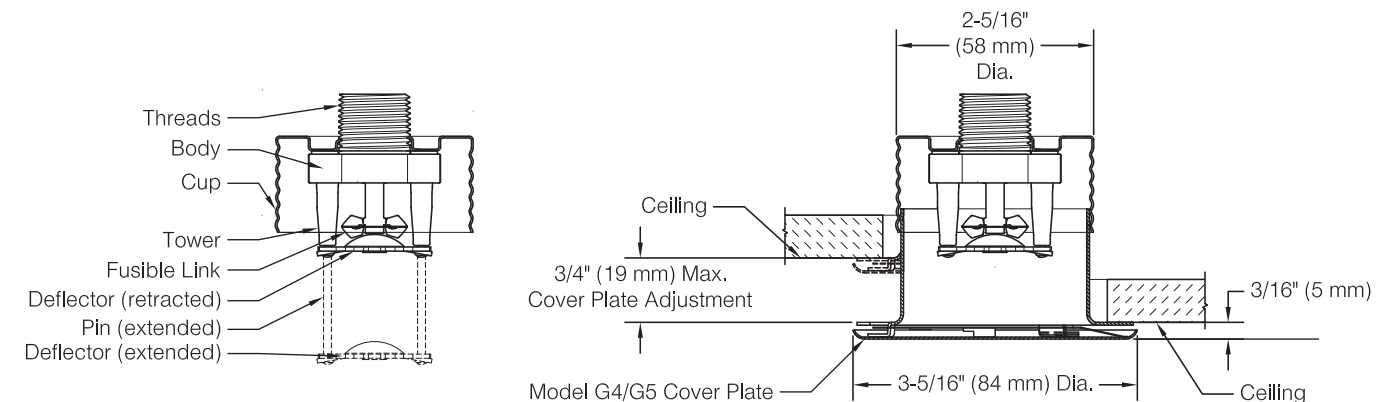
Cover Plate Model	Listing or Approval Agency	
	cULus	FM
G4/G5	QR	SR
G4/G5 QR Gasket	QR	--
G4/G5 SR Gasket	SR	SR

QR: Quick-response

SR: Standard-response

Model G5-42 Standard Coverage, Concealed Pendent Sprinkler		SIN RA3413
Technical Specifications Style: Flat Concealed Pendent Threads: 1/2" NPT or ISO 7-1 R1/2 Nominal K-Factor: 4.2 (60 metric) Max. Working Pressure: 175 psi (12 bar) Material Specifications Fusible Link: Beryllium Nickel Sprinkler Body: Brass Alloy Levers: Bronze Alloy Yoke: Brass Alloy Sealing washer: Nickel with PTFE Load Screw: Bronze Alloy Towers: Copper Alloy Pins: Stainless Steel Deflector: Bronze Alloy Cup: Steel	Sprinkler Temperature Ratings 165°F (74°C) 212°F (100°C) Sensitivity (See Table C) Cover Plates Model G4/G5 Model G4/G5 QR Gasket Model G4/G5 SR Gasket Cover Plate Finishes (See Table I) Sprinkler Wrench Model W3 Model FC Listings and Approvals cULus Listed (Light Hazard only)	

Model G5-42 Sprinkler Components and Dimensions Figure 2



Model G5-42 Sensitivity		Table C
Cover Plate Model	Listing or Approval Agency	
	cULus	
G4/G5	QR	
G4/G5 QR Gasket	QR	
G4/G5 SR Gasket	SR	

QR: Quick-response
SR: Standard-response

Model G5-56 Standard Coverage, Concealed Pendent Sprinkler

SIN RA3415

Technical Specifications

Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications

Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings

165°F (74°C)
212°F (100°C) (cULus, FM, LPCB, CE only)

Sensitivity

(See Table D)

Cover Plates

Model G4/G5
Model G4/G5 QR Gasket (cULus only)
Model G4/G5 SR Gasket (cULus and FM only)

Cover Plate Finishes

(See Table I)

Sprinkler Wrench

Model W3
Model FC

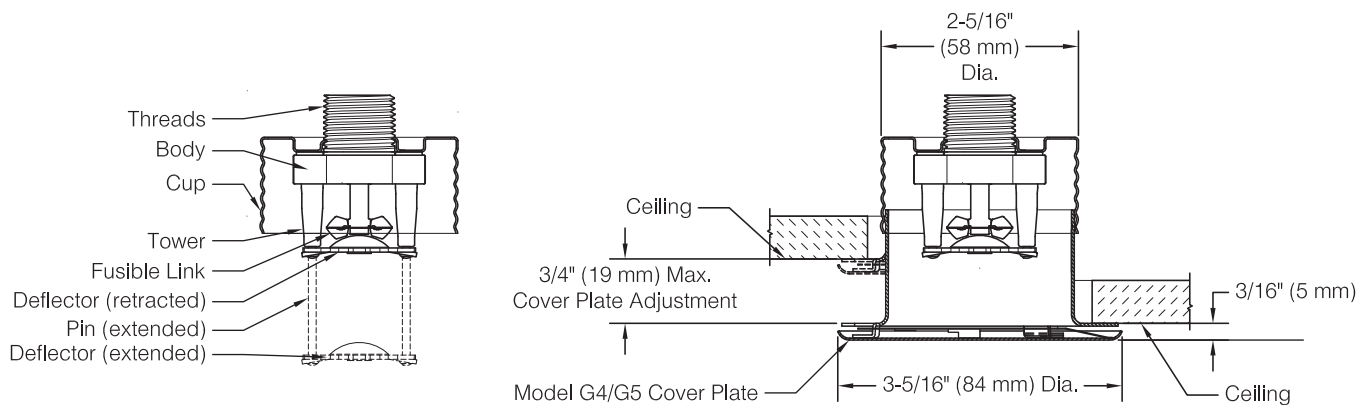
Listings and Approvals

cULus Listed (Light & Ordinary Hazard only)
FM Approved
LPCB Approved
VdS Approved [165°F (74°C) only]
CE Listed (2831-CPR-S2062)



Model G5-56 Sprinkler Components and Dimensions

Figure 3



Model G5-56 Sensitivity

Table D

Cover Plate Model	Listing or Approval Agency		
	cULus	FM	LPCB, VdS, CE
G4/G5	QR	SR	SR
G4/G5 QR Gasket	QR	--	--
G4/G5 SR Gasket	SR	SR	--

QR: Quick-response

SR: Standard-response

Model G5-56 300 Standard Coverage, Concealed Pendent Sprinkler

SIN RA4014

Technical Specifications

Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 300 psi (21 bar)

Material Specifications

Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings

165°F (74°C)
212°F (100°C)

Sensitivity

(See Table E)

Cover Plates

Model G4/G5
Model G4/G5 QR Gasket
Model G4/G5 SR Gasket

Cover Plate Finishes

(See Table I)

Sprinkler Wrench

Model W3
Model FC

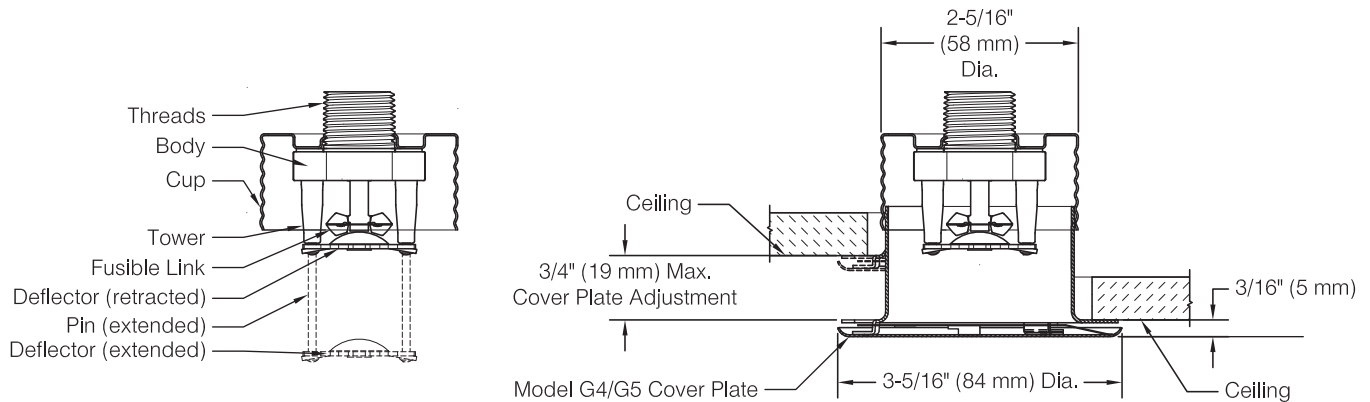
Listings and Approvals

cULus Listed (Light & Ordinary Hazard only)



Model G5-56 300 Sprinkler Components and Dimensions

Figure 4




Model G5-56 300 Sensitivity

Table E

Cover Plate Model	Listing or Approval Agency	
	cULus	
G4/G5	QR	
G4/G5 QR Gasket	QR	
G4/G5 SR Gasket	SR	

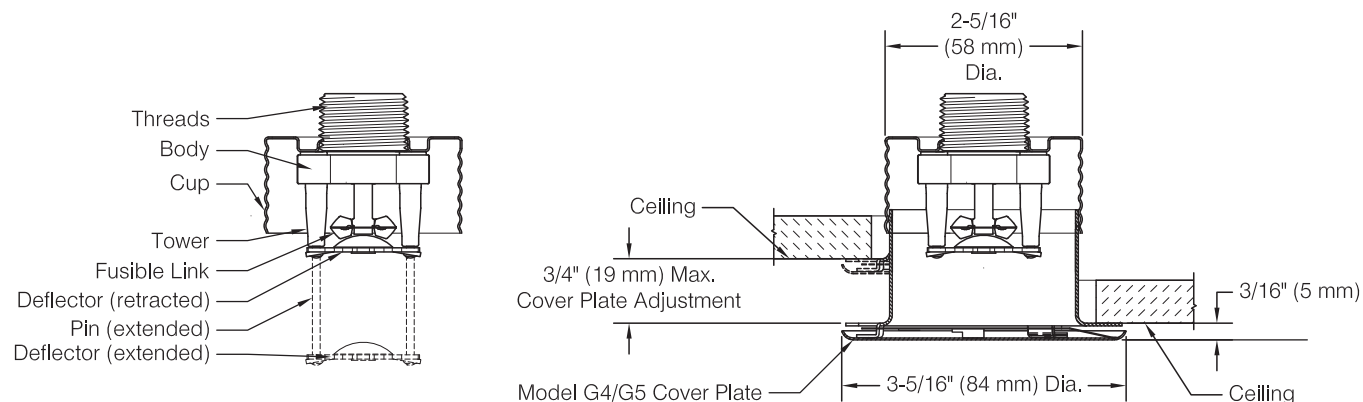
QR: Quick-response

SR: Standard-response

Model G5-80 Standard Coverage, Concealed Pendent Sprinkler		SIN RA3412
Technical Specifications Style: Flat Concealed Pendent Threads: 3/4" NPT or ISO 7-1 R3/4 Nominal K-Factor: 8.0 (115 metric) Max. Working Pressure: 175 psi (12 bar)	Sprinkler Temperature Ratings 165°F (74°C) 212°F (100°C)	
Material Specifications Fusible Link: Beryllium Nickel Sprinkler Body: Brass Alloy Levers: Bronze Alloy Yoke: Brass Alloy Sealing washer: Nickel with PTFE Load Screw: Bronze Alloy Towers: Copper Alloy Pins: Stainless Steel Deflector: Bronze Alloy Cup: Steel	Sensitivity (See Table F)	
	Cover Plates Model G4/G5 Model G4/G5 QR Gasket Model G4/G5 SR Gasket	
	Cover Plate Finishes (See Table I)	
	Sprinkler Wrench Model W3 Model FC	
	Listings and Approvals cULus Listed (Light & Ordinary Hazard only)	

Model G5-80 Sprinkler Components and Dimensions

Figure 5




Model G5-80 Sensitivity

Table F

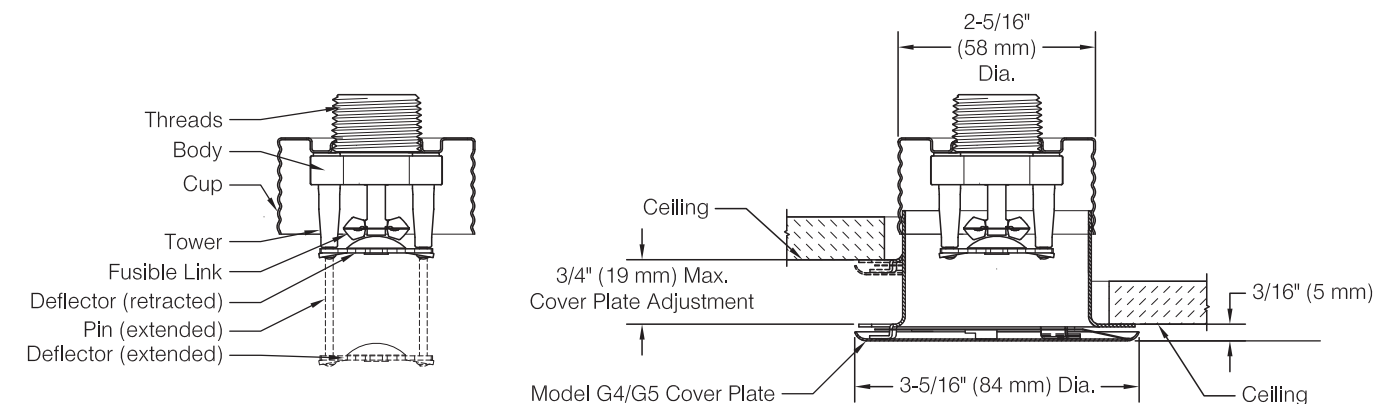
Cover Plate Model	Listing or Approval Agency	
	cULus	
G4/G5	QR	
G4/G5 QR Gasket	QR	
G4/G5 SR Gasket	SR	

QR: Quick-response

SR: Standard-response

Model G5-80F Standard Coverage, Concealed Pendent Sprinkler		SIN RA3417
Technical Specifications Style: Flat Concealed Pendent Threads: ¾" NPT or ISO 7-1 R¾ Nominal K-Factor: 8.0 (115 metric) Max. Working Pressure: 175 psi (12 bar)	Sprinkler Temperature Ratings 165°F (74°C) 212°F (100°C) Sensitivity Standard Response	
Material Specifications Fusible Link: Beryllium Nickel Sprinkler Body: Brass Alloy Levers: Bronze Alloy Yoke: Brass Alloy Sealing washer: Nickel with PTFE Load Screw: Bronze Alloy Towers: Copper Alloy Pins: Stainless Steel Deflector: Stainless Steel Cup: Steel	Cover Plates Model G4/G5 Model G4/G5 SR Gasket Cover Plate Finishes (See Table I) Sprinkler Wrench Model W3 Model FC Listings and Approvals FM Approved	

Model G5-80F Sprinkler Components and Dimensions Figure 6



Model G5-80F Sensitivity		Table G
Cover Plate Model	Listing or Approval Agency	
	FM	
G4/G5	SR	
G4/G5SR Gasket	SR	

SR: Standard-response

Installation Dimensions and Cover Plate Information

Table H

Cover Plate Model	Cover Plate Diameter Inch (mm)	Recommended Hole Diameter in Ceiling Inch (mm)	Cover Plate Adjustment Inch (mm)	Min. to Max. Face of Fitting to Ceiling ⁽¹⁾ Inch (mm)	Min. to Max. Dropped Deflector Distance below Ceiling Inch (mm)	Cover Plate Temperature Rating °F (°C)
G4/G5	3-5/16 (84)	2-5/8 (67)	3/4 (19)	1-1/2 to 2-1/4 (38 to 57)	1/4 to 1 (6 to 25)	135°F ⁽³⁾ (57°C)
G4/G5 QR Gasket ⁽²⁾	3-11/16 (94)					or
G4/G5 SR Gasket ⁽²⁾	4 (101 mm)					165°F ⁽⁴⁾ (74°C)

Notes:

1. Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation. A 1/2" x 1/2" brass nipple extension (Reliable P/N 6999991900) is available to assist with replacement of Reliable Model G4A sprinklers.
2. Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates are sold as assembled units including both the cover plate and gasket. Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates and gaskets are not interchangeable.
3. For use with 165°F (74°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 100°F (38°C).
4. For use with 212°F (100°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 150°F (66°C).

Cover Plate Finishes⁽¹⁾

Table I

Standard Finishes	Special Application Finishes
White Paint Chrome	Off-White Paint Black Paint Custom Color Paint – Specify ⁽²⁾ Raw Brass (Lacquered) Bright Brass Finished Bronze Black Plated Satin Chrome Stainless Steel Clad ⁽³⁾

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties. Gaskets for Model G5 QR Gasket and Model G4/G5 SR Gasket cover plates are only available in white.
2. Custom color paint is semi-gloss unless specified otherwise.
3. Stainless steel clad cover plates are Type 316 Stainless Steel on the finished side and C102 Copper Alloy on the back side. Cover plates are not listed or approved as corrosion resistant.

Application

Model G5 series sprinklers are standard coverage, flat plate concealed pendent sprinklers. The sprinklers are intended for use in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets, as well as the requirements of the applicable approval agencies.

Model G5 series sprinklers are available as either Quick-response (QR) or Standard-response (SR) depending on the approval agency and cover plate selected.

Model G5 series sprinklers use Model G4/G5 flat cover plates. Model G4/G5 QR Gasket and G4/G5 SR Gasket cover plates are available to limit air and dust movement through the ceiling.

Listing & Approval Agencies

Individual Model G5 series sprinkler may be listed or approved by the following agencies:

- Underwriters Laboratories, Inc. and UL Canada (cULus)
Listing Category: Sprinklers, Automatic and Open
Guide Number: VNIV
- FM Approvals (FM)
- Loss Prevention Certification Board (LPCB)
- VdS Schadenverhütung GmbH (VdS)
- EC-Certificate of Conformity 0832-CPD-2062 (CE)

See Table A and the individual sprinkler data sheets in this Bulletin for listings and approvals applicable to each sprinkler.

Installation

Model G5 series sprinklers are intended to be installed in accordance with NFPA 13, FM Global Property Loss Prevention Data Sheets, and the requirements of applicable authorities having jurisdiction. Model G5 series sprinklers must not be installed in ceilings with positive pressure in the space above. Ensure that the 4 slots in the cup are open and unobstructed following installation.

Model G5 series sprinklers are shipped with a wrench-able protective cap that should remain on the sprinkler until the sprinkler system is placed in service following construction.

Model G5 series sprinklers can be installed without removing the wrench-able protective cap using the Model W3 wrench. Alternatively, Model G5 series sprinklers can be installed using the Model FC wrench by temporarily removing the protective cap during installation of the sprinkler. The use of any other wrench to install Model G5 series sprinklers is not permitted and may damage the sprinkler.

Wrench



Model FC

For use with Model G5 Series sprinklers without wrench-able cap installed



Model W3

For use with Model G5 Series sprinklers with wrench-able cap installed



Fully insert the Model W3 wrench over the cap until it reaches the bottom of the cup, or the Model FC wrench over the sprinkler until the wrench engages the body. Do not wrench any other part of the sprinkler/cup assembly. The Model W3 and FC wrenches are designed to be turned with a standard 1/2" square drive. Tighten the sprinkler into the fitting after applying a PTFE based thread sealant to the sprinkler's threads. Recommended installation torque is specified in Table J.

Replace any sprinkler or cover plate which has been painted (other than factory applied). Properly installed Model G5 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates. Model G5 series sprinklers have holes in the cup that must remain unobstructed.

Replace any sprinkler which has been damaged. A stock of spare sprinklers should be maintained to allow quick re-placement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Installation Torque

Table J

Sprinkler Threads	Recommended Installation Torque (min. – max.)	
	ft.lb	N.m
1/2" NPT or ISO7-1R1/2	8-18	11-24
3/4" NPT or ISO7-1R3/4	14-20	19-27

Do not exceed the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinkler. Use care when inserting or removing the wrench from the sprinkler to avoid damage to the sprinkler.

Install the cover plate by hand, pushing and then turning the cover in the clockwise direction until it is tight against the ceiling. For Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates, the gasket should be attached to the flange of the cover plate skirt only. Do not glue the gasket in place or allow the gasket to overlap both the cover plate and the flange of the skirt.

Maintenance

Reliable Model G5 series sprinkler should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

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

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

Guarantee

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

Patents

Model G5 series sprinklers may be covered by one or more of the following patents:

U.S. Patent 6,554,077, U.S. Patent 7,275,603, U.S. Patent 8,776,903, U.S. Patent 9,248,327

Ordering Information

Specify the following when ordering.

Sprinkler

- Model [G5-28] [G5-42] [G5-56] [G5-56 300] [G5-80] [G5-80F]
- Temperature Rating [165°F (74°C)] [212°F (100°C)]
- Threads [NPT or ISO 7-1]

Cover Plate

- Model [G4/G5, G4/G5 QR Gasket, G4/G5 SR Gasket]
- Finish (See Table I)

Sprinkler Wrench

- Model W3
- Model FC



Always ready to protect your most valuable assets.

As the leading supplier of steel sprinkler pipe, we understand that there are no second chances in fire suppression. You need products of enduring quality and exceptional strength—plus reliable service. You need Bull Moose.

Bull Moose Fire Sprinkler Pipe Product Information

Nominal Pipe Size (Inches)		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"	NPS (In.)		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
SCHEDULE 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625	SCHEDULE 40		1.315	1.660	1.900	2.375	2.875	3.500	4.500
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249			1.049	1.380	1.610	2.067	2.469	3.068	4.026
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940			1.680	2.270	2.720	3.660	5.800	7.580	10.800
	Water Filled Weight (lb/ft)	1.820	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086			2.055	2.918	3.602	5.114	7.875	10.783	16.316
	C.R.R.	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805			1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Pieces per Lift	91	61	61	37	30	19	19	10	7			70	51	44	30	30	19	19
	Lift Weight (lbs) 21' lengths	2,695	2,319	2,677	2,051	2,224	1,732	2,242	1,951	2,490			2,470	2,431	2,513	2,306	3,654	3,024	4,309
	Lift Weight (lbs) 24' lengths	3,079	2,650	3,060	2,344	2,542	1,979	2,563	2,230	2,848			2,822	2,778	2,872	2,635	4,176	3,456	4,925
	Lift Weight (lbs) 25' lengths	3,208	2,760	3,187	2,442	2,648	2,062	2,670					2,940	2,894	2,992	2,745	4,350	3,601	5,130

SCHEDULE 10 & 40 ADVANTAGES:

- UL listed (US & Canada) and FM approved
- ASTM A135 and A795 Type E, Grade A Certified
- Complies with NFPA-13, 13R and 14
- Industry-leading hydraulic characteristics
- CRR of 1.0 and greater
- All pipe NDT weld tested

OTHER BENEFITS/SERVICES:

- We have the most stocking locations in the industry, for best delivery and availability
- Plain end or roll groove
- Eddy Guard II™ bacterial-resistant internal coating
- Custom length options
- Hot dipped galvanization
- Reddi-Pipe® red or black pipe eliminates field painting
- Compatible for use in wet, dry, preaction and deluge sprinkler systems
- The only maker with EPDs (to help earn LEED points).

Exclusive maker of Reddi-Pipe®
RED OR BLACK PAINTED PIPE.



cULus LISTED



BULL MOOSE
TUBE

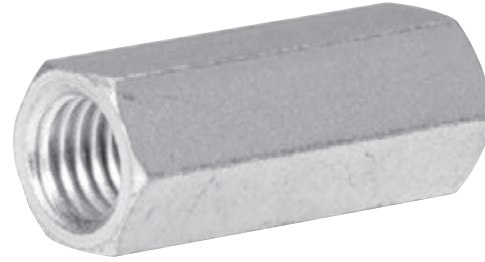
800.325.4467
sales@BullMooseIndustries.com
BullMooseTube.com

5.0 Installation System Hangers

Rod couplers

Material Specifications

Material	ASTM A563, Grade A carbon steel;
Finish	Zinc electroplated to ASTM B 633-98, SC 1, Type I
Thread	Class 2A fit; Class 2B thread



Ordering Information

Description	Length	Width across flats	Qty	Item No.	MSS-SP-58 ¹ Allowable Tensile Load at 650°F	AISC ² Allowable Load (lb)
1/4" Rod Coupler	7/8"	3/8"	100	411746	300	780
3/8" Rod Coupler	1-1/8"	1/2"	50	411747	730	1750
1/2" Rod Coupler	1-1/4"	5/8"	50	411748	1350	3110
5/8" Rod Coupler	2-1/8"	13/16"	50	411749	2160	4860
3/4" Rod Coupler	2-1/4"	1"	25	411750	3230	6700

¹ Per MSS-SP-58-2002, the ultimate tensile loads are based on a tensile stress of 50,000 psi multiplied by the threaded rod root area based on coarse thread UNC.

² AISC Allowable Tensile load = $0.33 \times F_u \times A_{nom}$

AISC Allowable Shear load = $0.17 \times F_u \times A_{nom}$

3.2.11.1 Product description

3.2.11.2 Material specifications

3.2.11.3 Technical data

3.2.11.4 Installation instructions

3.2.11.5 Ordering information



X-W6

W10

Listings/Approvals

ICC-ES (International Code Council)
 ESR-1663 with LABC/LARC Supplement

FM (Factory Mutual)

W10-30-27P10, W10-30-32P10 and W10-30-42P10 Fasteners for Sprinkler Pipe Hangers

UL (Underwriters Laboratories)

W10-30-32P10 and W10-30-42P10, Fasteners for Sprinkler Pipe Hangers - Up to 2-1/2" diameter pipe



3.2.11 STUD FASTENERS FOR ATTACHMENT TO CONCRETE

3.2.11.1 PRODUCT DESCRIPTION

The Hilti threaded stud program is for use with Hilti powder-actuated tools to provide a faster and more reliable solution for making attachments to concrete base materials. Threaded studs are available in standard carbon steel. The X-W6 and W10 threaded

studs have varying shank lengths to provide more reliable fastenings to standard and high strength concrete. Thread diameters of 1/4" have thread lengths ranging from 1/2" through 1-1/2". The 3/8" thread diameter has a single thread length of 1-3/16".

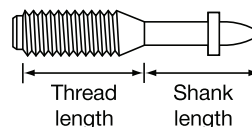
3.2.11.2 Material specifications

Fastener designation	Fastener material	Fastener plating
X-W6	Carbon Steel	5 µm Zinc ¹
W10	Carbon Steel	5 µm Zinc ¹

¹ ASTM B633, SC1, Type III. Refer to Section 2.3.3.1 for more information.

3.2.11.3 Technical data

Fastener designation	Thread designation	Thread length in. (mm)	Shank length in. (mm)
X-W6-20-22	UNC 1/4-inch	3/4 (20)	7/8 (22)
X-W6-20-27	UNC 1/4-inch	3/4 (20)	1 (27)
X-W6-38-27	UNC 1/4-inch	1-1/2 (38)	1 (27)
W10-30-27	UNC 3/8-inch	1-3/16 (30)	1 (27)
W10-30-32	UNC 3/8-inch	1-3/16 (30)	1-1/4 (32)
W10-30-42	UNC 3/8-inch	1-3/16 (30)	1-5/8 (42)



Allowable loads in normal weight concrete^{1,2}

Description	Fastener	Shank diameter in. (mm)	Minimum embedment in. (mm)	Concrete compressive strength			
				2000 psi		4000 psi	
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
1/4-20 Threaded stud	X-W6	0.145 (3.7)	3/4 (19)	40 (0.18)	55 (0.24)	40 (0.18)	55 (0.24)
			1 (25)	85 (0.38)	195 (0.87)	110 (0.49)	225 (1.00)
3/8-16 Threaded stud	W10	0.205 (5.2)	1 (25)	85 (0.38)	95 (0.42)	100 (0.44)	105 (0.47)
			1-1/4 (32)	175 (0.78)	345 (1.53)	200 (0.89)	380 (1.69)
			1-5/8 (41)	285 (1.27)	380 (1.69)	385 (1.71)	395 (1.76)

¹ The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.

² Multiple fasteners are recommended for any attachment.

Direct Fastening Technical Guide, Edition 21

Allowable Loads in Minimum $f'_c = 3000$ psi Structural Lightweight Concrete^{1,4}

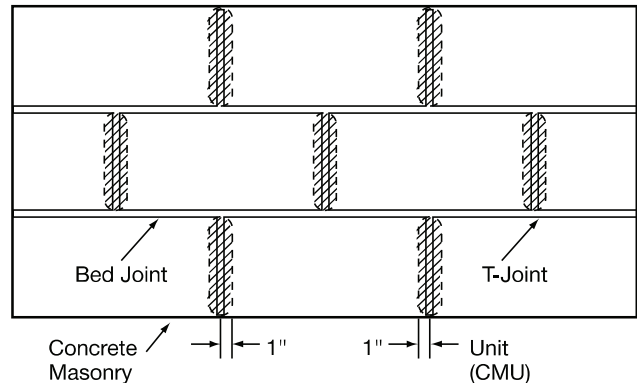
Fastener description	Fastener	Shank dia. in. (mm)	Min. embed. in. (mm)	Fastener location				
				Installed into concrete		Installed through 3" deep metal deck into concrete ^{2,3}		
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)		Shear lb (kN)
						Upper flute	Lower flute	
1/4-20 Threaded Stud	X-W6	0.145 (3.7)	3/4 (20)	125 (0.56)	185 (0.82)	125 (0.56)	115 (0.54)	185 (0.82)
			1 (25)	175 (0.78)	185 (0.82)	160 (0.71)	180 (0.80)	185 (0.82)
3/8-16 Threaded Stud	W10	0.205 (5.2)	1 (25)	265 (1.18)	190 (0.85)	160 (0.71)	–	185 (0.82)
			1-1/4 (32)	280 (1.25)	380 (1.69)	160 (0.71)	210 (0.93)	470 (2.09)
			1-5/8 (41)	445 (1.98)	540 (2.40)	435 (1.93)	325 (1.45)	675 (3.00)

- The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.
- The steel deck profile is 3" deep composite floor deck with a thickness of 20 gauge (0.0358"). Figure 1 (Section 3.2.1.6) shows the nominal flute dimensions, fastener locations and load orientations for the deck profile.
- Structural lightweight concrete fill above top of metal deck shall be a minimum of 3-1/4" deep.
- Multiple fasteners are recommended for any attachment.

Allowable Loads in Concrete Masonry Units^{1,2,3,4,5,8}

Fastener description	Fastener	Shank diameter in. (mm)	Minimum embedment in. (mm)	Hollow CMU				Grout filled CMU			
				Face shell ⁶		Mortar joint ⁶		Face shell ⁶		Mortar joint ⁶	
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear ⁷ lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear ⁷ lb (kN)
1/4-20 Threaded Stud	X-W6	0.145 (3.7)	1 (25)	105 (0.47)	175 (0.78)	80 (0.36)	110 (0.49)	125 (0.56)	175 (0.78)	135 (0.60)	150 (0.67)

- The tabulated allowable load values are for the low-velocity fastener only, using a safety factor of 5.0 or higher. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.
- The tabulated allowable load values are for low-velocity fasteners installed in normal weight or lightweight concrete masonry units conforming to ASTM C90.
- The tabulated allowable load values are for low-velocity fasteners installed in concrete masonry units with mortar conforming to ASTM C270, Type N.
- The tabulated allowable load values are for low-velocity fasteners installed in concrete masonry units with grout conforming to ASTM C476, as coarse grout.
- The tabulated allowable load values are for one low-velocity fastener installed in an individual masonry unit cell and at least 4" from the edge of the wall.
- Fastener can be located anywhere on the face shell or mortar joint as shown in the figure to the right.
- Shear direction can be horizontal or vertical (Bed Joint or T-Joint) along the CMU wall plane.
- Multiple fasteners are recommended for any attachment.



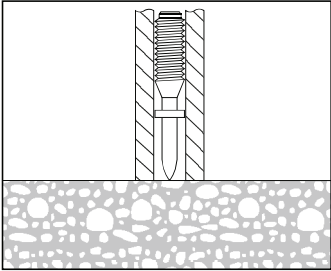
Acceptable locations (NON-SHADED AREAS) for threaded studs in CMU walls

Allowable bending moments for threaded stud fasteners installed in minimum 2,000 psi concrete^{1,2}

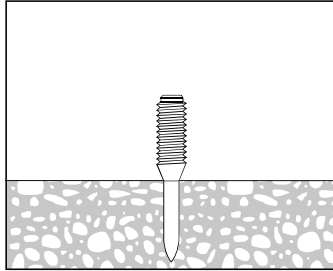
Fastener designation	M_{rec} ft-lb (Nm)
X-W6	3.6 (4.9)
W10	10.0 (13.6)

- Based on a safety factor greater than or equal to 2.0.
- For more information on bending moments, reference Section 3.2.2.7.

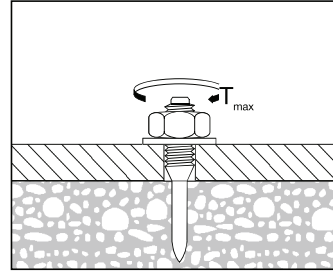
3.2.11.4 INSTALLATION INSTRUCTIONS*



1. Press tip of fastener to concrete base material. Drive fastener with Hilti powder-actuated tool.



2. Ensure proper threaded stud embedment.



3. Make attachment. Do not exceed Maximum Tightening Torque, T_{max} .

* These are abbreviated instructions which may vary by application. **ALWAYS** review/follow the instructions accompanying the product.

Maximum tightening torque, T_{max} , for threaded studs driven into concrete, ft-lb (Nm)

Stud type	
X-W6	W10
3.0 (4.0)	4.5 (6.0)

3.2.11.5 ORDERING INFORMATION

Fastener description	Shank length in. (mm)	Shank Ø in. (mm)	Thread length in. (mm)	Thread Ø	Guidance washer Ø	Packaging quantity
X-W6-20-22 FP8	7/8 (22)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch	8 mm plastic	100 pcs
X-W6-20-27 FP8	1 (27)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch	8 mm plastic	100 pcs
X-W6-38-27 FP8	1 (27)	0.145 (3.7)	1-1/2 (38)	UNC 1/4-inch	8 mm plastic	100 pcs
W10-30-27 P10	1 (27)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch	10 mm plastic	100 pcs
W10-30-32 P10	1-1/4 (32)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch	10 mm plastic	100 pcs
W10-30-42 P10	1-5/8 (42)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch	10 mm plastic	100 pcs



X-W6



W10*

* W10 threaded stud installation requires a 10mm fastener base plate.

Fasteners

Anchors, expansion shields, concrete inserts, explosive-driven fasteners and threaded head screws provide anchorage to building structural members for supporting pipe hangers. See PIPE HANGER listing for other components and minimum rod sizes. Unless specifically noted in the listing, the following fasteners are FM Approved for vertical installation only.

Explosive-Driven Fasteners

Explosive-driven fasteners provide anchorage to concrete or steel building members for supporting pipe hangers. The powder-actuated tool used for driving these fasteners may represent an ignition source; therefore, it should not be used in classified hazardous locations or near easily ignited materials. Fasteners should not be used for support of pipe hangers to structural members in Earthquake Zones 500 or less as defined by FM Global Property Loss Prevention Data Sheet 1-2.

A coupling and locknut are provided with each fastener for attaching a pipe hanger to the fastener.

Explosive-Driven Fasteners

<i>Fastener, Cat. No.</i>	<i>Coupling, Cat. No.</i>	<i>For Use In</i>	<i>Max Pipe Size, in. (mm)</i>
W10-30-27P10	D1025	Concrete	2 (51)
W10-30-27P10	ACI-F	"	3 1/2 (89)
W10-30-27P10	ACI-H	"	5 (127)
W10-30-32P10	D1025	"	2 (51)
W10-30-32P10	ACI-F	"	3 1/2 (89)
W10-30-32P10	ACI-H	"	5 (127)
W10-30-42P10	D1025	"	2 (51)
W10-30-42P10	ACI-F	"	3 1/2 (89)
W10-30-42P10	ACI-H	"	5 (127)
W10-30-47P10	D1025	"	2 (51)
W10-30-47P10	ACI-F	"	3 1/2 (89)
W10-30-47P10	ACI-H	"	5 (127)
EW10-30-15P10	D1025	Steel	2 (51)
EW10-30-15P10	ACI-F	"	3 1/2 (89)
EW10-30-15P10	ACI-H	"	5 (127)

<i>Fastener, Cat. No.</i>	<i>Rod Size, in.</i>	<i>For Use In</i>	<i>Max Pipe Size, in. (mm)</i>
X-EW6H-11-9 FP8	1/4	Steel	3 1/2 (89)
X-EW6H-11-9 P12	1/4	Steel	3 1/2 (89)
X-EW6H-20-9 FP8	1/4	Steel	3 1/2 (89)
X-EW6H-20-9 P12	1/4	Steel	3 1/2 (89)
X-EW6H-28-9 FP8	1/4	Steel	3 1/2 (89)
X-EW6H-28-9 P12	1/4	Steel	3 1/2 (89)
X-EW6H-38-9 FP8	1/4	Steel	3 1/2 (89)
X-EW6H-38-9 P12	1/4	Steel	3 1/2 (89)
X-HS W6 U19 P8 S15	1/4	Steel	3 1/2 (89)
X-HS W10 U19 P8 S15	3/8	Steel	5 (127)
X-EW10H-30-14 P10	3/8	Steel	5 (127)

These fasteners are also FM Approved for horizontal installation. Max pipe size 3 1/2 in. (89 mm).

Company Name:	Hilti Inc
Company Address:	5400 S 122nd East Ave, Tulsa, Oklahoma 74146, USA
Company Website:	http://www.hilti.com
New/Updated Product Listing:	No
Listing Country:	United States of America
Certification Type:	FM Approved



THREADED IRON

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[GROOVED FITTINGS](#)
[THREADED IRON](#)
[BALL VALVES](#)
[FASTENERS](#)


CAST IRON

- Available in sizes from 1" to 2½", Class 125 Standard
- **UL / FM Approved** at 300 psi

• Air Tested

MALLEABLE IRON

- Available in sizes from 1/8" to 6", Class 150
- **UL / FM Approved** at 300 psi
- Air Tested

DUCTILE IRON

- Available in sizes from 1/2" to 2", Class 150 Standard DI
- **UL / FM Approved** at 500 psi



TITUS

MALLEABLE IRON THREADED PRODUCTS TECHNICAL BULLETINS

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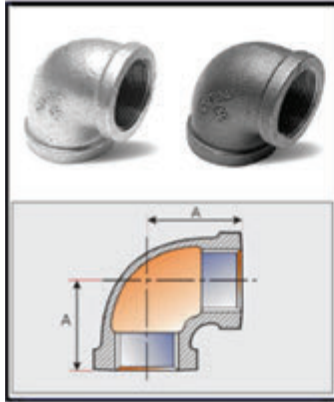
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MALLEABLE IRON THREADED PRODUCTS

ELBOWS 90°

AL 90, BL 90

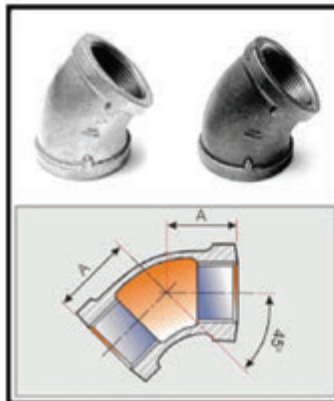


Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	17.5	50	600	12	0.0306	18
1/4	20.6	35	420	12	0.0515	22
3/8	24.1	90	360	4	0.0710	26
1/2	28.4	50	200	4	0.1195	24
3/4	33.3	35	105	3	0.1865	20
1	38.1	20	60	3	0.2838	17
1 1/4	44.5	20	40	2	0.4504	18
1 1/2	49.3	15	30	2	0.5736	17
2	57.2	8	16	2	0.8932	14
2 1/2	68.6	-	12	1	1.4816	18
3	78.2	-	8	1	2.2560	20
3 1/2	86.9	-	4	1	3.1930	13
4	96.3	-	2	1	4.2200	8
5	114.3	-	2	1	6.7980	14
6	132.0	-	1	1	8.8690	9

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

ELBOWS 45°

AL 45, BL 45

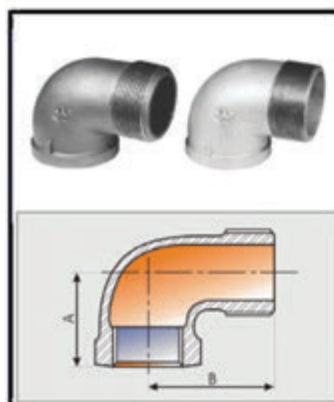


Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	16.0	50	600	12	0.0245	15
1/4	18.5	30	360	12	0.0464	17
3/8	20.3	75	300	4	0.0676	20
1/2	22.3	50	200	4	0.1024	20
3/4	24.9	40	120	3	0.1628	20
1	28.4	20	60	3	0.2503	15
1 1/4	32.8	20	40	2	0.3467	14
1 1/2	36.3	10	30	3	0.5098	15
2	42.7	12	24	2	0.8008	19
2 1/2	49.5	-	12	1	1.2640	15
3	55.1	-	10	1	1.9436	19
4	66.3	-	4	1	3.4280	14
5	77.5	-	2	1	4.8500	10
6	87.9	-	1	1	6.7660	7

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

STREET ELBOWS 90°

ASL 90, BSL 90



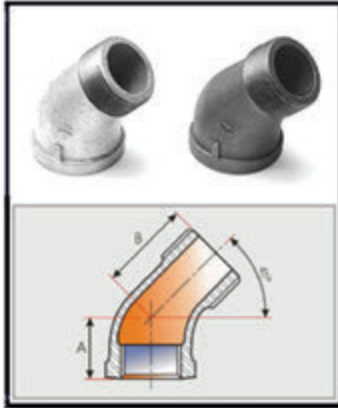
Size (inch)	Dimensions A	Dimensions B	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	17.5	25.4	60	720	12	0.0256	18
1/4	20.6	30.2	35	420	12	0.0440	18
3/8	24.1	36.6	60	240	4	0.0720	17
1/2	28.4	41.4	60	180	3	0.1070	19
3/4	33.3	48.0	35	105	3	0.1740	18
1	38.1	54.3	45	90	2	0.2693	24
1 1/4	44.5	62.2	25	50	2	0.4216	21
1 1/2	49.3	68.3	9	27	3	0.5734	15
2	57.2	82.8	8	16	2	1.0092	16
2 1/2	68.6	98.0	5	10	2	1.6400	16
3	78.2	114.5	-	8	1	2.4160	19
4	96.3	144.5	-	4	1	4.2400	17
5	114.3	174.2	-	1	1	5.5000	6
6	130.3	204.0	-	1	1	12.3666	12

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

STREET ELBOWS 45°

ASL 45, BSL 45



Size (inch)	Dimensions		Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
	A	B					
1/8	16.0	21.0	70	840	12	0.0243	20
1/4	18.5	23.9	40	480	12	0.0395	19
3/8	20.3	26.2	100	400	4	0.0582	23
1/2	22.3	33.0	75	225	3	0.0996	22
3/4	24.9	37.5	40	120	3	0.1436	17
1	28.4	43.0	25	75	3	0.2540	19
1 1/4	32.8	47.4	10	40	4	0.3546	14
1 1/2	36.3	51.7	10	30	3	0.5104	15
2	42.7	60.4	12	24	2	0.7944	19
2 1/2	49.5	69.0	6	12	2	1.3512	16
3	55.1	80.2	3	6	2	2.1280	13
4	66.3	99.0	-	4	1	3.3770	14

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

CROSSES

ACR, BCR

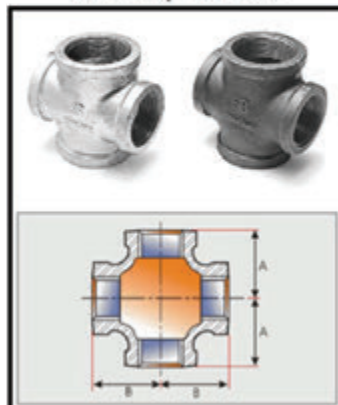


Size (inch)	Dimensions A	Inner Box B	Master Ctn. Pcs./Box	NO. of Pcs./Ctn.	Weight/Pcs. Inner Box	N.W./Ctn. (Kgs.)
1/8	17.5	30	360	12	0.0520	19
1/4	20.6	60	240	4	0.0881	21
3/8	24.1	50	150	3	0.1310	20
1/2	28.4	30	90	3	0.1980	18
3/4	33.3	20	60	3	0.3006	18
1	38.1	15	30	2	0.4642	14
1 1/4	44.5	10	20	2	0.7200	14
1 1/2	49.3	8	16	2	0.9384	15
2	57.2	5	10	2	1.4200	14
2 1/2	68.6	3	6	2	2.4520	15
3	78.2	2	4	2	3.7440	15
4	96.3	1	2	2	6.2900	13

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

REDUCING CROSSES

ARCR, BRRCR



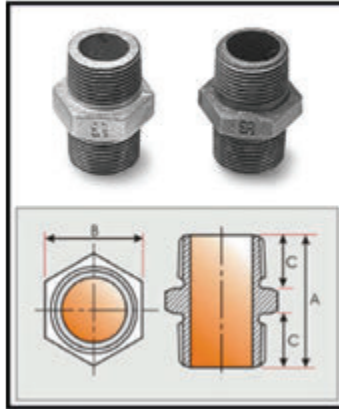
Size (inch)	Dimensions		Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
	A	B					
1 1/2 X 1 1/4	46.2	47.8	9	18	2	0.9060	16
2 X 1 1/4	48.3	53.3	5	10	2	1.1380	11
2 1/2 X 1 1/4	52.0	62.0	4	8	2	1.4510	12
2 1/2 X 1 1/2	56.0	63.0	4	8	2	1.5430	12

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

NIPPLES

NI

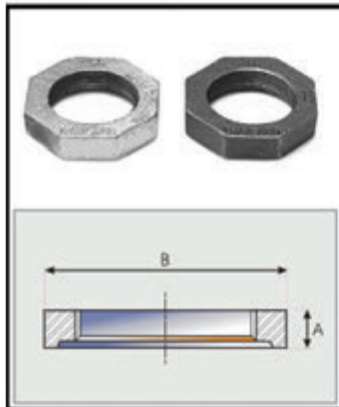


Size (inch)	Dimensions			Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
	A	B	C					
1/8	32	14	11.0	240	960	4	0.0220	21
1/4	34	17	12.0	200	800	4	0.0260	21
3/8	36	21	13.0	150	600	4	0.0410	25
1/2	45	27	18.5	80	320	4	0.0692	22
3/4	48	32	19.5	60	180	3	0.1056	20
1	53	38	21.5	40	120	3	0.1560	19
1 1/4	56	48	23.0	35	70	2	0.2226	19
1 1/2	60	55	24.0	25	50	2	0.3360	17
2	70	70	28.0	18	36	2	0.6112	22
2 1/2	76	85	31.0	10	20	2	0.8636	17
3	84	100	34.0	6	12	2	1.2865	15
4	95	130	38.5	3	6	2	1.8512	11

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

LOCKNUTS

ALN, LN

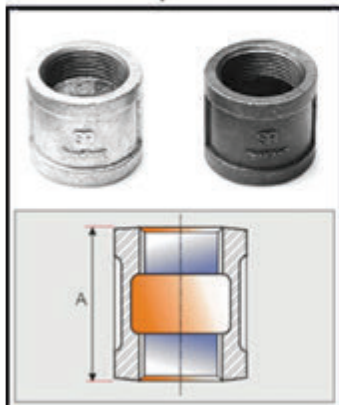


Size (inch)	Dimensions		Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
	A	B					
1/8	5.0	17.5	250	3000	12	0.0080	24
1/4	6.6	21.3	125	1500	12	0.0117	18
3/8	7.3	25.4	125	1500	12	0.0150	23
1/2	8.1	30.0	150	600	4	0.0387	23
3/4	8.8	36.3	90	360	4	0.0526	19
1	9.9	44.5	60	240	4	0.0826	20
1 1/4	10.9	53.3	45	180	4	0.1220	22
1 1/2	12.1	59.7	45	135	3	0.2084	28
2	13.7	73.2	25	75	3	0.2680	19
2 1/2	15.2	98.0	20	40	2	0.5150	21
3	17.2	117.3	20	40	2	0.6090	24
4	20.5	147.1	7	14	2	0.7530	11

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

COUPLINGS

AS, BS



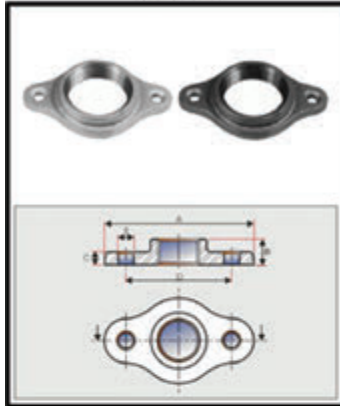
Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	24.4	70	840	12	0.0250	21
1/4	26.9	40	480	12	0.0399	19
3/8	29.5	40	480	12	0.0574	28
1/2	34.0	60	240	4	0.0920	22
3/4	38.6	50	150	3	0.1330	20
1	42.4	25	100	4	0.2077	21
1 1/4	49.0	16	64	4	0.3164	20
1 1/2	54.6	18	36	2	0.4196	15
2	64.3	12	24	2	0.6556	16
2 1/2	73.2	8	16	2	1.0320	17
3	80.8	-	12	1	1.6377	20
4	93.7	3	6	2	2.6060	16

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

WASTENUTS

AWN

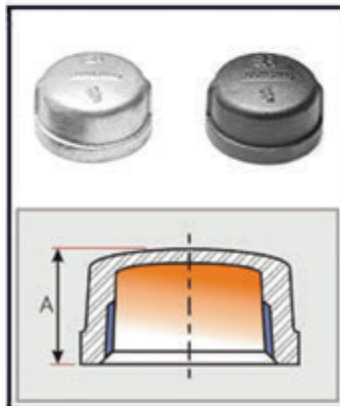


Size (inch)	Dimensions					Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight./Pcs	N.W./Ctn. (Kgs.)
	A	B	C	D	E					
1/2	62.0	6.0	4.4	46.0	6.0	90	360	4	0.0540	19
3/4	73.0	10.5	5.0	54.0	7.3	80	240	3	0.0800	19
1	84.1	11.2	4.8	65.1	7.2	50	200	4	0.0960	19
1 1/4	100.0	12.7	5.6	77.8	8.7	30	120	4	0.1450	17
1 1/2	109.5	14.3	6.4	87.3	8.7	50	100	2	0.1890	19
2	130.2	16.0	7.2	104.8	8.7	30	60	2	0.2850	17

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

CAPS

ACA, BCA

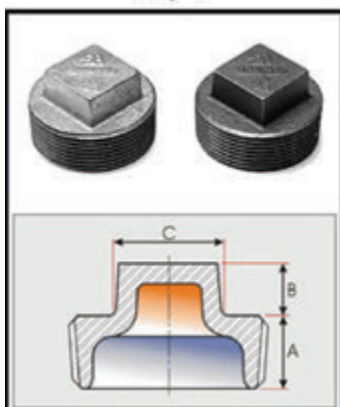


Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	13.5	120	1440	12	0.0161	23
1/4	16.0	80	960	12	0.0245	24
3/8	18.8	60	720	12	0.0347	25
1/2	22.1	75	300	4	0.0575	17
3/4	24.6	40	160	4	0.0966	15
1	29.5	25	100	4	0.1424	14
1 1/4	32.5	20	80	4	0.2008	16
1 1/2	33.8	18	54	3	0.2528	14
2	36.8	12	36	3	0.4220	15
2 1/2	43.2	20	40	2	0.7270	29
3	45.7	-	24	1	1.0684	26
3 1/2	48.3	6	12	2	1.4680	18
4	52.8	6	12	2	1.7672	21

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

PLUGS

AP, P



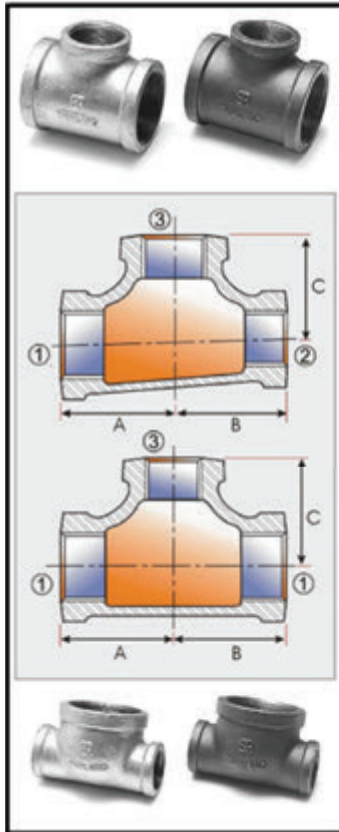
Size (inch)	Dimensions			Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
	A	B	C					
1/8	9.8	6.1	7.1	300	3,600	12	0.0058	21
1/4	11.6	7.1	9.5	150	1,800	12	0.0149	27
3/8	12.6	8.0	11.0	100	1,200	12	0.0220	26
1/2	14.7	9.7	14.3	50	600	12	0.0414	22
3/4	16.5	11.2	15.9	30	360	12	0.0660	21
1	19.1	12.7	20.9	20	240	12	0.1100	22
1 1/4	20.9	14.2	23.8	40	120	3	0.1840	21
1 1/2	21.7	15.8	28.6	30	90	3	0.2500	20
2	23.2	17.3	33.3	20	60	3	0.3840	21
2 1/2	32.0	18.8	38.1	16	32	2	0.5091	16
3	29.4	20.3	42.9	16	32	2	0.7532	24
4	31.0	25.4	58.0	6	12	2	1.4873	18

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

REDUCING TEES

ART, BRT



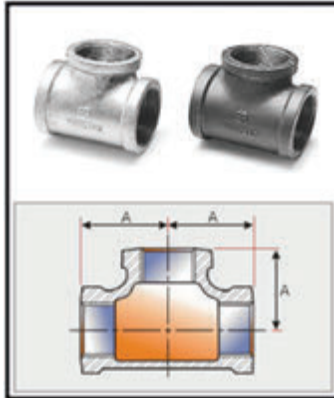
Size 1 x 2 x 3 (inch)	Dimensions A B C			Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/4 X 1/8	18.8	18.8	19.3	25	300	12	0.0601	18
3/8 X 1/8	22.4	20.6	21.6	90	360	4	0.0730	26
3/8 X 1/4	22.4	22.4	22.9	60	240	4	0.0979	23
1/2 X 1/8	21.9	21.9	23.5	40	160	4	0.1080	17
1/2 X 1/4	24.6	24.6	24.9	40	160	4	0.1248	20
1/2 X 3/8	25.9	25.9	25.7	40	160	4	0.1350	22
3/4 X 1/8	24.0	24.0	25.7	32	128	4	0.1520	19
3/4 X 1/4	26.7	26.7	27.4	25	100	4	0.1746	17
3/4 X 3/8	27.9	27.9	28.1	25	100	4	0.1800	18
3/4 X 1/2	29.9	29.9	30.4	20	80	4	0.2239	18
1 X 1/4	27.6	27.6	30.4	20	80	4	0.2398	19
1 X 3/8	30.0	30.0	32.3	15	60	4	0.2730	16
1 X 1/2	31.4	31.4	34.8	15	60	4	0.3060	18
1 X 3/4	34.8	34.8	36.8	12	48	4	0.3484	17
1 1/4 X 1/4	30.0	30.0	36.6	20	40	2	0.3450	14
1 1/4 X 3/8	32.0	32.0	36.6	20	40	2	0.4009	16
1 1/4 X 1/2	34.0	34.0	38.9	20	40	2	0.4206	17
1 1/4 X 3/4	36.8	36.8	41.2	20	40	2	0.4719	19
1 1/4 X 1	40.1	40.1	42.2	20	40	2	0.5369	21
1 1/2 X 3/8	40.1	40.1	40.2	18	36	2	0.4450	16
1 1/2 X 1/2	35.8	35.8	42.2	18	36	2	0.4840	17
1 1/2 X 3/4	35.8	35.8	44.5	15	30	2	0.5320	16
1 1/2 X 1	41.9	41.9	45.7	10	30	3	0.6168	19
1 1/2 X 1 1/4	41.9	41.9	47.8	12	24	2	0.6906	17
2 X 3/8	46.2	46.2	-	10	20	2	0.6600	13
2 X 1/2	37.9	37.9	47.8	10	20	2	0.6768	14
2 X 3/4	40.6	40.6	50.0	10	20	2	0.7980	16
2 X 1	43.9	43.9	51.3	10	20	2	0.8096	16
2 X 1 1/4	47.3	47.3	52.2	8	16	2	0.9056	14
2 X 1 1/2	50.3	50.3	53.8	8	16	2	1.0662	17
2 1/2 X 1/2	40.2	40.2	55.9	6	12	2	1.2800	3
2 1/2 X 3/4	44.2	44.2	58.9	6	12	2	1.2680	15
2 1/2 X 1	46.5	46.5	59.0	5	10	2	1.3776	14
2 1/2 X 1 1/4	47.5	47.5	62.2	5	10	2	1.4808	15
2 1/2 X 1 1/2	54.9	54.9	63.8	5	10	2	1.5068	15
2 1/2 X 2	60.7	60.7	66.0	4	8	2	1.7044	14
3 X 1/2	46.5	46.5	65.0	4	8	2	1.7130	14
3 X 3/4	45.5	45.5	65.3	3	6	2	1.3280	8
3 X 1	50.8	50.8	67.6	3	6	2	1.9765	12
3 X 1 1/4	55.1	55.1	69.6	3	6	2	1.6976	10
3 X 1 1/2	58.2	58.2	71.1	3	6	2	2.1740	13
3 X 2	64.0	64.0	73.4	3	6	2	2.3873	14
3 X 2 1/2	71.9	71.9	76.0	3	6	2	2.7200	16
4 X 1/2	53.5	53.5	79.2	2	4	2	2.5000	10
4 X 3/4	53.5	53.5	79.2	2	4	2	2.7500	11
4 X 1	-	-	-	2	4	2	3.0466	12
4 X 1 1/4	61.0	61.0	86.5	2	4	2	3.1120	12
4 X 1 1/2	62.5	62.5	82.6	2	4	2	3.4200	14
4 X 2	68.2	68.2	84.9	-	3	1	3.6770	11
4 X 2 1/2	77.5	77.5	89.2	-	3	1	4.1900	13
4 X 3	82.1	82.1	89.6	1	2	2	4.1920	8

THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

TEES

AT, BT

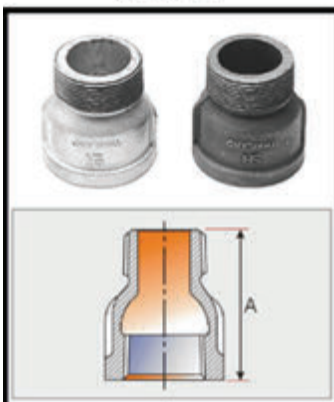


Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/8	17.5	120	480	4	0.0452	22
1/4	20.6	75	300	4	0.0702	21
3/8	24.1	45	180	4	0.1087	20
1/2	28.4	40	120	3	0.1686	20
3/4	33.3	35	70	2	0.2542	18
1	38.1	20	40	2	0.3998	16
1 1/4	44.5	14	28	2	0.6020	17
1 1/2	49.3	12	24	2	0.7254	17
2	57.2	8	16	2	1.2100	19
2 1/2	68.6	4	8	2	2.2133	18
3	78.2	-	6	1	2.9500	18
4	96.3	1	2	2	5.2920	11
5	114.3	-	1	1	9.1200	9
6	132.0	-	1	1	11.8133	12

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

EXTENSION

AX, BX

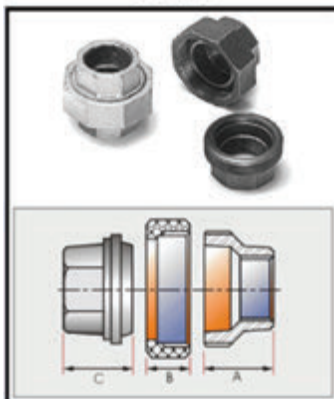


Size (inch)	Dimensions A	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
3/8	32	40	480	12	0.0480	23
1/2	40	75	300	4	0.0712	5
3/4	48	40	160	4	0.1400	20
1	55	30	90	3	0.1892	17
1 1/4	60	30	60	2	0.2872	17
1 1/2	65	20	40	2	0.3902	16
2	70	15	30	2	0.5990	18

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

UNIONS CONICAL IRON TO IRON SEAT

U340



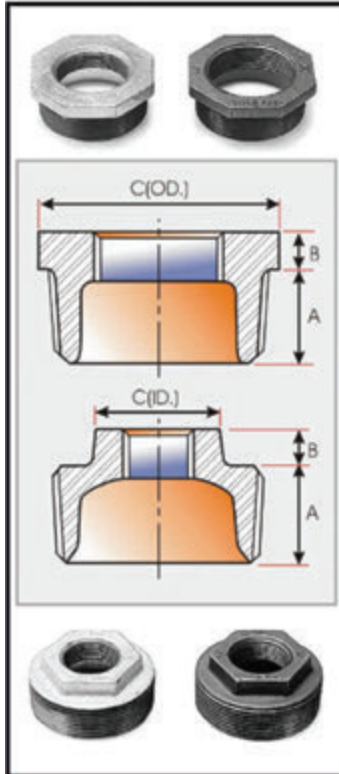
Size (inch)	Dimensions A	Dimensions B	Dimensions C	Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
1/2	26.0	19.0	30.0	50	100	2	0.1990	20
3/4	28.0	20.0	30.5	35	70	2	0.2860	20
1	31.0	22.0	34.0	20	40	2	0.3480	14
1 1/4	33.0	24.0	40.0	15	30	2	0.6040	18
1 1/2	36.0	25.0	42.5	10	20	2	0.7180	14
2	42.0	27.0	46.0	6	12	2	1.0740	13
2 1/2	44.0	33.5	51.5	4	8	2	2.0000	16

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$

MALLEABLE IRON THREADED PRODUCTS

BUSHINGS

ABU, BU



Size (inch)	Dimensions				Inner Box Pcs./Box	Master Ctn. Pcs./Ctn.	NO. of Inner Box	Weight/Pcs.	N.W./Ctn. (Kgs.)
A	B	C(id)	C(od)						
1/4 X 1/8	13.2	3.8	-	16.3	120	1440	12	0.0130	19
3/8 X 1/8	12.2	4.1	-	21.6	75	900	12	0.0250	23
3/8 X 1/4	12.2	4.1	-	21.1	75	900	12	0.0201	18
1/2 X 1/8	16.4	4.8	-	26.2	150	600	4	0.0492	30
1/2 X 1/4	14.2	4.8	-	26.2	150	600	4	0.0425	26
1/2 X 3/8	14.2	4.8	-	26.2	150	600	4	0.0352	21
3/4 X 1/8	16.0	5.6	-	29.2	75	300	4	0.0758	23
3/4 X 1/4	16.0	5.6	-	29.2	75	300	4	0.0616	18
3/4 X 3/8	16.0	5.6	-	29.2	75	300	4	0.0524	16
3/4 X 1/2	18.0	5.6	-	29.2	75	300	4	0.0500	15
1 X 1/8	19.1	9.6	28.5	-	50	200	4	0.0938	19
1 X 1/4	19.1	9.6	28.5	-	50	200	4	0.0910	18
1 X 3/8	19.1	9.6	28.5	-	50	200	4	0.0862	17
1 X 1/2	21.6	6.4	-	36.1	50	200	4	0.1044	21
1 X 3/4	21.6	6.4	-	36.1	50	200	4	0.0844	17
1 1/4 X 1/4	22.8	8.6	28.5	-	30	120	4	0.1338	16
1 1/4 X 3/8	22.8	8.6	28.5	-	30	120	4	0.1200	14
1 1/4 X 1/2	22.8	8.6	31.5	-	30	120	4	0.1474	18
1 1/4 X 3/4	20.3	7.1	-	44.7	30	120	4	0.1864	22
1 1/4 X 1	20.3	7.1	-	44.7	30	120	4	0.1350	16
1 1/2 X 1/8	21.1	9.4	28.4	-	25	75	3	0.2950	22
1 1/2 X 1/4	23.6	9.4	28.5	-	25	75	3	0.1790	13
1 1/2 X 3/8	23.6	9.4	28.5	-	25	75	3	0.1740	13
1 1/2 X 1/2	23.6	9.4	34.0	-	25	75	3	0.1936	15
1 1/2 X 3/4	23.6	9.4	36.5	-	25	75	3	0.1892	14
1 1/2 X 1	23.3	7.9	-	50.8	25	75	3	0.2160	16
1 1/2 X 1 1/4	23.3	7.9	-	50.8	25	75	3	0.1471	11
2 X 1/4	21.8	10.6	28.5	-	20	60	3	0.2732	16
2 X 3/8	22.4	10.0	28.5	-	20	60	3	0.2784	26
2 X 1/2	24.9	10.4	34.0	-	20	60	3	0.2832	17
2 X 3/4	24.9	10.4	41.4	-	20	60	3	0.3150	19
2 X 1	24.9	10.4	45.0	-	20	60	3	0.3080	18
2 X 1 1/4	27.0	11.0	-	63.0	20	60	3	0.3840	23
2 X 1 1/2	27.0	11.0	-	63.0	20	60	3	0.3155	19
2 1/2 X 1/2	27.2	11.2	34.0	-	15	30	2	0.7130	21
2 1/2 X 3/4	27.2	11.2	41.4	-	15	30	2	0.4328	13
2 1/2 X 1	27.2	11.2	49.5	-	15	30	2	0.4576	14
2 1/2 X 1 1/4	27.2	11.2	60.7	-	15	30	2	0.4973	15
2 1/2 X 1 1/2	27.2	11.2	-	75.7	15	30	2	0.6208	19
2 1/2 X 2	29.7	9.4	-	75.7	15	30	2	0.4460	13
3 X 1/2	28.7	12.2	34.0	-	12	24	2	1.0100	24
3 X 3/4	28.7	12.2	41.4	-	12	24	2	0.6180	15
3 X 1	28.7	12.2	49.5	-	12	24	2	0.6536	16
3 X 1 1/4	28.7	12.2	60.7	-	12	24	2	0.7950	19
3 X 1 1/2	28.7	12.2	68.1	-	12	24	2	0.7576	18
3 X 2	28.7	12.2	-	98.0	12	24	2	0.9220	22
3 X 2 1/2	28.7	12.2	-	98.0	12	24	2	0.8360	20
3 1/2 X 1 1/2	30.0	13.2	70.0	-	8	16	2	1.0000	16
3 1/2 X 2	33.0	13.2	83.3	-	8	16	2	1.1500	18
3 1/2 X 3	30.0	10.9	-	117.3	8	16	2	0.8488	14
4 X 1/2	39.8	14.2	-	121.0	5	10	2	1.6600	17
4 X 3/4	38.0	13.0	-	121.0	5	10	2	1.4650	15
4 X 1	31.0	15.2	-	-	5	10	2	1.1620	12
4 X 1 1/4	31.0	15.2	60.7	-	5	10	2	1.3712	14
4 X 1 1/2	31.0	15.2	68.1	-	5	10	2	1.0866	11
4 X 2	36.0	15.2	83.3	-	5	10	2	1.3592	14
4 X 2 1/2	31.0	15.2	98.0	-	5	10	2	1.5376	15
4 X 3	37.0	14.0	-	126.0	5	10	2	1.6804	17

* THE ACTUAL WEIGHT CAN VARY BY $\pm 3\%$



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BAND HANGERS



NFPA SWIVEL RING HANGER

FIG. 141 & 141F

Function: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Captured knurled insert nut present on pipe sizes $\frac{1}{2}$ " (15mm) to 2" (50mm). The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but preventing the knurled insert nut from falling completely out. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

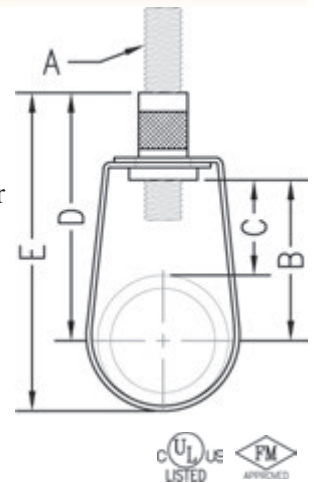
Material: Carbon steel

Finish: Pre-galvanized (**Fig. 141**) or pre-galvanized with felt lining (**Fig. 141F**)

Approvals: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for use with standard steel pipe sizes $\frac{3}{4}$ " (20mm) to 8" (200mm) and CPVC pipe size $\frac{3}{4}$ " (20mm) to 4" (100mm). Factory Mutual Approved for steel pipe sizes $\frac{3}{4}$ " (20mm) to 8" (200mm). Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 10) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: If ordering Fig. 141F felt lined hangers for pipe sizes of $3\frac{1}{2}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining. Metric knurl insert nuts available upon request.



Pipe Size		Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
$\frac{1}{2}$	(15)	$\frac{3}{8}$	$\frac{17}{8}$	(47.63)	$\frac{17}{16}$	(36.51)	$2\frac{3}{4}$	(69.85)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.10	(.05)
$\frac{3}{4}$	(20)	$\frac{3}{8}$	$1\frac{11}{16}$	(42.86)	$1\frac{1}{8}$	(28.58)	$2\frac{1}{2}$	(63.50)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.10	(.05)
1	(25)	$\frac{3}{8}$	$1\frac{5}{8}$	(41.28)	1	(25.40)	$2\frac{1}{2}$	(63.50)	$3\frac{3}{16}$	(80.96)	300	(1.33)	.10	(.05)
$1\frac{1}{4}$	(32)	$\frac{3}{8}$	$1\frac{15}{16}$	(49.21)	$1\frac{1}{16}$	(26.99)	$2\frac{13}{16}$	(71.44)	$3\frac{9}{16}$	(90.49)	300	(1.33)	.11	(.05)
$1\frac{1}{2}$	(40)	$\frac{3}{8}$	$2\frac{1}{8}$	(53.98)	$1\frac{1}{16}$	(26.99)	$3\frac{1}{8}$	(79.38)	$3\frac{7}{8}$	(98.43)	300	(1.33)	.11	(.05)
2	(50)	$\frac{3}{8}$	$2\frac{7}{16}$	(61.91)	$1\frac{1}{8}$	(28.58)	$3\frac{5}{16}$	(84.14)	$4\frac{3}{8}$	(111.13)	300	(1.33)	.14	(.06)
$2\frac{1}{2}$	(65)	$\frac{3}{8}$	$3\frac{1}{16}$	(77.79)	$1\frac{5}{8}$	(41.28)	$3\frac{15}{16}$	(100.01)	$5\frac{3}{8}$	(136.53)	525	(2.34)	.19	(.09)
3	(80)	$\frac{3}{8}$	$3\frac{11}{16}$	(93.66)	$1\frac{7}{8}$	(47.63)	$4\frac{9}{16}$	(115.89)	$6\frac{5}{16}$	(160.34)	525	(2.34)	.23	(.10)
$3\frac{1}{2}$	(90)	$\frac{3}{8}$	$3\frac{3}{4}$	(95.25)	$1\frac{7}{8}$	(47.63)	$4\frac{5}{8}$	(117.48)	$6\frac{5}{8}$	(168.28)	525	(2.34)	.25	(.11)
4	(100)	$\frac{3}{8}$	$4\frac{3}{16}$	(106.36)	$1\frac{7}{8}$	(47.63)	$5\frac{1}{16}$	(128.59)	$7\frac{5}{16}$	(185.74)	650	(2.89)	.30	(.14)
5	(125)	$\frac{1}{2}$	$4\frac{5}{8}$	(117.48)	$1\frac{5}{8}$	(41.28)	$5\frac{5}{8}$	(142.88)	$8\frac{3}{8}$	(212.73)	1000	(4.45)	.50	(.23)
6	(150)	$\frac{1}{2}$	$5\frac{5}{8}$	(142.88)	$2\frac{1}{4}$	(57.15)	$6\frac{1}{2}$	(165.10)	$9\frac{13}{16}$	(249.24)	1000	(4.45)	.58	(.26)
8	(200)	$\frac{1}{2}$	$6\frac{13}{16}$	(173.04)	$2\frac{7}{16}$	(61.91)	$7\frac{15}{16}$	(201.61)	$12\frac{1}{4}$	(311.15)	1000	(4.45)	.90	(.41)

BAND HANGERS



SURGE RESTRAINT

FIG. 055

Function: Designed to restrict the upward movement of activated fire sprinkler systems.

Grips ring hanger, NOT THE NUT, and allows for fine tuning adjustments. Listed for use with PHD Manufacturing, Inc. Figure 141 ring hangers only.

Material: Spring Steel

Finish: Powder Coated

Install: Installs easily before or after pipe installation and without tools. Simply clip Fig. 055 onto Fig. 141 ring hanger and run the hanger rod down to the bottom plate surface to ensure proper restraint.

Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number.

NOTE: For use up to 2" (50) pipe, one size fits all.

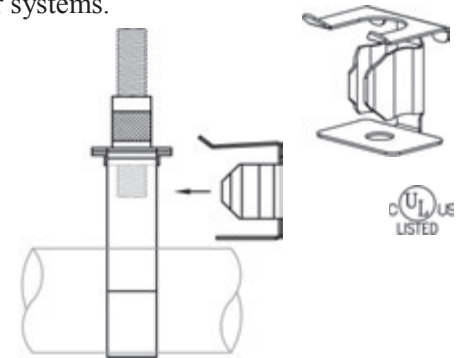


Fig. 055
(Pictured With Fig. 141)



PHD Manufacturing, Inc.

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Columbiana, Ohio 44408-9481
Phone: 800-321-2736 • 330-482-9256
Fax: 330-482-2763
Web: www.phd-mfg.com

FIG. 055 SURGE RESTRAINT

PIPE SIZES:

3/4" through 2"

FUNCTION:

Designed to restrict the upward movement of activated fire sprinkler systems. Grips ring hanger, NOT THE NUT, and allows for fine tuning adjustments. Listed for use with PHD Manufacturing, Inc. Figure 141 ring hangers only.

ORIENTATIONS:

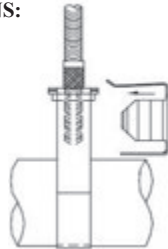


Illustration 1

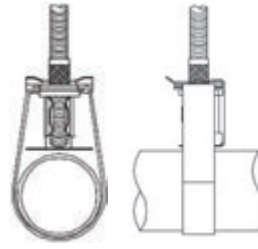


Illustration 1

APPROVALS:

Underwriters Laboratories listed for US and Canada

MATERIAL:

Spring Steel

FINISH:

Black E-Coat

INSTALLATION:

Installs easily before or after pipe installation and without tools. Simply clip Fig. 055 onto Fig. 141 ring hanger as shown above in Illustration 1. Run the hanger rod down to the bottom plate surface to ensure proper restraint as seen in Illustration 2.



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